Simulink® Verification and Validation™

Reference

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Simulink® Verification and Validation™ Reference

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Contents

1 Function Reference

2 Class Reference

3 Functions — Alphabetical List

4 Block Reference

5 Model Advisor Checks

Function Reference

Requirements Management Interface

Model Coverage

add (cv.cvtestgroup)	Add `cvtest` objects
allNames (cv.cvdatagroup)	Get names of all models associated with `cvdata` objects in `cv.cvdatagroup`
allNames (cv.cvtestgroup)	Get names of all models associated with `cvtest` objects in `cv.cvtestgroup`
complexityinfo	Cyclomatic complexity coverage information
conditioninfo	Collect condition coverage information for model object
cv.cvdatagroup	Create collection of `cvdata` objects for model reference hierarchy
cv.cvtestgroup	Create collection of `cvtest` objects for model reference hierarchy
cvexit	Exit model coverage environment
cvhtml	Produce HTML report from model coverage objects
cvload	Load coverage tests and stored results into memory
cvmodelview	Display model coverage results with model coloring
cvsave	Save coverage tests and results to file
cvsim	Simulate and return model coverage results for test objects
cvsimref	Simulate and return model coverage results for referenced models
cvtest	Create model coverage test specification object

decisioninfo	Display decision coverage information for model object
get (cv.cvdatagroup)	Get `cvdata` object
get (cv.cvtestgroup)	Get `cvtest` objects
getAll (cv.cvdatagroup)	Get all `cvdata` objects
getCoverageInfo	Coverage information for Simulink Design Verifier™ blocks
mcdcinfo	Collect modified condition/decision coverage information for model object
sigrangeinfo	Collect signal range coverage information for model object
sigsizeinfo	Collect signal size coverage information for model object
tableinfo	Display lookup table coverage information for model object

Component Analysis and Verification

Model Preparation

slvnvextract	Extract subsystem or subchart contents into new model for analysis
slvnvlogsignals	Log simulation input port values

Test Execution

slvnvruncgvtest	Invoke Code Generation Verification (CGV) API and execute model
slvnvruntest	Simulate model using input data
slvnvruntestopts	Generate simulation or execution options for `slvnvruntest` or `slvnvruncgvtest`

Analysis Results

slvnvharnessopts	Generate default options for `slvnvmakeharness`
slvnvmakeharness	Generate Simulink Verification and Validation™ harness model
slvnvmergedata	Merge test case data
slvnvmergeharness	Merge test cases and initializations into one model

Model Checking

Model Advisor Customization API

addCheck (ModelAdvisor.FactoryGroup)	Add check to folder
addGroup (ModelAdvisor.Group)	Add subfolder to folder
addProcedure (ModelAdvisor.Group)	Add procedure to folder
addProcedure (ModelAdvisor.Procedure)	Add subprocedure to procedure
addTask (ModelAdvisor.Group)	Add task to folder
addTask (ModelAdvisor.Procedure)	Add task to procedure
getID (ModelAdvisor.Check)	Return check identifier
ModelAdvisor.Action	Add actions to custom checks
ModelAdvisor.Check	Create custom checks
ModelAdvisor.FactoryGroup	Define subfolder in **By Task** folder
ModelAdvisor.Group	Define custom folder
ModelAdvisor.InputParameter	Add input parameters to custom checks
ModelAdvisor.ListViewParameter	Add list view parameters to custom checks
ModelAdvisor.Procedure	Define custom procedures
ModelAdvisor.Root	Identify root node
ModelAdvisor.Task	Define custom tasks
publish (ModelAdvisor.Root)	Publish object in Model Advisor root
register (ModelAdvisor.Root)	Register object in Model Advisor root
setAction (ModelAdvisor.Check)	Specify action for check
setCallbackFcn (ModelAdvisor.Action)	Specify action callback function
setCallbackFcn (ModelAdvisor.Check)	Specify callback function for check
setCheck (ModelAdvisor.Task)	Specify check used in task

setColSpan (ModelAdvisor.InputParameter)	Specify number of columns for input parameter
setInputParameters (ModelAdvisor.Check)	Specify input parameters for check
setInputParametersLayoutGrid (ModelAdvisor.Check)	Specify layout grid for input parameters
setRowSpan (ModelAdvisor.InputParameter)	Specify rows for input parameter

