# System Composer™

Reference

MATLAB® & SIMULINK®

**R**2020**a**

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*System Composer™ Reference*

**Revision History**

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| March 2019 | Online only | New for Version 1.0 (Release 2019a) |
| September 2019 | Online only | Revised for Version 1.1 (Release 2019b) |
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# Contents

# Functions

## addChoice

Add a variant choice to a variant component

### Syntax

```
compList = addChoice(variantComponent,choices)
compList = addChoice(variantComponent,choices,labels)
```

### Description

`compList = addChoice(variantComponent,choices)` creates variant choices specified in `choices` in the specified variant component and returns their handles.

`compList = addChoice(variantComponent,choices,labels)` creates variant choices specified in `choices` with labels `labels` in the specified variant component and returns their handles.

### Input Arguments

**`variantComponent` — Architecture component**
component

The architecture where the variant choices are added.

Data Types: `systemcomposer.arch.Component`

**`choices` — Variant choice names**
cell array of strings

Cell array where each element defines the name of a choice component. The length of `choices` must be the same as `labels`.

Data Types: `string`

**`labels` — Variant choice labels**
cell array of strings

Array of labels where each element is the label for the corresponding choice.. The length of `labels` must be the same as `choices`.

Data Types: `string`

### Output Arguments

**`compList` — Created components**
array of components

Array of created components. This array is the same size as `choices` and `labels`.

## See Also

`getActiveChoice` | `getChoices` | `makeVariant`

**Topics**

"Create Variants"

**Introduced in R2019a**

# addComponent

Add a component to the architecture

## Syntax

```
components = addComponent(architecture,compNames)
components = addComponent(architecture,compNames,stereotypes)
```

## Description

`components = addComponent(architecture,compNames)` adds a set of components specified by the array of names.

`components = addComponent(architecture,compNames,stereotypes)` applies stereotypes specified in the `stereotypes` to the new components.

## Examples

### Create a Model with two Components

Create model, get root architecture, and create components.

```
model = systemcomposer.createModel('archModel');
arch = get(model,'Architecture');
names = {'Component1','Component2'}
comp = addComponent(arch, names);
```

## Input Arguments

**`architecture` — Architecture model element**
architecture

Parent architecture to which the component is added.

Data Types: `systemcomposer.arch.Architecture`

**`compNames` — Names of components**
cell array of strings

Cell array where each element defines the name of a new component. The length of `compNames` must be the same as `stereotypes`.

Data Types: `string`

**`stereotypes` — Stereotypes to apply to the components**
cell array of stereotypes

Array of stereotypes where each element is the qualified stereotype name for the corresponding component in the form `'<profileName>.<stereotypeName>'`. The length of `stereotypes` must be the same as `compNames`.

Data Types: `string`

## Output Arguments

**`components` — Created components**
array of components

Array of created components. This array is the same size as `compNames` and `stereotypes`.

## See Also
`addPort` | `connect`

**Topics**
"Components"

**Introduced in R2019a**

# addComponent

**Package:** `systemcomposer.View`

Add component to view given path

## Syntax

`compOccur = addComponent(object, compPath, contextView)`

## Description

`compOccur = addComponent(object, compPath, contextView)` adds the component with the specified path to the view given by the `contextView` parameter.

`addComponent` is a method for the class `systemcomposer.view.ViewArchitecture`.

## Input Arguments

**`object` — View architecture object**
`systemcomposer.view.ViewArchitecture`

<argument description>

Data Types: `<object data type>`

**`compPath` — <argument purpose>**
<argument value> (default) | <argument value>

Path to the component including the name of the top-model.

Data Types: `<argument data type>`

**`contextView` — <argument purpose>**
<argument value> (default) | <argument value>

Property 'Parent' is empty.

Data Types: `systemcomposer.view.ViewArchitecture`

## Output Arguments

**`parent` — <argument purpose>**
<argument value>

<argument description>

Data Types: `<argument data type>`

## See Also

**Introduced in R2019b**

## addVariantComponent

Add a component to the architecture

### Syntax

```
variantList = addVariantComponent(architecture,variantComponents)
variantList = addVariantComponent(architecture,variantComponents,'Position',
position)
```

### Description

`variantList = addVariantComponent(architecture,variantComponents)` adds a set of components specified by the array of names.

`variantList = addVariantComponent(architecture,variantComponents,'Position', position)` creates a variant component the architecture at a given position.

### Examples

#### Create a Variant with two Components

Create model, get root architecture, and create a component with two variants.

```
model = systemcomposer.createModel('archModel');
arch = get(model,'Architecture');
names = {'Component1','Component2'}
variants = addVariantComponent(arch, names);
```

### Input Arguments

**`architecture` — Architecture model element**
architecture

Parent architecture to which the component is added.

Data Types: `systemcomposer.arch.Architecture`

**`variantComponents` — Names of variant components**
cell array of strings

Cell array where each element defines the name of a variant component.

Data Types: `string`

**`position` — four-element vector that specifies location of the top corner of the component**
1x4 array

The array denotes the top corner of the component in terms of its x and y coordinates followed by the x and y coordinates of the bottom corner. When adding more than one variant component, a matrix of size [NX4] may be specified where N is the number of variant components being added.

Data Types: `double`

## Output Arguments

**`variantList` — Handles to variant components**
array of components

Array of variant components. This array is the same size as `variantComponents`.

## See Also

`addPort` | `connect`

**Topics**
“Components”

**Introduced in R2019a**

# addElement

Add a signal interface element

## Syntax

```
element = addElement(interface,name)
element = addElement(interface,name,Name,Value)
```

## Description

`element = addElement(interface,name)` adds an element to a signal interface with default properties.

`element = addElement(interface,name,Name,Value)` sets the properties of the element as specified in `Name,Value`.

## Examples

### Add an Interface and an Element

Add an interface `newinterface` to the interface dictionary of the model and add an element with type `double` to it.

```
interface = addInterface(archModel.InterfaceDictionary,'newsignal');
element = addElement(interface,'newelement','Type','double')
```

## Input Arguments

**`interface` — new interface object**
signal interface

This is the interface that the new element is to be added.

Data Types: `systemcomposer.interface.SignalInterface`

**name — Name of the new element**
string

The new element name must be a valid variable name.

Data Types: `char`

### Name-Value Pair Arguments

Specify optional comma-separated pairs of `Name,Value` arguments. `Name` is the argument name and `Value` is the corresponding value. `Name` must appear inside quotes. You can specify several name and value pair arguments in any order as `Name1,Value1,...,NameN,ValueN`.

Example: `'Type', 'double'`

**Type — Type of element**
valid data type string

Data type of the element. Must be a valid data type.

Data Types: `char`

**`Dimensions` — Dimensions of element**
positive integer array

Each element is the size of the element in the corresponding direction. A scalar integer indicates a scalar or vector element, a row vector with two integers indicates a matrix element.

Data Types: `char`

**`Complexity` — Complexity of element**
real | complex

This describes whether the element is purely real, or if an imaginary part is allowed.

Data Types: `string`

## Output Arguments

**`element` — new interface element object**
signal element

## See Also

`getElement` | `getInterfaces` | `linkDictionary` | `systemcomposer.createDictionary` | `unlinkDictionary`

**Topics**
"Define Interfaces"

**Introduced in R2019a**

# addPort

Add ports to architecture

## Syntax

```
ports = addPort(architecture,portNames,portTypes)
ports = addPort(architecture,portNames,portTypes,stereotypes)
```

## Description

`ports = addPort(architecture,portNames,portTypes)` adds a set of ports with specified names.

`ports = addPort(architecture,portNames,portTypes,stereotypes)` also applies stereotypes.

## Examples

### Add Ports to Architecture

Create model, get root architecture, add component, and add ports.

```
model = systemcomposer.createModel('archModel');
rootArch = get(model,'Architecture');
newcomponent = addComponent(rootArch,'NewComponent');
newport = addPort(newcomponent.Architecture,'NewCompPort','in');
```

## Input Arguments

**`architecture` — Component architecture**
Architecture

`addPort` adds ports to the architecture of a component. Use <*component*>.*Architecture* to access the architecture of a component.

Data Types: `systemcomposer.arch.Architecture`

**`portNames` — Names of ports**
cell array of strings

Port names must be unique within each component. If necessary, System Composer appends a number to the port name to ensure uniqueness. The size of `portNames`,`portTypes`, and `stereotypes` must be the same.

Data Types: `string`

**`portTypes` — Port directions**
cell array of strings

Port directions are given in a cell array. Each element is either `'in'` or `'out'`.

Data Types: `string`

**`stereotypes` — Stereotypes to apply to the components**
Array of stereotypes

Each stereotype in the array must either be a mixin stereotype or a port stereotype. The size of `portNames`,`portTypes`, and `stereotypes` must be the same.

Data Types: `systemcomposer.profile.Stereotype`

## Output Arguments

**`ports` — Created ports**
Array of ports

## See Also

`addComponent` | `connect` | `destroy` | `systemcomposer.arch.BasePort`

**Topics**
"Ports"

**Introduced in R2019a**

## addInterface

Create a named interface in an interface dictionary

### Syntax

```
interface = addInterface(dictionary,name)
interface = addInterface(dictionary,name,'SimulinkBus',busObject)
```

### Description

`interface = addInterface(dictionary,name)` adds a named interface to a specified interface dictionary.

`interface = addInterface(dictionary,name,'SimulinkBus',busObject)` constructs an interface that mirrors an existing Simulink® bus object.

### Examples

#### Add an Interface

Add an interface `newinterface` to the specified data dictionary.

```
interface = addInterface(dictionary,'newinterface')
```

#### Add a Simulink Bus Mirrored Interface

Add a named interface that mirrors an existing Simulink bus object to a specified dictionary.

```
interface = addInterface(dictionary, 'newInterface', 'SimulinkBus', 'myBus')
```

### Input Arguments

**`dictionary` — Data dictionary attached to the architecture model**
System Composer dictionary

Default data dictionary that defines local interfaces or an external data dictionary that carries interface definitions. If the model links to multiple data dictionaries, then `dictionary` must be the one that carries interface definitions. For information on how to create a dictionary, see `systemcomposer.createDictionary`.

Data Types: `systemcomposer.interface.Dictionary`

**name — Name of the new interface**
string

Name of the new interface, specified as a valid variable name.

Data Types: `char`

**`busObject` — Simulink bus object that the new interface mirrors**
Simulink bus

Argument used when the interface is already defined in a Simulink bus object.

Data Types: `simulink bus`

## Output Arguments

**`interface` — new interface object**
signal interface

Interface object with properties `Dictionary`, `Name`, and `Elements`.

## See Also

`addElement` | `getInterface` | `getInterfaces` | `linkDictionary` | `systemcomposer.createDictionary`

**Topics**
"Define Interfaces"

**Introduced in R2019a**

# addProperty

Define a custom property for a stereotype

## Syntax

```
property = addProperty(stereotype,name)
property = addProperty(stereotype,name,Name,Value)
```

## Description

`property = addProperty(stereotype,name)` returns a new `property` definition with `name` that is contained in `stereotype`.

`property = addProperty(stereotype,name,Name,Value)`returns a `property` definition that is configured with specified property values.

## Examples

### Add a Property

Add a component stereotype and add a `VoltageRating` property with value `5`.

```
profile = systemcomposer.profile.Profile.createProfile('myProfile')
stype = addStereotype(profile,'electricalComponent','AppliesTo','Component')
property = addProperty(stype,'VoltageRating','DefaultValue','5');
```

## Input Arguments

**`stereotype` — Stereotype to which the property is added**
stereotype object

Stereotype definition, specified as an object.

**`name` — Name of the property**
character vector

Name of the property must be unique within the stereotype.

### Name-Value Pair Arguments

Specify optional comma-separated pairs of `Name,Value` arguments. `Name` is the argument name and `Value` is the corresponding value. `Name` must appear inside quotes. You can specify several name and value pair arguments in any order as `Name1,Value1,...,NameN,ValueN`.

Example: `'Type', 'double'`

**Type — Property data type**
`double` (default) | `single` | `int64` | `int32` | `int16` | `int8` | `uint64` | `uint32` | `uint8` | `boolean` | `string` | enumeration class name

Type of this property. One of valid data types or the name of a MATLAB class that defines an enumeration. For more information, see “Use Enumerated Data in Simulink Models” (Simulink).

Example: `addProperty(stype,'Color','Type','BasicColors')`

Data Types: `char`

**`Dimensions` — Dimensions of property**
`[]` (default) | positive integer array

Array of dimensions describing the matrix shape of the value of this property. Empty implies no restriction.

Data Types: `double`

**`Min` — Minimum value**
numeric value

Optional minimum value of this property. To set both `'Min'` and `'Max'` together, use the `setMinAndMax` method.

Example: `setMinAndMax(property, min, max)`

Data Types: `double`

**`Max` — Maximum value**
numeric value

Optional maximum value of this property. To set both `'Min'` and `'Max'` together, use the `setMinAndMax` method.

Example: `setMinAndMax(property, min, max)`

Data Types: `double`

**`Units` — Property units**
string

Units of the property value, specified as a string. If specified, all values of this property on model elements are checked for consistency with these units according to Simulink unit checking rules. For more information, see “Unit Consistency Checking and Propagation” (Simulink).

Data Types: `char`

**`DefaultValue` — Default value**
string expression | cell array of string value and string unit

Default value of this property, specified as a string expression or a cell array of string value and string unit.

Data Types: `double`

## Output Arguments

**`property` — Created property**
property object

Property object.

## See Also
`getProperty` | `setProperty`

**Topics**
"Define Profiles and Stereotypes"
"Set Tags and Properties for Analysis"

**Introduced in R2019a**

# addStereotype

Add a stereotype to the profile

## Syntax

```
stereotype = addStereotype(profile,stereotypeName)
stereotype = addStereotype(profile,stereotypeName,Name,Value)
```

## Description

`stereotype = addStereotype(profile,stereotypeName)` adds a new stereotype with the specified name.

`stereotype = addStereotype(profile,stereotypeName,Name,Value)` specifies the properties of the stereotype.

## Examples

### Add a Component Stereotype

Add a component stereotype to the profile.

```
addStereotype(profile,'electricalComponent','AppliesTo','Component')
```

## Input Arguments

**`profile` — Profile object**
profile

The profile that contains the new stereotype.

Data Types: `systemcomposer.profile.Profile`

**`stereotypeName` — Name of new stereotype**
string

The name of the stereotype must be unique within the profile.

Data Types: `char`

### Name-Value Pair Arguments

Specify optional comma-separated pairs of `Name,Value` arguments. `Name` is the argument name and `Value` is the corresponding value. `Name` must appear inside quotes. You can specify several name and value pair arguments in any order as `Name1,Value1,...,NameN,ValueN`.

Example: `'AppliesTo', 'Component'`

**`Name, Value` — Stereotype properties and values**
positive integer array

See `systemcomposer.profile.Stereotype` for stereotype properties and values.

## Output Arguments

**`stereotype` — Created stereotype**
stereotype

## See Also
`applyStereotype` | `removeStereotype`

**Topics**
“Define Profiles and Stereotypes”

**Introduced in R2019a**

# applyProfile

Apply profile to a model

## Syntax

`applyProfile(modelObject,profileFile)`

## Description

`applyProfile(modelObject,profileFile)` applies the profile to an architecture model and makes all of the constituent stereotypes available.

## Input Arguments

**`modelObject` — Architecture model object**
architecture model

Data Types: `systemcomposer.arch.Model`

**`profileFile` — Profile file**
string

Data Types: `string`

## See Also
`createProfile` | `removeProfile`

**Topics**
"Define Profiles and Stereotypes"

**Introduced in R2019a**

## applyStereotype

Apply a stereotype to a model element

### Syntax

```
applyStereotype(element,stereotype)
```

### Description

`applyStereotype(element,stereotype)` applies a stereotype to a model element. Adds the specified stereotype if not already applied to a model element. Stereotypes can be applied to Base Architecture, Base Architecture port, and Base Connector model elements.

### Input Arguments

**`element` — Architecture model element**
architecture component | architecture port | architecture connector

The stereotype is applied to this component, port, or connector.

Data Types: `systemcomposer.arch.Element`

**`stereotype` — Reference stereotype**
architecture stereotype

The qualified stereotype name in the form `<profile>.<stereotype>`. The profile must already be applied to the model.

