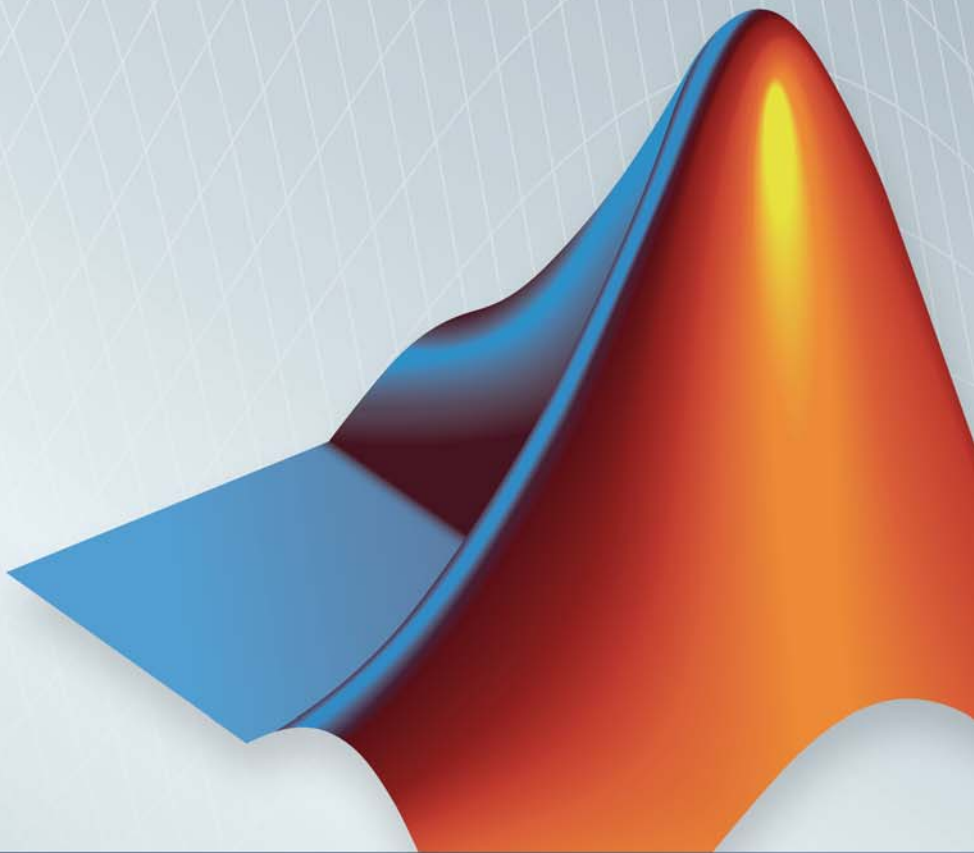


Stateflow®

API

R2014a



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Stateflow[®] API

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API Object Properties and Methods

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Using the API

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Overview of the Stateflow API

In this section...
“What Is the Stateflow API?” on page 1-2
“Stateflow API Object Hierarchy” on page 1-3
“Getting a Handle on Stateflow API Objects” on page 1-5
“What Are API Object Properties and Methods?” on page 1-6

What Is the Stateflow API?

The Stateflow® Application Programming Interface (API) is a tool you use to create or change Stateflow charts with MATLAB® commands. By placing Stateflow API commands in a MATLAB script, you can automate chart editing processes in a single command.

Applications for the Stateflow API include:

- Creating a script that performs common graphical edits and simplifies editing of Stateflow charts
- Creating a script that creates a repetitive "base" Stateflow chart
- Creating a script that produces a specialized report of your model

The Stateflow API consists of objects that represent actual Stateflow objects. For example, an API object of type State represents a Stateflow state, an API object of type Junction represents a Stateflow junction, and so on.

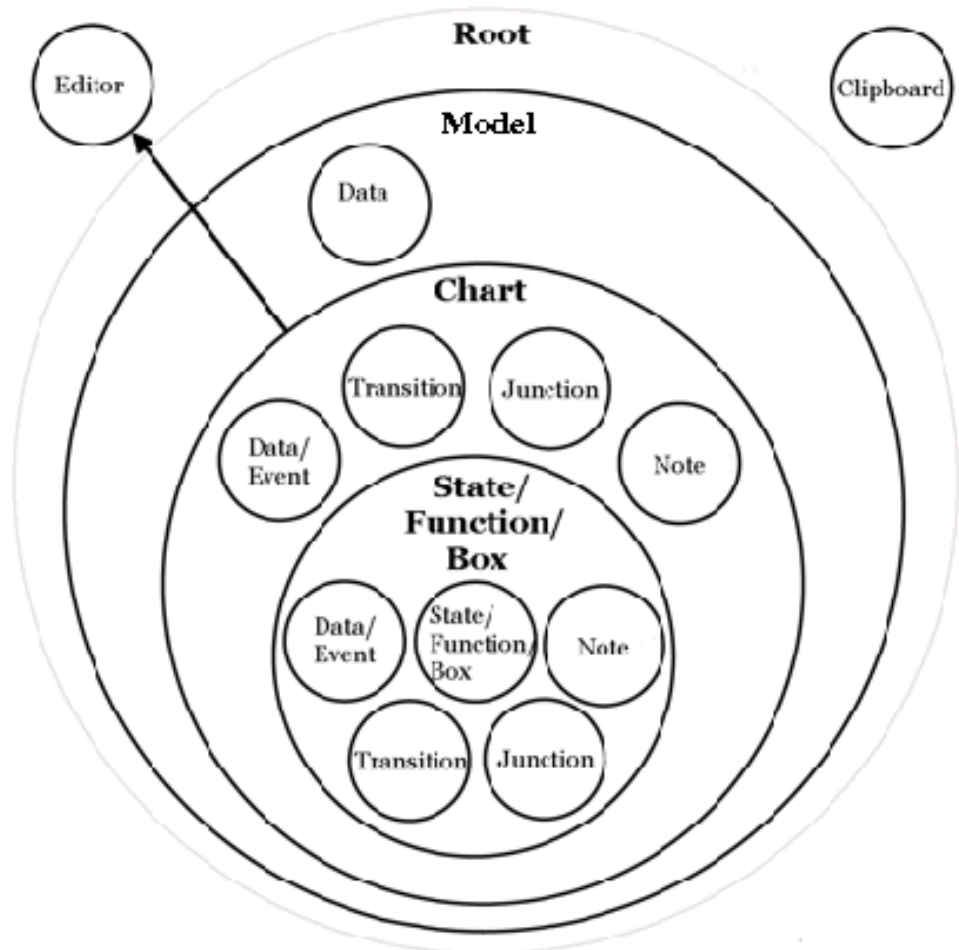
Each API object has properties and methods you use to perform editing operations on it. The correspondence between API object and Stateflow object is so close that what you do to a Stateflow API object affects the object it represents in the Stateflow Editor, and what you do to a graphical object in the Stateflow Editor affects the Stateflow API object that represents it.

Note You cannot undo any operation in the Stateflow Editor that you perform using the Stateflow API. If you perform an editing operation through the API, the undo and redo buttons are disabled from undoing and redoing any prior operations.

Stateflow API Object Hierarchy

Stateflow API objects represent actual Stateflow objects in a Stateflow chart. Like Stateflow objects, API objects contain or are contained by other Stateflow objects. For example, if state A contains state B in the Stateflow Editor, then the API object for state A contains the API object for state B.

This diagram shows the Stateflow API hierarchy of objects:



Rules of containment define the Stateflow hierarchy and the Stateflow API object hierarchy. For example, charts can contain states but states cannot contain charts. The hierarchy of Stateflow objects appears in the section “Stateflow Hierarchy of Objects” in the Stateflow documentation. The Stateflow API hierarchy consists of these layers of containment:

- **Root** — The Root object (only one exists) is the parent of all Stateflow API objects. It is a placeholder at the top of the Stateflow API hierarchy to distinguish Stateflow objects from other objects, such as Simulink® model

objects. You automatically create the Root object when you load a model containing a Stateflow chart or call the function `sfnew` to create a new model with a Stateflow chart.

- **Model** — Objects of type `Model` are available through the Stateflow Root object. Model objects are equivalent to Simulink models from a Stateflow chart perspective. Model objects can hold objects of type `Chart`, `Data`, and `Event`.
- **Chart** — Within any `Model` object (`model`) there can be any number of chart objects. Within each object of type `Chart`, there can be objects of type `State`, `Function`, `Box`, `Note`, `Data`, `Event`, `Transition`, and `Junction`. These objects represent the components of a Stateflow chart.
- **State/Function/Box** — Nested within objects of type `State`, `Function`, and `Box`, there can be other objects of type `State`, `Function`, `Box`, `Note`, `Junction`, `Transition`, `Data`, and `Event`. Levels of nesting can continue indefinitely.

The preceding figure also shows two object types that exist outside the Stateflow containment hierarchy:

- **Editor** — Though not a part of the Stateflow containment hierarchy, an object of type `Editor` provides access to the purely graphical aspects of objects of type `Chart`. For each `Chart` object, there is an `Editor` object that provides API access to the Stateflow Editor.
- **Clipboard** — The `Clipboard` object has two methods, `copy` and `pasteTo`, that use the clipboard as a staging area to implement copy and paste functionality in the Stateflow API.

Getting a Handle on Stateflow API Objects

You manipulate Stateflow objects by manipulating the Stateflow API objects that represent them. You manipulate Stateflow API objects through a MATLAB variable called a *handle*.

The first handle you need in the Stateflow API is a handle to the Root object, which is the parent of all objects in the Stateflow API. In this command, the function `sfroot` returns a handle to the Root object:

```
rt = sfroot
```

Once you have a Root object handle, you can find a handle to the Model object for the Simulink model with which you want to work. Once you have a handle to a Model object, you can find a handle to a Chart object for the chart you want to edit. Later, when you create objects or find existing objects in a Stateflow chart, you receive a handle to the object that you can use to manipulate the actual object in the Stateflow Editor.

To learn how to use API object handles to create and edit Stateflow charts, see “Create and Access Charts Using the Stateflow API” on page 1-8.

What Are API Object Properties and Methods?

Once you obtain handles to Stateflow API objects, you can manipulate the Stateflow objects that they represent through the properties and methods that each Stateflow API object possesses. You access the properties and methods of an object through a handle to the object.

API Object Properties

API properties correspond to values that you normally set for an object through the user interface of the Stateflow Editor. For example, you can change the position of a transition by changing the Position property of the Transition object that represents the transition. In the Stateflow Editor, you can click-drag the source, end, or midpoint of a transition to change its position.

API Object Methods

API methods are similar to functions for creating, finding, changing, or deleting the objects they belong to. They provide services that are normally provided by the Stateflow Editor. For example, you can delete a transition in the Stateflow Editor by calling the `delete` method of the Transition object that represents the transition. Deleting a transition in the Stateflow Editor is normally done by selecting a transition and pressing the **Delete** key.

Common API Properties and Methods

Stateflow API objects have some common properties and methods. For example, all API objects have an `Id` and a `Description` property. All API objects have a `get` and a `set` method for viewing or changing the properties of an object, respectively. Most API objects also have a `delete` method. Methods

held in common among all Stateflow objects are listed in the reference section “Methods That Apply to All API Objects” on page 2-4.

Unique API Properties and Methods

Each API object also has properties and methods unique to its type. For example, a State object has a **Position** property containing the spatial coordinates for the state it represents in the Stateflow Editor. A Data object, however, has no **Position** property.

Create and Access Charts Using the Stateflow API

In this section...
“Create a New Model and Chart” on page 1-8
“Access the Model Object” on page 1-8
“Access the Chart Object” on page 1-9
“Create New Objects in the Chart” on page 1-10

Create a New Model and Chart

- 1 Close all models.
- 2 Type the function `sfnew` to create a new, untitled model with a new Stateflow chart in it.

MATLAB is the default action language of a chart you create with `sfnew`. To open a new C chart or to change the default action language, see “Modify the Action Language for a Chart”.

You have only one Simulink model in memory. Do not open the chart. You can now access the API Model object that represents the model itself.

Access the Model Object

In the Stateflow API, each model you create or load into memory is represented by an object of type `Model`. Before accessing the Stateflow chart you created in the previous section, you must first connect to its `Model` object. However, in the Stateflow API, all `Model` objects are contained by the Stateflow API Root object, so you must use the Root object returned by the function `sfroot` to access a `Model` object:

- 1 Use this command to obtain a handle to the Root object:

```
rt = sfroot;
```

- 2 Use the handle to the Root object, `rt`, to find the `Model` object representing your new untitled Simulink model and assign it a handle `m` in this command:


```
m = rt.find('-isa','Simulink.BlockDiagram');
```

If, instead of one model, there are several models open, this command returns an array of different Model objects that you can access through indexing (`m(1)`, `m(2)`, etc.) You can identify a specific Model object using the properties of each model, particularly the `Name` property, which is the name of the model. For example, you can use the `Name` property to find a Model object named **myModel** with this command:

```
m = rt.find('-isa', 'Simulink.BlockDiagram', '-and', ...
'Name', 'myModel');
```

However, since you now have only one model loaded, the object handle `m` in the command for step 2 returns the Model object for the model that you just created. You are now ready to use `m` to access the empty chart so that you can start filling it with Stateflow objects.

Access the Chart Object

In “Access the Model Object” on page 1-8, you accessed the Model object containing your new chart to return a handle to the Model object for your new model, `m`. Perform these steps to access the new chart:

- 1 Access the new Chart object and assign it to the workspace variable `ch` as follows:

```
ch = m.find('-isa','Stateflow.Chart');
```

In the preceding command, the `find` method of the Model object `m` returns an array of all charts belonging to that model. Because you created only one chart, the result of this command is the chart you created. If you created several charts, the `find` method returns an array of charts that you could access through indexing (for example, `ch(1)`, `ch(2)`, and so on).

You can also use standard function notation instead of dot notation for the preceding command. In this case, the first argument is the Model object handle, `m`.

```
ch = find(m, '-isa','Stateflow.Chart');
```

- 2 Open the Stateflow chart with this API command:

```
ch.view;
```

The preceding command calls the `view` method of the `Chart` object whose handle is `ch`. The specified chart appears. Other Stateflow API objects have `view` methods as well.

Create New Objects in the Chart

In the previous section, you created a handle to the new `Chart` object, `ch`. Continue by creating new objects for your chart using these steps:

- 1** Create a new state in the `Chart` object `ch` with this command:

```
sA = Stateflow.State(ch);
```

This command is a Stateflow API constructor for a new state in which `Stateflow.State` is the object type for a state, `ch` is a workspace variable containing a handle to the parent chart of the new state, and `sA` is a workspace variable to receive the returned handle to the new state.

An empty state now appears in the upper left-hand corner of the chart.

- 2** Use the `ch.view` command to bring the chart to the foreground for viewing.
- 3** Assign a name and position to the new state by assigning values to the properties of the new `State` object as follows:

```
sA.Name = 'A';  
sA.Position = [50 50 310 200];
```

- 4** Create new states `A1` and `A2` inside state `A` and assign them properties with these commands:

```
sA1 = Stateflow.State(ch);  
sA1.Name = 'A1';  
sA1.Position = [80 120 90 60];  
sA2 = Stateflow.State(ch);  
sA2.Name = 'A2';  
sA2.Position = [240 120 90 60];
```

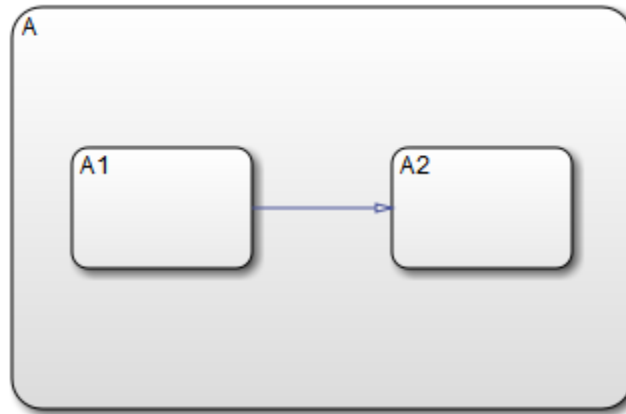
These commands create and use the workspace variables `sA`, `sA1`, and `sA2` as handles to the new states, which now appear as follows.



- 5 Create a transition from the 3 o'clock position (right side) of state A1 to the 9 o'clock position (left side) of state A2 with these commands:

```
tA1A2 = Stateflow.Transition(ch);  
tA1A2.Source = sA1;  
tA1A2.Destination = sA2;  
tA1A2.SourceOClock = 3;  
tA1A2.DestinationOClock = 9;
```

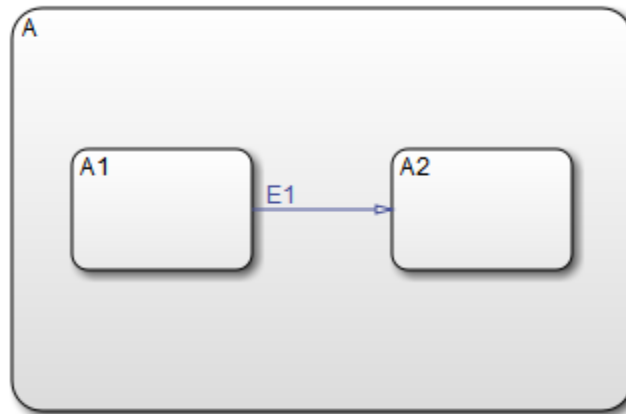
A transition now appears as shown.



- 6 Add the label E1 to the transition from state A1 to state A2 with this command:

```
tA1A2.LabelPosition = [180 140 0 0];  
tA1A2.LabelString = 'E1';
```

The chart now looks like this:



The state and transition labels in this chart are simple one-line labels. To enter more complex multiline labels, see “Enter Multiline Labels” on page 1-42. Labels for transitions also have a `LabelPosition` property you can use to move the labels to better locations.

- 7** Use these commands to move the label for the transition from A1 to A2 to the right by 5 pixels:

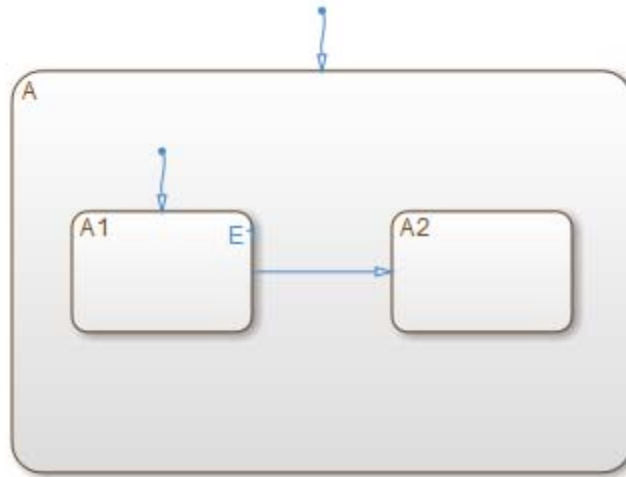
```
pos = tA1A2.LabelPosition;
pos(1) = pos(1)+5;
tA1A2.LabelPosition = pos;
```

- 8** Finish your new chart by adding default transitions to states A and A1 with source points 20 pixels above and 10 pixels to the left of the top midpoint of each state:

```
% Add a default transition to state A
dtA = Stateflow.Transition(ch);
dtA.Destination = sA;
dtA.DestinationOClock = 0;
xsource = sA.Position(1)+sA.Position(3)/2;
ysource = sA.Position(2)-30;
dtA.SourceEndPoint = [xsource ysource];
dtA.MidPoint = [xsource ysource+15];

% Add a default transition to state A1
dtA1 = Stateflow.Transition(ch);
dtA1.Destination = sA1;
dtA1.DestinationOClock = 0;
xsource = sA1.Position(1)+sA1.Position(3)/2;
ysource = sA1.Position(2)-30;
dtA1.SourceEndPoint = [xsource ysource];
dtA1.MidPoint = [xsource ysource+15];
```

Your complete chart looks like this:



- 9 Save the model with the new chart to the current folder as `myModel`:

```
sfsave(m.Name, 'myModel');
```

This command uses the `Name` property of the Model object `m` for saving the model under a new name.

You are now finished with “Create and Access Charts Using the Stateflow API” on page 1-8. You can continue with “Access the Properties and Methods of Objects” on page 1-15, or you can go to “Create a MATLAB Script of API Commands” on page 1-46 to see how to create a script of the API commands you used in this Quick Start section.

Access the Properties and Methods of Objects

In this section...

“Naming Conventions for Properties and Methods” on page 1-15

“Using Dot Notation with Properties and Methods” on page 1-15

“Access Methods Using Function Notation” on page 1-16

Naming Conventions for Properties and Methods

By convention, all properties begin with a capital letter, for example, the property `Name`. However, if a property consists of concatenated words, the words following the first word are capitalized, for example, the property `LabelString`. The same naming convention applies to methods, with the exception that a method name must begin with a letter in lowercase; for example, the method `find`.

Using Dot Notation with Properties and Methods

You can access the properties and methods of an object by adding a period (.) and the name of the property or method to the end of an object's handle variable. For example, this command returns the `Type` property for a `State` object represented by the handle `s`:

```
stype = s.Type;
```

This command calls the `dialog` method of the `State` object `s` to open a properties dialog box for that state:

```
s.dialog;
```

Nesting Dot Notation

You can nest smaller dot expressions in larger dot expressions of properties. For example, the `Chart` property of a `State` object returns the `Chart` object of the containing chart. Therefore, the expression `s.Chart.Name` returns the name of the chart containing the `State` whose object is `s`.

Methods can also be nested in dot expressions. For example, if the State object `sA1` represents state A1 in a chart, this command returns the string label for state A1's inner transition to a substate A11.

```
label = sA1.innerTransitions.LabelString;
```

The preceding command uses the `LabelString` property of a `Transition` object and the `innerTransitions` method for a `State` object. The command works as shown only when state A1 has one inner transition. If state A1 has more than one transition, you must first find all the inner transitions and then use an array index to access each one:

```
innerTransitions = sA1.innerTransitions;  
label1 = innerTransitions(1).LabelString;  
label2 = innerTransitions(2).LabelString;
```

Access Methods Using Function Notation

As an alternative to dot notation, you can access object methods with standard function call notation. For example, you can use the `get` method to access the `Name` property of a `Chart` object, `ch`, through one of these commands:

```
name = ch.get('Name');  
name = get(ch, 'Name');
```

If you have array arguments to methods you call, use function notation. This example returns a vector of strings with the names of each chart in the array of `Chart` objects `chartArray`:

```
names = get(chartArray, 'Name');
```

If, instead, you attempt to use the `get` command with this dot notation, an error results:

```
names = chartArray.get('Name');
```


Display Properties and Methods

In this section...

“Display Properties” on page 1-17

“Display Names of Methods” on page 1-17

“Display Property Subproperties” on page 1-18

“Display Enumerated Values for Properties” on page 1-18

Display Properties

To access the names of all properties for any particular object, use the `get` method. For example, if the object `s` is a `State` object, enter this command to list the properties and current values for any `State` object:

```
get(s);
```

To get a quick description for each property, use the `help` method. For example, if `s` is a `State` object, this command returns a list of `State` object properties, each with a small accompanying description:

```
s.help;
```

Note Some properties do not have a description, because their names are considered descriptive enough.

Display Names of Methods

Use the `methods` method to list the methods for any object. For example, if the object `t` is a handle to a `Transition` object, use this command to list the methods for any `Transition` object:

```
t.methods;
```

Note These internal methods may be displayed by the methods method for an object, but you cannot use them and they are not documented: areChildrenOrdered, getChildren, getDialogInterface, getDialogSchema, getDisplayClass, getDisplayIcon, getDisplayLabel, getFullName, getHierarchicalChildren, getPreferredProperties, isHierarchical, isLibrary, isLinked, isMasked.

Use a combination of the get method and the classhandle method to list only the names of the methods for an object. For example, list the names of the methods for the Transition object t with this command:

```
get(t.classhandle.Methods, 'Name');
```

Display Property Subproperties

Some properties are objects that have properties referred to as subproperties. For example, when you invoke the command get(ch) on a chart object, ch, the output displays the following for the StateFont property:

```
StateFont: [1x1 Stateflow.StateFont]
```

This value indicates that the StateFont property of a state has subproperties. To view the subproperties of StateFont, enter the command get(ch.StateFont) to see something like this:

```
Name: 'Helvetica'  
Size: 12  
Weight: 'NORMAL'  
Angle: 'NORMAL'
```

This list shows that Name, Size, Weight, and Angle are subproperties of the property StateFont. In the API reference pages for this guide, these properties are listed by their full names: StateFont.Name, StateFont.Size, and so on.

Display Enumerated Values for Properties

Many API object properties can be set only to one of a group of enumerated strings. You can identify these properties from the API reference pages. When

you use the `get` method to access object properties (see “Display Properties” on page 1-17) the values for these properties appear as strings of capital letters.

You can use the `set` method to display a list of acceptable strings for a property requiring enumerated values. For example, if `ch` is a handle to a `Chart` object, you can display the allowed enumerated values for the `Decomposition` property of that chart with this command:

```
set(ch, 'Decomposition')
```

Create and Destroy API Objects

In this section...
“About Creating and Destroying API Objects” on page 1-20
“Create Stateflow Objects” on page 1-20
“Establish the Parent (Container) of an Object” on page 1-22
“Destroy Stateflow Objects” on page 1-23

About Creating and Destroying API Objects

You create (construct), parent (contain), and delete (destroy) objects in Stateflow charts through constructor methods in the Stateflow API. For all but the Editor and Clipboard objects, creating objects establishes a handle to them that you can use for accessing their properties and methods to make modifications to Stateflow charts.

