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Q3D Extractor® Scripting Guide



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1 - Introduction to Scripting

Using scripts is a fast, effective way to accomplish tasks you want to repeat. When you execute a script, the commands in the script are performed in the order in which they appear.

Electronics Desktop can record scripts in Python, and can run external scripts written in Python. Additionally, it contains a Python command shell for executing scripts.

When running Ansys Electronics Desktop from the command line, scripts can be written in any language that provides Microsoft COM methods.

The following sections contain more information about scripting:

- [Scripting Help Conventions](#) – explains the layout of the scripting help.
- [Introduction to IronPython](#) – provides a broad overview of IronPython.
- [Introduction to C-Python](#) – provides guidance on using C-Python for Ansys Electronics Desktop scripts.
- [Ansys Electronics Desktop Scripting](#) – details instructions and tips for running, recording, and working with scripts in Electronics Desktop.
- [PyAEDT](#) (Beta) – a Python library that interacts directly with the AEDT API to make scripting simpler for the end user.

Scripting Help Conventions

The majority of this guide lists individual script commands using the following format.

[ScriptName]

[Description of script use.]

UI Access	[UI commands corresponding to the script command, if any.]
Parameters	[List of arguments taken by the script command, if any. Includes argument types and brief descriptions.]
Return Value	[The script's return value, if any.]

Python Syntax	[Correct syntax for the command in Python. Arguments are enclosed in angle brackets (<>).]
Python Example	[Sample script]

Variable Types

The following data types are used throughout the help:

- **<string>** – use within quotation marks.
- **<bool>** – boolean value; should be set to either True or False.
- **<int>** – an integer. For example, 1.
- **<double>** – a double precision value. For example, 1.2.
- **<array>** – a list contained in square brackets.
- **<value>** – can be an integer, string, or other variable, depending on context.

Introduction to IronPython

IronPython is an implementation of the Python programming language targeting the .NET runtime. What this means in practical terms is that IronPython uses the Python programming language syntax and standard python libraries and can additionally use .NET classes and objects to give one the best of both worlds. This usage of .NET classes is fairly seamless in that a class defined in a .NET assembly can be used as a base class of a python class.

Scope

Functioning as a tutorial on Python or IronPython is way out of the scope of this document. There are several excellent resources online that do a very good job in that regard. This document only attempts to provide a limited introduction to IronPython as used to script Ansys EM products.

This document is also not a tutorial on the scripting of Ansys EM products. It complements the existing scripting guide (available from a product's Help menu) and provides a pythonic interpretation of that information.

Python Compatibility

The version of IronPython in use is **2.7** and built on the .NET framework version 4.0: this version targets **Python 2.7** language compatibility. While most python files will execute under IronPython with no changes, python libraries that make use of extensions written in the C programming language (NumPy or SciPy for instance), are not expected to work under IronPython. In such cases, it might be possible to locate .NET implementation of such libraries or explore the use of IronClad.

[\(http://code.google.com/p/ironclad/\)](http://code.google.com/p/ironclad/).

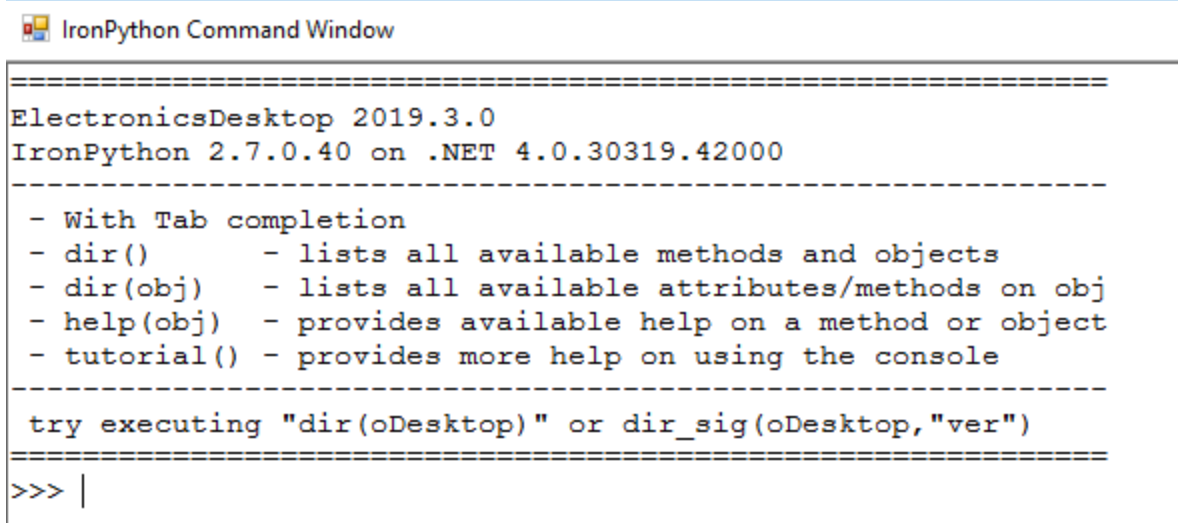
Advantages of IronPython

The advantages that IronPython use provides are significant:

- Python has a large eco-system with plenty of supporting libraries, Visual IDEs and debuggers. It is actively developed and enhanced.

- IronPython, in addition, has access to the entire .NET eco system. This allows us, for instance, to create a modern GUI using the **System.Windows.Forms** assembly from IronPython code and call any other .NET assembly for that matter.
- The use of IronPython's technologies enables the ability to interactively script Desktop (feature in development).
- The Python syntax of dictionaries is somewhat easier to read and write when supplying arguments to the scripting methods.

This document describes IronPython briefly and then goes on to describe the desktop provided IronPython scripting console and scripting with IronPython. You can open an IronPython Command Window by clicking **Tools > Open Command Window**.



```

IronPython Command Window

=====
ElectronicsDesktop 2019.3.0
IronPython 2.7.0.40 on .NET 4.0.30319.42000
=====
- With Tab completion
- dir()      - lists all available methods and objects
- dir(obj)   - lists all available attributes/methods on obj
- help(obj)  - provides available help on a method or object
- tutorial() - provides more help on using the console
=====
try executing "dir(oDesktop)" or dir_sig(oDesktop,"ver")
=====
>>> |

```

[Scripting Using Iron Python](#)

[Standalone IronPython and Desktop IronPython](#)

[IronPython Examples](#)

[Creating User Defined Primitives and User Defined Models in Python Scripts](#)

Scripting Using Iron Python

The following topics detail scripting using Iron Python:

[IronPython Script Execution Environment](#)

[Scripting with IronPython](#)

[Standalone IronPython and Desktop IronPython](#)

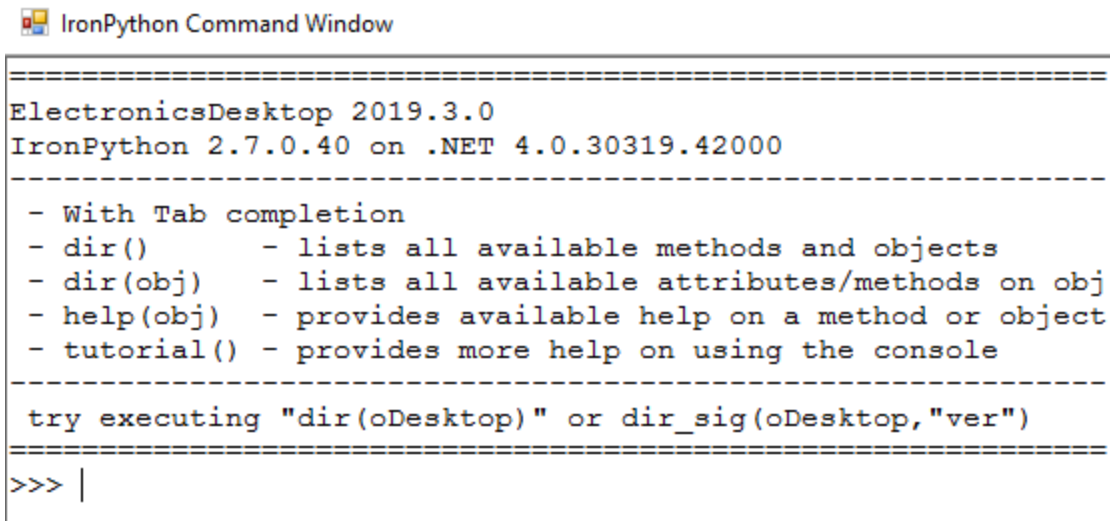
[Introduction to IronPython](#)

[Appendix: IronPython Samples](#)

IronPython Script Execution Environment

Scripts written in IronPython are executed by desktop in four different ways:

- **Tools > Open Command Window**, to open the **IronPython Command Window**:



```
IronPython Command Window

=====
ElectronicsDesktop 2019.3.0
IronPython 2.7.0.40 on .NET 4.0.30319.42000
=====

- With Tab completion
- dir()      - lists all available methods and objects
- dir(obj)   - lists all available attributes/methods on obj
- help(obj)  - provides available help on a method or object
- tutorial() - provides more help on using the console
=====

try executing "dir(oDesktop)" or dir_sig(oDesktop,"ver")
=====

>>> |
```

- **Tools > Run Script** menu item, select "IronPython" from the file type drop-down list.
- Launch the product with a script argument.
- Register an IronPython script as an external tool using the **Tools > External Tools** menu item.

When desktop executes a script, it does so in an execution environment setup with predefined variables and functions. These predefined variables and functions are how the script communicates with the desktop, and they come in four flavors addressed in the following subtopics:

[Script Argument for IronPython](#)

Script Argument for IronPython

When scripts are launched using the **Tools > Run Script** menu item, the dialog that pops up allows the user to specify arguments.

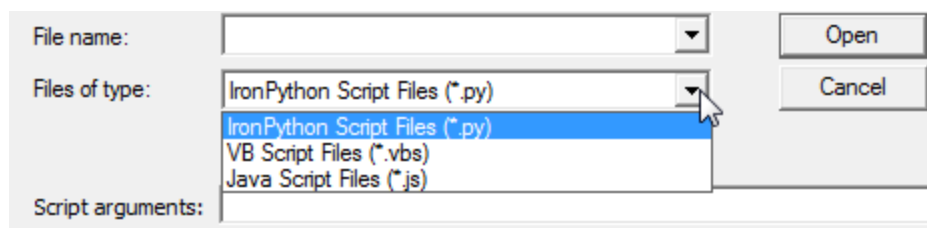


Figure 1: Run Script dialog and script arguments

Any argument specified here is communicated to the script being executed as the predefined variable **ScriptArgument**.

Related Topics

[IronPython Script Execution Environment](#)

Scripting using Embedded VBScript or JavaScript

While Ansys Electronics Desktop no longer supports VBScript or JavaScript, users may have a significant collection of VBScript or JavaScript assets. These existing script files can be executed via Python. Various **Run<*>Command** methods have been designed for this purpose.

For example, a user can create a parameterized cone in HFSS by executing the following Python script from the **Tools > Run Script** menu:

```
# assign the VBScript snippet obtained from a script recording from
HFSS to

# coneScript and replace the BottomRadius recorded value with botRa-
dius

coneScript = """Dim oAnsoftApp

Dim oDesktop

Dim oProject

Dim oDesign

Dim oEditor

Dim oModule

Set oAnsoftApp = CreateObject("Ansoft.ElectronicsDesktop")

Set oDesktop = oAnsoftApp.GetAppDesktop()

oDesktop.RestoreWindow

Set oProject = oDesktop.GetActiveProject()

oProject.InsertDesign "HFSS", "HFSSPyTestDesign", "DrivenModal", ""

Set oDesign = oProject.SetActiveDesign("HFSSPyTestDesign")

Set oEditor = oDesign.SetActiveEditor("3D Modeler")

oEditor.CreateCone Array("NAME:ConeParameters", _
    "XCenter:=", "0mm", "YCenter:=", "0mm", "ZCenter:=", "0mm", _
    "WhichAxis:=", "Z", "Height:=", "2mm", _
    "BottomRadius:=", "3mm", _
```

```
"TopRadius:=", "0mm"), Array("NAME:Attributes", "Name:=", _  
"Cone1", "Flags:=", "", "Color:=", "(132 132 193)", "Trans-  
parency:=", 0, _  
"PartCoordinateSystem:=", "Global", "UDMId:=", "", "Mater-  
ialValue:=", _  
"" & Chr(34) & "vacuum" & Chr(34) & "", "SolveInside:=", _  
true)  
""
```

```
SetScriptingLanguageToVBScript()
```

```
RunScriptCommand(coneScript, "")
```

This hybrid approach is useful when you have existing VBScript commands that you want to reuse or when you want to quickly parameterize a recorded sample, but one significant limitation of this approach is the inability to capture return values from VBScript or JavaScript calls that do return something. Full two-way communication with the product requires the use of pure Python to directly invoke the script objects.

Related Topics

[IronPython Script Execution Environment](#)

Scripting with Python

Access to application scripting objects is provided via the predefined **oDesktop** object.

Note the following:

- Any argument is supplied via the built in **ScriptArgument** variable.
- The **oDesktop** object is always available.
- Method calls have to adhere to the rule of ensuring trailing parentheses irrespective of whether the function returns anything or has any arguments.
- Any compound/block arguments should be translated to the appropriate Python array or dictionary syntax.

Related Topics

[IronPython Script Execution Environment](#)

[Standalone IronPython and Desktop IronPython](#)

Standalone IronPython

In general, it is easier to run a script directly from Electronics Desktop. Standalone IronPython does not implement all the functionality available when a script is run from Electronics Desktop. It only implements full support for COM functions.

Running Standalone IronPython

Standalone IronPython uses COM to get the handle to the AnsysEDT app. To run standalone IronPython, you'll need to call the IronPython interpreter `ipy64.exe`.

It is located in:

```
\\<AnsysEDTInstallationPath>\common\IronPython\ipy64.exe
```

For example, to run `myScript.py`, type the following in the command line:

```
"C:\Program Files\ANSYS Inc\v252\AnsysEM\common\IronPython\ipy64.exe"  
"<filePath>\myScript.py"
```

You can set the interpreter to be the default program when double-clicking the `.py` script. You can use any recorded script as the basis for a standalone script and simply add an installation-internal path to the python module search path (as shown below) and end the script with a new shutdown call.

Using a Recorded Script

A python script recorded in AnsysEDT already has the required lines to be run as a standalone, except for the first two lines (path settings) and the final `Shutdown()` call. See the [example script](#) below.

Creating an External Script

When creating a script outside of Electronics Desktop, the following lines should be included at the beginning of your script:

- `import sys`
`# Imports the sys module containing system-specific functions native to IronPython.`
- `sys.path.append("<InstallationPath>")`
`# Adds the Electronics Desktop installation path to the list of directories Python searches for modules and files.`
- `sys.path.append("<InstallationPath>/PythonFiles/DesktopPlugin")`
`# Adds the PythonFiles/DesktopPlugin subfolder to the list of directories Python searches for modules and files.`
- `import ScriptEnv`
`# This imports ScriptEnv.py from the installation path specified above. ScriptEnv.py performs an operating system check and defines functions used in Electronics Desktop scripts. See the annotations in the ScriptEnv.py file for more information.`
- `ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")`
`or ScriptEnv.InitializeNew(NonGraphical=True)`

`# Initialize` and `InitializeNew` are functions within `ScriptEnv.py`. The first option launches Electronics Desktop. The second allows you to run a script without launching Electronics Desktop. See the annotations in the `ScriptEnv.py` file for more information.

You must end the script with:

- `ScriptEnv.Shutdown()`

`# This stops ScriptEnv.py`. If you are running multiple scripts, include this only at the end of the last script.

Example Script

```
import sys

sys.path.append(r"C:\Program Files\ANSYS Inc\v252\AnsysEM")

sys.path.append(r"C:\Program Files\ANSYS Inc\v252\An-
sysEM\PythonFiles\DesktopPlugin")

import ScriptEnv

ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")

oDesktop.RestoreWindow()

oProject = oDesktop.NewProject()

oProject.InsertDesign("HFSS", "HFSSDesign1", "DrivenModal", "")

oDesign = oProject.SetActiveDesign("HFSSDesign1")

oEditor = oDesign.SetActiveEditor("3D Modeler")

oEditor.CreateRectangle(
[
    "NAME:RectangleParameters",
    "IsCovered:= ", True,
    "XStart:= ", "-0.2mm",
    "YStart:= ", "-3mm",
    "ZStart:= ", "0mm",
    "Width:= ", "0.8mm",
    "Height:= ", "1.2mm",
    "WhichAxis:= ", "Z"
],
```

```
[
    "NAME:Attributes",
    "Name:= ", "Rectangle1",
    "Flags:= ", "",
    "Color:= ", "(132 132 193)",
    "Transparency:= ", 0,
    "PartCoordinateSystem:=", "Global",
    "UDMId:= ", "",
    "MaterialValue:= ", "\"vacuum\"",
    "SolveInside:= ", True
])

oDesign.SetDesignSettings(['NAME:Design Settings Data', 'Allow Material Override:=' , True, 'Calculate Lossy Dielectrics:=' , True])

oEditor.SetModelUnits(['NAME:Units Parameter', 'Units:=' , 'mil', 'Rescale:=' , False ])

ScriptEnv.Shutdown()
```

IronPython Samples

Important:

VBScript is no longer supported in Ansys Electronics Desktop. It is referenced here only to aid users in translating existing VBScript scripts to Python.

Change property

The following snippets show how a change property command (in this case, to change the color of a cone) looks in VBScript and its two possible IronPython variants.

```
oEditor.ChangeProperty Array("NAME:AllTabs", Array("NAME:Geometry3DAttributeTab", _
    Array("NAME:PropServers", "Cone1"), _
    Array("NAME:ChangedProps", _
    Array("NAME:Color", "R:=", 255, "G:=", 255, "B:=", 0))))
```

Sample Script: ChangeProperty command to change color of a cone

```
oEditor.ChangeProperty(
```

```
["NAME:AllTabs",  
  ["NAME:Geometry3DAttributeTab",  
    ["NAME:PropServers", "Cone1"],  
    ["NAME:ChangedProps",  
      ["NAME:Color", "R:=", 0, "G:=", 0, "B:=", 64]  
    ]  
  ]  
]  
  
  ])
```

Sample Script: ChangeProperty command to change color of cone using Python arrays

Any time there are named arrays composed purely of key-value pairs, they can always be represented using a Python dictionary, irrespective of the nesting of said named array.

```
oEditor.ChangeProperty(  
  ["NAME:AllTabs",  
    ["NAME:Geometry3DAttributeTab",  
      ["NAME:PropServers", "Cone1"],  
      ["NAME:ChangedProps",  
        {  
          "NAME": "Color",  
          "R" : 0,  
          "G" : 64,  
          "B" : 0  
        }  
      ]  
    ]  
  ]  
])
```

Sample Script: ChangeProperty command to change the color of a cone using Python arrays and dictionaries

Create a Cone using IronPython

Most scripting tasks using IronPython are expected to be formatted as the following example. One starts with the predefined **oDesktop** object and drills down to the design, editors, modules etc and issues any required commands on the object while formatting the script command arguments in natural python syntax.

```
oProject = oDesktop.GetActiveProject()
```

```
oDesign = oProject.InsertDesign("HFSS","Random","DrivenModal","")
oEditor = oDesign.SetActiveEditor("3D Modeler")
oEditor.CreateCone(
{
    "NAME" : "ConeParameters",
    "XCenter" : "0mm",
    "YCenter" : "0mm",
    "ZCenter" : "0mm",
    "WhichAxis" : "Z",
    "Height" : "2mm",
    "BottomRadius" : "1.56204993518133mm",
    "TopRadius" : "0mm"
},
{
    "NAME" : "Attributes",
    "Name" : "Cone1",
    "Flags" : "",
    "Color" : "(132 132 193)",
    "Transparency" : 0,
    "PartCoordinateSystem": "Global",
    "UDMId" : "",
    "MaterialValue" : "\"vacuum\"",
    "SolveInside" : True
}
)
```

Sample Script: IronPython script to create a cone

Create geometry and then create a grid from it using copy/paste/move

The following script demonstrates slightly more advanced use of scripting and the use of return values from script methods. It creates a 5x5 grid of cones and also demonstrates the adding of information messages to the application's message window.

```
oProject = oDesktop.GetActiveProject()
```

```
oDesign = oProject.InsertDesign("HFSS","Hersheys Kis-
ses","DrivenModal","")

oEditor = oDesign.SetActiveEditor("3D Modeler")

# create the first cone
AddInfoMessage("Creating first cone")
firstConeName = "firstCone"
coneBotRad = "1.5mm"
oEditor.CreateCone(
    {
        "NAME" : "ConeParameters",
        "XCenter" : "0mm",
        "YCenter" : "0mm",
        "ZCenter" : "0mm",
        "WhichAxis" : "Z",
        "Height" : "2mm",
        "BottomRadius": coneBotRad,
        "TopRadius" : "0mm"
    },
    {
        "NAME" : "Attributes",
        "Name" : firstConeName,
        "Flags" : "",
        "Color" : "(132 132 193)",
        "Transparency" : 0,
        "PartCoordinateSystem": "Global",
        "UDMId" : "",
        "MaterialValue" : "\"vacuum\"",
        "SolveInside" : True
    }
)
```



```
)

# Now replicate this a few times and create an array out of it
AddInfoMessage("Replicating it 24 times")
for x in range(5):
    for y in range(5):
        # leave the first one alone in it's created
        # position
        if x == 0 and y == 0:
            continue

# all other grid positions, replicate from the
# first one

# copy first
oEditor.Copy(
    {
        "NAME" : "Selections",
        "Selections" : firstConeName
    }
)

# paste it and capture the pasted name
# the pasted names come in an array as we could
# be pasting a selection composed of multiple objects
pasteName = oEditor.Paste()[0]

# now move the pasted item to it's final position
oEditor.Move(
    {
```

```
"NAME" : "Selections",
"Selections" : pasteName
},
{
"NAME" : "TransalateParameters",
"CoordinateSystemID" : -1,
"TranslateVectorX" : "%d * 3 * %s" % (x, coneBotRad),
"TranslateVectorY" : "%d * 3 * %s" % (y, coneBotRad),
"TranslateVectorZ" : "0mm"
}
)

# Now fit the display to the created grid
oEditor.FitAll()
```

Related Topics

[Introduction to IronPython](#)

[Scripting Using Iron Python: Putting it all Together](#)

Creating User Defined Primitives and User Defined Models in Python Scripts

You can create User Defined Primitives and User Defined Models in Python scripts (based on the IronPython implementation).

Advantages Compared to C++

- No need to create and build project; all you need to do is create a Python script
- Python script is platform independent
- Scripts can inherit functionality from existing scripts
- Garbage collector - no need to free memory
- Easy debugging

Changes compared to C

Though methods, constants and structures are kept as close to the C implementation as possible, some changes had to be made to make code Python-compatible.

Structures

- Structures have the same names as in C implementation.
- Structures fields names are capitalized.
- Arrays in structures become lists in Python (Technically a .NET IList container)
- Structure instances are created using the supplied constructors and members are accessed using the provided access methods.

For a complete list of structures and examples please see [UDP/UDM Structures](#).

Return Values for UDM and UDP Functions

For information on return values for each UDM and UDP function, see the [Return Values](#) section.

Constants

Enumeration/Enum constants have almost the same names as in C but the enum must be qualified by the type. Additionally, redundant "UDP", "UDM" or type prefixes have been removed. This allows for better human-readability.

```
# Example of specifying the LengthUnit enum by qualifying it
# with the type of the enum: UnitType
unitType = UnitType.LengthUnit
```

For a complete list of enum constants please see [UDP/UDM Constants](#).

Methods

Methods are described in [IUDPExtension methods](#), [IUDMExtension methods](#), and [UDMFunctionLibrary](#) listed further in this document. A separate chapter includes a [UDP IronPython example of fillet and chamfer](#).

The main differences in functions parameters (from C implementation):

- functions names in UDPFunctionLibrary and UDMFunctionLibrary are capitalized
- arrays become a python list of objects
- `void * callback parameter` is dropped from the parameter list
- output parameters (pointer types that are filled during the function call) usually become return values
- 'list size' parameter usually will be omitted as redundant

Output Parameters

The rule for the output parameters is as follows:

- If the function has one output parameter variable and no return value, the variable will become function's return value. The same will happen if the return value is a

'success/failure' boolean ('None' will be returned on failure and parameter variable - on success).

- If the function has one output parameter and a return value, the function will return a Python tuple where function return value will be the first one in the tuple.
- If there is more than one out variable, the function will return a Python tuple with all output parameters in the specified order. If function has a return value, it must always be the first in the tuple.

one output parameter; return value is ignored

```
udmDefinition = udmFunctionLibrary.GetDefinition()
```

one output parameter; return value must be preserved. return

and output values are packed into the return tupe, in order

```
(lRet, partIdsList) = udpFunctionLibrary.DetachFaces(nPartIds, faceId-
sList)
```

Two output parameter; return value must be preserved

the return tuple is (returnVal, output1, output2)

```
(bRet, udpPositionLow, udpPositionHigh) = udmFunc-
tionLibrary.GetBoundingBox(partId,exact);
```

Comparison with C function:

C	Python
<pre>bool getDefinition(UDMDefinition* udmDefinition, void* callbackData); where udmDefinition is an output parameter</pre>	<pre>udmDefinition = udmFunctionLibrary.GetDefinition()</pre> (Note: callbackData is omitted in py interface)
<pre>long detachIFaces(int nFacesAndPartIds, long* facelds, long* partIds, void* callbackData); where partIds is an output para- meter</pre>	<pre>(bRet, partIds) = udmFunctionLibrary.DetachIFaces (nFacesAndPartIds, facelds)</pre> (Note: callbackData is omitted in py interface)

'List Size' Parameters

The rule for the 'list size' is as follows:

- If function has input 'List' parameter and input 'list size' parameter, 'list size' parameter will be omitted.
- If function has output 'List' parameter and output 'list size' parameter, 'list size' parameter will be omitted.
- If function has output 'List' parameter and input 'list size' parameter, 'list size' parameter won't be omitted as it's needed for memory allocation in the corresponding C++ function from the UDP/UDM function library.

Example:

```
# input list, input list size
```

```
lret = udpFunctionLibrary.Unite(objectIds)
```

```
# output list, output list size
```

```
faceIdList = udmFunctionLibrary.GetAllFaces(PartId)
```

```
# output list, input list size
```

```
(lret, partIdList) = udpFunctionLibrary.DetachFaces(listSize,  
faceIdList)
```

Comparison with C function:

C	Python
<pre>bool getAllFaces(long partId, long* numFaces, long** facIds, void* callbackData);</pre> where numFaces and facIds are output parameters and numFaces is the size of facId.	<pre>facIds = udmFunc- tionLibrary.GetAllFaces(partId)</pre> (ignore numFaces as redundant: folded into facIds, return value is omitted: folded into the facIds is None check callbackData is omitted)
<pre>long unite(long numObjects, long* objectIds, void* callbackData);</pre>	<pre>lret = udpFunctionLibrary.Unite (objectIds)</pre>

C	Python
where numObjects and objectIds are input parameters and numObjects is the size of objectIds.	(ignore numObjects as redundant: folded into objectIds callbackData is omitted)
long detachFaces(long nSize, long* facelds, long* partIds, void* callbackData); where partIds is and output list and nSize is an input parameters and nSize is the size of partIds.	(lret, partIdList) = udpFunctionLibrary.DetachFaces(nSize, facelds) (nSize is not ignored, callbackData is omitted)

Added Parameters

There is a special case in UDPFunctionLibrary: two functions - DuplicateAlongLine and DuplicateAroundAxis - have new integer listSize parameter added to their signatures.

This parameter defines the size of the output List. This is done for compliance with C++ geometry library as the size of the List must be predefined and this size is different from the existing parameter's values.

Example:

```
(ret, cloneIDs) = funcLib.DuplicateAlongLine(partID, transVec,
numCubes, cloneIdsSize)

(ret, cloneIDs) = funcLib.DuplicateAroundAxis(partID, axis, angle,
nClones, cloneIdsSize)
```

Here cloneIdsSize is a new integer parameter.

Comparison with C function:

C	Python
long duplicateAlongLine(long partId, UDPVector transVector, int nClones, long* nClones, void* callbackData);	(lret, cloneIds) = udmFunctionLibrary.DuplicateAlongLine(partId, transVec, nClones, cloneIdsSize) (callbackData is omitted cloneIdsSize is a new parameter)
long duplicateAroundAxis(long partId,	(lret, cloneIds) = udmFunctionLibrary.DuplicateAroundAxis(partId, axis, angle, nClones, cloneIdsSize)

C	Python
UDPCoordinateSystemAxis axis, double angle, int nClones, long* nClones, void* callbackData);	(callbackData is omitted cloneldsSize is a new parameter)

Developing a UDM/UDP

Creation

To create a User Defined Primitive in Python you write a Python script that implements [UDPExtension class](#). To create a User Defined Model in Python you write a Python script that implements [UDMExtension](#) class (see links for full description).

Location

The scripts are located the same way the C based UDM/UDP are. They are expected to be under the UserDefinedParts or UserDefinedModels sub-directories of one of the library folders (SysLib, UserLib or PersonalLib). They will then appear under the appropriate menu items:

Draw > User Defined Primitives for UDP or **Draw > User Defined Model for UDM**.

The sub-directories structure created in one of the specified directory will be displayed in the UDP/UDM menu.

Keep in mind that there is no difference between the menu display for C and Python implementations of UDM or UDP - only the file names without extensions are displayed

Organize

"Lib" sub-directory is a special directory. The contents of this directory is not shown in the menu. In the "Lib" directory you can create Python scripts with base classes and utilities to be used in UDP/UDM Python scripts. All the Lib directories upstream of a script (till the UserDefinedModels or UserDefinedPrimitives) are included in the Python search path and this allows for easy import of helper modules in such directories.

To use UDM data structures, constants, and/or classes in your Lib sub-directory scripts you have to add import statement to the scripts:

For UDM:extension:

```
from UDM import *
```

For UDP:extension:

```
from UDP import *
```

Edit/Reload

Python is a scripting language, so if you have errors in your script, you will see them at the time you try to run the script. The errors will be displayed in the Message Manager Window. If you need more information, you might be able to get it from log files. See: Debug Logging.

You can always change your script, call **Update Menu** command from **Draw > User Defined Model > menu** or **Draw > User Defined Primitives > menu** and run the script again. If you delete script you might want to restart the application instead of calling **Update Menu**.

UDPExtension

Import

You do not have to add import statements for the predefined classes, structures, and constants - it is done for you and all data types described in this document can be used in your Python script.

However you have to add import statements to your helper scripts in your Lib sub-directory.

```
from UDP import *
```

Main class: UDPExtension

You must write a class derived from IUDPExtension with a mandatory name UDPExtension:

```
class UDPExtension(IUDPExtension):
```

The class should implement [IUDPExtension methods](#) described in the topic that follows.

IUDPExtension Methods

All methods are same as the methods in the C UDP implementation. The changes to the methods signatures are just to conform to the Python style.

Mandatory Methods

These methods must be implemented in the UDP Python script as methods of UDPExtension class.

GetLengthParameterUnits()

- returns string.

GetPrimitiveTypeInfo()

- returns UDPPrimitiveTypeInfo.

GetPrimitiveParametersDefinition2()

- returns a list of UDPPrimitiveParameterDefinition2 or None on failure

AreParameterValuesValid2(errorMsg, udpParams)

- errorMsg is a c# list of strings
- udpParams is a c# list of UDPParam
- returns True if udpParams are valid, False otherwise.

CreatePrimitive2(funcLib, udpParams)

- funcLib is [UDMFunction library](#)
- udpParams is a c# list of UDPParam
- returns True on success, False on failure.

Optional Methods

These methods, which have default implementations, can be implemented as methods of UDPEXtension class as needed. Default methods will return NULL or FALSE depending on the return type.

GetPrimitiveParameters()

- returns Python list of strings or NULL

GetRegisteredFaceNames()

- returns Python list of strings or NULL

GetRegisteredEdgeNames()

- returns Python list of strings or NULL

GetRegisteredVertexNames()

- returns Python list of strings or NULL

ProjectParametersOnToValidPlane2(currentUDPParams, projectedUDPParams)

- currentUDPParams is a list of UDPParam
- projectedUDPParams is a list of UDPParam
- returns True on success, False on failure.

MapParametersDefinitionVersions2(oldVersion, oldUDPParams)

- oldVersion is a string
- oldUDPParamsis a list of UDPParam

- returns Python list of UDPPParam or NULL

GetOldPrimitiveParametersDefinition2(version)

- version is a string
- returns a list of UDPPPrimitiveParameterDefinition2 or None on failure.

Example UDP

```
import sys

class UDPExtension(IUDPExtension):

    def GetLengthParameterUnits(self):
        return "mm"

    def GetPrimitiveTypeInfo(self)
        typeInfo = UDPPPrimitiveTypeInfo(
            name = "SampleUDP",
            purpose = "example",
            company="Ansys",
            date="12.21.12",
            version = "1.0")

        return typeInfo

    ...

    ...
```

UDMExtension

Import

You do not have to add import statements for the predefined classes and structures - it is done for you, and all data types described in this document can be used in your Python script.

However you have to add import statements to your helper scripts in your Lib sun-directory.

```
from UDM import *
```

Main class: UDMExtension

You must write a class derived from IUDMExtension with a mandatory name UDMExtension:

```
class UDMExtension(IUDMExtension):
```

The class should implement [UDMExtension methods](#) described below.

UDMExtension Methods

All methods are the same as the methods in the C UDM implementation. The changes to the methods signatures are just to conform to the Python style.

Mandatory Methods

These methods must be implemented in the UDM Python script as methods of UDMExtension class.

GetInfo()

- returns UDMInfo object populated with appropriate UDM information.

IsAttachedToExternalEditor()

- returns True if UDM dll is attached to external editor.
- In case of python UDMs, this should typically return False

CreateInstance(funcLib)

- funcLib is UDMFunctionLibrary
- returns UDMPParameters.

GetUnits(instanceId)

- instanceId is an integer.
- returns string containing units for the instance.

Refresh(funcLib, udmlnParams, updatedParams, refreshModifiedPartsOnly, nonEditedPartRefs)

This method is called every time a UDM is refreshed. Geometry creation/refresh should happen in this method.

- funcLib is UDMFunctionLibrary
- udmlnParams is a list of UDMPParameters that comes from desktop
- updatedParams: UDM script can change the UDM parameters it receives. Updated parameters need to be sent back to desktop. If the UDM script is not going to change any of the parameters that it received, it needs to copy udmlnParams to updatedParams.
- refreshModifiedPartsOnly is a Boolean

Supporting this flag is optional. For UDMs where the refresh performance is not an issue, it is recommended to ignore this flag and update all parts every time.

This flag can be used to optimize performance of Refresh method when the model created by UDM is large. If the UDM consists of multiple parts, and new parameters change only a few parts amongst them, UDM script can only modify parts that are changed by the new parameters.

- `nonEditedPartRefIds`: If `RefreshModifiedPartsOnly` is true and the UDM script supports partial update, Refresh method needs to return ids of parts that are unchanged.

returns True on success, False on failure.

ReleaseInstance(instanceId)

- `instanceId` is an integer.
- This should release any resources assigned to this particular instance of UDM.
- returns True on success, False on failure.

GetAttribNameForEntityId()

- Returns string that acts as a the name of the attribute containing entity IDs.
- For example, it can return a unique string such as "ATTRIB_XACIS_ID"
- Python UDMs should implement this method.

GetAttribNameForPartId()

- Returns a string that acts as a the name of the attribute containing entity IDs.
- For example, it can return a unique string such as "ATTRIB_XACIS_ID" (Can be same as `GetAttribNameForEntityId()`)
- Python UDMs should implement this method.

Optional Methods

These methods have default implementations (default is to return NULL or FALSE depending on the return type) but can be overridden by the user as needed as methods of `UDMExtension` class.

DialogForDefinitionOptionsAndParams(self, defData, optData, params):

Replaces the old `UDMDialogForDefinitionAndOptions` method, which is still supported, but users are urged to use `UDMDialogForDefinitionOptionsAndParams`. If both methods are present, application will use `UDMDialogForDefinitionOptionsAndParams`.

- UDM can open a dialog box for UDM definition, options, parameters in this method. Definition, options, and parameters are set/modified by user and returned to application. DII can

also just give default definition, options and parameters.

- Returns two Booleans and a string
 - First Boolean returns whether the method was successful or not.
 - Second Boolean returns whether the application should open a dialog box. If it is True, application will populate a dialog box with definition, options, parameters that are returned.
 - String returned contains length units for parameters.

DialogForDefinitionAndOptions(self, defData, optData) [Deprecated]

UDM can open a dialog box for UDM definition and options in this method. Definition, and options are set/modified by user and returned to application. Dll can also just give default definition and options.

- Returns two Booleans.
 - First Boolean provides whether the call to this method was successful or not.
 - Second Boolean determines whether the application should pop up a dialog box. If this is true, application will populate the dialog box with the definitions and options that are returned. As no parameters are returned, no parameters are shown in this dialog box.

GetInstanceSourceInfo(instancelid)

- instancelid is an integer.
- returns string containing source information of UDM instance. It is used to create initial name for UDM instance.

ShouldAttachDefinitionFilesToProject()

- returns True if any of definition files needs to be attached to project
- returns a Python list of strings containing definition names of files or NULL

Example UDM

```
class UDMExtension(IUDMExtension):  
  
    def IsAttachedToExternalEditor(self):  
        return False  
  
    def GetInfo(self)  
        udmInfo = UDMInfo(  
            name = "SampleUDM",  
            purpose = "udm example",
```

```
    company="Ansys",
    date="12.21.12",
    version = "1.0")

    return udmInfo

...

...
```

UDMFunctionLibrary

UDMFunctionLibrary implements IUDMFunctionLib interface. The IUDMFunctionLib object is passed as a parameter to Python script in the following functions

- CreateInstance
- Refresh

You can call any of the functions from the functions list (shown below).

```
partRefId = udmFunctionLib.GetPartRefId(partId)
```

For example sample code that calls GetBoundingBox in Python script can look like this:

```
partId = 10
exact = True
udpPosition = UDPPosition(0,0,0)

(bret, udpPositionLow, udpPositionHigh) = udmFunctionLibrary.GetBoundingBox(partId, exact);

if bret:
    udpPosition.X = udpPositionLow.X
```

As you can see udpPositionLow and udpPositionHigh output parameters are defined in the call to GetBoundingBox function. There is no need to define them before the function call.

Functions list:

1. **List_of_UDMDefinition:** udmDefinitionList = **GetDefinition()**
2. **List_of_UDMOption:** udmOptionList = **GetOptions()**
3. **bool:** bret = **SetMaterialName(string: matName, int: partId)**
4. **bool:** bret = **SetMaterialName2(string: matName, string: partName)**

5. **bool:** bret = **SetPartName**(**string:** partName, **int:** partId)
6. **int:** iret = **GetInstanceId**()
7. **string:** str = **GetPartRefId**(**int:** partId)
8. **bool:** bret = **SetPartRefId**(**int:** partId, **string:** refId)
9. **List_of_int:** facelds = **GetAllFaces**(**int:** partId)
10. **List_of_int:** edgelds = **GetAllEdges**(**int:** partId)
11. **List_of_int:** vertexIds = **GetAllVertices**(**int:** partId)
12. **bool:** bret = **SetFaceAttribs**(**List_of_int:** facelds, **List_of_string:** attribs)
13. **bool:** bret = **SetEdgeAttribs**(**List_of_int:** edgelds, **List_of_string:** attribs)
14. **bool:** bret = **SetVertexAttribs**(**List_of_int:** vertexIds, **List_of_string:** attribs)
15. **string:** str = **GetModelerUnit**()
16. **string:** str = **GetCacheFileForUDMResume**()
17. **bool:** bret = **SetPartColor**(**int:** partId, **int:** nColor)
18. **bool:** bret = **SetPartFlags**(**int:** partId, **int:** nFlags)
19. (**bool:** bret, **UDPPosition:** low, **UDPPosition:** high) = **GetBoundingBox**(**int:** partId, **bool:** exact)
20. **bool:** bret = **IsParametricUpdate**()
21. **bool:** bret = **SetMaterialNameByRefId**(**string:** partRefId, **string:** matName)
22. **bool:** bret = **SetPartNameByRefId**(**string:** partRefId, **string:** partName)
23. **bool:** bret = **SetPartColorByRefId**(**string:** partRefId, **int:** nColor)
24. **bool:** bret = **SetPartFlagsByRefId**(**string:** partRefId, **int:** nFlags)

In addition to the above functions all functions defined in the UDPFunctionLib are available in the IUDMFunctionLib and can be called directly exactly the same way as the IUDMFunctionLib functions.

Example:

```
udmFunctionLib.CreateCircle(center, radius, ratio, isCovered)
```

UDM/UDP Functions

Return Values for Each UDM and UDP Function

ID – ID of created Object

SI – Success Indicator. Identifies whether or not operation was successful.

Functions list:

1. **bool:** SI = **AddMessage**(**MessageSeverity:** messageSeverity, **string:** message)
2. **bool:** SI = **NameAFace**(**UDPPosition:** pointOnFace, **string:** faceName)
3. **bool:** SI = **NameAEdge**(**UDPPosition:** pointOnEdge, **string:** edgeName)
4. **bool:** SI = **NameAVertex**(**UDPPosition:** pointOnVertex, **string:** vertexName)

5. **int**: ID = **GetFacelDFromPosition**(**UDPPosition**: pointOnFace)
6. **int**: ID = **GetEdgeIDFromPosition**(**UDPPosition**: pointOnEdge)
7. **int**: ID = **CreatePolyline**(**UDPPolylineDefinition**: polylineDefinition)
8. **int**: ID = **CreateRectangle**(**CoordinateSystemPlane**: whichPlane, **UDPPosition**: center-Point, **List_of_double**: widthAndHeight, **int**: isCovered)
9. **int**: ID = **CreateArc**(**CoordinateSystemPlane**: whichPlane, **UDPPosition**: centerPoint, **UDPPosition**: startPoint, **double**: fAngle)
10. **int**: ID = **CreateCircle**(**CoordinateSystemPlane**: whichPlane, **UDPPosition**: center-Point, **double**: fRadius, **int**: isCovered)
11. **int**: ID = **CreateEllipse**(**CoordinateSystemPlane**: whichPlane, **UDPPosition**: center-Point, **double**: fMajorRadius, **double**: fRadiusRatio, **int**: isCovered)
12. **int**: ID = **CreateRegularPolygon**(**CoordinateSystemPlane**: whichPlane, **UDPPosition**: centerPoint, **UDPPosition**: startPoint, **int**: numOfSides, **int**: isCovered)
13. **int**: ID = **CreateEquationBasedCurve**(**UDPEquationBasedCurveDefinition**: curveDefinition)
14. **int**: ID = **CreateEquationBasedSurface**(**UDPEquationBasedSurfaceDefinition**: surfaceDefinition)
15. **int**: ID = **CreateSpiral**(**UDPSpiralDefinition**: spiralDefinition)
16. **int**: ID = **CreateBox**(**UDPPosition**: startPoint, **List_of_double**: boxXYZsize)
17. **int**: ID = **CreateSphere**(**UDPPosition**: centerPoint, **double**: fRadius)
18. **int**: ID = **CreateCylinder**(**CoordinateSystemAxis**: whichAxis, **UDPPosition**: center-Point, **double**: fRadius, **double**: fHeight)
19. **int**: ID = **CreateCone**(**CoordinateSystemAxis**: whichAxis, **UDPPosition**: centerPoint, **double**: fBottomRadius, **double**: fTopRadius, **double**: fHeight)
20. **int**: ID = **CreateTorus**(**CoordinateSystemAxis**: whichAxis, **UDPPosition**: centerPoint, **double**: fMajorRadius, **double**: fMinorRadius)
21. **int**: ID = **CreatePolyhedron**(**CoordinateSystemAxis**: whichAxis, **UDPPosition**: center-Point, **UDPPosition**: startPosition, **int**: numOfSides, **double**: fHeight)
22. **int**: ID = **CreateHelix**(**UDPHelixDefinition**: helixDefinition)
23. **bool**: SI = **Unite**(**List_of_int**: pObjectIDArray)
24. **bool**: SI = **Subtract**(**List_of_int**: pBlankObjectIDArray, **List_of_int**: pToolObjectIDArray)
25. **bool**: SI = **Intersect**(**List_of_int**: pObjectIDArray)
26. **bool**: SI = **Imprint**(**List_of_int**: pBlankObjectIDArray, **List_of_int**: pToolObjectIDArray)
27. **bool**: SI = **SweepAlongVector**(**int**: profileID, **UDPVector**: sweepVector, **UDPSweepOptions**: sweepOptions)
28. **bool**: SI = **SweepAroundAxis**(**int**: profileID, **CoordinateSystemAxis**: whichAxis, **double**: sweepAngle, **UDPSweepOptions**: sweepOptions)
29. **bool**: SI = **SweepAlongPath**(**int**: profileID, **int**: pathID, **UDPSweepOptions**: sweepOptions)

-
30. **bool:** SI = **Translate**(*int:* partID, **UDPVector:** translateVector)
 31. **bool:** SI = **Rotate**(*int:* partID, **CoordinateSystemAxis:** whichAxis, **double:** rotateAngle)
 32. **bool:** SI = **Mirror**(*int:* partID, **UDPPosition:** mirrorPlaneBasePosition, **UDPVector:** mirrorPlaneNormalVector)
 33. **bool:** SI = **Transform**(*int:* partID, **List_of_double:** rotationMatrix, **UDPVector:** translateVector)
 34. **bool:** SI = **Scale**(*int:* partID, **double:** xScale, **double:** yScale, **double:** zScale)
 35. (**bool:** SI, **List_of_int:** cloneIDs) = **DuplicateAlongLine**(*int:* partID, **UDPVector:** translateVector, *int:* numTotalObjs, *int:* cloneIDsListSize)
 36. (**bool:** SI, **List_of_int:** cloneIDs) = **DuplicateAroundAxis**(*int:* partID, **CoordinateSystemAxis:** whichAxis, **double:** rotateAngle, *int:* numTotalObjs, *int:* cloneIDsListSize)
 37. *int:* ID = **DuplicateAndMirror**(*int:* partID, **UDPPosition:** mirrorPlaneBasePosition, **UDPVector:** mirrorPlaneNormalVector)
 38. **bool:** SI = **Connect**(**List_of_int:** objectIDArray)
 39. **bool:** SI = **Offset**(*int:* partID, **double:** offsetDistance)
 40. *int:* ID? = **Section**(*int:* partID, **CoordinateSystemPlane:** sectionPlane)
 41. (**bool:** SI, *int:* ID) = **Split**(*int:* partID, **CoordinateSystemPlane:** splitPlane, **SplitWhichSideToKeep:** whichSideToKeep, **bool:** bSplitCrossingObjectsOnly)
 42. (**bool:** SI, **List_of_int:** importedObjectIDs) = **ImportNativeBody2**(*string:* fileNameWithFullPath)
 43. (**bool:** SI, **List_of_int:** importedObjectIDs) = **ImportAnsoftGeometry**(*string:* fileNameWithFullPath, **List_of_string:** overridingParamsNameArray, **List_of_UDPParam:** overridingParamsArray)
 44. *int:* ID = **Clone**(*int:* partID)
 45. **bool:** SI = **DeletePart**(*int:* partID)
 46. *int:* ID = **CreateObjectFromFace**(*int:* faceID)
 47. **bool:** SI = **Fillet**(**UDPBLNDElements:** entitiesToFillet, **UDPBLNDFilletOptions:** filletOptions)
 48. **bool:** SI = **Chamfer**(**UDPBLNDElements:** entitiesToChamfer, **UDPBLNDChamferOptions:** chamferOptions)
 49. (**bool:** SI, **List_of_int:** newPartIDs) = **DetachFaces**(*int:* newPartIDArraySize, **List_of_int:** faceIDs)
 50. (**bool:** SI, **List_of_int:** newPartIDs) = **DetachEdges**(*int:* newPartIDArraySize, **List_of_int:** edgeIDs)
 51. *int:* ID = **CreateObjectFromEdge**(*int:* edgeID)
 52. **bool:** SI = **SheetThicken**(*int:* partID, **double:** fThickness, **bool:** bThickenBothSides)
 53. (**bool:** SI, **List_of_int:** newPartIDArray) = **SweepFaceAlongNormal**(*int:* newPartIDArraySize, **List_of_int:** faceIDArray, **double:** sweepLength)
-

- 54. **bool**: SI = **CoverLine**(*int*: partID)
- 55. **bool**: SI = **CoverSurface**(*int*: partID)
- 56. **bool**: SI = **UncoverFaces**(*List_of_int*: faceIDArray)
- 57. (**bool**: SI , *int*: numPartsCreated, *List_of_int*: faceIDArray) = **SeparateBodies**(*int*: partID, *int*: numPartsCreated)
- 58. **bool**: SI = **MoveFaces**(*List_of_int*: faceIDArray, **bool**: bMoveAlongNormal, **double**: fOffsetDistance, *UDPVector*: moveVector)
- 59. **bool**: SI = **WrapSheet**(*int*: sheetBodyID, *int*: targetBodyID)
- 60. **bool**: SI = **ImprintProjection**(*int*: blankBodyID, *List_of_int*: toolBodyIDArray, **bool**: bNormalProjection, *UDPVector*: projectDirection, **double**: projectDistance)
- 61. **string**: path = **GetTempDirPath**()
- 62. **string**: path = **GetSysLibDirPath**()
- 63. **string**: path = **GetUserLibDirPath**()
- 64. **string**: path = **GetPersonalLibDirPath**()
- 65. **string**: path = **GetInstallDirPath**()
- 66. **string**: path = **GetProjectPath**()
- 67. (**bool**: SI, **bool**: abort) = **SetProgress**(*UDPProgress*: progress)

UDP/UDM Structures and Constants

The following sections describe:

- [UDP/UDM Structures](#)
- [UDP/UDM Constants](#)

UDP/UDM Structures

Differences compared to C API:

- **UDMDefinition**
- **UDMOptions**
- **UDMPParameters**

Instead of containing arrays of data, the structures contain single fields where each field corresponds to an item in a different array from the original C API. The structure objects thus constructed are added to the Python list. Alternately the Python list can be initialized using the structure objects.

Example (creating UDMPParameter list):

```
udmParamList = [  
    UDMPParameter(  
        "cubeSizeName", UnitType.LengthUnit,
```

```
UDPParam(ParamDataType.Double, cubeSize),  
ParamPropType.Value,  
ParamPropFlag.MustBeReal),  
UDMParameter(  
    "cubeDistanceName", UnitType.LengthUnit,  
    UDPParam(ParamDataType.Double, cubeDistance),  
    ParamPropType.Value,  
    ParamPropFlag.MustBeReal),  
UDMParameter("numCubesName", UnitType.LengthUnit,  
    UDPParam(ParamDataType.Int, numCubes),  
    ParamPropType.Number,  
    ParamPropFlag.MustBeInt]
```

- **UDPParam**
- **UDPParamData**

Data field in UDPParam is now an object - the same for all types of data used - as Python can work with any type of data.

UDPParamData is obsolete, thus not implemented. Be sure to set proper data type to UDPParam.DataType when setting UDPParam.Data.

Example:

```
nCubesParam = UDPParam(ParamDataType.Int, numCubes)  
nCubes = nCubesParam.Data
```

```
distanceParam = UDPParam()  
distanceParam.setDouble(10.5)  
doubleDistance = distanceParam.Data * 2
```

- **UDP3x3Matrix**

The structure is not implemented. Use size 9 Python List of doubles instead.

Example:

```
rotationMatrix = [0,0,1, 1,0,0, 0,0,1]
```

```
udpFunctionLib.Transform(partId, rotationMatrix, translationVector)
```

List of Structures

You can use constructors to create a structure. You can also modify fields - directly or by provided methods.

Example:

```
pos1 = UDPPosition(1,2,3)
pos2 = UDPPosition(x=1,y=10,z=0)
pos2.Z = pos1.Z
udpParam = UDPParam(ParamDataType.Double,1)
value = udpParam.Data
```

Structure	Construction	Members
UDPPrimitiveTypeInfo	UDPPrimitiveTypeInfo(string name, string purpose, string company, string date, string version)	string Name string Purpose string Company string Date string Version
UDPPrimitiveParameterDefinition	UDPPrimitiveParameterDefinition(string name, string description, UnitType unitType, double defaultValue)	string Name string Description UnitType UnitType double DefaultValue
UDPParam	UDPParam() UDPParam(ParamDataType dataType, object data) object can be int, double, string, bool or UDPPosition	ParamDataType DataType object Data object can be int, double , string, bool or UDPPosition

Structure	Construction	Members
	methods: setInt(int val) setBool(bool val) setString(string val) setDouble(double val) setPosition(UDPPosition val)	
UDPPrim- itiveParameterDefinition2	UDPPrim- itiveParameterDefinition2(string name, string description, UnitType unitType, ParamPropType propType, ParamPropFlag propFlag, UDPPParam defaultValue)	string Name string Description UnitType UnitType ParamPropType PropType ParamPropFlag PropFlag UDPPParam DefaultValue
UDPPosition	UDPPosition(double x, double y, double z)	double X double Y double Z
UDPVector	UDPVector(double x, double y, double z)	double X double Y double Z
UDPSweepOptions	UDPSweepOptions(SweepDraftType draftType, double draftAngle, double twistAngle)	SweepDraftType DraftType double DraftAngle double TwistAngle
UDPPolylineSeg- mentDefinition	UDPPolylineSeg- mentDefinition(	PolylineSegmentType Seg- mentType

Structure	Construction	Members
	PolylineSegmentType seg- mentType, int segmentStartIndex, int numberOfPoints, double angle, UDPPosition centerPoint, CoordinateSystemPlane arcPlane)	int segmentStartIndex, int numberOfPoints, double angle, UDPPosition centerPoint, CoordinateSystemPlane arcPlane)
UDPPolylineDefinition	UDPPolylineDefinition() UDPPolylineDefinition(List_of_UDPPosition pos- itions, List_of_UDPPolylineSeg- mentDefinition segDefs, int closed, int covered)	int IsClosed int IsCovered List_of_UDPPosition ArrayOfPos- ition List_of_UDPPolylineSeg- mentDefinition ArrayOfSeg- mentDefinition
UDPEqua- tionBasedCurveDefinition	UDPEqua- tionBasedCurveDefinition(string functionXt, string functionYt, string functionZt, double tStart, double tEnd, int numOfPointsOnCurve)	string FunctionXt string FunctionYt string FunctionZt double TStart double TEnd int NumOfPointsOnCurve
UDPEqua- tionBasedSurfaceDefinition	UDPEqua- tionBasedSurfaceDefinition(string functionXuv, string functionYuv, string functionZuv, double uStart, double uEnd, double vStart, double vEnd)	string FunctionXuv string FunctionYuv string FunctionZuv double UStart double UEnd double VStart double VEnd

Structure	Construction	Members
	double vEnd int reserved1 int reserved2)	two integer arguments that are reserved for future use. They need to be provided, for example as 0. For example: <pre>theSurfaceDefinition = UDPEqua- tionBasedSur- faceDefinition ("u", "v", "1", 0, 1, 0, 1, 0, 0)</pre>
UDPHelixDefinition	UDPHelixDefinition(int profileID, UDPPosition ptOnAxis, UDPPosition axisDir, double noOfTurns, bool isRightHanded, double radiusChangePerTurn, double pitch)	int ProfileID UDPPosition PtOnAxis UDPPosition AxisDir double NoOfTurns bool IsRightHanded double RadiusChangePerTurn double Pitch
UDPSpiralDefinition	UDPSpiralDefinition(int profileID, UDPPosition ptOnAxis, UDPPosition axisDir, double noOfTurns, bool isRightHanded, double radiusChangePerTurn)	int ProfileID UDPPosition PtOnAxis UDPPosition AxisDir double NoOfTurns bool IsRightHanded double RadiusChangePerTurn
UDPBLNDElements	UDPBLNDElements(int partID, int noOfEdges; int* listOfEdges;) UDPBLNDElements(int partID,	UDPBLNDElements can hold either edges or vertices, but not both at the same time. Edges should be applied to solids, and vertices should be applied to sheets. int PartID /* part to be blended i.e. filleted/chamfered */ int noOfEdges;

Structure	Construction	Members
	<pre>int noOfVertices; int* listOfVertices;)</pre>	<pre>int* listOfEdges; /* edges to be blended */ int noOfVertices; int* listOfVertices; /* vertices to be blended */</pre>
UDPBLNDFilletOptions	<pre>UDPBLNDFilletOptions(bool suppressFillet, BLNDFilletRadiusLaw fil- letRadiusLaw, double filletStartRadius, double filletEndRadius, bool fol- lowSmoothEdgeSequence, BLNDFilletType filletType, double setbackDistance, double bulgeFactor)</pre>	<pre>bool SuppressFillet /* Reserved for future */ BLNDFilletRadiusLaw Fil- letRadiusLaw double FilletStartRadius double FilletEndRadius bool Fol- lowSmoothEdgeSequence /* Reserved for future */ BLNDFilletType FilletType double SetbackDistance double BulgeFactor /* Reserved for future */</pre>
UDPBLNDChamferOptions	<pre>UDPBLNDChamferOptions(bool suppressChamfer, BLNDChamferRangeLaw Cham- ferRangeLaw, double chamferLeftRange, double chamferRightRange)</pre>	<pre>bool SuppressChamfer BLNDChamferRangeLaw Cham- ferRangeLaw double ChamferLeftRange double ChamferRightRange</pre>
UDPPProgress	<pre>UDPPProgress(int prog, int subProg, string mesg, string subMesg)</pre>	<pre>int Prog int SubProg string Mesg string SubMesg</pre>
UDMInfo	<pre>UDMInfo(string name, string purpose,</pre>	<pre>string Name string Purpose string Company</pre>

Structure	Construction	Members
	string company, string date, string version)	string Date string Version
UDMDefinition	UDMDefinition() UDMDefinition(string name, UDParam value, ParamPropType propType, ParamPropFlag propFlag)	string DefName UDPParam DefValue ParamPropType PropType ParamPropFlag PropFlag
UDMOption	UDMOption() UDMOption(string name, UDParam value, ParamPropType propType, ParamPropFlag propFlag)	string OptName UDPParam OptValue ParamPropType PropType ParamPropFlag PropFlag
UDMParameter	UDMParameter() UDMParameter(string name, UDParam value, UnitType unitType, ParamPropType propType, ParamPropFlag propFlag)	string ParamName UDPParam ParamValue UnitType UnitType ParamPropType PropType ParamPropFlag PropFlag

UDP/UDM Constants

Full names of enum constants must be used in scripts.

Example:

```
unitType = UnitType.LengthUnit
```

```
dataType = ParamDataType.Int
```

Enum constants:

enum Constant	Parameters
UnitType	NoUnit LengthUnit AngleUnit
ParamDataType	Int Double String Bool Position Unknown
ParamPropType	Text Menu Number Value FileName Checkbox Position Unknown
ParamPropFlag	NoFlag ReadOnly MustBeInt MustBeReal Hidden Unknown
CoordinateSystemAxis	XAxis YAxis ZAxis
CoordinateSystemPlane	XYPlane YZPlane

enum Constant	Parameters
	ZXPlane
SweepDraftType	ExtendedDraft RoundDraft NaturalDraft MixedDraft
SplitWhichSideToKeep	SplitKeepBoth SplitKeepPositiveOnly SplitKeepNegativeOnly
PolylineSegmentType	LineSegment ArcSegment SplineSegment AngularArcSegment
MessageSeverity	WarningMessage ErrorMessage InfoMessage IncompleteMessage FatalMessage
BLNDFilletRadiusLaw	BLNDConstantRadius BLNDVariableRadius
BLNDFilletType	BLNDRound /* The outward surface of the fillet is curved.*/ BLNDMitered /* The outward surface of the fillet is flat and cut at an angle.*/
BLNDChamferRangeLaw	BLNDConstantRange BLNDVariableRange
PartPropertyFlags	PropNonModel PropDisplayWireFrame PropReadOnly PostprocessingGeometry PropInvisible PropShowDirection PropDummy

UDP Python Example

This Python script example demonstrates how to use the UDPBLNDElements structure and the UDP chamfer and fillet functions.

```
import sys

primitive_info = UDPPrimitiveTypeInfo(
    name="Fillet_Chamfer",
    purpose="Fillet Chamfer Example",
    company="Ansys",
    date="09/11/2020",
    version="1.0")

primitive_param_definitions = [
    UDPPrimitiveParameterDefinition2(
        "x_size",
        "",
        UnitType.LengthUnit,
        ParamPropType.Value,
        ParamPropFlag.MustBeReal,
        UDPParam(ParamDataType.Double, 10)),
    UDPPrimitiveParameterDefinition2(
        "y_size",
        "",
        UnitType.LengthUnit,
        ParamPropType.Value,
        ParamPropFlag.MustBeReal,
        UDPParam(ParamDataType.Double, 5)),
    UDPPrimitiveParameterDefinition2(
        "z_size",
        "",
        UnitType.LengthUnit,
        ParamPropType.Value,
```

```
        ParamPropFlag.MustBeReal,
        UDPParam(ParamDataType.Double, 2))
]

length_units = "mm"

#####
# Class Implementation
#####

class UDPExtension(IUDPExtension):
    def CreatePrimitive2(self, func_lib, param_values):
        """
        Inbuilt function that is called to generate a UDP after suc-
        cessful validation

        :param func_lib: drawing inbuilt class, see in Help: UDMFunc-
        tionLibrary

        :param param_values: list of udp parameter values (user input)
        generated by UDP Core

        :return: None
        """

        param_dict = self.get_param_dict(param_values)

        start_point = UDPPosition(0, 0, 0)
        box = func_lib.CreateBox(start_point, [
            param_dict["x_size"],
            param_dict["y_size"],
            param_dict["z_size"]
        ])

        # points on the middle of 4 vertical edges
        points = [
            [0, 0, param_dict["z_size"]/2],
```

```
[param_dict["x_size"], 0, param_dict["z_size"]/2],
[param_dict["x_size"], param_dict["y_size"], param_dict["z_
size"]/2],s
[0, param_dict["y_size"], param_dict["z_size"]/2]
]

edges = [func_lib.GetEdgeIDFromPosition(UDPPosition(point[0],
point[1], point[2])) for point in points]

fillet_rad = 0.1 * param_dict["x_size"] # 10% of X size
fillet_opt = UDPBLNDFilletOptions(True, BLNDFil-
letRadiusLaw.BLNDConstantRadius, fillet_rad, 0.0, True, BLNDFil-
letType.BLNDRound, 0.0, 0.0)

chamfer_length = 0.1 * param_dict["x_size"] # 10% of X size
chamfer_opt = UDPBLNDChamferOptions(False, BLNDCham-
ferRangeLaw.BLNDConstantRange, chamfer_length, 0.0)

# select your geometry to which to apply operations
blend_element = UDPBLNDElements(box)

# specify attribute ListOfEdges to which edges to apply fillet
operation
blend_element.ListOfEdges = edges[0:2]
func_lib.Fillet(blend_element, fillet_opt)

# redeclare attribute ListOfEdges to which edges to apply chamfer
operation
blend_element = UDPBLNDElements(box)
blend_element.ListOfEdges = edges[2:4]
func_lib.Chamfer(blend_element, chamfer_opt)

# Provide to the user Info message indicating success
```

```
func_lib.AddMessage(MessageSeverity.InfoMessage, "Completed!")

def GetPrimitiveTypeInfo(self):
    return primitive_info

def GetLengthParameterUnits(self):
    return length_units

def GetPrimitiveParametersDefinition2(self):
    return primitive_param_definitions

def AreParameterValuesValid2(self, error, udp_params):
    return True

# Custom Functions

def get_param_value_by_name(self, param_values, param_name):
    """
    Function to get a value of a single parameter accessing it by
    name

    :param param_values: list of udp parameter values (user input)
    generated by UDP Core

    :param param_name: name of the parameter as specified in defin-
    ition list

    :return: Value of the parameter or None if parameter does not
    exist
    """
    param_dict = self.get_param_dict(param_values)
    value = param_dict.get(param_name, None)
    return value

def get_param_dict(self, param_values):
    """
```

```
Function to return a dictionary of UDP parameter name and value
(key: value) pairs

:param param_values: list of udp parameter values (user input)
generated by UDP Core

:return: dict of parameter name and values
"""

udm_param_def = self.GetPrimitiveParametersDefinition2()
param_dict = {}
for i, param in enumerate(udm_param_def):
    param_value = param_values[i].Data
    if str(param.PropType) != "Menu":
        param_dict[param.Name] = param_value
    else:
        param_dict[param.Name] = param_value.replace('"', '').split(
            ",", 1)[0]

return param_dict
```

Introduction to CPython

CPython can be used to:

- Launch Ansys Electronics Desktop ([InitializeNew](#))
- Connect with a running instance of Ansys Electronics Desktop ([Initialize](#))
- Execute Ansys Electronics Desktop script functions

One advantage of CPython is the large set of libraries and tools that are available. See below for instructions on modifying a script so that it can be launched with CPython interpreters.

CPython Script Engine and ansysedt process are communicated using GRPC, the ansysedt process started as GRPC server, the Script Script Engine acted as the GRPC client.

Creating an External Script

While [the same as IronPython](#) when run externally, a CPython recorded script must be modified by adding the following lines to the beginning of your script *before* `import ScriptEnv`

```
import sys

# Imports the sys module containing system-specific functions native to Python.

sys.path.append(r"<InstallationPath>/PythonFiles/DesktopPlugin")
```



```
# Adds the PythonFiles/DesktopPlugin subfolder to the list of directories Python searches for modules and files.
```

Those lines are followed by:

```
import ScriptEnv

# This imports ScriptEnv.py from the installation path specified above.
```

Follow that with:

- Either InitializeNew() or Initialize(), as described below.
- Any desired Electronics Desktop scripting commands.
- Closing command, as described below.

Start ansysedt as GRPC server

But default ansysedt process will be started as GRPC server. When there is no argument provided ansysedt.exe it start listening on the first available port from 50051.

-grpcsrv Flag

ansysedt -grpcsrv <optional port number or port range>.

ansysedt -grpcsrv

If no Port Number specified, same as the default like no grpcsrv flag

ansysedt -grpcsrv portNumber

ansysedt process will be listening on the port number, but report error as the port is used by other application.

ansysedt -grpcsrv FirstPortNumber:LastPortNumber

ansysedt process will be listening on the first available port within the port range, but report error if all ports in the range used.

ansysedt -grpcsrv FirstPortNumber:NumberOfPorts

ansysedt process will be listening on the first available port within the port range, but report error if all ports in the range used.

Note: If the last number is smaller than the first number the last number will be treated as the number of ports. (50051: 50250 has the same range as 50051:200)

Connect Functions:

1. Connect(projectPath)
 - a. Connect to the opened project.
 - b. Launch ansysedt.exe, open the project, then connect to it.
 - c. Error if the project does not exist.

2. `Connect(portNumber)` Connect to running ansyedt process in the local machine. Error if no ansyedt process listening on this port.
3. `Connect(machine, projectPath)` connect to an open project in remote Machine. projectPath must be a network path. Error if no ansyedt process opened the project.
4. `Connect(machine, portNumber)` connect to a running ansyedt process on the remote machine. Error if no ansyedt process listening on this port.

Example:

```
import sys

sys.path.append(r"<InstallationPath>/PythonFiles/DesktopPlugin")

import ScriptEnv

ScriptEnv.Connect(r"c:\myProjects\Project1.aedt")

oProject = oDesktop.GetActiveProject()

print(oProject.GetName())
```

Launching Electronics Desktop

To launch a new instance of Electronics Desktop and connect oApplication and oDesktop to it:

```
InitializeNew(NonGraphical = <True|False>, Module = None, Machine =
"", Port = <Port#>)
```

Where:

- **NonGraphical** – Specifies whether to launch Electronics Desktop in non-graphical mode.
- **Module** – Behavior remains unchanged from [Iron Python](#) and should be left defaulted to "None." See the code in ScriptEnv.py for more details.
- **Machine** – Currently an empty string, as InitializeNew() will only launch Electronics Desktop on the current machine.
- **Port** – Electronics Desktop will launch using the first unused port it finds starting at <Port#>. If Port = 0, the starting port will be 50051.

Note:

InitializeNew() will *always* launch a new instance of Electronics Desktop. Please use Initialize() to connect to an existing instance. See below.

Connecting with a Running Instance of Electronics Desktop

To connect oApplication and oDesktop to an existing Electronics Desktop instance, or launch a new instance and connect to it if necessary:

```
Initialize(name, NG = <True|False>, machine = "", port = <Port#>)
```

Where:

- **Name** – Ignored.
- **NG** – If launch is necessary, specifies whether to launch Electronics Desktop in non-graphical mode.
- **Machine** – The machine on which to launch/connect. For current machine, pass empty string or use localhost.
- **Port** – If port is nonzero, the script tries to connect to an existing instance on <port#> running on <machine>. If there is no instance running on that <port>, a new instance of Electronics Desktop launches on that port and then connects to it. If port = 0, the new instance is launched on the first free port, starting at 50051.

Closing Electronics Desktop/Ending the Script

To close Electronics Desktop, add the following line to the end of the script:

```
ScriptEnv.Shutdown()  
  
# This stops ScriptEnv.py. If you are running multiple scripts,  
include this only at the end of the last script.
```

-grpcsrv Flag

This flag will launch the application in a mode where the executable serves as a scripting server that can be used for CPython scripting in conjunction with the CPython stand alone scripting instructions that were mentioned earlier. The -ng flag can be combined with -grpcsrv.

On Windows:

```
ansysedt.exe -grpcsrv <optional port number>.
```

On Linux:

```
ansysedt -grpcsrv <optional port number>.
```

If the port number is omitted, the default of 50051 will be used.

With -grpcsrv, a message will be displayed in the **Messages** window indicating that the server was started. If the requested port is in use by another application, starting the sever may fail.

Related Topics:

[Standalone Scripting in Iron Python](#)

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Ansys Electronics Desktop Scripting

This chapter provides an overview of scripting in Ansys Electronics Desktop.

[Overview of Ansys Electronics Desktop Scripting Objects](#)

[Running a Script](#)

[Recording a Script](#)

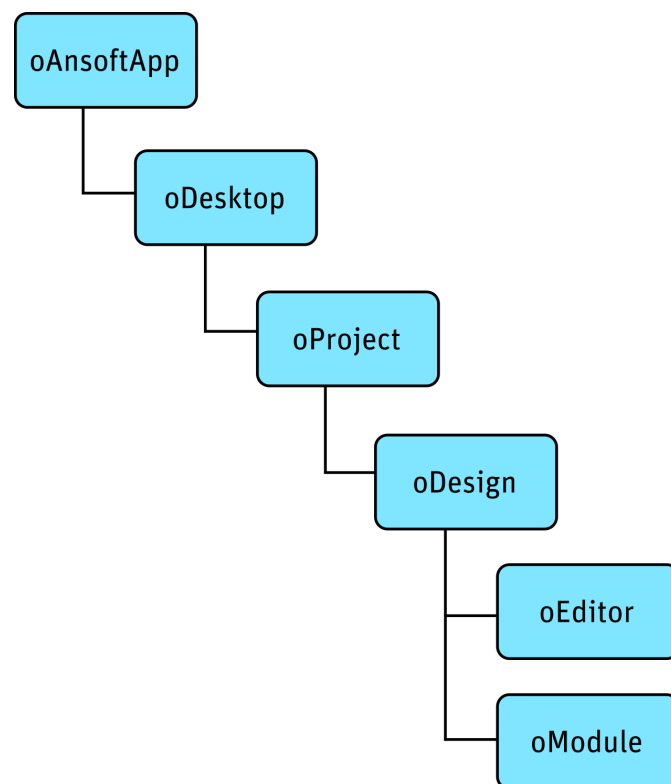
[Working with Project Scripts](#)

[Executing a Script from Within a Script](#)

[Ansys Electronics Desktop Scripting Conventions](#)

Overview of Electronics Desktop Scripting Objects

When you record a script using Ansys Electronics Desktop, the beginning of the script must contain some standard commands, as illustrated in the following chart. The commands in the chart define the objects used by Electronics Desktop in the script and assign values to these objects. The objects are used in the hierarchical order shown.



The commands are described below, followed by examples.

oAnsoftApp

The **oAnsoftApp** object provides a handle for Iron Python to access the `Ansoft.ElectronicsDesktop` product.

In Iron Python, for example:

```
oAnsoftApp = CreateObject('Ansoft.ElectronicsDesktop')
```

oDesktop

The **oDesktop** object is used to perform desktop-level operations, including project management.

In Iron Python, for example:

```
oDesktop = oAnsoftApp.GetAppDesktop()
```

Consult the following for details about script commands recognized by **oDesktop**:

- [Desktop Object Script Commands](#).

oProject

The **oProject** object corresponds to one project open in Electronics Desktop. It is used to manipulate the project and its data. Its data includes variables, material definitions, and one or more designs.

In Iron Python, for example:

```
oProject = oDesktop.GetActiveProject()
```

Consult the following for details about script commands recognized by **oProject**:

- [Project Object Script Commands](#)

oDesign

The **oDesign** object corresponds to a design in the project. This object is used to manipulate the design and its data, including variables, modules, and editors.

In Iron Python, for example:

```
oDesign = oProject.GetActiveDesign()
```

Consult the following for details about script commands recognized by **oDesign**:

- [Design Object Script Commands](#)
- [Output Variable Script Commands](#)
- [Reporter Editor Script Commands](#)

oEditor

The **oEditor** object corresponds to an editor, such as the 3D Modeler, Layout, or Schematic editor. This object is used to add and modify data in the editor.

In Iron Python, for example:

```
oEditor = oDesign.SetActiveEditor('3D Modeler')
```

Consult the following for details about script commands recognized by `oEditor`:

- [3D Modeler Editor Script Commands](#)

Important:

There is no Reporter Editor object for `oEditor`. Reporter Editor commands are executed by `oDesign`.

See: [Reporter Editor Script Commands](#).

oModule

The **oModule** object corresponds to a module in the design. Modules are used to handle a set of related functionalities.

In IronPython, for example:

```
oModule = oDesign.GetModule('BoundarySetup')
```

Consult the following for details about script commands recognized by `oModule`:

- Analysis Module Script Commands
- Boundary and Excitation Module Script Commands
- Field Overlays Module Script Commands
- Mesh Operations Module Script Commands
- Optimetrics Module Script Commands
- Radiation Module Script Commands
- Reduce Matrix Module Script Commands
- Solutions Module Script Commands

Example Script Opening

Combining the above objects, a script in Iron Python could begin like the following:

```
oAnsoftApp = CreateObject("Ansoft.ElectronicsDesktop")
oDesktop = oAnsoftApp.GetAppDesktop()
oProject = oDesktop.SetActiveProject("Project1")
oDesign = oProject.SetActiveDesign("Design1")
oEditor = oDesign.SetActiveEditor("3D Modeler")
oModule = oDesign.GetModule("BoundarySetup")
```

GetActiveProject and GetActiveDesign for Wider Use

The sample script above only works for "Design1" within "Project1". To create a script that is usable for any open project, you can use one or both of `GetActiveProject` and `GetActiveDesign`.

In IronPython:

```
oProject = oDesktop.GetActiveProject()  
  
oDesign = oProject.GetActiveDesign()
```

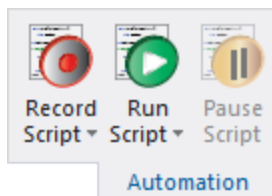
Running a Script

Electronics Desktop scripts can be run from within the software or from the command line.

Within Electronics Desktop

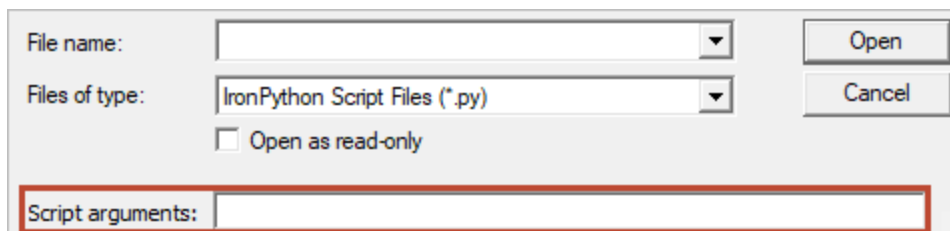
To run scripts in Electronics Desktop:

1. Click **Tools > Run Script**, or select the **Automation** tab and click the **Run Script** icon:



The **Run Script** file browser appears.

2. Use the file browser to locate the script file (*.py).
3. If desired, type script arguments in the Script Arguments field:



4. Click **Open**.

Electronics Desktop executes the script.

While script execution is in progress, the **Run Script** button transforms into a **Stop Script** button. Click **Stop Script** to stop the script execution.

To temporarily pause a running script, click **Pause Script**. This button transforms into a **Resume Script** button, which you can click to resume script execution.

From the Command Line

To run a script from a command line, add the `-runscriptandexit` or `-runscript` argument to the Electronics Desktop command line syntax.

To use script arguments, add the `-scriptargs` parameter and specify the arguments. For example:

```
ansyedt.exe -scriptargs "hello there"
```

The command line parameter following `-scriptargs` is passed without modification as a single string in the `ScriptArgument` python variable.

For more information about running a script from the command line, consult the Q3D Extractor help topic "Running Ansys Electronics Desktop from the Command Line".

Recording a Script

Electronics Desktop can record a script based on UI actions and save this script in Python (*.py) format.

Scripts can be saved to an [external file](#), or [to the project](#).

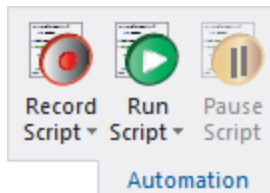
Important:

When you record a script, every subsequent action you take is recorded. You must manually stop recording.

Recording a Script to File

To record a script to file:

1. Click **Tools > Record Script to File**, or select the **Automation** tab and click the **Record Script** icon:

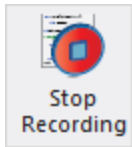


A **Save As** file browser appears.

2. Navigate to the location where you want to save the script.
3. In the **File Name** field, type a name for the script file.

4. Click **Save**.

The **Record Script** button transforms into a **Stop Recording** button, and Electronics Desktop begins recording your actions.



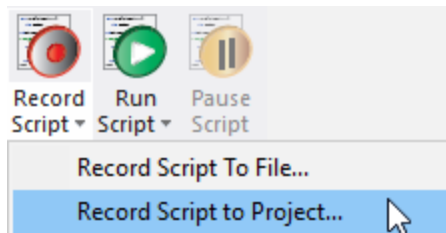
5. Perform the steps you want to record.
6. When you have finished recording the script, click **Stop Recording**, or select **Tools > Stop Script Recording**.

The recorded script is saved to the folder you specified.

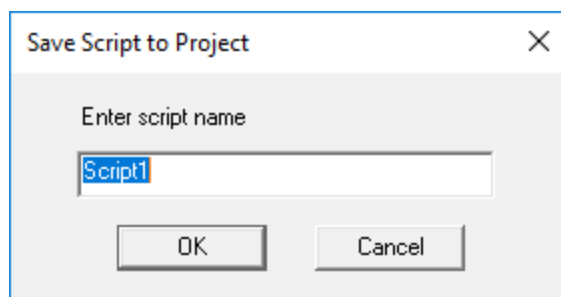
Recording a Script to a Project

To record a script to a project:

1. Click **Tools > Record Script to Project**, or select the **Automation** tab and use the **Record Script** drop-down menu to select **Record Script to Project**.



The **Save Script to Project** dialog box appears:



2. Enter a name for the script in the text box, then click **OK**.

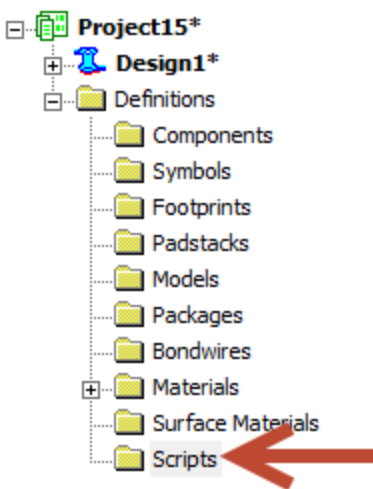
3. Perform the steps you want to record.
4. When you have finished, click **Stop Recording**, or select **Tools > Stop Script Recording**.

The recorded script is saved to *scriptname.py* in the Scripts library and can be accessed from the Project Manager. See: [Working with Project Scripts](#).

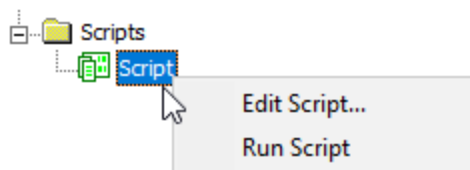
Working with Project Scripts

Scripts can be [recorded to a project](#).

Once a script has been recorded to the project, you can manage it in the **Project Manager** from the **Definitions** folder:



Individual scripts appear in this folder. Right-click a script to edit or run it:



You can also run project scripts from the **Automation** tab by selecting **Run Script > Project Scripts > [Script Name]**.

Note:

Project scripts are stored in the project scripts library. Refer to the topic "Managing Library Contents" for information on working with libraries.

Executing a Script from Within a Script

Electronics Desktop provides a script command that enables you to launch another script from within the script that is being executed.

In CPython:

```
oDesktop.RunScript (<ScriptName>)
```

If the full path to the script is not specified, Electronics Desktop searches for the specified script in the following locations, in order:

1. Personal Library Directory (PersonalLib)
2. User Library Directory (UserLib)
3. System Library Directory (SysLib)
4. Installation Directory

Each of the library directories can be specified in Electronics Desktop under **Tools > Options > General Options**, on the **Project Options** tab.

Electronics Desktop Scripting Conventions

A number of scripting conventions exist for Electronics Desktop regarding syntax, arguments, and numerical values.

Consult the following topics:

- [Named Arguments](#)
- [Setting Numerical Values](#)

Named Arguments

Many Electronics Desktop script commands use named arguments. The names can appear in three ways:

1. Named data, where name precedes data.

For example:

```
..., "SolveInside:=", true, ...
```

2. Named Array, where name precedes array.

For example:

```
..., "Attributes:=", Array(...), ...
```

3. Named Array, where name is inside an array.

For example:

```
..., Array("NAME:Attributes",...),...
```

In the first and second examples, the name is formatted as "<Name>:". This signals to Electronics Desktop that this is a name for the next argument in the script command. In the third example, the name is formatted as "NAME:<name>" and is the first element of the array.

The names are used both to identify what the data means to you and to inform Electronics Desktop which data is being given. The names must be included or the script will not play back correctly. However, if you are writing a script, you do not need to pass in every piece of data that the command can take. For example, if you are modifying a boundary, the script will be recorded to include every piece of data needed for the boundary, whether or not it was modified. If you are writing a script by hand, you can add only the data that changed and omit anything that you do not want to change. Electronics Desktop will use the names to determine which data you provided.

IronPython Example

When editing a port excitation, Electronics Desktop records the `Edit` command as follows in IronPython:

```
oModule.Edit("Port1",
    ["NAME:Port1",
        ["NAME:Properties",
            "PortSolver:=", "true",
            "Phase:=", "0deg",
            "Magnitude:=", "2mA",
            "Impedance:=", "50Ohm",
            "Theta:=", "0deg",
            "Phi:=", "0deg",
            "PostProcess:=", "false",
            "Renormalize:=", "50Ohm + 0i Ohm",
            "Deembed:=", "0mm",
            "RefToGround:=", "false"
        ],
        "Type:=", "EdgePort",
        "IsGapSource:=", true,
        "UpperProbe:=", false,
```

```
"LayoutObject:=", "Port1",  
"Pin:=", "",  
"ReferencePort:=", ""  
]  
)
```

If you only wish to change the magnitude, you can leave out the other data arguments when manually writing a script:

```
oModule.Edit("Port1",  
  ["NAME:Port1",  
    ["Magnitude:=", "1mA"]  
  ]  
)
```

Setting Numerical Values

For script arguments that expect a number, the following options are possible:

- Pass in the number directly.

```
oModule.EditVoltage('Voltage1', ['NAME:Voltage1', 'Voltage:=',  
  3.5])
```

- Pass in a string containing the number with units.

```
oModule.EditVoltage('Voltage1', ['NAME:Voltage1', 'Voltage:=',  
  '3.5V'])
```

- Pass in a variable name.

```
var = 3.5  
  
oModule.EditVoltage('Voltage1', ['NAME:Voltage1', 'Voltage:=',  
  var])
```

Layout Scripts and the Active Layer

A design's active layer is the layer that is used for object creation and placement during adding operations in the user interface. Adding operations include paste and placement of instances, as well as object creation. Usually there is an active layer, but it is not required and cannot be assumed. Adding operations are responsible for ensuring that the active layer exists and meets any particular requirements (such as layer type) for the operation. Adding operations may change the active layer to a different layer that meets requirements. If the active layer is changed, Electronics Desktop generates an alert. If no layer is available to be active, the operation is not done.

The active layer is not used during script adding operations. Script adding operations are responsible for ensuring that the specified layer exists and meets the particular requirements (such as layer type) for the operation. If there is a problem with using the specified layer, the operation is not done. The active layer is always visible and selectable. These attributes are reset, if needed, when a layer is made active. The current active layer is indicated by a combo box display in the toolbar. The list for the combo box contains all layers that may be set active.

The active text style is related to the active layer. If there is no active layer, there is no active text style. Objects on the active layer have priority during snapping.

Scripts and Locked Layers

The locked attribute of a layer is defined to mean that you may not edit, delete, or add objects on the layer, either directly or with scripts (i.e., scripts run on layout or footprint definitions). This includes not being able to change properties of objects on the layer. Note, however, that parameter changes can alter objects on locked layers.

The locked attribute of a layer is configurable using script commands and is user-editable via the **Edit Layers Dialog** in the Layout Editor.

PyAEDT (Beta)

PyAEDT is a Python library that interacts with the AEDT API to make scripting simpler for the end user. It supports all AEDT 3D products (HFSS, Icepak, Maxwell 3D, and Q3D Extractor), 2D tools, Ansys Mechanical, EMIT, Circuit tools like Nexxim, system simulation tools like Twin Builder, and layout tools like HFSS 3D Layout and EDB. Additionally, it enables the end user to have a CPython interface with AEDT. Its class and method structures simplify operation for the end user, enabling more Pythonic code while reusing information as much as possible across the various APIs.

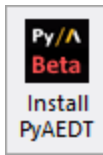
Documentation for PyAEDT can be found online at: <https://aedt-docs.pyansys.com/version/stable/>

Installing PyAEDT adds three items to the **Tools > Toolkit > PersonalLib** menu and to the **Automation** tab:

- **Console** – launches the PyAEDT console.
- **Jupyter Notebook** – launches Jupyter Notebook (a computational notebook) in an internet browser.
- **Run PyAEDT Script** – launches a file browser allowing you to select a Python script to run via PyAEDT.

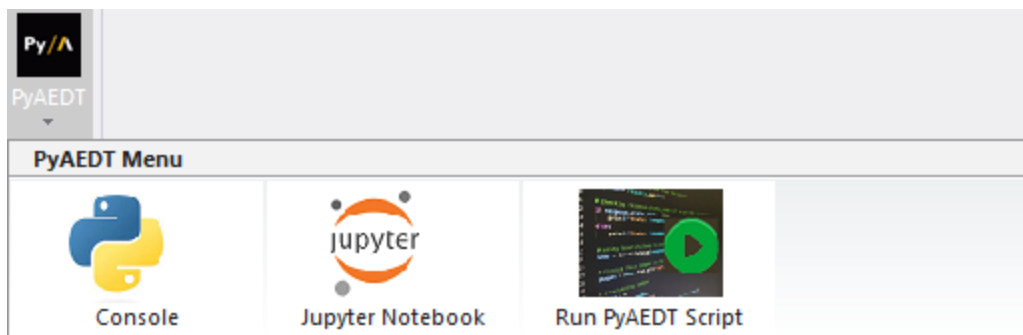
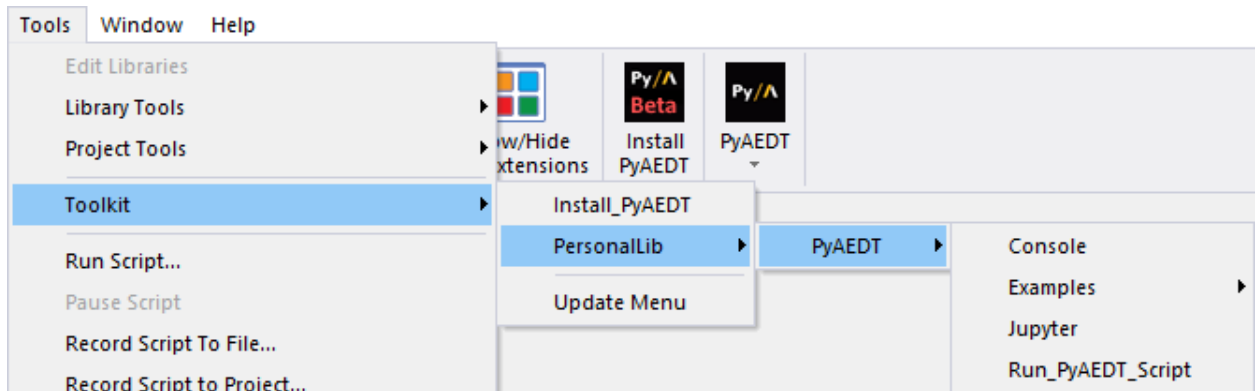
To install PyAEDT:

- From the **Automation** tab, click **Install PyAEDT**.



A web browser launches, and takes you to detailed installation instructions.

When installation is complete, the **Tools > Toolkit > PersonalLib** menu and the **Automation** tab update to display PyAEDT menu options:



2 - Object-Oriented Property Scripting

Object-oriented scripting enhances scripting in AEDT by allowing object-oriented access to retrieve or modify object properties. The primary gain is the ease with which properties of various existing objects in an AEDT project or design can be read, modified, and set. This feature also allows for much less code to be written to access object properties and enables much more readable code for users, avoiding complex array input.

This topic covers the following:

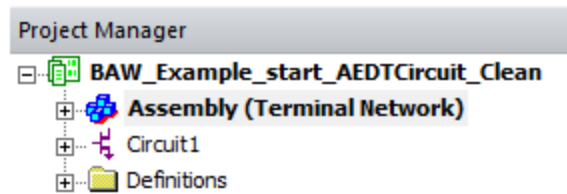
- Logic/syntax
- Basic attributes of project and design properties
- Example Scripts

Object-Oriented Scripting

There are five basic functions in object-oriented scripting for retrieving and setting properties:

1. GetChildNames()
2. GetChildObjects()
3. GetPropNames()
4. GetPropValue()
5. SetPropValue()

At a high level, use GetChildNames() to determine what object instances exist for a given object. An example is shown below to demonstrate for an AEDT Project shown that has two Designs.



If you open the Command Window that allows for executing python code, you first define the Project Object, oProject, and the Design Object, oDesign, as shown:

```
>>> oProject = oDesktop.GetActiveProject()  
>>> oDesign = oProject.GetActiveDesign()
```

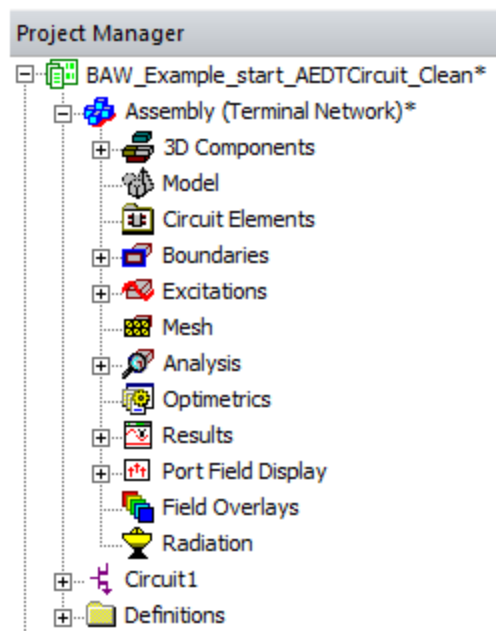
Once the objects have been defined, you can use GetChildNames() to learn what object instances exist for each. As an example, observe the Child Names of oProject, and you see a list of the Designs in the AEDT Project, per the GUI.

```
>>> oProject.GetChildNames()  
['Assembly', 'Circuit1']
```

As another example, retrieve the names of the Object Instances available in oDesign, to see the various objects associated with a Design setup:

```
>>> oDesign.GetChildNames()  
['Boundaries', 'Excitations', 'Circuit Elements', 'Model', 'Mesh', 'Analysis', 'Optimetrics', 'Port  
Field Display', 'Field Overlays', 'Radiation', 'Results', '3D Modeler']
```

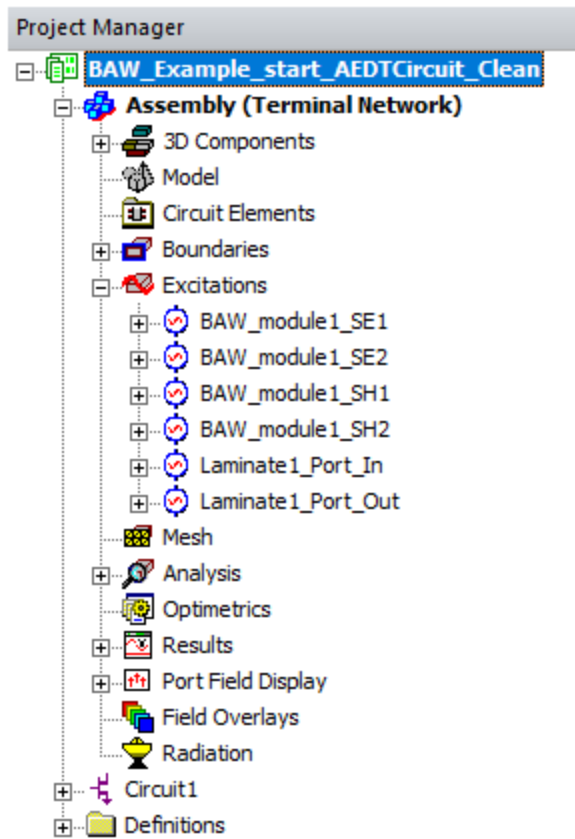
These names are what you would expect based on the Project Manager Layout:



In the **Project Manager** above, any object that has the '+' symbol is populated with children that you can query. Once you know the name of the object you want, you can instance it via the `GetChildObject()` command. This defines the instance to the desired object. As an example, set an instance for the Excitations:

```
>>> oExcitations = oDesign.GetChildObject('Excitations')
```

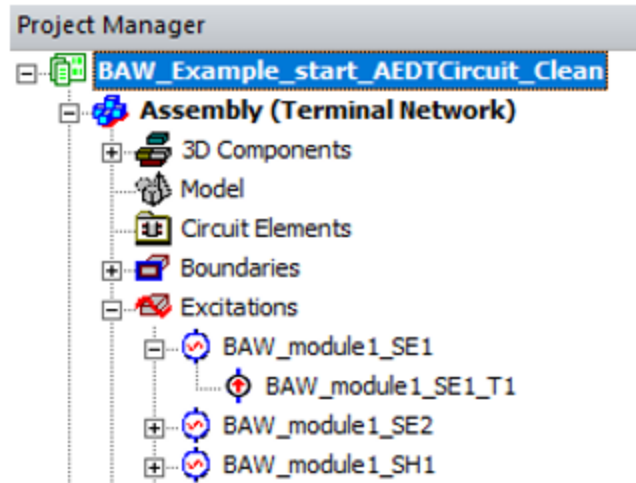
You now have an object, oExcitations defined to be the oDesign Child Object 'Excitations'. What does this mean? If you expand the Excitations dialogue in the Project Manager, you expect that the Child Names of this object would be the names of the Excitations as defined, in this case six ports:



```
>>> oExcitations.GetChildNames()  
['Laminat1_Port_In', 'Laminat1_Port_Out', 'BAW_module1_SE1', 'BAW_module1_SE2', 'BAW_module1_SH1',  
'BAW module1 SH2']
```

There is clear logic to the Object Child Names as the children of the oExcitations object as the ports that have been defined in HFSS. Looking at the Project tree can help you to conceive and retrieve desired information.

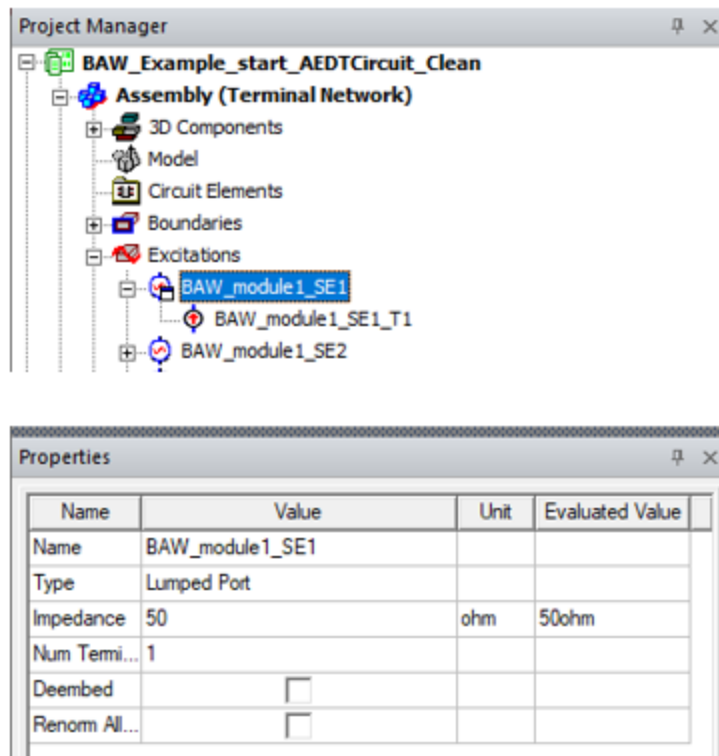
Expand the first port to see its expected Child Object, its Terminal, in the **Project Manager** Window:



Through scripting, first define the Port Object (in this example, oPort) using the 'GetChildObject()' command for the first port, 'BAW_module1_SE1.' Then determine its Object Child Name, the terminal definition:

```
>>> oPort = oExcitations.GetChildObject('BAW_module1_SE1')
>>> oPort.GetChildNames()
['BAW_module1_SE1_T1']
```

As the use and logic for `GetChildNames()` and `GetChildObject()` have been demonstrated, you can now explore the properties of each of these objects, if they exist. The function to determine what properties exist is `GetPropNames()`. Use this to determine what properties exist to be retrieved or modified for a given object. The properties available are readily identifiable in the **Property** window, by default located beneath the **Project Manager** window. For example, if you select a given port object, 'BAW_module1_SE1' the Property window populates as shown:



If you execute the `GetPropNames()` function on the previously defined object, `oPort`, you see the same Property Names as available in the **Properties** window:

```
>>> oPort.GetPropNames()  
['Name', 'Type', 'Impedance', 'Num Terminals', 'Deembed', 'Renorm All Terminals']
```

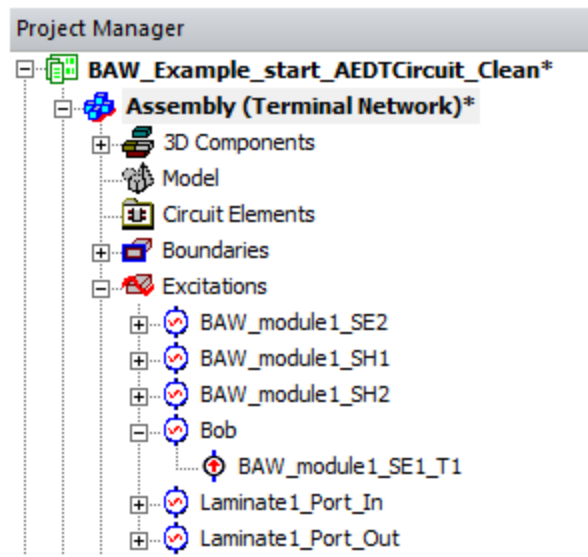
Once you identify the desired object and you know the desired property, you can access the value via `GetPropValue()`. For example, if you want to retrieve the name of the object `oPort`:

```
>>> oPort.GetPropValue('Name')  
'BAW_module1_SE1'
```

To change the value of the property, use the `SetPropValue()` function. The arguments for this function are (*Property Name*, *New Value*). For example, to change the name of the port to 'Bob':

```
>>> oPort.SetPropValue('Name', 'Bob')  
True
```

This function returns a Boolean 'True' if successful. The Project Manager window updates accordingly:



This approach for retrieving and setting properties is general and can be used for many aspects of an Ansys Electronics Desktop simulation. This Object-Oriented method of property identification and modification operates only on existing objects. Object-Oriented scripting cannot create new instances; you must revert to the functions in a given Module to do that. Not all Children of a given object may be accessible via the GetChildNames() command just yet. An example is given for Material property modification later in this App Note. However, if you need specific objects you can reference details in the Scripting Help or reach out to an Application Engineer.

Material Properties and Examples

This section discusses the material properties and how to access and modify them. Because materials are globally defined, the objects are children of the Project, oProject, as shown below:

```
>>> oProject = oDesktop.GetActiveProject()
>>> oMaterials = oProject.GetChildObject('Materials')
>>> oMaterials.GetChildNames()
['vacuum', 'Cap_Mat', 'Outline_Mat', 'SolderMask_Mat', 'copper', 'pec']
```

All materials with a Project Definition, or assigned to an object, in the Project are accessible. For example, assume you want to see the conductivity of 'copper.' Follow the same flow as in the previous section:

```
>>> oCopper = oMaterials.GetChildObject('copper')
>>> oCopper.GetPropNames()
['Coordinate System Type', 'Coordinate System Type/Choices', 'Relative Permittivity Type', 'Relative Permittivity Type/Choices', 'Relative Permeability Type', 'Relative Permeability Type/Choices', 'Relative Permeability', 'Bulk Conductivity Type', 'Bulk Conductivity Type/Choices', 'Bulk Conductivity', 'Dielectric Loss Tangent Type', 'Dielectric Loss Tangent Type/Choices', 'Dielectric Loss Tangent', 'Magnetic Loss Tangent Type', 'Magnetic Loss Tangent Type/Choices', 'Magnetic Loss Tangent', 'Electric Coercivity Type', 'Electric Coercivity Magnitude', 'Magnetic Coercivity Type', 'Magnetic Coercivity Magnitude', 'Thermal Conductivity Type', 'Thermal Conductivity Type/Choices', 'Thermal Conductivity', 'Magnetic Saturation Type', 'Magnetic Saturation', 'Lande G Factor Type', 'Lande G Factor', 'Delta H Type', 'Delta H', '- Measured Frequency Type', '- Measured Frequency', 'Core Loss Model', 'Core Loss Model/Choices', 'Mass Density Type', 'Mass Density', 'Composition', 'Composition/Choices', 'Specific Heat Type', 'Specific Heat', 'Young's Modulus Type', 'Young's Modulus Type/Choices', 'Young's Modulus', 'Poisson's Ratio Type', 'Poisson's Ratio Type/Choices', 'Poisson's Ratio', 'Thermal Expansion Coefficient Type', 'Thermal Expansion Coefficient Type/Choices', 'Thermal Expansion Coefficient', 'Magnetostriiction Type', 'Inverse Magnetostriiction Type', 'Thermal Material Type', 'Thermal Material Type/Choices', 'Solar Behavior Type', 'Solar Behavior Type/Choices', 'Solar Behavior']
```

The Material Property of interest is "Bulk Conductivity." So you create a "Cond" object to store the value and use the GetPropValue function to obtain it. Then name the Cond object to see the value:

```
>>> Cond = oCopper.GetPropValue('Bulk Conductivity')
>>> Cond
'58000000'
```

To change the conductivity, use the `SetPropValue()` function as shown below:

```
>>> oCopper.SetPropValue('Bulk Conductivity', '100')
True
>>> NewCond = oCopper.GetPropValue('Bulk Conductivity')
>>> NewCond
'100'
```

Body Properties and Modification

The following example shows how to retrieve the properties of a Body in the model, in this case a Region object. Once you identify the desired property, you can modify it as needed.

```
>>> oModel = oDesign.GetChildObject('3D Modeler')
>>> oModel.GetChildNames()
['RadBox_Region_1']
>>> oRegion = oModel.GetChildObject('RadBox_Region_1')
>>> oRegion.GetPropNames()
['Name', 'Material', 'Solve Inside', 'Orientation', 'Orientation/Choices', 'Model', 'Group', 'Display
Wireframe', 'Material Appearance', 'Color', 'Color/Red', 'Color/Green', 'Color/Blue', 'Transparent']
```

Retrieving Variables

Retrieving defined variables in a Design or Project is a common effort for automation. There are two types of variables, Design and Project. Project variables are preceded with a '\$' symbol and are retrieved in the Project object as it is globally defined to all Designs. Design variables do not have any preceding symbols and are retrieved in the Design object as their scope is limited to a given Design. The following example demonstrates the retrieval of Project Variable names and values, and then Design variable names and values.:

```
>>> oProjVar = oProject.GetChildObject("Variables")
>>> oProjVar.GetPropNames()
['$test']
>>> oProjVar.GetPropValue('$test')
'0'
>>> oDesVar = oDesign.GetChildObject("Variables")
>>> oDesVar.GetPropNames()
['test']
>>> oDesVar.GetPropValue('test')
'0'
```

Retrieve Datasets and Values

The `GetChildObject`, `GetChildTypes` and `GetChildNames` functions operate on the `oDesktop` objects. This allows you to retrieve and view datasets and values. The dataset script wrapper store all values internally in SI units, and converts them back to user-supplied units when you request non-SI property values. For example, if you assigned a dataset to the example `OptimTee` project in HFSS, you could use these functions in the command window:

```
>>>oDesktop.GetChildTypes()

['Projects']

>>>oDesktop.GetChildNames()

['OptimTee']

>>>arrProjectNames = oDesktop.GetChildNames()

>>>tp = oDesktop.GetChildObject('OptimTee')

>>>tp.GetChildTypes()
```

```
['Design', 'Project Data']
>>>tp.GetChildNames('Project Data')
['Variables', 'Materials', 'Surface Materials', 'Datasets']
>>>ds = tp.GetChildObject('datasets')
>>>ds.GetChildNames()
['$ds1']
>>>ds1=ds.GetChildObject('$ds1')
>>>ds1.GetPropValue('[:,:]')
[[1.0, 4.0], [2.0, 5.0], [3.0, 6.0]]
>>>ds1.GetPropSIValue()
[[1.0, 4.0], [2.0, 5.0], [3.0, 6.0]]
>>>ds1.DimUnits
>>>ds1.DimUnits = ['mm','mm']
>>>ds1.DimUnits
['mm', 'mm']
>>>ds1.GetPropSIValue()
[[0.001, 0.00400000000000000001], [0.002, 0.00500000000000000001], [0.00300000000000000001,
0.00600000000000000001]]
>>>ds1.GetPropValue('[:,:]')
[[1.0, 4.0], [2.0, 5.0], [3.0, 6.0]]
```

GetSolutionData API

Many users want to use scripts to extract solution data from Ansys Electronics Desktop for custom Post Processing. Scripting includes a new method to do this without having to export data to a file and then re-import it for use in a script. The new function is accessible via the “ReportSetup” Module. The function call is “GetSolutionDataPerVariation()”. A code snippet to extract Terminal S Parameter data is shown:

```
8  oModule=.oDesign.GetModule("ReportSetup")
9  Results=.oModule.GetSolutionDataPerVariation("Terminal.Solution.Data", "Setup1::Sweep1:",
10  .....[
11  ..... "Domain:=", "Sweep"
12  .....],
13  .....[
14  ..... "Freq:=", ["All"]
15  .....],
16  .....[
17  ..... "dB(St(Terminal_1,Terminal_1))"
18  .....]
19  ##.Get.Dependent.and.Independent.Variable.data.for.Nominal.Variation
20  NominalData=.Results[0]
21  ##.Get.Independent.Variable.Data
22  ##.For.second.argument,.if.pass.True.then.data.is.in.SI.Units
23  ##.if.pass.False.then.data.is.in.default.scale.units.instead.of.SI
24  SweepValues=.NominalData.GetSweepValues("Freq", True)
25  ##.Get.Dependent.Variable.DataValues
26  ##.Note:.Can.pass.any.'Y.Component'.Name
27  DataValues=.NominalData.GetRealDataValues("dB(St(Terminal_1))")
```

The above code shows how you can extract the Dependent and Independent data to variables for easy manipulation. For more information on other functions available for this, see [GetSolutionDataPerVariation](#).

Summary

Scripting has been advancing in Ansys Electronics Desktop to better allow you to customize and automate their repetitive or complex simulations. The ability to easily retrieve and set property values via the Object-Oriented scripting allows for ease of both writing and

reading. The ability to extract solution data within a script execution is a new functionality that markedly enables more advanced post processing.

Object oriented property scripting presents an easy to use, intuitive and object oriented representation of the data model. The framework supports query of objects and their properties including the edits of the data model in an object oriented fashion. With the new scripting framework, data exposure is intuitive and provides maximum coverage.

Each exposed script object supports the following COM functions:

- **GetName**
 - Return name of the object as text string
 - e.g. name of a design, solve setup, boundary, etc
- **GetChildTypes**
 - An object can have different types of children.
 - Return array of text string. Can be empty if the object's children are NOT categorized into different types.

For example, a design object has 3 children types. The following examples show how the commands run in the **Tools > Open Command Window** for IronPython.

```
>>> design.GetChildTypes()  
  
['Module', 'Editor', 'Design Data']
```

- **GetChildNames**
 - Input: [String – Type]. Default = “Module” and “Editor” for design script object. ‘All’ for other script objects.
 - Return an array of immediate children's names, of a given type if specified

For example, a Mechanical design object has these children.

```
>>> design.GetChildNames()  
  
['Boundaries', 'Excitations', 'Optimetrics', 'Results', '3D Modeler']
```

Four of the children are of “Module” type

```
>>> design.GetChildNames("module")
```

```
['Boundaries', 'Excitations', 'Optimetrics', 'Results']
```

- **GetChildObject**

- Input: String -- Object path. The path may include multiple generations.
- Return the child object if found

For example,

```
>>> d = project.GetChildObject("hfss")
>>> d.GetChildObject("3d modeler").GetChildNames()
['Box1', 'Box1_1', 'Box1_1_1']
>>> project.GetChildObject("hfss/3d modeler").GetChildNames()
['Box1', 'Box1_1', 'Box1_1_1']
```

- **GetPropNames**

- Input: [BOOL - IncludeReadOnly] -- default to true
- Return an array of the object's properties

For example,

```
>>> geom = project.GetChildObject("hfss/3d modeler").GetChildObject("Box1")
>>> geom.GetPropNames()
['Name', 'Material', 'Material/SIValue', 'Material/EvaluatedValue', 'Solve Inside', 'Orientation', 'Orientation/Choices', 'Model', 'Group', 'Display Wireframe', 'Material Appearance', 'Color', 'Color/Red', 'Color/Green', 'Color/Blue', 'Transparent']
```

- **GetPropValue**

- Input: String – Property Path. The path may include multiple generations.
- Return the property value as VARIANT

For example,

```
>>> geom.GetPropValue("material")
'vacuum'
>>> geom.GetPropValue("xsize")
'3mm'
>>> op.GetPropValue("attach to original object")
False
```

- **SetPropValue**

- Input: String – Property Path. The path may include multiple generations.
- Input: String – Data. New value of the property.
- Return -- True if property data is updated successfully. False if failed to assign the new value.

For example,

```
>>> geom.SetPropValue("model", False)
>>> boxcmd.SetPropValue("ysize", "4mm")
```

- **GetPropEvaluatedValue (<PropName>)**

For example,

```
oVar = oDesign.GetChildObject(" Variables/var")
oVar.GetPropEvaluatedValue()
```

- **GetPropSIValue (<PropName>)**

For example,

```
oCreateBox = oDesign.GetChildObject("3D Modeler/Box1/CreateBox:1")
oCreateBox.GetPropValue("xSize")
```

```
    return "length / 2"

oCreateBox.GetPropEvaluatedValue("xSize")

    return '0.4mm'

oCreateBox.GetPropSIValue("xSize")

    return 0.0004
```

Additional Details Specific to AEDT Solvers

“3D Modeler” of 3D products and “Machine” of RMXprt are exposed as “Editor” type children of a design script object.

“Variables” and “Design Settings” are exposed as “Design Data” type children of a design script object.

The following “Module” types are exposed as “Module” type children of a design script object.

HFSS

- Boundaries, Excitations, Circuit Elements, Hybrid Regions, Analysis, Radiation, Field Overlays, Optimetrics, Results

HFSS 3D Layout

- Boundaries, Excitations, Circuit Elements, Analysis, Radiation, Field Overlays, Optimetrics, Results

Maxwell 3D/2D

- Boundaries, Excitations, Analysis, Field Overlays, Optimetrics, Results

RMxpert

- Analysis, Field Overlays, Optimetrics, Results

Q3D

- Boundaries, Nets, Analysis, Optimetrics,

Q2D

- Boundaries, Conductors, Analysis, Field Overlays, Optimetrics,

Icepak

- Thermal, Monitor, Mesh, Analysis, Field Overlays, Optimetrics, Results

Mechanical

- Boundaries, Excitations, Analysis, Field Overlays, Optimetrics, Results

Circuit

- Optimetrics, Results

Circuit Netlist

- Results

EMIT

- Coupling

Simplorer/Twin Builder

- Analysis, Optimetrics, Results

Additional details on Boundaries/Excitations

Each design type presents its boundaries/excitations data in the project tree as different groups. For example, an HFSS design has Boundaries, Excitations, Circuit Elements and Hybrid Regions while a Icepak design has just a “Thermal” project tree folder.

These module script objects do not have properties

```
>>> project.GetChildObject("icepak/thermal").GetPropNames()
```

```
[]
```

GetChildTypes of these module script objects returns the types of its immediate children

```
>>> d = p.GetChildObject("q2d")
>>> d.GetChildObject("conductors").GetChildTypes()
['NonIdealGround', 'SignalLine']
```

GetChildNames of these module object returns its immediate children

```
>>> p.GetChildObject("icepak/thermal").GetChildNames()
['Source1', 'Resistance1', 'ConductingPlate1', 'Source2', 'Resistance2', 'ConductingPlate2',
'Source3', 'Resistance3', 'ConductingPlate3']
```

GetChildNames can be invoked with a “type” and the returns will be filtered by that given type.

```
>>> p.GetChildObject("icepak/thermal").GetChildNames("resistance")
['Resistance1', 'Resistance2', 'Resistance3']
```

Children of a module object are scriptable objects and have properties.

```
>>> port = p.GetChildObject("hfss/excitations/1")
>>> port.GetPropNames(False)
['Name', 'Deembed', 'Deembed Dist', 'Renorm All Terminals']
```

You can query/edit these properties

```
>>> port.GetPropValue("deembed")
False
>>> port.SetPropValue("deembed", True)
True
>>> port.GetPropValue("deembed")
True
```

A boundary/excitation script object can also have children. For example, HFSS terminal is a child of its port. Q3D source/sink can be children of a net.

```
>>> port.GetChildNames()
['Box1_T1']
>>> port.GetChildTypes()
['Terminal']
>>> p.GetChildObject("q3d/nets/s2").GetChildNames()
['Source2', 'Sink2']
>>> p.GetChildObject("q3d/nets/s2").GetChildTypes()
['Sink', 'Source']
```

3D component encapsulation

These script interfaces are compliant with encapsulation. For example,

- Design.GetChildObject("boundaries").GetChildNames() will not return component boundaries
- SetPropValues of component excitations can only be used to edit post processing settings such as 'Deembed', 'Deembed Dist' of a HFSS port.

Additional details on Solve setup

All solve setups are children of the "Analysis" script object. This parent script object is also of the type "Module".

```
>>> d = oDesktop.GetActiveProject().GetChildObject("hfss")
>>> d.GetChildNames()
['Boundaries', 'Excitations', 'Hybrid Regions', 'Circuit Elements', 'Analysis', 'Optimetrics',
'RadField', 'Results', '3D Modeler']
>>> setups = d.GetChildObject("analysis")
```

This module script object has no property

```
>>> setups.GetPropNames()

[]
```

The children of this module script object in a 3D design is not categorized into different types because the solve setup type is one-to-one to the solution type of a 3D design.

```
>>> setups.GetChildTypes()

[]
```

The children of this module script object in a 3DLayout and Simplorer/TwinBuilder design is categorized into different solve setup types, such as “Transient”, “AC” and “DC” in a Simplorer/TwinBuilder design and “HFSS” and “SIwave” in a 3D layout design.

A solve setup script object can also have children. Children are typically frequency sweeps.

```
>>> setup.GetChildNames()

['Sweep', 'Sweep1', 'Sweep2']

>>> setup.GetChildTypes()

['Discrete', 'Interpolating']

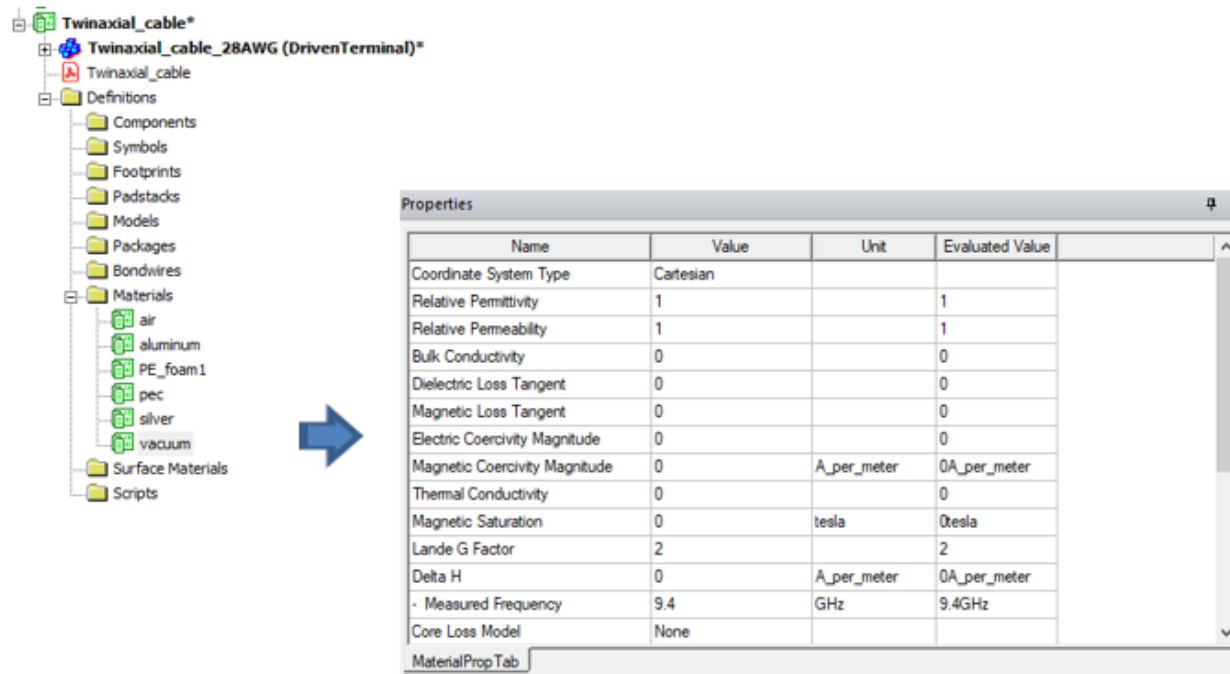
>>> sweep1 = setup.GetChildObject("sweep")
```

Related Topics

Example: GetPropNames and GetPropValues for Layered Impedance Boundary Script

Materials Scripting Support

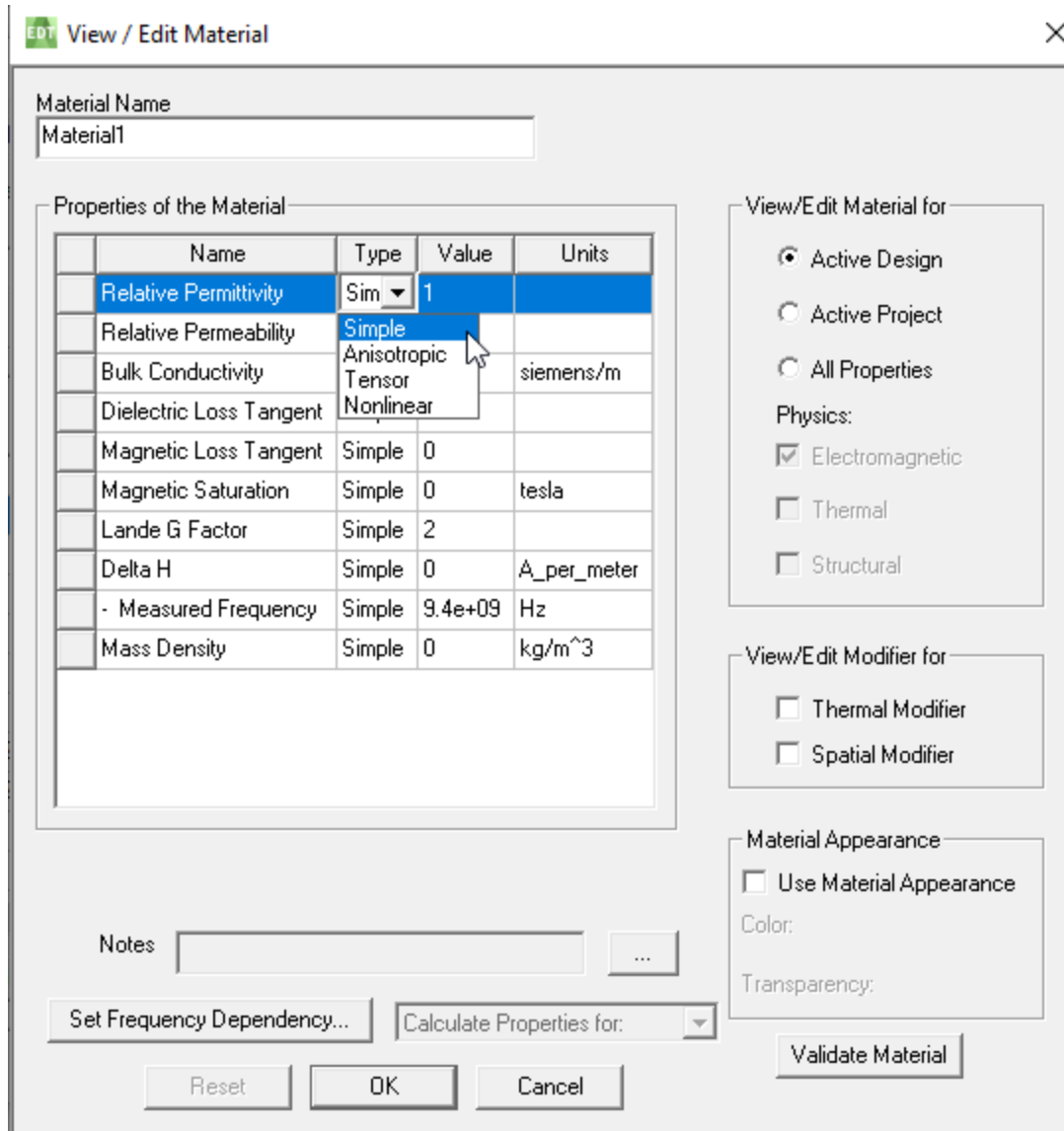
Supported material properties are shown in a Property window for the material item.



The Properties window displays the following material properties:

Name	Value	Unit	Evaluated Value
Coordinate System Type	Cartesian		
Relative Permittivity	1		1
Relative Permeability	1		1
Bulk Conductivity	0		0
Dielectric Loss Tangent	0		0
Magnetic Loss Tangent	0		0
Electric Coercivity Magnitude	0		0
Magnetic Coercivity Magnitude	0	A_per_meter	0A_per_meter
Thermal Conductivity	0		0
Magnetic Saturation	0	tesla	0tesla
Lande G Factor	2		2
Delta H	0	A_per_meter	0A_per_meter
- Measured Frequency	9.4	GHz	9.4GHz
Core Loss Model	None		

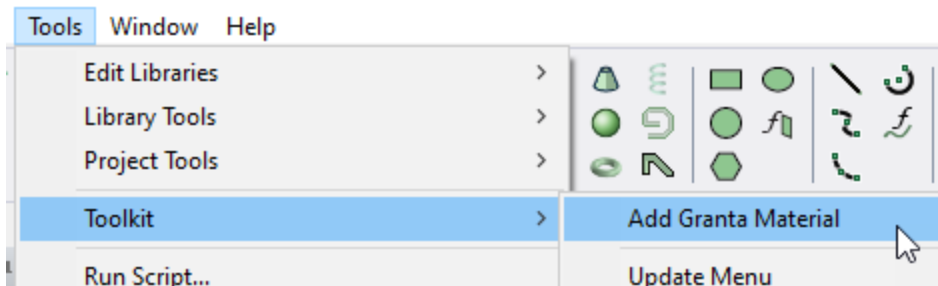
Some Material Properties like Relatively Permittivity may have values assigned as BH Curves or Tensors, as discussed in the Assigning Materials chapter of the online help.

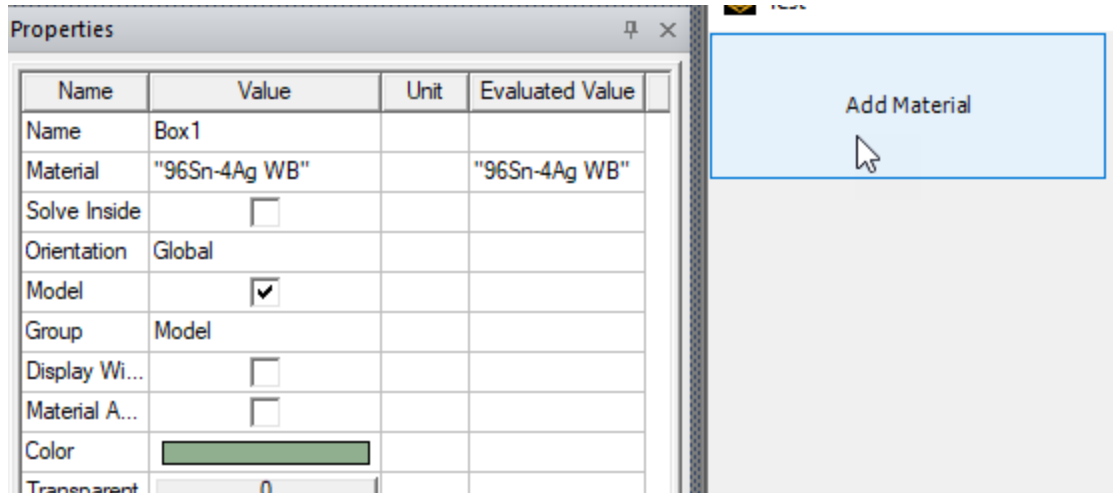


With this feature enabled you can then:

- Get/Set Simple material property
- Get/Set Anisotropic material property
- Get/Set Nonlinear material property
- Get/Set Vector material property
 - Components hide/shown as needed
- Get/Set Tensor material property
- Get/Set Choice material property
- [AddDefinitionFromBlock](#)
- [AddDefiniitonFromLibFile](#)
- [GetExtendedDefinitionObect](#)

A new Toolkit allows you to select materials from the Granta materials gateway, such that project materials will automatically be added when you select a material from the gateway, and that the gateway itself is easily accessed from the materials.





What is not supported:

- Change of property type
- Custom material property, due to its complexity

Object Oriented Scripting for Materials

Materials are Child objects of the Active Project. In the IronPython command window, you can execute `GetPropNames()` for a specified material as follows:

```
>>> omats = oDesktop.GetActiveProject().GetChildObject("Materials")
>>> omat = omats.GetChildObject("vacuum")
>>> omat.GetPropNames()
```

```
['Coordinate System Type', 'Coordinate System Type/Choices', 'Relative Permeability Type',  
'Relative Permeability Type/Choices', 'Relative Permeability', 'Relative Per-  
meability/SIValue', 'Relative Permeability/EvaluatedValue', 'Bulk Conductivity Type', 'Bulk  
Conductivity Type/Choices', 'Bulk Conductivity', 'Bulk Conductivity/SIValue', 'Bulk Con-  
ductivity/EvaluatedValue', 'Magnetic Coercivity Type', 'Magnetic Coercivity Magnitude', 'Mag-  
netic Coercivity Magnitude/SIValue', 'Magnetic Coercivity Magnitude/EvaluatedValue',  
'Composition', 'Composition/Choices', 'Young's Modulus Type', 'Young's Modulus Type/Choices',  
'Young's Modulus', 'Young's Modulus/SIValue', 'Young's Modulus/EvaluatedValue', 'Poisson's  
Ratio Type', 'Poisson's Ratio Type/Choices', 'Poisson's Ratio', 'Poisson's Ratio/SIValue',  
'Poisson's Ratio/EvaluatedValue']
```

Examples showing change to material property type:

```
>>> omat.GetPropValue("Relative Permeability Type/Choices")  
  
['Simple', 'Anisotropic', 'Tensor', 'Nonlinear']  
  
>>> omat.GetPropValue("Relative Permeability Type")  
  
'Nonlinear'  
  
>>> omat.SetPropValue("Relative Permeability Type", "Simple")  
  
True  
  
>>> omat.GetPropValue("Relative Permeability Type")  
  
'Simple'  
  
>>> omat.SetPropValue("Relative Permeability", 10)  
  
True
```

Examples showing change to a vector component value

```
>>> omat.GetPropValue("Magnetic Coercivity Magnitude")  
  
'0A_per_meter'  
  
>>> omat.SetPropValue("Magnetic Coercivity Magnitude", "-1A_per_meter")
```

```
True
```

```
>>> omat.GetPropNames()
```

```
['Coordinate System Type', 'Coordinate System Type/Choices', 'Relative Permeability Type',  
'Relative Permeability Type/Choices', 'Relative Permeability', 'Relative Per-  
meability/SIValue', 'Relative Permeability/EvaluatedValue', 'Bulk Conductivity Type', 'Bulk  
Conductivity Type/Choices', 'Bulk Conductivity', 'Bulk Conductivity/SIValue', 'Bulk Con-  
ductivity/EvaluatedValue', 'Magnetic Coercivity Type', 'Magnetic Coercivity Magnitude', 'Mag-  
netic Coercivity Magnitude/SIValue', 'Magnetic Coercivity Magnitude/EvaluatedValue', 'Magnetic  
Coercivity Components', 'Magnetic Coercivity Components/Component1', 'Magnetic Coercivity Com-  
ponents/Component2', 'Magnetic Coercivity Components/Component3', 'Composition', 'Com-  
position/Choices', '- Stacking Factor Type', '- Stacking Factor', '- Stacking Factor/SIValue',  
'- Stacking Factor/EvaluatedValue', '- Stacking Direction', '- Stacking Direction/Choices',  
"Young's Modulus Type", "Young's Modulus Type/Choices", "Young's Modulus", "Young's Mod-  
ulus/SIValue", "Young's Modulus/EvaluatedValue", "Poisson's Ratio Type", "Poisson's Ratio  
Type/Choices", "Poisson's Ratio", "Poisson's Ratio/SIValue", "Poisson's Ratio/EvaluatedValue"]
```

```
>>> omat.SetPropValue("Magnetic Coercivity Components/Component2", 2)
```

```
True
```

```
>>> omat.GetPropValue("Magnetic Coercivity Components")
```

```
['Component1:=', '2', 'Component2:=', '2', 'Component3:=', '0']
```

Change choice property value

```
>>> omat.GetPropValue("Composition/Choices")
```

```
['Solid', 'Lamination', 'Litz Wire']
```

```
>>> omat.SetPropValue("Composition", "Lamination")
```

```
True
```

```
>>> omat.GetPropNames()
```

```
[ 'Coordinate System Type', 'Coordinate System Type/Choices', 'Relative Permeability Type',
'Relative Permeability Type/Choices', 'Relative Permeability', 'Relative Per-
meability/SIValue', 'Relative Permeability/EvaluatedValue', 'Bulk Conductivity Type', 'Bulk
Conductivity Type/Choices', 'Bulk Conductivity', 'Bulk Conductivity/SIValue', 'Bulk Con-
ductivity/EvaluatedValue', 'Magnetic Coercivity Type', 'Magnetic Coercivity Magnitude', 'Mag-
netic Coercivity Magnitude/SIValue', 'Magnetic Coercivity Magnitude/EvaluatedValue', 'Magnetic
Coercivity Components', 'Magnetic Coercivity Components/Component1', 'Magnetic Coercivity Com-
ponents/Component2', 'Magnetic Coercivity Components/Component3', 'Composition', 'Com-
position/Choices', '- Stacking Factor Type', '- Stacking Factor', '- Stacking Factor/SIValue',
'- Stacking Factor/EvaluatedValue', '- Stacking Direction', '- Stacking Direction/Choices',
"Young's Modulus Type", "Young's Modulus Type/Choices", "Young's Modulus", "Young's Mod-
ulus/SIValue", "Young's Modulus/EvaluatedValue", "Poisson's Ratio Type", "Poisson's Ratio
Type/Choices", "Poisson's Ratio", "Poisson's Ratio/SIValue", "Poisson's Ratio/EvaluatedValue"]
```

```
>>> omat.SetPropValue("Magnetic Coercivity Components/Component2", 2)
```

```
True
```

```
>>> omat.GetPropValue("Magnetic Coercivity Components")
```

```
['Component1:=', '2', 'Component2:=', '2', 'Component3:=', '0']
```

Change choice property value

```
>>> omat.GetPropValue("Composition/Choices")
```

```
['Solid', 'Lamination', 'Litz Wire']
```

```
>>> omat.SetPropValue("Composition", "Lamination")
```

```
True
```

```
>>> omat.GetPropNames()
```

```
[ 'Coordinate System Type', 'Coordinate System Type/Choices', 'Relative Permeability Type',
'Relative Permeability Type/Choices', 'Relative Permeability', 'Relative Per-
meability/SIValue', 'Relative Permeability/EvaluatedValue', 'Bulk Conductivity Type', 'Bulk
Conductivity Type/Choices', 'Bulk Conductivity', 'Bulk Conductivity/SIValue', 'Bulk
```

```
Conductivity/EvaluatedValue', 'Magnetic Coercivity Type', 'Magnetic Coercivity Magnitude',  
'Magnetic Coercivity Magnitude/SIValue', 'Magnetic Coercivity Magnitude/EvaluatedValue', 'Mag-  
netic Coercivity Components', 'Magnetic Coercivity Components/Component1', 'Magnetic Coer-  
civity Components/Component2', 'Magnetic Coercivity Components/Component3', 'Composition',  
'Composition/Choices', '- Stacking Factor Type', '- Stacking Factor', '- Stacking Fact-  
or/SIValue', '- Stacking Factor/EvaluatedValue', '- Stacking Direction', '- Stacking Dir-  
ection/Choices', 'Young's Modulus Type', 'Young's Modulus Type/Choices', 'Young's Modulus',  
'Young's Modulus/SIValue', 'Young's Modulus/EvaluatedValue', 'Poisson's Ratio Type', 'Pois-  
son's Ratio Type/Choices', 'Poisson's Ratio', 'Poisson's Ratio/SIValue', 'Poisson's Ratio/E-  
valuatedValue']
```

```
>>>
```

Property Script Commands

Property script commands allow you to navigate through all objects and properties in a project. You can get and set all properties for all objects in the Project tree with simple data types.

Property Object is the base class defined for all script objects that support the properties Get and Set.

`GetName()`

- Returns the name of the object.

`GetChildTypes()`

- An object may have different types of children. For example, a design may have variables, modules, and editors.
- Returns an array of text strings; may be empty if the children are not divided into different types.

`GetChildNames(<type>)`

- <type> – Child type name. By default, returns all children names for all types.
- Returns an array of immediate children names, belonging to a type if specified.

`GetChildObject(<objPath>)`

- <objPath> – A child object path; can contain multiple generations (for example, designObject/moduleObject/SetupObject).
- Returns a child property object if the object is found.

`GetPropNames (<bIncludeReadOnly>)`

- <bIncludeReadOnly> – Optional; defaults to true. True includes read-only properties; False excludes read-only properties.
- Returns an array of the object's property names.

`GetPropValue (<propertyPath>)`

- <propertyPath> – The property's path; may be a child object's path appended with a property name (for example, TeeModel/Offset/SIValue).
- Returns the property value if found. Otherwise causes script error.

`SetPropValue (<propertyPath>, <data>)`

- <propertyPath> – The property's path; may be a child object's path appended with a property name (for example, TeeModel/Offset/SIValue).
- <data> – New data; type depends on property type.
- Returns True if updated successfully; False if new data is invalid.

For a detailed summary of how Property script commands are used in a range of contexts, including Variable objects, see: [Object Script Property Function Summary](#). Additional examples for these commands are listed under [Project Objects](#), [Design Objects](#), [3D Modeler](#), [Optimetrics](#), [Radiation Module](#) and [Reporter](#).

Note:

Older property commands should be executed by the oProject object.

```
oProject = oDesktop.SetActiveProject("Project1")
```

```
oProject.CommandName <args>
```

Some of the topics covered in this chapter are as follows:

[Object Script Property Function Summary](#)

[Conventions Used in this Chapter](#)

[GetArrayVariables](#)

[GetProperties](#)

[GetPropertyValue](#)

[GetVariables](#)

[GetVariableValue](#)

[SetPropertyValue](#)

[SetVariableValue](#)

[Example Use of Record Script and Edit Properties](#)

Object Script Property Function Summary

Object Path

The Object path can be used to navigate through objects and properties in an Ansys EM project.

- An Object path consisted of one or multiple Object-ID-Nodes separated by "/" .
- Object-ID-Node; may exist in the following forms:
 - A simple object name or property name.
 - Type[Name] for object; Tab[name] for property.
 - Name[attr1="v1", attr2 = "v2", ...]. When more than one child object have the same name, use attributes to specify the difference.
 - ArrayName[index]. For example, in an Optimetric setup with multiple calculations, "Calculation[0]" could be used to identify the first calculation.

- Name beginning with '@' character denoted as a property name, when an object has a child and property with the same name.

Property Object

The Property Object is the base class defined for all script object that support property Get & Set.

- GetName()
 - Returns the name of the object.
- GetChildTypes()
 - An object may have different type of children. For example, a design may have variables, modules, and editors.
 - Returns array of text strings; may be empty if the children are *not* divided to different types.
- GetChildNames(<type>)
 - <type> – children type name; default returns all children names for all types.
 - Returns an array of immediate children names, belonging to the type if specified.
- GetChildObject(<objPath>)
 - <objPath> – A child object path. The path may include multiple generations, such as (designObject/moduleObj/SetupObject).
 - Returns a child property object if the object found.
- GetPropEvaluatedValue(<propName>)
 - Return the Evaluated-Value for Value-Property and Variable.
 - Return the Property-value as text string for other property types.
- GetPropSIValue(<propName>)
 - Return the SI-Value for Value-Property and Variable.
 - Return NAN for other property type if its value is cannot be converted to a double-floating point value.
- GetPropNames(<blIncludeReadOnly>);
 - <blIncludeReadOnly> – optional, default to true; True will include read-only properties, False will exclude read-only properties.

- Returns an array of the object's property names.
- GetPropValue(<propertyPath>)
 - <propertyPath> – the property's full path. A property name or child object's path appended with a property name, like "TeeModel/Offset/SIValue"
 - Returns the property value if the property is found; otherwise causes script error.
- SetPropValue(<propertyPath>, <data>)
 - <propertyPath> – the property's full path. A property name or child object's path appended with a property name, like "TeeModel/Offset/Value"
 - <data> – new data, type is dependent on property type.
 - Returns True if property data is updated successfully; False if the new data is invalid.

Project Object

Project Object inherited all functions defined in the Property Object. But it doesn't have property, GetPropValue() & SetPropValue() function can be used to set its child object's property.

- GetChildTypes() always return ["Design", "Variable"].
- GetChildNames(type)
GetChildNames() & GetChildName("Design") will return all Design names of the project.
GetChildNames("Variable") return all project variable names.
- GetChildObject(objPath)

oDesign = oProject("TeeModel")

oVariable = oProject.GetChildObject("VariableName")

oReport = oProject.GetChildObject("TeeModel/Results/S Parameter Plot 1")
- GetPropNames(bIncludeReadOnly) always return empty array since the project has no property.

- `GetPropValue(propertyPath)`

```
oProject.GetPropValue("TeeModel/offset") //get the offset variable value in the TeeModel Design
oProject.GetPropValue("TeeModel/Results/S Parameter Plot 1/Display Type") // Get the report display type.
```

- `SetPropValue(propertyPath, newValue)`

```
oProject.SetPropValue("TeeModel/offset", "2mm") //Set the offset variable value to "2mm" in the TeeModel Design
oProject.SetPropValue("TeeModel/Results/S Parameter Plot 1/Display Type", "Data Table") // Set the report display type to data table.
```

Design Object

Design Object inherited all functions defined in the Property Object. But it doesn't have property, `GetPropValue()` & `SetPropValue()` function can be used to set its child object's property..

- `GetChildTypes()` always return ['Module', 'Editor', 'Variable'].
- `GetChildNames(type)`
`GetChildNames()` will return modules & editor child names.
`GetChildNames("Variable")` will return all variable names
`GetChildNames("Module")` will return all module names that support property-object-script like ['Optimetrics', 'RadField', 'Results']
`GetChildNames("Editor")` will return a 3D editor name for all 3D Designs
- `GetChildObject()`
`oVariable = oDesign.GetChildObject("VariableName")`
`oReport = oDesign.GetChildObject("Results/S Parameter Plot 1")`
`oRptModule = oDesign.GetChildObject("ReportSetup")`
- `GetPropNames(bIncludeReadOnly)` always return empty array since the design has no property.
- `GetPropValue()`
`oDesign.GetPropValue("offset/SIValue")` //get the offset variable SI value in the Design
`oDesign.GetPropValue("offset/SIValue")` //get the offset variable SI value in the Design
`oDesign.GetPropValue("Results/S Parameter Plot 1/Display Type")` // Get the report display type

- SetPropValue()
oDesign.SetPropValue("offset", "2mm") //Set the offset variable value to "2mm" in the Design
oDesign.SetPropValue("Results/S Parameter Plot 1/Display Type", "Data Table") // Set the report display type to data table.

3D Modeler Object

GetChild commands returns the appropriate properties for modeler objects. For 3D Components and UDMs, these commands do not return parts, coordinate systems, plans, as top-level modeler children.

```
oModeler = oDesktop.GetActiveProject().GetActiveDesign().GetChildObject("3D Modeler")
oModeler.GetChildNames()
oModeler.GetChildNames("ModelParts")
oModeler.GetChildNames("AllParts")
oModeler.GetChildNames("NonModelParts")
oModeler.GetChildNames("Planes")
oModeler.GetChildNames("CoordinateSystems")
```

Variable Object

Is a Property Object that has no child. It also provides quick function call to get/set it properties by adding functions with property name appended to Get_ & Set_ prefix. To find what functions it provided enter dir(oVar) the command window. It can accessed by the project or design object's GetChildObject(VariableName) function.

```
oProjVar = oProject.GetChildObject("$VarName")
oVar = oProject.GetChildObject("DesignName/VarName")
oVar = oDesign.GetChildObject("variableName")
oProject..GetChildNames("Variable") will return all project variable names.
oDesign.GetChildNames(Variable) will return all Design Variable names.
```

- GetChildTypes() always return empty array.
- GetChildNames() always return empty array , since variable has no child.
- GetChildObject(objPath) it has no child.

- `GetPropNames(bIncludeReadOnly)` ['EvaluatedValue', 'SIValue'] are read-only properties
 - Independent variable :['Value', 'EvaluatedValue', 'SIValue', 'Description', 'ReadOnly', 'Hidden', 'Sweep', 'Optimization/Included', 'Optimization/Min', 'Optimization/Max', 'Sensitivity/Included', 'Sensitivity/Min', 'Sensitivity/Max', 'Sensitivity/IDisp', 'Statistical', 'Statistical/Included', 'Tuning/Included', 'Tuning/Step', 'Tuning/Min', 'Tuning/Max'].
 - Dependent variable ['Value', 'EvaluatedValue', 'SIValue', 'Description', 'ReadOnly', 'Hidden', 'Sweep']
- `GetPropValue(propName)`
`oVar.GetPropValue()` return the variable value as text string.
`oVar.GetPropValue("Value")` return the variable value as text string.
`oVar.GetPropValue("SIValue")` return the SI-value of variable as number.
`oVar.Get_SIValue()` also return the SI value.
- `SetPropValue(propName, newValue)`
`oVar.SetPropValue("Value", 888)`
`oVar.SetPropValue("Sensitivity/Included", True)`
`oVar.SetPropValue("Sensitivity/Max", '1.8pF')`
`oVar.Set_Sensitivity_Max( '1.8pF')` also works as last call.
`oVar.SetPropValue("Sensitivity", ['Min:=' , '0.8pF', 'Max:=' , '1.8pF'])`
//set multiple attributes at one call:
`oVar.SetPropValue("@", ['Value:=' , 288, 'Sensitivity', ['Included', True, 'Min', '0.0']])`
`oVar.SetPropValue("", ['Value:=' , 288, 'Sensitivity', ['Included', True, 'Min', '0.0']])`

Optimetrics Module Object:

Optimetrics Module Object inherited all functions defined in the Property Object. But it doesn't have property, `GetPropValue()` & `SetPropValue()` function can be used to set its child object's property..

- `GetChildTypes()` there are six type of children, they are ['OptiParametric', 'OptiOptimization', 'OptiSensitivity', 'OptiStatistical', 'OptiDesignExplorer', 'OptiDXDOE']. But the return array only included those that have setup defined, so it may be an empty array if no optimetrics setup is defined. The `GetChildNames(type)` function also recognized the type name without the prefix "Opti".
- `GetChildNames(type)`
`GetChildNames()` will return all setup for all types.
`GetChildNames("OptiOptimization")` & `GetChildNames("Optimization")` will return all Optimization setup.

- `GetChildObject()`
`oParamSetup = oOptModule.GetChildObject('ParametricSetup1')` get the
`oOptSetup = oOptModule.GetChildObject('OptimizationSetup1')`
- `GetPropNames(bIncludeReadOnly)` always return empty array since the it has no property.
- `GetPropValue(propPath)` may be used to get its child's property value
`oOptModule.GetPropValue("OptimizationSetup1\Optimizer")` get the optimizer name for OptimizationSetup1
- `SetPropValue(propPath, newValue)` may be used to set its child's property value
`oOptModule.SetPropValue(ParametricSetup1\Enabled", False)` //disable ParametricSetup1

Optimetrics Setup Object

This is a new Object inherited all functions defined in the Property Object. But it doesn't have child. It is accessible through its parents.

```
oOptSetup = oOptModule.GetChildObject('OptimizationSetup1')
```

```
oOptSetup = oDesign.GetChildObject('Optimetrics\OptimizationSetup1')
```

```
oOptSetup = oProject.GetChildObject('TeeModel\Optimetrics\OptimizationSetup1')
```

- `GetChildTypes()` always return empty array.
- `GetChildNames(type)` always return empty array
- `GetChildObject()`
- `GetPropNames(bIncludeReadOnly)` will return the property names listed in the property window when the setup is selected.
- `GetPropValue(propName)`
`oOptSetup.GetPropValue("Optimizer")` return the selected optimizer name.
`oOptSetup.GetPropValue("Optimizer/Choices")` return all optimizer names.
- `SetPropValue(propName, newValue)`
`oOptSetup.SetPropValue("Optimizer", "NotAnOptimizerName");` will return false.
`oOptSetup.SetPropValue("Optimizer", "Quasi Newton");` return true, since "Quasi Newton" is one of the optimizer name returned as the Optimizer Choices.
- `HasResult()` return true if the setup is solved. Otherwise return false.

- Validate() return true if the setup is valid for analyze. Otherwise return false. Calling the SetPropValue() function to change the property may invalid the setup.

ReportSetup(Results) Module Object:

ReportSetup module Object inherited all functions defined in the Property Object. But it doesn't have property, GetPropValue() & SetPropValue() function can be used to get/set its child object's property..

- GetChildTypes() always empty array.
- GetChildNames(type)
GetChildNames() return all report names
- GetChildObject(objPath)
oRpt = oRptModule.GetChildObject("S Parameter Plot 1") return the report property object
oTrace = oRptModule.GetChildObject("S Parameter Plot 1/dB(S(Port1,Port1))") return the trace property object
oAxisX = oRptModule.GetChildObject("S Parameter Plot 1/AxisX") return the axis X property object
- GetPropNames(bIncludeReadOnly) always return empty array since the it \has no property.
- GetPropValue()
oRptModule.GetPropValue("S Parameter Plot 1/Display Type")
- SetPropValue()
oRptModule.SetPropValue("S Parameter Plot 1/Display Type", "DataTable")

ReportSetup(Results) Module Child Objects:

These are Property Objects. Its first level of child object is report. Report has trace, axis, header, Legend, and more children. Trace has curve as child etc.

Those child objects can be accessed by calling all levels of parent object's GetChildObject(path) function.

```
oRpt = oRptModule.GetChildObject(reportName)
```

```
oRpt = oDesign.GetChildObject("Results/reportName")
```

```
oTrace = oRpt.GetChildObject(traceName)
```

```
oTrace = oRptModule.GetChildObject(ReportName/TraceName)
```

- `GetChildTypes()` always return empty array.
- `GetChildNames()` get the object's child names. What will be returned will depend on the object instance.
- `GetChildObject(objPath)`
- `GetPropNames(bIncludeReadOnly)` will return the property names listed in the property window when the object is selected.
- `GetPropValue(propName)`
 - `oRpt.GetPropValue("Display Type")` return the report's display type.
 - `oOptSetup.GetPropValue("Display Type/Choices")` return all optimizer names.
 - `oTrace.GetPropValue("X Component")`
- `SetPropValue(propName, newValue)`
 - `oTrace.SetPropValue("Primary sweep", "Freq")`

Radiation Module Object:

This inherited all functions defined in the Property Object. But it doesn't have property, `GetPropValue()` & `SetPropValue()` function can be used to set its child object's property.

- `GetChildTypes()` always return empty array, now its children
- `GetChildNames(type)`
 - `GetChildNames()` return all setup names.
- `GetChildObject(setupName)` return the setup object as Property object.
 - `oOverlay = oRadModule.GetChildObject('Antenna Parameter Overlay1')`
 - `oSphere = oRadModule.GetChildObject('Infinite Sphere1')`
- `GetPropNames()` return empty array; it has no property.
- `GetPropValue()`
 - `oRadModule.GetPropValue('Line1/Num Points')` //Get the the Line1 setups' "Num Points" property value.
- `SetPropValue()`
 - `oRadModule.SetPropValue('Line1/Num Points', 100)` ; Set the Line1 setups' "Num Points" property to 100.

Radiation Module Child Objects:

These are Property Objects. It also provides quick function call to get/set its properties by adding functions with property name appended to Get_ & Set_ prefix. To find what functions it provides enter dir(oVar) the command window.

Those child objects can be access by call all levels of parent object's GetChildObject(path) function.

```
oRadSetup = oRadModule.GetChildObject(setupName)
```

```
oRadSetup = oDesign.GetChildObject(RadField/setupName)
```

- GetChildTypes() always return empty array.
- GetChildNames() always return empty array , since Radiation setup has no child.
- GetChildObject(objPath) it has no child.
- GetPropNames(bIncludeReadOnly) will return the property names listed in the property window when the setup is selected.
- GetPropValue(propName)
oRadSetup.GetPropValue("Num Points") return the line setup's "Num Points" property value.
oRadSetup.Get_NumPoints() will also get the same value.
- SetPropValue(propName, newValue)
oRadSetup.SetPropValue('Num Points', 888)
oRadSetup.Set_NumPoints(888)

Conventions Used in this Chapter

General Definitions:

Property	A single item that can be modified in the Properties window or in the modal Properties pop-up window.
<PropServer>	The item whose properties are being modified. This is usually a compound name, giving all information needed by the editor, design, or project in order to locate the item.
<PropTab>	Corresponds to one tab in the Properties window, the one under which properties are being edited.
<PropName>	The name of a single property.

The following tables list specific <PropServer> and <PropTab> values for different property types.

For Project Variables:

<PropServer>	"ProjectVariables"
<PropTab>	"ProjectVariableTab"

For Local Variables:

<PropServer>	"LocalVariables"
<PropTab>	"LocalVariableTab"

For Passed Parameters:

<PropServer>	"Instance:<Name of Circuit Instance>"
<PropTab>	"PassedParameter Tab"

For Definition Parameters:

<PropServer>	"DefinitionParameters"
<PropTab>	"DefinitionParameters"

For Modules and Editors:

<PropServer>	<ModuleName>:<ItemName> where <ItemName> is the boundary name, solution setup name, etc. For example, "BoundarySetup:PerfE1"
<PropTab>	Boundary Module: "HfssTab" Mesh Operations Module: "MeshSetupTab" Analysis Module: "HfssTab" Optimetrics Module: "OptimetricsTab" Solutions Module: <i>Does not support properties.</i> Field Overlays Module: "FieldsPostProcessorTab" Radiation Module: "RadFieldSetupTab"

	Circuit Module: "CCircuitTab" System Module: "SystemTab" HFSS 3D Layout Module: "HFSS 3D LayoutTab" Nexxim Module: "NexximTab" Layout elements: "BaseElementTab" Schematic elements: "ComponentTab" Optimetrics Module: "OptimetricsTab"

For 3D Model Editor objects:

<PropServer>	Name of the object. For example, "Box1".
<PropTab>	"Geometry3DAttributeTab"

For 3D Model Editor operations:

<PropServer>	<ObjName>:<OperationName>:<int> where <int> is the operation's history index. For example, "Box2:CreateBox:2" refers to the second "CreateBox" operation in Box2's history.
<PropTab>	"Geometry3DCmdTab"

For Reporter operations on Report properties:

<PropServer>	<ReportSetup>
<ChangeProperty>	Array. For example, to set the company name in a plot header to "My Company": <pre>Set oModule = oDesign.GetModule("ReportSetup") oModule.ChangeProperty Array("NAME:AllTabs", _ Array("NAME:Header", _ Array ("NAME:PropServers", _ "XY Plot1:Header"), Array("NAME:ChangedProps", _ Array("NAME:Company Name", "Value:=", "My Company"))))</pre>

For Q3D Extractor Modules:

<PropServer>	<ModuleName>:<ItemName> where <ItemName> is the solution setup name.
<PropTab>	Boundary Module: "Q3D ExtractorTab" or "2D ExtractorTab" Mesh Operations Module: "MeshSetupTab" Analysis Module: "Q3D ExtractorTab" or "2D ExtractorTab" Optimetrics Module: "OptimetricsTab" Solutions Module: <i>Does not support properties.</i> Field Overlays Module: "FieldsPostProcessorTab"

Note:

For scripted property changes in the various modules and editors, refer to the chapters on the System, HFSS 3D Layout, and Nexxim tools, as well as the Layout and Schematic editors.

GetArrayVariables

Returns a list of array variables. To get a list of indexed project variables, execute with oProject. To get a list of indexed local variables, use oDesign.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing names of variables.

Python Syntax	GetArrayVariables()
Python Example	<pre>oProject.GetArrayVariables() oDesign.GetArrayVariables()</pre>

GetProperties

Gets a list of all the properties belonging to a specific <PropServer> and <PropTab>. This can be executed by the oProject, oDesign, or oEditor variables.

UI Access	N/A		
Parameters	Name	Type	Description
	<PropTab>	String	One of the following, where tab titles are shown in parentheses: • PassedParameterTab ("Parameter Values") • DefinitionParameterTab (Parameter Defaults) • LocalVariableTab ("Variables" or "Local Variables") • ProjectVariableTab ("Project variables") • ConstantsTab ("Constants") • BaseElementTab ("Symbol" or "Footprint") • ComponentTab ("General") • Component ("Component") • CustomTab ("Intrinsic Variables") • Quantities ("Quantities") • Signals ("Signals")
	<PropServer>	String	An object identifier, generally returned from another script method, such as CompInst@R;2;3
Return Value	Array of strings containing the names of the appropriate properties.		

Python Syntax	<code>GetProperties(<PropTab>, <PropServer>)</code>
Python Example	<code>oEditor.GetProperties('PassedParameterTab', 'k')</code>

GetPropertyValue

Returns the value of a single property belonging to a specific *<PropServer>* and *<PropTab>*. This function is available with the Project, Design or Editor objects, including definition editors.

Tip: Use the script recording feature and edit a property, and then view the resulting script to see the format for that property.

UI Access	N/A		
Parameters	Name	Type	Description
	<i><PropTab></i>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults") - LocalVariableTab ("Variables" or "Local Variables") - ProjectVariableTab ("Project variables") - ConstantsTab ("Constants") - BaseElementTab ("Symbol" or "Footprint") - ComponentTab ("General") - Component("Component") - CustomTab ("Intrinsic Variables")

			- Quantities ("Quantities") - Signals ("Signals")
	<i><PropServer></i>	String	An object identifier, generally returned from another script method, such as <code>CompInst@R;2;3</code>
	<i><PropName></i>	String	Name of the property.
Return Value	String value of the property.		

Python Syntax	<code>GetPropertyValue (<PropTab>, <PropServer>, <PropName>)</code>
Python Example	<pre>selectionArray = oEditor.GetSelections() for k in selectionArray: val = oEditor.GetPropertyValue("PassedParameterTab", k, "R") ...</pre>

GetVariables

Returns a list of all defined variables. To get a list of project variables, execute this command using `oProject`. To get a list of local variables, use `oDesign`.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing the variables.

Python Syntax	<code>GetVariables ()</code>
Python Example	<code>oProject.GetVariables()</code> <code>oDesign.GetVariables()</code>

GetVariableValue

Gets the value of a single specified variable. To get the value of project variables, execute this command using `oProject`. To get the value of local variables, use `oDesign`.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><VarName></code>	String	Name of the variable to access.
Return Value	String represents the value of the variable.		

Python Syntax	<code>GetVariableValue(<VarName>)</code>
Python Example	<code>oProject.GetVariableValue("var_name")</code>

SetPropertyValue

Sets the value of a single property belonging to a specific PropServer and PropTab. This function is available with the Project, Design or Editor objects, including definition editors. This is not supported for properties of the following types: ButtonProp, PointProp, V3DPointProp, and VPointProp. Only the ChangeProperty command can be used to modify these properties.

Use the script recording feature and edit a property, and then view the resulting script entry or use `GetPropertyValue` for the desired property to see the expected format.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><propTab></code>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults") - LocalVariableTab ("Variables" or "Local Variables") - ProjectVariableTab ("Project variables") - ConstantsTab ("Constants") - BaseElementTab ("Symbol" or "Footprint") - ComponentTab ("General") - Component("Component") - CustomTab ("Intrinsic Variables") - Quantities ("Quantities") - Signals ("Signals")
	<code><propServer></code>	String	An object identifier, generally returned from another script method, such as <code>CompInst@R;2;3</code>
	<code><propName></code>	String	Name of the property.
	<code><propValue></code>	String	The value for the property
Return Value	None.		

Python Syntax	<code>SetPropertyValue(<propTab>, <propServer>, <propName>, <propValue>)</code>
Python Example	<code>oEditor.SetPropertyValue("PassedParameterTab", "k", "R", "2200")</code>

SetVariableValue

Sets the value of a variable. To set the value of a project variable, execute this command using `oProject`. To set the value of a local variable, use `oDesign`.

UI Access	N/A		
Parameters	Name	Type	Description
	<VarName>	String	Variable name.
	<VarValue>	Value	New value for the variable.
Return Value	None.		

Python Syntax	<code>SetVariableValue (<VarName>, <VarValue>)</code>
Python Example	<code>oProject.SetVariableValue('\$Var1', '3mm')</code>

3 - Application Object Script Commands

The Application object commands permit you to get the AppDesktop. Application object commands should be executed by the oAnsoftApp object.

`oAnsoftApp.<CommandName> <args>`

General Application Script Commands

The following are general script commands recognized by the **oAnsoftApp** object:

- [GetAppDesktop](#)

The following deprecated commands are no longer supported and produce an error if used.

- GetDesiredRamMBLimit (deprecated)
- GetHPCLicenseType (deprecated)
- GetMaximumRamMBLimit (deprecated)
- GetMPISpawnCmd(deprecated)
- GetMPIVendor (deprecated)
- GetNumberOfProcessors (deprecated)
- GetUseHPCForMP (deprecated)
- SetDesiredRamMBLimit (deprecated)
- SetHPCLicenseType (deprecated)
- SetMaximumRamMBLimit (deprecated)
- SetMPISpawnCmd (deprecated)
- SetMPIVendor (deprecated)
- SetNumberOfProcessors (deprecated)
- SetUseHPCForMP (deprecated)

GetAppDesktop

GetAppDesktop is a function of oAnsoftApp. This function does not take an input and it returns an object. The object is assigned to the variable oDesktop.

UI Access	NA		
Parameters	Name	Type	Description
	None		
Return Value	Object		

Python Syntax	GetAppDesktop()
Python Example	<code>oDesktop = oAnsoftApp.GetAppDesktop()</code>

4 - Desktop Object Script Commands

Desktop commands should be executed by the oDesktop object. Some new commands permit you to query objects when you do not know the names. See: [Object Oriented Property Scripting](#).

```
Set oDesktop =  
    CreateObject("Ansoft.ElectronicsDesktop")  
    oDesktop.CommandName <args>
```

[AddMessage](#)

[AreThereSimulationsRunning](#)

[ClearMessages](#)

[CloseAllWindows](#)

[CloseProject](#)

[CloseProjectNoForce](#)

[DeleteProject](#)

[DeleteRegistryEntry](#)

[DoesRegistryValueExist](#)

[DownloadJobResults](#)

[EnableAutoSave](#)

[ExportOptionsFiles](#)

[GetActiveProject](#)

[GetActiveScheduler](#)

[GetActiveSchedulerInfo](#)

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[GetBuildDateTimeString](#)

[GetCustomMenuSet](#)

[GetDefaultUnit](#)

[GetDesktopConfiguration](#)

[GetDistributedAnalysisMachines](#)

[GetDistributedAnalysisMachinesForDesignType](#)

[GetExeDir](#)

[GetGDIObjectCount](#)

[GetLibraryDirectory](#)

[GetLocalizationHelper](#)

[GetMessages](#)

[GetMonitorData](#)

[GetPersonalLibDirectory](#)

[GetProcessID](#)

[GetProjectDirectory](#)

[GetProjectList](#)

[GetProjects](#)

[GetRegistryInt](#)

[GetRegistryString](#)

[GetRunningInstancesMgr](#)

[GetSchematicEnvironment](#)

[GetScriptingToolsHelper](#)

[GetSysLibDirectory](#)

[GetTempDirectory](#)

[GetUserLibDirectory](#)

[GetVersion](#)

[IsFeatureEnabled](#)

[KeepDesktopResponsive](#)

[LaunchJobMonitor](#)

[NewProject](#)

[OpenAndConvertProject](#)

[OpenMultipleProjects](#)

[OpenProject](#)

[OpenProjectWithConversion](#)

[PageSetup](#)

[PauseRecording](#)

[PauseScript](#)

[Print](#)

[QuitApplication](#)

[RefreshJobMonitor](#)

[ResetLogging](#)

[RestoreProjectArchive](#)

[RestoreWindow](#)

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[RunACTWizardScript](#)

[RunProgram](#)

[RunScript](#)

[RunScriptWithArguments](#)

[SelectScheduler](#)

[SetActiveProject](#)

[SetActiveProjectByPath](#)

[SetCustomMenuSet](#)

[SetDesktopConfiguration](#)

[SetLibraryDirectory](#)

[SetProjectDirectory](#)

[SetRegistryFromFile](#)

[SetRegistryInt](#)

[SetRegistryString](#)

[SetSchematicEnvironment](#)

[SetTempDirectory](#)

[ShowDockingWindow](#)

[Sleep](#)

[StopSimulations](#)

[SubmitJob](#)

[TileWindows](#)

Related Topics:

[Desktop Commands For Registry Values](#)

[ImportExport Tool Commands](#)

AddMessage

Add a message with severity and context to message window.

UI Access	N/A		
Parameters	Name	Type	Description
	<projectName>	String	Project name. Passing an empty string adds the message as the desktop global message.
	<designName>	String	Design name. Ignored if project name is empty. Passing an empty string adds the message to project node in the message tree.
	<severity>	Integer	One of "Error", "Warning" or "Info". Anything other than the first two is treated as "Info" 0 = Informational, 1 = Warning, 2 = Error, 3 = Fatal
	<msg>	String	The message for the message window.
	<category>	String	Optional. The category is created with the message under the design tree node if the category does not exist. If the category already exists, the new message is added to the end of the existing category. It is ignored if the project or design is empty. If missing or empty, the message is added to the Design node in the message tree.
Return Value	None.		

Python Syntax	AddMessage(<projectName>, <designName>, <severity>, <msg>, <category>)
Python Example	<pre>oDesktop.AddMessage("Project1", "Q3D Extractor", 0, "This is a test message", "")</pre>

AreThereSimulationsRunning

Returns a bool specifying whether there are simulations running, or either running or pending, depending on the inclusion of alsoPending.

UI Access	NA		
Parameters	Name	Type	Description
	<bool> <AlsoPending>	Integer	Whether to report if simulations are running, or running and pending.
Return Value	A human readable status string specifying what happened.		

Python Syntax	AreThereSimulationsRunning (<bool>, clean)
Python Example	<pre>oDesktop.AreThereSimulationsRunning(bool clean)</pre>

ClearMessages

For a specified project and design, this command clears all messages in a specified severity range. The user-specified integral severity level is interpreted as:

0 => info, 1 => warning, 2 => error, and 3 => fatal error.

The ClearMessages function accepts four input arguments. The first two specifies project and design, respectively. This function clears messages in the range specified by the third (interpreted as start severity) and fourth (interpreted as stop severity) arguments. The fourth argument has a default value of 0. The last two arguments need not be specified in any given order, i.e., they can indicate either ascending or descending trend. The function clears all messages having severity level within this specified range. The start and stop severity need not be specified in any given order (i.e., they can indicate either ascending or descending severity).

UI Access	In Message Manager , right-click and select Clear messages for [ProjectName]...		
Parameters	Name	Type	Description
	<projectName>	String	Name of the project from which to clear messages.
	<designName>	String	Name of the design under the <projectName> from which to clear messages.
	<startSeverity>	Integer	User-specified severity level at which messages start getting cleared: • 0 = informational • 1 = warning • 2 = error • 3 = fatal error
	<stopSeverity>	Integer	<i>Optional.</i> User-specified stop severity level until which messages will be cleared. • 0 = informational • 1 = warning • 2 = error • 3 = fatal error If not specified, <stopSeverity> has a default value of 0.
Return Value	None.		

Python Syntax	ClearMessages(<projectName>, <designName>, <startSeverity>, <stopSeverity>)
Python Example	Preserve Current Functionality; stopSeverity = 0 (DEFAULT VALUE) <pre># startSeverity = 0; clears just the Info messages oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor", "Maxwell3DDesign1", 0)</pre>

```
# startSeverity = 1; clears all the Info and Warning messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor", "Maxwell3DDesign1", 1)
# startSeverity = 2; clears all the Info, Warning, Error
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor", "Maxwell3DDesign1", 2)
# startSeverity = 3; clears all messages, i.e., Info, Warning, Error, Fatal
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor", "Maxwell3DDesign1", 3)
Extend the current functionality by enabling range-based deletion
# startSeverity = 0; clears the Info messages;
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor", "Maxwell3DDesign1", 0)
# startSeverity = 0 and stopSeverity = 0; clears all the Info messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor", "Maxwell3DDesign1", 0,
0)
# startSeverity = 0 and stopSeverity = 1; clears all the Info and Warning mes-
sages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor", "Maxwell3DDesign1", 0,
1)
# startSeverity = 0 and stopSeverity = 2; clears all the Info, Warning, and Error
messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor", "Maxwell3DDesign1", 0,
2)
# startSeverity = 0 and stopSeverity = 3; clears all the Info, Warning, Error,
and Fatal messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor", "Maxwell3DDesign1", 0,
3)
```

```
# startSeverity = 1; clears all the Info and Warning messages;
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",1)
# startSeverity = 1 and stopSeverity = 1; clears all the Warning messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",1, 1)
# startSeverity = 1 and stopSeverity = 2; clears all the Warning and Error mes-
sages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",1, 2)
# startSeverity = 1 and stopSeverity = 3; clears all the Warning, Error, and
Fatal messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",1, 3)

# startSeverity = 2; clears all the Info, Warning, and Error messages;
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",2)
# startSeverity = 2 and stopSeverity = 2; clears all the Error messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",2, 2)
# startSeverity = 2 and stopSeverity = 3; clears all the Error and Fatal messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",2, 3)
# startSeverity = 2 and stopSeverity = 0; clears all the Info, Warning, and Error
messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",2, 0)
```

```
# startSeverity = 3; clears all the Info, Warning, Error, and Fatal messages;
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",3)
# startSeverity = 3 and stopSeverity = 3; clears all the Fatal error messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",3, 3)
# startSeverity = 3 and stopSeverity = 0; clears all the Info, Warning, Error,
and Fatal messages
oDesktop.ClearMessages("Ex_EC_1_Asymmetrical_Conductor","Maxwell3DDesign1",3, 0)
```

CloseAllWindows

Closes all MDI child windows on the desktop.

UI Access	From main menu, Window > CloseAll .
Parameters	None.
Return Value	None.