Data Types: `char`

### See Also

`batchApplyStereotype` | `removeStereotype`

**Topics**
“Use Stereotypes and Profiles”

**Introduced in R2019a**

# batchApplyStereotype

Apply stereotype to all elements in the specified architecture

## Syntax

```
= batchApplyStereotype(architecture,elementType,stereotype)
= batchApplyStereotype(architecture,elementType,stereotype,'Recurse',flag)
```

## Description

`= batchApplyStereotype(architecture,elementType,stereotype)` applies the `stereotype` to all elements that match `elementType` within `architecture`.

`= batchApplyStereotype(architecture,elementType,stereotype,'Recurse',flag)` applies the `stereotype` to all elements that match `elementType` within `architecture` and its sub-architectures.

## Examples

### Apply a Stereotype to All Connectors

Apply the `standardConn` stereotype in `GeneralProfile` profile to all connectors within the architecture `arch`.

```
batchApplyStereotype(arch,'Connector','GeneralProfile.standardConn');
```

## Input Arguments

**`architecture` — Architecture model element**
architecture

Parent architecture layer for all components to attach the stereotype.

Data Types: `systemcomposer.arch.Architecture`

**`elementType` — Type of architecture element**
'Component' | 'Port' | 'Connector'

The element type to apply the stereotype. The stereotype must be applicable for this element type.

Data Types: `string`

**`stereotype` — Stereotype to apply**
string

Qualified name for the stereotype in the form `'profileName.stereotypeName'` The stereotype must be applicable to components.

Data Types: `string`

**`flag` — Apply stereotype recursively**
true | false

If this flag is set, the stereotype is applied to the elements in the architecture and its sub-architectures.

Data Types: `logical`

## See Also

`removeStereotype`

**Topics**

"Use Stereotypes and Profiles"

**Introduced in R2019a**

# close

**Package:** `systemcomposer.arch`

Close System Composer model

## Syntax

`close(objModel)`

## Description

`close(objModel)` closes the specified model in System Composer.

## Examples

### Create, Open, and Close a Model

```
Model = systemcomposer.createModel('modelName');
open(Model)
close(Model)
```

## Input Arguments

**`objModel` — Model to close in editor**
`systemcomposer.arch.Model` object

Model to close in the System Composer editor.

## See Also

`createModel`

**Topics**
"Create an Architecture Model"

**Introduced in R2019a**

# connect

Connect pairs of components

## Syntax

```
connectors = connect(srcComponent,destComponent)
connectors = connect(srcComponent,destComponent,'Stereotype',stereotypes)
connectors = connect(srcComponent,destComponent,'Rule',rule)
connectors = connect(architecture,srcPorts,destPorts,stereotypes,rule)
```

## Description

`connectors = connect(srcComponent,destComponent)` connects the unconnected output ports of `srcComponent` to the unconnected input ports of `destComponent` based on matching port names, and returns a handle to the connector.

`connectors = connect(srcComponent,destComponent,'Stereotype',stereotypes)` additionally applies the specified stereotype to the connector.

`connectors = connect(srcComponent,destComponent,'Rule',rule)` specifies a rule for establishing connections.

`connectors = connect(architecture,srcPorts,destPorts,stereotypes,rule)` connects pairs of ports in the architecture.

## Examples

### Connect System Composer Components

This example shows how to create and connect two components.

Create the top level architecture model.

```
modelName = "archModel";
arch = systemcomposer.createModel(modelName);
rootArch = get(arch,'Architecture');
```

Create two new components.

```
names = {'Component1','Component2'};
newcomponents = addComponent(rootArch,names);
```

Add ports to these components.

```
outport1 = addPort(newcomponents(1).Architecture,'testsig','out');
inport1 = addPort(newcomponents(2).Architecture,'testsig','in');
```

Connect the components.

```
conns = connect(newcomponents(1),newcomponents(2));
```

View the model.

```
systemcomposer.openModel(modelName);
```

Improve the layout.

```
Simulink.BlockDiagram.arrangeSystem(modelName)
```

## Input Arguments

**`architecture` — Architecture model element**
architecture

Interface and the underlying structural definition of a model or component, specified as an `Architecture` object.

Data Types: `systemcomposer.arch.Architecture`

**`srcPorts` — Array of source ports**
array of ports

Array of source ports. Must be the same length as `destPorts` and must consist of all output ports.

Data Types: `systemcomposer.arch.Port`

**`destPorts` — Array of destination ports**
array of ports

Array of destination ports. Must be the same length as `srcPorts` and must consist of all source ports.

Data Types: `systemcomposer.arch.Port`

**`srcComponent` — Source component**
architecture component

Source component.

Data Types: `systemcomposer.arch.Component`

**`destComponent` — Destination component**
architecture component

Destination component.

Data Types: `systemcomposer.arch.Component`

**`stereotypes` — Stereotypes to apply to the connections**
array of stereotypes

Stereotypes to apply to the connections, specified as an array.

Data Types: `systemcomposer.profile.Stereotype`

**`rule` — Rule to match ports for connection**
`'name'` | `'interface'`

Rule to match ports for connection.

Data Types: `systemcomposer.arch.Component`

## Output Arguments

**`connectors` — Created connections**
array of connections

Array of connections.

## See Also

`addPort`

**Topics**
“Create an Architecture Model”

**Introduced in R2019a**

# systemcomposer.createDictionary

Create data dictionary

## Syntax

```
dict_id = systemcomposer.createDictionary(dictionaryName)
```

## Description

`dict_id = systemcomposer.createDictionary(dictionaryName)` creates a new Simulink data dictionary to hold interfaces and returns a handle to the `systemcomposer.interface.Dictionary` object.

## Input Arguments

**`dictionaryName` — Name of new data dictionary**
string

Name of the new data dictionary, returned as a string. The name must include the `.sldd` extension.

Example: `'new_dictionary.sldd'`

Data Types: `char`

## Output Arguments

**`dict_id` — Handle to the dictionary**
`systemcomposer.interface.Dictionary` object

Handle to the dictionary, specified as a `systemcomposer.interface.Dictionary` object.

## Examples

```
dict_id = systemcomposer.createDictionary('new_dictionary.sldd')
```

## See Also

`addInterface` | `linkDictionary` | `save` | `unlinkDictionary`

**Topics**
"Save and Link Interfaces"

**Introduced in R2019a**

# createModel

Create a System Composer model

## Syntax

```
objModel = systemcomposer.createModel(modelName)
```

## Description

`objModel = systemcomposer.createModel(modelName)` creates a model with name `modelName` and returns its handle.

`createModel` is the constructor method for the class `systemcomposer.arch.Model`.

## Input Arguments

**`modelName` — Name of a new model**
character vector | string

Model name must be a valid MATLAB variable name.

Data Types: `char` | `string`

## Output Arguments

**`objModel` — Model handle**
Model object

Data Types: `systemcomposer.arch.Model`

## Examples

```
Model = systemcomposer.createModel('model_name')
```

```
Model = 

  Model with properties:

                   Name: 'model_name'
           Architecture: [1×1 systemcomposer.arch.Architecture]
         SimulinkHandle: 2.0005
                  Views: [0×0 systemcomposer.view.ViewArchitecture]
               Profiles: [0×0 systemcomposer.profile.Profile]
    InterfaceDictionary: [1×1 systemcomposer.interface.Dictionary]
```

## See Also
`loadModel` | `open` | `save`

**Topics**
"Compose Architecture Visually"

**Introduced in R2019a**

## createProfile

Create profile

### Syntax

```
profile = systemcomposer.createProfile(profileName)
```

### Description

`profile = systemcomposer.createProfile(profileName)` creates a new profile object of type `systemcomposer.profile.Profile` to set up a set of stereotypes. To save a profile in a different directory, type `profile.save(‘my/New/File/Path/’)`.

### Input Arguments

**`profileName` — Name of new profile**
string

Name of the new profile, specified as a string.

Example: 'new_profile'

Data Types: `char` | `string`

### Output Arguments

**`profile` — Profile handle**
profile object

### Examples

```
systemcomposer.createProfile('new_profile')
profile = systemcomposer.createProfile('new_profile')
```

### See Also

`applyProfile` | `removeProfile` | `systemcomposer.loadProfile`

**Topics**
“Create a Profile and Add Stereotypes”

**Introduced in R2019a**

# createSimulinkBehavior

Create a Simulink model and link component to it

## Syntax

```
createSimulinkBehavior(component,modelName)
```

## Description

`createSimulinkBehavior(component,modelName)` creates a new Simulink model with the same interface as the component and links the component to the new model. This method works only if the component has no children.

## Examples

### Create a Simulink Model and Link

Create a Simulink behavior model for the component `robotcomp` in `Robot.slx` and link the component to the model.

```
createSimulinkBehavior(robotcomp,'Robot');
```

## Input Arguments

**`component` — Architecture component**
architecture component

The component must have no children.

Data Types: `systemcomposer.arch.Component`

**`modelName` — Model name**
string

Name of the Simulink model created by this function.

Data Types: `char`

## See Also
`linkToModel`

**Topics**
“Implement Components in Simulink”

**Introduced in R2019a**

## createViewArchitecture

**Package:** systemcomposer.arch

Create a view

### Syntax

```
view = createViewArchitecture(obj, name,Name,Value)
view = createViewArchitecture(obj, name,constraint,Name,Value)
view = createViewArchitecture(obj, name,constraint,groupBy,Name,Value)
```

### Description

`view = createViewArchitecture(obj, name,Name,Value)` creates an empty view with the given name.

`view = createViewArchitecture(obj, name,constraint,Name,Value)` creates a view with the given name where the contents are populated by finding all components in the model that satisfy the provided query.

`view = createViewArchitecture(obj, name,constraint,groupBy,Name,Value)` creates a view with the given name where the contents are populated by finding all components in the model which satisfy the provided query. The selected components are then grouped by the fully qualified property name.

### Examples

#### Create a View Based on a Query and Review Status

```
scKeylessEntrySystem;
m = systemcomposer.openModel('KeylessEntryArchitecture');

import systemcomposer.query.*;
myQuery = HasStereotype(IsStereotypeDerivedFrom("AutoProfile.SoftwareComponent"));

view = m.createViewArchitecture('Software Review Status', myQuery, 'AutoProfile.BaseComponent.Re

m.openViews;
```

### Input Arguments

**obj — Model object**
`systemcomposer.arch.Model` object

Model object to use to create a view.

**name — Name of the view**
character vector | string

Name of the view, specified as a character vector or string.

**`constraint` — Query object**
`systemcomposer.query` object

Constraint created using `systemcomposer.query*` objects representing specific conditions. A constraint can contain a subconstraint that can be joined together with another constraint using `AND` or `OR`. A constraint can also be negated using `NOT`.

**`groupBy` — User-defined property**
enumeration

User-defined property specified as an enumeration by which to group components.

#### Name-Value Pair Arguments

Specify optional comma-separated pairs of `Name,Value` arguments. `Name` is the argument name and `Value` is the corresponding value. `Name` must appear inside quotes. You can specify several name and value pair arguments in any order as `Name1,Value1,...,NameN,ValueN`.

Example: `'IncludeReferenceModels', true`

**`IncludeReferenceModels` — Option to search for reference architectures**
`false` (default) | `true`

Indicates if find searches referenced architectures or does not include referenced architectures. The default is `false`.

Example: `'IncludeReferenceModels', true`

**`Color` — Color of the view**
string | character array | hexadecimal value

Associated color of the view specified as a string or character array that contains the name of the color or an RGB hexadecimal value.

Example: `'Color','blue'`

Example: `'Color,'#FF00FF'`

## Output Arguments

**`view` — Model architecture view**
`ViewArchitecture` object

Model architecture view created based on the specified query and properties.

## See Also

**Topics**
"Build an Architecture Model from Command Line"

**Introduced in R2019b**

## createViewComponent

Create new view component

### Syntax

```
vc = createViewComponent(object, name, contextView)
```

### Description

`vc = createViewComponent(object, name, contextView)` creates a new view component with the provided name in the view given by the parameter ‘contextView’.

`createViewComponent` is a method for the class `systemcomposer.view.ViewArchitecture`

### Input Arguments

**`object` — <argument purpose>**
<object> (default) | <object>

<argument description>

Data Types: `<object data type>`

**name — Name of component**
character vector (default)

Name of component

Data Types: `character vector`

**`contextView` — <argument purpose>**
<argument value> (default) | <argument value>

Property ‘Parent’ is empty.

Data Types: `systemcomposer.view.ViewArchitecture`

### Output Arguments

**`parent` — <argument purpose>**
<argument value>

<argument description>

Data Types: `<argument data type>`

### See Also

**Introduced in R2019b**

# deleteInstance

Delete an architecture instance

## Syntax

`deleteInstance(architectureInstance)`

## Description

`deleteInstance(architectureInstance)` deletes an existing instance.

## Input Arguments

**`architectureInstance` — The architecture instance**
architecture instance

The architecture instance to be deleted.

Data Types: `systemcomposer.analysis.ArchitectureInstance`

## See Also

`instantiate`

### Topics

"Write Analysis Function"

**Introduced in R2019a**

## destroy

Remove and destroy a model element

### Syntax

`destroy(element)`

### Description

`destroy(element)` removes and destroys the model element.

### Examples

#### Destroy a Component

Create a component and then remove it from the model.

```
newcomponent = addComponent(rootArch,'NewComponent');
destroy(newcomponent)
```

### Input Arguments

**`element` — Architecture model element**
architecture element | interface element | signal element | property

Data Types: `systemcomposer.arch.Element` | `systemcomposer.interface.SignalInterface` | `systemcomposer.interface.SignalElement` | `systemcomposer.profile.Property`

### See Also

`removeElement` | `removeProfile` | `removeProperty`

**Introduced in R2019a**

# systemcomposer.exportModel

Export model information as MATLAB tables

## Syntax

```
[exportedSet] = systemcomposer.exportModel(modelName)
```

## Description

`[exportedSet] = systemcomposer.exportModel(modelName)` exports model information for components, ports, connectors, and interfaces to be imported into MATLAB® tables. The exported tables have prescribed formats to specify model element relationships, stereotypes, and properties.

## Input Arguments

**`modelName` — Name of model to be exported**
string | character vector

Name of System Composer model to be exported, specified as a string.

Example: 'exMobileRobot'

Data Types: `char` | `string`

## Output Arguments

**`exportedSet` — Model tables**
struct

Structure containing tables `components`, `ports`, `connections`, and `portInterfaces`.

## Examples

### Export a System Composer Model

To export a model, pass the model name and as an argument to the `exportModel` function. The function returns a structure containing four tables `components`, `ports`, `connections`, and `portInterfaces`.

```
exportedSet = systemcomposer.exportModel('exMobileRobot')

exportedSet = 

  struct with fields:

        components: [11×4 table]
             ports: [22×4 table]
       connections: [16×4 table]
    portInterfaces: [0×9 table]
```

## See Also
`systemcomposer.importModel`

**Topics**
“Importing and Exporting Architecture Models”

**Introduced in R2019a**

# systemcomposer.extractArchitectureFromSimulink

Extract architecture from Simulink model

## Syntax

```
systemcomposer.extractArchitectureFromSimulink(SimulinkModel,
architectureModelName)
```

## Description

`systemcomposer.extractArchitectureFromSimulink(SimulinkModel, architectureModelName)` exports the Simulink model `SimulinkModel` to an architecture model `architectureModelName` and saves it in the current directory.

## Examples

### Extract Architecture from Example Model

Extract architecture from a model with subsystem and variant architecture.

```
ex_modeling_variants;
systemcomposer.extractArchitectureFromSimulink('ex_modeling_variants','archModel')
```

## Input Arguments

**`SimulinkModel` — Model from which to extract the architecture**
Simulink model

The model must be on the path.

Data Types: `model`

**`architectureModelName` — Architecture model name**
string

A new architecture model that shows the architecture of the Simulink model. This model is saved in the current directory.

Data Types: `char`

## See Also
`linkToModel`

### Topics
"Extract Architecture from Simulink Model"

**Introduced in R2019a**

# find

**Package:** `systemcomposer.arch`

Find architecture elements using a query

## Syntax

```
[p] = find(obj,constraint,Name,Value)
[p, elem] = find(___)
[p] = find(obj,constraint,rootArch,Name,Value)
```

## Description

`[p] = find(obj,constraint,Name,Value)` finds all element paths starting from the root architecture of the model that satisfy the `constraint` query with additional options specified by one or more name-value pair arguments.

`[p, elem] = find(___)` returns the architecture element objects and their paths that satisfy the `constraint` query. If `rootArch` is not provided, then the function finds model elements in the root architecture of the model. The output argument paths contain a fully qualified named `path` to the element `e` from the given root architecture.