Stateflow objects are contained (parented) by other objects as defined in the Stateflow hierarchy of objects (see “Stateflow API Object Hierarchy” on page 1-3). You control containment of nongraphical objects in the Model Explorer.

Create Stateflow Objects

You create a Stateflow object as the child of a parent object through API constructor methods. Each Stateflow object type has its own constructor method. See “Constructor Methods” on page 2-23 for a list of the valid constructor methods.

Use this process to create Stateflow objects with the Stateflow API:

- 1** Access the parent object to obtain a handle to it.

When you first begin populating a model or chart, this means that you must get a handle to the Stateflow Model object or a particular Chart object. See “Access the Model Object” on page 1-8 and “Access the Chart Object” on page 1-9.

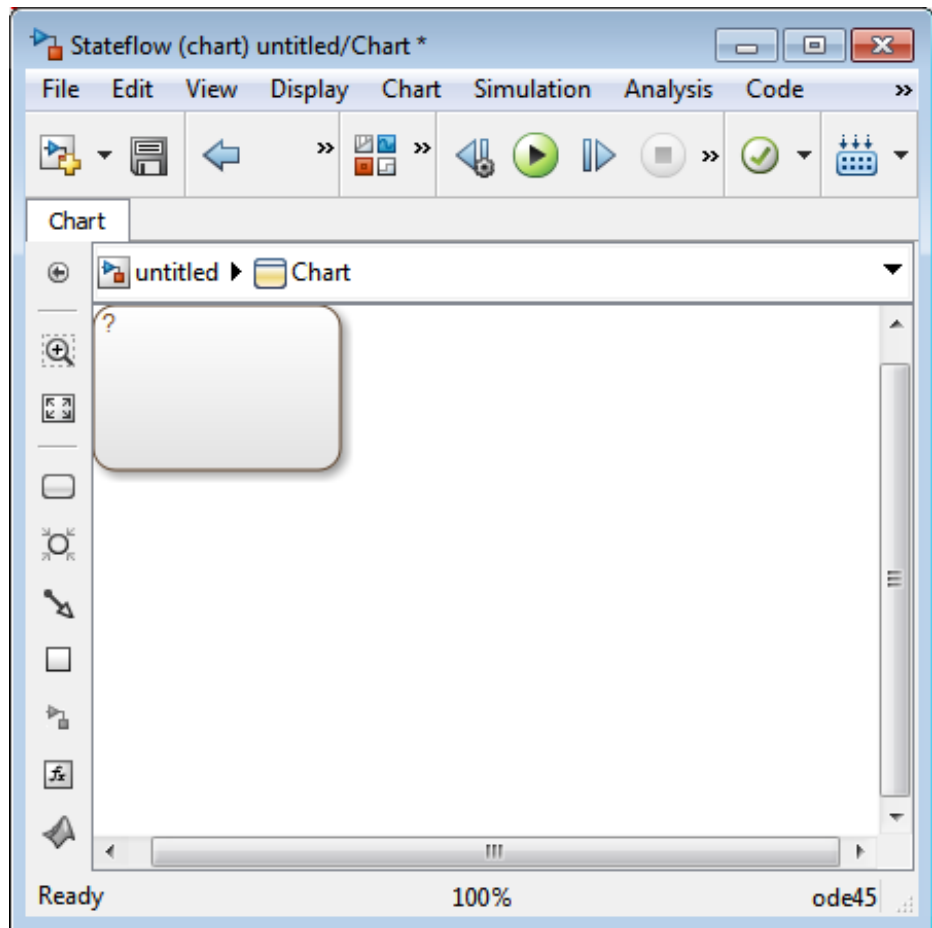
See also “Access Existing Stateflow Objects” on page 1-24 for a more general means of accessing (getting an object handle to) an existing Stateflow object.

- 2 Call the appropriate constructor method for the creation of the object using the parent (containing) object as an argument.

For example, this command creates and returns a handle `s` to a new state object in the chart object with the handle `ch`:

```
s = Stateflow.State(ch);
```

By default, the newly created state from the preceding command appears in the upper left corner of the chart:



The constructor returns a handle to an API object for the newly created Stateflow object. Use this handle to display or change the object through its properties and methods.

- 3** Use the object handle returned by the constructor to make changes to the object in the chart.

For example, you can now use the handle `s` to set its name (Name property) and position (Position property). You can also connect it to other states or junctions by creating a Transition object and setting its Source or Destination property to `s`. See “Create New Objects in the Chart” on page 1-10 for examples.

Use the preceding process to create all Stateflow objects in your chart. “Create New Objects in the Chart” on page 1-10 gives examples for creating states and transitions. You can also create objects of other types. For example, this command creates and returns a handle (`d1`) for a new Data object belonging to the state A (handle `sA`):

```
d1 = Stateflow.Data(sA)
```

Note Currently, there is no constructor for a Stateflow chart. To create a chart with the Stateflow API you must use the `sfnew` function.

Establish the Parent (Container) of an Object

As discussed in the previous section, “Create Stateflow Objects” on page 1-20, the Stateflow API constructor establishes the parent for a newly created object by taking a handle for the parent object as an argument to the constructor.

Graphical Object Parentage

When you create graphical objects (states, boxes, notes, functions, transitions, junctions), they appear completely inside their containing parent object. In the chart, graphical containment is a necessary and sufficient condition for establishing the containing parent.

Repositioning a graphical object through its Position property can change an object’s parent or cause an undefined parent error condition. Parsing a chart

in which the edges of one object overlap with another produces an undefined parent error condition that the Stateflow parser cannot resolve. You can check for this condition by examining the value of the `BadIntersection` property of a `Chart` object, which equals 1 if the edges of a graphical object overlap with other objects. You must set the size and position of objects so that they are separate from other objects.

Nongraphical Object Parentage

When you create nongraphical objects (data, events), they appear in the Model Explorer at the hierarchical level of their owning object. Containment for nongraphical objects is established through the Model Explorer only. See “Use the Model Explorer with Stateflow Objects” in the Stateflow documentation.

Destroy Stateflow Objects

Most Stateflow objects have a destructor method named `delete`. In this example, a `State` object, `s`, is deleted:

```
s.delete;
```

The preceding command is equivalent to performing a mouse select and keyboard delete operation in the chart. Upon deletion, graphical Stateflow objects are sent to the clipboard; nongraphical objects, such as data and events, are completely deleted. The workspace variable `s` still exists but is no longer a handle to the deleted state.

Access Existing Stateflow Objects

In this section...

“About Stateflow Object Handles” on page 1-24

“Find Objects and Properties” on page 1-24

“Find Objects at Different Levels of Containment” on page 1-26

“Retrieve Recently Selected Objects” on page 1-27

“Get and Set the Properties of Objects” on page 1-28

About Stateflow Object Handles

Creating Stateflow objects through the Stateflow API gives you an immediate handle to the newly created objects (see “Create Stateflow Objects” on page 1-20). You can also connect to Stateflow objects that already exist for which you have no current API handle.

Find Objects and Properties

There are several object methods that you use to traverse the Stateflow hierarchy to locate existing objects. For example, you can use the `find` method.

With the `find` method, you specify what to search for by specifying combinations of these types of information:

- The type of object to find
- A property name for the object to find and its value

This example searches through Model object `m` to return every State object with the name `'On'`.

```
onState = m.find('-isa', 'Stateflow.State', '-and', 'Name', 'On');
```

If a `find` command finds more than one object that meets its specifications, it returns an array of qualifying objects. This example returns an array of all charts in your model:


```
chartArray = m.find('-isa','Stateflow.Chart');
```

Use array indexing to access individual properties and methods for a chart. For example, if the preceding command returns three charts, this command returns the Name property of the second chart found:

```
name2 = chartArray(2).Name;
```

Tip To access the property of a Stateflow object in a linked library chart, do one of the following:

- Open the library model explicitly.
- View a linked subsystem or block in the main model.
- Compile or simulate the model.

Doing one of those steps loads a library model into the Simulink workspace. Just opening a main model that refers to a linked Stateflow chart does not guarantee that the Stateflow API can find a linked chart.

By default, the `find` command finds objects at all depths of containment within an object. This includes the zeroth level of containment, which is the searched object itself. For example, suppose that state A, which corresponds to State object `sA`, contains two states, A1 and A2. Use a `find` command that finds all the states in A:

```
states= sA.find('-isa','Stateflow.State');
```

The preceding command finds three states: A, A1, and A2.

Note Be careful when specifying the objects you want to find with the `find` method for a Root or Model object. Using the `find` method for these objects can return Simulink objects matching the arguments you specify. For example, if `rt` is a handle to the Root object, the command `find('Name', 'ABC')` might return a Simulink subsystem or block named ABC. See the reference for the `find` method for a full description of the method and its parameters.

Find Objects at Different Levels of Containment

Once you find a particular object in a Stateflow chart by its name or another property, you might want to find the objects that it contains (children), or the object that contains it (parent). To find child objects, use the `find` method. To find a parent object, use the `up` method.

Find Child Objects

The `find` method finds objects at the depth of containment within an object that you specify. If you want to limit the containment search depth with the `find` command, use the `depth` switch. For example, to find all the objects in State object `sA` at the first level of containment, use this command:

```
objArray = sA.find('-depth', 1);
```

Don't forget, however, that the `find` command always includes the zeroth level of containment, which is the object itself. So, the preceding command also includes state `A` in the list of objects found. However, you can exclude state `A` from the vector of objects in `objArray` with the MATLAB function `setdiff` as follows:

```
objArray = setdiff(objArray, sA);
```

This command returns a collection of all junctions at the first level of containment inside the state `A` that is represented by State object `sA`:

```
juncArray = sA.find('-isa', 'Stateflow.Junction', '-depth', 1);
```

This command returns an array of all transitions inside state `A` at all levels of containment:

```
transArray = sA.find('-isa', 'Stateflow.Transition');
```

Find a Parent Object

The `up` method finds the parent container object of any given object. Suppose that you have a chart where state `A` contains states `A1` and `A2`. Also, state `A1` contains state `A11`. In the example, `sA11` is a handle to the state `A11`. This means that

```
>> pA11 = sA11.up;
>> pA11.Name
```

```
ans =
```

```
A1
```

returns a handle pA11 to the state A1, the parent of state A11, and

```
>> ppA11 = pA11.up;
>> ppA11.Name
```

```
ans =
```

```
A
```

returns a handle ppA11 to the state A, the parent of state A1.

Retrieve Recently Selected Objects

You can retrieve the most recently selected objects in a chart by using the `sfgco` function. This function returns object handles or a vector of handles depending on these conditions:

If...	Then <code>sfgco</code> returns...
There are no open charts	An empty matrix
There is no selection list	Handle of the chart most recently clicked
You select one object in a chart	Handle to the selected object
You select multiple objects in a chart	Vector of handles for the selected objects
You select objects in multiple charts	Handles of the most recently selected objects in the most recently selected chart

For example, suppose that you run the `sf_boiler` model and open the Bang-Bang Controller chart. If you select the Off state in the chart, `sfgco` returns:

```
ans =  
  
          Path: 'sf_boiler/Bang-Bang Controller/Heater'  
          Id: 20  
          Machine: [1x1 Stateflow.Machine]  
          Name: 'Off'  
Description: ''  
LabelString: [1x27 char]  
  FontSize: 12  
  ArrowSize: 8  
  TestPoint: 0  
          Chart: [1x1 Stateflow.Chart]  
BadIntersection: 0  
          Subviewer: [1x1 Stateflow.Chart]  
          Document: ''  
          Tag: []  
RequirementInfo: ''  
ExecutionOrder: 0  
HasOutputData: 0  
          Position: [31.7440 40.9730 214.1807 88.1000]  
Decomposition: 'EXCLUSIVE_OR'  
          Type: 'OR'  
IsSubchart: 0  
IsGrouped: 1  
          Debug: [1x1 Stateflow.StateDebug]
```

Get and Set the Properties of Objects

Once you obtain a particular object, you can access its properties directly or through the `get` method. For example, you obtain the description for a State object `s` with one of these commands:

- `od = s.Description;`
- `od = s.get('Description');`
- `od = get(s, 'Description');`

You change the properties of an object directly or through the `set` method. For example, you change the description of the State object `s` with one of these commands:

- `s.Description = 'This is the On state.';`
- `s.set('Description', 'This is the On state.');`
- `set(s, 'Description', 'This is the On state.');`

Move Graphical Objects

In this section...

“How to Move Objects Programmatically” on page 1-30

“Move a Subcharted State” on page 1-30

“Rules for Moving Objects Programmatically” on page 1-31

How to Move Objects Programmatically

To move a graphical object programmatically, choose one of these techniques:

Technique	Example
Change the <code>Position</code> property of the object directly.	<code>object.Position = [40 40 100 60];</code>
Use the <code>set</code> method to change the <code>Position</code> property of the object.	<code>object.set('Position', [40 40 100 60]);</code> <code>set(object, 'Position', [40 40 100 60]);</code>

In each 1-by-4 array, the first two values are the (x,y) coordinates of the upper left corner of the object. The last two values are the width and height, respectively.

Note These programmatic techniques work only for objects that have the `Position` property.

Move a Subcharted State

You can adjust the location of a subcharted state as follows:

1 Open the `sf_elevator` model.

2 Get a handle to the root object.

```
rt = slroot;
```

- 3** Get a handle to the subcharted state `Elevator_Manager` in the `Elevator System` chart.

```
em = rt.find('-isa', 'Stateflow.State', 'Name', 'Elevator_Manager');
```

- 4** Change the chart position of `Elevator_Manager`.

```
em.set('Position', [20 250 200 60]);
```

The following changes occur:

- The `Elevator_Manager` subchart moves to the location (20,250) from the upper left corner of the chart.
- The subchart now has a width of 200 and a height of 60.

Rules for Moving Objects Programmatically

- The object you move must be visible in the Stateflow Editor.

To...	You must be viewing...
Change the position or size of the subchart icon	The parent or container of the subchart
Change the size of the subchart boundary in the subviewer	The contents of the subchart

- To switch to a chart-level view programmatically, use these commands:

```
rt = sfroot;
ch = rt.find('-isa', 'Stateflow.Chart', 'Name', 'name');
ch.view;
```

- To view the contents of a subcharted state programmatically, use these commands:

```
rt = sfroot;
sub = rt.find('-isa', 'Stateflow.State', 'Name', 'name');
sub.view;
```

- When you view the contents of a subcharted state, box, or graphical function in the subviewer, you cannot change the position of the subchart boundary programmatically.
- For objects in a subcharted state, box, or graphical function, you cannot use the `set` method to move these objects between different levels of the chart hierarchy. See “Copy Objects” on page 1-33 for directions on copying and pasting objects from one container object to another.

Copy Objects

In this section...

“Access the Clipboard Object” on page 1-33

“copy Method Limitations” on page 1-33

“Copy by Grouping” on page 1-34

“Copy Objects Individually” on page 1-35

Access the Clipboard Object

The Clipboard object (only one exists) provides an interface to the clipboard used in copying Stateflow objects. You cannot directly create or destroy the Clipboard object as you do other Stateflow API objects. However, you can attach a handle to it to use its properties and methods to copy Stateflow objects.

You create a handle to the Clipboard object by using the `sfclipboard` function as follows:

```
cb = sfclipboard;
```

Clipboard objects have two methods, `copy` and `pasteTo`, that together provide the functionality to copy objects from one object to another. The `copy` method copies the specified objects to the Clipboard object, and the `pasteTo` method pastes the contents of the clipboard to a new container.

copy Method Limitations

The `copy` method is subject to these limitations for all objects:

- The objects you copy must be *all* graphical (states, boxes, functions, transitions, junctions) or *all* nongraphical (data, events).

You cannot copy a mixture of graphical and nongraphical objects to the clipboard in the same copy operation.

- To maintain the transition connections and containment relationships between copied objects, you must copy the entire array of related objects.

All related objects must be part of the array of objects copied to the clipboard. For example, if you try to copy two states connected by a transition to another container, you can only accomplish this by copying both the states and the transition at the same time. That is, you must do a single copy of a single array containing both the states and the transition that connects them.

If you copy a grouped state to the clipboard, you copy all the objects contained in the state, as well as all the relations among the objects in the grouped state. See “Copy by Grouping” on page 1-34.

Copy Graphical Objects

The copy method is subject to these limitations for all graphical objects:

- Copying graphical objects also copies the Data and Event objects that the graphical objects contain.
- If all copied objects are graphical, they must all be visible in the same subviewer.

In other words, all graphical objects copied in a single copy command must reside in the same chart or subchart.

Copy by Grouping

Copying a grouped state in a Stateflow chart copies not only the state but all of its contents. By grouping a state before you copy it, you can copy it and all of its contained objects at all levels of containment with the Stateflow API. This method is the simplest way of copying objects. Use it whenever possible.

You use the Boolean `IsGrouped` property for a state to group that state. If you set the `IsGrouped` property for a state to a value of true (=1), it is grouped. If you set `IsGrouped` to a value of false (=0), the state is not grouped.

This example procedure copies state A to the chart X through grouping. In this example, assume that you already have a handle to state A and chart X through the MATLAB variables `sA` and `chX`, respectively:

- 1** If the state to copy is not already grouped, group it along with its contents by setting the `IsGrouped` property for that state to true (=1).

```

prevGrouping = sA.IsGrouped;
if (prevGrouping == 0)
    sA.IsGrouped = 1;
end

```

2 Get a handle to the Clipboard object.

```
cb = sfclipboard;
```

3 Copy the grouped state to the clipboard using the Clipboard object.

```
cb.copy(sA);
```

4 Paste the grouped object to its new container.

```
cb.pasteTo(chX);
```

5 Set the copied state and its source state to its previous IsGrouped property value.

```

sA.IsGrouped=prevGrouping;
sNew=chX.find('-isa','Stateflow.State','Name',sA.Name);
sNew.IsGrouped=prevGrouping;

```

Copy Objects Individually

You can copy specific objects from one object to another. However, in order to preserve transition connections and containment relations between objects, you must copy all the connected objects at once. To accomplish this, use the general technique of appending objects from successive finds in the MATLAB workspace to a growing array of objects before copying the finished object array to the clipboard.

Using the example of the Stateflow chart at the end of “Create New Objects in the Chart” on page 1-10, you can copy states A1, A2, and the transition connecting them to another state, B, with these API commands, where sA and sB are object handles to states A and B, respectively.

```

objArrayS = sA.find('-isa','Stateflow.State','-depth',1);
objArrayT = sA.find('-isa','Stateflow.Transition','-depth',1);
sourceObjs = {objArrayS ; objArrayT};

```

```
cb = sfclipboard;  
cb.copy(sourceObjs);  
cb.pasteTo(sB);
```

You can also copy nongraphical data and event objects individually. However, since there is no way for these objects to find their new owners, you must ensure that you copy each of these objects separately to its appropriate owner object.

Note Copying objects individually is harder than copying grouped objects. See “Copy by Grouping” on page 1-34.

Zoom a Chart Object Using the API

In this section...

“How to Zoom a Chart Object” on page 1-37

“Objects You Can Zoom” on page 1-37

“Zoom States in a Chart” on page 1-37

How to Zoom a Chart Object

Use the Stateflow API method `fitToView` to zoom in on a graphical object in the chart. (See “Getting a Handle on Stateflow API Objects” on page 1-5 for information about obtaining object handles.)

Objects You Can Zoom

You can zoom the following chart objects:

- Charts
- Subcharts
- States
- Transitions
- Graphical functions
- Truth table functions
- MATLAB functions
- Simulink functions
- Connective junctions
- History junctions
- Boxes
- Notes

Zoom States in a Chart

Follow these steps to zoom in on different states:

- 1** At the MATLAB command prompt, type:

```
old_sf_car;
```

The chart `shift_logic` appears.

- 2** To define an object handle for the chart `shift_logic`, type:

```
myChart = find(sfroot, '-isa', 'Stateflow.Chart', 'Name', ...  
    'shift_logic');
```

- 3** To define an object handle for the state `upshifting`, type:

```
myState = find(sfroot, '-isa', 'Stateflow.State', 'Name', ...  
    'upshifting');
```

- 4** To zoom in on the state `upshifting`, type:

```
myState.fitToView;
```

The chart zooms in on the state and highlights it.

- 5** To define an object handle for the state `downshifting`, type:

```
myState = find(sfroot, '-isa', 'Stateflow.State', 'Name', ...  
    'downshifting');
```

- 6** To zoom in on the state `downshifting`, type:

```
myState.fitToView;
```

The chart zooms in on the state and highlights it.

- 7** To zoom out to the chart-level view, type:

```
myChart.fitToView;
```

The chart `shift_logic` reappears.

- 8** You can also zoom in on a state using the `sfgco` function. Follow these steps:

- a** Click any state in the chart.

- b** At the MATLAB command prompt, type:

```
myState = sfgco;
```

This command assigns the selected state to the object handle `myState`.

- c** To zoom in on the selected state, type:

```
myState.fitToView;
```

The chart zooms in on the state and highlights it.

Access Graphical Properties and Methods Using the Editor Object

In this section...
“About Editor Objects” on page 1-40
“Access the Editor Object” on page 1-40
“Change the Display in the Stateflow Editor” on page 1-40

About Editor Objects

The Editor object provides access to the purely graphical properties and methods of Chart objects. Each Chart object has its own Editor object.

Access the Editor Object

You cannot directly create or destroy the Editor and Clipboard objects as you do other Stateflow API objects. However, you can attach a handle to them to use their properties and methods for modifications to Stateflow charts.

When you create a chart, an Editor object is automatically created for it. If `ch` is a workspace handle to a chart, you create a handle to the Editor object for that chart with this command:

```
ed = ch.Editor;
```

Change the Display in the Stateflow Editor

Use the handle `ed` from the preceding example to access the Editor object properties and methods. For example, this command calls the `zoomIn` method to zoom in the chart by a factor of 20%:

```
ed.zoomIn;
```

Or, you can simply set the `ZoomFactor` property to an absolute zoom factor of 150%:

```
ed.ZoomFactor = 1.5;
```


You can also use an Editor object to change the window position of the Stateflow Editor. For a reference to all the Editor object's properties and methods, see "Stateflow.Editor Properties" on page 2-35 and "Stateflow.Editor Methods" on page 2-36.

Enter Multiline Labels

The following state uses a multiline label:



There are two ways to enter multiline labels for states and transitions. In the following examples, `sA` is a handle to the State object in the chart for state A:

- Use the MATLAB function `sprintf`:

```
str = sprintf('A\nen: entrA()\ndu: durIA()\nex: exitA()');
sA.LabelString = str;
```

In this example, the escape sequence `\n` inserts carriage returns into a string expression.

- Use a concatenated string expression:

```
str = ['A',10,'entr: entrA()',10,'du: durIA()',...
      10,'ex: exitA()'];
sA.LabelString = str;
```

In this example, the ASCII equivalent of a carriage return, the integer 10, inserts carriage returns into a concatenated string expression.

Create Default Transitions

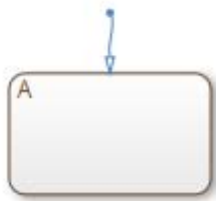
Default transitions differ from normal transitions in not having a source object. You can create a default transition with these steps:

- 1 Create a transition.
- 2 Attach the destination end of the transition to an object.
- 3 Position the source endpoint for the transition.

If you assume that the variable `sA` is a handle to state A, these commands create a default transition and position the source 25 pixels above and 15 pixels to the left of the top midpoint of state A:

```
dt = Stateflow.Transition(sA);  
dt.Destination = sA;  
dt.DestinationOClock = 0;  
xsource = sA.Position(1)+sA.Position(3)/2;  
ysource = sA.Position(2)-30;  
dt.SourceEndPoint = [xsource ysource];  
dt.MidPoint = [xsource ysource+15];
```

The created default transition looks like this:



This method is also used for adding the default transitions toward the end of the example chart constructed in “Create New Objects in the Chart” on page 1-10.

Make Supertransitions

The Stateflow API does not currently support the direct creation of supertransitions. Supertransitions are transitions between a state or junction in a top-level chart and a state or junction in one of its subcharts, or between states residing in different subcharts at the same or different levels in a chart. For a better understanding of supertransitions, see “What Is a Supertransition?” in the Stateflow documentation.

You can use a workaround for indirectly creating supertransitions. In this example, a supertransition is desired from a junction inside a subchart to a junction outside the subchart. In order to use the Stateflow API to create the supertransition in this example, first use the API to create the superstate as an ordinary state with a transition between its contained junction and a junction outside it.



Now set the `IsSubchart` property of the state A to true (=1).



This step makes state A a subchart, and the transition between the junctions is now a supertransition.

You can also connect supertransitions to and from objects in an existing subchart (state A, for example) with these steps:

- 1** Save the original position of subchart A to a temporary workspace variable.

For example, if the subchart A has the API handle `sA`, store its position with this command:

```
sA_pos = sA.Position;
```

- 2** Convert subchart A to a state by setting the `IsSubchart` property to false (=0).

```
sA.IsSubchart = 0;
```

- 3** Ungroup state A by setting the `IsGrouped` property to false (=0).

```
sA.IsGrouped = 0;
```

When you convert a subchart to a normal state, it stays grouped to hide the contents of the subchart. When you ungroup the subchart, it might resize to display its contents.

- 4** Make the necessary transition connections.

See “Create New Objects in the Chart” on page 1-10 for an example of creating a transition.

- 5** Set the `IsSubchart` property of state A back to true (=1).