Python Syntax	CloseAllWindows()
Python Example	oDesktop.CloseAllWindows()

CloseProject

Closes a specified project. Changes to the project are not saved. Save the project using the Project command **Save** or **Save As** before closing to save changes.

UI Access	File > Close		
Parameters	Name	Type	Description
	<ProjectName>	String	The name of the project already in the Desktop that is to be closed, without path or extension
Return Value	None		

Python Syntax	CloseProject (<ProjectName>)
Python Example	<code>oDesktop.CloseProject ("MyProject")</code>

CloseProjectNoForce

Use: Close a named project currently open in the Desktop, unless a simulation is running. Changes to the project will not be saved. Save the project using the Project command **Save** or **Save As** before closing to save changes. To determine if the project has been closed, use `GetProjectList` and see if the named project is present.

UI Access	File > Close		
Parameters	Name	Type	Description
	<ProjectName>	String	The name of the project already on the Desktop that is to be closed, without

	path or extension
Return Value	None

Python Syntax	CloseProjectNoForce (< <i>ProjectName</i> >)
Python Example	<code>oDesktop.CloseProjectNoForce("MyProject")</code>

Count

Gets the total number of queried projects or designs obtained by GetProjects() and GetDesigns() commands.

UI Access	N/A
Parameters	None.
Return Value	Integer
Python Syntax	Count
Python Example	<code>projects = oDesktop.GetProjects() numprojects = projects.Count</code>

DeleteProject

Deletes a project from disk.

UI Access	Edit > Delete

Parameters	Name	Type	Description
	<ProjectName>	String	Name of the project
Return Value	None		

Python Syntax	DeleteProject (<ProjectName>)
Python Example	<code>oDesktop.DeleteProject("MyProject")</code>

DownloadJobResults

This command is for downloading results from Ansys Cloud. Before using this script command, the command [SelectScheduler\(\)](#) must be used first to select “ansys cloud” scheduler. This makes sure that current scheduler is Ansys Cloud, and user is logged in. Then, either a valid .q file or .q.completed file must be in the project folder, or, a valid job ID and a “batchinfo” folder containing the corresponding .jobid file are required in the project folder. When the download requirements are met, the command downloads results from Ansys Cloud using the specified filters to the given folder.

UI Access	Select Scheduler		
Parameters	Name	Type	Description
	<jobID>	String	Provide the job ID of the target job. The job ID must be able to be found in current .q (or .q.completed) file, or inside the “batchinfo” folder in projectPath. If the job ID is empty, the job ID in current .q (or .q.completed) file will be used.
	<projectPath>	String	A string of path to locate the project folder. The project file may be not necessary, but .q (or .q.completed) file or “batchinfo” folder with valid .jobid files are required.
	<resultPath>	String	A string giving the folder path for the download to save to.

	<table><tr><td><Filters> (optional)</td><td>String</td><td>A string containing filters to download. The delimiter of file types is “;”. If no filter specified, the default filter “*” will be applied, which requests all files for download.</td></tr></table>	<Filters> (optional)	String	A string containing filters to download. The delimiter of file types is “;”. If no filter specified, the default filter “*” will be applied, which requests all files for download.
<Filters> (optional)	String	A string containing filters to download. The delimiter of file types is “;”. If no filter specified, the default filter “*” will be applied, which requests all files for download.		
Return Value	A Boolean result about download complete or not			

Python Syntax	<code>DownloadJobResults(jobID, projectPath, resultsPath, filters)</code>
Python Example	<pre>boolDownloadCompleted = oDesktop.DownloadJobResults("012345678901234567890", "C:\\projects\\basic.aedt", "C:\\projects\\DownloadResults\\", "*")</pre>

DeleteRegistryEntry

Deletes a registry entry from a registry key. Returns true if deletion succeeded.

UI Access	N/A		
Parameters	Name	Type	Description
	<pathToRegistry>	String	Path to Registry entry.
Return Value	Boolean: • True – Key has been deleted. • False – Key does not exist.		

Python Syntax	<code>DeleteRegistryEntry(<pathToRegistry>)</code>
Python Example	<pre>res = oDesktop.DeleteRegistryEntry("Desktop/ColorScheme")</pre>

DoesRegistryValueExist

Determines whether a registry value exists.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
Return Value	Boolean: • True – Key exists. • False – Key does not exist.		

Python Syntax	DoesRegistryValueExist(<KeyName>)
Python Example	<pre>Exist = oDesktop.DoesRegistryValueExist('Desktop/ActiveDSOConfigurations/Q3D Extractor')</pre>

EnableAutoSave

Enable or disable autosave feature.

UI Access	N/A

Parameters	Name	Type	Description
	<enable>	Boolean	True to enable autosave; False disables it.
Return Value	None.		

Python Syntax	EnableAutoSave(<enable>)		
Python Example	<code>oDesktop.EnableAutoSave(True)</code>		

ExportOptionsFiles

Copies the options config files to the *DestinationDirectory*.

UI Access	Tools > Options > Export Options Files ...		
Parameters	Name	Type	Description
	<DestinationDirectory>	String	The path to the destination directory.
Return Value	None		

Python Syntax	ExportOptionsFiles(<DestinationDirectory>)		
Python Example	<code>oDesktop.ExportOptionsFiles("D:/test/export/")</code>		

GetActiveProject

Obtains the project currently active in the Desktop, as an object.

Note:

GetActiveProject returns normally if there are no active objects.

UI Access	N/A
Parameters	None.
Return Value	Object: the project that is currently active in the desktop.

Python Syntax	GetActiveProject()
Python Example	<pre>oProject = oDesktop.GetActiveProject()</pre>

GetActiveScheduler

Obtains the name of the scheduler active in the Desktop.

Note:

GetActiveScheduler returns normally if there are no active objects.

UI Access	N/A
Parameters	None.
Return Value	Name of the scheduler that is currently active in the desktop. Gets results such as "RSM", "Remote RSM", "Ansys Cloud", "SLURM", "LSF", "PBS", "SGE", "Windows HPC", etc. (User-friendly scheduler names.)

Python Syntax	<code>GetActiveScheduler()</code>
Python Example	<code>oSchedulerName = oDesktop.GetActiveScheduler()</code>

GetActiveSchedulerInfo

Obtains info for the scheduler active in the Desktop.

Note:

GetActiveSchedulerInfo returns normally if there are no active objects.

UI Access	N/A
Parameters	None.
Return Value	Info for the scheduler that is currently active in the desktop or a remote scheduler. Gets results such as "RSM", "Remote RSM", "Ansys Cloud", "SLURM", "LSF", "PBS", "SGE", "Windows HPC", as well as server info used to select a server. For a local scheduler, the return format resembles '{"Selected Scheduler":"RSM","Scheduler Name":"RSM","Server":""}'. For a remote scheduler, the return format resembles '{"Selected Scheduler":"Remote RSM","Scheduler Name":"SLURM","Server":"<server>"}'

Python Syntax	GetActiveSchedulerInfo()
Python Example	<code>oSchedulerInfo = oDesktop.GetActiveSchedulerInfo()</code>

GetAutoSaveEnabled

Checks whether the autosave feature is enabled.

UI Access	N/A
Parameters	None.
Return Value	Integer: • 1 – Autosave is enabled. • 0 – Autosave is not enabled.

Python Syntax	GetAutoSaveEnabled()
Python Example	<code>Enabled = oDesktop.GetAutoSaveEnabled()</code>

GetBuildDateTimeString

Returns a string representing the build date and time of the product;

UI Access	N/A
Parameters	None.
Return Value	String build date and time, in the format: year-month-day hour:minute:second. Example: 2019-01-18 21:59:33

Python Syntax	GetBuildDateTimeString()
Python Example	<code>oDesktop.GetBuildDateTimeString()</code>

GetCustomMenuSet

Returns the name of the current selected menu set in **Tools > Options > General Options > General > Desktop Configuration**.

UI Access	N/A
Parameters	None.
Return Value	String containing current menu set. For example, 'Default', 'EM', 'Twin Builder'.

Python Syntax	GetCustomMenuSet ()
Python Example	<code>oDesktop.GetCustomMenuSet ()</code>

GetDefaultUnit

Returns the default unit for a physical quantity.

UI Access	Tools > Options > General Options > Default Units. Note that this menu only displays units that can be changed, while the script can be used to view additional default units.		
Parameters	Name	Type	Description
	<type>	String	String containing a type of measurement. Valid strings are (case insensitive): • "Acceleration" • "Angle" • "AngularAcceleration" • "AngularDamping" • "AngularSpeed" • "Capacitance" • "Conductance" • "Current" • "CurrentChangeRate" • "DataRate" • "DeltaH" (Magnetic Field Strength) • "Density" • "Flux" • "Force" • "Frequency"

			• "Inductance" • "Length" • "MagneticReluctance" • "Mass" • "MassFlowRate" • "MomentInertia" • "Power" • "Pressure" • "PressureCoefficient" • "Resistance" • "SaturateMagnetization" (Magnetic Inductance) • "Speed" • "Temperature" • "Time" • "Torque" • "Voltage" • "VoltageChangeRate" • "Volume" • "VolumeFlowPerPressureRoot" • "VolumeFlowRate"
Return Value	String containing the default unit (for example, "mm").		

Python Syntax	GetDefaultUnit(<type>)
Python Example	<code>oDesktop.GetDefaultUnit("Length")</code>

GetDesktopConfiguration

Returns the name of the current selected configuration in **Tools > Options > General Options > General > Desktop Configuration**.

UI Access	N/A
Parameters	None.
Return Value	String containing current Desktop configuration. For example, 'All', 'Twin Builder'.

Python Syntax	GetDesktopConfiguration()
Python Example	<code>oDesktop.GetDesktopConfiguration()</code>

GetDistributedAnalysisMachines

Gets a list of machines used for distributed analysis. You can iterate through the list using standard scripting methods.

UI Access	N/A
Parameters	None.
Return Value	Returns a collection of names of machines used for distributed analysis.

Python Syntax	<code>GetDistributedAnalysisMachines()</code>
Python Example	<code>oDesktop.GetDistributedAnalysisMachines()</code>

GetDistributedAnalysisMachinesForDesignType

To obtain a list of the machines set up for analysis of the specified design type.

UI Access	NA		
Parameters	Name	Type	Description
	<designTypeName>	String	The name of the type of design, such as "Twin Builder", "HFSS", "HFSS-IE", "Maxwell 3D", "Maxwell 2D", "RMxprt", "EM Design", "Circuit", "System", "Q3D Extractor", "2D Extractor"
Return Value	Object; returns a collection of machine names.		

Python Syntax	<code>GetDistributedAnalysisMachinesForDesignType (<designTypeName>)</code>
Python Example	<pre>machineNames =oDesktop. GetDistributedAnalysisMachinesForDesignType ("Q3D Extractor")</pre>

GetExeDir

Returns the path where the executable is located.

UI Access	N/A
Parameters	None.
Return Value	String path where executable is located. Example: "C:\Program Files\ANSYS Inc\v252\AnsysEM"

Python Syntax	GetExeDir()
Python Example	<code>oDesktop.GetExeDir()</code>

GetGDIObjectCount

Note:

This command is for internal Ansys use only.

Python Syntax	GetGDIObjectCount()
Python Example	<code>oDesktop.GetGDIObjectCount()</code>

GetLibraryDirectory

Get the path to the `SysLib` directory.

UI Access	NA		
Parameters	Name	Type	Description
	None		
Return Value	String		
	The path to the SysLib directory.		

Python Syntax	GetLibraryDirectory()		
Python Example	AddInfoMessage (str (oDesktop.GetLibraryDirectory()))		

GetLocalizationHelper

Note:

This command is for internal Ansys use only.

Returns the object for the localization helper.

UI Access	NA		
Parameters	Name	Type	Description
	None		
Return Value	Object		
	Localization helper object, such as "IDispatch(ILocalizationHelper)"		

Python Syntax	GetLocalizationHelper()
Python Example	oDesktop.GetLocalizationHelper()

GetMessages

Get the messages from a specified project and design.

UI Access	NA		
Parameters	Name	Type	Description
	<ProjectName>	String	Name of the project for which to collect messages. An incorrect project name results in no messages (design is ignored). An empty project name results in all messages (design is ignored)
	<DesignName>	String	Name of the design in the named project for which to collect messages. An incorrect design name results in no messages for the named project. An empty design name results in all messages for the named project
	<Severity>	Integer	Severity is 0-3, and is tied in to info/warning/error/fatal types as follows: • 0 – info and above • 1 – warning and above • 2 – error and fatal • 3 – fatal only (rarely used)
Return Value	Array of string messages.		

Python Syntax	GetMessages (<ProjectName>, <DesignName>, <Severity>)

Python Example	<pre>Messages = oDesktop.GetMessages("MyProject", "Q3D Extractor1", 1)</pre>

GetMonitorData

Get monitor data. This command requires a -monitor flag on the ansyedt.exe command line and is used only with the web client.

UI Access	NA		
Parameters	Name	Type	Description
	<Request>	String	a json string describing what monitor data is desired. This is a list of triples separated by spaces of the form: <code>type startposition maxnumber</code>. The <code>type</code> must be one of convergence profile sweptvar progress variations, displaytype, or a guide that was previously returned in a displaytype block. The <code>startposition</code> is an integer that specifies where to start in the sequence of monitor data of that type. Each of these types is available in a list, ordered by time. For example, as the simulation goes on, data points are added to the internal list of convergence items. If the caller needs to incrementally update a display, it can repeatedly call this method with the <code>startposition</code> for each of the types given as the size of the list it has previously obtained and displayed, which ensures there will be no duplication and the returned data will be new each time. The <code>maxnumber</code>, if greater than 0, is the limit on the number of new items returned for each type. If the caller is able to handle any number of returned values, it can be left at 0.
Return Value	a json string with the results.		

Python Syntax	GetMonitorData (<Request>)
Python Example	<code>Messages = oDesktop.GetMonitorData(request)</code>

GetPersonalLibDirectory

Get the path to the `PersonalLib` directory.

UI Access	N/A
Parameters	None.
Return Value	String path to the <code>PersonalLib</code> directory.

Python Syntax	GetPersonalLibDirectory()
Python Example	<code>oDesktop.GetPersonalLibDirectory()</code>

GetProcessID

Returns the process ID of `ansysedt.exe`.

UI Access	N/A
Parameters	None.
Return Value	Integer process ID of <code>ansysedt.exe</code> . For example, 12716.

Python Syntax	GetProcessID ()
Python Example	<code>oDesktop.GetProcessID()</code>

GetProjectDirectory

Gets the path to the Project directory.

UI Access	N/A
Parameters	None.
Return Value	String path to the Project directory.

Python Syntax	GetProjectDirectory()
Python Example	<code>oDesktop.GetProjectDirectory()</code>

GetProjectList

Returns a list of all projects that are open in Electronics Desktop.

UI Access	N/A
Parameters	None.

Return Value	Array of strings containing the names of all open projects in Electronics Desktop.

Python Syntax	<code>GetProjectList()</code>
Python Example	<code>list_of_projects = oDesktop.GetProjectList()</code>

GetProjects

Returns a list of all the projects that are currently open in Electronics Desktop. Once you have the projects, you can iterate through them using standard scripting methods.

UI Access	N/A
Parameters	None.
Return Value	Returns a collection containing objects for all open projects in Electronics Desktop.

Python Syntax	<code>GetProjects()</code>
Python Example	<code>oDesktop.GetProjects()</code>

GetRegistryInt

Obtains registry key integer value.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
Return Value	Integer if the integer value is found. Return as Bad-Argument-Value if registry key does not exist or it is not an integer value.		

Python Syntax	GetRegistryInt(<KeyName>)		
Python Example	<pre>num = oDesktop.GetRegistryInt('Desktop/Settings/ProjectOptions/Q3D Extractor/UpdateReportsDynamicallyOnEdits')</pre>		

GetRegistryString

Obtains registry key string value.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
Return Value	String if the string value is found. Return as Bad-Argument-Value if registry key does not exist or it is not a string value.		

Python Syntax	GetRegistryString(<KeyName>)		

Python Example	<pre>activeDSO = oDesktop.GetRegistryString('Desktop/ActiveDSOConfigurations/Q3D Extractor')</pre>

GetRunningInstancesMgr

Returns the object of the Running Instances Manager.

UI Access	N/A		
Parameters	Name	Type	Description
	None		
Return Value	Object Running instances manager object		

Python Syntax	GetRunningInstancesMgr()
Python Example	<pre>oRunningInstances = oDesktop.GetRunningInstanceMgr()</pre>

GetSchematicEnvironment

Returns the name of the current schematic environment set in **Tools > Options > General Options > General > Desktop Configuration**.

UI Access	N/A

Parameters	None.
Return Value	Integer representing a schematic environment: • 0 = Circuit • 1 = Twin Builder • 2 = Maxwell Circuit

Python Syntax	GetSchematicEnvironment()
Python Example	<code>oDesktop.GetSchematicEnvironment()</code>

GetScriptingToolsHelper

Note:

This command is for internal Ansys use only.

Returns the object for the scripting tools helper.

UI Access	NA		
Parameters	Name	Type	Description
	None		
Return Value	Object ScriptingTools helper object		

Python Syntax	GetScriptingToolsHelper()
Python Example	<code>oDesktop.GetScriptingToolsHelper()</code>

GetSysLibDirectory

Get the path to the `SysLib` directory.

UI Access	N/A
Parameters	None.
Return Value	String path to the <code>SysLib</code> directory.

Python Syntax	GetSysLibDirectory()
Python Example	<code>oDesktop.GetSysLibDirectory()</code>

GetTempDirectory

Gets the path to the `Temp` directory.

UI Access	N/A
Parameters	None.
Return Value	String path to the <code>Temp</code> directory.

Python Syntax	GetTempDirectory()
Python Example	<code>oDesktop.GetTempDirectory()</code>

GetUserLibDirectory

Gets the path to the UserLib directory.

UI Access	N/A
Parameters	None.
Return Value	Stringpath to the <code>UserLib</code> directory.

Python Syntax	GetUserLibDirectory()
Python Example	<code>oDesktop.GetUserLibDirectory()</code>

GetVersion

Returns a string representing the version.

UI Access	N/A
Parameters	None.

Return Value	String containing version of the product.

Python Syntax	GetVersion()
Python Example	<code>oDesktop.GetVersion()</code>

IsFeatureEnabled

Returns a Boolean for whether a queried feature is enabled.

UI Access	N/A
Parameters	<FeatureID>.
Return Value	Boolean for named feature.

Python Syntax	IsFeatureEnabled()
Python Example	<pre>import ScriptEnv ScriptEnv.Initialize("Ansoft.ElectronicsDesktop") oDesktop.RestoreWindow() feature_strs = ["SF3519", "F195709_EXPORT_TO_EMIT", "F362235_EMIT_RESULTS_WINDOW_</pre>

```

IMPROVEMENTS",_
    "F136736_SBR_Rough_Surface", "F353006_VOLUMETRIC_SBR", "F359673_SBR_MULTISTATE_ARRAY",
    "F393115_SWE_ANTENNA",_
    "S196592_SBR_Directivity", "F432541_VSBR_IMPROVEMENTS", "F353007_VRT_FILTERS_ENHANCE",
    "S540337_SBR_REGION_LOSS_DIRECTIVITY",_
    "F11941_VRT_CURRENT_DENSITY", "S544593_SBR_3D_COMPONENT_ARRAY", "F539850_SBR_GO_
    BLOCKAGE", "F540275_SBR_RAYSTATS"]

results = [oDesktop.IsFeatureEnabled(str) for str in feature_strs]
result_txt = open("C:/Users/MyResults/Downloads/results.txt", "w")

    for i in range(len(feature_strs)):
        result_txt.write('%s : %s\n' % (feature_strs[i], results[i]))

result_txt.close()

```

KeepDesktopResponsive

Specifies the minimum number of milliseconds to keep the desktop from showing hung.

UI Access	N/A		
Parameters	Name	Type	Description
	<MinTimeInMilliseconds>	Integer	The minimum number of milliseconds to keep the desktop window from showing hung, that is, not responding.
Return Value	Boolean True for success and to keep running; False to indicate that the calling script should shut down.		

Python Syntax	KeepDesktopResponsive (<TimeInMilliseconds>)
Python Example	<code>oDesktop.KeepDesktopResponsive(10000)</code>

LaunchJobMonitor

Use: For use in starting job monitoring. This brings up the **Monitor Job** dialog box.

UI Access	Launch Job Monitor		
Parameters	Name	Type	Description
	<projectPath>	String	Path to the project file to be monitored
Return Value	None		

Python Syntax	LaunchJobMonitor()
Python Example	<code>oDesktop.LaunchJobMonitor("C:\\projects\\basic.aedt")</code>

NewProject

Creates a new project. The new project becomes the active project.

UI Access	File > New.
Parameters	None.

Return Value	Object, the project that is added.

Python Syntax	NewProject()
Python Example	<pre>oProject = oDesktop.NewProject()</pre>

OpenAndConvertProject

Opens a legacy project and converts or copies it to .aedt format.

UI Access	Click File > Open , and choose a legacy project		
Parameters	Name	Type	Description
	<itemPath>	String	full project path of the legacy project
	<legacyChoice>	Integer	0: show conversion dialog box, (same as File > Open of a legacy file) 1: rename (changes extension to .aedt, the original file and results are renamed) 2: copy (creates new file with .aedt extension, and the original file and results remain available)
Return Value	An object reference to the newly opened project which has the .aedt extension		

Warning: If project file/results with the same name and .aedt extension already exist in the same directory, they will be overwritten.

Python Syntax	OpenAndConvertProject(<i>filePath</i> , <i>legacyChoice</i>)
Python Example	<pre>oProject = oDesktop.OpenAndConvertProject("c:\files\optimtee.hfss", 1)</pre> Note: optimtee.hfss is gone after this code executes

```
oProject = oDesktop.OpenAndConvertProject("c:\files\optimtee.hfss", 2)
```

Note: optimtee.hfss remains after this code executes

OpenMultipleProjects

Opens all files of a specified type in a specified directory.

UI Access	N/A		
Parameters	Name	Type	Description
	<directory>	String	Path to the projects.
	<file Type>	String	Type of projects to open.
Return Value	None.		

Python Syntax	OpenAndConvertProject(<filePath>, <legacyChoice>)		
Python Example	oProject = oDesktop.OpenAndConvertProject("c:\files\optimtee.", "*.aedt")		

OpenProject

Opens a specified project.

UI Access	Click File > Open .		
Parameters	Name	Type	Description
	<FileName>	String	Full path of the project to open.

Return Value	An object reference to the newly opened project.

Python Syntax	OpenProject(<FileName>)
Python Example	oDesktop.OpenProject("D:/Projects/Project1.aedt")

OpenProjectWithConversion

Note:

This command is for internal Ansys use only.

Python Syntax	OpenProjectWithConversion()
Python Example	oDesktop.OpenProjectWithConversion()

PageSetup

Specifies page settings for printing.

UI Access	File > Page Setup.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. [

			<code>"NAME:PageSetupData", "margins:=", <SetupArray>]</code>
	<code><SetupArray></code>	Array	Structured Array <code>["left:=", <string>, "right:=", <string>, "top:=", <string>, "bottom:=", <string>)]</code>
Return Value	None.		

Python Syntax	<code>PageSetup(<Parameters>)</code>
Python Example	<pre>oEditor.PageSetup(["NAME:PageSetupData", "margins:=", ["left:=", "10mm", "right:=", "10mm",</pre>

	<pre> "top:=", "10mm", "bottom:=", "10mm"]]) </pre>

PauseRecording

Temporarily stop script recording.

UI Access	NA		
Parameters	Name	Type	Description
	None		
Return Value	None		

Python Syntax	PauseRecording()
Python Example	oDesktop.PauseRecording()

PauseScript

Pause the execution of the script and pop up a message to the user. The script execution will not resume until the user chooses.

UI Access	Tools > Pause Script		
Parameters	Name	Type	Description
	<Message>	String	Any Text.

Return Value	None

Python Syntax	PauseScript (<Message>)
Python Example	<code>oDesktop.PauseScript("Text to display in pop-up dialog box.")</code>

Print

Prints the contents of the active view window.

UI Access	File > Print.
Parameters	None.
Return Value	None.

Python Syntax	Print()
Python Example	<code>oDesktop.Print()</code>

QuitApplication

Exits the desktop.

UI Access	File > Exit.
Parameters	None.
Return Value	None.

Python Syntax	<code>QuitApplication()</code>
Python Example	<code>oDesktop.QuitApplication()</code>

RefreshJobMonitor

For use in monitoring a job.

UI Access	Tools > Job Management > Monitor Jobs.
Parameters	None.
Return Value	A string specifying the job state. The result can be any of the following strings: • "Monitor Not Visible" • "Queued" • "Running" • "Shutting Down" • "Unknown" • "Completed" • "Not Monitoring"

	• "Starting Monitoring"

Python Syntax	RefreshJobMonitor()
Python Example	<code>oDesktop.RefreshJobMonitor()</code>

ResetLogging

Redirects simulation log file to a specified directory and log level.

UI Access	N/A		
Parameters	Name	Type	Description
	<logFile>	String	Path to log file.
	<logLevel>	Integer	Specified log level.
Return Value	None.		

Python Syntax	ResetLogging(<logFile>, <logLevel>)
Python Example	<code>oDesktop.ResetLogging("C:/Project1.aedtresults/", 1)</code>

RestoreProjectArchive

Restores a previously archived project to a specified path.

UI Access	File > Restore Archive.		
Parameters	Name	Type	Description
	<ArchiveFilePath>	String	Path to archived file
	<ProjectFilePath>	String	Path to restore location
	<OverwriteExistingFiles>	Boolean	True to overwrite an existing file of the same name; else False.
	<OpenProjectAfterRestore>	Boolean	True to open the project after it is restored; else False.
Return Value	None.		

Python Syntax	RestoreProjectArchive (<Archivefilepath>, <ProjectFilePath>, <OverwriteExistingFiles>, <OpenProjectAfterRestore>)
Python Example	oDesktop.RestoreProjectArchive("C:\Users\jdoe\Documents\OptimTee.aedt", "C:\Documents\OptimTee.aedt", False, True)

RestoreWindow

Restores a minimized Desktop window.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	RestoreWindow()
Python Example	<code>oDesktop.RestoreWindow()</code>

ResumeRecording

Resume recording a script.

UI Access	N/A
Parameters	None.
Return Value	None

Python Syntax	ResumeRecording()
Python Example	<code>oDesktop.ResumeRecording()</code>

RunACTWizardScript

Note:

This command is for internal Ansys use only.

Python Syntax	RunACTWizardScript()
Python Example	<code>oDesktop.RunACTWizardScript()</code>

RunProgram

Runs an external program.

UI Access	NA		
Parameters	Name	Type	Description
	<ProgName>	String	Name of the program to run.
	<ProgPath>	String	Location of the program. Pass in an empty string to use the system path.
	<WorkPath>	String	Working directory in which program will start.
	<ArgArray>	Array of Strings	Arguments to pass to the program. If no arguments, pass in <code>None</code>
Return Value	None		

Python Syntax	RunProgram (<ProgName>, <ProgPath>, <WorkPath>, <ArgArray>)
Python Example	<code>oDesktop.RunProgram("winword.exe", _ "C:\Program Files\Microsoft Office\Office10", _ "", None)</code>

RunScript

Launches another script from within the script currently being executed.

UI Access	Tools>Run Script		
Parameters	Name	Type	Description
	<ScriptPath>	String	Name or full path of the script to execute. If the full path to the script is not specified, Twin Builder searches for the specified script in the following locations, in this order: 1. Personal library directory. This is the PersonalLib subdirectory in the project directory. The project directory can be specified in the General Options dialog box (click >Tools > Options > General Options to open this dialog box) under the Project Options tab. 2. User library directory. This is the userlib subdirectory in the library directory. The library directory can be specified General Options dialog in the box (click Tools > Options > General Options to to open this dialog box) under the Project Options tab. 3. System library directory. This is the syslib subdirectory in the library directory. The library directory can be specified in the General Options dialog box (click Tools > Options > General Options to open this dialog box) under the Project Options tab. 4. HFSS installation directory.
Return Value	Long the return code for the script method.		

Python Syntax	RunScript (<ScriptPath>)
Python Example	oDesktop.RunScript ("C:/Project/test1.vbs")

RunScriptWithArguments

Similar to RunScript, launch another script from within the currently executing script, but with arguments.

UI Access	NA		
Parameters	Name	Type	Description
	<ScriptPath>	String	The name or full path of the script to execute. If the full path to the script is not specified, the software looks for the script in the following locations: - Personal library directory: "PersonalLib" The PersonalLib directory can be specified in Tools > Options > General Options on the 'Project Options' tab. - User library directory: "userlib" The UserLib directory can be specified in Tools > Options > General Options on the 'Project Options' tab. - System library directory: "syslib" The SysLib directory can be specified in Tools > Options > General Options on the 'Project Options' tab. - Software installation directory
	<Arguments>	String	The arguments to supply to the specified script.
Return Value	Long		

	the return code for the script method.

Python Syntax	RunScriptWithArguments (<ScriptPath>, <Arguments>)
Python Example	<pre>oDesktop.RunScriptWithArguments ("C:/Project/test2.py", "foo")</pre>

SelectScheduler

Selects the scheduler used for batch job submission. It tries non-graphical selection of the scheduler, attempting to get version information from the scheduler in order to check for successful selection. If unable to get the information, it displays the **Select Scheduler** window and waits for the user to complete the settings.

UI Access	Tools > Job Management > Select Scheduler.		
Parameters	Name	Type	Description
	<option>	String	One of the following options (not case sensitive): • Empty string for remote RSM service • "RSM" for local RSM • "Windows HPC" for Windows HPC • "LSF" for Load-Sharing Facility • "SGE" for Grid Engine (GE, OGE, SGE, UGE, etc.) • "PBS" for Portable Batch Scheduler/System (PBSPro, Torque, Maui, etc.) • "Ansys Cloud" for Ansys Cloud

	<address (optional)>	String	String specifying the IP address or hostname of the head node or for the remote host running the RSM service.
	<username (optional)>	String	Username string to use for remote RSM service (or blank to use username stored in current submission host user settings). If the (non-blank) username doesn't match the username stored in current submission host user settings, then the Select Scheduler dialog is displayed to allow for password entry prior to job submission.
	<forcePasswordEntry (optional)>	String	Boolean used to force display of the Select Scheduler GUI to allow for password entry prior to job submission.
Return Value	The selected scheduler (if selection was successful, this string should match the input option string, although it could differ in upper/lowercase).		

Python Syntax	Select Scheduler(<option>, <address>, <username>, <forcePasswordEntry>)
Python Example	<pre>result = oDesktop.SelectScheduler("Windows HPC", "headnode.win.example.com")</pre>

SetActiveProject

Specifies the name of the project that should become active in the desktop. Returns that project.

UI Access	N/A		
Parameters	Name	Type	Description
	<ProjectName>	String	The name of the project already in the Desktop that is to be activated.
Return Value	Object, the project that is activated.		

Python Syntax	<code>SetActiveProject (<ProjectName>)</code>
Python Example	<code>oProject = oDesktop.SetActiveProject ("Project1")</code>

SetActiveProjectByPath

Specifies the name of the project that should become active in the desktop. Returns that project. If a user has two projects open with the same name, the result of `SetActiveProject` is ambiguous (the first one listed in selected). This command permits unambiguous specification of the active project.

UI Access	N/A		
Parameters	Name	Type	Description
	<ProjectName>	String	The full path name of the project already in the Desktop that is to be activated.
Return Value	Object, the project that is activated.		

Python Syntax	<code>SetActiveProjectByPath(<ProjectName>)</code>
Python Example	<code>oProject = oDesktop.SetActiveProjectByPath ("c:\Projects\MyProject.aedt")</code>

SetCustomMenuSet

Sets the custom menu set for Electronics Desktop.

UI Access	Navigate to Tools > Options > General Options > General > Desktop Configuration . Select a configuration using the Custom Menu Set drop-down menu.		
Parameters	Name	Type	Description
	<customMenuSet>	String	Name of desired menu set. Can be one of: • 'Default' • 'EM' • 'RF' • 'RF.0' • 'SI' • 'SI1.0' • 'SI2.0' • 'Twin Builder'
Return Value	None		

Python Syntax	SetCustomMenuSet(<customMenuSet>)
Python Example	<code>oDesktop.SetCustomMenuSet('Default')</code>

SetDesktopConfiguration

Sets the desktop configuration.

UI Access	Navigate to Tools > Options > General Options > General > Desktop Configuration . Select a configuration using the Set targeted configuration drop-down menu.

Parameters	Name	Type	Description
	<configName>	String	Name of desired Desktop configuration. Can be one of: • 'All' • 'EM' • 'RF' • 'SI' • 'Twin Builder'
Return Value	None		

Python Syntax	SetDesktopConfiguration (<configName>)
Python Example	<code>oDesktop.SetDesktopConfiguration('RF')</code>

SetLibraryDirectory

Sets the library directory path. The specified directory must already exist and contain a syslib folder.

UI Access	NA		
Parameters	Name	Type	Description
	<DirectoryPath>	String	The path to the SysLib Directory
Return Value	None		

Python Syntax	SetLibraryDirectory (<DirectoryPath>)
Python Example	<code>oDesktop.SetLibraryDirectory("c:\libraries")</code>

SetProjectDirectory

Sets the project directory path.

UI Access	N/A		
Parameters	Name	Type	Description
	<DirectoryPath>	String	The path to the project directory. This should be writeable by the user.
Return Value	None.		

Python Syntax	SetProjectDirectory (<DirectoryPath>)
Python Example	<code>oDesktop.SetProjectDirectory("c:\projects")</code>

SetRegistryFromFile

Configures registry by specifying an Analysis Configuration file which must have been exported from the HPC and Analysis panel.

UI Access	N/A		
Parameters	Name	Type	Description
	<filePath>	String	Full file path of registry file.

Return Value	Success if configuration is imported. Bad argument value if the file is not found or does not contain valid analysis configuration data.

Python Syntax	SetRegistryFromFile(<filePath>)
Python Example	<code>oDesktop.SetRegistryFromFile('c:/temp/test.acf')</code>

SetRegistryInt

Sets registry key to an integer value.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
	<int>	Integer	Integer value to be assigned to registry key.
Return Value	Success if the key is defined as an integer. Bad argument value if a key is not defined, or if the value is a text string.		

Python Syntax	SetRegistryInt(<KeyName>, <int>)
Python Example	<code>oDesktop.SetRegistryInt('Desktop/Settings/ProjectOptions/Q3D Extractor/UpdateReportsDynamicallyOnEdits', 0)</code>

SetRegistryString

Sets registry key to a string value.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
	<value>	String	String value to be assigned to registry key.
Return Value	Success if the key is defined as a text string. Bad argument value if the key is not defined or requires an integer value.		

Python Syntax	SetRegistryString(<KeyName>, <value>)
Python Example	oDesktop.SetRegistryString('Desktop/ActiveDSOConfigurations/Q3D Extractor', 'Local')

SetSchematicEnvironment

Sets the schematic environment for Electronics Desktop.

UI Access	Navigate to Tools > Options > General Options > General > Desktop Configuration . Select a schematic environment using the Custom Menu Set drop-down menu.		
Parameters	Name	Type	Description
	<schEnv>	Integer	Desired schematic environment. Can be one of:

			• 0 (Circuit) • 1 (Twin Builder) • 2 (Maxwell Circuit)
Return Value	None		

Python Syntax	SetSchematicEnvironment(<schEnv>)
Python Example	<code>oDesktop.SetSchematicEnvironment(1)</code>

SetTempDirectory

Sets the temp directory path. The directory will be automatically created if it does not already exist.

UI Access	N/A		
Parameters	Name	Type	Description
	<DirectoryPath>	String	The path to the Temp directory. This should be writeable by the user.
Return Value	None.		

Python Syntax	SetTempDirectory (<DirectoryPath>)
Python Example	<code>oDesktop.SetTempDirectory("c:\tmp")</code>

ShowDockingWindow

Shows or hides a docking window.

UI Access	Right click docking window > Show/Hide.		
Parameters	Name	Type	Description
	<windowName>	String	The window name (for example, "Message Manager", "Component Libraries", "Properties")
	<show>	Boolean	True to show; False to hide.
Return Value	None.		

Python Syntax	ShowDockingWindow (<windowName>, <show>)
Python Example	<code>oDesktop.ShowDockingWindow('Message Manager', False)</code>

Sleep

Suspends execution of HFSS for the specified number of milliseconds, up to 60,000 milliseconds (1 minute).

UI Access	NA		
Parameters	Name	Type	Description
	<TimeInMil- liseconds>	Integer	The time that the execution should be suspended in milliseconds
Return Value	None		

Python Syntax	Sleep (< <i>TimeInMilliseconds</i> >)
Python Example	<code>oDesktop.Sleep(1000)</code>

StopSimulations

Either cleanly stops all running and pending simulations, or aborts them.

UI Access	NA		
Parameters	Name	Type	Description
	<bool> <Clean>	Integer	If true, clean stop for all running and pending simulations. If false, aborts them.
Return Value	A human readable status string specifying what happened.		

Python Syntax	StopSimulations (<bool>, clean)
Python Example	<code>oDesktop.StopSimulations(bool clean)</code>

SubmitJob

Submits a batch job to a scheduler. When submitting the same project file multiple times, you should have the script wait for each job (or jobs for multi-step) to finish, which can be done via the monitoring functions `LaunchJobMonitor()` and `RefreshJobMonitor()`, checking the result of `RefreshJobMonitor()` in a loop until it returns completed ("Monitor Not Visible") status.

UI Access	Tools > Job Management > Submit Job.		
Parameters	Name	Type	Description
	<settingsPath>	String	Path to the settings file (exported from the Submit Job GUI) to use for submission.
	<projectPath>	String	Path to the project file to use in the batch job. This could be an archive (.aedtz file) or an un-archived project.
	<design (optional)>	String	Name of the design to use for batch solve.
	<setup (optional)>	String	Name of the specific setup to solve.
Return Value	Array of job ID strings (empty if no jobs submitted).		

Python Syntax	SubmitJob(<settingsPath>, <projectPath>, <design>, <setup>)
Python Example	<pre> jobIDs = oDesktop.SubmitJob("C:\\hpc-settings\\Submit_ Job_Settings.ared", "C:\\projects\\basic.aedt")) moreIDs = oDesktop.SubmitJob("C:\\hpc-settings\\Submit_ Job_Settings.ared", "C:\\projects\\basic.aedt", "Design1", "Setup1") </pre>

TileWindows

Arrange all open windows in a tiled format.

UI Access	From main menu, Window >Tile Horizontally or Window >Tile Vertically .		
Parameters	Name	Type	Description
	<TilingFlag>	Integer	• 0 – Tile vertically. • 1 – Tile horizontally.
Return Value	None.		

Python Syntax	TileWindows(<TilingFlag>)
Python Example	<code>oDesktop.TileWindows(0)</code>

Desktop Commands For Registry Values

The Ansys Registry is stored as XML format file. By default it is located at C:\User-s\<UserName>\Documents\Ansoft\<AnsysProductNameversion>\config\<PC_NAME>_user.XML. Most of the Ansys product configuration information is stored in this XML file. These methods allow you to change the product configuration.

For example, to set the DSO & HPC analysis setup for HFSS using a Python script:

1. Start Q3D Extractor.
2. Go to the DSO and HPC options and create a setup named "test".
3. Export the setup to a file (for example, c:\temp\test.acf).
4. Copy the exported file to a target PC (for example, f:\temp\test.acf).

5. Run the following script:

```
#import the setup

oDesktop.SetRegistryFromFile("f:\\temp\\test.acf")

# Set Active Setup to "test"

oDesktop.SetRegistryString("Desktop/ActiveDSOConfigurations/Q3D Extractor", "test")
```

See the following subtopics:

[DeleteRegistryEntry](#)

[DoesRegistryValueExist](#)

[GetRegistryInt](#)

[GetRegistryString](#)

[SetRegistryFromFile](#)

[SetRegistryInt](#)

[SetRegistryString](#)

DeleteRegistryEntry

Deletes a registry entry from a registry key. Returns true if deletion succeeded.

UI Access	N/A		
Parameters	Name	Type	Description
	<pathToRegistry>	String	Path to Registry entry.
Return Value	Boolean: • True – Key has been deleted. • False – Key does not exist.		

Python Syntax	DeleteRegistryEntry(<pathToRegistry>)
Python Example	<pre>res = oDesktop.DeleteRegistryEntry("Desktop/ColorScheme")</pre>

DoesRegistryValueExist

Determines whether a registry value exists.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
Return Value	Boolean: • True – Key exists. • False – Key does not exist.		

Python Syntax	DoesRegistryValueExist(<KeyName>)
Python Example	<pre>Exist = oDesktop.DoesRegistryValueExist('Desktop/ActiveDSOConfigurations/Q3D Extractor')</pre>

GetRegistryInt

Obtains registry key integer value.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
Return Value	Integer if the integer value is found. Return as Bad-Argument-Value if registry key does not exist or it is not an integer value.		

Python Syntax	GetRegistryInt(<KeyName>)
Python Example	<pre>num = oDesktop.GetRegistryInt('Desktop/Settings/ProjectOptions/Q3D Extractor/UpdateReportsDynamicallyOnEdits')</pre>

GetRegistryString

Obtains registry key string value.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
Return Value	String if the string value is found. Return as Bad-Argument-Value if registry key does not exist or it is not a string value.		

Python Syntax	GetRegistryString(<KeyName>)
Python Example	<pre>activeDSO = oDesktop.GetRegistryString('Desktop/ActiveDSOConfigurations/Q3D Extractor')</pre>

SetRegistryFromFile

Configures registry by specifying an Analysis Configuration file which must have been exported from the HPC and Analysis panel.

UI Access	N/A		
Parameters	Name	Type	Description
	<filePath>	String	Full file path of registry file.
Return Value	Success if configuration is imported. Bad argument value if the file is not found or does not contain valid analysis configuration data.		

Python Syntax	SetRegistryFromFile(<filePath>)
Python Example	<pre>oDesktop.SetRegistryFromFile('c:/temp/test.acf')</pre>

SetRegistryInt

Sets registry key to an integer value.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
	<int>	Integer	Integer value to be assigned to registry key.
Return Value	Success if the key is defined as an integer. Bad argument value if a key is not defined, or if the value is a text string.		

Python Syntax	SetRegistryInt(<KeyName>, <int>)
Python Example	oDesktop.SetRegistryInt('Desktop/Settings/ProjectOptions/Q3D Extractor/UpdateReportsDynamicallyOnEdits', 0)

SetRegistryString

Sets registry key to a string value.

UI Access	N/A		
Parameters	Name	Type	Description
	<KeyName>	String	Full name of registry key, including path.
	<value>	String	String value to be assigned to registry key.
Return Value	Success if the key is defined as a text string. Bad argument value if the key is not defined or requires an integer value.		

Python Syntax	SetRegistryString(<KeyName>, <value>)
Python Example	<code>oDesktop.SetRegistryString('Desktop/ActiveDSOConfigurations/Q3D Extractor', 'Local')</code>

ImportExport Tool Commands

These oDesktop commands are run by using the GetTool script to call the ImportExport Tool.

```
oTool = oDesktop.GetTool("ImportExport")
```

Scripts run via the ImportExport Tool include:

[ImportANF](#)

[ImportANFV2](#)

[ImportAutoCAD](#)

[ImportAWRMicrowaveOffice](#)

[ImportEDB](#)

[ImportExtracta](#)

[ImportGDSII](#)

[ImportGerber](#)

[ImportIDF](#)

[ImportIDFandMerge](#)

[ImportIPC](#)

[ImportODB](#)

[ImportXFL](#)**ImportANF**

Imports an ANF file into a new project. For older ANFv2 files, use [ImportANFv2](#).

UI Access	File > Import > ANF.		
Parameters	Name	Type	Description
	<ANFfilename>	String	Full path of ANF file.
Return Value	None.		

Python Syntax	ImportANF(<ANFfilename>)
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportANF('C:\\AnsTranslator\\results\\package4.anf')</pre>

ImportANFv2

Imports an ANFv2 file into a new project. For newer ANF files, use [ImportANF](#).

UI Access	File > Import > ANF.		
Parameters	Name	Type	Description
	<ANFfilename>	String	Full path of ANF file.
	<outputPathName>	String	Full path of *.aedb output file.
	<controlFileName>	String	Full path of XML control file.
	<cmpFileName>	String	Full path of CMP file. Pass empty string if none.

Return Value	None.

Python Syntax	<code>ImportANFv2 (<ANFfilename>, <outputPathName>, <controlFileName>, <cmpFileName>)</code>
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportANFV2("C:/Users/jdoe/Documents/SAMPLEFILES/my_model.anf", "C:/Users/jdoe/Documents/Ansoft/my_model.aedb", "C:/Users/jdoe/Documents/Ansoft/my_model.xml", "")</pre>

ImportAutoCAD

Imports an AutoCAD file into a new project.

UI Access	File > Import > AutoCAD.		
Parameters	Name	Type	Description
	<code><dxfileName></code>	String	Full path of DXF file.
	<code><outputPathFileName></code>	String	Full path of EDB file to create during import.
	<code><controlFileName></code>	String	Full path of XML control file. Pass empty string if none.
Return Value	None.		

Python Syntax	<code>ImportAutoCAD (<dxfileName>, <outputPathFileName>, <controlFileName>)</code>
Python Example	<pre>Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportAutoCAD('C:/MyPath/a4lines.dxf', 'C:/MyPath/a4lines.aedb.edb', 'C:/MyPath/a4lines.xml')</pre>

ImportAWRMicrowaveOffice

Imports an AWRMicrowaveOffice file into a new project.

UI Access	File > Import > AWRMicrowaveOffice.		
Parameters	Name	Type	Description
	<code><xmlFileName></code>	String	Full path of XML file.
	<code><outputPathName></code>	String	Full path of output file.
	<code><logFileName></code>	String	Full path of log file.
Return Value	None.		

Python Syntax	<code>ImportAWRMicrowaveOffice (<xmlFileName>, <outputPathName>, <logFileName>)</code>
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportAWRMicrowaveOffice('C:/MyFiles/package4.xml', 'C:/MyFiles/package4.aedb', 'C:/MyFiles/package4.log')</pre>

ImportEDB

Imports an EDB file into a new project.

UI Access	File > Import > EDB.		
Parameters	Name	Type	Description
	<edbFileName>	String	Full path of EDB file.
Return Value	None.		

Python Syntax	ImportEDB (<edbFileName>)
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportEDB('C:/MyFiles/projectforimport.aedb/edb.def')</pre>

ImportExtracta

Imports a Cadence Extracta file into a new project.

Note:

In order for this script to work, you must have the Cadence-supplied executable Extracta.exe installed on your machine.

UI Access	File > Import > Cadence APD / Allegro / SiP.

Parameters	Name	Type	Description
	<extractaFileName>	String	Full path of Extracta file.
	<outputPathName>	String	Full path of output file to be created.
	<controlFileName>	String	Optional. Full path to XML control file.
Return Value	None.		

Python Syntax	ImportExtracta (<extractaFileName>, <outputPathName>, <controlFileName>)
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportExtracta('C:/MyFiles/projectforimport.brd', 'C:/MyFiles/project.edb', '')</pre>

ImportGDSII

Imports a GDSII file into a new project.

UI Access	File > Import > GDSII.		
Parameters	Name	Type	Description
	<gdsiiFileName>	String	Full path of GDSII file.
	<outputPathName>	String	Full path of EDB file to create during import.
	<controlFileName>	String	Optional. Full path of XML control file. Full path of “technology” (corresponding to -t=technologyfile argument in anstranlator). Pass empty string if none.
	<mapFileName>	String	If technology file was used in place of the control file. Full path to either gdsii mapping file (corresponding to -g=gdsMappingFile argument in anstrans-

	<table><tr><td></td><td></td><td>lator) or XML control file. Otherwise, pass empty string.</td></tr></table>			lator) or XML control file. Otherwise, pass empty string.
		lator) or XML control file. Otherwise, pass empty string.		
Return Value	None.			

Python Syntax	<code>ImportGDSII(<gdsiiFileName>, <outputPathName>, <controlFileName>, <mapFileName>)</code>
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportGDSII('C:/Files/test.gds', 'C:/Files/test.aedb', 'C:/Files/test.ircx', 'C:/Files/test.xml')</pre>

ImportGerber

Imports a GERBER file into a new project.

UI Access	File > Import > GERBER.		
Parameters	Name	Type	Description
	<gerberFileName>	String	Full path of GERBER file.
	<outputPathName>	String	Full path of EDB file to create during import.
	<controlFileName>	String	Optional. Full path of XML control file. Pass empty string if none.
Return Value	None.		

Python Syntax	<code>ImportGerber(<gerberFileName>, <outputPathName>, <controlFileName>)</code>
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportGERBER('C:/Files/test.gbr', 'C:/Files/test.aedb.edb', 'C:/Files/test.xml')</pre>

ImportIDF

Imports an IDF file into a new project. To merge with an existing design, use [ImportIDFandMerge](#).

UI Access	placeholder		
Parameters	Name	Type	Description
	<NAME>	string	Settings
	<Board>	bool	Full path of board file
	<Library>	int	Full path of library file
	<Control>	int	Full path of control file
	<Filters>	list	["Cap", "Height", "HeightExclude2D", "Ind", "Power", "Res"]
	<CreateFilteredAsNonModel>	bool	True or False
	<FootPrint>	string	Footprint size and unit
	<NAME>	string	definitionOverridesMap
	<NAME>	string	instanceOverridesMap
	<HighSurfThickness>	string	High side surface thickness and unit
	<LowSurfThickness>	string	Low side surface thickness and unit
	<InternalLayerThickness>	string	Internal layer thickness and unit
	<NumInternalLayer>	int	Number of internal layers
	<HighSurfaceCopper>	int	High side surface coverage percentage

	<LowSurfaceCopper>	int	Low side surface coverage percentage
	<InternalLayerCopper>	int	Internal layer coverage percentage
	<TraceMaterial>	string	Trace material name
	<SubstrateMaterial>	int	Substrate material name
	<CreateBoard>	bool	True or False
	<ModelBoardAsRect>	bool	True or False
	<ModelDeviceAsRect>	bool	True or False
	<Cutoff>	bool	True or False
	<IncludeDrilledHoles>	bool	True or False
	<HoleDiameterCutoff>	string	Hole diameter size and unit
	<ReplaceDevices>	bool	True or False
	<CreatePointsOnBoardForInstances>	bool	True or False
Return Value	None.		

Python Syntax	ImportIDF_1 (<NAME>, <Board>, <Library>, <Control>, <Filters>, <CreateFilteredAsNonModel>, <NAME>, <NAME>, <HighSurfThickness>, <LowSurfThickness>, <InternalLayerThickness>, <NumInternalLayer>, <HighSurfaceCopper>, <LowSurfaceCopper>, <InternalLayerCopper>, <TraceMaterial>, <SubstrateMaterial>, <CreateBoard>, <ModelBoardAsRect>, <ModelDeviceAsRect>, <Cutoff>, <IncludeDrilledHoles>, <ReplaceDevices>)		
Python Example	<pre>oDesign.ImportIDF(["NAME:Settings", "Board:=", "Library:="], "C:\\Users\\Model Files\\brd_board.emn", "C:\\Users\\Model Files\\brd_board.emp",</pre>		

```

"Control:="                , "C:\\Users\\Model Files\\brd_board.xml",
"Filters:="                , ["HeightExclude2D"],
"CreateFilteredAsNonModel:=", False,
"FootPrint:="              , "0.1mm2",
[
    "NAME:definitionOverridesMap"
],
[
    "NAME:instanceOverridesMap"
],
"HighSurfThickness:="      , "0.07mm",
"LowSurfThickness:="       , "0.07mm",
"InternalLayerThickness:=", "0.07mm",
"NumInternalLayer:="       , 2,
"HighSurfaceCopper:="      , 30,
"LowSurfaceCopper:="       , 30,
"InternalLayerCopper:="    , 30,
"TraceMaterial:="          , "Cu-Pure",
"SubstrateMaterial:="      , "FR-4",
"CreateBoard:="            , True,
"ModelBoardAsRect:="       , True,
"ModelDeviceAsRect:="      , False,
"Cutoff:="                 , False,
"IncludeDrilledHoles:="    , True,
"HoleDiameterCutoff:="     , "0.1mm",
"ReplaceDevices:="         , False,
"CreatePointsOnBoardForInstances:=", False
] )

```

ImportIDFandMerge

Imports an IDF file into a new project. To import without merging, use [ImportIDF](#).

UI Access	File > Import > IDF. Enable Merge with existing and select a project/design.		
Parameters	Name	Type	Description
	<idfFileName>	String	Full path of GERBER file.
	<libFileName>	String	Optional. Full path of library file. Pass empty string if none.
	<controlFileName>	String	Optional. Full path of XML control file. Pass empty string if none.
	<project>	String	Name of project to merge with.
	<design>	String	Name of design to merge with.
Return Value	None.		

Python Syntax	ImportIDFandMerge(<idfFileName>, <libPathName>, <controlFileName>, <project>, <design>)		
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportIDFandMerge('C:/Files/test.brd', 'C:/Files/test.aedb.lib', 'C:/Files/test.xml', 'Project1', 'Design12')</pre>		

ImportIDX

Imports and IDX model into a new Icepak project.

UI Access	Icepak > Import IDX		
Parameters	Name	Type	Description
	<NAME>	string	Settings

	<Board>	bool	Full path of .idx file
	<Library>	string	NA
	<Control>	string	NA
	<Filters>	list	HeightExclude2D
	<CreateFilteredAsNonModel>	bool	True or False
	<NAME>	string	definitionOverridesMap
	<NAME>	string	instanceOverridesMap
	<HighSurfThickness>	string	High surface layer thickness value and unit
	<LowSurfThickness>	string	Low surface layer thickness value and unit
	<InternalLayerThickness>	string	Internal surface layer thickness value and unit
	<NumInternalLayer>	int	Number of internal layers value
	<HighSurfaceCopper>	int	High surface percent coverage value
	<LowSurfaceCopper>	int	Low surface percent coverage value
	<InternalLayerCopper>	int	Internal layer percent coverage value
	<TraceMaterial>	string	Trace material name
	<SubstrateMaterial>	int	Substrate material name
	<CreateBoard>	bool	True or False
	<ModelBoardAsRect>	bool	True or False
	<ModelDeviceAsRect>	bool	True or False
	<Cutoff>	bool	True or False
	<ReplaceDevices>	bool	True or False
Return Value	None		

Python Syntax	ImportIDX (<NAME>, <Board>, <Library>, <Control>, <Filters>, <CreateFilteredAsNonModel>, <NAME>, <NAME>, <HighSurfThickness>, <LowSurfThickness>, <InternalLayerThickness>, <NumInternalLayer>, <HighSurfaceCopper>, <LowSurfaceCopper>, <InternalLayerCopper>, <TraceMaterial>, <SubstrateMaterial>, <CreateBoard>, <ModelBoardAsRect>, <ModelDeviceAsRect>, <Cutoff>, <ReplaceDevices>)

Python Example	<pre>oDesign.ImportIDX(["NAME:Settings", "Board:=" , "C:\\Users\\Model files\\PCB-00278_A.idx", "Library:=" , "", "Control:=" , "", "Filters:=" , ["HeightExclude2D"], "CreateFilteredAsNonModel:=", False, ["NAME:definitionOverridesMap"], ["NAME:instanceOverridesMap"], "HighSurfThickness:=" , "0.07mm", "LowSurfThickness:=" , "0.07mm", "InternalLayerThickness:=", "0.07mm", "NumInternalLayer:=" , 2, "HighSurfaceCopper:=" , 30, "LowSurfaceCopper:=" , 30, "InternalLayerCopper:=" , 30, "TraceMaterial:=" , "Cu-Pure", "SubstrateMaterial:=" , "FR-4", "CreateBoard:=" , True, "ModelBoardAsRect:=" , False, "ModelDeviceAsRect:=" , False, "Cutoff:=" , False, "ReplaceDevices:=" , False])</pre>

ImportIPC

Imports an IPC2581 file into a new project.

UI Access	File > Import > IPC2581.		
Parameters	Name	Type	Description
	<ipcFileName>	String	Full path of IPC2581 file.
	<outputPathName>	String	Full path of EDB file to create during import.
	<controlFileName>	String	Optional. Full path of XML control file. Pass empty string if none.
Return Value	None.		

Python Syntax	ImportIPC(<ipcFileName>, <outputPathName>, <controlFileName>)		
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportIPC('C:/Files/test.cvg', 'C:/Files/test.aedb', 'C:/Files/test.xml', 'C:/Files/test.txt')</pre>		

ImportODB

Imports an ODB++ file into a new project.

UI Access	File > Import > ODB++.		
Parameters	Name	Type	Description
	<odbFileName>	String	Full path of ODB++ file.
	<outputPathName>	String	Full path of EDB file to create during import.

	<table><tr><td><controlFileName></td><td>String</td><td>Optional. Full path of XML control file. Pass empty string if none.</td></tr></table>	<controlFileName>	String	Optional. Full path of XML control file. Pass empty string if none.
<controlFileName>	String	Optional. Full path of XML control file. Pass empty string if none.		
Return Value	None.			

Python Syntax	ImportODB(<odbFileName>, <outputPathName>, <controlFileName>)
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportODB('C:/Files/test.odb', 'C:/Files/test.aedb', 'C:/Files/test.xml')</pre>

ImportXFL

Imports an XFL file into a new project.

UI Access	File > Import > XFL.		
Parameters	Name	Type	Description
	<xflFileName>	String	Full path of XFL file.
	<outputPathName>	String	Full path of EDB file to create during import.
	<controlFileName>	String	Optional. Full path of XML control file. Pass empty string if none.
Return Value	None.		

Python Syntax	<code>ImportXFL(<xflFileName>, <outputPathName>, <controlFileName>)</code>
Python Example	<pre>oDesktop.RestoreWindow() Set oTool = oDesktop.GetTool('ImportExport') oTool.ImportXFL('C:/Files/test.xfl', 'C:/Files/test.aedb', 'C:/Files/test.xml')</pre>

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5 - Running Instances Manager Script Commands

The Running Instances Manager is a scripting object that lets you identify and connect to all running instances of Electronics Desktop. oDesktop objects that are returned provide full scripting functionality. Running Instances Manager commands should be executed by the oDesktop object. For example:

```
oRunningInstances = oDesktop.GetRunningInstancesMgr()
```

[GetAllRunningInstances](#)

[GetRunningInstanceByProcessID](#)

[GetRunningInstanceByProject](#)

GetAllRunningInstances

Returns a list of running instances of Ansys Electronics Desktop.

UI Access	N/A
Parameters	None.
Return Value	Array containing list of Ansys Electronics Desktop instances.

Python Syntax	GetAllRunningInstances()
Python Example	<code>obj = oRunningInstances.GetAllRunningInstances()</code>

GetRunningInstanceByProcessID

Returns the instance of Ansys Electronics Desktop that is running a specified process.

UI Access	N/A		
Parameters	Name	Type	Description
	<processID>	Integer	Process ID
Return Value	String of the returned instance.		

Python Syntax	GetRunningInstanceByProcessID(<processID>)
Python Example	<code>obj = oRunningInstances.GetRunningInstanceByProcessID(12345)</code>

GetRunningInstancesMgr

Returns the object of the Running Instances Manager.

UI Access	N/A		
Parameters	Name	Type	Description
	None		
Return Value	Object Running instances manager object		

Python Syntax	GetRunningInstancesMgr()
Python Example	<code>oRunningInstances = oDesktop.GetRunningInstanceecMgr()</code>

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6 - Project Object Script Commands

Project commands should be executed by the oProject object.

One example of accessing this object is:

```
oProject = oDesktop.GetActiveProject()
```

Dataset Script Commands:

[AddDataset](#)

[DeleteDataset](#)

[EditDataset](#)

[ExportDataset](#)

[HasDataset](#)

[ImportDataset](#)

Other Project Object Script Commands:

[AddMaterial](#)

[AnalyzeAll](#)

[ChangeProperty](#)

[ClearMessages](#)

[CloneMaterial](#)

[Close](#)

[CopyDesign](#)

[CutDesign](#)

[DeleteDesign](#)

[DeleteToolObject](#)

[EditMaterial](#)

[ExportMaterial](#)

[GetActiveDesign](#)

[GetArrayVariables](#)

[GetChildNames \[Project\]](#)

[GetChildObject \[Project\]](#)

[GetChildTypes \[Project\]](#)

[GetDefinitionManager](#)

[GetDependentFiles](#)

[GetDesign](#)

[GetDesigns](#)

[GetEDBHandle](#)

[GetLegacyName](#)

[GetName \[Project\]](#)

[GetObjPath \[Project\]](#)

[GetPath](#)

[GetPropEvaluatedValue](#)

[GetPropNames \[Project\]](#)

[GetPropSIValue](#)

[GetPropValue \[Project\]](#)

[GetProperties](#)

[GetPropertyValue](#)

[GetTopDesignList](#)

[GetVariableValue](#)

[GetVariables](#)

[InsertDesign](#)

InsertDesign (Layout Editor)

[InsertDesignWithWorkflow](#)

[InsertToolObject](#)

[Paste \[Project Object\]](#)

[Redo \[Project Level\]](#)

[RemoveAllUnusedDefinitions](#)

[RemoveMaterial](#)

[RemoveUnusedDefinitions](#)

[Rename](#)

[RunToolkit](#)

[Save](#)

[SaveAs](#)

[SaveAsStandAloneProject](#)

[SaveProjectArchive](#)

[SetActiveDefinitionEditor](#)

[SetActiveDesign](#)

[SetPropValue \[Project\]](#)

[SetPropertyValue](#)

[SetVariableValue](#)

[SimulateAll](#)

[Undo \[Project\]](#)

[UpdateDefinitions](#)

AddDataset

Adds a dataset. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Add.		
Parameters	Name	Type	Description
	<DatasetDataArray> >	Array	Array("NAME:<DatasetName>", Array("NAME:Coordinates", <CoordinateArray>, <CoordinateArray>, ...)
	<DatasetName>	String	Name of the dataset.
	<CoordinateArray>	Array	Array("NAME:Coordinate", "X:=", <double>, "Y:=",<double>)
Return Value	None.		

Python Syntax	AddDataset <DatasetDataArray>
Python Example	<pre>oProject.AddDataset(["NAME:\$ds1", ["NAME:Coordinates", ["NAME:Coordinate", "X:=", 2, "Y:=", 4], ["NAME:Coordinate", "X:=", 6, "Y:=", 8]]]) oDesign.AddDataset([</pre>

	<pre>"NAME:\$dsl", ["NAME:Coordinates", ["NAME:Coordinate", "X:=", 2, "Y:=", 4], ["NAME:Coordinate", "X:=", 6, "Y:=", 8]]])</pre>

AddMaterial

Adds a local material.

UI Access	Add Material in the material editor.

Parameters	Name	Type	Description
	<code><MaterialParams></code>	Array	["NAME: <name of the material to be added>", <MatProperty>, <MatProperty>, ...]
	<code><MatProperty></code>	Array	For simple material: "<PropertyName>:=", <value> For anisotropic material: ["NAME:<PropertyName>", "property_type:=", "AnisoProperty", "unit:=", <Unit>," "component1:=", <value>," "component2:=", <value>," "component3:=", <value>))]
	<code><PropertyName></code>	String	Should be one of the following (depending on the material, design, and solution types):

		Electromagnetic (Maxwell-exclusive material properties omitted, see Maxwell Scripting help): "permittivity", "permeability", "conductivity", "dielectric_loss_tangent", "magnetic_loss_tangent", "electric_coercivity", "magnetic_coercivity", "saturation_mag", "lande_g_factor", "delta_H", "delta_h_freq", "mass_density" Thermal (including solids, Icepak fluid flow, and Mechanical rotating fluid modeling): "thermal_conductivity", "mass_density", "specific_heat", "thermal_expansion_coefficient", "thermal_material_type", "viscosity", "diffusivity", "molecular_mass", "clarity_type" Structural: "mass_density", "youngs_modulus", "poissons_ratio", "thermal_expansion_coefficient"
<Unit>	String	Possible values (Maxwell-exclusive properties omitted, see Maxwell Scripting Help; other missing entries are unitless): conductivity: "siemens/m" saturation_mag: "uTesla", "mTesla", "tesla", "kTesla", "uGauss", "mGauss", "gauss", "kGauss" delta_H: "A_per_meter", "kA_per_meter", "Oe", "kOe" delta_h_frequency: "Hz", "kHz", "MHz", "GHz", "THz", "rps", "per_sec"

			mass_density: "kg/m^3" thermal_conductivity: "W/m-C" specific_heat: "J/kg-C" youngs_modulus: "N/m^2" thermal_expansion_coefficient: "1/C"
Return Value	None		

Python Syntax	AddMaterial (["NAME:<MaterialName>", <MatProperty>, <MatProperty>, ...])
Python Example	<pre> oDefinitionManager.AddMaterial(["permittivity:=", "2.2", "0.002"]) oDefinitionManager.AddMaterial [("NAME:Material2",_ "dielectric_loss_tangent:=", "44", Array("NAME:saturation_mag",_ "property_type:=", "AnisoProperty",_ "unit:=", "Gauss",_ "component1:=", "11", _ "component2:=", "22", _ </pre>

	<pre>"component3:=", "33"), _ "delta_H:=", "440e")]</pre>

AnalyzeAll [project]

Runs the project-level script command from the script, which simulates all solution setups and Optimetrics setups for all design instances in the project. The UI waits until simulation is finished before continuing with the script.

UI Access	Project > Analyze All.
Parameters	None.
Return Value	None.

Python Syntax	AnalyzeAll()
Python Example	<code>oProject.AnalyzeAll()</code>

ChangeProperty

Changes the properties of an object in the history tree.

UI Access	Right-click an object in the History Tree and select Properties .

Parameters	Name	Type	Description
	<propertyArgs>	Array	Structured array. The properties vary depending on the object. Due to the number of potential configurations, it is recommended that you generate this script using the UI's Automation tab.
Return Value	None.		

Python Syntax	ChangeProperty(<propertyArgs>)
Python Example	Example: Changing the Position of a Box <pre> oEditor.ChangeProperty(["NAME:AllTabs", ["NAME:Geometry3DCmdTab", ["NAME:PropServers" , "Box1:CreateBox:1"], ["NAME:ChangedProps", ["NAME:Position", "X:=" , "0.35in", "Y:=" , "0.55in", "Z:=" , "0in"]]]]) </pre>

Example: Offset the Position of a 3D Component or Layout Component with a Variable

```
oDesign.ChangeProperty(  
  [  
    "NAME:AllTabs",  
    [  
      "NAME:LocalVariableTab",  
      [  
        "NAME:PropServers",  
        "LocalVariables"  
      ],  
      [  
        "NAME:NewProps",  
        [  
          "NAME:zH",  
          "PropType:=",           , "VariableProp",  
          "UserDef:=",           , True,  
          "Value:=",             , "50mm"  
        ]  
      ]  
    ]  
  ]  
)  
oEditor = oDesign.SetActiveEditor("3D Modeler")  
oEditor.ChangeProperty(  
  [  
    "NAME:AllTabs",  
    [  
      "NAME:General",  
      [  
        "NAME:PropServers",  
        "LC1_1"  
      ],  
      [  
        "NAME:ChangedProps",
```

```

        [
            "NAME:Position",
            "X:=" , "0mm",
            "Y:=" , "0mm",
            "Z:=" , "zH"
        ]
    ]
]
])

```

Example: Changing a Box's Material and Wireframe Display

```

oEditor.ChangeProperty(
[
    "NAME:AllTabs",
    [
        "NAME:Geometry3DAttributeTab",
        [
            "NAME:PropServers" ,
            "Box1"
        ],
        [
            "NAME:ChangedProps",
            [
                "NAME:Material",
                "Value:=" , "\"vacuum\""
            ],
            [
                "NAME:Display Wireframe",
                "Value:=" , True
            ]
        ]
    ]
]
])

```

Example: Change Default Handle (reference coordinate system) for a 3D Component or Layout Component

```
oEditor.ChangeProperty(  
  [  
    "NAME:AllTabs",  
    [  
      "NAME:General",  
      [  
        "NAME:PropServers",  
        "LC1_1"  
      ],  
      [  
        "NAME:ChangedProps",  
        [  
          "NAME:Handle",  
          "Value:=" , " NotchOutY"  
        ]  
      ]  
    ]  
  ]  
)
```

```
oEditor.ChangeProperty(  
  [  
    "NAME:AllTabs",  
    [  
      "NAME:Component Data",  
      [  
        "NAME:PropServers",  
        "BoundarySetup:LC1_1_Port1"  
      ],  
      [  
        "NAME:ChangedProps",
```

Clears information in the **Messages** window.

Note:

Additional options are available when using the Desktop-level [ClearMessages](#) command.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	ClearMessages()
Python Example	<code>oProject.ClearMessages()</code>

CloneMaterial

Clones a local material.

UI Access	N/A		
Parameters	Name	Type	Description
	<matName>	String	Name of existing material.
	<newName>	String	Name for newly cloned material.
Return Value	Boolean: 1 - Material is cloned.		

- 0 - Existing material not found or a conflict with the new material name.

Python Syntax	<code>CloneMaterial (<matName>, <newName>)</code>
Python Example	<code>oDefinitionManager.CloneMaterial("copper1", "copper3")</code>

Close

Closes the active project.

Warning:

Unsaved changes will be lost.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	<code>Close()</code>
Python Example	<code>oProject.Close()</code>

CopyDesign

Copies a specified design.

UI Access	Edit > Copy.		
Parameters	Name	Type	Description
	<DesignName>	String	Name of the design to copy from.
Return Value	None.		

Python Syntax	CopyDesign (<DesignName>)
Python Example	<pre>oProject.CopyDesign ("HFSSDesign1")</pre>

CutDesign

Cuts a design from the active project. The design is stored in memory and can be pasted.

Warning:

This is a legacy command that is no longer supported and should not be used as it may have unintended effects on solved designs.

UI Access	Edit > Cut.

Parameters	Name	Type	Description
	<DesignName>	String	Name of the design.
Return Value	None.		

Python Syntax	CutDesign (<DesignName>)
Python Example	<code>oProject.CutDesign("SimplorerDesign1")</code>

DeleteDataset

Deletes a specified dataset. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Remove.		
Parameters	Name	Type	Description
	<DatasetName>	String	Name of the dataset found in the project.
Return Value	None.		

Python Syntax	DeleteDataset (<DatasetName>)
Python Example	<code>oProject.DeleteDataset('\$ds1')</code> <code>oDesign.DeleteDataset('\$ds1')</code>

DeleteDesign

Deletes a specified design in the project.

UI Access	Edit > Delete, or Delete in the ribbon.		
Parameters	Name	Type	Description
	<DesignName>	String	Name of the design.
Return Value	None.		

Python Syntax	DeleteDesign (<DesignName>)
Python Example	<pre>oProject.DeleteDesign("Q3D ExtractorDesign2")</pre>

DeleteToolObject

Note:

This command is for internal Ansys use only.

UI Access	N/A		
Parameters	Name	Type	Description
	<ObjectName>	String	Name of the tool object.
Return Value	None.		

Python Syntax	DeleteToolObject(<ObjectName>)
Python Example	<code>oProject.DeleteToolObject("object1")</code>

EditDataset

Modifies a dataset. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Edit.		
Parameters	Name	Type	Description
	<OriginalName>	String	Name of the original dataset.
	<DatasetDataArray>	Array	Data for the modified dataset.
Return Value	None.		

Python Syntax	EditDataset (<OriginalName> <DatasetDataArray>)
Python Example	<pre>oProject.EditDataset ("ds1" ["NAME:ds2", ["NAME:Coordinates", ["NAME:Coordinate", "X:=", 1, "Y:=", 2],],])</pre>

```
[
    "NAME:Coordinate",
    "X:=", 3, "Y:=", 4
]
]
]
)
oDesign.EditDataset ("ds1"
["NAME:ds2",
    ["NAME:Coordinates",
        [
            "NAME:Coordinate",
            "X:=", 1, "Y:=", 2
        ],
        [
            "NAME:Coordinate",
            "X:=", 3, "Y:=", 4
        ]
    ]
]
]
```

	)

EditMaterial

Modifies an existing material.

UI Access	View/Edit Materials command in the material editor		
Parameters	Name	Type	Description
	<OriginalName>	String	Name of the material before editing.
	<MatProperties>	Array	Structured array containing material properties:
			<pre>["NAME:<New material name>", "CoordinateSystemType:=", <string>, "BulkOrSurfaceType:=" , <integer>, ["NAME:PhysicsTypes", "set:=" , <array containing string physics types>], <Optional ModifierDataArray>, "permeability:=" , <string containing value>, "conductivity:=" , <string containing value>, "thermal_conductivity:=", <string containing value>, "mass_density:=" , <string containing value>, </pre>

			<pre>"specific_heat:=" , <string containing value>, "youngs_modulus:=" , <string containing value>, "poissons_ratio:=" , <string containing value>, "thermal_expansion_coefficient:=" , <string containing value>]</pre>
	<code><ModifierDataArray></code>	Array	Optional structured array containing thermal or spatial modifiers: <pre>["NAME:ModifierData", ["NAME:<ThermalModifierData or SpatialModifierData>", "modifier_data:=" , <"thermal_modifier_data" or "spa- tial_modifier_data">, ["NAME:<all_thermal_modifiers or all_spatial_mod- ifiers>", ["NAME:<modifierName>", "Property::=" , <string property being mod- ified>, "Index::=" , <integer>, "prop_modifier:=" , <"thermal_modifier" or "spa-</pre>

			<pre> tial_modifier">, "use_free_form:=" , <Boolean>, "free_form_value:=" , <string modifier value>,]]]] </pre>
Return Value	None.		

Python Syntax	EditMaterial (<OriginalName>, <MatProperties>)
Python Example	Without Modifiers: <pre> oDefinitionManager.EditMaterial("alumina_92pct", ["NAME:alumina_92pct", "CoordinateSystemType:=" , "Cartesian", "BulkOrSurfaceType:=" , 1, ["NAME:PhysicsTypes", "set:=" , ["Electromagnetic","Thermal","Structural"]], </pre>

```
"permittivity:=" , "9.3",  
"dielectric_loss_tangent:=" , "0.008",  
"thermal_conductivity:=" , "26",  
"mass_density:=" , "3720",  
"specific_heat:=" , "790",  
"youngs_modulus:=" , "267000000000",  
"poissons_ratio:=" , "0.26",  
"thermal_expansion_coefficient:=" , "7.2e-006"  
]  
)
```

With Thermal Modifier:

```
oDefinitionManager.EditMaterial("copper",  
[  
  "NAME:copper",  
  "CoordinateSystemType:=" , "Cartesian",  
  "BulkOrSurfaceType:=" , 1,  
  [  
    "NAME:PhysicsTypes",  
    "set:=" , ["Electromagnetic","Thermal","Structural"]  
  ],  
]
```

```
[
  "NAME:ModifierData",
  [
    "NAME:ThermalModifierData",
    "modifier_data:=" , "thermal_modifier_data",
    [
      "NAME:all_thermal_modifiers",
      [
        "NAME:one_thermal_modifier",
        "Property::=" , "permittivity",
        "Index::=" , 0,
        "prop_modifier:=" , "thermal_modifier",
        "use_free_form:=" , True,
        "free_form_value:=" , "if(Temp > 1000cel, 1, if(Temp < -273.15cel, 1, 1))"
      ]
    ]
  ],
  "permeability:=" , "0.999991",
  "conductivity:=" , "58000000",
  "thermal_conductivity:=" , "400",
```

```
"mass_density:=" , "8933",  
"specific_heat:=" , "385",  
"youngs_modulus:=" , "120000000000",  
"poissons_ratio:=" , "0.38",  
"thermal_expansion_coefficient:=" , "1.77e-05"  
])
```

Transient Solve, Non-linear Drude Data Plasma

```
import ScriptEnv  
ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")  
oDesktop.RestoreWindow()  
oProject = oDesktop.SetActiveProject("Drude_plasma_parameters_r231")  
oDefinitionManager = oProject.GetDefinitionManager()  
oDefinitionManager.EditMaterial("Drude",  
[  
    "NAME:Drude",  
    "CoordinateSystemType:=", "Cartesian",  
    "BulkOrSurfaceType:=" , 1,  
    [  
        "NAME:PhysicsTypes",  
        "set:=" , ["Electromagnetic"]
```

```

    ],
    [
        "NAME:AttachedData",
        [
            "NAME:MatNonLinearDrudeFreqDepData",
            "property_data:=" , "nonlinear_drude_data",
            "EpsilonInfinity:=" , "1",
            "PlasmaFrequency:=" , "4.62348462366278GHz",
            "CollisionFrequency:=" , "0.00054491190162662GHz",
            "FieldBreakdown:=" , "10000V_per_meter",
            "PlasmaMaintainFrequency:=" , "2.31174231183139GHz",
            "NeutralDensity:=" , 2.65164580488373E+20,
            "ElectronDensity:=" , 2.65164580488373E+17,
            "CollisionRateConstant:=" , 2.05499505485618E-15
        ]
    ]
] )

```

ExportDataset

Exports a dataset to a named file. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Export.		
Parameters	Name	Type	Description
	<datasetFilePath>	String	The full path to the file.
Return Value	None.		

Python Syntax	ExportDataset (<datasetFilePath>)		
Python Example	oProject.ExportDataset ('e:/tmp/dsdata.txt')		
	oDesign.ExportDataset ('e:/tmp/dsdata.txt')		

ExportMaterial

Exports a local material to a library.

UI Access	Export to Library command in the material editor.		
Parameters	Name	Type	Description
	<ExportData>	Array	["NAME:<LibraryName>", <MaterialName>, <MaterialName>, ...]
	<LibraryName>	String	Name of the exported library.
	<MaterialName>	String	Name of the material to be exported.
	<LibraryLocation>	String	Location to save the library. Only "PersonalLib" and "UserLib" are allowed.
Return Value	None.		

Python Syntax	<code>ExportMaterial (<ExportData>, <LibraryLocation>)</code>
Python Example	<pre>oDefinitionManager.ExportMaterial (["NAME:mylib",_ "Material1", "Material2", "Material3"], "PersonalLib")</pre>

GetActiveDesign

Returns the design in the active project

Note: `GetActiveDesign` will return normally if there are no active objects.

UI Access	N/A
Parameters	None.
Return Value	Object of the active design.

Python Syntax	<code>GetActiveDesign()</code>
Python Example	<pre>oDesign = oProject.GetActiveDesign()</pre>

GetArrayVariables

Returns a list of array variables. To get a list of indexed project variables, execute with `oProject`. To get a list of indexed local variables, use `oDesign`.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing names of variables.

Python Syntax	<code>GetArrayVariables()</code>
Python Example	<pre>oProject.GetArrayVariables() oDesign.GetArrayVariables()</pre>

GetChildNames [Project]

Returns the names of the project's child objects.

UI Access	N/A		
Parameters	Name	Type	Description
	<type>	String	(Optional) Default is "design"; Any value returned by GetChildTypes() can be used.
Return Value	Array of names of children for the queried object.		

Python Syntax	<code>GetChildNames (<type>)</code>
Python Example	<pre>arrDesignNames = oProject.GetChildNames()</pre>


```
arrVarbleNames = oProject.GetChildNames("Variable")
```

GetChildObject [Project]

Returns the project's child objects.

Note:

`GetChildObject` will return normally if there are no active objects.

UI Access	N/A		
Parameters	Name	Type	Description
	<path>	String	The path may include multiple generations (for example, "designObject/moduleObj/SetupObject"). See Object Path .
Return Value	Object of a found child.		

Python Syntax	<code>GetChildObject(<path>)</code>
Python Example	<pre>oProject = oDesktop.GetActiveProject() oDesign = oProject.GetChildObject("TeeModel") oVariable = oProject.GetChildObject("VariableName") oReport = oProject.GetChildObject("TeeModel/Results/S Parameter Plot 1")</pre>

GetChildTypes [Project]

Returns the types of the project's child objects.

UI Access	N/A
Parameters	None.
Return Value	Array of string represents types of the child objects.

Python Syntax	GetChildTypes()
Python Example	<code>oProject.GetChildTypes()</code>

GetDefinitionManager

Gets the `DefinitionManager` object.

UI Access	N/A
Parameters	None.
Return Value	<code>DefinitionManager</code> object.

Python Syntax	GetDefinitionManager()
Python Example	<code>oDefinitionManager = oProject.GetDefinitionManager()</code>

Note: For more information on commands for the DefinitionManager, see [Definition Manager Script Commands](#).

GetDependentFiles

Provides a list of the external files referenced in the project, including characteristic (for example, MDX) and coupled project files.

UI Access	N/A
Parameters	None.
Return Value	List of referenced files.

Python Syntax	GetDependentFiles()
Python Example	<code>files = oProject.GetDependentFiles()</code>

GetDesign

Returns the interface to a specific design in a given project.

UI Access	N/A		
Parameters	Name	Type	Description

	<table><tr><td><designName></td><td>String</td><td>Name of the design.</td></tr></table>	<designName>	String	Name of the design.
<designName>	String	Name of the design.		
Return Value	Object of the specified design.			

Python Syntax	GetDesign (<designName>)
Python Example	<code>oProject.GetDesign("HFSSDesign1")</code>

GetDesigns

Obtains all designs in the current project.

UI Access	N/A
Parameters	None.
Return Value	List of objects for all designs in the project.

Python Syntax	GetDesigns()
Python Example	<code>oProject.GetDesigns()</code>

GetEDBHandle

Returns the EDB handle for the project.

Important:

This script is for internal Ansys use only.

UI Access	N/A
Parameters	None.
Return Value	String indicating the EDB handle for the project.

Python Syntax	GetEDBHandle()
Python Example	<code>oProject.GetEDBHandle()</code>

GetLegacyName

Obtains the legacy name of a project.

Note:

This command is for internal Ansys use only.

UI Access	N/A
Parameters	None.

Return Value	String containing the legacy project name.

Python Syntax	GetLegacyName()
Python Example	<code>oProject.GetLegacyName()</code>

GetName [Project]

Obtains the project name

UI Access	N/A
Parameters	None.
Return Value	String containing the project name, not including the path or extension.

Python Syntax	GetName()
Python Example	<code>oProject.GetName()</code>

GetObjPath [Project]

Obtains the project name from the full path.

UI Access	N/A
Parameters	None.
Return Value	String containing only the project name.

Python Syntax	GetObjPath()
Python Example	<code>oProject.GetObjPath()</code>

GetPath

Returns the location of the project on disk.

UI Access	N/A
Parameters	None.
Return Value	String containing the path to the project, not including the project name.

Python Syntax	GetPath()
Python Example	<code>oProject.GetPath()</code>

GetPropEvaluatedValue

Returns the Evaluated-Value for Value-Property and Variable. Returns the Property-value as text string for other property types

Note:

This command is not supported by the EMIT and Circuit design types.

UI Access	N/A		
Parameters	Name	Type	Description
	<PropName>	String	Name of the property.
Return Value	String value of the evaluated value.		

Python Syntax	GetPropEvaluatedValue (<PropName>)		
Python Example	<pre>oVar = oDesign.GetChildObject(" Variables/var") oVar.GetPropEvaluatedValue()</pre>		

GetPropNames [Project]

Obtains the property name of the object. At the project level, GetPropNames always returns empty because the project is not associated with any property.

UI Access	N/A		
Parameters	Name	Type	Description
	<includeReadOnly>	Boolean	(Optional)

			• True – Include read only props. • False – Do not include read only props.
Return Value	Empty array.		

Python Syntax	GetPropNames ()
Python Example	<code>oProject.GetPropNames ()</code>

GetPropSIValue

Returns the SI-Value for Value-Property and Variable. Return NAN for other property type if its value is not able to convert to be a double-floating point value.

Note:

This command is not supported by the EMIT and Circuit design types.

UI Access	N/A		
Parameters	Name	Type	Description
	<PropName>	String	Name of the property.
Return Value	Property value as a double floating value, or NAN if the property value cannot be converted to double floating point.		

Python Syntax	<code>GetPropSIValue (<PropName>)</code>
Python Example	<pre>oCreateBox = oDesign.GetChildObject("3D Modeler/Box1/CreateBox:1") oCreateBox.GetPropValue("xSize") return "length / 2" oCreateBox.GetPropEvaluatedValue("xSize") return '0.4mm' oCreateBox.GetPropSIValue("xSize") return 0.0004</pre>

GetPropValue [Project]

Returns the property value for the active project object, or specified property values.

UI Access	N/A		
Parameters	Name	Type	Description
	<propPath>	String	A child object's property path. See: Property Function Summary .
Return Value	String of property value.		

Python Syntax	<code>GetPropValue(<propPath>)</code>
Python Example	<pre>oProject.GetPropValue("TeeModel/offset")</pre>

GetProperties

Gets a list of all the properties belonging to a specific <PropServer> and <PropTab>. This can be executed by the oProject, oDesign, or oEditor variables.

UI Access	N/A		
Parameters	Name	Type	Description
	<PropTab>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults) - LocalVariableTab ("Variables" or "Local Variables") - ProjectVariableTab ("Project variables") - ConstantsTab ("Constants") - BaseElementTab ("Symbol" or "Footprint") - ComponentTab ("General") - Component("Component") - CustomTab ("Intrinsic Variables") - Quantities ("Quantities") - Signals ("Signals")
	<PropServer>	String	An object identifier, generally returned from another script method, such as CompInst@R;2;3
Return Value	Array of strings containing the names of the appropriate properties.		

Python Syntax	GetProperties(<PropTab>, <PropServer>)
Python Example	oEditor.GetProperties('PassedParameterTab', 'k')

GetPropertyValue

Returns the value of a single property belonging to a specific *<PropServer>* and *<PropTab>*. This function is available with the Project, Design or Editor objects, including definition editors.

Tip: Use the script recording feature and edit a property, and then view the resulting script to see the format for that property.

UI Access	N/A		
Parameters	Name	Type	Description
	<i><PropTab></i>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults") - LocalVariableTab ("Variables" or "Local Variables") - ProjectVariableTab ("Project variables") - ConstantsTab ("Constants") - BaseElementTab ("Symbol" or "Footprint") - ComponentTab ("General") - Component("Component") - CustomTab ("Intrinsic Variables") - Quantities ("Quantities") - Signals ("Signals")
	<i><PropServer></i>	String	An object identifier, generally returned from another script method, such as <code>Component@R;2;3</code>
	<i><PropName></i>	String	Name of the property.

Return Value	String value of the property.

Python Syntax	GetPropertyValue (<PropTab>, <PropServer>, <PropName>)
Python Example	<pre>selectionArray = oEditor.GetSelections() for k in selectionArray: val = oEditor.GetPropertyValue("PassedParameterTab", k, "R") ...</pre>

GetTopDesignList

Returns a list of top-level design names.

UI Access	N/A
Parameters	None.
Return Value	List of strings containing name of top-level designs.

Python Syntax	GetTopDesignList()
Python Example	<pre>oProject.GetTopDesignList()</pre>

GetVariableValue

Gets the value of a single specified variable. To get the value of project variables, execute this command using `oProject`. To get the value of local variables, use `oDesign`.

UI Access	N/A		
Parameters	Name	Type	Description
	<VarName>	String	Name of the variable to access.
Return Value	String represents the value of the variable.		

Python Syntax	GetVariableValue(<VarName>)
Python Example	<code>oProject.GetVariableValue("var_name")</code>

GetVariables

Returns a list of all defined variables. To get a list of project variables, execute this command using `oProject`. To get a list of local variables, use `oDesign`.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing the variables.

Python Syntax	<code>GetVariables ()</code>
Python Example	<pre>oProject.GetVariables() oDesign.GetVariables()</pre>

ImportDataset

Imports a dataset from a named file. This can be executed by the `oProject`, or `oDesign` variables. The name of the dataset is file-name+index number (e.g., `dsdata1`) unless the filename ends with a trailing number. When there is a trailing number at the end, we will remove the number and use first unused index. Alternatively, the name of the dataset can be explicitly defined by providing a string as an optional second argument.

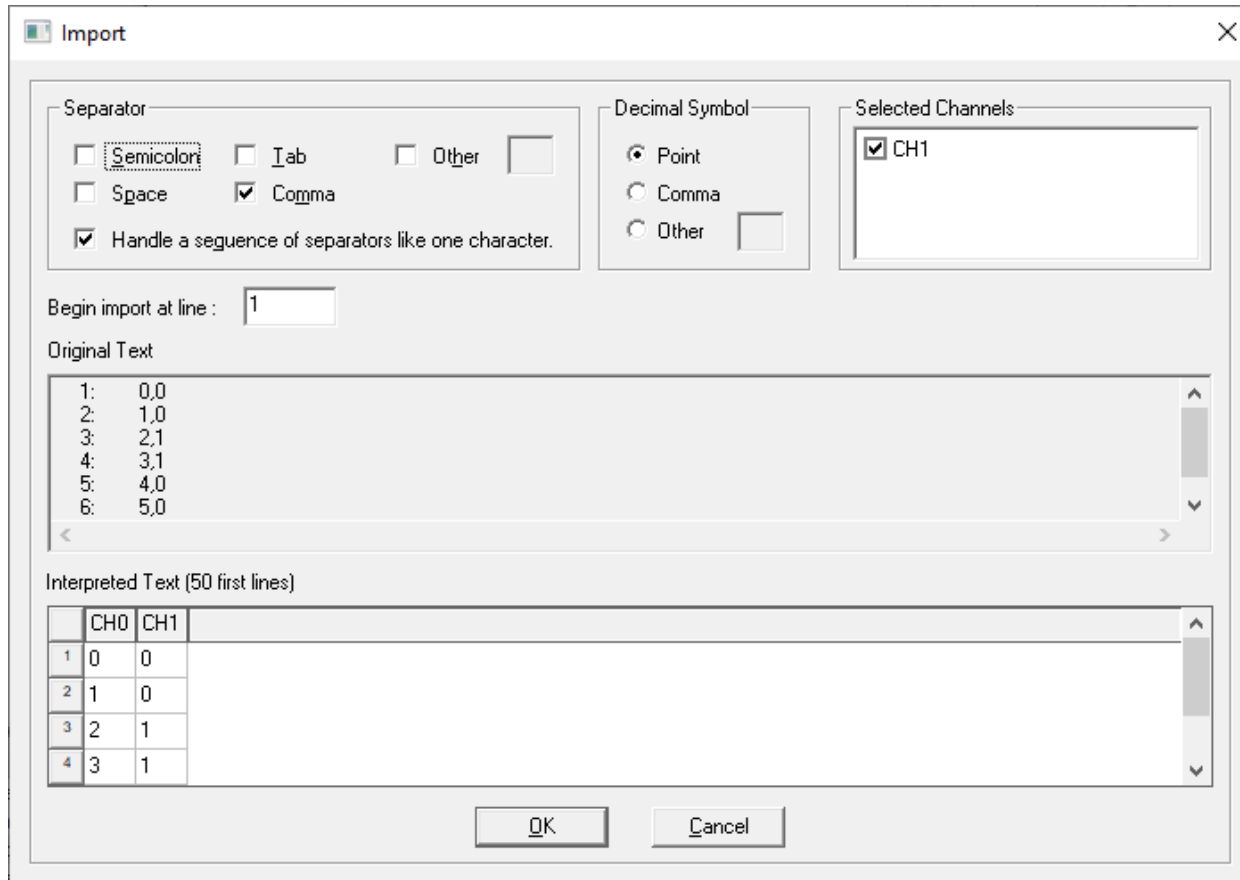
UI Access	Project > Datasets > Import.		
Parameters	Name	Type	Description
	<code><datasetFileFullPath></code>	String	The full path to the file containing the dataset values. *.tab files recommended (see note below).
	<code><optionalDatasetName></code>	String	<i>Optional.</i> User-defined dataset name.
Return Value	None.		

Python Syntax	<code>ImportDataset (<datasetFileFullPath>,<optionalDatasetName>)</code>
Python Example	<pre>oProject.ImportDataset('e:\tmp\dsdata.tab') oDesign.ImportDataset('e:\tmp\dsdata.tab') oProject.ImportDataset('e:\tmp\dsdata.tab', 'MyDatasetName') oDesign.ImportDataset('e:\tmp\dsdata.tab', 'MyDatasetName')</pre>

Note About File Types:

Tab-delimited or space-delimited files with the extension *.tab are the recommended file type. When using ImportDataset at the Design level, *.tab is the only file type supported.

At the Project level, other file types are supported (for example, *.csv). However, after calling the command, you must configure the file import format manually through the Electronics Desktop GUI by selecting **Project > Datasets** and clicking **Import**.



InsertDesign

Inserts a new design in the project. For Q3D Extractor and 2D Extractor scripts, the last two arguments will always be empty.

UI Access	Project > [Insert Q3D Extractor Design / Insert 2D Extractor Design].		
Parameters	Name	Type	Description
	<DesignType>	String	Design type. "Q3D Extractor" or "2D Extractor".
	<DesignName>	String	Design name.
	""	None	Empty argument.
	""	None	Empty argument.
Return Value	None.		

Python Syntax	InsertDesign (<DesignType>, <DesignName>, ",")
Python Example	<pre>oProject.InsertDesign('Q3D Extractor', 'Q3DDesign2', '', '')</pre>

InsertDesignWithWorkflow

Inserts a design with a named workflow and returns an IDispatch string.

UI Access	N/A		
Parameters	Name	Type	Description
	<type>	String	Type of design.
	<workflowName>	String	Name of the workflow.
	<specName>	String	Name of the spec.
	<fileName>	String	Name of the file.
	<libLoc>	String	Type of library, such as SysLib.
	<stationaryPath>	String	Path.

Return Value	IDispatch string, such as 'IDispatch(IAltraSimScript)'

Python Syntax	InsertDesignWithWorkflow(<type>, <workflowName>, <specName>, <fileName>, <libLoc>, <stationaryPath>)
Python Example	<pre>oProject.InsertDesignWithWorkflow ("Circuit Design", "Serial Design", "PCIE3 Stressed", "LongChannel", "SysLib", "C:\\Program Files\\ANSYS Inc\\v252\\AnsysEM\\syslib\\MS" - RT_duroid 6010 (Er=10.2) 0.010 inch, 0.5 oz copper.asty")</pre>

InsertToolObject

Note:

This command is for internal Ansys use only.

Python Syntax	InsertToolObject()
Python Example	<code>oProject.InsertToolObject()</code>

Paste (Project Object)

Pastes copied objects and returns an array of pasted objects from the 3D model editor.

UI Access	Edit > Paste.

Parameters	None.
Return Value	One dimensional array of pasted object names. The order is not guaranteed to be alphabetical.

Python Syntax	Paste()
Python Example	<code>oProject.Paste()</code>

Redo [Project Level]

Reapplies the last project-level command.

UI Access	Edit > Redo.
Parameters	None.
Return Value	None.

Python Syntax	Redo()
Python Example	<code>oProject.Redo()</code>

RemoveAllUnusedDefinitions

Removes all unused project definitions.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	<code>RemoveAllUnusedDefinitions()</code>
Python Example	<code>oProject.RemoveAllUnusedDefinitions()</code>

RemoveMaterial

Removes a material from a library.

UI Access	Remove Material(s) command in the material editor		
Parameters	Name	Type	Description
	<code><MaterialName></code>	String	Name of the material to be removed.
	<code><IsProjectMaterial></code>	Boolean	If True, Q3D Extractor assumes the material is a project material. The last two parameters will be ignored. If False, the material is not a project material.
	<code><LibraryName></code>	String	Name of the user or personal library where the material resides.
	<code><LibraryLocation></code>	String	Location of library. Valid options: "UserLib" or "PersonalLib".
Return Value	None.		

Python Syntax	RemoveMaterial (<MaterialName>, <IsProjectMaterial>, <LibraryName>, <LibraryLocation>)
Python Example	oDefinitionManager.RemoveMaterial (["Material1", false, "mo0907", "UserLib"])

RemoveUnusedDefinitions

Removes any unused project definitions.

UI Access	Tools > Project Tools > Remove Unused Definitions.		
Parameters	Name	Type	Description
	<Definitions>	Array	Definitions to be removed, such as materials and surface materials.
Return Value	None.		

Python Syntax	RemoveUnusedDefinitions(<Definitions>)
Python Example	oProject.RemoveUnusedDefinitions ([["NAME:Materials", "Al-Extruded"

	<pre>], ["NAME:SurfaceMaterials", "Steel-oxidised-surface"]]) </pre>

Rename

Renames the project and saves it. Similar to [SaveAs\(\)](#).

UI Access	Edit > Rename.		
Parameters	Name	Type	Description
	<NewName>	String	Desired name of the project. The path is optional.
	<OverWriteOk>	Boolean	• True - overwrite the file on disk if it exists. • False - prevent overwrite.
Return Value	None.		

Python Syntax	Rename(<NewName>,<OverWriteOK>)
Python Example	oProject.Rename("c:\projects\MyProject.aedt", True)

RunToolkit

Runs a Python toolkit script, applying it to the active design. The toolkit script itself may have prerequisites, such as sweeps defined, or specific model characteristics, such as port definitions.

Important:

Full scripting for cable modeling is not supported and no arguments are allowed in the script. The **RunToolkit** command will not automatically create a cable bundle, but will simply open the **Cable Modeling** dialog box. You will have to manually input your parameters.

UI Access	[Q3D Extractor] > Toolkit > [Script Name].		
Parameters	Name	Type	Description
	<LibraryType>	String	Name of the library in which the script is located.
	<ToolkitName>	String	Name of the Python script.
	<ToolkitArg>	Array	Structured array containing arguments required by the toolkit script.
Return Value	User-defined solution(s) and/or output(s).		

Python Syntax	RunToolkit(<LibraryType>, <ToolkitName>, <ToolkitArg>)
Python Example	<pre>oDesign.RunToolkit("SysLib", "Cable Modeling/Automotive Cable Bundle", []) oDesign.RunToolkit("SysLib", "Cable Modeling/Oil-Gas Cable Bundle", [])</pre>

Save

Saves the active project.

UI Access	File > Save.
Parameters	None.
Return Value	None.

Python Syntax	Save()
Python Example	<code>oProject.Save()</code>

SaveAs

Saves the project under a new name. Requires a full path.

Note:

This script takes two parameters for non-schematic/layout designs and four parameters for schematic/layout designs.

UI Access	File > Save As.		
Parameters	Name	Type	Description
	<NewName>	String	The desired name of the project, with directory and extension.
	<OverWriteOK>	Boolean	True to overwrite the file of the same name, if it exists. False to prevent over-write.

	<DefaultAction>	String	For Schematic/Layout projects only. Otherwise omit. See note below. Valid actions: ef_overwrite , ef_copy_no_overwrite, ef_make_path_absolute, or empty string.
	<OverrideActions>	Array	For Schematic/Layout projects only. Otherwise omit. See note below. Structured array: Array("Name: <Action>", <FileName>, <FileName>, ...) Valid actions: ef_overwrite , ef_copy_no_overwrite, ef_make_path_absolute, or empty string.
Return Value	None.		

Python Syntax	For non-Schematic/Layout project: SaveAs (<NewName> <OverWriteOK>) For Schematic/Layout project: SaveAs (<NewName> <OverWriteOK> <DefaultAction> <OverrideActions>)
Python Example	<pre>oProject.SaveAs('D:/projects/project1.aedt', True) ---- oProject.SaveAs('D:/Projects/Project1.aedt', True, 'ef_overwrite', ['NAME:OverrideActions', ['NAME:ef_copy_no_overwrite', ['NAME:Files', '\$PROJECTDIR/circuit_models.inc']], ['NAME:ef_make_path_absolute', ['NAME:Files', '\$PROJECTDIR/SL_6s.sp']]])</pre>

Important:

The DefaultAction and OverrideActions strings correspond to the following actions:

- **ef_overwrite** – Copy file to new project directory and overwrite.
- **ef_copy_no_overwrite** – Copy file to new project directory and don't overwrite.
- **ef_make_path_absolute** – Change reference to point to file in old project directory.
- **Empty String** – Do nothing.

The DefaultAction is applied to all files that are NOT explicitly listed in the OverrideActions array. Those in the OverrideActions array are separate arrays for actions that are different from the default action; those actions are applied to the files listed in the same array:

- If OverrideActions are not specified, DefaultAction is applied to ALL files in project directory.

SaveAsStandAloneProject

Saves the project as a standalone copy.

Note:

This script is not supported when the application is being controlled by Ansys Workbench.

UI Access	N/A		
Parameters	Name	Type	Description
	<projectName>	String	The desired name of the project, with directory and extension.
Return Value	None.		

Python Syntax	SaveAsStandAloneProject(<projectName>)
Python Example	<code>oProject.SaveAsStandAloneProject('D:/projects/project1.aedt')</code>

SaveProjectArchive

Saves the active project as an archive to the specified file path.

UI Access	File > Archive.		
Parameters	Name	Type	Description
	<archiveFilePath>	String	Path to archived file.
	<IncludeExternalFiles>	Boolean	True to include external files; False to exclude.
	<IncludeResultsFiles>	Boolean	True to include simulation files associated with the project; False to exclude.
	<AdditionalFiles>	Array	Additional specified files to include.
	<ArchiveNotes>	String	String describe the archive.
Return Value	None.		

Python Syntax	SaveProjectArchive(<archivefilepath>, <IncludeExternalFiles>, <IncludeResultsFiles>, <AdditionalFiles>, <ArchiveNotes>)
Python Example	<code>oProject.SaveProjectArchive("C:\\Users\\Documents\\Ansoft\\Project27.aedtz", True, False, [], "")</code>

SetActiveDefinitionEditor

Obtains a specified definition editor.

UI Access	N/A		
Parameters	Name	Type	Description
	<EditorName>	String	Name of the definition editor to set active, one of "SymbolEditor", "FootprintEditor".
	<DefinitionName>	String	The combination name for the symbol or footprint, <libname>:<def-name>
Return Value	Object for the definition to be edited.		

Python Syntax	SetActiveDefinitionEditor(<EditorName>, <DefinitionName>)		
Python Example	<pre>oProject.SetActiveDefinitionEditor("SymbolEditor", "Simplorer Elements\Basic Elements\Circuit\Passive Elements:R")</pre>		

SetActiveDesign

Sets a design to be the active design.

UI Access	N/A		
Parameters	Name	Type	Description
	<DesignName>	String	Name of the design to set as the active design.
Return Value	None.		

Python Syntax	SetActiveDesign (<DesignName>)
Python Example	<code>oDesign = oProject.SetActiveDesign("SimplorerDesign2")</code>

SetPropValue [Project]

Sets a property value for an active project's child object.

UI Access	Edit Properties on ProjectTree objects.		
Parameters	Name	Type	Description
	<propPath>	String	A child object's property path. See: Property Function .
	<newValue>	String	New property value.
Return Value	Boolean: • True – property found. • False – property not found.		

Python Syntax	SetPropValue(<propPath>, <newValue>)
Python Example	<code>oProject.SetPropValue("TeeModel/offset", "2mm")</code> <code>oProject.SetPropValue("TeeModel/Results/S Parameter Plot 1/Display Type", "Data Table")</code>

SetPropertyValue

Sets the value of a single property belonging to a specific PropServer and PropTab. This function is available with the Project, Design or Editor objects, including definition editors. This is not supported for properties of the following types: ButtonProp, PointProp, V3DPointProp, and VPointProp. Only the ChangeProperty command can be used to modify these properties.

Use the script recording feature and edit a property, and then view the resulting script entry or use GetPropertyValue for the desired property to see the expected format.

UI Access	N/A		
Parameters	Name	Type	Description
	<propTab>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults") - LocalVariableTab ("Variables" or "Local Variables") - ProjectVariableTab ("Project variables") - ConstantsTab ("Constants") - BaseElementTab ("Symbol" or "Footprint") - ComponentTab ("General") - Component("Component") - CustomTab ("Intrinsic Variables") - Quantities ("Quantities") - Signals ("Signals")
	<propServer>	String	An object identifier, generally returned from another script method, such as CompInst@R;2;3
	<propName>	String	Name of the property.
	<propValue>	String	The value for the property
Return Value	None.		

Python Syntax	<code>SetPropertyValue(<propTab>, <propServer>, <propName>, <propValue>)</code>
Python Example	<code>oEditor.SetPropertyValue("PassedParameterTab", "k", "R", "2200")</code>

SetVariableValue

Sets the value of a variable. To set the value of a project variable, execute this command using `oProject`. To set the value of a local variable, use `oDesign`.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><VarName></code>	String	Variable name.
	<code><VarValue></code>	Value	New value for the variable.
Return Value	None.		

Python Syntax	<code>SetVariableValue (<VarName>, <VarValue>)</code>
Python Example	<code>oProject.SetVariableValue('\$Var1', '3mm')</code>

SimulateAll

Simulates all solution setups and Optimetrics setups for all design instances in the project. Script processing only continues when all analyses are finished.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	SimulateAll()
Python Example	<code>oProject.SimulateAll()</code>

Undo [Project]

Cancels the last project-level command.

UI Access	Edit > Undo.
Parameters	None.
Return Value	None.

Python Syntax	Undo()
Python Example	<code>oProject.Undo()</code>

UpdateDefinitions

Updates all definitions. The **Messages** window reports when definitions are updated, or warns when definitions cannot be found.

UI Access	Tools > Project Tools > Update Definitions. Click Select All , then Update .
Parameters	None.
Return Value	None.

Python Syntax	UpdateDefinitions()
Python Example	<code>oProject.UpdateDefinitions()</code>

7 - Design Object Script Commands

Design object commands should be executed by the oDesign object.

```
oDesign.CommandName <args>
```

For example:

```
Set oDesign = oProject.SetActiveDesign("Q3DExtractorDesign1")
```

Conventions Used in this Chapter

<ModuleName> is a placeholder for any one of the following modules:

- [Analysis Module](#) – "AnalysisSetup"
- [Boundary Module](#) – "BoundarySetup"
- [Field Overlays Module](#) – "FieldsReporter"
- [Mesh Module](#) – "MeshSetup"
- [Optimetrics Module](#) – "Optimetrics"
- [Radiation Module](#) – "RadField"
- [Reduce Matrix Module](#) – "ReduceMatrix"
- [Reporter Module](#) – "ReportSetup"
- [Simulation Setup Module](#) – "SimSetup"
- [Solutions Module](#) – "Solutions"

[ApplyMeshOps](#)

[ConstructVariationString](#)

[CopyArray](#)

[DeleteFieldVariation](#)

[DeleteFullVariation](#)

[DeleteLinkedDataVariation](#)

[EditDesignSettings](#)

[EditNotes](#)

[ExportConvergence](#)

[ExportForHSpice](#)

[ExportNMFData](#)

[ExportLayoutViaCurrentDensity](#)

[ExportMatrixData](#)

[ExportMeshStats](#)

[ExportNetworkData](#)

[ExportProfile](#)

[ExportReport](#)

[GenerateMesh](#)

[GetAllPorts](#)

[GetChildNames \[Design\]](#)

[GetChildObject \[Design\]](#)

[GetChildTypes \[Design\]](#)

[GetDesignType](#)

[GetDesignValidationInfo](#)

[GetManagedFilesPath](#)

[GetModule](#)

[GetName](#)

[GetNominalVariation](#)

[GetNoteText](#)

[GetProject](#)

[GetPostProcessingVariables](#)

[GetPropNames \[Design\]](#)

[GetPropValue \[Design\]](#)

[GetSelections](#)

[PasteDesign](#)

[Redo](#)

[RemoveModelingProperties](#)

[RenameDesignInstance](#)

[RenameSource](#)

[RunToolkit](#)

[SetActiveEditor](#)

[SetBackgroundMaterial](#)

[SetDesignSettings \(2D Extractor\)](#)

[SetDesignSettings \(Q3D Extractor\)](#)

[SetLengthSettings](#)

[SetObjectAttributesForLayoutComponents](#)

[SetObjectTemperature](#)

[SetPropValue \[Design\]](#)

[SetPropertyValue](#)

[SetShowLayoutForLayoutComponent](#)

[SetSolutionType](#)

[Solve](#)

[Undo](#)

[ValidateDesign](#)

AddDataset

Adds a dataset. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Add.		
Parameters	Name	Type	Description
	<DatasetDataArray>	Array	Array("NAME:<DatasetName>", > Array("NAME:Coordinates", <CoordinateArray>, <CoordinateArray>, ...)
	<DatasetName>	String	Name of the dataset.
	<CoordinateArray>	Array	Array("NAME:Coordinate", "X:=", <double>, "Y:=",<double>)
Return Value	None.		

Python Syntax	AddDataset <DatasetDataArray>
Python Example	<pre>oProject.AddDataset(["NAME:\$ds1", ["NAME:Coordinates", ["NAME:Coordinate", "X:=", 2, "Y:=", 4], ["NAME:Coordinate", "X:=", 6, "Y:=", 8]]]) oDesign.AddDataset([</pre>

```
"NAME:$dsl",  
  
[  
  "NAME:Coordinates",  
  
  [  
    "NAME:Coordinate",  
    "X:=", 2,  
    "Y:=", 4  
  ],  
  
  [  
    "NAME:Coordinate",  
    "X:=", 6,  
    "Y:=", 8  
  ]  
]  
  
]  
  
)
```

AddModelingProperties

Use: Add a modeling property to a design

Command: None

Syntax: AddModelingProperties <design>

Return Value: None

Parameters: <design>

Type: string

Analyze

Solves a single solution setup and all of its frequency sweeps.

UI Access	Right-click a solution setup in the project tree, and select Analyze .		
Parameters	Name	Type	Description
	<setup>	String	Setup name.
	isBlocking	Boolean	An optional arg that defaults to <code>true</code> . If it's <code>false</code> , the command immediately returns while the analysis or analyses run in the background. The status of the analyses can be checked with the <code>AreThereSimulationsRunning</code> command.
Return Value	Integer value: • 0 – Success • Else – Error		

Python Syntax	Analyze (<setup>)
Python Example	<code>oDesign.Analyze("Setup1", isBlocking)</code>

AnalyzeAll [design]

Runs all solution setups and Optimetrics setups for the current design instance.

UI Access	N/A		
Parameters	Name	Type	Description
	isBlocking	Boolean	An optional arg that defaults to <code>true</code> . If it's <code>false</code> , the command immediately returns while the analysis or analyses run in the background. The status of the analyses can be checked with the <code>AreThereSimulationsRunning</code> command.
Return Value	None		

Python Syntax	<code>AnalyzeAll()</code>
Python Example	<code>oDesign.AnalyzeAll(isBlocking)</code>

AnalyzeAllNominal

Runs all defined setups.

UI Access	Right-click Analysis in the project tree, and select Analyze All .		
Parameters	Name	Type	Description
	isBlocking	Boolean	An optional arg that defaults to <code>true</code> . If it's <code>false</code> , the command immediately returns while the analysis or analyses run in the background. The status of the analyses can be checked with the <code>AreThereSimulationsRunning</code> command.
Return Value	None		

Python Syntax	AnalyzeAllNominal()
Python Example	<code>oDesign.AnalyzeAllNominal()</code>

ApplyMeshOps

This script has been replaced by [GenerateMesh](#).

ChangeProperty[ReportSetup]

Change the properties for a Report.

UI Access	Double-click on a report to change its properties.		
Parameters	Name	Type	Description
	<PropertyArray>	Array	Varies, depending on the properties associated with the select object command.
Return Value	None.		

Python Syntax	ChangeProperty(<PropertyArray>)
Python Example	<pre>oModule = oDesign.GetModule("ReportSetup") oModule.ChangeProperty(["NAME:AllTabs",</pre>

```
[
    "NAME:General",
    [
        "NAME:PropServers",
        "XY Plot 1:General"
    ],
    [
        "NAME:ChangedProps",
        [
            "NAME:Use Scientific Notation",
            "Value:=", True
        ]
    ]
]
])

oModule = oDesign.GetModule("ReportSetup")
oModule.ChangeProperty(
    [
        "NAME:AllTabs",
```

```
[
    "NAME:Legend",
    [
        "NAME:PropServers",
        "S Parameter Plot 1:Legend"
    ],
    [
        "NAME:ChangedProps",
        [
            "NAME:Legend Name",
            "Value:=" , "Ansys"
        ]
    ]
]
])

oModule.ChangeProperty(
[
    "NAME:AllTabs",
    [
        "NAME:General",
        [
```

```
        "NAME:PropServers",  
        "S Parameter Plot 1:General"  
    ],  
    [  
        "NAME:ChangedProps",  
        [  
            "NAME:Auto Scale Fonts",  
            "Value:=" , False  
        ]  
    ]  
]  
])
```

Example For Rectangular Stacked Plot

```
oProject = oDesktop.SetActiveProject("antenna_test")  
oDesign = oProject.SetActiveDesign("Design1")  
oModule = oDesign.GetModule("ReportSetup")  
oModule.ChangeProperty(  
    [  

```

```

"NAME:AllTabs",
[
  "NAME:Scaling",
  [
    "NAME:PropServers",
    "S Parameter Plot 1:AxisY2:Stack1",
    "S Parameter Plot 1:AxisY2:Stack2"
  ],
  [
    "NAME:ChangedProps",
    [
      "NAME:Min",
      "Value:="
      , "-60"
    ]
  ]
]
])

```

Example Change eye rect and eye plot:

```

ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")
oDesktop.RestoreWindow()
oProject = oDesktop.SetActiveProject("test_nport_synth2")

```

```
oDesign = oProject.SetActiveDesign("Circuit1")
oModule = oDesign.GetModule("ReportSetup")
oModule.ChangeProperty(
    [
        "NAME:AllTabs",
        [
            "NAME:Grid",
            [
                "NAME:PropServers",
                "QuickEye Voltage Plot 1:Grid:Eye"
            ],
            [
                "NAME:ChangedProps",
                [
                    "NAME:Major grid line style",
                    "Value:=" , "Dot"
                ],
                [
                    "NAME:Minor grid line style",
                    "Value:=" , "Dot"
                ]
            ]
        ]
    ]
)
```



```
    ]  
  ]  
],  
[  
  "NAME:Axis",  
  [  
    "NAME:PropServers",  
    "QuickEye Voltage Plot 1:AxisX:Eye"  
  ],  
  [  
    "NAME:ChangedProps",  
    [  
      "NAME:Axis Color",  
      "R:=" , 255,  
      "G:=" , 128,  
      "B:=" , 128  
    ]  
  ]  
],  
[  
  "NAME:Axis",
```

```
[
    "NAME:PropServers",
    "QuickEye Voltage Plot 1:AxisY1:Rect"
],
[
    "NAME:ChangedProps",
    [
        "NAME:Axis Color",
        "R:=" , 255,
        "G:=" , 128,
        "B:=" , 128
    ]
]
]
]
oModule.ChangeProperty(
    [
        "NAME:AllTabs",
        [
            "NAME:Grid",
```

```
[  
    "NAME:PropServers",  
    "QuickEye Voltage Plot 1:Grid:Rect"  
],  
[  
    "NAME:ChangedProps",  
    [  
        "NAME:Major grid line style",  
        "Value:=", "LongDash"  
    ],  
    [  
        "NAME:Minor grid line style",  
        "Value:=", "LongDash"  
    ]  
]  
]  
])
```

ConstructVariationString

Lists and orders the variables and values associated with a design variation.

UI Access	N/A		
Parameters	Name	Type	Description
	<ArrayOfVariableNames>	Array of Strings	List of variable names.
	<ArrayOfVariableValuesIncludingUnits>	Array of Strings	List of variable values, including units, in the same order as the list of names.
Return Value	Returns variation string with the variables ordered to correspond to the order of variables in design variations. The values for the variables are inserted into the variation string. For an example of how ConstructionVariationString can be used, see the Python example.		

Python Syntax	ConstructVariationString(<ArrayOfVariableNames>, <ArrayOfVariableValuesIncludingUnits>)		
Python Example	<pre>varStr = oDesign.ConstructVariationString(["xx", "yy"], ["2mm", "1mm"]) oDesign.ExportProfile("Setup1", varStr, "C:\\profile.prof")</pre>		

CopyArray

Copies a specified array.

UI Access	Edit > Copy.		
Parameters	Name	Type	Description
	<ArrayName>	String	Name of the array to copy.
Return Value	None.		

Python Syntax	Copy (<ArrayName>)
Python Example	<pre>oModule = oDesign.GetModule("ModelSetup") oModule.CopyArray("Array") oModule.PasteArray() # returns the new array name</pre>

CopyItemCommand

Use: Copy tree items, such as Altrasim Solution Setups in Nexxim, or Solve Setups and Frequency Sweeps in Ensemble.

Command: None

Syntax: CopyItemCommand <ItemPathList>

Return Value: None

Parameters: <ItemPathList>

Type: Array of strings

CreateEMLossTarget

CreateEMLossTarget creates a target Icepak or Mechanical design from a source HFSS, Q3D, or Maxwell design.

UI Access	Design Type > Create Target Design		
Parameters	Name	Type	Description
	Icepak only: <Setup1 >	int	NA
	Icepak only: <NAME>	string	DesignSetup
	Icepak only: <Sim Type>	string	Forced or Natural
Return Value	placeholder		

Python Syntax	CreateEMLossTarget (<Setup1 >, <NAME>, <Sim Type>)
Python Example	<pre>oDesign.CreateEMLossTarget("Icepak", "Setup1 : LastAdaptive", ["NAME:DesignSetup", "Sim Type:=" , "Forced"])</pre>

DeleteDataset

Deletes a specified dataset. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Remove.		
Parameters	Name	Type	Description
	<DatasetName>	String	Name of the dataset found in the project.
Return Value	None.		

Python Syntax	DeleteDataset (<DatasetName>)
Python Example	<pre>oProject.DeleteDataset ('\$ds1') oDesign.DeleteDataset ('\$ds1')</pre>

DeleteFieldVariation

Deletes field variations, fields and meshes, or fields and meshes for specified variations.

UI Access	[Solver] > Results > Clean Up Solutions > [Fields Only / Fields and Meshes].		
Parameters	Name	Type	Description
	<variationKeys>	Array	Array containing either "All" string to select all variations, or strings of variations to include.
	<deleteMesh>	Boolean	When true, deletes mesh data.
	<deleteLinkedData>	Boolean	When true, deletes linked data.
Return Value	None.		

Python Syntax	DeleteFieldVariation(<variationKeys>, <deleteMesh>, <deleteLinkedData>)		
Python Example	<pre>oProject = oDesktop.GetActiveProject() oDesign = oProject.GetActiveDesign() Design.DeleteFieldVariation(['All'], True, False)</pre>		

DeleteFullVariation

Deletes either all solution data, or selected variation data.

UI Access	[Q3D Extractor] > Results > Clean Up Solutions.		
Parameters	Name	Type	Description
	<variationKeys>	Array	Array containing either "All" string to select all variations, or strings of variations to include.
	<deleteLinkedData>	Boolean	When true, deletes linked data as well.
Return Value	None.		

Python Syntax	DeleteFullVariation(<variationKeys>, <deleteLinkedData>)
Python Example	<code>oDesign.DeleteFullVariation(['All'], false)</code>

DeleteLinkedDataVariation

Deletes the linked data of specified variations.

UI Access	[Q3D Extractor] > Results > Clean Up Solutions.		
Parameters	Name	Type	Description
	<DesignVariationKeys>	Array	Array containing strings of the variations keys whose linked data are going to be deleted.
Return Value	None.		

Python Syntax	DeleteLinkedDataVariation(<DesignVariationKeys>)
Python Example	<code>oDesign.DeleteLinkedDataVariation(["current=\'0.9mA\'", "current=\'1.0mA\'"])</code>

DeleteOutputVariable

Deletes an existing output variable. The variable can only be deleted if it is not in use by any traces.

UI Access	Q3D Extractor or 2D Extractor > Results > Output Variables. In the Output Variables window, click Delete .		
Parameters	Name	Type	Description
	<OutputVarName>	String	Name of the output variable.

Return Value	None.

Python Syntax	DeleteOutputVariable (<OutputVarName>)
Python Example	<pre>oModule = oDesign.GetModule("OutputVariable") oModule.DeleteOutputVariable ("testNew")</pre>

DeletePlotEntities

Delete plot entities including limit line, marker, X-marker, Y-marker and note.

UI Access	[Edit] > Delete.		
Parameters	Name	Type	Description
	<plotname>	string	Name of the plot containing entities to delete.
	<"NAME:PlotEntityNames" , "<PlotEntityName">"	string	limit line, marker, X-marker, Y-marker and not
Return Value	None.		

Python Syntax	DeletePlotEntities(<plotName>, ["NAME:PlotEntityNames", "<PlotEntityName>"])
Python Example	<pre>oProject = oDesktop.SetActiveProject("Tee-23R2-01") oDesign = oProject.SetActiveDesign("TeeModel") oModule = oDesign.GetModule("ReportSetup") oModule.DeletePlotEntities("Z Parameter Plot 1-01",</pre>

	<pre>[["NAME:PlotEntityNames", "LimitLine1"]])</pre>

DeleteSolutionVariation

Deletes all solution data for specific solutions and design variations. This is obsolete and is supported only for backward compatibility. You should use DeleteFullVariation, DeleteFieldVariation, and DeleteLinked Variation.

UI Access	Right-click on Results , select Browse Solutions... , click Delete button in the dialog.		
Parameters	Name	Type	Description
	<SoluParams>	Array	Structured array. Array(<DataSpecifierArray>, ...)
	<DataSpecifierArray>	Array	Structured array. Array(<DesignVariationKey>, <SetupName>, <Sol-nName>)
Return Value	None.		

Python Syntax	DeleteSolutionVariation(<SoluParams>)
Python Example	<pre>oModule.DeleteSolutionVariation([["width='2in'", "Setup1", "Adaptive_1"], ["width='2in'", "Setup1", "Sweep1"]])</pre>

DeleteOutputVariable

Deletes an existing output variable. The variable can only be deleted if it is not in use by any traces.

UI Access	Q3D Extractor or 2D Extractor > Results > Output Variables. In the Output Variables window, click Delete .		
Parameters	Name	Type	Description
	<OutputVarName>	String	Name of the output variable.
Return Value	None.		

Python Syntax	DeleteOutputVariable (<OutputVarName>)
Python Example	<pre>oModule = oDesign.GetModule("OutputVariable") oModule.DeleteOutputVariable ("testNew")</pre>

EditCoSimulationOptions

Sets options for cosimulation.

Command: None

Syntax: EditCoSimulationOptions <array_name>

Return Value: None

Parameters: <array_name>

Type: string

EditDesignSettings

Edits design settings.

UI Access	[Q3D Extractor] > Design Settings.		
Parameters	Name	Type	Description
	<overrideArray>	Array	Structured array.
Return Value	None.		

Python Syntax	EditDesignSettings(<overrideArray>)
Python Example	<pre>oDesign.EditDesignSettings(["NAME:Design Settings Data", "Allow Material Override:=", True, "Perform Minimal validation:=", False, "EnabledObjects:=" , []</pre>

```

],
[
    "NAME:Model Validation Settings",
    "EntityCheckLevel:="      , "Strict",
    "IgnoreUnclassifiedObjects:=", False,
    "SkipIntersectionChecks:=", False,
    "SkipMeshChecks:=", True
])

```

EditInfiniteArray

Edits the properties of an infinite array

Command: None

Syntax: EditInfiniteArray <array_name>

Return Value: None

Parameters: <array_name>

Type: string

EditLayoutForLayoutComponent

Opens the definition component for editing in HFSS 3D Layout for a Layout Component in an HFSS 3D design.

UI Access	Edit Layout...

Parameters	Name	Type	Description
	<ComponentDefinitionName>	String	Name of the Layout Component Definition.
Return Value	None.		

Python Syntax	EditLayoutForLayoutComponent ([Name:LayoutComponent EDB", Definitions:=", [<ComponentDefinitionName>])
Python Example	<pre>oDesign.EditLayoutForLayoutComponent (["NAME:Layout Component EDB", "Definitions:=" , ["Diff_Via_diffViaNominal"]])</pre>

EditNotes

Updates the notes for the design.

UI Access	Q3D Extractor > Edit Notes.		
Parameters	Name	Type	Description
	<DesignNotes>	String	New design notes that are applied, replacing any current notes.
Return Value	None.		

Python Syntax	EditNotes(<DesignNotes>)
Python Example	oDesign.EditNotes("My design notes.")

EMDesignOptions

Use: Set options for an EM Design.

Command: Right click on design and select **EM Design Options**

Syntax: DesignOptions <Options Array>

Return Value: None

Parameters:

<Options Array>

```
Array("NAME:options",  
"SaveSolFilesAsBinary:=", <boolean>,  
"LowPriorityForSimulations:=", <boolean>,  
"SaveNearFieldSolutions:=", <boolean>,  
"SchematicEnabled:=", <boolean>,  
"UseGlobalNumProc:=", <boolean>,  
"ComputeBothEvenAndOddCPWModes:=", <boolean>,  
"NumProcessors:=", <int>,  
"NumProcessorsDistrib:=", <int>,  
"CausalMaterials:=", <boolean>,
```

```
"UseHPCForMP:=", <boolean>,  
"HPCLicenseType:=", <int>)
```

- SaveSolFilesAsBinary - if true, solutions files are saved using a binary format.
- LowPriorityForSimulations - if true, run simulations at a lower CPU priority.
- SaveNearFieldSolutions - if true, save near field solutions
- SchematicEnabled - if true, enable schematics
- UseGlobalNumProc - if true, use global number of processors and ignore NumProcessors
- ComputeBothEvenAndOddCPWModes - if true, compute both even and odd cpw modes
- NumProcessors - number of processors
- NumProcessorsDistrib- number of distributed processors
- CausalMaterials - if true, use causal materials
- UseHPCForMP - if true, use hpc for mp
- HPCLicenseType - number indicating hpc license type

ExportConvergence

For a given variation, exports convergence data (max mag delta S, E, freq) to *.conv file.

UI Access	Results > Solution Data. Select Convergence tab and click Export.		
Parameters	Name	Type	Description
	<Setup>	String	Setup name.
	<VariationKeys>	String	The variation. Pass empty string for the current nominal variation.

	<ProbType>	String	For Q3D Extractor designs. Valid options are "CG", "DC RL", and "AC RL".
	<FilePath>	String	Full path to desired *.conv file location.
Return Value	None.		

Python Syntax	ExportConvergence(<Setup>, <VariationKeys>, <ProbType>, <FilePath> <OverwriteIfExists>)		
Python Example	<pre>oDesign.ExportConvergence("Setup1", "", "CG", "C:/Project12_Q3DDesign1.conv") oDesign.ExportConvergence("Setup1", "", "CG", "C:/Project12_Q3DDesign1.conv", False)</pre>		

ExportArray

Exports an array definition to a csv file.

UI Access	Export Array to CSV File
Parameters	<filepath>.
Return Value	None.

Python Syntax	ExportArray()
Python Example	<pre>oModule = oDesign.GetModule("ModelSetup") oModule.ExportArray("Array", "C:\\Users\\MyFolder\\Export Array3.csv")</pre>

ExportDataset

Exports a dataset to a named file. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Export.		
Parameters	Name	Type	Description
	<datasetFilePath>	String	The full path to the file.
Return Value	None.		

Python Syntax	ExportDataset (<datasetFilePath>)
Python Example	oProject.ExportDataset ('e:/tmp/dsdata.txt')
	oDesign.ExportDataset ('e:/tmp/dsdata.txt')

ExportForHSpice

Exports matrix solution data to a file in a format suitable for HSpice analysis. Available only for Driven Terminal solution types with ports. Output in an appropriate format will be generated for each of the non-empty file names provided.

UI Access	N/A		
Parameters	Name	Type	Description
	<DesignVariation>	String	Design variation key.
	<SoluSelections>	Array	Array of selected solutions.
	<SpiceType>	Integer	1 - HSpice.

	<BandWidth>	Integer	0 - Low (narrow) band width.
	<FWSFile>	String	Full wave spice file name.
	<LumpedElementFile>	String	Lumped element file name.
	<PoleZeroSpiceFile>	String	Pole zero spice file name.
	<PoleZeroMatlabFile>	String	Pole zero Matlab file name.
	<PartialFractionFile>	String	Partial fraction file name.
	<FittingError>	Double	The accuracy to use in fitting the pole zero model.
	<MinimumOrder>	Integer	Minimum number of poles in rational function expansion.
	<MaximumOrder>	Integer	Maximum number of poles in rational function expansion.
	<UseCommonGround>	Integer	Optional. 1 to use common ground, 0 otherwise.
	<EnforcePassivity>	Integer	Optional. 1 to enforce passivity, 0 otherwise.
Return Value	None.		

Python Syntax	ExportForHSpice(<DesignVariation>, <SoluSelections>, <SpiceType>, <BandWidth>, <FWSFile>, <LumpedElementFile>, <PoleZeroSpiceFile>, <PoleZeroMatlabFile>, <PartialFractionFile>, <FittingError>, <MinimumOrder>, <MaximumOrder>, [Optional <UseCommonGround>], [Optional <EnforcePassivity>])
Python Example	<pre>oModule.ExportForHSpice("width='2in'", ["Setup1:Sweep1"], 1, 0, "c:\mydir\Sweep1.fws", "", "", "", "", .005, 20, 200)</pre>

ExportMatrixData

Exports Matrix data.

UI Access	Results > Solution Data. Select the Matrix tab, then the Export tab. Click Export > RLCC .

Parameters	Name	Type	Description
	<fileName>	String	Full file path for export. The file extension determines the export format. Valid formats: *.m, *.lvl, *.csv, *.txt.
	<probType>	String	"C", "AC RL", or "DC RL".
	<variationKey>	String	Design variation. Empty string uses the current nominal variation.
	<sourceName>	String	Full source name.
	<reduceMatrix>	String	"Original" or the name of a reduced matrix.
	<rUnit>	String	Resistance unit.
	<lUnit>	String	Inductance unit.
	<cUnit>	String	Capacitance unit.
	<gUnit>	String	Optional. Conductance unit.
	<freq>	Long Int	Optional. Frequency.
	<matrixType>	String	Optional. Matrix type.
	<pass>	Long Int	Optional. The pass number (for AdaptivePass solutions).
	<exportACPlusDCRes>	Boolean	Optional. If True, selects Add DC and AC resistance option.
	<precision>	Integer	Optional.
	<fieldWidth>	Integer	Optional.
	<useSciNotation>	Boolean	Optional. True to use scientific notation. False to use display format.
Return Value	None.		

Python Syntax	ExportMatrixData(<fileName>, <probType>, <variationKey>, <sourceName>, <reduceMatrix>, <rUnit>, <lUnit>, <cUnit>, <gUnit>, <freq>, <matrixType>, <pass>, <exportACPlusDCRes>, <precision>, <fieldwidth>, <useSciNotation>)
Python Example	oDesign.ExportMatrixData("C:/path/via_gsg_ViaModel.m", "C", "padrad-d='0.5999999999999998mm\' viarad='0.20000000000000001mm\'", "Setup1:LastAdaptive", "Original", "ohm", "nH", "pF", "mSie", 100000000, "Maxwell,Spice,Couple", 0, False, 15, 20, 1)

Python Syntax	
Python Example	

ExportMeshStats

Exports mesh statistics to a file.

UI Access	N/A		
Parameters	Name	Type	Description
	<setupName>	String	Name of the solution setup.
	<variationString>	String	Name of the variation. An empty string is interpreted as the current nominal variation.
	<probType>	String	For Q3D Extractor designs. Valid options are "CG", "DC RL", and "AC RL".
	<filePath>	String	Full file path, including extension *.ms.
	<overwriteIfExists>	Boolean	(Optional). Defaults to True. If True, script overwrites any existing file of the same name. If False, no overwrite.
Return Value	None.		

Python Syntax	ExportMeshStats(<setupName>, <variationString>, <probType>, <filePath>, <overwriteIfExists>)
Python Example	oDesign.ExportMeshStats ("Setup1", "radius=3mm", "CG", "C:\mydir\meshstats.ms", True)

ExportNetworkData

Exports matrix solution data to a file.

UI Access	N/A		
Parameters	Name	Type	Description
	<DesignVariationKey>	String	Design variation key. Pass empty string for the current nominal variation.
	<SolnSelectionArray>	Array	Array of selected solutions. Array(<SolnSelector>, <SolnSelector>, ...) If more than one array entry, this indicates a combined Interpolating sweep.
	<SolnSelector>	String	Solution setup name and solution name, separated by a colon.
	<FileFormat>	Integer	File format value. 2 : Tab delimited spreadsheet format (.tab) 3 : Touchstone (.sNp) 4 : CitiFile (.cit) 7 : Matlab (.m) 8 : Terminal Z0 spreadsheet
	<OutFile>	String	Full path to the file to write out.
	<FreqsArray>	Array	The frequencies to export. The <FreqsArray> argument contains a vector (e.g. "1GHz", "2GHz", ...) to use, or "all". To export all frequencies, use Array("all"). If no frequencies are specified, all frequencies are used.
	<DoRenorm>	Boolean	For Touchstone format only. Specifies whether to renormalize the data before export.
	<RenormImped>	Double	For Touchstone format only. Real impedance value in ohms, for renormalization. Required in syntax, but ignored if DoRenorm is false.
	<DataType>	Array	Optional. Type: "S", "Y", or "Z". The matrix to export.

	<i><pass></i>	Integer	Optional. The pass to export. This is ignored if the sourceName is a frequency sweep. Leaving out this value or specifying -1 gets all passes.
	<i><ComplexFormat></i>	Integer	Optional. Type: "0", "1", or "2" The format to use for the exported data. 0 = Magnitude/Phase. 1 = Real/Imaginary. 2 = db/Phase.
	<i><Precision></i>	Integer	Optional. Touchstone number of digits precision. Default if not specified is 15.
	<i><UseExportFreqs></i>	Boolean	Specifies whether to use export frequencies.
	<i><IncludeGammaComments></i>	Boolean	Touchstone only. Specifies whether to include Gamma and Impedance comments.
	<i><SupportNonStdExport></i>	Boolean	Specifies whether to support non-standard Touchstone extensions for mixed reference impedance.
Return Value	None.		

Python Syntax	ExportNetworkData(<i><DesignVariationKey></i> , <i><SolnSelectionArray></i> , <i><SolnSelector></i> , <i><FileFormat></i> , <i><OutFile></i> , <i><FreqsArray></i> , <i><DoRenorm></i> , <i><RenormImped></i> , [Optional <i><DataType></i>], [Optional <i><pass></i>], [Optional <i><ComplexFormat></i>], [Optional <i><Precision></i>], [Optional <i><UseExportFreqs></i>], [Optional <i><IncludeGammaComments></i>], [Optional <i><SupportNonStdExport></i>])
Python Example	

ExportNMFData

Exports s-parameters in neutral file format (*.nmf).

UI Access	Results > Solution Data. On the Matrix tab, click Export tab. Then click Export > S-parameter . Select Neutral Model format and export.		
Parameters	Name	Type	Description
	<sourceName>	Array	String names of solutions. Use more than one array entry for a combined Interpolating sweep.
	<outputFileName>	String	Full path of output file, including *.nmf extension.
	<reduceMat>	String	Either "Original" or name of reduced matrix.
	<refImp>	Double	Reference impedance.
	<freqs>	Array	Either "All" or array of doubles representing frequencies.
	<variationKey>	String	Design variation key. Pass empty string for the current nominal variation.
	<displayFormat>	String	"MagPhase", "Reallmag", "DbPhase".
	<length>	String	2D Extractor only. Optional. Number with units.
	<pass>	Integer	Optional. The pass to export. This is ignored if the <i>sourceName</i> is a frequency sweep. Leaving out this value or specifying -1 gets all passes.
	<ComplexFormat>	Integer	Optional. The format to use for the exported data. Options are 0 = Magnitude/Phase 1= Real/Imaginary. 2= db/Phase.
	<Precision>	Integer	Optional. Number of digits precision. If not specified, the default is 6.
Return Value	None.		
Python Syntax	ExportNMFData (<sourceName>, <outputFileName>, <reduceMat>, <refImp>, <freqs>, <variationKey>, <displayFormat>, <length> (2D Extractor only), <pass>, <ComplexFormat>, <Precision>)		

Python Example	<pre>oDesign.ExportNMFData("Setup2 : LastAdaptive", "C:/outputs/data.nmf, "Original", 50, [10000000, 20000000, 30000000, 40000000, 50000000, 60000000, 70000000, 80000000, 90000000, 100000000], "", "MagPhase", 0, 1, 11)</pre>

ExportProfile

Exports a solution profile to file.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Text of the design's notes.
	<VariationString>	String	Variation name. Pass empty string for the current nominal variation.
	<probType>	String	For Q3D Extractor designs. Valid options are "CG", "DC RL", and "AC RL".
	<filePath>	String	Full file path, including extension *.prof.
Return Value	None.		

Python Syntax	<code>ExportProfile(<SetupName>, <VariationString>, <probType>, <filePath>, <overwriteIfExists>)</code>
Python Example	<pre>oDesign.ExportProfile('Setup1', 'radius=3mm', 'CG', 'C:\Files\Profile.prof', True)</pre>

Generate Mesh

If any mesh operations have been defined but not yet performed in the current variation for the specified solution setups, they will be applied to the current mesh. If necessary, an initial mesh will be computed first. No further analysis will be performed.

UI Access	[Q3D Extractor] > Analysis Setup > Generate Mesh.		
Parameters	Name	Type	Description
	<SimulationNames>	Array	List of simulation names.
Return Value	Integer: • 0 – Success • Else – Failure		
Python Syntax	GenerateMesh(<SimulationNames>)		
Python Example	oDesign.GenerateMesh(['Setup1', 'Setup2', 'Setup3'])		

GetChildNames [Design]

Returns the names of the design's child objects.

UI Access	N/A		
Parameters	Name	Type	Description
	<type>	String	Optional. Valid options are "Module", "Editor", and "Variable". Default returns Module names.
Return Value	Names of children for the queried object).		

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Python Syntax	GetChildNames (<type>)
Python Example	oDesign.GetChildNames ("Variable")

GetChildObject [Design]

Returns the design's child objects.

UI Access	N/A		
Parameters	Name	Type	Description
	<path>	String	The path may include multiple generations (for example, "designObject/moduleObj/SetupObject"). See: Object Path .
Return Value	A child object if one is found. Otherwise script error.		

Python Syntax	GetChildObject(<path>)
Python Example	<pre> oDesign = oProject.GetActiveDesign() oOptimModule = oDesign.GetChildObject("Optimetrics") oEditor = oDesign.GetChildObject("3D Model") oBox = oDesign.GetChildObject("3D Model/Box1") oRpt = oDesign.GetChildObject("Results/S Parameter Plot 1") oVariable= oDesign.GetChildObject("Offset") </pre>

GetChildTypes [Design]

Returns the design's child object types.

UI Access	N/A

Parameters	None.
Return Value	String: "Module", "Editor", or "Variable"

Python Syntax	GetChildTypes()
Python Example	<code>oDesign.GetChildTypes()</code>

GetDesignID

Returns the unique identification number of the active design.

UI Access	N/A
Parameters	None.
Return Value	String indicating the unique identification number of the active design.

Python Syntax	GetDesignID()
Python Example	<code>oDesign = oProject.GetActiveDesign() oDesign.GetDesignID()</code>

GetDesignType

Returns the design type of the active design.

UI Access	N/A
Parameters	None.
Return Value	String indicating the design type of the active design ("Circuit Design", "Circuit Netlist", "EMIT", "HFSS 3D Layout Design", "HFSS", "HFSS-IE", "Icepak", "Maxwell 2D", "Maxwell 3D", "Q2D Extractor", "Q3D Extractor", "RMxprt", or "Twin Builder").

Python Syntax	GetDesignType()
Python Example	<pre>oDesign = oProject.GetActiveDesign() oDesign.GetDesignType()</pre>

GetDesignValidationInfo

Returns the design's validation information.

UI Access	N/A		
Parameters	Name	Type	Description
	<validationResultFilePath>	String	Full path for validation file, including *.xml extension.
Return Value	Boolean: • 0 – Failure (validation not done) • 1 – Success (results written to specified location; see file format below)		

Python Syntax	<code>GetDesignValidationInfo(<validationResultFilePath>)</code>
Python Example	<code>oDesign.GetDesignValidationInfo('E:/MyProjects/Validation.xml')</code>

GetEdgePositionAtNormalizedParameter

Gets the position on an edge with normalized parameter.

UI Access	N/A		
Parameters	Name	Type	Description
	<EdgeID>	Integer	Edge ID.
	<NormParam>	Double	Normalized parameter.(Proportional to the length of the specified edge) For example, 0 leads to the start vertex position of the edge, 1 leads to the end vertex position of the edge, 0.5 leads to the mid position on the edge.
Return Value	Array of string containing the x, y and z coordinate values.		

Python Syntax	<code>GetEdgePositionAtNormalizedParameter(<EdgeID>, <NormParam>)</code>
Python Example	<code>oEditor.GetEdgePositionAtNormalizedParameter(5, 0)</code> <code>oEditor.GetEdgePositionAtNormalizedParameter(5, 1)</code> <code>oEditor.GetEdgePositionAtNormalizedParameter(5, 0.5)</code>

GetManagedFilePath

Get the path to the project's results folder.

UI Access	N/A
Parameters	None.
Return Value	String containing path where project results are located.

Python Syntax	<code>oDesign.GetManagedFilePath()</code>
Python Example	<code>oDesign.GetManagedFilePath()</code>

GetModule

Returns the IDispatch for the specified module.

UI Access	N/A		
Parameters	Name	Type	Description
	<modulename>	String	One of the following: • Analysis Module – "AnalysisSetup" • Boundary Module – "BoundarySetup" • Field Overlays Module – "FieldsReporter" • Mesh Module – "MeshSetup" • Optimetrics Module – "Optimetrics" • Radiation Module – "RadField"

			• Reduce Matrix Module – "ReduceMatrix" • Reporter Module – "ReportSetup" • Simulation Setup Module – "SimSetup" • Solutions Module – "Solutions"
Return Value	Module IDispatch		

Python Syntax	GetModule (<modulename>)
Python Example	<code>oModule = oDesign.GetModule("SimSetup")</code>

GetModule (RadiationSetupMgr)

Returns the IDispatch for the specified module.

UI Access	N/A		
Parameters	Name	Type	Description
	<modulename>	String	One of the following: • Analysis Module – "AnalysisSetup" • Boundary Module – "BoundarySetup" • Field Overlays Module – "FieldsReporter" • Mesh Module – "MeshSetup" • Optimetrics Module – "Optimetrics" • Radiation Module – "RadField"

			• Reduce Matrix Module – "ReduceMatrix" • Reporter Module – "ReportSetup" • Simulation Setup Module – "SimSetup" • Solutions Module – "Solutions"
Return Value	Module IDispatch		

Python Syntax	GetModule (<modulename>)
Python Example	<code>oModule = oDesign.GetModule("SimSetup")</code>

GetName

Returns the design name of the active design, in that order separated by a semicolon.

UI Access	N/A
Parameters	None.
Return Value	String indicating the name of the active design.

Python Syntax	GetName()
Python Example	<code>design_name = oDesign.GetName()</code>

GetNominalVariation

Returns the current nominal variation.

UI Access	N/A
Parameters	None.
Return Value	String containing current nominal variation.

Python Syntax	GetNominalVariation()
Python Example	<code>oDesign.GetNominalVariation()</code>

GetNoteText

Returns the text of the note attached to a design.

UI Access	N/A
Parameters	None.
Return Value	String: text of the design note.

Python Syntax	GetNoteText()
Python Example	<code>oDesign.GetNoteText()</code>

GetObjPath [Design]

Obtains the path to the design.

UI Access	N/A
Parameters	None.
Return Value	String containing the path to the design.

Python Syntax	GetObjPath()
Python Example	<code>oDesign.GetObjPath()</code>

GetOutputVariableValue

Returns the double value of an output variable. Only expressions that return a double value are supported. The expression is evaluated only for a single point.

UI Access	N/A		
Parameters	Name	Type	Description
	<OutputVarName>	String	Name of the output variable.
	<IntrinsicVariation>	String	A set of intrinsic variable value pairs to use when evaluating the output expression.
			Q3D example: "Freq='20GHz' x_size='1.0in'"

	<SolutionName>	String	Name of the solution as listed in the output variable UI. For example, "Setup1 : Last Adaptive".
	<ReportType>	String	The name of the report type as seen in the output variable UI. Possible values in Q3D Extractor are: • "Matrix" • "C Fields Report" • "DC R/L Fields Report" • "AC R/L Fields Report"
	<ContextArray>	Array	Structured array containing context for which the output variable expression is being evaluated. Can be empty. Array("Context:=", <string>)
Return Value	Double value of the output variable.		

Python Syntax	GetOutputVariableValue(<OutputVarName>, <IntrinsicVariation>, <SolutionName>, <ReportTypeName>, <ContextArray>)
Python Example	Val = oDesign.GetOutputVariableValue("test", "Freq = '20Ghz' Theta='20deg' Phi='30deg'", "TR", "Standard", [])

GetOutputVariables

Returns the list of output variables.

UI Access	N/A

Parameters	None.
Return Value	Array containing all output variables.

Python Syntax	<code>GetOutputVariables()</code>
Python Example	<code>oDesign.GetOutputVariables()</code>

GetPostProcessingVariables

Returns the list of post-processing variables.

UI Access	N/A
Parameters	None.
Return Value	Returns array containing variables.

Python Syntax	<code>GetPostProcessingVariables()</code>
Python Example	<code>oDesign.GetPostProcessingVariables()</code>

GetProperties

Gets a list of all the properties belonging to a specific <PropServer> and <PropTab>. This can be executed by the oProject, oDesign, or oEditor variables.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><PropTab></code>	String	One of the following, where tab titles are shown in parentheses: • PassedParameterTab ("Parameter Values") • DefinitionParameterTab (Parameter Defaults") • LocalVariableTab ("Variables" or "Local Variables") • ProjectVariableTab ("Project variables") • ConstantsTab ("Constants") • BaseElementTab ("Symbol" or "Footprint") • ComponentTab ("General") • Component("Component") • CustomTab ("Intrinsic Variables") • Quantities ("Quantities") • Signals ("Signals")
	<code><PropServer></code>	String	An object identifier, generally returned from another script method, such as <code>CompInst@R;2;3</code>
Return Value	Array of strings containing the names of the appropriate properties.		

Python Syntax	<code>GetProperties(<PropTab>, <PropServer>)</code>
Python Example	<code>oEditor.GetProperties('PassedParameterTab', 'k')</code>

GetPropertyValue

Returns the value of a single property belonging to a specific `<PropServer>` and `<PropTab>`. This function is available with the Project, Design or Editor objects, including definition editors.

Tip: Use the script recording feature and edit a property, and then view the resulting script to see the format for that property.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><PropTab></code>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults") - LocalVariableTab ("Variables" or "Local Variables") - ProjectVariableTab ("Project variables") - ConstantsTab ("Constants") - BaseElementTab ("Symbol" or "Footprint") - ComponentTab ("General") - Component("Component") - CustomTab ("Intrinsic Variables") - Quantities ("Quantities") - Signals ("Signals")
	<code><PropServer></code>	String	An object identifier, generally returned from another script method, such as <code>CompInst@R;2;3</code>
	<code><PropName></code>	String	Name of the property.
Return Value	String value of the property.		

Python Syntax	GetPropertyValue (<PropTab>, <PropServer>, <PropName>)
Python Example	<pre>selectionArray = oEditor.GetSelections() for k in selectionArray: val = oEditor.GetPropertyValue("PassedParameterTab", k, "R") ...</pre>

GetPropNames [Design]

Returns array containing names of property. For designs, always returns an empty array because the design has no property.

UI Access	N/A		
Parameters	Name	Type	Description
	<includeReadOnly>	Boolean	(Optional). • True - include read only property. • False - do not include read only property.
Return Value	Empty array.		

Python Syntax	GetPropNames(<includeReadOnly>)

Python Example	<code>oDesign.GetPropNames()</code>

GetPropValue [Design]

Returns the property value for the active design object, or specified property values.

UI Access	N/A		
Parameters	Name	Type	Description
	<propPath>	String	A child object's property path. See: Object Property Script Function Summary .
Return Value	The property value (integer, string, or array of strings) of the specified child object.		

Python Syntax	<code>GetPropValue(<propPath>)</code>
Python Example	<code>oDesign.GetPropValue('offset/SIValue')</code>
	<code>oDesign.GetPropValue('Results/S Parameter Plot 1/Display Type')</code>
	<code>oDesign.GetPropValue('Results/S Parameter Plot 1/Display Type/Choices')</code>

GetSelections [Design]

This script serves no function at the Design level. See: GetSelections (Layout Editor), [GetSelections \(Model Editor\)](#), or Get Selections (Schematic Editor).

GetSolutionType

Returns solution type of the design.

UI Access	N/A

Parameters	None.
Return Value	String containing the solution type. Possible values are: "SBR+", "HFSS [Modal Terminal] [Network Composite]", "Transient [Network Composite]", "Eigenmode", or "Characteristic".

Python Syntax	<code>GetSolutionType()</code>
Python Example	<code>oDesign.GetSolutionType()</code>

GetSolveInsideThreshold

Returns the solve inside threshold. This command does not apply to HFSS-IE.

UI Access	N/A
Parameters	None.
Return Value	Double representing the solve inside threshold.

Python Syntax	<code>GetSolveInsideThreshold()</code>
Python Example	<code>oDesign.GetSolveInsideThreshold()</code>

GetVariables

Returns a list of all defined variables. To get a list of project variables, execute this command using `oProject`. To get a list of local variables, use `oDesign`.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing the variables.

Python Syntax	<code>GetVariables ()</code>
Python Example	<code>oProject.GetVariables ()</code> <code>oDesign.GetVariables ()</code>

GetVariableValue

Gets the value of a single specified variable. To get the value of project variables, execute this command using `oProject`. To get the value of local variables, use `oDesign`.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><VarName></code>	String	Name of the variable to access.
Return Value	String represents the value of the variable.		

Python Syntax	<code>GetVariableValue(<VarName>)</code>
Python Example	<code>oProject.GetVariableValue("var_name")</code>

GetVariationVariableValue

Returns the value for a specified variation's variable.

UI Access	N/A		
Parameters	Name	Type	Description
	<VariationString>	String	The name of the design variation.
	<VariableName>	String	The name of the variable.
Return Value	Returns a double precision value in SI units, interpreted to mean the value of the variable contained in the variation string.		

Python Syntax	<code>GetVariationVariableValue(<VariationString>, <VariableName>)</code>
Python Example	<code>oDesign.GetVariationVariableValue('x_size = 2mm y_size = 1mm', 'y_size')</code>

ImportArray

Imports an array definition using a csv file.

UI Access	Create Array Through CSV

Parameters	<filepath>.
Return Value	None.

Python Syntax	ImportArray()
Python Example	<pre>oModule = oDesign.GetModule("ModelSetup") oModule.ImportArray("Array", "C:\\Users\\MyFolder\\Export Array3.csv")</pre>

ImportDataset

Imports a dataset from a named file. This can be executed by the oProject, or oDesign variables. The name of the dataset is file-name+index number (e.g., dsdata1) unless the filename ends with a trailing number. When there is a trailing number at the end, we will remove the number and use first unused index. Alternatively, the name of the dataset can be explicitly defined by providing a string as an optional second argument.

UI Access	Project > Datasets > Import.		
Parameters	Name	Type	Description
	<datasetFileFullPath>	String	The full path to the file containing the dataset values. *.tab files recommended (see note below).
	<optionalDatasetName>	String	<i>Optional.</i> User-defined dataset name.
Return Value	None.		

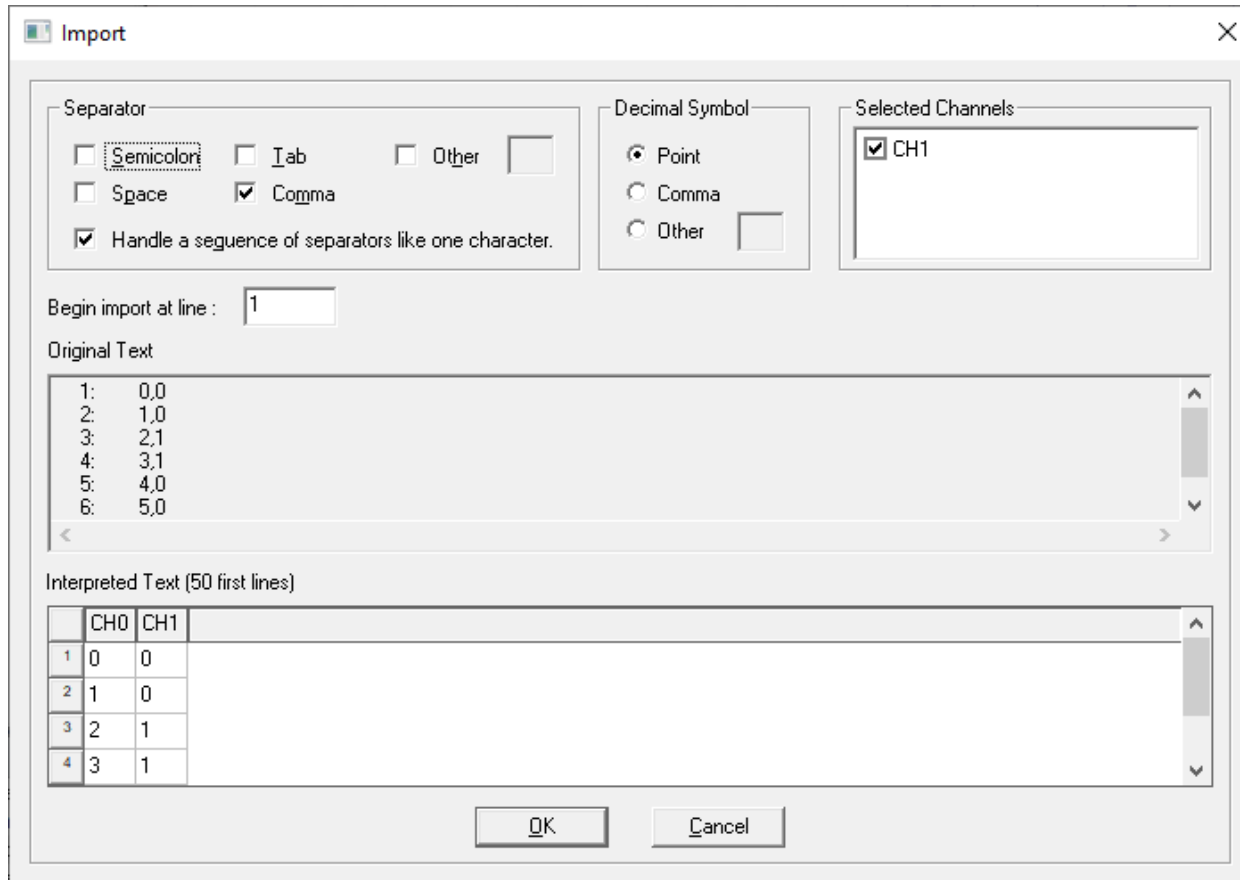
Python Syntax	ImportDataset (<datasetFileFullPath>,<optionalDatasetName>)
Python Example	oProject.ImportDataset('e:\tmp\dsdata.tab')

	<pre>oDesign.ImportDataset('e:\tmp\dsdata.tab') oProject.ImportDataset('e:\tmp\dsdata.tab', 'MyDatasetName') oDesign.ImportDataset('e:\tmp\dsdata.tab', 'MyDatasetName')</pre>

Note About File Types:

Tab-delimited or space-delimited files with the extension *.tab are the recommended file type. When using ImportDataset at the Design level, *.tab is the only file type supported.

At the Project level, other file types are supported (for example, *.csv). However, after calling the command, you must configure the file import format manually through the Electronics Desktop GUI by selecting **Project > Datasets** and clicking **Import**.



InsertDesign

Inserts a new design in the project. For Q3D Extractor and 2D Extractor scripts, the last two arguments will always be empty.

UI Access	Project > [Insert Q3D Extractor Design / Insert 2D Extractor Design].		
Parameters	Name	Type	Description
	<DesignType>	String	Design type. "Q3D Extractor" or "2D Extractor".
	<DesignName>	String	Design name.
	""	None	Empty argument.
	""	None	Empty argument.
Return Value	None.		

Python Syntax	InsertDesign (<DesignType>, <DesignName>, ",")
Python Example	<pre>oProject.InsertDesign('Q3D Extractor', 'Q3DDesign2', '', '')</pre>

PasteArray

Copies a specified array.

UI Access	Edit > Paste.
Parameters	None. You must previously use CopyArray.
Return Value	New array name.

Python Syntax	Paste ()

Python Example	<pre>oModule = oDesign.GetModule("ModelSetup") oModule.CopyArray("Array") oModule.PasteArray() # returns the new array name</pre>

PasteDesign (Design Object)

Pastes a design that has already been copied to the clipboard into another design.

UI Access	Edit > Paste.		
Parameters	Name	Type	Description
	< <i>pasteOption</i> >	Integer	One of the following: • 0 – Link to the existing design that was copied • 1 – Create a new copy of the design and keep the original layers of the design being copied • 2 – Create a new copy of the design and merge the layers of the design being copied.
Return Value	None.		

Python Syntax	PasteDesign(< <i>pasteOption</i> >)
Python Example	<pre>oProject.CopyDesign('DesignB') oDesign = oProject.SetActiveDesign('DesignA') oDesign.PasteDesign(1)</pre>

Redo [Design]

Reapplies the last design-level command.

UI Access	Edit > Redo.
Parameters	None.
Return Value	None.

Python Syntax	Redo()
Python Example	<code>oDesign.Redo()</code>

RenameDesignInstance

Renames a design instance.

UI Access	Right-click a design instance in the project tree, and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<OldName>	String	The current name of the design, which must be the design on which this command is invoked.
	<NewName>	String	The new name for the design.
Return Value	None.		

Python Syntax	RenameDesignInstance (<OldName>, <NewName>)
Python Example	oDesign.RenameDesignInstance ("Design1", "Design2")

RenameSource [Interface Source]

Use: Renames an interface source

Syntax: RenameSource (STRING: Interface Source name)

Example: oModule.RenameSource "OldName" "NewName"

RunToolkit

Runs a Python toolkit script, applying it to the active design. The toolkit script itself may have prerequisites, such as sweeps defined, or specific model characteristics, such as port definitions.

Important:

Full scripting for cable modeling is not supported and no arguments are allowed in the script. The **RunToolkit** command will not automatically create a cable bundle, but will simply open the **Cable Modeling** dialog box. You will have to manually input your parameters.

UI Access	[Q3D Extractor] > Toolkit > [Script Name].		
Parameters	Name	Type	Description
	<LibraryType>	String	Name of the library in which the script is located.
	<ToolkitName>	String	Name of the Python script.
	<ToolkitArg>	Array	Structured array containing arguments required by the toolkit script.
Return Value	User-defined solution(s) and/or output(s).		

Python Syntax	<code>RunToolkit(<LibraryType>, <ToolkitName>, <ToolkitArg>)</code>
Python Example	<pre>oDesign.RunToolkit("SysLib", "Cable Modeling/Automotive Cable Bundle", [])\noDesign.RunToolkit("SysLib", "Cable Modeling/Oil-Gas Cable Bundle", [])</pre>

SARSetup

Sets up for the specific absorption rate (SAR) computation. This command does not apply to HFSS-IE.

UI Access	HFSS > Fields > SAR Setting.		
Parameters	Name	Type	Description
	<TissueMass>	Double	Value represents mass of tissue between 1 and 10 in grams.
	<MaterialDensity>	Double	Density of material in gram/cm^3.
	<TissueObjectListID>	Integer	ID of an object list which will be treated as tissues for SAR calculation.
	<VoxelSize>	Double	Size of a voxel in millimeters.
	<AverageSARMethod>	Integer	0 - IEEE std 1528. 1 - Gridless, i.e. classical Ansoft method.
Return Value	None.		

Python Syntax	<code>SARSetup(<TissueMass>, <MaterialDensity>, <TissueObjectListID>, <VoxelSize>, <AverageSARMethod>)</code>
Python Example	<pre>oDesign.SARSetup(1.0, 1.0, 678, 1.0, 0)</pre>

SetActiveEditor

Sets the active editor.

UI Access	N/A.		
Parameters	Name	Type	Description
	<EditorName>	String	Text of the design's notes.
Return Value	Editor object.		

Python Syntax	SetActiveEditor(<EditorName>)
Python Example	<code>oDesign.SetActiveEditor('3D Modeler')</code>

SetAllowMaterialOverride

Sets the option to allow material override.

UI Access	N/A.		
Parameters	Name	Type	Description
	<allowMaterialOverride>	Integer	1 - allow material override. 0 - does not allow material override.
Return Value	None.		

Python Syntax	SetAllowMaterialOverride(<allowMaterialOverride>)
Python Example	<code>oDesign.SetAllowMaterialOverride(1)</code>

SetBackgroundMaterial

Sets the design's background material.

Important:

You can only use this script in 2D Extractor if there is no surface ground in the design *and* the problem type is "open".

UI Access	From the Project Manager , right-click the design and select Set Background Material .		
Parameters	Name	Type	Description
	<matName>	String	Material name.
Return Value	None.		

Python Syntax	SetBackgroundMaterial(<matName>)		
Python Example	<code>oDesign.SetBackgroundMaterial('vacuum')</code>		

SetDesignMode

Switches between HFSS 3D Layout operating modes.

UI Access	Edit Layout...		
Parameters	Name	Type	Description
	<modeName>	String	Enter "IC" or "General" to change operating modes.

Return Value	None.

Python Syntax	SetDesignMode(<modeName>)
Python Example	<code>oDesign.SetDesignMode("IC")</code>

SetDesignSettings (2D Extractor)

Sets design settings for a 2D Extractor design.

UI Access	2D Extractor > Design Settings.		
Parameters	Name	Type	Description
	<variationKeys>	Array	Structured array containing design settings: <code>Array("NAME:Design Settings Data", "Background Material:=" , <string>, "LumpedLength:=" , <string>, "RiseTime:=" , <string>, "DistribLengthUnits:=" , <string>, "Calculate Lossy Dielectrics:=" , <boolean>, "Perform Minimal validation:=" , <boolean>)</code>
	<modelSettings>	Array	Optional. Structured array containing model validation settings: <code>Array("NAME:Validation Options", "EntityCheckLevel:=" , "[Strict None WarningOnly Basic]",</code>

			"IgnoreUnclassifiedObjects:=", <boolean>, "SkipIntersectionChecks:=", <boolean>)
Return Value	None.		

Python Syntax	SetDesignSettings(<variationKeys>, <modelSettings>)		
Python Example	<pre>oDesign.SetDesignSettings(["NAME:Design Settings Data", "Background Material:=" , "water_sea", "LumpedLength:=" , "1meter", "RiseTime:=" , "1ns", "Dis- tribLengthUnits:=" , "mile", "Calculate Lossy Dielectrics:=", True, "Perform Min- imal validation:=", True], ["NAME:Model Validation Settings", "EntityCheckLevel:=" , "WarningOnly", "IgnoreUnclassifiedObjects:=", True, "SkipIntersectionChecks:=", True])</pre>		

SetDesignSettings (Q3D Extractor)

Sets design settings for a Q3D Extractor design.

UI Access	Q3D Extractor > Design Settings.		
Parameters	Name	Type	Description
	<variationKeys>	Array	Structured array containing design settings: Array("NAME:Design Settings Data", "BackgroundMaterial: =", "<string>", "SParamCalcMethod: =", "[LumpedRGLC EqTransLine]", "Allow Material Override:=", <Boolean>, "Calculate Lossy Dielectrics:=", <Boolean>

			"Perform Minimal validation:=", <boolean>)
	<modelSettings>	Array	Optional. Structured array containing model validation settings: Array("NAME:Validation Options", "EntityCheckLevel:=", "[Strict None WarningOnly Basic]" "IgnoreUnclassifiedObjects:=", <boolean>, "SkipIntersectionChecks:=", <boolean>)
Return Value	None.		

Python Syntax	SetDesignSettings(<variationKeys>, <modelSettings>)
Python Example	<pre>oDesign.SetDesignSettings(["NAME:Design Settings Data", "Background Material:=" , "glass", "SParamCalcMethod:=" , "LumpedRLGC", "Allow Material Override:=", True, "Calculate Lossy Dielectrics:=", True, "Perform Minimal validation:=", False], ["NAME:Model Validation Settings", "EntityCheckLevel:=" , "WarningOnly", "IgnoreUnclassifiedObjects:=", True, "SkipIntersectionChecks:=", True])</pre>

SetFastTransformationForLayoutComponent

Toggles whether layout components in show outlines of objects across layers during view changes. This improves the visualization performance.

UI Access	Fast Transformation		
Parameters	Name	Type	Description
	<Layout ComponentName>	String	Name of the Layout Component.
	Boolean	String	True or False
Return Value	None.		

Python Syntax	<code>SetFastTransformationForLayoutComponent("<LayoutComponentName", <boolean>)</code>
Python Example	<code>oDesign.SetFastTransformationForLayoutComponent ("LC1_1", False)</code>

SetLengthSettings

Sets the distributed and lumped lengths of the design, as well as the rise time.

Important:

This script works in 2D Extractor only.

UI Access	N/A		
Parameters	Name	Type	Description
	<i><DistributedUnits></i>	String	Length units used for post-processing.
	<i><LumpedLength></i>	String	Length of design in post-processing.
	<i><RiseTime></i>	String	Time used in post-processing.
Return Value	None.		

Python Syntax	<code>SetLengthSettings(<DistributedUnits>, <LumpedLength>, <RiseTime>)</code>
Python Example	<code>oDesign.SetLengthSettings('mm', '7meter', '1s')</code>

SetObjectAttributesForLayoutComponent

Sets visualization attributes for layout components in for a named component for layers, nets, and objects.

UI Access	Object Attributes		
Parameters	Name	Type	Description
	<Layout ComponentName>	String	Name of the Layout Component.
	<ShowDielectric>	Boolean	True to show dielectrics; false to hide dielectrics
	<DisplayMode>	Integer	0 (for layout mode), 1 (for net mode), and 2 (for object mode)
	<ObjectAttributesinLayerMode>	Array	List of layers. The three arguments for each layer represent the “Show”, “Wire Frame”, “and “Transparency” options for that layer in the “Object Attributes” dialog box.
	<ObjectAttributesinNetMode>	Array	List of nets. The three arguments for each net represent the “Show”, “Wire Frame”, “and “Transparency” options for that net in the “Object Attributes” dialog box.
	<ObjectAttributesinObjectMode>	Array	List of objects. The three arguments for each object represent the “Show”, “Wire Frame”, “and “Transparency” options for that object in the “Object Attributes” dialog box.
Return Value	None		

Python Syntax	SetObjectAttributesForLayoutComponent (<LayoutComponentName>, <ShowDielectric>, <DisplayMode>, <ObjectAttributesinLayerMode> <ObjectAttributesinNetMode>, <ObjectAttributesinObjectMode>)
Python Example	<pre>oDesign.SetObjectAttributesForLayoutComponent (["Name:=", "ShowDielectric:=", "LC1_1", False,</pre>

```
"DisplayMode:=" , 2,
[
  "NAME:ObjectAttributesInLayerMode",
  "GND_1_L2:=" , [True,True,0],
  "GND_2_L4:=" , [True,True,0],
  "GND_3_L6:=" , [True,True,0],
  "GND_4_L9:=" , [True,True,0],
  "GND_5_L11:=" , [True,True,0],
  "Inner_Layer_3_L10:=" , [True,True,0],
  "Top_L1:=" , [True,True,100],
  "VCC1_L7:=" , [True,True,0],
  "VCC2_L8:=" , [True,True,0]
],
[
  "NAME:ObjectAttributesInNetMode",
  "GND:=" , [True,True,29],
  "VCC:=" , [True,True,0],
  "neg:=" , [True,True,67],
  "pos:=" , [True,True,67]
],
```

```

[
    "NAME:ObjectAttributesInObjectMode",
    "line_1:="                , [True,True,0],
    "line_2:="                , [True,True,0],
    "line_3:="                , [True,True,100],
    "line_4:="                , [True,True,100],
    "rect_6:="                , [True,True,0],
    "rect_17:="               , [True,True,0],
    "rect_18:="               , [True,True,0],
    "rect_19:="               , [True,True,0],
    "rect_20:="               , [True,True,0],
    "rect_21:="               , [True,True,0],
    "rect_22:="               , [True,True,0],
    "line_24:="               , [True,True,100],
    "via_0:="                 , [True,True,100],
    "via_1:="                 , [True,True,100],
    "via_2:="                 , [True,True,100],
    "via_3:="                 , [True,True,100]
]
])

```

SetObjectTemperature

Sets the temperature of objects.

UI Access	Q3D Extractor > Set Object Temperature		
Parameters	Name	Type	Description
	<TemperatureSettings>	Array	["NAME": <SettingName>, "IncludeTemperatureDependence:=", <boolean, True to include temperature dependence. False to not include.>, "EnableFeedback:=", <boolean, True to enable feedback. False to not enable feedback.>, "Temperatures:=", <Temperatures>]
	<Temperatures>	Array	Objects and temperatures.
Return Value	None.		

Python Syntax	oDesign.SetObjectTemperature(<TemperatureSettings>)
Python Example	<pre>oDesign.SetObjectTemperature(["NAME:TemperatureSettings", "IncludeTemperatureDependence:=", True, "EnableFeedback:=" , False,</pre>

	<code>"Temperatures:=" , ["RegularPolyhedron1","22cel","Polygon1","22cel"])</code>

SetPropValue [Design]

Sets the property value for the active property object.

UI Access	Edit properties on Project Tree objects.		
Parameters	Name	Type	Description
	<code><propPath></code>	String	A child object's property path. See: Object Property Script Function Summary .
	<code><Value></code>	String	New property value.
Return Value	Boolean: • True - property found and the new value is valid. • False - property not found.		