`[p] = find(obj,constraint,rootArch,Name,Value)` finds all element paths starting from the specified root architecture that satisfy the `constraint` query with additional options specified by one or more name-value pair arguments.

## Examples

### Find Model Element Paths that Satisfy the Query

```
find(modelObj, HasStereotype(IsStereotypeDerivedFrom('mProfile.BaseComp')),...
 'Recurse', true, 'IncludeReferenceModels', true, 'ElemType', 'Component')
```

### Find Elements in an Architecture Model

This example shows how to find elements in an architecture model based on a query.

#### Create Model

Create an architecture model with two components.

```
m = systemcomposer.createModel('exModel');
comps = m.Architecture.addComponent({'c1','c2'});
```

#### Create Profile and Stereotypes

Create a profile and stereotypes for your architecture model.

```
pf = systemcomposer.profile.Profile.createProfile('mProfile');
b = pf.addStereotype('BaseComp', 'AppliesTo','Component','Abstract', true);
s = pf.addStereotype('sComp', 'Parent',b);
```

### Apply Profile and Stereotypes

Apply the profile and stereotypes to your architecture model.

```
m.Architecture.applyProfile(pf.Name)
comps(1).applyStereotype(s.FullyQualifiedName)
```

### Find the Element

Find the element in your architecture model based on a System Composer query.

```
import systemcomposer.query.*;
[p, elem] = find(m, HasStereotype(IsStereotypeDerivedFrom('mProfile.BaseComp')),...
'Recurse', true, 'IncludeReferenceModels', true)
```

```
p = 1x1 cell array
    {'exModel/c1'}


elem = 
  Component with properties:

     IsAdapterComponent: 0
           Architecture: [1x1 systemcomposer.arch.Architecture]
                   Name: 'c1'
                 Parent: [1x1 systemcomposer.arch.Architecture]
                  Ports: [0x0 systemcomposer.arch.ComponentPort]
             OwnedPorts: [0x0 systemcomposer.arch.ComponentPort]
      OwnedArchitecture: [1x1 systemcomposer.arch.Architecture]
               Position: [15 15 65 65]
                  Model: [1x1 systemcomposer.arch.Model]
         SimulinkHandle: 2.0005
    SimulinkModelHandle: 4.8828e-04
                   UUID: '9aad619b-c3a9-4f15-8ab8-654fe348a233'
            ExternalUID: ''
```

### Clean Up

Uncomment to remove the model and the profile.

```
% m.close('force');
% systemcomposer.profile.Profile.closeAll;
```

#### Find Architecture Element Paths that Satisfy the Query

```
find(modelObj, HasStereotype(IsStereotypeDerivedFrom('mProfile.BaseComp')),...
archToQuery, 'Recurse', true, 'IncludeReferenceModels', true)
```

## Input Arguments

### `obj` — Model object
`systemcomposer.arch.Model` object

Model object to query using the `constraint`.

### `constraint` — Query object
`systemcomposer.query` object

Constraint created using `systemcomposer.query*` objects representing specific conditions. A constraint can contain a subconstraint that can be joined together with another constraint using `AND` or `OR`. A constraint can also be negated using `NOT`.

#### Query Objects

| Query Object | Condition |
|---|---|
| `Property` | Retrieve a nonevaluated value or the given property. |
| `PropertyValue` | Retrieve a property from a System Composer object or a stereotype property and then evaluate the property value. |
| `Compare` | Compare a property value to the given value. |
| `HasPort` | A component has a port that satisfies the given subconstraint. |
| `HasInterface` | A port has an interface that satisfies the given subconstraint. |
| `HasInterfaceElement` | An interface has an interface element that satisfies the given subconstraint. |
| `HasStereotype` | An architecture element has a stereotype that satisfies the given subconstraint. |
| `IsInRange` | A property value is within the given range. |
| `AnyComponents` | An element is a component. |
| `IsStereotypeDerivedFrom` | A stereotype is derived from the given stereotype. |

### `rootArch` — Root architecture
string

Root architecture of the model specified as a string.

#### Name-Value Pair Arguments

Specify optional comma-separated pairs of `Name,Value` arguments. `Name` is the argument name and `Value` is the corresponding value. `Name` must appear inside quotes. You can specify several name and value pair arguments in any order as `Name1,Value1,...,NameN,ValueN`.

Example: `'Recurse', true, 'IncludeReferenceModels', true`

**`Recurse` — Option to recursively search through model**
`true` (default) | `false`

Indicates if find recursively searches through the model or searches only the specified layer. The default is `true`.

Example: `'Recurse', true`

**`IncludeReferenceModels` — Option to search for reference architectures**
`false` (default) | `true`

Indicates if find searches referenced architectures or does not include referenced architectures. The default is `false`.

Example: `'IncludeReferenceModels', true`

## Output Arguments

**p — Element paths**
cell array of element paths

Cell array of paths to the elements that satisfy `constraint`.

**`elem` — Element objects**
element object

Architecture element objects that satisfy `constraint`.

## See Also

**Topics**
“Build an Architecture Model from Command Line”

**Introduced in R2019a**

# getActiveChoice

Get the active choice on the variant component

## Syntax

`choice = getActiveChoice(variantComponent)`

## Description

`choice = getActiveChoice(variantComponent)` finds which choice is active for the variant component.

## Input Arguments

**`variantComponent` — Architecture component**
component

The architecture where the variant choices are selected.

Data Types: `systemcomposer.arch.Component`

## Output Arguments

**`choice` — Handle of chosen variant**
component

Handle to the chosen variant.

Data Types: `systemcomposer.arch.Component`

## See Also

`addChoice` | `getChoices` | `setActiveChoice`

**Topics**
"Create Variants"

**Introduced in R2019a**

# getChoices

Get available choices in the variant component

## Syntax

```
compList = getChoices(variantComponent)
```

## Description

`compList = getChoices(variantComponent)` returns the list of choices available for a variant component.

## Input Arguments

**`variantComponent` — Architecture component**
component

Variant component with multiple choices.

Data Types: `systemcomposer.arch.Component`

## Output Arguments

**`compList` — Choices available for the variant component**
array of components

List of possible choices for the variant component.

## See Also

`addChoice` | `getActiveChoice` | `setActiveChoice`

**Topics**
"Create Variants"

**Introduced in R2019a**

## getCondition

Return the variant control on the choice within the variant component

### Syntax

`expression = getCondition(variantComponent,choice)`

### Description

`expression = getCondition(variantComponent,choice)` returns the variant control on the choice within the variant component.

### Input Arguments

**`variantComponent` — Architecture component**
component

Variant component with multiple choices.

Data Types: `systemcomposer.arch.Component`

**`choice` — Choice in a variant component**
component

The choice whose control string is returned by this function.

Data Types: `systemcomposer.arch.Component`

### Output Arguments

**`expression` — The control string**
string

The control string that controls the selection of the particular `choice`.

### See Also

`makeVariant` | `setActiveChoice` | `setCondition`

**Topics**
"Create Variants"

**Introduced in R2019a**

# getElement

Get the object a signal interface element

## Syntax

```
element = getElement(interface,elementName)
```

## Description

`element = getElement(interface,elementName)` gets the object for an element in a signal interface.

## Examples

### Get the Object for a Named Element

Add an interface `newinterface` to the interface dictionary of the model and add an element with type `double` to it. Then get the object for the element.

```
interface = addInterface(arch.InterfaceDictionary,'newsignal');
addElement(interface,'newelement','Type','double)
element = getElement(interface,'newsignal')
element =
  SignalElement with properties:

      Interface: [1×1 systemcomposer.interface.SignalInterface]
           Name: 'newelement2'
           Type: 'double'
     Dimensions: '1'
          Units: ''
     Complexity: 'real'
        Minimum: '[]'
        Maximum: '[]'
    Description: ''
           UUID: 'f42c8166-e4ad-4488-926a-293050016e1a'
    ExternalUID: ''
```

## Input Arguments

**`interface` — interface object**
signal interface

The object handle to the element to be identified.

Data Types: `systemcomposer.interface.SignalInterface`

**`elementName` — Name of the element to be identified**
string

Data Types: `char`

## Output Arguments

**`element` — new interface element object**
signal element

## See Also

`addElement` | `getInterface` | `removeElement`

**Topics**
"Define Interfaces"

**Introduced in R2019a**

# getEvaluatedPropertyValue

Get evaluated value of property from component

## Syntax

`[value] = getEvaluatedPropertyValue(compObj,qualifiedPropName)`

## Description

`[value] = getEvaluatedPropertyValue(compObj,qualifiedPropName)` obtains the evaluated value of a property specified on the component.

## Input Arguments

**`compObj` — Component to get the property value from**
`systemcomposer.arch.BaseComponent` object

Component from which to obtain the property value, specified as a `systemcomposer.arch.BaseComponent` object.

**`qualifiedPropName` — Property name**
string | character array

Qualified propery name, specified as a string or character array.

## Output Arguments

**`value` — Property value**
any variable type

Value of the property.

## See Also

`getValue` | `setValue`

**Topics**
“Write Analysis Function”

**Introduced in R2019a**

## getInterface

Get the object for a named interface in an interface dictionary

### Syntax

```
interface = getInterface(dictionary,name)
```

### Description

`interface = getInterface(dictionary,name)` gets the object for a named interface in the interface dictionary.

### Examples

#### Add an Interface

Add an interface `newinterface` to the interface dictionary of the model. Obtain the interface object

```
addInterface(arch.InterfaceDictionary,'newsignal')
iface = getInterface(arch.InterfaceDictionary,'newsignal')
iface =
  SignalInterface with properties:
     Dictionary: [1×1 systemcomposer.interface.Dictionary]
           Name: 'newsignal'
       Elements: [0×0 systemcomposer.interface.SignalElement]
           UUID: '438b5004-6cab-40eb-955b-37e0df5a914f'
    ExternalUID: ''
```

### Input Arguments

**`dictionary` — Data dictionary**
`systemcomposer.interface.Dictionary` object

This is the data dictionary attached to the model. It could be the local dictionary of the model or an external data dictionary.

Data Types: `systemcomposer.interface.Dictionary`

**name — Name of the interface**
string scalar | char array

Name of the interface specified as a string scalar or char array.

Data Types: `string scalar` | `char array`

### Output Arguments

**`interface` — Object for the interface**
signal interface

Object for a named interface.

## See Also

`addElement` | `addInterface` | `removeElement`

### Topics

"Define Interfaces"

**Introduced in R2019a**

## getInterfaceNames

Get the object for a named interface in an interface dictionary

### Syntax

`interfaceNames = getInterfaceNames(dictionary)`

### Description

`interfaceNames = getInterfaceNames(dictionary)` gets the names of all interfaces in the interface dictionary.

### Examples

#### Get Interface Names

```
interfaceNames = getInterfaceNames(arch.InterfaceDictionary)
```

### Input Arguments

**`dictionary` — Data dictionary**
System Composer dictionary

Data dictionary attached to the model, specified as the local dictionary of the model or an external data dictionary.

Data Types: `systemcomposer.interface.Dictionary`

### Output Arguments

**`interfaceNames` — interface names**
array of interface names

Names of all the interfaces in the dictionary.

### See Also

`addInterface` | `getInterface` | `removeInterface`

**Topics**
“Define Interfaces”

**Introduced in R2019a**

# getPort

Get the port from a component

## Syntax

`port = getPort(compObj,portName)`

## Description

`port = getPort(compObj,portName)` gets the port on this component with a specified name.

## Input Arguments

**`compObj` — Component to get the port from**
`systemcomposer.arch.BaseComponent` object

Component from which to get the port, specified as a `systemcomposer.arch.BaseComponent` object.

**`portName` — Name of the port to find**
string | character array

Name of the port to find, specified as a string or character array.

## Output Arguments

**`port` — Port of this component**
component port

Port of the component.

## See Also

`addElement` | `getElement` | `getInterface` | `removeElement`

**Introduced in R2019a**

## getProperty

Get the property value corresponding to a stereotype applied to the element

### Syntax

```
[propertyValue,propertyUnits] = getProperty(element,propertyName)
```

### Description

`[propertyValue,propertyUnits] = getProperty(element,propertyName)` obtains the value and units of the property specified in the `propertyName` argument. Get the property corresponding to an applied stereotype by qualified name <stereotype>.<property> .

### Examples

#### Get a Property from a Component

Get the `weight` property from a component with `sysComponent` stereotype applied.

```
>> [val, units] = getProperty(element,'sysComponent.weight')
val =
    '0'
units =
    'kg'
```

### Input Arguments

**`element` — Architecture model element**
architecture component | architecture port | architecture connector

This function gets the specified property of this element. A stereotype with the property must be applied to the element.

Data Types: `systemcomposer.arch.Element` | `systemcomposer.arch.Architecture` | `systemcomposer.arch.Component` | `systemcomposer.arch.Port`

**`propertyName` — Name of the property**
string

The property name must be qualified with the stereotype name, in the form `'<stereotype>.<property>'`.

Data Types: `char`

### Output Arguments

**`propertyValue` — Value of the property**
string | number | enumeration

Data Types: `char`

**`propertyUnits` — Unit of the property**
string

Data Types: `char`

## See Also
`setProperty`

**Topics**
"Set Tags and Properties for Analysis"

**Introduced in R2019a**

## getStereotypes

Get the stereotypes applied on the element

### Syntax

`stereotypes = getStereotypes(element)`

### Description

`stereotypes = getStereotypes(element)` gets an array of fully qualified stereotype names that have been applied on the element.

### Examples

#### Get Stereotypes

```
stypes = getStereotypes(component_handle)
```

### Input Arguments

**`element` — Model element**
component | port | connector

This is the element of which stereotypes are queried.

Data Types: `systemcomposer.arch.Element`

### Output Arguments

**`stereotypes` — list of stereotypes**
cell array of stereotypes

### See Also

`applyStereotype` | `removeStereotype`

**Topics**
"Use Stereotypes and Profiles"

**Introduced in R2019a**

# getValue

Get value of a property from an element instance

## Syntax

`[value,unit] = getValue(instance,property)`

## Description

`[value,unit] = getValue(instance,property)` obtains the `property` of the `instance` and assigns it to `value`. This function is part of the instance API that you can use to analyze the model iteratively, element by element.`instance` refers to the element instance on which the iteration is being performed.

## Examples

### Get the Weight Property

Assume that a `MechComponent` stereotype is attached to the specification of the instance.

```
weightValue = getValue(instance,'MechComponent.weight');
```

## Input Arguments

**`instance` — The element instance**
architecture instance | component instance | port instance | connector instance

This function is part of the instance API that you can use to analyze the model iteratively, element by element.`instance` refers to the element instance on which the iteration is being performed.

Data Types: `systemcomposer.analysis.ArchitectureInstance` | `systemcomposer.analysis.ComponentInstance` | `systemcomposer.analysis.PortInstance` | `systemcomposer.analysis.ConnectorInstance`

**`property` — The property field**
stereotype.property

String in the form `<stereotype>.<property>`.

Data Types: `string`

## Output Arguments

**`value` — Property value**
any variable type

Value of the property. The data type depends on how the property is defined in the profile.

**`unit` — Property unit**
string

String that describe the unit of the property as defined in the profile.

## See Also

`setValue`

**Topics**
“Write Analysis Function”

**Introduced in R2019a**

# HasStereotype

**Package:** `systemcomposer.query`

Create a query to select architecture elements that have a stereotype based on the specified subconstraint

## Syntax

```
query = HasStereotype(subconstraint)
```

## Description

`query = HasStereotype(subconstraint)` creates a query object that the `systemcomposer.arch.Model.find` method and the `systemcomposer.arch.Model.createViewArchitecture` method use to select architecture elements with a stereotype that satisfies the given subconstraint.

## Examples

### Construct a Query to Select All Hardware Components

Select all of the hardware components in an architecture model.

Import the package that contains all of the System Composer queries.

```
import systemcomposer.query.*;
```

Open the Simulink project file.

```
scKeylessEntrySystem
```

Run the query.

```
hwCompQuery = HasStereotype(IsStereotypeDerivedFrom("AutoProfile.HardwareComponent"))
```

```
HasStereotype with properties:

    AllowedParentConstraints: {[1×1 meta.class]}
               SubConstraint: [1×1 systemcomposer.query.IsStereotypeDerivedFrom]
              SkipValidation: 0
```

## Input Arguments

### `subconstraint` — Condition
string

Condition restricting the query, specified as a string.

Example: `IsStereotypeDerivedFrom`

## Output Arguments

**`query` — Query object**
`systemcomposer.query` object

Query.