For example, `sA.IsSubchart = 1;`

- 6** Assign subchart A its original position.

```
sA.Position = sA_pos;
```

When you convert a subchart to a normal state and ungroup it, it might resize to accommodate the size of its contents. The first step of this procedure stores the original position of the subchart so that this position can be restored after the transition connection is made.

Create a MATLAB Script of API Commands

In “Create and Access Charts Using the Stateflow API” on page 1-8, you created and saved a new model through a series of Stateflow API commands. You can include the same API commands in the following MATLAB script. This script lets you quickly recreate the same model with the single command `makeMyModel`.

```
function makeMyModel

% Get all previous models loaded
rt = sfroot;
prev_models = rt.find('-isa','Simulink.BlockDiagram');

% Create new model, and get current models
sfnew;
curr_models = rt.find('-isa','Simulink.BlockDiagram');

% New model is current models - previous models
m = setdiff(curr_models, prev_models);

% Get chart in new model
ch = m.find('-isa', 'Stateflow.Chart');

% Create state A in chart
sA = Stateflow.State(ch);
sA.Name = 'A';
sA.Position = [50 50 310 200];

% Create state A1 inside of state A
sA1 = Stateflow.State(ch);
sA1.Name = 'A1';
sA1.Position = [80 120 90 60];

% Create state A2 inside of state A
sA2 = Stateflow.State(ch);
sA2.Name = 'A2';
sA2.Position = [240 120 90 60];

% Create a transition from A1 to A2
```

```
tA1A2 = Stateflow.Transition(ch);
tA1A2.Source = sA1;
tA1A2.Destination = sA2;
tA1A2.SourceOClock = 3;
tA1A2.DestinationOClock = 9;

% Label transition from state A1 to state A2
tA1A2.LabelPosition = [180 140 0 0];
tA1A2.LabelString = 'E1';

% Create the Event E1
E1 = Stateflow.Event(ch);
E1.Name = 'E1';

% Move label for transition A1-A2 to the right a bit
pos = tA1A2.LabelPosition;
pos(1) = pos(1)+5;
tA1A2.LabelPosition = pos;

% Add a default transition to state A
dtA = Stateflow.Transition(ch);
dtA.Destination = sA;
dtA.DestinationOClock = 0;
xsource = sA.Position(1)+sA.Position(3)/2;
ysource = sA.Position(2)-30;
dtA.SourceEndPoint = [xsource ysource];
dtA.MidPoint = [xsource ysource+15];

% Add a default transition to state A1
dtA1 = Stateflow.Transition(ch);
dtA1.Destination = sA1;
dtA1.DestinationOClock = 0;
xsource = sA1.Position(1)+sA1.Position(3)/2;
ysource = sA1.Position(2)-30;
dtA1.SourceEndPoint = [xsource ysource];
dtA1.MidPoint = [xsource ysource+15];
```


API Object Reference

Properties and Methods Sorted By Chart Object

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Reference Table Column Descriptions

Reference tables for Stateflow API properties and methods have these columns:

- **Name** — The name for the property or method. Each property or method has a name that you use in dot notation along with a Stateflow object to set or obtain the property’s value or call the method.
- **Type** — A data type for the property. Some types are other Stateflow API objects, such as the `Machine` property, which is the `Machine` object that contains this object.
- **Access** — An access type for the property. Properties that are listed as RW (read/write) can be read and changed. For example, the `Name` and `Description` properties of particular objects are RW. However, some properties are RO (read-only) because they are set by the MATLAB workspace itself.

- **Description** — A description for the property or method. For some properties, the equivalent GUI operations for setting it are also given.

Methods That Apply to All API Objects

The following methods apply to all API objects including those of Stateflow charts. Only object-exclusive methods appear when you use the method methods to display methods for an object. However, the tables of methods for each API object that follow do list these methods as if they were their own.

Method	Description
delete	Delete this object. Used with all objects except the Root, Machine, Chart, Clipboard, and Editor objects.
disp	Display the property names and their settings for this object.
find	Find all objects of this object that meet the specified criteria.
get	Return the specified property settings for this object.
methods	Display all nonglobal methods of this object.
set	Set the specified property of this object with a specified value.
struct	Return and display a MATLAB structure containing the property settings of this object.

Stateflow.AtomicBox Properties

Stateflow API objects of type Atomic Box have the properties shown below. See also “Stateflow.AtomicBox Methods” on page 2-6.

Property	Type	Access	Description
ArrowSize	Double	RW	Size of transition arrows coming into this atomic box (default = 8).
BadIntersection	Boolean	RO	If true, this atomic box graphically intersects a box, state, MATLAB function, graphical function, Simulink function, or truth table function.
Chart	Chart	RO	Chart object containing this atomic box.

Property	Type	Access	Description
Description	String	RW	Description of this atomic box (default = ''). Equivalent to entering a description in the Description field of the properties dialog box.
Document	String	RW	Document link to this atomic box (default = ''). Equivalent to entering a link in the Document link field of the properties dialog box.
FontSize	Double	RW	Size of the font (default = 12) for the label text of this atomic box.
Id	Integer	RO	Unique identifier assigned to this atomic box to distinguish it from other objects in the model.
IsLink	Boolean	RO	If true, this atomic box is a library link.
LabelString	String	RW	Label for this atomic box (default = '?'). Equivalent to typing the label for this atomic box in the chart.
Machine	Machine	RO	Machine containing this atomic box.
Name	String	RW	Name of this atomic box (default = ''). Equivalent to entering a string in the Name field of the properties dialog box.
Position	Rect	RW	Position and size of this atomic box in the chart, given in the form of a 1-by-4 array (default is [0 0 90 60]): <ul style="list-style-type: none"> • (x,y) coordinates for the atomic box's upper left vertex relative to the upper left vertex of the chart • Width and height of the atomic box
Subviewer	Chart or State	RO	Chart or state in which you can graphically view this atomic box.
Tag	Any Type	RW	Holds data of any type (default = []) for this atomic box.

Stateflow.AtomicBox Methods

Atomic box objects have the methods in the table below.

See also “Stateflow.AtomicBox Properties” on page 2-4.

Method	Description
delete	Delete this object from the chart.
dialog	Display the properties dialog box.
disp	Display the property names and their settings for this object.
find	Find all objects that this atomic box contains that meet the specified criteria.
fitToView	Zoom in on this atomic box and highlight it in the chart.
get	Return the specified property settings for this atomic box.
help	Display a list of properties for this object with short descriptions.
highlight	Highlight this object in the chart.
methods	Display all nonglobal methods of this object.
set	Set the specified property of this object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this object.
view	Display the contents of this atomic box.

Stateflow.AtomicSubchart Properties

Stateflow API objects of type Atomic Subchart have the properties shown below. See also “Stateflow.AtomicSubchart Methods” on page 2-9.

Property	Type	Access	Description
ArrowSize	Double	RW	Size of transition arrows coming into this atomic subchart (default = 8).
BadIntersection	Boolean	RO	If true, this atomic subchart graphically intersects a box, state, MATLAB function, graphical function, Simulink function, or truth table function.

Property	Type	Access	Description
Chart	Chart	RO	Chart object containing this atomic subchart.
Debug. Breakpoints. OnDuring	Boolean	RW	If set to true (default = false), set the during breakpoint for this atomic subchart. Equivalent to selecting the State During check box in the properties dialog box.
Debug. Breakpoints. OnEntry	Boolean	RW	If set to true (default = false), set the entry breakpoint for this atomic subchart. Equivalent to selecting the State Entry check box in the properties dialog box.
Debug. Breakpoints. OnExit	Boolean	RW	If set to true (default = false), set the exit breakpoint for this atomic subchart. Equivalent to selecting the State Exit check box in the properties dialog box.
Description	String	RW	Description of this atomic subchart (default = ''). Equivalent to entering a description in the Description field of the properties dialog box.
Document	String	RW	Document link to this atomic subchart (default = ''). Equivalent to entering a link in the Document link field of the properties dialog box.
ExecutionOrder	Integer	RW	Specifies the order in which this atomic subchart wakes up for parallel (AND) decomposition. Equivalent to the Execution Order selection in the context menu for the atomic subchart. The <code>UserSpecifiedStateTransitionExecutionOrder</code> property of the parent chart must be true. Otherwise, this property does not apply.
FontSize	Double	RW	Size of the font (default = 12) for the label text of this atomic subchart.

Property	Type	Access	Description
HasOutputData	Boolean	RW	If set to true (default = false), create a data output port on the Stateflow block for this atomic subchart activity. Equivalent to selecting the Create Output port for monitoring self activity check box in the properties dialog box.
Id	Integer	RO	Unique identifier assigned to this atomic subchart to distinguish it from other objects in the model.
IsLink	Boolean	RO	If true, this atomic subchart is a library link.
LabelString	String	RW	Label for this atomic subchart (default = '?'). Equivalent to typing the label for this atomic subchart in the chart.
Machine	Machine	RO	Machine containing this atomic subchart.
Name	String	RW	Name of this atomic subchart (default = ''). Equivalent to entering a string in the Name field in the properties dialog box.
Position	Rect	RW	Position and size of this atomic subchart in the chart, given in the form of a 1-by-4 array (default is [0 0 90 60]): <ul style="list-style-type: none"> • (x,y) coordinates for the atomic subchart's upper left vertex relative to the upper left vertex of the chart • Width and height of the atomic subchart
Subviewer	Chart or State	RO	Chart or state in which you can graphically view this atomic subchart.
Tag	Any Type	RW	Holds data of any type (default = []) for this atomic subchart.

Property	Type	Access	Description
TestPoint	Integer	RW	If set to 1 (default = 0), sets this atomic subchart as a Stateflow test point. See “Monitor Test Points in Stateflow Charts” in the Stateflow documentation.
Type	Enum	RO	Type of decomposition for this atomic subchart (default = 'OR'). Can be 'OR' (exclusive) or 'AND' (parallel). The type of this atomic subchart derives from the parent's Decomposition property.

Stateflow.AtomicSubchart Methods

Atomic subchart objects have the methods in the table below.

See also “Stateflow.AtomicSubchart Properties” on page 2-6.

Method	Description
delete	Delete this object from the chart.
dialog	Display the properties dialog box.
disp	Display the property names and their settings for this object.
find	Find all objects that this atomic subchart contains that meet the specified criteria.
fitToView	Zoom in on this atomic subchart and highlight it in the chart.
get	Return the specified property settings for this atomic subchart.
help	Display a list of properties for this object with short descriptions.
highlight	Highlight this object in the chart.
methods	Display all nonglobal methods of this object.
set	Set the specified property of this object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this object.
view	Display the contents of this atomic subchart.

Stateflow.Box Properties

Stateflow API objects of type Box have the properties shown below. See also “Stateflow.Box Methods” on page 2-11.

Property	Type	Access	Description
ArrowSize	Double	RW	Size of transition arrows coming into this box (default = 8).
BadIntersection	Boolean	RO	If true, this box graphically intersects a state, MATLAB function, graphical function, truth table, or another box.
Chart	Chart	RO	Chart object containing this box.
Description	String	RW	Description of this box (default = ''). Equivalent to entering a description in the Description field of the Box properties dialog box.
Document	String	RW	Document link to this box (default = ''). Equivalent to entering the Document Link field of the Box properties dialog box.
FontSize	Double	RW	Size of the font (default = 12) for the label text of this box. This property overrides the font size set for this box at creation by the <code>StateFont.Size</code> property of the containing Chart's object.
Id	Integer	RO	Unique identifier assigned to this box to distinguish it from other objects loaded in memory.
IsGrouped	Boolean	RW	If set to true (default = false), group this box.
IsSubchart	Boolean	RW	If set to true (default = false), make this box a subchart.
LabelString	String	RW	Label for this box (default = '?'). Equivalent to typing the label for this box in its label text field in the chart.
Machine	Machine	RO	Machine that contains this box.

Property	Type	Access	Description
Name	String	RW	Name of this box (default = ''). Equivalent to typing this box's name into the beginning of the label text field for this box in the chart.
Position	Rect	RW	Position and size of this box in the chart, given in the form of a 1-by-4 array (default is [0 0 90 60]) consisting of the following: <ul style="list-style-type: none"> • (x,y) coordinates for the box's upper left vertex relative to the upper left vertex of the chart • Width and height of the box
Subviewer	Chart or State	RO	State or chart in which this box can be graphically viewed.
Tag	Any Type	RW	Holds data of any type (default = []) for this box.

Stateflow.Box Methods

Box objects have the methods in the table below.

See also "Stateflow.Box Properties" on page 2-10.

Method	Description
defaultTransitions	Return the default transitions in this box at the top level of containment.
delete	Delete this box from the Stateflow chart.
dialog	Display the Box properties dialog box.
disp	Display the property names and their settings for this Box object.
find	Find all objects that this box contains that meet the specified criteria.
fitToView	Zoom in on this box and highlight it in the chart.

Method	Description
get	Return the specified property settings for this box.
help	Display a list of properties for this Box object with short descriptions.
highlight	Highlight this object in the chart.
innerTransitions	Return the inner transitions that originate with this box and terminate on a contained object.
methods	Display all nonglobal methods of this Box object.
outerTransitions	Return an array of transitions that exit the outer edge of this box and terminate on an object outside the containment of this box.
set	Set the specified property of this Box object with the specified value.
sinkedTransitions	Return all inner and outer transitions whose destination is this box.
sourcedTransitions	Return all inner and outer transitions whose source is this box.
struct	Return and display a MATLAB structure containing the property settings of this Box object.
view	Display this box's chart in the editor with this box highlighted.

Stateflow.Chart Properties

Stateflow API objects of type Chart have the properties shown below. See also “Stateflow.Chart Methods” on page 2-22.

Properties for C Charts and MATLAB Charts

Property	Type	Access	Description
ActionLanguage	Enum	RO	Action language for programming the chart. Can be C or MATLAB.
ChartColor	[R,G,B]	RW	Set the background color of your chart by using a 1-by-3 RGB array (default = [1 0.9608 0.8824]) with each value normalized on a scale of 0 to 1.

Property	Type	Access	Description
ChartUpdate	Enum	RW	Activation method of this chart. Can be 'INHERITED' (default), 'DISCRETE', or 'CONTINUOUS'. Equivalent to the Update method field in the Chart properties dialog box, which takes one of these selections: Inherited , Discrete , Continuous .
Debug. Breakpoints. OnEntry	Boolean	RW	If set to true (default = false), set the chart entry breakpoint for this chart. Equivalent to selecting the Chart Entry check box in the Chart properties dialog box.
Decomposition	Enum	RW	Set this property to 'EXCLUSIVE_OR' (default) to specify exclusive (OR) decomposition for the states at the first level of containment in this chart. Set to 'PARALLEL_AND' to specify parallel (AND) decomposition for these states. Equivalent to the Decomposition selection in the context menu for a specific level of the chart hierarchy.
Description	String	RW	Description (default = '') of this state. Equivalent to entering a description in the Description field of the Chart properties dialog box.
Dirty	Boolean	RW	If set to true (default = false), this chart has changed since being opened or saved.
Document	String	RW	Document link (default = '') to this chart. Equivalent to entering a link in the Document Link field of the Chart properties dialog box.

Property	Type	Access	Description
Editor	Editor	RO	Editor object for this chart.
EnableBitOps	Boolean	RW	For C charts only. If set to true (default = false), enables C-like bit operations in generated code for the chart. Equivalent to selecting the Enable C-bit operations check box in the C Chart properties dialog box.
EnableNonTerminalStates	Boolean	RW	If set to true (default = false), enables super step semantics for the chart, as described in “Execution of a Chart with Super Step Semantics” in the Stateflow documentation.
EnableZeroCrossings	Boolean	RW	If set to true (default = true), enables zero-crossing detection on state transitions for continuous-time simulation of Stateflow charts. Applies only when the ChartUpdate property for this chart is set to 'CONTINUOUS'. See “When to Enable Zero-Crossing Detection” in the Stateflow documentation.
ErrorColor	[R,G,B]	RW	Set the color for errors in your chart by using a 1-by-3 RGB array (default = [1 0 0]) with each value normalized on a scale of 0 to 1.
ExecuteAtInitialization	Boolean	RW	If set to true (default = false), this chart’s state configuration is initialized at time zero instead of at the first input event. Equivalent to selecting the Execute (enter) Chart At Initialization check box in the Chart properties dialog box.

Property	Type	Access	Description
ExportChartFunctions	Boolean	RW	If set to true (default = false), graphical functions at the chart level become global. Equivalent to selecting the Export Chart Level Functions (Make Global) check box in the Chart properties dialog box.
HasOutputData	Boolean	RW	If set to true (default = false), create a data output port on the Stateflow block for this chart's state activity. Equivalent to selecting the Create Output port for monitoring child activity check box in the properties dialog box.
Iced	Boolean	RO	Equivalent to property Locked (default = false) except that this property is used internally to lock this chart from change during activities such as simulation.
Id	Integer	RO	Unique identifier assigned to this chart to distinguish it from other objects loaded in memory.
InitializeOutput	Boolean	RW	Applies the initial value of outputs every time a chart wakes up, not only at time 0. See "Set Properties for a Single Chart".
JunctionColor	[R,G,B]	RW	Set the color for junctions in your chart by using a 1-by-3 RGB array (default = [0.6824 0.3294 0]) with each value normalized on a scale of 0 to 1.
Locked	Boolean	RW	If set to true (default = false), mark this chart as read-only and prohibit any write operations on it. Equivalent to selecting the Lock Editor check box in the Chart properties dialog box.

Property	Type	Access	Description
Machine	Machine	RO	Machine that contains this chart.
Name	String	RW	Name of this chart (default = 'Chart'). Equivalent to changing the name of this chart in your model.
NonTerminalMaxCounts	String	RW	Maximum number of transitions a Stateflow chart can take in one super step. Applies only when EnableNonTerminalStates is true. See “Execution of a Chart with Super Step Semantics” in the Stateflow documentation.
NonTerminalUnstableBehavior	Enum	RW	Behavior of a Stateflow chart during simulation if it exceeds the maximum number of transitions specified in the NonTerminalMaxCounts property in a super step before reaching a stable state. Set this property to 'PROCEED' (default) if you want the chart to go back to sleep with the last active state configuration. Set this property to 'THROW ERROR' if you want the chart to generate an error. Applies only when EnableNonTerminalStates is true. See “Execution of a Chart with Super Step Semantics” in the Stateflow documentation.
SampleTime	String	RW	Sample time for activating this chart (default = ''). Applies only when the ChartUpdate property for this chart is set to 'DISCRETE' (= Discrete in the Update method field in the Chart properties dialog box).

Property	Type	Access	Description
SaturateOnIntegerOverflow	Boolean	RW	Specify whether or not integer overflows saturate in the generated code. For more information, see “Handle Integer Overflow for Chart Data” in the Stateflow documentation.
SelectionColor	[R,G,B]	RW	Color of selected items for this chart in a 1-by-3 RGB array (default value [1 0 0.5176]) with each value normalized on a scale of 0 to 1.
StateColor	[R,G,B]	RW	Color of the state box in a 1-by-3 RGB array (default value [0 0 0]) with each value normalized on a scale of 0 to 1.
StateFont. Angle	Enum	RW	Font angle for the labels of State, Box, Function, and Note objects. Can be 'ITALIC' or 'NORMAL' (default). Use with property StateFont.Weight to achieve Bold Italic style. You can individually override this property with the Font.Angle property for Note objects.
StateFont. Name	String	RW	Font style (default = 'Helvetica') used for the labels of State, Box, Function, and Note objects. Enter a string for the font name (there are no selectable values). Font remains set to previous font for unrecognized font strings.

Property	Type	Access	Description
StateFont. Size	Integer	RW	<p>Default font size for the labels of a new State, Box, Function, or Note object.</p> <p>You can change the font size for an existing State, Box, or Function object with the <code>FontSize</code> property of that object. You can change the font size for an existing Note object with its <code>Font.Size</code> property.</p>
StateFont. Weight	Enum	RW	<p>Font weight for state labels. Can be 'BOLD' or 'NORMAL' (default). Use with the property <code>StateFont.Angle</code> to achieve Bold Italic style.</p> <p>You can individually override this property with the <code>Font.Weight</code> property for Note objects.</p>
StateLabelColor	[R,G,B]	RW	<p>Color of the state labels for this chart in a 1-by-3 RGB array (default = [0 0 0]) with each value normalized on a scale of 0 to 1.</p>
StateMachineType	Enum	RW	<p>Type of state chart to create. Default is <i>Classic</i>, which provides the full set of semantics for MATLAB charts and C charts. You can also create Mealy and Moore charts, which use a subset of Stateflow chart semantics (see “Create Mealy and Moore Charts”).</p>

Property	Type	Access	Description
StatesWhenEnabling	String	RW	<p>If your chart contains function-call input events, specify how states behave when the event reenables the chart. Possible values include:</p> <ul style="list-style-type: none"> • held — Maintain most recent values of the states. • reset — Revert to the initial conditions of the states. • inherit — Inherit this setting from the parent subsystem. <p>If your chart does not contain function-call input events, this property has no effect. For more information, see “Control States When Function-Call Inputs Reenable Charts”.</p>
StrongDataTyping WithSimulink	Boolean	RW	<p>If set to true (default), set strong data typing with Simulink I/O. Equivalent to selecting the Use Strong Data Typing with Simulink I/O check box in the Chart properties dialog box.</p>
SupportVariableSizing	Boolean	RW	<p>If set to true (default), support chart input and output data that vary in dimension during simulation. Equivalent to selecting the Support variable-size arrays check box in the Chart properties dialog box.</p>
Tag	Any Type	RW	<p>A field you can use to hold data of any type for this chart (default = []).</p>

Property	Type	Access	Description
TransitionColor	[R,G,B]	RW	Set the color for transitions in your chart by using a 1-by-3 RGB array (default = [0.2902 0.3294 0.6039]) with each value normalized on a scale of 0 to 1.
TransitionFont.Angle	Enum	RW	Font angle for state labels. Can be 'ITALIC' or 'NORMAL' (default). Use with property StateFont.Weight to achieve Bold Italic style.
TransitionFont.Name	String	RW	Font style (default = 'Helvetica') used for transition labels. Enter a string for font name (there are no selectable values). Font remains set to previous font for unrecognized font strings.
TransitionFont.Size	Integer	RW	Default font size (default = 12) for transition labels. Truncated to closest whole number less than or equal to entered value.
TransitionFont.Weight	Enum	RW	Font weight for transition labels. Can be 'BOLD' or 'NORMAL' (default). Use with property StateFont.Angle to achieve Bold Italic style.
TransitionLabel Color	[R,G,B]	RW	Color of the transition labels for this chart in a 1-by-3 RGB array (default = [0.2902 0.3294 0.6039]) with each value normalized on a scale of 0 to 1.

Property	Type	Access	Description
UserSpecifiedState TransitionExecutionOrder	Boolean	RW	If set to true (default = false), you have complete control of the order in which transitions originating from a source are tested for execution. Equivalent to selecting the User specified state/transition execution order check box in the Chart properties dialog box.
Visible	Boolean	RW	If set to true (default), display this chart in the editor.

Fixed-Point Properties for MATLAB Charts

Property	Type	Access	Description
Em1DefaultFimath	string	RW	Default fimath properties for the MATLAB chart. If set to Same as MATLAB Default, the chart uses the same fimath properties as the current default fimath. Otherwise, specify the default fimath properties by constructing the fimath object in the MATLAB or model workspace and setting the property equal to the variable name.
InputFimath	embedded.fimath object	RW	The embedded.fimath object associated with inputs to the MATLAB chart from Simulink blocks.
TreatAsFi	Enum	RW	Determines whether to treat inherited fixed-point and integer signals as Fixed-Point Designer™ fi objects.

Property	Type	Access	Description
			<ul style="list-style-type: none"> • If set to Fixed-point (default), the MATLAB chart treats all fixed-point inputs as <code>fi</code> objects. • If set to Fixed-point & Integer, the MATLAB chart treats all fixed-point and integer inputs as <code>fi</code> objects.

Stateflow.Chart Methods

Chart objects have the methods in the table below.

See also “Stateflow.Chart Properties” on page 2-12.

Method	Description
<code>defaultTransitions</code>	Return the default transitions in this Stateflow chart at the top level of containment.
<code>dialog</code>	Display the Chart properties dialog box.
<code>disp</code>	Display the property names and their settings for this Chart object.
<code>find</code>	Find all objects that this chart contains that meet the specified criteria.
<code>fitToView</code>	Zoom in on this chart in the editor.
<code>get</code>	Return the specified property settings for this chart.
<code>help</code>	Display a list of properties for this Chart object with short descriptions.
<code>methods</code>	Display all nonglobal methods of this Chart object.
<code>parse</code>	Parse this chart.
<code>set</code>	Set the specified property of this Chart object with the specified value.

Method	Description
struct	Return and display a MATLAB structure containing the property settings of this Chart object.
view	Display this chart in the editor.

Stateflow.Clipboard Methods

The Clipboard object has the methods in the table below.

Method	Description
copy	Copy the objects specified to this Clipboard object.
get	Return the specified property settings for this Clipboard object.
help	Display a list of properties for this Clipboard object with short descriptions.
methods	Display all nonglobal methods of this Clipboard object.
pasteTo	Paste the contents of this clipboard to the specified container object.
set	Set the specified property of this Clipboard object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this Clipboard object.