Python Syntax	<code>SetPropValue(<propPath>, <Value>)</code>
Python Example	<pre>oDesign.SetPropValue("offset", "12mm") oDesign.SetPropValue("Results/S Parameter Plot 1/Display Type", "Rectangular Plot")</pre>

SetPropertyValue

Sets the value of a single property belonging to a specific PropServer and PropTab. This function is available with the Project, Design or Editor objects, including definition editors. This is not supported for properties of the following types: ButtonProp, PointProp,

V3DPointProp, and VPointProp. Only the ChangeProperty command can be used to modify these properties.

Use the script recording feature and edit a property, and then view the resulting script entry or use GetPropertyValue for the desired property to see the expected format.

UI Access	N/A		
Parameters	Name	Type	Description
	<propTab>	String	One of the following, where tab titles are shown in parentheses: • PassedParameterTab ("Parameter Values") • DefinitionParameterTab (Parameter Defaults) • LocalVariableTab ("Variables" or "Local Variables") • ProjectVariableTab ("Project variables") • ConstantsTab ("Constants") • BaseElementTab ("Symbol" or "Footprint") • ComponentTab ("General") • Component("Component") • CustomTab ("Intrinsic Variables") • Quantities ("Quantities") • Signals ("Signals")
	<propServer>	String	An object identifier, generally returned from another script method, such as CompInst@R;2;3
	<propName>	String	Name of the property.
	<propValue>	String	The value for the property
Return Value	None.		

Python Syntax	SetPropertyValue(<propTab>, <propServer>, <propName>, <propValue>)
Python Example	oEditor.SetPropertyValue("PassedParameterTab", "k", "R", "2200")

SetShowLayoutForLayoutComponent

Layout visualization, rather than bounding box, for a Layout Component in design.

UI Access	Edit Layout...		
Parameters	Name	Type	Description
	<Layout ComponentName>	String	Name of the Layout Component.
	Boolean	String	True or False
Return Value	None.		

Python Syntax	SetShowLayoutForLayoutComponent ("<LayoutComponentName", <boolean>)
Python Example	oDesign.SetShowLayoutForLayoutComponent ("LC1_1", True)

SetShowAllLayoutComponents

This command will show/hide all layout components in design.

UI Access	Edit Layout... View > Visibility > Show All or Hide All		
Parameters	Name	Type	Description
	Boolean	String	True or False

Return Value	None

Python Syntax	SetShowAllLayoutComponents (<boolean>)
Python Example	<pre>oDesign = oProject.GetActiveDesign() oDesign.SetShowAllComponentLayouts(True)</pre>

SetSolutionType

Sets the solution type for the design.

UI Access	HFSS > Solution Type.		
Parameters	Name	Type	Description
	<SolutionType>	String	Possible values are: "SBR+", "HFSS [Modal Terminal] [Network Composite]", "Transient [Network Composite]", "Eigenmode", or "Characteristic".
	EnableAutoOpen:=,	Boolean	Only . • True - turn on auto open mode. • False - turn off auto open mode.
	<ModelExteriorAsIE>	String	Only Applies for Driven Solution Type with Auto Open Mode as True. Possible values are: Radiation, FEBI, PML
Return Value	None.		

Python Syntax	SetSolutionType(<SolutionType>, <AutoOpenMode>, <ModelExteriorAsIE>)
Python Example	<pre> oDesign.SetSolutionType("HFSS Modal Network", ["NAME:Options", "EnableAutoOpen:" , False]) oDesign.SetSolutionType("Transient Network", ["NAME:Options", "EnableAutoOpen:" , False]) oDesign.SetSolutionType("HFSS Hybrid Modal Network", ["NAME:Options", "EnableAutoOpen:" , False]) oDesign.SetSolutionType("SBR+", [</pre>

	<pre>"NAME:Options", "EnableAutoOpen:=" , False])</pre>

SetSolveInsideThreshold

Sets the solve inside threshold to the specified double.

UI Access	N/A		
Parameters	Name	Type	Description
	<threshold>	Double	Siemens/m.
Return Value	None.		

Python Syntax	SetSolveInsideThreshold(<threshold>)
Python Example	oDesign.SetSolveInsideThreshold(100000)

SetSourceContexts

For Near or Far Field projects for Driven Modal or Driven Terminal Network Analysis Solutions, specifies the port name and all modes/terminals of that port to be enabled as Source Context.

UI Access	HFSS > Fields > Edit Sources.

Parameters	Name	Type	Description
	<SourceId>	Array	Name of modes/terminals to be set as source context.
Return Value	None.		

Python Syntax	SetSourceContexts(<SourceId>)
Python Example	<pre>oModule.SetSourceContexts(["Box1_T1", "Box1_T2", "Box1_T3", "Current1", "IncPWave1")</pre>

SetVariableValue

Sets the value of a variable. To set the value of a project variable, execute this command using `oProject`. To set the value of a local variable, use `oDesign`.

UI Access	N/A		
Parameters	Name	Type	Description
	<VarName>	String	Variable name.
	<VarValue>	Value	New value for the variable.
Return Value	None.		

Python Syntax	SetVariableValue (<VarName>, <VarValue>)

Python Example	<code>oProject.SetVariableValue('\$Var1', '3mm')</code>

Solve

Performs one or more simulation. The next script command will not be executed until the simulation(s) are complete.

UI Access	Select solution setup(s). Right-click and select Analyze .		
Parameters	Name	Type	Description
	< <i>SimulationNames</i> >	Array	Array containing string simulation names.
Return Value	Integer: • 0 – Simulation(s) completed. • 1 – Simulation error. • -1 – Command execution error.		

Python Syntax	Solve < <i>SimulationNames</i> >
Python Example	<code>oDesign.Solve(['Setup1', 'Setup2', 'Setup3'])</code>

Undo [Design]

Cancels the last design-level command.

UI Access	Edit > Undo
Parameters	None.

Return Value	None.

Python Syntax	Undo()
Python Example	<code>oDesign.Undo()</code>

ValidateDesign

Returns whether a design is valid.

UI Access	Q3D Extractor > Validation Check.
Parameters	None.
Return Value	Integer: • 1 – Validation passed. • 0 – Validation failed.

Python Syntax	ValidateDesign()
Python Example	<code>oDesign.ValidateDesign()</code>

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8 - 3D Modeler Editor Script Commands

3D Modeler commands should be executed by the "3D Modeler" editor:

```
Set oEditor = oDesign.SetActiveEditor("3D Modeler")
```

```
oEditor.<CommandName>
```

Conventions Used in this Chapter:

<AttributesArray>

<AttributesArray> takes the following structure:

```
Array("NAME:Attributes",  
      "Name:=", <string>,  
      "Flags:=", <string>,  
      "Color:=", <string>,  
      "Transparency:=", <value>,  
      "PartCoordinateSystem:=", <string>,  
      "UDMId:=", <string>,  
      "MaterialValue:=", <string>,  
      "SurfaceMaterialValue:=", <string>,  
      "Solveinside:=", <boolean>,  
      "ShellElement:=", <boolean>,  
      "ShellElementThickness:=", <string>,  
      "IsMaterialEditable:=", <boolean>,
```

```
"UseMaterialAppearance:=", <boolean>,  
"IsLightweight:=", <boolean>)
```

Where:

- **Flags** – Takes a string containing "NonModel" and/or "Wireframe", separated by the # character. For example, "NonModel#Wireframe".
- **Color** – Takes a string containing an RGB triple, formatted as "(*<RGB>*)". For example, "(255 255 255)".
- **Transparency** – Takes a value between 0 and 1.
- **PartCoordinateSystem** – Orientation of the primitive. The name of one of the defined coordinate systems should be specified.
- **UDMId** – Takes a string containing an ID.
- **MaterialValue** – Takes a string of the material name.
- **SurfaceMaterialValue** – Takes a string of the surface material name.
- **Solveinside** – Takes a boolean value.
- **ShellElement** – Takes a boolean value specifying whether or not a shell element is present.
- **ShellElementThickness** – Takes a string containing the shell element thickness. If element is not present, pass empty string.
- **IsMaterialEditable** – Takes a boolean value.
- **IsLightweight** – Takes a boolean value.

<SelectionsArray>

<SelectionsArray> typically takes the following structure:

```
Array("NAME:Selections",  
"Selections:=", <string>)
```

Where:

- **Selections** – Takes a comma-separated list of parts on which to perform the action. For example, "Rect1, Rect2, Rect3".

In some cases, <SelectionsArray> takes additional parameters:

```
Array("NAME:Selections",
    "AllowRegionDependentPartSelectionForPMLCreation:=", <boolean>,
    "AllowRegionSelectionForPMLCreation:=", <boolean>,
    "Selections:=", <string>,
    "NewPartsModelFlag:=" , <string>,
    "UseCurrentCS:=", <boolean>)
```

Where:

- **AllowRegionDependentPartSelectionForPMLCreation** – Takes a boolean value. See individual script for whether this parameter is required.
- **AllowRegionSelectionForPMLCreation** – Takes a boolean value. See individual script for whether this parameter is required.
- **Selections** – Takes a comma-separated list of parts on which to perform the action. For example, "Rect1, Rect2, Rect3".
- **NewPartsModelFlag** – Takes either string "Model" or string "Nonmodel". See individual script for whether this parameter is required.
- **UseCurrentCS** – Takes a boolean value. See individual script for whether this parameter is required. Use [GetActiveCoordinateSystem](#) to determine the current CS.

Note:

Selections is the only parameter required in *all* 3D Modeler Editor scripts. See individual scripts for additional required parameters.

Organization

3D Modeler editor scripts are organized into the following categories:

[Draw Menu Commands](#)

[Edit Menu Commands](#)

[Modeler Menu Commands](#)

[Cable Modeling Commands](#)

[Other oEditor Commands](#)

Draw Menu Commands

[Create3DComponent](#)

[CreateBondwire](#)

[CreateBox](#)

[CreateCircle](#)

[CreateCone](#)

[CreateCutplane](#)

[CreateCylinder](#)

[CreateEllipse](#)

[CreateEquationCurve](#)

[CreateEquationSurface](#)

[CreateHelix](#)

[CreatePoint](#)

[CreatePolyline](#)

[CreateRectangle](#)

[CreateRegion](#)

[CreateRegularPolygon](#)

[CreateRegularPolyhedron](#)

[CreateSphere](#)

[CreateSpiral](#)

[CreateSubregion](#)

[CreateTorus](#)

[CreateUserDefinedModel](#)

[CreateUserDefinedPart](#)

[Edit3DComponent](#)

[EditPolyline](#)

[Get3DComponentDefinitionNames](#)

[Get3DComponentInstanceNames](#)

[Get3DComponentMaterialNames](#)

[Get3DComponentMaterialProperties](#)

[Get3DComponentParameters](#)

[Insert3DComponent](#)

[InsertPolylineSegment](#)

[SweepAlongPath](#)

[SweepAlongVector](#)

[SweepAroundAxis](#)

[SweepFacesAlongNormal](#)

[SweepFacesAlongNormalWithAttributes](#)

[UpdateComponentDefinition](#)

Create3DComponent

Creates a 3D component.

UI Access	Draw > 3D Component Library > Create 3D Component.		
Parameters	Name	Type	Description
	<CreateData>	Array	Structured array containing geometry data: (Array["NAME:CreateData", "ComponentName:=", "<string>", "Company:=", "<string>", "Company URL:=", "<string>", "Model Number:=", "<string>", "Help URL:=" , "<string>", "Version:=", "<string>", "Notes:=", "<string>", "IconType:=", "<string>", "Owner:=", "<string>", "Email:=", "<string>", "Date:=", "<string>", #Component creation date "HasLabel:=", <boolean>,

			<pre> "IsEncrypted:=", <boolean>, "AllowEdit:=", <boolean>, "SecurityMessage:=", " <string>", "Password:=", " <string>", "EditPassword:=", " <string>", "PasswordType:=", " <string>", "HideContents:=", <boolean>, "ReplaceNames:=", <boolean>, #for objects and materials "ComponentOutline:=", " <string>,"#"None" or "Bounding Box" "IncludedParts:=", [Array of partnames], "HiddenParts:=", [Array of hidden parts], "IncludedCS:=", [Array of included CS], "DefaultHandle:=", " <reference CS>" "IncludedParameters:=", [Array of included parameters], "IncludedDependentParameters:=", [Array of dependent parameters], "ParameterDescription:=", <array> "IsLicensed:=", <boolean> "LicensingDllName:=", " <string>" "VendorComponentIdentifier:=", " <string>" "PublicKeyFile:=", " <string>" </pre>

			]
	<DesignData>	Array	Structured array containing design data: Array["NAME:DesignData", "Boundaries:=", <array>, "Excitations:=", <array>, "MeshOperations:=", <array>]
	<FileName>	String	Full file path to 3D component.
	<ImageFile>	Array	Optional. Structured array containing file path of 3D component image: Array["NAME:ImageFile", "ImageFile:=", <string>])
Return Value	None.		

Python Syntax	Create3DComponent(<CreateData>, <DesignData>, <FileName>, <ImageFile>)
Python Example	<pre>oEditor.Create3DComponent(["NAME:CreateData", "ComponentName:=", "Connector", "Company:=", "", "Company URL:=", "", "Version:=", "1.0", "Notes:=", "", "Owner:=", "", "IconType:=", "", "Email:=", "",</pre>


```

    "Date:=", "11:41:01 AM Aug 28, 2024",
    "HasLabel:=", false,
    "IsEncrypted:=", , False,
    "AllowEdit:=", , False,
    "SecurityMessage:=", , "",
    "Password:=", , "",
    "EditPassword:=", , "",
    "PasswordType:=", , "UnknownPassword",
    "HideContents:=", , True,
    "ReplaceNames:=", , True,
    "ComponentOutline:=", , "None",
    "IncludedParts:=", ["Box1", "Cylinder1", "Cone1"],
    "IncludedCS:=", ["RelativeCS1"],
    "DefaultHandle:=", "Global",
    "IncludedParameters:=", ["htcone", "lr", "htcyl", "zs", "radcyl", "xs", "$rp",
    "$con"],
    "IncludedDependentParameters:=", [],
    "ParameterDescription:=", [],
    "IsLicensed:=", , False,
    "LicensingDllName:=", , "",
    "VendorComponentIdentifier:=", "",
    "PublicKeyFile:=", , ""
  ],
  [
    "NAME:DesignData",
    "Boundaries:=", ["PerfE1", "FiniteCond1"],
    "Excitations:=", ["1"],
    "MeshOperations:=", []
  ],
  "C:/tmp/Connector.a3dcomp",
  [
    "NAME:ImageFile", "ImageFile:=", ""
  ]
)

```

Example with an External Circuit:

```
oDesign = oProject.SetActiveDesign("Maxwell3DDesign1")
oEditor = oDesign.SetActiveEditor("3D Modeler")
oEditor.Create3DComponent(
[
  "NAME:CreateData",
  "ComponentName:=" , "Maxwell3DDesign1",
  "Company:=" , "",
  "Company URL:=" , "",
  "Model Number:=" , "",
  "Help URL:=" , "",
  "Version:=" , "1.0",
  "Notes:=" , "",
  "IconType:=" , "",
  "Owner:=" , "",
  "Email:=" , "",
  "Date:=" , "3:36:11 PM Feb 14, 2025",
  "HasLabel:=" , False,
  "IsEncrypted:=" , False,
  "AllowEdit:=" , False,
  "SecurityMessage:=" , "",
  "Password:=" , "",
  "EditPassword:=" , "",
  "PasswordType:=" , "UnknownPassword",
  "HideContents:=" , True,
  "ReplaceNames:=" , True,
  "ComponentOutline:=" , "None",
  "IncludedParts:=" , ["Box1"],
  "HiddenParts:=" , [],
  "IncludedCS:=" , [],
  "DefaultHandle:=" , "Global",
  "IncludedParameters:=" , [],
  "IncludedDependentParameters:=" , [],
  "ParameterDescription:=" , [],
```

```

    "IsLicensed:=" , False,
    "LicensingDllName:=" , "",
    "VendorComponentIdentifier:=" , "",
    "PublicKeyFile:=" , ""
  ],
  [
    "NAME:DesignData",
    "Excitations:=" , ["CoilTerminal1","CoilTerminal2","Winding1","External Circuit"]
  ],
  "F:/Designs/ComponentExternalCircuit/test.a3dcomp",
  [
    "NAME:ImageFile",
    "ImageFile:=" , ""
  ]
])

```

CreateBondwire

Creates a bondwire.

UI Access	Draw > Bondwire.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array ("NAME:BondwireParameters", "WireType:=", <string("JEDEC_4Points", "JEDEC_5Points", or "LOW")>, "WireDiameter:=", <string>, "NumSides:=", <value>, "XPadPos:=", <value>, "YPadPos:=", <value>, "ZPadPos:=", <value>,

			<pre> "XDir:=", <value>, "YDir:=", <value>, "ZDir:=", <value>, "Distance:=", <value>, "h1:=", <value>, "h2:=", <value>, "alpha:=", <value>, "beta:=", <value>, "WhichAxis:=", <string("X","Y", or "Z")>, "ReverseDirection:=", <boolean> </pre>
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateBondwire(<Parameters>, <Attributes>)		
Python Example	<pre> oEditor.CreateBondwire(["NAME:BondwireParameters", "WireType:=" , "JEDEC_4Points", "WireDiameter:=" , "0.025mm", "NumSides:=" , "6", "XPadPos:=" , "1.6mm", </pre>		

```

"YPadPos:="          , "-0.2mm",
"ZPadPos:="          , "0mm",
"XDir:="             , "-2.2mm",
"YDir:="             , "-1.4mm",
"ZDir:="             , "0mm",
"Distance:="         , "2.60768096208106mm",
"h1:="               , "0.2mm",
"h2:="               , "0mm",
"alpha:="            , "80deg",
"beta:="             , "0",
"WhichAxis:="        , "Z",
"ReverseDirection:=" , True
],
["NAME:Attributes",
  "Name:="            , "Bondwire1",
  "Flags:="           , "",
  "Color:="           , "(143 175 143)",
  "Transparency:="    , 0,
  "PartCoordinateSystem:=", "Global",
  "UDMId:="           , "",
  "MaterialValue:="   , "\"vacuum\"",

```

	<pre>"SurfaceMaterialValue:=", "\"\\"", " SolveInside:=" , True, "ShellElement:=" , False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False])</pre>

CreateBox

Creates a box.

UI Access	Draw > Box.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array ("NAME:BoxParameters", "XPosition:=", <string>, "YPosition:=", <string>, "ZPosition:=", <string>, "XSize:=" , <string>, "YSize:=" , <string>,

			"ZSize:=" , <string>)
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateBox(<Parameters>, <Attributes>)
Python Example	<pre> oEditor.CreateBox(["NAME:BoxParameters", "XPosition:=" , "0.5mm", "YPosition:=" , "-6.5mm", "ZPosition:=" , "0mm", "XSize:=" , "2mm", "YSize:=" , "1.5mm", "ZSize:=" , "1.5mm"], ["NAME:Attributes", "Name:=" , "Box3", "Flags:=" , "", "Color:=" , "(143 175 143)", "Transparency:=" , 0, "PartCoordinateSystem:=" , "Global", "UDMId:=" , "", </pre>

	<pre>"MaterialValue:=" , "\"copper\"", "SurfaceMaterialValue:=" , "\"\"", "SolveInside:=" , False, "ShellElement:=" , False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False])</pre>

CreateCircle

Creates a circle.

UI Access	Draw > Circle.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:CircleParameters", "IsCovered:=", <boolean>, "XCenter:=", <value>, "YCenter:=", <value>, "ZCenter:=", <value>,

			"Radius:=", <value>, "WhichAxis:=", <string> "NumSegments:=", <string containing integer>)
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateCircle(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreateCircle(["NAME:CircleParameters", "IsCovered:=" , True, "XCenter:=" , "5.5mm", "YCenter:=" , "-3mm", "ZCenter:=" , "0mm", "Radius:=" , "0.707106781186548mm", "WhichAxis:=" , "Z", "NumSegments:=" , "0"], ["NAME:Attributes", "Name:=" , "Circle1", "Flags:=" , "", "Color:=" , "(143 175 143)",</pre>

	<pre>"Transparency:=" , 0, "PartCoordinateSystem:=", "Global", "UDMId:=" , "", "MaterialValue:=" , "\"copper\"", "SurfaceMaterialValue:=", "\"\"", "SolveInside:=" , False, "ShellElement:=" , False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False l)</pre>

CreateCone

Creates a cone.

UI Access	Draw > Cone.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:ConeParameters", "XCenter:=", <string>,

			"YCenter:=", <string>, "ZCenter:=", <string>, "WhichAxis:=", <string>, "Height:=", <string>, "BottomRadius:=", <string>, "TopRadius:=", <string>)
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateCone(<Parameters>, <Attributes>)
Python Example	<pre> oEditor.CreateCone (["NAME:ConeParameters", "XCenter:=" , "3mm", "YCenter:=" , "-4.5mm", "ZCenter:=" , "0mm", "WhichAxis:=" , "Z", "Height:=" , "2.5mm", "BottomRadius:=" , "2.82842712474619mm", "TopRadius:=" , "2.23606797749979mm"], ["NAME:Attributes", </pre>

	<pre>"Name:=" , "Cone1", "Flags:=" , "", "Color:=" , "(143 175 143)", "Transparency:=" , 0, "PartCoordinateSystem:=", "Global", "UDMId:=" , "", "MaterialValue:=" , "\"copper\"", "SurfaceMaterialValue:=", "\"\"", "SolveInside:=" , False, "ShellElement:=" , False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False]</pre>

CreateCutplane

Creates a cutplane.

UI Access	Draw > Plane.

Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. ["NAME:PlaneParameters", "PlaneBaseX=", <string>, "PlaneBaseY=", <string>, "PlaneBaseZ=", <string>, "PlaneNormalX=", <string>, "PlaneNormalY=", <string>, "PlaneNormalZ=", <string>]
	<AttributesArray>	Array	See: AttributesArray . CreateCutplane only takes the Name and Color attributes.
Return Value	None.		

Python Syntax	CreateCutplane(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreateCutplane(["NAME:PlaneParameters", "PlaneBaseX=" , "-0.6mm", "PlaneBaseY=" , "-0.8mm", "PlaneBaseZ=" , "0mm", "PlaneNormalX=" , "1.2mm", "PlaneNormalY=" , "0.2mm", "PlaneNormalZ=" , "0mm"])</pre>

	<pre>], ["NAME:Attributes", "Name:=" , "Plane1", "Color:=" , "(143 175 143)"]] </pre>

CreateCylinder

Creates a cylinder.

UI Access	Draw > Cylinder.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:CylinderParameters", "XCenter:=", <string>, "YCenter:=", <string>, "ZCenter:=", <string>, "Radius:=", <string>, "Height:=", <string>, "WhichAxis:=", <string>, "NumSides:=", <string containing integer>)
	<AttributesArray>	Array	Structured array. See: AttributesArray .

Return Value	None.

Python Syntax	CreateCylinder(<Parameters>, <Attributes>)
Python Example	<pre> oEditor.CreateCylinder(["NAME:CylinderParameters", "XCenter:=" , "6mm", "YCenter:=" , "-4.5mm", "ZCenter:=" , "0mm", "Radius:=" , "0.5mm", "Height:=" , "4.5mm", "WhichAxis:=" , "Z", "NumSides:=" , "0"], ["NAME:Attributes", "Name:=" , "Cylinder1", "Flags:=" , "", "Color:=" , "(143 175 143)", "Transparency:=" , 0, "PartCoordinateSystem:=" , "Global", "UDMId:=" , "", "MaterialValue:=" , "\"copper\"", </pre>

	<pre>"SurfaceMaterialValue:=", "\"\"\"", "SolveInside:=" , False, "ShellElement:=" , False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False])</pre>

CreateEllipse

Creates an ellipse.

UI Access	Draw > Ellipse.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:EllipseParameters", "IsCovered:=", <string>, "XCenter:=", <string>, "YCenter:=", <string>, "ZCenter:=", <string>, "MajRadius:=", <string>,

			"Ratio:=", <string>, "WhichAxis:=", <string>, "NumSegments:=", <string>
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateEllipse(<Parameters>, <Attributes>)
Python Example	<pre> oEditor.CreateEllipse(["NAME:EllipseParameters", "IsCovered:=" , True, "XCenter:=" , "0.6mm", "YCenter:=" , "-0.6mm", "ZCenter:=" , "0mm", "MajRadius:=" , "0.2mm", "Ratio:=" , "7", "WhichAxis:=" , "Z", "NumSegments:=" , "0"], ["NAME:Attributes", "Name:=" , "Ellipse1", "Flags:=" , "", </pre>

	<pre>"Color:=" , "(143 175 143)", "Transparency:=" , 0, "PartCoordinateSystem:=", "Global", "UDMId:=" , "", "MaterialValue:=" , "\"copper\"", "SurfaceMaterialValue:=", "\"\"", "SolveInside:=" , False, "ShellElement:=" , False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False])</pre>

CreateEquationCurve

Creates an equation-based curve.

UI Access	Draw > Equation-Based Curve.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:EquationBasedCurveParameters",

			"XtFunction:=", <string>, "YtFunction:=", <string>, "ZtFunction:=", <string>, "tStart:=", <string>, "tEnd:=", <string>, "NumOfPointsOnCurve:=", <string>, "Version:=", <integer>), <polylineArray(optional)>
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateEquationCurve(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreateEquationCurve(["NAME:EquationBasedCurveParameters", "XtFunction:=" , "1", "YtFunction:=" , "3", "ZtFunction:=" , "32", "tStart:=" , "1", "tEnd:=" , "3", "NumOfPointsOnCurve:=" , "0", "Version:=" , 1,</pre>

```
[ "NAME:PolylineXSection",  
  "XSectionType:="      , "None",  
  "XSectionOrient:="    , "Auto",  
  "XSectionWidth:="     , "0",  
  "XSectionTopWidth:="  , "0",  
  "XSectionHeight:="    , "0",  
  "XSectionNumSegments:=" , "0",  
  "XSectionBendType:="   , "Corner"  
]  
],  
[ "NAME:Attributes",  
  "Name:="              , "EquationCurve1",  
  "Flags:="             , "",  
  "Color:="             , "(143 175 143)",  
  "Transparency:="      , 0,  
  "PartCoordinateSystem:=", "Global",  
  "UDMId:="             , "",  
  "MaterialValue:="     , "\"copper\"",  
  "SurfaceMaterialValue:=", "\"\"",  
  "SolveInside:="       , False,
```

	<pre> "ShellElement:=" , False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False l) </pre>

CreateEquationSurface

Creates an equation-based surface.

UI Access	Draw > Equation-Based Surface.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre> Array("NAME:EquationBasedSurfaceParameters", "XuvFunction:=" , <string equation containing Func- tion, Operators and/or quantities _u, _v, or PI>, "YuvFunction:=" , <string equation containing Func- tion, Operators and/or quantities _u, _v, or PI>, "ZuvFunction:=" , <string equation containing Func- tion, Operators and/or quantities _u, _v, or PI>, "uStart:=" , <string>, "uEnd:=" , <string>, "vStart:=" , <string>, "vEnd:=" , <string>, </pre>

			"Version:=" , <integer>)
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateEquationSurface(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreateEquationSurface(["NAME:EquationBasedSurfaceParameters", "XuvFunction:=" , "_u", "YuvFunction:=" , "_v", "ZuvFunction:=" , "sin(_u)+cos(_v)", "uStart:=" , "1", "uEnd:=" , "10", "vStart:=" , "1", "vEnd:=" , "10", "Version:=" , 1], ["NAME:Attributes", "Name:=" , "EquationSurface1", "Flags:=" , "", "Color:=" , "(143 175 143)",</pre>

```

"Transparency:="          , 0,
"PartCoordinateSystem:=", "Global",
"UDMId:="                  , "",
"MaterialValue:="          , "\"copper\"",
"SurfaceMaterialValue:=", "\"\"",
"SolveInside:="            , False,
"ShellElement:="           , False,
"ShellElementThickness:=", "0mm",
"IsMaterialEditable:="     , True,
"UseMaterialAppearance:=", False,
"IsLightweight:="          , False
l)

```

CreateHelix

Creates a helix based on a sweep of specified objects.

UI Access	Draw > Helix.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array.
			<pre> Array("NAME:HelixParameters", "XCenter:=" , <string>, "YCenter:=" , <string>, </pre>

			<code>"ZCenter:=" , <string>, "XStartDir:=" , <string>, "YStartDir:=" , <string>, "ZStartDir:=" , <string>, "NumThread:=" , <string>, "RightHand:=" , <boolean>, "RadiusIncrement:=" , <string>, "Thread:=" , <string>)</code>
Return Value	None.		

Python Syntax	CreateHelix(<SelectionsArray>, <Parameters>)		
Python Example	<pre>oEditor.CreateHelix(["NAME:Selections", "Selections:=" , "EquationSurface2", "NewPartsModelFlag:=" , "Model"], ["NAME:HelixParameters", "XCenter:=" , "10000mm", "YCenter:=" , "40000mm", "ZCenter:=" , "0mm",</pre>		

	<pre> "XStartDir:=" , "0mm", "YStartDir:=" , "10000mm", "ZStartDir:=" , "0mm", "NumThread:=" , "1", "RightHand:=" , True, "RadiusIncrement:=" , "0mm", "Thread:=" , "1mm"]) </pre>

CreatePoint

Creates a point.

UI Access	Draw > Point.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:PointParameters", "PointX:=", <value>, "PointY:=", <value>, "PointZ:=", <value>)
	<AttributesArray>	Array	Structured array. See: AttributesArray . CreatePoint takes only the Name and Color attributes.
Return Value	None.		

Python Syntax	CreatePoint(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreatePoint(["NAME:PointParameters", "PointX:=" , "0.2mm", "PointY:=" , "-0.2mm", "PointZ:=" , "0mm"], ["NAME:Attributes", "Name:=" , "Point1", "Color:=" , "(143 175 143) "])</pre>

CreatePolyline

Creates a polyline.

UI Access	Draw > Line.		
Parameters	Name	Type	Description

	<Parameters>	Array	Structured array. Array("NAME:PolylineParameters", "IsPolylineCovered:=", <bool>, "IsPolylineClosed:=", <bool>, <PolylinePointsArray>, <PolylineSegmentsArray>)
	<PolylinePointsArray>	Array	Array("NAME:PolylinePoints", <OnePointArray>, <OnePointArray>, ...)
	<OnePointArray>	Array	Array("NAME:PLPoint", "X:=", <value>, "Y:=", <value>, "Z:=", <value>))
	<PolylineSegmentsArray>	Array	<PolylineSegmentsArray> Array("NAME:PolylineSegments", <OneSegmentArray>, <OneSegmentArray>, ...)
	<OneSegmentArray>	Array	Array("NAME:PLSegment", "SegmentType:=", <"Line", "Arc", "Spline", or "AngularArc">, "StartIndex:=", <value>, "NoOfPoints:=", <value>)
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreatePolyline(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreatePolyline(["NAME:PolylineParameters", "IsPolylineCovered:=" , True, "IsPolylineClosed:=" , False, ["NAME:PolylinePoints", ["NAME:PLPoint", "X:=" , "20000mm", "Y:=" , "-20000mm", "Z:=" , "0mm"], ["NAME:PLPoint", "X:=" , "-90000mm", "Y:=" , "20000mm", "Z:=" , "0mm"], ["NAME:PLPoint", "X:=" , "10000mm", "Y:=" , "-140000mm", "Z:=" , "0mm"</pre>

```

    ]
  ],
  ["NAME:PolylineSegments",
    ["NAME:PLSegment",
      "SegmentType:="      , "Line",
      "StartIndex:="      , 0,
      "NoOfPoints:="      , 2
    ],
    ["NAME:PLSegment",
      "SegmentType:="      , "Line",
      "StartIndex:="      , 1,
      "NoOfPoints:="      , 2
    ]
  ]
],
["NAME:PolylineXSection",
  "XSectionType:="      , "None",
  "XSectionOrient:="    , "Auto",
  "XSectionWidth:="     , "0mm",
  "XSectionTopWidth:="  , "0mm",
  "XSectionHeight:="    , "0mm",
  "XSectionNumSegments:=" , "0",

```

```
"XSectionBendType:="      , "Corner"
]],
["NAME:Attributes",
  "Name:="                  , "Polyline1",
  "Flags:="                 , "",
  "Color:="                 , "(143 175 143)",
  "Transparency:="         , 0,
  "PartCoordinateSystem:=", "Global",
  "UDMId:="                 , "",
  "MaterialValue:="        , "\"copper\"",
  "SurfaceMaterialValue:=", "\"\"",
  "SolveInside:="          , False,
  "ShellElement:="         , False,
  "ShellElementThickness:=", "0mm",
  "IsMaterialEditable:="    , True,
  "UseMaterialAppearance:=", False,
  "IsLightweight:="        , False
])
```

CreateRectangle

Creates a rectangle.

UI Access	Draw > Rectangle.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre>Array("NAME:RectangleParameters", "IsCovered:=" , <boolean>, "XStart:=" , <string>, "YStart:=" , <string>, "ZStart:=" , <string>, "Width:=" , <string>, "Height:=" , <string>, "WhichAxis:=" , <string "X", "Y", or "Z">)</pre>
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateRectangle(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreateRectangle(["NAME:RectangleParameters", "IsCovered:=" , True, "XStart:=" , "-80000mm", "YStart:=" , "-90000mm", "ZStart:=" , "0mm", "Width:=" , "20000mm",</pre>

```
"Height:="                , "30000mm",
"WhichAxis:="             , "Z"
],
["NAME:Attributes",
  "Name:="                 , "Rectangle1",
  "Flags:="                , "",
  "Color:="                , "(143 175 143)",
  "Transparency:="        , 0,
  "PartCoordinateSystem:=", "Global",
  "UDMId:="                , "",
  "MaterialValue:="        , "\"copper\"",
  "SurfaceMaterialValue:=", "\"\"",
  "SolveInside:="          , False,
  "ShellElement:="         , False,
  "ShellElementThickness:=", "0mm",
  "IsMaterialEditable:="    , True,
  "UseMaterialAppearance:=", False,
  "IsLightweight:="         , False
])
```


CreateRegion

Creates a region containing the design.

UI Access	Draw > Region.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre>Array("NAME:RegionParameters", "+XPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "+XPadding:=", <string X value>, "-XPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "-XPadding:=", <string -X value>, "+YPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "+YPadding:=", <string Y value>, "-YPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "-YPadding:=", <string -Y value>, "+ZPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "+ZPadding:=", <string Z value>, "-ZPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">,</pre>

			"-ZPadding:=", <string -Z value>)
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateRegion(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreateRegion(["NAME:RegionParameters", "+XPaddingType:=" , "Percentage Offset", "+XPadding:=" , "0", "-XPaddingType:=" , "Percentage Offset", "-XPadding:=" , "0", "+YPaddingType:=" , "Percentage Offset", "+YPadding:=" , "0", "-YPaddingType:=" , "Percentage Offset", "-YPadding:=" , "0", "+ZPaddingType:=" , "Percentage Offset", "+ZPadding:=" , "0", "-ZPaddingType:=" , "Percentage Offset", "-ZPadding:=" , "0"],</pre>

```
[ "NAME:Attributes",
  "Name:="                , "Region",
  "Flags:="                , "Wireframe#",
  "Color:="                , "(143 175 143)",
  "Transparency:="        , 0,
  "PartCoordinateSystem:=", "Global",
  "UDMId:="                , "",
  "MaterialValue:="        , "\"vacuum\"",
  "SurfaceMaterialValue:=", "\"\"",
  "SolveInside:="          , False,
  "ShellElement:="         , False,
  "ShellElementThickness:=", "nan ",
  "IsMaterialEditable:="   , True,
  "UseMaterialAppearance:=", False,
  "IsLightweight:="        , False
]
```

CreateRegularPolygon

Creates a regular polygon.

UI Access	Draw > Regular Polygon.		
Parameters	Name	Type	Description

	<i><Parameters></i>	Array	Structured array. Array("NAME:RegularPolygonParameters", "IsCovered:=" , <boolean>, "XCenter:=" , <string>, "YCenter:=" , <string>, "ZCenter:=" , <string>, "XStart:=" , <string>, "YStart:=" , <string>, "ZStart:=" , <string>, "NumSides:=" , <string containing number greater than 2>, "WhichAxis:=" , <string "X", "Y", or "Z">)
	<i><AttributesArray></i>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateRegularPolygon(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreateRegularPolygon(["NAME:RegularPolygonParameters", "IsCovered:=" , True, "XCenter:=" , "-70000mm",</pre>

```

"YCenter:="          , "-100000mm",
"ZCenter:="          , "0mm",
"XStart:="           , "-50000mm",
"YStart:="           , "-80000mm",
"ZStart:="           , "0mm",
"NumSides:="          , "12",
"WhichAxis:="         , "Z"
],
["NAME:Attributes",
  "Name:="             , "Polygon1",
  "Flags:="            , "",
  "Color:="            , "(143 175 143)",
  "Transparency:="     , 0,
  "PartCoordinateSystem:=", "Global",
  "UDMId:="            , "",
  "MaterialValue:="     , "\"copper\"",
  "SurfaceMaterialValue:=", "\"\"",
  "SolveInside:="      , False,
  "ShellElement:="     , False,
  "ShellElementThickness:=", "0mm",
  "IsMaterialEditable:=" , True,

```

	<pre>"UseMaterialAppearance:=", False, "IsLightweight:=" , False 1)</pre>

CreateRegularPolyhedron

Creates a regular polyhedron.

UI Access	Draw > Regular Polyhedron.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:PolyhedronParameters", "XCenter:=" , <string>, "YCenter:=" , <string>, "ZCenter:=" , <string>, "XStart:=" , <string>, "YStart:=" , <string>, "ZStart:=" , <string>, "Height:=" , <string>, "NumSides:=" , <string containing number greater than 2>, "WhichAxis:=" , <string "X", "Y", or "Z">)
	<AttributesArray>	Array	Structured array. See: AttributesArray .

Return Value	None.

Python Syntax	CreateRegularPolyhedron(<Parameters>, <Attributes>)
Python Example	<pre>oEditor.CreateRegularPolyhedron(["NAME:PolyhedronParameters", "XCenter:=" , "40000mm", "YCenter:=" , "-80000mm", "ZCenter:=" , "0mm", "XStart:=" , "50000mm", "YStart:=" , "-70000mm", "ZStart:=" , "0mm", "Height:=" , "50000mm", "NumSides:=" , "8", "WhichAxis:=" , "Z"], ["NAME:Attributes", "Name:=" , "RegularPolyhedron1", "Flags:=" , "", "Color:=" , "(143 175 143)", "Transparency:=" , 0, "PartCoordinateSystem:=" , "Global",</pre>

	<pre>"UDMId:=" , "", "MaterialValue:=" , "\"copper\"", "SurfaceMaterialValue:=", "\"\"", "SolveInside:=" , False, "ShellElement:=" , False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False])</pre>

CreateSphere

Creates a sphere.

UI Access	Draw > Sphere.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array ("NAME:SphereParameters", "XCenter:=", <string>, "YCenter:=", <string>, "ZCenter:=", <string>,

			"Radius:=", <string>)
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateSphere(<Parameters>, <Attributes>)
Python Example	<pre> oEditor.CreateSphere (["NAME:SphereParameters", "XCenter:=" , "-40000mm", "YCenter:=" , "-130000mm", "ZCenter:=" , "0mm", "Radius:=" , "22360.6797749979mm"], ["NAME:Attributes", "Name:=" , "Sphere1", "Flags:=" , "", "Color:=" , "(143 175 143)", "Transparency:=" , 0, "PartCoordinateSystem:=" , "Global", "UDMId:=" , "", "MaterialValue:=" , "\"copper\"", "SurfaceMaterialValue:=" , "\"\"", </pre>

	<pre>"SolveInside:=" , False, "ShellElement:=" , False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False])</pre>

CreateSpiral

Creates a spiral by sweeping the specified object(s).

UI Access	Draw > Spiral.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array ("NAME:SpiralParameters", "XCenter:=" , <string>, "YCenter:=" , <string>, "ZCenter:=" , <string>, "YStartDir:=" , <string>, "ZStartDir:=" , <string>,

			"NumThread:=" , <string>, "RightHand:=" , <boolean>, "RadiusIncrement:=" , <string>)
Return Value	None.		

Python Syntax	CreateSpiral(<Parameters>, <Attributes>)
Python Example	<pre> oEditor.CreateSpiral(["NAME:Selections", "Selections:=" , "Polygon2", "NewPartsModelFlag:=" , "Model"], ["NAME:SpiralParameters", "XCenter:=" , "-70000mm", "YCenter:=" , "50000mm", "ZCenter:=" , "0mm", "XStartDir:=" , "-60000mm", "YStartDir:=" , "-10000mm", "ZStartDir:=" , "0mm", "NumThread:=" , "1", "RightHand:=" , True, "RadiusIncrement:=" , "1mm" </pre>

	1)

CreateSubRegion

Creates a subregion containing a selected part of the design.

UI Access	Draw > Subregion.		
Parameters	Name	Type	Description
	<SubRegionParameters>	Array	Structured array. Array("NAME:SubRegionParameters", "+XPaddingType=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "+XPadding=", <string X value>, "-XPaddingType=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "-XPadding=", <string -X value>, "+YPaddingType=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "+YPadding=", <string Y value>, "-YPaddingType=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "-YPadding=", <string -Y value>, "+ZPaddingType=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">,

```
" + ZPadding:=", <string Z value>,  
"-ZPaddingType:=", <string "Percentage Offset",  
"Absolute Offset", or "Absolute Position">,  
"-ZPadding:=", <string -Z value>  
  
[  
  "NAME:BoxForVirtualObjects",  
    [  
      "NAME:LowPoint",  
        x,  
        y,  
        z  
    ],  
    [  
      "NAME:HighPoint",  
        x,  
        y,  
        z  
    ]  
  ],  
  [  
    "NAME:SubRegionParts",
```

			<pre><partID>], ["NAME:SubRegionSubmodels"]], ["NAME:Attributes", "Name:=" , "SubRegion", "Flags:=" , "Wireframe#", "Color:=" , "<colorID>", "Transparency:=" , <int>, "PartCoordinateSystem:=", "<coordID>", "UDMId:=" , "", "MaterialValue:=" , "\"<materialName>\"", "SurfaceMaterialValue:=", "\"\"\"", "SolveInside:=" , <Boolean>, "ShellElement:=" , <Boolean>, "ShellElementThickness:=", "<value> ", "ReferenceTemperature:=", "<value> ",</pre>

			<pre> "IsMaterialEditable:=" , <Boolean>, "UseMaterialAppearance:=", <Boolean>, "IsLightweight:=" , <Boolean>]) </pre>
Return Value	None.		

Python Syntax	CreateSubRegion(<Parameters>, <Attributes>)
Python Example	<pre> oEditor = oDesign.SetActiveEditor("3D Modeler") oEditor.CreateSubRegion(["NAME:SubRegionParameters", "+XPaddingType:=" , "Percentage Offset", "+XPadding:=" , "0", "-XPaddingType:=" , "Percentage Offset", "-XPadding:=" , "0", "+YPaddingType:=" , "Percentage Offset", "+YPadding:=" , "0", "-YPaddingType:=" , "Percentage Offset", "-YPadding:=" , "0", "+ZPaddingType:=" , "Percentage Offset", </pre>

```
+ZPadding:= " , "0",
-ZPaddingType:= " , "Percentage Offset",
-ZPadding:= " , "0",
[
  "NAME:BoxForVirtualObjects",
  [
    "NAME:LowPoint",
    1,
    1,
    1
  ],
  [
    "NAME:HighPoint",
    -1,
    -1,
    -1
  ]
],
[
  "NAME:SubRegionParts",
```



```
34
],
[
    "NAME:SubRegionSubmodels"
]
],
[
    "NAME:Attributes",
    "Name:=" , "SubRegion",
    "Flags:=" , "Wireframe#",
    "Color:=" , "(143 175 143)",
    "Transparency:=" , 0,
    "PartCoordinateSystem:=", "Global",
    "UDMId:=" , "",
    "MaterialValue:=" , "\"vacuum\"",
    "SurfaceMaterialValue:=", "\"\"",
    "SolveInside:=" , True,
    "ShellElement:=" , False,
    "ShellElementThickness:=", "nan ",
    "ReferenceTemperature:=", "nan ",
    "IsMaterialEditable:=" , True,
```

	<pre>"UseMaterialAppearance:=", False, "IsLightweight:=" , False])</pre>

CreateTorus

Creates a torus.

UI Access	Draw > Torus.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:TorusParameters", "XCenter:=" , <string>, "YCenter:=" , <string>, "ZCenter:=" , <string>, "MajorRadius:=" , <string>, "MinorRadius:=" , <string>, "WhichAxis:=" , <string "X", "Y", or "Z">)
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		
Python Syntax	CreateTorus(<Parameters>, <Attributes>)		

Python Example

```

oEditor.CreateTorus(
["NAME:TorusParameters",
    "XCenter:="          , "0.6mm",
    "YCenter:="          , "-0.6mm",
    "ZCenter:="          , "0mm",
    "MajorRadius:="      , "0.365028153987289mm",
    "MinorRadius:="      , "0.0821854415126694mm",
    "WhichAxis:="        , "Z"
],
["NAME:Attributes",
    "Name:="              , "Torus1",
    "Flags:="              , "",
    "Color:="              , "(143 175 143)",
    "Transparency:="       , 0,
    "PartCoordinateSystem:=", "Global",
    "UDMId:="              , "",
    "MaterialValue:="      , "\"copper\"",
    "SurfaceMaterialValue:=", "\"\"",
    "SolveInside:="        , False,
    "ShellElement:="       , False,
    "ShellElementThickness:=", "0mm",

```

	<pre>"IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False])</pre>

CreateUserDefinedModel

Creates a user-defined model.

Note: This option can be used to create a UDM from a Discovery model (**Modeler** > [Discovery Link](#)).

UI Access	Draw > User-Defined Model > [Model]		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. ["NAME:UserDefinedModelParameters", <definitionArray>, <optionsArray>, <geometryParamsArray>, "DllName:=", <string filepath>, "Library:=", <string>, "Version:=", <string> "ConnectionID:=", <string>]
	<definitionArray>	Array	Structured array containing string "NAME:Definition"

	<optionsArray>	Array	Structured array containing string "NAME:Options"
	<geometryParamsArray>	Array	Structured array containing arrays for individual parameters: <pre>["NAME:GeometryParameters", ["NAME:UDMParam", "Name:=" , <string>, "Value:=" , <string>, "PropType2:=" , <integer>, "PropFlag2:=" , <integer>]]</pre> Required UDM parameters depend on the UDM being created. To see which properties apply to a UDM, right-click the UDM in the Project Tree and select Properties. Then select the Parameters tab. PropType2 can be any of the following: • 0 – Property takes a string value. • 1 – Property is a menu option. • 2 – Property takes a number (integer or double). • 3 – Property takes a value (numbers, variables, or expressions). • 4 – Property is a file name. • 5 – Property corresponds to a check box. • 6 – Property specifies a 3D position. PropFlag2 can be any of the following: • 0 – No flags • 1 – Read-only • 2 – Must be integer • 4 – Must be real

		• 8 – Hidden PropFlag2 values can be combined. For example, a read-only property that must be an integer would take the value 3. A hidden property that must be real would take the value 12. These values are further described in the <code>UserDefinedPrimitiveStructures.h</code> file included with the installation under "...\\ANSYS Inc\\v252\\AnsysEM\\UserDefinedPrimitives\\Examples\\Headers"
Return Value	None	

Python Syntax	CreateUserDefinedModel(<Parameters>)	
Python Example	<pre>oEditor.CreateUserDefinedModel (["NAME:UserDefinedModelParameters", ["NAME:Definition"], ["NAME:Options"], ["NAME:GeometryParams", ["NAME:UDMParam", "Name:=", "ILD Thickness (ILD)", "Value:=", "0.006mm", "PropType2:=", 3, "PropFlag2:=", 4</pre>	

```
],  
["NAME:UDMParam",  
  "Name:="          , "Line Spacing (LS)",  
  "Value:="         , "0.004mm",  
  "PropType2:="     , 3,  
  "PropFlag2:="     , 4  
],  
["NAME:UDMParam",  
  "Name:="          , "Line Thickness (LT)",  
  "Value:="         , "0.005mm",  
  "PropType2:="     , 3,  
  "PropFlag2:="     , 4  
],  
["NAME:UDMParam",  
  "Name:="          , "Line Width (LW)",  
  "Value:="         , "0.004mm",  
  "PropType2:="     , 3,  
  "PropFlag2:="     , 4  
],  
["NAME:UDMParam",  
  "Name:="          , "No. of Turns (N)",
```

```
"Value:="                , "2",
"PropType2:="            , 3,
"PropFlag2:="            , 2
],
["NAME:UDMParam",
"Name:="                  , "Outer Diameter (OD)",
"Value:="                  , "0.15mm",
"PropType2:="              , 3,
"PropFlag2:="              , 4
],
["NAME:UDMParam",
"Name:="                  , "Substrate Thickness",
"Value:="                  , "0.2mm",
"PropType2:="              , 3,
"PropFlag2:="              , 4
],
["NAME:UDMParam",
"Name:="                  , "Inductor Type",
"Value:="                  , "\"Square,Square,Octagonal,Circular,Square-Differential,Octagonal-Dif-ferential,Circular-Differential\"",
```



```

"DataType:="          , "String",
"PropType2:="         , 1,
"PropFlag2:="         , 0
],
["NAME:UDMParam",
"Name:="              , "Underpass Thickness (UT) ",
"Value:="             , "0.001mm",
"PropType2:="         , 3,
"PropFlag2:="         , 4
],
["NAME:UDMParam",
"Name:="              , "Via Thickness (VT) ",
"Value:="             , "0.001mm",
"PropType2:="         , 3,
"PropFlag2:="         , 4
]
],
"DllName:="           , "Q3DExtractor/OnDieSpiralInductor.py",
"Library:="           , "syslib",
"Version:="           , "2.0",
"ConnectionID:="      , ""

```

])

])

Python Example of Creating a UDM from a [Discovery](#) Model

```
oEditor.CreateUserDefinedModel(  
    [  
        "NAME:UserDefinedModelParameters",  
        [  
            "NAME:Definition",  
            [  
                "NAME:UDMParam",  
                "Name:=" , "GeometryFilePath",  
                "Value:=" , "\"C:/Users/chenwan/Desktop/restored_files/tee.dsco\"",  
                "DataType:=" , "String",  
                "PropType2:=" , 0,  
                "PropFlag2:=" , 1  
            ],  
            [  
                "NAME:UDMParam",  
                "Name:=" , "ProcessID",  
                "Value:=" , "255988",  
                "DataType:=" , "Int",  
                "PropType2:=" , 2,  
                "PropFlag2:=" , 8  
            ]  
        ],  
        [  
            "NAME:Options",  
            [  
                "NAME:UDMParam",  
                "Name:=" , "IsDiscoveryLink",  
                "Value:=" , "1",  
                "DataType:=" , "Int",
```

```

        "PropType2:=" , 5,
        "PropFlag2:=" , 8
    ],
    [
        "NAME:UDMParam",
        "Name:=" , "Solid Bodies",
        "Value:=" , "1",
        "DataType:=" , "Int",
        "PropType2:=" , 5,
        "PropFlag2:=" , 0
    ],
    [
        "NAME:UDMParam",
        "Name:=" , "Surface Bodies",
        "Value:=" , "1",
        "DataType:=" , "Int",
        "PropType2:=" , 5,
        "PropFlag2:=" , 0
    ],
    [
        "NAME:UDMParam",
        "Name:=" , "Parameters",
        "Value:=" , "\"eCADImportParameterType_Independent,eCADImportParameterType_None,eCADIm-
portParameterType_Independent,eCADImportParameterType_All\"",
        "DataType:=" , "String",
        "PropType2:=" , 1,
        "PropFlag2:=" , 0
    ],
    [
        "NAME:UDMParam",
        "Name:=" , "Parameter Key",
        "Value:=" , "\"\"",
        "DataType:=" , "String",
        "PropType2:=" , 0,
        "PropFlag2:=" , 0
    ],
    [
        "NAME:UDMParam",

```

```
"Name:=" , "Named Selections",
"Value:=" , "1",
"DataType:=" , "Int",
"PropType2:=" , 5,
"PropFlag2:=" , 8
],
[
  "NAME:UDMParam",
  "Name:=" , "Materials",
  "Value:=" , "\"None,None,Assignments,Assignments and Properties\"",
  "DataType:=" , "String",
  "PropType2:=" , 1,
  "PropFlag2:=" , 0
],
[
  "NAME:UDMParam",
  "Name:=" , "Import As Lightweight",
  "Value:=" , "0",
  "DataType:=" , "Int",
  "PropType2:=" , 5,
  "PropFlag2:=" , 0
],
[
  "NAME:UDMParam",
  "Name:=" , "Facet Level",
  "Value:=" , "\"3,1,2,3,4,5\"",
  "DataType:=" , "String",
  "PropType2:=" , 1,
  "PropFlag2:=" , 0
],
[
  "NAME:UDMParam",
  "Name:=" , "Cleaning",
  "Value:=" , "0",
  "DataType:=" , "Int",
  "PropType2:=" , 5,
```

```

    "PropFlag2:=" , 0
],
[
    "NAME:UDMParam",
    "Name:=" , "Use Parasolid For Transfer",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
],
[
    "NAME:UDMParam",
    "Name:=" , "Tolerant Stitching",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
],
[
    "NAME:UDMParam",
    "Name:=" , "Stitch Tolerance",
    "Value:=" , "0.1",
    "PropType2:=" , 3,
    "PropFlag2:=" , 8
],
[
    "NAME:UDMParam",
    "Name:=" , "Tighten Gaps",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
],
[
    "NAME:UDMParam",
    "Name:=" , "Tighten Gaps Tolerance",
    "Value:=" , "1e-06",
    "PropType2:=" , 3,

```

```
    "PropFlag2:=" , 8
  ],
  [
    "NAME:UDMParam",
    "Name:=" , "Use Associativity",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
  ],
  [
    "NAME:UDMParam",
    "Name:=" , "Attributes",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
  ],
  [
    "NAME:UDMParam",
    "Name:=" , "Import Coordinate Systems",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
  ],
  [
    "NAME:UDMParam",
    "Name:=" , "Decompose Disjoint Faces",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
  ],
  [
    "NAME:UDMParam",
```

```

    "Name:=" , "Import Using Instances",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
  ],
  [
    "NAME:UDMParam",
    "Name:=" , "Line Bodies",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
  ],
  [
    "NAME:UDMParam",
    "Name:=" , "Mixed Import Resolution",
    "Value:=" , "\"eMixedImport_None\"",
    "DataType:=" , "String",
    "PropType2:=" , 0,
    "PropFlag2:=" , 8
  ],
  [
    "NAME:UDMParam",
    "Name:=" , "Enclosure and Symmetry Processing",
    "Value:=" , "1",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
  ],
  [
    "NAME:UDMParam",
    "Name:=" , "Reader Mode Saves Updated File",
    "Value:=" , "0",
    "DataType:=" , "Int",
    "PropType2:=" , 5,
    "PropFlag2:=" , 8
  ],
],

```

```
[
  "NAME:UDMParam",
  "Name:=" , "Smart CAD Update",
  "Value:=" , "0",
  "DataType:=" , "Int",
  "PropType2:=" , 5,
  "PropFlag2:=" , 8
],
[
  "NAME:UDMParam",
  "Name:=" , "Import Work Points",
  "Value:=" , "1",
  "DataType:=" , "Int",
  "PropType2:=" , 5,
  "PropFlag2:=" , 8
]
],
[
  "NAME:GeometryParams"
],
"DllName:=" , "SACADIntegUDM",
"Library:=" , "installLib",
"Version:=" , "1.0",
"ConnectionID:=" , ""
])
```

CreateUserDefinedPart

Creates a user-defined part.

UI Access	Draw > User-Defined Primitive > [Part]		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array.

			<pre>["NAME:UserDefinedPrimitiveParameters", "DllName:=" , <string>, "Version:=" , <string>, "NoOfParameters:=" , <integer>, "Library:=" , <string>, <paramVectorArray>]</pre>
	<paramVectorArray>	Array	Structured array containing arrays for each pair: <pre>["NAME:ParamVector", <pair>, <pair>, <pair>, ...] <pair>: ["NAME:Pair", "Name:=" , <string>, "Value:=" , <string>]</pre>
	<Attributes>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateUserDefinedPart(<Parameters>, <paramVectorArray>, <Attributes>)
Python Example	<pre>oEditor.CreateUserDefinedPart (["NAME:UserDefinedPrimitiveParameters", "DllName:=" , "RMxpert/LapCoil.dll",</pre>

```
"Version:=" , "16.0",  
"NoOfParameters:=" , 22,  
"Library:=" , "syslib",  
  ["NAME:ParamVector",  
    ["NAME:Pair",  
      "Name:=" , "DiaGap",  
      "Value:=" , "100mm"  
    ],  
    ["NAME:Pair",  
      "Name:=" , "DiaYoke",  
      "Value:=" , "20mm"  
    ],  
    ["NAME:Pair",  
      "Name:=" , "Length",  
      "Value:=" , "100mm"  
    ],  
    ["NAME:Pair",  
      "Name:=" , "Skew",  
      "Value:=" , "0deg"  
    ],  
  ],
```

```
[ "NAME:Pair",  
  "Name:=" , "Slots",  
  "Value:=" , "18"  
],  
[ "NAME:Pair",  
  "Name:=" , "SlotType",  
  "Value:=" , "1"  
],  
[ "NAME:Pair",  
  "Name:=" , "Hs0",  
  "Value:=" , "1mm"  
],  
[ "NAME:Pair",  
  "Name:=" , "Hs1",  
  "Value:=" , "1mm"  
],  
[ "NAME:Pair",  
  "Name:=" , "Hs2",  
  "Value:=" , "10mm"  
],  
[ "NAME:Pair",
```

```
"Name:=" , "Bs0",  
"Value:=" , "2.5mm"  
],  
["NAME:Pair",  
"Name:=" , "Bs1",  
"Value:=" , "8mm"  
],  
["NAME:Pair",  
"Name:=" , "Bs2",  
"Value:=" , "5mm"  
],  
["NAME:Pair",  
"Name:=" , "Rs",  
"Value:=" , "0mm"  
],  
["NAME:Pair",  
"Name:=" , "FilletType",  
"Value:=" , "0"  
],  
["NAME:Pair",
```

```
"Name:=" , "Layers",  
"Value:=" , "2"  
],  
["NAME:Pair",  
"Name:=" , "CoilPitch",  
"Value:=" , "4"  
],  
["NAME:Pair",  
"Name:=" , "EndExt",  
"Value:=" , "5mm"  
],  
["NAME:Pair",  
"Name:=" , "SpanExt",  
"Value:=" , "25mm"  
],  
["NAME:Pair",  
"Name:=" , "BendAngle",  
"Value:=" , "0deg"  
],  
["NAME:Pair",  
"Name:=" , "SegAngle",
```

```
    "Value:=" , "10deg"
  ],
  ["NAME:Pair",
    "Name:=" , "LenRegion",
    "Value:=" , "200mm"
  ],
  ["NAME:Pair",
    "Name:=" , "InfoCoil",
    "Value:=" , "0"
  ]
]
],
["NAME:Attributes",
  "Name:=" , "LapCoil1",
  "Flags:=" , "",
  "Color:=" , "(143 175 143)",
  "Transparency:=" , 0,
  "PartCoordinateSystem:=" , "Global",
  "UDMId:=" , "",
  "MaterialValue:=" , "\"copper\"",
```

	<pre> "SurfaceMaterialValue:=", "\"\"\"", "SolveInside:=", False, "ShellElement:=", False, "ShellElementThickness:=", "0mm", "IsMaterialEditable:=", True, "UseMaterialAppearance:=", False, "IsLightweight:=", False] </pre>

Edit3DComponent

Edits a specified 3D component by saving it to a new name so that its properties are accessible. To change the properties on an existing component without changing its name, see [ChangeProperty](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<compName>	String	Component name.
	<Parameters>	Array	Structured array.
			<pre> Array("NAME:EditComponentParametersData", "NewComponentName:=", <string>, "GeometryParameters:=", <string>, "MaterialParameters:=", <string>, "DesignParameters:=", <string>, <ComponentMeshing>, </pre>

			<Excitations>)
	<ComponentMeshing>	Array	Structured array. Array("NAME:Component Meshing", "MeshAssembly:=", <boolean>)
	<Excitations>	Array	Structured array containing array of suppressed excitations. Array("NAME:Excitations", "Suppressed:=", <array>)
Return Value	None.		

Python Syntax	Edit3DComponent (<compName>, <Parameters>)
Python Example	<pre>oEditor.Edit3DComponent ("Connector1", ["NAME:EditComponentParametersData", "NewComponentName:=", "Connector2", "GeometryParameters:=", "", "MaterialParameters:=", "", "DesignParameters:=", "", ["NAME:Component Meshing", "MeshAssembly:=", False], ["NAME:Excitations",</pre>

	<pre> "Suppressed:=", []]]) </pre>

Edit3DComponentDefinition

Edits definitions of a specified 3D component.

UI Access	N/A		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre> Array("NAME:EditComponentParametersData", "OriginalComponentName:=", <string>, "NewComponentName:=", <string>, "GeometryParameters:=", <string>, "MaterialParameters:=", <string>, "DesignParameters:=", <string>, <ComponentMeshing>, <Excitations>) </pre>
	<ComponentMeshing>	Array	Structured array. <pre> Array("NAME:Component Meshing", "MeshAssembly:=", <boolean>) </pre>
	<Excitations>	Array	Structured array containing array of suppressed excitations. <pre> Array("NAME:Excitations", </pre>

	<table><tr><td></td><td></td><td>"Suppressed:=", <array>)</td></tr></table>			"Suppressed:=", <array>)
		"Suppressed:=", <array>)		
Return Value	None.			
Python Syntax	Edit3DComponent (<Parameters>)			
Python Example	<pre>oEditor.Edit3DComponent(["NAME:EditComponentParametersData", "OriginalComponentName:=", "Connector1", "NewComponentName:=", "Connector2", "GeometryParameters:=", "", "MaterialParameters:=", "", "DesignParameters:=", "", ["NAME:Component Meshing", "MeshAssembly:=", False], ["NAME:Excitations", "Suppressed:=", []]])</pre>			

EditPolyline

Modifies a specified polyline. See: [CreatePolyline](#).

UI Access	N/A

Parameters	Name	Type	Description
	<code><SelectionsArray></code>	Array	Structured array. See: SelectionsArray .
	<code><Parameters></code>	Array	Structured array. <pre>Array("NAME:PolylineParameters", "IsPolylineCovered:=", <bool>, "IsPolylineClosed:=", <bool>, <PolylinePointsArray>, <PolylineSegmentsArray>)</pre>
	<code><PolylinePointsArray></code>	Array	<pre>Array("NAME:PolylinePoints", <OnePointArray>, <OnePointArray>, ...)</pre>
	<code><OnePointArray></code>	Array	<pre>Array("NAME:PLPoint", "X:=", <value>, "Y:=", <value>, "Z:=", <value>))</pre>
	<code><PolylineSegmentsArray></code>	Array	<code><PolylineSegmentsArray></code> <pre>Array("NAME:PolylineSegments", <OneSegmentArray>, <OneSegmentArray>, ...)</pre>
	<code><OneSegmentArray></code>	Array	<pre>Array("NAME:PLSegment", "SegmentType:=", <"Line", "Arc", "Spline", or "AngularArc">, "StartIndex:=", <value>, "NoOfPoints:=", <value>)</pre>
Return Value	None.		

Python Syntax	EditPolyline(<SelectionsArray>, <Parameters>)
Python Example	<pre>oEditor.EditPolyline(["NAME:Selections", "Selections:=", "Polyline1"] ["NAME:PolylineParameters", "IsPolylineCovered:=", True, "IsPolylineClosed:=", False, ["NAME:PolylinePoints", ["NAME:PLPoint", "X:=", "20000mm", "Y:=", "-20000mm", "Z:=", "0mm"], ["NAME:PLPoint", "X:=", "-90000mm", "Y:=", "20000mm", "Z:=", "0mm"], ["NAME:PLPoint",</pre>

```

        "X:="                , "10000mm",
        "Y:="                , "-140000mm",
        "Z:="                , "0mm"
    ]
],
["NAME:PolylineSegments",
    ["NAME:PLSegment",
        "SegmentType:="      , "Line",
        "StartIndex:="       , 0,
        "NoOfPoints:="       , 2
    ],
    ["NAME:PLSegment",
        "SegmentType:="      , "Line",
        "StartIndex:="       , 1,
        "NoOfPoints:="       , 2
    ]
],
["NAME:PolylineXSection",
    "XSectionType:="         , "None",
    "XSectionOrient:="       , "Auto",
    "XSectionWidth:="        , "0mm",

```

	<pre>"XSectionTopWidth:=" , "0mm", "XSectionHeight:=" , "0mm", "XSectionNumSegments:=" , "0", "XSectionBendType:=" , "Corner"]])</pre>

Get3DComponentDefinitionNames

Gets names of 3D component definitions.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing component definition names.

Python Syntax	Get3DComponentDefinitionNames()
Python Example	oEditor.Get3DComponentDefinitionNames()

Get3DComponentInstanceNames

Returns instance names of 3D component definitions.

UI Access	N/A		
Parameters	Name	Type	Description
	<DefinitionName>	String	Definition name.
Return Value	Array containing instance names.		

Python Syntax	Get3DComponentInstanceNames(<DefinitionName>)		
Python Example	oEditor.Get3DComponentInstanceNames ("Connector")		

Get3DComponentMaterialNames

Returns material names for a specified *.a3dcomp format 3D component.

UI Access	N/A		
Parameters	Name	Type	Description
	<InstanceName>	String	Component instance name.
Return Value	Array containing material names.		

Python Syntax	Get3DComponentMaterialNames(<InstanceName>)		
Python Example	oEditor.Get3DComponentMaterialNames ("Connector1.a3dcomp")		

Get3DComponentMaterialProperties

Returns material properties for a specified 3D component.

UI Access	N/A		

Parameters	Name	Type	Description
	<MaterialName>	String	Material name.
Return Value	Array containing material properties.		

Python Syntax	Get3DComponentMaterialProperties(<MaterialName>)
Python Example	<code>oEditor.Get3DComponentMaterialProperties('Connector1:Material01')</code>

Get3DComponentParameters

Returns parameters for a specified 3D component.

UI Access	N/A		
Parameters	Name	Type	Description
	<compName>	String	3D component name.
Return Value	Array containing component parameters.		

Python Syntax	Get3DComponentParameters(<compName>)
Python Example	<code>oEditor.Get3DComponentParameters('Connector')</code>

Get3DComponentPartNames

Returns part names for a specified 3D component.

UI Access	N/A		
Parameters	Name	Type	Description
	<InstanceName>	String	3D component instance.
Return Value	Array containing part names.		

Python Syntax	Get3DComponentParameters(<InstanceName>)
Python Example	oEditor.Get3DComponentPartNames('Connector')

Insert3DComponent

Inserts a 3D component in specified coordinate system with specified offset.

UI Access	Draw > 3D Component Library > Browse > [Component].		
Parameters	Name	Type	Description
	<ComponentData>	Array	Structured array. <pre>Array("NAME:InsertComponentData", "TargetCS:=", <string>, "ComponentFile:=", <string filepath>), "IsLocal:", <Boolean>, "InstanceParameters:=", <string>, "XOffset:=" , "float with unit", "YOffset:=" , "float with unit", "ZOffset:=" , "float with unit")</pre>

Return Value	None.

Python Syntax	Insert3DComponent(<ComponentData>)
Python Example	<pre>oEditor.Insert3DComponent(["NAME:InsertComponentData", "TargetCS:=" , "Global", "ComponentFile:=" , "C:/Program Files/ANSYS Inc/v252/An- sysEM/syslib/3DComponents/HFSS/Rectangular Waveguide/Straight.a3dcomp", "IsLocal:=" , False, "UniqueIdentifier:=" , "", ["NAME:InstanceParameters", "GeometryParameters:=" , "Flange='\0.4in\' FlangeFillet='\0.2in\' FlangeThickness='\0.2in\' GuideHeight='\0.4in\' GuideLength='\4in\' GuideWidth='\0.9in\' WallThickness='\0.1in\'", "MaterialParameters:=" , "", "DesignParameters:=" , ""], "XOffset:=" , "-70mm", "YOffset:=" , "45mm",])</pre>

	<pre>"ZOffset:=" , "0mm"])</pre>

InsertComponent

Inserts a component.

UI Access	N/A		
Parameters	Name	Type	Description
	<ComponentData>	Array	Structured array. <pre>Array("NAME:InsertComponentData", "Parameters:=", <string>, "TargetCS:=", <string>, "ComponentFile:=", <string filepath>)</pre>
Return Value	None.		

Python Syntax	InsertComponent(<ComponentData>)
Python Example	<pre>oEditor.InsertComponent(["NAME:InsertComponentData", "Parameters:=", "", "TargetCS:=", "Global", "ComponentFile:=", "C:\tmp\Connector.a3dcomp"])</pre>

InsertPolylineSegment

Inserts a polyline segment before or after a specified existing segment.

UI Access	Draw > Line Segment > [Selection].		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:Insert Polyline Segment", "Selections:=" , <string>, "Segment Indices:=" , <array containing integers>, "At Start:=" , <boolean>, "SegmentType:=" , <string "Line", "Arc", "Spline", or "AngularArc">, <PolylinePointsArray>
	<PolylinePointsArray>	Array	Structured array. See: CreatePolyline .
Return Value	None.		

Python Syntax	InsertPolylineSegment(<Parameters>)
Python Example	<pre>oEditor.InsertPolylineSegment(["NAME:Insert Polyline Segment", "Selections:=" , "Polyline1:CreatePolyline:1", "Segment Indices:=" , [0],</pre>

	<pre>"At Start:=" , True, "SegmentType:=" , "Line", ["NAME:PolylinePoints", ["NAME:PLPoint", "X:=" , "1.1mm", "Y:=" , "0.8mm", "Z:=" , "0mm"], ["NAME:PLPoint", "X:=" , "0.6mm", "Y:=" , "-0.8mm", "Z:=" , "0mm"]]</pre>
	<pre>])</pre>

ReassignSubRegion

After you create a subregion,you can use this function to change the enclosing parts/submodels to other parts/submodels.

UI Access	3D Modeler.		
Parameters	Name	Type	Description
	<SubRegionParameters>		[

			<pre> "NAME:Selections", "Selections:=" , "<SubRegion>"], "NAME:SubRegionParameters", "+XPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "+XPadding:=", <string X value>, "-XPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "-XPadding:=", <string -X value>, "+YPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "+YPadding:=", <string Y value>, "-YPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "-YPadding:=", <string -Y value>, "+ZPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "+ZPadding:=", <string Z value>, "-ZPaddingType:=", <string "Percentage Offset", "Absolute Offset", or "Absolute Position">, "-ZPadding:=", <string -Z value> </pre>

```
[  
  "NAME:BoxForVirtualObjects",  
  [  
    "NAME:LowPoint",  
    x,  
    y,  
    z  
  ],  
  [  
    "NAME:HighPoint",  
    x,  
    y,  
    z  
  ]  
],  
[  
  "NAME:SubRegionParts",  
  <partID>  
],  
[
```

			<pre>"NAME:SubRegionSubmodels"]], ["NAME:Attributes", "Name:=" , "SubRegion", "Flags:=" , "Wireframe#", "Color:=" , "(<colorID>)", "Transparency:=" , <int>, "PartCoordinateSystem:=" , "<coordID>", "UDMId:=" , "", "MaterialValue:=" , "\"<materialName>\"", "SurfaceMaterialValue:=" , "\"\"\"", "SolveInside:=" , <Boolean>, "ShellElement:=" , <Boolean>, "ShellElementThickness:=" , "<value> ", "ReferenceTemperature:=" , "<value> ", "IsMaterialEditable:=" , <Boolean>, "UseMaterialAppearance:=" , <Boolean>, "IsLightweight:=" , <Boolean></pre>

			])
Return Value	None.		

Python Syntax	ReassignSubregion(<Selections>, <Parameters>, <Attributes>)
Python Example	<pre> oEditor = oDesign.SetActiveEditor("3D Modeler") oEditor.ReassignSubregion(["NAME:Selections", "Selections:=" , "SubRegion"], ["NAME:SubRegionParameters", "+XPaddingType:=" , "Percentage Offset", "+XPadding:=" , "0", "-XPaddingType:=" , "Percentage Offset", "-XPadding:=" , "0", "+YPaddingType:=" , "Percentage Offset", "+YPadding:=" , "0", "-YPaddingType:=" , "Percentage Offset", "-YPadding:=" , "0", </pre>

```
+ZPaddingType:= " , "Percentage Offset",
+ZPadding:= " , "0",
-ZPaddingType:= " , "Percentage Offset",
-ZPadding:= " , "0",
[
  "NAME:BoxForVirtualObjects",
  [
    "NAME:LowPoint",
    1,
    1,
    1
  ],
  [
    "NAME:HighPoint",
    -1,
    -1,
    -1
  ]
],
[
```

```

        "NAME:SubRegionParts",
        34
    ],
    [
        "NAME:SubRegionSubmodels"
    ]
],
[
    "NAME:Attributes",
    "Name:=" , "SubRegion",
    "Flags:=" , "Wireframe#",
    "Color:=" , "(143 175 143)",
    "Transparency:=" , 0,
    "PartCoordinateSystem:=", "Global",
    "UDMId:=" , "",
    "MaterialValue:=" , "\"vacuum\"",
    "SurfaceMaterialValue:=", "\"\"",
    "SolveInside:=" , True,
    "ShellElement:=" , False,
    "ShellElementThickness:=", "nan ",
    "ReferenceTemperature:=", "nan ",

```

	<pre>"IsMaterialEditable:=" , True, "UseMaterialAppearance:=", False, "IsLightweight:=" , False])</pre>

SweepAlongPath

Sweeps the specified 1D or 2D parts along a path. The last 1D object specified is the path for the sweep.

UI Access	Draw > Sweep > Along Path.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<PathSweepParametersArray>	Array	Array("NAME:PathSweepParameters", "DraftAngle:=", <value>, "DraftType:=", <string>, "CheckFaceFaceIntersection:=", <bool>, "TwistAngle:=", <value>) Possible values for DraftType are "Extended", "Round", and "Natural".
Return Value	None.		

Python Syntax	SweepAlongPath(<SelectionsArray>, <PathSweepParametersArray>)

Python Example	<pre> oEditor.SweepAlongPath(["NAME:Selections", "Selections:=" , "Rectangle1,Polyline1", "NewPartsModelFlag:=" , "Model"], ["NAME:PathSweepParameters", "DraftAngle:=" , "0deg", "DraftType:=" , "Round", "CheckFaceFaceIntersection:=", False, "TwistAngle:=" , "0deg"]) </pre>

SweepAlongVector

Sweeps the specified 1D or 2D parts along a vector.

UI Access	Draw > Sweep > Along Vector.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<VecSweepParametersArray>	Array	Array("NAME:VectorSweepParameters", "DraftAngle:=", <value>,

		<pre>"DraftType:=", <string>, "CheckFaceFaceIntersection:=", <bool>, "SweepVectorX:=", <value> "SweepVectorY:=", <value> "SweepVectorZ:=", <value>)</pre> Possible values for DraftType are "Extended", "Round", and "Natural".
Return Value	None.	

Python Syntax	SweepAlongVector(<SelectionsArray>, <VecSweepParametersArray>)
Python Example	<pre>oEditor.SweepAlongVector(["NAME:Selections", "Selections:=" , "Rectangle1", "NewPartsModelFlag:=" , "Model"], ["NAME:VectorSweepParameters", "DraftAngle:=" , "0deg", "DraftType:=" , "Round",</pre>

	<pre> "CheckFaceFaceIntersection:=", False, "SweepVectorX:=" , "0mm" "SweepVectorY:=" , "0mm" "SweepVectorX:=" , "12mm"]) </pre>

SweepAroundAxis

Sweeps the specified 1D or 2D parts around an axis.

UI Access	Draw > Sweep > Around Axis.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<AxisSweepParametersArray>	Array	Array("NAME:AxisSweepParameters",
			<pre> "DraftAngle:=", <value>, "DraftType:=", <string>, "CheckFaceFaceIntersection:=", <bool>, "SweepAxis:=", <value> "SweepAngle:=", <value> "NumOfSegments:=", <value>) </pre> Possible values for DraftType are "Extended", "Round", and "Natural". Possible values for SweepAxis are "X", "Y", and "Z".

Return Value	None.

Python Syntax	SweepAroundAxis(<SelectionsArray>, <AxisSweepParametersArray>)
Python Example	<pre>oEditor.SweepAroundAxis(["NAME:Selections", "Selections:=" , "Rectangle1", "NewPartsModelFlag:=" , "Model"], ["NAME:AxisSweepParameters", "DraftAngle:=" , "0deg", "DraftType:=" , "Round", "CheckFaceFaceIntersection:=", False, "SweepAxis:=" , "X" "SweepAngle:=" , "360deg" "NumOfSegments:=" , "12"])</pre>

SweepFacesAlongNormal

Sweep the specified face(s) along normal.

UI Access	Modeler > Surface > Sweep Faces Along Normal		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<parameters>	Array	Structured array. <pre>Array("NAME:Parameters", "NAME:SweepFaceAlongNormalToParameters", "FacesToDetach:=", <faceIDarray>, "LengthOfSweep:=", "<value><units>")</pre>
Return Value	None		

Python Syntax	SweepFacesAlongNormal(<SelectionsArray> <parameters>)
Python Example	<pre>oEditor.SweepFacesAlongNormal(["NAME:Selections", "Selections:=", "Rectangle1", "NewPartsModelFlag:=", "Model"], ["NAME:Parameters", "NAME:SweepFaceAlongNormalToParameters", "FacesToDetach:=", [183],</pre>

	<code>"LengthOfSweep:=", "0.1mm"])</code>

SweepFacesAlongNormalWithAttributes

Sweep a face along normal, and specify attributes of the new object.

UI Access	Modeler > Surface > Sweep Faces Along Normal		
Parameters	Name	Type	Description
	<code><SelectionsArray></code>	Array	Structured array. See: SelectionsArray .
	<code><parameters></code>	Array	<code>Array("NAME:Parameters", "NAME:SweepFaceAlongNormalToParameters", "FacesToDetach:=", <faceIDarray>, "LengthOfSweep:=", "<value><units>")</code>
	<code><AttributesArray></code>	Array	Structured array. See: AttributesArray .
Return Value	None		

Python Syntax	<code>SweepFacesAlongNormalWithAttributes(<SelectionsArray>, <parameters>, <AttributesArray>)</code>
Python Example	<pre>oEditor.SweepFacesAlongNormalWithAttributes(["NAME:Selections", "Selections:=", "Rectangle1", "NewPartsModelFlag:=", "Model"],</pre>

```
[ "NAME:Parameters",  
    "NAME:SweepFaceAlongNormalToParameters",  
    "FacesToDetach:=", [183],  
    "LengthOfSweep:=", "0.1mm"],  
[ "NAME:Attributes",  
    "Name:=", "Box3",  
    "Flags:=", "",  
    "Color:=", "(143 175 143)",  
    "Transparency:=", 0,  
    "PartCoordinateSystem:=", "Global",  
    "UDMId:=", "",  
    "MaterialValue:=", "\"copper\"",  
    "SurfaceMaterialValue:=", "\"\"",  
    "SolveInside:=", False,  
    "ShellElement:=", False,  
    "ShellElementThickness:=", "0mm",  
    "IsMaterialEditable:=", True,  
    "UseMaterialAppearance:=", False,  
    "IsLightweight:=", False]
```

UpdateComponentDefinition

Updates a 3D component's definition.

UI Access	Draw > 3D Component Library > Definitions.		
Parameters	Name	Type	Description
	<data>	Array	Structured array. Array("NAME:UpdateDefinitionData", "DefinitionNames:=", <string>, "Passwords:=", <array of strings>)
Return Value	None.		

Python Syntax	UpdateComponentDefinition(<data>)
Python Example	<pre>oEditor.UpdateComponentDefinition(['NAME:UpdateDefinitionData', 'DefinitionNames:=', 'Connector, Magic_Tee', 'Passwords:=', ['', '']])]</pre>

Edit Menu Commands

[Copy](#)

[DeletePolylinePoint](#)[DuplicateAlongLine](#)[DuplicateAroundAxis](#)[DuplicateMirror](#)[Mirror](#)[Move](#)[OffsetFaces](#)[Paste](#)[Rotate](#)[Scale](#)

Copy

Copies specified part(s) to the clipboard.

UI Access	N/A		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	Copy(<SelectionsArray>)
Python Example	<pre>oEditor.Copy(["NAME:Selections", "Selections:=", "Box1"])</pre>

DeletePolylinePoint

Deletes either a start point or an end point from an existing polyline segment.

UI Access	Edit > Delete [Start/End] Point		
Parameters	Name	Type	Description
	<DeletePointArray>	Array	Structured array. Array("NAME:Delete Point", "Selections:=", <string "<PolylineName>:<PolylineAction>:<int>">, "Segment Index:=", <integer>, "At Start:=", <bool True for start point; False for end point>)
Return Value	None.		

Python Syntax	DeletePolylinePoint (<DeletePointArray>)
Python Example	<pre>oEditor.DeletePolylinePoint(["NAME:Delete Point", "Selections:=", "Polyline1:CreatePolyline:1", "Segment Index:=", 1, "At Start:=", True])</pre>

DuplicateAlongLine

Duplicates specified parts along a line.

UI Access	Edit > Duplicate > Along Line.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. <pre>Array("NAME:Selections", "Selections:=" , <string>, "NewPartsModelFlag:=" , <string>)</pre>
	<ParametersArray>	Array	Structured array. <pre>Array("NAME:DuplicateToAlongLineParameters", "CreateNewObjects:=" , <boolean>, "XComponent:=" , <string>, "YComponent:=" , <string>, "ZComponent:=" , <string>, "NumClones:=" , <string containing number greater than 1>)</pre>
	<OptionsArray>	Array	Structured array. <pre>Array("NAME:Options", "DuplicateAssignments:=" , <boolean>)</pre>
	<CreateGroup>	Array	Optional. Structured array. <pre>Array("CreateGroupsForNewObjects:=" , <boolean>)</pre>
Return Value	None.		

Python Syntax	DuplicateAlongLine (<SelectionsArray>, <ParametersArray>, <OptionsArray>, <CreateGroup>)
Python Example	<pre>oEditor.DuplicateAlongLine(["NAME:Selections", "Selections:=", "Box1", "NewPartsModelFlag:=", "Model"], ["NAME:DuplicateToAlongLineParameters", "CreateNewObjects:=", False, "XComponent:=", "1mm", "YComponent:=", "-0.7mm", "ZComponent:=", "0mm", "NumClones:=", "2"], ["NAME:Options", "DuplicateAssignments:=", False], ["CreateGroupsForNewObjects:=", False])</pre>

DuplicateAroundAxis

Duplicates specified parts around an axis.

UI Access	Edit > Duplicate > Around Axis.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. Array("NAME:Selections", "Selections:=" , <string>, "NewPartsModelFlag:=" , <string>)
	<ParametersArray>	Array	Structured array. Array("NAME:DuplicateAroundAxisParameters", "CreateNewObjects:=" , <boolean>, "WhichAxis:=" , <string>, "AngleStr:=" , <string>, "NumClones:=" , <string containing number greater than 1>)
	<OptionsArray>	Array	Structured array. Array("NAME:Options", "DuplicateAssignments:=" , <boolean>)
	<CreateGroup>	Array	Optional. Structured array. Array("CreateGroupsForNewObjects:=" , <boolean>)
Return Value	None.		

Python Syntax	DuplicateAroundAxis (<SelectionsArray>, <ParametersArray>, <OptionsArray>, <CreateGroup>)
Python Example	<pre>oEditor.DuplicateAroundAxis(["NAME:Selections", "Selections:=" , "Box1", "NewPartsModelFlag:=" , "Model"], ["NAME:DuplicateAroundAxisParameters", "CreateNewObjects:=" , True, "WhichAxis:=" , "Z", "AngleStr:=" , "90deg", "NumClones:=" , "2"], ["NAME:Options", "DuplicateAssignments:=", False], ["CreateGroupsForNewObjects:=", False])</pre>

DuplicateMirror

Duplicates specified parts according to a mirror plane.

UI Access	Edit > Duplicate > Mirror.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. Array("NAME:Selections", "Selections:=" , <string>, "NewPartsModelFlag:=" , <string>)
	<ParametersArray>	Array	Structured array. Array("NAME:DuplicateToMirrorParameters", "DuplicateMirrorBaseX:=" , <string>, "DuplicateMirrorBaseY:=" , <string>, "DuplicateMirrorNormalX:=" , <string>, "DuplicateMirrorNormalY:=" , <string>, "DuplicateMirrorNormalZ:=" , <string>) For 2D Extractor designs, Z parameters should be set to "0".
	<OptionsArray>	Array	Structured array. Array("NAME:Options", "DuplicateAssignments:=" , <boolean>)
	<CreateGroup>	Array	Optional. Structured array. Array("CreateGroupsForNewObjects:=" , <boolean>)
Return Value	None.		

Python Syntax	DuplicateMirror (<SelectionsArray>, <ParametersArray>, <OptionsArray>, <CreateGroup>)

Python Example

```

oEditor.DuplicateMirror(
["NAME:Selections",
    "Selections:=", "Box1",
    "NewPartsModelFlag:=", "Model"
],
["NAME:DuplicateToMirrorParameters",
    "DuplicateMirrorBaseX:=", "-0.4mm",
    "DuplicateMirrorBaseY:=", "-1.2mm",
    "DuplicateMirrorBaseZ:=", "0mm",
    "DuplicateMirrorNormalX:=", "0.124034734589208mm",
    "DuplicateMirrorNormalY:=", "0.992277876713668mm",
    "DuplicateMirrorNormalZ:=", "0mm"
],
["NAME:Options",
    "DuplicateAssignments:=", False
],
["CreateGroupsForNewObjects:=", False
])

```

Mirror

Mirrors specified part(s).

UI Access	Edit > Arrange > Mirror.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<MirrorParameters>	Array	Structured array. Array("NAME:MirrorParameters", "MirrorBaseX:=" , <string>, "MirrorBaseY:=" , <string>, "MirrorBaseZ:=" , <string>, "MirrorNormalX:=" , <string>, "MirrorNormalY:=" , <string>, "MirrorNormalZ:=" , <string>)
Return Value	None.		

Python Syntax	Mirror(<SelectionsArray>, <MirrorParameters>)
Python Example	<pre>oEditor.Mirror(["NAME:Selections", "Selections:=" , "Box1_1", "NewPartsModelFlag:=" , "Model"], ["NAME:MirrorParameters",</pre>

	<pre> "MirrorBaseX:=" , "-0.2mm", "MirrorBaseY:=" , "-1.2mm", "MirrorBaseZ:=" , "0mm", "MirrorNormalX:=" , "-0.316227766016838mm", "MirrorNormalY:=" , "0.948683298050514mm", "MirrorNormalZ:=" , "0mm"] </pre>

Move

Moves specified part(s).

UI Access	Edit > Arrange > Move.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<TranslateParameters>	Array	Structured array. <pre> Array (["NAME:TranslateParameters", "TranslateVectorX:=" , <string>, "TranslateVectorY:=" , <string>, "TranslateVectorZ:=" , <string>) </pre> For 2D Extractor designs, "TranslateVectorZ:=" should be set to "0".
Return Value	None.		

Python Syntax	Move(<SelectionsArray>, <TranslateParameters>)

Python Example	<pre>oEditor.Move(["NAME:Selections", "Selections:=" , "Box1_1", "NewPartsModelFlag:=" , "Model"], ["NAME:TranslateParameters", "TranslateVectorX:=" , "-0.5mm", "TranslateVectorY:=" , "0.1mm", "TranslateVectorZ:=" , "0mm"])</pre>

OffsetFaces

Offsets the faces of selected part(s).

UI Access	Edit > Arrange > Offset.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<OffsetParameters>	Array	Structured array. Array("NAME:OffsetParameters", "OffsetDistance:=" , <string>)
Return Value	None.		

Python Syntax	OffsetFaces (<SelectionsArray>, <OffsetParameters>)
Python Example	<pre>oEditor.OffsetFaces (["NAME:Selections", "Selections:=", "Box1_1", "NewPartsModelFlag:=", "Model"], ["NAME:OffsetParameters", "OffsetDistance:=", "16mm"]) </pre>

Paste (Model Editor)

Pastes previously copied object(s). See: [Copy](#).

UI Access	Edit > Paste.
Parameters	None.
Return Value	None.

Python Syntax	Paste()
Python Example	<pre>oEditor.Copy (["NAME:Selections", "Selections:=" , "Box1_2"] </pre>

```
] )  
oEditor.Paste()
```

Rotate

Rotates specified object(s).

UI Access	Edit > Arrange > Rotate.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<RotateParameters>	Array	Structured array. Array("NAME:RotateParameters", "RotateAxis:=" , <string "X", "Y", or "Z">, "RotateAngle:=" , <string>) For 2D Extractor designs, "RotateAxis:=" should be set to "Z".
Return Value	None.		

Python Syntax	Rotate(<SelectionsArray>, <RotateParameters>)
Python Example	<pre>oEditor.Rotate(["NAME:Selections", "Selections:=", "Box1_1", "NewPartsModelFlag:=", "Model"</pre>

```

],
["NAME:RotateParameters",
  "RotateAxis:=", "Z",
  "RotateAngle:=", "90deg"
])

```

Scale

Scales specified object(s).

UI Access	Edit > Scale.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<ScaleParameters>	Array	Structured array. <pre>Array("NAME:ScaleParameters", "ScaleX:=" , <string containing scale factor>, "ScaleY:=" , <string containing scale factor>, "ScaleZ:=" , <string containing scale factor>)</pre> For 2D Extractor designs, "ScaleZ:=" should be set to "0".
Return Value	None.		

Python Syntax	Scale (<SelectionsArray>, <ScaleParameters>)
Python Example	oEditor.Scale(

```
[ "NAME:Selections",  
  "Selections:=", "Box1",  
  "NewPartsModelFlag:=", "Model"  
],  
[ "NAME:ScaleParameters",  
  "ScaleX:=", "2",  
  "ScaleY:=", "2",  
  "ScaleZ:=", "2"  
]  
)
```

Modeler Menu Commands

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[WrapSheet](#)**AlignFaces**

Aligns the adjacent selected faces of imported objects which have only one operation in their History Tree.

UI Access	Modeler > Model Preparation > Align Faces		
Parameters	Name	Type	Description
	<argFaceList>	Array	["NAME:<SpecifiedName>", "BaseFaces:=" , <FaceNumberArray>, "SnapFaces:=" , <FaceNumberArray>]
	<FaceNumberArray>	Array	Array of number represents specified faces.
Return Value	None.		

Python Syntax	AlignFaces(<argFaceList>)
Python Example	<pre>oEditor.AlignFaces(["NAME:Entity List", "BaseFaces:=" , [9] , "SnapFaces:=" , [18]])</pre>

AssignMaterial

Assigns a material to specified object(s).

UI Access	Modeler > Assign Material.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<AttributesArray>	Array	Structured array. See: AttributesArray . This script supports the following attributes: • MaterialValue • SolveInside • ShellElement • ShellElementThickness • IsMaterialEditable • UseMaterialAppearance • IsLightweight
Return Value	None.		
Python Syntax	AssignMaterial(<SelectionsArray>, <AttributesArray>)		

Python Example	<pre> oEditor.AssignMaterial(["NAME:Selections", "AllowRegionDependentPartSelectionForPMLCreation:=", True, "AllowRegionSelectionForPMLCreation:=", True, "Selections:=" , "Box1"], ["NAME:Attributes", "MaterialValue:=" , "diamond", "SolveInside:=" , False, "ShellElement:=" , False, "ShellElementThickness:=" , "nan", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=" , False, "IsLightweight:=" , False]) </pre>

Chamfer

Creates a chamfer.

UI Access	Modeler > Chamfer.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .

	<Parameters>	Array	Structured array. Array("NAME:Parameters", Array("NAME:ChamferParameters", "Edges:=" , <array containing integer>, "Vertices:=" , <array>, "LeftDistance:=" , <string>, "RightDistance:=" , <string>, "ChamferType:=" , <string "Symmetric", "Left Distance-Angle", "Right Distance-Angle", or "Left Distance-Right Distance">)))
Return Value	None.		

Python Syntax	Chamfer(<SelectionsArray>, <Parameters>)
Python Example	<pre>oEditor.Chamfer(["NAME:Selections", "Selections:=" , "Box2", "NewPartsModelFlag:=" , "Model"], ["NAME:Parameters", ["NAME:ChamferParameters",</pre>

	<pre> "Edges:=" , [42], "Vertices:=" , [], "LeftDistance:=" , "0.1mm", "RightDistance:=" , "0.1mm", "ChamferType:=" , "Symmetric"]] </pre>

CleanUpModel

Cleans up history tree operations.

UI Access	Modeler > Cleanup Model History.
Parameters	None.
Return Value	None.

Python Syntax	CleanUpModel()
Python Example	oEditor.CleanUpModel()

Connect

Connects two or more 1D polyline objects or 2D sheet objects.

UI Access	Modeler > Surface > Connect.

Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	Connect(<SelectionsArray>)
Python Example	<pre>oEditor.Connect(["NAME:Selections", "Selections:=", "Polyline2,Polyline1"])</pre>

CoverLines

Covers two or more 1D objects to form a sheet.

UI Access	Modeler > Surface > Cover Lines.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	CoverLines(<SelectionsArray>)
Python Example	<pre>oEditor.CoverLines(["NAME:Selections", "Selections:=", "Polyline3,Polyline4",</pre>

	"NewPartsModelFlag:=", "Model"])

CoverSurfaces

Covers two or more faces to form a solid object.

UI Access	Modeler > Surface > Cover Faces.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	CoverSurfaces (<SelectionsArray>)
Python Example	<pre>oEditor.CoverSurfaces (["NAME:Selections", "Selections:=", "Obj1_Face1,Obj2_Face2", "NewPartsModelFlag:=", "Model"])</pre>

CreateEntityList

Creates a list of entities containing objects or faces (not both).

Warning: As of the Ansys Electronics Desktop25r2 release, this command has been deprecated. It will be removed in a future release. Please use the [CreateNamedSelection](#) command instead.

UI Access	Modeler > Named Selection > Create > [Object / Face] Selection		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <code>Array("NAME:GeometryEntityListParameters", "EntityType:=" , <string "Object" or "Face">, "EntityList:=" , <string of object names or IDs>)</code> See GetObjectIDByName for returning object IDs.
	<AttributesArray>	Array	Structured array. See: AttributesArray . CreateEntityList takes only the "Name" parameter.
Return Value	None.		

Python Syntax	CreateEntityList(<Parameters>,<AttributesArray>)
Python Example	<pre>oEditor.CreateEntityList(["NAME:GeometryEntityListParameters", "EntityType:=", "Object", "EntityList:=", "Bondwire1,Bondwire2"], ["NAME:Attributes", "Name:=", "Objectlist1"])</pre>

CreateFaceCS

Creates a Face Coordinate System from a selected face.

UI Access	Modeler > Coordinate System > Create > FaceCS.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre>Array("NAME:FaceCSParameters", <OriginArray>, "MoveToEnd:=", <boolean>, "FaceID:=", <integer>, <AxisPosnArray>, "WhichAxis:=", <string "X", "Y", or "Z">, "ZRotationAngle:=", <string>, "XOffset:=", <string>, "YOffset:=", <string>, "AutoAxis:=", <boolean>)</pre>
	<OriginArray>	Array	Structured array. <pre>Array("NAME:Origin", "IsAttachedToEntity:=", <boolean>, "EntityID:=", <integer>, "FacetedBodyTriangleIndex:=", <integer>, "TriangleVertexIndex:=", <integer>,</pre>

			<pre> "PositionType:=" , <string "FaceCenter", "EdgeCenter", "OnVertex", "OnEdge", or "OnFace">, "UParam:=" , <float between 0 and 1 representing the relative position of the point on the edge or face>, "VParam:=" , <float between 0 and 1 representing the relative position of the point on the edge or face>, "XPosition:=" , <string>, "YPosition:=" , <string>, "ZPosition:=" , <string>) </pre> IsAttachedToEntity specifies whether the point is anchored to a vertex, edge, or face. If True, provide UParam and VParam. If False, provide XPosition, YPosition, and ZPosition to provide fixed position. Pass "0" for unused parameters.
	<AxisPosnArray>	Array	Structured array. <pre> Array("NAME:AxisPosn", "IsAttachedToEntity:=" , <boolean>, "EntityID:=" , <integer>, "FacetedBodyTriangleIndex:=" , <integer>, "TriangleVertexIndex:=" , <integer>, "PositionType:=" , <string "FaceCenter", "EdgeCenter", "OnVertex", "OnEdge", or "OnFace">, "UParam:=" , <float>, </pre>

			"VParam:=" , <float>, "XPosition:=" , <string>, "YPosition:=" , <string>, "ZPosition:=" , <string>
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateFaceCS(<Parameters>,<AttributesArray>)		
Python Example	<pre> oEditor.CreateFaceCS (["NAME:FaceCSParameters", ["NAME:Origin", "IsAttachedToEntity:=" , True, "EntityID:=" , 46, "FacetedBodyTriangleIndex:=" , -1, "TriangleVertexIndex:=" , -1, "PositionType:=" , "FaceCenter", "UParam:=" , 0, "VParam:=" , 0, "XPosition:=" , "0", "YPosition:=" , "0", "ZPosition:=" , "0"]] </pre>		

```
],
"MoveToEnd:="          , False,
"FaceID:="              , 46,
["NAME:AxisPosn",
  "IsAttachedToEntity:=" , True,
  "EntityID:="           , 46,
  "FacetedBodyTriangleIndex:=", -1,
  "TriangleVertexIndex:=" , -1,
  "PositionType:="        , "OnFace",
  "UParam:="              , 0.487129134674319,
  "VParam:="              , 0.308528523557527,
  "XPosition:="           , "1292.27748080459mm",
  "YPosition:="           , "-814.882885865484mm",
  "ZPosition:="           , "0mm"
],
"WhichAxis:="           , "X",
"ZRotationAngle:="      , "0deg",
"XOffset:="              , "0mm",
"YOffset:="              , "0mm",
"AutoAxis:="             , False
```

```

],
["NAME:Attributes",
    "Name:="                , "FaceCS1",
    "PartName:="            , "Rectangle1"
])

```

CreateGroup

Creates a group from objects specified in the history tree.

UI Access	Modeler > Group > Create.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:GroupParameter", "ParentGroupID:=" , <string>, "Parts:=" , <string>, "SubmodelInstances:=" , <string>, "Groups:=" , <string>)
Return Value	None.		

Python Syntax	CreateGroup(<Parameters>)
Python Example	<pre> oEditor.CreateGroup(["NAME:GroupParameter", </pre>

	<pre>"ParentGroupID:=" , "Model", "Parts:=" , "Box1,Box2,Box3", "SubmodelInstances:=" , "", "Groups:=" , ""])</pre>

CreateNamedSelection

Creates a list of entities containing objects or faces (not both).

UI Access	Modeler > Named Selection > Create > [Object / Face] Selection		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:NamedSelectionParameters", "Type:=" , <string "Object" or "Face">, "Selection:=" , <string of object names or IDs>) See GetObjectIDByName for returning object IDs.
	<AttributesArray>	Array	Structured array. See AttributesArray . CreateNamedSelection takes only the "Name" parameter and UDM ID.
Return Value	None.		
Python Syntax	CreateNamedSelection(<Parameters>,<AttributesArray>)		

Python Example	<pre> namedSelectionName = oEditor.CreateNamedSelection(["NAME:NamedSelectionParameters", "Type:=" , "Face", "Selection:=" , [7,9]], ["NAME:Attributes", "Name:=" , "FaceSelection1", "UDM ID:=" , -1]) </pre>

CreateObjectCS

Creates an object coordinate system from a selected object.

UI Access	Modeler > Coordinate System > Create > Object > [Offset / Rotated / Both].		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre> Array("NAME:ObjectCSParameters", <OriginArray> "MoveToEnd:=" , <boolean>, "ReverseXAxis:=" , <boolean>, "ReverseYAxis:=" , <boolean>, <xAxisArray / xAxisPosArray> <yAxisArray / yAxisPosArray>) </pre> Note: xAxisArray and xAxisPosArray differ. Use xAxisArray for absolute position and xAxisPosArray for relative position. Do the same for yAx-

		isArray and yAxisPosArray.
<OriginArray>	Array	Structured array. <pre>Array("NAME:Origin", "IsAttachedToEntity:=" , <boolean>, "EntityID:=" , <integer>, "FacetedBodyTriangleIndex:=", <integer>, "TriangleVertexIndex:=" , <integer>, "PositionType:=" , <string "OnVertex", "EdgeCenter", "FaceCenter", "OnEdge", or "AbsolutePosition">, "UParam:=" , <float between 0 and 1 representing the relative position of the point on the edge or face>, "VParam:=" , <float between 0 and 1 representing the relative position of the point on the edge or face>, "XPosition:=" , <string>, "YPosition:=" , <string>, "ZPosition:=" , <string>)</pre> IsAttachedToEntity specifies whether the point is anchored. If True, provide UParam and VParam. If False, provide XPosition, YPosition, and ZPosition to provide fixed position. Pass "0" for unused parameters.
<xAxisArray>	Array	Structured array for absolute position: <pre>Array("NAME:xAxis",</pre>

		<pre> "DirectionType:=" , "AbsoluteDirection", "EdgeID:=" , <integer>, "FaceID:=" , <integer>, "xDirection:=" , <string>, "yDirection:=" , <string>, "zDirection:=" , <string>, "UParam:=" , <float>, "VParam:=" , <float>) </pre>
<xAxisPosArray>	Array	Structured array for relative position: <pre> Array("NAME:xAxisPos", "IsAttachedToEntity:=" , <boolean>, "EntityID:=" , <integer>, "FacetedBodyTriangleIndex:=" , <integer>, "TriangleVertexIndex:=" , <integer>, "PositionType:=" , <string "OnVertex", "EdgeCenter", "FaceCenter", or "OnEdge">, "UParam:=" , <float>, "VParam:=" , <float>, "XPosition:=" , <string>, "YPosition:=" , <string>, "ZPosition:=" , <string>) </pre>
<yAxisArray>	Array	Structured array for absolute position:

			<pre>Array("NAME:yAxis", "DirectionType:=" , "AbsoluteDirection", "EdgeID:=" , <integer>, "FaceID:=" , <integer>, "xDirection:=" , <string>, "yDirection:=" , <string>, "zDirection:=" , <string>, "UParam:=" , <float>, "VParam:=" , <float>)</pre>
	<yAxisPosArray>	Array	Structured array for relative position: <pre>Array("NAME:yAxisPos", "IsAttachedToEntity:=" , <boolean>, "EntityID:=" , <integer>, "FacetedBodyTriangleIndex:=" , <integer>, "TriangleVertexIndex:=" , <integer>, "PositionType:=" , <string "OnVertex", "EdgeCenter", "FaceCenter", or "OnEdge">, "UParam:=" , <float>, "VParam:=" , <float>, "XPosition:=" , <string>, "YPosition:=" , <string>,</pre>

			"ZPosition:=" , <string>)
	<AttributesArray>	Array	Structured array. See: AttributesArray .
Return Value	None.		

Python Syntax	CreateObjectCS(<Parameters>,<AttributesArray>)
Python Example	<pre> oEditor.CreateObjectCS(["NAME:ObjectCSParameters", ["NAME:Origin", "IsAttachedToEntity:=" , True, "EntityID:=" , 59, "FacetedBodyTriangleIndex:=", -1, "TriangleVertexIndex:=" , -1, "PositionType:=" , "OnVertex", "UParam:=" , 0, "VParam:=" , 0, "XPosition:=" , "0", "YPosition:=" , "0", "ZPosition:=" , "0"], "MoveToEnd:=" , False, "ReverseXAxis:=" , False, </pre>

```
"ReverseYAxis:="          , False,
["NAME:xAxis",
  "DirectionType:="        , "AbsoluteDirection",
  "EdgeID:="               , -1,
  "FaceID:="               , -1,
  "xDirection:="           , "1",
  "yDirection:="           , "0",
  "zDirection:="           , "0",
  "UParam:="               , 0,
  "VParam:="               , 0
],
["NAME:yAxis",
  "DirectionType:="        , "AbsoluteDirection",
  "EdgeID:="               , -1,
  "FaceID:="               , -1,
  "xDirection:="           , "0",
  "yDirection:="           , "1",
  "zDirection:="           , "0",
  "UParam:="               , 0,
  "VParam:="               , 0
```

```

    ]
  ],
  ["NAME:Attributes",
    "Name:=" , "ObjectCS1",
    "PartName:=" , "Box2"
  ])

```

CreateObjectFromEdges

Creates an object from the specified object edge.

UI Access	Modeler > Edge > Create Object From Edge		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<ParametersArray>	Array	Structured array. <pre> Array("NAME:Parameters", Array("NAME:BodyFromEdgeToParameters", "Edges:=" , <array containing integer edges>))</pre>
	<CreateGroupsForNewObjects>	Array	Structured array. <pre> Array("CreateGroupsForNewObjects:=", <boolean True to create groups for new objects; else False>)</pre>

Return Value	None.

Python Syntax	CreateObjectFromEdges(<SelectionsArray>, <ParametersArray>, <CreateGroupsForNewObjects>)
Python Example	<pre>oEditor.CreateObjectFromEdges(["NAME:Selections", "Selections:=", "Box2", "NewPartsModelFlag:=", "Model"], ["NAME:Parameters", ["NAME:BodyFromEdgeToParameters", "Edges:=", [41]]], ["CreateGroupsForNewObjects:=", False])</pre>

CreateObjectFromFace

Creates 2D objects from specified face(s).

UI Access	N/A

Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array ("NAME:Parameters", <BodyFromFaceToParameters>)
	<CreateGroupsForNewObjects>	Array	Optional. Structured array. Array ("CreateGroupsForNewObjects:=", <boolean>)
Return Value	None.		

Python Syntax	CreateObjectFromFace (<SelectionsArray>, <Parameters>, <CreateGroupsForNewObjects>)
Python Example	<pre>oEditor.CreateObjectFromFace (["NAME:Selections", "Selections:=" , "Box3", "NewPartsModelFlag:=" , "Model"], ["NAME:Parameters", ["NAME:BodyFromFaceToParameters", "FacesToDetach:=" , [68]]], ["CreateGroupsForNewObjects:=", False</pre>

	1)

CreateObjectFromFaces

Creates 2D objects from specified face(s).

UI Access	Modeler > Surface > Create Object from Face		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array ("NAME:Parameters", <BodyFromFaceToParameters>)
	<CreateGroupsForNewObjects>	Array	Structured array. Array ("CreateGroupsForNewObjects:=", <boolean>)
Return Value	None.		

Python Syntax	CreateObjectFromFaces (<SelectionsArray>,<Parameters>,<CreateGroupsForNewObjects>)		
Python Example	<pre>oEditor.CreateObjectFromFaces (["NAME:Selections", "Selections:=" , "Box3", "NewPartsModelFlag:=" , "Model"],</pre>		

	<pre>["NAME:Parameters", ["NAME:BodyFromFaceToParameters", "FacesToDetach:=" , [68]]], ["CreateGroupsForNewObjects:=", False])</pre>

CreateRelativeCS

Creates a Relative Coordinate System.

UI Access	Modeler > Coordinate System > Create > Relative CS > [Offset / Rotated / Both].		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:RelativeCSParameters", "Mode:=" , "Axis/Position", "OriginX:=" , <string>, "OriginY:=" , <string>, "OriginZ:=" , <string>, "XAxisXvec:=" , <string>, "XAxisYvec:=" , <string>, "XAxisZvec:=" , <string>,

			"YAxisXvec:=" , <string>, "YAxisYvec:=" , <string>, "YAxisZvec:=" , <string>)
	<AttributesArray>	Array	Structured array. See: AttributesArray . CreateRelativeCS supports only the "Name" parameter.
Return Value	None.		

Python Syntax	CreateRelativeCS(<Parameters>,<AttributesArray>)
Python Example	<pre>oEditor.CreateRelativeCS(["NAME:RelativeCSParameters", "Mode:=" , "Axis/Position", "OriginX:=" , "0.62mm", "OriginY:=" , "-0.7mm", "OriginZ:=" , "0mm", "XAxisXvec:=" , "1mm", "XAxisYvec:=" , "0mm", "XAxisZvec:=" , "0mm", "YAxisXvec:=" , "0mm", "YAxisYvec:=" , "1mm", "YAxisZvec:=" , "0mm"]</pre>


```
],
["NAME:Attributes",
    "Name:=" , "RelativeCS1"
])
```

DeleteEmptyGroups

Deletes group(s) from the history tree.

UI Access	Modeler > Group > Delete Empty.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("Groups:=" , <array of string group IDs>)
Return Value	None.		

Python Syntax	DeleteEmptyGroups(<Parameters>)
Python Example	<pre>oEditor.DeleteEmptyGroups (["Groups:=", ["Group1", "Group2", "Group3"]])</pre>

DeleteLastOperation

Deletes the last operation performed on the specified object(s).

UI Access	Modeler > Delete Last Operation.

Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	DeleteLastOperation(<SelectionsArray>)
Python Example	<pre>oEditor.DeleteLastOperation(["NAME:Selections", "Selections:=", "Box3", "NewPartsModelFlag:=", "Model"])</pre>

DeleteOperation

Deletes specified operation performed on a selected object.

UI Access	Select an operation in the project tree, then press Delete on the keyboard.		
Parameters	Name	Type	Description
	<ParamsArray>	Array	Structured array. Array("NAME:Parameters", Array("NAME:PartOperations", Array("NAME:<PartName>", "OperationIndices:=", <array of operation indices>)),

			Array("NAME:UDMOperations"))
Return Value	None.		

Python Syntax	DeleteOperation(<ParamsArray>)
Python Example	<pre> oEditor.DeleteOperation(["NAME:Parameters", ["NAME:PartOperations", ["NAME:Coil_0", "OperationIndices:=", [1]]], ["NAME:UDMOperations"]]) </pre>

DetachEdges

Detaches the specified edge(s) from an object.

UI Access	Modeler > Edge > Detach Edges.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array("NAME:Parameters", <DetachEdgesArray>)
	<DetachEdgesArray>	Array	Structured array. Array("NAME:DetachEdgesToParameters", "EdgesToDetach:=" , <array containing integer edge IDs>)
Return Value	None.		

Python Syntax	DetachEdges(<SelectionsArray>, <Parameters>)
Python Example	<pre>oEditor.DetachEdges(["NAME:Selections", "Selections:=", "Rectangle1", "NewPartsModelFlag:=", "Model"], ["NAME:Parameters", ["NAME:DetachEdgesToParameters", "EdgesToDetach:=", [18,17]</pre>

	<pre>]]) </pre>

DetachFaces

Detaches the specified face(s) from an object.

UI Access	Modeler > Surface > Detach Faces.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array("NAME:Parameters", <DetachFacesArray>)
	<DetachFacesArray>	Array	Structured array. Array("NAME:DetachFacesToParameters", "FacesToDetach:=" , <array containing integer face IDs>)
Return Value	None.		

Python Syntax	DetachFaces(<SelectionsArray>, <Parameters>)
Python Example	<pre> oEditor.DetachFaces (["NAME:Selections", "Selections:=", "Box3", "NewPartsModelFlag:=", "Model" </pre>

	<pre>], ["NAME:Parameters", ["NAME:DetachFacesToParameters", "FacesToDetach:=", [68,67]]]</pre>

EditEntityList

Modifies an entity list.

Warning: As of the Ansys Electronics Desktop25r2 release, this command has been deprecated. It will be removed in a future release. Please use the [EditNamedSelection](#) command instead.

UI Access	Modeler > Named Selection > Reassign.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array("NAME:GeometryEntityListParameters", "EntityType:=" , <string "Object" or "Face">, "EntityList:=" , <string list>)

Return Value	None.

Python Syntax	<code>EditEntityList(<SelectionsArray>, <Parameters>)</code>
Python Example	<pre>oEditor.EditEntityList(["NAME:Selections", "Selections:=" , "Objectlist1"], ["NAME:GeometryEntityListParameters", "EntityType:=" , "Object", "EntityList:=" , "Box1, Box2, Box3"])</pre>

EditFaceCS

Recreates an existing face coordinate system. See: [CreateFaceCS](#).

UI Access	Modeler > Coordinate System > Edit.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:FaceCSParameters", <OriginArray>, "MoveToEnd:=", <boolean>, "FaceID:=", <integer>,

		<pre><AxisPosnArray>, "WhichAxis:=" , <string "X", "Y", or "Z">, "ZRotationAngle:=" , <string>, "XOffset:=" , <string>, "YOffset:=" , <string>, "AutoAxis:=" , <boolean>)</pre>
	<i><OriginArray></i>	Array Structured array. <pre>Array("NAME:Origin", "IsAttachedToEntity:=" , <boolean>, "EntityID:=" , <integer>, "FacetedBodyTriangleIndex:=", <integer>, "TriangleVertexIndex:=" , <integer>, "PositionType:=" , <string "FaceCenter", "EdgeCenter", "OnVertex", "OnEdge", or "OnFace">, "UParam:=" , <float between 0 and 1 representing the relative position of the point on the edge or face>, "VParam:=" , <float between 0 and 1 representing the relative position of the point on the edge or face>, "XPosition:=" , <string>, "YPosition:=" , <string>,</pre>

			"ZPosition:=" , <string>) IsAttachedToEntity specifies whether the point is anchored to a vertex, edge, or face. If True, provide UParam and VParam. If False, provide XPosition, YPosition, and ZPosition to provide fixed position. Pass "0" for unused parameters.
	<AxisPosnArray>	Array	Structured array. <pre>Array("NAME:AxisPosn", "IsAttachedToEntity:=" , <boolean>, "EntityID:=" , <integer>, "FacetedBodyTriangleIndex:=", <integer>, "TriangleVertexIndex:=" , <integer>, "PositionType:=" , <string "FaceCenter", "EdgeCenter", "OnVertex", "OnEdge", or "OnFace">, "UParam:=" , <float>, "VParam:=" , <float>, "XPosition:=" , <string>, "YPosition:=" , <string>, "ZPosition:=" , <string>)</pre>
	<AttributesArray>	Array	Structured array. See: AttributesArray . Use to select the coordinate system to edit.
Return Value	None.		

Python Syntax	EditFaceCS (<Parameters>, <AttributesArray>)
Python Example	oEditor.EditFaceCS (

```
[ "NAME:FaceCSParameters",  
  [ "NAME:Origin",  
    "IsAttachedToEntity:=" , True,  
    "EntityID:=" , 12,  
    "FacetedBodyTriangleIndex:=" , -1,  
    "TriangleVertexIndex:=" , -1,  
    "PositionType:=" , "FaceCenter",  
    "UParam:=" , 0,  
    "VParam:=" , 0,  
    "XPosition:=" , "0",  
    "YPosition:=" , "0",  
    "ZPosition:=" , "0"  
  ],  
  "MoveToEnd:=" , False,  
  "FaceID:=" , 12,  
  [ "NAME:AxisPosn",  
    "IsAttachedToEntity:=" , True,  
    "EntityID:=" , 12,  
    "FacetedBodyTriangleIndex:=" , -1,  
    "TriangleVertexIndex:=" , -1,
```

	<pre>"PositionType:=" , "OnFace", "UParam:=" , 0.62951717774066, "VParam:=" , 0.226514925559344, "XPosition:=" , "1200mm", "YPosition:=" , "-354.697014888131mm", "ZPosition:=" , "125.903435548132mm"], "WhichAxis:=" , "X", "ZRotationAngle:=" , "0deg", "XOffset:=" , "0mm", "YOffset:=" , "0mm", "AutoAxis:=" , False], ["NAME:Attributes", "Name:=" , "FaceCS1", "PartName:=" , "Box1"])</pre>

EditNamedSelection

Modifies an entity list.

UI Access	Modeler > Named Selection > Reassign.

Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array("NAME:NamedSelectionParameters", "Type:=" , <string "Object" or "Face">, "Selection:=" , <string of object names or IDs>))
Return Value	None.		

Python Syntax	EditNamedSelection(<SelectionsArray>, <Parameters>)
Python Example	<pre>oEditor.EditNamedSelection(["NAME:Selections", "Selections:=" , "FaceSelection1"], ["NAME:NamedSelectionParameters", "Type:=" , "Face", "Selection:=" , [12]])</pre>

EditObjectCS

Edits an existing object coordinate system. See: [CreateObjectCS](#).

UI Access	Modeler > Coordinate System > Edit.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre>Array("NAME:ObjectCSParameters", <OriginArray> "MoveToEnd:=" , <boolean>, "ReverseXAxis:=" , <boolean>, "ReverseYAxis:=" , <boolean>, <xAxisArray / xAxisPosArray> <yAxisArray / yAxisPosArray>)</pre> Note: xAxisArray and xAxisPosArray differ. Use xAxisArray for absolute position and xAxisPosArray for relative position. Do the same for yAxisArray and yAxisPosArray.
	<OriginArray>	Array	Structured array. <pre>Array("NAME:Origin", "IsAttachedToEntity:=" , <boolean>, "EntityID:=" , <integer>, "FacetedBodyTriangleIndex:=", <integer>, "TriangleVertexIndex:=" , <integer>, "PositionType:=" , <string "OnVertex", "EdgeCenter", "FaceCenter", "OnEdge", or "AbsolutePosition">, "UParam:=" , <float between 0 and 1 representing the relative position of the point on the edge or</pre>

		<pre>face>, "VParam:=" , <float between 0 and 1 representing the relative position of the point on the edge or face>, "XPosition:=" , <string>, "YPosition:=" , <string>, "ZPosition:=" , <string>)</pre> IsAttachedToEntity specifies whether the point is anchored. If True, provide UParam and VParam. If False, provide XPosition, YPosition, and ZPosition to provide fixed position. Pass "0" for unused parameters.
<xAxisArray>	Array	Structured array for absolute position: <pre>Array("NAME:xAxis", "DirectionType:=" , "AbsoluteDirection", "EdgeID:=" , <integer>, "FaceID:=" , <integer>, "xDirection:=" , <string>, "yDirection:=" , <string>, "zDirection:=" , <string>, "UParam:=" , <float>, "VParam:=" , <float>)</pre>
<xAxisPosArray>	Array	Structured array for relative position: <pre>Array("NAME:xAxisPos",</pre>

		<pre> "IsAttachedToEntity:=" , <boolean>, "EntityID:=" , <integer>, "FacetedBodyTriangleIndex:=", <integer>, "TriangleVertexIndex:=" , <integer>, "PositionType:=" , <string "OnVertex", "EdgeCenter", "FaceCenter", or "OnEdge">, "UParam:=" , <float>, "VParam:=" , <float>, "XPosition:=" , <string>, "YPosition:=" , <string>, "ZPosition:=" , <string>) </pre>
<yAxisArray>	Array	Structured array for absolute position: <pre> Array("NAME:yAxis", "DirectionType:=" , "AbsoluteDirection", "EdgeID:=" , <integer>, "FaceID:=" , <integer>, "xDirection:=" , <string>, "yDirection:=" , <string>, "zDirection:=" , <string>, "UParam:=" , <float>, "VParam:=" , <float>) </pre>
<yAxisPosArray>	Array	Structured array for relative position:

			<pre>Array("NAME:yAxisPos", "IsAttachedToEntity:=" , <boolean>, "EntityID:=" , <integer>, "FacetedBodyTriangleIndex:=", <integer>, "TriangleVertexIndex:=" , <integer>, "PositionType:=" , <string "OnVertex", "EdgeCenter", "FaceCenter", or "OnEdge">, "UParam:=" , <float>, "VParam:=" , <float>, "XPosition:=" , <string>, "YPosition:=" , <string>, "ZPosition:=" , <string>)</pre>
	<AttributesArray>	Array	Structured array. See: AttributesArray . Use to select the coordinate system to edit.
Return Value	None.		

Python Syntax	EditObjectCS(<Parameters>,<AttributesArray>)
Python Example	<pre>oEditor.EditObjectCS(["NAME:ObjectCSParameters", ["NAME:Origin", "IsAttachedToEntity:=" , True,</pre>


```

"EntityID:="                , 59,
"FacetedBodyTriangleIndex:=", -1,
"TriangleVertexIndex:="    , -1,
"PositionType:="           , "OnVertex",
"UParam:="                  , 0,
"VParam:="                  , 0,
"XPosition:="               , "0",
"YPosition:="               , "0",
"ZPosition:="               , "0"
],
"MoveToEnd:="               , False,
"ReverseXAxis:="            , False,
"ReverseYAxis:="            , False,
["NAME:xAxis",
  "DirectionType:="         , "AbsoluteDirection",
  "EdgeID:="                , -1,
  "FaceID:="                , -1,
  "xDirection:="            , "1",
  "yDirection:="            , "0",
  "zDirection:="            , "0",
  "UParam:="                , 0,

```

```
        "VParam:="                , 0
    ],
    ["NAME:yAxis",
        "DirectionType:="        , "AbsoluteDirection",
        "EdgeID:="                , -1,
        "FaceID:="                , -1,
        "xDirection:="            , "0",
        "yDirection:="            , "1",
        "zDirection:="            , "0",
        "UParam:="                , 0,
        "VParam:="                , 0
    ]
],
["NAME:Attributes",
    "Name:="                      , "ObjectCS1",
    "PartName:="                  , "Box2"
])
```

EditRelativeCS

Edits an existing Relative Coordinate System. See: [CreateRelativeCS](#).

UI Access	Modeler > Coordinate System > Edit.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:RelativeCSParameters", "Mode:=" , "Axis/Position", "OriginX:=" , <string>, "OriginY:=" , <string>, "OriginZ:=" , <string>, "XAxisXvec:=" , <string>, "XAxisYvec:=" , <string>, "XAxisZvec:=" , <string>, "YAxisXvec:=" , <string>, "YAxisYvec:=" , <string>, "YAxisZvec:=" , <string>)
	<AttributesArray>	Array	Structured array. See: AttributesArray . Use to select the coordinate system to edit.
Return Value	None.		

Python Syntax	EditRelativeCS(<Parameters>,<AttributesArray>)
Python Example	<pre>oEditor.EditRelativeCS (["NAME:RelativeCSParameters", "Mode:=" , "Axis/Position",</pre>

	<pre>"OriginX:=" , "0.62mm", "OriginY:=" , "-0.7mm", "OriginZ:=" , "0mm", "XAxisXvec:=" , "1mm", "XAxisYvec:=" , "0mm", "XAxisZvec:=" , "0mm", "YAxisXvec:=" , "0mm", "YAxisYvec:=" , "1mm", "YAxisZvec:=" , "0mm"], ["NAME:Attributes", "Name:=" , "RelativeCS1"])</pre>

Export

Exports the model to a file.

Note: This script does not export image file types or GDSII files. See: [ExportModelImageToFile](#) and ExportGDSII.

UI Access	Modeler > Export

	Name	Type	Description
	<Parameters>	Array	Structured array. <pre>Array("NAME:ExportParameters", "AllowRegionDependentPartSelectionForPMLCreation:=", <boolean>, "AllowRegionSelectionForPMLCreation:=", <boolean>, "Selections:=" , <string list>, "File Name:=" , <string filepath>, "Major Version:=" , <integer (-1 if not applic- able)>, "Minor Version:=" , <integer (-1 if not applic- able)>)</pre>
Parameters			
Return Value	None.		

Python Syntax	Export(<Parameters>)
Python Example	<pre>oEditor.Export(["NAME:ExportParameters", "AllowRegionDependentPartSelectionForPMLCreation:=", True, "AllowRegionSelectionForPMLCreation:=", True, "Selections:=" , "Box1,Box2,Box3", "File Name:=" , "C:/Users/jdoe/Desktop/export.sab", "Major Version:=" , 25,</pre>

	"Minor Version:=" , 0 l)

ExportModelImageToFile

Exports the model as an image file (*.avz, *.bmp, *.gif, *.jpeg, *.tiff, *.wrl). In Release 23.1, this command is fully supports -ng (non-graphical) mode. To export to Enight use *.avz. For export to Enight in -ng mode, the corresponding version of Enight must be installed. On Linux, it might need manual set environment variable AWP_ROOT212 to its installation path, e.g. AWP_ROOT212-2=/installations/ansys_inc/v212/ for AnsysEDT v21.2 and Enight 21.2.

ExportModelImageToFile exports a model image with background type and color that respect the AEDT color scheme by default. You can specify the background type and color with following parameters:

Parameter Name	Description	Parameter Value
BackgroundType	Choose one out of four types of background	Default Plain LinearGradient RadialGradient
BackgroundColor	Plain: Background color Lin- earGradient/RadialGradient: Background start color	3 integers with a range of [0,255] that represent red, green, and blue respectively
BackgroundContrastColor	Plain: Ignored LinearGradient/RadialGradient: Back- ground end color	3 integers with a range of [0,255] that represent red, green, and blue respectively

Note: Current scripts will not be affected, the image will be exported with default background color as it always does

If no BackgroundType is specified, or BackgroundType is Default, BackgroundColor and BackgroundContrastColor will be ignored, and the image will be exported with default background color

ExportModelImageToFile supports export overlay of polar plot 3D with existing transformation (scaling, rotation and translation) in -ng (non-graphical) mode.

UI Access	Modeler > Export.		
Parameters	Name	Type	Description
	<path>	String	Full file path including extension.
	<width>	Integer	Width in pixels (use 0 for default).
	<height>	Integer	Height in pixels (use 0 for default).
	<Parameters>	Array	Structured array.
			<pre>Array("NAME:SaveImageParams", "ShowAxis:=" , <string containing boolean>, "ShowGrid:=" , <string containing boolean>, "ShowRuler:=" , <string containing boolean>, "ShowRegion:=" , <string>, "Selections:=" , <string>, "FieldPlotSelections:=", <string>' # Comma delimited string. #Use to set which field plot to show. "FitToSelections:=" , "", "FitToFieldPlotSelection:=" , ""</pre> Note: "FitToSelections" specify geometry objects for the "Fit" operation.

			Note: "FitToFieldPlotSelections" specifies field plots for the "Fit" operation. <pre>"AutoFit:=" , "True",</pre> Note: If FitToSlections or FitToFieldPlotSelections are used , then AutoFit is True, it makes sure color key does not overlap field plot. It is False by default. If neither is used, then "AutoFit" will "Fit" to full model. <pre>"Orientation:=" , <string></pre> <pre>"ShowOrientationGadget:=" , <False></pre>
Return Value	None.		

Python Syntax	<code>ExportModelImageToFile(<path> <width> <height> <Parameters>)</code>
Python Example	<pre>oEditor.ExportModelImageToFile ("D:/Image.png", 1920, 1080, ["NAME:SaveImageParams", "ShowAxis:=" , "True", "ShowGrid:=" , "True",</pre>

	<pre> "ShowRuler:=" , "True", "ShowRegion:=" , "Default", "Selections:=" , "", "FieldPlotSelections:=" , "", "FitToSelections:=" , "", "FitToFieldPlotSelections:=" , "", "AutoFit:=" , "True", "Orientation:=" , ""]) </pre>

ExportModelMeshToFile

Exports geometry model to a 3D model file (e.g. *.obj, *.wrl, etc.).

UI Access	N/A		
Parameters	Name	Type	Description
	<filePath>	String	Full file path, including extension *.obj, *.wrl, etc
	<selections>	Array	Selected parts.
Return Value	None.		

Python Syntax	ExportModelMeshToFile <filePath>, <selections>)
Python Example	<pre> oEditor.ExportModelMeshToFile("E:/MyDir/scriptRun/2Selected-ng.obj", ["BotCover- ", "AveragingVolumeAtPeakRMSEfieldLocation"]) </pre>

Fillet

Performs a fillet on specified edge(s).

UI Access	Modeler > Fillet.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array("NAME:Parameters", <FilletParametersArray>)
	<FilletParametersArray>	Array	Structured array. Array("NAME:FilletParameters", "Edges:=" , <array containing integer edge IDs>, "Vertices:=" , <empty array>, "Radius:=" , <string>, "Setback:=" , <string>)
Return Value	None.		

Python Syntax	Fillet(<SelectionsArray>, <Parameters>)
Python Example	<pre>oEditor.Fillet(["NAME:Selections", "Selections:=" , "Box1",</pre>

	<pre> "NewPartsModelFlag:=" , "Model"], ["NAME:Parameters", ["NAME:FilletParameters", "Edges:=" , [13], "Vertices:=" , [], "Radius:=" , "1mm", "Setback:=" , "0mm"]]]) </pre>

FlattenGroup

Flattens a specified history tree group.

UI Access	Modeler > Group > Flatten.		
Parameters	Name	Type	Description
	<GroupID>	Array	Structured array. Array("Groups:=", Array(<string list of group IDs>))
Return Value	None.		

Python Syntax	FlattenGroup (<GroupID>)

Python Example	<code>oEditor.FlattenGroup(["Groups:=", ["Group1"]])</code>

GenerateHistory

Generates the history for specified 1D object(s).

UI Access	Modeler > Generate History.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	GenerateHistory (<SelectionsArray>)
Python Example	<pre>oEditor.GenerateHistory(["NAME:Selections", "Selections:=" , "Polyline1", "NewPartsModelFlag:=" , "Model", "UseCurrentCS:=" , True])</pre>

GetActiveCoordinateSystem

Returns the active coordinate system.

UI Access	None.
Parameters	None.
Return Value	String name of active coordinate system.

Python Syntax	<code>GetActiveCoordinateSystem()</code>
Python Example	<code>oEditor.GetActiveCoordinateSystem()</code>

GetActiveCoordinateSystemTransform

Returns transformation information for the active coordinate system (with respect to the global coordinate system), which consists of the affine matrix for rotation of the coordinate system and a 3D vector with the translation of the coordinate system's origin with respect to the global coordinate system's origin.

UI Access	None
Parameters	None
Return Value	Array of strings containing transformation information

Python Syntax	<code>GetActiveCoordinateSystemTransform()</code>
Python Example	<code>oEditor.GetActiveCoordinateSystemTransform()</code>

GetCoordinateSystems

Returns the names of coordinate systems in the design.

UI Access	None.
Parameters	None.
Return Value	Array containing string names of coordinate systems.

Python Syntax	GetCoordinateSystems()
Python Example	<code>oEditor.GetCoordinateSystems()</code>

HealObject

Heals an imported object.

UI Access	Modeler > Model Preparation > Heal.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array("NAME:ObjectHealingParameters", "Version:=" , <integer>, "AutoHeal:=" , <boolean>, "TolerantStitch:=" , <boolean>, "SimplifyGeom:=" , <boolean>, "TightenGaps:=" , <boolean>, "HealToSolid:=" , <boolean>,

			<pre> "StopAfterFirstStitchError:=", <boolean>, "MaxStitchTol:=" , <float>, "ExplodeAndStitch:=" , <boolean>, "GeomSimplificationTol:=", <integer>, "MaximumGeneratedRadiusForSimplification:=", <integer>, "SimplifyType:=" , <integer>, "TightenGapsWidth:=" , <float>, "RemoveSliverFaces:=" , <boolean>, "RemoveSmallEdges:=" , <boolean>, "RemoveSmallFaces:=" , <boolean>, "SliverFaceTol:=" , <integer>, "SmallEdgeTol:=" , <integer>, "SmallFaceAreaTol:=" , <integer>, "BoundingBoxScaleFactor:=", <integer>, "RemoveHoles:=" , <boolean>, "RemoveChamfers:=" , <boolean>, "RemoveBlends:=" , <boolean>, "HoleRadiusTol:=" , <integer>, "ChamferWidthTol:=" , <integer>, "BlendRadiusTol:=" , <integer>, "AllowableSurfaceAreaChange:=", <integer>, </pre>

			"AllowableVolumeChange:=", <integer>)
Return Value	None.		

Python Syntax	HealObject(<SelectionsArray>, <Parameters>)
Python Example	<pre>oEditor.HealObject(["NAME:Selections", "Selections:=" , "Box1", "NewPartsModelFlag:=" , "Model"], ["NAME:ObjectHealingParameters", "Version:=" , 1, "AutoHeal:=" , True, "TolerantStitch:=" , True, "SimplifyGeom:=" , True, "TightenGaps:=" , True, "HealToSolid:=" , False, "StopAfterFirstStitchError:=", False, "MaxStitchTol:=" , 0.001, "ExplodeAndStitch:=" , True, "GeomSimplificationTol:=", -1,</pre>


```

"MaximumGeneratedRadiusForSimplification:=", -1,
"SimplifyType:=", 2,
"TightenGapsWidth:=", 1E-06,
"RemoveSliverFaces:=", False,
"RemoveSmallEdges:=", False,
"RemoveSmallFaces:=", False,
"SliverFaceTol:=", 0,
"SmallEdgeTol:=", 0,
"SmallFaceAreaTol:=", 0,
"BoundingBoxScaleFactor:=", 1250,
"RemoveHoles:=", False,
"RemoveChamfers:=", False,
"RemoveBlends:=", False,
"HoleRadiusTol:=", 0,
"ChamferWidthTol:=", 0,
"BlendRadiusTol:=", 0,
"AllowableSurfaceAreaChange:=", 5,
"AllowableVolumeChange:=", 5
] )

```

Import

Imports a 3D model file.

Note:

This script does not import DXF or GDSII models. See: [ImportDXF](#) and [ImportGDSII](#).

UI Access	Modeler > Import.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:NativeBodyParameters", "HealOption:=" , <integer>, "Options:=" , <string>, "FileType:=" , <string "UnRecognized">, "MaxStitchTol:=" , <integer>, "ImportFreeSurfaces:=" , <boolean>, "GroupByAssembly:=" , <boolean>, "CreateGroup:=" , <boolean>, "STLFileUnit:=" , <string>, "MergeFacesAngle:=" , <float>, "HealSTL:=" , <boolean>, "ReduceSTL:=" , <boolean>, "ReduceMaxError:=" , <integer>, "ReducePercentage:=" , <integer>,

			"PointCoincidenceTol:=" , <float>, "CreateLightweightPart:=" , <boolean>, "ImportMaterialNames:=" , <boolean>, "SeparateDisjointLumps:=" , <boolean>, "SourceFile:=" , <string>)
Return Value	None.		

Python Syntax	Import(<Parameters>)
Python Example	<pre> oEditor.Import (["NAME:NativeBodyParameters", "HealOption:=" , 0, "Options:=" , "-1", "FileType:=" , "UnRecognized", "MaxStitchTol:=" , -1, "ImportFreeSurfaces:=" , False, "GroupByAssembly:=" , False, "CreateGroup:=" , True, "STLFileUnit:=" , "Auto", "MergeFacesAngle:=" , 0.02, "HealSTL:=" , False, "ReduceSTL:=" , False, </pre>

	<pre> "ReduceMaxError:=" , 0, "ReducePercentage:=" , 100, "PointCoincidenceTol:=" , 1E-06, "CreateLightweightPart:=", False, "ImportMaterialNames:=" , False, "SeparateDisjointLumps:=", False, "SourceFile:=" , "C:\\Users\\jdoe\\Desktop\\export.model"] </pre>

ImportDXF [Modeler]

Imports a DXF model file.

UI Access	Modeler > Import.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre> Array("NAME:options", "FileName:=" , <string>, "Scale:=" , <float>, "AutoDetectClosed:=" , <boolean>, "SelfStitch:=" , <boolean>, "DefeatureGeometry:=" , <boolean>, </pre>

			<pre> "DefeatureDistance:=" , <integer>, "RoundCoordinates:=" , <boolean>, "RoundNumDigits:=" , <integer>, "WritePolyWithWidthAsFilledPoly:=", <boolean>, "ImportMethod:=" , <integer>, "2DSheetBodies:=" , <boolean>, <layersArray>) </pre>
	<code><layersArray></code>	Array	Structured array. <pre> Array("NAME:LayerInfo", <layer>, <layer>, <layer>,...) </pre>
	<code><layer></code>	Array	Structured array. <pre> Array("NAME:<layerName>", "source:=" , <string>, "display_source:=" , <string>, "import:=" , <boolean>, "dest:=" , <string>, "dest_selected:=" , <boolean>, "layer_type:=" , <string>) </pre>
Return Value	None.		

Python Syntax	ImportDXF(<Parameters>)
Python Example	oEditor.ImportDXF(

```
[ "NAME:options",  
  "FileName:=", "C:/Users/jdoe/Desktop/export.dxf",  
  "Scale:="      , 0.001,  
  "AutoDetectClosed:=" , True,  
  "SelfStitch:="    , True,  
  "DefeatureGeometry:=" , False,  
  "DefeatureDistance:=" , 0,  
  "RoundCoordinates:=" , False,  
  "RoundNumDigits:="   , 4,  
  "WritePolyWithWidthAsFilledPoly:=", False,  
  "ImportMethod:="     , 1,  
  "2DSheetBodies:="    , False,  
  [ "NAME:LayerInfo",  
    [ "NAME:0",  
      "source:="      , "0",  
      "display_source:=" , "0",  
      "import:="       , True,  
      "dest:="         , "0",  
      "dest_selected:=" , False,  
      "layer_type:="   , "signal"
```

```

    ],
    ["NAME:LAYER_1",
     "source:="                , "LAYER_1",
     "display_source:="        , "LAYER_1",
     "import:="                 , True,
     "dest:="                   , "LAYER_1",
     "dest_selected:="          , False,
     "layer_type:="             , "signal"
    ],
    ["NAME:LAYER_2",
     "source:="                , "LAYER_2",
     "display_source:="        , "LAYER_2",
     "import:="                 , True,
     "dest:="                   , "LAYER_2",
     "dest_selected:="          , False,
     "layer_type:="             , "signal"
    ]
  ]
]
]

```

ImportFromClipboard

Imports a model from clipboard.

UI Access	Modeler > Import From Clipboard.
Parameters	None.
Return Value	None.

Python Syntax	ImportFromClipboard ()
Python Example	oEditor.ImportFromClipboard()

ImportGDSII [Modeler]

Imports a GDSII model file.

UI Access	Modeler > Import.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:options", "FileName:=" , <string>, "FlattenHierarchy:=" , <boolean>, "ImportMethod:=" , <integer>, <layerMapArray>, <layerMapArray>, <layerMapArray>,... "OrderMap:=" , ["entry:=" , <entry>, <entry>, <entry>,...

			]
			])
	<layerMapArray>	Array	Structured array. Array("NAME:LayerMapInfo", "LayerNum:=" , <integer>, "DestLayer:=" , <string>, "layer_type:=" , <string>)
	<entry>	Array	Structured array. Array("order:=" , <integer LayerNum>, "layer:=" , <string DestLayer>)
Return Value	None.		

Python Syntax	ImportGDSII(<Parameters>)
Python Example	<pre>oEditor.ImportGDSII(["NAME:options", "FileName:=", "C:/Users/coil2.gds", "FlattenHierarchy:=" , True, "ImportMethod:=" , 1, ["NAME:LayerMap", ["NAME:LayerMapInfo", "LayerNum:=" , 12, "DestLayer:=" , "Signal12",</pre>

```
        "layer_type:="          , "signal"
    ],
    ["NAME:LayerMapInfo",
    "LayerNum:="                , 13,
    "DestLayer:="               , "Signal13",
    "layer_type:="              , "signal"
    ],
    ["NAME:LayerMapInfo",
    "LayerNum:="                , 14,
    "DestLayer:="               , "Signal14",
    "layer_type:="              , "signal"
    ]
],
"OrderMap:=",
[
    "entry:=",
        ["order:=", 0, "layer:=", "Signal12"],
    "entry:=",
        ["order:=", 1, "layer:=", "Signal13"],
    "entry:=",
```

	<pre>["order:=", 2, "layer:=", "Signal14"]]])</pre>

Imprint

Imprints the geometry of one object upon another.

UI Access	Modeler > Boolean > Imprint...		
Parameters	Name	Type	Description
	<Selections>	Array	Structured array. Array("NAME:Selections", "Blank Parts:=", <string, object name>, "Tool Parts:=", <string, object name>)
	<Parameters>	Array	Structured array. Array("NAME:ImprintParameters", "KeepOriginals:=", <boolean>)
Return Value	None.		

Python Syntax	Imprint (<Selections>, <Parameters>)
Python Example	<pre>oEditor.Imprint(["NAME:Selections", "Blank Parts:=", "Cylinder1",</pre>

	<pre>"Tool Parts:=", "Box1"], ["NAME:ImprintParameters", "KeepOriginals:=", False])</pre>

ImprintProjection

Projects the form of a sheet object onto the face or faces of another object (either solid or sheet).

UI Access	Modeler > Boolean > Imprint Projection.		
Parameters	Name	Type	Description
	<Selections>	Array	Structured array. <pre>Array("NAME:Selections", "Selections:=", <string, selected objects>)</pre>
	<Parameters>	Array	Structured array. <pre>Array("NAME:ImprintProjectionParameters", "KeepOriginals:=", <boolean>, "NormalProjection:=", <boolean>, "Distance:=", <float>, "DirectionX:=", <float>, "DirectionY:=", <float>, "DirectionZ:=", <float>)</pre>
Return Value	None.		

Python Syntax	ImprintProjection (<Selections>, <Parameters>)
Python Example	<pre>oEditor.ImprintProjection(["NAME:Selections", "Selections:=", "Rectangle1,Cylinder1"], ["NAME:ImprintProjectionParameters", "KeepOriginals:=", False, "NormalProjection:=", True, "Distance:=", "1.36014705087354mm", "DirectionX:=", "0.882257546512569", "DirectionY:=", "0.294085848837523", "DirectionZ:=", "0.367607311046904"])</pre>

Intersect

Intersects specified objects.

UI Access	Modeler > Boolean > Intersect.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array ("NAME:IntersectParameters", "KeepOriginals:=" , <boolean True to keep

	<table><tr><td></td><td></td><td>original objects; False to delete>)</td></tr></table>			original objects; False to delete>)
		original objects; False to delete>)		
Return Value	None.			

Python Syntax	<code>Intersect(<SelectionsArray>, <Parameters>)</code>
Python Example	<pre>oEditor.Intersect(["NAME:Selections", "Selections:=", "Rectangle1,Rectangle2"], ["NAME:IntersectParameters", "KeepOriginals:=", False])</pre>

MoveCStoEnd

Moves a specified Object Coordinate System to the end of the History tree.

UI Access	Modeler > Coordinate System > Move CS to End.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	<code>MoveCStoEnd (<SelectionsArray>)</code>
Python Example	<pre>oEditor.MoveCStoEnd(["NAME:Selections", "Selections:=" , "ObjectCS1"]) </pre>

MoveEntityToGroup

Moves a specified entity or entities to a specified group.

UI Access	Drag item into the group in the history tree.		
Parameters	Name	Type	Description
	<code><Objects></code>	Array	Structured array. Selects the entity/entities to move. Array("Objects:=" , <array containing string object IDs>)
	<code><MoveEntityToGroup></code>	Array	Structured array. Array("ParentGroup:=" , <string group name>)
Return Value	None.		

Python Syntax	<code>MoveEntityToGroup (<Objects>, <MoveEntityToGroup>)</code>
Python Example	<pre>oEditor.MoveEntityToGroup(["Objects:=", ["Box3"]], ["ParentGroup:=", "Box_Group"]) </pre>

MoveFaces

Moves the specified faces along normal or along a vector.

UI Access	Modeler > Surface > Move Faces > Along [Normal/Vector].		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<MoveFacesParametersArray>	Array	Structured array. Array ("NAME:Parameters", <FacesOfOneObjToMove>, <FacesOfOneObjToMove>, ...)
	<FacesOfOneObjToMove>	Array	Structured array. Array ("Name:MoveFacesParameters", "MoveAlongNormalFlag:=", <boolean>, "OffsetDistance:=", <string>, "MoveVectorX:=", <string>, "MoveVectorY:=", <string>, "MoveVectorZ:=", <string>, "FacesToMove:=", <array>) MoveAlongNormalFlag specifies whether to move along the face normal or along a vector. If false, provide the MoveVectorX, MoveVectorY, and MoveVectorZ parameters. FacesToMove is an array of integers (the IDs of the faces to

			move).
Return Value	None		

Python Syntax	MoveFaces (<SelectionsArray>, <MoveFacesParametersArray>)
Python Example	<pre> oEditor.MoveFaces (["NAME:Selections", "Selections:=" , "Rectangle1", "NewPartsModelFlag:=" , "Model"], ["NAME:Parameters", ["NAME:MoveFacesParameters", "MoveAlongNormalFlag:=" , True, "OffsetDistance:=" , "1mm", "MoveVectorX:=" , "0mm", "MoveVectorY:=" , "0mm", "MoveVectorZ:=" , "0mm", "FacesToMove:=" , [183]]]) </pre>

ProjectSheet

Project a sheet object, typically for modeling thin conformal deposits. Typically followed by **Thicken Sheet**.

UI Access	Click Modeler > Surface > Project Sheet .

Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Array containing string. Array ("NAME:ProjectSheetParameters")
Return Value	None.		

Python Syntax	ProjectSheet (<SelectionsArray>, <Parameters>)
Python Example	<pre>oEditor.ProjectSheet (['NAME:Selections', 'Selections:=', 'Box1,Box2,Polyline1'], ['NAME:ProjectSheetParameters'])</pre>

PurgeHistory

Purges the history of a specified object.

UI Access	Modeler > Purge History.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	PurgeHistory (<SelectionsArray>)
Python Example	<pre>oEditor.PurgeHistory(["NAME:Selections", "Selections:=", "Box2", "NewPartsModelFlag:=", "Model"])</pre>

ReplaceWith3DComponent

Replaces the selection with a 3D component.

UI Access	None.		
Parameters	Name	Type	Description
	<CreateData>	Array	Structured array.
	<DesignData>	Array	Structured array.
	<ImageFile>	Array	Structured array.
Return Value	None.		

Python Syntax	ReplaceWith3DComponent(<CreateData>, <DesignData>, <ImageFile>)
Python Example	<pre>oEditor.ReplaceWith3DComponent(["NAME>CreateData",</pre>

```
"ComponentName:=", "CoaxBend",  
"Company:=", "",  
"Company URL:=", "",  
"Model Number:=", "",  
"Help URL:=", "",  
"Version:=", "1.0",  
"Notes:=", "",  
"IconType:=", "",  
"Owner:=", "Jane Doe",  
"Email:=", "jdoe@email.com",  
"Date:=", "3:46:31 PM Jul 26, 2020",  
"HasLabel:=", False,  
"IncludedParts:=", ["outer","teflon","inner","teflon_1"],  
"HiddenParts:=", [],  
"IncludedCS:=", [],  
"DefaultHandle:=", "Global",  
"IncludedParameters:=", ["bend_angle"],  
"ParameterDescription:=", ["bend_angle:=", ""]  
],  
["NAME:DesignData",
```

	<pre> "Excitations:=", ["1","2"]], ["NAME:ImageFile", "ImageFile:=", ""]) </pre>

Section

Creates a 2D cross-section of the selection in the specified plane.

UI Access	Modeler > Surface > Section.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. <pre> Array("NAME:SectionToParameters", "CreateNewObjects:=" , <boolean>, "SectionPlane:=" , <string "XY", "YZ", or "ZX">, "SectionCrossObject:=" , <boolean>) </pre>
Return Value	None.		

Python Syntax	Section (<SelectionsArray>, <Parameters>)
Python Example	<pre>oEditor.Section(["NAME:Selections", "Selections:=" , "Cone1", "NewPartsModelFlag:=" , "Model"], ["NAME:SectionToParameters", "CreateNewObjects:=" , True, "SectionPlane:=" , "XY", "SectionCrossObject:=" , False])</pre>

SeparateBody

Separates the bodies of specified multi-lump objects.

UI Access	Modeler > Boolean > Separate Bodies.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	SeparateBody (<SelectionsArray>)
Python Example	<pre>oEditor.SeparateBody(["NAME:Selections", "Selections:=", "Rectangle1,Circle1", "NewPartsModelFlag:=", "Model"])</pre>

SetModelUnits

Sets the model units.

UI Access	Modeler > Units.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre>Array("NAME:Units Parameter", "Units:=", <string>, "Rescale:=", <boolean True to rescale model; else False>)</pre> To see valid unit strings, select Modeler > Units.
Return Value	None.		

Python Syntax	SetModelUnits (<Parameters>)

Python Example	<pre>oEditor.SetModelUnits(["NAME:Units Parameter", "Units:=", "km", "Rescale:=", False])</pre>

SetWCS

Sets the working coordinate system.

UI Access	Modeler > Coordinate System > Set Working CS.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:SetWCS Parameter", "Working Coordinate System:=", <string CS name>, "RegionDepCSOk:=" , <boolean True if region-dependent; else False)
Return Value	None.		

Python Syntax	SetWCS (<Parameters>)
Python Example	<pre>oEditor.SetWCS (</pre>


```
[ "NAME:SetWCS Parameter",
  "Working Coordinate System:=", "Global",
  "RegionDepCSOk:=", False
]
```

ShowWindow

Opens the active 3D Modeler window.

UI Access	None.
Parameters	None.
Return Value	None.

Python Syntax	ShowWindow
Python Example	<code>oEditor.ShowWindow()</code>

Simplify

Converts a complex MCAD object into simpler primitives which are easy to mesh and solve.

UI Access	Modeler > Model Preparation > Simplify.		
Parameters	Name	Type	Description
	<Selections>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array.

			<pre> Array("NAME:SimplifyParameters", "Type:=", <string fit type>, "ExtrusionAxis:=", <string>, "Cleanup:=", <boolean>, "Splitting:=", <boolean>, "SeparateBodies:=", <boolean>, "CloneBody:=", <boolean>, "Generate Primitive History:=", <boolean>, "NumberPointsCurve:=", <integer>, "LengthThresholdCurve:=", <integer>) </pre>
	<CreateGroup>	Array	Structured array. <pre> Array("CreateGroupsForNewObjects:=", <boolean>) </pre>
Return Value	None.		

Python Syntax	Simplify (<Selections>, <Parameters>, <CreateGroup>)
Python Example	<pre> oEditor.Simplify(["NAME:Selections", "Selections:=", "Cylinder1,Box2", "NewPartsModelFlag:=", "Model"], </pre>

```
["NAME:SimplifyParameters",
    "Type:=", "Polygon Fit",
    "ExtrusionAxis:=", "Auto",
    "Cleanup:=", True,
    "Splitting:=", True,
    "SeparateBodies:=", False,
    "CloneBody:=", False,
    "Generate Primitive History:=", True,
    "NumberPointsCurve:=", 3,
    "LengthThresholdCurve:=", 20],
["CreateGroupsForNewObjects:=", True]
)
```

Split

Splits the specified object(s) along a plane.

UI Access	Modeler > Boolean > Split.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array("NAME:SplitToParameters", "SplitPlane:=" , <string "XY", "YZ", "ZX", or "Dummy"> ,

			<pre>"WhichSide:=" , <string "PositiveOnly", "NegativeOnly" or "Both">, "ToolType:=" , <string "PlaneTool" or "FaceTool">, "ToolEntityID:=" , <-1 if using SplitPlane; else FaceID>, "SplitCrossingObjectsOnly:=", <boolean>, >DeleteInvalidObjects:=", <boolean>)</pre> You can split an object either along an existing plane , or by creating a plane using an edge. For existing plane: • SplitPlane is "XY", "YZ", or "ZX" • ToolType is "PlaneTool" • ToolEntityID is -1 For an edge: • SplitPlane is "Dummy" • ToolType is "EdgeTool" • ToolEntityID is the face ID
Return Value	None.		

Python Syntax	<code>Split(<SelectionsArray>, <Parameters>)</code>
Python Example	<code>oEditor.Split(</code>

```

["NAME:Selections",
  "Selections:="          , "Box1",
  "NewPartsModelFlag:="   , "Model"
],
["NAME:SplitToParameters",
  "SplitPlane:="          , "XY",
  "WhichSide:="           , "PositiveOnly",
  "ToolType:="            , "PlaneTool",
  "ToolEntityID:="        , -1,
  "SplitCrossingObjectsOnly:=", False,
  "DeleteInvalidObjects:=", True
]
)

```

Stitch

Stitches selected sheets.

UI Access	Modeler > Model Preparation > Stitch Sheets.		
Parameters	Name	Type	Description
	<Selections>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array("NAME:StitchParameters", "MaxTol:=", <integer maximum tolerance>)
Return Value	None.		

Python Syntax	Stitch (<Selections>, <Parameters>)
Python Example	<pre>oEditor.Stitch(["NAME:Selections", "Selections:=", "Rectangle3,Rectangle4", "NewPartsModelFlag:=", "Model"], ["NAME:StitchParameters", "MaxTol:=", -1])</pre>

Subtract

Subtracts the specified object(s).

UI Access	Modeler > Boolean > Subtract.		
Parameters	Name	Type	Description
	<Selections>	Array	Structured array. <pre>Array("NAME:Selections", "Blank Parts:=" , <string object name(s)>, "Tool Parts:=" , <string object name(s)>)</pre> The Tool Parts object is the object being removed.

			The Blank Parts object has any Tool Parts overlap removed. Either string can contain more than one object.
	<Parameters>	Array	Structured array. Array("NAME:SubtractParameters", "KeepOriginals:=" , <boolean>)
Return Value	None.		

Python Syntax	Subtract(<Selections>, <Parameters>)
Python Example	<pre>oEditor.Subtract(["NAME:Selections", "Blank Parts:=", "Rectangle1", "Tool Parts:=", "Rectangle2"], ["NAME:SubtractParameters", "KeepOriginals:=", False])</pre>

SweepFacesAlongNormal

Sweep the specified face(s) along normal.

UI Access	Modeler > Surface > Sweep Faces Along Normal		
Parameters	Name	Type	Description

	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<parameters>	Array	Structured array. Array("NAME:Parameters", "NAME:SweepFaceAlongNormalToParameters", "FacesToDetach:=", <faceIDarray>, "LengthOfSweep:=", "<value><units>")
Return Value	None		

Python Syntax	SweepFacesAlongNormal(<SelectionsArray> <parameters>)
Python Example	<pre>oEditor.SweepFacesAlongNormal(["NAME:Selections", "Selections:=", "Rectangle1", "NewPartsModelFlag:=", "Model"], ["NAME:Parameters", "NAME:SweepFaceAlongNormalToParameters", "FacesToDetach:=", [183], "LengthOfSweep:=", "0.1mm"])</pre>

ThickenSheet

Thickens a sheet object to convert it to a 3D object.

UI Access	Modeler > Surface > Thicken Sheet		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<parameters>	Array	Structured array. Array("NAME:SheetThickenParameters", "Thickness:=" , <string>, "BothSides:=" , <boolean>)
Return Value	None.		

Python Syntax	ThickenSheet (<SelectionsArray> <parameters>)
Python Example	<pre>oEditor.ThickenSheet (["NAME:Selections", "Selections:=" , "Rectangle3", "NewPartsModelFlag:=" , "Model"], ["NAME:SheetThickenParameters", "Thickness:=" , "0.01mm", "BothSides:=" , False])</pre>

	])

UncoverFaces

Uncovers the specified face(s).

UI Access	Modeler > Surface > Uncover Faces		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<parameters>	Array	Structured array. Array ("NAME:Parameters", Array ("NAME:UncoverFacesParameters", "FacesToUncover:=" , <array of face IDs>)))
Return Value	None.		

Python Syntax	UncoverFaces(<SelectionsArray> <parameters>)
Python Example	<pre>oEditor.UncoverFaces(["NAME:Selections", "Selections:=" , "Box1", "NewPartsModelFlag:=" , "Model"],</pre>

	<pre>["NAME:Parameters", ["NAME:UncoverFacesParameters", "FacesToUncover:=" , [12,16,18]]]</pre>

Unite

Unites the specified objects.

UI Access	Modeler > Boolean > Unite		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<parameters>	Array	Structured array.
			<pre>Array("NAME:UniteParameters", "KeepOriginals:=" , <boolean>, "TurnOnNBodyBoolean:=", <boolean>)</pre> Note: TurnOnNBodyBoolean is set to True by default. Enabled by Parasolid, this unites <i>n</i> bodies in a single step, rather than uniting them one by one.
Return Value	None.		

Python Syntax	<code>Unite(<SelectionsArray>, <parameters>)</code>
Python Example	<pre>oEditor.Unite(["NAME:Selections", "Selections:=", "Rectangle1,Rectangle2"], ["NAME:UniteParameters", "KeepOriginals:=", False, "TurnOnNBodyBoolean:=", True])</pre>

Ungroup

Ungroups a specified history tree group.

UI Access	Modeler > Group > Ungroup		
Parameters	Name	Type	Description
	<code><Groups></code>	Array	Structured array. <code>Array("Groups:=", <array of group names to ungroup>)</code>
Return Value	None		

Python Syntax	Ungroup(<Groups>)
Python Example	<code>oEditor.Ungroup(["Groups:=", ["Group1"]])</code>

WrapSheet

Wraps a sheet object to another object.

UI Access	None.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<Parameters>	Array	Structured array. Array("NAME:WrapSheetParameters", "Imprinted:=", <boolean>)
Return Value	None.		

Python Syntax	WrapSheet (<SelectionsArray>, <Parameters>)
Python Example	<pre>oEditor.WrapSheet(["NAME:Selections", "Selections:=", "Rectangle1, Box1"], ["NAME:WrapSheetParameters", "Imprinted:=", True])</pre>

	]
	)

Other oEditor Commands

[AddDefinitionFromBlock](#)

[AddDefinitionFromLibFile](#)

[BreakUDMConnection](#)

[ChangeProperty](#)

[Delete](#)

[FitAll](#)

[GetBodyNamesByPosition](#)

[GetChildNames \[Modeler\]](#)

[GetChildObject \[Modeler\]](#)

[GetChildTypes \[Modeler\]](#)

[GetEdgeByPosition](#)

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[GetEntityListIDByName](#)

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[GetFaceArea](#)

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[GetPropValue](#)

[GetSelections](#)

[GetUserPosition](#)

[GetVertexIdsFromEdge](#)[GetVertexIdsFromFace](#)[GetVertexIdsFromObject](#)[GetVertexPosition](#)[PageSetup](#)[RenamePart](#)[SetPropValue \[Modeler\]](#)

AddDefinitionFromBlock

Adds a material definition from block text (same definition format as would be contained in the material library file) by library type (using definition folder name). This scripting command directly supports the .AMAT (or .ASURF) definition formats.

UI Access	N/A		
Parameters	Name	Type	Description
	<defBlock>	String	Text of the new material definition in block form.
	<defFolderName>	String	Library type (by definition folder name)
	<newTimeStamp>	String	New timestamp (time_t as integer number of seconds since 1/1/1970 12:00am, as string), default is current time
	<replaceExisting>	Boolean	True to replace existing, False to choose a new unique name if an existing definition is found
Return Value	A property scripting object for the definition.		

P- yt- h- o- n S- y- nt- ax	AddDefinitionFromBlock(<defBlock>,<defFolderName>,<newTimeStamp>,<replaceExisting>)
P- yt- h- o- n E- x- a- m- p- l- e	<pre> oProject = oDesktop.NewProject() oProject.InsertDesign("HFSS", "HFSSDesign1", "DrivenModal", "") oDesign = oProject.SetActiveDesign("HFSSDesign1") oEditor = oDesign.SetActiveEditor("3D Modeler") oEditor.CreateBox(["NAME:BoxParameters", "XPosition:=" , "-0.4mm", "YPosition:=" , "-1mm", "ZPosition:=" , "0mm", "XSize:=" , "1.4mm", "YSize:=" , "1.6mm", "ZSize:=" , "0.6mm"] </pre>

```
    ],  
  
    [  
  
        "NAME:Attributes",  
            "Name:=" , "Box1",  
  
        "Flags:=" , "",  
  
        "Color:=" , "(143 175 143)",  
  
        "Transparency:=" , 0,  
  
        "PartCoordinateSystem:=", "Global",  
  
        "UDMId:=" , "",  
  
        "MaterialValue:=" , "\"vacuum\"",  
  
        "SurfaceMaterialValue:=", "\"\"",  
  
        "SolveInside:=" , True,  
  
        "ShellElement:=" , False,
```

```

        "ShellElementThickness:=", "0mm",

        "IsMaterialEditable:=" , True,

        "UseMaterialAppearance:=", False,

        "IsLightweight:="      , False

    ])

oDefinitionManager = oProject.GetDefinitionManager()

defBlock = "$begin 'vacuum2' $begin 'AttachedData' $begin 'MatAppearanceData' property_data-
='appearance_data' Red=230 Green=230 Blue=230 Transparency=0.95 $end 'MatAppearanceData'
$end 'AttachedData' simple('permittivity', 1) ModTime=1499970477 $end 'vacuum2'"

added = oDefinitionManager.AddDefinitionFromBlock(defBlock, "Materials", "10101010", True)
addedName = ''

    if isinstance(added, basestring):
        addedName = added
    elif isinstance(added, list):
        addedName = added[0]
else:

    addedName = added.GetName().replace("Materials:", "")

AddInfoMessage(os.path.basename(__file__) + " result: " + addedName)

materialNameInQuotes = "\"" + addedName + "\""

```

```
oEditor.ChangeProperty(  
    [  
        "NAME:AllTabs",  
        [  
            "NAME:Geometry3DAttributeTab",  
            [  
                "NAME:PropServers",  
                "Box1"  
            ],  
            [  
                "NAME:ChangedProps",  
                [  
                    "NAME:Material",
```

	<pre> "Value:=", materialNameInQuotes]]]]) </pre>

AddDefinitionFromLibFile

Adds a material definition from a library file (e.g. AMAT file), by name and library type (using definition folder name) . This scripting command directly supports the .AMAT (or .ASURF) definition formats.

UI Access	N/A		
Parameters	Name	Type	Description
	<FilePath>	String	Path of the library file (i.e. AMAT file or ASURF file)
	<defName>	String	Which definition to use, required because a lib file can have multiple definitions.
	<defFolderName>	String	Library type (by definition folder name).
	<newTimeStamp>	String	New timestamp string (time_t as integer, number of seconds since 1/1/1970 12:00am), default is current time
	<replaceExisting>	Boolean	True to replace existing, False to choose a new unique name if an existing definition is found, default is False
Return Value	Property scripting object for the definition.		

Python Syntax	AddDefinitionFromLibFile(<FilePath>, <defName>, <defFolderName>, <newTimeStamp>, <replaceExisting>)

**Python
Example**

```
oProject = oDesktop.NewProject()
oProject.InsertDesign("HFSS", "HFSSDesign1", "DrivenModal", "")
oDesign = oProject.SetActiveDesign("HFSSDesign1")
oEditor = oDesign.SetActiveEditor("3D Modeler")
oEditor.CreateBox(

    [

        "NAME:BoxParameters",

        "XPosition:="                , "-0.4mm",

        "YPosition:="                , "-1mm",

        "ZPosition:="                , "0mm",

        "XSize:="                    , "1.4mm",

        "YSize:="                    , "1.6mm",

        "ZSize:="                    , "0.6mm"

    ],

    [

        "NAME:Attributes",

        "Name:="                      , "Box1",
```

```
"Flags:="                , "",  
  
"Color:="                , "(143 175 143)",  
  
"Transparency:="        , 0,  
  
"PartCoordinateSystem:=", "Global",  
  
"UDMId:="                , "",  
  
"MaterialValue:="        , "\"vacuum\"",  
  
"SurfaceMaterialValue:=", "\"\"",  
  
"SolveInside:="          , True,  
  
    "ShellElement:="      , False,  
  
"ShellElementThickness:=", "0mm",  
  
"IsMaterialEditable:="    , True,  
  
"UseMaterialAppearance:=", False,  
  
"IsLightweight:="         , False
```

```
    ])  
  
    oDefinitionManager = oProject.GetDefinitionManager()  
    scriptDir = os.path.dirname(os.path.realpath(__file__))  
    amatFilePath = scriptDir + '/material0.txt'  
    materialName = "material0"  
    materialNameInQuotes = "\"" + materialName + "\""   
  
    added = oDefinitionManager.AddDefinitionFromLibFile(amatFilePath, materialName, "Materials", "")  
    addedName = ''  
    if isinstance(added, basestring):  
        addedName = added  
    elif isinstance(added, list):  
        addedName = added[0]  
    else:  
        addedName = added.GetName().replace("Materials:", "")  
    AddInfoMessage(os.path.basename(__file__) + " result: " + addedName)  
    oEditor.ChangeProperty(  
        [  
            "NAME:AllTabs",
```



```

[
    "NAME:Geometry3DAttributeTab",
    [
        "NAME:PropServers",
        "Box1"
    ],
    [
        "NAME:ChangedProps",
        [
            "NAME:Material",
            "Value:=", materialNameInQuotes
        ]
    ]
]
]
)

```

AddViewOrientation

Creates a new orientation using a script. Input parameters can be *either* vector components *or* angles. Local view orientation specific to a design can be saved in project by calling Save() on the project object.

Note:

You cannot use the name of an existing view. Default views include: top, bottom, right, left, front, back, trimetric, dimetric, and isometric.

UI Access	View > Modify Attributes > Orientation List. Enter parameters and click Add .		
Parameters	Name	Type	Description
	<orientationName>	String	Name of the new orientation.
	<isGlobalOrientation>	Long	1 to save global; else 0.
	<OrientationVectorComponents>	Array	Structured array. Use <i>either</i> <OrientationVectorComponents> <i>or</i> <OrientationAnglesArray>. <pre>Array("NAME:OrientationVectorComponents", Array("NAME:Direction", <float>, <float>, <float>, Array("NAME:Up", <float>, <float>, <float>))</pre>
	<OrientationAnglesArray>	Array	Structured array. Use <i>either</i> <OrientationVectorComponents> <i>or</i> <OrientationAnglesArray>. <pre>Array("NAME:OrientationAngles",</pre>

		<pre>"Psi:=" , <float>, "Theta:=" , <float>, "Phi:=" , <float>)</pre>
	<ProjectionParams>	Array <i>Optional.</i> Structured array containing arrays of four optional parameters: Scaling, Translation, Projection Type, and Projection Limits. <pre>Array("NAME:ProjectionParams", Array("NAME:Scaling", <float>, <float>, <float>), Array("NAME:Translation", <float>, <float>, <float>), "ProjectionType:=" , <string "Orthographic" or "Perspective">, Array("NAME:ProjectionLimits", <float>, <float>, <float>,</pre>

	<float>, <float>, <float>))
Return Value	None.

Python Syntax	AddViewOrientation(<orientationName>, <isGlobalOrientation>, <OrientationVectorComponents <u>or</u> OrientationAnglesArray>, <ProjectionParams>)
Python Example	Example Using Angles and Projection Parameters: <pre>oEditor.AddViewOrientation("orientation3", 0, ["NAME:OrientationAngles", "Psi:=" , -161.565002441406, "Theta:=" , 32.3115005493164, "Phi:=" , 0], ["NAME:ProjectionParams", ["NAME:Scaling", 0.591607987880707,</pre>

```
0.591607987880707,  
  
0.591607928276062  
],  
  
["NAME:Translation",  
  
0,  
2.38418579101563E-07,  
-5.7486834526062  
],  
"ProjectionType:=", "Orthographic",  
  
["NAME:ProjectionLimits",  
  
-2.44362282752991,  
2.44362282752991,  
  
-1,  
  
1,  
0.625207424163818,  
10.8721580505371  
]
```

```

    ]
)

Example Using Vector without Projection Parameters:

oEditor.AddViewOrientation("orientation6", 0,
["NAME:OrientationVectorComponents",
    ["NAME:Direction",
        -0.801783978939056,
        -0.267262011766434,
        -0.534521996974945
    ],
    ["NAME:Up",
        -0.507091999053955,
        -0.169030994176865,
        0.845155000686646
    ]
])

```

AssignSurfaceMaterial

Assigns a material to specified surfaces.

UI Access	N/A

Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
	<AttributesArray>	Array	Structured array. See: AttributesArray . This script supports the following attributes: • MaterialValue • SolveInside • ShellElement • ShellElementThickness • IsMaterialEditable • UseMaterialAppearance • IsLightweight
Return Value	None.		
Python Syntax	AssignSurfaceMaterial(<SelectionsArray>, <AttributesArray>)		

Python Example	<pre>oEditor.AssignSurfaceMaterial(["NAME:Selections", "AllowRegionDependentPartSelectionForPMLCreation:=", True, "AllowRegionSelectionForPMLCreation:=", True, "Selections:=" , "Rectangle1"], ["NAME:Attributes", "MaterialValue:=" , "diamond", "SolveInside:=" , False, "ShellElement:=" , False, "ShellElementThickness:=" , "nan", "IsMaterialEditable:=" , True, "UseMaterialAppearance:=" , False, "IsLightweight:=" , False])</pre>

BreakUDMConnection

Breaks a current UDM connection to Discovery.

UI Access	Break Connection.

Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	BreakUDMConnection (<SelectionsArray>)
Python Example	<pre>oEditor.BreakUDMConnection (["NAME:Selections", "Selections:=" , "Discovery1"]) </pre>

ChangeProperty

Changes the properties of an object in the history tree.

UI Access	Right-click an object in the History Tree and select Properties .		
Parameters	Name	Type	Description
	<propertyArgs>	Array	Structured array. The properties vary depending on the object. Due to the number of potential configurations, it is recommended that you generate this script using the UI's Automation tab.
Return Value	None.		