## See Also

`find` | `systemcomposer.arch.Model`

**Topics**
"Creating Architectural Views Programmatically"

**Introduced in R2019b**

# systemcomposer.importModel

Import model information from MATLAB tables

## Syntax

```
archModel = systemcomposer.importModel(modelName,components,ports,
connections)
```

## Description

`archModel = systemcomposer.importModel(modelName,components,ports, connections)` creates a new architecture model based on MATLAB tables that specify components, ports, and connections.

## Input Arguments

**`modelName` — Name of model to be created**
string

Example: 'importedModel'

Data Types: `char` | `string`

**`components` — Component information**
MATLAB table

Model components listed in a table created in MATLAB. The component table must include name, unique ID, and parent component ID for each component. It can also include other relevant information such as referenced model, stereotype qualifier name, and so on, required to construct the architecture hierarchy.

Data Types: `table`

**`ports` — Port information**
MATLAB table

Model ports listed in a table created in MATLAB. The ports table must include port name, direction, component, and port ID information. Port interface information may also be required to assign ports to components..

Data Types: `table`

**`connections` — Connections information**
MATLAB table

Model connections listed in a table created in MATLAB. The ports table must include port name, direction, component, and port ID information. Port interface information may also be required to assign ports to components..

Data Types: `table`

## Output Arguments

**`archModel` — Handle to the architecture model**
architecture object

Handle to the architecture model, specified as an architecture object.

## Examples

### Import and Export Architectures

This example shows how to import and export Architectures. In System Composer, an architecture is fully defined by three sets of information:

- Component information
- Port information
- Connection information

You can import an architecture into System Composer when this information is defined in, or converted into, MATLAB tables.

In this example, the architecture information of a simple UAV system is defined in an Excel spreadsheet and is used to create a System Composer architecture model. You can modify the files in this example to import architectures defined in external tools, when the data includes the required information. The example also shows how to export this architecture information from System Composer architecture model to an Excel spreadsheet.

### Architecture Definition Data

You can characterize the architecture as a network of components and import by defining components, ports, connections, and interfaces in MATLAB tables. The component table must include name, unique ID, and parent component ID for each component. It can also include other relevant information such as referenced model, stereotype qualifier name and so on. required to construct the architecture hierarchy. The port table must include port name, direction, component, and port ID information. Port interface information may also be required to assign ports to components. The connection table includes information to connect ports. This includes, at a minimum, connection ID, source port ID, and destination port ID.

The systemcomposer.importModel(importModelName) API :

- Reads stereotype names from Component table and load the profiles
- Creates components and attach ports
- Creates connections using the connection map
- Saves referenced models
- Saves the architecture model

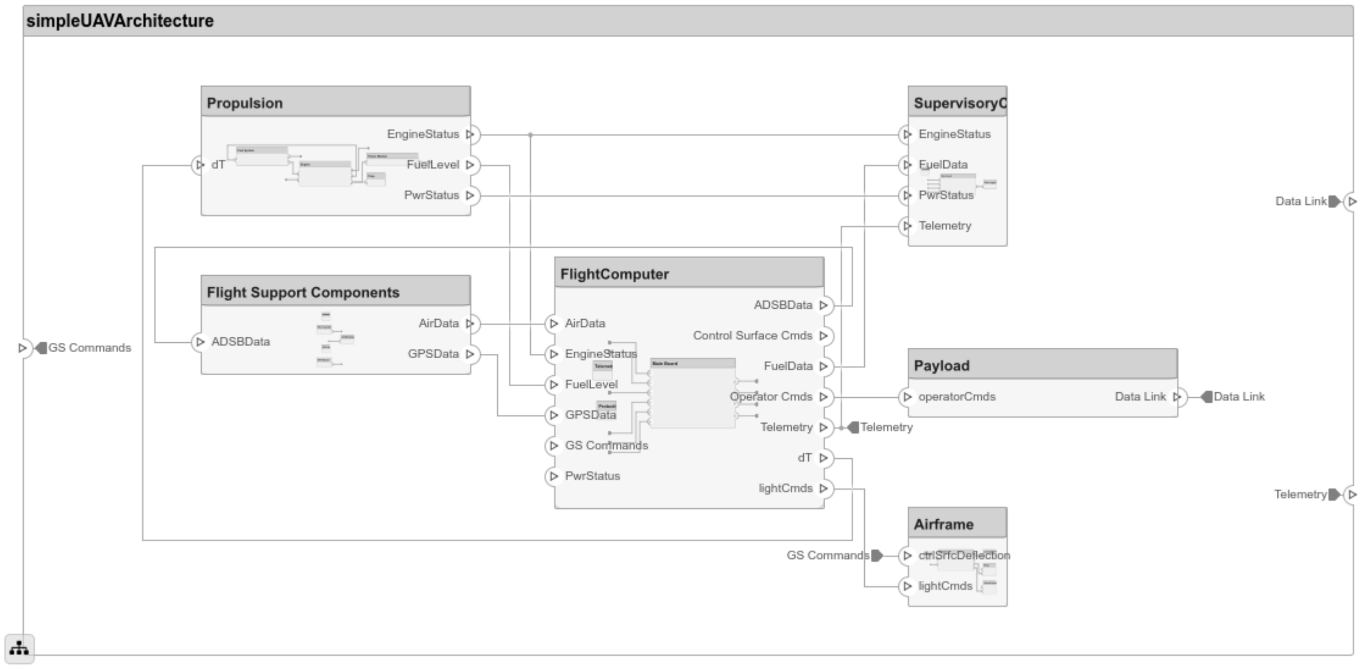
Make sure the current directory is writable because this example will be creating files.

```
[stat, fa] = fileattrib(pwd);
if ~fa.UserWrite
```

```
    disp('This script must be run in a writable directory');
    return;
end
% Instantiate adapter class to read from Excel.
modelName = 'simpleUAVArchitecture';
% importModelFromExcel function reads the Excel file and creates the MATLAB
% tables.
importAdapter = ImportModelFromExcel('SmallUAVModel.xls','Components','Ports','Connections','Por
importAdapter.readTableFromExcel();
```

### Import an Architecture

```
model = systemcomposer.importModel(modelName,importAdapter.Components,importAdapter.Ports,import
% Auto-arrange blocks in the generated model
Simulink.BlockDiagram.arrangeSystem(modelName);
```



### Export an Architecture

You can export an architecture to MATLAB tables and then convert to an external file

```
exportedSet = systemcomposer.exportModel(modelName);
% The output of the function is a structure that contains the component table, port table,
% connection table, and the interface table.
% Save the above structure to excel file.
SaveToExcel('ExportedUAVModel',exportedSet);
```

### Close Model

```
bdclose(modelName);
```

## See Also

`systemcomposer.exportModel`

**Topics**

"Importing and Exporting Architecture Models"

**Introduced in R2019a**

# inlineComponent

Inline reference architecture into model

## Syntax

```
componentHandle = inlineComponent(component,inlineFlag)
```

## Description

`componentHandle = inlineComponent(component,inlineFlag)` inlines the contents of the architecture model referenced by the specified `component` and breaks the link to the reference model. If `inlineFlag` is `false`, then the contents are removed and only interfaces remain.

## Examples

### Reuse a Component

Save the component `robotcomp` in the architecture model `Robot.slx` and reference it from another component, `robotArm` so that `robotArm` uses the architecture of `robotcomp`. Inline `robotcomp` so that its architecture can be edited independently.

```
saveAsModel(robotcomp,'Robot');
linkToModel(robotArm, 'Robot');
inlineComponent(robotArm,true);
```

## Input Arguments

**`component` — Architecture component**
architecture component

The component must be linked to an architecture model.

Data Types: `systemcomposer.arch.Component`

**`inlineFlag` — control the contents of the inlined component**
true | false

If `true`, contents of the referenced architecture model are copied to the component architecture. If `false`, the contents are not copied, only ports and interfaces are inlined.

Data Types: `char`

## Output Arguments

**`componentHandle` — Component object**
architecture component

## See Also
`saveAsModel`

**Topics**
“Decompose and Reuse Components”

**Introduced in R2019a**

# instantiate

Create an analysis instance from a specification

## Syntax

```
instance = instantiate(model,properties,name)
```

## Description

`instance = instantiate(model,properties,name)` creates an instance of a model for analysis.

## Examples

### Instantiate All Properties of a Stereotype

Instantiate all properties of a stereotype that will be applied to specific elements during instantiation.

```
 NodeLatency = struct('elementKinds',["Component"]);
 ConnectorLatency = struct('elementKinds',["Connector"]);
 LatencyBase = struct('elementKinds',["Connector","Port","Component"]);
 PortLatency = struct('elementKinds',["Port"]);

 LatencyAnalysis = struct('NodeLatency',NodeLatency, ...
               'ConnectorLatency',ConnectorLatency, ...
               'PortLatency',PortLatency, ...
               'LatencyBase',LatencyBase);

properties = struct('LatencyProfile',LatencyAnalysis);
instantiate(<model>,properties, name)
```

### Instantiate Specific Properties of a Stereotype

Instantiate specific properties of a stereotype that will be applied to specific elements during instantiation.

```
 NodeLatency = struct('elementKinds',["Component"], ...
               'properties',struct('resources',true));
 ConnectorLatency = struct('elementKinds',["Connector"], ...
               'properties',struct('secure',true,'linkDistance',true));
 LatencyBase = struct('elementKinds',[], ...
               'properties',struct('dataRate',true,'latency',false));
 PortLatency = struct('elementKinds',["Port"], ...
               'properties',struct('queueDepth',true));

 LatencyAnalysis = struct('NodeLatency',NodeLatency, ...
               'ConnectorLatency',ConnectorLatency, ...
               'PortLatency',PortLatency, ...
               'LatencyBase',LatencyBase);
```

```
properties = struct('LatencyProfile',LatencyAnalysis);
instantiate(<model>,properties, name)
```

## Input Arguments

**`model` — Model**
`systemcomposer.arch.Model` object

Model from which instance is generated, specified as a `systemcomposer.arch.Model` object.

**`properties` — Stereotype properties**
struct

Structure containing profile, stereotype, and property information through which the user can specify which stereotypes and properties need to be instantiated

**name — Name of the instance**
string

Name given to the instance generated from the model.

## Output Arguments

**`instance` — Element instance**
architecture instance | component instance | port instance | connector instance

This function is part of the instance API that you can use to analyze the model iteratively, element by element.`instance` refers to the element instance on which the iteration is being performed.

Data Types: `systemcomposer.analysis.ArchitectureInstance`

## See Also

`deleteInstance` | `loadInstance` | `saveInstance`

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

# isArchitecture

Find if an instance is an architecture instance

## Syntax

`flag = isArchitecture(instance)`

## Description

`flag = isArchitecture(instance)` finds whether the instance is an architecture instance.

## Input Arguments

**`instance` — Element instance**
architecture instance | component instance | port instance | connector instance

This function is part of the instance API that you can use to analyze the model iteratively, element by element.`instance` refers to the element instance on which the iteration is being performed.

Data Types: `systemcomposer.analysis.ArchitectureInstance` | `systemcomposer.analysis.ComponentInstance` | `systemcomposer.analysis.PortInstance` | `systemcomposer.analysis.ConnectorInstance`

## Output Arguments

**`flag` — Indicate if the instance is an architecture**
boolean

This argument is `true` if the instance is an architecture.

## See Also

`isComponent` | `isConnector` | `isPort`

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

## isComponent

Find if an instance is a component instance

### Syntax

```
flag = isComponent(instance)
```

### Description

`flag = isComponent(instance)` finds whether the instance is a component instance.

### Input Arguments

**`instance` — The element instance**
architecture instance | component instance | port instance | connector instance

This function is part of the instance API that you can use to analyze the model iteratively, element by element.`instance` refers to the element instance on which the iteration is being performed.

Data Types: `systemcomposer.analysis.ArchitectureInstance` | `systemcomposer.analysis.ComponentInstance` | `systemcomposer.analysis.PortInstance` | `systemcomposer.analysis.ConnectorInstance`

### Output Arguments

**`flag` — Indicate if the instance is a component**
boolean

This argument is `true` if the instance is a component.

### See Also

`isArchitecture` | `isConnector` | `isPort`

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

# isConnector

Find if an instance is a connector instance

## Syntax

`flag = isConnector(instance)`

## Description

`flag = isConnector(instance)` finds whether the instance is a connector instance.

## Input Arguments

**`instance` — The element instance**
architecture instance | component instance | port instance | connector instance

This function is part of the instance API that you can use to analyze the model iteratively, element by element.`instance` refers to the element instance on which the iteration is being performed.

Data Types: `systemcomposer.analysis.ArchitectureInstance` | `systemcomposer.analysis.ComponentInstance` | `systemcomposer.analysis.PortInstance` | `systemcomposer.analysis.ConnectorInstance`

## Output Arguments

**`flag` — Indicate if the instance is a connector**
boolean

This argument is `true` if the instance is a connector.

## See Also

`isArchitecture` | `isComponent` | `isPort`

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

## isPort

Find if an instance is a port instance

### Syntax

`flag = isPort(instance)`

### Description

`flag = isPort(instance)` finds whether the instance is a port instance.

### Input Arguments

**`instance` — The element instance**
architecture instance | component instance | port instance | connector instance

This function is part of the instance API that you can use to analyze the model iteratively, element by element.`instance` refers to the element instance on which the iteration is being performed.

Data Types: `systemcomposer.analysis.ArchitectureInstance` | `systemcomposer.analysis.ComponentInstance` | `systemcomposer.analysis.PortInstance` | `systemcomposer.analysis.ConnectorInstance`

### Output Arguments

**`flag` — Indicate if the instance is a port**
boolean

This argument is `true` if the instance is a port.

### See Also

`isArchitecture` | `isConnector`

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

# isReference

Find if a component is a is a reference to another model

## Syntax

```
isRef = isReference(compObj)
```

## Description

`isRef = isReference(compObj)` returns whether or not the component is a reference to another model.

## Input Arguments

**`compObj` — Component to get the port from**
`systemcomposer.arch.BaseComponent` object | component instance | port instance | connector instance

Component from which to get the port, specified as a `systemcomposer.arch.BaseComponent` object.

## Output Arguments

**`isRef` — Indicate if the component is a reference**
boolean

This argument is `true` if the component is a reference.

## See Also

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

## iterate

Iterate over model elements

### Syntax

```
iterate(architecture,iterType,iterFunction)
iterate(architecture,iterType,iterFunction,'Recurse',false)
iterate(architecture,iterType,iterFunction,'IncludePorts',true)
iterate(architecture,iterType,iterFunction,'FollowConnectivity',true)
iterate(architecture,iterType,iterFunction,additionalArgs)
```

### Description

`iterate(architecture,iterType,iterFunction)`iterates over components in the architecture in the order specified by `iterType` and invokes the function specified by the function handle `iterFunction` on each component.

`iterate(architecture,iterType,iterFunction,'Recurse',false)` iterates over components only in this architecture and does not navigate into the architectures of child components.

`iterate(architecture,iterType,iterFunction,'IncludePorts',true)` iterates over components and architecture ports.

`iterate(architecture,iterType,iterFunction,'FollowConnectivity',true)` ensures components are visited according to how they are connected from source to destination. If this option is specified, iteration type has to be either 'TopDown' or 'BottomUp'. If any other option is specified, iteration defaults to 'TopDown'.

`iterate(architecture,iterType,iterFunction,additionalArgs)` passes all trailing arguments as arguments to `iterFunction`.

### Examples

#### Battery Capacity Computation

Open the example “Battery Sizing and Automotive Electrical System Analysis”.

```
archModel = systemcomposer.openModel('scExampleAutomotiveElectricalSystemAnalysis');
% Instantiate Battery sizing class used by analysis function to stores
% analysis results.
objcomputeBatterySizing = computeBatterySizing;
% Run the analysis using the iterator
archModel.iterate('Topdown',@computeLoad,objcomputeBatterySizing);
```

### Input Arguments

**`architecture` — Architecture to iterate over**
architecture

The iteration type traverses elements in 'depth-first pre-order', 'depth-first post-order', 'breadth-first top-down', or 'breadth-first bottom-up' order.

Data Types: `systemcomposer.arch.Architecture`

**`iterType` — Iteration type**
'PreOrder' | 'PostOrder' | 'TopDown' | 'BottomUp'

The iteration type traverses elements in 'depth-first pre-order', 'depth-first post-order', 'breadth-first top-down', or 'breadth-first bottom-up' order.

Data Types: `char`

**`iterFunction` — Iteration function**
function handle

Handle to the function to be iterated on each component.