Model Advisor Result Template API

addRow (ModelAdvisor.FormatTemplate)	Add row to table
ModelAdvisor.FormatTemplate	Construct template object for formatting Model Advisor analysis results
setCheckText (ModelAdvisor.FormatTemplate)	Add description of check to result
setColTitles (ModelAdvisor.FormatTemplate)	Add column titles to table
setInformation (ModelAdvisor.FormatTemplate)	Add description of subcheck to result
setListObj (ModelAdvisor.FormatTemplate)	Add list of hyperlinks to model objects
setRecAction (ModelAdvisor.FormatTemplate)	Add Recommended Action section and text
setRefLink (ModelAdvisor.FormatTemplate)	Add See Also section and links
setSubBar (ModelAdvisor.FormatTemplate)	Add line between subcheck results
setSubResultStatus (ModelAdvisor.FormatTemplate)	Add status to check or subcheck result
setSubResultStatusText (ModelAdvisor.FormatTemplate)	Add text below status in result
setSubTitle (ModelAdvisor.FormatTemplate)	Add title for subcheck in result
setTableInfo (ModelAdvisor.FormatTemplate)	Add data to table
setTableTitle (ModelAdvisor.FormatTemplate)	Add title to table

Model Advisor Formatting API

addItem (ModelAdvisor.List)	Add item to list
addItem (ModelAdvisor.Paragraph)	Add item to paragraph
getEntry (ModelAdvisor.Table)	Get table cell contents
ModelAdvisor.Image	Include image in Model Advisor output
ModelAdvisor.LineBreak	Insert line break
ModelAdvisor.List	Create list class
ModelAdvisor.Paragraph	Create and format paragraph
ModelAdvisor.Table	Create table
ModelAdvisor.Text	Create Model Advisor text output
setAlign (ModelAdvisor.Paragraph)	Specify paragraph alignment
setBold (ModelAdvisor.Text)	Specify bold text
setColHeading (ModelAdvisor.Table)	Specify table column title
setColHeadingAlign (ModelAdvisor.Table)	Specify column title alignment
setColor (ModelAdvisor.Text)	Specify text color
setColWidth (ModelAdvisor.Table)	Specify column widths
setEntries (ModelAdvisor.Table)	Set contents of table
setEntry (ModelAdvisor.Table)	Add cell to table
setEntryAlign (ModelAdvisor.Table)	Specify table cell alignment
setHeading (ModelAdvisor.Table)	Specify table title
setHeadingAlign (ModelAdvisor.Table)	Specify table title alignment
setHyperlink (ModelAdvisor.Image)	Specify hyperlink location
setHyperlink (ModelAdvisor.Text)	Specify hyperlinked text
setImageSource (ModelAdvisor.Image)	Specify image location

setItalic (ModelAdvisor.Text)	Italicize text
setRetainSpaceReturn (ModelAdvisor.Text)	Retain spacing and returns in text
setRowHeading (ModelAdvisor.Table)	Specify table row title
setRowHeadingAlign (ModelAdvisor.Table)	Specify table row title alignment
setSubscript (ModelAdvisor.Text)	Specify subscripted text
setSuperscript (ModelAdvisor.Text)	Specify superscripted text
setType (ModelAdvisor.List)	Specify list type
setUnderlined (ModelAdvisor.Text)	Underline text

Class Reference

Model Coverage

cv.cvdatagroup	Collection of `cvdata` objects
cv.cvtestgroup	Collection of `cvtest` objects

Model Advisor Customization API

ModelAdvisor.Action	Add actions to custom checks
ModelAdvisor.Check	Create custom checks
ModelAdvisor.FactoryGroup	Define subfolder in **By Task** folder
ModelAdvisor.Group	Define custom folder
ModelAdvisor.InputParameter	Add input parameters to custom checks
ModelAdvisor.ListViewParameter	Add list view parameters to custom checks
ModelAdvisor.Procedure	Define custom procedures
ModelAdvisor.Root	Identify root node
ModelAdvisor.Task	Define custom tasks

Model Advisor Result Template API

Model Advisor Formatting API

ModelAdvisor.Image	Include image in Model Advisor output
ModelAdvisor.LineBreak	Insert line break
ModelAdvisor.List	Create list class
ModelAdvisor.Paragraph	Create and format paragraph
ModelAdvisor.Table	Create table
ModelAdvisor.Text	Create Model Advisor text output

3

Functions — Alphabetical List

cv.cvtestgroup.add

Purpose

Add `cvtest` objects

Syntax

`add(cvtg, cvto1, cvto2, ...)`

Description

`add(cvtg, cvto1, cvto2, ...)` adds the `cvtest` objects specified by the strings `cvto1`, `cvto2`, etc. to `cvtg`, which is an instantiation of the `cv.cvtestgroup` class.

Examples

Create two `cvtest` objects and add them to a newly created `cv.cvtestgroup` object:

```
cvto1 = cvtest;
cvto2 = cvtest;
cvtg = cv.cvtestgroup;
add(cvtg, cvto1, cvto2);
```

Purpose

Add check to folder

Syntax

`addCheck(fg_obj, check_ID)`

Description

`addCheck(fg_obj, check_ID)` adds checks, identified by `check_ID`, to the folder specified by `fg_obj`, which is an instantiation of the `ModelAdvisor.FactoryGroup` class.