Python Syntax	ChangeProperty(<propertyArgs>)
Python Example	Example: Changing the Position of a Box <pre>oEditor.ChangeProperty(["NAME:AllTabs", ["NAME:Geometry3DCmdTab", ["NAME:PropServers" , "Box1:CreateBox:1"], ["NAME:ChangedProps", ["NAME:Position", "X:=" , "0.35in", "Y:=" , "0.55in", "Z:=" , "0in"]]]])</pre> Example: Offset the Position of a 3D Component or Layout Component with a Variable <pre>oDesign.ChangeProperty(["NAME:AllTabs", ["NAME:LocalVariableTab", ["NAME:PropServers", </pre>

```

        "LocalVariables"
    ],
    [
        "NAME:NewProps",
        [
            "NAME:zH",
            "PropType:=",
            "UserDef:=",
            "Value:="
        ],
        [
            "VariableProp",
            True,
            "50mm"
        ]
    ]
]
])
oEditor = oDesign.SetActiveEditor("3D Modeler")
oEditor.ChangeProperty(
[
    "NAME:AllTabs",
    [
        "NAME:General",
        [
            "NAME:PropServers",
            "LC1_1"
        ],
        [
            "NAME:ChangedProps",
            [
                "NAME:Position",
                "X:=",
                "Y:=",
                "Z:="
            ],
            [
                "0mm",
                "0mm",
                "zH"
            ]
        ]
    ]
]
])

```

Example: Changing a Box's Material and Wireframe Display

```
oEditor.ChangeProperty(  
[  
  "NAME:AllTabs",  
  [  
    "NAME:Geometry3DAttributeTab",  
    [  
      "NAME:PropServers" ,  
      "Box1"  
    ],  
    [  
      "NAME:ChangedProps",  
      [  
        "NAME:Material",  
        "Value:="          , "\"vacuum\""  
      ],  
      [  
        "NAME:Display Wireframe",  
        "Value:="          , True  
      ]  
    ]  
  ]  
])
```

Example: Change Default Handle (reference coordinate system) for a 3D Component or Layout Component

```
oEditor.ChangeProperty(  
[  
  "NAME:AllTabs",  
  [  
    "NAME:General",
```

```

[
    "NAME:PropServers",
    "LC1_1"
],
[
    "NAME:ChangedProps",
    [
        "NAME:Handle",
        "Value:=",
        , " NotchOutY"
    ]
]
])
))

oEditor.ChangeProperty(
[
    "NAME:AllTabs",
    [
        "NAME:Component Data",
        [
            "NAME:PropServers",
            "BoundarySetup:LC1_1_Port1"
        ],
        [
            "NAME:ChangedProps",
            [
                "NAME:Voltage",
                "Value:=",
                , "10mV"
            ]
        ]
    ]
])
...

```

Example: Change Material Import for a Discovery Model

	<pre>oEditor = oDesign.SetActiveEditor("3D Modeler") oEditor.ChangeProperty(["NAME:AllTabs", ["NAME:Options", ["NAME:PropServers", "Discovery1"], ["NAME:ChangedProps", ["NAME:Materials", "Value:=" , "Assignments and Properties"]]]])</pre>

CloseAllWindows[Editor]

Closes all windows belong to current 3D Modeler editor.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	CloseAllWindows()
Python Example	<code>oEditor.CloseAllWindows()</code>

Defeature

Removes irrelevant features from a primitive.

UI Access	N/A		
Parameters	Name	Type	Description
	<Selections>	Array	Structured array. See: SelectionsArray .
	<Options>	Array	Structured array. Array("NAME:options", "tolerance:=", <double containing tolerance value>, "fix:=", <boolean, if true, then self-intersections are fixed.>)
Return Value	None.		

Python Syntax	Defeature(<Selections>, <Options>)
Python Example	<pre>oEditor.Defeature(["NAME:Selections", "Selections:=", "Box1"], ["NAME:Options", "Tolerance:=", 1E-006, "Fix:=", True])</pre>

Delete

Deletes the specified object(s).

UI Access	Edit > Delete.		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	None.		

Python Syntax	Delete(<SelectionsArray>)
Python Example	<pre>oEditor.Delete(["NAME:Selections", "Selections:=", "Rectangle1,Rectangle2"])</pre>

FitAll

Fits the design to the modeling area.

UI Access	View > Fit All > All Views.
Parameters	None.
Return Value	None.

Python Syntax	FitAll()
Python Example	<code>oEditor.FitAll()</code>

GenerateAllUserDefinedModels

Generates all user defined models.

UI Access	N/A
Parameters	None.
Return Value	Array of models generated.

Python Syntax	GenerateAllUserDefinedModels ()
Python Example	<code>oEditor.GenerateAllUserDefinedModels ()</code>

GenerateUserDefinedModel

Generates specified user defined model(s).

UI Access	N/A		
Parameters	Name	Type	Description
	<SelectionsArray>	Array	Structured array. See: SelectionsArray .
Return Value	Array of models generated.		

Python Syntax	GenerateUserDefinedModel (<SelectionsArray>)
Python Example	<pre>oEditor.GenerateUserDefinedModel(["NAME:Selections", "Selections:=", "model1, model2"])</pre>

GeometryCheckAndAutofix

Use: Runs Geometry Check and optionally applies autofixes.

Command: HFSS 3D Layout > Geometry Check

Syntax: GeometryCheckAndAutofix <ChecksArray>,

minimum_area_meters_squared,

<FixesArray>

Return Value: None

Parameters: <ChecksArray> - Array("NAME:checks", <check 1>, <check 2>, ..., <check n>)

Specify the checks that should be included. Specifying fewer checks may speed up execution but may also result in less problems reported in the message manager (or the logfile) and consequently less problems that can be fixed by autofixes.

The following are valid checks that can be specified:

- "Self-Intersecting Polygons"
- "Disjoint Nets (Floating Nodes)"
- "DC-Short Errors"

- "Identical/Overlapping Vias"
- "Misalignments"

There may be no checks, all 5 of the checks, or anything in between. The order that checks are specified in is not relevant.

minimum_area_meters_squared

Specify a decimal value for the minimum area (e.g. .000015) optionally in scientific notation (e.g. 2E-006). Cutouts smaller than this minimum area may be ignored during validation check.

<FixesArray> - Array("NAME:fixes", <fix 1>, <fix 2>, ..., <fix n>)

Specify the autofixes that should be applied if they are found by a check.

The following are valid fixes that can be specified:

- "Self-Intersecting Polygons"
- "Disjoint Nets",
- "Identical/Overlapping Vias"
- "Traces-Inside-Traces Errors"
- "Misalignments (Planes/Traces/Vias)"

There may be no fixes specified, all 5 fixes specified, or anything in between. The order that fixes are specified in is not relevant.

GetBodyNamesByPosition

Returns the names of objects that contact a specified point.

UI Access	N/A		
Parameters	Name	Type	Description
	<positionParameters>	Array	Structured array containing position coordinates for active coordinate system. Array("NAME:Parameters", "XPosition:=", <string>, "YPosition:=", <string>, "ZPosition:=", <string>)
Return Value	Array containing string object names.		

Python Syntax	GetBodyNamesByPosition (<positionParameters>)
Python Example	<pre>oEditor.GetBodyNamesByPosition(["NAME:Parameters", "XPosition:=", "0mm", "YPosition:=", "15mm", "ZPosition:=", "0mm"])</pre>

GetChildNames [Modeler]

Returns the names of children for a specified input. For 3D Components and UDMs, these commands do not return parts, coordinate systems, plans, as top-level modeler children.

Note:

This command is not supported by the EMIT and Circuit design types.

UI Access	N/A		
Parameters	Name	Type	Description
	<category>	String	<i>Optional.</i> Passing no input returns the list of possible strings: • "AllParts" – Returns the names of all parts. • "CoordinateSystems" – Returns the names of all coordinate systems. • "Groups" – Returns the names of all groups. • "Lists" – Returns the names of all lists. • "ModelParts" – Returns names of model parts. • "NonModelParts" – Returns the names of non-model parts. • "Planes" – Returns the names of all planes. • "Points" – Returns the names of all points. • "SubmodelDefinitions" – Returns the names of sub-model definitions.
Return Value	Array containing object names in the selected category.		

Python Syntax	GetChildNames(<category>)
Python Example	Standalone Example: <pre>oEditor.GetChildNames("ModelParts") oEditor.GetChildNames("Points")</pre> Example used in Conjunction with GetChildObject and GetPropNames: <pre>oDesign = oProject.GetActiveDesign() oModel = oDesign.GetChildObject("3D Modeler") oModel.GetChildTypes()</pre> • This returns an array containing strings: "ModelParts", "AllParts", "NonModelParts", "CoordinateSystems", "Points", "Planes", "SubmodelDefinitions", "Groups", and "Lists". <pre>oModel.GetChildNames("ModelParts")</pre> • This returns an array containing string model parts. For example: "WG_Interior", "WG", "MT_Interior", "MT", "Box2", "Cylinder1". <pre>oWGi = oModel.GetChildObject("WG_Interior")</pre> • This sets the object WG_Interior to variable oWGi. <pre>oWGi.GetPropNames()</pre> • This returns property names from child object assigned to oWGi. In this case: "Name", "Material", "Material/SIValue", "Material/EvaluatedValue", "Solve Inside", "Orientation", "Orientation/Choices", "Model", "Display Wireframe", "Material Appearance", "Color", "Color/Red", "Color/Green", "Color/Blue", and "Transparent".

GetChildObject [Modeler]

Returns a 3D modeler child object, which can be assigned to a variable. Will return normally if there are no active objects. For 3D Components and UDMs, these commands do not return parts, coordinate systems, plans, as top-level modeler children.

Note: This command is not supported by the EMIT and Circuit design types.

UI Access	N/A		
Parameters	Name	Type	Description
	<object>	String	In this case, "3D Modeler".
Return Value	Returns the 3D Modeler object. In the examples below, it is assigned to the variable oEditor.		

Python Syntax	GetChildObject(<object>)
Python Example	Standalone Example: <pre>oDesign = oProject.GetActiveDesign() oEditor = oDesign.GetChildObject("3D Modeler")</pre> Example used in Conjunction with GetChildNames and GetPropNames: <pre>oDesign = oProject.GetActiveDesign() oModel = oDesign.GetChildObject("3D Modeler") oModel.GetChildTypes()</pre> This returns an array containing strings: "ModelParts", "AllParts", "NonModelParts", "CoordinateSystems", "Points", "Planes", "SubmodelDefinitions", "Groups", and "Lists".

	<pre>oModel.GetChildNames("ModelParts")</pre> • This returns an array containing string model parts. For example: "WG_Interior", "WG", "MT_Interior", "MT", "Box2", "Cylinder1". <pre>oWGi = oModel.GetChildObject("WG_Interior")</pre> • This sets the object WG_Interior to variable oWGi. <pre>oWGi.GetPropNames()</pre> • This returns property names from child object assigned to oWGi. In this case: "Name", "Material", "Material/SIValue", "Material/EvaluatedValue", "Solve Inside", "Orientation", "Orientation/Choices", "Model", "Display Wireframe", "Material Appearance", "Color", "Color/Red", "Color/Green", "Color/Blue", and "Transparent".

GetChildTypes [Modeler]

Gets child types of queried designs or editors obtained by [GetActiveProject\(\)](#) and [GetActiveDesign\(\)](#) commands. For 3D Components and UDMs, these commands do not return parts, coordinate systems, plans, as top-level modeler children.

Note:

This command is not supported by the EMIT and Circuit design types.

UI Access	N/A
Parameters	None.
Return Value	Array containing the names of child types.

Python Syntax	GetChildTypes()
Python Example	Standalone Example: <pre>oDesign = oProject.GetActiveDesign() oEditor = oDesign.SetActiveEditor("3D Modeler") oEditor.GetChildTypes()</pre> - This returns an array containing strings: "Part", "CoordinateSystem", "Group", "ComponentDefinition", "UserDefinedModel", "Point", "Plane", and "List". Note: Users can query the Part type to see if it is a model or nonmodel. Example Used in Conjunction with GetChildNames: <pre>oProject = oDesktop.GetActiveProject() oDesign = oProject.GetActiveDesign() oDesign.GetChildNames()</pre> - This returns an array containing names of child objects for the design. For example: "Boundaries", "Nets", "Analysis", "Optimetrics", "Radiation", "Results", and "3D Modeler". <pre>oDesign.GetChildTypes()</pre> - This returns an array containing the child types. For example: "Module", "Editor", and "Variable".

GetEdgeByPosition

Returns the ID for edge(s) that contact a specified point.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><positionParameters></code>	Array	Structured array. <pre>Array("NAME:EdgeParameters", "BodyName:=", <string object name>, "Xposition:=", <string>, "YPosition:=", <string>, "ZPosition:=", <string>)</pre> Note: For 2D XY Designs, ZPosition should be set to "0". For 2D RZ Designs, YPosition should be set to "0".
Return Value	Array containing string edge IDs.		

Python Syntax	GetEdgeByPosition (<positionParameters>)
Python Example	<pre>oEditor.GetEdgeByPosition(["NAME:EdgeParameters", "BodyName:=", "Box1", "Xposition:=", "10mm", "YPosition:=", "0mm",</pre>

	<pre> "ZPosition:=", "10mm"])</pre>

GetEdgeIDFromNameForFirstOperation

Gets edge ID from first operation of a part.

UI Access	N/A		
Parameters	Name	Type	Description
	<PartName>	String	Name of specified part.
	<EdgeName>	String	Name of specified edge.
Return Value	Integer edge ID		

Python Syntax	GetEdgeIDFromNameForFirstOperation(<PartName>, <EdgeName>)
Python Example	oEditor.GetEdgeIDFromNameForFirstOperation("Coil_1", "Edge_4510")

GetEdgeIDsFromFace

Returns the edge IDs for a specified Face ID.

UI Access	N/A		
Parameters	Name	Type	Description
	<faceID>	Integer	ID of the specified face.

Return Value	Array containing string edge IDs.

Python Syntax	GetEdgeIDsFromFace (<faceID>)
Python Example	<code>oEditor.GetEdgeIDsFromFace(20)</code>

GetEdgeIDsFromObject

Returns the edge IDs for a specified object.

UI Access	N/A		
Parameters	Name	Type	Description
	<object>	String	Object name.
Return Value	Array containing string edge IDs.		

Python Syntax	GetEdgeIDsFromObject (<object>)
Python Example	<code>oEditor.GetEdgeIDsFromObject("Box1")</code>

GetEdgeLength

Returns the length of edges for a specified Edge ID.

UI Access	N/A

Parameters	Name	Type	Description
	<edgeID>	Integer	ID of the specified edge.
Return Value	Integer containing the length of found edges.		

Python Syntax	GetEdgeLength (<EdgeID>)
Python Example	<code>oEditor.GetEdgeLength(20)</code>

GetEntityIDsContainedByNamedSelection

Returns the list of entity IDs contained in the named selection. See [CreateNamedSelection](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<selectionName>	String	selection name.
Return Value	String containing the list of entity IDs contained in the named selection.		

Python Syntax	GetEntityIDsContainedByNamedSelection (<selectionName>)
Python Example	<code>entityIDs = oEditor.GetEntityIDsContainedByNamedSelection("FaceSelection1")</code>

GetEntityListIDByName

Returns the specified entity list's ID number. See [CreateNamedSelection](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<listName>	String	List name.
Return Value	String containing the entity list ID number.		

Python Syntax	GetEntityListIDByName (<listName>)
Python Example	oEditor.GetEntityListIDByName ("MyList")

GetExtendedDefinitionObject

Get an object-oriented property scripting object by name and library type (using definition folder name) which also supports getting/setting mod time and getting/setting generic string attributes. This scripting command directly supports the .AMAT (or .ASURF) definition formats.

UI Access	N/A		
Parameters	Name	Type	Description
	<defName>	String	Definition to retrieve.
	<defFolderName>	String	Library type (by definition folder name).
Return Value	An extended material wrapper script object (see material wrapper script object functions above).		

GetFaceArea

Returns the area of a specified face.

UI Access	N/A		
Parameters	Name	Type	Description
	<faceID>	Integer	ID of specified face.
Return Value	Long integer of face area.		

Python Syntax	GetFaceArea (<faceID>)
Python Example	<code>oEditor.GetFaceArea(19)</code>

GetFaceCenter

Returns the center position of a specified face.

UI Access	N/A		
Parameters	Name	Type	Description
	<planarFaceID>	Long	Face ID
Return Value	Array containing string X, Y, Z coordinates.		

Python Syntax	GetFaceCenter (<planarFaceID>)
Python Example	<code>oEditor.GetFaceCenter(12)</code>

GetFaceByPosition

Returns the face ID located at a specified position.

Note:

The coordinates must point to exactly one face, not a vertex or edge where two or more faces join.

UI Access	N/A		
Parameters	Name	Type	Description
	<FaceParameters>	Array	Structured Array. Array("NAME:FaceParameters", "BodyName:=", <string>, "XPosition:=", <string>, "YPosition:=", <string>, "ZPosition:=", <string>)
Return Value	Integer Face ID.		

Python Syntax	GetFaceByPosition(<FaceParameters>)
Python Example	<pre>oEditor.GetFaceByPosition(["NAME:FaceParameters",</pre>

	<pre> "BodyName:=", "Box1", "XPosition:=", "0.2mm", "YPosition:=", "-0.2mm", "ZPosition:=", "0.4mm"] </pre>

GetFaceIDFromNameForFirstOperation

Gets face ID from first operation of a part.

UI Access	N/A		
Parameters	Name	Type	Description
	<PartName>	String	Name of specified part.
	<FaceName>	String	Name of specified face.
Return Value	Integer face ID		

Python Syntax	GetFaceIDFromNameForFirstOperation(<PartName>, <FaceName>)
Python Example	<code>oEditor.GetFaceIDFromNameForFirstOperation("Rotor", "Face_14343")</code>

GetFaceIDs

Returns the face IDs associated with a specified object.

UI Access	N/A		
Parameters	Name	Type	Description
	<objectName>	String	Object name.
Return Value	Array containing string face IDs.		

Python Syntax	GetFaceIDs (<objectName>)		
Python Example	oEditor.GetFaceIDs ('Box1')		

GetFaceIDsOfSheet

Returns the face IDs associated with a specified sheet object.

UI Access	N/A		
Parameters	Name	Type	Description
	<sheetName>	String	Name of specified sheet object.
Return Value	Array containing string face IDs.		

Python Syntax	GetFaceIDsOfSheet(<sheetName>)		
Python Example	oEditor.GetFaceIDsOfSheet ('Sheet1')		

GetGeometryModelerMode

Returns the modeler mode (3D or XY) for the current design. This lets you know whether the current model is 2D or 3D.

UI Access	N/A
Parameters	None.
Return Value	String containing the modeling mode ("3D" or "XY").

Python Syntax	GetGeometryModelerMode()
Python Example	<code>oEditor.GetGeometryModelerMode()</code>

GetGroupSubmodelName

Returns name of models belong to a specific group.

UI Access	N/A		
Parameters	Name	Type	Description
	<groupName>	String	Group name.
Return Value	Array of strings containing the model names.		

Python Syntax	GetGroupSubmodelName(<groupName>)
Python Example	<code>oEditor.GetGroupSubmodelName("Group 1")</code>

GetMatchedObjectName

Returns all object names containing the input text string.

UI Access	N/A		
Parameters	Name	Type	Description
	<wildcardText>	String	Text string present in object name(s).
Return Value	Array containing string object names.		

Python Syntax	GetMatchedObjectName (<wildcardText>)		
Python Example	oEditor.GetMatchedObjectName ('Box*')		
	oEditor.GetMatchedObjectName ('?ox?')		

GetModelBoundingBox

Returns the bounding box of the current model using the global coordinate system as reference. The outputs are in the defined modeler units. Only modeled objects are considered for this computation (non-modeled objects are ignored).

UI Access	N/A		
Parameters	None.		
Return Value	Array containing string Xmin, Ymin, Zmin, Xmax, Ymax, and Zmax values of the bounding box in the global coordinate system		

Python Syntax	GetModelBoundingBox()
Python Example	<code>oEditor.GetModelBoundingBox()</code>

GetModelUnits

Returns the model's unit of measure.

UI Access	N/A
Parameters	None.
Return Value	String containing unit of measure.

Python Syntax	GetModelUnits()
Python Example	<code>oEditor.GetModelUnits()</code>

GetNumObjects

Returns the number of objects in a design.

UI Access	N/A
Parameters	None.
Return Value	Integer number of objects.

Python Syntax	GetNumObjects()
Python Example	<code>oEditor.GetNumObjects()</code>

GetObjectIDByName

Given an object's name, returns its ID. IDs are used with [CreateEntityList](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<objectName>	String	Object name.
Return Value	Integer object ID.		

Python Syntax	GetObjectIDByName(<objectName>)
Python Example	<code>oEditor.GetObjectIDByName('Box1')</code>

GetObjectName

Returns an object's name from its specified base index (creation order).

UI Access	N/A		
Parameters	Name	Type	Description
	<index>	Integer	Base index (where '0' is the first item created)

Return Value	String containing object name.

Python Syntax	<code>GetObjectName(<index>)</code>
Python Example	<code>oEditor.GetObjectName(3)</code>

GetObjectNameByEdgeID

Returns an object name given an edge ID.

UI Access	N/A		
Parameters	Name	Type	Description
	<EdgeID>	Integer	The edge ID.
Return Value	String containing object name.		

Python Syntax	<code>GetObjectNameByEdgeID(<EdgeID>)</code>
Python Example	<code>oEditor.GetObjectNameByEdgeID(88)</code>

GetObjectNameByFaceID

Returns an object name given a face ID.

UI Access	N/A

Parameters	Name	Type	Description
	<FaceID>	Integer	The face ID.
Return Value	String containing object name.		

Python Syntax	GetObjectByNameByFaceID (<FaceID>)
Python Example	<code>oEditor.GetObjectByNameByFaceID(88)</code>

GetObjectByNameID

Returns an object name given an ID.

UI Access	N/A		
Parameters	Name	Type	Description
	<ObjID>	Integer	The object ID.
Return Value	String containing object name.		

Python Syntax	GetObjectByNameID(<ObjID>)
Python Example	<code>oEditor.GetObjectByNameID(88)</code>

GetObjectByNameByVertexID

Returns an object name given a vertex ID.

UI Access	N/A		
Parameters	Name	Type	Description
	<VertexID>	Integer	The vertex ID.
Return Value	String containing object name.		

Python Syntax	GetObjectByNameByVertexID(<VertexID>)
Python Example	<code>oEditor.GetObjectByNameByVertexID(88)</code>

GetObjectsByMaterial

Returns a list of objects of a specified material.

UI Access	N/A		
Parameters	Name	Type	Description
	<material>	String	Material name.
Return Value	Array containing string object names.		

Python Syntax	GetObjectsByMaterial (<material>)
Python Example	<code>oEditor.GetObjectsByMaterial('copper')</code>

GetObjectShapeType

Returns the shape type of a specified object.

UI Access	N/A		
Parameters	Name	Type	Description
	<objName>	String	Name of specified object.
	<csName>	String	Name of coordinate system of the object.
Return Value	String containing shape type.		

Python Syntax	GetObjectShapeType(<objName>, <csName>)
Python Example	oEditor.GetObjectShapeType("box1", "Global")

GetObjectsInGroup

Returns a list of objects in a specified group.

UI Access	N/A		
Parameters	Name	Type	Description
	<group>	String	Group name. One of: "<materialName>"

			• "<assignmentName>" • "Non Model" • "Solids" • "Unclassified" • "Sheets" • "Lines"
Return Value	Array containing string object names.		

Python Syntax	GetObjectsInGroup (<group>)
Python Example	oEditor.GetObjectsInGroup (' Sheets ')

GetObjectVolume

Returns an object's volume from its name).

UI Access	N/A		
Parameters	Name	Type	Description
	<name>	String	Object name
Return Value	.Real		

Python Syntax	GetObjectVolume(<name>)
Python Example	oEditor.GetObjectVolume ("Box1")

GetObjPath [Editor]

Obtains the path to the 3D modeler.

UI Access	N/A
Parameters	None.
Return Value	String containing the path.

Python Syntax	GetObjPath()
Python Example	<code>oEditor.GetObjPath()</code>

GetPartsForUserDefinedModel

Obtains parts from a specified user defined model.

UI Access	N/A		
Parameters	Name	Type	Description
	<udmName>	String	Name of user defined model.
Return Value	Array of strings containing associated parts.		

Python Syntax	<code>GetPartsForUserDefinedModel (<udmName>)</code>
Python Example	<code>oEditor.GetPartsForUserDefinedModel ("OnDieSpiralInductor1")</code>

GetPoints [3D Modeler Editor]

Returns all the points defined in current 3D modeler.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing names of points.

Python Syntax	<code>GetPoints ()</code>
Python Example	<code>oEditor.GetPoints ()</code>

GetPropEvaluatedValue

Returns the Evaluated-Value for Value-Property and Variable. Returns the Property-value as text string for other property types

Note:

This command is not supported by the EMIT and Circuit design types.

UI Access	N/A		
Parameters	Name	Type	Description

	<table><tr><td><PropName></td><td>String</td><td>Name of the property.</td></tr></table>	<PropName>	String	Name of the property.
<PropName>	String	Name of the property.		
Return Value	String value of the evaluated value.			

Python Syntax	GetPropEvaluatedValue (<PropName>)
Python Example	<pre>oVar = oDesign.GetChildObject(" Variables/var") oVar.GetPropEvaluatedValue()</pre>

GetPropertyValue

Returns the value of a single property belonging to a specific <PropServer> and <PropTab>. This function is available with the Project, Design or Editor objects, including definition editors.

Tip: Use the script recording feature and edit a property, and then view the resulting script to see the format for that property.

UI Access	N/A		
Parameters	Name	Type	Description
	<PropTab>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults) - LocalVariableTab ("Variables" or "Local Variables")

			• ProjectVariableTab ("Project variables") • ConstantsTab ("Constants") • BaseElementTab ("Symbol" or "Footprint") • ComponentTab ("General") • Component("Component") • CustomTab ("Intrinsic Variables") • Quantities ("Quantities") • Signals ("Signals")
	<code><PropServer></code>	String	An object identifier, generally returned from another script method, such as <code>CompInst@R;2;3</code>
	<code><PropName></code>	String	Name of the property.
Return Value	String value of the property.		

Python Syntax	<code>GetPropertyValue (<PropTab>, <PropServer>, <PropName>)</code>
Python Example	<pre> selectionArray = oEditor.GetSelections() for k in selectionArray: val = oEditor.GetPropertyValue("PassedParameterTab", k, "R") ... </pre>

GetPropNames [Modeler]

Returns the property names for the active model object or specified property values.

Note:

This command is not supported by the EMIT and Circuit design types.

UI Access	N/A		
Parameters	Name	Type	Description
	<IncludeReadOnly>	Boolean	Optional. • True - includes all properties. • False - returns only property names that can be changed. True by default.
Return Value	Returns property names of the current 3D Model object; includes the following: ["Name", "Material", "Solve Inside", "Orientation", "Orientation/Choices", "Model", "Group", "Display Wireframe", "Material Appearance", "Color", "Color/Red", "Color/Green", "Color/Blue", "Transparent"]		

Python Syntax	GetPropNames(<IncludeReadOnly>)
Python Example	oEditor.GetPropNames(ObjectName)

GetPropSIValue

Returns the SI-Value for Value-Property and Variable. Return NAN for other property type if its value is not able to convert to be a double-floating point value.

Note:

This command is not supported by the EMIT and Circuit design types.

UI Access	N/A		
Parameters	Name	Type	Description
	<PropName>	String	Name of the property.
Return Value	Property value as a double floating value, or NAN if the property value cannot be converted to double floating point.		

Python Syntax	GetPropSIValue (<PropName>)
Python Example	<pre> oCreateBox = oDesign.GetChildObject("3D Modeler/Box1/CreateBox:1") oCreateBox.GetPropValue("xSize") return "length / 2" oCreateBox.GetPropEvaluatedValue("xSize") return '0.4mm' oCreateBox.GetPropSIValue("xSize") return 0.0004 </pre>

GetPropValue [Modeler]

Returns the property value for the active model object, or specified property values.

Note:

This command is not supported by the EMIT and Circuit design types.

UI Access	N/A		
Parameters	Name	Type	Description
	<propPath>		Optional. Child object's property path. See: Object Property Function Summary .
Return Value	The property value.		

Python Syntax	GetPropValue(<propPath>)
Python Example	<pre>Rh1 = oDesign.GetChildObject('Box1') Rh1.GetPropValue('Orientation') Returns the specified Property Value: 'Global'</pre>

GetRelativeCoordinateSystems

Returns the relative coordinate systems in the current 3D modeler.

UI Access	N/A

Parameters	None.
Return Value	Array containing name of relative coordinate systems.

Python Syntax	GetRelativeCoordinateSystems()
Python Example	<code>oEditor.GetRelativeCoordinateSystems()</code>

GetSelections [Model Editor]

Returns an array of currently selected objects.

UI Access	N/A
Parameters	None.
Return Value	Array containing object IDs

Python Syntax	GetSelections()
Python Example	<code>oEditor.GetSelections()</code>

GetSubGroupsInGroup

Returns subgroup names in a specified group.

UI Access	N/A

Parameters	Name	Type	Description
	<group>	String	Group name. One of: • "<materialName>" • "<assignmentName>" • "Non Model" • "Solids" • "Unclassified" • "Sheets" • "Lines"
Return Value	Array containing subgroup names.		

Python Syntax	GetSubGroupsInGroup(<group>)
Python Example	oEditor.GetSubGroupsInGroup('Sheets')

GetPosition

Returns a user's current coordinates in the 3D Modeler window.

UI Access	N/A		
Parameters	Name	Type	Description
	<prompt>	String	"Enter a point." Then click a point in the 3D Modeler window.

Return Value	Array containing X, Y, Z coordinates.

Python Syntax	<code>GetUserPosition(<prompt>)</code>
Python Example	<code>oEditor.GetUserPosition("Enter a point.")</code>

GetVertexIDFromNameForFirstOperation

Returns vertex ID associated with a specified vertex belongs to the first operation of a part.

UI Access	N/A		
Parameters	Name	Type	Description
	<PartName>	String	Name of specified part.
	<VertexName>	String	Name of specified vertex.
Return Value	Integer representing vertex ID.		

Python Syntax	<code>GetVertexIDFromNameForFirstOperation(<PartName>, <VertexName>)</code>
Python Example	<code>oEditor.GetVertexIDFromNameForFirstOperation("Part1", "Vertex1")</code>

GetVertexIDsFromEdge

Returns vertex IDs associated with a specified edge.

UI Access	N/A

Parameters	Name	Type	Description
	<edgeID>	Integer	Edge ID.
Return Value	Array containing string vertex IDs.		

Python Syntax	GetVertexIDsFromEdge(<edgeID>)
Python Example	<code>oEditor.GetVertexIDsFromEdge(10)</code>

GetVertexIDsFromFace

Returns vertex IDs associated with a specified face.

UI Access	N/A		
Parameters	Name	Type	Description
	<faceID>	Integer	Face ID.
Return Value	Array containing string vertex IDs.		

Python Syntax	GetVertexIDsFromFace(<faceID>)
Python Example	<code>oEditor.GetVertexIDsFromFace(10)</code>

GetVertexIDsFromObject

Returns vertex IDs associated with a specified object.

UI Access	N/A		
Parameters	Name	Type	Description
	<objectName>	String	Object name.
Return Value	Array containing string vertex IDs.		

Python Syntax	GetVertexIDsFromObject(<objectName>)		
Python Example	oEditor.GetVertexIDsFromObject('Box1')		

GetVertexPosition

Returns an array of coordinates for a specified vertex.

UI Access	N/A		
Parameters	Name	Type	Description
	<vertexID>	Integer	Vertex ID.
Return Value	Array containing X, Y, Z coordinates.		

Python Syntax	GetVertexPosition(<vertexID>)		
Python Example	oEditor.GetVertexPosition(1)		

GetWireBodyNames

Returns the wire body names in current 3D modeler.

UI Access	N/A
Parameters	None.
Return Value	Array containing string of names.

Python Syntax	GetWireBodyNames()
Python Example	<code>oEditor.GetWireBodyNames()</code>

PageSetup

Specifies page settings for printing.

UI Access	File > Page Setup.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. ["NAME:PageSetupData", "margins:=", <SetupArray>

			]
	<SetupArray>	Array	Structured Array ["left:=", <string>, "right:=", <string>, "top:=", <string>, "bottom:=", <string>)]
Return Value	None.		

Python Syntax	PageSetup(<Parameters>)
Python Example	<pre>oEditor.PageSetup(["NAME:PageSetupData", "margins:=", ["left:=", "10mm", "right:=", "10mm", "top:=", "10mm", "bottom:=", "10mm"]])</pre>

RemoveBadEdges

Removes bad edges from specified list.

UI Access	N/A		
Parameters	Name	Type	Description
	<EdgeList>	Array	Array containing edge IDs.
Return Value	None.		

Python Syntax	RemoveBadEdges (<EdgeList>)
Python Example	<code>oEditor.RemoveBadEdges ([18, 30])</code>

RemoveBadFaces

Removes bad faces from specified list.

UI Access	N/A		
Parameters	Name	Type	Description
	<FaceList>	Array	Array containing face IDs.
Return Value	None.		

Python Syntax	RemoveBadFaces (<FaceList>)
Python Example	<code>oEditor.RemoveBadFaces ([328, 333])</code>

RemoveBadVertices

Removes bad vertices from specified list.

UI Access	N/A		
Parameters	Name	Type	Description
	<VertexList>	Array	Array containing vertex IDs.
Return Value	None.		

Python Syntax	RemoveBadVertices (<VertexList>)
Python Example	<code>oEditor.RemoveBadVertices ([324, 325])</code>

RenamePart

Renames an object.

UI Access	Enter new name in Name field.		
Parameters	Name	Type	Description
	<renameParametersArray>	Array	Structured array. <code>Array("NAME:Rename Data", "Old Name:=", <string>,</code>

	<table><tr><td></td><td></td><td>"New Name:=", <string>)</td></tr></table>			"New Name:=", <string>)
		"New Name:=", <string>)		
Return Value	None.			

Python Syntax	oEditor.RenamePart(<renameParametersArray>)
Python Example	<pre>oEditor.RenamePart(['NAME:Rename Data', 'Old Name:=', 'partname', 'New Name:=', 'newpartname',])</pre>

SetPropValue [Modeler]

Sets the property value for the active model property.

Note:

This command is not supported by the EMIT and Circuit design types.

UI Access	Edit Properties on History Tree objects		
Parameters	Name	Type	Description
	<propPath>	String	Child object's property path. See: Object Property Function Summary .
	<value>	Varies	New property value.
Return Value	Boolean: • True – property found. • False – property not found.		

Python Syntax	SetPropValue(<propPath>, <value>)
Python Example	oEditor.SetPropValue("Color/r", 111)

SetTopDownViewDirectionForActiveView

Sets active view to top-down view direction.

UI Access	N/A		
Parameters	Name	Type	Description
	<RelativeCS>	String	Name of relative coordinate system
Return Value	None.		

Python Syntax	SetTopDownViewDirectionForActiveView (<RelativeCS>)
Python Example	oEditor.SetTopDownViewDirectionForActiveView("Global")

SetTopDownViewDirectionForAllViews

Sets all views to top-down view direction.

UI Access	N/A		
Parameters	Name	Type	Description
	<RelativeCS>	String	Name of relative coordinate system
Return Value	None.		

Python Syntax	SetTopDownViewDirectionForAllViews (<RelativeCS>)
Python Example	<code>oEditor.SetTopDownViewDirectionForAllViews ("Global")</code>

UpdatePriorityList

Updates specified priority lists.

UI Access	N/A		
Parameters	Name	Type	Description
	<Lists>	Array	Array of priority list names.
Return Value	None.		

Python Syntax	UpdatePriorityList (<Lists>)
Python Example	<code>oEditor.UpdatePriorityList(["PriorityList1", "PriorityList2"])</code>

UpgradeVersion

Upgrades legacy geometry to current version.

UI Access	Right-click on an operation icon in the history tree, select Upgrade Version .		
Parameters	Name	Type	Description
	<Selections>	Array	Structured array. <pre>Array("NAME:Parameters", Array("NAME:PartOperations", Array("NAME:<string>"), "OperationIndices:=", <array of integers>), Array("NAME:UDMOperations"))</pre>
Return Value	None.		

Python Syntax	UpgradeVersion (<Selections>)
Python Example	<code>oEditor.UpgradeVersion(["NAME:Parameters", ["NAME:PartOperations", ["NAME:source",</code>

	<pre> "OperationIndices:=", [0]]], ["NAME:UDMOperations"]])</pre>

Validate3DComponent

Validates a 3D component.

UI Access	N/A		
Parameters	Name	Type	Description
	<componentPath>	String	Path to a 3D component.
	<password>	String	Optional. Password to access the component.
Return Value	Boolean: • 1 - component is valid. • 0 - component is not valid.		

Python Syntax	Validate3DComponent (<componentPath>, <password>)
Python Example	<pre>oEditor.Validate3DComponent ("C:/temp/component.3dcomp", "")</pre>

WriteHistoryTreeLayoutForTest

Writes history tree layout to a file.

UI Access	N/A		
Parameters	Name	Type	Description
	<filePath>	String	Path to the file.
	<OrgByMaterial>	Integer	• 1 - organize objects by material. • 0 - do not organize by material.
	<OrgByAssignment>	Integer	• 1 - organize sheets by assignment. • 0 - do not organize by assignment.
	<OrgByCompDefinition>	Integer	• 1 - organize components by definition. • 0 - do not organize by definition.
	<DonotOrgUnderGroup>	Integer	• 1 - do not organize within group. • 0 - organize within group.
	<ShowGroup>	Integer	Optional. • 1 - show group. • 0 - do not show.
Return Value	None.		

Python Syntax	WriteHistoryTreeLayoutForTest (<filePath>, <OrgByMaterial>, <OrgByAssignment>, <OrgByCompDefinition>, <DonotOrgUnderGroup>, <ShowGroup>)
Python Example	<pre>oEditor.WriteHistoryTreeLayoutForTest ('C:\temp', 1, 0, 0, 0, 1)</pre>

Cable Modeling Commands

Cables are created and edited as design objects using the Cable Setup module, and then inserted as native components. For example, elements of a cable are created:

```
oModule = oDesign.GetModule("CableSetup")
```

```
oModule.CreateStraightWireCable(....
```

And then, when a Harness has been created from various components, it is inserted to the Modeler:

```
oEditor = oDesign.SetActiveEditor("3D Modeler")
```

```
oEditor.InsertNativeComponent(
```

```
[
```

```
    "NAME:InsertNativeComponentData",
```

```
    "TargetCS:=" , "Global",
```

```
    "SubmodelDefinitionName:=", "MyHarness",
```

```
...
```

[AddCableToBundle](#)

[CreateCableBundle](#)

[CreateCableHarness](#)

[CreateClockSource](#)

[CreatePWLSource](#)

[CreateStraightWireCable](#)

[CreateTwistedPairCable](#)[ExportCableLibrary](#)[ImportCableLibrary](#)[RemoveCable](#)[UpdateCableHarness](#)

AddCableToBundle

Add a cable to an existing bundle using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables > Edit Cables** to open the **Cable Editor**.

UI Access	3D Components > Cables > Edit Cables.
Parameters	None
Return Value	None

Python Syntax	AddCableToBundle(<parameters>))
Python Example	<pre>oModule.AddCableToBundle("bundle1", "tpwire2", 1, ["NAME:CableInstParams", "XPos:=" , "0mm", "YPos:=" , "0mm", "RotX:=" , "0deg"</pre>

	<pre>], ["NAME:CableInstAttribs", "Name:=" , "tpwire2"])</pre>

CreateCableBundle

Creates a cable bundle using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables>Edit Cables** to open the **Cable Editor**. Then **Add>Bundle....**

UI Access	3D Components>Cables > Edit Cables
Parameters	None
Return Value	None

Python Syntax	CreateCableBundle([<parameters>]), [<name>])
Python Example	<pre>oModule.CreateCableBundle(["NAME:BundleParams", "AutoPack:=" , True,]</pre>

	<pre> "NAME:InsulationJacketParams", "InsThickness:=" , "0.25mm", "JacketMaterial:=" , "PVC plastic", "InnerDiameter:=" , "2.5mm"]], ["NAME:BundleAttribs", "Name:=" , "bundle1"]) </pre>

CreateCableHarness

Creates a cable harness using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables>New Cable Harness** to open the **Insert Cable Harness Component Editor**.

UI Access	3D Components>Cables > New Cable Harness...
Parameters	None
Return Value	None

Python Syntax	CreateCableHarness(<parameters>))
Python Example	oModule.CreateCableHarness (

```
[  
    "NAME:HarnessParams",  
    "Bundle:="                , "bundle1",  
    "TwistAlongPath:="        , "720deg",  
    "Route:="                  , "Polyline1",  
    "AutoOrient:="            , False,  
    "Origin:="                  , ["0mm","0mm","0mm"],  
    "XAxisEnd:="                , ["-6mm","0mm","0mm"],  
    "PlaneFlip:="              , True,  
    [  
        "NAME:RefConductors",  
        "tpwire2/w1"  
    ],  
    [  
        "NAME:InputTerminations",  
        "tpwire2/w1:="          , [ "Source:=" ],  
        "tpwire2/w2:="          , [ "Imped:="  ],  
    ],  
    [  
        "NAME:OutputTerminations",
```

	<pre> "tpwire2/w1:=" , ["Imped:=" "tpwire2/w2:=" , ["Source:="]], ["NAME:HarnessAttribs", "Name:=" , "MyHarness"])</pre>

CreateClockSource

Creates a clock source using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables>Edit Cable Sources...** to open the **Cable Time Domain Sources Editor**.

UI Access	3D Components>Cables > Edit Cables
Parameters	None
Return Value	None

Python Syntax	CreateClockSource(<parameters>))
Python Example	<pre>oModule.CreateClockSource (["NAME:ClockSignalParams",</pre>

	<pre>"Period:=" , "35us", "LowPulseVal:=" , "0V", "HighPulseVal:=" , "1V", "Risetime:=" , "5us", "Falltime:=" , "5us", "PulseWidth:=" , "20us"], ["NAME:TDSourceAttribs", "Name:=" , "clock1"])</pre>

CreatePWLSource

Creates a PWL source using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables > Edit Cable Sources...** to open the **Cable Time Domain Sources Editor**.

UI Access	3D Components>Cables > Edit Cable Sources...
Parameters	None
Return Value	None

Python Syntax	CreatePWLSource(<parameters>))
Python Example	<pre>oModule.CreatePWLSource(["NAME:PWLSignalParams", ["NAME:SignalValues", "0V", "0.5V", "0V"], ["NAME:TimeValues", "0ns", "1ns", "2ns"]], ["NAME:TDSOURCEAttribs", "Name:=" , "pw13"])</pre>

CreateStraightWireCable

Creates a straight Wire Cable using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables > Edit Cables** to open the **Cable Editor**. Then **Add Straight Wire Cable**.

UI Access	3D Components>Cables > Edit Cables
Parameters	None
Return Value	None

Python Syntax	CreateStraightWireCable([<parameters>]), [<name>])
Python Example	<pre>oModule = oDesign.GetModule("CableSetup") oModule.CreateStraightWireCable(["NAME:StWireParams", "WireStandard:=" , "ISO", "WireGauge:=" , "0.13", "CondDiameter:=" , "0.55mm", "CondMaterial:=" , "copper", "InsThickness:=" , "0.25mm", "InsMaterial:=" , "PVC plastic",</pre>

	<pre> "InstType:=" , "Thin Wall"], ["NAME:StWireAttribs", "Name:=" , "stwire1"])</pre>

CreateTwistedPairCable

Creates a twisted pair cable using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables>Edit Cables** to open the **Cable Editor**. Then **Add Twisted Pair Cable**.

UI Access	3D Components>Cables > Edit Cables
Parameters	None
Return Value	None

Python Syntax	CreateTwisted Pair Cable([<parameters>]), [<name>])
Python Example	<pre>oModule.CreateTwistedPairCable("stwire1", ["NAME:TwistedPairParams", ["NAME:VirtualJacketParams",</pre>

	<pre>"JacketMaterial:=" , "", "InnerDiameter:=" , "0"], "IsLayLengthSpecified:=", False, "LayLength:=" , "13.8888888888889mm", "TurnsPerMeter:=" , "72"], ["NAME:TwistedPairAttribs", "Name:=" , "tpwire1"])</pre>

ExportCableLibrary

Exports a cable library created using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables > Export Cable Library**. to open a browser window.

UI Access	3D Components > Cables > Export Cable Library...
Parameters	None
Return Value	None

Python Syntax	<code>ExportCableLibrary(<parameters>))</code>
Python Example	<pre>oModule = oDesign.GetModule("CableSetup") oModule.ExportCableLibrary("D:\\Users\\JaneDoe\\PersonalLib\\MyCables")</pre>

ImportCableLibrary

Imports an existing cable library created using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables>Export Cable Library**. to open a browser window.

UI Access	3D Components>Cables > Import Cable Library...
Parameters	None
Return Value	None

Python Syntax	<code>ImportCableLibrary(<parameters>))</code>
Python Example	<pre>oModule = oDesign.GetModule("CableSetup") oModule.ExportCableLibrary("D:\\Users\\JaneDoe\\PersonalLib\\MyCables")</pre>

RemoveCable

Removes an existing cable created using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables>Edit Cables....** to open a **Cable Editor** window.

UI Access	3D Components>Cables > Edit Cables...
Parameters	None
Return Value	None

Python Syntax	<code>RemoveCable(<parameters>))</code>
Python Example	<pre>oModule = oDesign.GetModule("CableSetup") oModule.RemoveCable("bundle4")</pre>

UpdateCableHarness

Creates a cable harness using the Beta Cable Modeling feature. Right click on the 3D Component icon and select **Cables>New Cable Harness** to open the **Insert Cable Harness Component Editor**.

UI Access	3D Components>Cables > New Cable Harness...
Parameters	None
Return Value	None

Python Syntax	<code>UpdateCableHarness(<parameters>))</code>
Python Example	<pre>oModule.UpdateCableHarness([]</pre>

```

"NAME:HarnessParams",
"Bundle:="                , "bundle1",
"TwistAlongPath:="        , "720deg",
"Route:="                 , "Polyline1",
"AutoOrient:="            , False,
"Origin:="                 , ["0mm","0mm","0mm"],
"XAxisEnd:="              , ["-6mm","0mm","0mm"],
"PlaneFlip:="             , True,
[
    "NAME:RefConductors",
    "tpwire2/w1"
],
[
    "NAME:InputTerminations",
    "tpwire2/w1:="          , [                                "Source:="
    "tpwire2/w2:="          , [                                "Imped:="
],
[
    "NAME:OutputTerminations",
    "tpwire2/w1:="          , [                                "Imped:="
    "tpwire2/w2:="          , [                                "Source:="

```

	<pre>]], ["NAME:HarnessAttribs", "Name:=" , "MyHarness"])</pre>

9 - Output Variable Script Commands

Output variable commands should be executed by the "OutputVariable" module.

First, obtain the output variable module from oDesign and use it for output variable commands:

```
Set oModule = oDesign.GetModule("OutputVariable")

oModule.<CommandName><args>
```

The commands are:

[CreateOutputVariable](#)

[DeleteOutputVariable](#)

[DoesOutputVariableExist](#)

[EditOutputVariable](#)

[GetOutputVariableValue](#)

CreateOutputVariable

Adds a new output variable. Different forms of this command are executed for different design types.

Note:

Output variables are associated with a name and an expression. The name is not permitted to collide with design variable, sim value, or other output variable names. It cannot have spaces or any arithmetic or other operators in it. Expression definitions cannot be cyclic. For example, $A = 2*B$, $B=3*A$ is not allowed.

UI Access	Q3D Extractor > Results > Output Variables.		
Parameters	Name	Type	Description

	<OutputVarName>	String	Name of the new output variable.
	<Expression>	Value	Value to assign to the variable.
	<SolutionName>	String	Name of the solution, as seen in the output variable UI.
	<reportType>	String	The name of the report type as seen in the output variable UI.
	<ContextArray>	Array	Structured array containing context for which the output variable expression is being evaluated. Array("Context:=", <string>)
Return Value	None.		

Pyth-on Syn-tax	CreateOutputVariable (<OutputVarName>, <Expression>, <SolutionName>, <reportType solutionType>, <contextArray domainArray>)
Pyth-on Exa-mples	Q3D Extractor Example: Set oModule = oDesign.GetModule("OutputVariable") oModule.CreateOutputVariable("char_Z", "sqrt(ACL(via:via_source,via:via_source)/C(via,GroundPlane))", "Setup1 : LastAdaptive", "Matrix", ["Context:=", "Original"])

DeleteOutputVariable

Deletes an existing output variable. The variable can only be deleted if it is not in use by any traces.

UI Access	Q3D Extractor or 2D Extractor > Results > Output Variables . In the Output Variables window, click Delete .		
Parameters	Name	Type	Description
	<OutputVarName>	String	Name of the output variable.
Return Value	None.		

Python Syntax	DeleteOutputVariable (<OutputVarName>)		
Python Example	<pre>oModule = oDesign.GetModule("OutputVariable") oModule.DeleteOutputVariable ("testNew")</pre>		

DoesOutputVariableExist

Verifies whether or not a named output variable exists.

UI Access	N/A		
Parameters	Name	Type	Description
	<outputVariableName>	String	The output variable name.
Return Value	Boolean True if the variable exists; False if it does not.		

Python Syntax	DoesOutputVariableExist(<outputVariableName>)		
Python Example	<pre>oProject = oDesktop.GetActiveProject() oDesign = oProject.GetActiveDesign()</pre>		

```
oModule = oDesign.GetModule("OutputVariable")
oModule.DoesOutputVariableExist("MyTestVar")
```

EditOutputVariable

Changes the name or expression of an existing output variable.

UI Access	N/A		
Parameters	Name	Type	Description
	<OrigVarName>	String	Name of the original output variable.
	<NewExpression>	String	New value to assign to the variable.
	<NewVarName>	String	New name of the variable if any, else pass empty string.
	<SolutionName>	String	Name of the solution as seen in the output variable UI. For example, "Setup1 : Last Adaptive".
	<ReportType>	String	The name of the report type as seen in the output variable UI.
	<ContextArray>	Array	Structured array containing context for which the output variable expression is being evaluated. Array("Context:=", <string>)
Return Value	None		

Python	EditOutputVariable (<OrigVarName>, <NewExpression>, <NewVarName>, <SolutionName>, <ReportType>, <Con-

Syntax	<code>textArray>)</code>
Python Example	<pre>oModule = oDesign.GetModule("OutputVariable") oModule.EditOutputVariable ("test", "normalize(R1_0.V)", "testNew", "TR", "Standard", [])</pre>

ExportOutputVariables

Exports output variables to a file.

UI Access	Click on Export in the Output Variables dialog.		
Parameters	Name	Type	Description
	<FileName>	String	Name of the file include path.
Return Value	Boolean: • True - output variable successfully exported. • False - error when export output variables.		

Python Syntax	<code>ExportOutputVariables(<FileName>)</code>
Python Example	<code>oModule.ExportOutputVariables("C:/output_var.aoutvar")</code>

GetOutputVariables

Returns the list of output variables.

UI Access	N/A
Parameters	None.
Return Value	Array containing all output variables.

Python Syntax	GetOutputVariables()
Python Example	<code>oDesign.GetOutputVariables()</code>

GetOutputVariableValue

Returns the double value of an output variable. Only expressions that return a double value are supported. The expression is evaluated only for a single point.

UI Access	N/A		
Parameters	Name	Type	Description
	<OutputVarName>	String	Name of the output variable.
	<IntrinsicVariation>	String	A set of intrinsic variable value pairs to use when evaluating the output expression. Q3D example: "Freq='20GHz' x_size='1.0in'"
	<SolutionName>	String	Name of the solution as listed in the output variable UI. For example, "Setup1 : Last Adaptive".
	<ReportType>	String	The name of the report type as seen in the output variable UI. Possible values in Q3D Extractor are:

			• "Matrix" • "C Fields Report" • "DC R/L Fields Report" • "AC R/L Fields Report"
	<ContextArray>	Array	Structured array containing context for which the output variable expression is being evaluated. Can be empty. <code>Array("Context:=", <string>)</code>
Return Value	Double value of the output variable.		

Python Syntax	<code>GetOutputVariableValue(<OutputVarName>, <IntrinsicVariation>, <SolutionName>, <ReportTypeName>, <ContextArray>)</code>		
Python Example	<pre>Val = oDesign.GetOutputVariableValue("test", "Freq = '20Ghz' Theta='20deg' Phi='30deg'", "TR", "Standard", [])</pre>		

ImportOutputVariables

Imports output variables from a file.

UI Access	Click on Import in the Output Variables dialog.		
Parameters	Name	Type	Description
	<FileName>	String	Name of the file include path.
Return Value	Boolean: • True - output variable successfully imported.		

	• False - error when import output variables.

Python Syntax	ImportOutputVariables(<FileName>)
Python Example	oModule.ImportOutputVariables("C:/output_var.aoutvar")

SimValueContext

SimValueContext holds context information for a trace, and describes how data for a trace should be extracted from the simulation. SimValueContext contains a list of 14 required initial values:

```
SimValueContext (  
Domain ID, Calculation Type, Number of Cycles, Rise Time,  
Step, Impulse, Context ID, Window Width,  
Window Type, TDR Kaiser Parameter, Hold Time, DeviceName,  
TDR Step Time, DR Maximum Time )
```

For example, the following indicates a trace in the Time Domain, Standard Calculation with the number of cycles being 2:

```
"SimValueContext:=", Array(1, 0, 2, 0, false, false, -1, 1, 0, 1, 1, "", 0, 0)
```

Additional, context-specific values may follow the required values, as described in subsection 15 below.

1. Domain ID

No Domain	0
Time Domain	1
Spectrum Domain	2
Sweep Domain	3
Device Domain	4
SinglePt Domain	5
LoadPull Domain	6
Transient Domain	7
Budget Domain	8
NetworkFunction Domain	9
Oscillator Domain	55802
Noise Domain	55803
Transfer Function Domain	55807
Time Frequency Domain	55808
Transient Time Domain	55809
Periodic AC Domain	55818
UI Domain	55819
Eye Measurement Domain	55823
Initial Response Domain	55824
Peak Distortion Domain	55825

2. Calculation Type

Standard Calculation	0

Device2_DCIV	1
Device3_DCIV_Output	2
Device3_DCIV_Input	3
Device3_DCIV_Transfer	4
Device3_DCIV_Reverse	5
Device2_ACLoad	6
Device3_ACLoad_Output	7
Device3_ACLoad_Input	8
Device3_ACLoad_Transfer	9
Device3_ACLoad_Reverse	10
Constellation	11
EyeDiagram	12
FreeX (Statistic Report)	13

3. **Number of Cycles** — Used in Time Domain in HarmonicBalance analysis.

4. **Rise Time** — Not used by Designer/Nexxim.

5. **Step** — Not used by Designer/Nexxim.

6. **Impulse** — Not used by Designer/Nexxim.

7. **Context ID** — Not used by Designer/Nexxim.

8. **Window Width** — Not used by Designer/Nexxim.

9. **Window Type** — Not used by Designer/Nexxim.

10. **TDR Kaiser Parameter** — Not used by Designer/Nexxim.

11. **Hold Time** — Not used by Designer/Nexxim.
12. **DeviceName** — Not used by Designer/Nexxim.
13. **TDR Step Time** — Not used by Designer/Nexxim.
14. **TDR Maximum Time** — Not used by Designer/Nexxim.
15. **Context-specific values** — Used in Time Domain in HarmonicBalance analysis.

Context-specific values are entered in the format "key, true/false, keyvalue", where:

- **"key"** is the name of the key being set.
- **"true/false"** indicates whether the key is a string value.
- **"keyvalue"** is the value of the key.
- The order of the context keys is not significant.
- Context keys have software defaults that will be used if not provided in the script.

a. Plotting Range for Time domain in Transient and QuickEye analysis:

Description	Key Name	Is a string?	Key Value
Start Time	WS	False	0ns
Stop Time	WE	False	10ns
Minimum Time	WM	False	0ns
Maximum Time	WN	False	10ns
Is Thinning Enabled?	DE	False	0
Dy/dx Tolerance	DT	False	0.001

Number of points	DP	False	20000000

b.Transient report context for Spectral domain in Transient analysis:

Description	Key Name	Is a string?	Key Value
Start Time	TS	False	0ns
Stop Time	TE	False	10ns
Max Harmonics	MH	False	100
Max Frequency	MF	False	*
Window type	WT	False	0
Width Percentage	WW	False	100
Kaiser Parameter	KP	False	0
Adjust Coherent Gain	CG	False	0

* Script can specify either MH or MF. If neither is specified, Max Harmonics is set to 100. If both are specified, MF is used.

Window Type	ID
Rectangular	0
Bartlett	1
Blackman	2
Hamming	3
Hanning	4

Kaiser	5
Welch	6
Weber	7
Lanzcos	8

c. Eyeprobe index context for UI domain, Time domain, Eye Measurement domain in VeriEye and QuickEye analysis:

Description	Key Name	Is a string?	Key Value
Eyeprobe compinst ID	PCID	False	0

d. Eyesource index context for Initial Response domain and Peak Distortion domain in VeriEye and QuickEye analysis:

Description	Key Name	Is a string?	Key Value
Eyesource compinst ID	SCID	False	0

e. UI domain context in VeriEye and QuickEye analysis:

Description	Key Name	Is a string?	Key Value
Use midpoint?	MIDPOINT	False	0 - Don't use midpoint.

			1 - Use midpoint of amplitude. 2 - Use midpoint of UI.
Minimum latch overdrive	MLO	False	0

f. Distribution Context for UI Domain in VerifEye and QuickEye analysis:

Description	Key Name	Is a string?	Key Value
Use distribution?	USE_DIST	False	0 - No 1 - Yes
Distribution type	DIST	False	0 - Receiver Jitter 1 - Receiver Noise 2 - User Defined

Receiver Jitter Parameters

Description	Key Name	Is a string?	Key Value
DLL standard deviation	DSD	False	0
Distribution type	DIST	False	0
DLL taps	DMN	False	0

Static Offset	SOFF	False	0
Number of Gaussian data sets	NUMG	False	0
Gaussian std deviation	GS0,GS1...	False	0
Offset mean	GM1,GM1...	False	0
Number of Uniform data sets	NUMU	False	0
Uniform width	UW0,UW1...	False	0
Uniform mean	UM1,UM1...	False	0

Receiver Noise Parameters

Description	Key Name	Is a string?	Key Value
Number of Gaussian data sets	NUMG	False	0
Gaussian std deviation	GS0,GS1...	False	0
Number of Uniform data sets	NUMU	False	0
Uniform width	UW0,UW1...	False	0

User Defined Parameters

Description	Key Name	Is a string?	Key Value
Number of XY data pairs	NUMG	False	0
X data	X0,X1,X2...	False	0

Y data	Y0,Y1,Y2...	False	0
Cutoff probability	CP	False	0

10 - Reporter Editor Script Commands

Reporter commands should be executed by the oDesign object.

For example:

```
oDesign = Project.SetActiveDesign("Q3DDesign1")  
oModule = oDesign.GetModule("ReportSetup")
```

All Report and Trace properties can be edited using the **ChangeProperty** commands. This includes Title properties, General properties, and Background properties such as border color, fonts, X and Y axis scaling, and number display.

Note:

When you execute **Tools > Record Script**, operations performed in the Reporter are automatically recorded.

The list of commands is as follows:

[AddCartesianLimitLine](#)

[AddCartesianXMarker](#)

[AddCartesianYMarker](#)

[AddCartesianYMarkerToStack](#)

[AddDeltaMarker](#)

[AddMarker](#)

[AddNote](#)

[AddTraces](#)

AddVerifEyeAnalysis

[ClearAllMarkers](#)

[ClearAllMarkers](#)

[ClearAllTraceCharacteristics](#)

[CopyReportDefinitions](#)

[CopyReportData](#)

[CopyTraceDefinitions](#)

[CopyTracesData](#)

[CreateReport](#)

CreateReportFromFile

[CreateReportFromTemplate](#)

[CreateReportOfAllQuantities](#)

[DeleteMarker](#)

[DeleteAllReports](#)

[DeleteReports](#)

[DeleteTraces](#)

EditQuickEyeAnalysis

EditVerifEyeAnalysis

[FFTONReport](#)

[ExportFieldsToFile](#)

[ExportImageToFile](#)

[ExportModelImageToFile](#)

[ExportModelMeshToFile](#)

[ExportToFile \[Reporter\]](#)

[ExportMarkerTable](#)

[GetAllCategories](#)

[GetAllQuantities](#)

[GetAllReportNames](#)

[GetAvailableDisplayTypes](#)

[GetAvailableReportTypes](#)

[GetAvailableSolutions](#)

[GetChildNames](#)

[GetChildObject](#)

[GetChildTypes](#)

[GetDisplayType](#)

[GetPropertyValue](#)

[GetSolutionContexts](#)

[GetSolutionDataPerVariation](#)

[GroupPlotCurvesByGroupingStrategy](#)

[ImportIntoReport](#)

[MovePlotCurvesToGroup](#)

[MovePlotCurvesToNewGroup](#)

[PasteReports](#)

[PasteTraces](#)[RenameReport](#)[RenameTrace](#)[ResetPlotSettings](#)[SavePlotSettingsAsDefault](#)[SetPropValue](#)[UpdateAllFieldsPlots](#)[UpdateAllReports](#)[UpdateQuantityFieldsPlots](#)[UpdateReports](#)[UpdateTraces](#)[UpdateTracesContextandSweeps](#)[UnGroupPlotCurvesInGroup](#)

AddAllEyeMeasurements

Displays all the eye measurements in tabular format.

UI Access	Right-click the report and select Trace Characteristics > Add All Eye Measurements		
Parameters	Name	Type	Description
	<ReportName>	String	Name of the report.
Return Value	None.		

Python Syntax	AddAllEyeMeasurements(<ReportName>)
Python Example	<code>oModule.AddAllEyeMeasurements("DQS Eye")</code>

AddCartesianLimitLine

Adds a limit line to a report on the X axis.

UI Access	Report2D > Add Limit Line> Specify Points...		
Parameters	Name	Type	Description
	<ReportName>	String	Name of the report.
	<Def>	Array	Structured array:
			<pre>Array("NAME:CartesianLimitLine", Array("NAME:XValues", <integer X values>), "XUnits:=", <string unit of measure for X>, Array("NAME:YValues", <integer Y values>), "YUnits:=", "<string unit of measure for Y>", "YAxis:=", <string name of associated Y axis>)</pre>
Return Value	None.		

Python Syntax	AddCartesianLimitLine (<ReportName>, <Def>)
Python Example	<code>oModule.AddCartesianLimitLine("Project Outputs",</code>

	<pre>["NAME:CartesianLimitLine", ["NAME:XValues",0, 2, 5, 7, 10, 15], "XUnits:=", "s", ["NAME:YValues",0.05, 0.3, 0.65, 0.825, 0.95, 1], "YUnits:=", "mV", "YAxis:=", "Y1"])</pre>

AddCartesianLimitLineFromCurve

Adds a limit line to a report from selected curve on the plot.

UI Access	Report2D > Add Limit Line > From Selected Curve...		
Parameters	Name	Type	Description
	<ReportName>	String	Name of the report.
	<LimitLineParams>	String	Structured array.
			<pre>Array("NAME:CartesianLimitLineFromCurve", "TraceName:=", <string name of selected trace>, "CurveName:=", <string name of selected curve>, "Start:=", "<value><unit>", "Stop:=", "<value><unit>", "YAxis:=", <integer Y-Axis number>, "YOffset:=", <value offset from Y-Axis>,</pre>

			"CreateMode:=", "<AboveCurve BelowCurve Above and Below Curve>", "YShiftPercent:=", "<value percentage to shift from Y>"
Return Value	None.		

Python Syntax	AddCartesianLimitLineFromCurve(<ReportName>, <LimitLineParams>)
Python Example	<pre> oModule.AddCartesianLimitLineFromCurve("Variables Plot 2", ["NAME:CartesianLimitLineFromCurve", "TraceName:=" , "Phase", "CurveName:=" , "", "Start:=" , "0deg", "Stop:=" , "375deg", "YAxis:=" , 1, "YOffset:=" , 0, "CreateMode:=" , "AboveCurve", "YShiftPercent:=" , 10]) </pre>

AddCartesianLimitLineFromEquation

Adds a limit line to a report from a specified equation.

UI Access	Report2D > Add Limit Line > Specify Equation...		
Parameters	Name	Type	Description
	<ReportName>	String	Name of the report.
	<LimitLineParams>	Array	Structured array.
			<pre>Array("NAME:CartesianLimitLineFromEquation", "YAxis:=", <integer Y-Axis number>, "Start:=", <string start frequency with unit>, "Stop:=", <string end frequency with unit>, "Step:=", <string frequency resolution with unit>, "Equation:=", <string specified equation> "XValuesUnit:=", "GHz")</pre>
Return Value	None.		

Python Syntax	AddCartesianLimitLineFromEquation(<ReportName>, <LimitLineParams>)
Python Example	<pre>oModule.AddCartesianLimitLineFromEquation("S Parameter Plot 1", ["NAME:CartesianLimitLineFromEquation", "YAxis:=" , 1, "Start:=" , "9GHz", "Stop:=" , "11GHz",</pre>

	<pre> "Step:=" , "0.2GHz", "Equation:=" , "x+1" "XValuesUnit:=" , "GHz" 1) </pre>

AddCartesianXMarker

Adds a marker to a report on the X axis.

UI Access	Report2D > Marker > Add X Marker.		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<MarkerName>	String	Marker name, including any trailing number.
	<XValue>	Double	X coordinate.
Return Value	None		

Python Syntax	AddCartesianXMarker (<ReportName>, <MarkerName>, <XValue>)
Python Example	oModule.AddCartesianXMarker ("XY Plot 1", "MX1", 0)

AddCartesianYMarker

Adds a marker to a report on the Y axis.

UI Access	Report2D > Marker > Add Y Marker.

Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<MarkerName>	String	Marker name, including any trailing number.
	<AxisName>	String	Name of axis.
	<YValue>	Double	Y coordinate.
	<CurveName>	String	Name of curve.
Return Value	None		

Python Syntax	AddCartesianYMarker (<ReportName>, <MarkerName>, <AxisName>, <YValue>, <CurveName>)
Python Example	<pre>oModule.AddCartesianYMarker("XY Plot 1", "MY1", "Y1", 0, "dB() : Setup1 : Sweep1")</pre>

AddCartesianYMarkerToStack

Adds a marker to a stacked report on the Y axis.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<MarkerName>	String	Marker name, including any trailing number.
	<AxisName>	String	Name of axis.
	<YValue>	Double	Y coordinate.
	<CurveName>	String	Name of curve.
	<StackOption>	Array	"Current" to create marker on the current stack. "All" to create marker on all stack.

Return Value	None

Python Syntax	AddCartesianYMarkerToStack (<ReportName>, <MarkerName>, <AxisName>, <YValue>, <CurveName>, <StackOption>)
Python Example	oModule.AddCartesianYMarker("XY Plot 1", "MY1", "Y1", 0, "dB() : Setup1 : Sweep1", ["All"])

AddDeltaMarker

Add markers to calculate differences between two trace points on a plot.

UI Access	Report2D > Marker > Add Delta Marker.		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<MarkerName1>	String	Marker name, including any trailing number, for the first marker.
	<CurveName1>	String	Full trace name for the first marker.
	<PrimarySweepValue1>	String	Frequency, including unit, for the first marker's sweep.
	<MarkerName2>	String	Marker name, including any trailing number, for the second marker.
	<CurveName2>	String	Full trace name for the second marker.
	<PrimarySweepValue2>	String	Frequency, including unit, for the second marker's sweep.
Return Value	None		

Python Syntax	AddDeltaMarker(<ReportName>, <MarkerName1>, <CurveName1>, <PrimarySweepValue1>, <MarkerName2>, <CurveName2>, <PrimarySweepValue2>)
Python Example	oModule.AddDeltaMarker("C Matrix Plot 1", "m1",

	<pre>"C(top_gnd1 top_gnd1) : Setup1 : Sweep1 : diel_thick=\'0.2mm\' : Cartesian", "0.6GHz", "m2", "C(top_gnd1 top_gnd1) : Setup1 : Sweep1 : diel_thick=\'0.2mm\' : Cartesian", "1.9GHz")</pre>

AddMarker

Adds a marker to a trace on a report.

UI Access	Report2D > Marker > Add Marker.		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<MarkerName>	String	Marker name, including any trailing number.
	<CurveName>	String	Full trace name.
	<PrimarySweepValue>	String	Primary sweep value, including unit.
Return Value	None		

Python Syntax	AddMarker(<ReportName>, <MarkerName>, <CurveName>, <PrimarySweepValue>)
Python Example	<pre>oModule.AddMarker("XY Plot 1", "m5", "GS1.VAL : TR4 : Cartesian", "3.61599999999997s")</pre>

AddNote

Adds a note at a specified location to a given report.

UI Access	Right-click on the plot and select Add Note .		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report
	<NoteDataArray>	Array	Structured array. Array("NAME:<StringDataName>", <NoteArray>)
	<NoteArray>	Array	Structured array: Array("NAME:<NoteDataSourceName>", "SourceName:=", <string source name>, "HaveDefaultPos:=", <boolean True for position 0,0; False to specify below>, "DefaultXPos:=", <int X position for note; 0 for default>, "DefaultYPos:=", <int Y position for note; 0 for default>, "String:=", <string note text>)
Return Value	None		

Python Syntax	AddNote (<ReportName>, <NoteDataArray>)
Python Example	<pre>oModule.AddNote("XY Plot1", ["NAME:NoteDataSource",</pre>

	<pre>"SourceName:=", "Note1", "HaveDefaultPos:=", False, "DefaultXPos:=", 1996, "DefaultYPos:=", 3177, "String:=", "This is a note."])</pre>

AddTraceCharacteristics

Adds a trace characteristics field to the legend on a report.

UI Access	Report2D > Trace Characteristics > All. This opens the Add Trace Characteristics dialog box.		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<FunctionName>	String	The function name. See the Functions column of the Add Trace Characteristics dialog box.
	<FunctionArgs>	Array	Array containing string values for any function arguments. Pass empty array if no arguments exist. To see which argument(s) a function takes, see the bottom of the Add Trace Characteristics dialog box. For function with one argument: Array(<value>)

			For function with multiple arguments: <code>Array(<value>, <value>, ...)</code>
	<RangeArgs>	Array	Required. Array containing either string "Full" for a full sweep range, or "Specified" and strings containing the start and end values for the frequency range. For example: <code>Array("Specified", "19.5GHz", "24.4GHz")</code>
Return Value	None.		

Python Syntax	<code>AddTraceCharacteristics (<ReportName>, <FunctionName>, <FunctionArgs>, <RangeArgs>)</code>
Python Example	<pre>oModule.AddTraceCharacteristics("XY Plot 2", "delaytime", ["0"], ["Full"]) oModule.AddTraceCharacteristics("Differential S-parameters", "prms", ["0", "0"], ["Full"]) oModule.AddTraceCharacteristics("Rept2DRectFreq", "distortion", ["0"], ["Specified", "19.5GHz", "20.4GHz"])</pre>

AddTraces

Creates a new trace and adds it to the specified report.

UI Access	Modify Report > Add Trace.		
Parameters	Name	Type	Description
	<ReportName>	String	Name of Report
	<SolutionName>	String	Name of the solution as listed in the Modify Report dialog box.

	<ContextArray>	Array	Context for which the expression is being evaluated. This can be an empty string if there is no context. Array("Domain:=", <DomainType>) <DomainType> ex. "Sweep" or "Time" Array("Context:=", <GeometryType>) <GeometryType> ex. "Infinite Spheren", "Spheren", "Polylinen"
	<FamiliesArray>	Array	Contains sweep definitions for the report. Array("<VariableName>:= ", <ValueArray>) <ValueArray> Array("All") or Array("Value1", "Value2", ..."Valuen") examples of <VariableName> "Freq", "Theta", "Distance"
	<ReportDataArray>	Array	This array contains the report quantity and X, Y, and (Z) axis definitions. Array("X Component:=", <VariableName>, "Y Component:=", <VariableName> <ReportQuantityArray>) <ReportQuantityArray> ex. Array("dB(S(Port1, Port1))")
Return Value	None		

Python Syntax	Add Traces(<ReportName>, <SolutionName>, <ContextArray>, <FamiliesArray>, <ReportDataArray>)
Python Example	<pre>oModule.AddTraces("XY Plot1", "Setup1 : Sweep1", ["Domain:=", "Time", "HoldTime:=", 1, "RiseTime:=", 0, "StepTime:=", 6.24999373748E-012, "Step:=", False, "WindowWidth:=", 1, "WindowType:=", 0, "KaiserParameter:=", 1, "MaximumTime:=", 6.2437437437444E-009], ["Time:=", ["All"], "OverridingValues:=", ["0s", "6.24999373748188e-012s", ...]], ["X Component:=", "Time", "Y Component:=", ["TDRZ (WavePort1)"]], [])</pre>

ApplyReportTemplate

Applies settings to a report from a template file.

UI Access	Right-click on a report, select Report Templates > Apply Settings .		
Parameters	Name	Type	Description
	<ReportName>	String	Name of the report to apply settings to.
	<TemplateFile>	String	Template file name with path.
	<PropertyType>	String	Property types to apply. ("Graphical" "Data" "All")
Return Value	None.		

Python Syntax	<code>ApplyReportTemplate(<ReportName>, <TemplateFile>, <PropertyType>)</code>
Python Example	<code>oModule.ApplyReportTemplate("Variables Plot 1", "C:/MyTemplate.rpt", "Graphical")</code>

ChangeProperty[ReportSetup]

Change the properties for a Report.

UI Access	Double-click on a report to change its properties.		
Parameters	Name	Type	Description
	<PropertyArray>	Array	Varies, depending on the properties associated with the select object command.
Return Value	None.		

Python Syntax	<code>ChangeProperty(<PropertyArray>)</code>
Python Example	<pre>oModule = oDesign.GetModule("ReportSetup") oModule.ChangeProperty(["NAME:AllTabs", ["NAME:General",</pre>

```
[
    "NAME:PropServers",
    "XY Plot 1:General"
],
[
    "NAME:ChangedProps",
    [
        "NAME:Use Scientific Notation",
        "Value:=", True
    ]
]
])

oModule = oDesign.GetModule("ReportSetup")
oModule.ChangeProperty(
    [
        "NAME:AllTabs",
        [
            "NAME:Legend",
            [
```

```
        "NAME:PropServers",  
        "S Parameter Plot 1:Legend"  
    ],  
    [  
        "NAME:ChangedProps",  
        [  
            "NAME:Legend Name",  
            "Value:=" , "Ansys"  
        ]  
    ]  
]  
]  
])  
  
oModule.ChangeProperty(  
    [  
        "NAME:AllTabs",  
        [  
            "NAME:General",  
            [  
                "NAME:PropServers",  
                "S Parameter Plot 1:General"            ]  
        ]  
    ]  
)
```

```
        ],  
        [  
            "NAME:ChangedProps",  
            [  
                "NAME:Auto Scale Fonts",  
                "Value:=" , False  
            ]  
        ]  
    ]  
])
```

Example For Rectangular Stacked Plot

```
oProject = oDesktop.SetActiveProject("antenna_test")  
oDesign = oProject.SetActiveDesign("Design1")  
oModule = oDesign.GetModule("ReportSetup")  
oModule.ChangeProperty(  
    [  
        "NAME:AllTabs",  
        [  
            "NAME:Scaling",
```

```
[
    "NAME:PropServers",
    "S Parameter Plot 1:AxisY2:Stack1",
    "S Parameter Plot 1:AxisY2:Stack2"
],
[
    "NAME:ChangedProps",
    [
        "NAME:Min",
        "Value:="          , "-60"
    ]
]
])
```

Example Change eye rect and eye plot:

```
ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")
oDesktop.RestoreWindow()
oProject = oDesktop.SetActiveProject("test_nport_synth2")
oDesign = oProject.SetActiveDesign("Circuit1")
oModule = oDesign.GetModule("ReportSetup")
```

```
oModule.ChangeProperty(  
  [  
    "NAME:AllTabs",  
    [  
      "NAME:Grid",  
      [  
        "NAME:PropServers",  
        "QuickEye Voltage Plot 1:Grid:Eye"  
      ],  
      [  
        "NAME:ChangedProps",  
        [  
          "NAME:Major grid line style",  
          "Value:=" , "Dot"  
        ],  
        [  
          "NAME:Minor grid line style",  
          "Value:=" , "Dot"  
        ]  
      ]  
    ]  
  ],
```

```
[
  "NAME:Axis",
  [
    "NAME:PropServers",
    "QuickEye Voltage Plot 1:AxisX:Eye"
  ],
  [
    "NAME:ChangedProps",
    [
      "NAME:Axis Color",
      "R:=" , 255,
      "G:=" , 128,
      "B:=" , 128
    ]
  ]
],
[
  "NAME:Axis",
  [
    "NAME:PropServers",
```



```
        "QuickEye Voltage Plot 1:AxisY1:Rect"
    ],
    [
        "NAME:ChangedProps",
        [
            "NAME:Axis Color",
            "R:=" , 255,
            "G:=" , 128,
            "B:=" , 128
        ]
    ]
]
])
oModule.ChangeProperty(
    [
        "NAME:AllTabs",
        [
            "NAME:Grid",
            [
                "NAME:PropServers",
                "QuickEye Voltage Plot 1:Grid:Rect"
```

	<pre>], ["NAME:ChangedProps", ["NAME:Major grid line style", "Value:=", "LongDash"], ["NAME:Minor grid line style", "Value:=", "LongDash"]]]])</pre>

ClearAllMarkers

Clears all markers from a report.

UI Access	Report2D > Markers > Clear All.

Parameters	Name	Type	Description
	<ReportName>	String	Name of Report
Return Value	None		

Python Syntax	ClearAllMarkers(<ReportName>)
Python Example	<code>oModule.ClearAllMarkers("XY Plot 1")</code>

ClearAllTraceCharacteristics

Clears all trace characteristics from the legend in a report.

UI Access	Report2D > Trace Characteristics > Clear All.		
Parameters	Name	Type	Description
	<PlotName>	String	Name of the plot
Return Value	None		

Python Syntax	ClearAllTraceCharacteristics(<PlotName>)
Python Example	<code>oModule.ClearAllTraceCharacteristics("XY Plot 1")</code>

CloneReportsFromDatasetSolution

Clones a report for a solved solution from a dataset solution.

UI Access	Right-click the Project tree on the report and choose Clone from Dataset Solution > [Dataset_SolutionName]		
Parameters	Name	Type	Description
	<ReportsToClone>	Array	Array of report names to clone.
	<SoluNameToUse>	String	Name of the dataset solution.
Return Value	None.		

Python Syntax	CloneReportsFromDatasetSolution(<ReportsToClone>, <SoluNameToUse>)
Python Example	<pre>oModule.CloneReportsFromDatasetSolution(["Rectangular Plot1"], "DatasetSolution_rsm_5812")</pre>

CopyPlotSettings

Copies settings of a specified plot.

UI Access	Right-click a report, select Copy		
Parameters	Name	Type	Description
	<ReportName>	String	Name of specified report.
Return Value	None.		

Python Syntax	<code>CopyPlotSettings(<ReportName>)</code>
Python Example	<code>oModule.CopyPlotSettings("Plot 1")</code>

CopyReportDefinitions

Copy the definition of a report for paste operations.

UI Access	Select a report in the Project tree, right-click and select Copy Definition		
Parameters	Name	Type	Description
	<ReportsArray>	Array	Names of reports from which to copy the definitions
Return Value	None		

Python Syntax	<code>CopyReportDefinitions(<ReportsArray>)</code>
Python Example	<code>oModule.CopyReportDefinitions(["Transmission", "Reflection"])</code>

CopyReportsData

Copy all data corresponding to the specified reports.

UI Access	Select a report in the Project tree, right-click and select Copy Data

Parameters	Name	Type	Description
	<ReportsArray>	Array	Names of reports from which to copy data
Return Value	None		

Python Syntax	CopyReportsData (<ReportsArray>)
Python Example	<code>oModule.CopyReportsData (["Transmission", "Reflection"])</code>

CopyTraceDefinitions

Copy trace definitions for a paste operation.

UI Access	Select a trace in the Project tree, right-click and select Copy Definition		
Parameters	Name	Type	Description
	<ReportName>	String	Name of Report
	<TracesArray>	Array	Trace definitions to copy
Return Value	None		

Python Syntax	CopyTraceDefinitions(<ReportName>, <TracesArray>)
Python Example	<code>oModule.CopyTraceDefinitions ("Transmission", ["mag (S (Port1, Port2)) "])</code>

CopyTracesData

Copies trace data for a paste operation.

UI Access	Select a trace in the Project tree, right-click and select Copy Data .		
Parameters	Name	Type	Description
	<ReportName>	String	Name of Report.
	<TraceArray>	Array	Trace definitions from which to copy corresponding data.
Return Value	None.		

Python Syntax	CopyTracesData(<ReportName>, <TracesArray>)		
Python Example	<pre>oModule.CopyTracesData ("Transmission", ["mag(S(Port1,Port2))"])</pre>		

CreateReport (Q3D Extractor)

Creates a new Q3D Extractor report.

UI Access	Q3D Extractor > Results > Create [Type] Report.		
Parameters	Name	Type	Description
	<Name>	String	Report name.
	<ReportType>	String	"Matrix", "CG Fields", "AC R/L Fields", or "Far Fields"
	<PlotType>	String	If the <ReportType> is "Matrix", "CG Fields", or "AC R/L Fields" valid entries are:

		• "3D Rectangular Plot" • "Data Table" • "Rectangular Contour Plot" • "Rectangular Plot" • "Rectangular Stacked Plot" If the <ReportType> is "Far Fields" valid entries are: • "3D Polar Plot" • "3D Rectangular Plot" • "3D Rectangular Bar Plot" • "3D Spherical Plot" • "Data Table" • "Radiation Pattern" • "Rectangular Plot" • "Rectangular Contour Plot" • "Rectangular Stacked Plot"
<SolutionName>	String	Solution name as listed in the Context area of the Create Report window.
<Data>	Array	Data depends on display type, and is entered as a series of arrays. Context Array: <pre>Array("Context:=", <string context>)</pre> Values Array: <pre>Array("Phase:=", <array of values>, "Freq:=", <array of string values>, "Phase:=", <array of string values>,</pre>

		<pre>"viarad:=", <array of string values>, "padrad:=", <array of string values> Values Array (Far Fields): Array("Phi:=", <array of values>, "Theta:=", <array of string values>, "Freq:=", <array of string values>, "L:=", <array of string values>, "H:=", <array of string values>, "W:=", <array of string values>, "Lg:=", <array of string values>) Components Array: Array("X Component:=", <string or array>, "Y Component:=", <string or array>, "Z Component:=", <string or array>) Components (Far Fields): Array("Phi Component:=", <string or array>, "Theta Component:=", <string or array>, "Mag Component:=", <string or array>)</pre>

			Note: For the Context Array, Field reports usually require a polyline (for example, "Line1"). This does not apply if they are integrations. Q3D Extractor matrix data requires a Reduce Matrix operation (for example, "Original"). For reports requiring no context, pass empty array.
Return Value	None.		

Python Syntax	CreateReport(<Name>, <ReportType>, <PlotType>, <SolutionName>, <Data>)
Python Example	Example without Context Array: <pre>oModule.CreateReport("Variables Plot 2", "AC R/L Fields", "3D Rectangular Plot", "Setup1 : LastAdaptive", [], ["Freq:=" , ["All"], "viarad:=" , ["All"], "padrad:=" , ["0.6mm"]], ["X Component:=" , "Freq", "Y Component:=" , "viarad", "Z Component:=" , ["viarad"]</pre>

	<pre>]) Example with Context Array: oModule.CreateReport("C Matrix Plot 1", "Matrix", "Rectangular Plot", "Setup1 : LastAdaptive", ["Context:=" , "Original"], ["Freq:=" , ["All"], "viarad:=" , ["Nominal"], "padrad:=" , ["0.6mm"]], ["X Component:=" , "Freq", "Y Component:=" , ["C(groundplane,groundplane)"]])</pre>

CreateReport (2D Extractor)

Creates a new 2D Extractor report.

UI Access	2D Extractor > Results > Create [Type] Report.		
Parameters	Name	Type	Description
	<Name>	String	Report name.
	<ReportType>	String	"Matrix", "CG Fields", or "RL Fields"
	<PlotType>	String	Valid entries are:

		• "3D Rectangular Plot" • "Data Table" • "Rectangular Contour Plot" • "Rectangular Plot" • "Rectangular Stacked Plot"
<SolutionName>	String	Solution name as listed in the Context area of the Create Report window.
<Data>	Array	Data depends on display type, and is entered as a series of arrays. Context Array: <pre>Array("Context:=", <string context>)</pre> Values Array: <pre>Array("Phase:=", <array of values>, "Freq:=", <array of string values>, "diel_thick:=", <array of string values>)</pre> Components Array: <pre>Array("X Component:=", <string or array>, "Y Component:=", <string or array>, "Z Component:=", <string or array>)</pre>

			Note: For the Context array, Field reports usually require a polyline (for example, "Line1"). This does not apply if they are integrations. 2D Extractor matrix data requires a Reduce Matrix operation (for example, "Original"). For reports requiring no context, pass empty array.
Return Value	None.		

Python Syntax	CreateReport(<Name>, <ReportType>, <PlotType>, <SolutionName>, <Data>)
Python Example	Example without Context Array: <pre>oModule.CreateReport("Variables Plot 1", "CG Fields", "Rectangular Contour Plot", "Setup1 : LastAdaptive", [], ["Phase:=" , ["All"], "Freq:=" , ["All"], "diel_thick:=" , ["0.2mm"]], ["X Component:=", "Phase", "Y Component:=", "Freq", "Z Component:=", ["Phase"]]</pre>

	<pre>) Example with Context Array: oModule.CreateReport("C Matrix Plot 1", "Matrix", "Rectangular Plot", "Setup1 : Sweep1", ["Context:=" , "Original"], ["Freq:=" , ["All"], "diel_thick:=" , ["0.2mm"]], ["X Component:=", "Freq", "Y Component:=", ["C(top_gnd1,top_gnd1)"]])</pre>

CreateReportFromTemplate

Creates a report from a saved template.

UI Access	[product] > Results > Report Templates > PersonalLib > [TemplateName]		
Parameters	Name	Type	Description
	<TemplatePath>	String	Path to report template
Return Value	None		

Python Syntax	CreateReportFromTemplate(<TemplatePath>)
Python Example	oModule.CreateReportFromTemplate("C:/MyHFSSProjects/PersonalLib/ReportTemplates/TestTemplate.rpt")

CreateReportOfAllQuantities

Creates a report including all quantities in a category. Cannot create a report with expressions.

UI Access	NA		
Parameters	Name	Type	Description
	<ReportType>	String	Report type name as input parameter
	<DisplayType>	String	Display type name as input parameter
	<SolutionName>	String	Solution name as input parameter
	<SimValueCtxt>	String	A context name, or array of string that encoded the context(I).
	<CategoryName>	String	Category name as input parameter
	<PointSet>	Array	Array of strings(II)
	<CommonComponentsOfTraces>	Array	Array of strings(III)
	<ExtTraceInfo>	Array	Array of strings(IV)
Return Value	None.		

Python Syntax	CreateReportOfAllQuantities(<ReportNameArg>, <ReportType>, <DisplayType>, <SolutionName>, <SimValueCtxt>, <CategoryName>, <PointSet>, <CommonComponentsOfTraces>, <ExtTraceInfo>)
Python Example	oModule.CreateReportOfAllQuantities("Smith Chart all",

	<pre>"Modal Solution Data", "Smith Chart", "Setup1 : LastAdaptive", [], "S Parameter", ["Freq:=", ["All"], "offset:=", ["All"], "a:=", ["Nominal"], "b:=", ["Nominal"]], [], [])</pre>

DeleteMarker

*Use:*Deletes the specified marker.

UI Access	[product] > Fields > Fields > Marker > Delete Marker.		
Parameters	Name	Type	Description
	<MarkerName>	String	Name of the marker.
Return Value	None.		

Python Syntax	DeleteMarker(<MarkerName>)
Python Example	oModule.DeleteMarker("m1")

DeleteAllReports

Deletes all existing reports.

UI Access	Right-click the report to delete in the project tree, and then click Delete All Reports on the shortcut menu.

Parameters	None.
Return Value	None.

Python Syntax	DeleteAllReports()
Python Example	<code>oModule.DeleteAllReports()</code>

DeleteReports

Deletes an existing report or reports.

UI Access	Right-click the report to delete in the project tree, and then click Delete on the shortcut menu		
Parameters	Name	Type	Description
	<i><ReportNameArray></i>	Array	Array of report names to be deleted
Return Value	None.		

Python Syntax	DeleteReports(<i><ReportNameArray></i>)
Python Example	<code>oModule.DeleteReports (["Rept2DRectFreq"])</code>

DeleteTraceCharacteristics

Deletes a trace characteristics field from a report

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of the report to delete from.
	<TraceCharsNames>	Array	Array of trace characteristics to delete.
Return Value	None.		

Python Syntax	DeleteTraceCharacteristics(<ReportName>, <TraceCharsNames>)
Python Example	oModule.DeleteTraceCharacteristics("Variables Plot 1", ["lowercutoff", "gain-crossover"])

DeleteTraces

Deletes an existing traces or traces.

UI Access	Right-click the Trace to delete in the project tree, and then click Delete on the shortcut menu		
Parameters	Name	Type	Description
	<TraceSelection>	Array	Structured array define selections. Array("<ReportName>:=", <TracesArray>, <TracesArray>, ...)
	<ReportName>	String	Name of Report
	<TracesArray>	Array	Contains the traces to delete within a report Array(<Trace>, <Trace>, ...)

	<i><Trace></i>	String	A specific trace that the user wishes to delete
Return Value	None.		

Python Syntax	DeleteTraces(<i><TraceSelection></i>)		
Python Example	<pre>oModule.DeleteTraces (["XY Plot 1:=", ["dB(S(LumpPort1,LumpPort1))"], "XY Plot 2:=", ["Mag_E"]])</pre>		

DoesSupportTraceCharacteristics

Determines whether trace characteristics is supported in a specified display type.

UI Access	N/A		
Parameters	Name	Type	Description
	<i><DisplayType></i>	String	Specified display type to check.
Return Value	Integer 1 - trace characteristics is supported. 0 - trace characteristics not supported.		

Python Syntax	DoesSupportTraceCharacteristics(<i><DisplayType></i>)		
Python Example	oModule.DoesSupportTraceCharacteristics("Rectangular Plot")		

DumpAllReportsData

Dumps all reports data to an Ansoft report data file.

UI Access	N/A		
Parameters	Name	Type	Description
	<FileName>	String	File name with path.
Return Value	None.		

Python Syntax	DumpAllReportsData(<FileName>)
Python Example	<code>oModule.DumpAllReportsData("C:/ReportsData.rdat")</code>

EditCartesianXMarker

Edits an XMarker value.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<MarkerName>	String	Marker name, including any trailing number.
	<XValue>	Double	X coordinate.

Return Value	None.

Python Syntax	EditCartesianXMarker (<ReportName>, <MarkerName>, <XValue>)
Python Example	<pre>oModule.EditCartesianXMarker ("XY Plot 1", "MX1", 0)</pre>

EditCartesianYMarker

Edits a YMarker value.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<MarkerName>	String	Marker name, including any trailing number.
	<AxisName>	String	Name of axis.
	<YValue>	Double	Y coordinate.
	<CurveName>	String	Name of curve.
Return Value	None		

Python Syntax	EditCartesianYMarker (<ReportName>, <MarkerName>, <AxisName>, <YValue>, <CurveName>)
Python Example	<pre>oModule.EditCartesianYMarker("XY Plot 1", "MY1", "Y1", 0, "dB() : Setup1 : Sweep1")</pre>

EditMarker

Edits a marker on a report.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<MarkerName>	String	Marker name, including any trailing number.
	<CurveName>	String	Full trace name.
	<PrimarySweepValue>	String	Primary sweep value, including unit.
Return Value	None.		

Python Syntax	EditMarker(<ReportName>, <MarkerName>, <CurveName>, <PrimarySweepValue>)
Python Example	<pre>oModule.EditMarker("XY Plot 1", "m5", "GS1.VAL : TR4 : Cartesian", "3.615999999999997s")</pre>

ExportEyeMaskViolation

Exports eye mask violations to a file.

UI Access	N/A		
Parameters	Name	Type	Description

	<i><ReportName></i>	String	Name of specified report.
	<i><ExportFileName></i>	String	File name to export to.
Return Value	N/A		

Python Syntax	ExportEyeMaskViolation(<i><ReportName></i> , <i><ExportFileName></i>)		
Python Example	oModule.ExportEyeMaskViolation("Variables Plot 1", "C:/eyemask1.csv")		

ExportImageToFile [Reporter]

Exports a report image in a specified format. This command is fully supports -ng (non-graphical) mode.

UI Access	N/A		
Parameters	Name	Type	Description
	<i><ReportName></i>	String	Name of report to be exported.
	<i><FileName></i>	String	Full path of the exported image file name; with extension of jpg, gif, tiff, tif, bmp, or wrl.
	<i><Width></i>	Integer	Image width in pixels; if width or height is less or equal to zero, use the report window width, or 500 pixels if report window is closed.
	<i><Height></i>	Integer	Image height in pixels; if width or height is less or equal to zero, use the report window height, or 500 pixels report window is closed.
	[<i><SaveImageParameters2D></i>]	Boolean	Whether to ShowLegend, ShowMarkerTable, ShowDeltaMarkerTable. Values can be True, False or Default. Default is True.
	[<i><SaveImageParameters3D></i>]		Whether to AutoFit [Default is "False"] ShowLegend, ShowMarkerTable, ShowDeltaMarkerTable. Values can be True, False or Default. Default is True.
Return Value	None.		

Python Syntax	ExportImageToFile(<ReportName>, <FileName>, <Width>, <Height>)
Python Example	<pre>##### Script Recorded for Saving 2D oDesktop.OpenProject("E:/Ansoft/Tee2.aedt") oProject = oDesktop.SetActiveProject("Tee2") oDesign = oProject.SetActiveDesign("TeeModel") oModule = oDesign.GetModule("ReportSetup") oModule.ExportImageToFile("S Parameter Plot 1", "E:/Ansoft/S Parameter Plot 1.png", 1920, 1080) oModule.ExportImageToFile("S Parameter Plot 12", "E:/Ansoft/S Parameter Plot 12.png", 1920, 1080) oModule.ExportImageToFile("S Parameter Plot 1", "E:/Ansoft/S Parameter Plot 1.png", 1920, 1080, ["NAME:SaveImageParams", "ShowLegend:=" , "False", "ShowMarkerTable:=" , "False" "ShowDeltaMarkerTable:=" , "False"]) oModule.ExportImageToFile("S Parameter Plot 1", "E:/Ansoft/S Parameter Plot 1.png", 1920, 1080,</pre>


```

[
    "NAME:SaveImageParams",
    "ShowLegend:=" , "True",
    "ShowMarkerTable:=" , "True"
    "ShowDeltaMarkerTable:=" , "False"
])

oModule.ExportImageToFile("S Parameter Plot 12", "E:/Ansoft/S Parameter Plot 12.png",
1920, 1080,

[
    "NAME:SaveImageParams",
    "ShowLegend:=" , "False",
    "ShowMarkerTable:=" , "Default"
    "ShowDeltaMarkerTable:=" , "False"
])

oModule.ExportImageToFile("S Parameter Plot 12", "E:/Ansoft/S Parameter Plot 12.png",
1920, 1080,

[
    "NAME:SaveImageParams",
    "ShowLegend:=" , "True",
    "ShowMarkerTable:=" , "Default"
    "ShowDeltaMarkerTable:=" , "True"
])

oDesktop.CloseProject("Tee2")

```

Script Recorded for saving as 3D:

```
oDesktop.OpenProject("E:/Ansoft/Tee2.aedt")
oProject = oDesktop.SetActiveProject("Tee2")
oDesign = oProject.SetActiveDesign("TeeModel")
oModule = oDesign.GetModule("ReportSetup")
oModule.ExportImageToFile("S Parameter Plot 6", "E:/Ansoft/S Parameter Plot 11.png",
1335, 466,
[
    "NAME:SaveImageParams",
    "AutoFit:=" , "False",
    "Orientation:=" , "",
    "ShowOrientationGadget:=", "Default"
])
oModule.ExportImageToFile("S Parameter Plot 6", "E:/Ansoft/S Parameter Plot 11.png",
1335, 466,
[
    "NAME:SaveImageParams",
    "AutoFit:=" , "False",
    "Orientation:=" , "",
```

```

    "ShowOrientationGadget:=", "Default"

    "ShowLegend:=" , "True"

  })

oModule.ExportImageToFile("S Parameter Plot 6", "E:/Ansoft/S Parameter Plot 10.png",
1335, 466,

  [

    "NAME:SaveImageParams",

    "AutoFit:=" , "False",

    "Orientation:=" , "",

    "ShowOrientationGadget:=", "Default",

    "ShowLegend:=" , "False"

  ])

```

ExportModelImageToFile

Exports the model as an image file (*.avz, *.bmp, *.gif, *.jpeg, *.tiff, *.wrl). In Release 23.1, this command is fully supports -ng (non-graphical) mode. To export to Ensign use *.avz. For export to Ensign in -ng mode, the corresponding version of Ensign must be installed. On Linux, it might need manual set environment variable AWP_ROOT212 to its installation path, e.g. AWP_ROOT212-2=/installations/ansys_inc/v212/ for AnsysEDT v21.2 and Ensign 21.2.

ExportModelImageToFile exports a model image with background type and color that respect the AEDT color scheme by default. You can specify the background type and color with following parameters:

Parameter Name	Description	Parameter Value
BackgroundType	Choose one out of four types of background	Default Plain LinearGradient RadialGradient
BackgroundColor	Plain: Background color Lin- earGradient/RadialGradient: Background start color	3 integers with a range of [0,255] that represent red, green, and blue respectively
BackgroundContrastColor	Plain: Ignored LinearGradient/RadialGradient: Back- ground end color	3 integers with a range of [0,255] that represent red, green, and blue respectively

Note: Current scripts will not be affected, the image will be exported with default background color as it always does

If no BackgroundType is specified, or BackgroundType is Default, BackgroundColor and BackgroundContrastColor will be ignored, and the image will be exported with default background color

ExportModelImageToFile supports export overlay of polar plot 3D with existing transformation (scaling, rotation and translation) in -ng (non-graphical) mode.

UI Access	Modeler > Export.		
Parameters	Name	Type	Description
	<path>	String	Full file path including extension.
	<width>	Integer	Width in pixels (use 0 for default).
	<height>	Integer	Height in pixels (use 0 for default).
	<Parameters>	Array	Structured array. Array ("NAME:SaveImageParams", "ShowAxis:=" , <string containing boolean> ,

		<pre> "ShowGrid:=" , <string containing boolean>, "ShowRuler:=" , <string containing boolean>, "ShowRegion:=" , <string>, "Selections:=" , <string>, "FieldPlotSelections:=", <string>' # Comma delimited string. #Use to set which field plot to show. "FitToSelections:=" , "", </pre> Note: "FitToSelections" specify geometry objects for the "Fit" operation. <pre> "FitToFieldPlotSelection:=" , "" </pre> Note: "FitToFieldPlotSelections" specifies field plots for the "Fit" operation. <pre> "AutoFit:=" , "True", </pre> Note: If FitToSlections or FitToFieldPlotSelections are used , then AutoFit is True, it makes sure color key does not overlap field plot. It is False by default. If neither is used, then "AutoFit" will "Fit" to full model.

	<table><tr><td></td><td></td><td>"Orientation:=" , <string> "ShowOrientationGadget:=" , <False></td></tr></table>					"Orientation:=" , <string> "ShowOrientationGadget:=" , <False>
		"Orientation:=" , <string> "ShowOrientationGadget:=" , <False>				
Return Value	None.					

Python Syntax	ExportModelImageToFile(<path> <width> <height> <Parameters>)
Python Example	<pre>oEditor.ExportModelImageToFile ("D:/Image.png", 1920, 1080, ["NAME:SaveImageParams", "ShowAxis:=" , "True", "ShowGrid:=" , "True", "ShowRuler:=" , "True", "ShowRegion:=" , "Default", "Selections:=" , "", "FieldPlotSelections:=" , "", "FitToSelections:=" , "", "FitToFieldPlotSelections:=" , "", "AutoFit:=" , "True", "Orientation:=" , ""])</pre>

ExportModelMeshToFile

Exports geometry model to a 3D model file (e.g. *.obj, *.wrl, etc.).

UI Access	N/A		
Parameters	Name	Type	Description
	<filePath>	String	Full file path, including extension *.obj, *.wrl, etc
	<selections>	Array	Selected parts.
Return Value	None.		

Python Syntax	ExportModelMeshToFile <filePath>, <selections>)
Python Example	oEditor.ExportModelMeshToFile("E:/MyDir/scriptRun/2Selected-ng.obj", ["BotCover-", "AveragingVolumeAtPeakRMSEfieldLocation"])

ExportPlot3DToFile [Reporter]

Use: Exports 3D polar, spherical and rectangular plot to a case file. It works in both graphical and NG mode..

Command: None.

Syntax: ExportPlot3DToFile(<plotName>, <path>)

Return Value: A 3D plot file.

Parameters: <plotName>

Type: <string>

Plot name.

<Path>

Type: <string>

Path to file.

Python Syntax	ExportPlot3DToFile(<name> <Path>)
Python Example	<pre>oModule = oDesign.GetModule("ReportSetup") oModule.UpdateReports(["rE Plot 1"]) oModule.UpdateReports(["Directivity Plot 1"]) oModule.UpdateReports(["Gain Plot 1"]) oModule.ExportPlot3DToFile("rE Plot 1", "D:/projects/test2-output/rEPlot1.case") oModule.ExportPlot3DToFile("Directivity Plot 1", "D:/projects/test2-out- put/DirectivityPlot1.case") oModule.ExportPlot3DToFile("Gain Plot 1", "D:/projects/test2-out- put/GainPlot1.case")</pre>

ExportReport

Note:

The ExportReport script command has been replaced by the script command [ExportToFile](#). ExportReport remains in order to retain backward compatibility for existing scripts, but it is strongly recommended that you now use [ExportToFile](#).

Export a report to a data file.

Command: None

Syntax: ExportReport <ReportName>, <FileName>, <FileExtension>

Return Value: None

Parameters: <ReportName>

Type: string

<Filename>

Type: string

<FileExtension>

Type: string

Python Syntax	ExportReport(<ReportName>, <FileName>)
Python Example	<pre>oDesign.ExportReport("Plot1", "c:\report1.dat")</pre>

ExportReportDataToFile

Exports report data to a file.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of specified report.
	<ExportFileName>	String	Name of export file. File extension "rdat" is expected.
Return Value	None.		

Python Syntax	<code>ExportReportDataToFile(<ReportName>, <ExportFileName>)</code>
Python Example	<code>oModule.ExportReportDataToFile("Plot 1", "C:/Plot1data.rdat")</code>

ExportTableToFile

Exports a marker table from a report to a file.

UI Access	Right-click on a plot, select Marker > Export Marker Table... or Export Delta Marker Table...		
Parameters	Name	Type	Description
	<code><ReportName></code>	String	Name of specified report.
	<code><ExportFileName></code>	String	Name of export file.
	<code><TableType></code>	String	Type of marker table to export. "Marker" or "DeltaMarker".
Return Value	None.		

Python Syntax	<code>ExportTableToFile(<ReportName>, <ExportFileName>, <TableType>)</code>
Python Example	<code>oModule.ExportTableToFile("Plot 1", "C:/Marker.csv", "Marker")</code>

ExportToFile [Reporter]

From a data table or plot, generates text format, comma delimited, tab delimited, .dat, or .rdat type output files.

UI Access	Right-click on report name in the Project tree and select Export .			
Parameters	Name	Type	Description	
	<ReportName>	String	Name of the report	
	<FileName>	String	Path and File Name	
			Supported formats	
			.txt	Post processor format file
			.csv	Comma-delimited data file
			.tab	Tab-separated file
			.dat	Ansys plot data file
			.rdat	Ansys report data file
Return Value	None			

Python Syntax	ExportToFile (<ReportName>, <FileName>)
Python Example	<pre>oModule.ExportToFile("Plot1", "c:\report1.dat")</pre>

ExportUniformPointsToFile

Exports uniform points from a data table or plot report that includes the Export Uniform Points to File option enabled to text format, comma delimited, tab delimited, or .dat type output files.

File name:

erEPhi, Phi=0 plane For Phase Center Calc.csv

Save

Save as type:

Comma delimited data files(*.csv)

Cancel

Options

☒ Use Separate Columns for Curves

☒ Export Uniform Points

☒ Export with Full Sweep Range

Start:

-180

deg

Stop: 180

deg

Step: 36

deg

UI Access	Right-click on report name in the project tree and select Export Data .		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report to be exported.
	<FileName>	String	Full path of the exported image file name; with extension of .txt - Post processor format file .csv - Comma-delimited data file .tab - Tab-separated file .dat - Ansys plot data file
	<SweepRange>	String	Start, stop, and step range with units, for sweep.
	<UnitSpec>	String	For example, "kV, Mhz, yd"
	<UseTraceNumberFormat>	Boolean	"True", "False"

Return Value	None.

Python Syntax	<code>ExportUniformPointsToFile(<ReportName>, <FileName>, <SweepRange>)</code>
Python Example	<code>oModule.ExportUniformPointsToFile("S Parameter Table 2", "D:/MyFiles/cftt.csv", "4GHz", "5GHz", "1GHz", False, " kV, MHz, yd ", False)</code>

GetAllCategories

Get all available category names (not including variable and output-variables) in a solution for a report type and display type, returned as an array of text strings.

UI Access	NA		
Parameters	Name	Type	Description
	<ReportType>	String	Report type name.
	<DisplayType>	String	Name of display type.
	<SolutionName>	String	Name of solution.
	<SimValueCtxt>	Array	A context name, or array of strings that encode the contexts.
Return Value	Array of text strings		

Python Syntax	<code>GetAllCategories(<ReportType>, <DisplayType>, <SolutionName>, <SimValueCtxt>)</code>
Python Example	<code>oModule.GetAllCategories("Far Fields", "Rectangular Plot", "Setup1 : LastAdaptive", "Infinite Sphere1")</code>

GetAllQuantities

Gets all available quantity names in category, returned as an array of text strings.

UI Access	NA		
Parameters	Name	Type	Description
	<ReportType>	String	Report type name.
	<DisplayType>	String	Display type name.
	<SolutionName>	String	Name of solution.
	<SimValueCtxt>	Array	A context name, or array of string that encoded the contexts(l).
	<CategoryName>	String	A category name as input parameter. a category name returned in GetAllCategories() or "Variables", or "Output Variables"
Return Value	Array of text strings		

Python Syntax	GetAllQuantities(<ReportType>,<DisplayType>, <SolutionName>, <SimValueCtxt>, <CategoryName>)
Python Example	<pre>oModule.GetAllQuantities("Far Fields", "Rectangular Plot", "Setup1 : LastAdaptive", "Infinite Sphere1", "Gain")</pre>

GetAllReportNames

Gets the names of existing reports in a design

UI Access	N/A
Parameters	None.
Return Value	Array of report names

Python Syntax	GetAllReportNames()
Python Example	<code>oModule.GetAllReportNames()</code>

GetAvailableDisplayTypes

Retrieves all supported display types in report type as an array of text strings.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportType>	String	Report type name.
Return Value	Array of text strings		

Python Syntax	GetAvailableDisplayTypes(<ReportType>)
Python Example	<code>oModule.GetAvailableDisplayTypes("Far Fields")</code>

GetAvailableReportTypes

Retrieves all available report types in the current Design as an array of text string.

UI Access	N/A
Parameters	None.
Return Value	Array of text strings

Python Syntax	GetAvailableReportTypes()
Python Example	<code>oModule.GetAvailableReportTypes()</code>

GetAvailableSolutions

Gets all available solutions in report type as an array of text strings.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportType>	String	Report type name.
Return Value	Array of text strings		

Python Syntax	<code>GetAvailableSolutions(<ReportType>)</code>
Python Example	<code>oModule.GetAvailableSolutions("Far Fields")</code>

GetChildNames [Report Setup]

Gets a list of report names.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing all report names.

Python Syntax	<code>GetChildNames()</code>
Python Example	<code>oModule.GetChildNames()</code>

GetChildObject [Report Setup]

Gets a report object or report child object; the module's first level of child object is report. Report has trace, axis, header, Legend, and more children. Trace has curve as child etc. Those child objects can be accessed by calling all levels of parent object's GetChildObject(path) function.

UI Access	NA		
Parameters	Name	Type	Description
	<ObjectPath>	String	Report Name or an object path beginning with a report name.

Return Value	A ReportSetup(Results) Module Child Object, [ReportSetup(Results) Module Child Objects]

Python Syntax	GetChildObject(<ObjectPath>)
Python Example	<pre>oRpt = oRptModule.GetChildObject("S Parameter Plot 1") oTrace = oRptModule.GetChildObject("S Parameter Plot 1/dB(S(Port1,Port1))") oAxisX = oRptModule.GetChildObject("S Parameter Plot 1/AxisX")</pre>

GetChildTypes [ReportSetup]

Gets child types of queried Report module object.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing child object types.

Python Syntax	GetChildTypes ()
Python Example	<pre>oModule.GetChildTypes()</pre>

GetCurvePropServerName

Gets the PropServer (the owner of the properties, or the list containing them) name of a curve.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of specified report.
	<TraceName>	String	Name of specified trace.
Return Value	Array of string containing the PropServer name.		

Python Syntax	GetCurvePropServerName(<ReportName>, <TraceName>)
Python Example	<code>oModule.GetCurvePropServerName("Plot 1", "Phase")</code>

GetDisplayType

Gets the display type of a specified report.

UI Access	NA		
Parameters	Name	Type	Description
	<ReportName>	String	Report name
Return Value	String containing display type.		

Python Syntax	GetDisplayType(<ReportName>)
Python Example	<code>oModule.GetDisplayType("Design Plot 1")</code>

GetDynLinkIntrinsicVariables

Gets variable names from a trace included in dynamic link outputs.

UI Access	N/A		
Parameters	Name	Type	Description
	<TraceName>	String	Trace name with its report name.
Return Value	Array of variable names		

Python Syntax	GetDynLinkIntrinsicVariables(<TraceName>)
Python Example	<code>oModule.GetDynLinkIntrinsicVariables("Plot 1:Trace")</code>

GetDynLinkQtyValueState

Gets the state of the quantity values from a source dynamic linked trace.

UI Access	N/A		
Parameters	Name	Type	Description

	<TraceName>	String	Name of specified source trace.
	<QtyName>	String	Name of specified quantity value.
Return Value	Array of strings containing states.		

Python Syntax	GetDynLinkQtyValueState(<TraceName>, <QtyName>)		
Python Example	oModule.GetDynLinkQtyValueState("Plot 1:Trace1", "")		

GetDynLinkTraces

Gets the names of the dynamic linked traces.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of the source solution. If empty, refer to current solution.
Return Value	Array of strings containing trace names.		

Python Syntax	GetDynLinkTraces(<SoluName>)		
Python Example	oModule.GetDynLinkTraces("")		

GetDynLinkVariableValues

Gets the values of a variable from a dynamic linked trace.

UI Access	N/A		
Parameters	Name	Type	Description
	<TraceName>	String	Name of specified dynamic linked trace, with its report name.
	<VarName>	String	Name of specified variable.
Return Value	Array of strings containing variable values.		

Python Syntax	GetDynLinkVariableValues(<TraceName>, <VarName>)
Python Example	<code>oModule.GetDynLinkVariableValues("Plot 1:Trace", "Var1")</code>

GetName

Returns the design name of the active design, in that order separated by a semicolon.

UI Access	N/A
Parameters	None.
Return Value	String indicating the name of the active design.

Python Syntax	GetName()
Python Example	<code>design_name = oDesign.GetName()</code>

GetObjPath [Design]

Obtains the path to the design.

UI Access	N/A
Parameters	None.
Return Value	String containing the path to the design.

Python Syntax	GetObjPath()
Python Example	<code>oDesign.GetObjPath()</code>

GetPropertyValue

Returns the value of a single property belonging to a specific *<PropServer>* and *<PropTab>*. This function is available with the Project, Design or Editor objects, including definition editors.

Tip: Use the script recording feature and edit a property, and then view the resulting script to see the format for that property.

UI Access	N/A		
Parameters	Name	Type	Description
	<i><PropTab></i>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults")

			• LocalVariableTab ("Variables" or "Local Variables") • ProjectVariableTab ("Project variables") • ConstantsTab ("Constants") • BaseElementTab ("Symbol" or "Footprint") • ComponentTab ("General") • Component("Component") • CustomTab ("Intrinsic Variables") • Quantities ("Quantities") • Signals ("Signals")
	<PropServer>	String	An object identifier, generally returned from another script method, such as <code>CompInst@R;2;3</code>
	<PropName>	String	Name of the property.
Return Value	String value of the property.		

Python Syntax	<code>GetPropertyValue (<PropTab>, <PropServer>, <PropName>)</code>
Python Example	<pre>selectionArray = oEditor.GetSelections() for k in selectionArray: val = oEditor.GetPropertyValue("PassedParameterTab", k, "R") ...</pre>

GetPropNames [Reporter]

Report setup module does not have its own property, this function always returns empty array.

UI Access	N/A
Parameters	None.
Return Value	Empty array.

Python Syntax	GetPropNames()
Python Example	<code>oModule.GetPropNames()</code>

GetPropValue [Report Setup]

Gets the property value for a Report, or reports' child object.

UI Access	N/A		
Parameters	Name	Type	Description
	<PropPath>	String	A child object's property path. See property path discussion here .
Return Value	String containing the property value.		

Python Syntax	GetPropValue(<PropPath>)
Python Example	<code>oModule.GetPropValue("S Parameter Plot 1/Display Type")</code>

GetQtyExpressionsForSourceTrace

Gets the quantity expressions from a specified source trace.

UI Access	N/A		
Parameters	Name	Type	Description
	<SourceTraceName>	String	Name of specified source trace.
Return Value	Array of strings containing quantity expressions.		

Python Syntax	GetQtyExpressionsForSourceTrace(<SourceTraceName>)
Python Example	<code>oModule.GetQtyExpressionsForSourceTrace("Plot 1:Trace1")</code>

GetReportTraceNames

Gets the names of existing trace names in a plot.

UI Access	N/A		
Parameters	Name	Type	Description
	<PlotName>	String	Name of specified plot.
Return Value	Array of strings containing trace names.		

Python Syntax	<code>GetReportTraceNames(<PlotName>)</code>
Python Example	<code>oModule.GetReportTraceNames("SParameter Plot 1")</code>

GetReportSummaryForRegressionTesting

Gets report summary from a dumped report file.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of a specified dumped report.
Return Value	String containing report summary.		

Python Syntax	<code>GetReportSummaryForRegressionTesting(<ReportName>)</code>
Python Example	<code>oModule.GetReportSummaryForRegressionTesting("C:/report.rdat")</code>

GetSolutionContexts

Gets all available solution context names in a solution as an array of text strings.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportType>	String	Report type name.
	<DisplayType>	String	Display type name.
	<SolutionName>	String	Name of solution.

Return Value	Array of text strings

Python Syntax	<code>GetSolutionContexts(<ReportType>, <DisplayType>, <SolutionName>)</code>
Python Example	<pre>oModule.GetSolutionContexts("Far Fields", "Rectangular Plot", "Setup1:LastAdaptive")</pre>

GetSolutionDataPerVariation

Obtains solution data for a given report type and solution. You must have already run a simulation.

UI Access	N/A		
Parameters	Name	Type	Description
	<reportTypeArg>	String	Report type name as input parameter.
	<solutionNameArg>	String	Solution name as input parameter.
	<simValueCtxtArg>	Structured Array	Same as ContextArray values created in the relevant CreateReport script.
	<familiesArg>	Array of Strings	Same as FamiliesArray values created in the relevant CreateReport script.
	<expressionArg>	String or Array of Strings	Text string or array of text strings; valid expression, may validate it as the data-table Y-component.
Return Value	ARRAY of ISolutionDataResultComInterface objects, containing: • GetSweepNames() • GetSweepUnits()		

	• GetSweepValues() • IsPerQuantityPrimarySweep() • GetPerQuantityPrimarySweepValues() • IsDataComplex() • GetDataUnits() • GetRealDataValues() • GetImagDataValues() • ReleaseData() • GetDesignVariableNames() • GetDesignVariableUnits() • GetDesignVariableValue() • GetDesignVariationKey()

Note:

- This command is *not* recordable from the UI, but its parameters are similar to CreateReport, so you may record a CreateReport script to get the parameter values.
- For the returned ISolutionDataResultComInterface object, some of its functions have an optional boolean parameter: SValue. SValue defaults to True. When the pass in value is True, return data values will be in Standard International values; when False, return data values will be in the current units.

Example: Freq Sweep with [1GHz, 2GHz,3GHz], GetSweepUnits("Freq") return "GHz"; GetSweepValues("Freq", True) return [1000000,2000000,3000000]; GetSweepValues("Freq", False) return [1,2,3].

Python Syntax	GetSolutionDataPerVariation(reportTypeArg, solutionNameArg, simValueCtxtArg, familiesArg, expressionArg)
Python Example	<code>oModule = oDesign.GetModule("ReportSetup")</code>

	<pre>arr = oModule.GetSolutionDataPerVariation('Modal Solution Data', 'Setup1 : Sweep', ['Domain:=' , 'Sweep'], ['Freq:=' , ['All']], 'offset:=' , ['All']], ['S (Port1,Port1) ' , 'dB(S(Port1,Port3))'])</pre>

GetDataUnits

Returns text string containing units.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<expressionString>	String	Can be returned from <code>GetDataExpressions()</code>
Return Value	Text string of units; empty if no units		

Python Syntax	<code>GetDataUnits(<expressionString>)</code>
Python Example	<code>oModule.GetDataUnits(expressions)</code>

GetDesignVariableNames

Returns array of strings containing design variable names.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	NA
Parameters	NA
Return Value	Array of strings

Python Syntax	GetDesignVariableNames()
Python Example	<pre>names = oModule.GetDesignVariableNames()</pre>

GetDesignVariableUnits

Returns array of strings containing design variable units.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<varName>	String	Can be returned from GetDesignVariableNames()
Return Value	Text string of units; empty if no units.		

Python Syntax	GetDesignVariableUnits(<varName>)		
Python Example	<pre>units = oModule.GetDesignVariableUnits('Variable Name')</pre>		

GetDesignVariableValue

Returns a design variable's value.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<varName>	String	Can be returned from GetDesignVariableNames()
	<siValue>	Boolean	True to return SI-value; False to return by GetDesignVariableUnits()
Return Value	Double value		

Python Syntax	GetDesignVariableValue(<varName>, <siValue>)
Python Example	<pre>value = oModule.GetDesignVariableValue('varName',1)</pre>

GetDesignVariationKey

Returns a design's Variation Key.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A
Parameters	N/A
Return Value	String containing variation key.

Python Syntax	GetDesignVariationKey()
Python Example	<pre>oModule.GetDesignVariationKey()</pre>

GetImagDataValues

Returns array of imaginary data values.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<expressionString>	String	Can be returned from <code>GetDataExpressions()</code>
	<siValue>	Boolean	True to return SI-value; False to return with units returned in GetSweepUnits() .
Return Value	Array of doubles		

Python Syntax	<code>GetImagDataValues(<expressionString>,<siValue>)</code>
Python Example	<code>imaginaryvalues = oModule.GetImagDataValues('expression',1)</code>

GetPerQuantityPrimarySweepValues

Returns per quantity primary sweep values.

Important:

This is a member function of `ISolutionDataResultComInterface` object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<expressionString>	String	Can be returned from <code>GetDataExpressions()</code>
	<siValue>	Boolean	True to return SI-value; False to return by GetSweepUnits() .
Return Value	Array of doubles if IsPerQuantityPrimarySweep() returned True; error if returned False		

Python Syntax	<code>GetPerQuantitySweepValues(<expressionString>, <siValue>)</code>
Python Example	<pre>sweepvalues = oModule.GetPerQuantitySweepValues('0.111,0.201,0.345,0.231', 1)</pre>

GetRealDataValues

Returns array of real data values.

Important:

This is a member function of `ISolutionDataResultComInterface` object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<expressionString>	String	Can be returned from <code>GetDataExpressions()</code>
	<siValue>	Boolean	True to return SI-value; False to return with units returned in GetSweepUnits() .
Return Value	Array of doubles		

Python Syntax	<code>GetRealDataValues(<expressionString>,<siValue>)</code>
Python Example	<code>realvalues = oModule.GetRealDataValues('expression',1)</code>

GetSweepNames

Returns array of text strings containing primary sweep name(s).

Important:

This is a member function of `ISolutionDataResultComInterface` object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A
Parameters	N/A
Return Value	Array of text strings

Python Syntax	GetSweepNames()
Python Example	<code>sweepnames = arr[0].GetSweepNames()</code>

GetSweepUnits

Returns text string containing units.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<sweepName>	String	Primary sweep name
Return Value	Text string containing units		

Python Syntax	GetSweepUnits(<sweepName>)
Python Example	<code>sweepunits = oModule.GetSweepUnits('Sweep 1')</code>

GetSweepValues

Returns sweep values.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<sweepName>	String	Primary sweep name
	<siValue>	Boolean	True to return SI-value; False to return by GetSweepUnits() .
Return Value	Array of doubles		

Python Syntax	GetSweepValues(<sweepName>, <siValue>)
Python Example	sweepvalues = oModule.GetSweepValues('Sweep 1', True)

IsDataComplex

Returns whether an expression is complex.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	NA		
Parameters	Name	Type	Description
	<expressionString>	String	Can be returned from <code>GetDataExpressions()</code> .
Return Value	Boolean (True if expression is Complex data; False if not)		

Python Syntax	IsDataComplex(<expressionString>)		
Python Example	<code>oModule.IsDataComplex('.001, .234, .455, .434')</code>		

IsPerQuantityPrimarySweep

Returns whether data expressions have different primary sweep values.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A		

Parameters	N/A
Return Value	Boolean (True if data expressions have different primary sweep values)

Python Syntax	IsPerQuantityPrimarySweep()
Python Example	<pre>var = oModule.IsPerQuantityPrimarySweep()</pre>

Release Data

Releases all cached data. After this function is called, all subsequent function calls to the object will fail.

Important:

This is a member function of ISolutionDataResultComInterface object, which is the element of the returned array from function [GetSolutionDataPerVariation](#).

UI Access	N/A
Parameters	N/A
Return Value	N/A

Python Syntax	ReleaseData()
Python Example	<pre>oModule.ReleaseData()</pre>

GroupPlotCurvesByGroupingStrategy

Groups curves in a Stacked Plot automatically based on a curve grouping strategy.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<GroupStrategy>	String	Strategy for grouping, "Single", "By Trace" or "By Units".
Return Value	None.		

Python Syntax	GroupPlotCurvesByGroupingStrategy(<ReportName>, <GroupStrategy>)
Python Example	<code>oModule.GroupPlotCurvesByGroupingStrategy("Transient Plot 1", "By Trace")</code>

ImportIntoReport

Imports .tab, .csv, and .dat format files into a report.

UI Access	Right-click on report name in the Project tree and select Import....		
Parameters	Name	Type	Description
	<ReportName>	String	Name of the Report
	<FileName>	String	Path and File Name

			.csv	Comma-delimited data file
			.tab	Tab-separated file
			.dat	Ansys plot data file
Return Value	None			

Python Syntax	ImportIntoReport (<ReportName>, <FileName>)
Python Example	<code>oDesign.ImportIntoReport ("Plot1", "c:\report1.dat")</code>

ImportReportDataIntoReport

Imports report data from a file into a specified report.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of specified report.
	<FileName>	String	Name of specified data file. File extension "rdat" is expected.
Return Value	None.		

Python Syntax	ImportReportDataIntoReport(<ReportName>, <FileName>)

Python Example	<code>oModule.ImportReportDataIntoReport("Plot 1", "C:/Plot1data.rdat")</code>

MovePlotCurvesToGroup

In a Stacked Plot move curve(s) from its stack(s) to an existing stack. Here term 'group' is synonymous to 'stack' in the context of cartesian stacked plot.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<CurveArray>	Array	Array of curve names to move.
	<StackName>	String	Name of stack to move to.
Return Value	None.		

Python Syntax	<code>MovePlotCurvesToGroup(<ReportName>, <CurveArray>, <StackName>)</code>
Python Example	<code>oModule.MovePlotCurvesToGroup("XY Stacked Plot 1", ["R2.V : TR", "R2.I : TR"], "Stack 2")</code>

MovePlotCurvesToNewGroup

Move curve(s) from its stack(s) to a new stack. Here term 'group' is synonymous to 'stack' in the context of Cartesian stacked plot.

UI Access	N/A

Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<CurveArray>	Array	Array of curve names to move.
Return Value	None.		

Python Syntax	MovePlotCurvesToNewGroup (<ReportName>, <CurveArray>)
Python Example	<pre>oModule.MovePlotCurvesToNewGroup("XY Stacked Plot 1", ["R2.V : TR", "R2.I : TR"])</pre>

OpenWindowForAllReports

Opens windows for all reports belong to current design.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	OpenWindowForAllReports()
Python Example	<pre>oModule.OpenWindowForAllReports()</pre>

OpenWindowForReports

Opens windows for specified reports.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportNames>	Array	Array of strings containing report names.
Return Value	None.		

Python Syntax	OpenWindowForReports(<ReportNames>)
Python Example	<code>oModule.OpenWindowForReports(["Report1", "Report2"])</code>

PastePlotSettings

Paste plot settings to a specified report.

UI Access	Right-click a report, select Paste		
Parameters	Name	Type	Description
	<ReportName>	String	Name of specified report.
	<PropTypeToApply>	String	Property type to paste. "Graphical", "Data", or "All".
Return Value	None.		

Python Syntax	PastePlotSettings(<ReportName>, <PropTypeToApply>)
Python Example	<code>oModule.PastePlotSettings("Plot 1", "Graphical")</code>

PasteReports

Paste copied reports to results in the current project.

UI Access	Edit > Paste
Parameters	None.
Return Value	None.

Python Syntax	PasteReports ()
Python Example	<code>oModule.PasteReports ()</code>

PasteReportsWithLegacyNames

Pastes copied reports to results in the current project with legacy name definitions.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	PasteReportsWithLegacyNames ()
Python Example	<code>oModule.PasteReportsWithLegacyNames ()</code>

PasteTraces

Pastes copied traces to a named plot.

UI Access	Paste		
Parameters	Name	Type	Description
	<ReportName>	String	Name of plot
Return Value	None		

Python Syntax	PasteTraces (<ReportName>)
Python Example	<code>oModule.PasteTraces ("XY Plot1")</code>

PasteTracesWithLegacyNames

Pastes copied traces to a named plot using legacy name definitions.

UI Access	N/A

Parameters	Name	Type	Description
	<ReportName>	String	Name of plot
Return Value	None		

Python Syntax	PasteTracesWithLegacyNames (<ReportName>)
Python Example	<code>oModule.PasteTracesWithLegacyNames ("XY Plot1")</code>

RenameReport

Renames an existing report.

UI Access	Select a report on the Project tree, right-click and select Rename		
Parameters	Name	Type	Description
	<OldReportName>	String	Old Report Name
	<NewReportName>	String	New Report Name
Return Value	None.		

Python Syntax	RenameReport (<OldReportName>, <NewReportName>)
Python Example	<code>oModule.RenameReport ("XY Plot1", "Reflection")</code>

RenameTrace

To rename a trace in a plot

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report.
	<TraceName>	String	Name of Trace
	<NewName>	String	New trace name.
Return Value	None.		

Python Syntax	RenameTrace(<ReportName>, <TraceName>, <NewName>)
Python Example	<pre>oModule.RenameTrace ("XY Plot1", "dB(S(WavePort1,WavePort1))1", "Port1dbS")</pre>

ResetPlotSettings

Resets plot settings to defaults.

UI Access	Right-click on a plot, select Edit > Reset Plot Settings		
Parameters	Name	Type	Description
	<PlotName>	String	Name of specified plot.
Return Value	None.		

Python Syntax	<code>ResetPlotSettings(<PlotName>)</code>
Python Example	<code>oModule.ResetPlotSettings("Differential S-parameters")</code>

SavePlotSettingsAsDefault

Saves report plot settings as default.

UI Access	Report Templates > Save Settings as Default		
Parameters	Name	Type	Description
	<PlotName>	String	Name of plot to use for plot defaults.
Return Value	None.		

Python Syntax	<code>SavePlotSettingsAsDefault("<PlotName>")</code>
Python Example	<code>oModule.SavePlotSettingsAsDefault ("XY Plot1")</code>

SetLinkOutputTraces

Specifies dynamic link output traces from the current design.

UI Access	Right-click the Results , select Link Output...

Parameters	Name	Type	Description
	<TraceArray>	Array	Array of traces to set. Array("<ReportName>:=", <array of trace names>, "<ReportName>:=", <array of trace names>,...)
Return Value	None.		

Python Syntax	SetLinkOutputTraces(<TraceArray>)
Python Example	<pre>oModule.SetLinkOutputTraces (["Plot 1:=", ["Trace1"], "Plot 2:=", ["Trace1"]])</pre>

SetPropValue [Report Setup]

Sets the property value for report module child object.

UI Access	Select Edit Properties on Report objects.		
Parameters	Name	Type	Description
	<PropPath>	String	A child object's property path. See property path discussion here .
	<NewValue>	String, Number, or Boolean	New value data type is depending on the property type,
Return Value	True if the property is found and the new value is valid. Otherwise return False.		

Python Syntax	<code>SetPropValue(<PropPath>, <NewValue>)</code>
Python Example	<pre>oRptModule.SetPropValue("S Parameter Plot 1/Display Type", "DataTable") oRptModule.SetPropValue("S Parameter Plot 1/db(S(port1,port2)/Primary sweep", "Freq")</pre>

UnGroupPlotCurvesInGroup

From a Stacked Plot, ungroups curves in a stack.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><ReportName></code>	String	Name of report.
	<code><GroupName></code>	String	Stack group name.
Return Value	None.		

Python Syntax	<code>UnGroupPlotCurvesInGroup(<ReportName>, <GroupName>)</code>
Python Example	<pre>oModule.UngroupPlotCurvesInGroup("S Parameter Plot 3", "Stack 1")</pre>

UpdateAllReports

Updates all reports in the **Results** branch in the project tree.

UI Access	Right-click on Results in the project tree, select Update All Reports
Parameters	None
Return Value	None

Python Syntax	UpdateAllReports()
Python Example	<code>oModule.UpdateAllReports()</code>

UpdateReports

Updates specified reports.

UI Access	N/A		
Parameters	Name	Type	Description
	<ReportNames>	Array	Array of strings containing report names.
Return Value	None.		

Python Syntax	UpdateReports(<ReportNames>)
Python Example	<code>oModule.UpdateReports(["XY Plot 1", "XY Plot 4"])</code>

UpdateTraces

Update the traces in a report for which traces are not automatically updated by the Report Traces dialog box, Update Report, Real Time selection.

UI Access	In Report dialog, click Apply Traces button		
Parameters	Name	Type	Description
	<ReportName>	String	Name of Report.
	<TraceNames>	Array	Array of strings containing trace names.
	<SolutionName>	String	Name of the solution.
	<ContextArray>	Array	Context for which the expression is being evaluated. This can be an empty string if there is no context. <code>Array("Domain:=", <DomainType>)</code> <code><DomainType> ex. "Sweep" or "Time"</code> <code>Array("Context:=", <GeometryType>)</code> <code><GeometryType> ex. "Infinite Spheren", "Spheren", "Polylinen"</code>
	<FamiliesArray>	Array	Contains sweep definitions for the report. <code>Array("<VariableName>:= ", <ValueArray>)</code> <code><ValueArray></code> <code>Array("All") or Array("Value1", "Value2", ... "Valuen")</code> examples of <VariableName> "Freq", "Theta", "Distance"
	<ReportDataArray>	Array	This array contains the report quantity and X, Y, and (Z) axis definitions.

			Array("X Component:=", <VariableName>, "Y Component:=", <VariableName> <ReportQuantityArray>) <ReportQuantityArray> ex. Array("dB(S(Port1, Port1))")
	<ExtTraceInfo>	Array	Optional. Array defines extended trace information.
Return Value	None.		

Python Syntax	UpdateTraces(<ReportName>, <SolutionName>, <ContextArray>, <FamiliesArray>, <ReportDataArray>)
Python Example	<pre>oModule.UpdateTraces("XY Plot 1", ["NEG1.VAL"], "TR4", ["NAME:Context", "SimValueContext:=", [2,0,2,0,False,False, -1,1,0,1,1,"",0,0,"CG",False,"0","KP",False,"0","MH",False, "100","TE",False,"100s","TH",False,"40", "TS",False,"0ns","UF",False, "0","WT",False,"0","WW",False,"100"]], ["Spectrum:=", ["All"]],</pre>

	<pre>["X Component:=", "Spectrum", "Y Component:=", ["mag (NEG1.VAL) "]], [])</pre>

UpdateTracesContextAndSweeps

Edits sweeps and context of multiple traces without affecting their component expressions.

UI Access	Modify Report with multiple traces selected.		
Parameters	Name	Type	Description
	<ReportName>	String	Name of Report.
	<TraceNames>	Array	Array of strings containing trace names.
	<SolutionName>	String	Name of the solution as listed in the Modify Report dialog box. For example: "Setup1 : Last Adaptive"
	<ContextArray>	Array	Context for which the expression is being evaluated. This can be an empty string if there is no context. ex. "Sweep" or "Time"
	<PointSet>	Array	Point set for the selected traces, for example, X and Y values for the plot.
Return Value	None		
Python Syntax	UpdateTracesContextAndSweeps(<ReportName>, <TraceNames>, <SolutionName>, <ContextArray>,		

	<PointSet>)
Python Example	<pre>oModule.UpdateTracesContextAndSweeps_ ("Active S Parameter Quick Report", ["dB(ActiveS(Port1:1))", "dB(ActiveS(Port2:1))"], "Setup1 : Sweep1", [], ["Freq:=", ["9GHz", "9.05GHz", "9.1GHz", "9.15GHz", "9.2GHz", "9.25GHz", "9.3GHz", "9.35GHz", "9.4GHz", "9.45GHz", "9.5GHz", "9.55GHz", "9.6GHz", "9.65GHz", "9.7GHz", "9.9GHz", "9.95GHz", "10GHz"], "offset:=", ["All"]])</pre>

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left blank.

11 - Boundary and Excitation Module Script Commands

Boundary and excitation commands should be executed by the "BoundarySetup" module.

Set oModule = oDesign.GetModule("BoundarySetup")

Conventions Used in this Chapter

<BoundName>

Type: string.

Name of a boundary.

<AssignmentObjects>

Type: Array of strings.

An array of object names.

<AssignmentFaces>

Type: Array of integers.

An array of face IDs. The ID of a face can be determined through the user interface using the **3D Modeler> Measure> Area** command. The face ID is given in the **Measure Information** dialog box.

<LineEndPoint>

Array(<double>, <double>, <double>)

The topics for this section include:

[General Commands Recognized by the Boundary/Excitations Module](#)

[Script Commands for Creating and Modifying Boundaries](#)

[Script Commands for Creating and Modifying PMLs](#)

[Script Commands for Creating and Modifying Boundaries in 2D Extractor](#)

[Script Commands for Creating and Modifying Boundaries in Q3D Extractor](#)

General Commands Recognized by the Boundary/Excitations Module

[AddAssignmentToBoundary](#)

[AutoIdentifyNets](#)

[AutoIdentifyPorts](#)

[AutoIdentifyTerminals](#)

[ChangeImpedanceMult](#)

[ConvertNPortCircuitElementToPorts](#)

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[GetExcitationAssignment\(2DExtractor\)](#)

[GetExcitationsOfType](#)

[GetHybridRegions](#)

[GetHybridRegionsOfType](#)[GetNumBoundaries](#)[GetNumBoundariesOfType](#)[GetNumExcitations](#)[GetNumExcitations\(2DExtractor\)](#)[GetNumExcitationsOfType](#)[GetPortExcitationsCount](#)[ListNets](#)[ReassignBoundary](#)[RemoveAssignmentFromBoundary](#)[RenameBoundary](#)[ReprioritizeBoundaries](#)[SetDefaultBaseName](#)

AddAssignmentToBoundary

Adds a new geometry assignment to a boundary.

UI Access	N/A		
Parameters	Name	Type	Description
	<Assignment>	Array	Structured array. <code>Array("Name:<BoundName>", "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>)</code>

Return Value	None.

Python Syntax	AddAssignmentToBoundary(<Assignment>)
Python Example	<pre>oModule.AddAssignmentToBoundary((["NAME:PerfE1", "Faces:=", [12]])</pre>

AutoidentifyLatticePair

Automatically identifies coupled lattice pair within specified object.

UI Access	Boundaries > Assign > Coupled... > Auto Identify Lattice Pair...		
Parameters	Name	Type	Description
	<PlaneName>	String	Name of relative plane.
	<ObjectName>	String	Name of specified object.
Return Value	None.		

Python Syntax	AutoidentifyLatticePair (<PlaneName>, <ObjectName>)
Python Example	<pre>oModule.AutoIdentifyLatticePair("Global:XY", "Cylinder1")</pre>

AutoidentifyNets

Use: Automatically identifies nets.

Command: Q3D Extractor>Nets>Auto Identify Nets

Syntax: AutoidentifyNets

Return Value: None

Command: oModule.AutoidentifyNets

AutoidentifyPorts

Automatically identifies ports in a terminal design.

UI Access	N/A		
Parameters	Name	Type	Description
	<FaceIDArray>	Array	Array of face IDs. <pre>Array("NAME:Faces", <FaceID>, <FaceID>, ...)</pre>
	<IsWavePort>	Boolean	• True - waveport • False - lumped port.
	<ReferenceConductorsArray>	Array	Structured array. <pre>Array("NAME:ReferenceConductors", <ConductorName>, <ConductorName>, ...)</pre>
	<BaseName-forCreatedPorts>	String	Optional. Base name to use for created ports
	<UseConductorNames>	Boolean	Optional. • True - use conductor names.

			• False - use port object name as base name
Return Value	None.		

Python Syntax	AutoIdentifyPorts (<FaceIDArray>, <IsWavePort>, <ReferenceConductorsArray>)
Python Example	<pre>oModule.AutoIdentifyPorts(["NAME:Faces", 52], True, ["NAME:ReferenceConductors", "Conductor1"], True)</pre>

AutoIdentifyTerminals

Automatically identifies the terminals within the given ports.

UI Access	N/A		
Parameters	Name	Type	Description
	<ConductorsArray>	Array	Structured array. Array("NAME:ReferenceConductors", <ConductorName>, <ConductorName>, ...)
	<PortNames>	String	Names of given ports.
	<UseConductorNames>	Boolean	• True - use conductor names.

			• False - use port object name as base name.
Return Value	None.		

Python Syntax	AutoIdentifyTerminals (<ConductorsArray>, <PortNames>, <UseConductorNames>)
Python Example	<pre>oModule.AutoIdentifyTerminals(["NAME:ReferenceConductors", "Conductor1"], "WavePort1", True)</pre>

ChangeImpedanceMult

Modifies the port impedance multiplier.

UI Access	HFSS > Excitations > Edit Port Impedance Multiplier.		
Parameters	Name	Type	Description
	<MultVal>	Double	New value for the impedance multiplier.
Return Value	None.		

Python Syntax	ChangeImpedanceMult (<MultVal>)
Python Example	oModule.ChangeImpedanceMult(0.5)

ConvertNportCircuitElementsToPorts

Converts one or more HFSS Circuit Element to one or more ports.

UI Access	Right-click on element and select Convert to HFSS Ports .		
Parameters	Name	Type	Description
	<NportName>	Array	Array of Nport names.
Return Value	None.		

Python Syntax	ConvertNportCircuitElementToPorts(<NportName>)
Python Example	oModule.ConvertNportCircuitElementToPorts(["Nport2"])

CreateNportCircuitElements

Creates an HFSS Circuit Element from one or more ports.

UI Access	Right-click Circuit Elements > Create Single Port Model... or Circuit Elements > Create Multi-Terminal Model...		
Parameters	Name	Type	Description
	<NPortArray>	Array	Structured array. Array("NAME:<NPortName>", "Definition:=", <string>, <AssignmentArray>)

Return Value	None.

Python Syntax	CreateNportCircuitElement (<NPortArray>)
Python Example	<pre>oModule.CreateNportCircuitElement(["NAME:Nport1", "Definition:=", "Model", ["NAME:Assignments", ["NAME:Model", "Assign:=", "1"]]]) oModule.CreateNportCircuitElement(["NAME:Nport2", "Definition:=", "Model2", ["NAME:Assignments", ["NAME:P01__NET179__T1", "Assign:=", "2"], ["NAME:P02__NET178__T1", "Assign:=", "3"], ["NAME:P03__NET178__T1", "Assign:=", "4"],</pre>

	<pre>["NAME:P04__NET179__T1", "Assign:=", "5"],]])</pre>

DeleteAllBoundaries

Deletes all boundaries.

UI Access	[product] > Boundaries > Delete All
Parameters	None.
Return Value	None.

Python Syntax	DeleteAllBoundaries()
Python Example	oModule.DeleteAllBoundaries()

DeleteAllExcitations

Deletes all excitations.

UI Access	[product] > Excitations > Delete All

Parameters	None.
Return Value	None.

Python Syntax	DeleteAllExcitations()
Python Example	<code>oModule.DeleteAllExcitations()</code>

DeleteBoundaries

Deletes the specified boundaries and excitations.

UI Access	Delete command in the List dialog box. Click [product] > List to open the List dialog box.		
Parameters	Name	Type	Description
	<NameArray>	Array	Array of boundary condition names.
Return Value	None.		

Python Syntax	DeleteBoundaries(<NameArray>)
Python Example	<code>oModule.DeleteBoundaries(["PerfE1", "WavePort1"])</code>

EditNportCircuitElement

Edits an HFSS Circuit Element.

UI Access	N/A

Parameters	Name	Type	Description
	<NPortArray>	Array	Structured array. Array("NAME:<NPortName>", "Definition:=", <string>, <AssignmentArray>)
Return Value	None.		

Python Syntax	EditNportCircuitElement(<NPortArray>)
Python Example	<pre>oModule.EditNportCircuitElement(["NAME:Nport1", "Definition:=", "Model", ["NAME:Assignments", ["NAME:Model", "Assign:=", "1"]]])</pre>

GetBoundaries

Gets boundary names in the current design.

UI Access	N/A
Parameters	None.
Return Value	Array of boundary names.

Python Syntax	GetBoundaries()
Python Example	<code>oModule.GetBoundaries()</code>

GetBoundariesOfType

Gets boundary names of the given type.

UI Access	N/A		
Parameters	Name	Type	Description
	<BoundaryType>	String	Name of boundary type.
Return Value	Array of boundary names of the given type.		

Python Syntax	GetBoundariesOfType(<BoundaryType>)
Python Example	<code>oModule.GetBoundariesOfType("PerfectE")</code>

GetBoundaryAssignment

Gets a list of face IDs associated with the given boundary or excitation assignment.

UI Access	N/A		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the specified boundary or excitation.
Return Value	Array of face IDs or object IDs.		

Python Syntax	GetBoundaryAssignment(<BoundaryName>)
Python Example	<code>oModule.GetBoundaryAssignment("Rad1")</code>

GetDefaultBaseName

Gets the default base name for boundaries for a project.

UI Access	N/A		
Parameters	Name	Type	Description
	<BoundaryType>	String	Name of legal boundary type.
Return Value	String of boundary default base name.		

Python Syntax	GetDefaultBaseName(< <i>BoundaryType</i> >)
Python Example	<code>oModule.GetDefaultBaseName("Radiation")</code>

GetDiffPairs

Gets the names of differential pairs defined.

UI Access	N/A
Parameters	None.
Return Value	Array of differential pair names.

Python Syntax	GetDiffPairs()
Python Example	<code>oModule.GetDiffPairs()</code>

GetExcitations

Gets excitation port and terminal names for a model.

UI Access	N/A
Parameters	None.
Return Value	Array of excitation name paired with excitation type.

Python Syntax	GetExcitations()
Python Example	<code>oModule.GetExcitations()</code>

GetExcitationsOfType

Gets excitation names of the given type.

UI Access	N/A		
Parameters	Name	Type	Description
	<ExcitationType>	String	Name of excitation type.
Return Value	Array of excitation names of the given type.		

Python Syntax	GetExcitationsOfType(<ExcitationType>)
Python Example	<code>oModule.GetExcitationsOfType("Wave Port")</code>

GetHybridRegions

Gets hybrid region names for a project.

UI Access	N/A
Parameters	None.
Return Value	Array of hybrid region names.

Python Syntax	GetHybridRegions ()
Python Example	<code>oModule.GetHybridRegions ()</code>

GetHybridRegionsOfType

Gets hybrid region names of the given type.

UI Access	N/A		
Parameters	Name	Type	Description
	<HybridRegionType>	String	Name of legal hybrid region type.
Return Value	Array of hybrid region names of the given type.		

Python Syntax	GetHybridRegionsOfType(<HybridRegionType>)
Python Example	<code>oModule.GetHybridRegionsOfType ("FE-BI")</code>

GetNumBoundaries

Gets the number of boundaries in a design.

UI Access	N/A
Parameters	None.
Return Value	Integer number of boundaries.

Python Syntax	GetNumBoundaries()
Python Example	<code>oModule.GetNumBoundaries()</code>

GetNumBoundariesOfType

Gets the number of boundaries of the given type.

UI Access	N/A		
Parameters	Name	Type	Description
	< <i>BoundaryType</i> >	String	Specified boundary type.
Return Value	Integer number of boundaries.		

Python Syntax	GetNumBoundariesOfType(< <i>BoundaryType</i> >)
Python Example	<code>oModule.GetNumBoundariesOfType("PerfectE")</code>

GetNumExcitations

Gets the number of excitations in a design.

UI Access	N/A
Parameters	None.

Return Value	Integer number of excitations.

Python Syntax	<code>GetNumExcitations()</code>
Python Example	<code>oModule.GetNumExcitations()</code>

GetNumExcitationsOfType

Gets the number of excitations of the given type, including all defined modes and terminals of ports.

UI Access	N/A		
Parameters	Name	Type	Description
	<ExcitationType>	String	Specified type of excitation.
Return Value	Integer number of excitations.		

Python Syntax	<code>GetNumExcitationsOfType(<ExcitationType>)</code>
Python Example	<code>oModule.GetNumExcitationsOfType("Voltage")</code>

GetNumHybridRegions

Gets number of hybrid regions in a design.

UI Access	N/A
Parameters	None.

Return Value	Integer number of hybrid regions.

Python Syntax	<code>GetNumHybridRegions()</code>
Python Example	<code>oModule.GetNumHybridRegions()</code>

GetNumHybridRegionsOfType

Gets number of hybrid regions of the given type.

UI Access	placeholder		
Parameters	Name	Type	Description
	<i><HybridRegionType></i>	String	Name of legal hybrid region type.
Return Value	Integer number of hybrid regions.		

Python Syntax	<code>GetNumHybridRegionsOfType(<HybridRegionType>)</code>
Python Example	<code>oModule.GetNumHybridRegionsOfType("FE-BI")</code>

GetPortExcitationCounts

Gets all port names and corresponding number of modes/terminals for each port excitation.

UI Access	N/A
Parameters	None.
Return Value	Array of port names and corresponding mode/terminal counts.

Python Syntax	GetPortExcitationCounts()
Python Example	<code>oModule.GetPortExcitationCounts()</code>

ListNets

Returns a list of nets and their associated objects and sources.

UI Access	N/A		
Parameters	Name	Type	Description
	<rmName>	String	<i>Optional.</i> Name of Reduce Matrix operation. Use "Original" to specify the original matrix.
Return Value	If <rmName> is provided, returns a list of nets under the specified Reduce Matrix operation. If no <rmName> is provided, returns a list of all nets in the design.		

Python Syntax	ListNets(<rmName>)
Python Example	<code>oModule.ListNets('Original')</code>

ReassignBoundary

Specifies a new geometry assignment for a boundary.

UI Access	Right-click Boundaries > Reassign or Excitations > Reassign		
Parameters	Name	Type	Description
	<AssignmentArray>	Array	Structured array. Array ("Name:<BoundName>", "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>)
Return Value	None.		

Python Syntax	ReassignBoundary(<AssignmentArray>)
Python Example	<pre>oModule.ReassignBoundary(["NAME:PerfH12", "Faces:=", [17]])</pre>

RemoveAssignmentFromBoundary

Removes a geometry assignment from a boundary.

UI Access	Right-click on a boundary or an excitation, select Remove from Assignment .		
Parameters	Name	Type	Description
	<AssignmentArray>	Array	Structured array. Array("Name:<BoundName>", "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>)
Return Value	None.		

Python Syntax	RemoveAssignmentFromBoundary(<AssignmentArray>)
Python Example	<pre>oModule.RemoveAssignmentFromBoundary(["NAME:Rad1", "Faces:=", [11]]) </pre>

RenameBoundary

Renames a boundary or excitation.

UI Access	Right-click a boundary in the project tree, and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<OldName>	String	Name of the boundary to be renamed.

	<table><tr><td><NewName></td><td>String</td><td>New name for the boundary.</td></tr></table>			<NewName>	String	New name for the boundary.
<NewName>	String	New name for the boundary.				
Return Value	None.					

Python Syntax	RenameBoundary(<OldName>, <NewName>)
Python Example	oModule.RenameBoundary("Rad2", "Rad3")

ReprioritizeBoundaries

Specifies the order in which the boundaries and excitations are recognized by the solver. The first boundary in the list has the highest priority.

Note: this command is only valid if all defined boundaries and excitations appear in the list. All ports must be listed before any other boundary type.

UI Access	[product] > Boundaries > Reprioritize		
Parameters	Name	Type	Description
	<NewOrderArray>	Array	Structured array. Array("NAME:NewOrder", <BoundName>, <BoundName>, ...)
Return Value	None.		

Python Syntax	ReprioritizeBoundaries(<NewOrderArray>)
Python Example	<pre>oModule.ReprioritizeBoundaries(["NAME:NewOrder", "Imped1", "PerfE1", "PerfH1"])</pre>

SetDefaultBaseName

Sets the default base name for boundaries for a project.

UI Access	N/A		
Parameters	Name	Type	Description
	<BoundaryType>	String	Name of legal boundary type.
	<DefaultName>	String	Default name for boundaries of specified type.
Return Value	None.		

Python Syntax	SetDefaultBaseName(<BoundaryType>, <DefaultName>)
Python Example	oModule.SetDefaultBaseName("Radiation", "RadBnd")

Script Commands for Creating and Modifying Boundaries

Following are script commands for creating and modifying boundaries that are recognized by the BoundarySetup module. In the following commands, all named data can be included or excluded as desired and may appear in any order.

[AssignCircuitPort \[HFSS\]](#)

[AssignCurrent](#)

[AssignDielectricCavity](#)

[AssignFiniteCond](#)

[AssignFloquet](#)

[AssignGradientSurfaceRoughness](#)

[AssignHalfSpace](#)

[AssignHybridRegion](#)

[AssignImpedance](#)

[AssignIncidentWave](#)

[AssignInteriorNearFieldSource](#)

[AssignLayeredImp](#)

[AssignLinkedRegion](#)

[AssignLumpedPort](#)

[AssignLumpedRLC](#)

[AssignMagneticBias](#)

[AssignRFDischARGE DC Bias](#)

[AssignPrimary](#)

[AssignPerfectE](#)

[AssignPerfectH](#)

[AssignRadiation](#)

[AssignRadiation](#)

[AssignScreeningImpedance](#)

[AssignSymmetry](#)

[AssignTerminal](#)

[AssignVoltage](#)

[AssignWavePort](#)

[AutoCreatePECCapForWavePort](#)

[CircuitPortToLumpedPort](#)

[EditCircuitPort \[HFSS\]](#)

[EditCurrent](#)

[EditDiffPairs](#)

[EditFiniteCond](#)

[EditGradientSurfaceRoughness](#)

[EditHalfSpace](#)

[EditHybridRegion](#)

[EditImpedance](#)

[EditIncidentWave](#)

[EditInteriorNearFieldSource](#)

[EditLayeredImpedance](#)

[EditPrimary](#)

[EditPerfectE](#)

[EditPerfectH](#)

[EditLumpedPort](#)

[EditLumpedRLC](#)

[EditMagneticBias](#)

[EditNPortCircuitElement](#)

[EditRadiation](#)

[EditRFDischargeDCBias](#)

[EditSymmetry](#)

[EditTerminal](#)

[EditVoltage](#)

[EditWavePort](#)

[LumpedPortToCircuitPort](#)

[SetHybridRegionCoupledGroup](#)

[SetSBRSources](#)

[SetSBRSourcesBlockage](#)

[SetSBRWedgeSettings](#)

[SetTerminalReferenceImpedances](#)

[SwapCircuitPortAssignment](#)

AssignCircuitPort

Assigns a circuit port for a driven terminal or driven modal design in HFSS.

UI Access	HFSS > Excitations > Assign > Circuit Port...		
Parameters	Name	Type	Description
	<CircuitPortArray>	Array	Structured array. <pre>Array("NAME:<PortName>", "Edges:=", [n1, n2], "Impedance:=", "valueohm", "DoDeembed:=", <boolean> "RenormalizeAllTerminals:=", <boolean> "TerminalIDLit:=", Array())</pre>
Return Value	None.		

Python Syntax	AssignCircuitPort (<CircuitPortArray>)
Python Example	<pre>oModule.AssignCircuitPort(["NAME:1",</pre>

	<pre>"Edges:=" , [50,56], "Impedance:=" , "50ohm", "DoDeembed:=" , False, "RenormalizeAllTerminals:=", True, "TerminalIDList:=" , []])</pre>

AssignCurrent

Creates a current source.

UI Access	HFSS > Excitations > Assign > Current		
Parameters	Name	Type	Description
	<CurrentArray>	Array	Structured array. Array("NAME:<BoundName>", "Objects:=", <AssignmentObjects>, "Current:=", <value>, <DirectionArray>, "Faces:=", <AssignmentFaces>) "TerminalIDLit:=", Array())
	<DirectionArray>	Array	Structured array. Array("NAME:Direction",

			"Start:=", <LineEndPoint>, "End:=", <LineEndPoint>)
Return Value	None.		

Python Syntax	AssignCurrent (<CurrentArray>)
Python Example	<pre>oModule.AssignCurrent (["NAME:Current1", "Current:=", "1000mA", ["NAME:Direction", "Start:=", [-0.4, 0.4, -1.6], "End:=", [-0.4, 0.4, 0]], "Faces:=", [12]])</pre>

AssignCylindricalWave

Creates an incident Cylindrical wave

UI Access	HFSS > Excitations > Assign > Incident Wave > Cylindrical Wave.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:IncCWave1", "Objects:=" , <Array of objects>,

			<pre>"IsCartesian:=" , <boolean>, "EoX:=" , <string of integer value>, "EoY:=" , <string of integer value>, "EoZ:=" , <string of integer value>, "kX:=" , <string of integer value>, "kY:=" , <string of integer value>, "kZ:=" , <string of integer value>, "OriginX:=" , <string of integer value>, "OriginY:=" , <string of integer value>, "OriginZ:=" , <string of integer value>, "CylinderRadius:=" , <string of float value></pre>
Return Value	None.		

Python Syntax	AssignCylindricalWave (<Parameters>)		
Python Example	<pre>oModule.AssignCylindricalWave(["NAME:IncCWave1", "Objects:=" , ["Cylinder1"], "IsCartesian:=" , True, "EoX:=" , "1",</pre>		

	<pre> "EoY:=" , "0", "EoZ:=" , "0", "kX:=" , "0", "kY:=" , "0", "kZ:=" , "1", "OriginX:=" , "0mm", "OriginY:=" , "0mm", "OriginZ:=" , "0mm", "CylinderRadius:=" , "0.25in" l) </pre>

AssignDielectricCavity

Assigns a Hybrid Region as a Dielectric Cavity.

UI Access	HFSS > Hybrid > Assign Hybrid > Dielectric Cavity.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. Array("NAME:<cavity name>", "Objects:=", <array of objects>)
Return Value	None.		

Python Syntax	<code>AssignDielectricCavity(<Parameters>)</code>
Python Example	<pre>oModule.AssignDielectricCavity(["NAME:Cavity1", "Objects:=", ["Cylinder1"]])</pre>

AssignFEBI

Assigns a Hybrid Region as a FEBI.

UI Access	HFSS > Hybrid > Assign Hybrid > FE-BI....		
Parameters	Name	Type	Description
	<code><Parameters></code>	Array	Structured array. Array("NAME:<name of the FEBI Hybrid Region.>", "Objects:=", <array of names for the geometry assigned as FEBI Hybrid Region>)
Return Value	None.		

Python Syntax	<code>AssignFEBI(<Parameters>)</code>
Python Example	<pre>oModule.AssignFEBI(["NAME:FE-BI1", "Objects:=", ["RegularPolyhedron1"]])</pre>

AssignFiniteCond

Assigns a single finite conductivity boundary on selected edges.

UI Access	2D Extractor > Boundary > Assign > Finite Conductivity.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre>Array("NAME:<name of the boundary.>", "Edges:=", <array of edge ids>, "Roughness:=", "<string of double with units of length>", "UseCoating:=", <boolean>, "LayerThickness:=", "<string of double with units of length>", "UseMaterial:=", <boolean>, "Material:=", "<string material name for coating>", "Radius:=", <string of double with units of length>, "Ratio:=", <string of double>)</pre>
Return Value	None.		

Python Syntax	AssignFiniteCond(<Parameters>)
Python Example	Example for the Hammerstad-Jensen surface roughness model.

	<pre>oModule.AssignFiniteCond ["NAME:FiniteCond1", "Edges:=", [7,9], "Roughness:=", "2um", "UseCoating:=", True, "LayerThickness:=", "1.2um", "UseMaterial:=", True, "Material:=", "Copper"]</pre> Example for the Hurray surface roughness model <pre>oModule.AssignFiniteCond ["NAME:FiniteCond1", "Edges:=", [7], "UseCoating:=", False, "Radius:=", "0.5um", "Ratio:=", "2.9"]</pre>

AssignFloquet

Creates a Floquet port.

UI Access	HFSS > Excitations > Assign > Floquet.

Parameters	Name	Type	Description
	<i><FloquetPortArray></i>	Array	Structured array. <pre> Array("NAME:<BoundName>", "Faces:=", <array of face IDs>, "NumModes:=", <integer>, "RenormalizeAllTerminals:=", <boolean>, "DoDeembed:=", <boolean>, <ModesArray>, "ShowReporterFilter:=", <boolean>, "UseScanAngles:=", <boolean>, "Phi:=", "<numdeg>", "Theta:=", "<numdeg>", <LatticeAVector>, <LatticeBVector>, <ModesCalculator>, <ModesList>) </pre>
	<i><ModesArray></i>	Array	Structured array. <pre> Array("NAME:Modes", Array("NAME:<ModeName>", "ModeNum:=", <integer>, "UseIntLine:=", <boolean>), ...) </pre>
	<i><LatticeAVector></i>	Array	Structured array.

		<pre> Array("NAME:LatticeAVector", "Start:=", Array("<num><units>", "<num><units>", "<num><units>"), "End:=", Array("<num><units>", "<num><units>", "<num><units>")) </pre>
<LatticeBVector>	Array	Structured array. <pre> Array("NAME:LatticeBVector", "Start:=", Array("<num><units>", "<num><units>", "<num><units>"), "End:=", Array("<num><units>", "<num><units>", "<num><units>")) </pre>
<ModesCalculator>	Array	Structured array. <pre> Array("NAME:ModesCalculator", "Frequency:=", "<Value>GHz", "FrequencyChanged:=", <Boolean>, "PhiStart:=", "<num>deg", "PhiStop:=", "<num>deg", "PhiStep:=", "<num>deg", "ThetaStart:=", "<num>deg", "ThetaStop:=", "<num>deg", "ThetaStep:=", "<num>deg") </pre>
<ModesList>	Array	Structured array.

			<pre> Array("NAME:ModesList", Array("NAME:Mode", "ModeNumber:=", <ModeID>, "IndexM:=", <integer index>, "IndexN:=", <integer index>, "KC2:=", <integer value>, "PropagationState:=", "Propagating", "Attenuation:=", <integer value>, "PolarizationState:=", <TE or TM>, "AffectsRefinement:=", <boolean>), ...) </pre>
Return Value	None.		

Python Syntax	AssignFloquetPort (<FloquetPortArray>)
Python Example	<pre> oModule.AssignFloquetPort(["NAME:FloquetPort1", "Faces:=", [7], "NumModes:=", 2, "RenormalizeAllTerminals:=", True, "DoDeembed:=", False, ["NAME:Modes", </pre>

```
["NAME:Model",
"ModeNum:=", 1,
"UseIntLine:=", False],
["NAME:Mode2",
"ModeNum:=", 2,
"UseIntLine:=", False]],
"ShowReporterFilter:=", False,
"UseScanAngles:=", True, "Phi:=", "0deg", "Theta:=", "0deg",
["NAME:LatticeAVector",
"Start:=", ["0mm", "0mm", "0.8mm"],
"End:=", ["0mm", "0.6mm", "0.8mm"]],
["NAME:LatticeBVector",
"Start:=", ["0mm", "0mm", "0.8mm"],
"End:=", ["0.8mm", "0mm", "0.8mm"]],
["NAME:ModesCalculator",
"Frequency:=", "1GHz",
"FrequencyChanged:=", False,
"PhiStart:=", "0deg",
"PhiStop:=", "0deg",
"PhiStep:=", "0deg",
```

```
        "ThetaStart:=", "0deg",  
        "ThetaStop:=", "0deg",  
        "ThetaStep:=", "0deg"],  
["NAME:ModesList",  
    ["NAME:Mode",  
        "ModeNumber:=", 1,  
        "IndexM:=", 0,  
        "IndexN:=", 0,  
        "KC2:=", 0,  
        "PropagationState:=", "Propagating",  
        "Attenuation:=", 0,  
        "PolarizationState:=", "TE",  
        "AffectsRefinement:=", False],  
["NAME:Mode",  
    "ModeNumber:=", 2,  
    "IndexM:=", 0,  
    "IndexN:=", 0,  
    "KC2:=", 0,  
    "PropagationState:=", "Propagating",  
    "Attenuation:=", 0,  
    "PolarizationState:=", "TM",
```

	<pre>"AffectsRefinement:=", False]]])</pre>

AssignFresnel

Assigns a Fresnel boundary condition, allows specifying either a perfect absorber or to import a Fresnel table file that describes reflection and transmission coefficients.

UI Access	HFSS > Boundaries > Assign > Fresnel (SBR+)...		
Parameters	Name	Type	Description
	<ArgArray>	Array	Structured array. Array("NAME:<FresnelName>", "Faces:=", <array of face IDs>, "Fresnel Boundary Type:=", <PerfectAbsorber or ImportFromTableFile>, "RTTable Path:=", <string path to table file>)
Return Value	None.		

Python Syntax	AssignFresnel(<ArgArray>)
Python Example	<pre>oModule.AssignFresnel(["NAME:Fresnel2", "Faces:=", [8], "Fresnel Boundary Type:=", "ImportFromTableFile",</pre>

	<pre>"RTTable Path:=", "C:\\temp\\reflection-transmission-table.rttbl"]</pre>

AssignGaussianBeam

Assigns a Gaussian Beam type of incident wave excitation.

UI Access	HFSS > Excitations > Assign > Incident Wave > Gaussian Beam...		
Parameters	Name	Type	Description
	<IncidentWaveArray>	Array	Structured array. <pre>Array("NAME:<Name of incident wave>", "Faces:=", <array of face IDs>, "IsCartesian:=", <boolean>, "EoX:=", "<numeric value>", "EoY:=", "<numeric value>", "EoZ:=", "<numeric value>", "kX:=", "<numeric value>", "kY:=", "<numeric value>", "kZ:=", "<numeric value>", "PhiStart:=", <value>, "PhiStop:=", <value>, "PhiPoints:=", <int>, "ThetaStart:=", <value>,</pre>

			<pre> "ThetaStop:=", <value>, "ThetaPoints:=", <int>, "EoPhi:=", <value>, "EoTheta:=", <value>, "OriginX:=", "<numUnit>", "OriginY:=", "<numUnit>", "OriginZ:=", "<numUnit>", "BeamWidth:=", "<numUnit>") IsCartesian If true, provide the EoX, EoY, EoZ, kX, kY, kZ parameters. If false, provide the PhiStart, PhiStop, PhiPoints, ThetaStart, ThetaStop, ThetaPoints, EoPhi, EoTheta parameters. </pre>
Return Value	None.		

Python Syntax	AssignGaussianBeam(<IncidentWaveArray>)
Python Example	<pre> oModule.AssignGaussianBeam(["NAME:IncGBeam1", "Faces:=", , [9], "IsCartesian:=", , True, </pre>

```

"EoX:="                , "1",
"EoY:="                , "0",
"EoZ:="                , "0",
"kX:="                 , "0",
"kY:="                 , "0",
"kZ:="                 , "1",
"OriginX:="            , "0mm",
"OriginY:="            , "0mm",
"OriginZ:="            , "0mm",
"BeamWidth:="          , "10mm"
])
oModule.AssignGaussianBeam(
["NAME:IncGBeam2",
"Faces:="              , [9],
"IsCartesian:="        , False,
"PhiStart:="            , "0deg",
"PhiStop:="             , "0deg",
"PhiPoints:="           , 1,
"ThetaStart:="          , "0deg",
"ThetaStop:="           , "0deg",
"ThetaPoints:="         , 1,

```

	<pre>"EoPhi:=" , "1", "EoTheta:=" , "0", "OriginX:=" , "0mm", "OriginY:=" , "0mm", "OriginZ:=" , "0mm", "BeamWidth:=" , "10mm"])</pre>

AssignGradientSurfaceRoughness

Assigns a Gradient Surface Roughness boundary.

UI Access	HFSS > Boundaries > Assign > Gradient Surface Roughness...		
Parameters	Name	Type	Description
	<ArgArray>	Array	Structured array. Array(NAME:<Name of GradientSurfaceBoundary>"," ["NAME:<Name of GradientSurfaceBoundary>"," "Objects:=" , ["<geometryID>"], "RMS Roughness:=" , "<value><units>"," "Bulk Conductivity:=" , "<value>"," "Thickness:=" , ""<value><units>","

			"Max Frequency:=" , "<value><units>", "Surface Type:=" , "[Low Profile High Profile]"
Return Value	None.		

Python Syntax	AssignGradientSurfaceRoughness(<ArgArray>)
Python Example	<pre> oModule = oDesign.GetModule("BoundarySetup") oModule.AssignGradientSurfaceRoughness (["NAME:GradientImped1", "Objects:=" , ["Box1"], "RMS Roughness:=" , "1um", "Bulk Conductivity:=" , "58000000", "Thickness:=" , "15um", "Max Frequency:=" , "100GHz", "Surface Type:=" , "Low Profile"])</pre>

AssignHalfSpace

Assigns a Half Space boundary, dividing the background material at a specified Z axis point. You also assign a material, typically to the lower half.

UI Access	HFSS > Boundaries > Assign > Half Space...		
Parameters	Name	Type	Description
	<ArgArray>	Array	Structured array. Array("NAME:<Name of Half Space>", "ZLocation:=", "<intUnits>", "Material:=", "<string material name>")
Return Value	None.		

Python Syntax	AssignHalfSpace(<ArgArray>)
Python Example	<pre>oModule.AssignHalfSpace(["NAME:HalfSpace1", "ZLocation:=", "2mm", "Material:=", "water_sea"])</pre>

AssignHertzianDipoleWave

Assigns an incident Hertzian-Dipole wave as excitation.

UI Access	HFSS > Excitations > Assign > Incident Wave > Hertzian-Dipole Wave...		
Parameters	Name	Type	Description
	<ArgArray>	Array	Structured array. Array("NAME:<Name of incident wave>",

			<pre> "Faces:=", <array of face IDs>, "IsCartesian:=", <boolean>, "EoX:=" , "<numeric value>", "EoY:=" , "<numeric value>", "EoZ:=" , "<numeric value>", "kX:=" , "<numeric value>", "kY:=" , "<numeric value>", "kZ:=" , "<numeric value>", "OriginX:=" , "<numUnit>", "OriginY:=" , "<numUnit>", "OriginZ:=" , "<numUnit>", "SphereRadius:=" , "<numUnit>", "IsElectricDipole:=" , <boolean>) </pre>
Return Value	None.		

Python Syntax	AssignHertzianDipoleWave(<ArgArray>)
Python Example	<pre> oModule.AssignHertzianDipoleWave(["NAME:InchDWave2", "Faces:=" , [9], </pre>

	<pre>"IsCartesian:=" , True, "EoX:=" , "0", "EoY:=" , "0", "EoZ:=" , "1", "kX:=" , "0", "kY:=" , "0", "kZ:=" , "1", "OriginX:=" , "0mm", "OriginY:=" , "0mm", "OriginZ:=" , "0mm", "SphereRadius:=" , "10mm", "IsElectricDipole:=" , True])</pre>

AssignHybridRegion

Assigns a Hybrid Region to a conductor, one of IE, PO, or SBR.

UI Access	HFSS > Hybrid > Assign Hybrid > IE Region... or PO Region... or SBR+ Region....		
Parameters	Name	Type	Description
	<ArgArray>	Array	Structured array. Array("NAME:<name of hybrid region>",

			<pre> "Objects:=", <array of names for the geometry assigned as Hybrid Region>, "Type:=" , <string one of "IE", "PO" or "SBR">, "IsLinkedRegion:=" , <boolean>, "ConductivityThreshold:=", "<numUnit>") </pre>
Return Value	None.		