Constructor Methods

The following methods create a new Stateflow object for a parent object specified as an argument in the general expression `o = Stateflow.Object(p)`, where `o` is a handle to an API object for the new Stateflow object, `p` is a handle to the parent object, and *Object* is the type of the object:

Method	Description
Stateflow.AtomicSubchart	Create an atomic subchart for a parent chart or state.
Stateflow.Box	Create a box for a parent chart, state, box, or function.
Stateflow.Data	Create a data for a parent machine, chart, state, box, or function.
Stateflow.EMFunction	Create a MATLAB function for a parent chart or state.

Method	Description
Stateflow.Event	Create an event for a parent chart or state.
Stateflow.Function	Create a graphical function for a parent chart, state, box, or function.
Stateflow.Junction	Create a junction for a parent chart, state, box, or function.
Stateflow.Note	Create a note for a parent chart, state, box, or function.
Stateflow.SLFunction	Create a Simulink function for a parent chart or state.
Stateflow.State	Create a state for a parent chart, state, box, or function.
Stateflow.Target	Create a target for a parent machine.
Stateflow.Transition	Create a transition for a parent chart, state, box, or function.
Stateflow.TruthTable	Create a truth table for a parent chart or state.

Stateflow.Data Properties

Stateflow API objects of type Data have the properties shown below. See also “Stateflow.Data Methods” on page 2-35.

Tip All properties of the Props field must be set individually.

Property	Type	Access	Description
CompiledSize	String	RW	Size of data as determined by the compiler.
CompiledType	String	RW	Type of data as determined by the compiler.
Debug. Watch	Integer	RW	If set to 1 (default = 0), causes the Debugger window to halt execution if this data is modified. Setting this property to 1 is equivalent to selecting the Watch in debugger check box in the Data properties dialog box.

Property	Type	Access	Description
Description	String	RW	Description of this data (default = ''). Equivalent to entering a description in the Description field of the Data properties dialog box.
Document	String	RW	Document link to this data (default = ''). Equivalent to entering a link in the Document link field of the Data properties dialog box.
Id	Integer	RO	Unique identifier assigned to this data to distinguish it from other objects in the model.
InitializeMethod	String	RW	Method for initializing value of this data, based on scope of data: <ul style="list-style-type: none"> • If scope is Local or Output, you can set InitializeMethod to Expression or Parameter. Equivalent to setting the Initial value field in the Data properties dialog box. • If scope is Parameter, Input, or Data Store Memory, you should set InitializeMethod to Not Needed as a read-only property. • If scope is Constant, you should set InitializeMethod to Expression as a read-only property.
LoggingInfo. DataLogging	Boolean	RW	Signal logging mode: <ul style="list-style-type: none"> • 1 = log signal • 0 = do not log signal (default)

Property	Type	Access	Description
LoggingInfo. DecimateData	Boolean	RW	Limit the amount of data logged by skipping samples. Uses the interval specified by LoggingInfo.Decimation. <ul style="list-style-type: none"> • 1 = decimate logged data • 0 = do not decimate logged data (default)
LoggingInfo. Decimation	Integer	RW	Decimation interval. Default value is 2, which means the chart logs every other sample.
LoggingInfo. LimitDataPoints	Boolean	RW	Limit number of data points to log. Uses the value specified by LoggingInfo.MaxPoints. <ul style="list-style-type: none"> • 1 = limit number of points • 0 = do not limit number of points (default)
LoggingInfo. MaxPoints	Integer	RW	Maximum number of data points to log. Default value is 5000, which means the chart logs the last 5000 data points generated by the simulation.
LoggingInfo. NameMode	String	RW	Source of signal logging name: <ul style="list-style-type: none"> • `SignalName` = same as signal name (default) • `Custom` = name specified by user as LoggingInfo.UserSpecifiedLogName.
LoggingInfo. UserSpecifiedLogName	String	RW	User-specified (custom) signal logging name.

Property	Type	Access	Description
Machine	Machine	RO	Stateflow machine that contains this data.
Name	String	RW	Name of this data. Equivalent to entering the name of this data in the Name field of the Data properties dialog box.
Path	String	RO	Location of this data in the model hierarchy
Port	Integer	RW	Port index number for this data (default = 1).
Props. Array. FirstIndex	String	RW	Index of the first element of this data (default = 0) if it is an array (that is, Props.Array.Size > 1). Equivalent to entering a value of zero or greater in the First index field in the Data properties dialog box.
Props. Array. Size	String	RW	Size of this data. Assigning a positive value indicates that the data is an array of the specified size (default = 0). Equivalent to entering a positive value in the Size column for this data in the Model Explorer or the Size field in the Data properties dialog box.
Props. Complexity	Enum	RW	If set to 'On', the data can take complex values. The default value is 'Off', which indicates that the data cannot take complex values. Equivalent to setting Complexity in the Data properties dialog box.

Property	Type	Access	Description
Props. Frame	Enum	RW	If set to 'Frame based', the data supports frame-based signals. The default value is 'Sample based', which indicates that the data supports sample-based signals.
Props. Initial Value	String	RW	Initial value of this data (default = ''). Equivalent to entering a value in the Initial value column for this data in the Model Explorer or the Initial value field in the Data properties dialog box.
Props. Range. Maximum	String	RW	Maximum value (default = '') that this data can have during execution or simulation of the state machine. Equivalent to entering a value in the Maximum column for this data in the Model Explorer or the Maximum field in the Data properties dialog box.
Props. Range. Minimum	String	RW	Minimum value (default = '') that this data can have during execution or simulation of the state machine. Equivalent to entering a value in the Minimum column for this data in the Model Explorer or the Minimum field in the Data properties dialog box.

Property	Type	Access	Description
Props. Resolve To Signal Object	Integer	RW	If set to 1, the data must resolve to a Simulink.Signal object that you define in the model workspace or base workspace. The default value is 0, indicating that the data does not have to resolve to a signal object. Equivalent to setting Data must resolve to Simulink signal object in the Data properties dialog box.
Props. Type. BusObject	String	RW	If Props.Type.Method is Bus Object, you must set this property to the name of the Simulink.Bus object that defines this data. Equivalent to setting the data type Mode to Bus Object, and entering the name of a Simulink.Bus object in the Data Type Assistant of the Data properties dialog box.
Props. Type. EnumType	String	RW	If Props.Type.Method is Enumerated, you must set this property to the name of the enumerated type that defines this data. Equivalent to setting the data type Mode to Enumerated, and entering the name of an enumerated type in the Data Type Assistant of the Data properties dialog box.

Property	Type	Access	Description
Props. Type. Expression	String	RW	If Props.Type.Method is Expression, you must set this property to an expression that evaluates to a data type (see “Enter Expressions and Parameters for Data Properties” in the Stateflow documentation). Equivalent to setting the data type Mode to Expression, and entering an expression in the Data Type Assistant of the Data properties dialog box.
Props. Type. Fixpt. Bias	String	RW	The bias value for fixed-point data (default = 0.0) when Props.Type.Fixpt.ScalingMode equals Slope and bias ; otherwise this value is ignored. Equivalent to entering a real number in the Bias field of the Data Type Assistant in the Data properties dialog box.
Props. Type. Fixpt. FractionLength	String	RW	The location of the binary point in fixed-point data (default = 0) when Props.Type.Fixpt.ScalingMode equals Binary point ; otherwise this value is ignored. Equivalent to entering a positive or negative integer in the Fraction length field of the Data Type Assistant in the Data properties dialog box.

Property	Type	Access	Description
Props. Type. Fixpt. Lock	Integer	RW	If set to 1 (default = 0), prevents Simulink software from replacing the current fixed-point type with a type that the Fixed-Point Tool or Fixed-Point Advisor chooses. Equivalent to setting Lock data type setting against changes by the fixed-point tools in the Data properties dialog box.
Props. Type. Fixpt. ScalingMode	String	RW	Method for scaling fixed point data to avoid overflow conditions and minimize quantization errors. The settings are: <ul style="list-style-type: none"> • None (the default) • Binary point • Slope and bias Equivalent to setting the Scaling field of the Data Type Assistant in the Data properties dialog box.
Props. Type. Fixpt. Slope	String	RW	The slope value for fixed-point data (default = 1.0) when Props.Type.Fixpt.ScalingMode equals Slope and bias ; otherwise this value is ignored. Equivalent to entering a positive real number in the Slope field of the Data Type Assistant in the Data properties dialog box.

Property	Type	Access	Description
Props. Type. Method	String	RW	Method for setting the type of this data, based on scope: <ul style="list-style-type: none"> • If scope is Local , you can set this property to Built in, Fixed point, Enumerated, Expression, or Bus Object. • If scope is Constant, you can set this property to Built in, Fixed point, or Expression. • If scope is Parameter, Input, or Output, you can set this property to Inherit, Built in, Fixed point, Enumerated, Expression, or Bus Object. • If scope is Data Store Memory, you should set Props.Type.Method to Inherit as a read-only property. Equivalent to setting the Mode field of the Data Type Assistant in the Data properties dialog box.
Props. Type. Signed	Integer	RW	If set to 1, indicates that fixed-point data should be signed. The default value is 0, indicating that the data is unsigned. Equivalent to setting the Signedness field of the Data Type Assistant in the Data properties dialog box.
Props. Type. Units	String	RW	Units of measurement for the data value (default = '').

Property	Type	Access	Description
Props. Type. WordLength	String	RW	Size in bits of the word that will hold the quantized integer of fixed-point data. Equivalent to entering an integer in the Word length field of the Data Type Assistant in the Data properties dialog box.
SaveTo Workspace	Integer	RW	If set to 1 (default = 0), this data is saved to the MATLAB workspace. Setting this property to 1 is equivalent to selecting the SaveToWorkspace column entry for this data in the Model Explorer or selecting the Save final value to base workspace field in the Data properties dialog box.
Scope	Enum	RW	Scope of this data: <ul style="list-style-type: none"> • Local — Data defined in current Stateflow chart. • Constant — Read-only constant value that is visible to the parent Stateflow object and its children. • Parameter — Constant defined in the MATLAB workspace or derived from a Simulink parameter that is defined and initialized in the parent masked subsystem. • Input — If the parent is a graphical, truth table, or MATLAB function, the data is an input argument. Otherwise, it is provided by the Simulink

Property	Type	Access	Description
			<p>model to the Stateflow chart via an input port.</p> <ul style="list-style-type: none"> • Output — If the parent is a graphical, truth table, or MATLAB function, the data is a return value. Otherwise, it is provided by the Stateflow chart to the Simulink model via an output port. • Data Store Memory — Data that binds to a Simulink data store. • Temporary — Data that persists only during the execution of a function. • Imported — Data parented by the Simulink model, but defined in external code embedded in the Stateflow machine. • Exported — Data from the Simulink model that you provide to external code. Parent must be a Stateflow machine. <p>Equivalent to setting the Scope field in the Data properties dialog box. See “Scope” in the Stateflow documentation.</p>
TestPoint	Integer	RW	<p>If set to 1 (default = 0), sets this data as a Stateflow test point. You can monitor individual Stateflow test points with a floating scope during model simulation. You can also log test point values into MATLAB workspace objects.</p>

Property	Type	Access	Description
			See “Monitor Test Points in Stateflow Charts” in the Stateflow documentation.

Stateflow.Data Methods

Data objects have the methods in the table below.

See also “Stateflow.Data Properties” on page 2-24.

Method	Description
delete	Delete this data.
dialog	Display the Data properties dialog box.
disp	Display the property names and their settings for this Data object.
get	Return the specified property settings for this data.
help	Display a list of properties for this Data object with short descriptions.
methods	Display all nonglobal methods of this Data object.
set	Set the specified property of this Data object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this Data object.
view	Display this data in the Data properties dialog box.

Stateflow.Editor Properties

The Editor object has the properties shown below. See also “Stateflow.Editor Methods” on page 2-36.

Property	Type	Access	Description
WindowPosition	Rect	RW	<p>Position and size of this Stateflow chart given in the form of a 1-by-4 array consisting of the following:</p> <ul style="list-style-type: none"> • (x,y) coordinates for the window's left bottom vertex relative to the lower left corner of the screen • Width and height of the box <p>Default value = [124.3125 182.8125 417 348.75]</p>
ZoomFactor	Double	RW	<p>View magnification level (zoom factor) of this chart in the editor. A value of 1 corresponds to a zoom factor of 100%, 2 to a value of 200%, and so on. Default value = 1.</p>

Stateflow.Editor Methods

The Editor object has the methods in the table below.

See also “Stateflow.Editor Properties” on page 2-35.

Method	Description
disp	Display the property names and their settings for this Editor object.
get	Return the specified property settings for the Editor object.
help	Display a list of properties for this Editor object with short descriptions.
methods	Display all nonglobal methods of this Editor object.
set	Set the specified property of this Editor object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this Editor object.
zoomIn and zoomOut	Cause the chart to zoom in or zoom out in the editor.

Stateflow.EMFunction Properties

Stateflow API objects for MATLAB functions have the properties shown below. See also “Stateflow.EMFunction Methods” on page 2-39.

Property	Type	Access	Description
ArrowSize	Double	RW	Size of transition arrows coming into the MATLAB function in the Stateflow chart (default = 8).
BadIntersection	Boolean	RO	If true, this MATLAB function graphically intersects a state, box, graphical function, truth table, or another MATLAB function.
Chart	Chart	RO	Chart object containing this MATLAB function.
Description	String	RW	Description of this MATLAB function (default = ''). Equivalent to entering a description in the Description field of the properties dialog box for this MATLAB function.
Document	String	RW	Document link to this MATLAB function. Equivalent to entering the Document Link field of the properties dialog box for this MATLAB function.
FontSize	Double	RW	Size of the (default = 12) font of the label text for this MATLAB function. This property overrides the font size set for this MATLAB function at creation by the <code>StateFont.Size</code> property of the containing Chart object.
Id	Integer	RO	Unique identifier assigned to this MATLAB function to distinguish it from other objects in the model.

Property	Type	Access	Description
LabelString	String	RW	Full label for this MATLAB function (default = '()') including its return, name, and arguments. Equivalent to typing the label for this MATLAB function in its label text field in the chart.
Machine	Machine	RO	Machine that contains this MATLAB function.
Name	String	RW	Name of this MATLAB function (default = ''). Equivalent to typing a name for this MATLAB function into the label text field in the chart. Label syntax is <i>return = Name (arguments)</i> .
Position	Rect	RW	Position and size of this MATLAB function in the chart, given in the form of a 1-by-4 array (default is [0 0 90 60]) consisting of the following: <ul style="list-style-type: none"> • (x,y) coordinates for the box's upper left vertex relative to the upper left vertex of the chart • Width and height of the box
Script	String	RW	String that holds the lines of code in the MATLAB function. For example, you can use the property to define code in this way: <pre>fcn = Stateflow.EMFunction(c); str = sprintf('y=proc(x)\n y=x;'); fcn.script = str;</pre>
Subviewer	Chart or State	RO	State or chart in which you can graphically view this MATLAB function.
Tag	Any Type	RW	Holds data of any type (default = []) for this MATLAB function.

Stateflow.EMFunction Methods

MATLAB Function objects have the methods in the table below.

See also “Stateflow.EMFunction Properties” on page 2-37.

Method	Description
<code>delete</code>	Delete this MATLAB function from the Stateflow chart.
<code>dialog</code>	Display the properties dialog box of this MATLAB function.
<code>disp</code>	Display the property names and their settings for this MATLAB function object.
<code>find</code>	Find all objects that this MATLAB function contains that meet the specified criteria.
<code>fitToView</code>	Zoom in on this MATLAB function and highlight it in the chart.
<code>get</code>	Return the specified property settings for this MATLAB function.
<code>help</code>	Display a list of properties for this MATLAB function with short descriptions.
<code>highlight</code>	Highlight this object in the chart.
<code>methods</code>	Display all nonglobal methods of this MATLAB function object.
<code>set</code>	Set the specified property of this MATLAB function object with the specified value.
<code>struct</code>	Return and display a MATLAB structure containing the property settings of this MATLAB function object.
<code>view</code>	Opens this MATLAB function in its editor.

Stateflow.Event Properties

Stateflow API objects of type Event have the properties shown below. See also “Stateflow.Event Methods” on page 2-42.

Property	Type	Access	Description
Debug. Breakpoints. StartBroadcast	Boolean	RW	If set to true (default = false), set a debugger breakpoint for the start of the broadcast of the selected local or input event. Equivalent to selecting the Start of broadcast check box in the Event properties dialog box.
Debug. Breakpoints. EndBroadcast	Boolean	RW	If set to true (default = false), set a debugger breakpoint for the end of the broadcast of the selected local event. Equivalent to selecting the End of broadcast check box in the Event properties dialog box.
Description	String	RW	Description of this event (default = ''). Equivalent to entering a description in the Description field in the Event properties dialog box.
Document	String	RW	Document link to this event (default = ''). Equivalent to entering the Document Link field in the Event properties dialog box.
Id	Integer	RO	Unique identifier assigned to this event to distinguish it from other objects in the model.
Machine	Machine	RO	Machine to which this event belongs.
Name	String	RW	Name of this event (default = event n , where n is a counter of events with the name root event). Equivalent to entering the name in the Name field of the Event properties dialog box.
Port	Integer	RO	Port index number for this event (default = 1).

Property	Type	Access	Description
Scope	Enum	RW	<p>Scope of this event. Allowed values vary with the object containing this data.</p> <p>The following applies to any event:</p> <ul style="list-style-type: none"> • 'Local' <p>The following apply to events for charts only:</p> <ul style="list-style-type: none"> • 'input' (Input from Simulink in properties dialog box) • 'Output' (Output to Simulink in properties dialog box) <p>The following apply to events for machines only:</p> <ul style="list-style-type: none"> • 'Imported' • 'Exported'
Tag	Any Type	RW	<p>Holds data of any type (default = []) for this event.</p>
Trigger	Enum	RW	<p>Type of signal that triggers this chart input event. Also the type of trigger associated with this chart output event. Equivalent to the entries for the Trigger field in the Event properties dialog box.</p> <p>The following triggers apply to both chart input and output events:</p> <ul style="list-style-type: none"> • 'Either' (Either Edge) • 'Function call' (Function Call)

Property	Type	Access	Description
			<p>The following triggers apply only to chart input events:</p> <ul style="list-style-type: none"> • 'Rising' (Rising Edge) • 'Falling' (Falling Edge)

Stateflow.Event Methods

Event objects have the methods in the table below.

See also “Stateflow.Event Properties” on page 2-39.

Method	Description
delete	Delete this event.
dialog	Display the Event properties dialog box.
disp	Display the property names and their settings for this Event object.
get	Return the specified property settings for this event.
help	Display a list of properties for this Event object with short descriptions.
methods	Display all nonglobal methods of this Event object.
set	Set the specified property of this Event object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this Event object.
view	Display this event in its properties dialog box.

Stateflow.Function Properties

Stateflow API objects of type Function have the properties shown below. See also “Stateflow.Function Methods” on page 2-45.

Property	Type	Access	Description
ArrowSize	Double	RW	Size of transition arrows coming into this graphical function (default = 8).
BadIntersection	Boolean	RO	If true, this function graphically intersects a state, box, MATLAB function, truth table, or another graphical function.
Chart	Chart	RO	Chart object containing this function.
Debug. Breakpoints. OnDuring	Boolean	RW	If true, sets the during breakpoint for this graphical function. Equivalent to selecting the Function Call check box in the properties dialog box for this graphical function.
Description	String	RW	Description of this function (default = ''). Equivalent to entering a description in the Description field of the properties dialog box for this graphical function.
Document	String	RW	Document link to this function. Equivalent to entering a link in the Document Link field of the properties dialog box for this graphical function.
FontSize	Double	RW	Size of the (default = 12) font of the label text for this function. This property overrides the font size set for this function at creation by the <code>StateFont.Size</code> property of the containing Chart's object.
Id	Integer	RO	Unique identifier assigned to this function to distinguish it from other objects in the model.

Property	Type	Access	Description
InlineOption	String	RW	<p>Determine how generated code for this graphical function appears. Possible settings are:</p> <ul style="list-style-type: none"> • 'Inline' — Call to function is replaced by code. • 'Function' — Function becomes a C function. • 'Auto' — Determines if the function is inlined or made a function through an internal calculation.
IsGrouped	Boolean	RW	If set to true (default = false), group this function.
IsSubchart	Boolean	RW	If set to true (default = false), make this function a subchart.
LabelString	String	RW	Label for this function (default = ' () '). Equivalent to typing the label for this function in its label text field in the chart.
Machine	Machine	RO	Machine that contains this function.
Name	String	RW	Name of this function (default = ' '). Equivalent to typing this function's name into the beginning of the label text field after the word 'function' in the chart.
Position	Rect	RW	<p>Position and size of this function's box in the chart, given in the form of a 1-by-4 array (default is [0 0 90 60]) consisting of the following:</p> <ul style="list-style-type: none"> • (x,y) coordinates for the box's upper left vertex relative to the upper left vertex of the chart • Width and height of the box

Property	Type	Access	Description
Subviewer	Chart or State	RO	State or chart in which this function can be graphically viewed.
Tag	Any Type	RW	Holds data of any type (default = []) for this function.

Stateflow.Function Methods

Function objects have the methods in the table below.

See also “Stateflow.Function Properties” on page 2-42.

Method	Description
defaultTransitions	Return the default transitions in this function at the top level of containment.
delete	Delete this function from the Stateflow chart.
dialog	Display the properties dialog box of this graphical function.
disp	Display the property names and their settings for this Function object.
find	Find all objects that this graphical function contains that meet the specified criteria.
fitToView	Zoom in on this graphical function and highlight it in the chart.
get	Return the specified property settings for this function.
help	Display a list of properties for this Function object with short descriptions.
highlight	Highlight this object in the chart.
methods	Display all nonglobal methods of this Function object.
set	Set the specified property of this Function object with the specified value.

Method	Description
struct	Return and display a MATLAB structure containing the property settings of this Function object.
view	Display this function's chart in the editor with this state highlighted.

Stateflow.Junction Properties

Stateflow API objects of type Junction have the properties shown below. See also “Stateflow.Junction Methods” on page 2-47.

Property	Type	Access	Description
ArrowSize	Double	RW	Size of transition arrows (default = 8) coming into this junction.
Chart	Chart	RO	Chart that this junction resides in.
Description	String	RW	Description of this junction (default = ''). Equivalent to entering a description in the Description field of the Junction properties dialog box.
Document	String	RW	Document link to this junction (default = ''). Equivalent to entering the Document link field of the Junction properties dialog box.
Id	Integer	RO	Unique identifier assigned to this junction to distinguish it from other objects in the model.
Machine	Machine	RO	Machine containing this junction.
Position.Center	Rect	RW	Position of the center of this junction (default = [10 10]) relative to the upper left corner of the parent chart or state as an [x,y] point array.
Position.Radius	Rect	RO	Radius of this junction (default = 10).
Subviewer	Chart or State	RO	State or chart in which this junction can be graphically viewed.

Property	Type	Access	Description
Tag	Any Type	RW	Holds data of any type (default = []) for this junction.
Type	Enum	RO	Type of this junction. For junctions, can be 'CONNECTIVE' (default) or 'HISTORY'

Stateflow.Junction Methods

Junction objects have the methods in the table below.

See also “Stateflow.Junction Properties” on page 2-46.

Method	Description
delete	Delete this junction from the Stateflow chart.
dialog	Display the Junction properties dialog box.
disp	Display the property names and their settings for this Junction object.
fitToView	Zoom in on this junction and highlight it in the chart.
get	Return the specified property settings for this junction.
help	Display a list of properties for this Junction object with short descriptions.
highlight	Highlight this object in the chart.
methods	Display all nonglobal methods of this Junction object.
set	Set the specified property of this Junction object with the specified value.
sinkedTransitions	Return all transitions whose destination is this junction.
sourcedTransitions	Return all transitions whose source is this junction.
struct	Return and display a MATLAB structure containing the property settings of this Junction object.
view	Display this junction’s chart in the editor with this junction highlighted.

Stateflow.Machine Properties

Stateflow API objects of type Machine have the properties shown below. See also “Stateflow.Machine Methods” on page 2-51.

Property	Type	Access	Description
Created	String	RO	Date of creation of this machine.
Creator	String	RW	Creator (default = 'Unknown') of this machine.
Debug. Animation. Enabled	Boolean	RW	If set to true (default), animation (simulation) is enabled. If false, disabled. Equivalent to the Enabled or Disabled radio button in the Debugger window.
Debug. Animation. Delay	Double	RW	Specify a value to delay (slow down) animation (default value = 0). Equivalent to the Delay (sec) field in the Debugger window.
Debug. BreakOn. ChartEntry	Boolean	RW	If set to true (default = false), set the chart entry breakpoint for all charts in this machine. Equivalent to the Chart Entry check box in the Debugger window.
Debug. BreakOn. EventBroadcast	Boolean	RW	If set to true (default = false), set the event broadcast breakpoint for all charts in this machine. Equivalent to the Event Broadcast check box in the Debugger window.
Debug. BreakOn. StateEntry	Boolean	RW	If set to true (default = false), set the state entry breakpoint for all charts in this machine. Equivalent to the State Entry check box in the Debugger window.

Property	Type	Access	Description
Debug. DisableAllBreakpoints	Boolean	RW	If set to true (default = false), disable the use of all breakpoints in this machine. Equivalent to the Disable all check box in the Debugger window.
Debug. RunTimeCheck. CycleDetection	Boolean	RW	If set to true, check for cyclical behavior errors during a debug session. Equivalent to the Detect Cycles check box in the Debugger window.
Debug. RunTimeCheck. DataRangeChecks	Boolean	RW	If set to true (default), check for data range violations during a debug session. Equivalent to the Data Range check box in the Debugger window.
Debug. RunTimeCheck. StateInconsistencies	Boolean	RW	If set to true (default), check for state inconsistencies during a debug session. Equivalent to the State Inconsistency check box in the Debugger window.
Debug. RunTimeCheck. TransitionConflicts	Boolean	RW	If set to true (default), check for transition conflicts during a debug session. Equivalent to the Transition Conflict check box in the Debugger window.
Description	String	RW	Description of this state (default = ''). Equivalent to entering a description in the Description field of the properties dialog box for this machine.
Dirty	Boolean	RW	If true (default), this model has changed since it was opened or saved.