Data Types: `string`

**`additionalArgs` — Additional function arguments**
function argument

Comma separated list of arguments to be passed to `iterFunction`

## See Also

**Topics**
"Analyze Architecture"

**Introduced in R2019a**

## linkDictionary

**Package:** `systemcomposer.arch`

Link data dictionary to an architecture model

### Syntax

`linkDictionary(obj,dictionaryFile)`

### Description

`linkDictionary(obj,dictionaryFile)` associates the specified Simulink data dictionary with the model.

### Input Arguments

**`obj` — Architecture model object**
`systemcomposer.arch.Model` object

**`dictionaryFile` — Dictionary file name**
string

Dictionary file name with the `.sldd` extension.

### See Also

`getInterfaces` | `systemcomposer.createDictionary`

**Topics**
"Save and Link Interfaces"

**Introduced in R2019a**

# linkToModel

Link component to a model

## Syntax

`modelHandle = linktoModel(component,modelName)`

## Description

`modelHandle = linktoModel(component,modelName)` links from the component to a model.

## Examples

### Reuse a Component

Save the component `robotcomp` in the architecture model `Robot.slx` and reference it from another component, `robotArm` so that `robotArm` uses the architecture of `robotcomp`.

```
saveAsModel(robotcomp,'Robot');
linkToModel(robotArm, 'Robot');
```

## Input Arguments

**`component` — Architecture component**
architecture component

The component must have no children.

Data Types: `systemcomposer.arch.Component`

**`modelName` — Model name**
string

An existing model that define the architecture or behavior of the component.

Data Types: `char`

## Output Arguments

**`modelHandle` — Handle to the linked model**
numeric handle

## See Also

`inlineComponent`

**Topics**
“Decompose and Reuse Components”

**Introduced in R2019a**

# loadInstance

Load an architecture instance

## Syntax

`loadInstance(fileName,overwrite)`

## Description

`loadInstance(fileName,overwrite)` loads an architecture instance from a MAT-file.

## Input Arguments

**`fileName` — File that contains an architecture instance**
string

This is a MAT-file that was previously saved with an architecture instance.

**`overwrite` — Whether to overwrite an instance if it already exists in the workspace**
1 | 0

If true, the load operation overwrites duplicate instances in the workspace.

## See Also

`deleteInstance` | `saveInstance` | `updateInstance`

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

# loadModel

Load architecture model

## Syntax

```
model = systemcomposer.loadModel(modelName)
```

## Description

`model = systemcomposer.loadModel(modelName)` loads the model with name `modelName`and returns its handle. The loaded model is not displayed.

## Input Arguments

**`modelName` — Name of model**
string

Model must exist on the MATLAB path.

Example: 'new_arch'

Data Types: `char` | `string`

## Output Arguments

**`model` — Model handle**
Model object

## Examples

```
systemcomposer.loadModel('new_arch')
model = systemcomposer.loadModel('new_arch')
```

## See Also
open | save

**Topics**
"Create an Architecture Model"

**Introduced in R2019a**

# systemcomposer.loadProfile

Load profile

## Syntax

```
profile = systemcomposer.loadProfile(profileName)
```

## Description

`profile = systemcomposer.loadProfile(profileName)` loads a profile with the specified file name

## Input Arguments

**`profileName` — Name of new profile**
string

Profile must be available on the MATLAB path.

Example: 'new_profile'

Data Types: `char` | `string`

## Output Arguments

**`profile` — Profile handle**
Profile object

## Examples

```
systemcomposer.loadProfile('new_profile')
profile = systemcomposer.loadProfile('new_profile')
```

## See Also

`applyProfile`

**Topics**
“Define Profiles and Stereotypes”

**Introduced in R2019a**

## lookup

**Package:** `systemcomposer.arch`

Look up an architecture element

### Syntax

`e = lookup(obj,nameValPair)`

### Description

`e = lookup(obj,nameValPair)` finds an architecture element based in its UUID or full path.

### Examples

#### Look Up a Component by Path

```
>> lookup(arch,'Path','RobotSystem/Sensors')
```

```
ans =

  Component with properties:

                 Name: 'Sensors'
               Parent: [1×1 systemcomposer.arch.Architecture]
                Ports: [1×2 systemcomposer.arch.ComponentPort]
           OwnedPorts: []
         Architecture: [1×1 systemcomposer.arch.Architecture]
    OwnedArchitecture: []
             Position: [275 75 391 161]
                Model: [1×1 systemcomposer.arch.Model]
                 UUID: 'f43c9d51-9dc6-43fc-b3af-95d458b81248'
       SimulinkHandle: 9.0002
  SimulinkModelHandle: 2.0002
          ExternalUID: ''
```

### Input Arguments

**obj — Architecture model object**
`systemcomposer.arch.Model` object

Model object to look up using the `UUID`.

**nameValPair — Name-value pair**
`‘UUID’,uuidVal` | `‘SimulinkHandle’,slhdl` | `'Path',pathVal`

- `‘UUID’,uuidVal` — Uses `lookup` to find any model element by `UUID`.
- `‘SimulinkHandle’,slhdl` — Uses `lookup` to find any model element by Simulink handle.

- `'Path',pathVal` — Uses `lookup` to find components by path.

## Output Arguments

**e — Element objects**
element object

Architecture element objects to look up using different keys.

## See Also
`instantiate`

**Topics**
"Analyze Architecture"

**Introduced in R2019a**

# makeVariant

Convert component to a variant choice

## Syntax

`[variantComp,choices] = makeVariant(components)`

## Description

`[variantComp,choices] = makeVariant(components)` converts `components` to variant choices and returns the parent component and available choices.

## Input Arguments

**`components` — Architecture components**
array of components

Architecture components to be converted to variants.

Data Types: `systemcomposer.arch.Component`

## Output Arguments

**`variantComp` — Component containing the variants**
component

Component that contains the variants.

**`choices` — Variant choice names**
cell array of strings

Choices available in the new variant.

Data Types: `string`

## See Also

`addChoice` | `getChoices`

**Topics**
"Create Variants"

**Introduced in R2019a**

# open

**Package:** `systemcomposer.arch`

Open System Composer model

## Syntax

`open(objModel)`

## Description

`open(objModel)` opens the specified model in System Composer.

open is a method for the class `systemcomposer.arch.Model`.

## Examples

### Create and Open a Model

```
Model = systemcomposer.createModel('modelName');
open(Model)
```

## Input Arguments

### `objModel` — Model to open in editor

`Model` object

Model to open in System Composer Editor, specified as a `Model` object.

Data Types: `systemcomposer.arch.Model`

## See Also

`createModel`

**Topics**

"Create an Architecture Model"

**Introduced in R2019a**

## systemcomposer.openModel

Open a System Composer architecture model

### Syntax

`model = systemcomposer.openModel(modelName)`

### Description

`model = systemcomposer.openModel(modelName)` opens the model with name `modelName` for editing and returns its handle.

### Input Arguments

**`modelName` — Name of new model**
string

Model must exist on the MATLAB path.

Example: 'new_arch'

Data Types: `char` | `string` | `Model`

### Output Arguments

**`model` — Model handle**
Model object

### Examples

```
systemcomposer.openModel('new_arch')
model = systemcomposer.openModel('new_arch')
```

### See Also

`createModel` | `open`

**Topics**
“Create an Architecture Model”

**Introduced in R2019a**

# openViews

Open architecture views editor

## Syntax

`openViews(objModel)`

## Description

`openViews(objModel)` opens the architecture views editor for the specified model. If the model is already open, openViews will bring the views to the front..

The method `openViews` is for the class `systemcomposer.arch.Model`.

## Input Arguments

**`objModel` — Name of a model**
Model object (default)

Data Types: `systemcomposer.arch.Model`

## See Also

**Introduced in R2019b**

# removeComponent

**Package:** `systemcomposer.view`

Remove a component from a view

## Syntax

```
removeComponent(object, compObj, contextView)
```

## Description

`removeComponent(object, compObj, contextView)` removes the component with the specified path from the view given by the `contextView` parameter.

`removeComponent` is a method for the class `systemcomposer.view.ViewArchitecture`.

## Input Arguments

**`object` — View architecture object**
`systemcomposer.view.ViewArchitecture` (default)

View architecture object.

**`compObj` — <argument purpose>**
<argument value> (default) | <argument value>

Path to the component including the name of the top-model.

**`contextView` — <argument purpose>**
`systemcomposer.view.ViewArchitecture` (default) | <argument value>

<argument description>

## See Also

**Introduced in R2019b**

# removeElement

Remove a signal interface element

## Syntax

`removeElement(interface,elementName)`

## Description

`removeElement(interface,elementName)` removes an element from a signal interface.

## Examples

### Add an Interface and an Element

Add an interface `newinterface` to the interface dictionary of the model and add an element with type `double` to it, then remove the element.

```
interface = addInterface(arch.InterfaceDictionary,'newsignal');
element = addElement(interface,'newelement','Type','double);
removeElement(interface,'newsignal')
```

## Input Arguments

**`interface` — interface object**
signal interface

Data Types: `systemcomposer.interface.SignalInterface`

**`elementName` — Name of the element to be removed**
String

Data Types: `char`

## See Also
`addElement` | `getElement`

**Topics**
"Define Interfaces"

**Introduced in R2019a**

## removeInterface

Remove a named interface from an interface dictionary

### Syntax

`removeInterface(dictionary,name)`

### Description

`removeInterface(dictionary,name)` removes a named interface from the interface dictionary.

### Examples

#### Remove an Interface

Add an interface `newinterface` to the interface dictionary of the model and then remove it.

```
addInterface(arch.InterfaceDictionary,'newsignal')
removeInterface(arch.InterfaceDictionary,'newsignal')
```

### Input Arguments

**`dictionary` — Data dictionary attached to the architecture model**
System Composer dictionary

Data Types: `systemcomposer.interface.Dictionary`

**name — Name of the new interface**
string

Data Types: `char`

### See Also

`addInterface` | `getInterface` | `getInterfaces`

**Topics**
“Define Interfaces”

**Introduced in R2019a**

# removeProfile

Remove profile from a model

## Syntax

`removeProfile(modelObject,profileFile)`

## Description

`removeProfile(modelObject,profileFile)` applies the profile to a model and makes all of the constituent stereotypes available.

## Examples

### Remove a Profile

```
removeProfile(arch,'SystemProfile')
```

## Input Arguments

**`modelObject` — Architecture model object**
architecture model

Data Types: `systemcomposer.arch.Model`

**`profileFile` — Profile file**
string

Name of a profile attached to the model.

Data Types: `string`

## See Also

`applyProfile` | `createProfile`

**Topics**
"Define Profiles and Stereotypes"

**Introduced in R2019a**

## removeProperty

Remove a property from a stereotype

### Syntax

`removeProperty(stereotype,propertyName)`

### Description

`removeProperty(stereotype,propertyName)` removes a property from the stereotype.

### Examples

#### Remove a Property

Add a component stereotype and add a `VoltageRating` property with value `5`. Then remove the property.

```
stype = addStereotype(profile,'electricalComponent','AppliesTo','Component')
property = addProperty(stype,'VoltageRating','DefaultValue','5');
removeProperty(stype,'VoltageRating');
```

### Input Arguments

**`stereotype` — Stereotype to which the property is added**
stereotype

**`propertyName` — Property to be removed**
string

### See Also
`addProperty`

**Topics**
"Define Profiles and Stereotypes"

**Introduced in R2019a**

# removeStereotype

Remove a stereotype from a model element

## Syntax

`removeStereotype(element,stereotype)`

## Description

`removeStereotype(element,stereotype)` removes a stereotype from the mode element. Removes the specified stereotype if already applied to a model element.

## Input Arguments

**`element` — Architecture model element**
architecture component | architecture port | architecture connector

The stereotype and all its properties are removed from this element.

Data Types: `systemcomposer.arch.Element`

**`stereotype` — Reference stereotype**
stereotype

The stereotype must be specified in the form `<profile>.<stereotype>`.

Data Types: `systemcomposer.internal.profile.Stereotype`

## See Also
`applyStereotype`

**Topics**
“Remove a Stereotype”

**Introduced in R2019a**

## reparent

Move stereotype

### Syntax

```
reparent(stereotype,parentStereotype)
```

### Description

`reparent(stereotype,parentStereotype)` reparents the stereotype to the specified stereotype.

### Examples

#### Reparent a Property

Add an architecture stereotype and reparent it to a component.

```
stype = addStereotype(profile,'electricalComponent','systemcomposer.Architecture','General elect
reparent(stype,'systemcomposer.Component')
```

### Input Arguments

**`stereotype` — Stereotype whose inheritance changes**
stereotype

**`parentStereotype` — the new stereotype to inherit from**
stereotype

### See Also

**Introduced in R2019a**

# save

Save the architecture model or data dictionary

## Syntax

```
save(architecture)
save(dictionary)
```

## Description

`save(architecture)` saves the architecture model to the file specified in its `Name` property.

`save(dictionary)` saves the data dictionary.

## Examples

### Save Model and Data Dictionary

```
save(arch);
save(arch.InterFaceDictionary);
```

## Input Arguments

**`architecture` — The architecture model**
System Composer architecture

Data Types: `systemcomposer.arch.Model`

**`dictionary` — Data dictionary attached to the architecture model**
System Composer dictionary

Data Types: `systemcomposer.interface.Dictionary`

## See Also
`loadModel`

**Topics**
"Create an Architecture Model"
"Save and Link Interfaces"

**Introduced in R2019a**

# saveAsModel

Save the Architecture to a separate model

## Syntax

`saveAsModel(component,modelName)`

## Description

`saveAsModel(component,modelName)` saves the architecture of the component to a separate architecture model and references the model from this component.

## Examples

### Save a Component

Save the component `robotcomp` in `Robot.slx` and reference the model.

```
saveAsModel(robotcomp,'Robot');
```

## Input Arguments

**`component` — Architecture component**
architecture component

The component must have an architecture with definition type `composition`. For other definition types, this function gives an error.

Data Types: `systemcomposer.arch.Component`

**`modelName` — Model name**
string

Data Types: `char`

## See Also

`inlineComponent` | `linkToModel`

**Topics**
"Decompose and Reuse Components"

**Introduced in R2019a**

# saveInstance

Save an architecture instance

## Syntax

`saveInstance(architectureInstance,fileName)`

## Description

`saveInstance(architectureInstance,fileName)` saves an architecture instance to a MAT-file.

## Input Arguments

**`architectureInstance` — The architecture instance**
architecture instance

The architecture instance to be saved.

Data Types: `systemcomposer.analysis.ArchitectureInstance`

**`fileName` — File to save the instance**
string

This is a MAT-file to save the architecture instance.

## See Also
`loadInstance`

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

## setActiveChoice

Set the active choice in the variant component

### Syntax

`setActiveChoice(variantComponent,choice)`

### Description

`setActiveChoice(variantComponent,choice)` sets the active choice on the variant component.

### Input Arguments

**`variantComponent` — Architecture component**
component

Variant component with multiple choices.

Data Types: `systemcomposer.arch.Component`

**`choice` — Choice in a variant component**
component | string

The choice whose control string is returned by this function. This can be a component object or label of the variant choice.

Data Types: `systemcomposer.arch.Component` | `string`

### See Also

`addChoice` | `getActiveChoice` | `getChoices`

**Topics**
“Create Variants”

**Introduced in R2019a**

# setCondition

Set the condition on the variant choice

## Syntax

`setCondition(variantComponent,choice, expression)`

## Description

`setCondition(variantComponent,choice, expression)` sets the variant control for a choice for the variant component.

## Input Arguments

**`variantComponent` — Architecture component**
component

Variant component with multiple choices.

Data Types: `systemcomposer.arch.Component`

**`choice` — Choice in a variant component**
component | string

The choice whose control string is set by this function.

Data Types: `systemcomposer.arch.Component`

**`expression` — The control string**
string

The control string that controls the selection of the `choice`.

## See Also

`getCondition` | `makeVariant` | `setActiveChoice`

**Topics**
"Create Variants"

**Introduced in R2019a**

## setDefaultComponentStereotype

Set the default stereotype for components

### Syntax

`= setDefaultComponentStereotype(S,stereotypeName)`

### Description

`= setDefaultComponentStereotype(S,stereotypeName)` specifies a stereotype for components in the subcomposition of a component, to which stereotype `S` is applied.

### Input Arguments

**S — Stereotype object**
`systemcomposer.profile.Stereotype` object

Stereotype of the parent component, specified as a `systemcomposer.profile.Stereotype` object.

**`stereotypeName` — Name of default stereotype**
string

Name of the stereotype set on subcomponents, specified as a string.