Python Syntax	AssignHybridRegion(<ArgArray>)
Python Example	<pre> oModule.AssignHybridRegion(["NAME:Hybrid1", "Objects:=" , ["Cylinder1"], "Type:=" , "IE", "IsLinkedRegion:=" , False, "ConductivityThreshold:=", "20000S_per_m"]) </pre>

AssignInteriorNearFieldSource

Assigns an interior near field source as an external data file and associated coordinate system.

UI Access	HFSS > Boundaries > Assign > Linked Field>Near Field...		
Parameters	Name	Type	Description

	<ArgArray>	Array	Structured array. ("NAME:<Name of Near Field Source data>", "Type:=" , "Incident", "ExternalDataFile:=" , "<filePath>.and", "SourceCoordSystem:=" , "<CS_name>")
Return Value	None.		

Python Syntax	AssignInteriorNearFieldSource(<ArgArray>)
Python Example	<pre>oDesign = oProject.SetActiveDesign("internal") oModule = oDesign.GetModule("BoundarySetup") oModule.AssignInteriorNearFieldSource(["NAME:ExtNFDData2", "Type:=" , "Incident", "ExternalDataFile:=" , "D:\\Ansoft\\Sphere_EH.and", "SourceCoordSystem:=" , "Global"])</pre>

AssignImpedance

Creates an impedance boundary for an HFSS design.

UI Access	HFSS > Boundaries > Assign > Impedance...		
Parameters	Name	Type	Description
	<ImpedanceArray>	Array	Structured array. <pre>Array ("NAME:<BoundName>", "Resistance:=", <value>, "Reactance:=", <value>, "InfGroundPlane:=", <boolean>, "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>) </pre>
Return Value	None.		

Python Syntax	AssignImpedance(<ImpedanceArray>)
Python Example	<pre>oModule.AssignImpedance (["NAME:Imped1", "Resistance:=", "50", "Reactance:=", "50", "InfGroundPlane:=", False, "Faces:=", [12]] </pre>

	)

AssignIncidentWave

Creates an incident wave excitation.

UI Access	N/A		
Parameters	Name	Type	Description
	<IncidentWaveArray>	Array	Structured array. Array("NAME:<BoundName>", "Faces:=", <array of face IDs>, "IsCartesian:=", <boolean>, "EoX:=", <value>, "EoY:=", <value>, "EoZ:=", <value>, "kX:=", <value>, "kY:=", <value>, "kZ:=", <value> "PhiStart:=", <value>, "PhiStop:=", <value>, "PhiPoints:=", <int>, "ThetaStart:=", <value>,

			<pre> "ThetaStop:=", <value>, "ThetaPoints:=", <int>, "EoPhi:=", <value>, "EoTheta:=", <value>, "IsPropagating:=", <boolean>, "IsEvanescent:=", <boolean>, "IsEllipticallyPolarized:=", <boolean>) IsCartesian If true, provide the EoX, EoY, EoZ, kX, kY, kZ parameters. If false, provide the PhiStart, PhiStop, PhiPoints, ThetaStart, ThetaStop, ThetaPoints, EoPhi, EoTheta parameters. </pre>
Return Value	None.		

Python Syntax	AssignIncidentWave (<IncidentWaveArray>)
Python Example	<pre> oModule.AssignIncidentWave(["NAME:IncWave1", "Faces:=", [9], "IsCartesian:=", True, "EoX:=", "1", "EoY:=", "0", "EoZ:=", "0", "kX:=", "0", "kY:=", "0", "kZ:=", "1", "IsPropagating:=", True, "IsEvanescent:=", False, </pre>

```
"IsEllipticallyPolarized:=", False]
)
oModule.AssignIncidentWave(["NAME:IncWave2",
    "Faces:=", [9],
    "IsCartesian:=", False,
    "PhiStart:=", "0deg",
    "PhiStop:=", "90deg",
    "PhiPoints:=", 2,
    "ThetaStart:=", "0deg",
    "ThetaStop:=", "180deg",
    "ThetaPoints:=", 3,
    "EoPhi:=", "1", "EoTheta:=", "0",
    "IsPropagating:=", True,
    "IsEvanescent:=", False,
    "IsEllipticallyPolarized:=", False
])
```

AssignLatticePair

Assigns coupled Lattice Pair boundaries.

UI Access	HFSS > Boundaries > Assign > Coupled... > Lattice Pair...		
Parameters	Name	Type	Description
	<BoundaryArray>	Array	Structured array. <pre> Array("NAME:<BoundName>", "Faces:=", <Array of face IDs>, "ReverseV:=", <boolean>, "PhaseDelay:=", <UseScanAngle InputPhaseDelay>, "Phi:=", <numdeg>, "Theta:=", <numdeg>, "Phase:=", <numdeg>) </pre>
Return Value	None.		

Python Syntax	AssignLatticePair(<BoundaryArray>)
Python Example	<pre> oModule.AssignLatticePair(["NAME:LatticePair1", "Faces:=" , [9,8], "ReverseV:=" , False, "PhaseDelay:=" , "UseScanAngle", "Phi:=" , "0deg", "Theta:=" , "0deg"]) </pre>

	<pre>oModule.AssignLatticePair(["NAME:LatticePair2", "Faces:=" , [8,9], "ReverseV:=" , False, "PhaseDelay:=" , "InputPhaseDelay", "Phase:=" , "10deg"])</pre>

AssignLayeredImp

Creates a layered impedance boundary.

UI Access	HFSS > Boundaries > Assign > Layered Impedance...		
Parameters	Name	Type	Description
	<LayeredImpArray>	Array	Structured array. Array ("NAME:<BoundName>", "Frequency:=", <value>, "Roughness:=", <value>, "IsInternal:=", <bool>, "IsTwoSided:=", <bool>, "IsShellElement:=", <bool>, <LayersArray>,

			<code>"Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>, "InfGroundPlane:=", <boolean>)</code>
	<code><LayersArray></code>	Array	Structured array. <code>Array("NAME:Layers", <OneLayerArray>, <OneLayerArray>, ...)</code>
	<code><OneLayerArray></code>	Array	Structured array. <code>Array("NAME:<LayerName>", "LayerType:=", <LayerType>, "Thickness:=", <value>, "Material:=", <string>)</code> Thickness Thickness of the layer. Should be specified for all layers except the last layer. Material Material assigned on the layer. For the last layer, do not specify a material if the LayerType is "PerfectE" or "PerfectH".
	<code><LayerName></code>	String	Specifies the layer number, such as "Layer1" or "Layer2"
	<code><LayerType></code>	String	Should be specified for the last layer only. Possible values: "Infinite", "PerfectE", or "PerfectH"
Return Value	None.		

Python Syntax	AssignLayeredImp(<LayeredImpArray>)
Python Example	<pre>oModule.AssignLayeredImp(["NAME:Layered1", "Objects:=", ["Rectangle1"], "Frequency:=", "0GHz", "Roughness:=", "0um", "IsTwoSided:=", True, "IsShellElement:=", True, ["NAME:Layers", ["NAME:Layer1", "Thickness:=", "1um", "Material:=", "vacuum"]], "InfGroundPlane:=", False])</pre>

AssignLinearAntennaWave

Creates an incident linear antenna wave excitation.

UI Access	HFSS > Excitations > Assign > Incident Wave > Linear Antenna Wave...		
Parameters			
	Name	Type	Description
	<IncidentWaveArray>	Array	Structured array. Array("NAME:<Name of incident wave>", "Faces:=", <array of face IDs>,

			<pre> "IsCartesian:=", <boolean>, "EoX:=" , "<numeric value>", "EoY:=" , "<numeric value>", "EoZ:=" , "<numeric value>", "kX:=" , "<numeric value>", "kY:=" , "<numeric value>", "kZ:=" , "<numeric value>", "PhiStart:=", <value>, "PhiStop:=", <value>, "PhiPoints:=", <int>, "ThetaStart:=", <value>, "ThetaStop:=", <value>, "ThetaPoints:=", <int>, "EoPhi:=", <value>, "EoTheta:=", <value>, "OriginX:=" , "<numUnit>", "OriginY:=" , "<numUnit>", "OriginZ:=" , "<numUnit>", "AntennaRadius:=" , "<numUnit>", "AntennaLength:=" , "<numUnit>") IsCartesian </pre>

			If true, provide the EoX, EoY, EoZ, kX, kY, kZ parameters. If false, provide the PhiStart, PhiStop, PhiPoints, ThetaStart, ThetaStop, ThetaPoints, EoPhi, EoTheta parameters.
Return Value	None.		

Python Syntax	AssignLinearAntennaWave(<IncidentWaveArray>)
Python Example	<pre>oModule.AssignLinearAntennaWave(["NAME:IncLWave1", "Faces:=", , [9], "IsCartesian:=", , True, "EoX:=", , "1", "EoY:=", , "0", "EoZ:=", , "0", "kX:=", , "0", "kY:=", , "0", "kZ:=", , "1", "OriginX:=", , "0mm", "OriginY:=", , "0mm", "OriginZ:=", , "0mm", "AntennaRadius:=", , "10mm",</pre>


```

"AntennaLength:="      , "10mm"
])
oModule.AssignLinearAntennaWave(
["NAME:IncLWave2",
"Faces:="              , [9],
"IsCartesian:="        , False,
"PhiStart:="            , "0deg",
"PhiStop:="             , "0deg",
"PhiPoints:="           , 1,
"ThetaStart:="          , "0deg",
"ThetaStop:="           , "0deg",
"ThetaPoints:="         , 1,
"EoPhi:="               , "1",
"EoTheta:="             , "0",
"OriginX:="             , "0mm",
"OriginY:="             , "0mm",
"OriginZ:="             , "0mm",
"AntennaRadius:="       , "10mm",
"AntennaLength:="       , "10mm"
])

```

AssignLinkedImpedance

Assigns a linked Impedance boundary.

UI Access	HFSS > Boundaries > Assign > Linked Impedance...		
Parameters	Name	Type	Description
	<LinkedImpArray>	Array	Structured array. Array("NAME:<BoundName>", "Faces:=", <array of face IDs>, "UseInfiniteGroundPlane:=", <boolean>, "UseShellElement:=", <boolean>, <LinkDataArray>)
	<LinkDataArray>	Array	Structured array. Array("NAME:<LinkName>", "Project:=", <string file path>, "Product:=", <string product type>, "Design:=", <string linked source design name>, "Soln:=", <string linked source solution name>, <array solution parameters>, "ForceSourceToSolve:=", <boolean>, "PreservePartnerSoln:=", <boolean>, "PathRelativeTo:=", <string target project name>)

Return Value	None.

Python Syntax	AssignLinkedImpedance(<LinkedImpArray>)
Python Example	<pre>oModule.AssignLinkedImpedance(["NAME:Linked1", "Faces:=", [9], "UseInfiniteGroundPlane:=", True, "UseShellElement:=", True, ["NAME:XLink", "Project:=", "C://temp/linkedproject.aedt", "Product:=", "HFSS", "Design:=", "Source_Project_Solver", "Soln:=", "1000MHz : LastAdaptive", ["NAME:Params", "xfactor:=", "1.2", "yfactor:=", "1.6"], "ForceSourceToSolve:=", True, "PreservePartnerSoln:=", False, "PathRelativeTo:=", "TargetProject"]])</pre>

AssignLinkedRegion

Assigns a Hybrid Region as a Linked Region.

UI Access	N/A		
Parameters	Name	Type	Description
	<LinkedRegionArray>	Array	Structured array. Array("NAME:<name of linked region>", "Objects:=", <array, names for the objects assigned as Hybrid Region>, "Type:=" , <string, one of "IE", "PO" or "SBR">, "IsLinkedRegion:=" , <boolean, true for linked region>)
Return Value	None.		

Python Syntax	AssignLinkedRegion (<LinkedRegionArray>)
Python Example	<pre>oModule.AssignLinkedRegion (["NAME:Linked1", "Objects:=", ["RegularPolyhedron1"], "Type:=", "PO", "IsLinkedRegion:=", True])</pre>

AssignLumpedPort

Creates a lumped port excitation.

UI Access	HFSS > Excitations > Assign > Port > Lumped Port...		
Parameters	Name	Type	Description
	<LumpedPortArray>	Array	Structured array. <pre>Array("NAME:<BoundName>", "Faces:=", <FaceIDArray>, "RenormalizeAllTerminals:=", <boolean>, "DoDeembed:=", <boolean>, <ModesArray>, "ShowReporterFilter:=", <boolean>, "ReporterFilter:=", <array of boolean>, "Impedance:=" , <value>)</pre>
	<ModesArray>	Array	Structured array. <pre>Array("NAME:<ModesArrayName>", <OneModeArray>, <OneModeArray>, ...)</pre>
	<OneModeArray>	Array	Structured array. <pre>Array("NAME:<ModeName>", "ModeNum:=", <integer>, "UseIntLine:=", <boolean>, <IntegerationLineArray>,</pre>

			"AlignmentGroup:=", <integer, group id>, "CharImp:=", <string, characteristic impedance>, "RenormImp:=" , <value, renormalize impedance to>
	<IntegerationLineArray >	Array	Structured array. Array("NAME:<LineName>", "Coordinate System:=", <string, relative coordinate system>, "Start:=" , <array, start location coordinates>, "End:=" , <array, end location coordinates>)
Return Value	None.		

Python Syntax	AssignLumpedPort (<LumpedPortArray>)
Python Example	<pre>oModule.AssignLumpedPort(["NAME:LumpedPort1", "Faces:=", [9], "DoDeembed:=", False, "RenormalizeAllTerminals:=", True, ["NAME:Modes", ["NAME:Model", "ModeNum:=", 1,</pre>

	<pre>"UseIntLine:=", True, ["NAME:IntLine", "Coordinate System:=", "Global", "Start:=", ["-0.4mm", "-1mm", "0.8mm"], "End:=" , ["-0.3mm", "-1.2mm", "0.8mm"]], "AlignmentGroup:=", 0, "CharImp:=", "Zpi", "RenormImp:=", "50ohm"]], "ShowReporterFilter:=", False, "ReporterFilter:=", [True], "Impedance:=", "50ohm"])</pre>

AssignLumpedRLC

Creates a lumped RLC boundary.

UI Access	HFSS > Boundaries > Assign > Lumped RLC...		
Parameters	Name	Type	Description
	<LumpedRLCArray>	Array	Structured array. Array("NAME:<BoundName>", "RLC Type:=" , <"Parallel" "Serial" > ,

			<pre>"UseResist:=", <boolean>, "Resistance:=", <value>, "UseInduct:=", <boolean>, "Inductance:=", <value>, "UseCap:=", <boolean>, "Capacitance:=", <value>, <CurrentLineArray>, "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>)</pre>
	<code><CurrentLineArray></code>	Array	Structured array. <pre>Array("NAME:CurrentLine", _ "Start:=", <LineEndPoint>, "End:=", <LineEndPoint>)</pre>
Return Value	None.		

Python Syntax	<code>AssignLumpedRLC (<LumpedRLCArray>)</code>
Python Example	<pre>oModule.AssignLumpedRLC (["NAME:LumpRLC1",</pre>

	<pre>"Objects:=", ["Box1"], ["NAME:CurrentLine", "Start:=", ["0.15mm", "-0.2mm", "0mm"], "End:=" , ["0.15mm", "0.6mm", "0mm"]], "RLC Type:=", "Parallel", "UseResist:=", True, "Resistance:=", "100ohm", "UseInduct:=", True, "Inductance:=", "10nH", "UseCap:=", True, "Capacitance:=", "10pF"])</pre>

AssignMagneticBias

Creates a magnetic bias source.

UI Access	HFSS > Excitations > Assign > Magnetic Bias...		
Parameters	Name	Type	Description
	<MagneticBiasArray>	Array	Structured array. Array("NAME:<BoundName>",

			<pre>"IsUniformBias:=", <boolean>, "Bias:=", <value>, "XAngle:=", <value>, "YAngle:=", <value>, "ZAngle:=", <value>, "Project:=", <string>, "Objects:=", <AssignmentObjects>)</pre> IsUniformBias If true, supply the Bias, XAngle, YAngle, and ZAngle parameters. If false, supply the Project parameter.
Return Value	None.		

Python Syntax	AssignMagneticBias (<MagneticBiasArray>)
Python Example	<pre>oModule.AssignMagneticBias (["NAME:MagBias1", "IsUniformBias:=", True, "Bias:=", "1", "XAngle:=", "10deg", "YAngle:=", "10deg",</pre>

	<pre> "ZAngle:=", "10deg", "Objects:=", ["Box2"]]) oModule.AssignMagneticBias(["NAME:MagBias2", "IsUniformBias:=", False, "Project:=", "D:/Maxwell/testing/m3dfs.pjt", "Objects:=", ["Box2"]]) </pre>

AssignMultipactionChargeRegion

Creates a Multipaction Charge Region for HFSS multipaction analysis.

UI Access	HFSS > Excitations > Assign > Multipaction Charge Region...		
Parameters	Name	Type	Description
	<ChargeRegionArray>	Array	Structured array. <pre> Array("NAME:MultipactionChargeRegion1", "Objects:=", <array of objects>, "Faces:=", <array of face IDs>, "NumParticles:=", "<integer, number of particles>", "ParticleCharge:=", "<num><unit>", "ParticleMass:=", "<num><unit>", "Vx:=", "<num><unit>", </pre>

	<table><tr><td></td><td></td><td>"Vy:=", "<num><unit>", "Vz:=", "<num><unit>")</td></tr></table>			"Vy:=", "<num><unit>", "Vz:=", "<num><unit>")
		"Vy:=", "<num><unit>", "Vz:=", "<num><unit>")		
Return Value	None.			

Python Syntax	AssignMultipactionChargeRegion(<ChargeRegionArray>)
Python Example	<pre>oModule.AssignMultipactionChargeRegion(["NAME:MultipactionChargeRegion1", "Objects:=" , ["Cylinder1"], "NumParticles:=" , "100", "ParticleCharge:=" , "-1.60217662e-19Coulomb", "ParticleMass:=" , "9.10938356e-31kg", "Vx:=" , "0.1m_per_sec", "Vy:=" , "0.3m_per_sec", "Vz:=" , "0.15m_per_sec"])</pre>

AssignMultipactionDCBias

Set up DC electric or magnetic bias fields for a multipaction analysis

UI Access	HFSS > Excitations > Assign > Multipaction DC Bias...

Parameters	Name	Type	Description
	<DCBiasArray>	Array	Structured array. <pre>Array (NAME:MultipactionDCBias1", "Objects:=", <array of objects>, "UniformE:=", <boolean>, "Ex:=", "<value><unit>", "Ey:=", "<value><unit>", "Ez:=", "<value><unit>", <LinkedField>, "UniformH:=", "<boolean>, "Hx:=", "<value><unit>", "Hy:=", "<value><unit>", "Hx:=", "<value><unit>", <LinkedField>)</pre> UniformE or Uniform H: • True - provide filed values. • False - provide field through linked Maxwell analysis.
	<LinkedField>	Array	Structured array. <pre>Array ("NAME:<EField HField>", "Project:=", <string, path to linked project file>, "Product:=", "Maxwell",</pre>

			<code>"Design:=", <string, name of source design>, "Soln:=", <string, name of linked solution>, <Parameters for linked solution>, "ForceSourceToSolve:=", <boolean>, "PreservePartnerSoln:=", <boolean>, "PathRelativeTo:=", "TargetProject")</code>
Return Value	None.		

Python Syntax	AssignMultipactionDCBias (< <i>DCBiasArray</i> >)
Python Example	<pre>oModule.AssignMultipactionDCBias(["NAME:MultipactionDCBias1", "Objects:=", ["Cylinder1"], "UniformE:=", False, ["NAME:EField", "Project:=", "C://projects/Maxwell/HallSensor.aedt", "Product:=", "Maxwell", "Design:=", "3_Maxwell3D", "Soln:=", "Setup1 : Transient", ["NAME:Params",</pre>

```

"angle:=", "0deg",
"cell_spacing:=", "2.5mm",
"die_thickness:=", "2mm",
"gap:=", "1.5mm",
"magnet_center_y:=", "0mm",
"magnet_center_z:=", "0mm",
"magnet_x:=", "3mm",
"magnet_y:=", "6mm",
"magnet_z:=", "5mm",
"move_x:=", "-1.5mm",
"sensor_offset_x:=", "0mm",
"sensor_offset_y:=", "0mm",
"sensor_offset_z:=", "0mm",
"sensor_pitch:=", "0deg",
"sensor_roll:=", "0deg",
"sensor_yaw:=", "0deg",
"target_dia:=", "80mm"

],
"ForceSourceToSolve:=", False,
"PreservePartnerSoln:=", False,
"PathRelativeTo:=", "TargetProject"

```

	<pre>], "UniformH:=", True, "Hx:=", "0A_per_m", "Hy:=", "0A_per_m", "Hz:=", "0A_per_m" l)</pre>

AssignMultipactionSEE

Creates Secondary Electron Emission (SEE) boundaries for a Multipaction analysis.

UI Access	HFSS > Boundaries > Assign > Multipaction SEE...		
Parameters	Name	Type	Description
	<SEEArray>	Array	Structured array. Array("NAME:<SEEName>", "Faces:=", <array of face IDs>, "AlphaMax:=", <value>, "Alpha0:=", <value>, "E0:=", <value>, "E1:=", <value>, "E2:=", <value>, "Em:=", <value>,

			"DielectricSurface:=", <boolean>)
Return Value	None.		

Python Syntax	AssignMultipactionSEE (<SEEArray>)
Python Example	<pre>oModule.AssignMultipactionSEE(["NAME:SEE1", "Faces:=", [342, 7, 341, 11, 8, 175, 35], "AlphaMax:=", "2.25", "Alpha0:=", "0", "E0:=", "12.5", "E1:=", "25", "E2:=", "5000", "Em:=", "175", "DielectricSurface:=", false])</pre>

AssignPerfectE

Creates a perfect E boundary.

UI Access	HFSS > Boundaries > Assign > Perfect E...		
Parameters	Name	Type	Description
	<PerfectEArray>	Array	Structured array. Array("NAME:<BoundName>", "InfGroundPlane:=", <boolean>,

			<code>"Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>)</code>
Return Value	None.		

Python Syntax	AssignPerfectE (<PerfectEArray>)
Python Example	<pre>oModule.AssignPerfectE(["NAME:PerfE1", "InfGroundPlane:=", False, "Faces:=", [12]])</pre>

AssignPerfectH

Creates a perfect H boundary.

UI Access	HFSS > Boundaries > Assign > Perfect H...		
Parameters	Name	Type	Description
	<PerfectHArray>	Array	Structured array. <code>Array("NAME:<BoundName>", "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>)</code>

Return Value	None.

Python Syntax	AssignPerfectH (<PerfectHArray>)
Python Example	<pre>oModule.AssignPerfectH(["NAME:PerfH1", "Faces:=", [12]])</pre>

AssignPlaneWave

Creates an incident plane wave excitation.

UI Access	HFSS > Excitations > Assign > Incident Wave > Plane Wave...		
Parameters	Name	Type	Description
	<PlaneWaveArray> >	Array	Structured array. <pre>Array("NAME:<Name of incident wave>", "Faces:=", <array of face IDs>, "IsCartesian:=", <boolean>, "EoX:=", "<numeric value>", "EoY:=", "<numeric value>", "EoZ:=", "<numeric value>", "kX:=", "<numeric value>", "kY:=", "<numeric value>,"</pre>

			<pre>"kZ:=", "<numeric value>", "PhiStart:=", <value>, "PhiStop:=", <value>, "PhiPoints:=", <int>, "ThetaStart:=", <value>, "ThetaStop:=", <value>, "ThetaPoints:=", <integer>, "EoPhi:=", <value>, "EoTheta:=", <value>, "OriginX:=", "<numUnit>",&br/>"OriginY:=", "<numUnit>",&br/>"OriginZ:=", "<numUnit>",&br/>"IsPropagating:=", <boolean>, "IsEvanescent:=", <boolean>, "IsEllipticallyPolarized:=", <boolean>, "RealPropConst:=", "<value>",&br/>"ImagPropConst:=", "<value>",&br/>"PolarizationAngle:=", "<value>deg",&br/>"PolarizationRatio:=", "<value>") IsCartesian:</pre>

			• True - provide the EoX, EoY, EoZ, kX, kY, kZ parameters. • False - provide the PhiStart, PhiStop, PhiPoints, ThetaStart, ThetaStop, ThetaPoints, EoPhi, EoTheta parameters. IsEvanescent: • True - provide the RealPropConst, ImagPropConst. IsEllipticallyPolarized: • True - provide the PolarizationAngle, PolarizationRatio.
Return Value	None.		

Python Syntax	AssignPlaneWave(<PlaneWaveArray>)
Python Example	<pre>oModule.AssignPlaneWave(["NAME:IncPWave1", "Faces:=", , [9], "IsCartesian:=", , True, "EoX:=", , "1", "EoY:=", , "0", "EoZ:=", , "0", "kX:=", , "0", "kY:=", , "0", "kZ:=", , "1", "OriginX:=", , "0mm",</pre>

```
"OriginY:="          , "0mm",
"OriginZ:="          , "0mm",
"IsPropagating:="    , True,
"IsEvanescent:="     , False,
"IsEllipticallyPolarized:=", False
])
oModule.AssignPlaneWave(
["NAME:IncPWave2",
"Faces:="            , [8],
"IsCartesian:="      , False,
"PhiStart:="         , "0deg",
"PhiStop:="          , "0deg",
"PhiPoints:="        , 1,
"ThetaStart:="       , "0deg",
"ThetaStop:="        , "0deg",
"ThetaPoints:="      , 1,
"EoPhi:="            , "1",
"EoTheta:="          , "0",
"OriginX:="          , "0mm",
"OriginY:="          , "0mm",
```

	<pre> "OriginZ:=" , "0mm", "IsPropagating:=" , False, "IsEvanescent:=" , True, "IsEllipticallyPolarized:=", False, "RealPropConst:=" , "0", "ImagPropConst:=" , "1" l) </pre>

AssignPrimary

Creates a primary boundary.

UI Access	HFSS > Boundaries > Assign > Coupled > Primary...		
Parameters	Name	Type	Description
	<PrimaryBondArray>	Array	Structured array. <pre> Array ("NAME:<BoundName>", <CoordSysArray>, "ReverseV:=", <boolean>, "Faces:=", <AssignmentFaces>) </pre>
	<CoordSysArray>	Array	Structured array. <pre> Array ("NAME:CoordSysVector", "Origin:=", <CoordSysPoint>, "UPos:=", <LineEndPoint>) </pre>

Return Value	None.

Python Syntax	AssignPrimary (<PrimaryBondArray>)
Python Example	<pre>oModule.AssignPrimary(["NAME:Primary1", ["NAME:CoordSysVector", "Origin:=", [-1.4, -1.4, -0.8], "UPos:=", [-1.4, -1.4, 0]], "ReverseV:=", False, "Faces:=", [12]])</pre>

AssignRadiation

Creates a radiation boundary.

UI Access	HFSS > Boundaries > Assign > Radiation...		
Parameters	Name	Type	Description
	<RadiationArray>	Array	Structured array. Array ("NAME:<BoundName>", "Objects:=", <AssignmentObjects>,

			<pre>"Faces:=", <AssignmentFaces>, "IsFssReference:=", <boolean>, "IsForPML:=", <boolean>)</pre> "IsFssReference" and "IsForPML" are only used to support legacy designs. In the current version, these should always be set to "False".
Return Value	None.		

Python Syntax	<code>AssignRadiation(<RadiationArray>)</code>
Python Example	<pre>oModule.AssignRadiation(["NAME:Rad1", "Faces:=", [6, 7], "IsFssReference:=", False, "IsForPML:=", False]) </pre>

AssignRFDischargeDCBias

Creates the DC bias for an RF Discharge simulation.

UI Access	HFSS > Excitations > Assign > RF Discharge DC Bias...		
Parameters	Name	Type	Description

	<DCBiasParameters>	Array	Structured array. Array("NAME:<DCBiasName>", "UniformH:=", <boolean>, "Hx:=", "<real>A_per_m", "Hy:=", "<real>A_per_m", "Hz:=", "<real>A_per_m")
Return Value	None.		

Python Syntax	AssignRFDischargeDCBias (<DCBiasParameters>)
Python Example	<pre>oModule.AssignRFDischargeDCBias(["NAME:RFDischargeDCBias1", "UniformH:=", True, "Hx:=", "795774.71546A_per_m", "Hy:=", "0A_per_m", "Hz:=", "0A_per_m"])</pre>

AssignScreeningImpedance

Creates a screening impedance boundary.

Command: HFSS>Boundaries>Assign>Screening Impedance

Syntax: AssignScreeningImpedance <ScreeningArray>

Return Value: None.

Parameters: <ScreeningArray>

Array("NAME:<name>",

"Objects:=", Array("<name>"),

"IsAnisotropic:=", <Boolean>,

If true, you need to specify the coordinate system

"CoordSystem:=", <integer or name>,

"HasExternalLink:=", <Boolean>,

true or false. If False, specify XResistance and XReactance values. Also see the first example.

"XResistance:=", "<value>",

"XReactance:=", "<value>"

If true, then specify the external link array with the project and solution to use. Also see the second example.

Array("NAME:XLink",

"Project:=", "<projectName>.aedt",

"Design:=", "<DesignName>",

"Soln:=", "Setup1 : LastAdaptive",

Array("NAME:Params", "<variable>:=", "<value>"),

```
"ForceSourceToSolve:=", <Boolean>,  
"PreservePartnerSoln:=", <Boolean>,  
"PathRelativeTo:=", "TargetProject"),  
    Array("NAME:YLink",  
"Project:=", "<projectName>.aedt",  
"Design:=", "HFSSDesign1",  
"Soln:=", "Setup1 : LastAdaptive",  
Array("NAME:Params", "<variable>:=", "<value>"),  
"ForceSourceToSolve:=", <Boolean>  
"PreservePartnerSoln:=", <Boolean>,  
"PathRelativeTo:=", "TargetProject"))
```

AssignSymmetry

Creates a symmetry boundary.

UI Access	HFSS > Boundaries > Assign > Symmetry.		
Parameters	Name	Type	Description
	<SymmetryArray>	Array	Structured array.
			<pre>Array ("NAME:<BoundName>", "IsPerfectE:=", <boolean>, "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>)</pre>

Return Value	None.

Python Syntax	<code>AssignSymmetry (<SymmetryArray>)</code>
Python Example	<pre>oModule.AssignSymmetry(["NAME:Sym1", "IsPerfectE=", True, "Faces=", [12]])</pre>

AssignTerminal

Assigns 1D and 2D terminals.

UI Access	Q3D Extractor > Nets > AssignTerminals		
Parameters	Name	Type	Description
	<TerminalArray>	Array	Structured array. <pre>Array("NAME:AssignTerminals", Array("Name:SourceList", Array("Name:<SourceName>", "Net:=", <NetObject>, "Objects:=", <Assignment 2D/1D>)), Array("Name:SinkList", Array("Name:<SinkName>",</pre>

	<table><tr><td></td><td></td><td><pre>"Net:=", <NetObject>, "Objects:=", <Assignment 2D/1D>)), "Name>DeleteList", <Name Array>)</pre></td></tr></table>			<pre>"Net:=", <NetObject>, "Objects:=", <Assignment 2D/1D>)), "Name>DeleteList", <Name Array>)</pre>
		<pre>"Net:=", <NetObject>, "Objects:=", <Assignment 2D/1D>)), "Name>DeleteList", <Name Array>)</pre>		
Return Value	None.			

Python Syntax	AssignTerminal (<TerminalArray>)
Python Example	<pre>oModule.AssignTerminals(["NAME:AssignTerminals", ["NAME:SourceList", ["NAME:Polyline2", "Objects:=", ["Polyline2"], "ParentBndID:=", "Box1", "Net:=", "Box1"]], ["NAME:SinkList" ["NAME:Rectangle1", "Objects:=", ["Rectangle1"], "ParentBndID:=", "Box1", "Net:=", "Box1"]], "DeleteList:=", ""])</pre>

AssignVoltage

Creates a voltage source.

UI Access	HFSS > Excitations > Assign > Voltage...		
Parameters	Name	Type	Description
	<VoltageArray>	Array	Structured array. <pre>Array("NAME:<BoundName>", "Voltage:=", <value>, <DirectionArray>, "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>)</pre>
	<DirectionArray>	Array	Structured array. <pre>Array("NAME:Direction",_ "Start:=", <LineEndPoint>, "End:=", <LineEndPoint>)</pre>
Return Value	None.		

Python Syntax	AssignVoltage (<VoltageArray>)
Python Example	<pre>oModule.AssignVoltage(["NAME:Voltage1", "Voltage:=", "1000mV", ["NAME:Direction",</pre>

	<pre>"Start:=", [-0.4, -1.2, 0], "End:=", [-1.4, -1.2, 0]], "Faces:=", [7])</pre>

AutoCreatePECCapforWavePort

Use: If the HFSS Option for HFSS>Boundary Assignment>Automatic PEC cap creation for wave port is enabled, HFSS automatically creates a PEC cap under the following conditions: The general rule is that the dialog for creating wave port PEC backing appears if the wave port is internal to the design and does not touch any non-solve-inside component. If a project has open region defined, all geometries are considered internal.

Command: None.

Syntax: AutoCreatePECCapForWavePort ([<PECCapParameters>])

Return Value: None

Parameters: <PECCapParameters>

```
"NAME:AutoCreatePECCapForWavePort",
"Wave Port Name:=" , "<string>",
"Face ID:=" , <intID>,
"Flip Side:=" , Boolean,
"Thickness:=" , "<real><units>"
```

Python Syntax	AutoCreatePECCapforWavePort(<PECCapParameters>)

Python Example	<pre> AutoCreatePECCapForWavePort (["NAME:AutoCreatePECCapForWavePort", "Wave Port Name:=" , "2", "Face ID:=" , 280, "Flip Side:=" , False, "Thickness:=" , "0.18mm"]) </pre>

CircuitPortToLumpedPort

Converts a circuit port to a lumped port for a driven terminal or driven modal design in HFSS.

UI Access	Right-click on a circuit port, then select Convert to Lumped Port .		
Parameters	Name	Type	Description
	<PortName>	String	Name of specified circuit port.
Return Value	None.		

Python Syntax	CircuitPortToLumpedPort (<PortName>)
Python Example	oModule.CircuitPortToLumpedPort ("1")

EditAnisotropicImpedance

Modifies an Anisotropic Impedance boundary condition.

UI Access	Double-click the boundary condition in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<BondName>	String	Name of boundary condition to be edited.
	<Aniso-tropicImpArray>	Array	Structured array. Array("NAME:<string name of anisotropic impedance>", "Faces:=" , <array of face IDs>, "UseInfiniteGroundPlane:=" , <boolean>, "CoordSystem:=" , <string coordinate system name>, "HasExternalLink:=" , <boolean>, "ZxxResistance:=" , <string of an integer value>, "ZxxReactance:=" , <string of an integer value>, "ZxyResistance:=" , <string of an integer value>, "ZxyReactance:=" , <string of an integer value>, "ZyxResistance:=" , <string of an integer value>, "ZyxReactance:=" , <string of an integer value>, "ZyyResistance:=" , <string of an integer value>, "ZyyReactance:=" , <string of an integer value>)
Return Value	None.		

Python Syntax	EditAnisotropicImpedance (<BondName>, <AnisotropicImpArray>)
Python Example	<pre> oModule.EditAnisotropicImpedance("Anistropic10", ["NAME:Anisotropic1", "Faces:=" , [17215], "UseInfiniteGroundPlane:=", False, "CoordSystem:=" , "Global", "HasExternalLink:=" , False, "ZxxResistance:=" , "377", "ZxxReactance:=" , "0", "ZxyResistance:=" , "0", "ZxyReactance:=" , "0", "ZyxResistance:=" , "0", "ZyxReactance:=" , "0", "ZyyResistance:=" , "377", "ZyyReactance:=" , "0"]) </pre>

EditAperture

Modifies an aperture boundary.

UI Access	Double-click the boundary condition in the project tree to modify its settings.

Parameters	Name	Type	Description
	<BondName>	String	Name of boundary condition to be edited.
	<ApertureArray>	Array	Array defines selected objects.
Return Value	None.		

Python Syntax	EditAperture(<BondName>, <ApertureArray>)
Python Example	<pre>oModule.EditAperture("Aperture1" ["NAME:Aperture2", "Objects:=", ["Rectangle1"]])</pre>

EditCircuitPort[HFSS]

Edits a circuit port for a driven terminal or driven modal design in HFSS.

UI Access	Double-click the excitation in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<ExcitationName>	String	Name of the excitation to be edited.
	<CircuitPortArray>	Array	Structured array. Array ("NAME:<PortName>", "Impedance:=", "valueohm", "DoDeembed:=", <boolean>

			"RenormalizeAllTerminals:=", <boolean> "TerminalIDLit:=", Array())
Return Value	None.		

Python Syntax	EditCircuitPort (<ExcitationName>, <CircuitPortArray>)
Python Example	<pre>oModule.EditCircuitPort ("5" ["NAME:1", "Impedance:=" , "50ohm", "DoDeembed:=" , False, "RenormalizeAllTerminals:=", True, "TerminalIDList:=" , []])</pre>

EditDielectricCavity

Modifies definitions of a Dielectric Cavity.

UI Access	Double-click the cavity under Hybrid Regions in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<CavityName>	String	Name of the cavity to be edited.
	<CavityArray>	Array	Structured array. Array("NAME:<new name>")

Return Value	None.

Python Syntax	EditDielectricCavity(<CavityName>, <CavityArray>)
Python Example	<pre>oModule.EditDielectricCavity("Cavity1" ["NAME:Cavity2"])</pre>

EditDiffPairs

Edits the properties of differential pairs defined from terminal excitations on wave ports.

UI Access	HFSS > Excitations > Differential Pairs.		
Parameters	Name	Type	Description
	<DifferentialPairsArray>	Array	Structured array. Array("NAME:EditDiffPairs", <OneDiffPairArray>, <OneDiffPairArray>,...)
	<OneDiffPairArray>	Array	Structured array. Array("NAME:Pair1",_ "PosBoundary:=", <string, name of the terminal to use as the positive terminal.>, "NegBoundary:=", <string, name of the terminal to

			<pre> use as the negative terminal.>, "CommonName:=", <string, name for the common mode.>, "CommonRefZ:=", <value, reference impedance for the common mode.>, "DiffName:=", <string, name for the differential mode.>, "DiffRefZ:=", <value, reference impedance for the differential mode.>, "IsActive:=", <boolean>) </pre>
Return Value	None.		

Python Syntax	EditDiffPairs(< <i>DifferentialPairsArray</i> >)
Python Example	<pre> oModule.EditDiffPairs(["NAME:EditDiffPairs", ["NAME:Pair1", "PosBoundary:=", "Rectangle1_T1", "NegBoundary:=", "Rectangle2_T1", "CommonName:=", "Comm1", "CommonRefZ:=", "25ohm", "DiffName:=", "Diff1", "DiffRefZ:=", "100ohm", "IsActive:=", True]] </pre>

	)

EditFEBI

Modifies a FE-BI hybrid region.

UI Access	Double-click the FE-BI under Hybrid Regions in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<FEBIName>	String	Name of the FE-BI region to be edited.
	<FEBIArray>	Array	Structured array. Array("NAME:<new name>")
Return Value	None.		

Python Syntax	EditFEBI (<FEBIName>, <FEBIArray>)
Python Example	<pre>oModule.EditFEBI ("FE-BI1" ["NAME:FE-BI2"])</pre>

EditFiniteCond

Modifies parameters of single finite conductivity boundary.

UI Access	Double-click finite conductivity boundary in project tree.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the finite conductivity boundary to be edited.
	<FiniteCondArray>	Array	Structured array. <pre>Array("NAME:<Name of the boundary>", "Roughness:=", "<string, double value with units of length>", "UseCoating:=", <boolean>, "LayerThickness:=", "<string, double value with units of length>", "UseMaterial:=", <boolean>, "Material:=", "<string, material name for coating.>")</pre>
Return Value	None.		

Python Syntax	<code>EditFiniteCond (<BoundaryName>, <FiniteCondArray>)</code>
Python Example	<pre>oModule.EditFiniteCond("FiniteCond1", ["NAME:FiniteCond1", "Roughness:=", "2um", "UseCoating:=", false])</pre>

EditFloquetPort

Modifies a Floquet port excitation.

UI Access	Double-click on a floquet port under Excitations in history tree.		
Parameters	Name	Type	Description
	<FloquetPortName>	String	Name of the floquet port excitation to be edited.
	<FloquetPortArray>	Array	Structured array. Array ("NAME:<BoundName>", "NumModes:=", <integer>, "RenormalizeAllTerminals:=", <boolean>, "DoDeembed:=", <boolean>, <ModesArray>, "ShowReporterFilter:=", <boolean>, "UseScanAngles:=", <boolean>, "Phi:=", "<numdeg>",&br/> "Theta:=", "<numdeg>",&br/> <LatticeAVector>, <LatticeBVector>, <ModesCalculator>, <ModesList>)
	<ModesArray>	Array	Structured array.

		<pre> Array("NAME:Modes", Array("NAME:<ModeName>", "ModeNum:=", <integer>, "UseIntLine:=", <boolean>), ...)</pre>
<LatticeAVector>	Array	Structured array. <pre> Array("NAME:LatticeAVector", "Start:=", Array("<num><units>", "<num><units>", "<num><units>"), "End:=", Array("<num><units>", "<num><units>", "<num><units>"))</pre>
<LatticeBVector>	Array	Structured array. <pre> Array("NAME:LatticeBVector", "Start:=", Array("<num><units>", "<num><units>", "<num><units>"), "End:=", Array("<num><units>", "<num><units>", "<num><units>"))</pre>
<ModesCalculator>	Array	Structured array. <pre> Array("NAME:ModesCalculator", "Frequency:=", "<Value>GHz", "FrequencyChanged:=", <Boolean>, "PhiStart:=", "<num>deg", "PhiStop:=", "<num>deg", "PhiStep:=", "<num>deg", "ThetaStart:=", "<num>deg",</pre>

			<code>"ThetaStop:=", "<num>deg", "ThetaStep:=", "<num>deg")</code>
	<code><ModesList></code>	Array	Structured array. <code>Array("NAME:ModesList", Array("NAME:Mode", "ModeNumber:=", <ModeID>, "IndexM:=", <integer index>, "IndexN:=", <integer index>, "KC2:=", <integer value>, "PropagationState:=", "Propagating", "Attenuation:=", <integer value>, "PolarizationState:=", <TE or TM>, "AffectsRefinement:=", <boolean>), ...)</code>
Return Value	None.		

Python Syntax	<code>EditFloquetPort(<FloquetPortName>, <FloquetPortArray>)</code>
Python Example	<code>oModule.EditFloquetPort("FloquetPort1", ["NAME:FloquetPort1After",</code>

```

"NumModes:=", 2,
"RenormalizeAllTerminals:=", True,
"DoDeembed:=", False,
["NAME:Modes",
    ["NAME:Model",
        "ModeNum:=", 1,
        "UseIntLine:=", False],
    ["NAME:Mode2",
        "ModeNum:=", 2,
        "UseIntLine:=", False]],
"ShowReporterFilter:=", False,
"UseScanAngles:=", True, "Phi:=", "0deg", "Theta:=", "0deg",
["NAME:LatticeAVector",
    "Start:=", ["0mm", "0mm", "0.8mm"],
    "End:=", ["0mm", "0.5mm", "0.8mm"]],
["NAME:LatticeBVector",
    "Start:=", ["0mm", "0mm", "0.8mm"],
    "End:=", ["0.8mm", "0mm", "0.5mm"]],
["NAME:ModesCalculator",
    "Frequency:=", "1GHz",
    "FrequencyChanged:=", False,

```

```
"PhiStart:=", "0deg",  
"PhiStop:=", "0deg",  
"PhiStep:=", "0deg",  
"ThetaStart:=", "0deg",  
"ThetaStop:=", "0deg",  
"ThetaStep:=", "0deg"],  
["NAME:ModesList",  
  ["NAME:Mode",  
    "ModeNumber:=", 1,  
    "IndexM:=", 0,  
    "IndexN:=", 0,  
    "KC2:=", 0,  
    "PropagationState:=", "Propagating",  
    "Attenuation:=", 0,  
    "PolarizationState:=", "TE",  
    "AffectsRefinement:=", False],  
  ["NAME:Mode",  
    "ModeNumber:=", 2,  
    "IndexM:=", 0,  
    "IndexN:=", 0,
```

	<pre> "KC2:=", 0, "PropagationState:=", "Propagating", "Attenuation:=", 0, "PolarizationState:=", "TM", "AffectsRefinement:=", False]]]) </pre>

EditFresnel

Modifies a Fresnel boundary condition.

UI Access	Double-click on a fresnel under Boundaries in project history tree.		
Parameters	Name	Type	Description
	<FresnelName>	String	Name of the fresnel boundary to be edited.
	<FresnelArray>	Array	Structured array. <pre> Array("NAME:<FresnelName>", "Fresnel Boundary Type:=", <PerfectAbsorber or ImportFromTableFile>, "RTTable Path:=", <string path to table file>) </pre>
Return Value	None.		

Python Syntax	EditFresnel(<FresnelName>, <FresnelArray>)
Python Example	oModule.AssignFresnel("Fresnel1"

	<pre>["NAME:Fresnel2", "Fresnel Boundary Type:=", "PerfectAbsorber"]</pre>

EditGlobalMatEnv

Modifies global material environment setting to tell HFSS what material properties to use when calculating far fields.

UI Access	HFSS > Boundaries > Edit Global Material Environment...		
Parameters	Name	Type	Description
	<MatEnvName>	String	Name of the global material environment, default is "vacuum".
Return Value	None.		

Python Syntax	EditGlobalMatEnv(<MatEnvName>)
Python Example	oModule.EditGlobalMatEnv("water_distilled")

EditGradientSurfaceRoughness

Edit an existing Gradient Surface Roughness boundary.

UI Access	Double-click on a half space under Boundaries in history tree		
Parameters	Name	Type	Description

	<ArgArray>	Array	Structured array. <pre>["NAME:<Name of GradientSurfaceBoundary>", "Objects:=" , ["<geometryID>"], "RMS Roughness:=" , "<value><units>", "Bulk Conductivity:=" , "<value>", "Thickness:=" , ""<value><units>", "Max Frequency:=" , ""<value><units>", "Surface Type:=" , "[Low Profile High Profile]"]</pre>
Return Value	None.		

Python Syntax	AssignGradientSurfaceRoughness(<ArgArray>)
Python Example	<pre>oModule = oDesign.GetModule("BoundarySetup") oModule.AssignGradientSurfaceRoughness(["NAME:GradientImped1", "Objects:=" , ["Box1"], "RMS Roughness:=" , "1um", "Bulk Conductivity:=" , "58000000", "Thickness:=" , "15um",</pre>

	<pre>"Max Frequency:=" , "100GHz", "Surface Type:=" , "Low Profile"])</pre>

EditHalfSpace

Modifies a Half Space boundary name, Z location, and or materials.

UI Access	Double-click on a half space under Boundaries in history tree.		
Parameters	Name	Type	Description
	<HalfSpaceName>	String	Name of the half space boundary to be edited.
	<HalfSpaceArray>	Array	Structured array. Array("NAME:<Name of Half Space>", "ZLocation:=", "<intUnits>", "Material:=", "<string material name>")
Return Value	None.		

Python Syntax	EditHalfSpace(<HalfSpaceName>, <HalfSpaceArray>)
Python Example	<pre>oModule.EditHalfSpace("HalfSpace1" ["NAME:HalfSpace1After", "ZLocation:=", "2mm",</pre>

	<code>"Material:=", "tungsten"])</code>

EditHybridRegion

Modifies settings of an assigned hybrid region.

UI Access	Double-click on an assignment under Hybrid Regions in project history tree.		
Parameters	Name	Type	Description
	<code><HybridRegionName></code>	String	Name of the hybrid region to be edited.
	<code><HybridRegionArray></code>	Array	Structured array. <code>Array("NAME:<new name of hybrid region>", "Type:=", <string one of "IE", "PO" or "SBR">, "IsLinkedRegion:=", <boolean>)</code>
Return Value	None.		

Python Syntax	<code>EditHybridRegion(<HybridRegionName>, <HybridRegionArray>)</code>
Python Example	<pre>oModule.EditHybridRegion("Hybrid1" ["NAME:Hybrid1After", "Type:=", "IE", "IsLinkedRegion:=", False])</pre>

EditImpedance

Modifies an impedance boundary definitions.

UI Access	Double-click on an impedance under Boundaries in the project history tree.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the impedance boundary to be edited.
	<ImpedanceArray>	Array	Structured array. Array("NAME:<New name>", "Resistance:=", <value>, "Reactance:=", <value>, "InfGroundPlane:=", <boolean>)
Return Value	None.		

Python Syntax	EditImpedance(<BoundaryName>, <ImpedanceArray>)
Python Example	<pre>oModule.AssignImpedance("Imped1" ["NAME:Imped1After", "Resistance:=", "50", "Reactance:=", "50", "InfGroundPlane:=", False])</pre>

EditIncidentWave

Modifies an incident wave excitation.

UI Access	Double-click the excitation in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the incident wave excitation to be edited.
	<IncidentWaveArray>	Array	Structured array. <pre> Array("NAME:<BoundName>", "IsCartesian:=", <boolean>, "EoX:=", <value>, "EoY:=", <value>, "EoZ:=", <value>, "kX:=", <value>, "kY:=", <value>, "kZ:=", <value>, "PhiStart:=", <value>, "PhiStop:=", <value>, "PhiPoints:=", <int>, "ThetaStart:=", <value>, "ThetaStop:=", <value>, "ThetaPoints:=", <int>,</pre>

			<pre> "EoPhi:=", <value>, "EoTheta:=", <value>, "IsPropagating:=", <boolean>, "IsEvanescent:=", <boolean>, "IsEllipticallyPolarized:=", <boolean>) IsCartesian If true, provide the EoX, EoY, EoZ, kX, kY, kZ parameters. If false, provide the PhiStart, PhiStop, PhiPoints, ThetaStart, ThetaStop, ThetaPoints, EoPhi, EoTheta parameters. </pre>
Return Value	None.		

Python Syntax	<code>EditIncidentWave(<BoundaryName>, <IncidentWaveArray>)</code>
Python Example	<pre> oModule.EditIncidentWave("IncWave1", ["NAME:IncWave1After", "IsCartesian:=", True, "EoX:=", "1", "EoY:=", "0", "EoZ:=", "0", "kX:=", "0", "kY:=", "0", "kZ:=", "1", "IsPropagating:=", True, "IsEvanescent:=", False, "IsEllipticallyPolarized:=", False]) </pre>

EditInteriorNearFieldSource

Edits an interior near field source as an external data file and associated coordinate system.

UI Access	HFSS > Boundaries > Assign > Linked Field>Near Field...		
Parameters	Name	Type	Description
	<ArgArray>	Array	Structured array. ("NAME:<Name of Near Field Source data>", "Type:=" , "Incident", "ExternalDataFile:=" , "<filePath>.and", "SourceCoordSystem:=" , "<CS_name>"
Return Value	None.		

Python Syntax	AssignInteriorNearFieldSource(<ArgArray>)
Python Example	<pre> oDesign = oProject.SetActiveDesign("internal") oModule = oDesign.GetModule("BoundarySetup") oModule.AssignInteriorNearFieldSource(["NAME:ExtNFDData2", "Type:=" , "Incident", "ExternalDataFile:=" , "D:\\Ansoft\\Elliptical_EH.and", </pre>

	<pre>"SourceCoordSystem:=" , "Global"])</pre>

EditLatticePair

Modifies coupled Lattice Pair boundaries.

UI Access	Double-click on a lattice pair under Boundaries in the project history tree.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the lattice pair boundary to be edited.
	<BoundaryArray>	Array	Structured array. Array ("NAME:<BoundName>", "ReverseV:=", <boolean>, "PhaseDelay:=", <UseScanAngle InputPhaseDelay>, "Phi:=", <numdeg>, "Theta:=", <numdeg>, "Phase:=", <numdeg>)
Return Value	None.		

Python Syntax	EditLatticePair(<BoundaryName>, <BoundaryArray>)
Python Example	oModule.EditLatticePair("LatticePair1",

	<pre>["NAME:LatticePair1After", "ReverseV:=", False, "PhaseDelay:=", "UseScanAngle", "Phi:=", "10deg", "Theta:=", "0deg"])</pre>

EditLayeredImp

Modifies a layered impedance boundary.

UI Access	Double-click on a layered impedance under Boundaries in the project history tree.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the layered impedance boundary.
	<LayeredImpArray>	Array	Structured array.
			<pre>Array ("NAME:<BoundName>", "Frequency:=", <value>, "Roughness:=", <value>, "IsInternal:=", <bool>, "IsTwoSided:=", <bool>, "IsShellElement:=", <bool>, <LayersArray>, "InfGroundPlane:=", <boolean>)</pre>

	<LayersArray>	Array	Structured array. Array("NAME:Layers", <OneLayerArray>, <OneLayerArray>, ...)
	<OneLayerArray>	Array	Structured array. Array("NAME:<LayerName>", "LayerType:=", <LayerType>, "Thickness:=", <value>, "Material:=", <string>) Thickness Thickness of the layer. Should be specified for all layers except the last layer. Material Material assigned on the layer. For the last layer, do not specify a material if the LayerType is "PerfectE" or "PerfectH".
	<LayerName>	String	Specifies the layer number, such as "Layer1" or "Layer2"
	<LayerType>	String	Should be specified for the last layer only. Possible values: "Infinite", "PerfectE", or "PerfectH"
Return Value	None.		

Python Syntax	EditLayeredImp(<BoundaryName>, <LayeredImpArray>)
Python Example	oModule.EditLayeredImp("Layered1",

	<pre>["NAME:Layered1After", "Frequency:=", "10GHz", "Roughness:=", "0um", "IsTwoSided:=", True, "IsShellElement:=", True, ["NAME:Layers", ["NAME:Layer1", "Thickness:=", "1um", "Material:=", "vacuum"]], "InfGroundPlane:=", False])</pre>

EditLinkedImpedance

Edits a linked Impedance boundary.

UI Access	Double-click on a linked impedance under Boundaries in project history tree.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the linked impedance boundary to be edited.
	<LinkedImpArray>	Array	Structured array. <pre>Array ("NAME:<BoundName>", "UseInfiniteGroundPlane:=", <boolean>, "UseShellElement:=" , <boolean>, <LinkDataArray>)</pre>
	<LinkDataArray>	Array	Structured array. <pre>Array ("NAME:<LinkName>",</pre>

			<pre> "Project:=", <string file path>, "Product:=", <string product type>, "Design:=", <string linked source design name>, "Soln:=", <string linked source solution name>, <array solution parameters>, "ForceSourceToSolve:=", <boolean>, "PreservePartnerSoln:=" , <boolean>, "PathRelativeTo:=" , <string target project name> </pre>
Return Value	None.		

Python Syntax	<code>EditLinkedImpedance(<BoundaryName>, <LinkedImpArray>)</code>
Python Example	<pre> oModule.EditLinkedImpedance("Linked1", ["NAME:Linked1After", "UseInfiniteGroundPlane:=", True, "UseShellElement:=", True, ["NAME:XLink", "Project:=", "C://temp/linkedproject.aedt", "Product:=", "HFSS", "Design:=", "Source_Project_Solver", "Soln:=", "1000MHz : LastAdaptive", </pre>

	<pre>["NAME:Params", "xfactor:=", "1.2", "yfactor:=", "1.6"], "ForceSourceToSolve:=", True, "PreservePartnerSoln:=", False, "PathRelativeTo:=", "TargetProject"]])</pre>

EditLinkedRegion

Edits a Linked Region.

UI Access	N/A		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of linked region.
	<LinkedRegionArray>	Array	Structured array. <pre>Array("NAME:<New name>", "Type:=" , <string, one of "IE", "PO" or "SBR">, "IsLinkedRegion:=" , <boolean, true for linked region>)</pre>
Return Value	None.		

Python Syntax	EditLinkedRegion(<BoundaryName>, <LinkedRegionArray>)
Python Example	<pre>oModule.EditLinkedRegion("Linked1", ["NAME:Linked1After",</pre>

	<pre>"Type:=", "PO", "IsLinkedRegion:=", True])</pre>

EditLumpedPort

Modifies a lumped port.

UI Access	Double-click the excitation in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of lumped port excitation to be edited.
	<LumpedPortArray>	Array	Structured array. Array("NAME:<BoundName>", "RenormalizeAllTerminals:=", <boolean>, "DoDeembed:=", <boolean>, <ModesArray>, "ShowReporterFilter:=", <boolean>, "ReporterFilter:=", <array of boolean>, "Impedance:=" , <value>)
	<ModesArray>	Array	Structured array. Array("NAME:<ModesArrayName>",<OneModeArray>, <OneModeArray>,...)

	<code><OneModeArray></code>	Array	Structured array. <pre>Array("NAME:<ModeName>", "ModeNum:=", <integer>, "UseIntLine:=", <boolean>, <IntegrationLineArray>, "AlignmentGroup:=", <integer, group id>, "CharImp:=", <string, characteristic impedance>, "RenormImp:=" , <value, renormalize impedance to>)</pre>
	<code><IntegrationLineArray></code>	Array	Structured array. <pre>Array("NAME:<LineName>", "Coordinate System:=", <string, relative coordinate system>, "Start:=" , <array, start location coordinates>, "End:=" , <array, end location coordinates>)</pre>
Return Value	None.		

Python Syntax	<code>EditLumpedPort(<BoundaryName>, <LumpedPortArray>)</code>
Python Example	<pre>oModule.EditLumpedPort("LumpedPort1", ["NAME:LumpedPort1After", "DoDeembed:=", False, "RenormalizeAllTerminals:=", True,</pre>

```
[ "NAME:Modes",  
    [ "NAME:Model",  
        "ModeNum:=", 1,  
        "UseIntLine:=", True,  
        [ "NAME:IntLine",  
            "Coordinate System:=", "Global",  
            "Start:=", [ "-0.4mm", "-1mm", "0.8mm" ],  
            "End:=" , [ "-0.3mm", "-1.2mm", "0.8mm" ]  
        ],  
        "AlignmentGroup:=", 0,  
        "CharImp:=", "Zpi",  
        "RenormImp:=", "50ohm" ] ],  
    "ShowReporterFilter:=", False,  
    "ReporterFilter:=", [True],  
    "Impedance:=", "50ohm"  
]
```

EditLumpedRLC

Modifies a lumped RLC boundary.

UI Access	Double-click the boundary in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the boundary to be edited.
	<LumpedRLCArray>	Array	Structured array. <pre>Array ("NAME:<NewBoundName>", "RLC Type:=", <"Parallel" "Serial" >, "UseResist:=", <boolean>, "Resistance:=", <value>, "UseInduct:=", <boolean>, "Inductance:=", <value>, "UseCap:=", <boolean>, "Capacitance:=", <value>, <CurrentLineArray>)</pre>
	<CurrentLineArray>	Array	Structured array. <pre>Array ("NAME:CurrentLine", "Start:=", <LineEndPoint>, "End:=", <LineEndPoint>)</pre>
Return Value	None.		

Python Syntax	EditLumpedRLC(<BoundaryName>, <LumpedRLCArray>)
Python Example	oModule.AssignLumpedRLC ("LumpRLC1",

	<pre>["NAME:LumpRLC1After", ["NAME:CurrentLine", "Start:=", ["0.15mm", "-0.2mm", "0mm"], "End:=", ["0.15mm", "0.6mm", "0mm"]], "RLC Type:=", "Parallel", "UseResist:=", True, "Resistance:=", "100ohm", "UseInduct:=", True, "Inductance:=", "10nH", "UseCap:=", True, "Capacitance:=", "10pF"])</pre>

EditMagneticBias

Modifies a magnetic bias excitation.

UI Access	Double-click on the magnetic bias under Excitations in the project tree.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the magnetic bias excitation to be edited.
	<MagneticBiasArray>	Array	Structured array. Array ("NAME:<NewBoundName>", "IsUniformBias:=", <boolean> ,

			<pre>"Bias:=", <value>, "XAngle:=", <value>, "YAngle:=", <value>, "ZAngle:=", <value>, "Project:=", <string>) IsUniformBias</pre> If true, supply the Bias, XAngle, YAngle, and ZAngle parameters. If false, supply the Project parameter.
Return Value	None.		

Python Syntax	<code>EditMagneticBias(<BoundaryName>, <MagneticBiasArray>)</code>
Python Example	<pre>oModule.EditMagneticBias("MagBias1", ["NAME:MagBias1After", "IsUniformBias:=", True, "Bias:=", "1", "XAngle:=", "10deg", "YAngle:=", "10deg", "ZAngle:=", "10deg"])</pre>

EditMultipactionChargeRegion

Modifies settings for a Multipaction Charge Region.

UI Access	Double-click on the excitation in project tree to edit its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the multipaction charge region to be edited.
	<ChargeRegionArray>	Array	Structured array. Array("NAME:MultipactionChargeRegion1", "NumParticles:=", "<integer, number of particles>", "ParticleCharge:=", "<num><unit>", "ParticleMass:=", "<num><unit>", "Vx:=", "<num><unit>", "Vy:=", "<num><unit>", "Vz:=", "<num><unit>")
Return Value	None.		

Python Syntax	EditMultipactionChargeRegion (<BoundaryName>, <ChargeRegionArray>)
Python Example	<pre>oModule.EditMultipactionChargeRegion("MultipactionChargeRegion1", ["NAME:MultipactionChargeRegion1After", "NumParticles:=", "100",</pre>

	<pre> "ParticleCharge:=", "-1.60217662e-19Coulomb", "ParticleMass:=", "9.10938356e-31kg", "Vx:=", "0.1m_per_sec", "Vy:=", "0.3m_per_sec", "Vz:=", "0.15m_per_sec"])</pre>

EditMultipactionDCBias

Edits settings for a multipaction DC bias boundary.

UI Access	Double-click on the excitation in the project tree to edit its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the multipaction DC bias to be edited.
	<DCBiasArray>	Array	Structured array. <pre> Array (NAME:MultipactionDCBias1", "UniformE:=", <boolean>, "Ex:=", "<value><unit>", "Ey:=", "<value><unit>", "Ez:=", "<value><unit>", <LinkedField>, "UniformH:=", <boolean>, "Hx:=", "<value><unit>", "Hy:=", "<value><unit>,"</pre>

			<code>"Hz:=", "<value><unit>",</code> <code><LinkedField>)</code> UniformE or Uniform H: • True - provide filed values. • False - provide field through linked Maxwell analysis.
	<code><LinkedField></code>	Array	Structured array. <code>Array("NAME:<EField HField>",</code> <code>"Project:=", <string, path to linked project</code> <code>file>,</code> <code>"Product:=", "Maxwell",</code> <code>"Design:=", <string, name of source design>,</code> <code>"Soln:=", <string, name of linked solution>,</code> <code><Parameters for linked solution>,</code> <code>"ForceSourceToSolve:=", <boolean>,</code> <code>"PreservePartnerSoln:=", <boolean>,</code> <code>"PathRelativeTo:=", "TargetProject")</code>
Return Value	None.		

Python Syntax	<code>EditMultipactionDCBias(<BoundaryName>, <DCBiasArray>)</code>
Python Example	<code>oModule.EditMultipactionDCBias("MultipactionDCBias1",</code>

```

["NAME:MultipactionDCBias1After",
"UniformE:=", False,
["NAME:EField",
    "Project:=", "C://projects/Maxwell/HallSensor.aedt",
    "Product:=", "Maxwell",
    "Design:=", "3_Maxwell3D",
    "Soln:=", "Setup1 : Transient",
    ["NAME:Params",
        "angle:=", "0deg",
        "cell_spacing:=", "2.5mm",
        "die_thickness:=", "2mm",
        "gap:=", "1.5mm",
        "magnet_center_y:=", "0mm",
        "magnet_center_z:=", "0mm",
        "magnet_x:=", "3mm",
        "magnet_y:=", "6mm",
        "magnet_z:=", "5mm",
        "move_x:=", "-1.5mm",
        "sensor_offset_x:=", "0mm",
        "sensor_offset_y:=", "0mm",
        "sensor_offset_z:=", "0mm",

```

	<pre> "sensor_pitch:=", "0deg", "sensor_roll:=", "0deg", "sensor_yaw:=", "0deg", "target_dia:=", "80mm"], "ForceSourceToSolve:=", False, "PreservePartnerSoln:=", False, "PathRelativeTo:=", "TargetProject"], "UniformH:=", True, "Hx:=", "0A_per_m", "Hy:=", "0A_per_m", "Hx:=", "0A_per_m"])</pre>

EditMultipactionSEE

Edits a Secondary Electron Emission (SEE) boundary settings.

UI Access	Double-click on the boundary in the project tree to edit its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the boundary to be edited.

	<code><SEERray></code>	Array	Structured array. <pre> Array("NAME:<NewSEERName>", "AlphaMax:=", <value>, "Alpha0:=", <value>, "E0:=", <value>, "E1:=", <value>, "E2:=", <value>, "Em:=", <value>, "DielectricSurface:=", <boolean>)</pre>
Return Value	None.		

Python Syntax	<code>EditMultipactionSEE(<BoundaryName>, <SEERray>)</code>		
Python Example	<pre> oModule.EditMultipactionSEE("SEE1", ["NAME:SEE1After", "AlphaMax:=", "2.25", "Alpha0:=", "0", "E0:=", "12.5", "E1:=", "25", "E2:=", "5000", "Em:=", "175", "DielectricSurface:=", false])</pre>		

EditRFDISchargeDCBias

Edits settings for an RF discharge DC bias excitation.

UI Access	Double-click on the excitation in the project tree to edit its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the excitation to be edited.
	<DCBiasParameters>	Array	Structured array. Array("NAME:<DCBiasName>", "UniformH:=", <boolean>, "Hx:=", "<real>A_per_m", "Hy:=", "<real>A_per_m", "Hz:=", "<real>A_per_m")
Return Value	None.		

Python Syntax	EditRFDISchargeDCBias(<BoundaryName>, <DCBiasParameters>)
Python Example	<pre>oModule.EditRFDISchargeDCBias("DCBias1", ["NAME:RFDISchargeDCBias1", "UniformH:=", True, "Hx:=", "795774.71546A_per_m",</pre>

	<pre> "Hy:=", "0A_per_m", "Hz:=", "0A_per_m"]) </pre>

EditPerfectE

Modifies a perfect E boundary.

UI Access	Double-click on the boundary in project tree to edit its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the boundary to be edited.
	<PerfectEArray>	Array	Structured array. <pre> Array("NAME:<NewBoundName>", "InfGroundPlane:=", <boolean>) </pre>
Return Value	None.		

Python Syntax	<pre> EditPerfectE(<BoundaryName>, <PerfectEArray>) </pre>
Python Example	<pre> oModule.EditPerfectE("PerfE1", ["NAME:PerfE1After", "InfGroundPlane:=", False,]) </pre>

EditPerfectH

Modifies a perfect H boundary.

UI Access	Double-click on the boundary in the project tree to edit its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the boundary to be edited.
	<PerfectHArray>	Array	Structured array. <code>Array ("NAME:<NewBoundName>")</code>
Return Value	None.		

Python Syntax	<code>EditPerfectH(<BoundaryName>, <PerfectHArray>)</code>
Python Example	<pre>oModule.EditPerfectH("PerfH1", ["NAME:PerfH1After"])</pre>

EditRadiation

Modifies a radiation boundary.

UI Access	Double-click the boundary in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the boundary to be edited.
	<RadiationArray>	Array	Structured array.

			<pre> Array("NAME:<BoundName>", "IsIncidentField:=", <boolean>, "IsEnforcedHField:=", <boolean>, "IsEnforcedEField:=", <boolean>, "IsFssReference:=", <boolean>, "IsForPML:=", <boolean>, "UseAdaptiveIE:=", <boolean>, "IncludeInPostproc:=", <boolean>) </pre>
Return Value	None.		

Python Syntax	<code>EditRadiation(<BoundaryName>, <RadiationArray>)</code>
Python Example	<pre> oModule.EditRadiation("Rad1", ["NAME:Rad1After", "IsIncidentField:=", True, "IsEnforcedField:=", False, "IsFssReference:=", False, "IsForPML:=", False, "UseAdaptiveIE:=", False, "IncludeInPostproc:=", True]) </pre>

EditSymmetry

Modifies a symmetry boundary.

UI Access	Double-click the symmetry boundary in the project tree to edit its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the symmetry boundary to be edited.
	<SymmetryArray>	Array	Structured array. Array("NAME:<BoundName>", "IsPerfectE:=", <boolean>)
Return Value	None.		

Python Syntax	EditSymmetry(<BoundaryName>, <SymmetryArray>)
Python Example	<pre>oModule.EditSymmetry("Sym1", ["NAME:Sym1After", "IsPerfectE:=", True])</pre>

EditTerminal

Modifies properties of a terminal

UI Access	Edit Properties for a selected terminal.		
Parameters	Name	Type	Description
	<TerminalName>	String	Name of the terminal to be edited.
	<TerminalArray>	Array	Structured array. <pre>Array("NAME: <TerminalName>", "ParentBndID:=", "<PortName>", "TerminalResistance:=", "<Value and units of res- istance>")</pre>
Return Value	None.		

Python Syntax	EditTerminal (<TerminalName>, <TerminalArray>)
Python Example	<pre>oModule.EditTerminal("Rectangle2_T1", ["NAME:Rectangle2_T1", "ParentBndID:=", "WavePort1", "TerminalResistance:=", "75ohm"])</pre>

EditVoltage

Modifies a voltage source.

UI Access	Double-click the excitation in the project tree to modify its settings.		
Parameters	Name	Type	Description

	<BoundaryName>	String	Name of the voltage source to be edited.
	<VoltageArray>	Array	Structured array. <pre>Array("NAME:<BoundName>", "Voltage:=", <value>, <DirectionArray>)</pre>
	<DirectionArray>	Array	Structured array. <pre>Array("NAME:Direction", "Start:=", <LineEndPoint>, "End:=", <LineEndPoint>)</pre>
Return Value	None.		

Python Syntax	EditVoltage(<BoundaryName>, <VoltageArray>)
Python Example	<pre>oModule.EditVoltage("Voltage1", ["NAME:Voltage1After", "Voltage:=", "1000mV", ["NAME:Direction", "Start:=", [-0.4, -1.2, 0], "End:=", [-1.4, -1.2, 0]])</pre>

EditVoltageDrop

Use: Edits a voltage drop excitation.

Command: Double-click the excitation in the project tree to edit it.

Syntax: EditVoltageDrop <BoundName> <VoltageDropArray>

Return Value: None

EditWavePort

Modifies a wave port.

UI Access	Double-click the excitation in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the wave port to be edited.
	<WavePortArray>	Array	Structured array.
			<pre> Array ("NAME:<BoundName>", "NumModes:=", <integer>, "PolarizeEField:=", <boolean>, "DoDeembed:=", <boolean>, "DeembedDist:=", <value>, "DoRenorm:=", <boolean>, "RenormValue:=", <value>, <ModesArray>, "TerminalIDList:=", <TerminalsArray>)</pre>

			NumModes Number of modes for modal problems. Number of terminals for terminal problems.
	<ModesArray>	Array	Structured array. <code>Array("NAME:Modes", <OneModeArray>, <OneModeArray>, ...)</code>
	<OneModeArray>	Array	Structured array. <code>Array("NAME:<ModeName>", "ModeNum:=", <integer>, "UseIntLine:=", <boolean>, <IntLineArray>)</code>
	<IntLineArray>	Array	Structured array. <code>Array("NAME:IntLine", "Start:=", <LineEndPoint>, "End:=", <LineEndPoint>, "CharImp:=", <string, Characteristic impedance of the mode. Possible values are "Zpi", "Zpv", or "Zvi">)</code>
Return Value	None.		

Python Syntax	<code>EditWavePort(<BoundaryName>, <WavePortArray>)</code>

Python Example	<pre>oModule.EditWavePort("WavePort1", ["NAME:WavePort1After", "NumModes:=", 2, "PolarizeEField:=", False, "DoDeembed:=", True, "DeembedDist:=", "10mil", "DoRenorm:=", True, "RenormValue:=", "50Ohm", ["NAME:Modes", ["NAME:Model", "ModeNum:=", 1, "UseIntLine:=", True, ["NAME:IntLine", "Start:=", [-0.4, -1.2, 0], "End:=", [-1.4, 0.4, 0]], "CharImp:=", "Zpi"), ["NAME:Mode2", "ModeNum:=", 2, "UseIntLine:=", False]]])</pre>

LumpedPortToCircuitPort

Converts a lumped port to a circuit port for a driven terminal or driven modal design in HFSS.

UI Access	Right-click on a lumped port excitation in the project tree, then select Convert to Circuit Port .		
Parameters	Name	Type	Description
	<PortName>	String	Name of the lumped port to be converted.
Return Value	None.		

Python Syntax	LumpedPortToCircuitPort(<PortName>)
Python Example	<code>oModule.LumpedPortToCircuitPort("Port1")</code>

SetAllHybridRegionsToOneWayCoupled

Specifies one-way coupling for all hybrid regions.

UI Access	Right-click Hybrid Regions > Set Regions > All Regions Are One Way Coupled .
Parameters	None.
Return Value	None.

Python Syntax	<code>SetAllHybridRegionsToOneWayCoupled()</code>
Python Example	<code>oModule.SetAllHybridRegionsToOneWayCoupled()</code>

SetAllHybridRegionsToTwoWayCoupled

Specifies two-way coupling for all hybrid regions.

UI Access	Right-click Hybrid Regions > Set Regions > All Regions Are Two Way Coupled .
Parameters	None.
Return Value	None.

Python Syntax	<code>SetAllHybridRegionsToTwoWayCoupled()</code>
Python Example	<code>oModule.SetAllHybridRegionsToTwoWayCoupled()</code>

SetHybridRegionCoupledGroup

Use: To set coupling for hybrid regions.

Command: **HFSS>HybridRegions>Set Coupling**

Syntax: `SetHybridRegionCoupledGroup <value>`

Return Value: None

Parameters: <value>

Type: <string>

"OneWayCoupled" or "TwoWayCoupled" for all regions or "Advanced", Array("One Way:= <hybridregionname>, Array(Two Way:=", Array("<hybridregionname>" ,)))

Example:

Setting All Hybrid Regions to One Way Coupled

```
oProject = oDesktop.SetActiveProject("Project35")
oDesign = oProject.SetActiveDesign("HFSSDesign1")
oModule = oDesign.GetModule("BoundarySetup")
oModule.SetHybridRegionCoupledGroup "OneWayCoupled"
```

Setting All Hybrid Regions to Two Way Coupled

```
oProject = oDesktop.SetActiveProject("Project35")
oDesign = oProject.SetActiveDesign("HFSSDesign1")
oModule = oDesign.GetModule("BoundarySetup")
oModule.SetHybridRegionCoupledGroup "TwoWayCoupled"
```

Setting Hybrid Region Groupings

```
oProject = oDesktop.SetActiveProject("Project35")
oDesign = oProject.SetActiveDesign("HFSSDesign1")
oModule = oDesign.GetModule("BoundarySetup")
oModule.SetHybridRegionCoupledGroup "Advanced", ["One Way:=", ["Two Way:=",
["Hybrid1", "Hybrid2"]]]
```

SetHybridRegionsCoupling

Sets coupling for hybrid regions.

UI Access	Right-click Hybrid Regions > Set Couling > Advanced .		
Parameters	Name	Type	Description
	<CouplingArray>	Array	Structured array. <pre>Array("One Way:=", <array of region names>, "Two Way:=", <array of region names>) </pre> Note: At least two regions must be specified in a group.
Return Value	None		

Python Syntax	SetHybridRegionsCoupling(<CouplingArray>)
Python Example	<pre>oModule.SetHybridRegionsCoupling(["One Way:=", ["FE-BI1", "FE-BI2"], "Two Way:=", ["FE-BI3", "FE-BI4", "FE-BI5"]]) </pre>

SetScatteredFieldFormulation

Sets incident wave to scattered field formulation. **Note:** Incident field formulation is only applicable in a driven terminal/modal design with incident wave.

UI Access	Right-click on Excitations , then select Set Incident Field Formulation > Scattered .
Parameters	None.
Return Value	None.

Python Syntax	SetScatteredFieldFormulation()
Python Example	<code>oModule.SetScatteredFieldFormulation()</code>

SetSBRCreepingWaveSettings

Sets creeping wave settings for SBR+ solutions.

UI Access	Right-click on Hybrid Regions , then select Creeping Wave Settings...		
Parameters	Name	Type	Description
	<CWArray>	Array	Structured array. Array("NAME:SBRCreepingWaveSettings", "CWRaySampleDensity:=" , <value>, "CWRayCutoffDb:=" , <value>, "CWCurvatureSensitivity:=" , <value>,

	"CWAngularRayInterval:=", <value>)
Return Value	None.

Python Syntax	SetSBRCreepingWaveSettings(<CWArray>)
Python Example	<pre>oModule.SetSBRCreepingWaveSettings(["NAME:SBRCreepingWaveSettings", "CWRaySampleDensity:=" , 10, "CWRayCutoffDb:=" , 40, "CWCurvatureSensitivity:=", 50, "CWAngularRayInterval:=", 2])</pre>

SetSBRTxRxSettings

Assigns Transmit and Receive assignments for antennas in SBR+ solutions.

UI Access	Right-click on Excitations > Select Tx/Rx...		
Parameters	Name	Type	Description
	<TxRxArray>	Array	Structured array. Array("NAME:SBRTxRxSettings", <AssignmentList>, <AssignmentList>,...)
	<AssignmentList>	Array	Structured array.

	<table><tr><td></td><td></td><td>Array("NAME:<ListName>", "Tx Antenna:=", <string, antenna components>, "Rx Antennas:=", <string, antenna components>)</td></tr></table>			Array("NAME:<ListName>", "Tx Antenna:=", <string, antenna components>, "Rx Antennas:=", <string, antenna components>)
		Array("NAME:<ListName>", "Tx Antenna:=", <string, antenna components>, "Rx Antennas:=", <string, antenna components>)		
Return Value	None.			

Python Syntax	SetSBRTxRxSettings(<TxRxArray>)
Python Example	<pre>oModule.SetSBRTxRxSettings(["NAME:SBRTxRxSettings", ["NAME:Tx/Rx List 0", "Tx Antenna:=", "cHorn1_1_p1", "Rx Antennas:=", "Beam1_1_p1,pHorn1_1_p1,sDipole1_1_p1"], ["NAME:Tx/Rx List 1", "Tx Antenna:=", "Beam1_1_p1", "Rx Antennas:=", "Beam1_1_p1,pHorn1_1_p1,sDipole1_1_p1"], []</pre>

	<pre> "NAME:Tx/Rx List 2", "Tx Antenna:=", "sDipole1_1_p1", "Rx Antennas:=", "Beam1_1_p1,pHorn1_1_p1,sDipole1_1_p1"]]) </pre>

SetTerminalReferenceImpedances

Sets the reference impedance for all terminals within a specified port.

UI Access	HFSS > Excitations > Set Terminal Renormalizing Impedances...		
Parameters	Name	Type	Description
	<RefImpValue>	String	Impedance value with unit.
	<PortName>	String	Optional. Name of the port.
	<RenormalizeTerminals>	Boolean	Optional. • True - renormalize terminals. • False - do not renormalize terminals.
Return Value	None.		

Python Syntax	SetTerminalReferenceImpedances(<RefImpValue>, <PortName>, <RenormalizeTerminals>)
Python Example	oModule.SetTerminalReferenceImpedances("50ohm", "", False)

SetTotalFieldFormulation

Sets incident wave to total field formulation. **Note:** Incident field formulation is only applicable in a driven terminal/modal design with incident wave.

UI Access	Right-click on Excitations , then select Set Incident Field Formulation > Total .
Parameters	None.
Return Value	None.

Python Syntax	SetTotalFieldFormulation()
Python Example	<code>oModule.SetTotalFieldFormulation()</code>

SwapCircuitPortDirection

Swaps the direction of a circuit port.

UI Access	N/A		
Parameters	Name	Type	Description
	<PortName>	String	Name of specified port.
Return Value	None.		

Python Syntax	SwapCircuitPortDirection(<PortName>)

Python Example	<code>oModule.SwapCircuitPortDirection("1")</code>

SwapLatticePair

Swaps the faces defined in a lattice pair.

UI Access	Right-click on a lattice pair in the project tree, then select Swap Faces .		
Parameters	Name	Type	Description
	<LatticePairName>	String	Name of specified lattice pair boundary to be edited.
Return Value	None.		

Python Syntax	<code>SwapLatticePair(<LatticePairName>)</code>
Python Example	<code>oModule.SwapLatticePair("LatticePair1")</code>

Script Commands for Creating and Modifying PMLs

Following are script commands for creating and modifying PMLs that are recognized by the **BoundarySetup** module.

The **PML Setup** wizard allows you to set up one or more PMLs in the model. There is not a single 'Create PML' or 'Edit PML' command that represents the work performed by the **PML Setup** wizard. Instead, a series of geometry and material commands are executed. As a result, when a script is being recorded, a series of geometry and material creation commands is what is actually recorded in the script for a PML setup. This is followed by a script command stating that PMLs have been set up or modified.

[CreatePML](#)

[ModifyPMLGroup](#)

[PMLGroupCreated](#)

[PMLGroupModified](#)

[RecalculatePMLMaterial](#)

CreatePML

Set up a perfectly matched layer (PML) boundary.

UI Access	HFSS > Boundaries > PML Setup Wizard...		
Parameters	Name	Type	Description
	<PMLArray>	Array	Structured array. For manually created PMLs: <pre>Array("NAME:PMLCreationSettings", "UserDrawnGroup:=", true, "PMLObj:=", <string, name of the object to use as the PML cover.>, "BaseObj:=", <string, name of the base object touching the PML cover object>, "Thickness:=", <value>, "Orientation:=", <string, orientation of the PML. Poss- ible values are: "XAxis", "YAxis", and "ZAxis">, "RadDist:=", <value>, "UseFreq:=", <boolean, If true, provide the MinFreq parameter. If false, provide the MinBeta parameter.>, "MinFreq:=", <value>,</pre>

			<pre>"MinBeta:=", <double>) For automatically created PMLs: Array("NAME:PMLCreationSettings", "UserDrawnGroup:=", false, "PMLFaces:=", <AssignmentFaces>, "CreateJoiningObjs:=", <bool>, "Thickness:=", <value>, "RadDist:=", <value>, "UseFreq:=", <boolean, If true, provide the MinFreq parameter. If false, provide the MinBeta parameter.>, "MinFreq:=", <value>, "MinBeta:=", <double>)</pre>
Return Value	None.		

Python Syntax	CreatePML(<PMLArray>)
Python Example	<pre>oModule.CreatePML(["NAME:PMLCreationSettings", "UserDrawnGroup:=", True, "PMLFaces:=", [120], "Thickness:=", "1mm", "CreateJoiningObjs:=", False,</pre>

	<pre>"PMLObj:=", 6, "BaseObj:=", 15, "Orientation:=", "ZAxis", "UseFreq:=", True, "MinFreq:=", "1GHz", "MinBeta:=", 20, "RadDist:=", "0.3mm" l)</pre>

ModifyPMLGroup

Modifies a PML group.

UI Access	N/A		
Parameters	Name	Type	Description
	<PMLGroupArray>	Array	Structured array. <pre>Array("NAME:<GroupName>", "RadDist:=", <value>, "UseFreq:=", <boolean>, "MinFreq:=", <value>, "MinBeta:=", <double>)</pre> UseFreq

			If true, provide the MinFreq argument. If false, provide the MinBeta argument.
Return Value	None.		

Python Syntax	ModifyPMLGroup(<PMLGroupArray>)
Python Example	<pre>oModule.ModifyPMLGroup(["NAME:PMLGroup1", "RadDist:=", "1.166666667mm", "UseFreq:=", False, "MinBeta:=", 2])</pre>

PMLGroupCreated

Command added by HFSS after a PML has been created. It is not responsible for creating the PML objects and materials. It just contains the information needed by the **PML Setup** wizard for future modification of the PML. This script command is not intended to be modified by you. Removing this command from the script will prevent future modification of the PML through the user interface after the script is played back.

UI Access	N/A		
Parameters	Name	Type	Description
	<PMLArray>	Array	Array represents the created PML group.
Return Value	None.		

Python Syntax	PMLGroupCreated(<PMLArray>)
Python Example	<pre>oModule.PMLGroupCreated(["NAME:PMLCreationSettings", "UserDrawnGroup:=", True, "PMLFaces:=", [120], "Thickness:=", "1mm", "CreateJoiningObjs:=", False, "PMLObj:=", 6, "BaseObj:=", 15, "Orientation:=", "ZAxis", "UseFreq:=", True, "MinFreq:=", "1GHz", "MinBeta:=", 20, "RadDist:=", "0.3mm"])</pre>

PMLGroupModified

Modifies a defined PML Group.

UI Access	Click Update in the PML Setup wizard.		
Parameters	Name	Type	Description
	<PMLGroupArray>	Array	Structured array. <pre>Array("NAME:<GroupName>", "RadDist:=", <value>, "UseFreq:=", <boolean>, "MinFreq:=", <value>, "MinBeta:=", <double>)</pre> UseFreq If true, provide the MinFreq argument. If false, provide the MinBeta argument.
Return Value	None.		

Python Syntax	PMLGroupModified(<PMLGroupArray>)
Python Example	<pre>oModule.PMLGroupModified(["NAME:PMLGroup1", "RadDist:=", "2.008333333333333in", "UseFreq:=", True, "MinFreq:=", "2GHz", ["NAME:ProjectMaterials"], ["NAME:InternalPrivateMaterials"]</pre>

	])

RecalculatePMLMaterials

Updates the PML materials to match the current state of the **PML Setup** wizard data.

UI Access	Click Recalculate Materials in the PML Setup wizard.
Parameters	None.
Return Value	None.

Python Syntax	RecalculatePMLMaterials()
Python Example	<code>oModule.RecalculatePMLMaterials()</code>

Script Commands for Creating and Modifying Boundaries in 2D Extractor

Following are script commands for creating and modifying boundaries that are recognized by the "BoundarySetup" module. In the following commands, all named data can be included/excluded as desired and may appear in any order.

[AutoAssignSignals](#)

[AssignSingleSignalLine](#)

[AssignSingleNonIdealGround](#)

[AssignSingleReferenceGround](#)

[AssignSingleSurfaceGround](#)

[AssignSingleFloatingLine](#)

[AssignMultiFloatingLine](#)

[AssignMultiSignalLine](#)

[AssignMultiNonIdealGround](#)

[ToggleConductor](#)

[EditSignalLine](#)

[EditNonIdealGround](#)

[EditReferenceGround](#)

[EditSurfaceGround](#)

[EditFloatingLine](#)

[GetNumExcitations \(2D Extractor\)](#)

[GetExcitationAssignment \(2D Extractor\)](#)

[GetExcitations \(2D Extractor\)](#)

[AssignFiniteConductivity](#)

[EditFiniteConductivity](#)

AutoAssignSignals

Use: Automatically assigns conducting objects to be "Signal" conductor.

Command: **2D Extractor>Conductor>Auto Assign Signals**

Syntax: AutoAssignSignals

Return Value: None

Command: oModule.AutoAssignSignals

AssignSingleSignalLine

Use: Assigns a single "Signal Line" on an object.

Command: **2D Extractor>Conductor>Assign>Signal Line**

Syntax: AssignSingleSignalLine <AssignmentParameters>

Return Value: None

Parameters: <AssignmentParameters>

```
Array("NAME:<SourceName>", "Objects:=", <AssignmentObjects>)
```

```
"SolveOptions:=<SolveOptions>", "Thickness:=<Thickness>")
```

```
<SourceName>
```

```
Type:<String>
```

```
Name of the conductor
```

```
<AssignmentObjects>
```

```
Type:<String>
```

```
Name of the object or body in geometry.
```

```
<SolveOptions>
```

```
Type: <String>
```

```
Value: one of the following - "SolveInside", "SolveOnBoundary", "Automatic".
```

```
<Thickness>
```

Type: String

Value: a double value with units of length.

AssignSingleNonIdealGround

Use: Assigns a single "NonIdealGround" on an object.

Command: **2D Extractor>Conductor>Assign>Non Ideal Ground**

Syntax: AssignSingleNonIdealGround <AssignmentParameters>

Return Value: None

Parameters: <AssignmentParameters>

Array("NAME:<SourceName>", "Objects:=", <AssignmentObjects>)

"SolveOptions:=<SolveOptions>", "Thickness:=<Thickness>")

<SourceName>

Type:<String>

Name of the conductor

<AssignmentObjects>

Type:<String>

Name of the object or body in geometry.

<SolveOptions>

Type: <String>

Value: one of the following - "SolveInside", "SolveOnBoundary", "Automatic".

<Thickness>

Type: String

Value: a double value with units of length.

AssignSingleReferenceGround

Use: Assigns a single "Reference Ground" on an object.

Command: **2D Extractor>Conductor>Assign>Reference Ground**

Syntax: AssignSingleReferenceGround <AssignmentParameters>

Return Value: None

Parameters: <AssignmentParameters>

```
Array("NAME:<SourceName>", "Objects:=", <AssignmentObjects>)
```

```
"SolveOptions:=<SolveOptions>", "Thickness:=<Thickness>")
```

```
<SourceName>
```

```
Type:<String>
```

```
Name of the conductor
```

```
<AssignmentObjects>
```

```
Type:<String>
```

```
Name of the object or body in geometry.
```

```
<SolveOptions>
```

```
Type: <String>
```

```
Value: one of the following - "SolveInside", "SolveOnBoundary", "Automatic".
```

```
<Thickness>
```

```
Type: String
```


Value: a double value with units of length.

AssignSingleSurfaceGround

Assigns a single "SurfaceGround" on an object.

Command: 2D Extractor>Conductor>Assign>Surface Ground

Syntax: AssignSingleSurfaceGround <AssignmentParameters>

Return Value: None

Parameters: <AssignmentParameters>

Array("NAME:<SourceName>", "Objects:=", <AssignmentObjects>)

"SolveOptions:=<SolveOptions>", "Thickness:=<Thickness>")

<SourceName>

Type:<String>

Name of the conductor

<AssignmentObjects>

Type:<String>

Name of the object or body in geometry.

<SolveOptions>

Type: <String>

Value: one of the following - "SolveInside", "SolveOnBoundary", "Automatic".

<Thickness>

Type: String

Value: a double value with units of length.

AssignSingleFloatingLine

Use: Assigns a single "FloatingLine" on an object.

Command: **2D Extractor>Conductor>Assign>Floating Line**

Syntax: AssignSingleFloatingLine <AssignmentParameters>

Return Value: None

Parameters: <AssignmentParameters>

```
Array("NAME:<SourceName>", "Objects:=", <AssignmentObjects>)
```

```
"SolveOptions:=<SolveOptions>", "Thickness:=<Thickness>")
```

```
<SourceName>
```

```
    Type:<String>
```

```
    Name of the conductor
```

```
<AssignmentObjects>
```

```
    Type:<String>
```

```
    Name of the object or body in geometry.
```

```
<SolveOptions>
```

```
    Type: <String>
```

```
    Value: one of the following - "SolveInside", "SolveOnBoundary", "Automatic".
```

```
<Thickness>
```

```
    Type: String
```

```
    Value: a double value with units of length.
```

AssignMultiFloatingLine

Use: Assigns multiple "Floating Line" on selected objects (each per object).

Command: Click **2D Extractor>Conductor>Assign>Floating Line**

Syntax: AssignMultiFloatingLine <MultiAssignmentParameters>

Return Value: None

Parameters: <MultiAssignmentParameters>

 Array(<ConductorName>,<ConductorName>..), <AssignmentParameters>

<ConductorName>

 Type:<String>

 Name of the assigned conductors.

<AssignmentParameters>

 Array("NAME:<SourceName>", "Objects:=", <AssignmentObjects>)

 "SolveOptions:=<SolveOptions>", "Thickness:=<Thickness>")

<SourceName>

 Type:<String>

 Name of the conductor

<AssignmentObjects>

 Type:<String>

 Name of the object or body in geometry.

<SolveOptions>

 Type: <String>

Value: one of the following - "SolveInside", "SolveOnBoundary", "Automatic".

<Thickness>

Type: String

Value: a double value with units of length.

AssignMultiSignalLine

Use: Assigns multiple "Signal Line" on selected objects (each per object).

Command: **2D Extractor>Conductor>Assign>Signal Line**

Syntax: AssignMultiSignalLine <MultiAssignmentParameters>

Return Value: None

Parameters: <MultiAssignmentParameters>

Array(<ConductorName>,<ConductorName>..), <AssignmentParameters>

<ConductorName>

Type:<String>

Name of the assigned conductors.

<AssignmentParameters>

Array("NAME:<SourceName>", "Objects:=", <AssignmentObjects>)

"SolveOptions:=<SolveOptions>", "Thickness:=<Thickness>")

<SourceName>

Type:<String>

Name of the conductor

<AssignmentObjects>

Type:<String>

Name of the object or body in geometry.

<SolveOptions>

Type: <String>

Value: one of the following - "SolveInside", "SolveOnBoundary", "Automatic".

<Thickness>

Type: String

Value: a double value with units of length.

AssignMultiNonIdealGround

Use: Assigns multiple "Non Ideal Ground" on selected objects (each per object).

Command: **2D Extractor>Conductor>Assign>Non Ideal Ground**

Syntax: AssignMultiNonIdealGround <MultiAssignmentParameters>

Return Value: None

Parameters: <MultiAssignmentParameters>

Array(<ConductorName>,<ConductorName>..), <AssignmentParameters>

<ConductorName>

Type:<String>

Name of the assigned conductors.

<AssignmentParameters>

Array("NAME:<SourceName>", "Objects:=", <AssignmentObjects>)

```
"SolveOptions:=<SolveOptions>", "Thickness:=<Thickness>")  
  
<SourceName>  
    Type:<String>  
    Name of the conductor  
  
<AssignmentObjects>  
    Type:<String>  
    Name of the object or body in geometry.  
  
<SolveOptions>  
    Type: <String>  
    Value: one of the following - "SolveInside", "SolveOnBoundary", "Automatic".  
  
<Thickness>  
    Type: String  
    Value: a double value with units of length.
```

ToggleConductor

Use: Toggles between one conductor to other.

Command: Click a conductor in the project tree, and then click **Toggle** on the shortcut menu.

Syntax: ToggleConductor <TerminalName>, <NewType>

Return Value: None

Parameters: <ConductorName>

```
Type: <string>
```

Conductor name that is selected.

<NewType>

Type: <String>

New type of conductor to be toggled.

Example: oModule.ToggleConductor "Rectangle5", "ReferenceGround"

EditSignalLine

Use: Edits the properties of a signal line conductor.

Command: Double-click a conductor.

Syntax: EditSignalLine <ConductorName> , <ConductorParameters>

Return Value: None

Parameters: <ConductorName>

Type: <string>

Conductor name that is selected.

<ConductorParameters>

Array(("Name:="<NewName>", "SolveOptions:="<SolveOptions>", "Thickness:="<Thickness>"))

<SolveOptions>

Type: <String>

Value: one of the following, "SolveInside", "SolveOnBoundary", "Automatic"

<Thickness>

Type: String

Value: a double value with units of length.

<NewName>

Type: <String>

New name of conductor to be toggled.

EditNonIdealGround

Use: Edits the properties of a non ideal ground conductor.

Command: Double-click a conductor.

Syntax: EditNonIdealGround <ConductorName> , <ConductorParameters>

Return Value: None

Parameters: <ConductorName>

Type: <string>

Conductor name that is selected.

<ConductorParameters>

Array(("Name:="<NewName>", "SolveOptions:="<SolveOptions>", "Thickness:="<Thickness>"))

<SolveOptions>

Type: <String>

Value: one of the following, "SolveInside", "SolveOnBoundary", "Automatic"

<Thickness>

Type: String

Value: a double value with units of length.

<NewName>

Type: <String>

New name of conductor to be toggled.

EditReferenceGround

Use: Edits the properties of a reference ground conductor.

Command: Double-click a conductor.

Syntax: EditReferenceGround <ConductorName> , <ConductorParameters>

Return Value: None

Parameters: <ConductorName>

Type: <string>

Conductor name that is selected.

<ConductorParameters>

Array(("Name:="<NewName>", "SolveOptions:="<SolveOptions>", "Thickness:="<Thickness>"))

<SolveOptions>

Type: <String>

Value: one of the following, "SolveInside", "SolveOnBoundary", "Automatic"

<Thickness>

Type: String

Value: a double value with units of length.

<NewName>

Type: <String>

New name of conductor to be toggled.

EditSurfaceGround

Use: Edits the properties of a surface ground conductor.

Command: Double-click a conductor.

Syntax: EditSurfaceGround <ConductorName> , <ConductorParameters>

Return Value: None

Parameters: <ConductorName>

Type: <string>

Conductor name that is selected.

<ConductorParameters>

Array(("Name:="<NewName>", "SolveOptions:="<SolveOptions>", "Thickness:="<Thickness>"))

<SolveOptions>

Type: <String>

Value: one of the following, "SolveInside", "SolveOnBoundary", "Automatic"

<Thickness>

Type: String

Value: a double value with units of length.

<NewName>

Type: <String>

New name of conductor to be toggled.

EditFloatingLine

Use: Edits the properties of a floating line conductor.

Command: Double-click a conductor.

Syntax: EditFloatingLine <ConductorName> , <ConductorParameters>

Return Value: None

Parameters: <ConductorName>

Type: <string>

Conductor name that is selected.

<ConductorParameters>

Array(("Name:="<NewName>", "SolveOptions:="<SolveOptions>", "Thickness:="<Thickness>"))

<SolveOptions>

Type: <String>

Value: one of the following, "SolveInside", "SolveOnBoundary", "Automatic"

<Thickness>

Type: String

Value: a double value with units of length.

<NewName>

Type: <String>

New name of conductor to be toggled.

GetNumExcitations (2D Extractor)

Use: Gets the number of excitations in a design, including all defined signal lines, non-ideal grounds, floating lines, reference ground and surface ground.

Syntax: GetNumExcitations()

Return Value: Integer count

Parameters: None

GetExcitationAssignment (2D Extractor)

Use: Return the geometry assignment of an excitation.

Command: None.

Syntax: GetExcitationAssignment "<name>"

Return Value: Variant array of the geometry

Parameters: <name>

Type: String

The name of the excitation

GetExcitations (2D Extractor)

Use: Return a listing of excitations

Command: none

Syntax: GetExcitations

Return Value: Variant array, excitation name paired with excitation type.

AssignFiniteCond

Assigns a single finite conductivity boundary on selected edges.

UI Access	2D Extractor > Boundary > Assign > Finite Conductivity.		
Parameters	Name	Type	Description
	<Parameters>	Array	Structured array. <pre>Array("NAME:<name of the boundary.>", "Edges:=", <array of edge ids>, "Roughness:=", "<string of double with units of length>", "UseCoating:=", <boolean>, "LayerThickness:=", "<string of double with units of length>", "UseMaterial:=", <boolean>, "Material:=", "<string material name for coating>", "Radius:=", <string of double with units of length>, "Ratio:=", <string of double>)</pre>
Return Value	None.		

Python Syntax	AssignFiniteCond(<Parameters>)
Python Example	Example for the Hammerstad-Jensen surface roughness model. <pre>oModule.AssignFiniteCond</pre>

	<pre>["NAME:FiniteCond1", "Edges:=", [7,9], "Roughness:=", "2um", "UseCoating:=", True, "LayerThickness:=", "1.2um", "UseMaterial:=", True, "Material:=", "Copper"] Example for the Hurray surface roughness model oModule.AssignFiniteCond ["NAME:FiniteCond1", "Edges:=", [7], "UseCoating:=", False, "Radius:=", "0.5um", "Ratio:=", "2.9"]</pre>

EditFiniteCond

Modifies parameters of single finite conductivity boundary.

UI Access	Double-click finite conductivity boundary in project tree.		
Parameters	Name	Type	Description
	<BoundaryName>	String	Name of the finite conductivity boundary to be edited.

	<code><FiniteCondArray></code>	Array	Structured array. Array("NAME:<Name of the boundary>", "Roughness:=", "<string, double value with units of length>", "UseCoating:=", <boolean>, "LayerThickness:=", "<string, double value with units of length>", "UseMaterial:=", <boolean>, "Material:=", "<string, material name for coat- ing.>")
Return Value	None.		

Python Syntax	EditFiniteCond (<BoundaryName>, <FiniteCondArray>)
Python Example	<pre>oModule.EditFiniteCond("FiniteCond1", ["NAME:FiniteCond1", "Roughness:=", "2um", "UseCoating:=", false])</pre>

Script Commands for Creating and Modifying Boundaries in Q3D Extractor

Following are script commands for creating and modifying boundaries that are recognized by the "BoundarySetup" module. In the following commands, all named data can be included/excluded as desired and may appear in any order.

[Assign2DTerminal](#)

[AssignContactResistance](#)

[AssignNet](#)

[AssignSource](#)

[AssignSink](#)

[AssignTerminals](#)

[AssignThinConductor](#)

[EditContactResistance](#)

[EditEMLoss](#)

[EditThinConductor](#)

[EditNet](#)

[GetExcitationAssignment](#)

[GetExcitations](#)

[GetNumExcitations](#)

[ToggleTerminal](#)

[SetMaterialThreshold](#)

Assign2DTerminal

Use: Assigns 2D terminals

Command: **Q3D Extractor>Nets>Assign 2D Terminals**

Syntax: Assign2DTerminal <TerminalArray>

Parameters: <TerminalArray>

```
Array("NAME:AssignTerminals",
      Array("Name:SourceList", Array("Name:<SourceName>",
    "Net:=", <NetObject>, "Objects:=", <Assignment 2D>)),
      Array("Name:SinkList", Array("Name:<SinkName>",
    "Net:=", <NetObject>, "Objects:=", <Assignment 2D>)),
      "Name:DeleteList", <Name Array>)
```

Return Value: None

AssignContactResistance

Assigns a Contact Resistance boundary.

UI Access	Q3D Extractor > Boundary> Assign > Contact Resistance.		
Parameters	Name	Type	Description
	<ContactResistanceArray>	Array	Structured array: Array("NAME:<Name>", "Faces:=", <FacesArray>, "Contact Resistance Type:=", <ContactResistanceType>,

			"Conductivity:=", <Conductivity>, "Thickness:=", <Thickness>, "Resistance:=", <Resistance>, "ResistanceType:=", <ResistanceType>)
	<Name>	String	String boundary name.
	<FacesArray>	Array	Array containing a list of the face IDs for the new boundary assignment.
	<ContactResistanceType>	String	Type of contact resistance boundary, either "Thin Layer" or "Resistive Sheet"
	<Conductivity>	String	For contact resistance type "Thin Layer" only, specifies the conductivity of the thin conducting layer. String contains unit of measure.
	<Thickness>	String	For contact resistance type "Thin Layer" only, specifies the thickness of the thin conducting layer. String contains unit of measure.
	<Resistance>	Real	For contact resistance type "Resistive Sheet" only, specifies the numeric resistance value in Ohm or Ohm/square, depending on the <ResistanceType>. Real number without unit.
	<ResistanceType>	String	For contact resistance type "Resistive Sheet" only, specifies how the resistance value will be interpreted, either "Total" or "Per Square" "Total" indicates that the resistance value provided is the total resistance across all assignments of this boundary. "Per Square" indicates that the resistance value provided is the resistance of a unit square in SI for the material used in the assigned resistive sheets.
Return Value	None.		

Python Syntax	AssignContactResistance(<ContactResistanceArray>)
Python Example	<pre> oModule.AssignContactResistance(["NAME:ContactResistance1", "Faces:=" , [7,9] "Contact Resistance Type:=", "Thin Layer", "Conductivity:=", "5000s_per_m", "Thickness:=", "0.02mm"]) </pre>

AssignNet [Q3D Extractor]

Use: Creates a net.

Command: **Q3D Extractor>Nets>Assign>Net**

Syntax: AssignNet <NetArray>

Return Value: None

Parameters: <NetArray>

```
Array("NAME:<NetName>", "Objects:=", <AssignmentObjects>)
```

AssignSource [Q3D Extractor]

Creates a current source.

UI Access	Q3D Extractor > Nets > Assign Excitation > Source.		
Parameters	Name	Type	Description
	<SourceArray>	Array	Structured array: Array("NAME:<SourceName>", <string "Objects:=", "Faces:=", or "Edges:=">, <array containing IDs>, "Net:=", <string net name, optional>, "TerminalType:=", <string "UniformCurrent" or "Con- stantVoltage">) Note: • The use of "Objects:=", "Faces:=" or "Edges:=" depends on the type of assignment. In any case, the array takes ID numbers. • The net string is optional for this script. However, you will need to associate the source with a net prior to simulation in order for the simulation to be valid.
Return Value	None.		

Python Syntax	AssignSource(<SourceArray>)
Python Example	<pre>oModule.AssignSource(["NAME:Source1", "Faces:=" , [9], "Net:=" , "via", "TerminalType:=" , "UniformCurrent"])</pre>

AssignSink

Creates a current sink.

UI Access	Q3D Extractor > Nets > Assign Excitation > Sink.		
Parameters	Name	Type	Description
	<SinkArray>	Array	Structured array: Array("NAME:<SinkName>", <string "Objects:=", "Faces:=", or "Edges:=">, <array containing IDs>, "Net:=", <string net name, optional>, "TerminalType:=", <string "UniformCurrent" or "ConstantVoltage">)

			Note: • The use of "Objects:=", "Faces:=" or "Edges:=" depends on the type of assignment. In any case, the array takes ID numbers. • The net string is optional for this script. However, you will need to associate the sink with a net prior to simulation in order for the simulation to be valid.
Return Value	None.		

Python Syntax	AssignSink(<SinkArray>)
Python Example	<pre>oModule.AssignSink(["NAME:Sink1", "Faces:=" , [8], "Net:=", "via", "TerminalType:=" , "UniformCurrent"])</pre>

AssignTerminals [Q3D Extractor]

*Use:*Assigns 1D and 2D terminals.

Command: Click **Q3D Extractor>Nets>Assign Terminals**

Syntax: AssignTerminals <TerminalArray>

<TerminalArray>

```
Array("NAME:AssignTerminals",
Array("Name:SourceList", Array("Name:<SourceName>", "Net:=", <NetObject>, "Objects:=", <Assignment 2D/1D>)),
Array("Name:SinkList", Array("Name:<SinkName>", "Net:=", <NetObject>, "Objects:=", <Assignment 2D/1D>)),
"Name>DeleteList", <Name Array>)
```

Return Value:None

Python Example	<pre>oModule.AssignTerminals (["NAME:AssignTerminals",["NAME:SourceList", ["NAME:Rectangle1","Objects:=" , ["Rectangle1"]]], ["NAME:SinkList", ["NAME:Rectangle2", "Objects:=" , ["Rectangle2"]]], "DeleteList:=" , ""])</pre>

AssignThinConductor

Use:Assign a thin conductor boundary on a 2D object.

Command:Q3D Extractor>Boundary>Assign>Thin Conductor

Syntax: AssignThinConductor <Boundary Name>, Array("NAME:<Boundary Name>,"Material:=", <Material Name>, "Thickness:=", <thickness string>, "Direction:=", <direction string>)

Return Value: none

Parameters: <Name>

Type: <String>

Name of the boundary

<sheet ids>

Type: <String>

List of 2D object names, separated by comma.

<ThinCondParameters>

Parameters:

"Material:=", "<Material Name>", "Thickness:=", <Thickness>

<Material Name>

Type: <String>

Value: material name, default is "Copper"

<Thickness>

Type: String

Value: double with units of length

<Direction>

Type: String

Value: can be "Positive" or "Negative"

EditContactResistance

Edits a Contact Resistance boundary.

UI Access	From the Project Manager , right-click a Contact Resistance boundary and select Properties .		
Parameters	Name	Type	Description
	<oldName>	String	String name of the existing boundary to be edited.
	<ContactResistanceArray>	Array	Structured array: <pre>Array ("NAME:<Name>", "Contact Resistance Type:=", <ContactResistanceType>, "Conductivity:=", <Conductivity>, "Thickness:=", <Thickness>, "Resistance:=", <Resistance>, "ResistanceType:=", <ResistanceType>)</pre>
	<Name>	String	String boundary name.
	<ContactResistanceType>	String	Type of contact resistance boundary, either "Thin Layer" or "Resistive Sheet"
	<Conductivity>	String	For contact resistance type "Thin Layer" only, specifies the conductivity of the thin conducting layer. String contains unit of measure.
	<Thickness>	String	For contact resistance type "Thin Layer" only, specifies the thickness of the thin conducting layer. String contains unit of measure.
	<Resistance>	Real	For contact resistance type "Resistive Sheet" only, specifies the numeric resistance value in Ohm or Ohm/square, depending on the <ResistanceType>. Real number without unit.
	<ResistanceType>	String	For contact resistance type "Resistive Sheet" only, specifies how the resistance value will be interpreted, either "Total" or

			"Per Square" "Total" indicates that the resistance value provided is the total resistance across all assignments of this boundary. "Per Square" indicates that the resistance value provided is the resistance of a unit square in SI for the material used in the assigned resistive sheets.
Return Value	None.		

Python Syntax	EditContactResistance(<oldName>, <ContactResistanceArray>)
Python Example	<pre>oModule.EditContactResistance("ContactResistance1" "NAME:ADifferentName", "Contact Resistance Type:=", "Resistive Sheet", "Resistance:=", "50000", "Resistance Type:=", "Per Square"])</pre>

EditEMLoss [Q3D Extractor]

Modifies EM Loss settings for Q3D designs exported to Icepak.

UI Access	These options can be set from the Setup Link window. In Icepak, they can be set from the Project Manager. Right-click Thermal > Assign > EM Loss.		
Parameters	Name	Type	Description
	<Name>	String	A name for the EM Loss plot.
	<EMLossArray>	Array	Structured array. <pre> Array("NAME:<name>", "Project:=", <string project name>, "Product:=", "ElectronicsDesktop", "Design:=", <string design name>, "Soln:=", <string solution name>, <optional Parameters array> "ForceSourceToSolve:=", <boolean True to force; else False>, "PreservePartnerSoln:=", <boolean True to preserve; else False>, "PathRelativeTo:=", <string target>, "Intrinsics:=", <array containing string frequencies>, "IntrinsicsHarmonicLoss:=", <array containing string frequencies> "HarmonicLossCoupling:=", <boolean True for coupling; else False>, "HarmonicLossSweepCoupling:=", <boolean True for sweep; else False>, "SurfaceOnly:=", <array containing string surface </pre>

	<table><tr><td></td><td></td><td>object names>, "LossMultiplier:=", <string containing integer></td></tr></table>					object names>, "LossMultiplier:=", <string containing integer>
		object names>, "LossMultiplier:=", <string containing integer>				
Return Value	None.					

Pyth-on Syn-tax	EditEMLoss (<Name>, <EMLossArray>)
Pyth-on Exa-mples	<pre>oModule.EditEMLoss ("EMLoss1" ["NAME:EMLoss1", "Project:=", "myproject", "Product:=", "ElectronicsDesktop", "Design:=", "designname", "Soln:=", "Setup1 : LastAdaptive", ["NAME:Params"] "ForceSourceToSolve:=", True, "PreservePartnerSoln:=", True,</pre>

```

    "PathRelativeTo:=",          "Target Project",
    "Intrinsics:=",              ["1Ghz"],
    "IntrinsicsHarmonicLoss:=",  ["0Ghz", "1e-09Ghz", "1e-08Ghz", "1e-07Ghz", "1e-06Ghz", "1e-05Ghz", "0.0001Ghz", "0.001Ghz", "0.01Ghz", "0.1Ghz", "1Ghz"]
    "HarmonicLossCoupling:=",    True,
    "HarmonicLossSweepCoupling:=", False
    "SurfaceOnly:=",              ["Box1", "Box2", "Box3"],
    "LossMultiplier:=",          "1"
  ]
)

```

EditThinConductor

*Use:*Edit parameters of single thin conductor boundary.

*Command:*Double-click thin conductor boundary in the project tree.

*Syntax:*EditThinConductor <BoundaryName>, Array("NAME:<Name>", <ThinCondParameters>

*Return Value:*none

*Parameters:*BoundaryName>

Type: <String>

Name of the boundary to edit.

<Name>

Type:<String>

Name of the boundary

EditNet [Q3D Extractor]

Use: Edits a net.

Command: Double-click the net in the project tree to modify its settings.

Syntax: EditNet <NetName>, <NetArray>

Return Value: None

GetExcitationAssignment [Q3D Extractor]

Use: Return the geometry assignment of an excitation.

Command: None.

Syntax: GetExcitationAssignment "<name>"

Return Value: VARIANT array of the geometry

Parameters: <name>

Type: String

The name of the excitation

GetExcitations [Q3D Extractor]

Use: Return a listing of excitations

Command: None.

Syntax: GetExcitations

Return Value: Variant array, excitation name paired with excitation type.

GetNumExcitations [Q3D Extractor]

Use: Gets the number of excitations in a design, including all defined sources, sinks, and nets.

Command: None.

Syntax: GetNumExcitations "<Type>"

Return Value: Long

Parameters: <Type>

Type: <string>

Comma separated string. Choices for "string" are "Sink", "Source", "Net"

ToggleTerminal

Use: Toggles between source and sink.

Command: Click a terminal in the project tree, and then click **Toggle** on the shortcut menu.

Syntax: ToggleTerminal <TerminalName>

Return Value: None

SetMaterialThresholds [Q3D Extractor]

Use: Sets conductivity threshold.

Command: Click **Q3D Extractor>Nets>Set Material Thresholds**

Syntax: SetMaterialThresholds

Return Value: None

Parameters: SetMaterialThresholds <InsulatorThreshold>, <PerfectConductorThreshold>, <Magnetic Threshold>

<InsulatorThreshold>

Type: <double>

Threshold for insulator/conductor.

<PerfectConductorThreshold>

Type:<double>

Threshold that decides whether a conductor is perfectly conducting. It must be higher than insulator threshold.

<Magnetic Threshold>

Type:<double>

Threshold that decides whether a material is magnetic. You must specify a threshold for permeability.

Default Value: 1.01

Python Syntax	SetMaterialThresholds (<InsulatorThreshold>, <PerfectConductorThreshold>, <Magnetic Threshold>)
Python Example	oModule.SetMaterialThresholds(10000, 1E+030, 1.01)

12 - Mesh Operations Module Script Commands

Commands for mesh setup and operations should be executed by the "MeshSetup" module.

```
Set oModule = oDesign.GetModule("MeshSetup")
```

```
oModule.CommandName <args>
```

Conventions Used in this Chapter

<OpName>

Type: <string>

Name of a mesh operation.

<AssignmentObjects>

Type: Array of strings

An array of object names.

<AssignmentFaces>

Type: Array of integers.

An array of face IDs. The ID of a face can be determined through the user interface using the **3DModeler > Measure > Area** command. The face ID is given in the **Measure Information** dialog box.

The topics for this section include:

[General Commands Recognized by the Mesh Operations Module](#)

[Script Commands for Creating and Modifying Mesh Operations](#)

General Commands Recognized by the Mesh Operations Module

General commands recognized by the Mesh Operations Module:

[DeleteOp](#)

[GetMeshOpAssignment](#)

[GetOperationName](#)

[RenameOp](#)

DeleteOp

Deletes the specified mesh operations.

UI Access	Delete command in the List dialog box.		
Parameters	Name	Type	Description
	<NameArray>	Array	Array of mesh operation names.
Return Value	None.		

Python Syntax	DeleteOp(<NameArray>)
Python Example	<code>oModule.DeleteOp(["Length1", "SkinDepth1", "Length2"])</code>

GetMeshOpAssignment

Find a list of objects that are associated with a mesh operation.

UI Access	N/A		
Parameters	Name	Type	Description
	<OperationType>	String	Specified mesh operation name.
Return Value	Array of IDs containing body/face assignments for this mesh operation.		

Python Syntax	GetMeshOpAssignment(<OperationType>)		
Python Example	oModule.GetMeshOpAssignment("Length Based")		

GetOperationNames

Gets the names of mesh operations defined in a design.

UI Access	N/A		
Parameters	Name	Type	Description
	<OperationType>	String	Specified operation type.
Return Value	Array of strings containing mesh operation names.		

Python Syntax	GetOperationNames(<OperationType>)		
Python Example	oModule.GetOperationNames("Length Based")		

ReassignOp

Reassigns a mesh operation

UI Access	Right-click on a mesh operation, then select Reassign		
Parameters	Name	Type	Description
	<OpName>	String	Operation name to reassign.
	<AssignParams>	Array	Structured array.
			Array("Objects:=", <array of objects> "Faces:=", <array of faces>)
Return Value	None.		

Python Syntax	ReassignOp(<OpName>, <AssignParams>)
Python Example	<pre>oModule.ReassignOp("ApplyCurvilinear1", ["Faces:=", [16]]) oModule.ReassignOp("Length1", ["Objects:=", ["Box1"]])</pre>

RenameOp

Renames a mesh operation.

UI Access	Right-click the mesh operation in the project tree, and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<OldName>	String	Old name for the mesh operation.
	<NewName>	String	New name for the mesh operation.
Return Value	None.		

Python Syntax	<code>RenameOp(<OldName>, <NewName>)</code>
Python Example	<code>oModule.RenameOp("SkinDepth1", "NewName")</code>

Script Commands for Creating and Modifying Mesh Operations

Script commands for creating and modifying mesh operations are as follows:

[AssignApplyCurvilinearElementsOp](#)

[AssignCurvatureExtractionOp](#)

[AssignLengthOp](#)

[AssignModelResolutionOp](#)

[AssignSkinDepthLayerSetting](#)

[AssignSBRCurvatureExtractionOp](#)

[AssignSkinDepthOp](#)

[AssignTrueSurfOp](#)

[EditLengthOp](#)

[EditModelResolutionOp](#)

[EditSBRCurvatureExtractionOp](#)

[EditSkinDepthOp](#)

[EditTrueSurfOp](#)

[InitialMeshSettings](#)

AssignApplyCurvilinearElementsOp

Applies a curvilinear elements mesh operation to the selection.

UI Access	HFSS > Mesh > Assign Mesh Operation > On Selection > Apply Curvilinear Meshing...		
Parameters	Name	Type	Description
	<CurvilinearElementsOpParams>	Array	Structured array. Array("NAME:<OpName>", "Faces:=", <AssignmentFaces>, "Object- s:=", Array("objectID") "Apply:=", <bool>)
Return Value	None.		

Python Syntax	AssignApplyCurvilinearElementsOp(<CurvilinearElementsOpParams>)

Python Example	<pre>oModule.AssignApplyCurvilinearElementsOp(["NAME:ApplyCurvilinear1", "Faces:=", [155], "Apply:=", False])</pre>

AssignCloneOp

Uses the mesh data from a user-specified parent region to apply identical meshes to its cloned regions

UI Access	Maxwell 2D > Mesh > Assign Mesh Operation > Clone Mesh...		
Parameters	Name	Type	Description
	<CloneOpParams>	Array	Structured array. Array("NAME:<CloneOpName>", "Enabled:=", <boolean>, "InnerRadius:=", "<value><unit>", "OuterRadius:=", "<value><unit>", "StartAngle:=", "<value (default = 0)><unit>", "EndAngle:=", "<value><unit>", "GapAngle:=", "<value angular spacing between clones><unit>", "NumberofClones:=", "<integer number of periodic regions (including the parent)>",

	<table><tr><td></td><td></td><td>"ParentRegionSymmetry:=", <boolean>)</td></tr></table>					"ParentRegionSymmetry:=", <boolean>)
		"ParentRegionSymmetry:=", <boolean>)				
Return Value	None.					

Python Syntax	AssignCloneOp(<CloneOpParams>)
Python Example	<pre>oModule.AssignCloneOp(["NAME:Clone1", "Enabled:=", True, "InnerRadius:=", "55mm", "OuterRadius:=", "175mm", "StartAngle:=", "0deg", "EndAngle:=", "15deg", "GapAngle:=", "0deg", "NumberOfClones:=", "6", "ParentRegionSymmetry:=", True])</pre>

AssignLengthOp

Assigns length-based operations to the selection.

UI Access	> Mesh > Assign Mesh Operation > On Selection Inside Selection > Length Based		
Parameters	Name	Type	Description
	<LengthOpParams>	Array	Structured array. <pre>Array("NAME:<OpName>", "RefineInside:=", <bool>, "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>, "RestrictElem:=", <bool> "NumMaxElem:=", <integer> "RestrictLength:=", <bool> "MaxLength:=", <value> RefineInside RestrictElem RestrictLength)</pre> If true, Objects should be specified. Implies apply restrictions to tetrahedra inside the object. If false, Faces and/or Objects can be specified. Implies apply restrictions to triangles on the surface of the face or object. If true, NumMaxElem should be specified. If true, MaxLength should be specified.
Return Value	None.		

Python Syntax	AssignLengthOp(<LengthOpParams>)
Python Example	<pre>oModule.AssignLengthOp (["NAME:Length1", "RefineInside:=", True, "Objects:=", ["Box1"], "RestrictElem:=", True, "NumMaxElem:=", 1000, "RestrictLength:=", True, "MaxLength:=", "1mm"])</pre>

AssignMeshRegion

Assigns a mesh region to selection.

UI Access	HFSS .> Mesh > Assign Mesh Region...		
Parameters	Name	Type	Description
	<MeshRegionParams>	Array	Structured array. Array("NAME:<MeshRegionName>", "Enabled:=", <boolean>,

			"Objects:=", <array containing a single solid body>)
Return Value	None.		

Python Syntax	AssignMeshRegion(<MeshRegionParams>)
Python Example	<pre>oModule.AssignMeshRegion(["NAME:MeshRegion1", "Enabled:=", True, "Objects:=", ["Polyline1"]])</pre>

AssignModelResolutionOp

Assigns a model resolution name, value and unit for mesh operations, or specify to UseAutoFeaturelength. If UseAutoFeature length is true, the Defeature length is not used.

UI Access	> Mesh > Assign Mesh Operation > Model Resolution		
Parameters	Name	Type	Description
	<ModelResParams>	Array	Structured array. Array("NAME:<ModelResName>", "Objects:=", <array of object names>, "UseAutoLength:=", <boolean>,

	"DefeatureLength:=", "<value><units>")		
Return Value	None.		

Python Syntax	AssignModelResolutionOp(<ModelResParams>)
Python Example	<pre>oModule.AssignModelResolutionOp (["NAME:ModelResolution1", "Objects:=", ["waveguide"], "UseAutoLength:=", True, "DefeatureLength:=", "71.5891053163818mil"])</pre>

AssignRotationalLayerOp

Assigns a rotational layer mesh operation.

UI Access	Right-click to open the context menu, and select Assign Mesh Operation > Inside Selection > Rotational Layer Mesh .		
Parameters	Name	Type	Description
	<RotLayerOpParams>	Array	Structured array. Array("NAME:<RotationalLayerName>",

			<code>"Objects:=", <array of objects>, "Number of Layers:=", "<integer>", "Total Layer Thickenss:=", "<numeric value with unit>")</code>
Return Value	None.		

Python Syntax	<code>AssignRotationalLayerOp(<RotLayerOpParams>)</code>
Python Example	<pre>oModule.AssignRotationalLayerOp(["NAME:RotationalLayer1", "Objects:=", ["Box1"], "Number of Layers:=", "3", "Total Layer Thickenss:=", "1.5mm"])</pre>

AssignSkinDepthLayerSetting

Use: Assigns a skin-depth layer settings to the selected edges.

Command: Click **Mesh > Assign Mesh Operation > On Selection > Skin Depth Based**

Syntax: AssignSkinDepthLayerSetting Array("NAME:<LayerSettingName>", "Enabled:=", <SettingEnabled>, "Edges:=", Array(<EdgeIDArray>), "SkinDepth:=", "<SkinDepthValue>", "NumLayers:=", "<LayerNumber>")

Return Value: None

Parameters: <LayerSettingName>

The name of the skin depth layer setting.

<SettingEnabled>

Boolean: "Enabled:=", true

<EdgeIDArray>

Array of edge IDs. "Edges:=", Array(10, 12, 13)

<SkinDepthValue>

Skin depth value with unit. "SkinDepth:=", "1mm"

<LayerNumber>

Integer, the number of layers. "NumLayers:=", "2"

Example: oModule.AssignSkinDepthLayerSetting Array("NAME:SkinDepthLayer1",
"Enabled:=", true
"Edges:=", Array(10, 12, 13),
"SkinDepth:=", "1mm",
"NumLayers:=", 2)

AssignSkinDepthOp

Assigns a skin-depth based operations to the selection.

UI Access	> Mesh > Assign Mesh Operation > On Selection > Skin Depth Based		
Parameters	Name	Type	Description
	<SkinDepthOpParams>	Array	Structured array.

			<pre> Array("NAME:<OpName>", "Faces:=", <AssignmentFaces>, "RestrictElem:=", <bool>, "NumMaxElem:=", <int>, "SkinDepth:=", <value>, "SurfTriMaxLength:=", <value>, "NumLayers:=", <int>) RestrictElem <i>If true, NumMaxElem should be specified.</i> </pre>
Return Value	None.		

Python Syntax	AssignSkinDepthOp(<SkinDepthOpParams>)
Python Example	<pre> oModule.AssignSkinDepthOp ("NAME:SkinDepth1", "Faces:=", [7], "RestrictElem:=", True, "NumMaxElem:=", 1000, "SkinDepth:=", "1mm", "SurfTriMaxLength:=", "1mm", </pre>

	<pre>"NumLayers:=", 2]</pre>

AssignSurfPriorityForTauOp

Sets the mesh operation surface representation priority for TAU mesh.

UI Access	Right-click to open the context menu, and select Assign Mesh Operation > Surface Priority for TAU...		
Parameters	Name	Type	Description
	<SurfPriorityParams>	Array	Structured array. Array("NAME:<SurfPriorityName>", "Faces:=", <array of face IDs>, "SurfaceRepPriority:=", <0 - normal priority, 1 - high priority>)
Return Value	None.		

Python Syntax	AssignSurfPriorityForTauOp(<SurfPriorityParams>)
Python Example	<pre>oModule.AssignSurfPriorityForTauOp(["NAME:SurfPriority1", "Faces:=", [15],</pre>

	<pre>"SurfaceRepPriority:=", 1]</pre>

AssignTrueSurfOp

Assigns a true surface-based mesh operation on the selection.

UI Access	Q3D Extractor > Mesh > Assign Mesh Operation > Surface Approximation		
Parameters	Name	Type	Description
	<TrueSurfOpParams>	Array	Structured array. <pre>Array ("NAME:<OpName>", "Faces:=", <AssignmentFaces>, "SurfDevChoice:=", <RadioOption>, "SurfDev:=", <value>, "NormalDevChoice:=", <RadioOption>, "NormalDev:=", <value>, "AspectRatioChoice:=", <RadioOption>, "AspectRatio:=", <double>)</pre> <RadioOption> <i>Type: <int></i> 0: Ignore 1: Use defaults

	<table><tr><td></td><td></td><td>2: Specify the value</td></tr></table>			2: Specify the value
		2: Specify the value		
Return Value	None.			

Python Syntax	AssignTrueSurfOp(<TrueSurfOpParams>)
Python Example	<pre>oModule.AssignTrueSurfOp (["NAME:TrueSurf1", "Faces:=", [9], "SurfDevChoice:=", 2, "SurfDev:=", "0.04123105626mm", "NormalDevChoice:=", 2, "NormalDev:=", "15deg", "AspectRatioChoice:=", 1])</pre>

EditApplyCurvilinearElementsOp

Edits a curvilinear elements mesh operation to the selection.

UI Access	Double-click on the mesh operation to edit its settings.

Parameters	Name	Type	Description
	<OpName>	String	Name of the operation to be edited.
	<CurvilinearElementsOpParams>	Array	Structured array. Array("NAME:<OpName>", "Apply:=", <bool>)
Return Value	None.		

Python Syntax	EditApplyCurvilinearElementsOp(<OpName>, <CurvilinearElementsOpParams>)
Python Example	<pre>oModule.EditApplyCurvilinearElementsOp ("ApplyCurvilinear1", ["NAME:ApplyCurvilinear2", "Apply:=", False])</pre>

EditCloneOp

Modifies an existing clone mesh operation.

UI Access	Double-click on a clone mesh operation in the project tree.

Parameters	Name	Type	Description
	<CloneOpName>	String	Name of the operation to be edited.
	<CloneOpParams>	Array	Structured array. Array("NAME:<CloneOpName>", "Enabled:=", <boolean>, "InnerRadius:=", "<value><unit>", "OuterRadius:=", "<value><unit>", "StartAngle:=", "<value (default = 0)><unit>", "EndAngle:=", "<value><unit>", "GapAngle:=", "<value angular spacing between clones><unit>", "NumberOfClones:=", "<integer number of periodic regions (including the parent)>", "ParentRegionSymmetry:=", <boolean>)
Return Value	None.		

Python Syntax	EditCloneOp (<CloneOpName>, <CloneOpParams>)
Python Example	<pre>oModule.EditCloneOp("Clone1", ["NAME:Clone2", "Enabled:=", True,</pre>

	<pre> "InnerRadius:=", "45mm", "OuterRadius:=", "175mm", "StartAngle:=", "0deg", "EndAngle:=", "15deg", "GapAngle:=", "0deg", "NumberOfClones:=", "5", "ParentRegionSymmetry:=", True] </pre>

EditLengthOp

Edits an existing length-based operation. This cannot be used to modify assignments. Instead, the mesh operation should be deleted and a new one created.

UI Access	Double-click the operation in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<OpName>	String	Name of the operation to be edited.
	<LengthOpParams>	Array	Structured array.
			<pre> Array("NAME:<OpName>", "RefineInside:=", <bool>, "Objects:=", <AssignmentObjects>, "Faces:=", <AssignmentFaces>, "RestrictElem:=", <bool>, "NumMaxElem:=", <integer>, </pre>

			<pre>"RestrictLength:=", <bool>, "MaxLength:=", <value></pre> RefineInside If true, Objects should be specified. Implies apply restrictions to tetrahedra inside the object. If false, Faces and/or Objects can be specified. Implies apply restrictions to triangles on the surface of the face or object. RestrictElem <i>If true</i>, NumMaxElem should be specified. RestrictLength <i>If true</i>, MaxLength should be specified.
Return Value	None.		

Python Syntax	EditLengthOp(<OpName>, <LengthOpParams>)
Python Example	<pre>oModule.EditLengthOpK("Length1", ["NAME:Length1", "RefineInside:=", True, "Objects:=", ["Circle2", "Rectangle1"], "RestrictElem:=", False,</pre>

	<pre> "NumMaxElem:=", 1000, "RestrictLength:=", True, "MaxLength:=", "2mm",] </pre>

EditMeshRegion

Modifies an existing mesh region settings.

UI Access	Right-click on a mesh region in the project tree, then select Properties...		
Parameters	Name	Type	Description
	<MeshRegionName>	String	Name of specified mesh region.
	<MeshRegionParams>	Array	Structured array. <pre> Array("NAME:<MeshRegionName>", "Enabled:=", <boolean>) </pre>
Return Value	None.		

Python Syntax	EditMeshRegion (<MeshRegionName>, <MeshRegionParams>)
Python Example	<pre> oModule.EditMeshRegion("MeshRegion1", ["NAME:MeshRegion2", "Enabled:=", True]) </pre>

	1)

EditModelResolutionOp

Assigns a model resolution name, value and unit for mesh operations. If UseAutoLength is true, the Defeature length is not used.

UI Access	Double-click the operation in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<OpName>	String	Name of the operation to be edited.
	<ModelResParams>	Array	Structured array. Array ("NAME:<ModelResName>", "UseAutoLength:=", <boolean>, "DefeatureLength:=", "<value><units>")
Return Value	None.		

Python Syntax	EditModelResolutionOp(<OpName>, <ModelResParams>
Python Example	<pre>oModule.EditModelResolutionOp("ModelResolution1", ["NAME:ModelResolution1", "UseAutoLength:=", False, "DefeatureLength:=", "71.5891053163818mil"</pre>

	])

EditRotationalLayerOp

Modifies a existing rotational layer mesh operation.

UI Access	Right-click on a rotational layer mesh in the project tree, then select Properties...		
Parameters	Name	Type	Description
	<RotationalLayerName>	String	Name of rotational layer mesh operation to be edited.
	<RotLayerOpParams>	Array	Structured array. Array("NAME:<RotationalLayerName>", "Number of Layers:=", "<integer>", "Total Layer Thickenss:=", "<numeric value with unit>")
Return Value	None.		

Python Syntax	EditRotationalLayerOp(<RotationalLayerName>, <RotLayerOpParams>)
Python Example	<pre>oModule.EditRotationalLayerOp("RotationalLayer1", ["NAME:RotationalLayer2", "Number of Layers:=", "4", "Total Layer Thickenss:=", "1.8mm"])</pre>

EditSkinDepthOp

Modifies an existing skin-depth based mesh operation. Assignments cannot be changed using this command. To change the assignment, you must delete operation and create it using a new assignment.

UI Access	Double-click the operation in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<OpName>	String	Name of the operation to be edited.
	<SkinDepthOpParams>	Array	Structured array. Array ("NAME:<OpName>", "RestrictElem=", <bool>, "NumMaxElem=", <int>, "SkinDepth=", <value>, "SurfTriMaxLength=", <value>, "NumLayers=", <int>) RestrictElem If true, NumMaxElem should be specified.
Return Value	None.		

Python Syntax	EditSkinDepthOp(<OpName>, <SkinDepthOpParams>)
Python Example	oModule.EditSkinDepthOp("SkinDepth1",

```
[
    "NAME:SkinD",
    "RestrictElem:=", False,
    "SkinDepth:=", "2mm",
    "SurfTriMaxLength:=", "1mm",
    "NumLayers:=", 2
]
```

EditSurfPriorityOp

Modifies an existing surface representation priority for TAU mesh.

UI Access	Right-click on a surface priority in the project tree, then select Properties...		
Parameters	Name	Type	Description
	<SurfPriorityName>	String	Name of the surface priority to be edited.
	<SurfPriorityParams>	Array	Structured array. Array("NAME:<SurfPriorityName>", "SurfaceRepPriority:=", <0 - normal priority, 1 - high priority>)
Return Value	None.		

Python Syntax	EditSurfPriorityOp(<SurfPriorityName>, <SurfPriorityParams>)
Python Example	oModule.EditSurfPriorityOp("SurfPriority1",

	<pre>["NAME:SurfPriority1", "SurfaceRepPriority:=", 1]</pre>

EditTrueSurfOp

Modifies an existing true surface approximation-based mesh operation. Assignments cannot be changed using this command. To change the assignment, delete this operation and create it using a new assignment.

UI Access	Double-click the operation in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<OpName>	String	Name of the operation to be edited.
	<TrueSurfOpParams>	Array	Structured array.
			<pre>Array("NAME:<OpName>", "SurfDevChoice:=", <RadioOption>, "SurfDev:=", <value>, "NormalDevChoice:=", <RadioOption>, "NormalDev:=", <value>, "AspectRatioChoice:=", <RadioOption>, "AspectRatio:=", <double>)</pre>

			<RadioOption> <i>Type: <int></i> 0: Ignore 1: Use defaults 2: Specify the value
Return Value	None.		

Python Syntax	EditTrueSurfOp(<OpName>, <TrueSurfOpParams>)
Python Example	<pre>oModule.EditTrueSurfOp("TrueSurf2", ["NAME:trusurf", "SurfDevChoice:=", 2, "SurfDev:=", "0.03mm", "NormalDevChoice:=", 1, "AspectRatioChoice:=", 2, "AspectRatio:=", 10])</pre>

InitialMeshSettings

Assigns a true surface-based mesh operation to the selection.

UI Access	Mesh > Initial Mesh Settings		
Parameters	Name	Type	Description
	<InitialMeshSettingsParams>	Array	Structured array. Array("NAME:<MeshSettings>", "CurvedSurfaceApproxChoice:=", <"UseSlider" or "Manual Settings"> "SliderMeshSettings:=", <integer 1 through 9>, "UseLegacyFaceterForTauVolumeMesh:=", <boolean>, "DynamicSurfaceResolution:=", <boolean>, "UseFlexMeshingForTAUvolumeMesh:=", <boolean>, "UseAlternativeMeshMethodsAsFallBack:=", <boolean>, "AllowPhiForLayeredGeometry:=", <boolean>)
Return Value	None.		

Python Syntax	InitialMeshSettings(<InitialMeshSettingsParams>)
Python Example	<pre>oModule.InitialMeshSettings (["NAME:MeshSettings", [</pre>

```
"NAME:GlobalSurfApproximation",  
"CurvedSurfaceApproxChoice:=", "UseSlider",  
"SliderMeshSettings:=" , 5  
],  
[  
"NAME:GlobalCurvilinear",  
"Apply:=", False  
],  
[  
"NAME:GlobalModelRes",  
"UseAutoLength:=", True  
],  
"MeshMethod:=", "Auto",  
"UseLegacyFaceterForTAUVolumeMesh:=", False,  
"DynamicSurfaceResolution:=", False,  
"UseFlexMeshingForTAUvolumeMesh:=", False,  
"UseAlternativeMeshMethodsAsFallBack:=", False,  
"AllowPhiForLayeredGeometry:=", True  
])
```

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13 - Analysis Setup Module Script Commands

Q3D Extractor analysis setup commands should be executed by the Analysis module, referred to in Q3D Extractor scripts as the "AnalysisSetup" module.

Set oModule = oDesign.GetModule("AnalysisSetup")

ClearLinkedData

[CopySetup](#)

[CopySweep](#)

DeleteDrivenSweep

[DeleteSetups](#)

[EditCircuitSettings](#)

[EditSetup](#)

[EditSetup \(2D Extractor\)](#)

[ExportCircuit](#)

[ExportCircuit \(2D Extractor\)](#)

[GetSetupCount](#)

[GetSetups](#)

[InsertSetup \(Q3D Extractor\)](#)

[InsertSetup \(2D Extractor\)](#)

[InsertSetup \[Transient\]](#)

[PasteSetup](#)

[PasteSweep](#)

[RenameDrivenSweep](#)[RenameSetup](#)[RevertAllToInitial](#)[RevertAllToInitialTemperature](#)[RevertSetupToInitial](#)[RevertSetupToInitialTemperature](#)

CopySetup

Copy the specified Optimetrics setup.

UI Access	NA		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup.
Return Value	None.		

Python Syntax	CopySetup (<SetupName>)
Python Example	oModule.CopySetup ("OptimizationSetup1")

CopyDrivenSetup

Copies a driven setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup.
Return Value	None.		

Python Syntax	CopyDrivenSetup(<SetupName>)		
Python Example	oModule.CopyDrivenSetup("Setup1")		

CopyEigenSetup

Copies an eigen-analysis setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup.
Return Value	None.		

Python Syntax	CopyEigenSetup(<SetupName>)		
Python Example	oModule.CopyEigenSetup("Setup1")		

CopySweep

Copies a frequency sweep from an analysis setup.

UI Access	Right-click on a sweep, select Copy		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup to which the sweep belongs.
	<SweepName>	String	Name of the sweep.
Return Value	None.		

Python Syntax	CopySweep (<SetupName>, <SweepName>)
Python Example	<code>oModule.CopySweep("Setup1", "Sweep2")</code>

DeleteSetups

Deletes one or more solution setups, which are specified by an array of solution setup names.

UI Access	Right-click a solution setup in the project tree and then click Delete on the shortcut menu, or delete selected solution setups in the List dialog box.		
Parameters	Name	Type	Description
	<SetupArray>	Array	Array of solution setup names.
Return Value	None.		

Python Syntax	DeleteSetups (<SetupArray>)
Python Example	oModule.DeleteSetups (["Setup1", "Setup2"])

DoesSweepSetupExists

Determines whether a specified sweep exists.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup to which the sweep belongs.
	<SweepName>	String	Name of the sweep.
Return Value	Integer: • 1 - sweep exists. • 0 - sweep does not exist.		

Python Syntax	DoesSweepSetupExists (<SetupName>, <SweepName>)
Python Example	oModule.DoesSweepSetupExists ("Setup1", "Sweep2")

EditCircuitSettings

Use: Exports equivalent circuit data.

Command: Right-click the **Analysis** folder, and then choose **Edit Circuit Settings**.

Syntax: EditCircuitSettings <ExportSettings>

Return Value: None

Parameters: <ExportSettings>

See ExportCircuit for details.

EditDrivenSweep

Modifies a driven frequency sweep.

UI Access	N/A.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the solution setup containing the sweep to be edited.
	<SweepName>	String	Name of the sweep to be edited.
	<Attributes>	Array	Structured array.
			<pre>Array("NAME:<SweepName>", "IsEnabled:=", <boolean>, "SetupType:=", <SetupType>, <FrequencyInformation>, "Type:=", <SweepType>, <SaveFieldsList> <DCExtrapInfo> "SMatrixOnlySolveMode:=", <"Manual"> "Auto">, "SMatrixOnlySolveAbove:=", "<real><units>")</pre>
Return Value	None.		

Python Syntax	<code>EditDrivenSweep (<SetupName>, <SweepName>, <Attributes>)</code>
Python Example	<pre>oModule.EditDrivenSweep("Setup1", "Sweep3", ["NAME:Sweep3", "IsEnabled:=", True, "SetupType:=", "SinglePoints", "ValueList:=", ["1GHz", "2GHz", "3GHz"], "Type:=", "Discrete", "SaveFieldsList:=", [False, False, False], "ExtrapToDC:=", False])</pre>

EditSetup

Modifies an existing solution setup.

UI Access	Double-click a solution setup in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the solve setup being edited.
	<Attributes>	Array	Structured array. Array("NAME:<NewSetupName>", <NamedParameters>) See the InsertSetup command for details and examples.
Return Value	None.		

Python Syntax	EditSetup (<SetupName>, <Attributes>)
Python Example	<pre>oModule.EditSetup("Setup1", ["NAME:NewSetup", "AdaptiveFreq:=", "1GHz", "EnableDistribProbTypeOption:=", false, "SaveFields:=", "true", "Enabled:=", true, ["NAME:Cap", "MaxPass:=", 10, "MinPass:=", 1, "MinConvPass:=", 2, "PerError:=", 1, "PerRefine:=", 30, "AutoIncreaseSolutionOrder:=", false, "SolutionOrder:=", "Normal"], ["NAME:DC", "Residual:=", 1E-005, "SolveResOnly:=", false, ["NAME:Cond",</pre>


```
        "MaxPass:=", 10,  
        "MinPass:=", 1,  
        "MinConvPass:=", 1,  
        "PerError:=", 1,  
        "PerRefine:=", 30),  
    ["NAME:Mult",  
        "MaxPass:=", 1,  
        "MinPass:=", 1,  
        "MinConvPass:=", 1,  
        "PerError:=", 1,  
        "PerRefine:=", 30]],  
    ["NAME:AC",  
        "MaxPass:=", 10,  
        "MinPass:=", 1,  
        "MinConvPass:=", 2,  
        "PerError:=", 1,  
        "PerRefine:=", 30]]  
)  
oModule.EditSetup("HfssDrivenAuto",  
    ["NAME:Setup1",  
        "IsEnabled:=", True,
```

```
"AutoSolverSetting:=", "Balanced",  
  ["NAME:Sweeps",  
    ["NAME:Sweep",  
      "RangeType:=", "LinearStep",  
      "RangeStart:=", "1GHz",  
      "RangeEnd:=", "10GHz",  
      "RangeStep:=", "1GHz"  
    ]  
  ],  
  "SaveRadFieldsOnly:=", False,  
  "SaveAnyFields:=", True,  
  "Type:=", "Discrete"  
])  
  
oModule.EditSetup("AC Magnetic",  
[  
  "NAME:AC Magnetic",  
  "Enabled:="                , True,  
  [  
    "NAME:MeshLink",
```

```

    "ImportMesh:="          , False
  ],
  "MaximumPasses:="        , 4,
  "MinimumPasses:="        , 2,
  "MinimumConvergedPasses:=", 1,
  "PercentRefinement:="     , 30,
  "SolveFieldOnly:="        , False,
  "PercentError:="          , 0.1,
  "SolveMatrixAtLast:="     , True,
  "UseNonLinearIterNum:="   , False,
  [
    "NAME:ExpressionCache",
    [
      "NAME:CacheItem",
      "Title:="              , "eddy_loss1",
      "Expression:="          , "eddy_loss",
      "Intrinsics:="          , "Phase=\'0deg\'",
      "ReportType:="          , "Fields",
      [
        "NAME:ExpressionContext"
      ]
    ]
  ]

```

```
]
],
"UseCacheFor:="      , ["Pass"],
"UseIterativeSolver:=" , False,
"RelativeResidual:="  , 0.0001,
"NonLinearResidual:=" , 0.0001,
"SmoothBHCurve:="     , False,
"Frequency:="         , "200Hz",
"HasSweepSetup:="     , False,
"UseHighOrderShapeFunc:=", False,
"UseMuLink:="         , False,
"LossAdaptiveCtrl:="  , "0.3"
])
oModule.EditSetup("HfssDriven",
["NAME:Setup3",
    "AdaptMultipleFreqs:=", False,
    "Frequency:=", "5GHz",
    "MaxDeltaS:=", 0.02,
    "PortsOnly:=", False,
    "UseMatrixConv:=", False,
```

```
"MaximumPasses:=", 6,  
"MinimumPasses:=", 1,  
"MinimumConvergedPasses:=", 1,  
"PercentRefinement:=", 30,  
"IsEnabled:=", True,  
"BasisOrder:=", 1,  
"DoLambdaRefine:=", True,  
"DoMaterialLambda:=", True,  
"SetLambdaTarget:=", False,  
"Target:=", 0.3333,  
"UseMaxTetIncrease:=", False,  
"PortAccuracy:=", 2,  
"UseABConPort:=", False,  
"SetPortMinMaxTri:=", False,  
"UseDomains:=", True,  
"UseIterativeSolver:=", False,  
"IterativeResidual:=", 1E-06,  
"DDMSolverResidual:=", 0.0001,  
"EnhancedLowFreqAccuracy:=", True,  
"SaveRadFieldsOnly:=", False,  
"SaveAnyFields:=", True,
```

```
"IESolverType:=", "Auto",  
"LambdaTargetForIESolver:=", 0.15,  
"UseDefaultLambdaTgtForIESolver:=", True,  
"SkipIERegionSolveDuringAdaptivePasses:=", True  
"RayDensityPerWavelength:=", 4,  
"MaxNumberOfBounces:=" , 5,  
"InfiniteSphereSetup:=" , "Infinite Sphere1",  
"SkipSBRsSolveDuringAdaptivePasses:=", True,  
"PTDUTDSimulationSettings:=", "PTD Correction + UTD Rays",  
"PTDEdgeDensity:=" , 20  
])
```

Edit an SBR+ Setup with Fast Frequency Looping

```
oModule.EditSetup("HfssDriven",  
[  
    "NAME:Setup1",  
    "IsEnabled:=" , True,  
    [  
        "NAME:MeshLink",  
        "ImportMesh:=" , False  
    ],  
],
```

```

    "IsSbrRangeDoppler:="      , False,
    "RayDensityPerWavelength:=", 4,
    "MaxNumberOfBounces:="     , 5,
    "IsMonostaticRCS:="        , True,
    "EnableCWRays:="           , False,
    "RadiationSetup:="         , "",
    "PTDUTDSimulationSettings:=", "None",
    "FastFrequencyLooping:=", True,
    [
        "NAME:Sweeps",
        [
            "NAME:Sweep",
            "RangeType:="              , "LinearStep",
            "RangeStart:="             , "1GHz",
            "RangeEnd:="               , "10GHz",
            "RangeStep:="              , "1GHz"
        ]
    ],
    "ComputeFarFields:="      , True
    "UseSBREnhancedRadiatedPowerCalculation:=", True,
    "IsGOBlockageEnabled:="   , False,

```

```
        "GOBlockageSurfaceSelfBlock:=", False
    })

Edit and RF Discharge Setup for HFSS

import ScriptEnv
ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")
oDesktop.RestoreWindow()
oProject = oDesktop.SetActiveProject("coaxbend_discharge_r212")
oDesign = oProject.SetActiveDesign("HFSSDesign60degBendTeflon")
oModule = oDesign.GetModule("AnalysisSetup")
oModule.EditSetup("RFDischarge1",
[
    "NAME:RFDischarge1",
    "Enabled:="                , True,
    [
        "NAME:MeshLink",
        "ImportMesh:="        , True,
        "Project:="            , "This Project*",
        "Product:="            , "HFSS",
        "Design:="             , "This Design*",
        "Soln:="                , "Setup1 : Sweep",
```



```

[
  "NAME:Params",
  "bend_angle:="          , "bend_angle"
],
"ForceSourceToSolve:="    , True,
"PreservePartnerSoln:="   , False,
"PathRelativeTo:="         , "SourceProduct",
"ApplyMeshOp:="           , True
],
[
  "NAME:Excitations",
  [
    "NAME:1:1",
    "Magnitude:="          , "1",
    "Phase:="              , "0deg"
  ],
  [
    "NAME:2:1",
    "Magnitude:="          , "0",
    "Phase:="              , "0deg"
  ]
]

```

```
],  
[  
    "NAME:Frequencies",  
    "10GHz"  
],  
"Minimum Power:="      , "0.01",  
"Maximum Power:="      , "1000000",  
"Minimum Pressure:="    , "100pascal",  
"Maximum Pressure:="    , "101325pascal",  
"Postproc Sampling:="   , 500,  
"Temperature:="         , "0cel",  
"BuiltInGas:="          , "Helium"  
])
```

EditSetup (2D Extractor)

Use: Modifies an existing solution setup.

Command: Double-click a solution setup in the project tree to modify its settings.

Syntax: EditSetup <SetupName>, Array("NAME:<NewSetupName>,<SolverParam>")

Return Value: None

Parameters: <SetupName>

Type: <string>
Name of the solution setup being edited.
 <NewSetupName>
Type: <string>
Name of the solution setup being edited.
 <SolverParam>
See the InsertSetup command for details.

Python Example	<pre>oModule.EditSetup("Setup1", ["NAME:Setup1", "AdaptiveFreq:=" , "2GHz", "SaveFields:=" , False, "Enabled:=" , True, ["NAME:Cap", "MaxPass:=" , 10, "MinPass:=" , 1, "MinConvPass:=" , 1, "PerError:=" , 1, "PerRefine:=" , 30, "AutoIncreaseSolutionOrder:=" , True, "SolutionOrder:=" , "High"],</pre>

```
["NAME:DC",  
  "SolveResOnly:=" , False,  
  [ "NAME:Cond",  
    "MaxPass:=" , 10,  
    "MinPass:=" , 1,  
    "MinConvPass:=" , 1,  
    "PerError:=" , 1,  
    "PerRefine:=" , 30 ],  
  [ "NAME:Mult",  
    "MaxPass:=" , 1,  
    "MinPass:=" , 1,  
    "MinConvPass:=" , 1,  
    "PerError:=" , 1,  
    "PerRefine:=" , 30 ],  
  "Solution Order:=" , "Normal" ],  
  [ "NAME:AC",  
    "MaxPass:=" , 10,  
    "MinPass:=" , 1,  
    "MinConvPass:=" , 1,
```

	<pre>"PerError:=", 1, "PerRefine:=", 30]])</pre>

ExportCircuit

Use: Export equivalent circuit data.

Command: Right-click a setup in the project tree or the **Analysis** folder and choose **Export Circuit**.

Syntax: ExportCircuit <Solution>, <Variation>, <FileName>, <ExportSettings>, <ModelName>, <Freq>

Return Value: none

Parameters: <Solution>

<SetupName>:<SolutionName>

<SetupName>

Type: <string>

Name of the setup where circuit is being exported

<SolutionName>

Type: <String>

Name of the solution.

<Variation>

Type: <string>

The variation where circuit is being exported

<FileName>

Type: <string>

The name of the file where circuit is being exported

<ModelName>

Type: <String>

Model name or name of the sub circuit (Optional). If not specified then <FileName> is considered as model name.

<Freq>

Type: <double>

Sweep frequency in hz.

<ExportSettings>

Array("NAME:CircuitData", "MatrixName:=", _

<ReduceMatrix>, "NumberOfCells:=", <NumCell>, "UserHasChangedSettings:=", <User-ChangedSettings>, "IncludeCap:=", <IncludeCap>, "IncludeCond:=", <IncludeCond>, Array("NAME:CouplingLimits", <CouplingLimitsArray>, "IncludeDCR:=", <IncludeDCR>, "IncludeDCL:=", <IncludeDCL>, "IncludeACR:=", <IncludeACR>, "IncludeACL:=", <IncludeACL>, "ADDResistance:=", <AddResistance>)

Parameters:

<ReduceMatrix>

Type: <string>

One of the reduced matrix setup or "Original"

<NumCell>

Type: <string>

Number of cells in export. Can be a variable.

<UserChangedSettings>

Type: <bool>

Whether user changed settings or use default settings.wirebond

<IncludeCap>

Type: <bool>

Flag indicates whether to export Capacitance matrix.

<IncludeCond>

Type: <bool>

Flag indicates whether to export Conductance matrix.

<IncludeDCR>

Type: <bool>

Flag indicates whether to export DC resistance matrix.

<IncludeDCL>

Type: <bool>

Flag indicates whether to export DC Inductance matrix.

<IncludeACR>

Type: <bool>

Flag indicates whether to export AC resistance matrix.

<IncludeACL>

Type: <bool>

Flag indicates whether to export AC inductance matrix.

<AddResistance>

Type: <bool>

Adds the DC and AC resistance.

Note:

You cannot export both AC and DC matrices unless **AddResistance** is selected.

<CouplingLimitsArray>

```
Array("NAME:CouplingLimits", "CouplingLimitType:=", <CouplingLimitType>, _  
<CouplingLimitsParameters>, 0.01, "CondFraction:=", 0.01)
```

<CouplingLimitType> = "None"

Argument not needed

<CouplingLimitType> = "ByFraction"

<CouplingLimitsParameters>

"CapFraction:=", <Fraction>, "IndFraction:=", <Fraction>,

"ResFraction:=", <Fraction>, "CondFraction:=", <Fraction>,

Parameters:

<Fraction>

Type: <double>

Fraction of the self term


```
<CouplingLimitType> = "ByValue"
```

```
<CouplingLimitsParameters>
```

```
"CapLimit:=", <Limit>, "IndLimit:=", <Limit>, "ResLimit:=", <Limit>,
```

```
"CondLimit:=", <Limit>,
```

Parameters:

```
<Limit>
```

```
Type: <string>
```

Value of the limit.

ExportCircuit (2D Extractor)

*Use:*Exports equivalent circuit data.

*Command:*Right-click a setup in the project tree or in the **Analysis** folder, and then choose **Export Circuit**.

Syntax: ExportCircuit <SolutionName>, <Variation>, <FileName>, <ExportSettings>, <ModelName>, <FileType>, <Freq>

Return Value: None

Parameters: <SolutionName>

```
Type: <string>
```

Name of the setup where the circuit is being exported.

```
<Variation>
```

```
Type: <string>
```

The variation where circuit is being exported.

```
<FileName>
```

```
Type: <string>
```

The name of the file where circuit is being exported.

<ExportSettings>

```
Array("NAME:CircuitData", "MatrixName:=", _  
      <MatrixName>, "NumberOfCells:=", <NumberOfCells>, "User-  
HasChangedSettings:=", <UserHasChangedSettings >, "IncludeCap:=", <IncludeCap>,  
      "IncludeCond:=", <IncludeCond>, <CouplingLimitsArray>, "IncludeR:=", <IncludeR>, "IncludeL:=",  
      <IncludeL>, "ExportDistributed:=", <ExportDistributed>, "LumpedLength:=", <LumpedLength>,  
      "RiseTime:=", <RiseTime>)
```

Parameters:

<MatrixName>

Type: <string>

One of the reduced matrix setup or "Original"

<NumberOfCells>

Type: <string>

Number of cells in export. Can be a variable.

<UserHasChangedSettings>

Type: <bool>

Whether user has changed settings or not, defaulted to false.

We set the default values for circuit data is user has changed the settings.

<IncludeCap>

Type: <bool>

Flag to tell whether to include capacitance matrix when exporting.

<IncludeCond>

Type:<bool>

lag to tell whether to include conductance matrix when exporting.

<IncludeR>

Type:<bool>

Flag to tell whether to include resistance matrix when exporting.

<IncludeL>

Type:<bool>

Flag to tell whether to include inductance matrix when exporting.

<ExportDistributed>

Type: <bool>

Flag to tell whether to export in distributed mode or Lumped mode.

<LumpedLength>

Type: <String>

Length of the design.

<RiseTime>

Type:<String>

Rise time to calculate the number of cells.

<CouplingLimitsArray>

Array("NAME:CouplingLimits", "CouplingLimitType:=", <CouplingLimitType>, _
<CouplingLimitsParameters>, 0.01, "CondFraction:=", 0.01)

```
<CouplingLimitType> = "None"
```

A rgument not needed

```
<CouplingLimitType> = "ByFraction"
```

```
<CouplingLimitsParameters>
```

```
"CapFraction:=", <Fraction>, "IndFraction:=", <Fraction>,
```

```
"ResFraction:=", <Fraction>, "CondFraction:=", <Fraction>,
```

```
Parameters:
```

```
<Fraction>
```

Type: <double>

Fraction of the self term

```
<CouplingLimitType> = "ByValue"
```

```
<CouplingLimitsParameters>
```

```
"CapLimit:=", <Limit>, "IndLimit:=", <Limit>, "ResLimit:=", <Limit>,
```

```
"CondLimit:=", <Limit>,
```

```
Parameters:
```

```
<Limit>
```

Type: <string>

Value of the limit.

```
<FileType>
```

```
Type: <string>
```

The type of file format, right now used to specify the type of "HSPICE" file format (because all HSPICE file formats have same extension *.sp).

Values:

"Hspice": simple HSPICE file format.

"Welement": Nexxim/HSPICE W Element file format

"RLGC": Nexxim/HSPICE RLGC W Element file format

<ModelName>

Type: <String>

Model name or name of the sub circuit (Optional). If not specified then <FileName> is considered as model name.

<Freq>

Type: <double>

Sweep frequency in hz.

GetSetupCount

Gets the number of analysis setups in a design.

UI Access	N/A
Parameters	None.
Return Value	Integer containing number of setups.

Python Syntax	GetSetupCount ()
Python Example	oModule.GetSetupCount ()

GetSetups

Gets the names of analysis setups in a design.

UI Access	N/A
Parameters	None.
Return Value	Array of analysis setup names

Python Syntax	GetSetups ()
Python Example	oModule.GetSetups ()

GetSetupNames

Gets the names of far field and near field radiation setups in a design.

UI Access	N/A		
Parameters	Name	Type	Description
	<RadiationType>	String	Type of radiation.

Return Value	Array of strings containing setup names.

Python Syntax	GetSetupNames(< <i>RadiationType</i> >)
Python Example	<code>oModule.GetSetupNames("Infinite Sphere")</code>

GetSweeps

Gets the names of all sweeps in a given analysis setup.

UI Access	N/A		
Parameters	Name	Type	Description
	< <i>SetupName</i> >	String	Name of specified setup.
Return Value	Array of sweep names.		

Python Syntax	GetSweeps (< <i>SetupName</i> >)
Python Example	<code>oModule.GetSweeps("Setup1")</code>

InsertDrivenSweep

Adds a frequency sweep to a Driven solution-type setup.

UI Access	N/A.

Parameters	Name	Type	Description
	<SetupName>	String	Name of the solution setup into which the sweep will be inserted.
	<Attributes>	Array	Structured array. <pre> Array("NAME:<string name of sweep>", "IsEnabled:=", <boolean> "RangeType:=", <"LinearStep" "LinearCount" "LogScale">, <LinearStepArray> "RangeStart:=", "<real>GHz", "RangeEnd:=", "<real>GHz", "RangeStep:=", "<real>GHz", <LinearCountArray> "RangeStart:=", "<real>GHz", "RangeEnd:=", "<real>GHz", "RangeCount:=", <int>, <LogScaleArray> RangeStart:=", "<real>GHz", "RangeEnd:=", "<real>GHz", "RangeCount:=", <int>, "RangeSamples:=", <int>, <SweepTypeArray> </pre>

			<pre> "Type:=", <"Interpolating" "Fast" "Discrete">, <InterpolatingParametersArray> "SaveFields:=", <boolean>, "SaveRadFields:=", <boolean>, "InterpTolerance:=", <real>, "InterpMaxSolns:=", <int>, "InterpMinSolns:=", <int>, "InterpMinSubranges:=", <int>, "ExtrapToDC:=", <boolean>, "InterpUseS:=", <boolean>, "InterpUsePortImped:=", <boolean>, "InterpUsePropConst:=", <boolean>, "UseDerivativeConvergence:=", true, "InterpDerivTolerance:=", <real>, "UseFullBasis:=", <boolean>, "EnforcePassivity:=", <boolean>, "PassivityErrorTolerance:=", <real>) "EnforceCausality:=", <boolean>, "UseQ3DForDCSolve:=", <boolean>, "SMatrixOnlySolveMode:=", <"Manual"> "Auto">, "SMatrixOnlySolveAbove:=", "<real><units>" </pre>

			<pre><FastParametersArray> "SaveFields:=", <boolean>, "SaveRadFields:=", <boolean>, "GenerateFieldsForAllFreqs:=", <boolean>, "ExtrapToDC:=", <boolean>) <DiscreteParametersArray> "SaveFields:=", <boolean>, SaveRadFields:=", <boolean>, "ExtrapToDC:=", <boolean>)</pre>
Return Value	None.		

Python Syntax	InsertDrivenSweep(<SetupName>, <Attributes>)		
Python Example	<pre>oModule.InsertDrivenSweep("Setup1", ["NAME:Sweep1", "IsEnabled:=" , True, "RangeType:=" , "LinearCount", "RangeStart:=" , "2.5GHz", "RangeEnd:=" , "7.5GHz",</pre>		

```

"RangeCount:="          , 401,
"Type:="                 , "Interpolating",
"SaveFields:="           , False,
"SaveRadFields:="        , False,
"InterpTolerance:="      , 0.5,
"InterpMaxSolns:="       , 250,
"InterpMinSolns:="       , 0,
"InterpMinSubranges:="   , 1,
"InterpUseS:="           , True,
"InterpUsePortImped:="   , False,
"InterpUsePropConst:="   , True,
"UseDerivativeConvergence:=", False,
"InterpDerivTolerance:=", 0.2,
"UseFullBasis:="         , True,
"EnforcePassivity:="     , True,
"PassivityErrorTolerance:=", 0.0001,
"SMatrixOnlySolveMode:=", "Manual",
"SMatrixOnlySolveAbove:=", "1MHz"

])

```

InsertSetup (Q3D Extractor)

Adds a new Q3D Extractor solution setup.

UI Access	Q3D Extractor > Analysis Setup > Add Solution Setup. Select settings using the various tabs.		
Parameters	Name	Type	Description
	<SetupType>	String	For Q3D Extractor, string "Matrix".
	<Attributes>	Array	Structured array. <pre>Array ("NAME:<SetupName>", "AdaptiveFreq:=", <string freq>, "SaveFields:=" , <boolean True to save fields; else False>, "Enabled:=" , <boolean True to enable setup; else False>, <CG Data Block (if adding CG solution)> <DC RL Data Block (if adding DC RL solution)> <AC RL Data Block (if adding AC RL solution)></pre>
	<CG Data Block>	Array	<i>Optional. See <Attributes> above.</i> Structured array: <pre>Array ("NAME:Cap", "MaxPass:=" , <integer maximum number of passes>, "MinPass:=" , <integer minimum number of passes>, "MinConvPass:=" , <integer minimum number of converged</pre>

			<pre> passes>, "PerError:=" , <integer percent error>, "PerRefine:=" , <integer percent refinement per pass>, "AutoIncreaseSolutionOrder:=", <boolean>, "SolutionOrder:=" , <string "Normal", "High", "Higher", or "Highest">, "Solver Type:=" , <string "Direct" or "Iterative">, <if using direct solver, string "Compression Tol- erance:="; else omit>, <if using direct solver, compression tolerance value; else omit> </pre>
	<DC RL Data Block>	Array	<i>Optional. See <Attributes> above.</i> Structured array: <pre> Array("NAME:DC", "SolveResOnly:=" , <boolean True to solve Resistance; False to solve Resistance/Inductance>, Array("NAME:Cond", "MaxPass:=" , <integer maximum number of passes for conduction>, "MinPass:=" , <integer minimum number of passes for conduction>, "MinConvPass:=" , <integer minimum number of con- verged passes for </pre>

		<pre>conduction>, "PerError:=" , <integer percent error for con- duction>, "PerRefine:=" , <integer percent refinement per pass for conduction>), Array("NAME:Mult", "MaxPass:=" , <integer maximum number of passes for inductance>, "MinPass:=" , <integer minimum number of passes for inductance>, "MinConvPass:=" , <integer minimum number of con- verged passes for inductance>, "PerError:=" , <integer percent error for induct- ance>, "PerRefine:=" , <integer percent refinement per pass for inductance>), "Solution Order:=" , <string "Normal", "High", "Higher", or "Highest">) </pre>
<AC RL Data Block>	Array	Optional. See <Attributes> above.

			Structured array: <pre> Array("NAME:AC", "MaxPass:=" , <integer maximum number of passes>, "MinPass:=" , <integer minimum number of passes>, "MinConvPass:=" , <integer minimum number of converged passes>, "PerError:=" , <integer percent error>, "PerRefine:=" , <integer percent refinement per pass>) </pre>
Return Value	None.		

Python Syntax	InsertSetup(<SetupType>, <Attributes>)
Python Example	<pre> oModule.InsertSetup("Matrix", ["NAME:Setup1", "AdaptiveFreq:=" , "1GHz", "SaveFields:=" , True, "Enabled:=" , True, ["NAME:Cap", "MaxPass:=" , 10, "MinPass:=" , 1, "MinConvPass:=" , 1, </pre>

```
"PerError:="      , 1,  
"PerRefine:="      , 30,  
"AutoIncreaseSolutionOrder:=", True,  
"SolutionOrder:=" , "High",  
"Solver Type:="    , "Direct",  
"Compression Tolerance:=", 1E-06  
]  
])  
oModule.InsertSetup("Matrix",  
  ["NAME:Setup3",  
  "AdaptiveFreq:=" , "1GHz",  
  "SaveFields:="   , False,  
  "Enabled:="       , True,  
  ["NAME:DC",  
  "SolveResOnly:=", True,  
  ["NAME:Cond",  
  "MaxPass:="       , 10,  
  "MinPass:="        , 1,  
  "MinConvPass:="   , 1,  
  "PerError:="       , 1,
```



```

        "PerRefine:="      , 30
    ],
    ["NAME:Mult",
        "MaxPass:="        , 1,
        "MinPass:="         , 1,
        "MinConvPass:="    , 1,
        "PerError:="        , 1,
        "PerRefine:="       , 30
    ],
    "Solution Order:=", "Normal"
]
])
oModule.InsertSetup("Matrix",
    ["NAME:Setup4",
        "AdaptiveFreq:=", "1GHz",
        "SaveFields:="    , True,
        "Enabled:="        , True,
        ["NAME:AC",
            "MaxPass:="      , 10,
            "MinPass:="       , 1,
            "MinConvPass:="  , 1,

```

	<pre>"PerError:=" , 1, "PerRefine:=" , 30]])</pre>

InsertSetup (2D Extractor)

Adds a new 2D Extractor solution setup.

UI Access	2D Extractor > Analysis Setup > Add Solution Setup. Select settings using the various tabs.		
Parameters	Name	Type	Description
	<SetupType>	String	For 2D Extractor, string "2D Matrix".
	<Attributes>	Array	Structured array.
			<pre>Array("NAME:<SetupName>", "AdaptiveFreq:=", <string freq>, "SaveFields:=" , <boolean True to save fields; else False>, "Enabled:=" , <boolean True to enable setup; else False>, Array("NAME:MeshLink", "ImportMesh:=" , <boolean True to import mesh; else False>), <RL Data Block (if adding RL solution)></pre>

			<CG Data Block (if adding CG solution)>
	<RL/CG Data Block>	Array	Structured array: <pre> Array(<string "NAME:RLDataBlock" or "NAME:CGDataBlock">, "MaxPass:=" , <integer maximum number of passes>, "MinPass:=" , <integer minimum number of passes>, "MinConvPass:=" , <integer minimum number of converged passes>, "PerError:=" , <integer percent error>, "PerRefine:=" , <integer percent refinement per pass>, "DataType:=" , <string "RL" or "CG">, "Included:=" , <boolean>, "UseParamConv:=" , <boolean True to use parameter con- vergence (C Only or L Only); else False>, "UseLossyParamConv:=" , <boolean True to use lossy parameter convergence (CG or RL); else False>, "PerErrorParamConv:=" , <if using lossy parameter con- vergence, integer percent error for parameter convergence; else pass integer 1>, "UseLossConv:=" , <boolean True to use loss con- vergence; else False>)</pre>
Return Value	None.		