Property	Type	Access	Description
Document	String	RW	Document link to this machine (default = ''). Equivalent to entering the Document link field of the properties dialog box for this machine.
EnableBitOps	Boolean	RW	If true, recognize C bitwise operators (~, &, , ^, >>, and so on) in action statements for all C charts in the model and encode them as C bitwise operations.
FullFileName	String	RO	Full path name of file (default value = '') under which this machine (model) is stored.
Iced	Boolean	RO	Equivalent to property Locked (default = false) except that this property is used internally to lock this model from being changed during activities such as simulation.
Id	Integer	RO	Unique identifier assigned to this machine to distinguish it from other objects loaded in memory.
isLibrary	Boolean	RO	If true (default = false), specifies that the current model builds a library and not an application.
Locked	Boolean	RW	If set to true (default = false), prevents user from changing any Stateflow chart in this model.
Machine	Machine	RO	A handle to the Machine object for this Machine object, that is, this Machine object.
Modified	String	RW	Comment area (default = '') for entering date and name of modification to this model.

Property	Type	Access	Description
Name	String	RO	Name of this model (default = 'untitled') set when saved to disk.
SfVersion	Double	RO	Full version number for current Stateflow software. For example, the string '41112101' appears for Stateflow software version 4.1.1 and MATLAB software version 12.1. The remaining '01' is for internal use.
Tag	Any Type	RW	A field you can use to hold data of any type for this machine (default = []).
Version	String	RW	Comment string (default = 'none') for recording the version of this model.

Stateflow.Machine Methods

Machine objects have the methods in the table below.

See also “Stateflow.Machine Properties” on page 2-48.

Method	Description
dialog	Display the properties dialog box of this machine.
disp	Display the property names and their settings for this Machine object.
find	Find all objects that this machine contains that meet the specified criteria. Note Do not use the <code>-depth</code> switch with the <code>find</code> method for a machine object.
get	Return the specified property settings for this machine.
help	Display a list of properties for this Machine object with short descriptions.

Method	Description
methods	Display all nonglobal methods of this Machine object.
parse	Parse all the charts in this machine.
set	Set the specified property of this Machine object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this Machine object.

Stateflow.Note Properties

Stateflow API objects of type Note have the properties shown below. See also “Stateflow.Note Methods” on page 2-55.

Property	Type	Access	Description
Alignment	Enum	RW	Alignment of text in note box. Can be 'LEFT' (default), 'CENTER', or 'RIGHT'.
AutoBackgroundColor	String	RW	Use automatic background color. Options are '0' (off) or '1' (on, the default).
AutoForegroundColor	String	RW	Use automatic foreground (text) color. Options are '0' (off) or '1' (on, the default).
BackgroundColor	String	RW	Background color of this note. RGB value array string [r,g,b,a] where r, g, b, and a are the red, green, blue, and alpha values of the color normalized to the range 0.0 to 1.0, delineated with commas. The alpha value is optional and ignored. Note background color can also be 'black', 'white', 'red', 'green', 'blue', 'cyan', 'magenta', 'yellow', 'gray', 'lightBlue', 'orange', 'darkGreen'.
Chart	Chart	RO	Chart object containing this note.

Property	Type	Access	Description
ClickFcn	String	RW	MATLAB code to be executed when a user single-clicks this note. Stateflow stores the code entered in this field with the chart. See “Associate Click Functions with Annotations” for more information.
DeleteFcn	String	RW	MATLAB code to be executed before deleting this note. See “Annotation Callback Functions”.
Description	String	RW	Description of this note (default = ''). Equivalent to entering a description in the Description field of the Note properties dialog box.
Document	String	RW	Document link to this note (default = ''). Equivalent to entering a link in the Document link field of the Note properties dialog box.
DropShadow	String	RW	Display a drop shadow. Options are '1' or '0'.
FixedHeight	Numeric	RW	Resize the bottom border of the note as you add content. Options are '0' or '1', where '0' means that the bottom border resizes as you add content.
FixedWidth	Numeric	RW	Wrap text at fixed note box border. Choices are '0' or '1', where '0' means not to use wordwrap.
Font. Name	String	RO	Name of the font (default = 'Helvetica') for the text in this note. This property is set by the StateFont.Name property of the Chart object containing this note.
Font. Angle	String	RW	Style of the font for the text in this note. Can be 'ITALIC' or 'NORMAL' (default). This property overrides the default style for this note, which is set by the StateFont.Angle property of the Chart object containing this note.

Property	Type	Access	Description
Font. Size	Double	RW	Size of the font (default = 12) for the label text for this note. This property overrides the font size set for this note at creation by the <code>StateFont.Size</code> property of the containing Chart's object. Equivalent to selecting Font Size > < font size > in the context menu for this note.
Font. Weight	String	RW	Weight of the font for the label text for this note. Can be 'BOLD' or 'NORMAL' (default). This property overrides the default weight for the text in this note, which is set by the <code>StateFont.Weight</code> property of the Chart object containing this note.
ForegroundColor	String	RW	Foreground (text) color of this note. RGB value array string [r,g,b,a] where r, g, b, and a are the red, green, blue, and alpha values of the color normalized to the range 0.0 to 1.0, delineated with commas. The alpha value is optional and ignored. Note background color can also be 'black', 'white', 'red', 'green', 'blue', 'cyan', 'magenta', 'yellow', 'gray', 'lightBlue', 'orange', 'darkGreen'.
Id	Integer	RO	Unique identifier assigned to this note to distinguish it from other objects in the model.
InternalMargins	Array	RW	The space from the bounding box of text to the borders of the note. Use a 1x4 array [left top right bottom]. The default is [1 1 1 1] . The maximum value for a coordinate is 32767.
Interpretation	Enum	RW	How the text in this note is interpreted for text processing. Can be 'OFF' (default), 'RICH', or 'TEX'.

Property	Type	Access	Description
LoadFcn	String	RW	MATLAB code to be executed when the model containing this note is loaded. See “Annotation Callback Functions”.
Machine	Machine	RO	Machine that contains this note.
Path	String	RO	Path to the note.
PlainText	Vector	RO	Display of the text in the note, without formatting.
Position	Rect	RW	Position and size of the note box in the chart, given in the form of a 1-by-4 array [left top right bottom]. The maximum value for a coordinate is 32767.
Subviewer	Chart or State	RO	State or chart in which this note can be graphically viewed.
Tag	Any Type	RW	Holds data of any type (default = []) for this note.
Text	String	RW	Label for this note (default = '?'). The text content for this note that you enter directly into the note in the chart or in the Label field of the Note properties dialog box.
UseDisplayText-AsClickCallback	String	RW	Use the contents of the Text property as the click function for this note. Options are 'on' or 'off'. If set to 'on', the text of the note is interpreted as a valid MATLAB expression and run. If set to 'off', clicking the note runs the click function, if there is one. If there is no click function, clicking the note has no effect. See “Associate Click Functions with Annotations” for more information.

Stateflow.Note Methods

Note objects have the methods in the table below.

See also “Stateflow.Note Properties” on page 2-52.

Method	Description
delete	Delete this note from the Stateflow chart.
dialog	Display the Note properties dialog box.
disp	Display the property names and their settings for this Note object.
fitToView	Zoom in on this note and highlight it in the chart.
get	Return the specified property settings for this note.
help	Display a list of properties for this Note object with short descriptions.
methods	Display all nonglobal methods of this Note object.
set	Set the specified property of this Note object with the specified value.
setImage	Insert image from clipboard or image file into a note, or change an image annotation to a text annotation.
struct	Return and display a MATLAB structure containing the property settings of this Note object.
view	Display this note's chart in the editor with this note highlighted.

Root Methods

The Root object has the methods in the table below.

Method	Description
find	Find all objects that this Root object contains that meet the specified criteria.
get	Return the specified property settings for the Root object.
help	Display a list of properties for the Root object with short descriptions.
methods	Display all nonglobal methods of this Root object.
set	Set the specified property of this Root object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this Root object.

Stateflow.SLFunction Properties

Stateflow API objects of type Simulink Function have the properties shown below. See also “Stateflow.SLFunction Methods” on page 2-58.

Property	Type	Access	Description
ArrowSize	Double	RW	Size of transition arrows coming into this Simulink function (default = 8).
BadIntersection	Boolean	RO	If true, this function graphically intersects a state, box, MATLAB function, graphical function, truth table, or another Simulink function.
Chart	Chart	RO	Chart object containing this function.
Description	String	RW	Description of this function (default = ' ').
Document	String	RW	Document link to this note.
FontSize	Double	RW	Size of the font (default = 12) of the label text for this function. This property overrides the font size set for this function at creation by the <code>StateFont.Size</code> property of the containing Chart's object.
Id	Integer	RO	Unique identifier assigned to this function to distinguish it from other objects in the model.
LabelString	String	RW	Label for this function. Equivalent to typing the label for this function in its label text field in the chart.
Machine	Machine	RO	Machine that contains this function.
Name	String	RW	Name of this function (default = 'simfcn'). Equivalent to typing the name of this function in its label text field in the chart.

Property	Type	Access	Description
Position	Rect	RW	Position and size of this function box in the chart, given in the form of a 1-by-4 array (default is [0 0 90 60]) that consists of the following: <ul style="list-style-type: none"> • (x,y) coordinates for the box's upper left vertex relative to the upper left vertex of the chart • Width and height of the box
Subviewer	Chart	RO	Chart in which this function can be graphically viewed.
Tag	Any Type	RW	A field you can use to hold data of any type for this function.

Stateflow.SLFunction Methods

Simulink Function objects have the methods in the table below.

See also “Stateflow.SLFunction Properties” on page 2-57.

Method	Description
delete	Delete this function from the Stateflow chart.
disp	Display the property names and their settings for this Simulink Function object.
find	Find all objects that this Simulink function contains that meet the specified criteria.
fitToView	Zoom in on this Simulink function and highlight it in the chart.
get	Return the specified property settings for this function.
help	Display a list of properties for this Simulink Function object with short descriptions.
highlight	Highlight this object in the chart.
methods	Display all nonglobal methods of this Simulink Function object.

Method	Description
set	Set the specified property of this Simulink Function object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this Simulink Function object.
view	Display the contents of the subsystem inside this Simulink function.

Stateflow.State Properties

Stateflow API objects of type State have the properties shown below. See also “Stateflow.State Methods” on page 2-65.

Property	Type	Access	Description
ArrowSize	Double	RW	Size of transition arrows coming into this state (default = 8).
BadIntersection	Boolean	RO	If true, this state graphically intersects a box, MATLAB function, graphical function, truth table, or another state.
Chart	Chart	RO	Chart object containing this state.
Debug. Breakpoints. OnDuring	Boolean	RW	If set to true (default = false), set the state during breakpoint for this chart. Equivalent to selecting the State During check box in the State properties dialog box.
Debug. Breakpoints. OnEntry	Boolean	RW	If set to true (default = false), set the state entry breakpoint for this chart. Equivalent to selecting the State Entry check box in the State properties dialog box.

Property	Type	Access	Description
Debug. Breakpoints. OnExit	Boolean	RW	If set to true (default = false), set the state exit breakpoint for this chart. Equivalent to selecting the State Exit check box in the State properties dialog box.
Decomposition	Enum	RW	Set this property to 'EXCLUSIVE_OR' (default) to specify exclusive (OR) decomposition for the states at the first level of containment in this state. Set to 'PARALLEL_AND' to specify parallel (AND) decomposition for these states. Equivalent to the Decomposition selection in the context menu for the state.
Description	String	RW	Description of this state (default = ''). Equivalent to entering a description in the Description field of the State properties dialog box.
Document	String	RW	Document link to this state (default = ''). Equivalent to entering a link in the Document link field of the State properties dialog box.

Property	Type	Access	Description
ExecutionOrder	Integer	RW	Specifies the order in which this state wakes up for parallel (AND) decomposition. Equivalent to the Execution Order selection in the context menu for the state. The UserSpecifiedState TransitionExecutionOrder property of the parent chart must be true. Otherwise, this property does not apply.
FontSize	Double	RW	Size of the font (default = 12) for the label text for this state. This property overrides the font size set for this state at creation by the StateFont.Size property of the containing Chart's object.
HasOutputData	Boolean	RW	If set to true (default = false), create a data output port on the Stateflow block for this state in either self or child activity mode. OutputMonitoringMode will indicate the mode. Equivalent to selecting the Create Output port for monitoring check box in the properties dialog box.
Id	Integer	RO	Unique identifier assigned to this state to distinguish it from other objects in the model.

Property	Type	Access	Description
InlineOption	String	RW	<p>Determine how generated code for this state appears. Possible settings are:</p> <ul style="list-style-type: none"> • 'Inline' — Call to function is replaced by code. • 'Function' — Function becomes a C function. • 'Auto' — Determines if the function is inlined or made a function through an internal calculation. <p>For guidelines on controlling inlining of state functions, see “Inline State Functions in Generated Code” in the Stateflow documentation.</p>
IsGrouped	Boolean	RW	<p>If set to true (default = false), group this state.</p> <p>Nothing can change inside a grouped state.</p> <p>This property is also useful for copying states to a new location. See “Copy by Grouping” on page 1-34.</p>
IsSubchart	Boolean	RW	<p>If set to true (default = false), make this state a subchart.</p>
LabelString	String	RW	<p>Label for this state (default = '?'). Equivalent to typing the label for this state in its label text field in the chart.</p>

Property	Type	Access	Description
LoggingInfo. DataLogging	Boolean	RW	Signal logging mode: <ul style="list-style-type: none"> • 1 = log signal • 0 = do not log signal (default)
LoggingInfo. DecimateData	Boolean	RW	Limit the amount of data logged by skipping samples. Uses the interval specified by LoggingInfo. Decimation. <ul style="list-style-type: none"> • 1 = decimate logged data • 0 = do not decimate logged data (default)
LoggingInfo. Decimation	Integer	RW	Decimation interval. Default value is 2, which means the chart logs every other sample.
LoggingInfo. LimitDataPoints	Boolean	RW	Limit number of data points to log. Uses the value specified by LoggingInfo. MaxPoints. <ul style="list-style-type: none"> • 1 = limit number of points • 0 = do not limit number of points (default)
LoggingInfo. MaxPoints	Integer	RW	Maximum number of data points to log. Default value is 5000, which means the chart logs the last 5000 data points generated by the simulation.

Property	Type	Access	Description
LoggingInfo. NameMode	String	RW	Source of signal logging name: <ul style="list-style-type: none"> • `SignalName` = same as signal name (default) • `Custom` = name specified by user as LoggingInfo. UserSpecifiedLogName.
LoggingInfo. UserSpecifiedLogName	String	RW	User-specified (custom) signal logging name.
Machine	Machine	RO	Machine containing this state.
Name	String	RW	Name of this state (default = ''). Equivalent to typing this state's name into the beginning of the label text field for this state in the chart. Name is separated from the rest of the state label by a forward slash (/) character.
OutputMonitoringMode	String	RO	If HasOutputData is true, then OutputMonitoringMode indicates the monitoring mode either as `ChildActivity` or `SelfActivity`.
Position	Rect	RW	Position and size of this state's box in the chart, given in the form of a 1-by-4 array (default is [0 0 90 60]) consisting of the following: <ul style="list-style-type: none"> • (x,y) coordinates for the box's upper left vertex relative to the upper left vertex of the chart • Width and height of the box
Subviewer	Chart or State	RO	Chart or state in which you can graphically view this state.

Property	Type	Access	Description
Tag	Any Type	RW	Holds data of any type (default = []) for this state.
TestPoint	Integer	RW	If set to 1 (default = 0), sets this state as a Stateflow test point. See “Monitor Test Points in Stateflow Charts” in the Stateflow documentation.
Type	Enum	RO	Type of this state (default = 'OR'). Can be 'OR' (exclusive) or 'AND' (parallel). The type of this state is determined by the parent's Decomposition property.

Stateflow.State Methods

State objects have the methods in the table below.

See also “Stateflow.State Properties” on page 2-59.

Method	Description
defaultTransitions	Return the default transitions in this state at the top level of containment.
delete	Delete this state.
dialog	Display the State properties dialog box.
disp	Display the property names and their settings for this State object.
find	Find all objects that this state contains that meet the specified criteria.
fitToView	Zoom in on this state and highlight it in the chart.
get	Return the specified property settings for this state.
help	Display a list of properties for this State object with short descriptions.

Method	Description
highlight	Highlight this object in the chart.
innerTransitions	Return the inner transitions that originate with this state and terminate on a contained object.
methods	Display all nonglobal methods of this State object.
outerTransitions	Return an array of transitions that exit the outer edge of this state and terminate on an object outside the containment of this state.
outputData	Output the activity status of this state to the Simulink base workspace via a data output port on the Stateflow block of this state.
set	Set the specified property of this State object with the specified value.
sinkedTransitions	Return all inner and outer transitions whose destination is this state.
sourcedTransitions	Return all inner and outer transitions whose source is this state.
struct	Return and display a MATLAB structure containing the property settings of this State object.
view	Display this state's chart in the editor with this state highlighted.

Stateflow.Transition Properties

Stateflow API objects of type Transition have the properties shown below. See also “Stateflow.Transition Methods” on page 2-70.

Property	Type	Access	Description
ArrowSize	Double	RW	Size of the arrow (default = 10) for this transition.
Chart	Chart	RO	Stateflow chart object containing this transition.
Debug. Breakpoints. WhenTested	Boolean	RW	If set to true (default = false), set a debugging breakpoint to occur when this transition is tested to see whether it is a valid transition or not. Equivalent to selecting the When Tested check box in the properties dialog box of this transition.
Debug. Breakpoints. WhenValid	Boolean	RW	If set to true (default = false), set a debugging breakpoint to occur when this transition has tested as valid. Equivalent to selecting the When Valid check box in the properties dialog box of this transition.
Description	String	RW	Description of this transition (default = ''). Equivalent to entering a description in the Description field of the properties dialog box for this transition.
Destination	State, Box, or Junction	RW	Destination state, box, or junction of this transition. You can also use the property Destination to detach the destination endpoint of a transition, with the command <code>t.Destination = []</code> , where <code>t</code> is the Transition object.

Property	Type	Access	Description
DestinationEndPoint	Double	RW	<p>Provides [x y] coordinates for the transition endpoint at its destination. The coordinates are relative to the upper left corner of the chart, which is [0 0].</p> <p>If you enter non-integer values, only the integer part of the value is used.</p> <p>If you enter negative values for the coordinates, [0 0] is used instead.</p>
DestinationOClock	Double	RW	<p>Location of transition destination connection on state. Varies from 0 to 12 for full clock cycle location. Its value is taken as modulus 12 of its assigned value.</p>
Document	String	RW	<p>Document link to this transition (default = ''). Equivalent to entering the Document link field of the properties dialog box for this transition.</p>
ExecutionOrder	Integer	RW	<p>Specifies the number for this transition in the execution order for its source (see “Evaluation Order for Outgoing Transitions” in the Stateflow documentation). The <code>UserSpecifiedStateTransitionExecutionOrder</code> property of the parent chart has to be set to <code>true</code>, otherwise, this transition property will be ignored. <code>ExecutionOrder</code> has to be an integer between 1 and m, where m is the total number of transitions originating from the source.</p>
FontSize	Double	RW	<p>Size of the font (default = 12) for the label text for this box. This property overrides the default size for this box, which is set by the <code>TransitionFont.Size</code> property of the Chart object containing this box.</p>

Property	Type	Access	Description
Id	Integer	RO	Unique identifier assigned to this transition to distinguish it from other objects in the model.
LabelPosition	Double	RW	Position and size of this transition label in the chart, given in the form of a 1-by-4 array (default = [0 0 8 14]) that includes: <ul style="list-style-type: none"> • (x,y) coordinates for the label's upper left corner relative to the upper left corner of the chart, which is [0 0] • Width and height of the label
LabelString	String	RW	Label for this transition (default = '?'). Equivalent to typing the label for this transition in its label text field in the chart.
Machine	Machine	RO	Machine containing this transition.
MidPoint	Double	RW	Provides [x y] coordinates of the transition midpoint relative to the upper left corner of the chart, which is [0 0].
Source	State, Box, or Junction	RW	Source state, box, or junction of this transition. You can also use the property Source to detach the source endpoint of a transition, with the command <code>t.Source = []</code> , where <code>t</code> is the Transition object.
SourceEndPoint	Double	RW	Provides [x y] coordinates for the transition endpoint at its source. The coordinates are relative to the upper left corner of the chart, which is [0 0]. If you enter non-integer values, only the integer part of the value is used. If you enter negative values for the coordinates, [0 0] is used instead.

Property	Type	Access	Description
SourceClock	Double	RW	Location of transition source connection on state. Varies from 0 to 12 for full clock cycle location. The value taken for this property is the modulus 12 of the entered value.
Subviewer	Chart or State	RO	State or chart in which this transition can be graphically viewed.
Tag	Any type	RW	Holds data of any type (default = []) for this transition.

Stateflow.Transition Methods

Transition objects have the methods in the table below.

See also “Stateflow.Transition Properties” on page 2-67.

Method	Description
delete	Delete this transition from the Stateflow chart.
dialog	Display the properties dialog box of this transition.
disp	Display the property names and their settings for this Transition object.
fitToView	Zoom in on this transition and highlight it in the chart.
get	Return the specified property settings for this transition.
help	Display a list of properties for this Transition object with short descriptions.
highlight	Highlight this object in the chart.
methods	Display all nonglobal methods of this Transition object.
set	Set the specified property of this Transition object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this Transition object.
view	Display this transition’s chart in the editor with this transition highlighted.

Stateflow.TruthTable Properties

Stateflow API objects of type TruthTable have the properties shown below. See also “Stateflow.TruthTable Methods” on page 2-73.

Property	Type	Access	Description
ActionTable	Cell Array	RW	A cell array of strings containing the contents of the Action Table for this truth table.
ArrowSize	Double	RW	Size of transition arrows coming into the truth table function in the chart (default = 8).
BadIntersection	Boolean	RO	If true, this truth table graphically intersects a state, box, MATLAB function, graphical function, or another truth table.
Chart	Chart	RO	Chart object containing this truth table.
ConditionTable	Cell Array	RW	A cell array of strings containing the contents of the Condition Table for this truth table, including the Actions row.
Debug. Breakpoints. OnDuring	Boolean	RW	If true, sets the during breakpoint for this truth table. Equivalent to selecting the Function Call check box in the Truth Table properties dialog box.
Description	String	RW	Description of this truth table (default = ''). Equivalent to entering a description in the Description field of the Truth Table properties dialog box.
Document	String	RW	Document link to this truth table. Equivalent to entering a link in the Document link field of the Truth Table properties dialog box.
FontSize	Double	RW	Size of the (default = 12) font of the label text for this truth table. This property overrides the font size set for this truth table at creation by the <code>StateFont.Size</code> property of the containing Chart's object.

Property	Type	Access	Description
Id	Integer	RO	Unique identifier assigned to this truth table to distinguish it from other objects in the model.
LabelString	String	RW	Full label for this truth table (default = '()') including its return, name, and arguments. Equivalent to typing the label for this truth table in its label text field in the chart.
Machine	Machine	RO	Machine that contains this truth table.
Name	String	RW	Name of this truth table (default = ''). Equivalent to typing a name for this truth table into the label text field of the truth table box in the chart. Label syntax is <i>return = Name (arguments)</i> .
OverSpecDiagnostic	String	RW	Interprets the error diagnosis of this truth table as overspecified according to the possible values 'Error', 'Warning', or 'None'. In the Truth Table Editor, the value of this property is assigned by selecting Overspecified from the Settings menu item and then selecting one of the three values.
Position	Rect	RW	Position and size of this truth table's box in the chart, given in the form of a 1-by-4 array (default is [0 0 90 60]) consisting of the following: <ul style="list-style-type: none"> (x,y) coordinates for the box's upper left vertex relative to the upper left vertex of the chart

Property	Type	Access	Description
			<ul style="list-style-type: none"> Width and height of the box
Subviewer	Chart or State	RO	State or chart in which this truth table can be graphically viewed.
Tag	Any Type	RW	Holds data of any type (default = []) for this truth table.
UnderSpecDiagnostic	String	RW	Interprets the error diagnosis of this truth table as underspecified according to the possible values 'Error', 'Warning', or 'None'. In the Truth Table Editor, the value of this property is assigned by selecting Underspecified from the Settings menu item and then selecting one of the three values.

Stateflow.TruthTable Methods

Truth table objects have the methods in the table below.

See also “Stateflow.TruthTable Properties” on page 2-71.

Method	Description
delete	Delete this truth table from the Stateflow chart.
dialog	Display the Truth Table properties dialog box.
disp	Display the property names and their settings for this truth table object.
find	Find all objects that this graphical truth table contains that meet the specified criteria.
fitToView	Zoom in on this truth table and highlight it in the chart.
get	Return the specified property settings for this truth table.
help	Display a list of properties for this truth table object with short descriptions.
highlight	Highlight this object in the chart.
methods	Display all nonglobal methods of this truth table object.
set	Set the specified property of this truth table object with the specified value.
struct	Return and display a MATLAB structure containing the property settings of this truth table object.
view	Display this truth table's chart in the editor with this truth table highlighted.