Data Types: `char`

### See Also
`applyStereotype` | `removeStereotype`

**Topics**
“Define Profiles and Stereotypes”

**Introduced in R2019a**

# setDefaultConnectorStereotype

Set the default stereotype for connectors

## Syntax

`= setDefaultConnectorStereotype(S,stereotypeName)`

## Description

`= setDefaultConnectorStereotype(S,stereotypeName)` specifies a stereotype for connectors in the subcomposition of a component, to which stereotype `S` is applied.

## Input Arguments

**S — Stereotype object**
`systemcomposer.profile.Stereotype` object

Stereotype of the parent component, specified as a `systemcomposer.profile.Stereotype` object.

**`stereotypeName` — Name of default stereotype**
string

Name of the stereotype set on connectors in the subcomposition, specified as a string.

Data Types: `char`

## See Also

`applyStereotype` | `removeStereotype`

**Topics**
"Define Profiles and Stereotypes"

**Introduced in R2019a**

## setDefaultPortStereotype

Set the default stereotype for ports

### Syntax

`= setDefaultPortStereotype(S,stereotypeName)`

### Description

`= setDefaultPortStereotype(S,stereotypeName)` specifies a stereotype for ports in the subcomposition of a component, to which stereotype `S` is applied.

### Input Arguments

**S — Stereotype object**
`systemcomposer.profile.Stereotype` object

Stereotype of the parent component, specified as a `systemcomposer.profile.Stereotype` object.

**`stereotypeName` — Name of default stereotype**
string

Name of the stereotype set on ports in the subcomposition, specified as a string.

Data Types: `char`

### See Also
`applyStereotype` | `removeStereotype`

**Topics**
“Define Profiles and Stereotypes”

**Introduced in R2019a**

# setProperty

Set the property value corresponding to a stereotype applied to the element

## Syntax

```
setProperty(element,propertyName,propertyValue,propertyUnits)
```

## Description

`setProperty(element,propertyName,propertyValue,propertyUnits)` sets the value and units of the property specified in the `propertyName` argument. Set the property corresponding to an applied stereotype by qualified name <stereotype>.<property> . This is the verbose approach to setting a property.

## Examples

### Apply a Stereotype and Set Numeric Property Value

In this example, `weight` is a property of the stereotype `sysComponent`.

```
applyStereotype(element,'sysProfile.sysComponent')
setProperty(element,'sysComponent.weight','5','g')
```

### Apply a Stereotype and Set String Property Value

In this example, `description` is a property of the stereotype `sysComponent`.

```
expression = sprintf("'%s'",'component description')
setProperty(element,'sysComponent.description',expression)
```

## Input Arguments

**`element` — Architecture model element**
architecture component | architecture port | architecture connector

Data Types: `systemcomposer.arch.Element`

**`propertyName` — Name of the property**
stereotype.property

Qualified name of the property in the form `'<stereotype>.<property>'`.

Data Types: `char`

**`propertyValue` — Value of the property**
string

Specify numeric values in single quotes. Specify string values in the `sprintf("'%s'",'<property value>')` form. See example on this page.

Data Types: `char`

**`propertyUnits` — Units of the property**
string

Specify the units to interpret property values.

Data Types: `char`

## See Also
`getProperty`

**Topics**
"Set Tags and Properties for Analysis"

**Introduced in R2019a**

# setValue

Set the value of a property for an element instance

## Syntax

`setValue(instance,property,value)`

## Description

`setValue(instance,property,value)` sets the `property` of the `instance` to `value`. This function is part of the instance API that you can use to analyze the model iteratively, element by element.`instance` refers to the element instance on which the iteration is being performed.

## Examples

### Set the Weight Property

Assume that a `MechComponent` stereotype is attached to the specification of the instance.

```
setValue(instance,'MechComponent.weight',10);
```

## Input Arguments

**`instance` — The element instance**
architecture instance | component instance | port instance | connector instance

This function is part of the instance API that you can use to analyze the model iteratively, element by element.`instance` refers to the element instance on which the iteration is being performed.

Data Types: `systemcomposer.analysis.ArchitectureInstance` | `systemcomposer.analysis.ComponentInstance` | `systemcomposer.analysis.PortInstance` | `systemcomposer.analysis.ConnectorInstance`

**`property` — The property field**
stereotype.property

String in the form `<stereotype>.<property>`.

Data Types: `string`

## See Also

`getValue`

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

# unlinkDictionary

Unlink dictionary from a model

## Syntax

`unlinkDictionary(modelObject)`

## Description

`unlinkDictionary(modelObject)` removes the association of the model from its data dictionary.

## Examples

### Unlink the Data Dictionary

```
unlinkDictionary(arch);
```

## Input Arguments

### `modelObject` — Architecture model object

architecture

The model from which the dictionary link is to be removed.

Data Types: `systemcomposer.arch.Model`

## See Also

`linkDictionary`

### Topics

"Save and Link Interfaces"

**Introduced in R2019a**

# updateInstance

Update an architecture instance

## Syntax

`updateInstance(architectureInstance,updateFlag)`

## Description

`updateInstance(architectureInstance,updateFlag)` updates an instance to mirror the changes in the specification model.

## Input Arguments

**`architectureInstance` — The architecture instance**
architecture instance

The architecture instance to be updated.

Data Types: `systemcomposer.analysis.ArchitectureInstance`

**`updateFlag` — whether to update values changed directly in the model**
1 | 0

If true, the method reflects changes made directly in the specification model to the instance model.

## See Also

`loadInstance` | `saveInstance`

**Topics**
"Write Analysis Function"

**Introduced in R2019a**

# Classes

# systemcomposer.analysis.Instance

Class that represents an architecture model element in an analysis instance

## Description

The `Instance` class represents an instance of an architecture.

## Creation

Create an instance of an architecture

```
instance = instantiate(modelHandle,architecture,properties,name)
```

### Properties

**`Name` — Name of the instance**
string

This is the name of the instance.

Data Types: `char`

**`Specification` — The specification that the instance is created from**
architecture | component | port | connector

Every instance has a specification from which it took its form. The kind of the specification depends on the kind of the instance.

Data Types: `systemcomposer.arch.Architecture` | `systemcomposer.arch.Component` | `systemcomposer.arch.Port` | `systemcomposer.arch.Connector`

**Architecture Instance Properties**

**`Components` — Child components of the instance**
array of components

The components within the architecture.

Data Types: `systemcomposer.analysis.ComponentInstance`

**`Ports` — Ports of the architecture instance**
array of ports

These are the architecture ports that belong to the architecture instance.

Data Types: `systemcomposer.analysis.PortInstance`

**`Connectors` — Connectors in the architecture instance**
array of connectors

These are the connectors within the architecture, connecting child components.

Data Types: `systemcomposer.analysis.Connectors`

### Component Instance Properties

**`Components` — Child components of the instance**
array of components

The components within the architecture.

Data Types: `systemcomposer.analysis.ComponentInstance`

**`Ports` — Ports of the architecture instance**
array of ports

These are the architecture ports that belong to the architecture instance.

Data Types: `systemcomposer.analysis.PortInstance`

**`Connectors` — Connectors in the architecture instance**
array of connectors

These are the connectors within the architecture, connecting child components.

Data Types: `systemcomposer.analysis.Connectors`

**`Parent` — Parent of the component**
component

The architecture that contains the component

Data Types: `systemcomposer.analysis.Architecture`

### Port Instance Properties

**`Parent` — Parent of the port**
component

The component that contains the port

Data Types: `systemcomposer.analysis.Component`

### Connector Instance Properties

**`Parent` — Parent of the connector**
component

The component that contains the connector

Data Types: `systemcomposer.analysis.Component`

**`SourcePort` — Source port**
port

The port from which the connector originates.

Data Types: `systemcomposer.analysis.Port`

**`DestinationPort` — Destination port**
port

The port from which the connector ends.

Data Types: `systemcomposer.analysis.Port`

## Object Functions

| | |
|---|---|
| deleteInstance | Delete an architecture instance |
| getValue | Get value of a property from an element instance |
| instantiate | Create an analysis instance from a specification |
| isArchitecture | Find if an instance is an architecture instance |
| isComponent | Find if an instance is a component instance |
| isConnector | Find if an instance is a connector instance |
| isPort | Find if an instance is a port instance |
| loadInstance | Load an architecture instance |
| saveInstance | Save an architecture instance |
| setValue | Set the value of a property for an element instance |
| updateInstance | Update an architecture instance |

## See Also

**Topics**
“Write Analysis Function”

**Introduced in R2019a**

# systemcomposer.arch.Architecture

Class that represents an architecture in an architecture model

## Description

The `Architecture` class represents an architecture in the model. This class inherits from systemcomposer.base.BaseElement and implements the interface systemcomposer.base.BaseArchitecture.

## Creation

Create an model and get the root architecture:

```
model = systemcomposer.createModel('archModel');
arch=get(model,'Architecture')
```

### Properties

**`Name` — Name of the architecture**
character vector

The architecture name is derived from the parent component or model name to which the architecture belongs.

Example: 'system_architecture'

**`Definition` — Definition type of the architecture**
Composition | Behavior | View

The definition type can be a composition, a behavior model, or a view.

Example: Composition

Data Types: `ArchitectureDefinition enum`

**`Parent` — Handle to the parent component that owns this Architecture**
systemcomposer.arch.Component object

**`Components` — Array of handles to the set of child components of this architecture**
array of systemcomposer.arch.Component objects

**`Ports` — Array of architecture ports of this architecture**
array of systemcomposer.arch.ArchitecturePort objects

**`Connectors` — Array of connectors that either interconnect child components or connect child components to architecture ports**
array of systemcomposer.arch.Connector objects

## Object Functions

| | |
|---|---|
| addComponent | Add a component to the architecture |
| addVariantComponent | Add a component to the architecture |
| addPort | Add ports to architecture |
| connect | Connect pairs of components |

## See Also

`systemcomposer.arch.Component`

### Topics

"Create an Architecture Model"

**Introduced in R2019a**

# systemcomposer.arch.ArchitecturePort

Represent input and output ports of an architecture

## Description

This class inherits from `systemcomposer.arch.BasePort` .

## Creation

```
port = addPort(archObj,'in')
```

The `addPort` method is the constructor for the `systemcomposer.arch.ArchitecturePort` class.

### Properties

**`Direction` — Port direction**
`input` | `output`

Direction of the port, specified as `input` or `output`.

**`InterfaceName` — Interface name**
string

Name of the interface associated with this port, specified as a string.

**`Interface` — Interface**
`systemcomposer.internal.SignalInterface` object

Interface associated with this port specified as a `systemcomposer.internal.SignalInterface` object.

**`Connectors` — Connectors**
`systemcomposer.arch.Connector` object

Connectors associated with this port specified as a `systemcomposer.arch.Connector` object.

**`Connected` — If the port already has connections**
logical

Whether the port already has connections, specified as logical.

**`Parent` — Architecture that owns this port**
`systemcomposer.arch.Architecture` object

Architecture that owns this port, specified as a `systemcomposer.arch.Architecture` object.

## Object Functions

| | |
|---|---|
| connect | Connect pairs of components |
| setName | |
| setInterface | |
| createAnonymousInterface | |
| applyStereotype | Apply a stereotype to a model element |
| destroy | Remove and destroy a model element |

## See Also

**Topics**
"Create an Architecture Model"

**Introduced in R2019a**

# systemcomposer.arch.BaseComponent

Common base class for all components in an architecture model

## Description

A `systemcomposer.arch.BaseComponent` cannot be constructed. Either create a `systemcomposer.arch.Component` or `systemcomposer.arch.VariantComponent`.

### Properties

**`Parent` — Architecture that owns this component**
`systemcomposer.arch.Architecture` object

Architecture that owns this component, specified as a `systemcomposer.arch.Architecture` object.

**`Ports` — Input and output ports of this component**
`systemcomposer.arch.ComponentPort` object

Input and output ports of this component, specified as a `systemcomposer.arch.ComponentPort` object.

**`OwnedArchitecture` — Architecture directly owned by this component**
`systemcomposer.arch.Architecture` object

Architecture directly owned by this component, specified as a `systemcomposer.arch.Architecture` object.

**`Position` — Position of component on canvas**
vector of coordinates in pixels

Position of the component on the canvas, specified as a vector of coordinates, in pixels `[left top right bottom]`.

## Object Functions

| | |
|---|---|
| getStereotypes | Get the stereotypes applied on the element |
| getProperty | Get the property value corresponding to a stereotype applied to the element |
| setProperty | Set the property value corresponding to a stereotype applied to the element |
| getEvaluatedPropertyValue | Get evaluated value of property from component |
| isReference | Find if an instance is a port instance |
| getPort | Get the object a signal interface element |
| applyStereotype | Apply a stereotype to a model element |
| connect | Connect pairs of components |

## See Also

**Introduced in R2019b**

# systemcomposer.arch.BasePort

Common base class for all ports in an architecture model

## Description

A `systemcomposer.arch.Baseport` cannot be constructed. Create a `systemcomposer.arch.ArchitecturePort`.

### Properties

**`Direction` — Port direction**
`'Input'` | `'Output'`

Direction of the port.

**`InterfaceName` — Name of interface**
string

Name of the interface associated with this port.

**`Interface` — Interface associated with this port**
`systemcomposer.internal.SignalInterface` object

Interface associated with this port, specified as a `systemcomposer.internal.SignalInterface` object.

**`Connectors` — Connectors of this port**
`systemcomposer.arch.Connector` object

Connectors of this port, specified as a `systemcomposer.arch.Connector` object.

**`Connected` — If port already has connections**
logical

If the port already has connections, specified as logical.

### Object Functions

| | |
|---|---|
| applyStereotype | Apply a stereotype to a model element |
| getStereotypes | Get the stereotypes applied on the element |
| getProperty | Get the property value corresponding to a stereotype applied to the element |
| setProperty | Set the property value corresponding to a stereotype applied to the element |
| getEvaluatedPropertyValue | Get evaluated value of property from component |

### See Also

`systemcomposer.arch.Element`

**Topics**
“Ports”

**Introduced in R2019a**

# systemcomposer.arch.Component

Class that represents a component or view component

## Description

The `Component` class represents a component in the architecture model. This class inherits from systemcomposer.arch.BaseComponent.

## Creation

Create a component in an architecture model:

```
model = systemcomposer.createModel('archModel');
arch=get(model,'Architecture');
component = addComponent(arch,'NewComponent');
```

### Properties

**`ParentArchitecture` — Handle to the parent component that owns this component**
Architecture object

Data Types: `systemcomposer.arch.Architecture`

**`Architecture` — Architecture that defines the component structure**
Architecture object

For a component that references a different architecture model, this returns a handle to the root architecture of that model. For variant components, the architecture is that of the active variant.

Data Types: `systemcomposer.arch.Architecture`

**`OwnedArchitecture` — The architecture that this component directly owns**
architecture

For components that reference an architecture, this is be empty. For variant components , this is the architecture in which the individual variant components reside.

Data Types: `systemcomposer.arch.Architecture`

**`Ports` — Array of component ports**
array of ports

Data Types: `systemcomposer.arch.ComponentPort`

**`OwnedPorts` — Array of component ports**
array of ports

For all components except Variant View components, this will return the same value as `Ports`. For Variant View components, this returns the aggregate of all ports across all Views in which this component is present.

Data Types: `systemcomposer.arch.ComponentPort`

**`ReferenceName` — If linked component, the name of the model that the component references**
string

Data Types: `char`

## Object Functions

| | |
|---|---|
| saveAsModel | Save the Architecture to a separate model |
| createSimulinkBehavior | Create a Simulink model and link component to it |
| linkToModel | Link component to a model |
| inlineComponent | Inline reference architecture into model |
| connect | Connect pairs of components |

## See Also

`systemcomposer.arch.Architecture`

**Topics**
"Create an Architecture Model"

**Introduced in R2019a**

# systemcomposer.arch.ComponentPort

Represent input and output ports of a component

## Description

This class inherits from `systemcomposer.arch.BasePort`.

## Creation

```
addPort(compObj.Architecture,portName'in')
```

```
compPortObj = getPort(compObj,portName)
```

A component port is constructed by creating an architecture port on the architecture of the component.

### Properties

**`Direction` — Port direction**
`'Input'` | `'Output'`

Direction of the port.

**`InterfaceName` — Name of interface**
string

Name of the interface associated with this port.

**`Interface` — Interface associated with this port**
`systemcomposer.internal.SignalInterface` object

Interface associated with this port, specified as a `systemcomposer.internal.SignalInterface` object.