Python Syntax	InsertSetup(<SetupType>, <Attributes>)
Python Example	<pre>oModule.InsertSetup("2DMatrix", ["NAME:Setup1", "AdaptiveFreq:=", "1GHz", "SaveFields:=", True, "Enabled:=", True, ["NAME:MeshLink", "ImportMesh:=", False], ["NAME:CGDataBlock", "MaxPass:=", 10, "MinPass:=", 1, "MinConvPass:=", 1, "PerError:=", 1, "PerRefine:=", 30, "DataType:=", "CG", "Included:=", True, "UseParamConv:=", True, "UseLossyParamConv:=", False,</pre>

```

        "PerErrorParamConv:=" , 1,
        "UseLossConv:="      , True
    ]
    ["NAME:RLDataBlock",
        "MaxPass:="          , 10,
        "MinPass:="          , 1,
        "MinConvPass:="      , 1,
        "PerError:="         , 1,
        "PerRefine:="        , 30,
        "DataType:="         , "RL",
        "Included:="         , True,
        "UseParamConv:="     , True,
        "UseLossyParamConv:=" , True,
        "PerErrorParamConv:=" , 1,
        "UseLossConv:="      , True
    ]
] )

```

InsertSetup [Transient]

Add a new solution setup to a Transient design

Command: HFSS>Analysis Setup>Add Solution Setup

Syntax: InsertSetup <SetupType>, <AttributesArray>

Return Value: None

Parameters: <SetupType>

Type: <string>

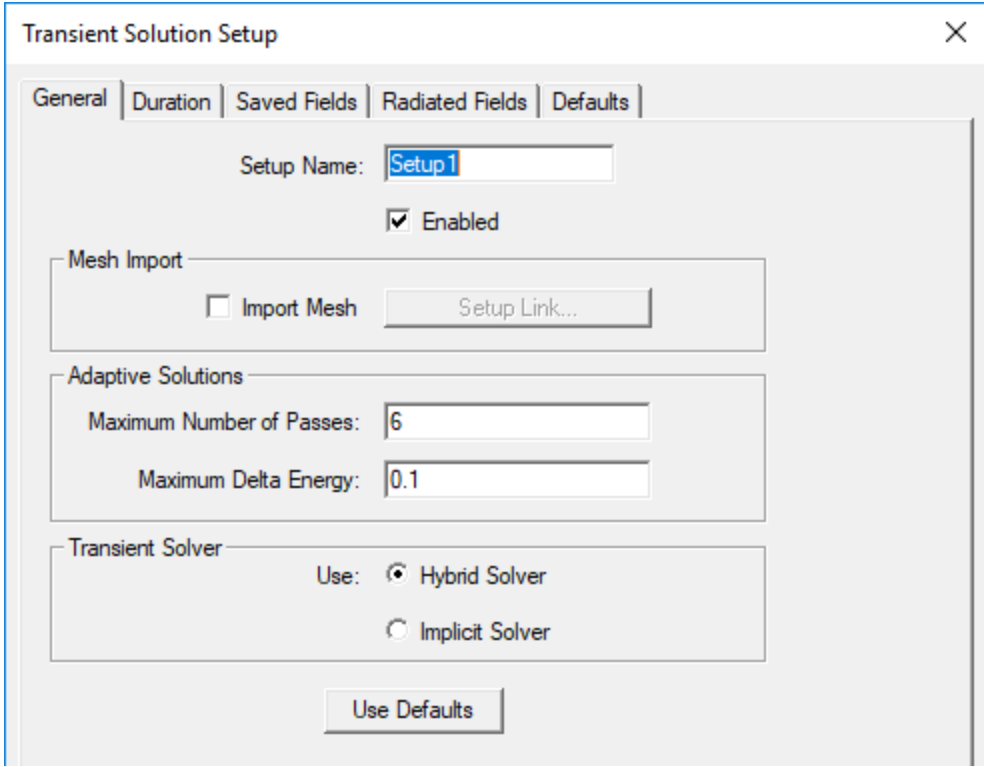
"HfssTransient". Must match the HFSS solution type.

<AttributesArray>

Array("NAME:<SetupName>", <Named Parameters>)

<Named Parameters>

The parameters correspond to fields in the **Setup** dialog box. For example, here is default dialog for an HFSS Transient driven Composite Excitation setup with one excitation assigned. To see the required parameters for a specific set of parameters and their format, use the record script function, and view the resulting script in a text editor.



Python Syntax	InsertSetup("HfssTransient", [<parameters>])
Python Example	<pre>oModule.InsertSetup("HfssTransient", ["NAME:Setup2", "Frequency:=", , "5GHz", "MaxDeltaS:=" , 0.02,</pre>

	<pre> "MaximumPasses:=" , 20, "UseImplicitSolver:=" , True, "IsEnabled:=" , True, "BasisOrder:=" , -1, ["NAME:Transient", "TimeProfile:=" , "Broadband Pulse", "HfssFrequency:=" , "5GHz", "MinFreq:=" , "100MHz", "MaxFreq:=" , "1GHz", "NumFreqsExtracted:=" , 401, "SweepMinFreq:=" , "100MHz", "SweepMaxFreq:=" , "1GHz", "ListsForFields:=" , ["Facelist1"], "UseSaveCount:=" , 1, "SaveCount:=" , 256, "UseSaveStart:=" , 1, "SaveStart:=" , "0s", "UseSaveDelta:=" , 1, "SaveDelta:=" , "10ps", "SaveRadFields:=" , 0, "SaveFDRadFields:=" , 0, "UseAutoTermination:=" , 1, "SteadyStateCriteria:=" , 0.01, "UseMinimumDuration:=" , 0, "TerminateOnMaximum:=" , 0]]) </pre>

PasteDrivenSetup

Pastes a driven setup.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	PasteDrivenSetup()
Python Example	<code>oModule.PasteDrivenSetup()</code>

PasteEigenSetup

Pastes an eigen-analysis setup.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	PasteEigenSetup()
Python Example	<code>oModule.PasteEigenSetup()</code>

PasteSetup

Use: Paste a solve setup.

Syntax: PasteSetup

Return Value: None

PasteSweep

Pastes a copied sweep.

UI Access	Right-click on a setup, select Paste		
Parameters	Name	Type	Description
	<SetupName>	String	Name of setup where the copied sweep is pasted to.
Return Value	None.		

Python Syntax	PasteSweep (<SetupName>)
Python Example	oModule.PasteSweep ("Setup1")

RenameDrivenSweep

Renames an existing frequency sweep in HFSS. For HFSS-IE use RenameSweep.

UI Access	Right-click a frequency sweep in the Project Manager and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of setup to which the sweep belongs.
	<OldSweepName>	String	Name of the sweep to be renamed.
	<NewSweepName>	String	New name for the sweep.

Return Value	None.

Python Syntax	<code>RenameDrivenSweep (<SetupName>, <OldSweepName>, <NewSweepName>)</code>
Python Example	<code>oModule.RenameDrivenSweep ("Setup1", "Sweep1", "MySweep")</code>

RenameSetup

Renames an existing solution setup.

UI Access	Right-click a solution setup in the Project Manager and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<code><OldSetupName></code>	String	Name of the solution setup being renamed.
	<code><NewSetupName></code>	String	New name for the solution setup.
Return Value	None.		

Python Syntax	<code>RenameSetup (<OldSetupName>, <NewSetupName>)</code>
Python Example	<code>oModule.RenameSetup ("Setup1", "MySetup")</code>

ResetToTimeZero

Resets a simulation to time zero.

UI Access	CleanStop when running Electronics Desktop in Batchmode.		
Parameters	Name	Type	Description
	<setupName>	String	Name of the simulation setup to be reset.
Return Value	None.		

Python Syntax	ResetToTimeZero(<setupName>)
Python Example	<code>oModule.ResetToTimeZero("Setup1")</code>

RevertAllToInitial

Marks the current mesh for all solution setups as invalid. This will force the next simulation to begin with the initial mesh.

UI Access	Q3D Extractor or 2D Extractor > Analysis Setup > Revert to Initial Mesh .
Parameters	None.
Return Value	None.

Python Syntax	RevertAllToInitial ()
Python Example	<code>oModule.RevertAllToInitial ()</code>

RevertAllToInitialTemperature

Reverts all setups to their initial temperature. Used when coupling with thermal designs.

UI Access	Q3D Extractor or 2D Extractor > Set Object Temperature > Enable Feedback . Then in the Project Manager, right-click Analysis > Revert to Initial Temperature . Repeat for all setups.
Parameters	None.
Return Value	None.

Python Syntax	<code>RevertAllToInitialTemperature()</code>
Python Example	<code>oModule.RevertAllToInitialTemperature()</code>

RevertAllToZeroDisplacement

Reverts the displacement values of all objects to zero.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	<code>RevertAllToZeroDisplacement()</code>
Python Example	<code>oModule.RevertAllToZeroDisplacement()</code>

RevertSetupToInitial

Marks the current mesh for a solution setup as invalid. This will force the next simulation to begin with the initial mesh.

UI Access	Right-click a solution setup in the Project Manager and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of specified setup.
Return Value	None.		

Python Syntax	RevertSetupToInitial (<SetupName>)
Python Example	<code>oModule.RevertSetupToInitial("Setup1")</code>

RevertSetupToInitialTemperature

Reverts a specified setup to its initial temperature. Used when coupling with thermal designs.

UI Access	Q3D Extractor or 2D Extractor > Set Object Temperature > Enable Feedback . Then in the Project Manager, right-click Analysis > Revert to Initial Temperature .		
Parameters	Name	Type	Description
	<setupName>	String	Name of solution setup.
Return Value	None		

Python Syntax	RevertSetupToInitialTemperature(<setupName>)
Python Example	<code>oModule.RevertSetupToInitialTemperature('Setup1')</code>

RevertSetupToZeroDisplacement

Reverts the displacement values of objects for a specified setup to zero.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of specified setup.
Return Value	None.		

Python Syntax	RevertSetupToZeroDisplacement (<SetupName>)		
Python Example	oModule.RevertSetupToZeroDisplacement ("Setup1")		

SolveSetup

Solves the specified setup.

UI Access	Right-click the setup in the project tree, and then click Analyze on the shortcut menu.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup to be solved
Return Value	None		

Python Syntax	SolveSetup (<SetupName>)
Python Example	<code>oModule.SolveSetup ("Setup1")</code>

14 - Optimetrics Module Script Commands

Optimetrics script commands should be executed by the `Optimetrics` module.

```
Set oModule = oDesign.GetModule("Optimetrics")
```

```
oModule.CommandName <args>
```

Conventions Used in this Chapter

<VarName>

Type: <string>

Name of a variable.

<VarValue>

Type: <string>

Value with unit (i.e., <value>, but cannot be an expression).

<StartV>

Type: <VarValue>

The starting value of a variable.

<StopV>

Type: <VarValue>

The stopping value of a variable.

<MinV>

Type: <VarValue>

The minimum value of a variable.

<MaxV>

Type: <VarValue>

The maximum value of a variable.

<IncludeVar>

Type: <bool>

Specifies whether the variable is included in the analysis.

<StartingPoint>

```
Array("NAME:StartingPoint", "<VarName>:=",  
      <VarValue>, .... "<VarName>:=", <VarValue>)
```

<SaveField>

Type: <bool>

Specifies whether HFSS will remove the non-nominal field solution.

<MaxIter>

Type: <int>

Maximum iteration allowed in an analysis.

<PriorSetup>

Type: <string>

The name of the embedded parametric setup.

<Precede>

Type: <bool>

If true, the embedded parametric setup will be solved before the analysis begins.

If false, the embedded parametric setup will be solved during each iteration of the analysis.

<Constraint>

```
Array("NAME:LCS",  
      "lc=", Array("<VarName>:=",  
                   "<Coeff>, ..."<VarName>:=", <Coeff>, "rel:=", <Cond>, "rhs:=", <Rhs>), ...  
      "lc=", Array("<VarName>:=", <Coeff>, ..."  
                   <VarName>:=", <Coeff>, "rel:=", <Cond>, "rhs:=",  
                   <Rhs>))
```

<Coeff>

Type: <double>

Coefficient for a variable in the linear constraint.

<Cond>

Type: <string>

Inequality condition.

<Rhs>

Type: <double>

Inequality value.

<OptiGoalSpec>

```
"Solution:=", <Soln>, "Calculation:=", <Calc>,  
"Context:=", <Geometry>  
Array("NAME:Ranges",  
  "Range:", Array("Var:=",  
    <VarName>, "Type:=", <RangeType>, "Start:=",  
    <StartV>, "Stop:=", <StopV>), ...  
  "Range:", Array("Var:=", <VarName>, "Type:=",  
    <RangeType>, "Start:=", <StartV>, "Stop:=",  
    <StopV>))
```

<Soln>

Type: <string>

Name of the solution.

<Calc>

Type: <string>

An expression that is composed of a basic solution quantity and an output variable.

<ContextName>

Type: <string>

Name of context needed in the evaluation of <Calc>.

<Geometry>

Type: <string>

Name of geometry needed in the evaluation of <Calc>.

<RangeType>

Type: <string>

if "r", start and stop values specify a range for the variable.

if "s", start values specify the single value for the variable.

[EditSetup](#)

[EditSetup \[Optimization\]](#)

[EditSetup \[Sensitivity\]](#)

[EditSetup \[Statistical\]](#)

[GetPropNames \[Optimetrics\]](#)

[GetPropValue \[Optimetrics\]](#)

[GetSetupNames \[Optimetrics\]](#)

[GetSetupNamesByType \[Optimetrics\]](#)

[InsertSetup \[Parametric\]](#)

[InsertSetup \[Optimization\]](#)

[InsertSetup \[Sensitivity\]](#)

[InsertSetup \[Statistical\]](#)

[PasteSetup \[Optimetrics\]](#)

[RenameSetup \[Optimetrics\]](#)

[SetPropValue \[Optimetrics\]](#)

[SolveSetup \[Optimetrics\]](#)

The topics for this section include:

[General Commands Recognized by the Optimetrics Module](#)

[Parametric Script Commands](#)

[Optimization Script Commands](#)

[Sensitivity Script Commands](#)

[Statistical Script Commands](#)

CopySetup

Copy the specified Optimetrics setup.

UI Access	NA		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup.
Return Value	None.		

Python Syntax	CopySetup (<SetupName>)
Python Example	oModule.CopySetup ("OptimizationSetup1")

DeleteSetups [Optimetrics]

Deletes the specified Optimetrics setups.

UI Access	Right-click the setup in the project tree, and then click Delete on the shortcut menu		
Parameters	Name	Type	Description
	<NameArray>	Array of Strings	An Array of Setup Names
Return Value	None		

Python Syntax	DeleteSetups (<NameArray>)
Python Example	<pre>oModule.DeleteSetups (["OptimizationSetup1"])</pre>

DistributedAnalyzeSetup

Distributes all variable value instances within a parametric sweep to different machines already specified from within the user interface

UI Access	Right-click the parametric setup name in the project tree and select Distribute Analysis.		
Parameters	Name	Type	Description
	<ParametricSetupName>	String	Name of the Setup
	isBlocking	Boolean	An optional arg that defaults to <code>true</code> . If it's <code>false</code> , the command immediately returns while the analysis or analyses run in the background. The status of the analyses can be checked with the <code>AreThereSimulationsRunning</code> command.

Return Value	None

Python Syntax	DistributedAnalyzeSetup (<ParametricSetupName>)
Python Example	<code>oModule.DistributedAnalyzeSetup("ParametricSetup1")</code>

EditSetup

Modifies an existing solution setup.

UI Access	Double-click a solution setup in the project tree to modify its settings.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the solve setup being edited.
	<Attributes>	Array	Structured array. <code>Array("NAME:<NewSetupName>", <NamedParameters>)</code> See the InsertSetup command for details and examples.
Return Value	None.		

Python Syntax	EditSetup (<SetupName>, <Attributes>)
Python Example	<code>oModule.EditSetup("Setup1",</code> <code>[</code>


```
"NAME:NewSetup",
"AdaptiveFreq:=", "1GHz",
"EnableDistribProbTypeOption:=", false,
"SaveFields:=", "true",
"Enabled:=", true,
["NAME:Cap",
    "MaxPass:=", 10,
    "MinPass:=", 1,
    "MinConvPass:=", 2,
    "PerError:=", 1,
    "PerRefine:=", 30,
    "AutoIncreaseSolutionOrder:=", false,
    "SolutionOrder:=", "Normal"],
["NAME:DC",
    "Residual:=", 1E-005,
    "SolveResOnly:=", false,
    ["NAME:Cond",
        "MaxPass:=", 10,
        "MinPass:=", 1,
        "MinConvPass:=", 1,
        "PerError:=", 1,
```

```
        "PerRefine:=", 30),  
    ["NAME:Mult",  
        "MaxPass:=", 1,  
        "MinPass:=", 1,  
        "MinConvPass:=", 1,  
        "PerError:=", 1,  
        "PerRefine:=", 30]],  
    ["NAME:AC",  
        "MaxPass:=", 10,  
        "MinPass:=", 1,  
        "MinConvPass:=", 2,  
        "PerError:=", 1,  
        "PerRefine:=", 30]]  
)  
oModule.EditSetup("HfssDrivenAuto",  
    ["NAME:Setup1",  
        "IsEnabled:=", True,  
        "AutoSolverSetting:=", "Balanced",  
        ["NAME:Sweeps",  
            ["NAME:Sweep",
```

```
        "RangeType:=", "LinearStep",  
        "RangeStart:=", "1GHz",  
        "RangeEnd:=", "10GHz",  
        "RangeStep:=", "1GHz"  
    ]  
  
],  
"SaveRadFieldsOnly:=", False,  
"SaveAnyFields:=", True,  
"Type:=", "Discrete"  
])
```

```
oModule.EditSetup("AC Magnetic",  
[  
    "NAME:AC Magnetic",  
    "Enabled:="                , True,  
    [  
        "NAME:MeshLink",  
        "ImportMesh:="        , False  
    ],  
    "MaximumPasses:="          , 4,  
    "MinimumPasses:="          , 2,
```

```
"MinimumConvergedPasses:=", 1,
"PercentRefinement:="      , 30,
"SolveFieldOnly:="         , False,
"PercentError:="           , 0.1,
"SolveMatrixAtLast:="      , True,
"UseNonLinearIterNum:="    , False,
[
  "NAME:ExpressionCache",
  [
    "NAME:CacheItem",
    "Title:="                , "eddy_loss1",
    "Expression:="           , "eddy_loss",
    "Intrinsics:="          , "Phase='\0deg'",
    "ReportType:="          , "Fields",
    [
      "NAME:ExpressionContext"
    ]
  ]
],
"UseCacheFor:="            , ["Pass"],
```

```

"UseIterativeSolver:=" , False,
"RelativeResidual:=" , 0.0001,
"NonLinearResidual:=" , 0.0001,
"SmoothBHCurve:=" , False,
"Frequency:=" , "200Hz",
"HasSweepSetup:=" , False,
"UseHighOrderShapeFunc:=", False,
"UseMuLink:=" , False,
"LossAdaptiveCtrl:=" , "0.3"
])
oModule.EditSetup("HfssDriven",
["NAME:Setup3",
    "AdaptMultipleFreqs:=", False,
    "Frequency:=", "5GHz",
    "MaxDeltaS:=", 0.02,
    "PortsOnly:=", False,
    "UseMatrixConv:=", False,
    "MaximumPasses:=", 6,
    "MinimumPasses:=", 1,
    "MinimumConvergedPasses:=", 1,
    "PercentRefinement:=", 30,

```

	<pre>"IsEnabled:=", True, "BasisOrder:=", 1, "DoLambdaRefine:=", True, "DoMaterialLambda:=", True, "SetLambdaTarget:=", False, "Target:=", 0.3333, "UseMaxTetIncrease:=", False, "PortAccuracy:=", 2, "UseABConPort:=", False, "SetPortMinMaxTri:=", False, "UseDomains:=", True, "UseIterativeSolver:=", False, "IterativeResidual:=", 1E-06, "DDMSolverResidual:=", 0.0001, "EnhancedLowFreqAccuracy:=", True, "SaveRadFieldsOnly:=", False, "SaveAnyFields:=", True, "IESolverType:=", "Auto", "LambdaTargetForIESolver:=", 0.15, "UseDefaultLambdaTgtForIESolver:=", True,</pre>

```

        "SkipIERegionSolveDuringAdaptivePasses:=", True
        "RayDensityPerWavelength:=", 4,
        "MaxNumberOfBounces:=", 5,
        "InfiniteSphereSetup:=", "Infinite Sphere1",
        "SkipSBRsSolveDuringAdaptivePasses:=", True,
        "PTDUTDSimulationSettings:=", "PTD Correction + UTD Rays",
        "PTDEdgeDensity:=", 20
    ])

```

Edit an SBR+ Setup with Fast Frequency Looping

```

oModule.EditSetup("HfssDriven",
    [
        "NAME:Setup1",
        "IsEnabled:=", True,
        [
            "NAME:MeshLink",
            "ImportMesh:=", False
        ],
        "IsSbrRangeDoppler:=", False,
        "RayDensityPerWavelength:=", 4,
        "MaxNumberOfBounces:=", 5,
        "IsMonostaticRCS:=", True,
        "EnableCWRays:=", False,
    ]
)

```

```
"RadiationSetup:="      , "",
"PTDUTDSimulationSettings:=", "None",
"FastFrequencyLooping:=", True,
[
    "NAME:Sweeps",
    [
        "NAME:Sweep",
        "RangeType:="      , "LinearStep",
        "RangeStart:="     , "1GHz",
        "RangeEnd:="       , "10GHz",
        "RangeStep:="      , "1GHz"
    ]
],
"ComputeFarFields:="      , True
"UseSBREnhancedRadiatedPowerCalculation:=", True,
"IsGOBlockageEnabled:="   , False,
"GOBlockageSurfaceSelfBlock:=", False

])
```

Edit and RF Discharge Setup for HFSS

```
import ScriptEnv
```



```

ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")
oDesktop.RestoreWindow()
oProject = oDesktop.SetActiveProject("coaxbend_discharge_r212")
oDesign = oProject.SetActiveDesign("HFSSDesign60degBendTeflon")
oModule = oDesign.GetModule("AnalysisSetup")
oModule.EditSetup("RFDischarge1",
[
    "NAME:RFDischarge1",
    "Enabled:="                , True,
    [
        "NAME:MeshLink",
        "ImportMesh:="        , True,
        "Project:="            , "This Project*",
        "Product:="            , "HFSS",
        "Design:="              , "This Design*",
        "Soln:="                , "Setup1 : Sweep",
        [
            "NAME:Params",
            "bend_angle:="      , "bend_angle"
        ],
    ],
    "ForceSourceToSolve:="    , True,

```

```
"PreservePartnerSoln:=" , False,  
"PathRelativeTo:="      , "SourceProduct",  
"ApplyMeshOp:="         , True  
],  
[  
  "NAME:Excitations",  
  [  
    "NAME:1:1",  
    "Magnitude:="      , "1",  
    "Phase:="          , "0deg"  
  ],  
  [  
    "NAME:2:1",  
    "Magnitude:="      , "0",  
    "Phase:="          , "0deg"  
  ]  
],  
[  
  "NAME:Frequencies",  
  "10GHz"
```

```

],
"Minimum Power:="      , "0.01",
"Maximum Power:="      , "1000000",
"Minimum Pressure:="    , "100pascal",
"Maximum Pressure:="    , "101325pascal",
"Postproc Sampling:="   , 500,
"Temperature:="         , "0cel",
"BuiltInGas:="          , "Helium"
])

```

EnableSetup

Enables and disables a defined optometrics analysis setup.

UI Access	Right-click on a setup in the project tree, select Enable Setup or Disable Setup		
Parameters	Name	Type	Description
	<SetupName>	String	Name of specified setup.
	<Enable>	Boolean	Determines whether enable or disable a setup. • True - enable setup. • False - disable setup.
Return Value	None.		

Python Syntax	<code>EnableSetup(<SetupName>, <Enable>)</code>
Python Example	<code>oModule.EnableSetup("OptimizationSetup1", True)</code>

ExportDXConfigFile

Create an xml file with the setup information for Design Xplorer

UI Access	Right click on the Design Xplorer setup in the project tree and choose Export External Connector Addin Configuration...		
Parameters	Name	Type	Description
	<SetupName>	String	Must be one of existing DesignExplorer setup names
	<FileName>	String	Must be a valid file path and name
Return Value	None		

Python Syntax	<code>ExportDXConfigFile (<SetupName>, <FileName>)</code>
Python Example	<code>oModule.ExportDXConfigFile ("DesignXplorerSetup1", "c:/exportdir/DXSetup1.xml")</code>

ExportOptimetricsProfile

Export Optimetrics profile data

UI Access	Right click on the Optimetrics setup in the project tree and choose View Analysis Result... On the Post Analysis Display dialog box, click the Profile tab and click on the Export button.		
Parameters	Name	Type	Description
	<SetupName>	String	Must be one of the existing Parametric, Optimization, Sensitivity, Statistical or DesignXplorer setup names
	<FileName>	String	Must be a valid file path and name with extension of csv, tab, dat, or txt
	[profileNum]	String	Must be a numeric string. Optional: defaulted to last profile number. It should be a zero indexed profile number.
Return Value	None		

Python Syntax	ExportOptimetricsProfile (<SetupName>, <FileName>, [profileNum])		
Python Example	<pre>oModule.ExportOptimetricsProfile ("StatisticalSetup1", "c:/exportdir/test.csv")</pre>		

ExportOptimetricsResult

Export an existing Optimization, Sensitivity, Statistical or DesignXplorer result. (Does not export Parametric results.)

UI Access	Right click on the desired Optimetrics setup in the project tree and choose View Analysis Result... On the Post Analysis Display dialog box, click the Result tab, then select Table view, and click on the Export button		
Parameters	Name	Type	Description
	<SetupName>	String	Must be one of the existing Optimization, Sensitivity, Statistical, or DesignXplorer setup names
	<FileName>	String	Must be a valid file path and name with extension of csv, tab, dat, or txt..
	[useFullOutputName]	Boolean	Optional: defaulted to false. If set to true values will be printed with units.

	<table><tr><td></td><td></td><td>This parameter is ignored for Optimization and Statistical results.</td></tr></table>					This parameter is ignored for Optimization and Statistical results.
		This parameter is ignored for Optimization and Statistical results.				
Return Value	None					

Python Syntax	ExportOptimetricsResult (<SetupName>, <FileName>, [useFullOutputName])
Python Example	<pre>oModule.ExportOptimetricsResult ("StatisticalSetup1", "c:/exportdir/test.csv", false)</pre>

ExportParametricResults

Export existing Parametric results.

UI Access	Right click on the desired Parametric setup in the project tree and choose View Analysis Result... On the Post Analysis Display dialog box, click the Result tab, then select Table view, and click on the Export button.		
Parameters	Name	Type	Description
	<SetupName>	String	Must be one of the existing Parametric setup names
	<FileName>	String	Must be a valid file path and name with extension of csv, tab, dat or txt
	<bOutputUnits>	Boolean	If set to true, values will be printed with units
Return Value	None		

Python Syntax	ExportParametricResults (<SetupName>, <FileName>, <bOutputUnits>)
Python Example	<pre>oModule.ExportParametricResults (<SetupName>, <FileName>, <bOutputUnits>)</pre>

```
"ParametricSetup1", "c:/exportdir/test.csv", False)
```

ExportParametricSetupTable

Exports the parametric setup table as a CSV file.

UI Access	Double-click parametric setup. Select Table tab. Click Export .		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup.
	<filePath>	String	Full path for file export.
Return Value	None		

Python Syntax	ExportParametricSetupTable (<SetupName>, <filePath>)
Python Example	<pre>oModule.ExportParametricSetupTable('ParametricSetup1', 'E:/Files/ParametricSetup1_ Table.csv')</pre>

ExportRespSurfaceMinMaxTable

Exports min-max table from a response surface to a file

UI Access	Click on Export... From the Response Surface tab of the Design of Experiments Post Analysis Display dialog.

Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None.		

Python Syntax	ExportRespSurfaceMinMaxTable(<DOEName>, <FileName>)
Python Example	<pre>oModule.ExportRespSurfaceMinMaxTable("DesignOfExperimentsSetup1", "C:/temp/DesignOfExperimentsSetup1_Min-Max_Search.csv")</pre>

ExportRespSurfaceRefinePoints

Exports refinement points table to a file

UI Access	From the Response Surface tab of the Design of Experiments Post Analysis Display dialog box, select Refinement Points option under View , Click on Export....		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None.		

Python Syntax	ExportRespSurfaceRefinePoints(<DOEName>, <FileName>)

Python Example	<code>oModule.ExportRespSurfaceRefinePoints("DesignOfExperimentsSetup1", "C:/temp/DesignOfExperimentsSetup1_Refine_Points.csv")</code>

ExportRespSurfaceResponsePoints

Exports response points table to a file

UI Access	From the Response Surface tab of the Design of Experiments Post Analysis Display dialog box, select Response Points option under View , Click on Export....		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None.		

Python Syntax	<code>ExportRespSurfaceResponsePoints (<DOEName>, <FileName>)</code>
Python Example	<code>oModule.ExportRespSurfaceResponsePoints("DesignOfExperimentsSetup1", "C:/temp/DesignOfExperimentsSetup1_Response_Points.csv")</code>

ExportRespSurfaceVerificationPoints

Exports verification points table to a file

UI Access	From the Response Surface tab of the Design of Experiments Post Analysis Display dialog box, select Verification Points option under View , Click on Export....

Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None.		

Python Syntax	ExportRespSurfaceVerificationPoints (<DOEName>, <FileName>)
Python Example	<pre>oModule.ExportRespSurfaceVerificationPoints("DesignOfExperimentsSetup1", "C:/temp/DesignOfExperimentsSetup1_Veri_Points.csv")</pre>

GenerateVariationData [Parametric]

Generate variation data before parametric solve for CAD integrated project

Command: Right click on the parametric setup in the project tree and choose "Generate Variation Data"

Syntax: GenerateVariationData <SetupName>

Return Value: None

Parameters: <SetupName>

Name of the setup.

GetChildNames [Optimetrics]

If used without a specific optimization setup name, gets a list of all setups for all types. If a with a specific setup name, returns names for that optimization setup.

UI Access	NA		
Parameters	Name	Type	Description
	typeName	text string	Optional, default to get all types of setup names. Or one of type name return in GetChildTypes(). Also, the type name can be used without the prefix “Opti”.
Return Value	Array of setup names.		

Python Syntax	GetChildNames()		
Python Example	<pre>oOptimModule = oDesign.GetChildObject("Optimetrics") arrAllSetup = oOptimModule.GetChildNames() arrParmSetup = oOptimModule.GetChildNames("'OptiParametric'") arrOptimizeSetup = oOptimModule.GetChildNames("'Optimization'")</pre>		

GetChildObject [Optimetrics]

Gets a Setup Object of the Optimetrics module

UI Access	NA		
Parameters	Name	Type	Description
	Setup Name	text string	A optimetrics setup name, names returned by the GetChildNames().
Return Value	A script object for the setup See discussion of Optimetrics Setup Objects in Object Script Property Function Summary .		

Python Syntax	GetChildObject()
Python Example	<pre>oParamSetup = oOptModule.GetChildObject('ParametricSetup1') oOptSetup = oOptModule.GetChildObject('OptimizationSetup1')</pre>

GetChildTypes [Optimetrics]

Use: Gets child types of queried Optimetrics module.

Syntax: GetChildTypes()

Return Value: Array of text string, it can be an empty array if there is no setup is defined. There are six types of setup, they are ['OptiParametric', 'OptiOptimization', 'OptiSensitivity', 'OptiStatistical', 'OptiDesignExplorer', 'OptiDXDOE'].

Python Syntax	GetChildTypes ()
Python Example	<pre>oOptimModule = oDesign.GetChildObject("Optimetrics") arrSetupTypes = oOptimModule.GetChildTypes()</pre>

GetName

Returns the design name of the active design, in that order separated by a semicolon.

UI Access	N/A
Parameters	None.
Return Value	String indicating the name of the active design.

Python Syntax	GetName()
Python Example	design_name = oDesign.GetName()

GetObjPath [Design]

Obtains the path to the design.

UI Access	N/A
Parameters	None.
Return Value	String containing the path to the design.

Python Syntax	GetObjPath()
Python Example	<code>oDesign.GetObjPath()</code>

GetOptimetricResult

Returns an Optimetric calculation. The specific calculation is determined by the setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Optimetrics setup name.
	<vars>	Array	Array containing string variable names. Use the Sweep Definitions tab in the UI or the <SweepDefs> parameter in the InsertSetup script to determine appropriate inputs.

	<values>	Array	<i>Optional.</i> Array containing string values. When multiple variables and values are provided, the order must be the same in both the <vars> and <values> arrays. The first variable is paired with the first value, the second variable is paired with the second value, and so on.
Return Value	Calculation result. If the setup contains more than one calculation, the output will be an array of values.		

Python Syntax	GetOptimetricResult(<SetupName>, <vars>, <values>)
Python Example	oModule.GetOptimetricResult('ParametricSetup1', ['AR', 'Re'], ['4.64', '6e+04'])

GetOptimetricsResult

Get an existing Optimization, Sensitivity, Statistical, Parametric or DesignXplorer result.

UI Access	Right click on the desired Optimetrics setup in the project tree and choose View Analysis Result... On the Post Analysis Display dialog box, click the Result tab, then select Table view, and click on the Export button		
Parameters	Name	Type	Description
	<SetupName>	String	Must be one of the existing Optimization, Sensitivity, Statistical, or DesignXplorer setup names
	<FileName>	String	Must be a valid file path and name with extension of csv, tab, dat, or txt..
	[useFullOutputName]	Boolean	Optional: defaulted to false. If set to true values will be printed with units. This parameter is ignored for Optimization and Statistical results.
Return Value	None		

Python Syntax	GetOptimetricsResult (<SetupName>, <FileName>, [useFullOutputName])
Python Example	<pre>oModule.GetOptimetricsResult ("StatisticalSetup1", "c:/exportdir/test.csv", false)</pre>

GetPropNames [Optimetrics]

Use: Always returns the empty set for Optimetrics objects since they do not have properties.

Syntax: GetPropNames(bIncludeReadOnly)

Return Value: Returns empty set.

Parameters: bIncludeReadOnly—optional, default to True.

Python Syntax	GetPropNames ()
Python Example	<pre>oOptModule.GetPropNames () oOptModule.GetPropNames (True) oOptModule.GetPropNames (False)</pre>

GetPropValue [Optimetrics]

Returns the property value for a setup property.

UI Access	NA		
Parameters	Name	Type	Description
	property-path		a child object's property path. See property path discussion here .
Return Value	Returns the value of an setup property.		

Python Syntax	GetPropValue(propPath)
Python Example	<pre>oOptModule.GetPropValue("OptimizationSetup1\Optimizer") //get the optimizer name for OptimizationSetup1 oOptModule.GetPropValue("OptimizationSetup1\Optimizer\Choices") //Get the menu property's menu items. In this case all Optimizer names.</pre>

GetSetupNames [Optimetrics]

Gets a list of Optimetrics setup names

UI Access	NA		
Parameters	Name	Type	Description
	None		
Return Value	IAnsoftCollectionObj – a collection of Optimetrics setup names		

Python Syntax	GetSetupNames()
Python Example	<pre>oModule = oDesign.GetModule("Optimetrics") setupNames = oModule.GetSetupNames()</pre>

GetSetupNamesByType [Optimetrics]

Gets a list of Optimetrics setup names by type.

UI Access	NA		
Parameters	Name	Type	Description
	<Optimetrics type>	String	Examples: parametric, optimization, statistical, sensitivity
Return Value	Array of Optimetrics setup names of the given type.		

Python Syntax	GetSetupNamesByType (<Optimetrics type>)		
Python Example	<pre>for name in oModule.GetSetupNamesByType("optimization") AddInfoMessage(str(name))</pre>		

ImportSetup

Import an Optimetric setup from a file.

UI Access	NA		
Parameters	Name	Type	Description
	<SetupTypeName>	String	Must be one of "OptiParametric" , "OptiOptimization" , "OptiSensitivity" , "OptiStatistical" , or "OptiDesignExplorer".
	<SetupInfo>	Array	Array("NAME:<SetupName>" , "FilePath") <SetupName>

			Type: <string> Name of the setup. <FilePath> Type : <string: file path> Must be a valid file path and name.
Return Value	None		

Python Syntax	ImportSetup (<SetupTypeName>, <SetupInfo>)
Python Example	<pre>oModule.ImportSetup ("OptiStatistical", ["NAME:StatisticalSetup1", "c:/importdir/mySetupInfoFile"])</pre>

PasteSetup [Optimetrics]

Pastes the specified Optimetrics setup.

UI Access	NA		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the Setup
Return Value	None		

Python Syntax	PasteSetup (<SetupName>)
Python Example	<code>oModule.PasteSetup ("OptimizationSetup1")</code>

RenameSetup [Optimetrics]

Renames the specified Optimetrics setup.

UI Access	Right-click the setup in the project tree, and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<OldName>	String	The name that needs to be replaced
	<NewName>	String	Replacement name
Return Value	None		

Python Syntax	RenameSetup (<OldName> <NewName>)
Python Example	<code>oModule.RenameSetup ("OptimizationSetup1" "MyOptimization")</code>

SetPropValue [Optimetrics]

Sets the property value for the active Optimetrics setup.

UI Access	Set Property value on Optimetrics objects		
Parameters	Name	Type	Description
	Property path	text string	Setup property path. See discussion of Property Path
	new Value	Text String, Number, or Boolean	New value data type is depending on the property type,
Return Value	True if the property is found and the new value is valid. Otherwise return False.		

Python Syntax	SetPropValue(propPath, newValue)		
Python Example	<pre>oOptModule.SetPropValue("ParametricSetup1\Enabled", False) //disable ParametricSetup1 oOptModule.SetPropValue("OptimizationSetup1/Optimizer", "Quasi Newton")</pre>		

SolveAllSetup

Solves all Optimetrics setups

UI Access	Right-click on Optimetrics in Project Manager and select Analyze>All from context menu		
Parameters	Name	Type	Description
	isBlocking	Boolean	An optional arg that defaults to <code>true</code> . If it's <code>false</code> , the command immediately returns while the analysis or analyses run in the background. The status of the analyses can be checked with the <code>AreThereSimulationsRunning</code> command.

Return Value	None

Python Syntax	SolveAllSetup()
Python Example	<code>oModule.SolveAllSetup()</code>

SolveSetup [Optimetrics]

Solves the specified Optimetrics setup.

UI Access	Right-click the setup in the project tree, and then click Analyze on the shortcut menu.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup to be solved
	isBlocking	Boolean	An optional arg that defaults to <code>true</code> . If it's <code>false</code> , the command immediately returns while the analysis or analyses run in the background. The status of the analyses can be checked with the <code>AreThereSimulationsRunning</code> command.
Return Value	None		

Python Syntax	SolveSetup (<SetupName>)
Python Example	<code>oModule.SolveSetup ("OptimizationSetup1")</code>

General Commands Recognized by the Optimetrics Module

Following are general script commands recognized by the **Optimetrics** module:

[CopySetup](#)

[DistributedAnalyzeSetup](#)

[EditSetup](#)

[ExportDXConfigFile](#)

[ExportOptimetricsProfile](#)

[ExportOptimetricsResult](#)

[ExportParametricResults](#)

[GetOptimetricResult](#)

[GetPropNames \[Optimetrics\]](#)

[GetPropValue \[Optimetrics\]](#)

[GetSetupNames \[Optimetrics\]](#)

[GetSetupNamesByType \[Optimetrics\]](#)

[ImportSetup](#)

[PasteSetup \[Optimetrics\]](#)

[RenameSetup \[Optimetrics\]](#)

[SetPropValue \[Optimetrics\]](#)

[SolveSetup \[Optimetrics\]](#)

[SolveAllSetup](#)

CopySetup

Copy the specified Optimetrics setup.

UI Access	NA		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup.
Return Value	None.		

Python Syntax	CopySetup (<SetupName>)
Python Example	oModule.CopySetup ("OptimizationSetup1")

DeleteSetups [Optimetrics]

Deletes the specified Optimetrics setups.

UI Access	Right-click the setup in the project tree, and then click Delete on the shortcut menu		
Parameters	Name	Type	Description
	<NameArray>	Array of Strings	An Array of Setup Names
Return Value	None		

Python Syntax	DeleteSetups (<NameArray>)
Python Example	oModule.DeleteSetups (["OptimizationSetup1"])

DistributedAnalyzeSetup

Distributes all variable value instances within a parametric sweep to different machines already specified from within the user interface

UI Access	Right-click the parametric setup name in the project tree and select Distribute Analysis.		
Parameters	Name	Type	Description
	<ParametricSetupName>	String	Name of the Setup
	isBlocking	Boolean	An optional arg that defaults to <code>true</code> . If it's <code>false</code> , the command immediately returns while the analysis or analyses run in the background. The status of the analyses can be checked with the <code>AreThereSimulationsRunning</code> command.
Return Value	None		

Python Syntax	<code>DistributedAnalyzeSetup (<ParametricSetupName>)</code>
Python Example	<code>oModule.DistributedAnalyzeSetup ("ParametricSetup1")</code>

EditSetup

Modifies an existing solution setup.

UI Access	Double-click a solution setup in the project tree to modify its settings.

Parameters	Name	Type	Description
	<SetupName>	String	Name of the solve setup being edited.
	<Attributes>	Array	Structured array. Array("NAME:<NewSetupName>", <NamedParameters>) See the InsertSetup command for details and examples.
Return Value	None.		

Python Syntax	EditSetup (<SetupName>, <Attributes>)
Python Example	<pre>oModule.EditSetup("Setup1", ["NAME:NewSetup", "AdaptiveFreq:=", "1GHz", "EnableDistribProbTypeOption:=", false, "SaveFields:=", "true", "Enabled:=", true, ["NAME:Cap", "MaxPass:=", 10, "MinPass:=", 1, "MinConvPass:=", 2, "PerError:=", 1, "PerRefine:=", 30,</pre>

```
"AutoIncreaseSolutionOrder:=", false,  
"SolutionOrder:=", "Normal"],  
["NAME:DC",  
"Residual:=", 1E-005,  
"SolveResOnly:=", false,  
["NAME:Cond",  
"MaxPass:=", 10,  
"MinPass:=", 1,  
"MinConvPass:=", 1,  
"PerError:=", 1,  
"PerRefine:=", 30),  
["NAME:Mult",  
"MaxPass:=", 1,  
"MinPass:=", 1,  
"MinConvPass:=", 1,  
"PerError:=", 1,  
"PerRefine:=", 30]],  
["NAME:AC",  
"MaxPass:=", 10,  
"MinPass:=", 1,
```

```
        "MinConvPass:=", 2,  
        "PerError:=", 1,  
        "PerRefine:=", 30]]  
    )  
oModule.EditSetup("HfssDrivenAuto",  
["NAME:Setup1",  
    "IsEnabled:=", True,  
    "AutoSolverSetting:=", "Balanced",  
    ["NAME:Sweeps",  
        ["NAME:Sweep",  
            "RangeType:=", "LinearStep",  
            "RangeStart:=", "1GHz",  
            "RangeEnd:=", "10GHz",  
            "RangeStep:=", "1GHz"  
        ]  
    ],  
    "SaveRadFieldsOnly:=", False,  
    "SaveAnyFields:=", True,  
    "Type:=", "Discrete"  
])
```

```
oModule.EditSetup("AC Magnetic",  
[  
  "NAME:AC Magnetic",  
  "Enabled:="          , True,  
  [  
    "NAME:MeshLink",  
    "ImportMesh:="      , False  
  ],  
  "MaximumPasses:="    , 4,  
  "MinimumPasses:="    , 2,  
  "MinimumConvergedPasses:=", 1,  
  "PercentRefinement:=" , 30,  
  "SolveFieldOnly:="   , False,  
  "PercentError:="     , 0.1,  
  "SolveMatrixAtLast:=" , True,  
  "UseNonLinearIterNum:=" , False,  
  [  
    "NAME:ExpressionCache",  
    [  
      "NAME:CacheItem",
```

```

        "Title:="                , "eddy_loss1",
        "Expression:="           , "eddy_loss",
        "Intrinsics:="           , "Phase=\'0deg\'",
        "ReportType:="           , "Fields",
        [
            "NAME:ExpressionContext"
        ]
    ]
],
    "UseCacheFor:="              , ["Pass"],
    "UseIterativeSolver:="       , False,
    "RelativeResidual:="         , 0.0001,
    "NonLinearResidual:="         , 0.0001,
    "SmoothBHCurve:="            , False,
    "Frequency:="                 , "200Hz",
    "HasSweepSetup:="             , False,
    "UseHighOrderShapeFunc:="     , False,
    "UseMuLink:="                 , False,
    "LossAdaptiveCtrl:="          , "0.3"
])
oModule.EditSetup("HfssDriven",

```

```
["NAME:Setup3",  
    "AdaptMultipleFreqs:=", False,  
    "Frequency:=", "5GHz",  
    "MaxDeltaS:=", 0.02,  
    "PortsOnly:=", False,  
    "UseMatrixConv:=", False,  
    "MaximumPasses:=", 6,  
    "MinimumPasses:=", 1,  
    "MinimumConvergedPasses:=", 1,  
    "PercentRefinement:=", 30,  
    "IsEnabled:=", True,  
    "BasisOrder:=", 1,  
    "DoLambdaRefine:=", True,  
    "DoMaterialLambda:=", True,  
    "SetLambdaTarget:=", False,  
    "Target:=", 0.3333,  
    "UseMaxTetIncrease:=", False,  
    "PortAccuracy:=", 2,  
    "UseABConPort:=", False,  
    "SetPortMinMaxTri:=", False,
```

```

    "UseDomains:=", True,
    "UseIterativeSolver:=", False,
    "IterativeResidual:=", 1E-06,
    "DDMSolverResidual:=", 0.0001,
    "EnhancedLowFreqAccuracy:=", True,
    "SaveRadFieldsOnly:=", False,
    "SaveAnyFields:=", True,
    "IESolverType:=", "Auto",
    "LambdaTargetForIESolver:=", 0.15,
    "UseDefaultLambdaTgtForIESolver:=", True,
    "SkipIERegionSolveDuringAdaptivePasses:=", True
    "RayDensityPerWavelength:=", 4,
    "MaxNumberOfBounces:=" , 5,
    "InfiniteSphereSetup:=" , "Infinite Sphere1",
    "SkipSBRsSolveDuringAdaptivePasses:=", True,
    "PTDUTDSimulationSettings:=", "PTD Correction + UTD Rays",
    "PTDEdgeDensity:=" , 20
  })

```

Edit an SBR+ Setup with Fast Frequency Looping

```

oModule.EditSetup("HfssDriven",
  [
    "NAME:Setup1",

```

```
"IsEnabled:="          , True,

[
    "NAME:MeshLink",
    "ImportMesh:="      , False
],
"IsSbrRangeDoppler:="  , False,
"RayDensityPerWavelength:=", 4,
"MaxNumberOfBounces:=" , 5,
"IsMonostaticRCS:="    , True,
"EnableCWRays:="       , False,
"RadiationSetup:="     , "",
"PTDUTDSimulationSettings:=", "None",
"FastFrequencyLooping:=", True,
[
    "NAME:Sweeps",
    [
        "NAME:Sweep",
        "RangeType:="          , "LinearStep",
        "RangeStart:="         , "1GHz",
        "RangeEnd:="           , "10GHz",
```



```

        "RangeStep:="          , "1GHz"
    ]
],
"ComputeFarFields:="        , True
"UseSBREnhancedRadiatedPowerCalculation:=", True,
"IsGOBlockageEnabled:="    , False,
"GOBlockageSurfaceSelfBlock:=", False
])

```

Edit and RF Discharge Setup for HFSS

```

import ScriptEnv
ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")
oDesktop.RestoreWindow()
oProject = oDesktop.SetActiveProject("coaxbend_discharge_r212")
oDesign = oProject.SetActiveDesign("HFSSDesign60degBendTeflon")
oModule = oDesign.GetModule("AnalysisSetup")
oModule.EditSetup("RFDischarge1",
[
    "NAME:RFDischarge1",
    "Enabled:="          , True,
[
    "NAME:MeshLink",

```

```
"ImportMesh:="          , True,
"Project:="              , "This Project*",
"Product:="              , "HFSS",
"Design:="               , "This Design*",
"Soln:="                  , "Setup1 : Sweep",
[
  "NAME:Params",
  "bend_angle:="          , "bend_angle"
],
"ForceSourceToSolve:="   , True,
"PreservePartnerSoln:=" , False,
"PathRelativeTo:="        , "SourceProduct",
"ApplyMeshOp:="           , True
],
[
  "NAME:Excitations",
  [
    "NAME:1:1",
    "Magnitude:="          , "1",
    "Phase:="               , "0deg"
```

```

    ],
    [
        "NAME:2:1",
        "Magnitude:="          , "0",
        "Phase:="              , "0deg"
    ]
],
[
    "NAME:Frequencies",
    "10GHz"
],
"Minimum Power:="          , "0.01",
"Maximum Power:="          , "1000000",
"Minimum Pressure:="        , "100pascal",
"Maximum Pressure:="        , "101325pascal",
"Postproc Sampling:="      , 500,
"Temperature:="             , "0cel",
"BuiltInGas:="              , "Helium"
])

```

EnableSetup

Enables and disables a defined optimetrics analysis setup.

UI Access	Right-click on a setup in the project tree, select Enable Setup or Disable Setup		
Parameters	Name	Type	Description
	<SetupName>	String	Name of specified setup.
	<Enable>	Boolean	Determines whether enable or disable a setup. • True - enable setup. • False - disable setup.
Return Value	None.		

Python Syntax	EnableSetup(<SetupName>, <Enable>)
Python Example	<code>oModule.EnableSetup("OptimizationSetup1", True)</code>

ExportDXConfigFile

Create an xml file with the setup information for Design Xplorer

UI Access	Right click on the Design Xplorer setup in the project tree and choose Export External Connector Addin Configuration...		
Parameters	Name	Type	Description
	<SetupName>	String	Must be one of existing DesignExplorer setup names
	<FileName>	String	Must be a valid file path and name

Return Value	None

Python Syntax	ExportDXConfigFile (<SetupName>, <FileName>)
Python Example	<pre>oModule.ExportDXConfigFile ("DesignXplorerSetup1", "c:/exportdir/DXSetup1.xml")</pre>

ExportOptimetricsProfile

Export Optimetrics profile data

UI Access	Right click on the Optimetrics setup in the project tree and choose View Analysis Result... On the Post Analysis Display dialog box, click the Profile tab and click on the Export button.		
Parameters	Name	Type	Description
	<SetupName>	String	Must be one of the existing Parametric, Optimization, Sensitivity, Statistical or DesignXplorer setup names
	<FileName>	String	Must be a valid file path and name with extension of csv, tab, dat, or txt
	[profileNum]	String	Must be a numeric string. Optional: defaulted to last profile number. It should be a zero indexed profile number.
Return Value	None		

Python Syntax	ExportOptimetricsProfile (<SetupName>, <FileName>, [profileNum])
Python Example	<pre>oModule.ExportOptimetricsProfile ("StatisticalSetup1", "c:/exportdir/test.csv")</pre>

ExportOptimetricsResult

Export an existing Optimization, Sensitivity, Statistical or DesignXplorer result. (Does not export Parametric results.)

UI Access	Right click on the desired Optimetrics setup in the project tree and choose View Analysis Result... On the Post Analysis Display dialog box, click the Result tab, then select Table view, and click on the Export button		
Parameters	Name	Type	Description
	<SetupName>	String	Must be one of the existing Optimization, Sensitivity, Statistical, or DesignXplorer setup names
	<FileName>	String	Must be a valid file path and name with extension of csv, tab, dat, or txt..
	[useFullOutputName]	Boolean	Optional: defaulted to false. If set to true values will be printed with units. This parameter is ignored for Optimization and Statistical results.
Return Value	None		

Python Syntax	ExportOptimetricsResult (<SetupName>, <FileName>, [useFullOutputName])
Python Example	<pre>oModule.ExportOptimetricsResult ("StatisticalSetup1", "c:/exportdir/test.csv", false)</pre>

ExportParametricResults

Export existing Parametric results.

UI Access	Right click on the desired Parametric setup in the project tree and choose View Analysis Result... On the Post Analysis Display dialog box, click the Result tab, then select Table view, and click on the Export button.		
Parameters	Name	Type	Description
	<SetupName>	String	Must be one of the existing Parametric setup names
	<FileName>	String	Must be a valid file path and name with extension of csv, tab, dat or txt
	<bOutputUnits>	Boolean	If set to true, values will be printed with units
Return Value	None		

Python Syntax	ExportParametricResults (<SetupName>, <FileName>, <bOutputUnits>)		
Python Example	<pre>oModule.ExportParametricResults ("ParametricSetup1", "c:/exportdir/test.csv", False)</pre>		

ExportParametricSetupTable

Exports the parametric setup table as a CSV file.

UI Access	Double-click parametric setup. Select Table tab. Click Export .		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup.
	<filePath>	String	Full path for file export.
Return Value	None		

Python	ExportParametricSetupTable (<SetupName>, <filePath>)

Syntax	
Python Example	<code>oModule.ExportParametricSetupTable('ParametricSetup1', 'E:/Files/ParametricSetup1_Table.csv')</code>

ExportRespSurfaceMinMaxTable

Exports min-max table from a response surface to a file

UI Access	Click on Export... From the Response Surface tab of the Design of Experiments Post Analysis Display dialog.		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None.		

Python Syntax	<code>ExportRespSurfaceMinMaxTable(<DOEName>, <FileName>)</code>
Python Example	<code>oModule.ExportRespSurfaceMinMaxTable("DesignOfExperimentsSetup1", "C:/temp/DesignOfExperimentsSetup1_Min-Max_Search.csv")</code>

ExportRespSurfaceRefinePoints

Exports refinement points table to a file

UI Access	From the Response Surface tab of the Design of Experiments Post Analysis Display dialog box, select Refinement Points option under View , Click on Export....		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None.		

Python Syntax	ExportRespSurfaceRefinePoints(<DOEName>, <FileName>)		
Python Example	<pre>oModule.ExportRespSurfaceRefinePoints("DesignOfExperimentsSetup1", "C:/temp/DesignOfExperimentsSetup1_Refine_Points.csv")</pre>		

ExportRespSurfaceResponsePoints

Exports response points table to a file

UI Access	From the Response Surface tab of the Design of Experiments Post Analysis Display dialog box, select Response Points option under View , Click on Export....		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None.		

Python Syntax	ExportRespSurfaceResponsePoints (<DOEName>, <FileName>)		

Python Example	<pre>oModule.ExportRespSurfaceResponsePoints("DesignOfExperimentsSetup1", "C:/temp/DesignOfExperimentsSetup1_Response_Points.csv")</pre>

ExportRespSurfaceVerificationPoints

Exports verification points table to a file

UI Access	From the Response Surface tab of the Design of Experiments Post Analysis Display dialog box, select Verification Points option under View , Click on Export...		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None.		

Python Syntax	<code>ExportRespSurfaceVerificationPoints (<DOEName>, <FileName>)</code>
Python Example	<pre>oModule.ExportRespSurfaceVerificationPoints("DesignOfExperimentsSetup1", "C:/temp/DesignOfExperimentsSetup1_Veri_Points.csv")</pre>

ExportDOEResponseCurve

Exports response curve from a response surface to a file.

UI Access	Click on Export... From the Response Surface tab of the Design of Experiments Post Analysis Display dia-

	log.		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None		

Python Syntax	<i>DOEName (<FileName>)</i>		
Python Example	<pre>oModule.ExportDOEResponseCurve ("DesignOfExperimentsSetup1", "C:/Users/AEDT/R24.1/D/DesignOfExperimentsSetup1_Response_Points.csv")</pre>		

ExportDOEResponseCurveSlices

Exports response curve slices from a response surface to a file.

UI Access	Click on Export... From the Response Surface tab of the Design of Experiments Post Analysis Display dialog.		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None		

Python Syntax	<i>DOEName (<FileName>)</i>		

Python Example	<pre>oModule.ExportDOEResponseCurveSlices("DesignOfExperimentsSetup1", "C:/Users/AEDT/R24.1/D/DesignOfExperimentsSetup1_Response_Points.csv")</pre>

ExportDOEResponseSurface

Exports response surface to a file.

UI Access	Click on Export... From the Response Surface tab of the Design of Experiments Post Analysis Display dialog.		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None		

Python Syntax	<i>DOEName (<FileName>)</i>
Python Example	<pre>oModule.ExportDOEResponseSurface("DesignOfExperimentsSetup1", "C:/Users/AEDT/R24.1/D/DesignOfExperimentsSetup1_Response_Points.csv")</pre>

ExportDOELocalSensitivity

Exports local sensitivity to a file.

UI Access	Click on Export... From the Response Surface tab of the Design of Experiments Post Analysis Display dia-

	log.		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None		

Python Syntax	<i>DOEName (<FileName>)</i>		
Python Example	<pre>oModule.ExportDOELocalSensitivity("DesignOfExperimentsSetup1", "C:/Users/AEDT/R24.1/D/DesignOfExperimentsSetup1_Response_Points.csv")</pre>		

ExportDOELocalSensitivityCurve

Exports local sensitivity curves to a file.

UI Access	Click on Export... From the Response Surface tab of the Design of Experiments Post Analysis Display dialog.		
Parameters	Name	Type	Description
	<DOEName>	String	Name of the Design of Experiments (DOE) setup.
	<FileName>	String	Output file name with path.
Return Value	None		

Python Syntax	<i>DOEName (<FileName>)</i>		

Python Example	<pre>oModule.ExportDOELocalSensitivityCurve("DesignOfExperimentsSetup1", "C:/Users/AEDT/R24.1/D/DesignOfExperimentsSetup1_Response_Points.csv")</pre>

GenerateVariationData [Parametric]

Generate variation data before parametric solve for CAD integrated project

Command: Right click on the parametric setup in the project tree and choose "Generate Variation Data"

Syntax: GenerateVariationData <SetupName>

Return Value: None

Parameters: <SetupName>

Name of the setup.

GetChildNames [Optimetrics]

If used without a specific optimization setup name, gets a list of all setups for all types. If a with a specific setup name, returns names for that optimization setup.

UI Access	NA		
Parameters	Name	Type	Description
	typeName	text string	Optional, default to get all types of setup names. Or one of type name return in GetChildTypes(). Also, the type name can be used without the prefix "Opti".
Return Value	Array of setup names.		

Python Syntax	GetChildNames()
Python Example	<pre>oOptimModule = oDesign.GetChildObject("Optimetrics") arrAllSetup = oOptimModule.GetChildNames() arrParamSetup = oOptimModule.GetChildNames("'OptiParametric'") arrOptimizeSetup = oOptimModule.GetChildNames("'Optimization'")</pre>

GetChildObject [Optimetrics]

Gets a Setup Object of the Optimetrics module

UI Access	NA		
Parameters	Name	Type	Description
	Setup Name	text string	A optimetrics setup name, names returned by the GetChildNames().
Return Value	A script object for the setup See discussion of Optimetrics Setup Objects in Object Script Property Function Summary .		

Python Syntax	GetChildObject()
Python Example	<pre>oParamSetup = oOptModule.GetChildObject('ParametricSetup1') oOptSetup = oOptModule.GetChildObject('OptimizationSetup1')</pre>

GetChildTypes [Optimetrics]

Use: Gets child types of queried Optimetrics module.

Syntax: GetChildTypes()

Return Value: Array of text string, it can be an empty array if there is no setup is defined. There are six types of setup, they are ['OptiParametric', 'OptiOptimization', 'OptiSensitivity', 'OptiStatistical', 'OptiDesignExplorer', 'OptiDXDOE'].

Python Syntax	GetChildTypes ()
Python Example	<pre>oOptimModule = oDesign.GetChildObject("Optimetrics") arrSetupTypes = oOptimModule.GetChildTypes()</pre>

GetName

Returns the design name of the active design, in that order separated by a semicolon.

UI Access	N/A
Parameters	None.
Return Value	String indicating the name of the active design.

Python Syntax	GetName()
Python Example	<pre>design_name = oDesign.GetName()</pre>

GetObjPath [Design]

Obtains the path to the design.

UI Access	N/A
Parameters	None.
Return Value	String containing the path to the design.

Python Syntax	GetObjPath()
Python Example	<code>oDesign.GetObjPath()</code>

GetOptimetricResult

Returns an Optimetric calculation. The specific calculation is determined by the setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Optimetrics setup name.
	<vars>	Array	Array containing string variable names. Use the Sweep Definitions tab in the UI or the <SweepDefs> parameter in the InsertSetup script to determine appropriate inputs.
	<values>	Array	<i>Optional.</i> Array containing string values. When multiple variables and values are provided, the order must be the same in both the <vars> and <values> arrays. The first variable is paired with the first value, the second variable is paired with the second value, and so on.

Return Value	Calculation result. If the setup contains more than one calculation, the output will be an array of values.

Python Syntax	<code>GetOptimetricResult(<SetupName>, <vars>, <values>)</code>
Python Example	<code>oModule.GetOptimetricResult('ParametricSetup1', ['AR', 'Re'], ['4.64', '6e+04'])</code>

GetPropNames [Optimetrics]

Use: Always returns the empty set for Optimetrics objects since they do not have properties.

Syntax: `GetPropNames(bIncludeReadOnly)`

Return Value: Returns empty set.

Parameters: `bIncludeReadOnly`—optional, default to True.

Python Syntax	<code>GetPropNames ()</code>
Python Example	<code>oOptModule.GetPropNames ()</code> <code>oOptModule.GetPropNames (True)</code> <code>oOptModule.GetPropNames (False)</code>

GetPropValue [Optimetrics]

Returns the property value for a setup property.

UI Access	NA		
Parameters	Name	Type	Description

	property-path	a child object's property path. See property path discussion here .
Return Value	Returns the value of an setup property.	

Python Syntax	GetPropValue(propPath)	
Python Example	<pre>oOptModule.GetPropValue("OptimizationSetup1\Optimizer") //get the optimizer name for OptimizationSetup1 oOptModule.GetPropValue("OptimizationSetup1\Optimizer\Choices") //Get the menu property's menu items. In this case all Optimizer names.</pre>	

GetSetupNames [Optimetrics]

Gets a list of Optimetrics setup names

UI Access	NA		
Parameters	Name	Type	Description
	None		
Return Value	IAnsoftCollectionObj – a collection of Optimetrics setup names		

Python Syntax	GetSetupNames()	
Python Example	<pre>oModule = oDesign.GetModule("Optimetrics") setupNames = oModule.GetSetupNames()</pre>	

GetSetupNamesByType [Optimetrics]

Gets a list of Optimetrics setup names by type.

UI Access	NA		
Parameters	Name	Type	Description
	<Optimetrics type>	String	Examples: parametric, optimization, statistical, sensitivity
Return Value	Array of Optimetrics setup names of the given type.		

Python Syntax	GetSetupNamesByType (<Optimetrics type>)
Python Example	<pre>for name in oModule.GetSetupNamesByType("optimization") AddInfoMessage(str(name))</pre>

ImportSetup

Import an Optimetric setup from a file.

UI Access	NA		
Parameters	Name	Type	Description
	<SetupTypeName>	String	Must be one of "OptiParametric", "OptiOptimization", "OptiSensitivity", "OptiStatistical", or "OptiDesignExplorer".
	<SetupInfo>	Array	Array("NAME:<SetupName>", "FilePath")

			<SetupName> Type: <string> Name of the setup. <FilePath> Type : <string: file path> Must be a valid file path and name.
Return Value	None		

Python Syntax	ImportSetup (<SetupTypeName>, <SetupInfo>)		
Python Example	<pre>oModule.ImportSetup ("OptiStatistical", ["NAME:StatisticalSetup1", "c:/importdir/mySetupInfoFile"])</pre>		

PasteSetup [Optimetrics]

Pastes the specified Optimetrics setup.

UI Access	NA		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the Setup
Return Value	None		

Python Syntax	PasteSetup (<SetupName>)
Python Example	<code>oModule.PasteSetup ("OptimizationSetup1")</code>

RenameSetup [Optimetrics]

Renames the specified Optimetrics setup.

UI Access	Right-click the setup in the project tree, and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<OldName>	String	The name that needs to be replaced
	<NewName>	String	Replacement name
Return Value	None		

Python Syntax	RenameSetup (<OldName> <NewName>)
Python Example	<code>oModule.RenameSetup ("OptimizationSetup1" "MyOptimization")</code>

SetPropValue [Optimetrics]

Sets the property value for the active Optimetrics setup.

UI Access	Set Property value on Optimetrics objects		
Parameters	Name	Type	Description
	Property path	text string	Setup property path. See discussion of Property Path
	new Value	Text String, Number, or Boolean	New value data type is depending on the property type,
Return Value	True if the property is found and the new value is valid. Otherwise return False.		

Python Syntax	SetPropValue(propPath, newValue)
Python Example	<pre>oOptModule.SetPropValue("ParametricSetup1\Enabled", False) //disable ParametricSetup1 oOptModule.SetPropValue("OptimizationSetup1/Optimizer", "Quasi Newton")</pre>

SolveAllSetup

Solves all Optimetrics setups

UI Access	Right-click on Optimetrics in Project Manager and select Analyze>All from context menu		
Parameters	Name	Type	Description
	isBlocking	Boolean	An optional arg that defaults to <code>true</code> . If it's <code>false</code> , the command immediately returns while the analysis or analyses run in the background. The status of the analyses can be checked with the <code>AreThereSimulationsRunning</code> command.
Return Value	None		

Python Syntax	<code>SolveAllSetup()</code>
Python Example	<code>oModule.SolveAllSetup()</code>

SolveSetup [Optimetrics]

Solves the specified Optimetrics setup.

UI Access	Right-click the setup in the project tree, and then click Analyze on the shortcut menu.		
Parameters	Name	Type	Description
	<code><SetupName></code>	String	Name of the setup to be solved
	<code>isBlocking</code>	Boolean	An optional arg that defaults to <code>true</code> . If it's <code>false</code> , the command immediately returns while the analysis or analyses run in the background. The status of the analyses can be checked with the <code>AreThereSimulationsRunning</code> command.
Return Value	None		

Python Syntax	<code>SolveSetup (<SetupName>)</code>
Python Example	<code>oModule.SolveSetup ("OptimizationSetup1")</code>

Parametric Script Commands

[EditSetup \[Parametric\]](#)

[ExportParametricSetupTable](#)

[GenerateVariationData \[Parametric\]](#)

[InsertSetup \[Parametric\]](#)

EditSetup [Parametric]

Modifies an existing parametric setup

UI Access	Right-click the setup in the project tree, and then click Properties on the shortcut menu.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the Setup
	<ParametricParams>	List	List that defines the parameters of the parametric setup; examples are listed below.
Return Value	None		

Python Syntax	EditSetup (<SetupName>, <ParametricParams>)
Python Example	See EditSetup [Optimization]

ExportParametricSetupTable

Exports the parametric setup table as a CSV file.

UI Access	Double-click parametric setup. Select Table tab. Click Export .		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup.

	<table><tr><td><filePath></td><td>String</td><td>Full path for file export.</td></tr></table>			<filePath>	String	Full path for file export.
<filePath>	String	Full path for file export.				
Return Value	None					

Python Syntax	ExportParametricSetupTable (<SetupName>, <filePath>)
Python Example	<pre>oModule.ExportParametricSetupTable('ParametricSetup1', 'E:/Files/ParametricSetup1_ Table.csv')</pre>

GenerateVariationData [Parametric]

Generate variation data before parametric solve for CAD integrated project

Command: Right click on the parametric setup in the project tree and choose "Generate Variation Data"

Syntax: GenerateVariationData <SetupName>

Return Value: None

Parameters: <SetupName>

Name of the setup.

InsertSetup [Parametric]

Inserts a new parametric setup.

UI Access	Right-click the Optimetrics folder in the project tree, and then click Add> Parametric on the shortcut menu.

Parameters	Name	Type	Description
	<Parametric Params>	Array	Array("NAME:<SetupName>", "SaveFields:=", <SaveField>, <StartingPoint>, "Sim. Setups:=", <SimSetups>, <SweepDefs>, <SweepOps>, Array("NAME:Goals", Array("NAME:Goal", <OptiGoalSpec>), ... Array("NAME:Goal", <OptiGoalSpec>)))
	<SetupName>	String	Name of the parametric setup.
	<SimSetups>	Array of Strings	An array of Twin Builder solution setup names.
	<SweepDefs>	Array	Array("NAME:Sweeps", Array("NAME:SweepDefinition", "Variable:=", <VarName>, "Data:=", <SweepData>, "Synchronize:=", <SyncNum>), ... Array("NAME:SweepDefinition", "Variable:=", <VarName>, "Data:=", <SweepData>, "Synchronize:=", <SyncNum>))
	<SweepData>	String	"<SweepType>, <StartV>, <StopV>, <StepV>"
	<SweepType>	String	The type of sweep data.
	<SyncNum>	Integer	<i>SweepData</i> s with the same value are synchronized.
	<SweepOps>		Array("NAME:Sweep Operations", "<OpType>:=, Array(<VarValue>, ..., <VarValue>), ... <OpType>:=, Array(<VarValue>, ..., <VarValue>))

	<table><tr><td><OpType></td><td>String</td><td>The sweep operation type.</td></tr></table>			<OpType>	String	The sweep operation type.
<OpType>	String	The sweep operation type.				
Return Value	None					

Python Syntax	InsertSetup ("OptiParametric", <ParametricParams>)
Python Example	<pre>oModule.InsertSetup("OptiParametric", ["NAME:ParametricSetup1", "SaveFields:=", true, ["NAME:StartingPoint"], "Sim. Setups:=", ["Setup1"], ["NAME:Sweeps", ["NAME:SweepDefinition", "Variable:=", "\$width", "Data:=", "LIN 12mm 17mm 2.5mm", "OffsetF1:=", false,</pre>

```
        "Synchronize:=", 0
    ],
    [
        "NAME:SweepDefinition",
        "Variable:=", "$length",
        "Data:=", "LIN 8mm 12mm 2mm",
        "OffsetF1:=", false,
        "Synchronize:=", 0
    ]
],
[
    "NAME:Sweep Operations"
],
[
    "NAME:Goals",
    [
        "NAME:Goal",
        "Solution:=", "Setup1 : LastAdaptive",
        "Calculation:=", "returnloss",
        "Context:=", ""
    ]
]
```

```
        "NAME:Ranges",
        "Range:=",
        [
        "Var:=", "Freq", "Type:=", "s"
        "Start:=", "8GHz",
        "Stop:=", "8GHz"
        ]
    ],
    [
        "NAME:Goal",
        "Solution:=", "Setup1 : LastAdaptive"
        "Calculation:=", "reflect",
        "Context:=", "",
        [
            "NAME:Ranges",
            "Range:=",
            [
                "Var:=", "Freq",
                "Type:=", "s",
                "Start:=", "8GHz",
```

	<pre>"Stop:=", "8GHz"]]])</pre>

EditSetup [Optimization]

EditSetup [Optimization]

UI Access	Right-click the setup in the Project Manager tree, and then click Properties from the shortcut menu		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the Setup
	<OptimizationParams>	List	Parameters that define the setup; examples are listed below.
Return Value	None		

Python Example

```
oModule.EditSetup("OptimizationSetup1",
[
    "NAME:OptimizationSetup1",
    "UseFastCalculationUpdateAlgo:=", False,
    "FastCalcOptCtrledByUser:=", False,
    "IsEnabled:=", True,
    "SaveSolutions:=", False,
    [
        "NAME:StartingPoint"
    ],
    "Optimizer:=", "Quasi Newton",
    [
        "NAME:AnalysisStopOptions",
        "StopForNumIteration:=" , True,
        "StopForElapsTime:=", False,
        "StopForSlowImprovement:=", False,
        "StopForGrdTolerance:=", False,
        "MaxNumIteration:=", 1000,
        "MaxSolTimeInSec:=", 3600,
        "RelGradientTolerance:=", 0,
```



```
    "MinNumIteration:=", 10
],
"CostFuncNormType:=", "L2",
"PriorPSetup:=", "",
"PreSolvePSetup:=", True,
[
    "NAME:Variables"
],
[
    "NAME:LCS"
],
[
    "NAME:Goals",
    [
        "NAME:Goal",
        "ReportType:=", "Standard",
        "Solution:=", "TR",
        [
            "NAME:SimValueContext",
            "SimValueContext:=", [1,0,2,0,False,False,-1,1,0,1,1,"",0,0
        ]
    ]
]
```

```
],
"Calculation:=", "acosh(Time)",
"Name:=", "Time",
[
  "NAME:Ranges",
  "Range:=", ["Var:=", "Time","Type:=", "a"]
],
"Condition:=", "==",
[
  "NAME:GoalValue",
  "GoalValueType:=", "Independent",
  "Format:=", "Real/Imag",
  "bG:=", ["v:=", "[1;]"]
],
"Weight:=", "[1;]"
],
"Acceptable_Cost:=", 0,
"Noise:=", 0.0001,
"UpdateDesign:=", False,
```

	<pre> "UpdateIteration:=", 5, "KeepReportAxis:=", True, "UpdateDesignWhenDone:=", True] </pre>

InsertSetup [Optimization]

Use: Inserts a new optimization setup.

UI Access	Right-click the Optimetrics folder in the project tree, and then click Add > Optimization on the shortcut menu.		
Parameters	Name	Type	Description
	<OptimizationParams>	Array	<pre> Array("NAME:<SetupName>", "SaveFields:=", <SaveField>, <StartingPoint>, "Optimizer:=", <Optimizer>, "MaxIterations:=", <MaxIter>, "PriorPSetup:=", <PriorSetup>, "PreSolvePSetup:=", <Preceed>, <OptimizationVars>, <Constraint>, Array("NAME:Goals", Array("NAME:Goal", <OptiGoalSpec>, <OptimizationGoalSpec>), ... Array("NAME:Goal", <OptiGoalSpec>, <OptimizationGoalSpec>)), "Acceptable_Cost:=", <AcceptableCost>, "Noise:=", <Noise>, "UpdateDesignWhenDone:=", <UpdateDesign> </pre>

	<OptimizationVars>	Array	Array("NAME:Variables", "VarName:=", Array("i:=", <IncludeVar>, "Min:=", <MinV>, "Max:=", <MaxV>, "MinStep:=", <MinStepV>, "MaxStep:=", <MaxStepV>), ... "VarName:=", Array("i:=", <IncludeVar>, "Min:=", <MinV>, "Max:=", <MaxV>, "MinStep:=", <MinStepV>, "MaxStep:=", <MaxStepV>))
	<MinStepV>	VarValue	The minimum step of the variable.
	<MaxStepV>	VarValue	The maximum step of the variable.
	<AcceptableCost>	Double	The acceptable cost value for the optimizer to stop.
	<Noise>	Double	The noise of the design.
	<UpdateDesign>	Boolean	Specifies whether or not to apply the optimal variation to the design after the optimization is done.
	<OptimizationGoalSpec>	Array	"Condition:=", <OptimizationCond>, Array("NAME:GoalValue", "GoalValeType:=", <GoalValueType>, "Format:=", <GoalValueFormat>, "bG:=", Array("v:=", <GoalValue>)), "Weight:=", <Weight>)
	<OptimizationCond>	String	Either "<=", "==", or ">="
	<GoalValueType>	String	Either "Independent" or "Dependent"
	<GoalValueFormat>	String	Either "Real/Imag" or "Mag/Ang".
	<GoalValue>	String	Value in string. Value can be a real number, complex number, or expression.
Return Value	None		

<MinStepV>

Type : <VarValue>

The minimum step of the variable.

<MaxStepV>

Type: <VarValue>

The maximum step of the variable.

<AcceptableCost>

Type: <double>

The acceptable cost value for the optimizer to stop.

<Noise>

Type: <double>

The noise of the design.

<UpdateDesign>

Type: <bool>

Specifies whether or not to apply the optimal variation to the design after the optimization is done.

<OptimizationGoalSpec>

"Condition:=", <OptimizationCond>,

Array("NAME:GoalValue", "GoalValueType:=",

<GoalValueType>,

"Format:=", <GoalValueFormat>, "bG:=",

Array("v:=", <GoalValue>)), "Weight:=", <Weight>)

<OptimizationCond>

Type: <string>

Either "<=", "==", or ">="

<GoalValueType>

Type: <string>

Either "Independent" or "Dependent"

<GoalValueFormat>

Type:<string>

Either "Real/Imag" or "Mag/Ang".

<GoalValue>

Type: <string>

Value in string. Value can be a real number, complex number, or expression.

Python Syntax	InsertSetup ("OptiOptimization", <OptimizationParams>)
Python Example	<pre>oModule.InsertSetup("OptiOptimization", ["NAME:OptimizationSetup1", "SaveFields=", false, _ ["NAME:StartingPoint", "\$length=", "8mm", "\$width=", "14.5mm"], "Optimizer=", "Quasi Newton",</pre>

```

"MaxIterations:=", 100,
"PriorPSetup:=", "ParametricSetup1",
"PreSolvePSetup:=", true,
["NAME:Variables",
"$length:=", ["i:=", true, "Min:=", "6mm",
"Max:=", "18mm",
"MinStep:=", "0.001mm", "MaxStep:=",
"1.2mm"],
"$width:=", ["i:=", true, "Min:=",
"6.5mm", "Max:=", "19.5mm",
"MinStep:=", "0.001mm", "MaxStep:=",
"1.3mm"]],
["NAME:LCS"],
["NAME:Goals",
["NAME:Goal",
"Solution:=", "Setup1 : LastAdaptive",
"Calculation:=", "reflect",
"Context:=", "",
["NAME:Ranges",
"Range:=", ["Var:=", "Freq",

```

```
"Type:=", "s",  
"Start:=", "8GHz", "Stop:=", "8GHz"]],  
"Condition:=", "<=",  
["NAME:GoalValue",  
"GoalValueType:=", "Independent",  
"Format:=", "Real/Imag",  
"bG:=", ["v:=", "[0.0001]"]],  
"Weight:=", "[1]"]],  
"Acceptable_Cost:=", 0.0002,  
"Noise:=", 0.0001,  
"UpdateDesign:=", true,  
"UpdateIteration:=", 5,  
"KeepReportAxis:=", true,  
"UpdateDesignWhenDone:=", true  
])
```

Sensitivity Script Commands

[EditSetup \[Sensitivity\]](#)

[InsertSetup \[Sensitivity\]](#)

EditSetup [Sensitivity]

Modifies an existing sensitivity setup.

UI Access	Right-click the setup in the project tree, and then click Properties on the shortcut menu		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the Setup
Return Value	None		

Python Syntax	EditSetup (<SetupName>, <SensitivityParams>)
Python Example	<pre>oModule.EditSetup("OptimizationSetup1", ["NAME:OptimizationSetup1", "UseFastCalculationUpdateAlgo:=", False, "FastCalcOptCtrledByUser:=", False, "IsEnabled:=", True, "SaveSolutions:=", False, ["NAME:StartingPoint"], "Optimizer:=", "Quasi Newton",</pre>

```
[
"NAME:AnalysisStopOptions",
"StopForNumIteration:=", True,
"StopForElapsTime:=", False,
"StopForSlowImprovement:=", False,
"StopForGrdTolerance:="      , False,
"MaxNumIteration:=", 1001,
"MaxSolTimeInSec:=", 3600,
"RelGradientTolerance:=", 0,
"MinNumIteration:=", 10
],
"CostFuncNormType:=", "L2",
"PriorPSetup:=", "",
"PreSolvePSetup:=", True,
[
"NAME:Variables"
],
[
"NAME:LCS"
```

```
],  
[  
  "NAME:Goals",  
  [  
    "NAME:Goal",  
    "ReportType:=", "Standard",  
    "Solution:=", "TR3",  
    [  
      "NAME:SimValueContext",  
      "SimValueContext:=", [1,0,2,0,False,False,-1,1,0,1,1,"",0,0]  
    ],  
    "Calculation:=", "mag(DIFF1.VAL)",  
    "Name:=", "DIFF1.VAL",  
    [  
      "NAME:Ranges",  
      "Range:=", [  
        "Var:=", "Time","Type:=", "a"]  
      ],  
    "Condition:=", "==",  
    [  
      "NAME:GoalValue",
```

	<pre>"GoalValueType:=", "Independent", "Format:=", "Real/Imag", "bG:=", ["v:=", "[1;]"]], "Weight:=", "[1;]"]], "Acceptable_Cost:=", 0, "Noise:=", 0.0001, "UpdateDesign:=", False, "UpdateIteration:=", 5, "KeepReportAxis:=", True, "UpdateDesignWhenDone:=", True])</pre>

InsertSetup [Sensitivity]

Inserts a new sensitivity setup.

UI Access	Right-click Optimetrics in the project tree, and then click Add>Sensitivity on the shortcut menu.		
Parameters	Name	Type	Description

	<SensitivityParams>	Array	Array("NAME:<SetupName>", "SaveFields:=", <SaveField>, <StartingPoint>, "MaxIterations:=", <MaxIter>, "PriorPSetup:=", <PriorSetup>, "PreSolvePSetup:=", <Preceed>, <SensitivityVars>, <Constraint>, Array("NAME:Goals", Array("NAME:Goal", <OptiGoalSpec>), ..., Array("NAME:Goal", <OptiGoalSpec>)), "Primary Goal:=". <PrimaryGoalID>, "PrimaryError:=", <PrimaryError>)
	<SensitivityVars>	Array	Array("NAME:Variables", "VarName:=", Array("i:=", <IncludeVar>, "Min:=", <MinV>, "Max:=", <MaxV>, "IDisp:=", <InitialDisp>),... "VarName:=", Array("i:=", <IncludeVar>, "Min:=", <MinV>, "Max:=", <MaxV>, "IDisp:=", <InitialDisp>))
	<InitialDisp>	VarValue	Index of the Primary goal. Index starts from zero.
	<PrimaryError>	Double	Error associated with the Primary goal.
Return Value	None		

Python Syntax	InsertSetup ("OptiSensitivity", <SensitivityParams>)

Python Example

```
oModule.InsertSetup(  
    "OptiSensitivity", _  
    ["NAME:SensitivitySetup1", _  
    "SaveFields:=", true, _  
    ["NAME:StartingPoint"], _  
    "MaxIterations:=", 20, _  
    "PriorPSetup:=", "", _  
    "PreSolvePSetup:=", true, _  
    ["NAME:Variables"], _  
    ["NAME:LCS"], _  
    "NAME:Goals", _  
    ["NAME:Goal", _  
    "Solution:=", "Setup1 : LastAdaptive", _  
    "Calculation:=", "returnloss", _  
    "Context:=", "", _  
    ["NAME:Ranges", _  
    "Range:=", ["Var:=", "Freq", _  
    Type:=", "s", _  
    "Start:=", "8GHz", "Stop:=", "8GHz"]]], _
```

	<pre>["NAME:Goal", _ "Solution:=", "Setup1 : LastAdaptive", _ "Calculation:=", "reflect", _ "Context:=", "", _ ["NAME:Ranges", _ "Range:=", ["Var:=", "Freq", _ "Type:=", "s", _ "Start:=", "8GHz", "Stop:=", "8GHz"]]], _ "Primary Goal:=", 1, _ "PrimaryError:=", 0.001])</pre>

Statistical Script Commands

[EditSetup \[Statistical\]](#)

[InsertSetup Statistical](#)

EditSetup [Statistical]

Modifies an existing statistical setup.

UI Access	Right-click the setup in the project tree, and clickProperties on the shortcut menu.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the Setup

Return Value	None

Python Syntax	EditSetup (<SetupName>, <StatisticalParams>)
Python Example	See EditSetup [Optimization]

InsertSetup [Statistical]

Inserts a new statistical setup.

UI Access	Right-click Optimetrics in the project tree, and then click Add>Statistical on the shortcut menu.		
Parameters	Name	Type	Description
	<StatisticalParams>	Array	Array("NAME:<SetupName>", "SaveFields:=", <SaveField>, <StartingPoint>, "MaxIterations:=", <MaxIter>, "PriorPSetup:=", <PriorSetup>, "PreSolvePSetup:=", <Preceed>, <StatisticalVars>, Array("NAME:Goals", Array("NAME:Goal", <OptiGoalSpec>), ..., Array("NAME:Goal", <OptiGoalSpec>)))
	<StatisticalVars>	Array	Array("NAME:Variables", "VarName:=", Array("i:=", <IncludeVar>, "Dist:=", <DistType>, "Tol:=", <Tolerance>, "StdD:=", <StdD>, "Min:=", <MinCutoff>, "Max:=",

			<code><MaxCutoff>, ...</code> <code>"VarName:=", Array("i:=", <IncludeVar>, "Dist:=",</code> <code><DistType>, "Tol:=", <Tolerance>, "StdD:=",</code> <code><StdD>, "Min:=", <MinCutoff>, "Max:=",</code> <code><MaxCutoff>))</code>
	<code><DistType></code>	String	Distrbution can be "Gaussian" or "Uniform".
	<code><Tolerance></code>	VarValue	The tolerance for the variable when distribution is Uniform
	<code><StdD></code>	VarValue	The standard deviation for the variable when distribution is Gaussian.
	<code><MinCutoff></code>	Double	The minimum cut-off for the variable when distribution is Gaussian.
	<code><MaxCutoff></code>	Double	The maximum cut-off for the variable when distribution is Gaussian.
Return Value	None		

Python Syntax	InsertSetup ("OptiStatistical", <StatisticalParams>)		
Python Example	<pre>oModule.InsertSetup("OptiStatistical", _ ["NAME:StatisticalSetup1", _ "SaveFields:=", true, _ ["NAME:StartingPoint"],_ "MaxIterations:=", 50,_ "PriorPSetup:=", "", _ ["NAME:Variables"], _ ["NAME:Goals", _</pre>		

```
["NAME:Goal", _  
"Solution:=", "Setup1 : LastAdaptive", _  
"Calculation:=", "returnloss", _  
"Context:=", "", _  
["NAME:Ranges", _  
"Range:=", ["Var:=", "Freq", _  
"Type:=", "s", _  
"Start:=", "8GHz", "Stop:=", "8GHz"]]], _  
["NAME:Goal", _  
"Solution:=", "Setup1 : LastAdaptive", _  
"Calculation:=", "reflect", _  
"Context:=", "", _  
["NAME:Ranges", _  
"Range:=", ["Var:=", "Freq", "Type:=", _  
"s", "Start:=", "8GHz", "Stop:=", "8GHz"]]]])
```

For Q3D Extractor and Circuit the command details are as follows:

Inserts a new statistical setup.

Command: Right-click **Optimetrics** in the project tree, and then click **Add>Statistical** on the shortcut menu.

Syntax: InsertSetup "OptiStatistical", <StatisticalParams>

Return Value: None

Parameters: <StatisticalParams>

```
Array("NAME:<SetupName>", "SaveFields:=",  
      <SaveField>, <StartingPoint>, "MaxIterations:=",  
      <MaxIter>, "PriorPSetup:=", <PriorSetup>,  
      "PreSolvePSetup:=", <Preceed>, <StatisticalVars>,  
      Array("NAME:Goals", Array("NAME:Goal",  
      <OptiGoalSpec>), ..., Array("NAME:Goal",  
      <OptiGoalSpec>))),  
<StatisticalVars>  
Array("NAME:Variables",  
      "VarName:=", Array("i:=", <IncludeVar>, "Dist:=",  
      <DistType>, "Tol:=", <Tolerance>,  
      "StdD:=", <StdD>, "Min:=", <MinCutoff>, "Max:=",  
      <MaxCutoff>, ...  
      "VarName:=", Array("i:=", <IncludeVar>, "Dist:=",  
      <DistType>, "Tol:=", <Tolerance>, "StdD:=",  
      <StdD>, "Min:=", <MinCutoff>, "Max:=",  
      <MaxCutoff>))
```

Parameters:

<DistType>

Type : <string>

Distribution can be "Gaussian" or "Uniform".

<Tolerance>

Type: <VarValue>

The tolerance for the variable when distribution is Uniform.

<StdD>

Type: <VarValue>

The standard deviation for the variable when distribution is Gaussian.

<MinCutoff>

Type: <double>

The minimum cut-off for the variable when distribution is Gaussian.

<MaxCutoff>

Type: <double>

The maximum cut-off for the variable when distribution is Gaussian.

15 - Solutions Module Script Commands

Solutions commands should be executed by the "Solutions" module.

```
Set oModule = oDesign.GetModule("Solutions")
```

```
oModule.CommandName <args>
```

[DeleteImportData](#)

[DeleteSolutionVariation](#)

[EditSources](#)

[ExportForHSpice](#)

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DeleteImportData

Deletes imported solution or table data in HFSS. Not in HFSS-IE

UI Access	Right-click on Results > Import Solutions , click Delete Selections button.		
Parameters	Name	Type	Description
	<i><ImportSpecArray></i>	Array	Array of import solutions. Array(<ImportName:SolnName OR TableName>, ...)
Return Value	None.		

Python Syntax	DeleteImportData(<i><ImportSpecArray></i>)
Python Example	<pre>oModule.DeleteImportData(["Import1:Adaptive_1", "Import2:DataTable"])</pre>

DeleteSolutionVariation

Deletes all solution data for specific solutions and design variations. This is obsolete and is supported only for backward compatibility. You should use DeleteFullVariation, DeleteFieldVariation, and DeleteLinked Variation.

UI Access	Right-click on Results , select Browse Solutions... , click Delete button in the dialog.		
Parameters	Name	Type	Description
	<SoluParams>	Array	Structured array. Array(<DataSpecifierArray>, ...)
	<DataSpecifierArray>	Array	Structured array. Array(<DesignVariationKey>, <SetupName>, <SolutionName>)
Return Value	None.		

Python Syntax	DeleteSolutionVariation(<SoluParams>)
Python Example	<pre>oModule.DeleteSolutionVariation([["width='2in'", "Setup1", "Adaptive_1"], ["width='2in'", "Setup1", "Sweep1"]])</pre>

EditSources

Indicates which source excitations should be used for fields post-processing.

Note:

This script has a different structure in Q3D Extractor and 2D Extractor. See separate sets of information below.

For Q3D Extractor:

UI Access	Q3D Extractor > Fields > Edit Sources. Modify the information on the CG, AC RL, DC RL, and Harmonic Loss tabs.		
Parameters	Name	Type	Description
	<acData>	Array	Structured array that corresponds to the AC RL tab in the UI. Within this array, each sub-array corresponds to columns in the UI. The Name column is represented by <sourceNames>. The <magnitudeArray> assigns the Magnitude and its Unit. The <phaseArray> assigns the Phase and its Unit. <pre>Array("NAME:AC", "Value Type:=" , <string "V" for Voltage or "A" for Current>, <sourceNames array>, <magnitudeArray>, <phaseArray>)</pre>
	<capData>	Array	Structured array that corresponds to the CG tab in the UI. Within this array, each sub-array corresponds to columns in the UI. The Name column is represented by <sourceNames>. The <magnitudeArray> assigns the Magnitude and its Unit. The <phaseArray> assigns the Phase and its Unit. <pre>Array("NAME:Cap",</pre>

			<pre>"Value Type:=" , <string "N" for null>, <sourceNames array>, <magnitudeArray>, <phaseArray>)</pre>
	<code><dcData></code>	Array	Structured array that corresponds to the DC RL tab in the UI. Within this array, each sub-array corresponds to columns in the UI. The Name column is represented by <code><sourceNames></code>. The <code><magnitudeArray></code> assigns the Magnitude and its Unit. The <code><phaseArray></code> assigns the Phase and its Unit. <pre>Array("NAME:DC", "Value Type:=" , <string "V" for Voltage or "A" for Current>, <sourceNames array>, <magnitudeArray>, <phaseArray>, "DC Loss Type:=", <string selecting the DC volume loss calculation assumption, either "True DC Loss" or "DC Loss Including Low Frequency Sinusoidals">)</pre>
	<code><harmonicLossData></code>	Array	Structured array that corresponds to the Harmonic Loss tab in the UI. Within this array, each sub-array corresponds to columns in the UI. The Name column is represented by <code><sourceNames></code>. <code><realNamesArray></code> and <code><imagNamesArray></code> assign the Real Current and Imag Current to those sources, in the same order. <pre>Array("NAME:Harmonic Loss", "Value Type:=" , <string "V" for Voltage or "A" for Current>, <sourceNames array>, <realNamesArray>, <imagNamesArray></pre>

		ray>)
<sourceNames>	Array	Structured array. Array("NAME:Source Names", <string source name>, <string source name>, ...)
<magnitudeArray>	Array	Structured array containing magnitude values in the same order as the sources in <sourceNames>. Array("NAME:Source Magnitudes", <string containing value and unit>, <string containing value and unit>, ...)
<phaseArray>	Array	Structured array containing phase values in the same order as the sources in <sourceNames>. Array("NAME:Source Phases", <string containing value and unit>, <string containing value and unit>, ...)
<realNamesArray>	Array	Structured array containing real values in the same order as the sources in <sourceNames>. Array("NAME:Source real dataset names", <string containing value and unit>, <string containing value and unit>, ...

	<table><tr><td></td><td>)</td></tr><tr><td><imagNamesArray></td><td>Array Structured array containing imag values in the same order as the sources in <sourceNames>. Array("NAME:Source imag dataset names", <string containing value and unit>, <string containing value and unit>, ...)</td></tr></table>		)	<imagNamesArray>	Array Structured array containing imag values in the same order as the sources in <sourceNames>. Array("NAME:Source imag dataset names", <string containing value and unit>, <string containing value and unit>, ...)
	)				
<imagNamesArray>	Array Structured array containing imag values in the same order as the sources in <sourceNames>. Array("NAME:Source imag dataset names", <string containing value and unit>, <string containing value and unit>, ...)				
Return Value	None.				

Python Syntax	EditSources(<acData>, <capData>, <dcData>, <harmonicLossData>)
Python Example	<pre>oModule.EditSources(["NAME:AC", "Value Type:=" , "V", ["NAME:Source Names", "via:Source1"], ["NAME:Source Magnitudes", "1V"]])</pre>

```
[
    "NAME:Source Phases",
    "30deg"
],
[
    "NAME:Cap",
    "Value Type:=" , "N",
    [
        "NAME:Source Names",
        "groundplane",
        "via"
    ],
    [
        "NAME:Source Magnitudes",
        "1V",
        "0V"
    ],
    [
        "NAME:Source Phases",
        "0deg",
        "0deg"
    ]
],
[
    "NAME:DC",
    "Value Type:=" , "V",
    [
        "NAME:Source Names",
        "via:Source1"
    ],
    [
        "NAME:Source Magnitudes",
```

	<pre>"Value Type:=" , "A", ["NAME:Source Names", "Box1:PH1", "Box1:PH2", "Box1:PH3"], ["NAME:Source real dataset names", "PH1_real", "PH2_real", "PH3_real"], ["NAME:Source imag dataset names", "PH1_imag", "PH2_imag", "PH3_imag"]]])</pre>

For 2D Extractor:

UI Access	2D Extractor > Fields > Edit Sources. Modify the information on the CG and RL tabs.		
Parameters	Name	Type	Description
	<cgSources>	Array	Structured array that corresponds to the CG tab in the UI. Within this array, each sub-array corresponds to columns in the UI. The Name column is represented by <sourceNames>. The <magnitudeArray> assigns the Magnitude and its Unit , while the <phaseArray> assigns the Phase and its Unit .

		<pre>Array("NAME:CGSources", <sourceNames array>, <magnitudeArray>, <phaseArray>)</pre>
<rlSources>	Array	Structured array that corresponds to the RL tab in the UI. Within this array, each sub-array corresponds to columns in the UI. The Name column is represented by <sourceNames>. The <magnitudeArray> assigns the Magnitude and its Unit, while the <phaseArray> assigns the Phase and its Unit. <pre>Array("NAME:RLSources", <sourceNames array>, <magnitudeArray>, <phaseArray>)</pre>
<sourceNames>	Array	Structured array. <pre>Array("NAME:Source Names", <string source name>, <string source name>, ...)</pre>
<magnitudeArray>	Array	Structured array containing magnitude values in the same order as the sources in <sourceNames>. <pre>Array("NAME:Magnitude", <string containing value and unit>, <string containing value and unit>, ...)</pre>
<phaseArray>	Array	Structured array containing phase values in the same order as the sources in <sourceNames>. <pre>Array("NAME:Phase",</pre>

	<table><tr><td></td><td></td><td> <string containing value and unit>, <string containing value and unit>, ...) </td></tr></table>			<string containing value and unit>, <string containing value and unit>, ...)
		<string containing value and unit>, <string containing value and unit>, ...)		
Return Value	None.			

Python Syntax	EditSources(<cgSources>, <rlSources>)
Python Example	<pre>oModule.EditSources(["NAME:CGSources", ["NAME:Source Names", "top_gnd1", "trace"], ["NAME:Magnitude", "1V", "2V"], ["NAME:Phase", "0deg", "0deg"]], [</pre>

	<pre> "NAME:RLSources", ["NAME:Source Names", "top_gnd1", "trace"], ["NAME:Magnitude", "1A", "2A"], ["NAME:Phase", "0deg", "1deg"]]) </pre>

ExportForHSpice

Exports matrix solution data to a file in a format suitable for HSpice analysis. Available only for Driven Terminal solution types with ports. Output in an appropriate format will be generated for each of the non-empty file names provided.

UI Access	N/A		
Parameters	Name	Type	Description
	<DesignVariation>	String	Design variation key.
	<SoluSelections>	Array	Array of selected solutions.
	<SpiceType>	Integer	1 - HSpice.
	<BandWidth>	Integer	0 - Low (narrow) band width.
	<FWSFile>	String	Full wave spice file name.

	<LumpedElementFile>	String	Lumped element file name.
	<PoleZeroSpiceFile>	String	Pole zero spice file name.
	<PoleZeroMatlabFile>	String	Pole zero Matlab file name.
	<PartialFractionFile>	String	Partial fraction file name.
	<FittingError>	Double	The accuracy to use in fitting the pole zero model.
	<MinimumOrder>	Integer	Minimum number of poles in rational function expansion.
	<MaximumOrder>	Integer	Maximum number of poles in rational function expansion.
	<UseCommonGround>	Integer	Optional. 1 to use common ground, 0 otherwise.
	<EnforcePassivity>	Integer	Optional. 1 to enforce passivity, 0 otherwise.
Return Value	None.		

Python Syntax	ExportForHSpice(<DesignVariation>, <SoluSelections>, <SpiceType>, <BandWidth>, <FWSFile>, <LumpedElementFile>, <PoleZeroSpiceFile>, <PoleZeroMatlabFile>, <PartialFractionFile>, <FittingError>, <MinimumOrder>, <MaximumOrder>, [Optional <UseCommonGround>], [Optional <EnforcePassivity>])
Python Example	<pre>oModule.ExportForHSpice("width='2in'", ["Setup1:Sweep1"], 1, 0, "c:\mydir\Sweep1.fws", "", "", "", "", .005, 20, 200)</pre>

ExportNetworkData

Exports matrix solution data to a file.

UI Access	N/A

Parameters	Name	Type	Description
	<DesignVariationKey>	String	Design variation key. Pass empty string for the current nominal variation.
	<SolnSelectionArray>	Array	Array of selected solutions. Array(<SolnSelector>, <SolnSelector>, ...) If more than one array entry, this indicates a combined Interpolating sweep.
	<SolnSelector>	String	Solution setup name and solution name, separated by a colon.
	<FileFormat>	Integer	File format value. 2 : Tab delimited spreadsheet format (.tab) 3 : Touchstone (.sNp) 4 : CitiFile (.cit) 7 : Matlab (.m) 8 : Terminal Z0 spreadsheet
	<OutFile>	String	Full path to the file to write out.
	<FreqsArray>	Array	The frequencies to export. The <FreqsArray> argument contains a vector (e.g. "1GHz", "2GHz", ...) to use, or "all". To export all frequencies, use Array("all"). If no frequencies are specified, all frequencies are used.
	<DoRenorm>	Boolean	For Touchstone format only. Specifies whether to renormalize the data before export.
	<RenormImped>	Double	For Touchstone format only. Real impedance value in ohms, for renormalization. Required in syntax, but ignored if DoRenorm is false.
	<DataType>	Array	Optional. Type: "S", "Y", or "Z". The matrix to export.
	<pass>	Integer	Optional. The pass to export. This is ignored if the sourceName is a frequency sweep. Leaving out this value or specifying -1 gets all passes.
	<ComplexFormat>	Integer	Optional. Type: "0", "1", or "2"

			The format to use for the exported data. 0 = Magnitude/Phase. 1= Real/Imaginary. 2= db/Phase.
	<Precision>	Integer	Optional. Touchstone number of digits precision. Default if not specified is 15.
	<UseExportFreqs>	Boolean	Specifies whether to use export frequencies.
	<IncludeGammaComments>	Boolean	Touchstone only. Specifies whether to include Gamma and Impedance comments.
	<SupportNonStdExport>	Boolean	Specifies whether to support non-standard Touchstone extensions for mixed reference impedance.
Return Value	None.		

Python Syntax	ExportNetworkData(<DesignVariationKey>, <SolnSelectionArray>, <SolnSelector>, <FileFormat>, <OutFile>, <FreqsArray>, <DoRenorm>, <RenormImped>, [Optional <DataType>], [Optional <pass>], [Optional <ComplexFormat>], [Optional <Precision>], [Optional <UseExportFreqs>], [Optional <IncludeGammaComments>], [Optional <SupportNonStdExport>])
Python Example	

ExportNMFData

Exports matrix solution data to a file in neutral model format. Available only for Driven solution types with ports. Variables can be held constant by setting their values in the variation field. For example: "length='50mm' width='30mm'". All other independent variables will be treated as NMF parameters.

UI Access	N/A		
Parameters	Name	Type	Description
	<sourceName>	Array	Array of selected solutions.
	<OutFile>	String	Full path to the file to write out, including the .nmf extension
	<FreqsArray>	Array	The frequencies to export. The <FreqsArray> argument contains a vector (e.g. "1GHz", "2GHz", ...) to use, or "all". To export all frequencies, use Array("all"). If no frequencies are specified, all frequencies are used.
	<DesignVariationKey>	String	Design variation.
	<DoRenorm>	Boolean	Specifies whether to renormalize the data before export.
	<RenormImped>	Double	Real impedance value in ohms, for renormalization. Required in syntax, but ignored if DoRenorm is false.
	<Pass>	Integer	Optional. The pass to export. This is ignored if the sourceName is a frequency sweep. Leaving out this value or specifying -1 gets all passes.
	<ComplexFormat>	Integer	Optional. The format to use for the exported data. Options are 0 = Magnitude/Phase 1 = Real/Imaginary. 2 = db/Phase.
	<Precision>	Integer	Optional. Number of digits precision. If not specified, the default is 6.
Return Value	None		

Python Syntax	ExportNMFData(<sourceName>, <OutFile>, <FreqsArray>, <DesignVariationKey>, <DoRenorm>, <RenormImped>, <Pass>, <ComplexFormat>, <Precision>)
Python Example	oModule.ExportNMFData(["Setup1:Sweep1"], "c:\mydir\out.nmf", ["all"], "", False, 0)

ExportTransientData

Exports transient solution data to a file.

UI Access	HFSS > Results > Solution Data..., then click Export .		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
	<Variation>	String	Design variation key. Pass empty string for the current nominal variation.
	<FileName>	String	Full path of output file.
	<DataType>	String	Optional. Type of output data.
	<DataFormat>	String	Optional. Format of output data.
			.csv - Comma Delimited Data. .tab - Tab Delimited Data files. .dat - Ansys Plot Data files .txt - Post Processing Files
Return Value	None.		

Python Syntax	ExportTransientData(<SoluName>, <Variation>, <FileName>)
Python Example	oModule.ExportTransientData("Setup1:Transient", "", "C:/transient_solu1.csv")

FFTONReport

Performs an FFT on a selected report.

UI Access	Right-click on Results in the project tree, select Perform FFT On Report...		
Parameters	Name	Type	Description
	<ReportName>	String	Name of specified report.
	<WindowName>	String	Name of window to apply for FFT. Possible values are "Rectangular", "Tri", "Van Hann", "Hamming", "Blackman", "Lanczos", "Weber", "Welch".
	<Function>	String	Function to apply on transformation values. Possible values are "none", "ang_deg", "ang_rad", "arg", "cang_deg", "cang_rad", "dB", "dB1 normalize", "dB20normalize", "dBc", "im", "mag", "normalize", "re".
Return Value	None.		

Python Syntax	FFTONReport <ReportName>, <WindowName>, <Function>
Python Example	oModule.FFTONReport("XY Plot 1", "Rectangular", "dB")

GetAdaptiveFreq

Obtains an adaptive frequency for a specified setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of specified setup.
Return Value	Double frequency value.		

Python Syntax	GetAdaptiveFreq(<SetupName>)

Python Example	<code>oModule.GetAdaptiveFreq("Setup1")</code>

GetAdaptiveSettings

Obtains the adaptive frequency settings of a specified setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of specified setup.
Return Value	Array of strings represents adaptive frequency settings.		

Python Syntax	<code>GetAdaptiveSettings(<SetupName>)</code>
Python Example	<code>oModule.GetAdaptiveSettings("Setup1")</code>

GetAllSourceMagnitudes

Obtains the magnitude values of all defined sources.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing magnitude values.

Python Syntax	GetAllSourceMagnitudes()
Python Example	<code>oModule.GetAllSourceMagnitudes()</code>

GetAllSourceModes

Obtains mode information of all defined sources.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing mode information.

Python Syntax	GetAllSourceModes()
Python Example	<code>oModule.GetAllSourceModes()</code>

GetAllSourcePhases

Obtains the phase values of all defined sources.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing phase values.

Python Syntax	GetAllSourcePhases()
Python Example	<code>oModule.GetAllSourcePhases()</code>

GetAllSources

Retrieves all sources defined in the current solution setup.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing source names.

Python Syntax	GetAllSources()
Python Example	<code>oModule.GetAllSources()</code>

GetAntennaParameters

Retrieves antenna parameters defined in a specified setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of specified setup.

Return Value	Array of strings containing antenna parameters.

Python Syntax	GetAntennaParameters(<SetupName>)
Python Example	<code>oModule.GetAntennaParameters("Setup1")</code>

GetAvailableVariations

Returns the available variation for a solution.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
Return Value	Array of strings containing available variations.		

Python Syntax	GetAvailableVariations(<SoluName>)
Python Example	<code>oModule.GetAvailableVariations("Setup1 : LastAdaptive")</code>

GetExcitationScaling

Gets source scaling parameters.

UI Access	N/A

Parameters	Name	Type	Description
	<portName>	String	Port ID.
	<Index>	Integer	Optional. Port/mode/terminal/eigenmode index, if present.
Return Value	Array of strings containing source scaling parameters.		

Python Syntax	GetExcitationScaling(<portName>, <portIndex>)
Python Example	<code>oModule.GetExcitationScaling("Port1", 2)</code>

GetFieldType

Gets the field type of a driven modal design solution.

UI Access	N/A
Parameters	None.
Return Value	String containing field type.

Python Syntax	GetFieldType()
Python Example	<code>oModule.GetFieldType()</code>

GetIncludePortPostProcessing

Determines whether the Include Port Post Processing Effects option is enabled.

UI Access	N/A
Parameters	None.
Return Value	Integer. • 1 - Include Port Post Processing Effects is enabled. • 0 - Include Port Post Processing Effects is disabled.

Python Syntax	GetIncludePortPostProcessing()
Python Example	<code>oModule.GetIncludePortPostProcessing()</code>

GetLayerAndNetOfMeshBody

For a given mesh body name, returns a pair of layer and net name to which this body belongs.

UI Access	N/A
Parameters	The input is a mesh body name.
Return Value	Returns a pair of layer and net name to which this body belongs.

Python Syntax	GetLayerAndNetOfMeshBody()

Python Example

```
LayerAndNetOfMeshBody("LC1_1:METAL-1") print layerNetInfo #prints ["METAL-1", "trace_P"]

Example usage to plot on the objects on certain layers and nets using GetLayerAndNetOfMeshBody with
GetMeshBodiesOnLayerAndNet.

meshBodies = oModule.GetMeshBodiesOnLayerAndNet(
    [
        "NAME:LayerNetInfo",
        "METAL-1:=" , ["trace_P", "ground"]
    ])
plotGeomInfo = [1, "Volume", "ObjList", ]
plotGeomInfo.append(len(meshBodies))
plotGeomInfo += meshBodies
oFieldsReporterModule = oDesign.GetModule("FieldsReporter")
oFieldsReporterModule.CreateFieldPlot(
    [
        "NAME:Mesh1",
        "SolutionName:=" , "Setup1 : LastAdaptive",
        "UserSpecifyName:=" , 0,
        "UserSpecifyFolder:=" , 0,
        "QuantityName:=" , "Mesh",
        "PlotFolder:=" , "MeshPlots",
```

```
"FieldType:=" , "Fields",
"StreamlinePlot:=" , False,
"AdjacentSidePlot:=" , False,
"FullModelPlot:=" , False,
"IntrinsicVar:=" , "Freq='\5GHz\' Phase='\0deg\'",
"PlotGeomInfo:=" , plotGeomInfo,
"FilterBoxes:=" , [0],
"Real time mode:=" , True,
[
  "NAME:MeshSettings",
  "Scale factor:=" , 100,
  "Transparency:=" , 0,
  "Mesh type:=" , "Shaded",
  "Surface only:=" , True,
  "Add grid:=" , True,
  "Refinement:=" , 0,
  "Use geometry color:=" , True,
  "Mesh line color:=" , [0,0,255],
  "Filled color:=" , [255,255,255]
],
"EnableGaussianSmoothing:=" , False,
```

	<pre>"SurfaceOnly:=" , False], "Field")</pre>

GetMeshBodiesOnLayerAndNet

Gets the field type of a driven modal design solution.

UI Access	N/A
Parameters	The inputs are a layer net block and a vector of component names (optional).
Return Value	The output is a vector of mesh body names that belong to the specified nets and layers and the component..

Python Syntax	GetMeshBodiesOnLayerAndNet()
Python Example	<pre>import ScriptEnv ScriptEnv.Initialize("Ansoft.ElectronicsDesktop") oDesktop.RestoreWindow() oProject = oDesktop.SetActiveProject("Tests") oDesign = oProject.SetActiveDesign("Reference_multiple") oModule = oDesign.GetModule("Solutions") meshBodies = oModule.GetMeshBodiesOnLayerAndNet ([</pre>


```

        "NAME:LayerNetInfo",
        "METAL-1:="                , ["trace_P","ground"]
    ])
print meshBodies    #prints["LC1_1:METAL-1", "LC1_2:METAL-1"]
meshBodiesForLC1_1 = oModule.GetMeshBodiesOnLayerAndNet(
    [
        "NAME:LayerNetInfo",
        "METAL-1:="                , ["trace_P","ground"]
    ], ["LC1_1"])
print meshBodiesForLC1_1    #prints ["LC1_1:METAL-1"]
moreMeshBodies = oModule.GetMeshBodiesOnLayerAndNet(
    [
        "NAME:LayerNetInfo",
        "METAL-1:="                , ["trace_P","Ground"],
        "METAL-2:="                , ["TRACE_p","GROUND"] #case insensitive
    ])
print moreMeshBodies    #prints ['LC1_1:METAL-1', 'LC1_2:METAL-1', 'LC1_1:METAL-2',
                              'LC1_2:METAL-2']
moreMeshBodiesForLC1_1 = oModule.GetMeshBodiesOnLayerAndNet(
    [
        "NAME:LayerNetInfo",
        "METAL-1:="                , ["trace_P","ground"],

```

	<pre>"METAL-2:=" , ["trace_P","ground"]], ["LC1_1"]) print moreMeshBodiesForLC1_1 #prints['LC1_1:METAL-1', 'LC1_1:METAL-2']</pre>

GetMultipactionBreakdown

Gets multipaction breakdown from the specified setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of specified setup.
	<Variation>	String	Design variation. Pass empty string for the current nominal variation.
Return Value	Array of string containing the multipaction breakdown.		

Python Syntax	GetMultipactionBreakdown(<SetupName>, <Variation>)
Python Example	oModule.GetMultipactionBreakdown("Setup1", "")

GetNetworkDataSolution

Gets matrix data solution from a specified setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of solution.
	<VariationKey>	String	Design variation key. Pass empty string for the current nominal variation.
Return Value	String containing matrix data.		

Python Syntax	GetNetworkDataSolution(<SoluName>, <VariationKey>)		
Python Example	oModule.GetNetworkDataSolution("Setup1:Sweep1", "")		

GetNetworkDataSolutionDefinition

Gets definition of network data solution from a specified setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
Return Value	String containing network data definition.		

Python Syntax	GetNetworkDataSolutionDefinition(<SoluName>)		
Python Example	oModule.GetNetworkDataSolutionDefinition("Setup1:Sweep1")		

GetNetworkPostprocSetup

Obtains network postprocessing setup.

UI Access	N/A
Parameters	None.
Return Value	String containing postprocessing setup.

Python Syntax	GetNetworkPostprocSetup()
Python Example	<code>oModule.GetNetworkPostprocSetup()</code>

GetSolutionVersionID

Use: To obtain the solution ID to help track solution validity.

Syntax: GetSolutionVersionID(BSTR fullSolutionName)

Return Value: Returns a solution ID.

Parameters: None

GetSolveRangeInfo

Determines the frequency range of a particular simulation setup. For fast sweeps and interpolating sweeps this command returns the start and stop frequencies. For discrete sweeps, it returns a list of frequencies. For an adaptive solution, it returns the adaptive

frequency.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
	<IncludeRangeFieldSaved>	Boolean	Optional. Specify whether to only include the range with field saved.
Return Value	Array of strings containing frequency values.		

Python Syntax	GetSolveRangeInfo(<SoluName>, [Optional <IncludeRangeFieldSaved>])		
Python Example	oModule.GetSolveRangeInfo ("Setup1:Sweep1")		

GetSourceContexts

Obtains sources currently enabled as context in the Edit Sources dialog Source Context tab.

UI Access	N/A		
Parameters	None.		
Return Value	Array of enabled source names		

Python Syntax	GetSourceContexts()		
Python Example	oModule.GetSourceContexts()		

GetTerminalExcitationType

Obtains the type for terminal excitation in a driven terminal design.

UI Access	N/A
Parameters	None.
Return Value	String containing excitation type.

Python Syntax	GetTerminalExcitationType()
Python Example	<code>oModule.GetTerminalExcitationType()</code>

GetTransientSolveTimes

Gets the transient solution solve time.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
	<Variation>	String	Design variation. Pass empty string for the current nominal variation.
Return Value	Array of strings containing solve time.		

Python Syntax	<code>GetTransientSolveTimes(<SoluName>, <Variation>)</code>
Python Example	<code>oModule.GetTransientSolveTimes("Setup1:Transient", "")</code>

GetValidSolutionList

Gets all available solution names that exist in a design.

UI Access	N/A		
Parameters	Name	Type	Description
	<IncludeImportedSolutions>	Boolean	Optional. Specifies whether to include imported solutions. Default is false.
Return Value	Array of strings containing solution names.		

Python Syntax	<code>GetValidSolutionList([Optional <IncludeImportedSolutions>])</code>
Python Example	<code>oModule.GetValidSolutionList()</code>

HasFields

Determines if fields exist for a particular solution.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
	<DesignVar>	String	Design variation.

Return Value	Integer (1 - True, 0 - False).

Python Syntax	HasFields(<SoluName>, <DesignVar>)
Python Example	<code>oModule.HasFields("Setup1:Sweep1", "x_size=2mm")</code>

HasMatrixData

Determines if matrix data exists for a particular solution.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
	<DesignVar>	String	Design variation.
Return Value	Integer (1 - True, 0 - False).		

Python Syntax	HasMatrixData(<SoluName>, <DesignVar>)
Python Example	<code>oModule.HasMatrixData("Setup1:Sweep1", "")</code>

HasMesh

Determines if a current mesh exists for a particular simulation setup, not including the initial mesh.

UI Access	N/A		
Parameters	Name	Type	Description
	<DesignName>	String	Name of specified design.
	<DesignVar>	String	Design variation.
Return Value	Integer (1 - True, 0 - False).		

Python Syntax	HasMesh(<DesignName>, <DesignVar>)		
Python Example	oModule.HasMesh("Setup1", "")		

ImportSolution

Imports a matrix solution in HFSS, which can then be used in creating reports or in the display of matrix data. The imported solution need not have the same characteristics as the current design. Imported terminal data that meets the required criteria can be used for full-wave Spice export. Not used in HFSS-IE.

UI Access	Right-click on Results > Import Solutions... , click on Import Solution... in the opened dialog window.		
Parameters	Name	Type	Description
	<FileName>	String	Location of the source data. The type of the data file will be determined strictly by its file extension. Supported types are Touchstone (.sNp or .yNp or .zNp or .tou), and Ansoft Designer (.flp).
	<ImportName>	String	Identifying name to use for the import, analogous to solution setup name.
	<SoluArray>	Array	The names of the solutions selected for import from the file. The only import format supporting multiple solutions in one file is HFSS8.x format.
Return Value	None.		

Python Syntax	<code>ImportSolution(<FileName>, <ImportName>, <SoluArray>)</code>
Python Example	<pre>oModule.ImportSolution("c:\mydir\in.s2p", "MeasuredData", ["Sweep1"])</pre>

ImportTable

Imports a data table for use in plotting reports in HFSS. Not used in HFSS-IE. The table can have multiple independent real-valued columns of data, and multiple dependent real- or complex-valued columns of data. The data supported imports are either tab delimited format (.tab) or comma delimited format (.csv). The first row may contain column names. Complex data columns are inferred from the column data format. In tab delimited format, "(double, double)" denotes a complex number. In comma delimited format, "(double, double)" denotes a complex number.

UI Access	Right-click on Results > Import Solutions... , click on Import Table... in the opened dialog window.		
Parameters	Name	Type	Description
	<FileName>	String	Location of the source data.
	<ImportName>	String	Identifying name to use for the import, analogous to solution setup name.
	<TableName>	String	Identifying name for the table, analogous to solution name.
	<IsReallmag>	Boolean	Whether to use real/imag to interpret data for any complex column. If false, then use mag/phase(degrees).
	<ContainsSoluData>	Boolean	Whether contains solution data.
	<ColNames>	Array	Non-empty array used only if intend to override the column names obtained from the table data file, in which case all column names are required.
	<ColIndepFlags>	Array	Indicates which columns are independent. If this is the empty array, the default is that only the first column is independent. If this is the non- empty array, a flag must be present for every column.
Return Value	None.		

Python Syntax	<code>ImportTable(<FileName>, <ImportName>, <TableName>, <IsReallmag>, <ContainsSoluData>, <ColNames>, <ColIndepFlags>)</code>
Python Example	<pre>oModule.ImportTable("c:\mydir\mytable.tab", "ImportData", "Measurements", True, True, [], [True, True, False, False, False])</pre>

IsFieldAvailableAt

Determines if a field solution exists for a particular frequency in a simulation.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
	<DesignVar>	String	Design varitaiton.
	<Freq>	Double	Specified frequency.
Return Value	Integer (1 - True, 0 - False).		

Python Syntax	<code>IsFieldAvailableAt(<SoluName>, <DesignVar>, <Freq>)</code>
Python Example	<code>oModule.IsFieldAvailableAt("Setup1:Sweep1", "", 100.0)</code>

ListMatchingVariations

Gets a list of solved variations that include the specified variable values.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solutions.
	<MatchVarNames>	Array	Array of matching variable names.
	<MatchValStrings>	Array	Array of matching variable value strings including units.
Return Value	Array of strings corresponding to solved variations. The match variables may be a partial set of design variables and the match values are one per variable in the same order as the variables.		

Python Syntax	ListMatchingVariations(<SoluName>, <MatchVarNames>, <MatchValStrings>)
Python Example	<pre>oModule.ListMatchingVariations("Setup1:LastAdaptive", ["x_size", "y_size"], ["2mm", "1mm"])</pre>

ListValuesOfVariable

Gets the values of a specified variable corresponding to the solved variations.

UI Access	N/A

Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
	<VariableName>	String	Name of specified variable.
Return Value	Array of double precision values in SI units interpreted as the specified variable corresponding to the solved variations.		

Python Syntax	ListValuesOfVariable(<SoluName>, <VariableName>)
Python Example	<code>oModule.ListValuesOfVariable("Setup1:LastAdaptive", "x_size")</code>

ListVariations

Gets a list of solved variations.

UI Access	N/A		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
Return Value	Array of strings corresponding to solved variations.		

Python Syntax	ListVariations(<SoluName>)
Python Example	<code>oModule.ListVariations("Setup1 : LastAdaptive")</code>

SetExternalExcitations

Can be used instead of the Circuit push excitations workflow to import excitation datasets into Q3D Extractor.

UI Access	N/A.		
Parameters	Name	Type	Description
	<folderName>	Array	Structured array containing the folder path for import. <code>Array("NAME:foldername", <string path>)</code>
	<args>	Array	Structured array containing excitation argument arrays. <code>Array(<argArray>, <argArray>, <argArray>...)</code>
	<argArray>	Array	Structured array containing parameter arrays. <code>Array(Array("NAME:Name", <string object name>) Array("NAME:Re", <string path to *.tab file containing real current values>) Array("NAME:Im", <string path to *.tab file containing imaginary current values>))</code>
Return Value	None.		

Python Syntax	SetExternalExcitations(<folderName>, <args>)

Python Example

```

oModule.SetExternalExcitations(
[
    "NAME:foldername",
    "F:/Project/Push_Excitation/testPushExcitation"
],
[
    [
        [
            "NAME:Name",
            "Box1:PH1",
        ],
        [
            "NAME:Re",
            "F:/Project/Push_Excitation/testPushExcitation/PH1_real.tab",
        ],
        [
            "NAME:Im",
            "F:/Project/Push_Excitation/testPushExcitation/PH1_imag.tab",
        ]
    ],
    [
        [
            "NAME:Name",
            "Box1:PH2",
        ],
        [
            "NAME:Re",
            "F:/Project/Push_Excitation/testPushExcitation/PH2_real.tab",
        ],
        [
            "NAME:Im",
            "F:/Project/Push_Excitation/testPushExcitation/PH2_imag.tab",
        ]
    ],
]

```

	<pre>[["NAME:Name", "Box1:PH3",], ["NAME:Re", "F:/Project/Push_Excitation/testPushExcitation/PH3_real.tab",], ["NAME:Im", "F:/Project/Push_Excitation/testPushExcitation/PH3_imag.tab",]]</pre>
	<pre>])</pre>

SetSourceContexts

For Near or Far Field projects for Driven Modal or Driven Terminal Network Analysis Solutions, specifies the port name and all modes/terminals of that port to be enabled as Source Context.

UI Access	HFSS > Fields > Edit Sources.		
Parameters	Name	Type	Description
	<SourceId>	Array	Name of modes/terminals to be set as source context.
Return Value	None.		

Python Syntax	SetSourceContexts(<SourceId>)
Python Example	<pre>oModule.SetSourceContexts (["Box1_T1", "Box1_T2", "Box1_T3", "Current1", "IncPWave1"])</pre>

TDROnReport

Performs a time-domain reflectometry (TDR) analysis on a specified report.

UI Access	Right-click on Result1 > Perform TDR On Report...		
Parameters	Name	Type	Description
	<ReportName>	String	Name of specified report.
	<IsStep>	Boolean	Specifies the input signal as Step or Impulse.
	<RiseTime>	Double	Specifies rise time with unit in 'ps'.
	<WindowName>	String	Name of window to apply. Possible values are "Rectangular", "Bartlett", "Blackman", "Hamming", "Hanning", "Kaiser", "Welch".
	<WindowWidth>	Integer	Width of window in percentage.
	<KaiserParams>	Double	Optional. If Kaiser window is specified, set corresponding parameters.
Return Value	None.		

Python Syntax	TDROnReport(<ReportName>, <IsStep>, <RiseTime>, <WindowName>, <WindowWidth>, [Optional <KaiserParams>])
Python Example	oModule.TDROnReport("Rept2DRectFreq", True, 1E-12, "Hanning", 100, 1)

16 - Reduce Matrix Module Script Commands

Reduce matrix commands should be executed by the "ReduceMatrix" module.

```
oDesign = oProject.SetActiveDesign ("Design1")
```

```
oModule = oDesign.GetModule("ReduceMatrix")
```

The following Reduce Matrix commands are available for Q3D Extractor and 2D Extractor:

[DeleteRM](#)

[DeleteRMO](#)

[DupRM](#)

[DupRMAddOp](#)

[EditRM](#)

[InsertRM](#)

[ListReduceMatrixes](#)

[ListReduceMatrixOperations](#)

[ListReduceMatrixReducedSources](#)

[RenameRM](#)

[RenameRMO](#)

[ReorderMatrix](#)

[RMAddOp](#)

The following commands are only available for 2D Extractor:

[AlphaNumericMatrix](#)

[2D Extractor Reduce Operations](#)

AlphaNumericMatrix (2D Extractor)

Reorders the sources in the matrix in alphanumeric order.

UI Access	Right-click a reduce matrix in the project tree, and then click Reorder Matrix . Then select the option for alpha numeric ordering.		
Parameters	Name	Type	Description
	<ReduceMatrixName>	String	Name of the reduce matrix.
Return Value	None.		

Python Syntax	AlphaNumericMatrix(<ReduceMatrixName>)
Python Example	oModule.AlphaNumericMatrix("RM1")

DeleteRM

*Use:*Deletes the specified reduce matrix.

*Command:*Right-click a reduce matrix in the project tree, and then choose **Delete**.

*Syntax:*DeleteRM <MatName>

*Return Value:*None

Parameters:<MatName>

Type: <string>

Name of the reduce matrix to be deleted.

DeleteRMO

*Use:*Deletes a reduce operation in an existing reduce matrix.

*Command:*Right-click a reduce matrix operation in the project tree, and then choose **Delete**.

*Syntax:*DeleteRMO <MatName> <OpName>

*Return Value:*None

Parameters:<MatName>

Type: <string>

Name of the reduce matrix being edited.

<OpName>

Type: <string>

Name of the reduce operation to be deleted.

DupRM

*Use:*Duplicates a reduce matrix.

*Command:*Right-click a reduce matrix in the project tree, and then choose **Duplicate**.

*Syntax:*DupRM <MatName>

*Return Value:*None

Parameters:<MatName>

Type: <string>

Name of the reduce matrix to be duplicated.

DupRMAddOp

*Use:*Duplicates an existing reduce matrix and then add an operation to the duplicated matrix.

*Command:*Right-click a reduce matrix in the project tree, and then choose the type of operation to add.

Syntax: RMAddOp <MatName>, <OpData>

*Return Value:*None

Parameters:<MatName>

Type: <string>

Name of the reduce matrix being edited.

<OpData>

See InsertRM for details.

EditRM

*Use:*Edits an existing operation in a reduce matrix.

*Command:*Double-click an operation in the project tree to modify its reduce matrix.

*Syntax:*EditRM <MatName>, <OpName>, <OpData>

*Return Value:*None

<MatName>

Type: <string>

Name of the reduce matrix being edited.

<OpName>

Type: <string>

Name of the reduce operation being edited

<OpData>

See InsertRM for details.

InsertRM

*Use:*Adds a new reduce matrix.

*Command:***Q3D Extractor>Reduce Matrix>Move Sink**

Q3D Extractor> ReduceMatrix>Add Sink

Q3D Extractor> ReduceMatrix>Join In Series

Q3D Extractor> ReduceMatrix>Join In Parallel

Q3D Extractor> ReduceMatrix>Float Net

Q3D Extractor> ReduceMatrix>Ground Net

Q3D Extractor> ReduceMatrix>Float Terminal

Q3D Extractor> ReduceMatrix>Float At Infinity

Q3D Extractor> ReduceMatrix>Return Path

Q3D Extractor> ReduceMatrix>Change Frequency

Q3D Extractor> ReduceMatrix>Join Selected Terminals

*Syntax:*InsertRM <MatName>, <OpData>

*Return Value:*None

Parameters:<MatName>

Type: <string>

Name of the reduce matrix

<OpData>

Type: <string>

One of:

"MoveSink(<Operand >)"

"AddSink(<Operand >)"

"JoinSeries(<Operand >, < Operand >, ...)"

"JoinParallel(<NewNet>, <NewSrc>, <NewSnk>, < Operand >, < Operand >, ...)"

"FloatNet(<Operand >, < Operand >, ...)"

"GroundNet(<Operand >, < Operand >, ...)"

"FloatTerminal(<Operand >, < Operand >, ...)"

"FloatInfinity()"

"ChangeFreq(<Freq>)"

"JoinSelectedTerminals (<NewSrc>, <Operand>, ..)"

Parameters:

<Operand>

Type: <string>

Name of the source/sink/net selected for this operation.

The string may contain a wildcard character ("*") in which case all sources, sinks, and nets which match the pattern will be added to the operand list.

<NewNet>

Type: <string>

Name of the new net resulting from this operation.

<NewSrc>

Type: <string>

Name of the new source resulting from this operation.

<NewSnk>

Type: <string>

Name of the new sink resulting from this operation.

Python Syntax	InsertRM (<MatName>, <OpData>)
Python Example	oModule.InsertRM ("JoinParallelMatrix1", "JoinParallel (\'Cylinder2\', \'Source1\', \'Sink2\', (\'Cylinder1\', \'Source2\', \'Source1\'))")

ListReduceMatrixes

Lists reduce matrixes in the current design. See: [ListReduceMatrixOperations](#) and [ListReduceMatrixReducedSources](#).

UI Access	N/A
Parameters	None.
Return Value	Array containing string Reduce Matrix names.

Python Syntax	ListReduceMatrixes()

Python Example	<code>oModule.ListReduceMatrixes()</code>

ListReduceMatrixOperations

Lists the operations under a specified Reduce Matrix. See: [ListReduceMatrixes](#) and [ListReduceMatrixReducedSources](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<ReduceMatrix>	String	String name of Reduce Matrix.
Return Value	Array containing string Reduce Matrix operations. Empty array if none found.		

Python Syntax	ListReduceMatrixOperations(<ReduceMatrix>)
Python Example	For one Reduce Matrix: <pre>oModule.ListReduceMatrixOperations('ReduceMatrix1')</pre> For all Reduce Matrixes: <pre>mats = oModule.ListReduceMatrixes() for mat in mats: ops = oModule.ListReduceMatrixOperations(mat) #Returns all operations</pre>

ListReduceMatrixReducedSources

Lists the reduced sources under a specified Reduce Matrix. See: [ListReduceMatrixes](#) and [ListReduceMatrixOperations](#).

UI Access	N/A		
Parameters	Name	Type	Description
	<ReduceMatrix>	String	String name of Reduce Matrix.
	<isGC>	Boolean	True to return CG sources; False to return RL sources.
Return Value	Array containing string Reduce Matrix sources. Empty array if none found.		

Python Syntax	ListReduceMatrixReducedSources(<ReduceMatrix>, <isGC>)
Python Example	For one Reduce Matrix: <pre>oModule.ListReduceMatrixReducedSources('ReduceMatrix1', True)</pre> For all Reduced Matrixes: <pre>mats = oModule.ListReduceMatrixes() for mat in mats: ops = oModule.ListReduceMatrixOperations(mat) cgsources = oModule.ListReduceMatrixReducedSources(mat, True) rlsources = oModule.ListReduceMatrixReducedSources(mat, False)</pre>

RenameRM

Use: Renames an existing reduce matrix.

Command:Right-click a reduce matrix in the project tree, and then choose **Rename**.

Syntax:RenameRM <OldName>, <NewName>

Return Value:None

Parameters:<OldName>

Type: <string>

Name of the reduce matrix being renamed.

<NewName>

Type: <string>

New name for the reduce matrix.

Example: oModule.RenameRM "RM1", "RM2"

RenameRMO

Use:Renames an existing reduce operation.

Command:Right-click a reduce operation in the project tree, and then choose **Rename**.

Syntax:RenameRMO <MatName> <OldName>, <NewName>

Return Value:None

Parameters:<Matname>

Type: <string>

Name of the reduce matrix being edited.

<OldName>

Type: <string>

Name of the reduce operation being renamed.

<NewName>

Type: <string>

New name for the reduce operation.

Example: oModule.RenameRMO "RM1", "MoveSink1" "MoveSink"

ReorderMatrix

Reorders the sources in the matrix.

UI Access	In the Project Manager, right-click Reduce Matrix and select Reorder Matrix .		
Parameters	Name	Type	Description
	<ReduceMatrixName>	String	Name of the Reduce Matrix.
	<ArgumentsArray>	Array	Structured array.
			For Q3D Extractor: Array(<NetArray>, <TerminalArray>) For 2D Extractor: Array(<string source name>, <string source name>,...)

	<NetArray>	Array	<i>Q3D Extractor Only.</i> Structured array containing string net names, in the order you want them arranged. <pre>Array("NAME:net", <string1>, <string2>, <string3>,)</pre> If you wish to sort nets in ascending alphanumeric order, you can pass the following in place of the NetArray: <pre>"net:=", "*AlphaNum"</pre>
	<TerminalArray>	Array	<i>Q3D Extractor Only.</i> Structured array containing string terminal names, in the order you want them arranged. <pre>Array("NAME:terminal", <string1>, <string2>, <string3>,)</pre> If you wish to sort terminals in ascending alphanumeric order, you can pass the following in place of the TerminalArray: <pre>"terminal:=", "*AlphaNum"</pre>

Return Value	None.

Python Syntax	ReorderMatrix(<ReduceMatrixName>, <ArgumentsArray>)
Python Example	Q3D Extractor: <pre>oModule.ReorderMatrix("Original", [["NAME:net", "via", "groundplane"], "terminal:=", "via:Source1"])</pre> 2D Extractor: <pre>oModule.ReorderMatrix("Original", ["trace", "top_gnd1"])</pre>

RMAddOp

*Use:*Adds an operation to an existing reduce matrix.

*Command:*Right-click a reduce matrix in the project tree, and then choose the type of operation to add.

*Syntax:*RMAddOp <MatName>, <OpData>

*Return Value:*None

Parameters:<MatName>

Type: <string>

Name of the reduce matrix being edited.

<OpData>

See InsertRM for details.

*Example:*oModule.RMAddOp "RM7", "MoveSink('src12')"

2D Extractor Reduce Operations

The following reduce operations can be performed in 2DExtractor:

- [Add Ground](#)
- [Float](#)
- [Parallel](#)
- [Diff Pair](#)

Add Ground

Syntax: AddGround <ReduceOpType>(<SelectionParameters>,<OverrideParameters>)

Parameters: <ReduceOpType>

Type: <String>

Value: "AddGround"

<SelectionParameters>

SelectionArray[<NumberOfSelectedConductors>: <ConductorName>,<ConductorName>,...]

<NumberOfSelectedConductors>

Type: <Integer>

Number of selected conductors, followed by conductor names.

<ConductorName>

Type:<String>

Name of selected conductor

<OverrideParameters>

OverrideInfo(<Parameters>)

<Parameters>

Type:<String>

Value: empty string for this operation.

Float

Syntax: Float <ReduceOpType>(<SelectionParameters>, <OverrideParameters>)

Parameters: <ReduceOpType>

Type: <String>

Value: "Float"

<SelectionParameters>

SelectionArray[<NumberOfSelectedConductors>: <ConductorName>, <ConductorName>, ...]

< NumberOfSelectedConductors>

Type: <Integer>

Number of selected conductors, followed by conductor names.

<ConductorName>

Type:<String>

Name of selected conductor

<OverrideParameters>

OverrideInfo(<Parameters>)

<Parameters>

Type:<String>

Value: empty string for this operation.

Parallel

Syntax: Parallel <ReduceOpType>(<SelectionParameters>, <OverrideParameters>)

Parameters: <ReduceOpType>

Type: <String>

Value: "Parallel"

<SelectionParameters>

SelectionArray[<NumberOfSelectedConductors>: <ConductorName>, <ConductorName>, ...]

<NumberOfSelectedConductors>

Type: <Integer>

Number of selected conductors, followed by conductor names.

<ConductorName>

Type:<String>

Name of selected conductor

<OverrideParameters>

OverrideInfo(<OverrideID>,<OverrideName>)

<OverrideID>

Type: <integer>

ID of Conductor with overridden name.

<OverrideName>

Type: <String>

New name of the conductor.

Diff Pair

Syntax:DiffPair <ReduceOpType>(<SelectionParameters>, <OverrideParameters>)

Parameters: <ReduceOpType>

Type: <String>

Value: "DiffPair"

<SelectionParameters>

SelectionArray[<NumberOfSelectedConductors>: <ConductorName>,<ConductorName>,...]

< NumberOfSelectedConductors>

Type: <Integer>

Number of selected conductors, followed by conductor names.

<ConductorName>

Type:<String>

Name of selected conductor

<OverrideParameters>

OverrideInfo(<OverrideID>,<OverrideName>)

<OverrideID>

Type: <integer>

ID of Conductor with overridden name.

<OverrideName>

Type: <String>

New name of the conductor.

17 - Field Overlays Module Script Commands

Field overlay commands should be executed by the Field Overlays module, which is called "FieldsReporter" in scripts.

Set oModule = oDesign.GetModule("FieldsReporter")

oModule.CommandName <args>

[AddAntennaOverlay](#)

[AddMarkerToPlot](#)

[CreateFieldPlot](#)

[DeleteFieldPlot](#)

[EditAntennaOverlay](#)

[EditSurfaceMeshSummaryData](#)

[ExportMarkerTable](#)

[ExportPlotImageWithViewToFile](#)

[ExportSurfaceMeshSummary](#)

[GetFieldPlotName](#)

[HideAntennaParametersOverlay](#)

[ModifyFieldPlot](#)

ModifyInceptionParameters

[RenameFieldPlot](#)

[RenamePlotFolder](#)

[SetFieldPlotSettings](#)

[SetPlotFolderSettings](#)[ShowAntennaParameterOverlay](#)[UpdateAllFieldsPlots](#)[UpdateQuantityFieldsPlots](#)

AddMarker[Fields Reporter]

Adds a marker to the current fields plot.

UI Access	Right-click Field Overlays > Plot Fields > Marker > Add Marker .		
Parameters	Name	Type	Description
	<Position>	Array	Array containing X, Y and Z coordinates.
Return Value	None.		

Python Syntax	AddMarker(<Position>)
Python Example	<pre>oModule.AddMarker(["-267.007756778494mil", "-640.898759461403mil", "9.09494701772928e-13mil"])</pre>

AddMarkerToPlot

Adds a marker to a trace on a named field plot.

UI Access	N/A		
Parameters	Name	Type	Description
	<Location>	Array	Array of strings containing X.Y, and Z coordinates for the marker.
	<PlotName>	String	Name of the field plot.
Return Value	None.		

Python Syntax	AddMarkerToPlot(<Location>, <PlotName>)
Python Example	<pre>oModule.AddMarkerToPlot (["0.290455877780914in", "-0.616900205612183in", "1.77635683940025e-015in"], "Mag_H1") oModule.AddMarkerToPlot (["-0.317279517650604in", "1.22481322288513in", "0in"], "Mag_H1")</pre>

AddNamedExpression

Creates a named expression using the expression at the top of the stack.

UI Access	Click Add in the Fields Calculator window.		
Parameters	Name	Type	Description
	<ExprName>	String	Name for the new named expression.
	<FieldType>	String	Type of field.
Return Value	None		

Python Syntax	AddNamedExpression(<ExprName>, <FieldType>)
Python Example	<code>oModule.AddNamedExpression("Mag_JxE", "Fields")</code>

CalcOp

Performs a calculator operation.

UI Access	Operation commands like Mag , + , etc.		
Parameters	Name	Type	Description
	<OpString>	String	The text on the corresponding calculator button.
Return Value	None.		

Python Syntax	CalcOp(<OpString>)
Python Example	<code>oModule.CalcOp("+")</code>

CalcStack

Performs an operation on the stack.

UI Access	Stack operation buttons such as Push and Pop .		
Parameters	Name	Type	Description
	<OpString>	String	The text on the corresponding calculator button.
Return Value	None.		

Python Syntax	CalcStack(<OpString>)
Python Example	<code>oModule.CalcStack("push")</code>

CalculatorRead

Gets a register file and applies it to the calculator stack.

UI Access	Click Read... in the Fields Calculator dialog.		
Parameters	Name	Type	Description
	<FileName>	String	Path to and including name of input register file.
	<SoluName>	String	Specified solution to read in.
	<FieldType>	String	Type of specified field.
	<VarArray>	Array	Array of variable names, value pairs.
Return Value	None.		

Python Syntax	CalculatorRead(<FileName>, <SoluName>, <FieldType>, <VarArray>)
Python Example	<pre>oModule.CalculatorRead("c:\example.reg", "Setup1: LastAdaptive", "Fields", ["Freq:=", "10GHz", "Phase:=", "0deg"])</pre>

CalculatorWrite

Writes contents of top register to file.

UI Access	Click Write... in the Fields Calculator window.		
Parameters	Name	Type	Description
	<OutputFilePath>	String	Path to and including name of output register file.
	<SoluNameArray>	Array	Array of strings containing solution names.
	<VarArray>	Array	Array of variable names, value pairs.
Return Value	None		

Python Syntax	CalculatorWrite(<OutputFilePath>, <SoluNameArray>, <VarArray>)
Python Example	<pre>oModule.CalculatorWrite("C:\test.reg", ["Solution:=", "Setup1 : LastAdaptive"],</pre>

```
[ "Freq:=", "1GHz", "Phase:=", "0deg" ]  
)
```

ChangeProperty

Changes the properties of a field plot marker.

UI Access	Select a field plot marker in the marker table.		
Parameters	Name	Type	Description
	<propertyArgs>	Array	Structured array.
Return Value	None.		

Python Syntax	ChangeProperty(<propertyArgs>)
Python Example	<pre>oDesign.ChangeProperty(["NAME:AllTabs", ["NAME:FieldPlotMarkerDataTab", ["NAME:PropServers",</pre>

```
                                "FieldsReporter:FieldsPlotMarker:m1"
                                ],
                                [
                                    "NAME:ChangedProps",
                                    [
                                        "NAME:Name",
                                        "Value:="                                , "Temp"
                                    ]
                                ]
                            ]
                        ])
oDesign.ChangeProperty(
[
    "NAME:AllTabs",
    [
        "NAME:FieldPlotMarkerDataTab",
        [
            "NAME:PropServers",
            "FieldsReporter:FieldsPlotMarker:Temp"
        ],
        [
            "NAME:ChangedProps",
            [
                "NAME:Display Value",
                "Value:="                                , True
            ]
        ]
    ]
]
```

```

ervers",
                                "FieldsReporter:FieldsPlotMarker:Temp"
                                ],
                                [
                                    "NAME:ChangedProps",
                                    [
                                        "NAME:Display Name",
                                        "Value:="
                                        , False
                                    ]
                                ]
                            ]
                        ])
oDesign.ChangeProperty(
[
    "NAME:AllTabs",
    [
        "NAME:FieldPlotMarkerDataTab",
        [
            "NAME:PropServers",
            "FieldsReporter:FieldsPlotMarker:Temp"
        ],
        [
            "NAME:ChangedProps",
            [
                "NAME:Display Name",
                "Value:="
                , True
            ]
        ]
    ]
])
oDesign.ChangeProperty(

```

	<pre> "NAME:PropServers", "FieldsReporter:FieldsPlotMarker:Temp"], ["NAME:ChangedProps", ["NAME:Symbol Size Scale", "Value:="], "1"]]])</pre>

ChangeGeomSettings

Changes the line discretization setting.

UI Access	In the Fields Calculator dialog box, click on Geom Settings...		
Parameters	Name	Type	Description
	<LineDiscr>	Integer	Line discretization value.
Return Value	None.		

Python Syntax	ChangeGeomSettings(<LineDiscr>)
Python Example	oModule.ChangeGeomSettings (500)

ClcEval

Evaluates the expression at the top of the stack using the provided solution name and variable values.

UI Access	Click Eval in the Fields Calculator dialog.		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
	<VarArray>	Array	Array of variable name, value pairs.
	<FieldType>	String	Optional. Type of specified field.
Return Value	None		

Python Syntax	ClcEval(<SoluName>, <VarArray>, [Optional <FieldType>])		
Python Example	<pre>oModule.ClcEval("Setup1: LastAdaptive", ["Freq:", "10GHz", "Phase:", "0deg"])</pre>		

ClcMaterial

Performs a material operation on the top stack element.

UI Access	Click Matl... in the Fields Calculator dialog.		
Parameters	Name	Type	Description
	<MatString>	String	The material property to apply.
	<OpString>	String	Name of operation. Possible values are "mult", or "div".

Return Value	None.

Python Syntax	<code>ClcMaterial(<MatString>, <OpString>)</code>
Python Example	<code>oModule.ClcMaterial("Permeability (mu)" "mult")</code>

ClcMaterialValue

Shows the value of the material property without performing any operation.

UI Access	Select None in the Material Operation dialog.		
Parameters	Name	Type	Description
	<MaterialName>	String	Name of specified material property.
Return Value	None.		

Python Syntax	<code>ClcMaterialValue(<MaterialName>)</code>
Python Example	<code>oModule.ClcMaterialValue("Mass Density")</code>

ClearAllMarkers[Fields Reporter]

Clears all markers in the current fields overlay plot.

UI Access	Right-click Field Overlays > Plot Fields > Marker > Clear All .
Parameters	None.
Return Value	None.

Python Syntax	<code>ClearAllMarkers()</code>
Python Example	<code>oModule.ClearAllMarkers()</code>

ClearAllNamedExpr

Clears all user-defined named expressions from the list.

UI Access	Click ClearAll in the Fields Calculator dialog.
Parameters	None.
Return Value	None.

Python Syntax	<code>ClearAllNamedExpr()</code>
Python Example	<code>oModule.ClearAllNamedExpr()</code>

CopyNamedExprToStack

Copies the named expression selected to the calculator stack.

UI Access	Select a named expression and then click Copy to stack .		
Parameters	Name	Type	Description
	<ExprName>	String	Name of the expression to be copied to the top of the stack.
Return Value	None.		

Python Syntax	CopyNamedExprToStack(<ExprName>)
Python Example	oModule.CopyNamedExprToStack("Mag_JxE")

CreateFieldPlot

Note:

Use in conjunction with GetGeometryIdsForNetLayerCombinations and GetGeometryIdsForAllNetLayerCombinations.

- GetGeometryIdsForNetLayerCombinations returns ID numbers of all faces and edges of the active design related to the current target combination of nets and layers.
- GetGeometryIdsForAllNetLayerCombinations returns ID numbers for all possible combinations of nets and layers it is possible to choose.

HFSS Multipaction SEY Plot

```
# Script Recorded by Ansys Electronics Desktop Version 2025.2.0
# 15:36:54 Jan 15, 2025
# -----

import ScriptEnv

ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")
oDesktop.RestoreWindow()
oProject = oDesktop.SetActiveProject("JPL_coax_r251")
oDesign = oProject.SetActiveDesign("Coaxial_7-8")
oModule = oDesign.GetModule("FieldsReporter")
oModule.CreateFieldPlot(
[
    "NAME:SEY_Plot1",
    "SolutionName:=" , "300MHz_low : Power",
    "UserSpecifyName:=" , 0,
    "UserSpecifyFolder:=" , 0,
    "QuantityName:=" , "Unknown",
    "PlotFolder:=" , "SEY_Plot",
    "StreamlinePlot:=" , False,
    "AdjacentSidePlot:=" , False,
    "FullModelPlot:=" , False,
    "IntrinsicVar:=" , "PowerMultiplier=\'250\' Time=\'0s\'",
```

```
"PlotGeomInfo:=" , [1,"Surface","FacesList",4,"16","17","18","24"],
"FilterBoxes:=" , [0],
[
  "NAME:PlotOnSurfaceSettings",
  "Filled:=" , False,
  "IsoValType:=" , "Tone",
  "AddGrid:=" , False,
  "MapTransparency:=" , True,
  "Refinement:=" , 0,
  "Transparency:=" , 0,
  "SmoothingLevel:=" , 0,
  "ShadingType:=" , 0,
  [
    "NAME:Arrow3DSpacingSettings",
    "ArrowUniform:=" , True,
    "ArrowSpacing:=" , 0,
    "MinArrowSpacing:=" , 0,
    "MaxArrowSpacing:=" , 0
  ],
  "GridColor:=" , [255,255,255]
```

```

],
"EnableGaussianSmoothing:=", False,
"SurfaceOnly:=" , False,
"QuantityName:=" , "QuantityName_SecondaryEmission",
"PlotFolder:=" , "SEY_Plot",
"IntrinsicVar:=" , "PowerMultiplier=\'250\' Time=\'0s\'"
], "SecondaryEmission")

```

Use: Creates a field/mesh plot.

Command: **Q3D Extractor** or **2D Extractor** > **Fields**

Syntax: CreateFieldPlot <PlotParameterArray>

Return Value: None

Parameters: <PlotParameterArray>

```

Array("NAME:<PlotName>",
      "SolutionName:="      , <string>, _
      "QuantityName:="      , <string>, _
      "PlotFolder:="        , <string>, _
      "UserSpecifyName:="   , <int>, _
      "UserSpecifyFolder:=" , <int>, _
      "IntrinsicVar:="      , <string>, _
      "PlotGeomInfo:="      , <PlotGeomArray>, _
      "FilterBoxes:="       , <FilterBoxArray>, _
      <PlotOnPointSettings> , <PlotOnLineSettings>, _
      <PlotOnSurfaceSettings>, <PlotOnVolumeSettings>)

```

SolutionName

Name of the solution setup and solution formatted as

```
"<SolveSetupName> : <WhichSolution>",
```

where <WhichSolution> can be "Adaptive_<n>", "LastAdaptive", or "PortOnly".

For example: "Setup1 : Adaptive_2"

HFSS requires a space on both sides of the ':' character. Otherwise, the plot is not be created.

QuantityName

Type of plot to create. Possible values are:

Mesh plots: "Mesh"

Q3D Field Plots:

Field type	Plot quantity names
AC R/L Fields	"SurfaceJac", "Mag_SurfaceJac"
DC R/L PEC Fields	"SurfaceJdc", "Mag_SurfaceJdc"
DC R/L Fields	"VolumeJdc", "Mag_VolumeJdc", "Phidc"
C Fields	"SmoothQ", "ABS_Q"

2D Extractor Field Plots:

Field type	Plot quantity names
CG Fields	"Mag_Phi", "PhiAtPhase", "Mag_E", "VectorE", "Mag_Jcg", "VectorJcg", and "energyCG"
RL Fields	"Flux Lines", "VectorA", "Mag_B", "VectorB", "Mag_H", "VectorH", "Jrl", "VectorJrl", "energyRL", "coenergy", "appenergy", and "emloss"

PlotFolder

Name of the folder to which the plot should be added. Possible values are:

"Q", "ABS_Q", "JDC Vol", "Phi", "JDC Surf", and "JAC".

UserSpecifyName

0 if default name for plot is used, 1 otherwise.

This parameter is not essential. <PlotName> is respected regardless of whether this flag is set.

UserSpecifyFolder

0 if the default folder for plot is used, 1 otherwise.

This parameter is not essential. The specified PlotFolder is respected regardless of whether this flag is set.

IntrinsicVar

Formatted string that specifies the frequency and phase at which to create the plot.

For example: "Freq='1GHz' Phase='30deg'"

<PlotGeomArray>

Array(<NumGeomTypes>, <GeomTypeData>, <GeomTypeData>, ...)

For example:

```
Array(4, "Volume", "ObjList", 1, "Box1", _  
      "Surface", "FacesList", 1, "12", "Line", 1, _  
      "Polyline1", "Point", 2, "Point1", "Point2")
```

<NumGeomTypes>

Type: <int>

Number of different geometry types (volume, surface, line, point) plotted at the same time.

<GeomTypeData>

<GeomType>, <ListType>, <NumIDs>, <ID>, <ID>, ...)

<GeomType>

Type: <string>

Possible values are:

"Volume", "Surface", "Line", "Point"

<ListType>

Type: <string>

Possible values are:

"ObjList", "FacesList".

These are used for GeomType values "Line" or "Point".

<NumIDs>

Type: <int>

Number of IDs or object names that will follow.

<ID>

Type: <int> or <string>

ID of a face or name of an object, line, or point on which to plot.

<FilterBoxArray>

Array of object names used to restrict the plot range.

Array(<NumFilters>, <ObjName>, <ObjName>, ...)

Examples:

Array(1, "Box1")

Array(0) *no filtering*

<PlotOnPointSettings>

```
Array("NAME:PlotOnPointSettings", _  
      "PlotMarker:=", <bool>, _  
      "PlotArrow:=", <bool>)
```

<PlotOnLineSettings>

```
Array("NAME:PlotOnLineSettings",  
      Array("NAME:LineSettingsID", _  
            "Width:=", <int>, _  
            "Style:=", <string>), _  
      "IsoValType:=", <string>, _  
      "ArrowUniform:=", <bool>, _  
      "NumofArrow:=", <int>)
```

Style

Possible values are

"Cylinder", "Solid", "Dashdash", "Dotdot", "Dotdash".

IsoValType

Possible values are

"Tone", "Fringe", "Gourard"

<PlotOnSurfaceSettings>

```
Array("NAME:PlotOnSurfaceSettings", _  
      "Filled:=", <bool>, _  
      "IsoValType:=", <string>, _  
      "SmoothShade:=", <bool>, _  
      "AddGrid:=", <bool>, _)
```

```
"MapTransparency:=", <bool>, _
"Transparency:="      , <double>, _
"ArrowUniform:="      , <bool>, _
"ArrowSpacing:="      , <double>, _
"GridColor:="         , Array(<int>, <int>, <int>)
```

IsoValType

Possible values are

```
"Tone", "Line", "Fringe", "Gourard"
```

GridColor

Array containing the R, G, B components of the color. Components should be in the range 0 to 255.

<PlotOnVolumeSettings>

```
Array("NAME:PlotOnVolumeSettings", _
      "PlotIsoSurface:=", <bool>, _
      "CloudDensity:="   , <double>, _
      "PointSize:="      , <int>, _
      "ArrowUniform:="   , <bool>, _
      "ArrowSpacing:="   , <double>)
```

DeleteFieldPlot

Deletes one or more field plots.

UI Access	Right-click on one filed plot, select Delete .		
Parameters	Name	Type	Description
	<NameArray>	Array	Array of strings containing the names of the plots to delete.

Return Value	None.

Python Syntax	DeleteFieldPlot(<NameArray>)
Python Example	<code>oModule.DeleteFieldPlot(["Mag_E1", "Vector_E1"])</code>

DeleteMarker[Fields Reporter]

Deletes one or more marker in the current field plot.

UI Access	Right-click Field Overlays > Plot Fields > Marker > Delete Marker .		
Parameters	Name	Type	Description
	<MarkerNames>	Array	Array of strings containing marker names.
Return Value	None.		

Python Syntax	DeleteMarker(<MarkerNames>)
Python Example	<code>oModule.DeleteMarker(["m1", "m2"])</code>

DeleteNamedExpr

Deletes the selected named expression from the list.

UI Access	Select a named expression and then click Delete .

Parameters	Name	Type	Description
	<ExprName>	String	Name of specified named expression.
Return Value	None.		

Python Syntax	DeleteNamedExpr(<ExprName>)
Python Example	<code>oModule.DeleteNamedExpr("Mag_JxE")</code>

DeleteUneditablePlot

Deletes one or more uneditable plots.

UI Access	N/A		
Parameters	Name	Type	Description
	<NameArray>	Array	Array of the plot names to delete.
Return Value	None.		

Python Syntax	DeleteUneditablePlot(<NameArray>)
Python Example	<code>oModule.DeleteUneditablePlot(["Mag_E1", "Vector_E1"])</code>

DoesNamedExpressionExists

Determines whether specified named expression exists.

UI Access	N/A		
Parameters	Name	Type	Description
	<ExpName>	String	Name of the specified named expression.
Return Value	Boolean: • 1 - named expression exists. • 0 - named expression does not exist.		

Python Syntax	DoesNamedExpressionExists(<ExpName>)
Python Example	oModule.DoesNamedExpressionExists("Mag_JxE")

EditSurfaceMeshSummaryData

Use: Defines or Edits Surface Mesh Summary Data.

Command: Create Surface Mesh Summary, **Setup...**

Syntax: EditSurfaceMeshSummaryData Array(Array(<Parameters Array>))

Return Value: None

Parameters:

"NAME:SurfaceMeshSummary"

Type: <string>
"NAME:SurfaceMeshSummary"
"SolutionName:=" <string>
Type: <string>
Solution Name.
"Variation Name:=" <string>
Type: <string>
Variation name.
<RowItemsArray>
Array<MeshRowItems>
Row data.
<ItemPerRow>
Array<EntityPerRow>
Entity ID.
<MeshDataPer Item>
Array<Mesh Data Category and Stats>

Python Syntax	RenameReport (<OldReportName>, <NewReportName>)
Python Example	oModule.EditSurfaceMeshSummaryData (

```
[
[
  "NAME:SurfaceMeshSummary",
  "SolutionName:="          , "Setup1 : LastAdaptive",
  "Variation:="              , "Nominal",
  [
    "NAME:MeshRowItems",
    [
      "NAME:ItemPerRow",
      "EntityPerRow:="        , "annular_rng",
      [
        "NAME:MeshDataPerItem",
        "Min Edge Len:="      , 0.000166961133900917,
        "Max Edge Len:="      , 0.00145730991671888,
        "Mean Edge Len:="     , 0.000524160923260581,
        "Std Devn Edge Len:="  , 0.000217758706109324,
        "Min Tri Area:="      , 3.4982570283924E-09,
        "Max Tri Area:="      , 3.73116346661249E-07,
        "Mean Tri Area:="     , 8.91526236529066E-08,
        "Std Devn Tri Area:="  , 6.89482807990471E-08,
        "DataState:="         , 2
      ]
    ]
  ]
]
```

```
]
],
[
  "NAME:ItemPerRow",
    "EntityPerRow:="      , "gap",
  [
    "NAME:MeshDataPerItem",
      "Min Edge Len:="    , 0.000105681286042456,
      "Max Edge Len:="    , 0.000362084671538928,
      "Mean Edge Len:="   , 0.000233090954707978,
      "Std Devn Edge Len:=" , 7.55387369793154E-05,
      "Min Tri Area:="     , 1.74640378345369E-09,
      "Max Tri Area:="     , 3.78166789228631E-08,
      "Mean Tri Area:="    , 1.56497981245286E-08,
      "Std Devn Tri Area:=" , 1.04691637802914E-08,
      "DataState:="       , 2
    ]
  ]
]
```


	1)

EnterComplex

Enters a complex number onto the stack.

UI Access	Click Number , and then click Scalar. Complex option is selected.		
Parameters	Name	Type	Description
	<ComplexNum>	String	String of complex value. Ex. "1 + 2j".
Return Value	None.		

Python Syntax	EnterComplex(<ComplexNum>)
Python Example	oModule.EnterComplex("1 + 2 j")

EnterComplexVector

Enters a complex vector onto the stack.

UI Access	Click Number , and then click Vector. Complex option is selected.		
Parameters	Name	Type	Description
	<ComplexVector>	Array	Array of strings containing X, Y and Z complex values.
Return Value	None.		

Python Syntax	EnterComplexVector(<ComplexVector>)
Python Example	<pre>oModule.EnterComplexVector (["1 + 2 j", "1 + 2 j", "1 + 2 j"])</pre>

EnterCoord

Enters a coordinate system defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Coord .		
Parameters	Name	Type	Description
	<CoordName>	String	Name of a coordinate system defined in the 3D Modeler editor.
Return Value	None.		

Python Syntax	EnterCoord(<CoordName>)
Python Example	<pre>oModule.EnterCoord("Global")</pre>

EnterEdge

Enters an edge defined in the 3D Modeler editor.

UI Access	N/A		
Parameters	Name	Type	Description
	<EdgeName>	String	Name of an edge defined in the 3D Modeler editor.
Return Value	None.		

Python Syntax	EnterEdge(<EdgeName>)		
Python Example	oModule.EnterPoint("Edge_1")		

EnterLine

Enters a line defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Line		
Parameters	Name	Type	Description
	<LineName>	String	Name of a line defined in the 3D Modeler editor.
Return Value	None.		

Python Syntax	EnterLine(<LineName>)		

Python Example	<code>oModule.EnterLine("Line1")</code>

EnterOutputVar

Enters Output Vars, only valid for Eigenmode problems.

UI Access	Click Geometry and then select Output Vars .		
Parameters	Name	Type	Description
	<VarName>	String	Name of the output vars. Only 'freq' is supported.
	<VarType>	String	Type of the output vars. 'Complex' type.
Return Value	None.		

Python Syntax	<code>EnterOutputVar(<VarName>, <VarType>)</code>
Python Example	<code>oModule.EnterOutputVar("Freq", "Complex")</code>

EnterPoint

Enters a point defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Point .		
Parameters	Name	Type	Description
	<PointName>	String	Name of a point defined in the 3D Modeler editor.

Return Value	None.

Python Syntax	EnterPoint(<PointName>)
Python Example	<code>oModule.EnterPoint("Point1")</code>

EnterQty

Enters a field quantity.

UI Access	Click Quantity , and then select from the list.		
Parameters	Name	Type	Description
	<FieldQty>	String	The field quantity to be entered onto the stack.
Return Value	None.		

Python Syntax	EnterQty(<FieldQty>)
Python Example	<code>oModule.EnterQty("E")</code>

EnterScalar

Enters a scalar onto the stack.

UI Access	Click Number and then click Scalar . Complex option not selected.

Parameters	Name	Type	Description
	<Scalar>	Double	The real number to enter onto the stack.
Return Value	None.		

Python Syntax	EnterScalar(<Scalar>)
Python Example	<code>oModule.EnterScalar(3.14159265358979)</code>

EnterScalarFunc

Enters a scalar function.

UI Access	Click Function and then select Scalar .		
Parameters	Name	Type	Description
	<VarName>	String	Name of a variable to enter as a scalar function onto the stack.
Return Value	None.		

Python Syntax	EnterScalarFunc(<VarName>)
Python Example	<code>oModule.EnterScalarFunc("Phase")</code>

EnterSurf

Enters a surface defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Surface .		
Parameters	Name	Type	Description
	<SurfName>	String	Name of a surface defined in the 3D Modeler editor.
Return Value	None.		

Python Syntax	EnterSurf(<SurfName>)
Python Example	<code>oModule.EnterSurf("Rectangle1")</code>

EnterVector

Enters a vector onto the stack.

UI Access	Click Number , and then click Vector . Complex option not selected.		
Parameters	Name	Type	Description
	<VectorArray>	Array	Array of strings containing X, Y and Z components of the vector.
Return Value	None.		

Python Syntax	EnterVector(<VectorArray>)

Python Example	<code>oModule.EnterVector([1.0, 1.0, 1.0])</code>

EnterVectorFunc

Enters a vector function.

UI Access	Click Function and then select Vector .		
Parameters	Name	Type	Description
	<VarNames>	Array	Array of strings containing names of a variable for the X, Y, and Z coordinates, respectively, to enter as a vector function on the stack.
Return Value	None.		

Python Syntax	<code>EnterVectorFunc(<VarNames>)</code>
Python Example	<code>oModuleEnterVectorFunc(["X", "Y", "Z"])</code>

EnterVol

Enters a volume defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Volume .		
Parameters	Name	Type	Description
	<VolumeName>	String	Name of a volume defined in the 3D Modeler editor.

Return Value	None.

Python Syntax	EnterVol(<VolumeName>)
Python Example	<code>oModule.EnterVol("Box1")</code>

ExportFieldPlot

Exports a field plot to a file.

UI Access	N/A		
Parameters	Name	Type	Description
	<PlotName>	String	Name of the field plot to export.
	<ShowHeader>	Boolean	True - export field plot header to a file. False - export field plot.
	<FileName>	String	Name of file to save as, including the file path.
Return Value	None.		

Python Syntax	ExportFieldPlot(<PlotName>, <ShowHeader>, <FileName>)
Python Example	<code>oModule.ExportFieldPlot("Mag_E1", True, "C:/field_report.dsp")</code>

ExportMarkerTable

Exports the marker table to a .csv or .tab file.

UI Access	[product] > Fields > Plot Fields > Marker > Export Marker Table .		
Parameters	Name	Type	Description
	<FileName>	String	Name of export file include path.
Return Value	None.		

Python Syntax	ExportMarkerTable(<FileName>)
Python Example	<code>oModule.ExportMarkerTable("C:/work/FieldMarkerTable.csv")</code>

ExportOnGrid [Field Overlays]

Evaluates the top stack element at a set of points specified by a grid and exports the data to a file.

UI Access	Click Export , and then click On Grid .		
Parameters	Name	Type	Description
	<OutputFile>	String	Name of the output file.
	<Min>	Array	Minimum values for the coordinate components of the grid system
	<Max>	Array	Maximum values for the coordinate components of the grid system
	<Spacing>	Array	Spacing values for the coordinate components of the grid system
	<SolnName>	String	Name of the simulation setup
	<VarVals>	Array	Array of strings containing setup definitions.

	<IncludePoints>	Boolean	Optional. Specifies whether include points in the output file.
	<CSType>	String	Optional. Type of coordinate system. "Cartesian" (default) "Cylindrical" "Spherical"
	<Offsets>	Array	Optional. Origin for the offset coordinate system. For Cartesian, x, y, z, for Cylindrical, R, Phi, Z, for Spherical, Rho, Theta, Phi.
	<ByCount>	Boolean	Optional.
Return Value	None.		

Note: Regarding the **ExportOnGrid** legacy script which only has “IncludePtInOutput” argument (the last Boolean one), AEDT can still read it and assign other new arguments as default values. Those default values are RefCSName = “global”, PtInSI = “True”, FieldInRefCS = “False”

Python Syntax	ExportOnGrid(<OutputFile>, <Min>, <Max>, <Spacing>, <SolnName>, <SolnParameters>, [<ExportOption>, "IncludePointsInOutput:=", <boolean>], "RefCSName:=", <CSName>, "PtsInSI:=", <boolean>, "FieldRefCS:=", <boolean>], "<CSType>", [<Offsets>, <ByCount>])
Python Example	<pre>oModule.ExportOnGrid("C:\offset_grid_model_unit_ref.fld", ["-1mm", "16mm", "0mm"], ["1mm", "18mm", "1mm"], ["2mm", "2mm", "1mm"], "4500MHz : LastAdaptive", ["Freq:=", "4.5GHz", "Phase:=" , "0deg"], ["NAME:ExportOption", "IncludePtInOutput:=" , True, "RefCSName:=" , "offset", "PtInSI:=" , False,</pre>

	<pre> "FieldInRefCS:=" , True], "Cartesian", ["0mm", "0mm", "0mm"], False)</pre>

ExportPlotImageToFile

Deprecated. Use [ExportPlotImageWithViewToFile](#).

Creates field plot exports of existing field plots from a given view points, and with the model being auto-sized automatically for each view.

UI Access	N/A		
Parameters	Name	Type	Description
	<FileName>	String	Full path plus file name.
	<FolderName>	String	Plot folder name.
	<ItemName>	String	Name of fields to plot.
	<SetViewTopDownDirectionByRCS>	String	Optional. Name of relative coordinate system to use for the field plot.
Return Value	None.		

Python Syntax	ExportPlotImageToFile(<FileName>, <FolderName>, <ItemName>, <SetViewTopDownDirectionByRCS>)
Python Example	oModule.ExportPlotImageToFile (

	"C:\TestEPITF2.jpg", "", "Mag_E2", "RelativeCS1")

ExportPlotImageWithViewToFile [Reporter]

Exports a field plot image to a specified file.

Note:

This script replaces ExportPlotImageToFile, which is deprecated.

UI Access	N/A		
Parameters	Name	Type	Description
	<FileName>	String	Full path of file to export.
	<PlotQuantityName>	String	Name of quantity to plot.
	<PlotItemName>	String	Name of fields to plot.
	<PixelSizeX>	Integer	Desired image width, in pixels.
	<PixelSizeY>	Integer	Desired image height, in pixels.
	<ViewOrientation>	String	<i>Optional.</i> Name of orientation to use for plot.
Return Value	Image file is exported to the specified path.		

Python Syntax	ExportPlotImageWithViewToFile(<FileName>, <PlotQuantityName>, <PlotItemName>, <PixelSizeX>, <PixelSizeY>, <ViewOrientation>)
Python Example	oModule.ExportPlotImageWithViewToFile("E:/MyDir/OptimToutput/magE2.gif", "E Field", "Mag_E2", 1920, 1080, "newot2")

ExportSurfaceMeshSummary

Use: Exports a Surface Mesh Summary.

Command: **Create Surface Mesh Summary.**

Syntax: ExportSurfaceMeshSummary Array(<SolutionName>, <DesignVariationKey> <ExportFileName>)

Return Value: None

Parameters: <SolutionName>

Type: <string>

Original name of the plot.

<DesignVariationKey>

Type: <string>

New name of the plot.

Python Syntax	ExportSurfaceMeshSummary (<SolutionName>, <DesignVariationKey>, <ExportFileName>)
Python Example	<pre>oModule.ExportSurfaceMeshSummary(["SolutionName:=" , "Setup1 : LastAdaptive", "DesignVariationKey:=" , "Nominal", "ExportFileName:=" , "D:\\Program Files\\Docu- ments\\surfaceMeshSummaryReport.csv"</pre>

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ExportToFile

Note:

The ExportToFile script command has replaced the script command [ExportReport](#). ExportReport remains in order to retain backward compatibility for existing scripts, but it is strongly recommended that you now use ExportToFile.

From a data table or plot, generates text format, comma delimited, tab delimited, or .dat type output files.

UI Access	Right-click on report name in the project tree and select Export Data .		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report to be exported.
	<FileName>	String	Full path of the exported image file name; with extension of .txt - Post processor format file .csv - Comma-delimited data file .tab - Tab-separated file .dat - Ansys plot data file
	<UnitSpec>	String	For example, "kV, Mhz, yd"
	<UseTraceNumberFormat>	Boolean	"True", "False"
Return Value	None.		

Python Syntax	<code>ExportToFile(<ReportName>, <FileName>)</code>
Python Example	<code>oModule.ExportToFile("rETotal", "C:/Users/Documents/rETotal.csv")</code> <code>oModule.ExportToFile("S Parameter Table 1", "D:/Users/Documents/cfft.csv", False, " kV, MHz, yd ", True)</code>

GetFieldFolderNames

Gets the folder names of the field plots.

UI Access	N/A
Parameters	None.
Return Value	Array of folder names.