Stateflow.TruthTableChart Properties

Stateflow API objects of type TruthTableChart have the properties shown below. See also “Stateflow.TruthTableChart Methods” on page 2-77.

Property	Type	Access	Description
ActionTable	Cell Array	RW	A cell array of strings containing the contents of the Action Table for this truth table block.
ChartUpdate	Enum	RW	Activation method of this chart. Can be 'INHERITED' (default), 'DISCRETE', or 'CONTINUOUS'.
ConditionTable	Cell Array	RW	A cell array of strings containing the contents of the Condition Table for this truth table block, including the Actions row.

Property	Type	Access	Description
Description	String	RW	Description of this truth table block (default = ''). Equivalent to entering a description in the Description field of the properties dialog box for this truth table block.
Dirty	Boolean	RW	If set to true (default = false), this chart has changed since being opened or saved.
Document	String	RW	Document link to this truth table block.
Iced	Boolean	RO	Equivalent to property Locked (default = false) except that this property is used internally to lock this block from change during activities such as simulation.
Id	Integer	RO	Unique identifier assigned to this truth table block to distinguish it from other objects in the model.
InputFimath	embedded.fimath object	RW	The embedded.fimath object that will be associated with inputs from Simulink blocks.
LabelString	String	RW	Full label for this truth table (default = '()') including its return, name, and arguments. Equivalent to typing the label for this truth table in its label text field.
Locked	Boolean	RW	If set to true (default = false), mark this block as read-only and prohibit any write operations on it.
Machine	Machine	RO	Machine that contains this truth table block.

Property	Type	Access	Description
Name	String	RW	Name of this truth table block. (default = ''). Equivalent to typing a name for this truth table into the label text field of the truth table box.
OverSpecDiagnostic	String	RW	Interprets the error diagnosis of this truth table as overspecified according to the possible values 'Error', 'Warning', or 'None'. In the Truth Table Editor, the value of this property is assigned by selecting Overspecified from the Settings menu item and then selecting one of the three values.
Path	String	RW	Path to the block.
SampleTime	String	RW	Sample time for activating this chart (default = '').
Tag	Any Type	RW	Holds data of any type (default = []) for this truth table block.
TreatInheritedIntegersAs	String	RW	Determines how inherited integer signals are treated in MATLAB functions. The two choices are Integers and Fixed-point . A Simulink model does not distinguish between a fixed-point signal with zero fraction length and an integer signal. However, the MATLAB workspace has two different classes for these two kinds of data: Integers (uint8, int16, etc...) and embedded.fi . You can specify the type for any given input signal to be either

Property	Type	Access	Description
			Integer or fixed-point and override this default.
UnderSpecDiagnostic	String	RW	Interprets the error diagnosis of this truth table as underspecified according to the possible values 'Error', 'Warning', or 'None'. In the Truth Table Editor, the value of this property is assigned by selecting Underspecified from the Settings menu item and then selecting one of the three values.

Stateflow.TruthTableChart Methods

Truth Table Chart objects have the methods in the table below.

See also “Stateflow.TruthTableChart Properties” on page 2-74.

Method	Description
delete	Delete this truth table block from the model.
dialog	Display the properties dialog box of this truth table.
disp	Display the property names and their settings for this truth table object.
find	Find all objects that this graphical truth table contains that meet the specified criteria.
get	Return the specified property settings for this truth table.
help	Display a list of properties for this truth table object with short descriptions.
methods	Display all nonglobal methods of this truth table object.
set	Set the specified property of this truth table object with the specified value.

Method	Description
struct	Return and display a MATLAB structure containing the property settings of this truth table object.
view	Display this truth table block in the model.

API Object Properties and Methods

Properties and Methods Sorted Alphabetically By Application

In this section...

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Reference Table Column Descriptions

Reference tables for Stateflow API properties and methods have these columns:

- **Name** — The name for the property or method. Each property or method has a name that you use in dot notation along with a Stateflow object to set or obtain the property’s value or call the method.
- **Type** — A data type for the property. Some types are other Stateflow API objects, such as the `Machine` property, which is the `Machine` object that contains this object.
- **Access** — An access type for the property. Properties that are listed as RW (read/write) can be read and changed. For example, the `Name` and `Description` properties of particular objects are RW. However, some

properties are RO (read-only) because they are set by the MATLAB workspace itself.

- **Description** — A description for the property or method. For some properties, the equivalent GUI operations for setting it are also given.
- **Objects** — The types of objects that have this property or method. The object types are listed as follows: Root (R), Machine (M), Chart (C), State (S), Atomic Box (AB), Atomic Subchart (AS), Box (B), Graphical Function (F), Truth Table (TT), MATLAB Function (EM), Simulink Function (SLF), Note (N), Transition (T), Junction (J), Event (E), Data (D), Target (X), Editor (ED), and Clipboard (CB).

Access Methods

The following methods find, get, and set objects and their properties.

Method	Description	Objects
defaultTransitions	Return the default transitions in this chart at the top level of containment.	C S B F
disp	Display the property names and their settings for this object.	C S AB AS B F N T J D E X TT EM SLF
find	Find all objects that this object contains that meet the criteria specified by the arguments.	All
get	Return the specified property settings for this object.	All
help	Display a list of properties for this object with short descriptions. Used with all objects except the Root and Machine object.	All
innerTransitions	Return the inner transitions that originate with this object and terminate on a contained object.	S B
methods	Return the methods of this object.	All
outerTransitions	Return an array of transitions that exit the outer edge of this object and terminate on an object outside the containment of this object.	S B

Method	Description	Objects
set	Set the specified property of this object with a specified value. Used with all objects except the Root object.	All
sinkedTransitions	Return all inner and outer transitions whose destination is this object.	S B J
sourcedTransitions	Return all inner and outer transitions whose source is this object.	S B J
struct	Return a MATLAB structure containing the property settings of this object.	C S AB AS B F N T J D E X TT EM SLF

Containment

The following properties control how one Stateflow object contains another Stateflow object.

Property	Type	Access	Description	Objects
Chart	Chart	RO	Chart object containing this object.	S AB AS B F N T J TT EM SLF
Decomposition	Enum	RW	Set this property to 'EXCLUSIVE_OR' to specify exclusive (OR) decomposition for the states at the first level of containment in this chart or state. Set to 'PARALLEL_AND' to specify parallel (AND) decomposition for these states.	C S

Property	Type	Access	Description	Objects
IsGrouped	Boolean	RW	<p>If set to true, group this object.</p> <p>Nothing is allowed to change inside a grouped object. You must first ungroup the object before you can change its contents.</p> <p>This property is also useful for copying states and their contents to a new location. See “Copy by Grouping” on page 1-34.</p>	S B F
IsSubchart	Boolean	RW	If set to true, makes this state, box, or graphical function a subchart.	S B F
Machine	Machine	RO	Machine that contains this object. A machine object contains all of the Chart objects in a Model.	C S AB AS B F N T J D E X TT EM SLF

Creating and Deleting Objects

Use the following methods to create and delete Stateflow objects.

Method	Description	Objects
copy	Copy the specified array of objects to the clipboard for pasting. See also the pasteTo method.	CB
delete	Delete this object.	All but R M C CB ED
pasteTo	Paste the objects in the Clipboard to the specified container object. See also copy method.	CB
setImage	Insert image from clipboard or image file into a note.	N
Stateflow.AtomicBox	Create an atomic box for a parent chart or state.	NA
Stateflow.AtomicSubchart	Create an atomic subchart for a parent chart or state.	NA

Method	Description	Objects
Stateflow.Box	Create a box for a parent chart, state, box, or function.	NA
Stateflow.Data	Create a data for a parent machine, chart, state, box, or function.	NA
Stateflow.EMFunction	Create a MATLAB function for a parent chart or state.	NA
Stateflow.Event	Create an event for a parent chart or state.	NA
Stateflow.Function	Create a graphical function for a parent chart, state, box, or function.	NA
Stateflow.Junction	Create a junction for a parent chart, state, box, or function.	NA
Stateflow.Note	Create a note for a parent chart or state.	NA
Stateflow.SLFunction	Create a Simulink function for a parent chart or state.	NA
Stateflow.State	Create a state for a parent chart, state, box, or function.	NA
Stateflow.Target	Create a custom target for a parent machine.	NA
Stateflow.Transition	Create a transition for a parent chart, state, box, or function.	NA
Stateflow.TruthTable	Create a truth table function for a parent chart or state.	NA

Data Definition Properties

The following properties control the type, size, and value of data in Stateflow charts.

Tip All properties of the Props field must be set individually.

Property	Type	Access	Description	Objects
DataType	Enum	RW	Data type of this data. Can have one of the following possible values: 'boolean', 'uint8', 'int8', 'uint16', 'int16', 'uint32', 'int32', 'single', 'double' and 'fixpt'. Equivalent to an entry in the Type column for this data in the Model Explorer or the Type field in the Data properties dialog box.	D
FixptType. Bias	Double	RW	The Bias value for this fixed-point type.	D
FixptType. FractionalSlope	Double	RW	The Fractional Slope value for this fixed-point type.	D
FixptType. RadixPoint	Integer	RW	The power of two specifying the binary point location for this fixed-point type.	D
FixptType. BaseType	Enum	RW	The size and sign of the base for the quantized integer, Q, of this fixed-point type.	D
ParsedInfo. Array. FirstIndex	Integer	RO	Numeric equivalent of string Data property Props.Range.FirstIndex.	D
ParsedInfo. Array. Size	Integer	RO	Numeric equivalent of string Data property Props.Array.Size.	D
ParsedInfo. InitialValue	Double	RO	Numeric equivalent of string Data property Props.InitialValue.	D
ParsedInfo. Range. Maximum	Double	RO	Numeric equivalent of string Data property Props.Range.Maximum.	D
ParsedInfo. Range. Minimum	Double	RO	Numeric equivalent of string Data property Props.Range.Minimum.	D

Property	Type	Access	Description	Objects
Port	Integer	RW	Port index number for this input or output data or event (default = 1).	D E
Props. Array. FirstIndex	String	RW	Index of the first element of this data if it is an array (<code>Props.Array.Size >= 1</code>). Equivalent to entering a value of zero or greater in the First index field of the Data properties dialog box.	D
Props. Array. Size	String	RW	Specifying a positive value for this property specifies that this data is an array of specified size. Equivalent to entering a positive value in the Size column for this data in the Model Explorer or in the Size field of the Data properties dialog box.	D
Props. Complexity	Enum	RW	If set to 'On', the data can take complex values. The default value is 'Off', which indicates that the data cannot take complex values. Equivalent to setting Complexity in the Data properties dialog box.	D
Props. Frame	Enum	RW	If set to 'Frame based', the data supports frame-based signals. The default value is 'Sample based', which indicates that the data supports sample-based signals.	D
Props. InitialValue	String	RW	If the source of the initial value for this data is the Stateflow hierarchy, this is the value used. Equivalent to entering this value in the InitVal column for this data in the Model Explorer or similar field in the Data properties dialog box.	D

Property	Type	Access	Description	Objects
Props. Range. Maximum	String	RW	Maximum value that this data can have during execution or simulation of the state machine. Equivalent to entering value in Max column for this data in the Model Explorer or the Maximum field in the Data properties dialog box.	D
Props. Range. Minimum	String	RW	Minimum value that this data can have during execution or simulation of the state machine. Equivalent to entering value in the Min column for this data in the Model Explorer or in the Minimum field in the Data properties dialog box.	D
Props. Resolve To Signal Object	Integer	RW	If set to 1, the data must resolve to a Simulink.Signal object that you define in the model workspace or base workspace. The default value is 0, indicating that the data does not have to resolve to a signal object. Equivalent to setting Data must resolve to Simulink signal object in the Data properties dialog box.	D
Props. Type. BusObject	String	RW	If Props.Type.Method is Bus Object, you must set this property to the name of the Simulink.Bus object that defines this data. Equivalent to setting the data type Mode to Bus Object, and entering the name of a Simulink.Bus object in the Data Type Assistant of the Data properties dialog box.	D

Property	Type	Access	Description	Objects
Props. Type. EnumType	String	RW	If Props.Type.Method is Enumerated, you must set this property to the name of the enumerated type that defines this data. Equivalent to setting the data type Mode to Enumerated, and entering the name of an enumerated type in the Data Type Assistant of the Data properties dialog box.	D
Props. Type. Expression	String	RW	If Props.Type.Method is Expression, you must set this property to an expression that evaluates to a data type (see “Enter Expressions and Parameters for Data Properties” in the Stateflow documentation). Equivalent to setting the data type Mode to Expression, and entering an expression in the Data Type Assistant of the Data properties dialog box.	D
Props. Type. Fixpt. Bias	String	RW	The bias value for fixed-point data (default = 0.0) when Props.Type.Fixpt.ScalingMode equals Slope and bias ; otherwise this value is ignored. Equivalent to entering a real number in the Bias field of the Data Type Assistant in the Data properties dialog box.	D
Props. Type. Fixpt. FractionLength	String	RW	The location of the binary point in fixed-point data (default = 0) when Props.Type.Fixpt.ScalingMode equals Binary point ; otherwise this value is ignored. Equivalent to entering a positive or negative integer in the Fraction length field of the Data Type Assistant in the Data properties dialog box.	D

Property	Type	Access	Description	Objects
Props. Type. Fixpt. Lock	Integer	RW	If set to 1 (default = 0), prevents Simulink software from replacing the current fixed-point type with a type that the Fixed-Point Tool or Fixed-Point Advisor chooses. Equivalent to selecting Lock data type setting against changes by the fixed-point tools in the Data properties dialog box.	D
Props. Type. Fixpt. ScalingMode	String	RW	Method for scaling fixed point data to avoid overflow conditions and minimize quantization errors. The settings are: <ul style="list-style-type: none"> • None (the default) • Binary point • Slope and bias Equivalent to setting the Scaling field of the Data Type Assistant in the Data properties dialog box.	D
Props. Type. Fixpt. Slope	String	RW	The slope value for fixed-point data (default = 1.0) when Props.Type.Fixpt.ScalingMode equals Slope and bias ; otherwise this value is ignored. Equivalent to entering a positive real number in the Slope field of the Data Type Assistant in the Data properties dialog box.	D

Property	Type	Access	Description	Objects
Props. Type. Method	String	RW	<p>Method for setting the type of this data, based on scope:</p> <ul style="list-style-type: none"> • If scope is Local , you can set this property to Built in, Fixed point, Enumerated, Expression, or Bus Object. • If scope is Constant, you can set this property to Built in, Fixed point, or Expression. • If scope is Parameter, Input, or Output, you can set this property to Inherit, Built in, Fixed point, Enumerated, Expression, or Bus Object. • If scope is Data Store Memory, you should set Props.Type.Method to Inherit as a read-only property. <p>Equivalent to setting the Mode field of the Data Type Assistant in the Data properties dialog box.</p>	D
Props. Type. Signed	Integer	RW	<p>If set to 1, indicates that fixed-point data should be signed. The default value is 0, indicating that the data is unsigned. Equivalent to setting the Signedness field of the Data Type Assistant in the Data properties dialog box.</p>	D
Props. Type. Units	String	RW	<p>Units of measurement for the data value (default = '').</p>	D

Property	Type	Access	Description	Objects
Props. Type. WordLength	String	RW	Size in bits of the word that will hold the quantized integer of fixed-point data. Equivalent to entering an integer in the Word length field of the Data Type Assistant in the Data properties dialog box.	D
SaveTo Workspace	Integer	RW	If set to 1 (default = 0), this data is saved to the MATLAB workspace. Setting this property to 1 is equivalent to selecting the SaveToWorkspace column entry for this data in the Model Explorer or selecting the Save final value to base workspace field in the Data properties dialog box.	D
Scope	Enum	RW	Scope of this data: <ul style="list-style-type: none"> • Local — Data defined in current Stateflow chart. • Constant — Read-only constant value that is visible to the parent Stateflow object and its children. • Parameter — Constant defined in the MATLAB workspace or derived from a Simulink parameter that is defined and initialized in the parent masked subsystem. • Input — If the parent is a graphical, truth table, or MATLAB function, the data is an input argument. Otherwise, it is provided by the Simulink model to the Stateflow chart via an input port. • Output — If the parent is a graphical, truth table, or MATLAB function, the data is a return value. 	D

Property	Type	Access	Description	Objects
			<p>Otherwise, it is provided by the Stateflow chart to the Simulink model via an output port.</p> <ul style="list-style-type: none"> • Data Store Memory — Data that binds to a Simulink data store. • Temporary — Data that persists only during the execution of a function. • Imported — Data parented by the Simulink model, but defined in external code embedded in the Stateflow machine. • Exported — Data from the Simulink model that you provide to external code. Parent must be a Stateflow machine. <p>Equivalent to setting the Scope field in the Data properties dialog box. See “Scope” in the Stateflow documentation.</p>	
TestPoint	Integer	RW	<p>If set to 1 (default = 0), sets this data as a Stateflow test point. You can monitor individual Stateflow test points with a floating scope during model simulation. You can also log test point values into MATLAB workspace objects. See “Monitor Test Points in Stateflow Charts” in the Stateflow documentation.</p>	D

Debugging Properties

The following properties control values used in debugging Stateflow chart applications with the Stateflow Debugger.

Property	Type	Access	Description	Objects
Debug. Animation. Delay	Double	RW	Specify a delay (slow down) value for animation. Equivalent to setting the Delay (sec) field in the Debugger window.	M
Debug. Animation. Enabled	Boolean	RW	If true, animation (simulation) is enabled. If false (=0), disabled. Equivalent to selecting the Enabled or Disabled radio button in the Debugger window.	M
Debug. BreakOn. ChartEntry	Boolean	RW	If true, sets the chart entry breakpoint for all charts in this machine. Equivalent to selecting the Chart Entry check box in the Debugger window.	M
Debug. BreakOn. EventBroadcast	Boolean	RW	If true, sets the event broadcast breakpoint for all charts in this machine. Equivalent to selecting the Event Broadcast check box in the Debugger window.	M
Debug. BreakOn. StateEntry	Boolean	RW	If true, sets the state entry breakpoint for all states in this machine. Equivalent to selecting the State Entry check box in the Debugger window.	M
Debug. Breakpoints. EndBroadcast	Boolean	RW	If true, sets a debugger breakpoint for the end of the broadcast of the selected local event. Equivalent to selecting the End of broadcast check box in the Event properties dialog box.	E
Debug. Breakpoints. StartBroadcast	Boolean	RW	If true, sets a debugger breakpoint for the start of the broadcast of the selected local or input event. Equivalent to selecting the Start of broadcast check box in the Event properties dialog box.	E

Property	Type	Access	Description	Objects
Debug. Breakpoints. OnDuring	Boolean	RW	If true, sets the during breakpoint for this object. Equivalent to selecting the State During check box in the properties dialog box for this state or atomic subchart, or selecting the Function Call check box in the properties dialog box for this graphical function or truth table.	F S AS TT
Debug. Breakpoints. OnEntry	Boolean	RW	If true, sets the entry breakpoint for this object. Equivalent to selecting the Chart Entry check box in the properties dialog box for this chart, or selecting the State Entry check box in the properties dialog box for this state or atomic subchart.	C S AS
Debug. Breakpoints. OnExit	Boolean	RW	If true, sets the exit breakpoint for this object. Equivalent to selecting the State Exit check box in the properties dialog box for this state or atomic subchart.	S AS
Debug. Breakpoints. WhenTested	Boolean	RW	If true, sets a debugging breakpoint to occur when this transition is tested to see if it is a valid transition. Equivalent to selecting the When Tested check box in the properties dialog box of this transition.	T
Debug. Breakpoints. WhenValid	Boolean	RW	If true, sets a debugging breakpoint to occur when this transition has tested as valid. Equivalent to selecting the When Valid check box in the properties dialog box of this transition.	T
Debug. DisableAll Breakpoints	Boolean	RW	If true, disables the use of all breakpoints in this machine. Equivalent to selecting the Disable all check box in the Debugger window.	M

Property	Type	Access	Description	Objects
Debug. State RunTimeCheck. Inconsistencies	Boolean	RW	If true, checks for state inconsistencies during a debug session. Equivalent to selecting the State Inconsistency check box in the Debugger window.	M
Debug. RunTimeCheck. TransitionConflicts	Boolean	RW	If true, checks for transition conflicts during a debug session. Equivalent to selecting the Transition Conflict check box in the Debugger window.	M
Debug. RunTimeCheck. CycleDetection	Boolean	RW	If true, checks for cyclical behavior errors during a debug session. Equivalent to selecting the Detect Cycles check box in the Debugger window.	M
Debug. RunTimeCheck. DataRangeChecks	Boolean	RW	If true, checks for data range violations during a debug session. Equivalent to selecting the Data Range check box in the Debugger window.	M
Debug. Watch	Boolean	RW	If true, causes the Debugger window to halt execution if this data is modified. Equivalent to selecting the Watch column entry for this data in the Model Explorer or selecting the Watch in debugger check box in the Data properties dialog box.	D
TestPoint	Boolean	RW	If true (default = false), sets this data, state, or atomic subchart as a Stateflow test point. You can monitor Stateflow test points with a floating scope during simulation. You can also log test point values into MATLAB workspace objects. See “Monitor Test Points in Stateflow Charts” in the Stateflow documentation.	D S AS

Display Control

- “Display Methods” on page 3-18
- “Display Properties” on page 3-18

Display Methods

The following methods control the current display.

Method	Description	Objects
dialog	Display the properties dialog box of this object.	M C S AB AS B F N T J D E X TT EM
fitToView	Zoom in on this object and highlight it in the editor.	C S AB AS B F N T J TT EM SLF
highlight	Highlight this graphical object in the editor.	S AB AS B F T J TT EM SLF
view	Make this object visible for editing.	C S AB AS B F N T J D E X TT EM SLF
zoomIn and zoomOut	Causes the editor to zoom in or zoom out on this chart.	ED

Display Properties

The following properties affect the display of the current Stateflow chart.

Property	Type	Access	Description	Objects
Visible	Boolean	RO	If true, indicates that this object is currently visible in the chart.	C
Subviewer	Chart or State	RO	Chart or state in which you can view this object graphically.	S AB AS B F N T J TT EM SLF
ZoomFactor	Double	RW	View magnification level (zoom factor) of this chart in the editor.	ED

Graphical Appearance

- “Color Properties” on page 3-19
- “Drawing Properties” on page 3-21
- “Font Properties” on page 3-21
- “Position Properties” on page 3-24
- “Text Properties” on page 3-26

Color Properties

The following properties set colors for the graphical objects in Stateflow charts.

Property	Type	Access	Description	Objects
AutoBackgroundColor	String	RW	Use automatic background color. Options are '0' (off) or '1' (on, the default).	N
AutoForegroundColor	String	RW	Use automatic foreground (text) color. Options are '0' (off) or '1' (on, the default).	N

Property	Type	Access	Description	Objects
BackgroundColor	String	RW	<p>Background color of this note. RGB value array string [r,g,b,a] where r, g, b, and a are the red, green, blue, and alpha values of the color normalized to the range 0.0 to 1.0, delineated with commas. The alpha value is optional and ignored.</p> <p>Note background color can also be 'black', 'white', 'red', 'green', 'blue', 'cyan', 'magenta', 'yellow', 'gray', 'lightBlue', 'orange', 'darkGreen'.</p>	N
ChartColor	[R,G,B]	RW	Background color of this chart in a 1-by-3 RGB array with each value normalized on a scale of 0 to 1.	C
ErrorColor	[R,G,B]	RW	Set the RGB color for errors in the chart using a 1-by-3 RGB array with each value normalized on a scale of 0 to 1.	C
ForegroundColor	String	RW	<p>Foreground (text) color of this note. RGB value array string [r,g,b,a] where r, g, b, and a are the red, green, blue, and alpha values of the color normalized to the range 0.0 to 1.0, delineated with commas. The alpha value is optional and ignored.</p> <p>Notebackground color can also be 'black', 'white', 'red', 'green', 'blue', 'cyan', 'magenta', 'yellow', 'gray', 'lightBlue', 'orange', 'darkGreen'.</p>	N
JunctionColor	[R,G,B]	RW	Set the RGB color for junctions in the chart using a 1-by-3 RGB array with each value normalized on a scale of 0 to 1.	C
SelectionColor	[R,G,B]	RW	Color of selected items for this chart in a 1-by-3 RGB array with each value normalized on a scale of 0 to 1.	C

Property	Type	Access	Description	Objects
StateColor	[R,G,B]	RW	Color of the state box in a 1-by-3 RGB array with each value normalized on a scale of 0 to 1.	C
StateLabelColor	[R,G,B]	RW	Color of the state labels for this chart in a 1-by-3 RGB array with each value normalized on a scale of 0 to 1.	C
TransitionColor	[R,G,B]	RW	Set the RGB color for transitions in the chart using a 1-by-3 RGB array with each value normalized on a scale of 0 to 1.	C
TransitionLabelColor	[R,G,B]	RW	Color of the transition labels for this chart in a 1-by-3 RGB array with each value normalized on a scale of 0 to 1.	C

Drawing Properties

The following properties control how Stateflow objects are drawn in their charts.

Property	Type	Access	Description	Objects
ArrowSize	Double	RW	Size of transition arrows coming into this object.	S AB AS B F T J TT EM SLF
DropShadow	String	RW	Display a drop shadow. Options are '1' or '0'.	N
Editor	Editor	RO	Editor object for this chart.	C

Font Properties

The following properties change the font used for text in a Stateflow chart.