**`Connectors` — Connectors of this port**
`systemcomposer.arch.Connector` object

Connectors of this port, specified as a `systemcomposer.arch.Connector` object.

**`Connected` — If port already has connections**
logical

If the port already has connections, specified as logical.

**`Parent` — Architecture that owns this port**
`systemcomposer.arch.Architecture` object

Architecture that owns this port, specified as a `systemcomposer.arch.Architecture` object.

**`ArchitecturePort` — Architecture port**
`systemcomposer.arch.ArchitecturePort` object

Architecture port within the component that maps to this port, specified as a `systemcomposer.arch.ArchitecturePort` object.

## Object Functions

| | |
|---|---|
| connect | Connect pairs of components |
| setName | |
| setInterface | |
| createAnonymousInterface | |
| applyStereotype | Apply a stereotype to a model element |

## See Also

`systemcomposer.arch.ArchitecturePort`

**Introduced in R2019a**

# systemcomposer.arch.Connector

Class that represents a connector between ports

## Description

The `connector` class represents a connectore between ports. This class is derived from `systemcomposer.arch.element`. This class inherits from systemcomposer.base.BaseElement and implements the interface systemcomposer.base.BaseConnector.

## Creation

Create a connector.

```
connector = connect(architecture, outports, inports)
```

### Properties

**`ParentArchitecture` — Handle to the parent component that owns this component**
Architecture object

Data Types: `systemcomposer.arch.Architecture`

**`SourcePort` — Source of the connection**
architecture port | component port

The source port is an output port.

**`DestinationPort` — Destination of the connection**
architecture port | component port

The destination port is an input port.

**`Direction` — Port direction**
`'Input'` | `'Output'`

**`Interface` — Interface attached to the port**
signal interface

Data Types: `systemcomposer.interface.SignalInterface`

### Object Functions

### See Also

`systemcomposer.arch.Element`

**Topics**
"Create an Architecture Model"

**Introduced in R2019a**

# systemcomposer.arch.Element

Base class of all model elements

## Description

The `Element` class is the base class for all model elements — Architecture, component, port, and connector. This class inherits from systemcomposer.base.BaseElement.

## Creation

Create an architecture, component, port, or connector:

```
addComponent
addPort
connect
```

### Properties

**`UUID` — Unique identifier for a model element**
character vector

<property description>

Example: '91d5de2c-b14c-4c76-a5d6-5dd0037c52df'

**`ExternalUID` — External identifier**
character vector

Set an external ID that is preserved over the lifespan of the element. The external ID is preserved through all operations that preserve the UUID.

Example: 'network_connector_01'

**`Model` — Handle to the parent System Composer model of the element**
systemcomposer.arch.Model object

<property description>

Example: <property example>

**`SimulinkHandle` — Simulink handle for Architecture element**
`'SimulinkHandle'`

Simulink handle for Architecture element. This property is necessary for several Simulink related workflows and for using Simulink Requirement APIs.

Example: name = get(object, 'SimulinkHandle')

## Object Functions

| | |
|---|---|
| applyStereotype | Apply a stereotype to a model element |
| getStereotypes | Get the stereotypes applied on the element |
| removeStereotype | Remove a stereotype from a model element |
| setProperty | Set the property value corresponding to a stereotype applied to the element |
| getProperty | Get the property value corresponding to a stereotype applied to the element |
| destroy | Remove and destroy a model element |

## See Also

`systemcomposer.arch.BasePort` | `systemcomposer.arch.Component` | `systemcomposer.arch.Connector`

### Topics

"Create an Architecture Model"

**Introduced in R2019a**

# systemcomposer.arch.Model

Represent a System Composer model

## Description

Use the `Model` class to create and manage architecture objects in a System Composer model.

## Creation

```
objModel = systemcomposer.createModel(modelName)
```

The `createModel` method is the constructor for the `systemcomposer.arch.Model` class.

### Properties

**Name — Name of a model**
character vector | string

Data Types: `char` | `string`

**`Architecture` — Root architecture of a System Composer model**
`Architecture` object

Data Types: `systemcomposer.arch.Architecture`

**`SimulinkHandle` — Handle**
real number

Handle to the Simulink representation of the System Composer model.

Data Types: `double`

**`Profiles` — Array of handles to profiles**
array of `Profile` objects

Array of handles to profiles attached to the model.

Data Types: `systemcomposer.internal.profile.Profile`

**`InterfaceDictionary` — Dictionary object that holds interfaces**
`systemcomposer.interface.Dictionary` object

`Dictionary` object that holds interfaces. If the model is not linked to an external dictionary, this is a handle to the implicit dictionary

**`Views` — Array of handles to model views**
array of `ViewArchitecture` objects

Array of handles to model views.

Example: `objViewArchitecture = get(objModel, 'Views')`

## Object Functions

| | |
|---|---|
| open | Open System Composer model |
| close | Close System Composer model |
| save | Save the architecture model or data dictionary |
| find | Find architecture elements using a query |
| lookup | Look up an architecture element |
| createViewArchitecture | Create a view |
| openViews | Open architecture views editor |
| applyProfile | Apply profile to a model |
| removeProfile | Remove profile from a model |
| linkDictionary | Link data dictionary to an architecture model |
| unlinkDictionary | Unlink dictionary from a model |

## See Also

**Topics**
"Create an Architecture Model"

**Introduced in R2019a**

# systemcomposer.arch.VariantComponent

Represent a variant component in a System Composer model

## Description

This class inherits from `systemcomposer.arch.BasePort`.

## Creation

`varComp = addVariant(archObj,compName)`

The `addVariantComponent` method is the constructor for the `systemcomposer.arch.VariantComponent` class.

### Properties

**`Parent` — Architecture that owns this variant component**
`systemcomposer.arch.Architecture` object

Architecture that owns this variant component, specified as `systemcomposer.arch.Architecture` object.

**`Ports` — Input and output ports**
`systemcomposer.arch.ComponentPort` objects

Input and output ports of this variant component, specified as `systemcomposer.arch.ComponentPort` objects.

**`OwnedArchitecture` — Architecture owned by variant component**
`systemcomposer.arch.Architecture` object

Architecture directly owned by this variant component, specified as `systemcomposer.arch.Architecture` object.

**`Architecture` — Architectire of active variant choice**
`systemcomposer.arch.Architecture` object

Architecture of the active variant choice, specified as a `systemcomposer.arch.Architecture` object.

### Object Functions

| | |
|---|---|
| addChoice | Add a variant choice to a variant component |
| setCondition | Set the condition on the variant choice |
| setActiveChoice | Set the active choice in the variant component |
| getChoices | Get available choices in the variant component |
| getActiveChoice | Get the active choice on the variant component |
| getCondition | Return the variant control on the choice within the variant component |

|  |  |
|---|---|
| destroy | Remove and destroy a model element |

## See Also

**Topics**
"Decompose and Reuse Components"

**Introduced in R2019a**

# systemcomposer.interface.Dictionary

Class that represents an element in the signal interface

## Description

The `systemcomposer.interface.Dictionary` class represents the interface dictionary of an architecture model.

## Creation

Create a signal element.

```
dictionary = <architecture>.InterfaceDictionary;
```

### Properties

**`Interfaces` — Interfaces defined in the dictionary**
array of signal interfaces

Data Types: `systemcomposer.interface.Dictionary`

**`UUID` — Unique identifier**
string

### Object Functions

| | |
|---|---|
| addInterface | Create a named interface in an interface dictionary |
| removeInterface | Remove a named interface from an interface dictionary |
| getInterface | Get the object for a named interface in an interface dictionary |
| getInterfaces | Get the object for a named interface in an interface dictionary |

### See Also

`systemcomposer.interface.SignalElement`

**Topics**
"Define Interfaces"

**Introduced in R2019a**

# systemcomposer.interface.SignalElement

Class that represents an element in the signal interface

## Description

The `SignalElement` class represents a single element in the signal interface

## Creation

Create a signal element.

`addElement(interface,elementName)`

### Properties

**`Interface` — Handle to the parent interface of the element**
Interface object

Data Types: `systemcomposer.interface.SignalInterface`

**`Name` — Element name**
string

**`Dimensions` — Dimensions of the element**
array of positive integers

**`Type` — Data type of the element**
string

**`Complexity` — complexity of the element**
'real' | 'complex'

**`Units` — Units of the element**
string

**`Minimum` — Minimum value for the element**
double

**`Maximum` — Maximum value for the element**
double

**`Description` — Description text for the element**
string

## Object Functions

| | |
|---|---|
| destroy | Remove and destroy a model element |

## See Also
`addInterface`

**Topics**
“Define Interfaces”

**Introduced in R2019a**

# systemcomposer.interface.SignalInterface

Class that represents the structure of the signal interface

## Description

The `SignalInterface` class represents the structure of the signal interface at a given port

## Creation

Create an interface.

```
interface = addInterface(architecture, name)
```

### Properties

**`Dictionary` — Handle to the parent dictionary of the interface**
Interface dictionary object

Data Types: `systemcomposer.interface.Dictionary`

**`Name` — Interface name**
string

**`Elements` — Elements in interface**
array of interface elements

## Object Functions

| | |
|---|---|
| addElement | Add a signal interface element |
| removeElement | Remove a signal interface element |
| getElement | Get the object a signal interface element |
| destroy | Remove and destroy a model element |

## See Also

`systemcomposer.interface.SignalInterface`

**Topics**

"Define Interfaces"

**Introduced in R2019a**

# systemcomposer.io.ModelBuilder

Model builder for System Composer architecture models

## Description

Build System Composermodels using the model builder utility class. Build System Composer models with these sets of information: components and their position in architecture hierarchy, ports and their mappings to components, connections between the components through ports, and interfaces in architecture models and their mappings to ports.

## Creation

### Syntax

`builder = systemcomposer.io.ModelBuilder(profile)`

#### Description

`builder = systemcomposer.io.ModelBuilder(profile)` creates the `ModelBuilder` object.

#### Input Arguments

**`profile` — Metadata XML file**
character vector

File that contains a set of properties for any model element.

#### Output Arguments

**`builder` — Model builder instantiation**
`ModelBuilder` object

`ModelBuilder` object used to build a System Composer model.

## Properties

**`Components` — Component information**
table

Table containing the hierarchical information of components, type of component (for example, reference, variant, or adapter), stereotypes applied on component, and ability to set property values of component.

**`Ports` — Ports information**
table

Table containing the information about ports, their mappings to components and interfaces, as well as stereotypes applied on them.

**`Connections` — Connections information**
table

Table containing information about the connections between the ports defined in ports table also stereotypes applied on connections.

**`Interfaces` — Interfaces information**
table

Table containing the definitions of various interfaces and their elements.

## Utility Functions

| Components | Description |
|---|---|
| `addComponent(compName, ID, ParentID)` | Add component with name and ID as a child of component with ID as `ParentID`. In case of root, `ParentID` is 0. |
| `setComponentProperty(ID, varargin)` | Set stereotype on component with ID. Key value pair of property name and value defined in the stereotype can be passed as input. In this example<br><br>`builder.setComponentProperty(ID, 'StereotypeName',...`<br>`'UAVComponent.PartDescriptor','ModelName',kind,'Manufacturer',doma`<br><br>`ModelName` and `Manufacturer` are properties under stereotype `PartDescriptor`. |

| Ports | Description |
|---|---|
| `addPort(portName, direction, ID, compID)` | Add port with name and ID with direction (either Input or Output) to component with ID as `compID`. |
| `setPropertyOnPort(ID, varargin)` | Set stereotype on port with ID. Key value pair of the property name and the value defined in the stereotype can be passed as input. |

| Connections | Description |
|---|---|
| `addConnection(connName, ID, sourcePortID,destPortID)` | Add connection with name and ID between ports with `sourcePortID` (direction: Output) and `destPortID` (direction: Input) defined in the ports table. |
| `setPropertyOnConnection(ID, varargin)` | Set stereotype on connection with ID. Key value pair of the property name and the value defined in the stereotype can be passed as input. |

| Interfaces | Description |
|---|---|
| `addInterface(interfaceName, ID)` | Add interface with name and ID to a data dictionary. |

| Interfaces | Description |
|---|---|
| `addElementInInterface(elementName, ID, interfaceID, datatype, dimensions, units, complexity, Maximum, Minimum)` | Add element with name and ID under an interface with ID as `interfaceID`. Data types, dimensions, units, complexity, and maximum and minimum are properties of an element. These properties are specified as strings. |
| `addAnonymousInterface(ID, datatype, dimensions, units, complexity, Maximum, Minimum)` | Add anonymous interface with ID and element properties like data type, dimensions, units, complexity, maximum and minimum. Data type of an anonymous interface cannot be another interface name. Anonymous interfaces do not have elements like other interfaces. |

| Interfaces and Ports | Description |
|---|---|
| `addInterfaceToPort(interfaceID, portID)` | Link an interface with ID specified as `InterfaceID` to a port with ID specifiedas `PortID`. |

| Models | Description |
|---|---|
| `build(modelName)` | Build model with model name passed as input. |

| Logging and Reporting | Description |
|---|---|
| `getImportErrorLog()` | Get `ErrorLogs` generated while importing the model . Called after the `build()` function |
| `getImportReport()` | Get a report of the import. Called after the `build()` function. |

## Examples

### Import System Composer Architecture using Model Builder.

This example shows how to import architecture specifications into System Composer using the systemcomposer.io.modelBuilder() utility class. These architecture specifications can be defined in external source such as Excel file.

In system composer, an architecture is fully defined by three sets of information:

- Components and its position in architecture hierarchy
- Ports and its mapping to components
- Connections between the components through ports In this example, we also import interface data definitions from external source.
- Interfaces in architecture models and its mapping to ports

This example uses systemcomposer.modelBuilder class to pass all of the above architecture information and import a System Composer model.

In this example, architecture information of a small UAV system is defined in an Excel spreadsheet and is used to create a System Composer architecture model.

### External Source Files

- Architecture.xlsx : This Excel file contains hierarchical information of the architecture model. This example maps the external source data to System Composer model elements. Below is the mapping of information in column names to System Composer model elements.

```
# Element     : Name of the element. Either can be component or port name.
# Parent      : Name of the parent element.
# Class       : Can be either component or port(Input/Output direction of the port).
# Domain      : Mapped as component property. Property "Manufacturer" defined in the
                profile UAVComponent under Stereotype PartDescriptor maps to Domain values in
# Kind        : Mapped as component property. Property "ModelName" defined in the
                profile UAVComponent under Stereotype PartDescriptor maps to Kind values in e
# InterfaceName : If class is of port type. InterfaceName maps to name of the interface link
# ConnectedTo : In case of port type, it specifies the connection to
                other port defined in format "ComponentName::PortName".
```

- DataDefinitions.xlsx : This excel file contains interface data definitions of the model. This example assumes the below mapping between the data definitions in the source excel file and interfaces hierarchy in System Composer :

```
# Name         : Name of the interface or element.
# Parent       : Name of the parent interface Name(Applicable only for elements) .
# Datatype     : Datatype of element. Can be another interface in format
                 Bus: InterfaceName
# Dimensions   : Dimensions of the element.
# Units        : Unit property of the element.
# Minimum      : Minimum value of the element.
# Maximum      : Maximum value of the element.
```

### Step 1. Instantiate the model builder class

You can instantiate the model builder class with a profile name.

Make sure the current directory is writable because this example will be creating files.

```
[stat, fa] = fileattrib(pwd);
if ~fa.UserWrite
    disp('This script must be run in a writable directory');
    return;
end
% Name of the model to build.
modelName = 'scExampleModelBuider';
% Name of the profile.
profile = 'UAVComponent';
% Name of the source file to read architecture information.
architectureFileName = 'Architecture.xlsx';

% Instantiate the ModelBuilder
builder = systemcomposer.io.ModelBuilder(profile);
```

### Step 2. Build Interface Data Definitions.

Reading the information in external source file DataDefinitions.xlsx, we build the interface data model.