Python Syntax	<code>GetFieldFolderNames()</code>
Python Example	<code>oModule.GetFieldFolderNames()</code>

GetFieldPlotNames

Gets the names of field overlay plots defined in a design.

UI Access	N/A
Parameters	None.

Return Value	Array of strings containing field plots names.

Python Syntax	GetFieldPlotNames()
Python Example	<code>oModule.GetFieldPlotNames()</code>

GetFieldPlotQuantityName

Gets the quantity name of a specified field plot.

UI Access	N/A		
Parameters	Name	Type	Description
	<PlotName>	String	Name of specified plot.
Return Value	String plot quantity name.		

Python Syntax	GetFieldPlotQuantityName(<PlotName>)
Python Example	<code>oModule.GetFieldPlotQuantityName("Mag_H1")</code>

GetMeshPlotNames

Gets the names of mesh plots defined in a design.

UI Access	N/A

Parameters	None..
Return Value	Array of plot name.

Python Syntax	GetMeshPlotNames
Python Example	<code>oModule.GetMeshPlotNames()</code>

GetTopEntryValue

Gets the value of the top entry of the calculator stack.

UI Access	N/A		
Parameters	Name	Type	Description
	<SolnName>	String	Name of specified solution.
	<VarVals>	Array	Array of variable name, value pairs.
Return Value	Array of strings containing top entry values.		

Python Syntax	GetTopEntryValue(<SolnName>, <VarVals>)
Python Example	<pre>oModule.GetTopEntryValue("Setup1:LastAdaptive", ["Freq:=", "1GHz", "Phase:=", "0deg", "x_size:=", "2mm"]</pre>

	)

HideAntennaParameterOverlay

Hides a currently visible antenna parameter overlay.

UI Access	HFSS or HFSS-IE > Fields > Plot Fields > Radiation Field		
Parameters	Name	Type	Description
	<Name>	String	The name of the antenna parameters overlay.
Return Value	None.		

Python Syntax	HideAntennaParameterOverlay(<Name>)
Python Example	<pre>oModule.HideAntennaParameterOverlay("Antenna Parameter Overlay1")</pre>

HidePolarPlot

Hides a currently visible polar plot.

UI Access	N/A		
Parameters	Name	Type	Description
	<PlotName>	String	Name of the polar plot.

Return Value	None.

Python Syntax	HidePolarPlot(<PlotName>)
Python Example	<code>oModule.HidePolarPlot("rE Plot 1")</code>

HideRadiatedPlotOverlay

Hides overlay radiation fields plot.

UI Access	N/A		
Parameters	Name	Type	Description
	<PlotName>	String	Name of specified plot.
Return Value	None.		

Python Syntax	HideRadiatedPlotOverlay(<PlotName>)
Python Example	<code>oModule.HideRadiatedPlotOverlay("Gain Plot 1")</code>

LoadNamedExpressions

Loads a named expression definition from a saved file.

UI Access	In the Fields Calculator, click Load From... in the Library area.		
Parameters	Name	Type	Description
	<FileName>	String	Filename and full path to the file to hold the named expression definition.
	<FieldType>	String	For products with just one filed type, it is set to "Fields".
	<NamedExpr>	Array	rray of strings containing the names of expression definitions to load from the file.
Return Value	None.		

Python Syntax	LoadNamedExpressions(<FileName>, <FieldType>, <NamedExpr>)		
Python Example	<pre>oModule.LoadNamedExpressions("C:\Ansoft\PersonalLib\smth.clc", "Fields", ["smoothedtemp"])</pre>		

ModifyFieldPlot

Modifies a plot definition.

UI Access	[product] > Fields > Modify Plot		
Parameters	Name	Type	Description
	<OriginalName>	String	Name of the plot to be modified.
	<PlotParams>	Array	Array containing modified settings.
Return Value	None.		

Python Syntax	ModifyFieldPlot(<OriginalName>, <PlotParams>)
Python Example	<pre>oModule.ModifyFieldPlot("Vector_E1" , ["NAME:Vector_E2", "SolutionName:=", "Setup1 : LastAdaptive", "QuantityName:=", "Vector_E", "PlotFolder:=", "E Field1", "UserSpecifyName:=", 0, "UserSpecifyFolder:=", 0, "IntrinsicVar:=", "Freq='1GHz' Phase='30deg'", "PlotGeomInfo:=", [1, "Surface", "FacesList", 1, "7"], "FilterBoxes:=", [0], ["NAME:PlotOnSurfaceSettings", "Filled:=", False, "IsoValType:=", "Fringe", "SmoothShade:=", True, "AddGrid:=", False, "MapTransparency:=", True, "Transparency:=", 0, _ "ArrowUniform:=", True,</pre>

	<pre>"ArrowSpacing:=", 0.100000001490116, "GridColor:=", [255, 255, 255]]])</pre>

ReassignFieldPlot

Reassigns a field plot.

UI Access	Right-click on a field plot > Reassign .		
Parameters	Name	Type	Description
	<PlotName>	String	Name of specified plot to reassign.
	<PlotParameterArray>	Array	See CreateFieldPlot
Return Value	None.		

Python Syntax	ReassignFieldPlot(<PlotName>, <PlotParameterArray>)
Python Example	<pre>oModule.ReassignFieldPlot "Mag_H1", Array("NAME:Mag_H1", _ "SolutionName:=", "Setup1 : LastAdaptive", _ "UserSpecifyName:=", 0, _ "UserSpecifyFolder:=", 0, _ "QuantityName:=", "Mag_H", _ "PlotFolder:=", "H Field", _</pre>

```
"StreamlinePlot:=", False,  
"AdjacentSidePlot:=", False,  
"FullModelPlot:=", False,  
"IntrinsicVar:=", "Freq=\'20GHz\' Phase=\'0deg\'",  
"PlotGeomInfo:=", [1,"Surface","FacesList",1,"117"],  
"FilterBoxes:=", [0],  
["NAME:PlotOnSurfaceSettings",  
  "Filled:=", False,  
  "IsoValType:=", "Fringe",  
  "AddGrid:=", False,  
  "MapTransparency:=", True,  
  "Refinement:=", 0,  
  "Transparency:=", 0,  
  "SmoothingLevel:=", 0,  
  "ShadingType:=", 0,  
  ["NAME:Arrow3DSpacingSettings",  
    "ArrowUniform:=", True,  
    "ArrowSpacing:=", 0,  
    "MinArrowSpacing:=", 0,  
    "MaxArrowSpacing:=", 0
```



```
],  
    "GridColor:=", [255,255,255]  
],  
    "EnableGaussianSmoothing:=", False  
])
```

RenameFieldPlot

Renames a plot.

UI Access	Right-click the plot you want to rename in the project tree, and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<OldName>	String	Original name of the plot.
	<NewName>	String	New name of the plot.
Return Value	None.		

Python Syntax	RenameFieldPlot(<OldName>, <NewName>)
Python Example	<pre>oModule.RenameFieldPlot("Vector_E1", "Vector_E2")</pre>

RenamePlotFolder

Renames a plot folder.

UI Access	Right-click a plot folder in the project tree, and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<OldName>	String	Original name of the folder.
	<NewName>	String	New name of the folder.
Return Value	None.		

Python Syntax	RenamePlotFolder(<OldName>, <NewName>)		
Python Example	<pre>oModule.RenamePlotFolder("E Field", "Surface Plots")</pre>		

SaveFieldsPlots

Saves field plot(s) to a file.

UI Access	HFSS > Fields > Save As...		
Parameters	Name	Type	Description
	<PlotNames>	Array	Array of plot names.
	<FileName>	String	Name of the file to save as, including the file path.
Return Value	None.		

Python Syntax	SaveFieldsPlots(<PlotNames>, <FileName>)
Python Example	<pre>oModule.SaveFieldsPlots(["Mag_E1", "Mag_E2"], "C:/field_report.dsp")</pre>

SaveNamedExpressions

Saves a named expression definition to a file.

UI Access	In the Fields Calculator, click Save To... in the Library area.		
Parameters	Name	Type	Description
	<FileName>	String	Filename and full path to the file to hold the named expression definition.
	<NamedExprs>	Array	Array of strings containing the names of expression definitions to load from the file.
	<Overwrite>	Boolean	Specifies whether to overwrite the file.
Return Value	None.		

Python Syntax	SaveNamedExpressions(<FileName>, <NamedExprs>, <Overwrite>)
Python Example	<pre>oModule.SaveNamedExpressions("C:\Ansoft\PersonalLib\smth.clc", ["smoothedtemp"], True)</pre>

SetFieldPlotSettings

Sets plot attributes.

UI Access	[product] > Fields > Modify Plot Attributes		
Parameters	Name	Type	Description
	<PlotName>	String	Name of the plot to modify.
	<PlotItemAttributes>	Array	Structured array.
			Array("NAME:FieldsPlotItemSettings", <PlotOnPointsSettings>, <PlotOnLineSettings>, <PlotOnSurfaceSettings>, <PlotOnVolumeSettings>) See description of CreateFieldPlot command for details.
Return Value	None.		

Python Syntax	SetFieldPlotSettings(<PlotName> <PlotItemAttributes>)
Python Example	<pre>oModule.SetFieldPlotSettings("Mag_E2", ["NAME:FieldsPlotItemSettings", ["NAME:PlotOnLineSettings", ["NAME:LineSettingsID",</pre>

	<pre>"Width:=", 4, "Style:=", "Cylinder"), "IsoValType:=", "Tone", "ArrowUniform:=", True, "NumofArrow:=", 100), ["NAME:PlotOnSurfaceSettings", "Filled:=", False, "IsoValType:=", "Tone", "SmoothShade:=", True, "AddGrid:=", False, "MapTransparency:=", True, "Transparency:=", 0, "ArrowUniform:=", True, "ArrowSpacing:=", 0.100000001490116, "GridColor:=", [255, 255, 255]])</pre>

SetPlotFolderSettings

Sets the attributes of all plots in the specified folder.

UI Access	[product] > Fields > Modify Plot Attributes

Parameters	Name	Type	Description
	<code><PlotFolderName></code>	String	Name of the folder with the attributes to modify.
	<code><PlotFolderAttributes></code>	Array	Structured array. <pre>Array("NAME:FieldsPlotSettings", "Real time mode:=", <bool>, <ColorMapSettings>, <Scale3DSettings>, <Marker3DSettings>, <Arrow3DSettings>)</pre>
	<code><ColorMapSettings></code>	Array	Structured array. <pre>Array("NAME:ColorMapSettings", "ColorMapType:=", <string Possible values are "Uniform", "Ramp", "Spectrum">, "SpectrumType:=", <string Possible values are "Rainbow", "Temperature", "Magenta", "Gray">, "UniformColor:=", <array containing the R, G, B components of the color. Components should be in the range 0 to 255.>, "RampColor:=", <array containing the R, G, B com- ponents of the color. Components should be in the range 0 to 255.>)</pre>
	<code><Scale3DSettings></code>	Array	Structured array. <pre>Array("NAME:Scale3DSettings", "m_nLevels:=", <int>,</pre>

		<pre> "m_autoScale:=", <bool>, "minvalue:=", <double>, "maxvalue:=", <double>, "log:=", <bool>, "IntrinsicMin:=", <double>, "IntrinsicMax:=", <double> </pre>
<Marker3DSettings>	Array	Structured array. <pre> Array("NAME:Marker3DSettings", "MarkerType:=", <integer 9: Sphere 10: Box 11: Tetrahedron 12: Octahedron default: Sphere>, "MarkerMapSize:=", <bool>, "MarkerMapColor:=", <bool>, "MarkerSize:=", <double>) </pre>
<Arrow3DSettings>	Array	Structured array. <pre> Array("NAME:Arrow3DSettings", "ArrowType:=", <integer 0: Line 1: Cylinder </pre>

			2: Umbrella default: Line>, "ArrowMapSize:=", <bool>, "ArrowMapColor:=", <bool>, "ShowArrowTail:=", <bool>, "ArrowSize:=", <double>)
Return Value	None.		

Python Syntax	SetPlotFolderSettings(<PlotFolderName>, <PlotFolderAttributes>)
Python Example	<pre>oModule.SetPlotFolderSettings("E Field1", ["NAME:FieldsPlotSettings", "Real time mode:=", True, ["NAME:ColorMapSettings", "ColorMapType:=", "Spectrum", "SpectrumType:=", "Rainbow", "UniformColor:=", [127, 255, 255], "RampColor:=", [255, 127, 127]], ["NAME:Scale3DSettings", "m_nLevels:=", 27,</pre>


```

    "m_autoScale:=", True,
    "minvalue:=", 9.34379863739014,
    "maxvalue:=", 13683.755859375,
    "log:=", False,
    "IntrinsicMin:=", 9.34379863739014,
    "IntrinsicMax:=", 13683.755859375),
    ["NAME:Marker3DSettings",
    "MarkerType:=", 0,
    "MarkerMapSize:=", True,
    "MarkerMapColor:=", False,
    "MarkerSize:=", 0.25],
    ["NAME:Arrow3DSettings",
    "ArrowType:=", 1,
    "ArrowMapSize:=", True,
    "ArrowMapColor:=", True,
    "ShowArrowTail:=", True,
    "ArrowSize:=", 0.25]]
  )

```

ShowAntennaParameterOverlay

Displays an existing antenna parameters overlay as a table on a far field plot.

UI Access	HFSS or HFSS-IE > Fields > Plot > Radiation Fields		
Parameters	Name	Type	Description
	<Name>	String	The name of the antenna parameters overlay.
Return Value	None.		

Python Syntax	ShowAntennaParameterOverlay(<Name>)		
Python Example	<pre>oModule.ShowAntennaParameterOverlay("Antenna Parameter Overlay1")</pre>		

UpdateAllFieldsPlots

Updates the All Fields Plots.

UI Access	N/A
Parameters	None.
Return Value	None.

Python Syntax	UpdateAllFieldsPlots()
Python Example	<pre>oModule.UpdateAllFieldsPlots()</pre>

UpdateQuantityFieldsPlots

Updates the Quantity Fields Plots.

UI Access	N/A		
Parameters	Name	Type	Description
	<FolderName>	String	Folder containing the plotted quantities.
Return Value	None.		

Python Syntax	UpdateQuantityFieldsPlots(<FolderName>)
Python Example	<code>oModule.UpdateQuantityFieldsPlots("fldplt")</code>

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left blank.

18 - Fields Calculator Script Commands

Fields Calculator commands should be executed by the Field Overlays module, which is called "FieldsReporter" in Q3D Extractor scripts.

```
Set oModule = oDesign.GetModule("FieldsReporter")  
oModule.CommandName <args>
```

The command associated with each of the following scripting commands will be a button pressed in the Fields Calculator.

[AddNamedExpression](#)

[CalcOp](#)

[CalculatorRead](#)

[CalcStack](#)

[CalculatorWrite](#)

[ChangeGeomSettings](#)

[ClcEval](#)

[ClcMaterial](#)

[ClearAllNamedExpr](#)

[CopyNamedExprToStack](#)

[DeleteNamedExpr](#)

[EnterComplex](#)

[EnterComplexVector](#)

[EnterLine](#)

[EnterPoint](#)

[EnterQty](#)[EnterScalar](#)[EnterScalarFunc](#)[EnterSurf](#)[EnterVector](#)[EnterVectorFunc](#)[EnterVol](#)[ExportOnGrid \[Fields Calculator\]](#)[ExportToFile \[Fields Calculator\]](#)[GetTopEntryValue](#)[LoadNamedExpressions](#)[SaveNamedExpressions](#)

AddNamedExpression

Creates a named expression using the expression at the top of the stack.

UI Access	Click Add in the Fields Calculator window.		
Parameters	Name	Type	Description
	<ExprName>	String	Name for the new named expression.
	<FieldType>	String	Type of field.
Return Value	None		

Python Syntax	AddNamedExpression(<ExprName>, <FieldType>)
Python Example	oModule.AddNamedExpression("Mag_JxE", "Fields")

CalcOp

Performs a calculator operation.

UI Access	Operation commands like Mag , + , etc.		
Parameters	Name	Type	Description
	<OpString>	String	The text on the corresponding calculator button.
Return Value	None.		

Python Syntax	CalcOp(<OpString>)
Python Example	oModule.CalcOp("+")

CalcRead(deprecated)

Reads a file that is written out by the CalcWrite command, and puts the result into a calculator numeric.

UI Access	Click Read... in the Fields Calculator dialog.		
Parameters	Name	Type	Description
	<FileName>	String	Name of the file to be read.
	<SoluName>	String	Specified solution to read in.
	<VarArray>	Array	Array of variables to read.

Return Value	None.

Python Syntax	<code>CalcRead(<FileName>, <SoluName>, <VarArray>)</code>
Python Example	<pre>oModule.CalcRead("c:\example.reg", "Setup1: LastAdaptive", ["Freq:=", "10GHz", "Phase:=", "0deg"])</pre>

CalculatorRead

Gets a register file and applies it to the calculator stack.

UI Access	Click Read... in the Fields Calculator dialog.		
Parameters	Name	Type	Description
	<FileName>	String	Path to and including name of input register file.
	<SoluName>	String	Specified solution to read in.
	<FieldType>	String	Type of specified field.
	<VarArray>	Array	Array of variable names, value pairs.
Return Value	None.		

Python Syntax	<code>CalculatorRead(<FileName>, <SoluName>, <FieldType>, <VarArray>)</code>

Python Example	<pre>oModule.CalculatorRead("c:\example.reg", "Setup1: LastAdaptive", "Fields", ["Freq=", "10GHz", "Phase=", "0deg"])</pre>

CalcStack

Performs an operation on the stack.

UI Access	Stack operation buttons such as Push and Pop .		
Parameters	Name	Type	Description
	<OpString>	String	The text on the corresponding calculator button.
Return Value	None.		

Python Syntax	CalcStack(<OpString>)
Python Example	oModule.CalcStack("push")

CalculatorWrite

Writes contents of top register to file.

UI Access	Click Write... in the Fields Calculator window.

Parameters	Name	Type	Description
	<OutputFilePath>	String	Path to and including name of output register file.
	<SoluNameArray>	Array	Array of strings containing solution names.
	<VarArray>	Array	Array of variable names, value pairs.
Return Value	None		

Python Syntax	CalculatorWrite(<OutputFilePath>, <SoluNameArray>, <VarArray>)
Python Example	<pre>oModule.CalculatorWrite("C:\test.reg", ["Solution:=", "Setup1 : LastAdaptive"], ["Freq:=", "1GHz", "Phase:=", "0deg"])</pre>

ChangeGeomSettings

Changes the line discretization setting.

UI Access	In the Fields Calculator dialog box, click on Geom Settings...		
Parameters	Name	Type	Description
	<LineDiscr>	Integer	Line discretization value.
Return Value	None.		

Python Syntax	ChangeGeomSettings(<LineDiscr>)
Python Example	oModule.ChangeGeomSettings(500)

ClcEval

Evaluates the expression at the top of the stack using the provided solution name and variable values.

UI Access	Click Eval in the Fields Calculator dialog.		
Parameters	Name	Type	Description
	<SoluName>	String	Name of specified solution.
	<VarArray>	Array	Array of variable name, value pairs.
	<FieldType>	String	Optional. Type of specified field.
Return Value	None		

Python Syntax	ClcEval(<SoluName>, <VarArray>, [Optional <FieldType>])
Python Example	<pre>oModule.ClcEval("Setup1: LastAdaptive", ["Freq:=", "10GHz", "Phase:=", "0deg"])</pre>

ClcMaterial

Performs a material operation on the top stack element.

UI Access	Click Matl... in the Fields Calculator dialog.		
Parameters	Name	Type	Description
	<MatString>	String	The material property to apply.
	<OpString>	String	Name of operation. Possible values are "mult", or "div".
Return Value	None.		

Python Syntax	ClcMaterial(<MatString>, <OpString>)		
Python Example	oModule.ClcMaterial("Permeability (mu)" "mult")		

ClcMaterialValue

Shows the value of the material property without performing any operation.

UI Access	Select None in the Material Operation dialog.		
Parameters	Name	Type	Description
	<MaterialName>	String	Name of specified material property.
Return Value	None.		

Python Syntax	ClcMaterialValue(<MaterialName>)		
Python Example	oModule.ClcMaterialValue("Mass Density")		

ClearAllNamedExpr

Clears all user-defined named expressions from the list.

UI Access	Click ClearAll in the Fields Calculator dialog.
Parameters	None.
Return Value	None.

Python Syntax	ClearAllNamedExpr()
Python Example	<code>oModule.ClearAllNamedExpr()</code>

CopyNamedExprToStack

Copies the named expression selected to the calculator stack.

UI Access	Select a named expression and then click Copy to stack .		
Parameters	Name	Type	Description
	<ExprName>	String	Name of the expression to be copied to the top of the stack.
Return Value	None.		

Python Syntax	CopyNamedExprToStack(<ExprName>)

Python Example	<code>oModule.CopyNamedExprToStack("Mag_JxE")</code>

DeleteNamedExpr

Deletes the selected named expression from the list.

UI Access	Select a named expression and then click Delete .		
Parameters	Name	Type	Description
	<ExprName>	String	Name of specified named expression.
Return Value	None.		

Python Syntax	<code>DeleteNamedExpr(<ExprName>)</code>
Python Example	<code>oModule.DeleteNamedExpr("Mag_JxE")</code>

DoesNamedExpressionExists

Determines whether specified named expression exists.

UI Access	N/A		
Parameters	Name	Type	Description
	<ExpName>	String	Name of the specified named expression.
Return Value	Boolean:		

	• 1 - named expression exists. • 0 - named expression does not exist.

Python Syntax	DoesNamedExpressionExists(<ExpName>)
Python Example	<code>oModule.DoesNamedExpressionExists("Mag_JxE")</code>

EnterComplex

Enters a complex number onto the stack.

UI Access	Click Number , and then click Scalar. Complex option is selected.		
Parameters	Name	Type	Description
	<ComplexNum>	String	String of complex value. Ex. "1 + 2j".
Return Value	None.		

Python Syntax	EnterComplex(<ComplexNum>)
Python Example	<code>oModule.EnterComplex("1 + 2 j")</code>

EnterComplexVector

Enters a complex vector onto the stack.

UI Access	Click Number , and then click Vector . Complex option is selected.		
Parameters	Name	Type	Description
	<ComplexVector>	Array	Array of strings containing X, Y and Z complex values.
Return Value	None.		

Python Syntax	EnterComplexVector(<ComplexVector>)
Python Example	<pre>oModule.EnterComplexVector (["1 + 2 j", "1 + 2 j", "1 + 2 j"])</pre>

EnterCoord

Enters a coordinate system defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Coord .		
Parameters	Name	Type	Description
	<CoordName>	String	Name of a coordinate system defined in the 3D Modeler editor.
Return Value	None.		

Python Syntax	EnterCoord(<CoordName>)
Python Example	oModule.EnterCoord("Global")

EnterEdge

Enters an edge defined in the 3D Modeler editor.

UI Access	N/A		
Parameters	Name	Type	Description
	<EdgeName>	String	Name of an edge defined in the 3D Modeler editor.
Return Value	None.		

Python Syntax	EnterEdge(<EdgeName>)
Python Example	oModule.EnterPoint("Edge_1")

EnterLine

Enters a line defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Line		
Parameters	Name	Type	Description
	<LineName>	String	Name of a line defined in the 3D Modeler editor.

Return Value	None.

Python Syntax	EnterLine(<LineName>)
Python Example	<code>oModule.EnterLine("Line1")</code>

EnterOutputVar

Enters Output Vars, only valid for Eigenmode problems.

UI Access	Click Geometry and then select Output Vars .		
Parameters	Name	Type	Description
	<VarName>	String	Name of the output vars. Only 'freq' is supported.
	<VarType>	String	Type of the output vars. 'Complex' type.
Return Value	None.		

Python Syntax	EnterOutputVar(<VarName>, <VarType>)
Python Example	<code>oModule.EnterOutputVar("Freq", "Complex")</code>

EnterPoint

Enters a point defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Point .		
Parameters	Name	Type	Description
	<PointName>	String	Name of a point defined in the 3D Modeler editor.
Return Value	None.		

Python Syntax	EnterPoint(<PointName>)		
Python Example	oModule.EnterPoint("Point1")		

EnterQty

Enters a field quantity.

UI Access	Click Quantity , and then select from the list.		
Parameters	Name	Type	Description
	<FieldQty>	String	The field quantity to be entered onto the stack.
Return Value	None.		

Python Syntax	EnterQty(<FieldQty>)		
Python Example	oModule.EnterQty("E")		

EnterScalar

Enters a scalar onto the stack.

UI Access	Click Number and then click Scalar . Complex option not selected.		
Parameters	Name	Type	Description
	<Scalar>	Double	The real number to enter onto the stack.
Return Value	None.		

Python Syntax	EnterScalar(<Scalar>)
Python Example	oModule.EnterScalar(3.14159265358979)

EnterScalarFunc

Enters a scalar function.

UI Access	Click Function and then select Scalar .		
Parameters	Name	Type	Description
	<VarName>	String	Name of a variable to enter as a scalar function onto the stack.
Return Value	None.		

Python Syntax	EnterScalarFunc(<VarName>)
Python Example	<code>oModule.EnterScalarFunc("Phase")</code>

EnterSurf

Enters a surface defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Surface .		
Parameters	Name	Type	Description
	<SurfName>	String	Name of a surface defined in the 3D Modeler editor.
Return Value	None.		

Python Syntax	EnterSurf(<SurfName>)
Python Example	<code>oModule.EnterSurf("Rectangle1")</code>

EnterVector

Enters a vector onto the stack.

UI Access	Click Number , and then click Vector . Complex option not selected.		
Parameters	Name	Type	Description
	<VectorArray>	Array	Array of strings containing X, Y and Z components of the vector.
Return Value	None.		

Python Syntax	EnterVector(<VectorArray>)
Python Example	oModule.EnterVector([1.0, 1.0, 1.0])

EnterVectorFunc

Enters a vector function.

UI Access	Click Function and then select Vector .		
Parameters	Name	Type	Description
	<VarNames>	Array	Array of strings containing names of a variable for the X, Y, and Z coordinates, respectively, to enter as a vector function on the stack.
Return Value	None.		

Python Syntax	EnterVectorFunc(<VarNames>)
Python Example	oModuleEnterVectorFunc(["X", "Y", "Z"])

EnterVol

Enters a volume defined in the 3D Modeler editor.

UI Access	Click Geometry and then select Volume .		
Parameters	Name	Type	Description
	<VolumeName>	String	Name of a volume defined in the 3D Modeler editor.
Return Value	None.		

Python Syntax	EnterVol(<VolumeName>)
Python Example	oModule.EnterVol("Box1")

ExportOnGrid [Fields Calculator]

Evaluates the top stack element at a set of points specified by a grid and exports the data to a file.

UI Access	Click Export , and then click On Grid .		
Parameters	Name	Type	Description
	<OutputFile>	String	Name of the output file.
	<Min>	Array	Minimum values for the coordinate components of the grid system
	<Max>	Array	Maximum values for the coordinate components of the grid system
	<Spacing>	Array	Spacing values for the coordinate components of the grid system
	<SolnName>	String	Name of the simulation setup
	<VarVals>	Array	Array of strings containing setup definitions.
	<IncludePoints>	Boolean	Optional. Specifies whether include points in the output file.
	<CSType>	String	Optional. Type of coordinate system. "Cartesian" (default) "Cylindrical" "Spherical"
	<Offsets>	Array	Optional. Origin for the offset coordinate system. For Cartesian, x, y, z, for Cylindrical, R, Phi, Z, for Spherical, Rho, Theta, Phi.
	<ByCount>	Boolean	Optional.

Return Value	None.

Note: Regarding the **ExportOnGrid** legacy script which only has “IncludePtInOutput” argument (the last Boolean one), AEDT can still read it and assign other new arguments as default values. Those default values are RefCSName = “global”, PtInSI = “True”, FieldInRefCS = “False”

Python Syntax	<code>ExportOnGrid(<OutputFile>, <Min>, <Max>, <Spacing>, <SolnName>, <SolnParameters>, [<ExportOption>, "IncludePointsInOutput:=", <boolean>], "RefCSName:=", <CSName>, "PtsInSI:=", <boolean>, "FieldRefCS:=", <boolean>], "<CSType>", [<Offsets>, <ByCount>])</code>
Python Example	<pre>oModule.ExportOnGrid("C:\offset_grid_model_unit_ref.fld", ["-1mm", "16mm", "0mm"], ["1mm", "18mm", "1mm"], ["2mm", "2mm", "1mm"], "4500MHz : LastAdaptive", ["Freq:=", "4.5GHz", "Phase:=" , "0deg"], ["NAME:ExportOption", "IncludePtInOutput:=" , True, "RefCSName:=" , "offset", "PtsInSI:=" , False, "FieldInRefCS:=" , True], "Cartesian", ["0mm", "0mm", "0mm"], False</pre>

	)

ExportToFile [Fields Calculator]

Evaluates the top stack element at a set of points specified in an external file and exports the data to a file.

Note: Regarding to legacy **ExportToFile** script which only has “IncludePtInOutput” argument (the last Boolean one), AEDT can still read it and assign other new arguments as default values. Those default values are RefCSName = “global”, PtInSI = “True”, FieldInRefCS = “False”

UI Access	Click Export , and then click To File .		
Parameters	Name	Type	Description
	<ReportName>	String	Name of report to be exported.
	<FileName>	String	Full path of the exported image file name; with extension of .txt - Post processor format file .csv - Comma-delimited data file .tab - Tab-separated file .dat - Ansys plot data file
	<solution>		Solution Name
	<freq>		frequency
	<phase>		phase
	<Export Options>		Whether to include points in output, RefCSName, Pts in SI units <boolean>, Field in RefCS, <boolean>.
Return Value	None.		

Python Syntax	ExportToFile(<ReportName>, <FileName>, <solution>, ["Freq:=", <freq>, "Phase:=", "<phase>"], <ExportOptions>)
Python Example	<pre>oModule.ExportToFile("C:\\offset_file_model_unit_ref.fld", "C:\\offset_SI.pts", "4500MHz : LastAdaptive", ["Freq:=" , "4.5GHz", "Phase:=" , "0deg"], ["NAME:ExportOption", "IncludePtInOutput:=" , True, "RefCSName:=" , "offset", "PtInSI:=" , False, "FieldInRefCS:=" , True])</pre>

GetTopEntryValue

Gets the value of the top entry of the calculator stack.

UI Access	N/A		
Parameters	Name	Type	Description
	<SolnName>	String	Name of specified solution.
	<VarVals>	Array	Array of variable name, value pairs.
Return Value	Array of strings containing top entry values.		

Python Syntax	GetTopEntryValue(<SolnName>, <VarVals>)		
Python Example	<pre>oModule.GetTopEntryValue("Setup1:LastAdaptive", ["Freq:=", "1GHz", "Phase:=", "0deg", "x_size:=", "2mm"])</pre>		

LoadNamedExpressions

Loads a named expression definition from a saved file.

UI Access	In the Fields Calculator, click Load From... in the Library area.		
Parameters	Name	Type	Description
	<FileName>	String	Filename and full path to the file to hold the named expression definition.
	<FieldType>	String	For products with just one filed type, it is set to "Fields".
	<NamedExpr>	Array	rray of strings containing the names of expression definitions to load from the file.
Return Value	None.		

Python Syntax	<code>LoadNamedExpressions(<FileName>, <FieldType>, <NamedExpr>)</code>
Python Example	<pre>oModule.LoadNamedExpressions("C:\Ansoft\PersonalLib\smth.clc", "Fields", ["smoothedtemp"])</pre>

SaveNamedExpressions

Saves a named expression definition to a file.

UI Access	In the Fields Calculator, click Save To... in the Library area.		
Parameters	Name	Type	Description
	<FileName>	String	Filename and full path to the file to hold the named expression definition.
	<NamedExprs>	Array	Array of strings containing the names of expression definitions to load from the file.
	<Overwrite>	Boolean	Specifies whether to overwrite the file.
Return Value	None.		

Python Syntax	<code>SaveNamedExpressions(<FileName>, <NamedExprs>, <Overwrite>)</code>
Python Example	<pre>oModule.SaveNamedExpressions("C:\Ansoft\PersonalLib\smth.clc",</pre>

	<code>["smoothedtemp"], True)</code>

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left blank.

19 - Radiation Module Script Commands

Radiation field commands should be executed by the **RadField** module.

```
oModule = oDesign.GetModule("RadField")
```

```
oModule.CommandName <args>
```

Note:

Q3D Extractor uses the Radiation Module to perform **EM Fields** commands.

Conventions Used in this Chapter

<SetupName>

Type: <string>

Name of a radiation setup.

<FaceListName>

Type: <string>

Name of a qualifying face list. Used for specifying custom radiation surfaces. In order to be valid for use in a radiation surface, the face list should not contain any faces on PML objects and should contain only model faces.

<CSName>

Type: string

Name of a coordinate system.

The topics for this section include:

[General Commands Recognized by the Radiation Module](#)

[Script Commands for Creating and Modifying Radiation Setups](#)

Script Commands for Modifying Antenna Array Setups

Script Commands for Exporting Antenna Parameters and Max Field Parameters

General Commands Recognized by the Radiation Module

[DeleteFarFieldSetup](#)

[DeleteNearFieldSetup](#)

[GetSetupNames](#)

[RenameSetup](#)

[SetPropValue \[Radiation\]](#)

CopyRadFieldSetup

Copies a radiation field setup to clipboard.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of radiation field setup to be copied.
Return Value	None.		

Python Syntax	CopyRadFieldSetup(<SetupName>)
Python Example	<code>oModule.CopyRadFieldSetup("RadField1")</code>

DeleteFarFieldSetup

Deletes an existing far-field setup.

UI Access	Right-click on a far field setup under Radiation in the project tree, select Delete .		
Parameters	Name	Type	Description
	<SetupName>	Array	Name of setup(s) to be deleted.
Return Value	None.		

Python Syntax	DeleteFarFieldSetup(<SetupName>)
Python Example	<code>oModule.DeleteFarFieldSetup(["Infinite Sphere1"])</code>

DeleteNearFieldSetup

Deletes an existing EM Fields line setup.

UI Access	Project Manager > EM Fields . Right-click a setup and click Delete .		
Parameters	Name	Type	Description
	<NameArray>	Array	List of fields for deletion.
Return Value	None.		

Python Syntax	DeleteNearFieldSetup(<i>NameArray</i>)
Python Example	<code>oModule.DeleteNearFieldSetup(['Line1', 'Sphere1', 'Box2', 'Rectangle1'])</code>

DeleteSetup

Deletes specified radiation field setup(s).

UI Access	Right-click on a setup under Radiation in the project, select Delete .		
Parameters	Name	Type	Description
	<SetupName>	Array	Array of setup names to be deleted.
Return Value	None.		

Python Syntax	DeleteSetup(<SetupName>)
Python Example	<code>oModule.DeleteSetup(["Rad Field1"])</code>

GetChildNames [Radiation]

Use: Gets setup names .

Syntax: GetChildNames()

Return Value: All setup names.

Parameters: Optional, this parameter is ignored.

Python Syntax	GetChildNames ()
Python Example	<code>GetChildNames() //return all setup names.</code>

GetChildObject [Radiation]

Gets a Setup Object of the Radiation module.

Python Syntax	GetChildObject()
Python Example	<pre>oOverlay= oRadModule.GetChildObject('Antenna Parameter Overlay1') oSphere = oRadModule.GetChildObject('Infinite Sphere1')</pre>

GetChildTypes [Radiation]

Use: Gets child types of queried Radiation module object.

Syntax: GetChildTypes()

Return Value: Returns empty array.

Python Syntax	GetChildTypes ()
Python Example	<pre>oRad = oDesign.GetChildObject("RadField") oRadModule.GetChildTypes ()</pre>

GetPropNames [Radiation]

Use: Radiation module does not have its own property, this function always returns empty array.

Syntax: GetPropNames(bIncludeReadOnly)

Return Value: Returns empty set.

Parameters: bIncludeReadOnly—optional, default to True.

Python Syntax	GetPropNames ()
Python Example	<pre>oRadModule.GetPropNames () oRadModule.GetPropNames (True) oRadModule.GetPropNames (False)</pre>

GetPropValue [Radiation]

Get the property value for a setup object.

UI Access	NA		
Parameters	Name	Type	Description
	PropPath Value	text string	A Property path begin with a setup name. See property path discussion here .
Return Value	The property value.		

Python Syntax	GetPropValue(propPath)
Python Example	<pre>oRadModule.GetPropValue('Line1/Num Points') //Get the Line1 setups' "Num Points" property value.</pre>

GetSetupNames

Gets the names of far field and near field radiation setups in a design.

UI Access	N/A

Parameters	Name	Type	Description
	<RadiationType>	String	Type of radiation.
Return Value	Array of strings containing setup names.		

Python Syntax	GetSetupNames(<RadiationType>)
Python Example	<code>oModule.GetSetupNames("Infinite Sphere")</code>

PasteRadFieldSetup

Pastes a copied radiation field setup.

UI Access	N/A
Parameters	None.
Return Value	String name of pasted setup.

Python Syntax	PasteRadFieldSetup()
Python Example	<code>oModule.PasteRadFieldSetup()</code>

RenameSetup [Radiation]

Renames an existing radiation setup.

UI Access	Right-click a radiation setup in the project tree, and then click Rename on the shortcut menu.		
Parameters	Name	Type	Description
	<OldName>	String	Name of specified setup to be renamed.
	<NewName>	String	New name for the setup.
Return Value	None.		

Python Syntax	RenameSetup(<OldName>, <NewName>)
Python Example	<code>oModule.RenameSetup("Sphere1", "MyNearSphere")</code>

SetPropValue [Radiation]

Sets the property value for the active Radiation property object.

UI Access	Edit Properties on ProjectTree objects		
Parameters	Name	Type	Description
	propPath	text string	A Property path begin with a setup name. See property path discussion here .
	Value	Text String, Number, or Boolean	New value data type is depending on the property type.
Return Value	True if the property is found and the new value is valid. Otherwise return False.		

Python Syntax	SetPropValue(propPath, value)
Python Example	oRadModule.SetPropValue('Line1/Num Points', 100) ; Set the Line1 setups' "Num Points" property to 100.

Script Commands for Creating and Modifying Radiation Setups

[EditBoxSetup](#)

[EditNearFieldLineSetup](#)

[EditNearFieldRectangleSetup](#)

[EditNearFieldSphereSetup](#)

[InsertBoxSetup](#)

[InsertNearFieldLineSetup](#)

[InsertNearFieldRectangleSetup](#)

[InsertNearFieldSphereSetup](#)

AddAntennaOverlay

Saves a table of antenna parameters for use an overlay on far field plots.

UI Access	Click on Save for Overlay in the Antenna Parameters dialog.		
Parameters	Name	Type	Description
	<AntennaParams>	Array	Structured array. Array("NAME:<AntennaOverlayName>", "Setup:=", <string far field radiation setup name>,

			<code>"Solution:=", <string for the Solution Setup and Pass>, "IntrinsicVariation:=", <string for variation definition>, "UseNominalDesign:=", <boolean>, "DesignVariation:=", <string>, "Calculations:=", <list of each antenna parameter to display>)</code>
Return Value	None.		

Python Syntax	<code>AddAntennaOverlay(<AntennaParams>)</code>
Python Example	<pre>oModule.AddAntennaOverlay(["NAME:Antenna Parameter Overlay1", "Setup:=", "Infinite Sphere1", "Solution:=", "4500MHz : LastAdaptive", "IntrinsicVariation:=", "Freq=4.5GHz ", "UseNominalDesign:=", False, "DesignVariation:=", "", "Calculations:=", "Max U,Peak Directivity,Peak Gain,Radiation Efficiency, Front To Back Ratio>Total Efficiency,System Efficiency"</pre>

	])

AddRadFieldSourceGroup

Adds source group definitions for radiation field setup.

UI Access	Right-click on Radiation in the project tree, select Insert Far Field Setup > Source Group...		
Parameters	Name	Type	Description
	<SourceGroupParams>	Array	Structured array <pre>Array("NAME:<SourceGroupName>", Array("NAME:Sources", <SourceName>, <SourceName>...))</pre>
Return Value	None.		

Python Syntax	AddRadFieldSourceGroup(<SourceGroupParams>)
Python Example	<pre>oModule.AddRadFieldSourceGroup(["NAME:Source Group1", ["NAME:Sources", "feedpin1_T1", "feedpin1_T2"]])</pre>

EditAntennaOverlay

Edits parameters in an existing antenna overlay.

UI Access	N/A		
Parameters	Name	Type	Description
	<AntennaOverlayName>	String	Name of the antenna overlay to be edited.
	<AntennaParams>	Array	Structured array. Array("NAME:<AntennaOverlayName>", "Setup:=", <string far field radiation setup name>, "Solution:=", <string for the Solution Setup and Pass>, "IntrinsicVariation:=", <string for variation defin- ition>, "UseNominalDesign:=", <boolean>, "DesignVariation:=", <string>, "Calculations:=" , <list of each antenna parameter to display>)
Return Value	None.		

Python Syntax	EditAntennaOverlay(<AntennaOverlayName>, <AntennaParams>)
Python Example	<pre>oModule.EditAntennaOverlay("Antenna Parameter Overlay1", [</pre>

	<pre> "NAME:Antenna Parameter Overlay1", "Setup:=", "Infinite Sphere1", "Solution:=", "4500MHz : LastAdaptive", "IntrinsicVariation:=", "Freq=4.5GHz ", "UseNominalDesign:=", False, "DesignVariation:=", "", "Calculations:=", "Max U,Peak Directivity,Peak Gain,Radiation Efficiency, Front To Back Ratio,Total Efficiency,System Efficiency"] </pre>

EditBoxSetup

Edits an EM Fields box setup.

UI Access	Project Manager > EM Fields > Box. Double-click and edit information.		
Parameters	Name	Type	Description
	<BoxParams>	Array	Structured array. <pre> Array("NAME:<SetupName>", "UseCustomRadiationSurface:=", <bool>, "CustomRadiationSurface:=", <FaceListName>, "Length:=", <string>, "Width:=", <string>, </pre>

			<pre>"LengthSamples:=", <int>, "WidthSamples:=", <int>, "CoordSystem:=", <CSname> "Height:=", <string>, "HeightSamples:=", <int>)</pre> For UseCustomRadiationSurface parameter, provide value if True. If False, radiation boundary/PML boundaries will be used as radiation surfaces.
Return Value	None.		

Python Syntax	EditBoxSetup(<BoxParams>)
Python Example	<pre>oModule.EditBoxSetup(['NAME:MyBox', 'UseCustomRadiationSurface:=', False, 'Length:=', '20mm', 'Width:=', '20mm', 'LengthSamples:=', 21, 'WidthSamples:=', 21, 'CoordSystem:=', 'Global', 'Height:=', '20mm', 'HeightSamples:=', 21</pre>

])

EditInfiniteSphereSetup

Modifies an infinite sphere radiation field setup.

UI Access	Double-click on a setup under Radiation in the project tree.		
Parameters	Name	Type	Description
	<InfSphereName>	String	Name of the infinite sphere setup to be edited.
	<InfSphereParams>	Array	Structured array. <pre>Array("NAME:<InfSphereName>", "UseCustomRadiationSurface:=", <boolean>, "CSDefinition:=", <string, "Theta-Phi" "Az Over EI" "EI Over AS">, "Polarization:=", <string, "Linear" "Slant">, "ThetaStart:=", "<value><unit>", "ThetaStop:=", "<value><unit>", "ThetaStep:=", "<value><unit>", "PhiStart:=", "<value><unit>", "PhiStop:=", "<value><unit>", "PhiStep:=", "<value><unit>", "UseLocalCS:=", boolean)</pre>
Return Value	None.		

Python Syntax	EditInfiniteSphereSetup(<InfSphereName>, <InfSphereParams>)
Python Example	<pre>oModule.EditInfiniteSphereSetup("Infinite Sphere1", ["NAME:Infinite Sphere1", "UseCustomRadiationSurface:=", False, "CSDefinition:=" , "Theta-Phi", "Polarization:=" , "Linear", "ThetaStart:=" , "0deg", "ThetaStop:=" , "180deg", "ThetaStep:=" , "2deg", "PhiStart:=" , "-180deg", "PhiStop:=" , "180deg", "PhiStep:=" , "2deg", "UseLocalCS:=" , False])</pre>

EditLineSetup

Modifies a near field line setup.

UI Access	Double-click on a setup under Radiation in the project tree.		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup to be edited.
	<LineParams>	Array	Structured array. <pre>Array("NAME:<LineName>", "UseCustomRadiationSurface:=", <boolean>, "Line:=", <string, name of specified line>, "NumPts:=", "<integer, number of points>")</pre>
Return Value	None.		

Python Syntax	EditLineSetup(<SetupName>, <LineParams>)
Python Example	<pre>oModule.EditLineSetup("Line1", ["NAME:Line1", "UseCustomRadiationSurface:=", False, "Line:=" , "Polyline1", "NumPts:=" , "1000"])</pre>

EditNearFieldBoxSetup

Modifies a near field box radiation field setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><BoxSetupName></code>	String	Name of the near field box setup to be edited.
	<code><BoxSetupParams></code>	Array	Structured array. Array("NAME:<BoxSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Length:=", "<value><unit>", "Width:=", "<value><unit>", "LengthSamples:=", <value>, "WidthSamples:=", <value>, "CoordSystem:=", <string name of coordinate system>, "Height:=", "<value><unit>", "HeightSamples:=", <value>)
Return Value	None.		

Python Syntax	<code>EditNearFieldBoxSetup(<BoxSetupName>, <BoxSetupParams>)</code>
Python Example	<pre>oModule.EditNearFieldBoxSetup("Box1", ["NAME:Box1", "UseCustomRadiationSurface:=", False,</pre>

	<pre> "Length:=" , "20meter", "Width:=" , "20meter", "LengthSamples:=" , 21, "WidthSamples:=" , 21, "CoordSystem:=" , "Global", "Height:=" , "20meter", "HeightSamples:=" , 21 1) </pre>

EditNearFieldLineSetup

Modifies a near field line setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SetupName>	String	Name of the setup to be edited.
	<LineParams>	Array	Structured array. <pre> Array("NAME:<LineName>", "UseCustomRadiationSurface:=", <boolean>, "Line:=", <string, name of specified line>, "NumPts:=", "<integer, number of points>") </pre>
Return Value	None.		

Python Syntax	EditNearFieldLineSetup(<SetupName>, <LineParams>)
Python Example	<pre>oModule.EditNearFieldLineSetup("Line1", ["NAME:Line1", "UseCustomRadiationSurface:=", False, "Line:=" , "Polyline1", "NumPts:=" , "1000"])</pre>

EditNearFieldRectangleSetup

Modifies a near field rectangle radiation setup.

UI Access	N/A.		
Parameters	Name	Type	Description
	<RectangleSetupName>	String	Name of rectangle radiation setup to be edited.
	<RectangleSetupParams>	Array	Structured array.
			<pre>Array("NAME:<RectangleSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Length:=", "<value><unit>", "Width:=", "<value><unit>", "LengthSamples:=", <value>,</pre>

			"WidthSamples:=", <value>, "CoordSystem:=", <string name of coordinate system>)
Return Value	None.		

Python Syntax	<code>EditNearFieldRectangleSetup(<RectangleSetupName>, <RectangleSetupParams>)</code>
Python Example	<pre>oModule.EditNearFieldRectangleSetup("Rectangle1", ["NAME:Rectangle1", "UseCustomRadiationSurface:=", False, "Length:=" , "20meter", "Width:=" , "20meter", "LengthSamples:=" , 41, "WidthSamples:=" , 41, "CoordSystem:=" , "Global"])</pre>

EditNearFieldSphereSetup

Modifies a near field sphere radiation setup.

UI Access	N/A

Parameters	Name	Type	Description
	<SphereSetupName>	String	Name of sphere radiation field setup to be edited.
	<SphereSetupParams>	Array	Structured array. Array("NAME:<SphereSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Radius:=", "<value><unit>", "ThetaStart:=", "<value><unit>", "ThetaStop:=", "<value><unit>", "ThetaStep:=", "<value><unit>", "PhiStart:=", "<value><unit>", "PhiStop:=", "<value><unit>", "PhiStep:=", "<value><unit>", "UseLocalCS:=", <boolean>)
Return Value	None.		

Python Syntax	EditNearFieldSphereSetup(<SphereSetupName>, <SphereSetupParams>)
Python Example	<pre>oModule.EditNearFieldSphereSetup("Sphere1", ["NAME:Sphere2", "UseCustomRadiationSurface:=", False,</pre>

	<pre> "Radius:=" , "20meter", "ThetaStart:=" , "0deg", "ThetaStop:=" , "180deg", "ThetaStep:=" , "2deg", "PhiStart:=" , "-180deg", "PhiStop:=" , "180deg", "PhiStep:=" , "2deg", "UseLocalCS:=" , False] </pre>

EditRadFieldSourceGroup

Modifies an existing source group definitions for radiation field setup.

UI Access	Double-click on a source group setup under Radiation in the project tree.		
Parameters	Name	Type	Description
	<SourceGroupName>	String	Name of the source group setup to be edited.
	<SourceGroupParams>	Array	Structured array <pre> Array("NAME:<SourceGroupName>", Array("NAME:Sources", <SourceName>, <SourceName>...)) </pre>
Return Value	None.		

Python Syntax	EditRadFieldSourceGroup(<SourceGroupName>, <SourceGroupParams>)
Python Example	<pre>oModule.EditRadFieldSourceGroup("Source Group1", ["NAME:Source Group1", ["NAME:Sources", "IncPWave1", "IncPWave2"]])</pre>

EditRectangleSetup

Modifies a near field rectangle radiation setup.

UI Access	Double-click on a rectangle setup under Radiation in the project tree.		
Parameters	Name	Type	Description
	<RectangleSetupName>	String	Name of rectangle radiation setup to be edited.
	<RectangleSetupParams>	Array	Structured array.
			<pre>Array("NAME:<RectangleSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Length:=", "<value><unit>", "Width:=", "<value><unit>", "LengthSamples:=", <value>,</pre>

			"WidthSamples:=", <value>, "CoordSystem:=", <string name of coordinate system>)
Return Value	None.		

Python Syntax	<code>EditRectangleSetup(<RectangleSetupName>, <RectangleSetupParams>)</code>
Python Example	<pre>oModule.EditRectangleSetup("Rectangle1", ["NAME:Rectangle1", "UseCustomRadiationSurface:=", False, "Length:=" , "20meter", "Width:=" , "20meter", "LengthSamples:=" , 41, "WidthSamples:=" , 41, "CoordSystem:=" , "Global"])</pre>

EditSphereSetup

Modifies a near field sphere radiation setup.

UI Access	Double-click on a sphere setup under Radiation in the project tree.

Parameters	Name	Type	Description
	<SphereSetupName>	String	Name of sphere radiation field setup to be edited.
	<SphereSetupParams>	Array	Structured array. Array("NAME:<SphereSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Radius:=", "<value><unit>", "ThetaStart:=", "<value><unit>", "ThetaStop:=", "<value><unit>", "ThetaStep:=", "<value><unit>", "PhiStart:=", "<value><unit>", "PhiStop:=", "<value><unit>", "PhiStep:=", "<value><unit>", "UseLocalCS:=", <boolean>)
Return Value	None.		

Python Syntax	EditSphereSetup(<SphereSetupName>, <SphereSetupParams>)
Python Example	<pre>oModule.EditSphereSetup("Sphere1", ["NAME:Sphere2", "UseCustomRadiationSurface:=", False,</pre>

	<pre> "Radius:=" , "20meter", "ThetaStart:=" , "0deg", "ThetaStop:=" , "180deg", "ThetaStep:=" , "2deg", "PhiStart:=" , "-180deg", "PhiStop:=" , "180deg", "PhiStep:=" , "2deg", "UseLocalCS:=" , False] </pre>

InsertBoxSetup

Inserts an EM Fields box setup.

UI Access	Q3D Extractor > EM Fields > Insert EM Fields Setup > Box.		
Parameters	Name	Type	Description
	<BoxParams>	Array	Structured array. <pre> Array("NAME:<SetupName>", "UseCustomRadiationSurface:=", <bool>, "CustomRadiationSurface:=", <FaceListName>, "Length:=", <string>, "Width:=", <string>, </pre>

			<pre>"LengthSamples:=", <int>, "WidthSamples:=", <int>, "CoordSystem:=", <CSname> "Height:=", <string>, "HeightSamples:=", <int>)</pre> For UseCustomRadiationSurface parameter, provide value if True. If False, radiation boundary/PML boundaries will be used as radiation surfaces.
Return Value	None.		

Python Syntax	InsertBoxSetup(<BoxParams>)
Python Example	<pre>oModule.InsertBoxSetup(['NAME:MyBox', 'UseCustomRadiationSurface:=', False, 'Length:=', '20mm', 'Width:=', '20mm', 'LengthSamples:=', 21, 'WidthSamples:=', 21, 'CoordSystem:=', 'Global', 'Height:=', '20mm', 'HeightSamples:=', 21</pre>

	]

InsertFarFieldSphereSetup

Inserts a far field infinite sphere setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><SphereParams></code>	Array	Structured array. <pre>Array("NAME:<InfSphereName>", "UseCustomRadiationSurface:=", <boolean>, "CSDefinition:=", <string, "Theta-Phi" "Az Over EI" "EI Over AS">, "Polarization:=", <string, "Linear" "Slant">, "ThetaStart:=", "<value><unit>", "ThetaStop:=", "<value><unit>", "ThetaStep:=", "<value><unit>", "PhiStart:=", "<value><unit>", "PhiStop:=", "<value><unit>", "PhiStep:=", "<value><unit>", "UseLocalCS:=", boolean)</pre>
Return Value	None.		

Python Syntax	InsertFarFieldSphereSetup(<SphereParams>)
Python Example	<pre>oModule.InsertFarFieldSphereSetup(["NAME:Infinite Sphere1", "UseCustomRadiationSurface:=", False, "CSDefinition:=" , "Theta-Phi", "Polarization:=" , "Linear", "ThetaStart:=" , "0deg", "ThetaStop:=" , "180deg", "ThetaStep:=" , "2deg", "PhiStart:=" , "-180deg", "PhiStop:=" , "180deg", "PhiStep:=" , "2deg", "UseLocalCS:=" , False])</pre>

InsertInfiniteSphereSetup

Inserts an infinite sphere radiation field setup.

UI Access	Right-click on Radiation in the project tree, select Insert Far Field Setup > Infinite Sphere...

	Name	Type	Description
	<i><InfSphereParams></i>	Array	Structured array. <pre>Array("NAME:<InfSphereName>", "UseCustomRadiationSurface:=", <boolean>, "CSDefinition:=", <string, "Theta-Phi" "Az Over EI" "EI Over AS">, "Polarization:=", <string, "Linear" "Slant">, "ThetaStart:=", "<value><unit>", "ThetaStop:=", "<value><unit>", "ThetaStep:=", "<value><unit>", "PhiStart:=", "<value><unit>", "PhiStop:=", "<value><unit>", "PhiStep:=", "<value><unit>", "UseLocalCS:=", boolean)</pre>
Parameters			
Return Value	None.		

Python Syntax	<code>InsertInfiniteSphereSetup(<InfSphereParams>)</code>
Python Example	<pre>oModule.InsertInfiniteSphereSetup(["NAME:Infinite Sphere1", "UseCustomRadiationSurface:=", False,</pre>

	<pre>"CSDefinition:=" , "Theta-Phi", "Polarization:=" , "Linear", "ThetaStart:=" , "0deg", "ThetaStop:=" , "180deg", "ThetaStep:=" , "2deg", "PhiStart:=" , "-180deg", "PhiStop:=" , "180deg", "PhiStep:=" , "2deg", "UseLocalCS:=" , False])</pre>

InsertLineSetup

Inserts a near field line setup.

UI Access	Right-click on Radiation in the project tree, select Insert Near Field Setup > Line...		
Parameters	Name	Type	Description
	<LineParams>	Array	Structured array. Array("NAME:<LineName>", "UseCustomRadiationSurface:=", <boolean>, "Line:=", <string, name of specified line>, "NumPts:=", "<integer, number of points>")

Return Value	None.

Python Syntax	InsertLineSetup(<LineParams>)
Python Example	<pre>oModule.InsertLineSetup(["NAME:Line1", "UseCustomRadiationSurface:=", False, "Line:=" , "Polyline1", "NumPts:=" , "1000"])</pre>

InsertNearFieldBoxSetup

Inserts a near field box radiation field setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<BoxSetupParams>	Array	Structured array. <pre>Array("NAME:<BoxSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Length:=", "<value><unit>", "Width:=", "<value><unit>",</pre>

			<code>"LengthSamples:=", <value>, "WidthSamples:=", <value>, "CoordSystem:=", <string name of coordinate system>, "Height:=", "<value><unit>", "HeightSamples:=", <value>)</code>
Return Value	None.		

Python Syntax	InsertNearFieldBoxSetup(<BoxSetupParams>)
Python Example	<pre>oModule.InsertNearFieldBoxSetup(["NAME:Box1", "UseCustomRadiationSurface:=", False, "Length:=" , "20meter", "Width:=" , "20meter", "LengthSamples:=" , 21, "WidthSamples:=" , 21, "CoordSystem:=" , "Global", "Height:=" , "20meter", "HeightSamples:=" , 21</pre>

	])

InsertNearFieldLineSetup

Inserts a near field line setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<LineParams>	Array	Structured array. Array("NAME:<LineName>", "UseCustomRadiationSurface:=", <boolean>, "Line:=", <string, name of specified line>, "NumPts:=", "<integer, number of points>")
Return Value	None.		

Python Syntax	InsertNearFieldLineSetup(<LineParams>)
Python Example	<pre>oModule.InsertNearFieldLineSetup(["NAME:Line1", "UseCustomRadiationSurface:=", False, "Line:=" , "Polyline1", "NumPts:=" , "1000"</pre>

	1)

InsertNearFieldRectangleSetup

Inserts a near field rectangle radiation setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<RectangleSetupParams>	Array	Structured array. Array("NAME:<RectangleSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Length:=", "<value><unit>", "Width:=", "<value><unit>", "LengthSamples:=", <value>, "WidthSamples:=", <value>, "CoordSystem:=", <string name of coordinate sys- tem>)
Return Value	None.		

Python Syntax	InsertNearFieldRectangleSetup(<RectangleSetupParams>)
Python Example	oModule.InsertNearFieldRectangleSetup(

```
[
  "NAME:Rectangle1",
  "UseCustomRadiationSurface:=", False,
  "Length:="                , "20meter",
  "Width:="                  , "20meter",
  "LengthSamples:="          , 41,
  "WidthSamples:="           , 41,
  "CoordSystem:="            , "Global"
]
```

InsertNearFieldSphereSetup

Inserts a near field sphere radiation setup.

UI Access	N/A		
Parameters	Name	Type	Description
	<SphereSetupParams>	Array	Structured array. <pre>Array("NAME:<SphereSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Radius:=", "<value><unit>", "ThetaStart:=", "<value><unit>", "ThetaStop:=", "<value><unit>", "ThetaStep:=", "<value><unit>",</pre>

			<code>"PhiStart:=", "<value><unit>", "PhiStop:=", "<value><unit>", "PhiStep:=", "<value><unit>", "UseLocalCS:=", <boolean>)</code>
Return Value	None.		

Python Syntax	InsertNearFieldSphereSetup(< <i>SphereSetupParams</i> >)
Python Example	<pre>oModule.InsertNearFieldSphereSetup(["NAME:Sphere2", "UseCustomRadiationSurface:=", False, "Radius:=" , "20meter", "ThetaStart:=" , "0deg", "ThetaStop:=" , "180deg", "ThetaStep:=" , "2deg", "PhiStart:=" , "-180deg", "PhiStop:=" , "180deg", "PhiStep:=" , "2deg", "UseLocalCS:=" , False</pre>

	]

InsertRectangleSetup

Inserts a near field rectangle radiation setup.

UI Access	Right-click on Radiation in the project tree ,select Insert Near Field Setup > Rectangle...		
Parameters	Name	Type	Description
	<RectangleSetupParams>	Array	Structured array. <pre>Array("NAME:<RectangleSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Length:=", "<value><unit>", "Width:=", "<value><unit>", "LengthSamples:=", <value>, "WidthSamples:=", <value>, "CoordSystem:=", <string name of coordinate system>)</pre>
Return Value	None.		

Python Syntax	InsertRectangleSetup(<RectangleSetupParams>)
Python Example	<pre>oModule.InsertRectangleSetup([</pre>

	<pre>"NAME:Rectangle1", "UseCustomRadiationSurface:=", False, "Length:=" , "20meter", "Width:=" , "20meter", "LengthSamples:=" , 41, "WidthSamples:=" , 41, "CoordSystem:=" , "Global"])</pre>

InsertSphereSetup

Inserts a near field sphere radiation setup.

UI Access	Right-click on Radiation in the project tree ,select Insert Near Field Setup > Sphere...		
Parameters	Name	Type	Description
	<SphereSetupParams>	Array	Structured array. Array ("NAME:<SphereSetupName>", "UseCustomRadiationSurface:=", <boolean>, "Radius:=", " <value><unit>", "ThetaStart:=", " <value><unit>", "ThetaStop:=", " <value><unit>", "ThetaStep:=", " <value><unit>",

			<pre>"PhiStart:=", "<value><unit>", "PhiStop:=", "<value><unit>", "PhiStep:=", "<value><unit>", "UseLocalCS:=", "<boolean>")</pre>
Return Value	None.		

Python Syntax	<code>InsertSphereSetup(<SphereSetupParams>)</code>
Python Example	<pre>oModule.InsertSphereSetup(["NAME:Sphere2", "UseCustomRadiationSurface:=", False, "Radius:=", , "20meter", "ThetaStart:=", , "0deg", "ThetaStop:=", , "180deg", "ThetaStep:=", , "2deg", "PhiStart:=", , "-180deg", "PhiStop:=", , "180deg", "PhiStep:=", , "2deg", "UseLocalCS:=", , False])</pre>

ExportFieldsToFile

Exports fields to a file.

UI Access	From the Antenna Parameters dialog box, Export Fields to .ffd file.		
Parameters	Name	Type	Description
	<ExportParams>	Array	Structured array. Array("ExportFileName:=", <string file name include path>, "SetupName:=", <string name of the Radiation Far Field or Near Field setup>, "IntrinsicVariationKey:=", <string from the Antenna Parameters dialog.>, "DesignVariationKey:=", <string>, "SolutionName:=" , <string name of solution to use>, "Quantity:=" , <string antenna Parameter name. If empty, all parameters are exported.>)
Return Value	None.		

Python Syntax	ExportFieldsToFile (<ExportParams>)
Python Example	oModule.ExportFieldsToFile (


```
[
  "ExportFileName:=", "C:/exportfields.ffd",
  "SetupName:=", "Infinite Sphere1",
  "IntrinsicVariationKey:=", "Freq='\4.5GHz'",
  "DesignVariationKey:=", "",
  "SolutionName:=", "4500MHz : LastAdaptive",
  "Quantity:=", ""
]
```

ExportParametersToFile

Exports antenna parameters to a file.

UI Access	Click Export in the Antenna Parameters dialog.		
Parameters	Name	Type	Description
	<DefParams>	Array	Structured array. Array("ExportFileName:=", <string file name include path>, "SetupName:=", <string name of setup to export>, "IntrinsicVariationKey:=", <string>, "DesignVariationKey:=", <string>, "SolutionName:=", <string name of solution to export>, "Quantity:=", <string name of quantity, empty to

	<table><tr><td></td><td></td><td>export all>)</td></tr></table>			export all>)
		export all>)		
Return Value	None.			

Python Syntax	ExportParametersToFile(<DefParams>)
Python Example	<pre>oModule.ExportParametersToFile(["ExportFileName:=", "C:/exportparams.txt", "SetupName:=", "Infinite Sphere1", "IntrinsicVariationKey:=", "Freq=\'4.5GHz\'", "DesignVariationKey:=", "", "SolutionName:=", "4500MHz : LastAdaptive", "Quantity:=", ""])</pre>

ExportRadiationFieldsToFile

Exports radiation fields to a file.

UI Access	N/A		
Parameters	Name	Type	Description
	<ExportParams>	Array	Structured array.

			<pre> Array("ExportFileName:=", <string file name include path>, "SetupName:=", <string name of the Radiation Far Field or Near Field setup>, "IntrinsicVariationKey:=", <string from the Antenna Parameters dialog.>, "DesignVariationKey:=", <string>, "SolutionName:=" , <string name of solution to use>, "Quantity:=" , <string antenna Parameter name. If empty, all parameters are exported.>) </pre>
Return Value	None.		

Python Syntax	ExportRadiationFieldsToFile (<ExportParams>)
Python Example	<pre> oModule.ExportRadiationFieldsToFile(["ExportFileName:=", "C:/exportfields.ffd", "SetupName:=", "Infinite Sphere1", "IntrinsicVariationKey:=", "Freq=\'4.5GHz\'", "DesignVariationKey:=", "", "SolutionName:=", "4500MHz : LastAdaptive", "Quantity:=", ""]) </pre>

20 - User Defined Document Script Commands

The product has to implement the [GetModule](#) call to create the UserDefinedDocument scripting object (e.g., Check AltraSimDesign.cpp (function GetMgrIDispatch())). To access the UserDefinedDocuments scripting object, use:

```
oModule = oDesign.GetModule("UserDefinedDocuments")
```

Once you have the scripting object, you can use the following methods:

- [AddDocument](#)
- [EditDocument](#)
- [RenameDocument](#)
- [DeleteDocument](#)
- [UpdateDocument](#)
- [ViewHtmlDocument](#)
- [ViewPdfDocument](#)
- [SaveHtmlDocumentAs](#)
- [SavePdfDocumentAs](#)
- [GetDocumentDefinitionNames](#)
- [DeleteAllDocuments](#)
- [UpdateAllDocuments](#)

You can find examples of how to use these methods on each of the methods' pages. A complete [example of a Python script](#) is also available, as is an example with a line by line explanation.

AddDocument

Creates a new document based on provided data and traces. The document names come from UserDefinedDocument folder under syslib, userlib, and personallib. This creates a document and places it in the Project Manager under **Results > Documents**.

UI Access	Right click on Results > Create Document . Choose a document name.		
Parameters	Name	Type	Description
	<data>	Array	Data the defines the document.
	<traces>	Array	trace data for the inputs in the document.
Return Value	None		

Python Syntax	AddDocument (<data>, <traces>)
Python Example	<pre>oModule.AddDocument (["NAME:Design Summary", "", "SysLib", "DesignSummary", ["NAME:Inputs"]], ["NAME:DocTraces"])</pre>

DeleteAllDocuments

Deletes all documents in the object.

UI Access	Right click on Documents in the Project Manager and click Delete All Documents .
Parameters	None.
Return Value	None.

Python Syntax	DeleteAllDocuments()
Python Example	<code>oModule.DeleteAllDocuments()</code>

DeleteDocument

Deletes a specified document.

UI Access	Right click on the created document in the Project Manager under Results > Documents and click Delete .		
Parameters	Name	Type	Description
	<name>	String	Name of the document to be deleted.
Return Value	None.		

Python Syntax	DeleteDocument(<names>)
Python Example	<code>oModule.DeleteDocument("Project Design Summary")</code>

EditDocument

Edits specified documents. If the document pops up a dialog box, the user can make a change the inputs for the document. The document is regenerated and updated. A new one is *not* created.

UI Access	Right click on the created document in the Project Manager under Results > Documents and click Modify document .		
Parameters	Name	Type	Description
	<originalName>	String	Name of the original document
	<modifiedData>	Array	New data to add to or modify the document
	<modifiedraces>	Array	Trace data for the inputs of the document
Return Value	None.		

Python Syntax	EditDocument(<name>,<data>,<traces>)
Python Example	<pre>oModule.EditDocument("Design Summary", ["NAME:Design Summary", "", "SysLib", "DesignSummary", ["NAME:Inputs"]],</pre>

	<pre>["NAME:DocTraces"])</pre>

GetDocumentDefinitionNames

Document definition names are the list of names that can be used to create a document. They appear when you click on **Create document**. This method returns the filenames of document definitions according to the files in the installation directories:

- syslib/UserDefinedDocuments
- userlib/UserDefinedDocuments
- personallb/UserDefinedDocuments

UI Access	NA		
Parameters	Name	Type	Description
	<separator>	String	Separator used to convey the directory "level"
Return Value	None.		

Python Syntax	GetDocumentDefinitionNames(<separator>)
Python Example	oModule.GetDocumentDefinitionNames ("/")

GetDocumentNames

Retrieves the names for all documents.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing document names.

Python Syntax	GetDocumentNames()
Python Example	<code>oModule.GetDocumentNames()</code>

RenameDocument

Changes the name of a document.

UI Access	Right click on the created document in the Project Manager under Results> Documents and click Rename .		
Parameters	Name	Type	Description
	<oldName>	String	Current name of the document
	<newName>	String	New name of the document
Return Value	None.		

Python Syntax	RenameDocument(<oldName>, <newName>)
Python Example	<code>oModule.RenameDocument("Design Summary", "Project Design Summary")</code>

SaveHtmlDocumentAs

Saves a pre-existing HTML file to a different name and/or location.

UI Access	Right click on the created document in the Project Manager under Results > Documents and click Save As > HTML .		
Parameters	Name	Type	Description
	<name>	String	Name of the document to be saved.
	<saveTo>	String	File path to save the document to.
Return Value	none		

Python Syntax	SaveHtmlDocumentAs(<name>, <saveTo>)
Python Example	<code>oModule.SaveHtmlDocumentAs("Design Summary 1", "DS1.html")</code>

SavePdfDocumentAs

Saves a pre-existing PDF file to a different name and/or location.

UI Access	Right click on the created document in the Project Manager under Results > Documents and click Save As > PDF .		
Parameters	Name	Type	Description
	<name>	String	Name of the document to be saved.
	<saveTo>	String	File path to save the document at.
Return Value	None.		

Python Syntax	SavePdfDocumentAs(<name>, <saveTo>)
Python Example	<code>oModule.SavePdfDocumentAs("Design Summary 1", "DS1.pdf")</code>

UpdateAllDocuments

Refreshes the contents of all created documents. This action is made on the folder rather than the individual document.

UI Access	Right click on Results > Documents in the Project Manager and click Update All Documents .
Parameters	None.
Return Value	None.

Python Syntax	UpdateAllDocuments()
Python Example	<code>oModule.UpdateAllDocuments()</code>

UpdateDocument

Refreshes the contents of the selected document.

UI Access	Right click on the created document in the Project Manager under Results > Documents and click Update Document .

Parameters	Name	Type	Description
	<name>	String	Name of the document to be updated
Return Value	None.		

Python Syntax	UpdateDocument(<name>)
Python Example	oModule.UpdateDocument("Test UDD Report")

ViewHtmlDocument

Displays a pre-existing document as HTML.

UI Access	Right click on the created document in the Project Manager under Results > Documents and click View Xml Document .		
Parameters	Name	Type	Description
	<name>	String	Name of the document to be viewed as a HTML
Return Value	None		

Python Syntax	ViewHtmlDocument(<name>)
Python Example	oModule.ViewHtmlDocument("Design Summary 1")

ViewPdfDocument

Displays a pre-existing document as a PDF file.

UI Access	Right click on the created document in the Project Manager under Results > Documents and click View PDF Document .		
Parameters	Name	Type	Description
	<name>	String	Name of the document to be viewed as a PDF
Return Value	None.		

Python Syntax	ViewPdfDocument(<name>)
Python Example	oModule.ViewPdfDocument("Design Summary 1")

Example Python Script: Defining a Document

This script creates a user-defined solution and a document.

```
import ScriptEnv
ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")
oDesktop.RestoreWindow()
oProject = oDesktop.SetActiveProject("BJT_Inverter")
oDesign = oProject.SetActiveDesign("Nexxim1")
oModule = oDesign.GetModule("UserDefinedSolutionModule")

oModule.CreateUserDefinedSolution("UDS Distance Trace Arithmetic Result1", "SysLib",
```

```

"TraceArithmetic/Distance Sweep Trace Arithmetic",
[
    "Offset 1:=", "0",
    "Scale 1:=", "1",
    "Offset 2:=", "0",
    "Scale 2:=", "1",
    "Operation:=", "Add"
],
[
    [
        "Standard",
        "probe1",
        "Transient",
        [
            style="font-family: monospace;">"NAME:Context",
            style="font-family: monospace;">"SimValueContext:=", [1,0,2,0,False,False,-
1,1,0,1,1,"",0,0,"DE",False,"0","DP",False,"500000000","DT",False,"0.001","NUMLEVELS",False,"0",-
"WE",False,"10us","WM",False,"10us","WN",False,"0ns","WS",False,"0ns"]
        ],
        [
            "Time:=", ["All"]
        ],
        [
            "Probe Component:=", ["V(Port1)"]
        ],
        []
    ],
    [
        "Standard",
        "probe2",
        "Transient",
        [
            "NAME:Context",
            "SimValueContext:=", [1,0,2,0,False,False,-

```

```

1,1,0,1,1,"",0,0,"DE",False,"0","DP",False,"500000000","DT",False,"0.001","NUMLEVELS",False,"0","-
WE",False,"10us","WM",False,"10us","WN",False,"0ns","WS",False,"0ns"]
    ],
    [
        "Time:=", ["All"]
    ],
    [
        "Probe Component:=", ["V(Port1)"]
    ],
    []
]
],
[])
oModule = oDesign.GetModule("UserDefinedDocuments")
oModule.AddDocument(
[
    "NAME:Test Report",
    "Test Report",
    "SysLib",
    "TestUDDInputs",
    [
        "NAME:Inputs",
        [
            "NAME:UDS1",
            "Solution",
            "UDS Distance Trace Arithmetic Result1",
            1000000,
            0
        ],
        [
            "NAME:UDS2",
            "Solution",

```



```

        "UDS Distance Trace Arithmetic Result2",
        1000000,
        2
    ]
]
],
[
    "NAME:DocTraces",
    [
        "NAME:UDS1",
        [
            "User Defined",
            "",
            "UDS Distance Trace Arithmetic Result1",
            [
                "Context:=", ""
            ],
            [
                "Distance:=", ["All"]
            ],
            [
                "Probe Component:=", [""]
            ],
            []
        ]
    ],
    [
        "NAME:UDS2",
        [
            "User Defined",
            "",
            "UDS Distance Trace Arithmetic Result1",
            [
                "Context:=", ""
            ]
        ]
    ]
]

```

```
],  
[  
    "Distance:=", ["All"]  
],  
[  
    "Probe Component:=", [""]  
],  
[]  
]  
]  
])
```

21 - User Defined Solutions Commands

User Defined Solution commands should be executed by the "UserDefinedSolutionModule" module.

```
oDesign = oProject.SetActiveDesign("TestDesign1")
```

```
oModule = oDesign.GetModule("UserDefinedSolutionModule")
```

The list of commands is as follows:

[CreateUserDefinedSolution](#)

[DeleteUserDefinedSolutions](#)

[EditUserDefinedSolution](#)

CreateUserDefinedSolution

Creates a new user defined solution.

UI Access	Right-click on Results > Create User Defined Solution .		
Parameters	Name	Type	Description
	<SoluName>	String	Name of user defined solution.
	<LibType>	String	Indicates the library where the UDS plugin file is located. This parameter must be one of the following values: "SysLib", "UserLib", "Personallib".
	<RelativePath>	String	The path of the UDS plugin file relative to the "UserDefinedOutputs" sub-directory of the library specified by <LibType>.
	<PropList>	Array	Strings specify name-value pairs corresponding to the UDS properties specified in the plugin file. For example: Array("multiply_factor:=", "2.0", "component_name:=", "resistor1")
	<ProbeSelections>	Array	Name of the probe being specified. Note: this must match a probe name spe-

			cified in the UDS plugin file.
	<DynamicProbes>	Array	Array of <ProbeSelection>'s, representing the probes that are used by dynamic-probes.
Return Value	String name of created user defined solution.		

Python Syntax	CreateUserDefinedSolution(<SoluName>, <LibType>, <RelativePath>, <PropList>, <ProbeSelections>, <DynamicProbes>)		
Python Example	<pre>oModule.CreateUserDefinedSolution("ConstantTimestep1", "SysLib", "ConstantTimestep", [], [], [])</pre>		

DeleteUserDefinedSolutions

Deletes one or more user defined solutions.

UI Access	Delete button from the User Defined Solutions dialog.		
Parameters	Name	Type	Description
	<SoluNames>	Array	Array of strings containing names of User Defined Solutions to be deleted.
Return Value	None.		

Python Syntax	DeleteUserDefinedSolutions(<SoluNames>)
Python Example	<code>oModule.DeleteUserDefinedSolutions(["Solution1", "Solution2"])</code>

EditUserDefinedSolution

Modifies an existing user defined solution.

UI Access	Edit button from the User Defined Solutions dialog box.		
Parameters	Name	Type	Description
	<SoluName>	String	Name of user defined solution to be edited.
	<NewSoluName>	String	New name for the specified user defined solution.
	<LibType>	String	Indicates the library where the UDS plugin file is located. This parameter must be one of the following values: "SysLib", "UserLib", "PersonalLib".
	<RelativePath>	String	The path of the UDS plugin file relative to the "UserDefinedOutputs" sub-directory of the library specified by <LibType>.
	<PropList>	Array	Strings specify name-value pairs corresponding to the UDS properties specified in the plugin file. For example: <code>Array("multiply_factor:=", "2.0", "component_name:=", "resistor1")</code>
	<ProbeSelections>	Array	Name of the probe being specified. Note: this must match a probe name specified in the UDS plugin file.
	<DynamicProbes>	Array	Array of <ProbeSelection>'s, representing the probes that are used by dynamic-probes.
Return Value	String name of update user defined solution.		

Python Syntax	<code>EditUserDefinedSolution(<SoluName>, <NewSoluName>, <LibType>, <RelativePath>, <PropList>, <ProbeSelections>, <DynamicProbes>)</code>
Python Example	<pre>oModule.EditUserDefinedSolution("ConstantTimestep1" "ConstantTimestep1After", "SysLib", "ConstantTimestep", [], [], [])</pre>

GetUserDefinedSolutionNames

Retrieves user defined solution names.

UI Access	N/A
Parameters	None.
Return Value	Array of strings containing solution names.

Python Syntax	<code>GetUserDefinedSolutionNames()</code>
Python Example	<pre>oModule.GetUserDefinedSolutionNames()</pre>

GetUserDefinedSolutionProperties

Obtains properties for a specified user defined solution.

UI Access	N/A		
Parameters	Name	Type	Description
	< <i>SoluName</i> >	String	Name of a specified user defined solution.
Return Value	Array of strings containing properties values.		

Python Syntax	<code>GetUserDefinedSolutionProperties(<<i>SoluName</i>>)</code>
Python Example	<code>oModule.GetUserDefinedSolutionProperties("ConstantTimestep1")</code>

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left blank.

22 - Network Data Explorer Script Commands

Network Data Explorer (NDE) scripting uses three objects, each with unique script commands:

- **Network Data Explorer** – top-level object obtained by calling `oNDE=oDesktop.GetTool("ndExplorer")`. Network Data Explorer commands are called using `oNDE`.
- **Network Data** – single set of S-parameters, corresponding to a single entry in the UI tree. Network Data commands are called using `oData`.
- **Post Process Settings** – settings that can be applied and removed from network data without making permanent changes to the underlying data. Post Process Settings commands are called using `oPostProc`.

Examples using the above objects:

```
oNDE = oDesktop.GetTool("ndExplorer")  
  
oData = oNDE.Open("D:\folder\test.s2p")  
  
success = oPostProc.AddDiffPair(2, 1, "Diff1", "Comm1", 100, 25)
```

The following commands are described in this section:

[AddDiffPair](#)

[Cascade \(SPISim\)](#)

[ClearDiffPairs](#)

[Clone](#)

[Close](#)

[Combine \(SPISim\)](#)

[Deembed \(SPISim\)](#)

[DeembedBack \(SPISim\)](#)

[DeembedFront \(SPISim\)](#)

[DisableDiffPairs](#)

[EnableDiffPairs](#)

[ExportCitiFile](#)

[ExportFullWaveSpice](#)

[ExportMatlab](#)

[ExportNMFData](#)

[ExportNetworkData](#)

[ExportSpreadsheet](#)

[ExportTouchstone](#)

[ExportTouchstone2](#)

[Extract \(SPISim\)](#)

[GetFrequencies](#)

[GetFrequencyCount](#)

[GetName](#)

[GetPortCount](#)

[GetPortNumber](#)

[GetPostProcSettings](#)

[GetSolutionVariation](#)

[GetVariation](#)

[HasSameData](#)

- [LoadSolution](#)
- [Open](#)
- [Rename \(SPISim\)](#)
- [Renormalize \(SPISim\)](#)
- [Reorder](#)
- [Reorder \(SPISim\)](#)
- [Reset](#)
- [SetAllPortImpedances](#)
- [SetAllPortImpedances](#)
- [SetPortDeembedDistance](#)
- [SetPortImpedance](#)
- [SetPostProcSettings](#)
- [Smooth](#)
- [Stretch \(SPISim\)](#)
- [Terminate](#)

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

AddDiffPair

Specifies a differential pair from two terminal ports.

UI Access	From the Network Data Explorer tab, select Differential Pairs in the NDE ribbon to open the Differential

	Pairs window. Then select differential pairs from the Pairs group box and click Add Pairs >> .		
Parameters	Name	Type	Description
	<positiveTerminal>	Integer	The portNumber of the positive terminal.
	<negativeTerminal>	Integer	The portNumber of the negative terminal.
	<diffName>	String	The new name of the differential pin (e.g., Diff1).
	<commName>	String	The new name of the common pin (e.g., Comm1).
	<diffImpedance>	Double	The differential pin characteristic impedance.
	<commImpedance>	Double	The common pin characteristic impedance.
	<matched>	Boolean	Specify whether to use matched pair.
			Note: The default value is False .
Return Value	Boolean.		

Python Syntax	AddDiffPair()
Python Example	<pre>success = oPostProc.AddDiffPair(2, 1, "Diff1", "Comm1", 100, 25)</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Cascade (SPISim)

Creates new network data from a group of network data objects cascaded together. The network data must have an even number of terminal ports and must have the same number of ports.

Note: Cascade opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Cascade from the drop-down menu.		
Parameters	Name	Type	Description
	<dataArray>	Array	These network data objects are cascaded together to create the new network data.
Return Value	Network IDispatch. Note: Cascade returns None if the specified network data does not have compatible terminal ports defined.		

Python Syntax	Cascade()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData2 = oNDE.Cascade([oData1, oData2, oData3])</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

ClearDiffPairs

Clears all differential pair definitions. All other post-processing settings remain the same.

UI Access	From the Network Data Explorer tab, select Differential Pairs in the NDE ribbon to open the Differential Pairs window. Then select differential pairs from the rightmost box and click << Remove Pairs .
Parameters	None.
Return Value	None.

Python Syntax	<code>ClearDiffPairs()</code>
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oPostProc.ClearDiffPairs()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Clone

Creates a copy of the network data object.

UI Access	From the Network Data Explorer tab, select the network data object to clone. Then select Clone from the NDE ribbon.
Parameters	None.
Return Value	Network IDispatch.

Python Syntax	Clone()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData1 = oData.Clone()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Close

Closes the network data object. The object will no longer be accessible.

UI Access	From the Network Data Explorer tab, click Close in the NDE ribbon, or select File > Close .
Parameters	None.
Return Value	None.

Python Syntax	Close()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData.Close()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Combine (SPISim)

Combines frequencies from multiple network data objects to create a new network data with all of the frequencies.

Note: Combine opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Combine from the drop-down menu.		
Parameters	Name <dataArray>	Type Array	Description These network data objects are combined to create the new network data.
	<freqTol>	Double	If $\text{abs}(f1 - f2) < \text{freqTol}$, $f1$ and $f2$ are considered the same frequency. Note: The default value is 100 .
Return Value	Network IDispatch. Note: Combine returns None if the network data does not have the same number of ports.		

Python Syntax	Combine()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData4 = oNDE.Combine([oData1, oData2, oData3], 1000)</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Deembed (SPISim)

Creates a new network data, dembedding the frontData and the backData from the front and back of the originalData.

Note: Deembed opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Deembed from the drop-down menu to open the Deembed... window, and choose Given 3 S-params in order of: Total, Front, Back from the Settings group box.		
Parameters	Name	Type	Description
	<originalData>	Object	Original network data that is deembeded.
	<frontData>	Object	Network data that is deembeded from the front of the original.
	<backData>	Object	Network data that is deembeded from the back of the original.
Return Value	Network IDispatch. Note: Deembed returns None if the specified network data does not have compatible terminal ports defined.		

Python Syntax	Deembed()
Python Example	oNDE = oDesktop.GetTool("ndExplorer")

	<code>oData2 = oNDE.Deembed(oData1, oDataFront, oDataBack)</code>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

DeembedBack (SPISim)

Creates a new network data, dembedding the backData from the back of the originalData.

Note: DeembedBack opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Deembed from the drop-down menu to open the Deembed... window, and choose Given 3 S-params in order of: Total, Back from the Settings group box.		
Parameters	Name	Type	Description
	<originalData>	Object	Original network data that is deembedded.
	<backData>	Object	Network data that is deembedded from the back of the original.
Return Value	Network IDispatch. Note: DeembedBack returns None if the specified network data does not have compatible terminal ports defined.		

Python Syntax	DeembedBack()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData2 = oNDE.DeembedBack(oData1, oDataBack)</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

DeembedFront (SPISim)

Creates a new network data, dembedding the frontData from the front of the originalData.

Note: DeembedFront opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Deembed from the drop-down menu to open the Deembed... window, and choose Given 3 S-params in order of: Total, Front from the Settings group box.		
Parameters	Name	Type	Description
	<originalData>	Object	Original network data that is deembedded.
	<frontData>	Object	Network Data that is deembedded from the front of the original.
Return Value	Network IDispatch. Note: DeembedFront returns None if the specified network data does not have compatible terminal ports defined.		

Python Syntax	DeembedFront()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData2 = oNDE.DeembedFront(oData1, oDataFront)</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

DisableDiffPairs

Deactivates all differential pair definitions. This script does not remove them, so they [can be reactivated](#).

UI Access	From the Network Data Explorer tab, select Differential Pairs in the NDE ribbon to open the Differential Pairs window. Once differential pairs have been added to the rightmost box (i.e., select differential pairs from the Pairs group box and click Add Pairs >>), remove check marks from the Enabled column to deactivate the corresponding differential pairs.
Parameters	None.
Return Value	None.

Python Syntax	DisableDiffPairs()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oPostProc.DisableDiffPairs()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

EnableDiffPairs

Enables all differential pair definitions.

UI Access	From the Network Data Explorer tab, select Differential Pairs in the NDE ribbon to open the Differential Pairs window. Once differential pairs have been added to the rightmost box (i.e., select differential pairs from the Pairs group box and click Add Pairs >>), add check marks to the Enabled column to activate the corresponding differential pairs.
Parameters	None.
Return Value	None.

Python Syntax	EnableDiffPairs()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") success = oPostProc.EnableDiffPairs()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

ExportCitiFile

Writes the S-parameters to disk in Citifile format (*.cit text file).

UI Access	From the Network Data Explorer tab, select File > Save As to open a Save As explorer window. Then select Citifile (*.cit) from the Save as type: drop-down menu.		
Parameters	Name	Type	Description
	<filePath>	String	The full path to the file.
	<matrixType>	Integer	One of the following: • 0 – S-Parameters • 1 – Y-Parameters • 2 – Z-Parameters • 3 – Gamma • 4 – Impedance Note: The default value is 0.
	<formalType>	Integer	One of the following: • 0 – Magnitude/Angle (degrees) • 1 – Real/Imaginary • 2 – dB/Angle (degrees) Note: The default value is 0.
	<precision>	Integer	The number of significant figures. Note: The default value is 10.
	<frequencies>	Array of Doubles	A subset of the calculated frequencies. Any array values that don't have calculated data will be ignored. An empty array will cause all frequencies to be written.

			Note: The default value is an empty array.
Return Value	Boolean True if file was successfully written; else False.		

Python Syntax	ExportCitiFile()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") success = oData.ExportCitiFile("D:\folder\ne133.cit", 0, 1, 12, [])</pre>

ExportFullWaveSpice

Use: Export FullWaveSpice data in a format of your choice.

Command: File > Export MacroModel > Broadband (SYZ, FWS....)

Syntax: ExportFullWaveSpice

```
"DesignName", // Design name. Can be left blank, if loading solution from a file.
true/false, // true - solution loaded from file, false- loaded from design
"Name", // If loading from design this is the solution name, else this is the
           // full path of the file from which the solution is loaded
"variation", // Pick a particular variation. Leave blank if no variation.
Array("NAME:Frequencies"), // Optional; if none defined all frequencies are used
Array("NAME:SpiceData", // Spice export options object
"SpiceType:=", "SSS", // SpiceType can be "PSpice", "HSpice", "Spectre", "SSS",
```

```
// "Simplorer", "TouchStone1.0", "TouchStone2.0"

"EnforcePassivity:=", false, // Enforce Passivity true/false
"EnforceCausality:=", false, // Enforce Causality true/false
"UseCommonGround:=", false, // Use common ground true/false
"FittingError:=", 0.5, // Fitting error
"MaxPoles:=", 400, // Maximum Order
"PassivityType:=", "ConvexOptimization", // Passivity Type can be "ConvexOptimization",
// "PassivityByPerturbation", or "IteratedFittingOfPV"
"ColumnFittingType:=", "Column", // Column FittingType can be "Column", "Entry", "Matrix"
"SSFittingType:=", "TWA", // SS Fitting Type can be "TWA", "IterativeRational"
"RelativeErrorToleranc:=", false, // Relative error tolerance true/false
"TouchstoneFormat:=", "MA", // Touchstone Format "MA", "RI", "DB"
"TouchstoneUnits:=", "Hz", // Touchstone Units "Hz", "KHz", "MHz", "MHz"
"TouchStonePrecision:=", 8, // Touchstone precision
"ExportDirectory:=", "C:/Examples/LNA/", // Directory to export to
"ExportSpiceFileName:=", "Linckt_HBTest_2.sss", // Spice export file
"FullwaveSpiceFileName:=", "Linckt_HBTest.sss", // FWS file
"CreateNPortModel:=", true // Create a model based on the exported file true/false
)
```


Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

ExportMatlab

Writes the S-parameters to disk in Matlab format (*.m text file).

UI Access	From the Network Data Explorer tab, select File > Save As to open a Save As explorer window. Then select MATLAB (*.m) from the Save as type: drop-down menu.		
Parameters	Name	Type	Description
	<filePath>	String	The full path to the file.
	<matrixType>	Integer	One of the following: • 0 – S-Parameters • 1 – Y-Parameters • 2 – Z-Parameters • 3 – Gamma • 4 – Impedance Note: The default value is 0.
	<formalType>	Integer	One of the following: • 0 – Magnitude/Angle (degrees) • 1 – Real/Imaginary • 2 – dB/Angle (degrees) Note: The default value is 0.

	<precision>	Integer	The number of significant figures. Note: The default value is 10 .
	<frequencies>	Array of Doubles	A subset of the calculated frequencies. Any array values that don't have calculated data will be ignored. An empty array will cause all frequencies to be written. Note: The default value is an empty array.
Return Value	Boolean True if file was successfully written; else False.		

Python Syntax	ExportMatlab()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") success = oData.ExportMatlab("D:\folder\ne133.m", 0, 1, 12, [])</pre>

ExportNMFData

Exports s-parameters in neutral file format (*.nmf).

UI Access	Results > Solution Data. On the Matrix tab, click Export tab. Then click Export > S-parameter . Select Neutral Model format and export.		
Parameters	Name	Type	Description
	<sourceName>	Array	String names of solutions. Use more than one array entry for a combined Interpolating sweep.

	<outputFileName>	String	Full path of output file, including *.nmf extension.
	<reduceMat>	String	Either "Original" or name of reduced matrix.
	<refImp>	Double	Reference impedance.
	<freqs>	Array	Either "All" or array of doubles representing frequencies.
	<variationKey>	String	Design variation key. Pass empty string for the current nominal variation.
	<displayFormat>	String	"MagPhase", "Reallmag", "DbPhase".
	<length>	String	2D Extractor only. Optional. Number with units.
	<pass>	Integer	Optional. The pass to export. This is ignored if the <i>sourceName</i> is a frequency sweep. Leaving out this value or specifying -1 gets all passes.
	<ComplexFormat>	Integer	Optional. The format to use for the exported data. Options are 0 = Magnitude/Phase 1 = Real/Imaginary. 2 = db/Phase.
	<Precision>	Integer	Optional. Number of digits precision. If not specified, the default is 6.
Return Value	None.		

Python Syntax	ExportNMFData (<sourceName>, <outputFileName>, <reduceMat>, <refImp>, <freqs>, <variationKey>, <displayFormat>, <length> (2D Extractor only), <pass>, <ComplexFormat>, <Precision>)
Python Example	oDesign.ExportNMFData("Setup2 : LastAdaptive", "C:/outputs/data.nmf", "Original", 50, [10000000, 20000000, 30000000, 40000000, 50000000, 60000000, 70000000, 80000000, 90000000, 100000000], "", "MagPhase", 0, 1, 11)

ExportNetworkData

Exports matrix solution data to a file.

UI Access	N/A		
Parameters	Name	Type	Description
	<DesignVariationKey>	String	Design variation key. Pass empty string for the current nominal variation.
	<SolnSelectionArray>	Array	Array of selected solutions. Array(<SolnSelector>, <SolnSelector>, ...) If more than one array entry, this indicates a combined Interpolating sweep.
	<SolnSelector>	String	Solution setup name and solution name, separated by a colon.
	<FileFormat>	Integer	File format value. 2 : Tab delimited spreadsheet format (.tab) 3 : Touchstone (.sNp) 4 : CitiFile (.cit) 7 : Matlab (.m) 8 : Terminal Z0 spreadsheet
	<OutFile>	String	Full path to the file to write out.
	<FreqsArray>	Array	The frequencies to export. The <FreqsArray> argument contains a vector (e.g. "1GHz", "2GHz", ...) to use, or "all". To export all frequencies, use Array("all"). If no frequencies are specified, all frequencies are used.
	<DoRenorm>	Boolean	For Touchstone format only. Specifies whether to renormalize the data before export.
	<RenormImped>	Double	For Touchstone format only. Real impedance value in ohms, for renormalization. Required in syntax, but ignored if DoRenorm is false.
	<DataType>	Array	Optional. Type: "S", "Y", or "Z". The matrix to export.

	<i><pass></i>	Integer	Optional. The pass to export. This is ignored if the sourceName is a frequency sweep. Leaving out this value or specifying -1 gets all passes.
	<i><ComplexFormat></i>	Integer	Optional. Type: "0", "1", or "2" The format to use for the exported data. 0 = Magnitude/Phase. 1 = Real/Imaginary. 2 = db/Phase.
	<i><Precision></i>	Integer	Optional. Touchstone number of digits precision. Default if not specified is 15.
	<i><UseExportFreqs></i>	Boolean	Specifies whether to use export frequencies.
	<i><IncludeGammaComments></i>	Boolean	Touchstone only. Specifies whether to include Gamma and Impedance comments.
	<i><SupportNonStdExport></i>	Boolean	Specifies whether to support non-standard Touchstone extensions for mixed reference impedance.
Return Value	None.		

Python Syntax	ExportNetworkData(<i><DesignVariationKey></i> , <i><SolnSelectionArray></i> , <i><SolnSelector></i> , <i><FileFormat></i> , <i><OutFile></i> , <i><FreqsArray></i> , <i><DoRenorm></i> , <i><RenormImped></i> , [Optional <i><DataType></i>], [Optional <i><pass></i>], [Optional <i><ComplexFormat></i>], [Optional <i><Precision></i>], [Optional <i><UseExportFreqs></i>], [Optional <i><IncludeGammaComments></i>], [Optional <i><SupportNonStdExport></i>])
Python Example	

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

ExportSpreadsheet

Writes the S-parameters to disk in spreadsheet format (*.tab text file).

UI Access	From the Network Data Explorer tab, select File > Save As to open a Save As explorer window. Then select Data Table (spreadsheet) (*.tab) from the Save as type: drop-down menu.		
Parameters	Name	Type	Description
	<filePath>	String	The full path to the file.
	<matrixType>	Integer	One of the following: • 0 – S-Parameters • 1 – Y-Parameters • 2 – Z-Parameters • 3 – Gamma • 4 – Impedance Note: The default value is 0.
	<formalType>	Integer	One of the following: • 0 – Magnitude/Angle (degrees) • 1 – Real/Imaginary • 2 – dB/Angle (degrees)

			Note: The default value is 0 .
	<precision>	Integer	The number of significant figures. Note: The default value is 10 .
	<frequencies>	Array of Doubles	A subset of the calculated frequencies. Any array values that don't have calculated data will be ignored. An empty array will cause all frequencies to be written. Note: The default value is an empty array.
	<renormalize>	Boolean	If True , will renormalize the data to the value of renormImpedance before writing. Note: The default value is False .
	<renormImpedance>	Double	Data will be renormalized to this impedance before writing only if renormalize is True . Note: The default value is 50 ohms .
Return Value	Boolean True if file was successfully written; else False.		

Python Syntax	ExportSpreadsheet()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData = oNDE.Open(<model path>)</pre>

```
success = oData.ExportSpreadsheet("D:\folder\ne133.tab", 0, 1, 12, [], True, 23)
```

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

ExportTouchstone

Writes the S-parameters to disk in Touchstone 1.0 format (*.snp text file).

UI Access	From the Network Data Explorer tab, select File > Save As to open a Save As explorer window. Then select Touchstone Format 1.0 (*.snp) from the Save as type: drop-down menu.		
Parameters	Name	Type	Description
	<filePath>	String	The full path to the file.
	<matrixType>	Integer	One of the following: • 0 – S-Parameters • 1 – Y-Parameters • 2 – Z-Parameters • 3 – Gamma • 4 – Impedance Note: The default value is 0.
	<formalType>	Integer	One of the following: • 0 – Magnitude/Angle (degrees) • 1 – Real/Imaginary

			• 2 – dB/Angle (degrees) Note: The default value is 0.
	<precision>	Integer	The number of significant figures. Note: The default value is 10.
	<frequencies>	Array of Doubles	A subset of the calculated frequencies. Any array values that don't have calculated data will be ignored. An empty array will cause all frequencies to be written. Note: The default value is an empty array.
	<renormalize>	Boolean	If True, will renormalize the data to the value of renormImpedance before writing. Note: The default value is False.
	<renormImpedance>	Double	Data will be renormalized to this impedance before writing only if renormalize is True. Note: The default value is 50 ohms.
	<freqUnits>	String	One of the following: "Hz", "KHz", "MHz", "GHz". Note: The default value is "Hz".
Return Value	Boolean True if file was successfully written; else False.		

Python Syntax	ExportTouchstone()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") success = oData.ExportTouchstone("D:\folder\nel133.s2p", 0, 1, 12, [], True, 23, "GHz")</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

ExportTouchstone2

Writes the S-parameters to disk in Touchstone 2 format (*.ts text file).

UI Access	From the Network Data Explorer tab, select File > Save As to open a Save As explorer window. Then select Touchstone 2 Format (*.ts) from the Save as type: drop-down menu.		
Parameters	Name	Type	Description
	<filePath>	String	The full path to the file.
	<matrixType>	Integer	One of the following:
			• 0 – S-Parameters • 1 – Y-Parameters • 2 – Z-Parameters • 3 – Gamma • 4 – Impedance

		Note: The default value is 0 .
<code><formalType></code>	Integer	One of the following: • 0 – Magnitude/Angle (degrees) • 1 – Real/Imaginary • 2 – dB/Angle (degrees) Note: The default value is 0.
<code><precision></code>	Integer	The number of significant figures. Note: The default value is 10.
<code><frequencies></code>	Array of Doubles	A subset of the calculated frequencies. Any array values that don't have calculated data will be ignored. An empty array will cause all frequencies to be written. Note: The default value is an empty array.
<code><renormalize></code>	Boolean	If True, will renormalize the data to the value of <code>renormImpedance</code> before writing. Note: The default value is False.
<code><renormImpedance></code>	Double	Data will be renormalized to this impedance before writing only if <code>renormalize</code> is True. Note: The default value is 50 ohms.
<code><freqUnits></code>	String	One of the following: "Hz", "KHz", "MHz", "GHz".

	Note: The default value is "Hz".
Return Value	Boolean True if file was successfully written; else False.

Python Syntax	ExportTouchstone2()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") success = oData.ExportTouchstone2("D:\folder\nel133.ts", 0, 1, 12, [], True, 23, "GHz")</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Extract (SPISim)

Creates a new smaller network data after removing data for the specified terminal port numbers.

Note: Extract opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Extract from the drop-down menu.		
Parameters	Name	Type	Description
	<oData>	Object	Data from this object is copied to a new network data and the copy

			is transformed.
	<portNumbers>	Array of Integers	The port numbers that will be retained (integers between 1 and <i>n</i>).
Return Value	Network IDispatch.		

Python Syntax	Extract()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData2 = oNDE.Extract(oData1, [3, 2])</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

GetFrequencies

Returns the frequency values with calculated data in the network data.

UI Access	None.
Parameters	None.
Return Value	Array of doubles.

Python Syntax	GetFrequencies()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer")</pre>

	<pre>Freqs = oData.GetFrequencies()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

GetFrequencyCount

Returns the number of frequencies with calculated data in the network data.

UI Access	None.
Parameters	None.
Return Value	Integer number of frequencies.

Python Syntax	<pre>GetFrequencyCount()</pre>
Python Example	<pre>oData = oDesktop.GetTool("ndExplorer") numFreqs = oData.GetFrequencyCount()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

GetName

Returns the name of the network data.

UI Access	None.
Parameters	None.
Return Value	String name.

Python Syntax	GetName()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") strName = oData.GetName()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

GetPortCount

Returns the total number of ports.

UI Access	From the Network Data Explorer tab, select Edit Ports in the NDE ribbon to open the Port properties window.
Parameters	None.
Return Value	Integer number of ports.

Python Syntax	GetPortCount()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") num = oData.GetPortCount()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

GetPortNumber

Returns the terminal port number for a given terminal port name.

Note: GetPortNumber can be used in other commands that require a port number, if a port name is preferable.

The PortNumber is the index of the name port in the original data and is not changed by any other settings applied to the oPostProc, including the Reorder settings. It is permanently linked to the port name and can be used interchangeably with the port name in many of the PostProcSettings script functions.

UI Access	From the Network Data Explorer tab, ensure the Full Port Names check box is activated. Port numbers will be represented in the object portNames.		
Parameters	Name	Type	Description
	<portName>	String	The designation of the port number.
Return Value	Integer.		

Python Syntax	GetPortNumber()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") index = oPostProc.GetPortNumber("Input35")</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

GetPostProcSettings

Returns a copy of the IDispatch to the postprocessing settings for the network data (oPostProc).

Note: Making changes to the PostProcSettings will not change the network data. To make changes, call oData.SetPostProcSettings to change the network data.

UI Access	None.
Parameters	None.
Return Value	PostProcSettings IDispatch

Python Syntax	GetPostProcSettings()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oPostProc = oData.GetPostProcSettings()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

GetSolutionVariation

Returns the network data object corresponding to a variation of the solution.

UI Access	None.		
Parameters	Name	Type	Description
	<solutionID>	Integer	ID of the solution (obtained with LoadSolution).
	<variation>	String	The variation key.
Return Value	Network IDispatch.		

Python Syntax	GetSolutionVariation()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData = oNDE.GetSolutionVariation("0, "offset='0.1'")</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

GetVariation

Returns the variation key for the network data.

UI Access	None.
Parameters	None.
Return Value	String variation key.

Python Syntax	GetVariation()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") variation = oData.GetVariation()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

HasSameData

Compares one network data object with another network data. Actual calculated values will be compared and no interpolation will be done.

UI Access	None.		
Parameters	Name	Type	Description
	<NetworkData>	Object	The second network data to compare against.
	<matrixType>	Integer	One of the following:

			• 0 – S-Parameters • 1 – Y-Parameters • 2 – Z-Parameters • 3 – Gamma • 4 – Impedance Note: The default value is 0.
	<code><comparePortNames></code>	Boolean	If True, port names must be identical. Note: The default value is True.
	<code><compareNoise></code>	Boolean	If True, and both network data have noise data, the comparison will fail unless the noise values also match. Note: The default value is 10.
	<code><relativeTolerance></code>	Double	If the absoluteTolerance test fails, then $\text{abs}(\text{value1} - \text{value2}) / \max(\text{abs}(\text{value1}), \text{abs}(\text{value2}))$ must be less than this to be considered equal. Note: The default value is 1e-14.
	<code><absoluteTolerance></code>	Double	If True, then $\text{abs}(\text{value1} - \text{value2}) < \text{absoluteTolerance}$. Note: The default value is 0.
Return Value	Boolean True if the compared network data have the same frequency and matrix values; otherwise, False.		

Python Syntax	HasSameData()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") success = oData.HasSameData(oData2, 0, True, False, 1e-10, 0)</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

LoadSolution

Loads the specified design (all variations) and returns an integer ID.

UI Access	After analyzing a design, from the Project Manager window, expand the Project Tree and Analysis folders. Then right-click on the completed analysis icon and select Network Data Explorer to open the solution in the Network Data Explorer tab.		
Parameters	Name	Type	Description
	<projectName>	String	Full path to the Electronics Desktop file.
	<designName>	String	Name of the design.
	<solutionName>	String	Name of the solution.
Return Value	Integer ID (identifying the solution); < 0 if the solution is not loaded.		

Python Syntax	LoadSolution()

Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") id = oNDE.LoadSolution("D:\folder\Tee.aedt", "HFSS_Test", "Setup1:Sweep1")</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Open

Reads contents of file and returns the IDispatch for the new network data.

UI Access	From the Network Data Explorer tab, select Open in the NDE ribbon, or select File > Open to open an explorer window. Then navigate to the required S-parameter file.		
Parameters	Name	Type	Description
	<fileName>	String	Full path to the file containing S-parameters.
Return Value	Network IDispatch.		

Python Syntax	Open()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData = oNDE.Open("D:\folder\test.s2p")</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Rename (SPISim)

Creates a new network data of the same size with the terminal ports renamed.

Note: Rename opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Rename from the drop-down menu.		
Parameters	Name <oData>	Type Object	Description Data from this object is copied to a new network data and the copy is transformed.
	<portNames>	Array of Strings	The new names (one for each port).
Return Value	Network IDispatch.		

Python Syntax	Rename()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData2 = oNDE.Rename(oData1, ["input", "control", "output"])</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Renormalize (SPISim)

Creates a new network data of the same size after renormalizing the terminal ports using the specified impedance values.

Note: Rename opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Renormalize from the drop-down menu.		
Parameters	Name	Type	Description
	<oData>	Object	Data from this object is copied to a new network data and the copy is transformed.
	<portImpedances>	Array of Doubles	The new impedance values to be applied to each port.
Return Value	Network IDispatch. Note: Renormalize returns None if there is not an impedance value for each port.		

Python Syntax	Renormalize()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData2 = oNDE.Renormalize(oData1, [3, 2])</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Reorder

Rearranges the terminal port entries but does not change the port names (i.e., switching first and third terminal port positions will give switched values for S(1,1) and S(3,3) but S(Port1,Port1) and S(Port3,Port3) do not change).

UI Access	From the Network Data Explorer tab, select Edit Ports in the NDE ribbon to open the Port properties window. Click+drag the terminal port rows to reorder them. Make changes, as necessary, then click OK .		
Parameters	Name	Type	Description
	<newOrder>	Array of Integers	Must have one entry for each port; all numbers 1 to <i>n</i> must be present.
Return Value	None.		

Python Syntax	Reorder()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oPostProc.Reorder([3, 2, 1])</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Reorder (SPISim)

Creates a new network data with the same number of terminal ports and with the port names in the same order. The data is also reordered so it corresponds to the new order (e.g., the data for S(Port1, Port1) may correspond to S(Port3, Port3).

Note: Reorder opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Reorder from the drop-down menu.		
Parameters	Name	Type	Description
	<oData>	Object	Data from this object is copied to a new network data and the copy is transformed.
	<portNumbers>	Array of Integers	The port numbers in new order (integers between 1 and <i>n</i>).
Return Value	Network IDispatch. Note: Reorder returns None if the array argument does not contain all the terminal port numbers, in any order.		

Python Syntax	Reorder()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData2 = oNDE.Reorder([3, 2, 1])</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Reset

Resets the post-processing to what it was when the network data was created.

Note: This is not equivalent to setting post-processing to an empty state. The network data may have been read from a file or created from solution data that already had post-processing settings.

Resetting the oPostProcSetting object does not change any data; it only changes the settings object. If you want to change a data object to apply the changed settings, you must follow the Reset function call with oData.SetPostProcSettings (oPostProc)

UI Access	From the Network Data Explorer tab, select Reset postprocessing in the NDE ribbon.
Parameters	None.
Return Value	None.

Python Syntax	<code>Reset()</code>
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oPostProc.Reset()</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

SetAllPortImpedances

Sets all terminal port impedances in a single call. The impedances are in an array of real or complex values.

UI Access	Through the UI, the terminal ports can only be edited individually. From the Network Data Explorer tab, select Edit Ports in the NDE ribbon to open the Port properties window. Make changes, then click OK .		
Parameters	Name	Type	Description
	<impedances>	Array of Doubles or String	Must have one entry for each port or a single complex (or real) value which will be applied to all ports.
Return Value	None.		

Python Syntax	SetAllPortImpedances()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oPostProc.SetAllPortImpedances([23, "2+3i", 50]) -or- oData.SetAllPortImpedances(50)</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

SetPortDeembedDistance

Sets terminal port impedance for a single port.

UI Access	From the Network Data Explorer tab, select Edit Ports in the NDE ribbon to open the Port properties window. Make changes, then click OK .		
Parameters	Name	Type	Description
	<portNumber>	Integer	The port number of the changed terminal port (integers between 1 and n).
	<distance>	String	Impedance with units (e.g., "20mm"); if no units, meters are assumed
Return Value	None.		

Python Syntax	SetPortDeembedDistance()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oPostProc.SetPortDeembedDistance(2, "20mm")</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

SetPortImpedance

Sets port impedance for a single port.

UI Access	From the Network Data Explorer tab, select Edit Ports in the NDE ribbon to open the Port properties win-

	dow. Make changes, then click OK .		
Parameters	Name	Type	Description
	<portNumber>	Integer	The port number of the changed terminal port (integers between 1 and n).
	<impedance>	Double or String	Double if impedance value is real; string format (e.g., 24+10i) for complex impedance.
Return Value	None.		

Python Syntax	SetPortImpedance()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oPostProc.SetPortImpedance(2, "25+3i")</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

SetPostProcSettings

Applies postprocessing settings (oPostProc) to the specified network data.

Note: Making changes to the PostProcSettings will not change the network data. To make changes, call oData.SetPostProcSettings to change the network data.

UI Access	None.		
Parameters	Name	Type	Description
	<PostProcSettings>	Object	The settings that will be applied to the data.
Return Value	None.		

Python Syntax	SetPostProcSettings()		
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData.SetPostProcSettings(oPostProc)</pre>		

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Smooth

Creates a new network data with values smoothed. The number of adjacent points smoothed is user-specified.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Smooth from the drop-down menu.		
Parameters	Name	Type	Description
	<oData>	Object	Data from this object is copied to a new network data and the copy is transformed.
	<order>	Integer	The number of adjacent points that are smoothed.

			Note: The default value is 10 .
	<code><enforceCausality></code>	Boolean	Casual data is calculated before smoothing.
			Note: The default value is False .
Return Value	Network IDispatch Note: Network IDispatch is returned only if the Smooth function was successfully able to perform the smoothing operation on the supplied data and meet the maximum 0.025 error tolerance. Otherwise it will return a < null object >. The user may want to try changing other input parameters, for example, <code>enforceCausality</code> .		

Python Syntax	Smooth()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData2 = oNDE.Smooth(oData1, 3, True)</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Stretch (SPISim)

Creates a new network data representing a matrix of transmission lines with the length of those transmission lines multiplied by a factor of n .

Note: Stretch opens and interacts with **SPISim** to complete.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Stretch from the drop-down menu.		
Parameters	Name	Type	Description
	<oData>	Object	Data from this object is copied to a new network data and the copy is transformed.
	<factor>	Double	The transmission line lengths are multiplied by this number.
Return Value	Network IDispatch. Note: Stretch returns None if the network data argument does not represent a matrix of transmission lines.		

Python Syntax	Stretch()
Python Example	<pre>oNDE = oDesktop.GetTool("ndExplorer") oData2 = oNDE.Stretch(oData1, 3.1)</pre>

Warning: The following command is preliminary. Its syntax may change. Be prepared to make changes to legacy scripts.

Terminate

Creates a new network data with specified ports terminated.

UI Access	From the Network Data Explorer tab, select Transforms in the NDE ribbon. Then select Terminate from the drop-down menu.		
Parameters	Name	Type	Description
	<oData>	Object	Data from this object is copied to a new network data and the copy is transformed.
	<portNumbers>	Array of Integers	The port numbers that are terminated (integers between 1 and <i>n</i>).
	<termImpedances>	Array of Complex Numbers	The impedance values used to terminate the specified ports.
Return Value	Network IDispatch. Note: Terminate returns None if the port numbers are not valid or there are no impedance value for the port numbers.		

Python Syntax	Terminate()
Python Example	<code>oNDE = oDesktop.GetTool("ndExplorer")</code>

	<code>oData2 = oNDE.Terminate(oData1, [2, 3], [23, "10+2i"])</code>

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left blank.

23 - CompInstance Script Commands

CompInstance commands should be executed by the **oDesign2** or **oPropHost2** object.

```
Set oDesign2 = CompInstance.GetParentDesign
```

```
Set oPropHost2 = CompInstance.GetPropHost
```

Callback Scripting Using CompInstance Object

Callback scripts are scripts that can be set in the Property Dialog for individual properties by clicking the button in the Callback column and choosing a script that is saved with the project. Callback scripts can contain any legal script commands including general Ansys script function calls (e.g., `GetApplicationName()`). In addition, Callback scripts can also call functions on a special object named `CompInstance`.

You can obtain an interface to a `CompInstance` in a schematic or layout by calling `oEditor.GetCompInstanceFromRefDes(refDes)`. For more information see Layout Scripting and Schematic Scripting. This interface is also available as a `CompInstance` object in `CompInstance` event callbacks, such as placing a component in a layout or schematic.

Definitions

<propName> = text string

<value> = double

<valueText> = text string

<fileName> = full path file name

<choices> = string containing menu choices separated by commas

<initialChoice> = string containing initial choice for menu; must be one of the **<choices>**

<scriptName> = string containing name of script stored in project

<bool> is 1 for true or 0 for false

<editorName> is either "Layout" or "SchematicEditor"

The topics for this section include:

[ComplInstance Functions](#)

ComplInstance Functions

Following are commands that can be used to manipulate properties from a ComplInstance script.

The topics for this section include:

[GetComponentName](#)

GetEditor

[GetInstanceID](#)

[GetInstanceName](#)

[GetParentDesign](#)

GetPropHost

[GetPropServerName](#)

GetComponentName

Returns the name of the component corresponding to this ComplInstance.

UI Access	NA		
Parameters	Name	Type	Description

	None		
Return Value	String name of component (e.g. MS_TRL) and stores it in "name"		

Python Syntax	GetComponentName()
Python Example	<code>name = CompInstance.GetComponentName()</code>

GetInstanceID [Component Instance]

Use: Returns the instanceID of the CompInstance.

Command: None

Syntax: GetInstanceID()

Return Value: String

Python Syntax	GetInstanceID()
Python Example	<code>id = CompInstance.GetInstanceID()</code>

GetInstanceName [Component Instance]

Use: Returns the instance name of the component corresponding to this CompInstance.

Command: None

Syntax: GetInstanceName()

Return Value: String

Returns instanceName (e.g. A7) of compInstance and stores it in "name".

Note that the Instance Name is not the same as the RefDes.

GetParentDesign

Use: Returns an interface to the compInstance's parent design. This interface can be used to call Design functions. See: [Design Object Script Commands](#).

Command: None

Syntax: GetParentDesign()

Return Value: Returns interface to design.

Python Syntax	GetParentDesign()
Python Example	<code>oDesign2 = CompInstance.GetParentDesign()</code>

GetPropServerName

Use: Returns the PropServerName of the Component corresponding to this CompInstance.

Command: None

Syntax: GetPropServerName()

Return Value: String

Python Syntax	GetPropServerName()
Python Example	<code>name = CompInstance.GetPropServerName()</code>

24 - Definition Manager Script Commands

The definition manager controls the use of materials and scripts in a project. It also provides access to the managers for symbols, footprints, padstacks, and components in a project.

```
Set oProject = oDesktop.SetActiveProject("Project1")
```

```
Set oDefinitionManager = oProject.GetDefinitionManager()
```

The topics for this section include:

[AddMaterial](#)

[CloneMaterial](#)

[DoesMaterialExist](#)

[EditMaterial](#)

[ExportMaterial](#)

[RemoveMaterial](#)

[RemoveUnusedDefinitions](#)

Related Topics:

[Component Manager Script Commands](#)

[Footprint Manager Script Commands](#)

[Material Manager Script Commands](#)

[Model Manager Script Commands](#)

[Network Data Explorer Manager Script Commands](#)

[Padstack Manager Script Commands](#)

[Script and Library Scripts](#)

[Symbol Manager Script Commands](#)

Add [component manager]

*Use:*Add a component

Command: Tools > Edit Configured Libraries > Components > Add Component

*Syntax:*Add Array("NAME:<ComponentName>",

"Info:=", <ComponentInfo>,

"RefBase:=", <string>, // reference designator

"NumParts:=", <int>, // parts per component

"OriginalComponent:=", <string>

"Terminal:=", <TerminalInfo>,

```
"Terminal:=", <TerminalInfo>, ...  
// The remaining parameters are optional  
Array("NAME:Parameters", // any combo of the following  
"VariableProp:=", <VariableInfo>,  
"CheckboxProp:=", <CheckBoxInfo>,  
"ButtonProp:=", <ButtonInfo>,  
"TextProp:=", <TextInfo>,  
"NumberProp:=", <NumberInfo>,  
"SeparatorProp:=", <SeparatorInfo>,  
"ValueProp:=", <ValueInfo>,  
"MenuProp:=", <MenuInfo>),  
Array("NAME:Properties", // any combo of the following  
"CheckboxProp:=", <CheckBoxInfo>,  
"TextProp:=", <TextInfo>,  
"NumberProp:=", <NumberInfo>,  
"SeparatorProp:=", <SeparatorInfo>,  
"ValueProp:=", <ValueInfo>,  
"MenuProp:=", <MenuInfo>),  
"VPointProp:=", <VPointInfo>,  
"PointProp:=", <PointInfo>),  
Array("Quantities",
```

```
"QuantityProp:=", <QuantityPropInfo>...),  
Array("NAME:CosimDefinitions",  
  <CosimDefInfo>,  
  <CosimDefInfo>...)
```

Return Value: <string>

```
// composite name of the component.  
// If the name requested conflicts with the name of an existing  
// component, the requested name is altered to be unique.  
// The name returned reflects any change made to be unique.
```

Parameters: <ComponentName>:

```
<string> // simple name of the component
```

```
<ComponentInfo>:  
Array("Type:=", <TypeInfo>,  
  "NumTerminals:=", <int>,  
  "DataSource:=", <string>,  
  "ModifiedOn:=", <ModifiedOnInfo>,  
  "Manufacturer:=", "<string>,"  
  "Symbol:=", <string>,
```

```
"Footprint:=", <string>,  
"Description:=", <string>,  
"InfoTopic:=", <string>,  
"InfoHelpFile:=", <string>,  
"IconFile:=", <string>,  
"LibraryName:=", "",  
"OriginalLocation:=", "Project", // Project Location  
"Author:=", <string>,  
"OriginalAuthor:=", <string>,  
"CreationDate:= ", <int>)
```

<TypeInfo>:

An integer that is the or-ing of bits for each product listed below. The default setting is 0xffffffff (4294967295) which indicates valid for all products. In the component editing dialog, checking different boxes in the "Specify products for which this component is valid" grid control sets specific flags that correspond to the following hex/decimal settings:

Nexxim -- 100 binary, 4 decimal, 0x4

SlwaveDeNovo -- 1000 binary, 8 decimal, 0x8

Simplorer -- 10000 binary, 16 decimal, 0x10

MaxwellCircuit -- 100000 binary, 32 decimal, 0x20

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<TerminalInfo>:

Array(<string>, // symbol pin

<string> // footprint pin

<string>, // gate name

<bool>, // shared

<int>, // equivalence number

<int>, // what to do if unconnected: flag as error:0, ignore:1

<string> // description

<Nature>)

<Nature>:

<string> // content varies as follows

Nexxim/Circuit:

"Electrical" // the only choice

Simplorer:

// several choices

"Electrical", "Magnetic", "Fluidic", "Translational",
"Translational_V", "Rotational", "Rotational_V",
""Radiant", "Thermal", or <VHDLPackageName>

<VHDLPackageName>:

<string> // in the form <Library>.<Package>

<Library>:

<string> // name of the VHDL library

<Package>:

<string> // name of the VHDL package

<VariableInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>) // value: number, variable, or expression

<FlagLetters>:

<string> // "D" - has description parameter,
// "RD" - readonly & has description parameter,
// or "RHD" - readonly, hidden, & has description parameter

<CheckBoxInfo>:

Array(<string>, // name
<FlagLetters>,
<string>, // description
"CB:=", <string>, // optional - script for call back
<bool>) // value: true or false

<ButtonInfo>:

Array(<string>, // name
<FlagLetters>,
<string>, // description
<string>, // button title
<string>, // extra text
<ClientID>,
"ButtonPropClientData:= ", <ClientDataArray>)

<ClientID>:

<int> // specifies Button Prop Client

// 0 - unknown, ButtonPropClientData

// array will be empty

// 1 - Netlist Prop Client

// 2 - not used

// 3 - File Name Prop Client

<ClientDataArray>:

varies with <ClientID>

<ClientID> is 0 or 1: empty array

Array()

<ClientID> is 3:

Array("InternalFormatText:=", "<prefix><RelativePath>")

<prefix>:

<string> // "<Project>", "<PersonalLib>", "<UserLib>", or "<SysLib>"

<RelativePath>:

<string> // relative path to file from <prefix>

<TextInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>) // value: a text string

<NumberInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<real>, // value: a number

<string>) // units

<SeparatorInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>) // value: a text string

<ValueInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>) // value: a number, variable or expression

<MenuPropInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

<string>, // menu choices - separated by commas

<int>) // 0 based index of current menu choice

<VPointInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>, // x value: number with length units

<string>) // y value: number with length units

<PointInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<real>, // x value

<real>) // y value

<QuantityPropInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

<string>, // value

<TypeString>,

<TypeStringDependentInfo>)

<TypeString>:

<string> // "Across", "Through", or "Free"

<TypeStringDependentInfo>:

<TypeString> is "Free" :

<string>, // direction: "In", "Out", "InOut", or "DontCare"

// Following <string> is not present if direction is "DontCare"

<string> // when to calculate: "BeforeAnalogSolver",

// "BeforeStateGraph", "AfterStateGraph", or "DontCareWhen"

<TypeString> is "Across" or "Through":

<int>, // terminal 1

<int> // terminal 2

<CosimDefInfo>:

Array("NAME:CosimDefinition",

"CosimulatorType:=", <int>,

"CosimDefName:=", <string> // "HFSS 3D Layout", "Circuit",

// "Custom", or "Netlist"

"IsDefinition:=", <bool>,

final array member(s) vary with CosimDefName)

final array members for HFSS 3D Layout:

```
"CosimStackup:=", <string>,  
"CosimDmbedRatio:=", <int>
```

final array members for Circuit:

```
"ExportAsNport:=", <int>,  
"UsePjt:=", <int>
```

final array member for Custom:

```
"DefinitionCompName:=", <string>
```

final array member for Netlist:

```
"NetlistString:=", <string>
```

Python Syntax	<pre>Add [("NAME:<ComponentName>"; "Info:=", <ComponentInfo>, "RefBase:=", <string>, // reference designator "NumParts:=", <int>, // parts per component "OriginalComponent:=", <string> "Terminal:=", <TerminalInfo>,</pre>

"Terminal:=", <TerminalInfo>, ...

The remaining parameters are optional.

["NAME:Parameters", // any combo of the following

"VariableProp:=", <VariableInfo>,

"CheckboxProp:=", <CheckBoxInfo>,

"ButtonProp:=", <ButtonInfo>,

"TextProp:=", <TextInfo>,

"NumberProp:=", <NumberInfo>,

"SeparatorProp:=", <SeparatorInfo>,

"ValueProp:=", <ValueInfo>,

"MenuProp:=", <MenuInfo>],

["NAME:Properties", Any combination of the following:

"CheckboxProp:=", <CheckBoxInfo>,

"TextProp:=", <TextInfo>,

"NumberProp:=", <NumberInfo>,

"SeparatorProp:=", <SeparatorInfo>,

"ValueProp:=", <ValueInfo>,

"MenuProp:=", <MenuInfo>,

"VPointProp:=", <VPointInfo>,

"PointProp:=", <PointInfo>],

["Quantities",

	<pre>"QuantityProp:=", <QuantityPropInfo>...], ["NAME:CosimDefinitions", <CosimDefInfo>, <CosimDefInfo>...]]</pre>
Python Example	<pre>oComponentManager.Add(["NAME:Component", "Info:=", ["Type:=", 0, "NumTerminals:=", 0, "DataSource:=", "", "ModifiedOn:=", 1467910752, "Manufacturer:=", "", "Symbol:=", "Component", "ModelNames:=", "", "Footprint:=", "", "Description:=", "", "InfoTopic:=", "", "InfoHelpFile:=", "", "IconFile:=", "",</pre>

	<pre> "Library:=", "", "OriginalLocation:=", "Project", "IEEE:=", "", "Author:=", "", "OriginalAuthor:=", "", "CreationDate:=", 1467910746, "ExampleFile:=", ""], "Refbase:=", "U", "NumParts:=", 1, "ModSinceLib:=", True, "CompExtID:=", 2]) </pre>

AddDataset

Adds a dataset. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Add.		
Parameters	Name	Type	Description
	<DatasetDataArray>	Array	Array("NAME:<DatasetName>", > Array("NAME:Coordinates", <CoordinateArray>, <CoordinateArray>, ...)
	<DatasetName>	String	Name of the dataset.
	<CoordinateArray>	Array	Array("NAME:Coordinate", "X:=", <double>, "Y:=", <double>)

Return Value	None.

Python Syntax	AddDataset <DatasetDataArray>
Python Example	<pre>oProject.AddDataset(["NAME:\$dsl", ["NAME:Coordinates", ["NAME:Coordinate", "X:=", 2, "Y:=", 4], ["NAME:Coordinate", "X:=", 6, "Y:=", 8]]]</pre>

```
]
)
oDesign.AddDataset (
[
"NAME:$ds1",
[
"NAME:Coordinates",
[
"NAME:Coordinate",
"X:=", 2,
"Y:=", 4
],
[
"NAME:Coordinate",
"X:=", 6,
"Y:=", 8
]
]
]
)
```

AddDefinitionFromBlock

Adds a material definition from block text (same definition format as would be contained in the material library file) by library type (using definition folder name). This scripting command directly supports the .AMAT (or .ASURF) definition formats.

UI Access	N/A		
Parameters	Name	Type	Description
	<defBlock>	String	Text of the new material definition in block form.
	<defFolderName>	String	Library type (by definition folder name)
	<newTimeStamp>	String	New timestamp (time_t as integer number of seconds since 1/1/1970 12:00am, as string), default is current time
	<replaceExisting>	Boolean	True to replace existing, False to choose a new unique name if an existing definition is found
Return Value	A property scripting object for the definition.		

P- yt- h- o- n S- y- nt- ax	AddDefinitionFromBlock(<defBlock>, <defFolderName>, <newTimeStamp>, <replaceExisting>)
P- yt-	<pre>oProject = oDesktop.NewProject() oProject.InsertDesign("HFSS", "HFSSDesign1", "DrivenModal", "")</pre>

h-o-n-e-x-a-m-p-l-e

```

oDesign = oProject.SetActiveDesign("HFSSDesign1")
oEditor = oDesign.SetActiveEditor("3D Modeler")
oEditor.CreateBox(

    [

        "NAME:BoxParameters",

        "XPosition:="                , "-0.4mm",

        "YPosition:="                , "-1mm",
        "ZPosition:="                , "0mm",
        "XSize:="                    , "1.4mm",
        "YSize:="                    , "1.6mm",
        "ZSize:="                    , "0.6mm"

    ],

    [

        "NAME:Attributes",
        "Name:="                    , "Box1",

        "Flags:="                    , "",

        "Color:="                    , "(143 175 143)",

```

```
"Transparency:="          , 0,  
  
"PartCoordinateSystem:=", "Global",  
  
"UDMId:="                  , "",  
  
"MaterialValue:="          , "\"vacuum\"",  
  
"SurfaceMaterialValue:=", "\"\"",  
  
"SolveInside:="            , True,  
  
    "ShellElement:="        , False,  
  
"ShellElementThickness:=", "0mm",  
  
"IsMaterialEditable:="     , True,  
  
"UseMaterialAppearance:=", False,  
  
"IsLightweight:="          , False  
  
])
```

```

oDefinitionManager = oProject.GetDefinitionManager()

defBlock = "$begin 'vacuum2' $begin 'AttachedData' $begin 'MatAppearanceData' property_data-
='appearance_data' Red=230 Green=230 Blue=230 Transparency=0.95 $end 'MatAppearanceData'
$end 'AttachedData' simple('permittivity', 1) ModTime=1499970477 $end 'vacuum2'"

added = oDefinitionManager.AddDefinitionFromBlock(defBlock, "Materials", "10101010", True)

addedName = ''

    if isinstance(added, basestring):
        addedName = added

    elif isinstance(added, list):
        addedName = added[0]
else:

    addedName = added.GetName().replace("Materials:", "")

AddInfoMessage(os.path.basename(__file__) + " result: " + addedName)

materialNameInQuotes = "\"" + addedName + "\""

oEditor.ChangeProperty(

    [

        "NAME:AllTabs",

        [

            "NAME:Geometry3DAttributeTab",

```

```
[  
    "NAME:PropServers",  
    "Box1"  
],  
  
[  
    "NAME:ChangedProps",  
    [  
        "NAME:Material",  
        "Value:=", materialNameInQuotes  
    ]  
    ]  
]  
  
])
```


AddMaterial

Adds a local material.

UI Access	Add Material in the material editor.		
Parameters	Name	Type	Description
	<MaterialParams>	Array	["NAME: <name of the material to be added>", <MatProperty>, <MatProperty>, ...]
	<MatProperty>	Array	For simple material: "<PropertyName>:=", <value> For anisotropic material: ["NAME:<PropertyName>", "property_type:=", "AnisoProperty", "unit:=", <Unit>," "component1:=", <value>," "component2:=", <value>," "component3:=", <value>))

		]
<PropertyName>	String	Should be one of the following (depending on the material, design, and solution types): Electromagnetic (Maxwell-exclusive material properties omitted, see Maxwell Scripting help): "permittivity", "permeability", "conductivity", "dielectric_loss_tangent", "magnetic_loss_tangent", "electric_coercivity", "magnetic_coercivity", "saturation_mag", "lande_g_factor", "delta_H", "delta_h_freq", "mass_density" Thermal (including solids, Icepak fluid flow, and Mechanical rotating fluid modeling): "thermal_conductivity", "mass_density", "specific_heat", "thermal_expansion_coefficient", "thermal_material_type", "viscosity", "diffusivity", "molecular_mass", "clarity_type" Structural: "mass_density", "youngs_modulus", "poissons_ratio", "thermal_expansion_coefficient"
<Unit>	String	Possible values (Maxwell-exclusive properties omitted, see Maxwell Scripting Help; other missing entries are unitless): conductivity: "siemens/m" saturation_mag: "uTesla", "mTesla", "tesla", "kTesla", "uGauss", "mGauss",

			"gauss", "kGauss" delta_H: "A_per_meter", "kA_per_meter", "Oe", "kOe" delta_h_frequency: "Hz", "kHz", "MHz", "GHz", "THz", "rps", "per_sec" mass_density: "kg/m^3" thermal_conductivity: "W/m-C" specific_heat: "J/kg-C" youngs_modulus: "N/m^2" thermal_expansion_coefficient: "1/C"
Return Value	None		

Python Syntax	AddMaterial(["NAME:<MaterialName>", <MatProperty>, <MatProperty>, ...])
Python Example	<pre>oDefinitionManager.AddMaterial(["permittivity:=", "2.2", "0.002"]) oDefinitionManager.AddMaterial [("NAME:Material2", _ "dielectric_loss_tangent:=", "44", Array("NAME:saturation_mag", _ "property_type:=", "AnisoProperty", _</pre>

	<pre>"unit:=", "Gauss", _ "component1:=", "11", _ "component2:=", "22", _ "component3:=", "33"), _ "delta_H:=", "440e")]</pre>

Add [padstack manager]

Use: Add a padstack

Command: Tools > Edit Configured Libraries > Padstacks > Add Padstack

Syntax: Add Array("NAME:<PadstackName>",

 "ModTime:=", <ModifiedOnInfo>,

 "Library:=", "", // name of the library

 "LibLocation:=", "Project", // location of the named library

 Array("NAME:psd",

 "nam:= ", <PadstackName>,

 "lib:=", "", // name of the library

 "mat:=", "", // hole plating material

 "plt:=", "0", // percent of hole's radius filled by plating

 Array("NAME:pds",

 <LayerGeometryArray>,

```
<LayerGeometryArray....),  
"hle:=", <PadInfo>  
"hRg:=", <HoleRange>,  
"sbsh:=", <SolderballShape>,  
"sbpl:=", <SolderballPlacement>,  
"sbr:=", <string>, // solderball diameter, real with units  
"sb2:=", <string>, // solderball mid diameter, real with units  
"sbn:=", <string>), // name of solderball material  
"ppl:=", <PadPortLayerArray>)
```

Return Value: simple name of the added padstack

// If the name requested conflicts with the name of an existing
// padstack, the requested name is altered to be unique.
// The name returned reflects any change made to be unique.

Parameters: <PadstackName>:

<string> // simple name of padstack to create

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed
since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<LayerGeometryArray>:

```
Array("Name:lgm",  
"lay:=", <string>, // definition layer name  
"id:=", <int>, // definition layer id  
"pad:=", <PadInfo>, // pad  
"ant:=", <PadInfo>, // antipad  
"thm:=", <PadInfo>, // thermal pad  
"X:=", <string>, // pad x connection, real with units  
"Y:=", <string>, // pad y connection, real with units  
"dir:=", <DirectionString>) // pad connection direction
```

<PadInfo>:

```
Array("shp:=", <PadShape>,  
"Szs:=", <DimensionArray>,  
"X:=", <string>, // x offset, real with units  
"Y:=", <string>, // y offset, real with units  
"R:=", <string>) // rotation, real with units
```

<PadShape>:

<string> one of these choices

"No" // no pad

"Cir" // Circle

"Sq" // Square

"Rct" // Rectangle

"Ov" // Oval

"Blt" // Bullet

"Ply" // Polygons

"R45" // Round 45 thermal

"R90" // Round 90 thermal

"S45" // Square 45 thermal

"S90" // Square 90 thermal

<DimensionArray>:

Array(<string>, ...) // each string is a real with units for one of the dimensions of the shape

<DirectionString>:

<string> one of these choices

"No" // no direction

"Any" // any direction

"0" // 0 degrees

"45" // 45 degrees

"90" // 90 degrees

"135" // 135 degrees

"180" // 180 degrees

"225" // 225 degrees

"270" // 270 degrees

"315" // 315 degrees

<HoleRange>:

<string> one of these choices

"Thr" // through all layout layers

"Beg" // from upper pad layer to lowest layout layer

"End" // from upper layout layer to lowest pad layer

"UTL" // from upper pad layer to lowest pad layer

<SolderballShape>:

<string> one of these choices

"None" // no solderball

"Cyl" // cylinder solderball

"Sph" // spheroid solderball

<SolderballPlacement>:

<string> one of these choices

"abv" // above padstack

"blw" // below padstack

<PadPortLayerArray>:

Array(<int>, <int>,....) where each int is a layer id

Add [symbol manager]

Use: Add a symbol

Command: Tools > Edit Configured Libraries > Symbols > Add Symbol

Syntax: Add Array("NAME:<SymbolName>",
"ModTime:=", <ModifiedTimeInfo>,
"Library:=", "", // Library name
"LibLocation:=", "Project", // Project Location
<PinDefInfo>,
<PinDefInfo>,... // optional, to define pins
<GraphicsDataInfo>, // optional, to define graphics
<PropDisplayMapInfo>)) // optional, to define property displays

Return Value: <string>

// composite name of the symbol.

// If the name requested conflicts with the name of an existing

// symbol, the requested name is altered to be unique.

// The name returned reflects any change made to be unique.

Parameters: <SymbolName>:

<string> // simple name of the symbol being added

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<PinDefInfo>:

Array("NAME:PinDef",
"Pin:=", Array (<string>, // pin name
<real>, // x location
<real>, // y location
<real>, // angle in radians
<PinType>,
<real>, // line width
<real>, // line length
<bool>, // mirrored
<int>, // color
<bool>, // true if visible, false if not

```
<string>, // hidden net name  
<OptionalPinInfo>, // optional info  
<PropDisplayMapInfo>)) // optional
```

```
<PinType>:  
<string> // "N" : normal pin  
// "I" : input pin  
// "O" : output pin
```

```
<OptionalPinInfo>:  
// Specify both or neither  
<bool>, // true if name is to be shown  
<bool>, // true if number is to be shown
```

```
<PropDisplayMapInfo>:  
Array("NAME:PropDisplayMap",  
<PropDisplayInfo>,  
<PropDisplayInfo>,...)
```

```
<PropDisplayInfo>:
```

```
<NameString>, Array(<DisplayTypeInfo>,  
<DisplayLocationInfo>,  
<int>, // optional, level number  
<TextInfo>)  
<NameString>:  
<string> // PropertyName:=, where PropertyName is the name of  
// the property to be displayed
```

```
<DisplayTypeInfo>:  
<int> // 0 : No display  
// 1 : Display name only  
// 2 : Display value only  
// 3 : Display both name and value  
// 4: Display evaluated value only  
// 5: Display both name and evaluated value
```

```
<DisplayLocationInfo>:  
<int> // 0 : Left  
// 1 : Top  
// 2 : Right
```

// 3 : Bottom

// 4 : Center

// 5 : Custom placement

<GraphicsDataInfo>:

Array("NAME:Graphics",

// one or more of the following

<RectInfo>,

<CircleInfo>,

<ArcInfo>,

<LineInfo>,

<PolygonInfo>,

<TextInfo>,

<ImageInfo>)

<RectInfo>:

"Rect:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<real>, // angle, in radians

<real>, // x position of center

<real>, // y position of center

<real>, // width

< real>) // height

<CircleInfo>:

"Circle:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>) // radius

<ArcInfo>:

"Arc:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>, // radius

<real>, // start angle, in radians

<end>) // end angle, in radians

<LineInfo>:

"Line:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<PointInfo>, // must specify at least 2 points

<PointInfo>...)

<PointInfo>:

<real>, // x position

<real> // y position

<PolygonInfo>:

"Polygon:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<PointInfo>, // must specify at least 3 points

<PointInfo>...)

<TextInfo>:

"Text:=", Array(<real>, // x position

<real>, // y position
<real>, // angle, in radians
<Justification>,
<bool>, // is plotter font
<string>, // font name
<int>, // color
<string>) // text string

<Justification>:
<int> // 0 : left top
// 1 : left base
// 2 : left bottom
// 3 : center top
// 4 : center base
// 5 : center bottom
// 6 : right top
// 7 : right base
// 8 : right bottom

<ImageInfo>:


```
"Image:=", Array(<RectInfo>,
<ImageData>,
<bool>) // is mirrored
```

```
<ImageData>:
<string>, // file path
<int>, // 0 : use the file path and link to it
// 1 : ignore file path and use next parameter
<string> // text data, only present if preceding int is 1
```

AreMaterialPropertiesEqual

Checks whether named material compared to added material data have equivalent major properties.

UI Access	None.		
Parameters	Name	Type	Description
	material_data	<string>	This will be the same format as the AddMaterial() input parameter, material_data. For example, material_data can be something like this.["NAME:Mold_Material", "CoordinateSystemType:=", "Cartesian", "BulkOrSurfaceType:=", 1, ["NAME:PhysicsTypes", "set:=", ["Thermal"]], "thermal_conductivity:=", "0.8", "mass_density:=", "1980", "specific_heat:=", "960"].
	<MaterialName>	<String>	Name of the material to compare with material database
Return Value	Boolean: • True – named materials have equivalent major properties.		

- **False** – named materials do not have equivalent major properties.

Python Syntax	<code>AreMaterialPropertiesEqual(<material_data>,'<MaterialName>')</code>
Python Example	<code>oDefinitionManager.AreMaterialPropertiesEqual(material_data, 'Mold_Material')</code>

AreSurfaceMaterialPropertiesEqual

Checks whether named surface material compared to added surface material data have equivalent major properties.

UI Access	None.		
Parameters	Name	Type	Description
	<code>material_data</code>	<code><string></code>	This will be the same format as the <code>AddMaterial()</code> input parameter, <code>material_data</code> . For example, <code>material_data</code> can be something like this. <code>["NAME:Mold_Material", "CoordinateSystemType:=", "Cartesian", "BulkOrSurfaceType:=", 1, ["NAME:PhysicsTypes", "set:=", ["Thermal"]], "thermal_conductivity:=", "0.8", "mass_density:=", "1980", "specific_heat:=", "960"]</code>
	<code><MaterialName></code>	<code><String></code>	Name of the surface material to compare with material data-base
Return Value	Boolean: • True – named surface materials have equivalent major properties. • False – named surface materials do not have equivalent major properties.		

Python Syntax	<code>AreSurfaceMaterialPropetiesEqual(<material_data>, '<MaterialName>')</code>
Python Example	<code>oDefinitionManager.AreSurfaceMaterialPropertiesEqual(material_data, 'Mold_Material')</code>

ChangeProperty (Symbol Editor)

Use: Changes to properties are scripted using the **ChangeProperty** command. This command can be executed by the **oEditor** to change editor properties, by the **oDesign** to change design level properties, and by the **oProject** to change project level properties. The command can be used to create, edit, and/or remove properties. In Circuit, only Variable and Separator properties can be deleted.

Command: None

Syntax: `ChangeProperty Array("Name:AllTabs", <PropTabArray>, <PropTabArray>, ...)`

Return Value: None

Parameters: <PropTabArray>

```

Array("Name:<PropTab>",
      <PropServersArray>,
      <NewPropArray>,
      <ChangedPropsArray>,
      <DeletedPropsArray>)

```

```

      <PropServersArray>

```

```

Array("Name:PropServers", <PropServer>,

```

<PropServer>, ...)

<NewPropArray>

Array("Name:NewProp", <PropDataArray>,

<PropDataArray>,...)

<ChangedPropsArray>

Array("Name:ChangedProps",<PropDataArray>,

<PropDataArray>, ...)

<DeletedPropsArray>

Array("Name:DeletedProps", <PropName>,

<PropName>, ...)

OR (for PropDisplay deletions only)

Array("Name:DeletedProps",<PropDataArray>,

<PropDataArray>, ...)

<PropDataArray>

Array("NAME:<PropName>",

```
"PropType:=", <PropType>,  
"NewName:=", <string>,  
"Description:=", <string>,  
"Callback:=", <string>,  
"NewRowPosition:=", <int>,  
"ReadOnly:=", <bool>,  
"Hidden:=", <bool>,  
<PropTypeSpecificArgs>)OR (for PropDisplays only)  
Array("Name:<PropName>",<PropDisplayData>)
```

<PropDisplayData>

for adding, changing, deleting PropDisplays

<PropDisplayAttributes>

for changing PropDisplays only

<PropDisplayNewAttributes>

<PropDisplayAttributes>

Layer & Location only used for PropDisplays in layout

For adding PropDisplays, this will add a single PropDisplay with attributes as shown; if an attribute is missing, a default value will be assigned. Adding PropDisplay to schematic with attributes that are identical to one already existing there will fail without an error message.

For deleting PropDisplays, these attributes are used to identify an existing PropDisplay to delete. If there doesn't exist a PropDisplay that matches the given attributes, then nothing will be deleted. If multiple PropDisplays match the given attributes, then all of them will be deleted. If an attribute is missing, then all PropDisplays match that missing attribute. For example, if Layer is missing, then PropDisplays on all layers that match the remaining given attributes will be deleted.

For changing PropDisplays, these attributes are used to identify an existing PropDisplay to change. If no PropDisplay matching the attributes is found, no changes will be made. If multiple PropDisplays match the attributes, all of them will be changed. If an attribute is missing, it matches all PropDisplays. For example, to change the format of PropDisplays that are on the bottom, but have any layer, style or format to show the name only, this command should have Location set to "Bottom" and all other attributes omitted.

"Format:=", <PropDisplayType>,

"Location:=", <PropDisplayLocation>,

"Layer:=", <string>,

"Style:=", <string>

<PropDisplayNewAttributes>

NewLayer & NewLocation only used for PropDisplays in layout

For changing PropDisplays, these attributes are used to identify which attributes to change and what the new value is. If the attribute should not be changed, the corresponding entry should be omitted.

"NewName:=", <string>,

"NewFormat:=", <PropDisplayType>,

"NewLocation:=", <PropDisplayLocation>,

"NewLayer:=", <string>,

"NewStyle:=", <string>

<PropDisplayType>

Type: string

Identifies the format of PropDisplay.

"Name"

"Value"

"NameAndValue"

"EvaluatedValue"

"NameAndEvaluatedValue"

<PropDisplayLocation>

Type: string

Identifies where PropDisplay is located with respect to object

"Left"

"Top"

"Right"

"Bottom"

"Custom"

<PropType>

Type: string

Identifies the type of property when a new property is added. In Circuit, only separator properties and variable properties can be added.

"SeparatorProp"

"VariableProp"

"TextProp"

"NumberProp"

"ValueProp"

"CheckboxProp"

"MenuProp"

"PointProp"

"VPointProp"

"ButtonProp"

newName

Specify the new name of a property if the property's name is being edited. In Circuit, the name can only be changed for separators and variables.

Description

Specify a description of the property. In Circuit, the description can only be changed for separators and variables.

Callback

Specify the name of the script callback to be run when the property value is changed.

NewRowPosition

Used to reorder rows in the **Property** dialog box. In Circuit, this only applies to the **Project>Project Variables** panel and the **Designer>DesignProperties** panel. Specify the new zero-based row index of the variable or separator.

ReadOnly

Used to mark a property as "read only" so it can not be modified. In Circuit, this flag can only be set for variables and separators.

Hidden

Used to hide a property so it can not be viewed outside of the **Property** dialog box. In Circuit, this flag can only be set for variables and separators.

<PropTypeSpecificArgs>

SeparatorProp: no arguments

TextProp: "Value:=", <string>

NumberProp: "Value:=", <double>

ValueProp: "Value:=", <value>

CheckboxProp: "Value:=", <bool>

MenuProp: "Value:=", <string>

PointProp "X:=", <double>, "Y:=", <double>

VPointProp: "X:=", <value>, "Y:=", <value>

Material Button: "Material:=", <string>

Color Button: "R:=", <int>, "G:=", <int>, "B:=", <int>

Transparency Button: "Value:=", <double>

<PropTypeSpecificArgs> for MenuProps

Syntax for NewProps array: "AllChoices:=",

<"choice1,choice2,..."> or <Array("choice1" "choice2", ...)>,

"Value:=", <string>

Syntax for ChangedProps array: "Value:=", <string>

<PropTypeSpecificArgs> for VariableProps

Syntax:

"Value:=", <value>, <OptimizationFlagsArray>,

<TuningFlagsArray>, <SensitivityFlagsArray>,

<StatisticsFlagsArray>

Parameters:

<OptimizationFlagsArray>

Array("NAME:Optimization",

```
"Included:=", <bool>,  
"Min:=", <value>,  
"Max:=", <value>)
```

<TuningFlagsArray>

```
Array("NAME:Tuning",  
"Included:=", <bool>,  
"Step:=", <value>,  
"Min:=", <value>,  
"Max:=", <value>)
```

<SensitivityFlagsArray>

```
Array("NAME:Sensitivity",  
"Included:=", <bool>,  
"Min:=", <value>,  
"Max:=", <value>,  
"IDisp:=", <value> )
```

<StatisticsFlagsArray>

```
Array("NAME:Statistical",  
"Included:=", <bool>,  
"Dist:=", <Distribution>,
```

"StdD:=", <value>,

"Min:=", <value>,

"Max:=", <value>,

"Tol:=", <string>)

<Distribution>

Type: string

Value should be **"Gaussian"** or **"Uniform"**

StdD

Standard deviation.

Min

Low cut-off for the distribution.

Max

High cut-off for the distribution.

Tol

Tolerance for uniform distributions. Format is "<int>%".

Example: "20%".

CloneMaterial

Clones a local material.

UI Access	N/A		
Parameters	Name	Type	Description
	<matName>	String	Name of existing material.
	<newName>	String	Name for newly cloned material.
Return Value	Boolean: • 1 - Material is cloned. • 0 - Existing material not found or a conflict with the new material name.		

Python Syntax	CloneMaterial (<matName>, <newName>)
Python Example	oDefinitionManager.CloneMaterial ("copper1", "copper3")

DeleteDataset

Deletes a specified dataset. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Remove.		
Parameters	Name	Type	Description
	<DatasetName>	String	Name of the dataset found in the project.

Return Value	None.

Python Syntax	DeleteDataset (<DatasetName>)
Python Example	<pre>oProject.DeleteDataset('\$ds1') oDesign.DeleteDataset('\$ds1')</pre>

DoesMaterialExist

Checks for the presence of a material in the library by name

UI Access	None.		
Parameters	Name	Type	Description
	<MaterialName>	<String>	Name of the material to search for in the material database
Return Value	Boolean: • True – specified material exists. • False – specified material does not exist.		

Python Syntax	DoesMaterialExist(<MaterialName>)
Python Example	<pre>oDefinitionManager.DoesMaterialExist("modified_epoxy")</pre>

Edit [component manager]

Modifies an existing component

Command: Tools > Edit Configured Libraries > Components > Edit Component

Syntax: Edit <ComponentName>,

```
    Array("NAME:<NewComponentName>",  
    "Info:=", <ComponentInfo>,  
    "RefBase:=", <string>, // reference designator  
    "NumParts:=", <int>, // parts per component  
    "OriginalComponent:=", <string>  
    "Terminal:=", <TerminalInfo>,  
    "Terminal:=", <TerminalInfo>, ...  
    // The remaining parameters are optional  
    Array("NAME:Parameters", // any combo of the following  
    "VariableProp:=", <VariableInfo>,  
    "CheckboxProp:=", <CheckBoxInfo>,  
    "ButtonProp:=", <ButtonInfo>,  
    "TextProp:=", <TextInfo>,  
    "NumberProp:=", <NumberInfo>,  
    "SeparatorProp:=", <SeparatorInfo>,  
    "ValueProp:=", <ValueInfo>,  
    "MenuProp:=", <MenuInfo>),
```

```
Array("NAME:Properties", // any combo of the following
"CheckboxProp:=", <CheckBoxInfo>,
"TextProp:=", <TextInfo>,
"NumberProp:=", <NumberInfo>,
"SeparatorProp:=", <SeparatorInfo>,
"ValueProp:=", <ValueInfo>,
"MenuProp:=", <MenuInfo>),
"VPointProp:=", <VPointInfo>,
"PointProp:=", <PointInfo>),
Array("Quantities",
"QuantityProp:=", <QuantityPropInfo>...),
Array("NAME:CosimDefinitions",
<CosimDefInfo>,
<CosimDefInfo>...)
```

Return Value: <string>

```
// composite name of the component.
// If the name requested conflicts with the name of an existing
// component, the requested name is altered to be unique.
// The name returned reflects any change made to be unique.
```


Parameters: <ComponentName>:

<string> // composite name of the component to edit

<NewComponentName>:

<string> // new simple name for the component

<ComponentInfo>:

Array("Type:=", <TypeInfo>,

"NumTerminals:=", <int>,

"DataSource:=", <string>,

"ModifiedOn:=", <ModifiedOnInfo>,

"Manufacturer:=", "<string>,"

"Symbol:=", <string>,"

"Footprint:=", <string>,"

"Description:=", <string>,"

"InfoTopic:=", <string>,"

"InfoHelpFile:=", <string>,"

"IconFile:=", <string>,"

"LibraryName:=", <string>,"

"OriginalLocation:=", <string>, // Project Location

"Author:=", <string>,"

"OriginalAuthor:=", <string>,

"CreationDate:= ", <int>)

<TypeInfo>:

An integer that is the or-ing of bits for each product listed below. The default setting is 0xffffffff (4294967295) which indicates valid for all products. In the component editing dialog, checking different boxes in the "Specify products for which this component is valid" grid control sets specific flags that correspond to the following hex/decimal settings:

Nexxim -- 100 binary, 4 decimal, 0x4

SlwaveDeNovo -- 1000 binary, 8 decimal, 0x8

Simplorer -- 10000 binary, 16 decimal, 0x10

MaxwellCircuit -- 100000 binary, 32 decimal, 0x20

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<TerminalInfo>:

Array(<string>, // symbol pin

<string> // footprint pin

<string >, // gate name

<bool>, // shared

<int>, // equivalence number

<int>, // what to do if unconnected: flag as error:0, ignore:1

<string>, // description

<Nature>)

<Nature>:

<string> // content varies as follows

Nexxim/Circuit:

"Electrical" // the only choice

Simplorer:

// several choices

"Electrical", "Magnetic", "Fluidic", "Translational",

"Translational_V", "Rotational", "Rotational_V",

""Radiant", "Thermal", or <VHDLPackageName>

<VHDLPackageName>:

<string> // in the form <Library>.<Package>

<Library>:

<string> // name of the VHDL library

<Package>:

<string> // name of the VHDL package

<VariableInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>) // value: number, variable, or expression

<FlagLetters>:

<string> // "D" - has description parameter,

// "RD" - readonly & has description parameter,

// or "RHD" - readonly, hidden, & has description parameter

<CheckBoxInfo>:

Array(<string>, // name

```
<FlagLetters>,  
<string>, // description  
"CB:=", <string>, // optional - script for call back  
<bool>) // value: true or false
```

```
<ButtonInfo>:  
Array(<string>, // name  
<FlagLetters>,  
<string>, // description  
<string>, // button title  
<string>, // extra text  
<ClientID>,  
"ButtonPropClientData:= ", <ClientDataArray>)
```

```
<ClientID>:  
<int> // specifies Button Prop Client  
// 0 - unknown, "ButtonPropClientData  
// array will be empty  
// 1 - Netlist Prop Client  
// 2 - not used  
// 3 - File Name Prop Client
```

<ClientDataArray>:

varies with <ClientID>

<ClientID> is 0 or 1: empty array

Array()

<ClientID> is 3:

Array("InternalFormatText:=", "<prefix><RelativePath>")

<prefix>:

<string> // "<Project>", "<PersonalLib>", "<UserLib>", or "<SysLib>"

<RelativePath>:

<string> // relative path to file from <prefix>

<TextInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back
<string>) // value: a text string

<NumberInfo>:

Array(<string>, // name
<FlagLetters>,
<string>, // description
"CB:=", <string>, // optional - script for call back
<real>, // value: a number
<string>) // units

<SeparatorInfo>:

Array(<string>, // name
<FlagLetters>,
<string>, // description
"CB:=", <string>, // optional - script for call back
<string>) // value: a text string

<ValueInfo>:

Array(<string>, // name
<FlagLetters>,
<string>, // description

"CB:=", <string>, // optional - script for call back
<string>) // value: a number, variable or expression

<MenuPropInfo>:
Array(<string>, // name
<FlagLetters>,
<string>, // description
<string>, // menu choices - separated by commas
<int>) // 0 based index of current menu choice

<VPointInfo>:
Array(<string>, // name
<FlagLetters>,
<string>, // description
"CB:=", <string>, // optional - script for call back
<string>, // x value: number with length units
<string>) // y value: number with length units

<PointInfo>:
Array(<string>, // name
<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<real>, // x value

<real>) // y value

<QuantityPropInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

<string>, // value

<TypeString>,

<TypeStringDependentInfo>)

<TypeString>:

<string> // "Across", "Through", or "Free"

<TypeStringDependentInfo>:

"Free" :

<string>, // direction: "In", "Out", "InOut", or "DontCare"

// Following <string> is not present if direction is "DontCare"

```
<string> // when to calculate: "BeforeAnalogSolver",  
// "BeforeStateGraph", "AfterStateGraph", or "DontCareWhen"
```

"Across" or "Through"

```
<int>, // terminal 1
```

```
<int> // terminal 2
```

```
<CosimDefInfo>:
```

```
Array("NAME:CosimDefinition",
```

```
"CosimulatorType:=", <int>,
```

```
"CosimDefName:=", <string> // "HFSS3D", "Circuit",
```

```
// "Custom", or "Netlist"
```

```
"IsDefinition:=", <bool>,
```

```
final array member(s) vary with CosimDefName)
```

final array members for HFSS 3D Layout:

```
"CosimStackup:=", <string>,
```

```
"CosimDmbedRatio:=", <int>
```

final array members for Circuit:

```
"ExportAsNport:=", <int>,
```

"UsePjt:=", <int>

final array member for Custom:

"DefinitionCompName:=", <string>

final array member for Netlist:

"NetlistString:=", <string>

Python Syntax	<pre> Edit <ComponentName>, ["NAME:<NewComponentName>", "Info:=", <ComponentInfo>, "RefBase:=", <string>, // reference designator "NumParts:=", <int>, // parts per component "OriginalComponent:=", <string> "Terminal:=", <TerminalInfo>, "Terminal:=", <TerminalInfo>, ... #The remaining parameters are optional ["NAME:Parameters", // any combo of the following "VariableProp:=", <VariableInfo>, "CheckboxProp:=", <CheckBoxInfo>, "ButtonProp:=", <ButtonInfo>, "TextProp:=", <TextInfo>, </pre>

	<pre> "NumberProp:=", <NumberInfo>, "SeparatorProp:=", <SeparatorInfo>, "ValueProp:=", <ValueInfo>, "MenuProp:=", <MenuInfo>], ["NAME:Properties", # any combo of the following "CheckboxProp:=", <CheckBoxInfo>, "TextProp:=", <TextInfo>, "NumberProp:=", <NumberInfo>, "SeparatorProp:=", <SeparatorInfo>, "ValueProp:=", <ValueInfo>, "MenuProp:=", <MenuInfo>), "VPointProp:=", <VPointInfo>, "PointProp:=", <PointInfo>), ["Quantities", "QuantityProp:=", <QuantityPropInfo>...], ["NAME:CosimDefinitions", <CosimDefInfo>, <CosimDefInfo>...]) </pre>
Python Example	<pre> name = oComponentManager.Edit ("Simplorer Circuit Elements\BJTs:Level01_NPN", _ ["NAME:Level01_NPN", "Info:=", ["Type:=", 4294901764,_ </pre>

```

"NumTerminals:=", 3, "DataSource:=", "Ansoft built-in component", _
"ModifiedOn:=", 1152722112, "Manufacturer:=", "", _
"Symbol:=", "nexx_bjt_npn", "Footprint:=", "", _
"Description:=", "BJT, GP, NPN", "InfoTopic:=", "NXBJT1.htm", _
"InfoHelpFile:=", "nexximcomponents.chm", "IconFile:=", "bjtsn.bmp", _
"Library:=", "Nexxim Circuit Elements\BJTs", _
"OriginalLocation:=", "SysLibrary ", "Author:=", "", _
"OriginalAuthor:=", "", "CreationDate:=", 1152722102], _
"Refbase:=", "Q", "NumParts:=", 1, "Terminal:=", ["collector", _
"collector", "A", false, 6, 0, "", "Electrical"], _
"Terminal:=", ["base", "base", "A", false, _
7, 0, "", "Electrical"], "Terminal:=", ["emitter", _
"emitter", "A", false, 8, 0, "", "Electrical"], _
["NAME:Parameters", "TextProp:=", ["LabelID", _
"HD", "Property string for netlist ID", _
"Q@ID"], "TextProp:=", ["MOD", "D", _
"Name of model data reference", "required"], _
"VariableProp:=", ["AREA", "D", _
"Emitter area multiplying factor, which affects
currents, resistances, and capacitances", "1"], _

```

	<pre> "VariableProp:=", ["AREAB", "D", "Base AREA", _ "1"], "VariableProp:=", ["AREAC", "D", "Collector AREA", _ "1"], "VariableProp:=", ["DTEMP", "D", _ "The difference between element and circuit temperature (deg Cel)", _ "0"], "VariableProp:=", ["M", "D", _ "Multiplier factor to simulate multiple BJTs in parallel", _ "1"], "ButtonProp:=", ["NexximNetlist", "HD", "", _ "Q@ID %0 %1 %2 *MOD(@MOD) *AREA (AREA=@AREA) "& _ " *AREAB (AREAB=@AREAB) *AREAC (AREAC=@" & _ "AREAC) *DTEMP (DTEMP=@DTEMP) *M (M=@M) ", _ "Q@ID %0 %1 %2 *MOD(@MOD) " & "*AREA (AREA=@AREA) *AREAB (AREAB=@AREAB) *AREAC (AREAC=@" & _ "AREAC) *DTEMP (DTEMP=@DTEMP) *M (M=@M) ", 1, _ "ButtonPropClientData:=", [], "TextProp:=", ["ModelName", "HD", "", "Q"]]]) </pre>
Python Example 2	<pre> name2 = oComponentManager.Edit ("MyComponent",_ (["NAME:MyOtherComponent","Info:=", ["Type:=", 4294901767, _ </pre>

```

"NumTerminals:=", 2, "DataSource:=", "", _

"ModifiedOn:=", 1071096503, "Manufacturer:=", "Ansoft", _

"Symbol:=", "bendo", "Footprint:=", "BENDO", _

"Description:=", "", "InfoTopic:=", "", _

"InfoHelpFile:=", "", "IconFile:=", "", _

"LibraryName:=", "", "OriginalLocation:=", "Project", _

"Author:=", "", "OriginalAuthor:=", "", _

"CreationDate:= ", 1147460679], "Refbase:=", "U", _

"NumParts:=", 1, "OriginalComponent:=", "", _

"Terminal:=", ["n1", "n1", "A", false, 0, 0, "", _

```

```
"Electrical"], "Terminal:=", ["n2", "n2", "A", _  
  
false, 1, 0, "", Electrical"], ["NAME:Parameters", _  
  
"MenuProp:=", ["CoSimulator", "D", "", _  
  
"Default,Custom,Netlist", 0], "ButtonProp:=", ["CosimDefinition", _  
  
"D", "", "", "Edit", 0, "ButtonPropClientData:=", []], _  
  
["NAME:CosimDefinitions", ["NAME:CosimDefinition", _  
  
"CosimulatorType:=", 0, "CosimDefName:=", "HFSS3D", _  
  
"IsDefinition:=", true, "CosimStackup:=", "Layout stackup", _  
  
"CosimDmbedRatio:=", 3], ["NAME:CosimDefinition", _
```



```

"CosimulatorType:=", 1, "CosimDefName:=", "", _

"IsDefinition:=", true, "ExportAsNport:=", 0, _

"UsePjt:=", 0], ["NAME:CosimDefinition", _

"CosimulatorType:=", 2, "CosimDefName:=", "Custom", _

"IsDefinition:=", true, "DefinitionCompName:=", ""], _

["NAME:CosimDefinition", "CosimulatorType:=", 3, _

"CosimDefName:=", "Netlist", "IsDefinition:=", true, _

"NetlistString:=", ""]]])

```

EditDataset

Modifies a dataset. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Edit.		
Parameters	Name	Type	Description
	<OriginalName>	String	Name of the original dataset.
	<DatasetdataArray>	Array	Data for the modified dataset.
Return Value	None.		

Python Syntax	EditDataset (<OriginalName> <DatasetdataArray>)
Python Example	<pre>oProject.EditDataset ("ds1" ["NAME:ds2", ["NAME:Coordinates", ["NAME:Coordinate", "X:=", 1, "Y:=", 2], ["NAME:Coordinate", "X:=", 3, "Y:=", 4]]])</pre>

```
)
oDesign.EditDataset ("ds1"
["NAME:ds2",
  ["NAME:Coordinates",
    [
      "NAME:Coordinate",
      "X:=", 1, "Y:=", 2
    ],
    [
      "NAME:Coordinate",
      "X:=", 3, "Y:=", 4
    ]
  ]
]
)
```

EditMaterial

Modifies an existing material.

UI Access	View/Edit Materials command in the material editor		
Parameters	Name	Type	Description
	<OriginalName>	String	Name of the material before editing.

	<code><MatProperties></code>	Array	Structured array containing material properties: ["NAME:<New material name>", "CoordinateSystemType:=", <string>, "BulkOrSurfaceType:=" , <integer>, ["NAME:PhysicsTypes", "set:=" , <array containing string physics types>], <Optional ModifierDataArray>, "permeability:=" , <string containing value>, "conductivity:=" , <string containing value>, "thermal_conductivity:=", <string containing value>, "mass_density:=" , <string containing value>, "specific_heat:=" , <string containing value>, "youngs_modulus:=" , <string containing value>, "poissons_ratio:=" , <string containing value>, "thermal_expansion_coefficient:=", <string containing value>]]
	<code><Modi-</code>	Array	Optional structured array containing thermal or spatial modifiers:

	<code>fierDataArray></code>		<pre> ["NAME:ModifierData", ["NAME:<ThermalModifierData or SpatialModifierData>", "modifier_data:=" , <"thermal_modifier_data" or "spa- tial_modifier_data">, ["NAME:<all_thermal_modifiers or all_spatial_mod- ifiers>", ["NAME:<modifierName>", "Property::=" , <string property being mod- ified>, "Index::=" , <integer>, "prop_modifier:=" , <"thermal_modifier" or "spa- tial_modifier">, "use_free_form:=" , <Boolean>, "free_form_value:=" , <string modifier value>,]]]] </pre>
Return Value	None.		

Python Syntax	EditMaterial (<OriginalName>, <MatProperties>)
Python Example	Without Modifiers: <pre>oDefinitionManager.EditMaterial("alumina_92pct", ["NAME:alumina_92pct", "CoordinateSystemType:=" , "Cartesian", "BulkOrSurfaceType:=" , 1, ["NAME:PhysicsTypes", "set:=" , ["Electromagnetic","Thermal","Structural"]], "permittivity:=" , "9.3", "dielectric_loss_tangent:=" , "0.008", "thermal_conductivity:=" , "26", "mass_density:=" , "3720", "specific_heat:=" , "790", "youngs_modulus:=" , "267000000000", "poissons_ratio:=" , "0.26",</pre>

```

    "thermal_expansion_coefficient:=", "7.2e-006"
]
)

With Thermal Modifier:

oDefinitionManager.EditMaterial("copper",
[
    "NAME:copper",
    "CoordinateSystemType:=", "Cartesian",
    "BulkOrSurfaceType:=" , 1,
    [
        "NAME:PhysicsTypes",
        "set:=" , ["Electromagnetic","Thermal","Structural"]
    ],
    [
        "NAME:ModifierData",
        [
            "NAME:ThermalModifierData",
            "modifier_data:=" , "thermal_modifier_data",
            [
                "NAME:all_thermal_modifiers",
                [

```

```
        "NAME:one_thermal_modifier",
        "Property:=" , "permittivity",
        "Index:=" , 0,
        "prop_modifier:=" , "thermal_modifier",
        "use_free_form:=" , True,
        "free_form_value:=" , "if(Temp > 1000cel, 1, if(Temp < -273.15cel, 1, 1))"
    ]
]
],
"permeability:=" , "0.999991",
"conductivity:=" , "58000000",
"thermal_conductivity:=" , "400",
"mass_density:=" , "8933",
"specific_heat:=" , "385",
"youngs_modulus:=" , "120000000000",
"poissons_ratio:=" , "0.38",
"thermal_expansion_coefficient:=" , "1.77e-05"
])
```

Transient Solve, Non-linear Drude Data Plasma


```
import ScriptEnv

ScriptEnv.Initialize("Ansoft.ElectronicsDesktop")

oDesktop.RestoreWindow()

oProject = oDesktop.SetActiveProject("Drude_plasma_parameters_r231")
oDefinitionManager = oProject.GetDefinitionManager()
oDefinitionManager.EditMaterial("Drude",

[
    "NAME:Drude",
    "CoordinateSystemType:=", "Cartesian",
    "BulkOrSurfaceType:="    , 1,
    [
        "NAME:PhysicsTypes",
        "set:="                , ["Electromagnetic"]
    ],
    [
        "NAME:AttachedData",
        [
            "NAME:MatNonLinearDrudeFreqDepData",
            "property_data:="    , "nonlinear_drude_data",
            "EpsilonInfinity:="  , "1",
            "PlasmaFrequency:="  , "4.62348462366278GHz",
```

	<pre>"CollisionFrequency:=" , "0.00054491190162662GHz", "FieldBreakdown:=" , "10000V_per_meter", "PlasmaMaintainFrequency:=", "2.31174231183139GHz", "NeutralDensity:=" , 2.65164580488373E+20, "ElectronDensity:=" , 2.65164580488373E+17, "CollisionRateConstant:=", 2.05499505485618E-15]]])</pre>

Edit [padstack manager]

Use: Edit an existing padstack.