Property	Type	Access	Description	Objects
Font. Angle	Enum	RW	Style of the font for the text in this note. Can be 'ITALIC' or 'NORMAL'. This property overrides the default style for this note, which is set by the <code>StateFont.Angle</code> property of the Chart object containing this note.	N
Font. Name	String	RO	Name of the font for the text in this note. This property is read-only (RO) and set by the <code>StateFont.Name</code> property of the Chart object containing this note.	N
Font. Weight	Enum	RW	Weight of the font for the label text for this note. Can be 'BOLD' or 'NORMAL'. This property overrides the default weight for the text in this note, which is set by the <code>StateFont.Weight</code> property of the Chart object containing this note.	N
FontSize	Double	RW	Size of the font for the label text for this object. This property overrides the default size for this object, which is set by the <code>StateFont.Size</code> property (<code>TransitionFont.Size</code> for transitions) of the Chart object containing this object.	S AB AS B F T TT EM SLF
PlainText	Vector	RO	Display of the text in the note, without formatting.	N
StateFont. Angle	Enum	RW	Font angle for the labels of State, Box, Function, and Note objects. Can be 'ITALIC' or 'NORMAL'. Use with property <code>StateFont.Weight</code> to achieve Bold Italic style. You can individually override this property with the <code>Font.Angle</code> property for Note objects.	C

Property	Type	Access	Description	Objects
StateFont. Name	String	RW	Font style used for the labels of State, Box, Function, and Note objects. Enter a string for the font name -- no selectable values. Font remains set to previous font for unrecognized font strings.	C
StateFont. Size	Integer	RW	Font size for the labels of State, Box, Function, and Note objects. You can individually override this property with the <code>FontSize</code> property for State, Box, and Function objects and with the <code>Font.Size</code> property for Note objects.	C
StateFont. Weight	Enum	RW	Font weight for state labels. Can be 'BOLD' or 'NORMAL'. Use with the property <code>StateFont.Angle</code> to achieve Bold Italic style. You can individually override this property with the <code>Font.Weight</code> property for Note objects.	C
TransitionFont. Angle	Enum	RW	Font angle for state labels. Can be 'ITALIC' or 'NORMAL'. Use with property <code>StateFont.Weight</code> to achieve Bold Italic style.	C
TransitionFont. Name	String	RW	Font used for transition labels. Enter string for font name (no selectable values). Font remains set to previous font for unrecognized font strings.	C
TransitionFont. Size	Integer	RW	Default font size for transition labels. Truncated to closest whole number less than or equal to entered value.	C
TransitionFont. Weight	Enum	RW	Font weight for transition labels. Can be 'BOLD' or 'NORMAL'. Use with property <code>StateFont.Angle</code> to achieve Bold Italic style.	C

Position Properties

The following properties control the position of Stateflow objects in a Stateflow chart.

Property	Type	Access	Description	Objects
BadIntersection	Boolean	RO	If true, this object graphically intersects another state, box, or function in an invalid way.	S AB AS B F TT EM SLF
Destination	State, Box, or Junction	RW	Destination state, box, or junction of this transition. You can also use the property <code>Destination</code> to detach the destination endpoint of a transition, with the command <code>t.Destination = []</code> , where <code>t</code> is the Transition object.	T
DestinationEndPoint	Double	RW	Provides [x y] coordinates for the transition endpoint at its destination. The coordinates are relative to the upper left corner of the chart, which is [0 0]. If you enter non-integer values, only the integer part of the value is used. If you enter negative values for the coordinates, [0 0] is used instead.	T
DestinationOClock	Double	RW	Location of transition destination connection on state. Varies from 0 to 12 for full clock cycle location. Value taken as modulus 12 of entered value.	T

Property	Type	Access	Description	Objects
LabelPosition	Rect	RW	<p>Position and size of this transition label in the chart, given in the form of a 1-by-4 array that includes:</p> <ul style="list-style-type: none"> • (x,y) coordinates for the label's upper left corner relative to the upper left corner of the chart, which is [0 0] • Width and height of the label 	T
MidPoint	Rect	RW	<p>Provides [x y] coordinates of the transition midpoint relative to the upper left corner of the chart, which is [0 0].</p>	T
Position	Rect	RW	<p>Position and size of box-like objects in the chart, given in the form of a 1-by-4 array that includes:</p> <ul style="list-style-type: none"> • (x,y) coordinates for the object's upper left vertex relative to the upper left vertex of the chart • Width and height of the object 	S AB AS B F TT EM SLF N
Position.Center	Rect	RW	<p>(x,y) position of junction relative to the upper left vertex of the parent chart or state.</p>	J
Position.Radius	Double	RW	<p>Radius of this junction.</p>	J
Source	State, Box, or Junction	RW	<p>Source state, box, or junction of this transition.</p> <p>You can also use the property <code>Source</code> to detach the source endpoint of a transition, with the command <code>t.Source = []</code>, where <code>t</code> is the Transition object.</p>	T

Property	Type	Access	Description	Objects
SourceEndPoint	Double	RW	<p>Provides [x y] coordinates for the transition endpoint at its source. The coordinates are relative to the upper left corner of the chart, which is [0 0].</p> <p>If you enter non-integer values, only the integer part of the value is used.</p> <p>If you enter negative values for the coordinates, [0 0] is used instead.</p>	T
SourceOClock	Double	RW	<p>Location of transition source connection on state. Varies from 0 to 12 for full clock cycle location. Value taken as modulus 12 of entered value.</p>	T
WindowPosition	Rect	RW	<p>Position and size of this chart given in the form of a 1-by-4 array consisting of the following:</p> <ul style="list-style-type: none"> • (x,y) coordinates for the window's left bottom vertex relative to the lower left corner of the screen • Width and height of the box 	ED

Text Properties

The following properties control the text and text appearance apart from font and color in Stateflow charts.

Property	Type	Access	Description	Objects
Alignment	Enum	RW	Alignment of text in note box. Can be 'LEFT', 'CENTER', or 'RIGHT'.	N
FixedHeight	Numeric	RW	Resize the bottom border of the note as you add content. Options are '0' or '1', where '0' means that the bottom border resizes as you add content.	N
FixedWidth	Numeric	RW	Wrap text at fixed note box border. Choices are '0' or '1', where '0' means not to use wordwrap.	N
InternalMargins	Array	RW	The space from the bounding box of text to the borders of the note. Use a 1x4 array [left top right bottom]. The default is [1 1 1 1]. The maximum value for a coordinate is 32767.	N
Interpretation	Enum	RW	How the text in this note is interpreted for text processing. Can be 'OFF', 'RICH' or 'TEX'.	N
LabelString	String	RW	Label for this object. Equivalent to typing the label for this object in its label text field in the chart.	S AB AS B F T TT EM SLF
Text	String	RW	Label for this note. The text content for this note that you enter directly into the note in the chart or in the Label field of the Note properties dialog box.	N

Identifiers

The following properties identify objects for the version of Stateflow software.

Property	Type	Access	Description	Objects
Description	String	RW	Description of this object. Equivalent to entering a description in the Description field of the properties dialog box for this object (except for Simulink functions).	M C S AB AS B F N T J D E X T T EM SLF
Document	String	RW	Document link for this object. Equivalent to entering a link in the Document link field of the properties dialog box for this object (except for Simulink functions).	M C S AB AS B F N T J D E X T T EM SLF
Id	Integer	RO	Unique identifier assigned to this object to distinguish it from other objects loaded in memory.	M C S AB AS B F N T J D E X T T EM SLF
Name	String	RW	Name of this object. This property is RW except for the name of a Machine object, which is RO.	M C S AB AS B F D E X T T EM SLF
SfVersion	Double	RO	Full version number for current Stateflow software. For example, the string '41112101' appears for Stateflow software version 4.1.1 and MATLAB software version 12.1. The remaining '01' is for internal use.	M
Tag	Any Type	RW	A field you can use to hold data of any type for this object.	M C S AB AS B F T J D E X T T EM SLF
Type	Enum	RO	Type of this state or junction. For states, can be one of the following: <ul style="list-style-type: none"> • 'OR' (inclusive) • 'AND' (parallel) The type of a state is determined by the parent's Decomposition property.	S J

Property	Type	Access	Description	Objects
			<p>For junctions, can be one of the following:</p> <ul style="list-style-type: none"> • 'CONNECTIVE' • 'HISTORY' 	

Interface to Simulink Model

The following properties (and methods) control how data and events are input from and output to the Simulink model for a Stateflow chart.

Property (Method)	Type	Access	Description	Objects
ChartUpdate	Enum	RW	<p>Activation method of this chart. Can be one of the following:</p> <ul style="list-style-type: none"> • 'INHERITED' (Inherited) • 'DISCRETE' (Discrete) • 'CONTINUOUS' (Continuous) <p>These preceding entries are equivalent to the parenthetical entries for the Update method field in the Chart properties dialog box.</p>	C
ClickFcn	String	RW	<p>MATLAB code to be executed when a user single-clicks this note. Stateflow stores the code entered in this field with the chart. See “Associate Click Functions with Annotations” for more information.</p>	N
DeleteFcn	String	RW	<p>MATLAB code to be executed before deleting this note. See “Annotation Callback Functions”.</p>	N

Property (Method)	Type	Access	Description	Objects
ExecuteAtInitialization	Boolean	RW	If set to true, initialize this chart's state configuration at time zero instead of at first input event. Equivalent to selecting the Execute (enter) Chart At Initialization check box in the Chart properties dialog box.	C
ExportChartFunctions	Boolean	RW	If set to true (default = false), graphical functions at the chart level become global. Equivalent to selecting the Export Chart Level Functions (Make Global) check box in the Chart properties dialog box.	C
HasOutputData	Boolean	RW	Output state activity through an output port to Simulink	C S AS
InitializeOutput	Boolean	RW	Applies the initial value of outputs every time a chart wakes up, not only at time 0. See "Set Properties for a Single Chart".	C
LoadFcn	String	RW	MATLAB code to be executed when the model containing this note is loaded. See "Annotation Callback Functions".	N

Property (Method)	Type	Access	Description	Objects
OutputMonitoringMode	String	RO	If HasOutputData is true for a state, then OutputMonditoringMode indicates the monitoring mode either as 'ChildActivity' or 'SelfActivity'.	S
Port	Integer	RW	Port index number for this input or output data or event (default = 1).	D E
SampleTime	String	RW	Sample time for activating this chart. Applies only when the ChartUpdate property for this chart is set to 'DISCRETE' (= Discrete in the Update method field in the Chart properties dialog box).	C
SaveToWorkspace	Boolean	RW	If set to true, this data is saved to the MATLAB workspace. Equivalent to selecting the SaveToWorkspace column entry for this data in the Model Explorer or selecting the Save final value to base workspace field in the Data properties dialog box.	D

Property (Method)	Type	Access	Description	Objects
Scope	Enum	RW	<p>Scope of this data. Allowed values vary with the object containing this data, which are as follows:</p> <ul style="list-style-type: none"> • 'Local' • 'Constant' • 'Imported' (machine objects only) • 'Exported' (machine objects only) • 'Input' (chart objects only) • 'Output' (chart objects only) • 'Temporary' (function objects only) • 'Function input' (function objects only) • 'Function output' (function objects only) <p>Above values correspond to entries in the Scope field of the Data or Event properties dialog box.</p>	D E
StrongDataTyping WithSimulink	Boolean	RW	<p>If set to true, set strong data typing with Simulink I/O. Equivalent to selecting the Use Strong Data Typing with Simulink I/O check box in the Chart properties dialog box.</p>	C

Property (Method)	Type	Access	Description	Objects
Trigger	Enum	RW	<p>Type of signal that triggers this chart input event. Also the type of trigger associated with this chart output event.</p> <p>The following triggers apply to both chart input and output events:</p> <ul style="list-style-type: none"> • 'Either' (Either Edge) • 'Function call' (Function Call) <p>The following triggers apply only to chart input events:</p> <ul style="list-style-type: none"> • 'Rising' (Rising Edge) • 'Falling' (Falling Edge) <p>The preceding entries are equivalent to the entries in parentheses for the Trigger field in the Event properties dialog box.</p>	E
UseDisplayTextAsClickCallback	String	RW	<p>Use the contents of the Text property as the click function for this note. Options are 'on' or 'off'.</p> <p>If set to 'on', the text of the note is interpreted as a valid MATLAB expression and run. If set to 'off', clicking the note runs the click function, if there is one. If there is no click function, clicking the note has no effect.</p>	N

Property (Method)	Type	Access	Description	Objects
			See “Associate Click Functions with Annotations” for more information.	

Logging Properties

The following properties allow you to manage logging for local data and state activity.

Property	Type	Access	Description	Objects
LoggingInfo. DataLogging	Boolean	RW	Signal logging mode: <ul style="list-style-type: none"> • 1 = log signal • 0 = do not log signal (default) 	S D
LoggingInfo. DecimateData	Boolean	RW	Limit the amount of data logged by skipping samples. Uses the interval specified by LoggingInfo. Decimation. <ul style="list-style-type: none"> • 1 = decimate logged data • 0 = do not decimate logged data (default) 	S D
LoggingInfo. Decimation	Integer	RW	Decimation interval. Default value is 2, which means the chart logs every other sample.	S D

Property	Type	Access	Description	Objects
LoggingInfo. LimitDataPoints	Boolean	RW	Limit number of data points to log. Uses the value specified by LoggingInfo. MaxPoints. <ul style="list-style-type: none"> • 1 = limit number of points • 0 = do not limit number of points (default) 	S D
LoggingInfo. MaxPoints	Integer	RW	Maximum number of data points to log. Default value is 5000, which means the chart logs the last 5000 data points generated by the simulation.	S D
LoggingInfo. NameMode	String	RW	Source of signal logging name: <ul style="list-style-type: none"> • `SignalName` = same as signal name (default) • `Custom` = name specified by user as LoggingInfo. UserSpecifiedLogName. 	S D
LooggingInfo. UserSpecifiedLogName	String	RW	User-specified (custom) signal logging name.	S D

Machine (Model) Identifier Properties

The following properties identify parts of the Simulink model containing a Stateflow chart.

Property	Type	Access	Description	Objects
Created	String	RO	Date of creation of this machine.	M
Creator	String	RW	Creator of this machine.	M
Dirty	Boolean	RW	If true, this object has changed since it was opened or saved.	M C
FullFileName	String	RO	Full path name of file under which this machine (model) is stored.	M
Iced	Boolean	RO	Equivalent to property Locked except that this property is used internally to lock this object from being changed during activities such as simulation.	M C
IsLibrary	Boolean	RO	If true, specifies that the current model builds a library and not an application.	M
Locked	Boolean	RW	If set to true, prevents user from changing any Stateflow chart in this machine or chart.	M C
Modified	String	RW	Comment area for entering date and name of modification to this machine (model).	M
Version	String	RW	Comment string for recording version of this model.	M

Truth Table Construction Properties

The following properties control the definition of a truth table.

Property	Type	Access	Description	Objects
ActionTable	Cell Array	RW	A cell array of strings containing the contents of the Action Table for this truth table.	TT
ConditionTable	Cell Array	RW	A cell array of strings containing the contents of the Action Table for this truth table.	TT

Property	Type	Access	Description	Objects
OverSpec Diagnostic	String	RW	Interprets the error diagnosis of this truth table as overspecified according to the possible values 'Error', 'Warning', or 'None'. In the Truth Table Editor, the value of this property is assigned by selecting Overspecified from the Settings menu item and then selecting one of the three values.	TT
UnderSpec Diagnostic	String	RW	Interprets the error diagnosis of this truth table as underspecified according to the possible values 'Error', 'Warning', or 'None'. In the Truth Table Editor, the value of this property is assigned by selecting Underspecified from the Settings menu item and then selecting one of the three values.	TT

API Method Reference

classhandle

Purpose Provide handle to schema class of object type

Syntax `handle = thisObject.classhandle`

Description The `classhandle` method returns a read-only handle to the schema class of this object's type. You can use the `classhandle` method to provide information about the structure of each object type.

Arguments

<code>thisObject</code>	The object for which to return a handle. Can be any Stateflow object.
-------------------------	---

Returns

<code>handle</code>	Handle to schema class of this object.
---------------------	--

Examples If `j` is a Junction object, the class handle of a Junction object is `j.classhandle`. You can see the class schema for a Junction object by using the following `get` command:

```
j.classhandle.get
```

Two member arrays of the displayed class schema are `Properties` and `Methods`. These two members are members of the schema class for every object.

List the class schema for `Properties` with the following command:

```
j.classhandle.Properties.get
```

Two displayed members of the `Properties` schema are `Name` and `DataType`. Finally, using the class handle for a junction, you can display the properties of a Junction object along with their data types with the following command:

```
get(j.classhandle.Properties,{'Name','DataType'})
```

Purpose	Copy specified array of objects to clipboard						
Syntax	<code>cbObj.copy(objArray)</code>						
Description	<p>The copy method copies the specified objects to the clipboard. Objects to copy are specified through a single argument array of objects.</p> <p>Later, complete the copy operation by invoking the <code>pasteTo</code> method.</p>						
Arguments	<table><tr><td><code>cbObj</code></td><td>The Clipboard object to copy to.</td></tr><tr><td><code>objArray</code></td><td>Array of Stateflow objects to copy. These objects must conform to the following:</td></tr><tr><td></td><td><ul style="list-style-type: none">• The objects copied must be all graphical (states, boxes, functions, transitions, junctions) or all nongraphical (data, events, targets).• If all objects are graphical, they must all be seen in the same subviewer.</td></tr></table>	<code>cbObj</code>	The Clipboard object to copy to.	<code>objArray</code>	Array of Stateflow objects to copy. These objects must conform to the following:		<ul style="list-style-type: none">• The objects copied must be all graphical (states, boxes, functions, transitions, junctions) or all nongraphical (data, events, targets).• If all objects are graphical, they must all be seen in the same subviewer.
<code>cbObj</code>	The Clipboard object to copy to.						
<code>objArray</code>	Array of Stateflow objects to copy. These objects must conform to the following:						
	<ul style="list-style-type: none">• The objects copied must be all graphical (states, boxes, functions, transitions, junctions) or all nongraphical (data, events, targets).• If all objects are graphical, they must all be seen in the same subviewer.						
Returns	None						
Examples	See “Copy Objects” on page 1-33.						

defaultTransitions

Purpose Return default transitions in object at top level of containment

Syntax `defaultTransitions = thisObject.defaultTransitions`

Description The `defaultTransitions` method returns the default transitions in this object at the top level of containment.

Arguments

<code>thisObject</code>	The object for which to return default transitions. Can be an object of type <code>Chart</code> , <code>State</code> , <code>Box</code> , or <code>Function</code> .
-------------------------	--

Returns

<code>defaultTransitions</code>	Array of default transitions in this object at the top level of containment.
---------------------------------	--

Examples If state A contains state A1, and state A1 contains state A11, and states A1 and A11 have default transitions attached to them, the `defaultTransitions` method of state A returns the default transition attached to state A1.

Purpose Delete object

Syntax `thisObject.delete`

Description The `delete` method deletes this object from the model. This is true for all but objects of type `Root`, `Chart`, `Clipboard`, and `Editor`.

Arguments

<code>thisObject</code>	The object to delete. Can be an object of type <code>Machine</code> , <code>State</code> , <code>Box</code> , <code>Function</code> , <code>Truth Table</code> , <code>Note</code> , <code>Transition</code> , <code>Junction</code> , <code>Data</code> , <code>Event</code> , or <code>Target</code> .
-------------------------	--

Returns None

Examples If a state A is represented by the State object `sA`, the command `sA.delete` deletes state A.

dialog

Purpose Open properties dialog box of object

Syntax `thisObject.dialog`

Description The `dialog` method opens the Properties dialog box of its object.

Arguments `thisObject` The object for which to open the Properties dialog box.

Returns None

Examples If state A is represented by State object `sA`, the MATLAB command statement `sA.dialog` opens the Properties dialog box for state A.

Purpose	Display properties and settings for object
Syntax	<code>thisObject.disp</code>
Description	The <code>disp</code> method displays the properties and settings for this object. This is true for all but objects of type <code>Root</code> and <code>Clipboard</code> .
Arguments	<code>thisObject</code> The object for which to display properties and settings.
Returns	None
Examples	If a state <code>A</code> is represented by the <code>State</code> object <code>sA</code> , the command <code>sA.disp</code> displays the property names and their settings for state <code>A</code> .

find

Purpose Return specified objects

Syntax `objArray = thisObject.find(Specifier, Value, ...)`

Note You can also nest specifications using braces ({}).

Description Using combinations of specifier-value argument pairs, the `find` method returns objects in this object that match the specified criteria. The specifier-value pairs can be property based or based on other attributes of the object such as its depth of containment. Specifiers can also be logical operators (`-and`, `-or`, etc.) that combine other specifier-value pairs.

By default, the `find` command finds objects at all depths of containment within an object. You can specify the maximum depth of search with the `-depth` specifier. However, the zeroth level of containment, i.e., the searched object itself, is always included if it happens to satisfy the search criteria.

If no arguments are specified, the `find` command returns all objects of this object at all levels of containment.

Arguments

<code>thisObject</code>	The object for which to find contained objects. Can be an object of type <code>Root</code> , <code>Machine</code> , <code>State</code> , <code>Box</code> , <code>Function</code> , or <code>Truth Table</code> .
<code>'-and'</code>	No value is paired to this specifier. Instead, this specifier relates a previous specifier-value pair to a following specifier-value pair in an AND relation.

- '-class' String class name of the class to search for. Use this option to find all objects whose class exactly matches a given class. To allow matches for subclasses of a given class, use the `-isa` specifier. Classes are specified as the string name (e.g., `'Stateflow.State'`, `'Stateflow.Transition'`, etc.) or as a handle to the class (see the method `classhandle`).
- '-depth' Integer depth to search, which can be 0, 1, 2,..., infinite. The default search depth is infinite.

Note For a machine object, using the `'-depth'` switch with the `find` method is not supported.

- '-function' Handle to a function that evaluates each object visited in the search. The function must always return a logical scalar value that indicates whether or not the value is a match. If no property is specified, the function is passed the handle of the current object in the search. If a property is specified, the function is passed the value of that property.

In the following example, a function with handle `f` (defined in first line) is used to filter a `find` to return only those objects of type `'andState'`:

```
f = @(h) (strcmp(get(h,'type'), 'andState'));  
objArray = thisObject.find('-function', f);
```

- '-isa' Name of the type of objects to search for. Object types are specified as a string name (e.g., `'Stateflow.State'`, `'Stateflow.Transition'`, etc.) or as a handle to the object type (see method `classhandle`).

find

- '-method' String that specifies the name of a method belonging to the objects to search for.
- '-not' No value is paired to this specifier. Instead, this specifier searches for the negative of the following specifier-value pair.
- '-or' No value is paired to this specifier. Instead, this specifier relates the previous specifier-value pair to the following specifier-value pair in an OR relation.

Note If no logical operator is specified, -or is assumed.

- 'property' The specifier takes on the name of the property. Value is the string value of the specified property for the objects you want to find.
- '-property' String name of the property that belongs to the objects you want to find.
- '-xor' No value is paired to this specifier. Instead, this specifier relates the previous specifier-value pair to the following specifier-value pair in an XOR relation.
- '-regexp' No value follows this specifier. Instead, this specifier indicates that the value of the following specifier-value pair contains a regular expression.

Returns

objArray Array of objects found matching the criteria specified.

Examples

If a Chart object *c* represents a Stateflow chart, the command `states=c.find('-isa','Stateflow.State')` returns an array, *states*, of all the states in the chart, and the command `states=c.find('Name','A')` returns an array of all objects whose Name property is 'A'.

If state A, which is represented by State object `sA`, contains two states, A1 and A2, and you specify a `find` command that finds all the states in A as follows:

```
states= sA.find('-isa','Stateflow.State')
```

then the above command finds three states: A, A1, and A2.

fitToView

Purpose	Zoom in on graphical Stateflow object
Syntax	<code>thisObject.fitToView</code>
Description	The <code>fitToView</code> method zooms in on this Stateflow object and highlights it in the editor.
Arguments	<code>thisObject</code> The object on which to zoom.
Returns	None
Examples	If <code>myState</code> is a State object, the command <code>myState.fitToView</code> zooms in on that state and highlights it in the editor.
See Also	<code>view</code> <code>zoomIn</code> and <code>zoomOut</code>

Purpose	Return MATLAB structure containing property settings of object or array of objects				
Syntax	<code>propList = thisObject.get(prop)</code>				
Description	<p>The <code>get</code> method returns and displays a MATLAB structure containing the settings for the specified property of this object. If no property is specified, the settings for all properties are returned.</p> <p>The <code>get</code> method is also vectorized so that it returns an <i>m</i>-by-<i>n</i> cell array of values for an array of <i>m</i> objects and an array of <i>n</i> properties.</p>				
Arguments	<table><tr><td><code>thisObject</code></td><td>The object for which to get specified property.</td></tr><tr><td><code>prop</code></td><td>String name of property (e.g., 'FontSize') to get value for. Can also be an array of properties (see return <code>propList</code> below). If no property is specified, a list of all properties is returned.</td></tr></table>	<code>thisObject</code>	The object for which to get specified property.	<code>prop</code>	String name of property (e.g., 'FontSize') to get value for. Can also be an array of properties (see return <code>propList</code> below). If no property is specified, a list of all properties is returned.
<code>thisObject</code>	The object for which to get specified property.				
<code>prop</code>	String name of property (e.g., 'FontSize') to get value for. Can also be an array of properties (see return <code>propList</code> below). If no property is specified, a list of all properties is returned.				
Returns	<table><tr><td><code>propList</code></td><td>MATLAB structure listing the properties of this object. Can also be an <i>m</i> by <i>n</i> cell array of values if <code>thisObject</code> is an array of <i>m</i> objects and <code>prop</code> is an array of <i>n</i> properties.</td></tr></table>	<code>propList</code>	MATLAB structure listing the properties of this object. Can also be an <i>m</i> by <i>n</i> cell array of values if <code>thisObject</code> is an array of <i>m</i> objects and <code>prop</code> is an array of <i>n</i> properties.		
<code>propList</code>	MATLAB structure listing the properties of this object. Can also be an <i>m</i> by <i>n</i> cell array of values if <code>thisObject</code> is an array of <i>m</i> objects and <code>prop</code> is an array of <i>n</i> properties.				
Examples	<p>State A is represented by the State object <code>sA</code>.</p> <p>The following command lists the properties of state A:</p> <pre>sA.get</pre> <p>The following command returns a handle to a MATLAB structure of the properties of state A to the workspace variable <code>Aprops</code>:</p> <pre>Aprops = sA.get</pre>				

help

Purpose	Display list of properties for object with accompanying descriptions
Syntax	<code>thisObject.help</code>
Description	The <code>help</code> method returns a list of properties for any object. To the right of this list appear simple descriptions for each property. Some properties do not have descriptions because their names are descriptive in themselves.
Arguments	None
Returns	None
Examples	If <code>j</code> is an API handle to a Stateflow junction, the command <code>j.help</code> returns a list of the property names and descriptions for a Stateflow API object of type <code>Junction</code> .