Create MATLAB tables from source Excel file.

```
opts = detectImportOptions('DataDefinitions.xlsx');
opts.DataRange = 'A2'; % force readtable to start reading from the second row.
definitionContents = readtable('DataDefinitions.xlsx', opts);

% systemcomposer.io.IdService class generates unique ID for a
% given key
idService = systemcomposer.io.IdService();

for rowItr =1:numel(definitionContents(:,1))
    parentInterface = definitionContents.Parent{rowItr};
    if isempty(parentInterface)
        % In case of interfaces adding the interface name to model builder.
        interfaceName = definitionContents.Name{rowItr};
        % Get unique interface ID. getID(container,key) generates
        % or returns(if key is already present) same value for input key
        % within the container.
        interfaceID = idService.getID('interfaces',interfaceName);
        % Builder utility function to add interface to data
        % dictionary.
        builder.addInterface(interfaceName,interfaceID);
    else
        % In case of element read element properties and add the element to
        % parent interface.
        elementName  = definitionContents.Name{rowItr};
        interfaceID = idService.getID('interfaces',parentInterface);
        % ElementID is unique within a interface.
        % Appending 'E' at start of ID for uniformity. The generated ID for
        % input element is unique within parent interface name as container.
        elemID = idService.getID(parentInterface,elementName,'E');
        % Datatype, dimensions, units, minimum and maximum properties of
        % element.
        datatype = definitionContents.DataType{rowItr};
        dimensions = string(definitionContents.Dimensions(rowItr));
        units = definitionContents.Units(rowItr);
        % Make sure that input to builder utility function is always a
        % string.
        if ~ischar(units)
            units = '';
        end
        minimum = definitionContents.Minimum{rowItr};
        maximum = definitionContents.Maximum{rowItr};
        % Builder function to add element with properties in interface.
        builder.addElementInInterface(elementName, elemID, interfaceID, datatype, dimensions, uni
    end
end
```

**Step 3. Build Architecture Specifications.**

Architecture specifications de Create MATLAB tables from source Excel file.

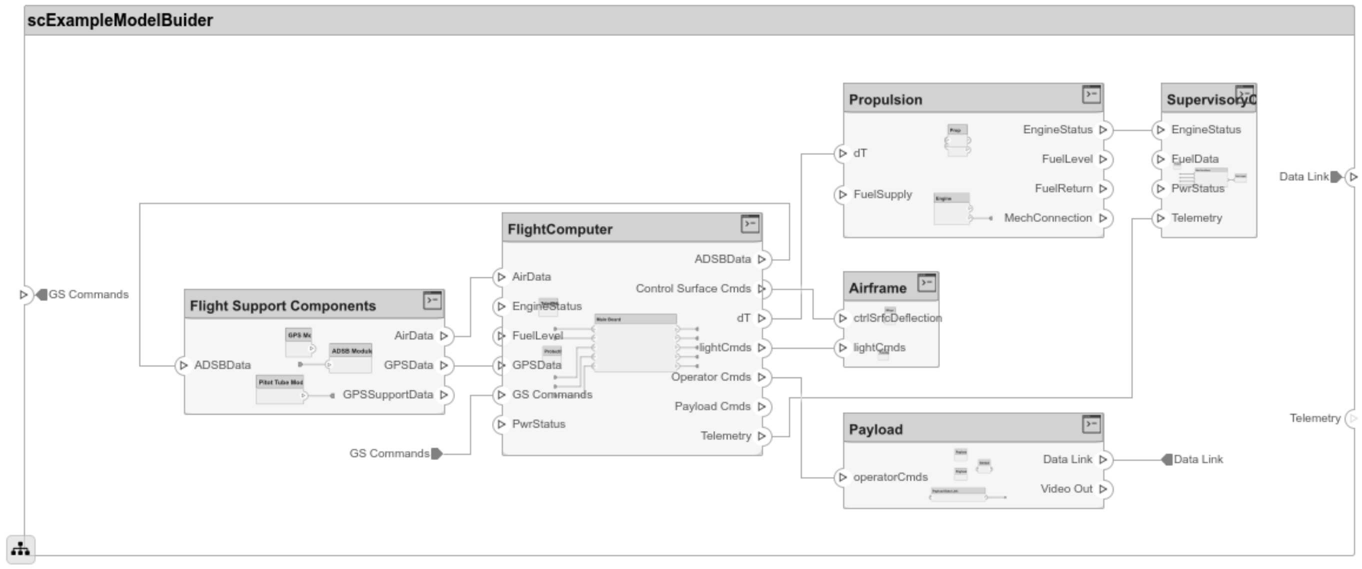
```
excelContents = readtable(architectureFileName);
% Iterate over each row in table.
for rowItr =1:numel(excelContents(:,1))
% Read each row of the excel file and columns.
    class = excelContents.Class(rowItr);
    Parent = excelContents.Parent(rowItr);
    Name = excelContents.Element{rowItr};
    % Populating the contents of table using the builder.
```

```
        if strcmp(class,'component')
            ID = idService.getID('comp',Name);
            % Root ID is by default set as zero.
            if strcmp(Parent,'scExampleSmallUAV')
                parentID = "0";
            else
                parentID = idService.getID('comp', Parent);
            end
            % Builder utility function to add component.
            builder.addComponent(Name,ID,parentID);
            % Reading the property values
            kind = excelContents.Kind{rowItr};
            domain = excelContents.Domain{rowItr};
            % *Builder to set stereotype and property values*
            builder.setComponentProperty(ID, 'StereotypeName','UAVComponent.PartDescriptor','ModelNar
        else
            % In this example, concatenation of port name and parent component name
            % is used as key to generate unique IDs for ports.
            portID = idService.getID('port',strcat(Name,Parent));
            % For ports on root architecture. compID is assumed as "0".
            if strcmp(Parent,'scExampleSmallUAV')
                compID = "0";
            else
                compID = idService.getID('comp',Parent);
            end
            % Builder utility function to add port.
            builder.addPort(Name, class, portID, compID );

            % InterfaceName specifies the name of the interface linked to port.
            interfaceName = excelContents.InterfaceName{rowItr};

            % Get interface ID. getID() will return the same IDs already
            % generated while adding interface in Step 2.
            interfaceID = idService.getID('interfaces',interfaceName);
            % Builder to map interface to port.
            builder.addInterfaceToPort(interfaceID, portID);

            % Reading the connectedTo information to build connections between
            % components.
            connectedTo = excelContents.ConnectedTo{rowItr};
            % connectedTo is in format -:
            % (DestinationComponentName::DestinationPortName).
            % For this example, considering the current port as source of the connection.
            if ~isempty(connectedTo)
                connID = idService.getID('connection',connectedTo);
                splits = split(connectedTo,'::');
                % Get the port ID of the connected port.
                % In this example, port ID is generated by concatenating
                % port name and parent component name. If port id is already
                % generated getID() function returns the same id for input key.
                connectedPortID = idService.getID('port',strcat(splits(2),splits(1)));
                % Using builder to populate connection table.
                sourcePortID = portID;
                destPortID = connectedPortID;
                % Builder to add connections.
                builder.addConnection(connectedTo,connID,sourcePortID,destPortID);
            end
```

```
    end
end
```

**Step 3. Builder build method imports model from populated tables.**

```
[model, importReport] = builder.build(modelName);
```



## Close Model

```
bdclose(modelName);
```

## See Also

**Topics**
“Importing and Exporting Architecture Models”

**Introduced in R2019b**

## systemcomposer.profile.Profile

Class that represents a profile

## Description

The `Profile` class represents architecture profiles.

## Creation

```
profiles = <architecture>.Profiles;
```

### Properties

**`Name` — Name of the profile**
string

Data Types: `char`

**`Description` — Description text for the profile**
string

Data Types: `char`

### Object Functions

|  |  |
|---|---|
| addStereotype |  |
| removeStereotype | Remove a stereotype from a model element |

### See Also

`systemcomposer.profile.Stereotype`

**Topics**
“Define Profiles and Stereotypes”

**Introduced in R2019a**

# systemcomposer.profile.Property

Class that represents a property

## Description

The `Property` class represents properties in a stereotype.

## Creation

`addProperty(stereotype,AttributeName,AttributeValue)`

### Properties

**`Name` — Name of the property**
string

Data Types: `char`

**`Name` — Property name**
string

Data Types: `char`

**`Datatype` — Property data type**
valid data type string

Data Types: `char`

**`Dimensions` — Dimensions of property**
positive integer array

Data Types: `char`

**`Min` — Minimum value**
numeric value

Data Types: `double`

**`Max` — Maximum value**
numeric value

Data Types: `double`

**`Units` — Property units**
string

Data Types: `char`

### Object Functions

| | |
|---|---|
| destroy | Remove and destroy a model element |

## See Also

`systemcomposer.profile.Profile` | `systemcomposer.profile.Stereotype`

**Topics**

"Define Profiles and Stereotypes"

**Introduced in R2019a**

# systemcomposer.profile.Stereotype

Class that represents a stereotype

## Description

The `Stereotype` class represents architecture stereotypes in a profile.

## Creation

`addStereotype(profile,name,type)`

### Properties

**`Name` — Name of the stereotype**
string

Data Types: `char`

**`Description` — Description text for the stereotype**
string

Data Types: `char`

**`Icon` — Icon for the stereotype**
string

Data Types: `char`

**`Parent` — Stereotype from which this stereotype inherits its properties**
`systemcomposer.profile.Stereotype` object

Stereotype from which this stereotype inherits its properties, specified as a `systemcomposer.profile.Stereotype` object.

**`AppliesTo` — Element type to which this stereotype can be applied**
stereotype

Element type to which this stereotype can be applied.

**`Abstract` — Whether the stereotype is abstract**
`true` | `false`

If true then stereotype cannot be directly applied on model elements, but instead serves as a parent for other stereotypes.

**`Properties` — Array of property definitions**
stereotype

Array of property definitions owned or inherited by this stereotype.

## Object Functions

| | |
|---|---|
| addProperty | Define a custom property for a stereotype |
| removeProperty | Remove a property from a stereotype |
| reparent | Move stereotype |
| setDefaultComponentStereotype | |
| setDefaultConnectorStereotype | Set the default stereotype for connectors |

## See Also

**Topics**
"Define Profiles and Stereotypes"

**Introduced in R2019a**

# systemcomposer.view.BaseViewComponent

Base class for view components

## Description

This class inherits from `systemcomposer.view.ViewElement` and implements the interface `systemcomposer.base.BaseComponent`.

### Properties

**`Name` — Name of the view component**
character vector | string

Name of the view component.

Example: `name = get(objBaseViewComponent, 'Name'); set(objBaseViewComponent, 'Name', name)`

**`Parent` — Handle to parent view architecture of this component**
`ViewArchitecture` object

Handle to the parent view architecture of this component.

Example: `parent = get(objBaseViewComponent, 'Parent')`

**`Architecture` — Handle to view architecture of this component**
`ViewArchitecture` object

Handle to the view architecture of this component.

Example: `p = get(objBaseViewComponent, 'ViewArchitecture')`

### Examples

### See Also

**Introduced in R2019b**

## systemcomposer.view.ComponentOccurrence

Shadow of a component from the composition in a view

## Description

This class inherits from `systemcomposer.view.BaseViewComponent`.

### Properties

**`Component` — Handle to the composition**
`systemcomposer.arch.BaseComponent` object

Handle to the composition Component of this occurrence.

Example: `get(object, 'Component')`

### See Also

**Introduced in R2019b**

# systemcomposer.view.ViewArchitecture

View components in an architecture view

## Description

A view architecture describes a set of view components that make up a view. This class inherits from the `systemcomposer.view.ViewElement` class and implements the `systemcomposer.base.BaseArchitecture` interface.

### Properties

**`Name` — Name of the architecture**
character vector | string

Architecture name derived from the parent component or model name to which the architecture belongs.

Example: `name = get(objViewArchitecture, 'Name')`

**`IncludeReferenceModels` — Control inclusion of referenced models**
true | false

Control inclusion of referenced models.

Example: `tf = get(objViewArchitecture, 'IncludeReferenceModels')`

**`Color` — Color of the view architecture**
character vector | string

Color of the view architecture, specified as a character vector or string (for example, `‘blue’`, `‘black’`, `‘green’`) or RGB value encoded in a hexadecimal string (for example, `‘#FF00FF’`, `‘#DDDDDD’`). An invalid color string results in an error.

Example: `color = get(objViewArchitecture, 'Color')`

**`Description` — Description of the view architecture**
character vector | string

Description of the view architecture.

Example: `description = get(objViewArchitecture, 'Description');`
`set(objViewArchitecture, 'Description', description)`

**`Parent` — Component that owns the view architecture**
`systemcomposer.view.BaseViewComponent` object

Handle to the component that owns this view architecture. The returned object is of type `systemcomposer.view.BaseViewComponent`. For a root view architecture, returns an empty handle.

Example: `parentComponent = get(objViewArchitecture, 'Parent')`

**`Components` — Array of handles to child components**
array of `systemcomposer.base.BaseViewComponents` objects

Array of handles to the set of child components of this view Architecture.

Example: `childComponents = get(objViewArchitecture, 'Components')`

## Methods

| | |
|---|---|
| addComponent | Add component to view given path |
| removeComponent | Remove a component from a view |

## Examples

## See Also

**Introduced in R2019b**

# systemcomposer.view.ViewComponent

View component within an architecture view

## Description

A view component is a component that exist only in the view it is created in. These components do not exist in the composition. This class inherits from `systemcomposer.view.BaseViewComponent`.

### See Also

**Introduced in R2019b**

## systemcomposer.view.ViewElement

Base class of all view elements

### Description

Base class of all view elements. This class inherits from `systemcomposer.base.BaseElement`.

#### Properties

**`ZCIdentifier` — Identifier of object**
character vector (default) | string

Gets the identifier of an object. Used by Simulink Requirements.

Example: identifier = get(objViewElement, 'ZCIdentifier')

#### Examples

#### See Also

**Introduced in R2009b**

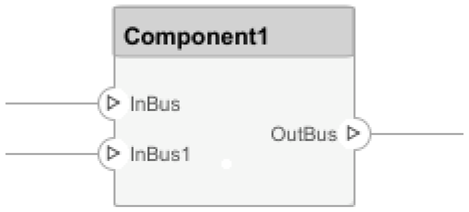
# Blocks

# Component

Add component to an architecture model

## Description

Use a Component block to represent a structural or behavioral element at any level of an architecture model hierarchy. Add ports to the block for connecting to other components. Define an interface for the ports and add properties using stereotypes.



## Ports

### Input Port

#### `Source` — Provide connection from another component

### Output Port

#### `Destination` — Provide connection to another component

## See Also

**Blocks**
Adapter | Reference Component | Variant Component

**Topics**
“Implement Components in Simulink”

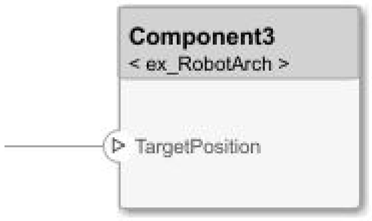
**Introduced in R2019a**

# Reference Component

Link to an architectural definition or Simulink behavior

## Description

Use a Reference Component block to link an architectural definition of a component or a Simulink behavior.



## Ports

### Input Port

**`Source` — Provide connection from another component**

### Output Port

**`Destination` — Provide connection to another component**

## See Also

**Blocks**
Adapter | Component | Variant Component

**Topics**
"Implement Components in Simulink"

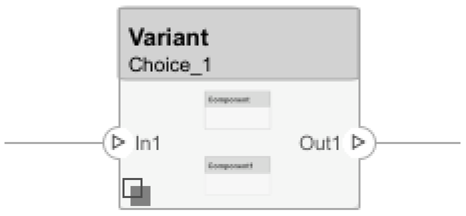
**Introduced in R2019a**

# Variant Component

Add components with alternative designs

## Description

Use a Variant Component block to create multiple deign alternatives for a component.



## Ports

### Input Port

**`Source` — Provide connection from another component**

### Output Port

**`Destination` — Provide connection to another component**

## See Also

**Blocks**
Adapter | Component | Reference Component | Subsystem

**Topics**
“Decompose and Reuse Components”

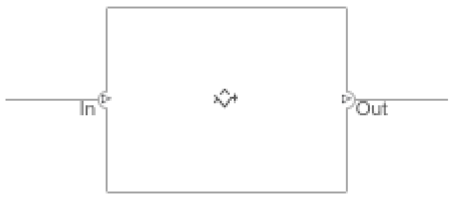
**Introduced in R2019a**

# Adapter

Connect components with different interfaces

## Description

The Adapter block allows you to adapt dissimilar interfaces. Connect the source and destination ports of components that have different interface definitions.



## Limitations

- When used for structural interface adaptations, the Adapter block uses bus element ports internally and, subsequently, only supports virtual buses.

## Ports

### Input Port

**`Source` — Provide connection from a component**

### Output Port

**`Destination` — Provide connection to a component**

## See Also

**Blocks**
Component | Reference Component | Variant Component

**Topics**
“Assign Interfaces to Ports”
“Interface Adapter”

**Introduced in R2019a**