Command: Tools > Edit Configured Libraries > Padstacks > Edit Padstack

Syntax: Edit <PadstackName>,

```
    Array("NAME:<NewPadstackName>",  
    "ModTime:=", <ModifiedOnInfo>,  
    "Library:=", "", // name of the library  
    "LibLocation:=", "Project", // location of the named library  
    Array("NAME:psd",  
    "nam:=", <PadstackName>,
```

```
"lib:=", "", // name of the library
"mat:=", "", // hole plating material
"plt:=", "0", // percent of hole's radius filled by plating
Array("NAME:pds",
<LayerGeometryArray>,
<LayerGeometryArray....>,
"hle:=", <PadInfo>
"hRg:=", <HoleRange>,
"sbsh:=", <SolderballShape>,
"sbpl:=", <SolderballPlacement>,
"sbr:=", <string>, // solderball diameter, real with units
"sb2:=", <string>, // solderball mid diameter, real with units
"sbn:=", <string>), // name of solderball material
"ppl:=", <PadPortLayerArray>)
```

Return Value: <string> // composite name of the padstack

// If the name requested conflicts with the name of an existing

// padstack, the requested name is altered to be unique.

// The name returned reflects any change made to be unique.

Parameters: <PadstackName>:

<string> // composite name of padstack to edit

<NewPadstackName>:

<string> // new simple name for padstack

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<LayerGeometryArray>:

Array("Name:lgm",

"lay:=", <string>, // definition layer name

"id:=", <int>, // definition layer id

"pad:=", <PadInfo>, // pad

"ant:=", <PadInfo>, // antipad

"thm:=", <PadInfo>, // thermal pad

"X:=", <string>, // pad x connection, real with units

"Y:=", <string>, // pad y connection, real with units

"dir:=", <DirectionString>) // pad connection direction

<PadInfo>:

```
Array("shp:=", <PadShape>,  
"Szs:=", <DimensionArray>,  
"X:=", <string>, // x offset, real with units  
"Y:=", <string>, // y offset, real with units  
"R:=", <string>) // rotation, real with units
```

<PadShape>:

<string> one of these choices

"No" // no pad

"Cir" // Circle

"Sq" // Square

"Rct" // Rectangle

"Ov" // Oval

"Blt" // Bullet

"Ply" // Polygons

"R45" // Round 45 thermal

"R90" // Round 90 thermal

"S45" // Square 45 thermal

"S90" // Square 90 thermal

<DimensionArray>:

Array(<string>, ...) // each string is a real with units for one of the
// dimensions of the shape

<DirectionString>:

<string> one of these choices

"No" // no direction

"Any" // any direction

"0" // 0 degrees

"45" // 45 degrees

"90" // 90 degrees

"135" // 135 degrees

"180" // 180 degrees

"225" // 225 degrees

"270" // 270 degrees

"315" // 315 degrees

<HoleRange>:

<string> one of these choices

"Thr" // through all layout layers

"Beg" // from upper pad layer to lowest layout layer

"End" // from upper layout layer to lowest pad layer

"UTL" // from upper pad layer to lowest pad layer

<SolderballShape>:

<string> one of these choices

"None" // no solderball

"Cyl" // cylinder solderball

"Sph" // spheroid solderball

<SolderballPlacement>:

<string> one of these choices

"abv" // above padstack

"blw" // below padstack

<PadPortLayerArray>:

Array(<int>, <int>,....) where each int is a layer id

ExportDataset

Exports a dataset to a named file. This can be executed by the oProject, or oDesign variables.

UI Access	Project > Datasets > Export.		
Parameters	Name	Type	Description
	<datasetFileFullPath>	String	The full path to the file.
Return Value	None.		

Python Syntax	<code>ExportDataset (<datasetFilePath>)</code>
Python Example	<pre>oProject.ExportDataset('e:/tmp/dsdata.txt') oDesign.ExportDataset('e:/tmp/dsdata.txt')</pre>

Export [footprint manager]

Use: Export a footprint to a library

Command: Tools > Edit Configured Libraries > Footprints > Export to Library

Syntax: Export Array("NAME:<LibraryName>",

 <FootprintName>,

 <FootprintName>...),

 <LibraryLocation>

Return Value: None

Parameters: <LibraryName>:

 <string> // name of the library

 <FootprintName>:

 <string> // composite name of footprint to export

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

ExportMaterial

Exports a local material to a library.

UI Access	Export to Library command in the material editor.		
Parameters	Name	Type	Description
	<ExportData>	Array	["NAME:<LibraryName>", <MaterialName>, <MaterialName>, ...]
	<LibraryName>	String	Name of the exported library.
	<MaterialName>	String	Name of the material to be exported.
	<LibraryLocation>	String	Location to save the library. Only "PersonalLib" and "UserLib" are allowed.
Return Value	None.		

Python Syntax	ExportMaterial (<ExportData>, <LibraryLocation>)
Python Example	oDefinitionManager.ExportMaterial (["NAME:mylib",_ "Material1", "Material2", "Material3"], "PersonalLib")

Export [padstack manager]

Use: Export a padstack to a library

Command: Tools > Edit Configured Libraries > Padstacks > Export to Library

Syntax: Export Array("NAME:<LibraryName>",
 <PadstackName>,
 <PadstackName>...),
 <LibraryLocation>

Return Value: None

Parameters: <LibraryName>:

<string> // name of the library

<PadstackName>:

<string> // simple name of padstack to export

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

ExportScript

Use: Export to Library in the script definition manager

Command: None

Syntax: ExportScript <ExportData>,<Library location>

Return Value: None

Parameters: <ExportData>

Array("NAME:<LibraryName>", <ScriptName>, <ScriptName>, ...)

Python Syntax	ExportScript(<ExportData>, <Library location>)
Python Example	<pre>oProject.ExportComponent (["NAME:mylib", "myscript"], "PersonalLib")</pre>

Export [symbol manager]

Use: Exports symbol(s) to a library

Command: Tools > Edit Configured Libraries > Symbols > Export to Library

Syntax: Export Array("NAME:<LibraryName>",

<SymbolName>,
<SymbolName>...),
<LibraryLocation>

Return Value: None

Parameters: <LibraryName>:

<string> // name of the library

<SymbolName>:

<string> // composite name of symbol to export

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

GetProjextMaterialNames

Returns the material names belonging to an active Project.

UI Access	N/A		
Parameters	Name	Type	Description
	None		
Return Value	String names of the materials in the active project.		

Python Syntax	GetProjectMaterialNames()
Python Example	<pre>oProject = oDesktop.GetActiveProject() oDefinitionManager = oProject.GetDefinitionManager() materials = oDefinitionManager.GetProjectMaterialNames() AddWarningMessage(str(materials))</pre>

GetPropertyValue

Returns the value of a single property belonging to a specific `<PropServer>` and `<PropTab>`. This function is available with the Project, Design or Editor objects, including definition editors.

Tip: Use the script recording feature and edit a property, and then view the resulting script to see the format for that property.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><PropTab></code>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults") - LocalVariableTab ("Variables" or "Local Variables") - ProjectVariableTab ("Project variables") - ConstantsTab ("Constants") - BaseElementTab ("Symbol" or "Footprint") - ComponentTab ("General") - Component("Component") - CustomTab ("Intrinsic Variables") - Quantities ("Quantities") - Signals ("Signals")
	<code><PropServer></code>	String	An object identifier, generally returned from another script method, such as <code>CompInst@R;2;3</code>
	<code><PropName></code>	String	Name of the property.
Return Value	String value of the property.		

Python Syntax	GetPropertyValue (<PropTab>, <PropServer>, <PropName>)
Python Example	<pre>selectionArray = oEditor.GetSelections() for k in selectionArray: val = oEditor.GetPropertyValue("PassedParameterTab", k, "R") ...</pre>

ImportDataset

Imports a dataset from a named file. This can be executed by the oProject, or oDesign variables. The name of the dataset is file-name+index number (e.g., dsdata1) unless the filename ends with a trailing number. When there is a trailing number at the end, we will remove the number and use first unused index. Alternatively, the name of the dataset can be explicitly defined by providing a string as an optional second argument.

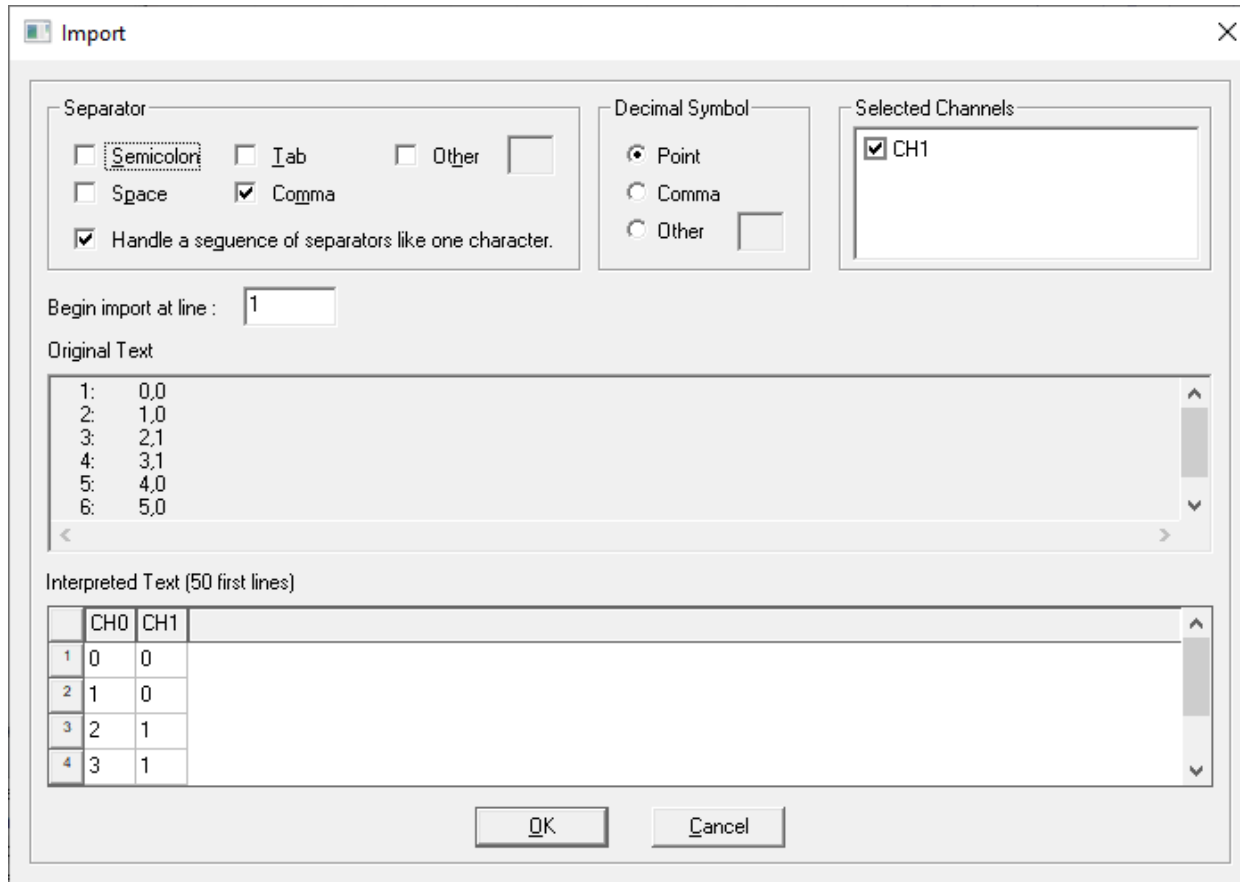
UI Access	Project > Datasets > Import.		
Parameters	Name	Type	Description
	<datasetFilePath>	String	The full path to the file containing the dataset values. *.tab files recommended (see note below).
	<optionalDatasetName>	String	Optional. User-defined dataset name.
Return Value	None.		

Python Syntax	<code>ImportDataset (<datasetFilePath>,<optionalDatasetName>)</code>
Python Example	<pre>oProject.ImportDataset('e:\tmp\dsdata.tab') oDesign.ImportDataset('e:\tmp\dsdata.tab') oProject.ImportDataset('e:\tmp\dsdata.tab', 'MyDatasetName') oDesign.ImportDataset('e:\tmp\dsdata.tab', 'MyDatasetName')</pre>

Note About File Types:

Tab-delimited or space-delimited files with the extension *.tab are the recommended file type. When using ImportDataset at the Design level, *.tab is the only file type supported.

At the Project level, other file types are supported (for example, *.csv). However, after calling the command, you must configure the file import format manually through the Electronics Desktop GUI by selecting **Project > Datasets** and clicking **Import**.



Remove [component manager]

Remove a component from a library

Command: Tools > Edit Configured Libraries > Components > Remove Component

Syntax: Remove <ComponentName>,

 <IsProjectComponent>,

 <LibraryName>,

 <LibraryLocation>

Return Value: None

Parameters: <ComponentName>:

 <string> // composite name of the component to remove

 <IsProjectComponent>:

 <bool>

 <LibraryName>:

 <string> // name of the library

 <LibraryLocation>:

 <string> // location of the library in <LibraryName>

 // One of "Project", "PersonalLib", or "UserLib"

Python Syntax	Remove (<ComponentName>, <IsProjectComponent>, <LibraryName>, <LibraryLocation>)
Python Example	oComponentManager.Remove ("Simplorer Circuit

	<code>Elements\BJTs:Level01_NPN", _ true, "Project")</code>

Remove [footprint manager]

Use: Removes a footprint from a library

Command: Tools > Edit Configured Libraries > Footprints > Remove Footprint

Syntax: Remove <FootprintName>,

 <IsProjectFootprint>,

 <LibraryName>,

 <LibraryLocation>

Return Value: None

Parameters: <FootprintName>:

 <string> // composite name of the footprint to remove

 <IsProjectFootprint>:

 <bool>

 <LibraryName>:

 <string> // name of the library

 <LibraryLocation>:

 <string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

RemoveMaterial

Removes a material from a library.

UI Access	Remove Material(s) command in the material editor		
Parameters	Name	Type	Description
	<MaterialName>	String	Name of the material to be removed.
	<IsProjectMaterial>	Boolean	If True, Q3D Extractor assumes the material is a project material. The last two parameters will be ignored. If False, the material is not a project material.
	<LibraryName>	String	Name of the user or personal library where the material resides.
	<LibraryLocation>	String	Location of library. Valid options:"UserLib" or "PersonalLib".
Return Value	None.		

Python Syntax	RemoveMaterial (<MaterialName>, <IsProjectMaterial>, <LibraryName>, <LibraryLocation>)
Python Example	oDefinitionManager.RemoveMaterial (["Material1", false, "mo0907","UserLib"])

Remove [padstack manager]

Use: Removes a padstack from a library

Command: Tools > Edit Configured Libraries > Padstacks > Remove Padstacks

Syntax: Remove <PadstackName>,

 <IsProjectPadstack>,

 <LibraryName>,

 <LibraryLocation>

Return Value: None

Parameters: <PadstackName>:

 <string> // simple name of the padstack to remove

 <IsProjectPadstack>:

 <bool>

 <LibraryName>:

 <string> // name of the library

 <LibraryLocation>:

 <string> // location of the library in <LibraryName>

 // One of "Project", "PersonalLib", or "UserLib"

RemoveScript

Use: Remove Script in the script definition manager

Command: None

Syntax: RemoveScript <ScriptName>,<IsProjectScript>, <LibraryName>,<LibraryLocation>

Return Value: None

Parameters: <ScriptName>

Type: <string>

<IsProjectScript>

Type: <bool>

<LibraryName>

Type: <string>

<LibraryLocation>

Type: <string>

Python Syntax	RemoveScript (<ScriptName>,<IsProjectScript>, <LibraryName>,<LibraryLocation>)
Python Example	oDefinitionManager.RemoveScript ("myscript", true, "Local", "Project")

Remove [symbol manager]

Use: Removes a symbol from a library

Command: Tools > Edit Configured Libraries > Symbols > Remove Symbol

Syntax: Remove <SymbolName>,
 <IsProjectSymbol>,
 <LibraryName>,
 <LibraryLocation>

Return Value: None

Parameters: <SymbolName>:

<string> // composite name of the symbol to remove

<IsProjectSymbol>:

<bool>

<LibraryName>:

<string> // name of the library

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

Example:

```
oSymbolManager.Remove "Nexxim Circuit Elements\Distributed\Distributed:bendo", true, "Project"
```

RemoveUnusedDefinitions

Removes any unused project definitions.

UI Access	Tools > Project Tools > Remove Unused Definitions.		
Parameters	Name	Type	Description
	<Definitions>	Array	Definitions to be removed, such as materials and surface materials.
Return Value	None.		

Python Syntax	RemoveUnusedDefinitions(<Definitions>)
Python Example	<pre>oProject.RemoveUnusedDefinitions([["NAME:Materials", "Al-Extruded"], ["NAME:SurfaceMaterials", "Steel-oxidised-surface"]])</pre>

SetPropertyValue

Sets the value of a single property belonging to a specific PropServer and PropTab. This function is available with the Project, Design or Editor objects, including definition editors. This is not supported for properties of the following types: ButtonProp, PointProp, V3DPointProp, and VPointProp. Only the ChangeProperty command can be used to modify these properties.

Use the script recording feature and edit a property, and then view the resulting script entry or use GetPropertyValue for the desired property to see the expected format.

UI Access	N/A		
Parameters	Name	Type	Description
	<propTab>	String	One of the following, where tab titles are shown in parentheses: - PassedParameterTab ("Parameter Values") - DefinitionParameterTab (Parameter Defaults") - LocalVariableTab ("Variables" or "Local Variables") - ProjectVariableTab ("Project variables") - ConstantsTab ("Constants") - BaseElementTab ("Symbol" or "Footprint") - ComponentTab ("General") - Component("Component") - CustomTab ("Intrinsic Variables") - Quantities ("Quantities") - Signals ("Signals")
	<propServer>	String	An object identifier, generally returned from another script method, such as CompInst@R;2;3
	<propName>	String	Name of the property.
	<propValue>	String	The value for the property

Return Value	None.

Python Syntax	<code>SetPropertyValue(<propTab>, <propServer>, <propName>, <propValue>)</code>
Python Example	<code>oEditor.SetPropertyValue("PassedParameterTab", "k", "R", "2200")</code>

UpdateDefFromBlock

Updates a material definition from block text (same definition format as would be contained in the material library file) by library type (using definition folder name). This scripting command directly supports the .AMAT (or .ASURF) definition formats.

UI Access	N/A		
Parameters	Name	Type	Description
	<targetDefName>	String	Name of the target definition, i.e. the name of the material to update.
	<defBlock>	String	Text of the new material definition in block format (string); this block could use a new definition name, which will cause a rename as part of the update.
	<defFolderName>	String	Library type (by definition, folder name).
	<newTimeStamp>	String	New timestamp string (time_t as integer, number of seconds since 1/1/1970 12:00am), default is current time.
Return Value	A property scripting object for the definition.		

P- y- t- h- o- n	<code>UpdateDefFromBlock(<targetDefName>, <defBlock>, <defFolderName>, <newTimeStamp>)</code>

S- y- nt- ax	
P- y- t- h- o- n E- x- a- m- p- l- e	<pre>oProject = oDesktop.NewProject() oProject.InsertDesign("HFSS", "HFSSDesign1", "DrivenModal", "") oDesign = oProject.SetActiveDesign("HFSSDesign1") oEditor = oDesign.SetActiveEditor("3D Modeler") oDefinitionManager = oProject.GetDefinitionManager() defBlock = "\$begin 'vacuum2' \$begin 'AttachedData' \$begin 'MatAppearanceData' property_data- ='appearance_data' Red=230 Green=230 Blue=230 Transparency=0.95 \$end 'MatAppearanceData' \$end 'AttachedData' simple('permittivity', 1) ModTime=1499970477 \$end 'vacuum2'" added = oDefinitionManager.AddDefinitionFromBlock(defBlock, "Materials", "10101010", True) addedName = '' if isinstance(added, basestring): addedName = added elif isinstance(added, list): addedName = added[0] else: addedName = added.GetName().replace("Materials:", "") AddInfoMessage(os.path.basename(__file__) + " result: " + addedName)</pre>

```

materialNameInQuotes = "\"" + addedName + "\""

# rename vacuum2 to vacuum3

newDefBlock = "$begin 'vacuum3' $begin 'AttachedData' $begin 'MatAppearanceData' property_
data='appearance_data' Red=230 Green=230 Blue=230 Transparency=0.95 $end 'MatAp-
pearanceData' $end 'AttachedData' simple('permittivity', 1) ModTime=1499970477 $end
'vacuum3'"

updatedObj = UpdateDefFromBlock(addedName, newDefBlock, "Materials")

```

UpdateDefFromBlockEx

Updates a material definition from block text (same definition format as would be contained in the material library file) by library type (using definition folder name). This scripting command directly supports the .AMAT (or .ASURF) definition formats. This resembles the UpdateDefFromBlock command, except UpdateDefFromBlockEx also allows for:

- updating a definition using a block where the name has changed without triggering a rename of the definition being updated
- updating multiple definitions from the same block
- renaming a definition to something other than the name in the block

UI Access	N/A		
Parameters	Name	Type	Description
	<targetDefName>	String	Name of the target definition, i.e. the name of the material to update.
			Name of the target definition, i.e. the name of the material to update (string).
			Name of the target definition, i.e. the name of the material to update

		(string).		
<desiredDefName>	String	New name to use for a rename. If this is the same as <i>targetDefName</i> , it means the definition is not being renamed. If this is blank, the block name will be used for this purpose instead.	New name to use for a rename. If this is the same as <i>targetDefName</i> , it means the definition is not being renamed. If this is blank, the block name will be used for this purpose instead.	New name to use for a rename. If this is the same as <i>targetDefName</i> , it means the definition is not being renamed. If this is blank, the block name will be used for this purpose instead.
<defBlock>	String	Text of the updated material definition in block form. (Same form as the defBlock input to the AddDefinitionFromBlock and UpdateDefFromBlock commands, for example.) Note that, unlike in the UpdateDefFromBlock command, the name of the definition in the block can be ignored, provided that desiredDefName is set.		
<defFolderName>	String	Library type (by definition, folder name).		
<newTimeStamp>	String	New timestamp string (time_t as integer, number of seconds since 1/1/1970 12:00am), default is current time.		
<continueIfConflict>	Boolean	A flag for whether to continue processing if there is some sort of conflict. A conflict only comes from the		

			target definition being in use, such as a material assigned to a particular part, and if trying to rename the target definition. If this argument is True, and there's a rename conflict, the tactic is to add/update the definition with the new name and leave the target definition untouched. If this argument is False, and there's a rename conflict, the command results in an exception.
Return Value	A property scripting object (extended definition object) for the definition. (In the event of a failure, the command throws an exception and there will be no result.)		

Python Syntax	UpdateDefFromBlockEx(<targetDefName>, <desiredDefName>, <defBlock>, <defFolderName>, <newTimeStamp>, <continuelIfConflict>)
Python Example	<pre># Note that the material block name will be ignored in this case defBlock = "\$begin 'unused_name' \$begin 'AttachedData' \$begin \ 'MatAppearanceData' property_data='appearance_data' \ Red=255 Green=0 Blue=0 Transparency=0.19 \$end \ 'MatAppearanceData' \$end 'AttachedData' \ simple('permittivity', 1.9) ModTime=1509090909 \ \$end 'unused_name'" try: updated = oDefinitionManager.UpdateDefFromBlockEx("red_material", "red_material",</pre>

```
defBlock,  
    "Materials",  
    "1609090909")  
  
updatedName = updated.GetName().replace("Materials:", "")  
AddInfoMessage("Result: " + updatedName)  
except:  
    AddErrorMessage("Unexpected error in UpdateDefFromBlockEx")
```

UpdateDefinitions

Updates all definitions. The **Messages** window reports when definitions are updated, or warns when definitions cannot be found.

UI Access	Tools > Project Tools > Update Definitions. Click Select All , then Update .
Parameters	None.
Return Value	None.

Python Syntax	UpdateDefinitions()
Python Example	oProject.UpdateDefinitions()

Component Manager Script Commands

The component manager provides access to components in a project. The manager object is accessed via the definition manager.

```
Set oDefinitionManager = oProject.GetDefinitionManager()
```

```
Set oComponentManager = oDefinitionManager.GetManager("Component")
```

The topics for this section include:

[Add](#)

[AddNPortData](#)

[AddSolverOnDemandModel](#)

[ClearSolutionCache](#)

[Edit](#)

[EditSolverOnDemandModel](#)

[EditWithComps](#)

[Export](#)

[GetNPortData](#)

[GetSolverOnDemandData](#)

[GetSolverOnDemandModelList](#)

[Remove](#)

[RemoveSolverOnDemandMode](#)

[UpdateDynamicLink](#)

Add [component manager]

*Use:*Add a component

Command: Tools > Edit Configured Libraries > Components > Add Component

Syntax: Add Array("NAME:<ComponentName>",
 "Info:=", <ComponentInfo>,
 "RefBase:=", <string>, // reference designator
 "NumParts:=", <int>, // parts per component
 "OriginalComponent:=", <string>
 "Terminal:=", <TerminalInfo>,
 "Terminal:=", <TerminalInfo>, ...
 // The remaining parameters are optional
 Array("NAME:Parameters", // any combo of the following
 "VariableProp:=", <VariableInfo>,
 "CheckboxProp:=", <CheckBoxInfo>,
 "ButtonProp:=", <ButtonInfo>,
 "TextProp:=", <TextInfo>,
 "NumberProp:=", <NumberInfo>,
 "SeparatorProp:=", <SeparatorInfo>,
 "ValueProp:=", <ValueInfo>,
 "MenuProp:=", <MenuInfo>),
 Array("NAME:Properties", // any combo of the following
 "CheckboxProp:=", <CheckBoxInfo>,


```
"TextProp:=", <TextInfo>,  
"NumberProp:=", <NumberInfo>,  
"SeparatorProp:=", <SeparatorInfo>,  
"ValueProp:=", <ValueInfo>,  
"MenuProp:=", <MenuInfo>),  
"VPointProp:=", <VPointInfo>,  
"PointProp:=", <PointInfo>),  
Array("Quantities",  
"QuantityProp:=", <QuantityPropInfo>...),  
Array("NAME:CosimDefinitions",  
  <CosimDefInfo>,  
  <CosimDefInfo>...)
```

Return Value:<string>

```
// composite name of the component.  
// If the name requested conflicts with the name of an existing  
// component, the requested name is altered to be unique.  
// The name returned reflects any change made to be unique.
```

Parameters:<ComponentName>:

<string> // simple name of the component

<ComponentInfo>:

```
Array("Type:=", <TypeInfo>,  
"NumTerminals:=", <int>,  
"DataSource:=", <string>,  
"ModifiedOn:=", <ModifiedOnInfo>,  
"Manufacturer:=", "<string>,"  
"Symbol:=", <string>,  
"Footprint:=", <string>,  
"Description:=", <string>,  
"InfoTopic:=", <string>,  
"InfoHelpFile:=", <string>,  
"IconFile:=", <string>,  
"LibraryName:=", "",  
"OriginalLocation:=", "Project", // Project Location  
"Author:=", <string>,  
"OriginalAuthor:=", <string>,  
"CreationDate:= ", <int>)
```

<TypeInfo>:

An integer that is the or-ing of bits for each product listed below. The default setting is 0xffffffff (4294967295) which indicates valid for all products. In the component editing dialog, checking different boxes in the "Specify products for which this component is valid" grid control sets specific flags that correspond to the following hex/decimal settings:

Nexxim -- 100 binary, 4 decimal, 0x4

SlwaveDeNovo -- 1000 binary, 8 decimal, 0x8

Simplorer -- 10000 binary, 16 decimal, 0x10

MaxwellCircuit -- 100000 binary, 32 decimal, 0x20

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<TerminalInfo>:

Array(<string>, // symbol pin

<string> // footprint pin

<string>, // gate name

<bool>, // shared

<int>, // equivalence number

<int>, // what to do if unconnected: flag as error:0, ignore:1

<string> // description

<Nature>)

<Nature>:

<string> // content varies as follows

Nexxim/Circuit:

"Electrical" // the only choice

Simplorer:

// several choices

"Electrical", "Magnetic", "Fluidic", "Translational",

"Translational_V", "Rotational", "Rotational_V",

""Radiant", "Thermal", or <VHDLPackageName>

<VHDLPackageName>:

<string> // in the form <Library>.<Package>

<Library>:

<string> // name of the VHDL library

<Package>:

<string> // name of the VHDL package

<VariableInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>) // value: number, variable, or expression

<FlagLetters>:

<string> // "D" - has description parameter,

// "RD" - readonly & has description parameter,

// or "RHD" - readonly, hidden, & has description parameter

<CheckBoxInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<bool>) // value: true or false

<ButtonInfo>:

Array(<string>, // name

```
<FlagLetters>,  
<string>, // description  
<string>, // button title  
<string>, // extra text  
<ClientID>,  
"ButtonPropClientData:= ", <ClientDataArray>)
```

```
<ClientID>:  
<int> // specifies Button Prop Client  
// 0 - unknown, ButtonPropClientData  
// array will be empty  
// 1 - Netlist Prop Client  
// 2 - not used  
// 3 - File Name Prop Client
```

```
<ClientDataArray>:  
varies with <ClientID>
```

```
<ClientID> is 0 or 1: empty array  
Array()
```

<ClientID> is 3:

```
Array("InternalFormatText:=", "<prefix><RelativePath>")
```

<prefix>:

<string> // "<Project>", "<PersonalLib>", "<UserLib>", or "<SysLib>"

<RelativePath>:

<string> // relative path to file from <prefix>

<TextInfo>:

```
Array(<string>, // name
```

```
<FlagLetters>,
```

```
<string>, // description
```

```
"CB:=", <string>, // optional - script for call back
```

```
<string>) // value: a text string
```

<NumberInfo>:

```
Array(<string>, // name
```

```
<FlagLetters>,
```

```
<string>, // description
```

"CB:=", <string>, // optional - script for call back

<real>, // value: a number

<string>) // units

<SeparatorInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>) // value: a text string

<ValueInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>) // value: a number, variable or expression

<MenuPropInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description
<string>, // menu choices - separated by commas
<int>) // 0 based index of current menu choice

<VPointInfo>:

Array(<string>, // name
<FlagLetters>,
<string>, // description
"CB:=", <string>, // optional - script for call back
<string>, // x value: number with length units
<string>) // y value: number with length units

<PointInfo>:

Array(<string>, // name
<FlagLetters>,
<string>, // description
"CB:=", <string>, // optional - script for call back
<real>, // x value
<real>) // y value

<QuantityPropInfo>:

Array(<string>, // name

```
<FlagLetters>,  
<string>, // description  
<string>, // value  
<TypeString>,  
<TypeStringDependentInfo>)
```

```
<TypeString>:  
<string> // "Across", "Through", or "Free"
```

```
<TypeStringDependentInfo>:
```

```
<TypeString> is "Free" :  
<string>, // direction: "In", "Out", "InOut", or "DontCare"  
// Following <string> is not present if direction is "DontCare"  
<string> // when to calculate: "BeforeAnalogSolver",  
// "BeforeStateGraph", "AfterStateGraph", or "DontCareWhen"
```

```
<TypeString> is "Across" or "Through":  
<int>, // terminal 1  
<int> // terminal 2
```

<CosimDefInfo>:

```
Array("NAME:CosimDefinition",  
"CosimulatorType:=", <int>,  
"CosimDefName:=", <string> // "HFSS 3D Layout", "Circuit",  
// "Custom", or "Netlist"  
"IsDefinition:=", <bool>,  
final array member(s) vary with CosimDefName)
```

final array members for HFSS 3D Layout:

```
"CosimStackup:=", <string>,  
"CosimDmbedRatio:=", <int>
```

final array members for Circuit:

```
"ExportAsNport:=", <int>,  
"UsePjt:=", <int>
```

final array member for Custom:

```
"DefinitionCompName:=", <string>
```

final array member for Netlist:

```
"NetlistString:=", <string>
```

Python Syntax	<pre>Add [("NAME:<ComponentName>", "Info:=", <ComponentInfo>, "RefBase:=", <string>, // reference designator "NumParts:=", <int>, // parts per component "OriginalComponent:=", <string> "Terminal:=", <TerminalInfo>, "Terminal:=", <TerminalInfo>, ... The remaining parameters are optional. ["NAME:Parameters", // any combo of the following "VariableProp:=", <VariableInfo>, "CheckboxProp:=", <CheckBoxInfo>, "ButtonProp:=", <ButtonInfo>, "TextProp:=", <TextInfo>, "NumberProp:=", <NumberInfo>, "SeparatorProp:=", <SeparatorInfo>, "ValueProp:=", <ValueInfo>, "MenuProp:=", <MenuInfo>], ["NAME:Properties", Any combination of the following: "CheckboxProp:=", <CheckBoxInfo></pre>

	<pre>"TextProp:=", <TextInfo>, "NumberProp:=", <NumberInfo>, "SeparatorProp:=", <SeparatorInfo>, "ValueProp:=", <ValueInfo>, "MenuProp:=", <MenuInfo>, "VPointProp:=", <VPointInfo>, "PointProp:=", <PointInfo>], ["Quantities", "QuantityProp:=", <QuantityPropInfo>...], ["NAME:CosimDefinitions", <CosimDefInfo>, <CosimDefInfo>...]]</pre>
Python Example	<pre>oComponentManager.Add(["NAME:Component", "Info:=", ["Type:=", 0, "NumTerminals:=", 0, "DataSource:=", "", "ModifiedOn:=", 1467910752, "Manufacturer:=", "",</pre>

	<pre>"Symbol:=", "Component", "ModelNames:=", "", "Footprint:=", "", "Description:=", "", "InfoTopic:=", "", "InfoHelpFile:=", "", "IconFile:=", "", "Library:=", "", "OriginalLocation:=", "Project", "IEEE:=", "", "Author:=", "", "OriginalAuthor:=", "", "CreationDate:=", 1467910746, "ExampleFile:=", ""], "Refbase:=", "U", "NumParts:=", 1, "ModSinceLib:=", True, "CompExtID:=", 2])</pre>

AddNPortData [component manager]

Use: Adds a component using the specified data

Command: Project Menu > Add Model > Add Nport Model

Syntax: AddNPortData Array("NAME:<ComponentDataName>",
 "ComponentDataType:=", "NportData",
 "name:=", <string>, // Name of the item
 "filename:=", <string>, // Path to the file to find the data
 "numberofports:=", <int>,
 "filelocation:=", <LocationType>,
 "domain:=", <string>, // "time" or "frequency"
 "datamode:=", <string> // "EnterData", "Import", or "Link"
 "devicename:=", <string>,
 "ImpedanceTab:=", <bool>,
 "NoiseDataTab:=", <bool>,
 "DCBehaviorTab:=", <bool>,
 "SolutionName:=", <string>,
 "displayformat:=", <DisplayInfo>,
 "datatype:=", <string>, // "SMatrix", "YMatrix", or "ZMatrix"
 "ShowRefPin:=", <bool>,
 "RefNodeCheckbox:=", <bool>, ...
 <ProductOptionsInfo>)

Return Value: <string>

// composite name of the component.
// If the name requested conflicts with the name of an existing
// component, the requested name is altered to be unique.
// The name returned reflects any change made to be unique.

Parameters: <ComponentDataName>:

<string> // simple name of the component

<LocationType>:

<string> // one of "UsePath", "PersonalLib", "UserLib", "SysLib",
// or "Project".

<dclInfo>:

<string> // one of "DCOpen", "DCShort", "DCShShort",
// "DCNone", or "DCEmpty".

<DisplayInfo>:

<string> // one of "MagnitudePhase", "ReallImaginary",
// or "DbPhase".


```
<ProductOptionsInfo>:  
// The remaining parameters differ by product  
  
// HFSS 3D Layout - doesn't support interpolation/DC behavior  
"DCOption:=", -1,  
"InterpOption:=", -1,  
"ExtrapOption:=", -1,  
"DataType:=", 0  
  
// Nexxim  
"DCOption:=", <NexximDCOption>,  
"InterpOption:=", <NexximInterpOption>,  
"ExtrapOption:=", <NexximExtrapOption>,  
"DataType:=", 2  
  
<NexximDCOption>:  
<int> // 0 : Zero Padding  
// 1 : Same as last point  
// 2 : Linear extrapolation from last 2 points  
// 3 : Constant magnitude, linear phase extrapolation
```

// 4 : Leave all signal lines open circuited

// 5 : Short all signal lines together

// 6 : Short all signal lines to ground

<NexximInterpOption>:

<int> // 0 : Step

// 1 : Linear

<NexximExtrapOption>:

<int> // 0 : Zero padding

// 1 : Same as last point

// 2 : Linear extrapolation from last 2 points

// 3 : Constant magnitude, linear phase extrapolation

<CircuitDCOption>:

<int> // 0 : Leave all signal lines open circuited

// 1 : Short all signal lines together

// 2 : Short all signal lines to ground

// 3 : Extrapolate from data provided (not recommended)

<CircuitInterpOption>:

<int> // 0 : Linear

// 1 : Cubic spline

// 2 : Rational polynomial

<CircuitExtrapOption>:

<int> // 0 : Same as interpolation

// 1 : Zero padding

// 2 : Same as last point

AddSolverOnDemandModel

Use: This method looks for a local component of the name passed in, and to this component it adds an SOD model definition using the information passed in the VARIANT. It returns the name of the SOD model added.

Parameters: BSTR component name.

Parameters: VARIANT which is the SOD model data.

Return Value: Returns the name of the model added.

ClearSolutionCache [component manager]

Use: Clear the solution cache for dynamic link component.

Command: Each of the following commands will clear the solution cache:

- **Dynamic Link Item RCM > Clear Solution Cache**
- **Dynamic Link Component in schematic RCM > Clear Solution Cache**

Syntax: ClearSolutionCache <Component Name >

Return Value: None

Parameters: <component name> is the name of the dynamic link component

Edit [component manager]

Modifies an existing component

Command: Tools > Edit Configured Libraries > Components > Edit Component

Syntax: Edit <ComponentName>,

```
    Array("NAME:<NewComponentName>",  
    "Info:=", <ComponentInfo>,  
    "RefBase:=", <string>, // reference designator  
    "NumParts:=", <int>, // parts per component  
    "OriginalComponent:=", <string>  
    "Terminal:=", <TerminalInfo>,  
    "Terminal:=", <TerminalInfo>, ...  
    // The remaining parameters are optional  
    Array("NAME:Parameters", // any combo of the following  
    "VariableProp:=", <VariableInfo>,  
    "CheckboxProp:=", <CheckBoxInfo>,  
    "ButtonProp:=", <ButtonInfo>,  
    "TextProp:=", <TextInfo>,  
    "NumberProp:=", <NumberInfo>,  
    "SeparatorProp:=", <SeparatorInfo>,
```

```
"ValueProp:=", <ValueInfo>,  
"MenuProp:=", <MenuInfo>),  
Array("NAME:Properties", // any combo of the following  
"CheckboxProp:=", <CheckBoxInfo>,  
"TextProp:=", <TextInfo>,  
"NumberProp:=", <NumberInfo>,  
"SeparatorProp:=", <SeparatorInfo>,  
"ValueProp:=", <ValueInfo>,  
"MenuProp:=", <MenuInfo>),  
"VPointProp:=", <VPointInfo>,  
"PointProp:=", <PointInfo>),  
Array("Quantities",  
"QuantityProp:=", <QuantityPropInfo>...),  
Array("NAME:CosimDefinitions",  
  <CosimDefInfo>,  
  <CosimDefInfo>...)
```

Return Value: <string>

```
// composite name of the component.  
// If the name requested conflicts with the name of an existing  
// component, the requested name is altered to be unique.  
// The name returned reflects any change made to be unique.
```

Parameters: <ComponentName>:

<string> // composite name of the component to edit

<NewComponentName>:

<string> // new simple name for the component

<ComponentInfo>:

Array("Type:=", <TypeInfo>,

"NumTerminals:=", <int>,

"DataSource:=", <string>,

"ModifiedOn:=", <ModifiedOnInfo>,

"Manufacturer:=", "<string>,

"Symbol:=", <string>,

"Footprint:=", <string>,

"Description:=", <string>,

"InfoTopic:=", <string>,

"InfoHelpFile:=", <string>,

"IconFile:=", <string>,

"LibraryName:=", <string>,

"OriginalLocation:=", <string>, // Project Location

"Author:=", <string>,

"OriginalAuthor:=", <string>,

"CreationDate:=", <int>)

<TypeInfo>:

An integer that is the or-ing of bits for each product listed below. The default setting is 0xffffffff (4294967295) which indicates valid for all products. In the component editing dialog, checking different boxes in the "Specify products for which this component is valid" grid control sets specific flags that correspond to the following hex/decimal settings:

Nexxim -- 100 binary, 4 decimal, 0x4

SlwaveDeNovo -- 1000 binary, 8 decimal, 0x8

Simplorer -- 10000 binary, 16 decimal, 0x10

MaxwellCircuit -- 100000 binary, 32 decimal, 0x20

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<TerminalInfo>:

Array(<string>, // symbol pin

<string> // footprint pin

<string>, // gate name

<bool>, // shared

<int>, // equivalence number

<int>, // what to do if unconnected: flag as error:0, ignore:1

<string>, // description

<Nature>)

<Nature>:

<string> // content varies as follows

Nexxim/Circuit:

"Electrical" // the only choice

Simplorer:

// several choices

"Electrical", "Magnetic", "Fluidic", "Translational",

"Translational_V", "Rotational", "Rotational_V",

""Radiant", "Thermal", or <VHDLPackageName>

<VHDLPackageName>:

<string> // in the form <Library>.<Package>

<Library>:

<string> // name of the VHDL library

<Package>:

<string> // name of the VHDL package

<VariableInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back

<string>) // value: number, variable, or expression

<FlagLetters>:

<string> // "D" - has description parameter,

// "RD" - readonly & has description parameter,

// or "RHD" - readonly, hidden, & has description parameter

<CheckBoxInfo>:

Array(<string>, // name

```
<FlagLetters>,  
<string>, // description  
"CB:=", <string>, // optional - script for call back  
<bool>) // value: true or false
```

```
<ButtonInfo>:  
Array(<string>, // name  
<FlagLetters>,  
<string>, // description  
<string>, // button title  
<string>, // extra text  
<ClientID>,  
"ButtonPropClientData:= ", <ClientDataArray>)
```

```
<ClientID>:  
<int> // specifies Button Prop Client  
// 0 - unknown, "ButtonPropClientData  
// array will be empty  
// 1 - Netlist Prop Client  
// 2 - not used
```

// 3 - File Name Prop Client

<ClientDataArray>:

varies with <ClientID>

<ClientID> is 0 or 1: empty array

Array()

<ClientID> is 3:

Array("InternalFormatText:=", "<prefix><RelativePath>")

<prefix>:

<string> // "<Project>", "<PersonalLib>", "<UserLib>", or "<SysLib>"

<RelativePath>:

<string> // relative path to file from <prefix>

<TextInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

"CB:=", <string>, // optional - script for call back
<string>) // value: a text string

<NumberInfo>:
Array(<string>, // name
<FlagLetters>,
<string>, // description
"CB:=", <string>, // optional - script for call back
<real>, // value: a number
<string>) // units

<SeparatorInfo>:
Array(<string>, // name
<FlagLetters>,
<string>, // description
"CB:=", <string>, // optional - script for call back
<string>) // value: a text string

<ValueInfo>:
Array(<string>, // name
<FlagLetters>,

```
<string>, // description  
"CB:=", <string>, // optional - script for call back  
<string>) // value: a number, variable or expression
```

```
<MenuPropInfo>:  
Array(<string>, // name  
<FlagLetters>,  
<string>, // description  
<string>, // menu choices - separated by commas  
<int>) // 0 based index of current menu choice
```

```
<VPointInfo>:  
Array(<string>, // name  
<FlagLetters>,  
<string>, // description  
"CB:=", <string>, // optional - script for call back  
<string>, // x value: number with length units  
<string>) // y value: number with length units
```

```
<PointInfo>:  
Array(<string>, // name  
<FlagLetters>,
```

<string>, // description

"CB:=", <string>, // optional - script for call back

<real>, // x value

<real>) // y value

<QuantityPropInfo>:

Array(<string>, // name

<FlagLetters>,

<string>, // description

<string>, // value

<TypeString>,

<TypeStringDependentInfo>)

<TypeString>:

<string> // "Across", "Through", or "Free"

<TypeStringDependentInfo>:

"Free" :

<string>, // direction: "In", "Out", "InOut", or "DontCare"

```
// Following <string> is not present if direction is "DontCare"  
<string> // when to calculate: "BeforeAnalogSolver",  
// "BeforeStateGraph", "AfterStateGraph", or "DontCareWhen"
```

```
"Across" or "Through"
```

```
<int>, // terminal 1
```

```
<int> // terminal 2
```

```
<CosimDefInfo>:
```

```
Array("NAME:CosimDefinition",
```

```
"CosimulatorType:=", <int>,
```

```
"CosimDefName:=", <string> // "HFSS3D", "Circuit",
```

```
// "Custom", or "Netlist"
```

```
"IsDefinition:=", <bool>,
```

```
final array member(s) vary with CosimDefName)
```

```
final array members for HFSS 3D Layout:
```

```
"CosimStackup:=", <string>,
```

```
"CosimDmbedRatio:=", <int>
```

```
final array members for Circuit:
```

```
"ExportAsNport:=", <int>,
```

"UsePjt:=", <int>

final array member for Custom:

"DefinitionCompName:=", <string>

final array member for Netlist:

"NetlistString:=", <string>

Python Syntax	<pre>Edit <ComponentName>, ["NAME:<NewComponentName>"], "Info:=", <ComponentInfo>, "RefBase:=", <string>, // reference designator "NumParts:=", <int>, // parts per component "OriginalComponent:=", <string> "Terminal:=", <TerminalInfo>, "Terminal:=", <TerminalInfo>, ... #The remaining parameters are optional ["NAME:Parameters", // any combo of the following "VariableProp:=", <VariableInfo>, "CheckboxProp:=", <CheckBoxInfo>, "ButtonProp:=", <ButtonInfo></pre>

	<pre> "TextProp:=", <TextInfo>, "NumberProp:=", <NumberInfo>, "SeparatorProp:=", <SeparatorInfo>, "ValueProp:=", <ValueInfo>, "MenuProp:=", <MenuInfo>], ["NAME:Properties", # any combo of the following "CheckboxProp:=", <CheckBoxInfo>, "TextProp:=", <TextInfo>, "NumberProp:=", <NumberInfo>, "SeparatorProp:=", <SeparatorInfo>, "ValueProp:=", <ValueInfo>, "MenuProp:=", <MenuInfo>), "VPointProp:=", <VPointInfo>, "PointProp:=", <PointInfo>), ["Quantities", "QuantityProp:=", <QuantityPropInfo>...], ["NAME:CosimDefinitions", <CosimDefInfo>, <CosimDefInfo>...]) </pre>
Python Example	<pre> name = oComponentManager.Edit ("Simplorer Circuit Elements\BJTs:Level01_NPN", _ ["NAME:Level01_NPN", "Info:=", ["Type:=", 4294901764,_ </pre>

```

"NumTerminals:=", 3, "DataSource:=", "Ansoft built-in component", _
"ModifiedOn:=", 1152722112, "Manufacturer:=", "", _
"Symbol:=", "nexx_bjt_npn", "Footprint:=", "", _
"Description:=", "BJT, GP, NPN", "InfoTopic:=", "NXBJT1.htm", _
"InfoHelpFile:=", "nexximcomponents.chm", "IconFile:=", "bjtsn.bmp", _
"Library:=", "Nexxim Circuit Elements\BJTs", _
"OriginalLocation:=", "SysLibrary ", "Author:=", "", _
"OriginalAuthor:=", "", "CreationDate:=", 1152722102], _
"Refbase:=", "Q", "NumParts:=", 1, "Terminal:=", ["collector", _
"collector", "A", false, 6, 0, "", "Electrical"], _
"Terminal:=", ["base", "base", "A", false, _
7, 0, "", "Electrical"], "Terminal:=", ["emitter", _
"emitter", "A", false, 8, 0, "", "Electrical"], _
["NAME:Parameters", "TextProp:=", ["LabelID", _
"HD", "Property string for netlist ID", _
"Q@ID"], "TextProp:=", ["MOD", "D", _
"Name of model data reference", "required"], _
"VariableProp:=", ["AREA", "D", _
"Emitter area multiplying factor, which affects

```

	<pre> currents, resistances, and capacitances", "1"], _ "VariableProp:=", ["AREAB", "D", "Base AREA", _ "1"], "VariableProp:=", ["AREAC", "D", "Collector AREA", _ "1"], "VariableProp:=", ["DTEMP", "D", _ "The difference between element and circuit temperature (deg Cel)", _ "0"], "VariableProp:=", ["M", "D", _ "Multiplier factor to simulate multiple BJTs in parallel", _ "1"], "ButtonProp:=", ["NexximNetlist", "HD", "", _ "Q@ID %0 %1 %2 *MOD(@MOD) *AREA(AREA=@AREA)" & _ " *AREAB(AREAB=@AREAB) *AREAC(AREAC=@" & _ "AREAC) *DTEMP(DTEMP=@DTEMP) *M(M=@M)", _ "Q@ID %0 %1 %2 *MOD(@MOD) " & "*AREA(AREA=@AREA) *AREAB(AREAB=@AREAB) *AREAC(AREAC=@" & _ "AREAC) *DTEMP(DTEMP=@DTEMP) *M(M=@M)", 1, _ "ButtonPropClientData:=", [], "TextProp:=", ["ModelName", "HD", "", "Q"]]]) </pre>
Python Example 2	<pre> name2 = oComponentManager.Edit ("MyComponent",_ (["NAME:MyOtherComponent","Info:=", ["Type:=", 4294901767, _ </pre>

```
"NumTerminals:=", 2, "DataSource:=", "", _  
  
"ModifiedOn:=", 1071096503, "Manufacturer:=", "Ansoft", _  
  
"Symbol:=", "bendo", "Footprint:=", "BENDO", _  
  
"Description:=", "", "InfoTopic:=", "", _  
  
"InfoHelpFile:=", "", "IconFile:=", "", _  
  
"LibraryName:=", "", "OriginalLocation:=", "Project", _  
  
"Author:=", "", "OriginalAuthor:=", "", _  
  
"CreationDate:= ", 1147460679], "Refbase:=", "U", _  
  
"NumParts:=", 1, "OriginalComponent:=", "", _
```

```

"Terminal:=", ["n1", "n1", "A", false, 0, 0, "", _
"Electrical"], "Terminal:=", ["n2", "n2", "A", _
false, 1, 0, "", Electrical"], ["NAME:Parameters", _
"MenuProp:=", ["CoSimulator", "D", "", _
"Default,Custom,Netlist", 0], "ButtonProp:=", ["CosimDefinition", _
"D", "", "", "Edit", 0, "ButtonPropClientData:=", []], _
["NAME:CosimDefinitions", ["NAME:CosimDefinition", _
"CosimulatorType:=", 0, "CosimDefName:=", "HFSS3D", _
"IsDefinition:=", true, "CosimStackup:=", "Layout stackup", _
"CosimDmbedRatio:=", 3], ["NAME:CosimDefinition", _

```

```
"CosimulatorType:=", 1, "CosimDefName:=", "", _  
  
"IsDefinition:=", true, "ExportAsNport:=", 0, _  
  
"UsePjt:=", 0], ["NAME:CosimDefinition", _  
  
"CosimulatorType:=", 2, "CosimDefName:=", "Custom", _  
  
"IsDefinition:=", true, "DefinitionCompName:=", ""], _  
  
["NAME:CosimDefinition", "CosimulatorType:=", 3, _  
  
"CosimDefName:=", "Netlist", "IsDefinition:=", true, _  
  
"NetlistString:=", ""]]])
```

EditSolverOnDemandModel

Use: This method looks for a local component of the name passed in, and in this component it looks for an SOD model using the name passed in the second BSTR. It modifies the SOD model using the data in the VARIANT. It returns the name of the SOD model edited.

Return Value: Returns the name of the model edited.

Parameters: BSTR component name.

Parameters: BSTR SOD model name.

Parameters: VARIANT which is the new SOD model data (can include changed name).

EditWithComps [component manager]

Edit an existing component.

Command: None

Syntax: EditWithComps <ComponentName>,
 Array("NAME:<NewComponentName>",
 "ModTime:=", <ModifiedTimeInfo>,
 "Library:=", <string>, // Library name
 "LibLocation:=", <string>, // Project Location
 <PinDefInfo>,
 <PinDefInfo>,... // optional, to define pins
 <GraphicsDataInfo>, // optional, to define graphics
 <PropDisplayMapInfo>), // optional, to define property displays
 Array(<ListOfComponentNames>) // Component names

Return Value: <string>

```
// composite name of the component.  
// If the name requested conflicts with the name of an existing  
// component, the requested name is altered to be unique.  
// The name returned reflects any change made to be unique.
```

Parameters: <ComponentName>:

<string> // composite name of the component being edited

<NewComponentName>:

<string> // new simple name for the component

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed
since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<PinDefInfo>:

```
Array("NAME:PinDef",  
"Pin:=", Array (<string>, // pin name  
<real>, // x location  
<real>, // y location
```



```
<real>, // angle in radians
<PinType>,
<real>, // line width
<real>, // line length
<bool>, // mirrored
<int>, // color
<bool>, // true if visible, false if not
<string>, // hidden net name
<OptionalPinInfo>, // optional info
<PropDisplayMapInfo>)) // optional
```

```
<PinType>:
```

```
<string> // "N" : normal pin
```

```
// "I" : input pin
```

```
// "O" : output pin
```

```
<OptionalPinInfo>:
```

```
// Specify both or neither
```

```
<bool>, // true if name is to be shown
```

```
<bool>, // true if number is to be shown
```

<PropDisplayMapInfo>:

```
Array("NAME:PropDisplayMap",  
<PropDisplayInfo>,  
<PropDisplayInfo>,...)
```

<PropDisplayInfo>:

```
<NameString>, Array(<DisplayTypeInfo>,  
<DisplayLocationInfo>,  
<int>, // optional, level number  
<TextInfo>)
```

<NameString>:

```
<string> // PropertyName:=, where PropertyName is the name of  
// the property to be displayed
```

<DisplayTypeInfo>:

```
<int> // 0 : No display  
// 1 : Display name only  
// 2 : Display value only  
// 3 : Display both name and value
```

// 4: Display evaluated value only

// 5: Display both name and evaluated value

<DisplayLocationInfo>:

<int> // 0 : Left

// 1 : Top

// 2 : Right

// 3 : Bottom

// 4 : Center

// 5 : Custom placement

<GraphicsDataInfo>:

Array("NAME:Graphics",

// one or more of the following

<RectInfo>,

<CircleInfo>,

<ArcInfo>,

<LineInfo>,

<PolygonInfo>,

<TextInfo>,

<ImageInfo>)

<RectInfo>:

"Rect:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<real>, // angle, in radians

<real>, // x position of center

<real>, // y position of center

<real>, // width

< real>) // height

<CircleInfo>:

"Circle:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>) // radius

<ArcInfo>:

```
"Arc:=", Array(<real>, // line width  
<int>, // line pattern  
<int>, // color  
<real>, // x position of center  
<real>, // y position of center  
<real>, // radius  
<real>, // start angle, in radians  
<end>) // end angle, in radians
```

<LineInfo>:

```
"Line:=", Array(<real>, // line width  
<int>, // line pattern  
<int>, // color  
<PointInfo>, // must specify at least 2 points  
<PointInfo>...)  
<PointInfo>:  
<real>, // x position  
<real> // y position
```

<PolygonInfo>:

```
"Polygon:=", Array(<real>, // line width
```

<int>, // fill pattern

<int>, // color

<PointInfo>, // must specify at least 3 points

<PointInfo>...)

<TextInfo>:

"Text:=", Array(<real>, // x position

<real>, // y position

<real>, // angle, in radians

<Justification>,

<bool>, // is plotter font

<string>, // font name

<int>, // color

<string>) // text string

<Justification>:

<int> // 0 : left top

// 1 : left base

// 2 : left bottom

// 3 : center top

```
// 4 : center base
// 5 : center bottom
// 6 : right top
// 7 : right base
// 8 : right bottom
```

```
<ImageInfo>:
"Image:=", Array(<RectInfo>,
<ImageData>,
<bool>) // is mirrored
```

```
<ImageData>:
<string>, // file path
<int>, // 0 : use the file path and link to it
// 1 : ignore file path and use next parameter
<string> // text data, only present if preceding int is 1
```

```
<ListOfComponentNames>:
<string>,<string> ...
// The list may be empty. When not empty, each string that is listed is a component
// that references the component to be edited. Prior to editing, a clone of the component is
```

```
// made, and the components that are listed are modified so that they now refer to  
// the clone.
```

Export [component manager]

Export component(s) to a library

Command: Tools > Edit Configured Libraries > Components > Export to Library

Syntax: Export Array("NAME:<LibraryName>",

```
<ComponentName>,  
<ComponentName>...),  
<LibraryLocation>
```

Return Value: None

Parameters: <LibraryName>:

```
<string> // name of the library
```

```
<ComponentName>:
```

```
<string> // composite name of the component to export
```

```
<LibraryLocation>:
```

```
<string> // location of the library in <LibraryName>
```

```
// One of "Project", "PersonalLib", or "UserLib"
```


Python Syntax	<code>Export(["NAME:<LibraryName>", <ComponentName>, <ComponentName>...], <LibraryLocation>)</code>
Python Example	<pre>oComponentManager.Export(["NAME:mylib", "Simplorer Circuit Elements\BJTs:Level01_NPN"], "PersonalLib")</pre>

GetNames [component manager]

Returns the names of the components (used and unused) in a design. The following script command, **IsUsed**, can then be used to separate used and unused components.

Command: None

Syntax: `GetNames()`

Return Value: An array of strings

Parameters: None

Python Syntax	<code>GetNames()</code>
Python Example	<code>componentNames = oComponentManager.GetNames()</code>

GetNPortData [component manager]

Returns NPort data for the component with the specified name.

Command: None

Return Value: Variant array, whose contents depend on the type of component. The array will be empty if the component does not have NPort data. See the syntax for `AddDynamicNPortData` and `AddNPortData` for descriptions of the array contents for components with those types of NPort data.

GetSolverOnDemandData

Use: This method looks for a local component of the name passed in, and in this component it looks for an SOD model of the name passed in and returns the SOD data pertaining to that model.

Parameters: BSTR component name.

Parameters: BSTR SOD model name

Return Value: VARIANT which is the SOD data.

GetSolverOnDemandModelList

Use: This method looks for a local component of the name passed in, and returns a list of SOD model names defined in the component.

Parameters: BSTR component name.

Return Value: VARIANT which is a list of SOD model names.

IsUsed [component manager]

Used to determine if a component is used in the design.

Command: None

Syntax: IsUsed(<ComponentName>)

Return Value: <Boolean> // true if the specified component is used in the design

Parameters: <ComponentName>:

<string>

Python Syntax	IsUsed(<ComponentName>)

Python Example	<code>IsUsed = oComponentManager.IsUsed("MyComponent")</code>

Remove [component manager]

Remove a component from a library

Command: Tools > Edit Configured Libraries > Components > Remove Component

Syntax: Remove <ComponentName>,

 <IsProjectComponent>,

 <LibraryName>,

 <LibraryLocation>

Return Value: None

Parameters: <ComponentName>:

 <string> // composite name of the component to remove

 <IsProjectComponent>:

 <bool>

 <LibraryName>:

 <string> // name of the library

 <LibraryLocation>:

 <string> // location of the library in <LibraryName>

 // One of "Project", "PersonalLib", or "UserLib"

Python Syntax	Remove (<ComponentName>, <IsProjectComponent>, <LibraryName>, <LibraryLocation>)
Python Example	<pre>oComponentManager.Remove ("Simplorer Circuit Elements\BJTs:Level01_NPN", _ true, "Project")</pre>

RemoveSolverOnDemandModel

Use: This method looks for a local component of the name passed in, and in this component it looks for an SOD model of the name passed in and deletes the SOD model definition from the component.

Parameters: BSTR component name.

Parameters: BSTR SOD model name

Return Value: None.

RemoveUnused [component manager]

Removes components that are not used in the design.

Command: **Project->Remove Unused Definitions** is similar but operates slightly different and does not record script commands.

Syntax: RemoveUnused()

Return Value: <bool> True if one or more components are removed.

Parameters: None

Note:

The order of calls to RemoveUnused is significant. As a result, removing definitions in an unordered fashion may cause other components in dependent definitions to be rendered unusable.

Also, the symbol and footprint of an unused component are not unusable until after the component itself is removed using the Component Manager Remove script.

Python Syntax	RemoveUnused()
Python Example	<code>removedDefs = oComponentManager.RemoveUnused()</code>

Update Dynamic Link [component manager]

Use: Reads data from the linked design and updates the dynamic link component. This will update the following: properties, solutions, ports, geometry.

Command: Each of the following commands will record a non-undoable script command:

- **Dynamic Link Item RCM > Refresh Dynamic Link**
- **Dynamic Link Component in schematic RCM > Refresh Dynamic Link**
- Click the **Refresh Dynamic Link** button in the Footprint tab of the **Properties Window** for selected Dynamic Link components in the Layout Editor.

Syntax: UpdateDynamicLink(<component name>)

Return Value: None

Parameters: <component name> is the name of the dynamic link component

Example:

```
oComponentManager.UpdateDynamicLink("TeeModel_L1")
```

Footprint Manager Script Commands

The footprint manager provides access to footprints in a project. The manager object is accessed via the definition manager.

```
Set oDefinitionManager = oProject.GetDefinitionManager()  
Set oFootprintManager = oDefinitionManager.GetManager("Footprint")
```

The footprint manager script commands are listed below:

- [Add](#)
- [Edit](#)
- [EditWithComps](#)
- [Export](#)
- [GetData](#)
- [GetNames](#)
- [IsUsed](#)
- [Remove](#)
- [RemoveUnused](#)

Add [footprint manager]

Use: Add a footprint

UI Access	Tools > Edit Configured Libraries > Footprints > Add Footprint		
Parameters	Name	Type	Description

	Name	Type	Description
Return Value	Returns a string: • Composite name of the footprint. • If the name requested conflicts with the name of an existing Footprint, the requested name is altered to be unique. • The name returned reflects any change made to be unique.		

Syntax: Add Array("NAME:<FootprintName>,"
"ModTime:=", <ModifiedOnInfo>,"
"Library:=", "",
"LibLocation:=", "Project",
"OkayToMirror:=", <bool>,"
"DefUnits:=", <UnitType>,"
Array(NAME:Lyrs",
"Layer:=", <LayerArray>,"
"Layer:=", <LayerArray>...,
"SLayer:=", <StackupLayerArray>,"
"SLayer:=", <StackupLayerArray>...),
"ActLyr:=", <string>, // name of active layer
"Tol:=", <ToleranceArray> // optional
<PrimitivesInfo>, // optional
<PinsInfo>, // optional

<ViasInfo>, // optional
<EdgeportsInfo>, // optional
<ComponentPropertyInfo>,
<ScriptInfo>) // optional, specified for scripted footprints

Parameters: <FootprintName>:

<string> // simple name of footprint to create

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<UnitType>:

<string> // default length units to use if units are not specified in other
// parameters

<LayerArray>:

Array("N:=", <string>, // layer name

"ID:=", <int> ,

"T:=", <LayerTypeInfo>, // layer type

"TB:=", <TopBottomInfo>,

"Col:=", <int>, // optional - color

"Pat:=", <int>, // optional - fill pattern

"Vis:=", <bool>, // optional - are objects on layer visible

"Sel:=", <bool>, // optional - are objects on layer selectable

"L:=", <bool>) // optional

// are objects on layer locked (can't be edited)

<LayerTypeInfo>:

<string> // one of: signal, dielectric, metalized signal, assembly, silkscreen, soldermask, solderpaste, glue, or user

<TopBottomInfo>:

<string> // one of: top, neither, bottom, or template

<StackupLayerArray>:

Array(<LayerArray>,

"Elev:=", <ElevationInfo>,

"SubL:=", Array("Th:=", <Dimension>,

"LElev:=", <Dimension>,

"R:=", <Dimension>,

"M:=", <MaterialInfo>))

<ElevationInfo>:

```
<string> // "top" - snap to top  
// "mid" - snap to middle  
// "bot" - snap to bottom  
// "edit" - manual edit  
// "none"
```

<Dimension>:

```
<string> // real number, may include units
```

<MaterialInfo>:

```
<string> // name of the layer material
```

<ToleranceArray>:

```
Array(<real>, // distance tolerance
```

```
<real>, // angle tolerance (radians)
```

```
<real>) // dimensionless tolerance
```

<PrimitivesInfo>:

```
Array("NAME:Prims",
```

```
// one or more of the following
```

```
<RectInfo>,  
<CircleInfo>,  
<ArcInfo>,  
<LineInfo>,  
<PolygonInfo>,  
<TextInfo>,  
<ImageInfo>)
```

<RectInfo>:

```
"Rect:=", Array(<real>, // line width  
<int>, // fill pattern  
<int>, // color  
<real>, // angle, in radians  
<real>, // x position of center  
<real>, // y position of center  
<real>, // width  
< real>) // height
```

<CircleInfo>:

```
"Circle:=", Array(<real>, // line width  
<int>, // fill pattern
```

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>) // radius

<ArcInfo>:

"Arc:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>, // radius

<real>, // start angle, in radians

<end>) // end angle, in radians

<LineInfo>:

"Line:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<PointInfo>, // must specify at least 2 points

<PointInfo>...)

<PointInfo>:

<real>, // x position

<real> // y position

<PolygonInfo>:

"Polygon:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<PointInfo>, // must specify at least 3 points

<PointInfo>...)

<TextInfo>:

"Text:=", Array(<real>, // x position

<real>, // y position

<real>, // angle, in radians

<Justification>,

<bool>, // is plotter font

<string>, // font name

<int>, // color

<string>) // text string

<Justification>: <int>

// 0 : left top

// 1 : left base

// 2 : left bottom

// 3 : center top

// 4 : center base

// 5 : center bottom

// 6 : right top

// 7 : right base

// 8 : right bottom

<ImageInfo>:

"Image:=", Array(<RectInfo>,

<ImageData>,

<bool>) // is mirrored

<ImageData>:

<string>, // file path

<int>, // 0 : use the file path and link to it

// 1 : ignore file path and use next parameter

<string> // text data, only present if preceding int is 1

<PinsInfo>:

Array("NAME:Pins",

"P:=", <PinArray>,

"P:=", <PinArray>,...)

<PinArray>:

Array("Port:=", Array("Id:=", <int>,

"Clr:=", <real>, // optional - clearance

"N:=", <string>), // pin name

"Pos:=", Array("x:=", <Location>, // padstack (x,y) position

"y:=", <Location>),

"VRt:=", <Angle>, // optional - rotation

"HD:=", <Size>, // optional - hole diameter

<PadstackImplementationInfo>)

<Location>:

<string> specifying real number and units (may use variables)

<Angle>:

<string> specifying angle with a real number and units

<Size>:

<string> specifying size with a real number and units

<PadstackImplementationInfo>:

If another with the same implementation has already been specified:

"Ref:=", <int> // id of the other

If not:

"Ref:=", <string>, // name

"Frm:=", <int>, // id of highest layer

"To:=", <int>, // id of lowest layer

<LayerPlacementInfo>,

"Man:=", <int>, // optional, 1 if manually placed, 0 if not (default)

"Use:=", Array(<PadUseInfo>, <PadUseInfo>...) // array may be empty

<LayerPlacementInfo>:

"Lyr:=", Array("Mrg:=", <int>, // optional,

// 1 if all layers have been merged (default)

// 0 if layer are not merged


```
"Flp:=", <int>, // optional,  
// 1 if placed bottom up  
// 0 if not (default)  
"Map:=", <ParentToLocalLayerInfo>)
```

```
<ParentToLocalLayerInfo>:  
Array("U:=", <DirectionOfUniqueness>,  
"F:=", Array(<int>, <int>, ...), // forward mapping  
// -1 is not mapped  
"B:=", Array(<int>, <int>, ...)) // backward mapping  
// -1 is not mapped
```

```
<PadUseInfo>:  
"Pad:=", Array("Lid:=", <int>, // layer id  
"T:=", <string>, // type : "connected", "thermal",  
// "no_pad", "not_connected",  
// or "not_connected_thermal"  
"Man:=", <int>) // optional, 1 if manually placed  
// 0 if not (default)
```

```
<DirectionOfUniqueness>:
```

<string> // one of "forward", "backward", or "two ways"

<ViasInfo>:

Array("NAME:Vias", <VialInfo>, <VialInfo>...)

<VialInfo>:

"V:=", Array("Id:=", <int>,

"N:=", <string>, // name

"Pos:=", Array("x:=", <Location>, // via (x,y) position

"y:=", <Location>),

"VRt:=", <Angle>, // optional - rotation

<ImplementationInfo>

<EdgeportsInfo>:

Array("NAME:EPorts", <EdgePortArray>, <EdgePortArray>...)

<EdgePortArray>:

Array("NAME:EP",

"LP:=", Array("Id:=", <int>, // port id

"N:=", <string>), // port name

"Eo:=", Array(<edge description>, <edge description>,...))

<edge description> for primitive edges

"et:=", "pe", "pr:=", <id>, "ei:=", <edge#>

<id>: integer that is the primitive id

<edge#>: integer that is the edge number on the primitive

<edge description> for via edges

"et:=", "pse", "layer:=", <layer id>, "se:=", <via id>,

"sx:=", <start X location>, "sy:=", <start Y location>, "ex:=", <end X location>,

"ey:=", <end Y location>, "h:=", <arc height>, "rad:=", <radians>

<via id>: an integer that is the id of the via to use

<layer id>: an integer that is the id of the layer of the pad of the via to use

<start X location>

<start Y Location>:

doubles that are the X, Y location of the start point of the edge arc <end X location>

<end Y Location>:

doubles that are the X, Y location of the end point of the edge arc

<arc height>: double giving the height of the edge arc (0 for a straight edge)

<radians>: double giving the arc size in radians (0 for a straight edge)

<ComponentPropertyInfo>:

```
Array("NAME:CProps",  
"VariableProp:=", <VariableInfo>,  
"VariableProp:=", <VariableInfo>,  
...)
```

<VariableInfo>:

```
Array(<string>, // name  
<FlagLetters>,  
<string>, // description  
"CB:=", <string>, // optional - script for call back  
<string>) // value: number, variable, or expression
```

```
<ScriptInfo>:  
Array("NAME:script",  
"language:=", <string>, // script language  
"UsesScript:=", true,  
"script:=", <string>) // contents of script
```

Edit [footprint manager]

Deprecated command — please use [EditWithComps](#).

EditWithComps [footprint manager]

Use: Edit an existing footprint.

Command: None

Syntax: EditWithComps <FootprintName>,
 Array("NAME:<NewFootprintName>,"
 "ModTime:=", <ModifiedOnInfo>,"
 "Library:=", "",
 "LibLocation:=", "Project",
 "OkayToMirror:=", <bool>,"
 "DefUnits:=", <UnitType>,"
 Array(NAME:Lyrs",
 "Layer:=", <LayerArray>,"
 "Layer:=", <LayerArray>....,

```
"SLayer:=", <StackupLayerArray>,  
"SLayer:=", <StackupLayerArray>...),  
"ActLyr:=", <string>, // name of active layer  
"Tol:=", <ToleranceArray> // optional  
<PrimitivesInfo>, // optional  
<PinsInfo>, // optional  
<ViasInfo>, // optional  
<EdgeportsInfo>, // optional  
<ComponentPropertyInfo>,  
<ScriptInfo>, // optional, specified for scripted footprints  
Array(<ListOfComponentNames>) // Component names
```

Return Value: <string>

```
// composite name of the footprint.  
// If the name requested conflicts with the name of an existing  
// footprint, the requested name is altered to be unique.  
// The name returned reflects any change made to be unique.
```

Parameters: <FootprintName>:

```
<string> // composite name of the footprint being edited
```

<NewFootprintName>:

<string> // new simple name for the footprint

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<**UnitType**>:

<string> // default length units to use if units are not specified in other
// parameters

<**LayerArray**>:

Array("N:=", <string>, // layer name
"ID:=", <int> ,
"T:=", <LayerTypeInfo>, // layer type
"TB:=", <TopBottomInfo>,
"Col:=", <int>, // optional - color
"Pat:=", <int>, // optional - fill pattern
"Vis:=", <bool>, // optional - are objects on layer visible
"Sel:=", <bool>, // optional - are objects on layer selectable
"L:=", <bool>) // optional

// are objects on layer locked (can't be edited)

<LayerTypeInfo>:

<string> // one of: signal, dielectric, metalized signal, assembly, silkscreen, soldermask, solderpaste, glue, or user

<TopBottomInfo>:

<string> // one of: top, neither, bottom, or template

<StackupLayerArray>:

```
Array(<LayerArray>,  
"Elev:=", <ElevationInfo>,  
"SubL:=", Array("Th:=", <Dimension>,  
"LElev:=", <Dimension>,  
"R:=", <Dimension>,  
"M:=", <MaterialInfo>))
```

<ElevationInfo>:

<string> // "top" - snap to top

// "mid" - snap to middle

// "bot" - snap to bottom


```
// "edit" - manual edit
```

```
// "none"
```

<Dimension>:

<string> // real number, may include units

<MaterialInfo>:

<string> // name of the layer material

<ToleranceArray>:

Array(<real>, // distance tolerance

<real>, // angle tolerance (radians)

<real>) // dimensionless tolerance

<PrimitivesInfo>:

Array("NAME:Prims",

// one or more of the following

<RectInfo>,

<CircleInfo>,

<ArcInfo>,

<LineInfo>,

```
<PolygonInfo>,  
<TextInfo>,  
<ImageInfo>)
```

<RectInfo>:

```
"Rect:=", Array(<real>, // line width  
<int>, // fill pattern  
<int>, // color  
<real>, // angle, in radians  
<real>, // x position of center  
<real>, // y position of center  
<real>, // width  
< real>) // height
```

<CircleInfo>:

```
"Circle:=", Array(<real>, // line width  
<int>, // fill pattern  
<int>, // color  
<real>, // x position of center  
<real>, // y position of center
```

< real>) // radius

<ArcInfo>:

"Arc:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>, // radius

<real>, // start angle, in radians

<end>) // end angle, in radians

<LineInfo>:

"Line:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<PointInfo>, // must specify at least 2 points

<PointInfo>...)

<PointInfo>:

<real>, // x position

<real> // y position

<PolygonInfo>:

"Polygon:=", Array(<real>, // line width
<int>, // fill pattern
<int>, // color
<PointInfo>, // must specify at least 3 points
<PointInfo>...)

<TextInfo>:

"Text:=", Array(<real>, // x position
<real>, // y position
<real>, // angle, in radians
<Justification>,
<bool>, // is plotter font
<string>, // font name
<int>, // color
<string>) // text string
<Justification>: <int>
// 0 : left top
// 1 : left base

// 2 : left bottom
// 3 : center top
// 4 : center base
// 5 : center bottom
// 6 : right top
// 7 : right base
// 8 : right bottom

<ImageInfo>:

"Image:=", Array(<RectInfo>,
<ImageData>,
<bool>) // is mirrored

<ImageData>:

<string>, // file path
<int>, // 0 : use the file path and link to it
// 1 : ignore file path and use next parameter
<string> // text data, only present if preceding int is 1

<PinsInfo>:

Array("NAME:Pins",

```
"P:=", <PinArray>,  
"P:=", <PinArray>,...)
```

<PinArray>:

```
Array("Port:=", Array("Id:=", <int>,  
"Clr:=", <real>, // optional - clearance  
"N:=", <string>), // pin name  
"Pos:=", Array("x:=", <Location>, // padstack (x,y) position  
"y:=", <Location>),  
"VRt:=", <Angle>, // optional - rotation  
"HD:=", <Size>, // optional - hole diameter  
<PadstackImplementationInfo>)
```

<Location>:

<string> specifying real number and units (may use variables)

<Angle>:

<string> specifying angle with a real number and units

<Size>:

<string> specifying size with a real number and units

<PadstackImplementationInfo>:

If another with the same implementation has already been specified:

"Ref:=", <int> // id of the other

If not:

"Ref:=", <string>, // name

"Frm:=", <int>, // id of highest layer

"To:=", <int>, // id of lowest layer

<LayerPlacementInfo>,

"Man:=", <int>, // optional, 1 if manually placed, 0 if not (default)

"Use:=", Array(<PadUseInfo>, <PadUseInfo>...) // array may be empty

<LayerPlacementInfo>:

"Lyr:=", Array("Mrg:=", <int>, // optional,

// 1 if all layers have been merged (default)

// 0 if layer are not merged

"Flp:=", <int>, // optional,

// 1 if placed bottom up

// 0 if not (default)

"Map:=", <ParentToLocalLayerInfo>)

<ParentToLocalLayerInfo>:

```
Array("U:=", <DirectionOfUniqueness>,  
"F:=", Array(<int>, <int>, ...), // forward mapping  
// -1 is not mapped  
"B:=", Array(<int>, <int>, ...)) // backward mapping  
// -1 is not mapped
```

<PadUseInfo>:

```
"Pad:=", Array("Lid:=", <int>, // layer id  
"T:=", <string>, // type : "connected", "thermal",  
// "no_pad", "not_connected",  
// or "not_connected_thermal"  
"Man:=", <int>) // optional, 1 if manually placed  
// 0 if not (default)
```

<DirectionOfUniqueness>:

```
<string> // one of "forward", "backward", or "two ways"
```

<ViasInfo>:


```
Array("NAME:Vias", <VialInfo>, <VialInfo>...)
```

<VialInfo>:

```
"V:=", Array("Id:=", <int>,  
"N:=", <string>, // name  
"Pos:=", Array("x:=", <Location>, // via (x,y) position  
"y:=", <Location>),  
"VRt:=", <Angle>, // optional - rotation  
<ImplementationInfo>
```

<EdgeportsInfo>:

```
Array("NAME:EPorts", <EdgePortArray>, <EdgePortArray>...)
```

<EdgePortArray>

```
Array("NAME:EP",  
"LP:=", Array("Id:=", <int>, // port id  
"N:=", <string>), // port name  
"Eo:=", Array(<edge description>, <edge description>,...))
```

<edgedescription> for primitive edges

"et:=", "pe", "pr:=", <id>, "ei:=", <edge#>

<id>: integer that is the primitive id

<edge#>: integer that is the edge number on the primitive

<edge description> for via edges

"et:=", "pse", "sel:=", <"via">, "layer:=", <layer id>,

"sx:=", <start X location>, "sy:=", <start Y location>, "ex:=", <end X location>, "ey:=", <end Y location>, "h:=", <arc height>,
"rad:=", <radians>

<"via">: text that is the name of the via to use

<layer id>: an integer that is the id of the layer of the pad of the via to use

<start X location>, <start Y Location>:

doubles that are the X, Y location of the start point of the edge arc

<end X location>, <end Y Location>:

doubles that are the X, Y location of the end point of the edge arc

<arc height>: double giving the height of the edge arc (0 for a straight edge)

<radians>: double giving the arc size in radians (0 for a straight edge)

<ComponentPropertyInfo>:

```
Array("NAME:CProps",  
"VariableProp:=", <VariableInfo>,  
"VariableProp:=", <VariableInfo>,  
...)
```

<VariableInfo>:

```
Array(<string>, // name  
<FlagLetters>,  
<string>, // description  
"CB:=", <string>, // optional - script for call back  
<string>) // value: number, variable, or expression
```

<ScriptInfo>:

```
Array("NAME:script",  
"language:=", <string>, // script language  
"UsesScript:=", true,  
"script:=", <string>) // contents of script
```

<ListOfComponentNames>:

<string>, <string> ...

// The list may be empty. When not empty, each string that is listed is a component

// that references the footprint to be edited. Prior to editing, a clone of the footprint is

// made, and the components that are listed are modified so that they now refer to

// the clone.

Export [footprint manager]

Use: Export a footprint to a library

Command: Tools > Edit Configured Libraries > Footprints > Export to Library

Syntax: Export Array("NAME:<LibraryName>",

<FootprintName>,

<FootprintName>...),

<LibraryLocation>

Return Value: None

Parameters: <LibraryName>:

<string> // name of the library

<FootprintName>:

<string> // composite name of footprint to export

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

GetNames [footprint manager]

Use: Returns the names of the footprints (used and unused) in a design. The following script command, **IsUsed**, can then be used to separate used and unused footprints.

Command: None

Syntax: GetNames()

Return Value: An array of strings

Parameters: None

IsUsed [footprint manager]

Use: Used to determine if a footprint is used in the design.

Command: None

Syntax: IsUsed(<FootprintName>)

Return Value: <Boolean> // true if the specified footprint is used in the design

Parameters: <FootprintName>:

<string>

Remove [footprint manager]

Use: Removes a footprint from a library

Command: Tools > Edit Configured Libraries > Footprints > Remove Footprint

Syntax: Remove <FootprintName>,

<IsProjectFootprint>,

<LibraryName>,
<LibraryLocation>

Return Value: None

Parameters: <FootprintName>:

<string> // composite name of the footprint to remove

<IsProjectFootprint>:
<bool>

<LibraryName>:
<string> // name of the library

<LibraryLocation>:
<string> // location of the library in <LibraryName>
// One of "Project", "PersonalLib", or "UserLib"

RemoveUnused [footprint manager]

Use: Removes footprints that are not used in the design.

Command: **Project->Remove Unused Definitions** is similar but operates slightly different and does not record script commands.

Syntax: RemoveUnused()

Return Value: <bool> True if one or more footprints are removed.

Parameters: None

Note:

The order of calls to RemoveUnused is significant. As a result, removing definitions in an unordered fashion may cause other footprints in dependent definitions to be rendered unusable.

Also, the symbol and footprint of an unused component are not unusable until after the component itself is removed using the Component ManagerRemove script.

Material Manager Script Commands

The material manager provides access to materials in a project. The manager object is accessed via the definition manager.

```
Set oDefinitionManager = oProject.GetDefinitionManager()
```

```
Set oMaterialManager = oDefinitionManager.GetManager("Material")
```

The topics for this section include:

[GetNames](#)

[GetProperties](#)

[IsUsed](#)

[RemoveUnused](#)

GetNames [material manager]

Use: Get the names of the materials in a project

Command: None

Syntax: GetNames

Return Value: Names of the materials in a project

Parameters: None

Example:

```
materialNames = oMaterialMgr.GetNames()
```

Python Syntax	GetNames()
Python Example	<code>materialnames = oMaterialManager.GetNames()</code>

GetProperties [material manager]

Get material properties. Differs from GetData in that only material properties available to the user are returned by GetProperties.

UI Access	NA		
Parameters	Name	Type	Description
	<material_name>	string Boolean	Name of the project material True or False. If you use False or only a single argument, then GetProperties returns only the properties that are different from the defaults.
Return Value	Array of material data		

Python Syntax	GetProperties (<materialname>)
Python Example	<code>oMaterialManager.GetProperties("Gold", True)</code>

	<code>oMaterialManager.GetProperties("vacuum")</code>

IsUsed [material manager]

Use: Checks if a project material is in use

Command: None

Syntax: IsUsed <material_name>

Return Value: Returns 'True' if the material is in use.

Parameters: <material_name>

Type: string

Value: Name of the project material to check.

Python Syntax	IsUsed(<ComboName>)
Python Example	<code>isused = oMaterialManager.IsUsed("mylib:mymaterial")</code>

RemoveUnused [material manager]

Use: Remove all unused materials from the project.

Command: None

Syntax: RemoveUnused

Return Value: None

Parameters: None

Python Syntax	RemoveUnused()
Python Example	<code>thereWereExtras = oMaterialManager.RemoveUnused()</code>

Model Manager Script Commands

The model manager provides access to models in a project. The manager object is accessed via the definition manager.

```
Set oDefinitionManager = oProject.GetDefinitionManager()
```

```
Set oModelManager = oDefinitionManager.GetManager("Model")
```

The model manager script commands are listed below:

[Add](#)

[ConvertToDynamic](#)

[ConvertToParametric](#)

[Edit](#)

[EditWithComps](#)

[Export](#)

[GetNames](#)

[IsUsed](#)

[Remove](#)

[RemoveUnused](#)

Add [model manager]

Use: Add a model

Command: Tools > Edit Configured Libraries > Models > Add Model

Syntax: Add Array("NAME:<modelName>",
 "ModTime:=", <ModifiedTimeInfo>,
 "Library:=", "", // Library name
 "LibLocation:=", "Project", // Project Location
 <PinDefInfo>,
 <PinDefInfo>,... // optional, to define pins
 <GraphicsDataInfo>, // optional, to define graphics
 <PropDisplayMapInfo>)) // optional, to define property displays

Return Value: <string>
 // composite name of the model.
 // If the name requested conflicts with the name of an existing
 // model, the requested name is altered to be unique.
 // The name returned reflects any change made to be unique.

Parameters: <modelName>:
 <string> // simple name of the model being added

 <ModifiedOnInfo>:
 An integer that corresponds to the number of seconds that have elapsed
 since 00:00 hours, Jan 1, 1970 UTC from the system clock.

```
<PinDefInfo>:  
Array("NAME:PinDef",  
"Pin:=", Array (<string>, // pin name  
<real>, // x location  
<real>, // y location  
<real>, // angle in radians  
<PinType>,  
<real>, // line width  
<real>, // line length  
<bool>, // mirrored  
<int>, // color  
<bool>, // true if visible, false if not  
<string>, // hidden net name  
<OptionalPinInfo>, // optional info  
<PropDisplayMapInfo>)) // optional  
  
<PinType>:  
<string> // "N" : normal pin  
// "I" : input pin
```

// "O" : output pin

<OptionalPinInfo>:

// Specify both or neither

<bool>, // true if name is to be shown

<bool>, // true if number is to be shown

<PropDisplayMapInfo>:

Array("NAME:PropDisplayMap",

<PropDisplayInfo>,

<PropDisplayInfo>,...)

<PropDisplayInfo>:

<NameString>, Array(<DisplayTypeInfo>,

<DisplayLocationInfo>,

<int>, // optional, level number

<TextInfo>)

<NameString>:

<string> // PropertyName:=, where PropertyName is the name of

// the property to be displayed

<DisplayTypeInfo>:

<int> // 0 : No display

// 1 : Display name only

// 2 : Display value only

// 3 : Display both name and value

// 4: Display evaluated value only

// 5: Display both name and evaluated value

<DisplayLocationInfo>:

<int> // 0 : Left

// 1 : Top

// 2 : Right

// 3 : Bottom

// 4 : Center

// 5 : Custom placement

<GraphicsDataInfo>:

Array("NAME:Graphics",

// one or more of the following

```
<RectInfo>,  
<CircleInfo>,  
<ArcInfo>,  
<LineInfo>,  
<PolygonInfo>,  
<TextInfo>,  
<ImageInfo>)
```

<RectInfo>:

```
"Rect:=", Array(<real>, // line width  
<int>, // fill pattern  
<int>, // color  
<real>, // angle, in radians  
<real>, // x position of center  
<real>, // y position of center  
<real>, // width  
< real>) // height
```

<CircleInfo>:

```
"Circle:=", Array(<real>, // line width  
<int>, // fill pattern
```

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>) // radius

<ArcInfo>:

"Arc:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>, // radius

<real>, // start angle, in radians

<end>) // end angle, in radians

<LineInfo>:

"Line:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<PointInfo>, // must specify at least 2 points

<PointInfo>...)

<PointInfo>:

<real>, // x position

<real> // y position

<PolygonInfo>:

"Polygon:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<PointInfo>, // must specify at least 3 points

<PointInfo>...)

<TextInfo>:

"Text:=", Array(<real>, // x position

<real>, // y position

<real>, // angle, in radians

<Justification>,

<bool>, // is plotter font

<string>, // font name

<int>, // color

<string>) // text string

<Justification>:

<int> // 0 : left top

// 1 : left base

// 2 : left bottom

// 3 : center top

// 4 : center base

// 5 : center bottom

// 6 : right top

// 7 : right base

// 8 : right bottom

<ImageInfo>:

"Image:=", Array(<RectInfo>,

<ImageData>,

<bool>) // is mirrored

<ImageData>:

<string>, // file path

<int>, // 0 : use the file path and link to it

// 1 : ignore file path and use next parameter

<string> // text data, only present if preceding int is 1

ConvertToDynamic

Use: Build a new dynamic model based on an existing parametric model.

Command: Right-click on a model under Definitions/Models in the Project Tree and choose ConvertToDynamic.

Syntax: ConvertToDynamic(defName, newname)

Return Value: <newname> // Name of the new model added

Parameters: <defName> // Model that is the base for the new conversion

ConvertToParametric

Use: Build a new parametric model based on an existing dynamic model.

Command: Right-click on a model under Definitions/Models in the Project Tree and choose ConvertToParametric.

Syntax: ConvertToParametric(defName, newname)

Return Value: <newname> // Name of the new model added

Parameters: <defName> // Model that is the base for the new conversion

Edit [deprecated]

Deprecated command — please use [EditSymbolAndUpdateComps](#).

EditWithComps [model manager]

Use: Edit an existing model.

Command: None

Syntax: EditWithComps <ModelName>,
Array("NAME:<NewModelName>",

```
"ModTime:=", <ModifiedTimeInfo>,  
"Library:=", <string>, // Library name  
"LibLocation:=", <string>, // Project Location  
<PinDefInfo>,  
<PinDefInfo>,... // optional, to define pins  
<GraphicsDataInfo>, // optional, to define graphics  
<PropDisplayMapInfo>), // optional, to define property displays  
Array(<ListOfComponentNames>) // Component names
```

Return Value: <string>

```
// composite name of the model.  
// If the name requested conflicts with the name of an existing  
// model, the requested name is altered to be unique.  
// The name returned reflects any change made to be unique.
```

Parameters: <ModelName>:

```
<string> // composite name of the model being edited
```

<NewModelName>:

```
<string> // new simple name for the model
```

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<PinDefInfo>:

```
Array("NAME:PinDef",  
"Pin:=", Array (<string>, // pin name  
<real>, // x location  
<real>, // y location  
<real>, // angle in radians  
<PinType>,  
<real>, // line width  
<real>, // line length  
<bool>, // mirrored  
<int>, // color  
<bool>, // true if visible, false if not  
<string>, // hidden net name  
<OptionalPinInfo>, // optional info  
<PropDisplayMapInfo>)) // optional
```

<PinType>:

<string> // "N" : normal pin

// "I" : input pin

// "O" : output pin

<OptionalPinInfo>:

// Specify both or neither

<bool>, // true if name is to be shown

<bool>, // true if number is to be shown

<PropDisplayMapInfo>:

Array("NAME:PropDisplayMap",

<PropDisplayInfo>,

<PropDisplayInfo>,...)

<PropDisplayInfo>:

<NameString>, Array(<DisplayTypeInfo>,

<DisplayLocationInfo>,

<int>, // optional, level number

<TextInfo>)

<NameString>:

<string> // PropertyName:=, where PropertyName is the name of
// the property to be displayed

<DisplayTypeInfo>:

<int> // 0 : No display

// 1 : Display name only

// 2 : Display value only

// 3 : Display both name and value

// 4: Display evaluated value only

// 5: Display both name and evaluated value

<DisplayLocationInfo>:

<int> // 0 : Left

// 1 : Top

// 2 : Right

// 3 : Bottom

// 4 : Center

// 5 : Custom placement

<GraphicsDataInfo>:

```
Array("NAME:Graphics",  
// one or more of the following  
<RectInfo>,  
<CircleInfo>,  
<ArcInfo>,  
<LineInfo>,  
<PolygonInfo>,  
<TextInfo>,  
<ImageInfo>)
```

<RectInfo>:

```
"Rect:=", Array(<real>, // line width  
<int>, // fill pattern  
<int>, // color  
<real>, // angle, in radians  
<real>, // x position of center  
<real>, // y position of center  
<real>, // width  
< real>) // height
```


<CircleInfo>:

"Circle:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>) // radius

<ArcInfo>:

"Arc:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>, // radius

<real>, // start angle, in radians

<end>) // end angle, in radians

<LineInfo>:

"Line:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<PointInfo>, // must specify at least 2 points

<PointInfo>...)

<PointInfo>:

<real>, // x position

<real> // y position

<PolygonInfo>:

"Polygon:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<PointInfo>, // must specify at least 3 points

<PointInfo>...)

<TextInfo>:

"Text:=", Array(<real>, // x position

<real>, // y position

<real>, // angle, in radians

<Justification>,

<bool>, // is plotter font

<string>, // font name

<int>, // color

<string>) // text string

<Justification>:

<int> // 0 : left top

// 1 : left base

// 2 : left bottom

// 3 : center top

// 4 : center base

// 5 : center bottom

// 6 : right top

// 7 : right base

// 8 : right bottom

<ImageInfo>:

"Image:=", Array(<RectInfo>,

<ImageData>,

<bool>) // is mirrored

<ImageData>:

<string>, // file path

<int>, // 0 : use the file path and link to it

// 1 : ignore file path and use next parameter

<string> // text data, only present if preceding int is 1

<ListOfComponentNames>:

<string>, <string> ...

// The list may be empty. When not empty, each string that is listed is a component

// that references the model to be edited. Prior to editing, a clone of the model is

// made, and the components that are listed are modified so that they now refer to

// the clone.

Export [model manager]

Use: Exports model(s) to a library

Command: Tools > Edit Configured Libraries > Models > Export to Library

Syntax: Export Array("NAME:<LibraryName>",

<ModelName>,

<ModelName>...),

<LibraryLocation>

Return Value: None

Parameters: <LibraryName>:

<string> // name of the library

<ModelName>:

<string> // composite name of model to export

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

Python Syntax	Export(["NAME:<LibraryName>", <ComboName>, <ComboName>...], <LibraryLocation>)
Python Example	oModelManager.Export(["NAME:mylib", "model1", "model2"])

GetNames [model manager]

Use: Returns the names of the models (used and unused) in a design. The following script command, **IsUsed**, can then be used to separate used and unused models.

Command: None

Syntax: GetNames()

Return Value: An array of strings

Parameters: None

Python Syntax	GetNames()
Python Example	<code>modelnames = oModelManager.GetNames()</code>

IsUsed [model manager]

Use: Used to determine if a model is used in the design.

Command: None

Syntax: IsUsed(<ModelName>)

Return Value: <Boolean> // true if the specified model is used in the design

Parameters: <ModelName>:

<string>

Python Syntax	IsUsed(<ComboName>)
Python Example	<code>isused = oModelManager.IsUsed ("mylib:mymodel")</code>

Remove [model manager]

Use: Removes a model from a library

Command: Tools > Edit Configured Libraries > Models > Remove Model

Syntax: Remove <ModelName>,

<IsProjectModel>,

<LibraryName>,

<LibraryLocation>

Return Value: None

Parameters: <ModelName>:

<string> // composite name of the model to remove

<IsProjectModel>:

<bool>

<LibraryName>:

<string> // name of the library

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

Python Syntax	Remove (<ModelName>, <IsLocal>, <LibraryName>, <LibraryLocation>)
Python Example	<pre>oModelManager.Export (["NAME:mylib", "model1", "model2"])</pre>

RemoveUnused [model manager]

Use: Removes models that are not used in the design.

Command: **Project->Remove Unused Definitions** is similar but operates slightly different and does not record script commands.

Syntax: RemoveUnused()

Return Value: <bool> True if one or more models are removed.

Parameters: None

Note:

The order of calls to RemoveUnused is significant. As a result, removing definitions in an unordered fashion may cause other models in dependent definitions to be rendered unusable.

Also, the model and footprint of an unused component are not unusable until after the component itself is removed using the Component Manager Remove script.

Python Syntax	RemoveUnused()
Python Example	<code>thereWereExtras = oModelManager.RemoveUnused()</code>

Network Data Explorer Manager Script Commands

The network data Explorer (NDE) Manager provides access to certain NDE data.

```
Set oDefinitionManager = oProject.GetDefinitionManager()
```

```
Set oNdExplorerManager = oDefinitionManager.GetManager("NdExplorer")
```

For NDE scripts accessed via the ndExplorer tool, see: [Network Data Explorer Script Commands](#).

The topics for this section include:

[ExportFullWaveSpice](#)

[ExportNetworkData](#)

[ExportNMFData](#)

ExportFullWaveSpice

Use: Export FullWaveSpice data in a format of your choice.

Command: File > Export MacroModel > Broadband (SYZ, FWS....)

Syntax: ExportFullWaveSpice

```
"DesignName", // Design name. Can be left blank, if loading solution from a file.  
true/false, // true - solution loaded from file, false- loaded from design  
"Name", // If loading from design this is the solution name, else this is the  
           // full path of the file from which the solution is loaded  
"variation", // Pick a particular variation. Leave blank if no variation.  
Array("NAME:Frequencies"), // Optional; if none defined all frequencies are used  
Array("NAME:SpiceData"), // Spice export options object  
"SpiceType:=", "SSS", // SpiceType can be "PSpice", "HSpice", "Spectre", "SSS",  
                      // "Simplorer", "TouchStone1.0", "TouchStone2.0"  
"EnforcePassivity:=", false, // Enforce Passivity true/false  
"EnforceCausality:=", false, // Enforce Causality true/false  
"UseCommonGround:=", false, // Use common ground true/false  
"FittingError:=", 0.5, // Fitting error  
"MaxPoles:=", 400, // Maximum Order  
"PassivityType:=", "ConvexOptimization", // Passivity Type can be "ConvexOptimization",
```

```
// "PassivityByPerturbation", or "IteratedFittingOfPV"

"ColumnFittingType:=", "Column", // Column FittingType can be "Column", "Entry", "Matrix"

"SSFittingType:=", "TWA", // SS Fitting Type can be "TWA", "IterativeRational"

"RelativeErrorToleranc:=", false, // Relative error tolerance true/false

"TouchstoneFormat:=", "MA", // Touchstone Format "MA", "RI", "DB"

"TouchstoneUnits:=", "Hz", // Touchstone Units "Hz", "KHz", "MHz", "MHz"

"TouchStonePrecision:=", 8, // Touchstone precision

"ExportDirectory:=", "C:/Examples/LNA/", // Directory to export to

"ExportSpiceFileName:=", "Linckt_HBTest_2.sss", // Spice export file

"FullwaveSpiceFileName:=", "Linckt_HBTest.sss", // FWS file

"CreateNPortModel:=", true // Create a model based on the exported file true/false

)
```

ExportNetworkData

Exports matrix solution data to a file.

UI Access	N/A		
Parameters	Name	Type	Description
	<DesignVariationKey>	String	Design variation key. Pass empty string for the current nominal variation.
	<SolnSelectionArray>	Array	Array of selected solutions. Array(<SolnSelector>, <SolnSelector>, ...)

		If more than one array entry, this indicates a combined Interpolating sweep.
<SolnSelector>	String	Solution setup name and solution name, separated by a colon.
<FileFormat>	Integer	File format value. 2 : Tab delimited spreadsheet format (.tab) 3 : Touchstone (.sNp) 4 : CitiFile (.cit) 7 : Matlab (.m) 8 : Terminal Z0 spreadsheet
<OutFile>	String	Full path to the file to write out.
<FreqsArray>	Array	The frequencies to export. The <FreqsArray> argument contains a vector (e.g. "1GHz", "2GHz", ...) to use, or "all". To export all frequencies, use Array("all"). If no frequencies are specified, all frequencies are used.
<DoRenorm>	Boolean	For Touchstone format only. Specifies whether to renormalize the data before export.
<RenormImped>	Double	For Touchstone format only. Real impedance value in ohms, for renormalization. Required in syntax, but ignored if DoRenorm is false.
<DataType>	Array	Optional. Type: "S", "Y", or "Z". The matrix to export.
<pass>	Integer	Optional. The pass to export. This is ignored if the sourceName is a frequency sweep. Leaving out this value or specifying -1 gets all passes.
<ComplexFormat>	Integer	Optional. Type: "0", "1", or "2" The format to use for the exported data. 0 = Magnitude/Phase. 1 = Real/Imaginary. 2 = db/Phase.

	<i><Precision></i>	Integer	Optional. Touchstone number of digits precision. Default if not specified is 15.
	<i><UseExportFreqs></i>	Boolean	Specifies whether to use export frequencies.
	<i><IncludeGammaComments></i>	Boolean	Touchstone only. Specifies whether to include Gamma and Impedance comments.
	<i><SupportNonStdExport></i>	Boolean	Specifies whether to support non-standard Touchstone extensions for mixed reference impedance.
Return Value	None.		

Python Syntax	ExportNetworkData(<i><DesignVariationKey></i> , <i><SolnSelectionArray></i> , <i><SolnSelector></i> , <i><FileFormat></i> , <i><OutFile></i> , <i><FreqsArray></i> , <i><DoRenorm></i> , <i><RenormImped></i> , [Optional <i><DataType></i>], [Optional <i><pass></i>], [Optional <i><ComplexFormat></i>], [Optional <i><Precision></i>], [Optional <i><UseExportFreqs></i>], [Optional <i><IncludeGammaComments></i>], [Optional <i><SupportNonStdExport></i>])		
Python Example			

ExportNMFData

Exports s-parameters in neutral file format (*.nmf).

UI Access	Results > Solution Data. On the Matrix tab, click Export tab. Then click Export > S-parameter . Select Neutral Model format and export.		
Parameters	Name	Type	Description
	<i><sourceName></i>	Array	String names of solutions. Use more than one array entry for a combined Interpolating sweep.
	<i><outputFileName></i>	String	Full path of output file, including *.nmf extension.
	<i><reduceMat></i>	String	Either "Original" or name of reduced matrix.

	<refImp>	Double	Reference impedance.
	<freqs>	Array	Either "All" or array of doubles representing frequencies.
	<variationKey>	String	Design variation key. Pass empty string for the current nominal variation.
	<displayFormat>	String	"MagPhase", "Reallmag", "DbPhase".
	<length>	String	2D Extractor only. Optional. Number with units.
	<pass>	Integer	Optional. The pass to export. This is ignored if the <i>sourceName</i> is a frequency sweep. Leaving out this value or specifying -1 gets all passes.
	<ComplexFormat>	Integer	Optional. The format to use for the exported data. Options are 0 = Magnitude/Phase 1= Real/Imaginary. 2= db/Phase.
	<Precision>	Integer	Optional. Number of digits precision. If not specified, the default is 6.
Return Value	None.		

Python Syntax	ExportNMFData (<sourceName>, <outputFileName>, <reduceMat>, <refImp>, <freqs>, <variationKey>, <displayFormat>, <length> (2D Extractor only), <pass>, <ComplexFormat>, <Precision>)
Python Example	oDesign.ExportNMFData("Setup2 : LastAdaptive", "C:/outputs/data.nmf", "Original", 50, [10000000, 20000000, 30000000, 40000000, 50000000, 60000000, 70000000, 80000000, 90000000, 100000000], "", "MagPhase", 0, 1, 11)

Padstack Manager Script Commands

The padstack manager provides access to padstacks in a project. The manager object is accessed via the definition manager.

```
oDefinitionManager = oProject.GetDefinitionManager()
```

```
oPadstackManager = oDefinitionManager.GetManager("Padstack")
```

The padstack manager script commands are listed below.

[Add](#)

[Edit](#)

[EditWithComps](#)

[Export](#)

[GetData](#)

[GetNames](#)

[IsUsed](#)

[Remove](#)

[RemoveUnused](#)

Add [padstack manager]

Use: Add a padstack

Command: Tools > Edit Configured Libraries > Padstacks > Add Padstack

Syntax: Add Array("NAME:<PadstackName>",
 "ModTime:=", <ModifiedOnInfo>,
 "Library:=", "", // name of the library
 "LibLocation:=", "Project", // location of the named library
 Array("NAME:psd",
 "nam:= ", <PadstackName>,
 "lib:=", "", // name of the library

```
"mat:=", "", // hole plating material
"plt:=", "0", // percent of hole's radius filled by plating
Array("NAME:pds",
<LayerGeometryArray>,
<LayerGeometryArray....>,
"hle:=", <PadInfo>
"hRg:=", <HoleRange>,
"sbsh:=", <SolderballShape>,
"sbpl:=", <SolderballPlacement>,
"sbr:=", <string>, // solderball diameter, real with units
"sb2:=", <string>, // solderball mid diameter, real with units
"sbn:=", <string>), // name of solderball material
"ppl:=", <PadPortLayerArray>)
```

Return Value: simple name of the added padstack

// If the name requested conflicts with the name of an existing

// padstack, the requested name is altered to be unique.

// The name returned reflects any change made to be unique.

Parameters: <PadstackName>:

<string> // simple name of padstack to create

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<LayerGeometryArray>:

```
Array("Name:lgm",  
"lay:=", <string>, // definition layer name  
"id:=", <int>, // definition layer id  
"pad:=", <PadInfo>, // pad  
"ant:=", <PadInfo>, // antipad  
"thm:=", <PadInfo>, // thermal pad  
"X:=", <string>, // pad x connection, real with units  
"Y:=", <string>, // pad y connection, real with units  
"dir:=", <DirectionString>) // pad connection direction
```

<PadInfo>:

```
Array("shp:=", <PadShape>,  
"Szs:=", <DimensionArray>,  
"X:=", <string>, // x offset, real with units  
"Y:=", <string>, // y offset, real with units
```


"R:=", <string>) // rotation, real with units

<PadShape>:

<string> one of these choices

"No" // no pad

"Cir" // Circle

"Sq" // Square

"Rct" // Rectangle

"Ov" // Oval

"Blt" // Bullet

"Ply" // Polygons

"R45" // Round 45 thermal

"R90" // Round 90 thermal

"S45" // Square 45 thermal

"S90" // Square 90 thermal

<DimensionArray>:

Array(<string>, ...) // each string is a real with units for one of the dimensions of the shape

<DirectionString>:

<string> one of these choices

"No" // no direction

"Any" // any direction

"0" // 0 degrees

"45" // 45 degrees

"90" // 90 degrees

"135" // 135 degrees

"180" // 180 degrees

"225" // 225 degrees

"270" // 270 degrees

"315" // 315 degrees

<HoleRange>:

<string> one of these choices

"Thr" // through all layout layers

"Beg" // from upper pad layer to lowest layout layer

"End" // from upper layout layer to lowest pad layer

"UTL" // from upper pad layer to lowest pad layer

<SolderballShape>:

<string> one of these choices

"None" // no solderball

"Cyl" // cylinder solderball

"Sph" // spheroid solderball

<SolderballPlacement>:

<string> one of these choices

"abv" // above padstack

"blw" // below padstack

<PadPortLayerArray>:

Array(<int>, <int>,....) where each int is a layer id

Edit [padstack manager]

Use: Edit an existing padstack.

Command: Tools > Edit Configured Libraries > Padstacks > Edit Padstack

Syntax: Edit <PadstackName>,

Array("NAME:<NewPadstackName>",

"ModTime:=", <ModifiedOnInfo>,

"Library:=", "", // name of the library

"LibLocation:=", "Project", // location of the named library

Array("NAME:psd",

"nam:= ", <PadstackName>,

"lib:=", "", // name of the library

"mat:=", "", // hole plating material

"plt:=", "0", // percent of hole's radius filled by plating

```
Array("NAME:pds",  
  <LayerGeometryArray>,  
  <LayerGeometryArray....>,  
  "hle:=", <PadInfo>  
  "hRg:=", <HoleRange>,  
  "sbsh:=", <SolderballShape>,  
  "sbpl:=", <SolderballPlacement>,  
  "sbr:=", <string>, // solderball diameter, real with units  
  "sb2:=", <string>, // solderball mid diameter, real with units  
  "sbn:=", <string>), // name of solderball material  
  "ppl:=", <PadPortLayerArray>)
```

Return Value: <string> // composite name of the padstack

// If the name requested conflicts with the name of an existing
// padstack, the requested name is altered to be unique.
// The name returned reflects any change made to be unique.

Parameters: <PadstackName>:

<string> // composite name of padstack to edit

<NewPadstackName>:

<string> // new simple name for padstack

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<LayerGeometryArray>:

Array("Name:lgm",

"lay:=", <string>, // definition layer name

"id:=", <int>, // definition layer id

"pad:=", <PadInfo>, // pad

"ant:=", <PadInfo>, // antipad

"thm:=", <PadInfo>, // thermal pad

"X:=", <string>, // pad x connection, real with units

"Y:=", <string>, // pad y connection, real with units

"dir:=", <DirectionString>) // pad connection direction

<PadInfo>:

Array("shp:=", <PadShape>,

"Szs:=", <DimensionArray>,

"X:=", <string>, // x offset, real with units

"Y:=", <string>, // y offset, real with units

"R:=", <string>) // rotation, real with units

<PadShape>:

<string> one of these choices

"No" // no pad

"Cir" // Circle

"Sq" // Square

"Rct" // Rectangle

"Ov" // Oval

"Blt" // Bullet

"Ply" // Polygons

"R45" // Round 45 thermal

"R90" // Round 90 thermal

"S45" // Square 45 thermal

"S90" // Square 90 thermal

<DimensionArray>:

Array(<string>, ...) // each string is a real with units for one of the

// dimensions of the shape

<DirectionString>:

<string> one of these choices

"No" // no direction

"Any" // any direction

"0" // 0 degrees

"45" // 45 degrees

"90" // 90 degrees

"135" // 135 degrees

"180" // 180 degrees

"225" // 225 degrees

"270" // 270 degrees

"315" // 315 degrees

<HoleRange>:

<string> one of these choices

"Thr" // through all layout layers

"Beg" // from upper pad layer to lowest layout layer

"End" // from upper layout layer to lowest pad layer

"UTL" // from upper pad layer to lowest pad layer

<SolderballShape>:

<string> one of these choices

"None" // no solderball

"Cyl" // cylinder solderball

"Sph" // spheroid solderball

<SolderballPlacement>:

<string> one of these choices

"abv" // above padstack

"blw" // below padstack

<PadPortLayerArray>:

Array(<int>, <int>,....) where each int is a layer id

EditWithComps [padstack manager]

Use: Edit an existing padstack.

Command: None

Syntax: EditWithComps <PadstackName>,

Array("NAME:<NewPadstackName>",

"ModTime:=", <ModifiedOnInfo>,

"Library:=", "", // name of the library

"LibLocation:=", "Project", // location of the named library


```
Array("NAME:psd",  
      "nam:= ", <PadstackName>,  
      "lib:=", "", // name of the library  
      "mat:=", "", // hole plating material  
      "plt:=", "0", // percent of hole's radius filled by plating  
      Array("NAME:pds",  
            <LayerGeometryArray>,  
            <LayerGeometryArray....>),  
      "hle:=", <PadInfo>  
      "hRg:=", <HoleRange>,  
      "sbsh:=", <SolderballShape>,  
      "sbpl:=", <SolderballPlacement>,  
      "sbr:=", <string>, // solderball diameter, real with units  
      "sb2:=", <string>, // solderball mid diameter, real with units  
      "sbn:=", <string>), // name of solderball material  
      "ppl:=", <PadPortLayerArray>,  
      Array(<ListOfComponentNames>) // Component names
```

Return Value: <string>

// composite name of the padstack.

// If the name requested conflicts with the name of an existing

// padstack, the requested name is altered to be unique.

// The name returned reflects any change made to be unique.

Parameters: <PadstackName>:

<string> // composite name of the padstack being edited

<NewPadstackName>:

<string> // new simple name for the padstack

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed since 00:00 hours, Jan 1, 1970 UTC from the system clock.

<LayerGeometryArray>:

Array("Name:lgm",

"lay:=", <string>, // definition layer name

"id:=", <int>, // definition layer id

"pad:=", <PadInfo>, // pad

"ant:=", <PadInfo>, // antipad

"thm:=", <PadInfo>, // thermal pad

"X:=", <string>, // pad x connection, real with units
"Y:=", <string>, // pad y connection, real with units
"dir:=", <DirectionString>) // pad connection direction

<PadInfo>:

Array("shp:=", <PadShape>,
"Szs:=", <DimensionArray>,
"X:=", <string>, // x offset, real with units
"Y:=", <string>, // y offset, real with units
"R:=", <string>) // rotation, real with units

<PadShape>:

<string> one of these choices

"No" // no pad

"Cir" // Circle

"Sq" // Square

"Rct" // Rectangle

"Ov" // Oval

"Blit" // Bullet

"Ply" // Polygons

"R45" // Round 45 thermal

"R90" // Round 90 thermal

"S45" // Square 45 thermal

"S90" // Square 90 thermal

<DimensionArray>:

Array(<string>, ...) // each string is a real with units for one of the

// dimensions of the shape

<DirectionString>:

<string> one of these choices

"No" // no direction

"Any" // any direction

"0" // 0 degrees

"45" // 45 degrees

"90" // 90 degrees

"135" // 135 degrees

"180" // 180 degrees

"225" // 225 degrees

"270" // 270 degrees

"315" // 315 degrees

<HoleRange>:

<string> one of these choices

"Thr" // through all layout layers

"Beg" // from upper pad layer to lowest layout layer

"End" // from upper layout layer to lowest pad layer

"UTL" // from upper pad layer to lowest pad layer

<SolderballShape>:

<string> one of these choices

"None" // no solderball

"Cyl" // cylinder solderball

"Sph" // spheroid solderball

<SolderballPlacement>:

<string> one of these choices

"abv" // above padstack

"blw" // below padstack

<PadPortLayerArray>:

Array(<int>, <int>,.....) where each int is a layer id

<ListOfComponentNames>:

```
<string>,<string> ...
```

```
// The list may be empty. When not empty, each string that is listed is a component  
// that references the padstack to be edited. Prior to editing, a clone of the padstack is  
// made, and the components that are listed are modified so that they now refer to  
// the clone.
```

Export [padstack manager]

Use: Export a padstack to a library

Command: Tools > Edit Configured Libraries > Padstacks > Export to Library

Syntax: Export Array("NAME:<LibraryName>",

```
    <PadstackName>,  
    <PadstackName>...),  
    <LibraryLocation>
```

Return Value: None

Parameters: <LibraryName>:

```
<string> // name of the library
```

```
<PadstackName>:
```

```
<string> // simple name of padstack to export
```

```
<LibraryLocation>:
```

<string> // location of the library in <LibraryName>
// One of "Project", "PersonalLib", or "UserLib"

GetNames [padstack manager]

Use: Returns the names of the padstack (used and unused) in a design. The following script command, **IsUsed**, can then be used to separate used and unused padstacks.

Command: None

Syntax: GetNames()

Return Value: An array of strings

Parameters: None

IsUsed [padstack manager]

Use: Used to determine if a component is used in the design.

Command: None

Syntax: IsUsed(<PadstackName>)

Return Value: <Boolean> // true if the specified padstack is used in the design

Parameters: <PadstackName>:

<string>

Remove [padstack manager]

Use: Removes a padstack from a library

Command: Tools > Edit Configured Libraries > Padstacks > Remove Padstacks

Syntax: Remove <PadstackName>,
<IsProjectPadstack>,

<LibraryName>,
<LibraryLocation>

Return Value: None

Parameters: <PadstackName>:

<string> // simple name of the padstack to remove

<IsProjectPadstack>:

<bool>

<LibraryName>:

<string> // name of the library

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

RemoveUnused [padstack manager]

Use: Removes padstacks that are not used in the design.

Command: **Project->Remove Unused Definitions** is similar but operates slightly different and does not record script commands.

Syntax: RemoveUnused()

Return Value: <bool> True if one or more padstacks are removed.

Parameters: None

Note:

The order of calls to RemoveUnused is significant. As a result, removing definitions in an unordered fashion may cause other padstacks in dependent definitions to be rendered unusable.

Script and Library Scripts

The definition manager provides access to materials in a project. The manager object is accessed via the definition manager.

```
oDefinitionManager = oProject.GetDefinitionManager()
```

The script and library script commands are listed below.

[AddScript](#)

[EditScript](#)

[ExportScript](#)

[RemoveScript](#)

[ModifyLibraries](#)

AddScript

Adds a script to the definition manager.

UI Access	N/A		
Parameters	Name	Type	Description
	<AddScriptArray>	Array	Structured array. Array("NAME:<string script name>",

	<table><tr><td></td><td></td><td>"ScriptLang:=", <string script language> "ScriptText:=", <string text of script>)</td></tr></table>			"ScriptLang:=", <string script language> "ScriptText:=", <string text of script>)
		"ScriptLang:=", <string script language> "ScriptText:=", <string text of script>)		
Return Value	None.			

Python Syntax	AddScript(<AddScriptArray>)
Python Example	<pre>oDefinitionManager.AddScript(["NAME:MyScript", "ScriptLang:=", "language", "ScriptText:=", "MsgBox(\"HelloWorld\") "])</pre>

EditScript

Edits a script in the definition manager.

UI Access	N/A		
Parameters	Name	Type	Description
	<OriginalName>	String	Name of the script to be edited.
	<EditScriptArray>	Array	Structured array. Array("NAME:<string script name>",

			"ScriptLang:=", <string script language> "ScriptText:=", <string text of script>
Return Value	None.		

Python Syntax	EditScript(<OriginalName>, <EditScriptArray>)
Python Example	<pre>oDefinitionManager.EditScript("MyScript", ["NAME:MyNewScript", "ScriptLang:=", "language", "ScriptText:=", "MsgBox(\"HelloAgain\") "])</pre>

ExportScript

Use: Export to Library in the script definition manager

Command: None

Syntax: ExportScript <ExportData>, <Library location>

Return Value: None

Parameters: <ExportData>

Array("NAME:<LibraryName>", <ScriptName>, <ScriptName>, ...)

Python Syntax	<code>ExportScript(<ExportData>,<Library location>)</code>
Python Example	<pre>oProject.ExportComponent (["NAME:mylib", "myscript"], "PersonalLib")</pre>

ModifyLibraries

Use: Configure Libraries on the Tools menu

Command: None

Syntax: `ModifyLibraries <DesignName>,Array(<ConfigLibArray>)`

Return Value: None

Parameters: `<DesignName>`

`Type: <string>`

`<ConfigLibArray>`

`Array("NAME:<LibraryType>,<ConfiguredLib>,<ConfiguredLib>,...),...`

`<ConfiguredLib> // blank to leave unchanged`

`<DefinitionType>`

`Array("<libraryname >","<libraryname>","...)`

Python Syntax	<code>ModifyLibraries (<DesignName>,[<ConfigLibArray>])</code>
Python Example	<pre>oDefinitionManager.ModifyLibraries("MyCircuit", _</pre>

	<pre>["NAME:PersonalLib"], _ ["NAME:UserLib"], _ ["NAME:SystemLib", _ "Symbols:=", ["Circuit Elements", "Symbols", _ "ParamExtraElements\PE_Symbols", _ "Vendor Elements\Nonlinear"]])</pre>

RemoveScript

Use: Remove Script in the script definition manager

Command: None

Syntax: RemoveScript <ScriptName>, <IsProjectScript>, <LibraryName>, <LibraryLocation>

Return Value: None

Parameters: <ScriptName>

Type: <string>

<IsProjectScript>

Type: <bool>

<LibraryName>

Type: <string>

<LibraryLocation>

Type: <string>

Python Syntax	<code>RemoveScript (<ScriptName>,<IsProjectScript>, <LibraryName>,<LibraryLocation>)</code>
Python Example	<pre>oDefinitionManager.RemoveScript("myscript", true, "Local", "Project")</pre>

Symbol Manager Script Commands

The symbol manager provides access to symbols in a project. The manager object is accessed via the definition manager.

```
oDefinitionManager = oProject.GetDefinitionManager()  
oSymbolManager = oDefinitionManager.GetManager("Symbol")
```

The symbol manager script commands are listed below.

[Add](#)

[BringToFront](#)

[Edit](#)

[EditSymbolAndUpdateComps](#)

[Export](#)

[GetNames](#)

[IsUsed](#)

[Remove](#)

[RemoveUnused](#)

Add [symbol manager]

Use: Add a symbol

Command: Tools > Edit Configured Libraries > Symbols > Add Symbol

Syntax: Add Array("NAME:<SymbolName>",
 "ModTime:=", <ModifiedTimeInfo>,
 "Library:=", "", // Library name
 "LibLocation:=", "Project", // Project Location
 <PinDefInfo>,
 <PinDefInfo>,... // optional, to define pins
 <GraphicsDataInfo>, // optional, to define graphics
 <PropDisplayMapInfo>)) // optional, to define property displays

Return Value: <string>
 // composite name of the symbol.
 // If the name requested conflicts with the name of an existing
 // symbol, the requested name is altered to be unique.
 // The name returned reflects any change made to be unique.

Parameters: <SymbolName>:
 <string> // simple name of the symbol being added

 <ModifiedOnInfo>:
 An integer that corresponds to the number of seconds that have elapsed
 since 00:00 hours, Jan 1, 1970 UTC from the system clock.

```
<PinDefInfo>:  
Array("NAME:PinDef",  
"Pin:=", Array (<string>, // pin name  
<real>, // x location  
<real>, // y location  
<real>, // angle in radians  
<PinType>,  
<real>, // line width  
<real>, // line length  
<bool>, // mirrored  
<int>, // color  
<bool>, // true if visible, false if not  
<string>, // hidden net name  
<OptionalPinInfo>, // optional info  
<PropDisplayMapInfo>)) // optional  
  
<PinType>:  
<string> // "N" : normal pin  
// "I" : input pin
```


// "O" : output pin

<OptionalPinInfo>:

// Specify both or neither

<bool>, // true if name is to be shown

<bool>, // true if number is to be shown

<PropDisplayMapInfo>:

Array("NAME:PropDisplayMap",

<PropDisplayInfo>,

<PropDisplayInfo>,...)

<PropDisplayInfo>:

<NameString>, Array(<DisplayTypeInfo>,

<DisplayLocationInfo>,

<int>, // optional, level number

<TextInfo>)

<NameString>:

<string> // PropertyName:=, where PropertyName is the name of

// the property to be displayed

<DisplayTypeInfo>:

<int> // 0 : No display

// 1 : Display name only

// 2 : Display value only

// 3 : Display both name and value

// 4: Display evaluated value only

// 5: Display both name and evaluated value

<DisplayLocationInfo>:

<int> // 0 : Left

// 1 : Top

// 2 : Right

// 3 : Bottom

// 4 : Center

// 5 : Custom placement

<GraphicsDataInfo>:

Array("NAME:Graphics",

// one or more of the following

```
<RectInfo>,  
<CircleInfo>,  
<ArcInfo>,  
<LineInfo>,  
<PolygonInfo>,  
<TextInfo>,  
<ImageInfo>)
```

<RectInfo>:

```
"Rect:=", Array(<real>, // line width  
<int>, // fill pattern  
<int>, // color  
<real>, // angle, in radians  
<real>, // x position of center  
<real>, // y position of center  
<real>, // width  
< real>) // height
```

<CircleInfo>:

```
"Circle:=", Array(<real>, // line width  
<int>, // fill pattern
```

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>) // radius

<ArcInfo>:

"Arc:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>, // radius

<real>, // start angle, in radians

<end>) // end angle, in radians

<LineInfo>:

"Line:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<PointInfo>, // must specify at least 2 points

<PointInfo>...)

<PointInfo>:

<real>, // x position

<real> // y position

<PolygonInfo>:

"Polygon:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<PointInfo>, // must specify at least 3 points

<PointInfo>...)

<TextInfo>:

"Text:=", Array(<real>, // x position

<real>, // y position

<real>, // angle, in radians

<Justification>,

<bool>, // is plotter font

<string>, // font name

<int>, // color

<string>) // text string

<Justification>:

<int> // 0 : left top

// 1 : left base

// 2 : left bottom

// 3 : center top

// 4 : center base

// 5 : center bottom

// 6 : right top

// 7 : right base

// 8 : right bottom

<ImageInfo>:

"Image:=", Array(<RectInfo>,

<ImageData>,

<bool>) // is mirrored

<ImageData>:

<string>, // file path

<int>, // 0 : use the file path and link to it

// 1 : ignore file path and use next parameter

<string> // text data, only present if preceding int is 1

BringToFront [symbol manager]

Use: Changes the drawing for the symbol so that the specified objects are drawn on top of other overlapping objects.

Command: Draw > Bring To Front

Syntax: BringToFront Array("NAME:Selections", "Selections:=", Array (<Object>, <Object>, ...))

Return Value: None

Parameters: <Object>

<string> // object to bring to the front

Edit [deprecated]

Deprecated command — please use [EditSymbolAndUpdateComps](#).

EditSymbolAndUpdateComps [symbol manager]

Use: Edit an existing symbol.

Command: None

Syntax: EditSymbolAndUpdateComps <SymbolName>,
 Array("NAME:<NewSymbolName>",
 "ModTime:=", <ModifiedTimeInfo>,
 "Library:=", <string>, // Library name
 "LibLocation:=", <string>, // Project Location
 <PinDefInfo>,

<PinDefInfo>,... // optional, to define pins
<GraphicsDataInfo>, // optional, to define graphics
<PropDisplayMapInfo>), // optional, to define property displays
Array(<ListOfComponentNames>), // Component names
<EditContext> //optional

Return Value: <string>

// composite name of the symbol.
// If the name requested conflicts with the name of an existing
// symbol, the requested name is altered to be unique.
// The name returned reflects any change made to be unique.

Parameters: <SymbolName>:

<string> // composite name of the symbol being edited

<NewSymbolName>:

<string> // new simple name for the symbol

<ModifiedOnInfo>:

An integer that corresponds to the number of seconds that have elapsed

since 00:00 hours, Jan 1, 1970 UTC from the system clock.

```
<PinDefInfo>:  
Array("NAME:PinDef",  
"Pin:=", Array (<string>, // pin name  
<real>, // x location  
<real>, // y location  
<real>, // angle in radians  
<PinType>,  
<real>, // line width  
<real>, // line length  
<bool>, // mirrored  
<int>, // color  
<bool>, // true if visible, false if not  
<string>, // hidden net name  
<OptionalPinInfo>, // optional info  
<PropDisplayMapInfo>)) // optional  
  
<PinType>:  
<string> // "N" : normal pin  
// "I" : input pin
```

// "O" : output pin

<OptionalPinInfo>:

// Specify both or neither

<bool>, // true if name is to be shown

<bool>, // true if number is to be shown

<PropDisplayMapInfo>:

Array("NAME:PropDisplayMap",

<PropDisplayInfo>,

<PropDisplayInfo>,...)

<PropDisplayInfo>:

<NameString>, Array(<DisplayTypeInfo>,

<DisplayLocationInfo>,

<int>, // optional, level number

<TextInfo>)

<NameString>:

<string> // PropertyName:=, where PropertyName is the name of

// the property to be displayed

<DisplayTypeInfo>:

<int> // 0 : No display

// 1 : Display name only

// 2 : Display value only

// 3 : Display both name and value

// 4 : Display evaluated value only

// 5 : Display both name and evaluated value

<DisplayLocationInfo>:

<int> // 0 : Left

// 1 : Top

// 2 : Right

// 3 : Bottom

// 4 : Center

// 5 : Custom placement

<GraphicsDataInfo>:

Array("NAME:Graphics",

// one or more of the following

<RectInfo>,
<CircleInfo>,
<ArcInfo>,
<LineInfo>,
<PolygonInfo>,
<TextInfo>,
<ImageInfo>)

<RectInfo>:

"Rect:=", Array(<real>, // line width
<int>, // fill pattern
<int>, // color
<real>, // angle, in radians
<real>, // x position of center
<real>, // y position of center
<real>, // width
< real>) // height

<CircleInfo>:

"Circle:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>) // radius

<ArcInfo>:

"Arc:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<real>, // x position of center

<real>, // y position of center

< real>, // radius

<real>, // start angle, in radians

<end>) // end angle, in radians

<LineInfo>:

"Line:=", Array(<real>, // line width

<int>, // line pattern

<int>, // color

<PointInfo>, // must specify at least 2 points

<PointInfo>...)

<PointInfo>:

<real>, // x position

<real> // y position

<PolygonInfo>:

"Polygon:=", Array(<real>, // line width

<int>, // fill pattern

<int>, // color

<PointInfo>, // must specify at least 3 points

<PointInfo>...)

<TextInfo>:

"Text:=", Array(<real>, // x position

<real>, // y position

<real>, // angle, in radians

<Justification>,

<bool>, // is plotter font

<string>, // font name

<int>, // color

<string>) // text string

<Justification>:

<int> // 0 : left top

// 1 : left base

// 2 : left bottom

// 3 : center top

// 4 : center base

// 5 : center bottom

// 6 : right top

// 7 : right base

// 8 : right bottom

<ImageInfo>:

"Image:=", Array(<RectInfo>,

<ImageData>,

<bool>) // is mirrored

<ImageData>:

<string>, // file path

<int>, // 0 : use the file path and link to it

// 1 : ignore file path and use next parameter

<string> // text data, only present if preceding int is 1

<ListOfComponentNames>:

<string>,<string> ...

// The list may be empty. When not empty, each string that is listed is a component

// that references the symbol to be edited. Prior to editing, a clone of the symbol is

// made, and the components that are listed are modified so that they now refer to

// the clone.

<EditContext>:

// Changes that will be made to the component in support of the symbol changes

<RefPinOption>:

// <int>

// 0 = implied reference to ground,

// 1 = single common reference port,

// 2 = individual hidden reference pins for each port,

// 3 = individual reference pin per port

<CompName> // <string>

<TermAttributes>:

//<array>

<Terminal Name> // <string>

<Symbol Pin Name> // <string>

<InOut> // <int>

// 0=in

// 1=out

// 2= inout

<Domain> // <array>

// kConservative=0

// kSignal

// kQuantity

// kParameter

// kState

// kFlexible

<ID> // <int>

// -1, not used.

<Description>

Export [symbol manager]

Use: Exports symbol(s) to a library

Command: Tools > Edit Configured Libraries > Symbols > Export to Library

Syntax: Export Array("NAME:<LibraryName>",

<SymbolName>,

<SymbolName>...),

<LibraryLocation>

Return Value: None

Parameters: <LibraryName>:

<string> // name of the library

<SymbolName>:

<string> // composite name of symbol to export

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

GetNames [symbol manager]

Use: Returns the names of the symbols (used and unused) in a design. The following script command, **IsUsed**, can then be used to separate used and unused symbols.

Command: None

Syntax: GetNames()

Return Value: An array of strings

Parameters: None

IsUsed [symbol manager]

Use: Used to determine if a symbol is used in the design.

Command: None

Syntax: IsUsed(<SymbolName>)

Return Value: <Boolean> // true if the specified symbol is used in the design

Parameters: <SymbolName>:

 <string>

Remove [symbol manager]

Use: Removes a symbol from a library

Command: Tools > Edit Configured Libraries > Symbols > Remove Symbol

Syntax: Remove <SymbolName>,

 <IsProjectSymbol>,

 <LibraryName>,

 <LibraryLocation>

Return Value: None

Parameters: <SymbolName>:

<string> // composite name of the symbol to remove

<IsProjectSymbol>:

<bool>

<LibraryName>:

<string> // name of the library

<LibraryLocation>:

<string> // location of the library in <LibraryName>

// One of "Project", "PersonalLib", or "UserLib"

Example:

```
oSymbolManager.Remove "Nexxim Circuit Elements\Distributed\Distributed:bendo", true, "Project"
```

RemoveUnused [symbol manager]

Use: Removes symbols that are not used in the design.

Command: **Project->Remove Unused Definitions** is similar but operates slightly different and does not record script commands.

Syntax: RemoveUnused()

Return Value: <bool> True if one or more symbols are removed.

Parameters: None

Note:

The order of calls to RemoveUnused is significant. As a result, removing definitions in an unordered fashion may cause other symbols in dependent definitions to be rendered unusable.

Also, the symbol and footprint of an unused component are not unusable until after the component itself is removed using the Component Manager Remove script.

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25 - Core Global Script Context Commands

To run these commands:

```
import CoreGlobalScriptContextFunctions

CoreGlobalScriptContextFunctions.[CommandName]
```

The following are general script commands recognized by the **CoreGlobalScriptContextFunctions** object:

- [AddErrorMessage](#)
- [AddFatalMessage](#)
- [AddInfoMessage](#)
- [AddWarningMessage](#)
- [LogDebug](#)
- [LogError](#)

AddErrorMessage

Adds an error message to the **Message Manager** window. AddErrorMessage is a function of CoreGlobalScriptContextFunctions.

UI Access	N/A		
Parameters	Name	Type	Description
	<message>	String	Error message.
Return Value	None.		

Python Syntax	AddErrorMessage(<message>)
Python Example	<pre>import CoreGlobalScriptContextFunctions CoreGlobalScriptContextFunctions.AddErrorMessage('My error message.')</pre>

AddFatalMessage

Adds a fatal error message to the **Message Manager** window. AddFatalMessage is a function of CoreGlobalScriptContextFunctions.

UI Access	N/A		
Parameters	Name	Type	Description

	<code><message></code>	String	Error message.
Return Value	None.		

Python Syntax	<code>AddFatalMessage(<message>)</code>		
Python Example	<pre>import CoreGlobalScriptContextFunctions CoreGlobalScriptContextFunctions.AddFatalMessage('My fatal error message.')</pre>		

AddInfoMessage

Adds an informational message to the **Message Manager** window. `AddInfoMessage` is a function of `CoreGlobalScriptContextFunctions`.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><message></code>	String	Informational message.
Return Value	None.		

Python Syntax	<code>AddInfoMessage(<message>)</code>		
Python Example	<pre>import CoreGlobalScriptContextFunctions CoreGlobalScriptContextFunctions.AddInfoMessage('My info.')</pre>		

AddWarningMessage

Adds a warning message to the **Message Manager** window. `AddWarningMessage` is a function of `CoreGlobalScriptContextFunctions`.

UI Access	N/A		
Parameters	Name	Type	Description
	<code><message></code>	String	Warning message.
Return Value	None.		

Python Syntax	AddWarningMessge(<message>)
Python Example	<pre>import CoreGlobalScriptContextFunctions CoreGlobalScriptContextFunctions.AddWarningMessage('My warning.')</pre>

LogDebug

Adds a debug line to the log specified at **Tools > Debug Logging**. LogDebug is a function of CoreGlobalScriptContextFunctions.

UI Access	N/A		
Parameters	Name	Type	Description
	<message>	String	Debug message.
Return Value	None.		

Python Syntax	LogDebug(<message>)
Python Example	<pre>import CoreGlobalScriptContextFunctions CoreGlobalScriptContextFunctions.LogDebug('My debug message.')</pre>

LogError

Adds an error line to the log specified at **Tools > Debug Logging**. LogError is a function of CoreGlobalScriptContextFunctions.

UI Access	N/A		
Parameters	Name	Type	Description
	<error>	String	Error to log.
Return Value	None.		

Python Syntax	LogError(<error>)

Python Example	<pre>import CoreGlobalScriptContextFunctions CoreGlobalScriptContextFunctions.LogError('My error.')</pre>

26 - Example Scripts

This section contains [IronPython example scripts](#).

IronPython Example Scripts

IronPython Examples:

- [BH Coordinates Python Script](#)
- [Equation Based Curve Python Script](#)

BH Coordinates Python Script

This sample Python script adds a material ("Posco 35PN250") with BH coordinates from a specified file (Posco_BH_curve.tab):

File	Edit	Format	View	Help
0	0.000			
10	0.050			
20	0.130			
23	0.152			
25	0.175			
28	0.202			
30	0.229			
33	0.257			
35	0.287			
38	0.318			
40	0.356			
43	0.395			
45	0.435			
48	0.477			
52	0.523			
56	0.574			
60	0.626			
66	0.683			
72	0.740			
78	0.795			
87	0.850			
97	0.906			
112	0.964			
130	1.024			
151	1.084			
175	1.140			
200	1.189			
225	1.228			

To recreate this tab file, paste [the text below the script](#) into a text editor and save as Posco_BH_curve.tab.

The script itself includes comment lines, which are preceded by # and offer explanations for the subsequent line(s).

Script Contents

```
# specify path to the file with BH coordinates
path_to_file = r"D:\Posco_BH_curve.tab"

# specify name of the material
material_name = "Posco 35PN250"

oProject = oDesktop.GetActiveProject()
oDefinitionManager = oProject.GetDefinitionManager()

""" create list with B and H points to pass to AddMaterial command
bh_coordinates list is a three dimensional array: 1D: name, 2D:
Coordinate list, 3D: BH point"""

bh_coordinates = ["NAME:BHCoordinates", ["NAME:DimUnits", "", ""]]

with open(path_to_file) as input_file:
    for line in input_file:
        h, b = line.split()

        bh_coordinates.append(["NAME:Coordinate", [
            "NAME:CoordPoint",
            float(h),
            float(b)
        ]
        ])

# create a new magnetic material with BH curve
oDefinitionManager.AddMaterial(
[
    "NAME:" + material_name,
    "CoordinateSystemType:=", "Cartesian",
    "BulkOrSurfaceType:=" , 1,
    [
        "NAME:PhysicsTypes",
        "set:=" , ["Electromagnetic"]
    ]
]
```

```

],
[
    "NAME:permeability",
    "property_type:=" , "nonlinear",
    "BTypeForSingleCurve:=" , "normal",
    "HUnit:=" , "A_per_meter", # unit can be specified as variable
    "BUnit:=" , "tesla", # unit can be specified as variable
    "IsTemperatureDependent:=", False,
    bh_coordinates,
    [
        "NAME:Temperatures"
    ]
],
"conductivity:=" , "1818181.82",
[
    "NAME:magnetic_coercivity",
    "property_type:=" , "VectorProperty",
    "Magnitude:=" , "0A_per_meter",
    "DirComp1:=" , "1",
    "DirComp2:=" , "0",
    "DirComp3:=" , "0"
]
])

```

Posco_BH_Curve.tab Contents

0	0.000
10	0.050
20	0.130
23	0.152
25	0.175
28	0.202

30	0.229
33	0.257
35	0.287
38	0.318
40	0.356
43	0.395
45	0.435
48	0.477
52	0.523
56	0.574
60	0.626
66	0.683
72	0.740
78	0.795
87	0.850
97	0.906
112	0.964
130	1.024
151	1.084
175	1.140
200	1.189
225	1.228
252	1.258
282	1.283
317	1.304
357	1.324
402	1.343
450	1.360
500	1.375
550	1.387

602	1.398
657	1.407
717	1.417
784	1.426
867	1.437
974	1.448
1117	1.461
1299	1.478
1515	1.495
1752	1.513
2000	1.529
2253	1.543
2521	1.557
2820	1.570
3167	1.584
3570	1.600
4021	1.617
4503	1.634
5000	1.652
5503	1.669
6021	1.685
6570	1.701
7167	1.717
7839	1.733
8667	1.749
9745	1.769
11167	1.793
12992	1.820
15146	1.851
17518	1.882

20000	1.909
22552	1.931
25417	1.948
28906	1.961
33333	1.971
38932	1.981

Equation Based Curve Python Script

This sample Python script creates an equation based curve that produces a helix.

```
from math import pi, sin, cos

oProject = oDesktop.GetActiveProject()
oDesign = oProject.GetActiveDesign()
oEditor = oDesign.SetActiveEditor("3D Modeler")

Start_t = 0
End_t = pi*2

Npoint = 128
Nsection = Npoint-1

d_t = (End_t-Start_t)/Nsection

for n in range(1,Nsection):

    P1 = Start_t+d_t*(n-1)
    P2 = P1+d_t
    X_t1 = cos(P1*6)
    Y_t1 = sin(P1*6)
    Z_t1 = P1
    X_t2 = cos(P2*6)
```



```
Y_t2 = sin(P2*6)
```

```
Z_t2 = P2
```

```
oEditor.CreatePolyline(  
  [  
    "NAME:PolylineParameters",  
    "IsPolylineCovered:=" , True,  
    "IsPolylineClosed:=" , False,  
    [  
      "NAME:PolylinePoints",  
      [  
        "NAME:PLPoint",  
        "X:=" , '1mm*' + str(X_t1),  
        "Y:=" , '1mm*' + str(Y_t1),  
        "Z:=" , '1mm*' + str(Z_t1)  
      ],  
      [  
        "NAME:PLPoint",  
        "X:=" , '1mm*' + str(X_t2),  
        "Y:=" , '1mm*' + str(Y_t2),  
        "Z:=" , '1mm*' + str(Z_t2)  
      ]  
    ],  
    [  
      "NAME:PolylineSegments",  
      [  
        "NAME:PLSegment",  
        "SegmentType:=" , "Line",  
        "StartIndex:=" , 0,
```

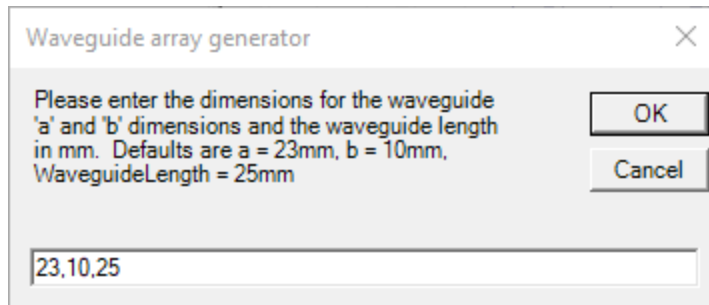
```
"NoOfPoints:=" , 2
]
],
[
"NAME:PolylineXSection",
"XSectionType:=" , "None",
"XSectionOrient:=" , "Auto",
"XSectionWidth:=" , "0mm",
"XSectionTopWidth:=" , "0mm",
"XSectionHeight:=" , "0mm",
"XSectionNumSegments:=" , "0",
"XSectionBendType:=" , "Corner"
]
],
[
"NAME:Attributes",
"Name:=" , "Polyline"+str(n),
"Flags:=" , "",
"Color:=" , "(132 132 193)",
"Transparency:=" , 0,
"PartCoordinateSystem:=" , "Global",
"UDMId:=" , "",
"MaterialValue:=" , "\"vacuum\"",
"SurfaceMaterialValue:=" , "\"\"",
"SolveInside:=" , True,
"IsMaterialEditable:=" , True,
"UseMaterialAppearance:=" , False,
"IsLightweight:=" , False
])
```

HFSS Waveguide Array Python Script

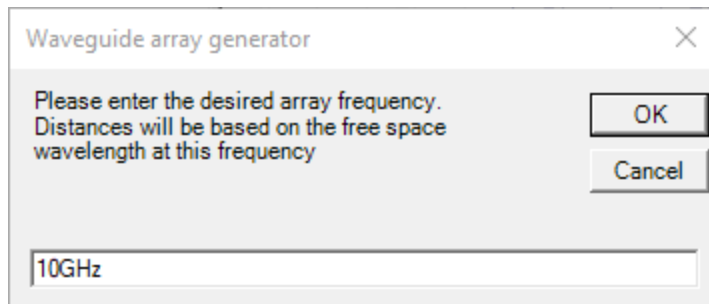
This sample Python script creates an HFSS Waveguide array. The script includes comment lines, which are preceded by an apostrophe ('), that offer explanations for each subsequent line or lines. The script includes examples of creating a 3D model, boundaries and excitation, solution setup and sweep, as well as reports.

You must insert an HFSS project before running the script. Running the script causes a series of input dialogs to appear that lets you set parameters.

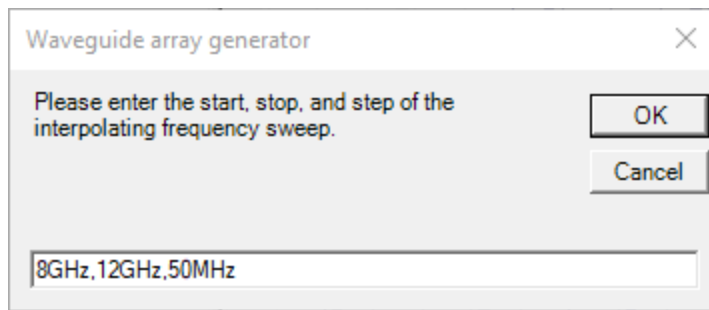
The first dialog asks for input for a and b dimensions and the waveguide length.



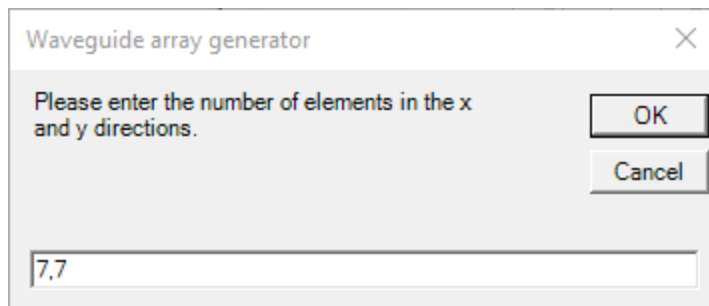
The next asks for the array frequency.



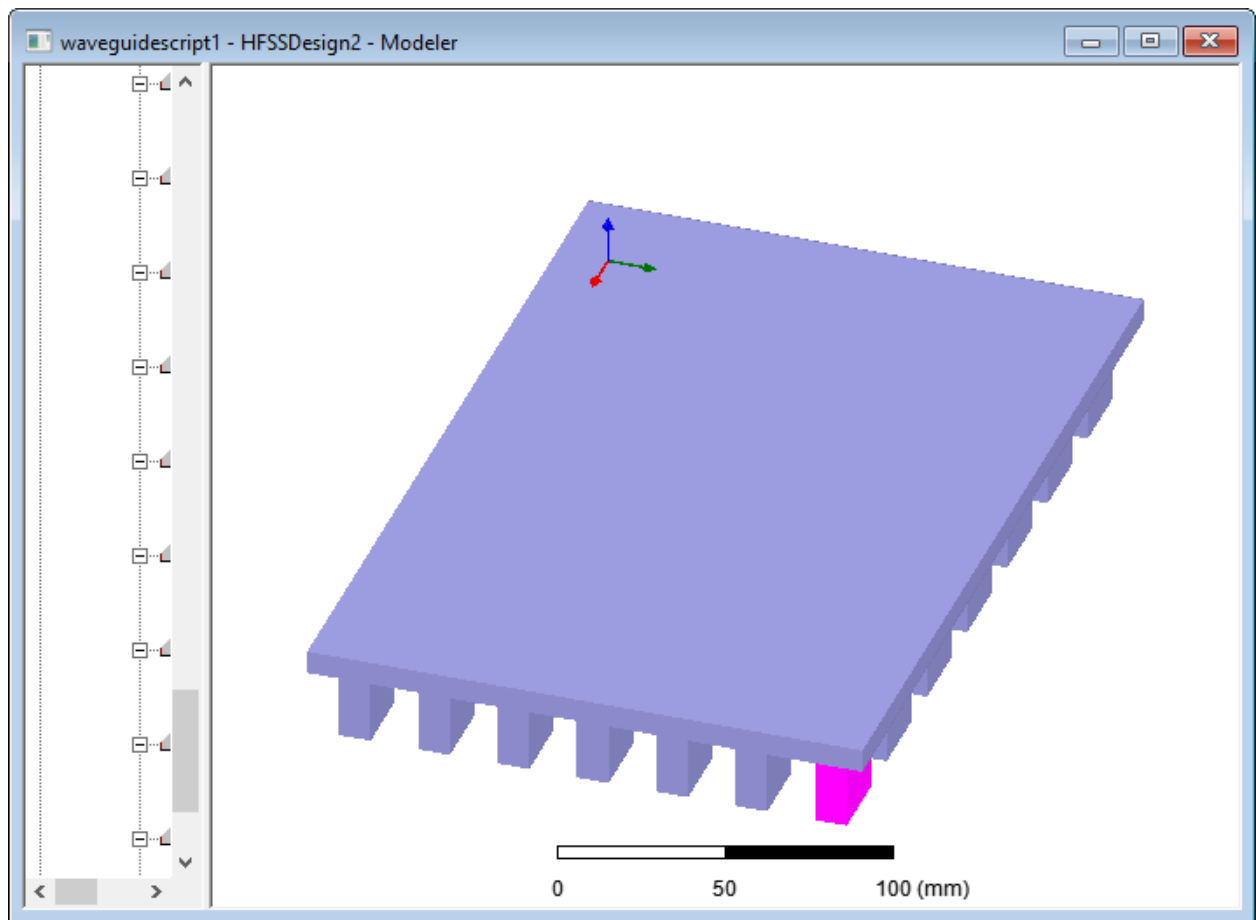
The next asks for start, stop and step values for in an interpolating frequency sweep.



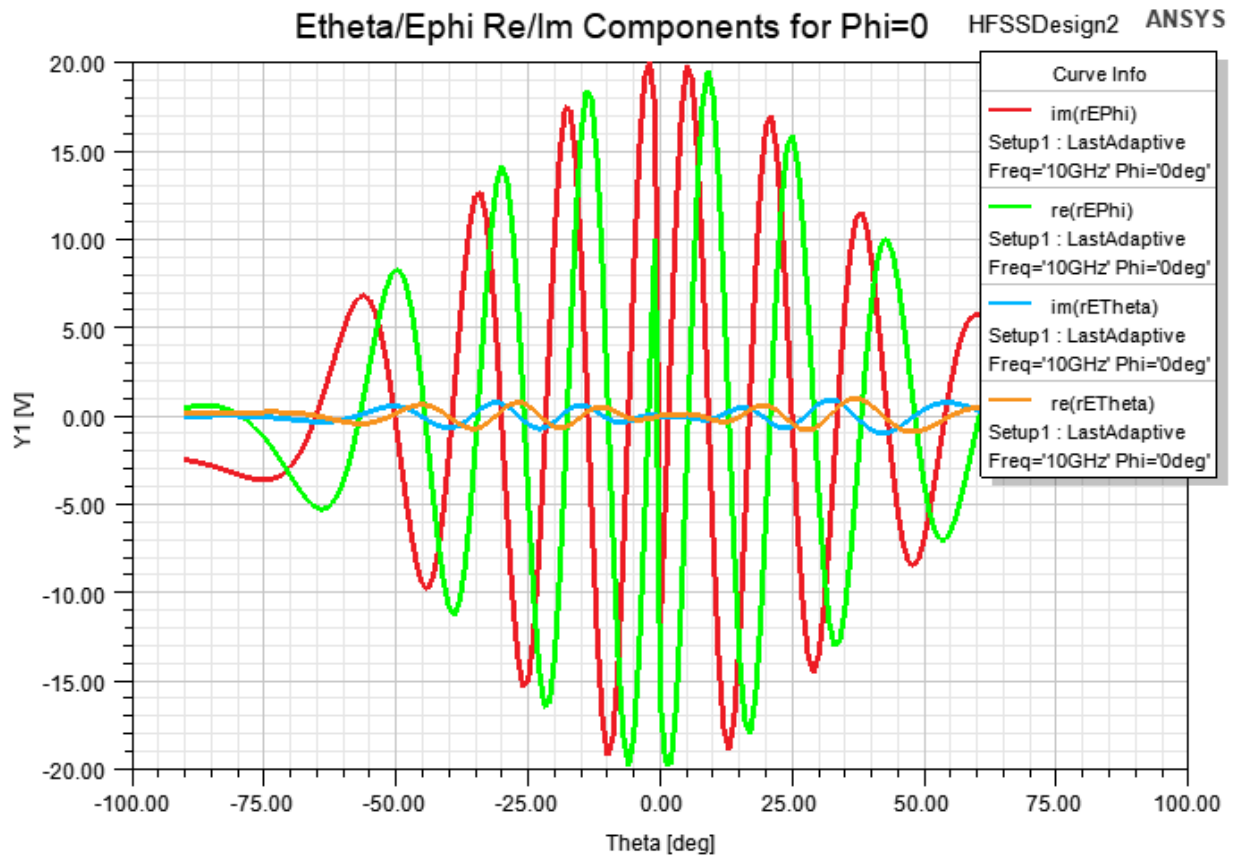
The last one asks for the array definition.

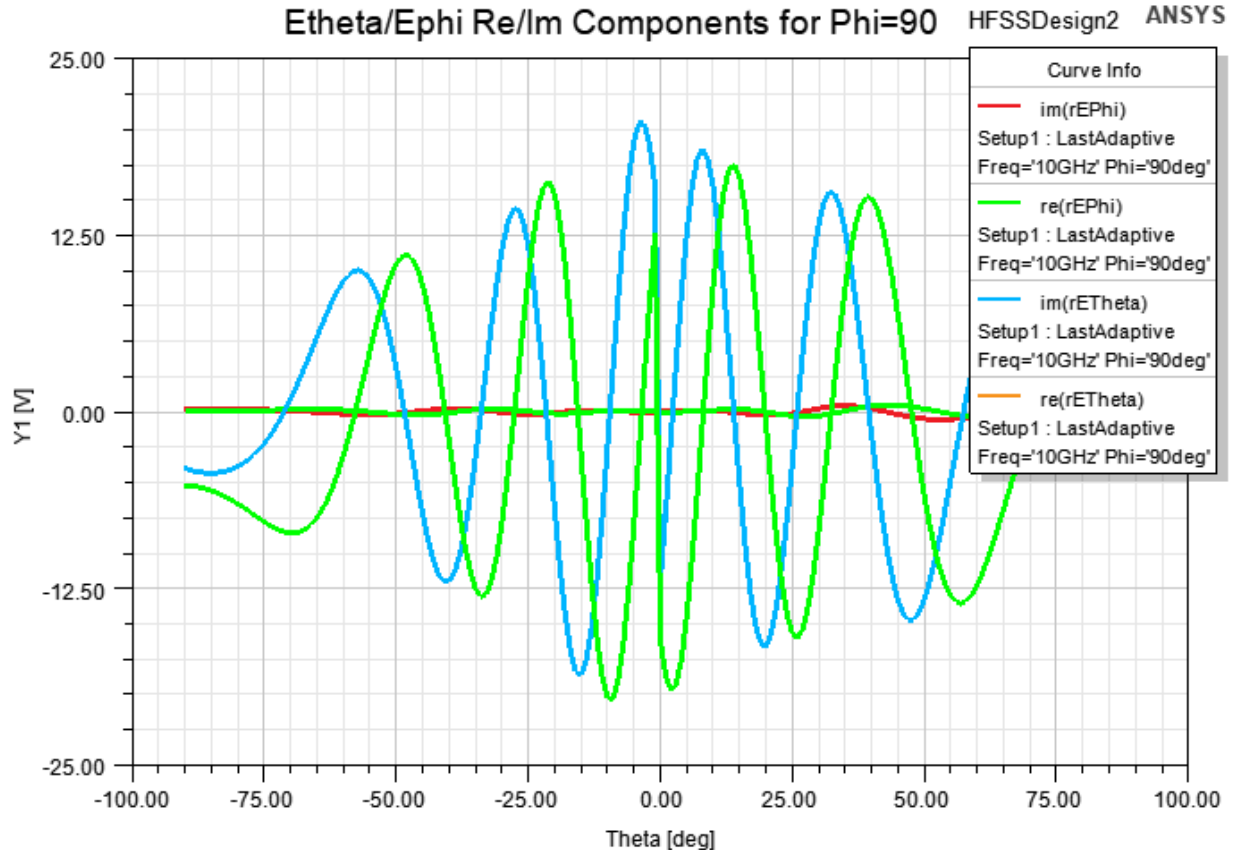


The following figure shows the waveguide array generated by the defaults.



After running the simulation, the plots defined by the script shows the following results.





The waveguide script in Python follows.

```
import clr

clr.AddReferenceByPartialName("Microsoft.VisualBasic")

from Microsoft.VisualBasic.Constants import
vbOKOnly, vbOKCancel, vbAbortRetryIgnore, vbYesNoCancel, vbYesNo, vbRetryC-
ancel

from Microsoft.VisualBasic.Constants import
vbOK, vbCancel, vbAbort, vbRetry, vbIgnore, vbYes, vbNo

from Microsoft.VisualBasic.Interaction import InputBox, MsgBox

oProject = oDesktop.GetActiveProject()

oDesign = oProject.GetActiveDesign()

oEditor = oDesign.SetActiveEditor("3D Modeler")
```

```
# Ask for dimensions for waveguide dimensions
# -----

dim = InputBox("Please enter the dimensions for the waveguide 'a' and
'b' dimensions "

    + "and the waveguide length in mm. Defaults are a = 23mm, b = 10mm,
    WaveguideLength = 25mm",

    "Waveguide array generator", "23,10,25")
Dimensions = dim.split(',')

a_str = Dimensions[0] + "mm"
b_str = Dimensions[1] + "mm"
b_over2 = float(Dimensions[1])/2

WaveguideLength_str = Dimensions[2] + "mm"

#Ask for the frequency of operation
#-----

Frequency = InputBox("Please enter the desired array frequency.
Distances will " +

    "be based on the free space wavelength at this frequency",

    "Waveguide array generator", "10GHz")

#Ask for the start, stop, and step of the interpolating frequency
sweep
#-----
--

inputText = InputBox("Please enter the start, stop, and step of the
interpolating " +

    "frequency sweep.", "Waveguide array generator",
    "8GHz,12GHz,50MHz")

StartFrequency, StopFrequency, StepFrequency = inputText.split(',')

```



```
#Ask for the number of elements in the x and y directions
#-----

inputText = InputBox("Please enter the number of elements in the x
and y directions.",

    "Waveguide array generator", "7,7")
numX, numY = [float(elem) for elem in inputText.split(',')]
TotalElements = numX*numY

# Make variables and set them equal to the values from the user input
# -----

oDesign.ChangeProperty(
    [
        "NAME:AllTabs",
        [
            "NAME:LocalVariableTab",
            [
                "NAME:PropServers",
                "LocalVariables"
            ],
            [
                "NAME:NewProps",
                [
                    "NAME:a", "PropType:=", "VariableProp", "UserDef:=", True,
                    "Value:=", a_str
                ],
            ],
            [
                "NAME:b", "PropType:=", "VariableProp", "UserDef:=", True,
                "Value:=", b_str
            ],
            [
```

```
"NAME:NumX", "PropType:=", "VariableProp", "UserDef:=", True,
"Value:=", numX
],
[
"NAME:NumY", "PropType:=", "VariableProp", "UserDef:=", True,
"Value:=", numY
],
[
"NAME:WaveguideLength", "PropType:=", "VariableProp", "User-
Def:=", True,
"Value:=", WaveguideLength_str
],
[
"NAME:Frequency", "PropType:=", "VariableProp", "UserDef:=",
True,
"Value:=", Frequency
],
[
"NAME:Lambda", "PropType:=", "VariableProp", "UserDef:=", True,
"Value:=", "c0/" + Frequency
],
[
"NAME:RadBoundDist", "PropType:=", "VariableProp", "UserDef:=",
True,
"Value:=", "Lambda/4"
]
]
])
#Create the radiation box
#-----
```

```

oEditor.CreateBox(
[
    "NAME:BoxParameters",
    "XPosition:=" , "-a/2-RadBoundDist",
    "YPosition:=" , "-b/2-RadBoundDist",
    "ZPosition:=" , "0mm",
    "XSize:=" , "NumX*a+(NumX-1)*Lambda/2+2*RadBoundDist",
    "YSize:=" , "NumY*b+(NumY-1)*Lambda/2+2*RadBoundDist",
    "ZSize:=" , "RadBoundDist"
],
[
    "NAME:Attributes",
    "Name:=" , "RadiationBox",
    "Flags:=" , "",
    "Color:=" , "(132 132 193)",
    "Transparency:=" , 0.8,
    "PartCoordinateSystem:=" , "Global",
    "UDMId:=" , "",
    "MaterialValue:=" , "\"vacuum\"",
    "SurfaceMaterialValue:=" , "\"\"",
    "SolveInside:=" , True,
    "IsMaterialEditable:=" , True,
    "UseMaterialAppearance:=" , False,
    "IsLightweight:=" , False
])

```

```

oEditor.FitAll() # Zoom out
#Create first element
#-----
oEditor.CreateBox(

```

```
[
  "NAME:BoxParameters",
  "XPosition:=" , "-a/2",
  "YPosition:=" , "-b/2",
  "ZPosition:=" , "0mm",
  "XSize:=" , "a",
  "YSize:=" , "b",
  "ZSize:=" , "-WaveguideLength"
],
[
  "NAME:Attributes",
  "Name:=" , "Element1",
  "Flags:=" , "",
  "Color:=" , "(132 132 193)",
  "Transparency:=" , 0.8,
  "PartCoordinateSystem:=" , "Global",
  "UDMId:=" , "",
  "MaterialValue:=" , "\"vacuum\"",
  "SurfaceMaterialValue:=" , "\"\"",
  "SolveInside:=" , True,
  "IsMaterialEditable:=" , True,
  "UseMaterialAppearance:=" , False,
  "IsLightweight:=" , False
])

# Define the port
# -----
# Get the numeric value of half of the b dimension of the port.
# The values fed in to the "Start" and "End" arrays cannot have mathematical operators. For example, if HFSS
```

has a variable 'b', and a desired coordinate is 'b/2', that value cannot be entered here as "b/2". The number

has to be computed explicitly in script and entered as a string such as "-200mm".

```
oModule = oDesign.GetModule("BoundarySetup")
```

```
# get bottom face ID
```

```
element1FaceID = oEditor.GetFaceByPosition(
```

```
[
    "NAME:Parameters",
    "BodyName:=", "Element1",
    "XPosition:=", "-a/2",
    "YPosition:=", "-b/2",
    "ZPosition:=", "-WaveguideLength"
])
```

```
oModule.AssignWavePort(
```

```
[
    "NAME:WavePort1",
    "Faces:=", [element1FaceID],
    "NumModes:=", 1,
    "RenormalizeAllTerminals:=", True,
    "UseLineModeAlignment:=", False,
    "DoDeembed:=", False,
    [
        "NAME:Modes",
        [
            "NAME:Model",
            "ModeNum:=", 1,
            "UseIntLine:=", True,
            [
                "NAME:IntLine",
```

```
"Start:=" , ["0mm", "-" +str(b_over2) + "mm", "-" + Wave-
guideLength_str],
"End:=" , ["0mm", str(b_over2) + "mm", "-" + WaveguideLength_str]
],
"AlignmentGroup:=" , 0,
"CharImp:=" , "Zpi"
]
],
"ShowReporterFilter:=" , False,
"ReporterFilter:=" , [True],
"UseAnalyticAlignment:=", False
])

#Set the radiation boundary
#-----
# Get face IDs for further assignment
top_face_id = oEditor.GetFaceByPosition(["NAME:FaceParameters",
    "BodyName:=", "RadiationBox",
    "XPosition:=", "0mm",
    "YPosition:=", "NumY*b-b/2+(NumY-1)*Lambda/2+RadBoundDist",
    "ZPosition:=", "0mm"])

faceIDs = [int(elem) for elem in oEditor.GetFaceIDs("RadiationBox")
if elem != str(top_face_id)]
oModule.AssignRadiation(
[
    "NAME:Radiation",
    "Faces:=" , faceIDs,
    "IsFssReference:=" , False,
    "IsForPML:=" , False
])
```

```
# Copy and paste elements/ports into a rectangular array.
# Duplicate boundaries with geometry" must be turned on under Tools-
>Options->HFSS Options
# -----
-----

ElementNum = 1
for i in range(1, int(numX)+1):
    for j in range(1, int(numY)+1):
        if ElementNum == 1:
            pass

elif ElementNum <= numY: #If in the first column, only
    oEditor.Copy(["NAME:Selections", "Selections:=", "Element1"])
    oEditor.Paste()
    oEditor.Move(["NAME:Selections", "Selections:=", "Element" + str
(ElementNum)],
["NAME:TranslateParameters", "CoordinateSystemID:=", -1,
"TranslateVectorX:=", "0mm",
"TranslateVectorY:=", str(j-1) + "*" + (b+Lambda/2)",
"TranslateVectorZ:=", "0mm"]])

elif ElementNum > numY:
    oEditor.Copy(["NAME:Selections", "Selections:=", "Element1"])
    oEditor.Paste()
    oEditor.Move(["NAME:Selections", "Selections:=", "Element" + str
(ElementNum)],
["NAME:TranslateParameters", "CoordinateSystemID:=", -1,
"TranslateVectorX:=", str(i-1) + "*" + (a+Lambda/2)",
"TranslateVectorY:=", str(j-1) + "*" + (b+Lambda/2)",
"TranslateVectorZ:=", "0mm"]])
```

```
ElementNum += 1

#Create the setup and interpolating sweep
#-----
oModule = oDesign.GetModule("AnalysisSetup")
oModule.InsertSetup("HfssDriven",
[
    "NAME:Setup1",
    "AdaptMultipleFreqs:" , False,
    "Frequency:" , Frequency,
    "MaxDeltaS:" , 0.02,
    "PortsOnly:" , False,
    "UseMatrixConv:" , False,
    "MaximumPasses:" , 15,
    "MinimumPasses:" , 1,
    "MinimumConvergedPasses:" , 1,
    "PercentRefinement:" , 50,
    "IsEnabled:" , True,
    "BasisOrder:" , 1,
    "DoLambdaRefine:" , True,
    "DoMaterialLambda:" , True,
    "SetLambdaTarget:" , False,
    "Target:" , 0.3333,
    "UseMaxTetIncrease:" , False,
    "PortAccuracy:" , 2,
    "UseABConPort:" , False,
    "SetPortMinMaxTri:" , False,
    "UseDomains:" , False,
    "UseIterativeSolver:" , False,
    "SaveRadFieldsOnly:" , False,
```



```
"SaveAnyFields:=" , True,  
"IESolverType:=" , "Auto",  
"LambdaTargetForIESolver:=", 0.15,  
"UseDefaultLambdaTgtForIESolver:=", True  
])
```

```
oModule.InsertFrequencySweep("Setup1",  
[  
  "NAME:InterpolatingSweep",  
  "IsEnabled:=" , True,  
  "RangeType:=" , "LinearStep",  
  "RangeStart:=" , StartFrequency,  
  "RangeEnd:=" , StopFrequency,  
  "RangeStep:=" , StepFrequency,  
  "Type:=" , "Interpolating",  
  "SaveFields:=" , False,  
  "InterpTolerance:=" , 0.5,  
  "InterpMaxSolns:=" , 50,  
  "InterpMinSolns:=" , 0,  
  "InterpMinSubranges:=" , 1,  
  "ExtrapToDC:=" , False,  
  "InterpUseS:=" , True,  
  "InterpUsePortImped:=" , False,  
  "InterpUsePropConst:=" , True,  
  "UseDerivativeConvergence:=", False,  
  "InterpDerivTolerance:=", 0.2,  
  "UseFullBasis:=" , True,  
  "EnforcePassivity:=" , True,  
  "PassivityErrorTolerance:=", 0.0001  
])
```

```
#Create a relative coordinate system centered on the array for radiation pattern calculations

#-----

oEditor.CreateRelativeCS(

[
    "NAME:RelativeCSParameters",
    "Mode:=" , "Axis/Position",
    "OriginX:=" , "-a/2+NumX*a/2+(NumX-1)*Lambda/4",
    "OriginY:=" , "-b/2+NumY*b/2+(NumY-1)*Lambda/4",
    "OriginZ:=" , "0mm",
    "XAxisXvec:=" , "1mm",
    "XAxisYvec:=" , "0mm",
    "XAxisZvec:=" , "0mm",
    "YAxisXvec:=" , "0mm",
    "YAxisYvec:=" , "1mm",
    "YAxisZvec:=" , "0mm"
],
[
    "NAME:Attributes",
    "Name:=" , "RelativeCS1"
])

#Create an infinite sphere with fine theta resolution and phi cuts at 0 and 90 degrees

#-----

oModule = oDesign.GetModule("RadField")
oModule.InsertFarFieldSphereSetup(

[
    "NAME:Infinite Sphere1",
    "UseCustomRadiationSurface:=", False,
```

```

    "ThetaStart:=" , "-90deg",
    "ThetaStop:=" , "90deg",
    "ThetaStep:=" , "1deg",
    "PhiStart:=" , "0deg",
    "PhiStop:=" , "90deg",
    "PhiStep:=" , "90deg",
    "UseLocalCS:=" , True,
    "CoordSystem:=" , "RelativeCS1"
  ])

```

```

#Create output plots for Ephi/Etheta real and imaginary components
for Phi = 0 and separately for Phi = 90

```

```

#-----
-----

```

```

oModule = oDesign.GetModule("ReportSetup")

```

```

#For phi = 0

```

```

oModule.CreateReport("Etheta/Ephi Re/Im Components for Phi=0", "Far
Fields",

```

```

    "Rectangular Plot", "Setup1 : LastAdaptive",

```

```

    [

```

```

    "Context:=" , "Infinite Sphere1"

```

```

    ],

```

```

    [

```

```

    "Theta:=" , ["All"],

```

```

    "Phi:=" , ["0deg"],

```

```

    "Freq:=" , ["All"],

```

```

    "a:=" , ["Nominal"],

```

```

    "b:=" , ["Nominal"],

```

```

    "NumX:=" , ["Nominal"],

```

```

    "NumY:=" , ["Nominal"],

```

```

    "WaveguideLength:=" , ["Nominal"],

```

```
"Frequency:=" , ["Nominal"]
],
[
  "X Component:=" , "Theta",
  "Y Component:=" , ["im(rEPhi)", "re(rEPhi)", "im(rETheta)", "re
(rETheta)"]
], [])

#For phi = 90
#-----

oModule.CreateReport("Etheta/Ephi Re/Im Components for Phi=90", "Far
Fields",
  "Rectangular Plot", "Setup1 : LastAdaptive",
  [
    "Context:=" , "Infinite Sphere1"
  ],
  [
    "Theta:=" , ["All"],
    "Phi:=" , ["90deg"],
    "Freq:=" , ["All"],
    "a:=" , ["Nominal"],
    "b:=" , ["Nominal"],
    "NumX:=" , ["Nominal"],
    "NumY:=" , ["Nominal"],
    "WaveguideLength:=" , ["Nominal"],
    "Frequency:=" , ["Nominal"]
  ],
  [
    "X Component:=" , "Theta",
    "Y Component:=" , ["im(rEPhi)", "re(rEPhi)", "im(rETheta)", "re
(rETheta)"]
  ]
]
```

], [])

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