Purpose	Highlight graphical object in chart
Syntax	<code>thisObject.highlight</code>
Description	<p>This method highlights one of the following objects in a chart:</p> <ul style="list-style-type: none">• Box• State• Transition• Junction• Atomic box• Atomic subchart• Graphical function• MATLAB function• Simulink function• Truth table function
Arguments	<code>thisObject</code> The object you want to highlight.
Returns	None
Examples	<p>The following example shows how to highlight a state in a chart.</p> <pre>sf_car; rt = sfroot; ss_state = rt.find('-isa', 'Stateflow.State', 'Name', 'steady_state'); ss_state.highlight;</pre>
See Also	<code>view</code> <code>zoomIn</code> and <code>zoomOut</code>

innerTransitions

Purpose	Return inner transitions that originate with chart or state and terminate on contained object
Syntax	<code>transitions = thisObject.innerTransitions</code>
Description	The <code>innerTransitions</code> method returns the inner transitions that originate with this object and terminate on a contained object.
Arguments	None
Returns	<code>thisObject</code> Object for which to get inner transitions. Can be of type State or Box. <code>transitions</code> Array of inner transitions originating with this object and terminating on a contained state or junction.
Examples	State A contains state A1, and state A1 contains state A11. State A has two transitions, each originating from its inside edge and terminating inside it. These are inner transitions. One transition terminates with state A1 and the other terminates with state A11. The <code>innerTransitions</code> method of state A returns both of these transitions.

Purpose List methods belonging to object

Syntax `thisObject.methods`

Description The methods method lists the names of the methods belonging to this object.

Note The methods method for this object displays some internal methods that do not apply to chart use, and are not documented. Unsupported methods include: `areChildrenOrdered`, `evalDialogParams`, `getChildren`, `getCurrentDialogPrompts`, `getDialogInterface`, `getDialogProxy`, `getDialogSchema`, `getDisplayClass`, `getDisplayIcon`, `getDisplayLabel`, `getFullName`, `getHierarchicalChildren`, `getInstanceProperties`, `getParent`, `getPreferredProperties`, `isHierarchical`, `isLibrary`, `isLinked`, `isMasked`, `isModelReference`, `isTunableProperty`, `isValidProperty`.

Arguments

<code>thisObject</code>	Object for which to list methods. Can be of any Stateflow object type.
-------------------------	--

Returns None

Examples If state A is represented by State object `sA`, the command `sA.methods` lists the methods of state A.

outerTransitions

Purpose Return array of outer transitions for object

Syntax `transitions = thisObject.outerTransitions`

Description The `outerTransitions` method returns an array of transitions that exit the outer edge of this object and terminate on objects outside the containment of this object.

Arguments None

`thisObject` The object for which to find outer transitions. Can be of object type `State` or `Box`.

Returns `transitions` An array of transitions exiting the outer edge of this state.

Examples A chart contains three states, A, B, and C. State A is connected to state B through a transition from state A to state B. State B is connected to state C through a transition from state B to state C. And state C is connected to state A through a transition from state C to state A. If state A is represented by State object handle `sA`, the command `sA.outerTransitions` returns the transition from state A to state B.

Purpose Create, retrieve, or delete data output to Simulink base workspace of state activity status

Syntax `StateData = thisState.outputData(action)`

Description The `outputData` method of this state creates, retrieves, or deletes a special data object of type `State`. This data is attached internally to an output port on this state's Stateflow block in a Simulink model to output the activity status of this state to the Simulink base workspace during run-time.

Note You cannot use the Model Explorer to create Data objects of type `State`.

Arguments

<code>thisState</code>	The state object for which to add a special port.
<code>action</code>	This string value can be one of the following: <ul style="list-style-type: none">• <code>'create'</code> — Returns a new data object of type <code>State</code> and attaches it internally to a new state activity output port on this state's Stateflow block.• <code>'get'</code> — Returns this state's existing data object of type <code>State</code> attached internally to an existing state activity output port on this state's Stateflow block.• <code>'delete'</code> — Deletes this state's data object of type <code>State</code> and the state activity output port on its Stateflow block to which it is attached.

Returns

<code>StateData</code>	The data object of type <code>State</code> for this state
------------------------	---

Examples

If state A is represented by State object `sA`, the following command creates a new data object of type `State`, which is output to the Simulink base workspace and contains state A's activity:

```
s.outputData('create')
```

The Chart block in the Simulink model that contains state A now has an output port labeled A, the name of state A. In the Model Explorer, state A now contains a data object of type `State` whose scope is `Output to Simulink`.

The following command returns a `Data` object, `d`, for the data output to the Simulink base workspace containing state A's activity:

```
s.outputData('get')
```

The following command deletes the data output to the Simulink base workspace containing state A's activity:

```
s.outputData('delete')
```


Purpose Parse single chart or all charts in model

Syntax `thisChart.parse`
`thisMachine.parse`

Description For Chart objects, the parse method parses this chart.
For Machine objects, the parse method parses all the charts in this machine.

Arguments

<code>thisChart</code>	The chart to parse.
<code>thisMachine</code>	The machine containing charts to parse.

Returns None

Examples If `ch` is a handle to an API object representing a chart, then the command `ch.parse` parses the chart.

pasteTo

Purpose Paste objects in clipboard to specified container object

Syntax `clipboard.pasteTo(newContainer)`

Description The paste method pastes the contents of the Clipboard to the specified container object. The receiving container is specified through a single argument. Use of this method assumes that you placed objects in the Clipboard with the copy method.

Arguments

<code>newContainer</code>	The Stateflow object to receive a copy of the contents of the Clipboard object. If the objects in the Clipboard are all graphical (states, boxes, functions, notes, transitions, junctions), this object must be a chart or subchart.
---------------------------	---

Returns None

Examples See the section “Copy Objects” on page 1-33.

Purpose Set properties with specified values

Syntax `thisObject.set(propName,value,...)`

Note Arguments can consist of an indefinite number of property (name, value) pairs.

Description The set method sets the value of a specified property or sets the values of a set of specified properties for this object. You specify properties and values through pairs of property (name, value) arguments.

The get method is also vectorized so that it sets an m-by-n cell array of values for an array of m objects and an array of n properties.

Arguments

<code>thisObject</code>	The object for which the specified property is set. Can be any Stateflow object.
<code>propName</code>	String name of the property to set (e.g., 'FontSize'). Can also be a cell array of m property names.
<code>value</code>	New value for the specified property. Can be a cell array of m-by-n values if <code>thisObject</code> is an array of m objects and <code>propName</code> is an array of n property names.

Returns None

Examples The following command sets the Name and Description properties of the State object `s`:

```
s.set('Name', 'Kentucky', 'Description', 'Bluegrass State')
```

set

The following command sets the `Position` property of the State object `s`:

```
s.set('Position', [200, 119, 90, 60])
```

Purpose Insert image from clipboard or image file into an annotation

Syntax

```
thisNote.setImage(path)  
  
thisNote.setImage('clipboard')  
thisNote.setImage('')
```

Description

`thisNote.setImage(path)` inserts a image from the file specified with the *path* argument.

`thisNote.setImage('clipboard')` inserts an image from the clipboard.

`thisNote.setImage('')` sets the annotation to be a text annotation.

Arguments

<code>path</code>	A string specifying the full path to the image file.
<code>'clipboard'</code>	A string specifying to insert an image from the clipboard.
<code>''</code>	An empty string that sets the annotation to be a text annotation.

Returns None

Examples

If note A is represented by Note object `sA`, the MATLAB command statement `sA.setImage('myfolder/annotation_images/converter.png')` inserts the `converter.png` image in annotation A.

See Also Stateflow.Note

sinkedTransitions

Purpose	Return transitions that have object as destination		
Syntax	<code>transitions = thisObject.sinkedTransitions</code>		
Description	The <code>sinkedTransitions</code> method returns all inner and outer transitions that have this object as their destination.		
Arguments	<table><tr><td><code>thisObject</code></td><td>Destination object of the returned transitions. Can be of type <code>State</code>, <code>Box</code>, or <code>Junction</code>.</td></tr></table>	<code>thisObject</code>	Destination object of the returned transitions. Can be of type <code>State</code> , <code>Box</code> , or <code>Junction</code> .
<code>thisObject</code>	Destination object of the returned transitions. Can be of type <code>State</code> , <code>Box</code> , or <code>Junction</code> .		
Returns	<table><tr><td><code>transitions</code></td><td>Array of all transitions whose destination is this object.</td></tr></table>	<code>transitions</code>	Array of all transitions whose destination is this object.
<code>transitions</code>	Array of all transitions whose destination is this object.		
Examples	The following example shows how to find all transitions whose destination is the state named <code>steady_state</code> .		

```
sf_car;  
rt = sfroot;  
ss_state = rt.find('-isa','Stateflow.State','Name','steady_state');  
sinked_trans = ss_state.sinkedTransitions;
```

Purpose	Return transitions that have object as source		
Syntax	<code>transitions = thisObject.sourcedTransitions</code>		
Description	The <code>sourcedTransitions</code> method returns all inner and outer transitions that have this object as their source.		
Arguments	<table><tr><td><code>thisObject</code></td><td>Source object of the returned transitions. Can be of type <code>State</code>, <code>Box</code>, or <code>Junction</code>.</td></tr></table>	<code>thisObject</code>	Source object of the returned transitions. Can be of type <code>State</code> , <code>Box</code> , or <code>Junction</code> .
<code>thisObject</code>	Source object of the returned transitions. Can be of type <code>State</code> , <code>Box</code> , or <code>Junction</code> .		
Returns	<table><tr><td><code>transitions</code></td><td>Array of all transitions whose source is this object</td></tr></table>	<code>transitions</code>	Array of all transitions whose source is this object
<code>transitions</code>	Array of all transitions whose source is this object		
Examples	<p>The following example shows how to find all transitions whose source is the state named <code>steady_state</code>.</p> <pre>sf_car; rt = sfroot; ss_state = rt.find('-isa', 'Stateflow.State', 'Name', 'steady_state'); sourced_trans = ss_state.sourcedTransitions;</pre>		

Stateflow.AtomicBox

Purpose Constructor for creating atomic box

Syntax `atomic_box_new = Stateflow.AtomicBox(parent)`

Description The `Stateflow.AtomicBox` method is a constructor method for creating an atomic box for a parent chart or state. This method returns a handle to the new Atomic Box object.

Arguments `parent` Handle to the object for the parent chart or state that contains the new atomic box

Returns `atomic_box_new` Handle to Atomic Box object for newly created atomic box

Examples If `sA` is a handle to a State object for the existing state A, the following command creates a new atomic box parented (contained) by state A:

```
atomic_box_new = Stateflow.AtomicBox(sA)
```

The new atomic box appears in the upper left corner of state A in the chart. `atomic_box_new` is a handle to the new Atomic Box object that you can use to rename the atomic box, set its properties, and execute its methods.

Purpose	Constructor for creating atomic subchart
Syntax	<code>atomic_subchart_new = Stateflow.AtomicSubchart(parent)</code>
Description	The <code>Stateflow.AtomicSubchart</code> method is a constructor method for creating an atomic subchart for a parent chart or state. This method returns a handle to the new Atomic Subchart object. For more information on atomic subcharts, see “What Is an Atomic Subchart?”.
Arguments	<code>parent</code> Handle to the object for the parent chart or state that contains the new atomic subchart
Returns	<code>atomic_subchart_new</code> Handle to Atomic Subchart object for newly created atomic subchart
Examples	<p>If <code>sA</code> is a handle to a State object for the existing state A, the following command creates a new atomic subchart parented (contained) by state A:</p> <pre>atomic_subchart_new = Stateflow.AtomicSubchart(sA)</pre> <p>The new atomic subchart appears in the upper left corner of state A in the chart. <code>atomic_subchart_new</code> is a handle to the new Atomic Subchart object that you can use to rename the atomic subchart, set its properties, and execute its methods.</p>

Stateflow.Box

Purpose Constructor for creating box

Syntax `box_new = Stateflow.Box(parent)`

Description The `Stateflow.Box` method is a constructor method for creating boxes in a parent chart, state, box, or function, that returns a handle to an Event object for the new function.

Arguments `parent` Handle to an object for the parent chart, state, box, or function of the new box

Returns `box_new` Handle to the Box object for the new box

Examples If `sA` is a handle to a State object for an existing state A, the following command creates a new box parented (contained by) state A:

```
box_new = Stateflow.Box(sA)
```

The new box is unnamed and appears in the upper left corner inside state A. `box_new` is a handle to a Box object for the new box.

Purpose Constructor for creating data

Syntax `data_new = Stateflow.Data(parent)`

Description The `Stateflow.Data` method is a constructor method for creating data for a parent machine, chart, state, box, or function, that returns a handle to the Data object for the new data.

Arguments

<code>parent</code>	Handle to an object for the parent machine, chart, state, box, or function of the new data
---------------------	--

Returns

<code>data_new</code>	Handle to the Data object for the new data
-----------------------	--

Examples If `sA` is a handle to a State object for an existing state A, the following command creates a new data parented (contained by) state A:

```
data_new = Stateflow.Data(sA)
```

The new data is named 'data' with an incremented integer suffix to distinguish additional creations. `data_new` is a handle to the Data object for the new data.

Stateflow.EMFunction

Purpose Constructor for creating MATLAB function

Syntax `efunction_new = Stateflow.EMFunction(parent)`

Description The `Stateflow.EMFunction` method is a constructor method for creating a MATLAB function in a parent chart, state, box, or graphical function. It returns a handle to the `EMFunction` object for the new MATLAB function.

Arguments

<code>parent</code>	Handle to parent chart or state of the new MATLAB function
---------------------	--

Returns

<code>efunction_new</code>	Handle to a Function object for the new MATLAB function
----------------------------	---

Examples If `sA` is a handle to a State object for the existing state A, the following command creates a new MATLAB function parented (contained by) state A:

```
efunction_new = Stateflow.EMFunction(sA)
```

The new MATLAB function is unnamed and appears in the upper left corner inside state A in the chart. `efunction_new` is a handle to the `EMFunction` object, which you use to rename the function, set its properties, and execute its methods.

Purpose Constructor for creating event

Syntax `event_new = Stateflow.Event(parent)`

Description The `Stateflow.Event` method is a constructor method for creating an event for a parent chart or state, that returns a handle to an `Event` object for the new event.

Arguments `parent` Handle to parent chart or state of new event

Returns `event_new` Handle to the `Event` object for the new event

Examples If `sA` is a handle to a `State` object for an existing state A, the following command creates a new event parented (contained by) state A:

```
event_new = Stateflow.Event(sA)
```

The new event is named 'event' with an incremented suffix to distinguish additional creations. `event_new` is a handle to an `Event` object for the new event that you use to rename the event, set its properties, and execute `Event` methods for the event.

Stateflow.Function

Purpose Constructor for creating graphical function

Syntax `function_new = Stateflow.Function(parent)`

Description The `Stateflow.Function` method is a constructor method for creating graphical functions in a parent chart or state that returns a handle to a Function object for the new graphical function.

Arguments

<code>parent</code>	Handle to parent chart or state of the new graphical function
---------------------	---

Returns

<code>function_new</code>	Handle to a Function object for the new graphical function
---------------------------	--

Examples If `sA` is a handle to a State object for the existing state A, the following command creates a new graphical function parented (or contained) by state A:

```
function_new = Stateflow.Function(sA)
```

The new graphical function is unnamed and appears in the upper left corner inside state A in the chart. `function_new` is a handle to the Function object for the new graphical function that you use to rename the function, set its properties, and execute its methods.

Purpose Constructor for creating junction

Syntax `junc_new = Stateflow.Junction(parent)`

Description The `Stateflow.Junction` method is a constructor method for creating a junction in a parent chart, state, box, or function, that returns a handle to the Junction object for the new junction.

Arguments

<code>parent</code>	Handle to the object for the parent chart, state, box, or function of the new junction
---------------------	--

Returns

<code>junc_new</code>	Handle to the Junction object for new junction
-----------------------	--

Examples If `sA` is a handle to a State object for the existing state A, the following command creates a new junction parented (contained by) state A:

```
junc_new = Stateflow.Junction(sA)
```

The new junction appears in the middle of state A in the chart. `junc_new` is a handle to the Junction object for the new junction that you use to set its properties, and execute its methods.

Stateflow.Note

Purpose Constructor for creating note

Syntax `note_new = Stateflow.Note(parent)`

Description The `Stateflow.Note` method is a constructor method for creating notes for a parent chart, state, box, or function, that returns a handle to the Note object for the new note.

Arguments

<code>parent</code>	Handle to the object for the parent chart, state, box, or function for the new note
---------------------	---

Returns

<code>note_new</code>	Handle to the Note object for the newly created note
-----------------------	--

Examples If `sA` is a handle to a State object for the existing state A, the following command creates a new note parented (contained by) state A:

```
note_new = Stateflow.Note(sA)
```

The new note appears in the upper left corner of state A in the chart, but is invisible because it has no text content. `note_new` is a handle to the Note object for the new note, that you use to set its text content with a command like the following:

```
note_new.Text = 'This is a note'
```


Purpose Constructor for creating Simulink function

Syntax `sl_function = Stateflow.SLFunction(parent)`

Description The `Stateflow.SLFunction` method is a constructor method for creating a Simulink function for a parent chart or state that returns a handle to the new Simulink Function object.

Arguments `parent` Handle to the object for the parent chart or state for the new Simulink Function object

Returns `sl_function` Handle to the newly created Simulink Function object

Examples If `sA` is a handle to a State object for the existing state A, the following command creates a new Simulink function parented (contained) by state A:

```
sl_function = Stateflow.SLFunction(sA)
```

The new Simulink function appears in the upper left corner of state A in the chart. `sl_function` is a handle to the new Simulink function that you can use to rename the function, set its properties, and execute its methods.

Stateflow.State

Purpose Constructor for creating state

Syntax `state_new = Stateflow.State(parent)`

Description The `Stateflow.State` method is a constructor method for creating a state for a parent chart, state, or box, that returns a handle to the `State` object for the new state.

Arguments `parent` Handle to the object for the parent chart, state, or box for the new state

Returns `state_new` Handle to `State` object for newly created state

Examples If `sA` is a handle to a `State` object for the existing state A, the following command creates a new state parented (contained) by state A:

```
state_new = Stateflow.State(sA)
```

The new state appears in the upper left corner of state A in the chart. `state_new` is a handle to the `State` object for the new state that you use to rename the state, set its properties, and execute its methods.

Purpose Constructor for creating custom target

Syntax `target_new = Stateflow.Target(parent_m)`

Description The `Stateflow.Target` method is a constructor method for creating a custom target for a parent machine, that returns a handle to the `Target` object for the new target.

Arguments

<code>parent_m</code>	Handle to object for the parent machine of the new custom target
-----------------------	--

Returns

<code>target_new</code>	Handle to the <code>Target</code> object for the newly created custom target
-------------------------	--

Examples The following command creates a new custom target for the machine with the `Machine` object whose handle is `pm`:

```
target_new = Stateflow.Target(pm)
```

The preceding command creates a custom target with the name `untitled`. `target_new` is a handle to the `Target` object, which you can use to rename and set properties for the custom target. This command renames the new target to `ctarg`:

```
target_new.Name = 'ctarg'
```

Stateflow.Transition

Purpose Constructor for creating transition

Syntax `transition_new = Stateflow.Transition(parent)`

Description The `Stateflow.Transition` method is a constructor method for creating transitions in a parent chart, state, box, or function that returns a handle to a Transition object for the new transition.

Arguments `parent` Handle to parent chart, state, box, or function of new transition

Returns `transition_new` Handle to Transition object for the new transition

Examples If `sA` is a handle to a State object for the existing state A, the following command creates a new transition parented by state A:

```
transition_new = Stateflow.Transition(sA)
```

The new transition is unlabeled and appears in the upper left corner of the chart. `transition_new` is a handle to the Transition object for the new transition that you use to rename the transition, set its properties, and execute its methods.

Purpose

Constructor for creating truth table

Syntax

```
truth_table_new = Stateflow.TruthTable(parent)
```

Description

The `Stateflow.TruthTable` method is a constructor method for creating truth tables in a parent chart, state, box, or function, that returns a handle to a Truth Table object for the new truth table.

Arguments

`parent` Handle to parent chart or state of new truth table

Returns

`truth_table_new` Handle to Truth Table object for new truth table

Examples

If `sA` is a handle to a State object for the existing state A, the following command creates a new truth table parented (contained by) state A:

```
truth_table_new = Stateflow.TruthTable(sA)
```

The new truth table is unnamed and appears in the upper left corner inside of state A in the chart. `truth_table_new` is a handle to the Truth Table object for the new truth table that you use to rename the truth table, set its properties, and execute its methods.

struct

Purpose Return MATLAB structure containing property settings of object

Syntax `propList = thisObject.struct`

Description The `struct` method returns and displays a MATLAB structure containing the property settings of this object.

Note You can change the values of the properties in this structure just as you would a property of the object. However, the MATLAB structure is not a Stateflow object and changing it does not affect the model.

Arguments `transitions` The object for which to display property settings. Can be any Stateflow object type.

Returns `propList` MATLAB structure listing the properties of this object

Examples If State object `sA` represents a state A, the command `x = sA.struct` returns a MATLAB structure `x`. You can use dot notation on `x` to report properties or set the values of other variables. For example, the command `y=x.Name` sets the MATLAB variable `y` to the value of the `Name` property of state A, which is 'A'. The command `x.Name = 'Kansas'` sets the `Name` property of `x` to 'Kansas' but does not change the `Name` property of state A.

Purpose	Return parent of object		
Syntax	<code>parentObject = thisObject.up</code>		
Description	The up method returns a handle to the parent of this object.		
Arguments	<table><tr><td><code>thisObject</code></td><td>Object for which to return parent (containing) object</td></tr></table>	<code>thisObject</code>	Object for which to return parent (containing) object
<code>thisObject</code>	Object for which to return parent (containing) object		
Returns	<table><tr><td><code>parentObject</code></td><td>Object containing <code>thisObject</code></td></tr></table>	<code>parentObject</code>	Object containing <code>thisObject</code>
<code>parentObject</code>	Object containing <code>thisObject</code>		
Examples	<p>Assume that a chart has two states, A and B, and state A contains state B. If the object <code>sB</code> represents the state B, then the command</p> <pre>p = sB.up</pre> <p>returns a handle <code>p</code> to the parent of B, which is state A.</p>		

view

Purpose Make object visible for editing

Syntax `thisObject.view`

Description The view method opens the Stateflow object in its appropriate editing environment as follows:

- For Chart objects, the view method opens the chart, if it is not already open, and brings it to the foreground.
- For State, Box, Function, Note, Junction, and Transition objects, the view method does the following:
 - 1 Opens the chart containing the object if it is not already open.
 - 2 Highlights the object.
 - 3 Zooms the object's editor window to the level of full expanse of the object's containing state or chart.
 - 4 Brings the editor window for this object to the foreground.
- For Atomic Subchart and Atomic Box objects, the view method shows the contents of the object.
- For Truth Table objects, the view method opens the Truth Table Editor for this truth table.
- For MATLAB Function objects, the view method opens the editor for this function.
- For Simulink Function objects, the view method shows the contents of the function-call subsystem.
- For Event, Data, and Target objects, the view method opens the Model Explorer.

Arguments `thisObject` Object for which to display editing environment.

Returns

None

zoomIn and zoomOut

Purpose Zoom in or out on Stateflow chart

Syntax `thisEditor.zoomIn`
`thisEditor.zoomOut`

Description The methods `zoomIn` and `zoomOut` cause the editor for a chart to zoom in or zoom out, respectively, by 20 percentage points.

Note The `zoomIn` and `zoomOut` methods do not open or give focus to the editor for the chart.

Arguments `thisEditor` Editor object on which to zoom in or out.

Returns None

Examples If the Editor object `ed` represents the editor for a chart with the zoom level at 100%, the command `ed.zoomIn` raises the zoom level to 120%.