Examples

Add three checks to `rec`:

```
% --- sample factory group
rec = ModelAdvisor.FactoryGroup('com.mathworks.sample.factorygroup');
.
.
.
addCheck(rec, 'com.mathworks.sample.Check1');
addCheck(rec, 'com.mathworks.sample.Check2');
addCheck(rec, 'com.mathworks.sample.Check3');
```

ModelAdvisor.Group.addGroup

Purpose Add subfolder to folder

Syntax

```
addGroup(group_obj, child_obj)
```

Description `addGroup(group_obj, child_obj)` adds a new subfolder, identified by `child_obj`, to the folder specified by `group_obj`, which is an instantiation of the `ModelAdvisor.Group` class.

Examples Add three checks to `rec`:

```
group_obj = ModelAdvisor.Group('com.mathworks.sample.group');
.
.
.
addGroup(group_obj, 'com.mathworks.sample.subgroup1');
addGroup(group_obj, 'com.mathworks.sample.subgroup2');
addGroup(group_obj, 'com.mathworks.sample.subgroup3');
```

ModelAdvisor.List.addItem

Purpose

Add item to list

Syntax

`addItem(`*`element`*`)`

Description

`addItem(`*`element`*`)` adds items to the list created by the `ModelAdvisor.List` constructor.

Input Arguments

`element`	Specifies an element to be added to a list in one of the following: • Element • Cell array of elements. When you add a cell array to a list, they form different rows in the list. • String

Examples

```
subList = ModelAdvisor.List();
setType(subList, 'numbered')
addItem(subList, ModelAdvisor.Text('Sub entry 1', {'pass','bold'}));
addItem(subList, ModelAdvisor.Text('Sub entry 2', {'pass','bold'}));
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Paragraph.addItem

Purpose

Add item to paragraph

Syntax

```
addItem(text, element)
```

Description

`addItem(text, element)` adds an element to `text`. `element` is one of the following:

- String
- Element
- Cell array of elements

Examples

Add two lines of text:

```
result = ModelAdvisor.Paragraph;
addItem(result, [resultText1 ModelAdvisor.LineBreak resultText2]);
```

See Also

“Model Advisor Customization”

How To

- “Authoring Checks”

Purpose

Add procedure to folder

Syntax

```
addProcedure(group_obj, procedure_obj)
```

Description

`addProcedure(group_obj, procedure_obj)` adds a procedure, specified by `procedure_obj`, to the folder `group_obj`. `group_obj` is an instantiation of the `ModelAdvisor.Group` class.

Examples

Add three procedures to `MAG`.

```
MAG = ModelAdvisor.Group('com.mathworks.sample.GroupSample');

MAP1=ModelAdvisor.Procedure('com.mathworks.sample.procedure1');
MAP2=ModelAdvisor.Procedure('com.mathworks.sample.procedure2');
MAP3=ModelAdvisor.Procedure('com.mathworks.sample.procedure3');

addProcedure(MAG, MAP1);
addProcedure(MAG, MAP2);
addProcedure(MAG, MAP3);
```

ModelAdvisor.Procedure.addProcedure

Purpose

Add subprocedure to procedure

Syntax

`addProcedure(procedure1_obj, procedure2_obj)`

Description

`addProcedure(procedure1_obj, procedure2_obj)` adds a procedure, specified by `procedure2_obj`, to the procedure `procedure1_obj`. `procedure2_obj` and `procedure1_obj` are instantiations of the `ModelAdvisor.Procedure` class.

Examples

Add three procedures to `MAP`.

```
MAP = ModelAdvisor.Procedure('com.mathworks.sample.ProcedureSample');

MAP1=ModelAdvisor.Procedure('com.mathworks.sample.procedure1');
MAP2=ModelAdvisor.Procedure('com.mathworks.sample.procedure2');
MAP3=ModelAdvisor.Procedure('com.mathworks.sample.procedure3');

addProcedure(MAP, MAP1);
addProcedure(MAP, MAP2);
addProcedure(MAP, MAP3);
```

Purpose

Add row to table

Syntax

`addRow(ft_obj, {item1, item2, ..., itemn})`

Description

`addRow(`*`ft_obj`*`, {`*`item1`*`, `*`item2`*`, ..., `*`itemn`*`})` is an optional method that adds a row to the end of a table in the result. *`ft_obj`* is a handle to the template object previously created. `{`*`item1`*`, `*`item2`*`, ..., `*`itemn`*`}` is a cell array of strings and objects to add to the table. The order of the items in the array determines which column the item is in. If you do not add data to the table, the Model Advisor does not display the table in the result.

Note Before adding rows to a table, you must specify column titles using the `setColTitle` method.

Examples

Find all of the blocks in the model and create a table of the blocks:

```
% Create FormatTemplate object, specify table format
ft = ModelAdvisor.FormatTemplate('TableTemplate');

% Add information to the table
setTableTitle(ft, {'Blocks in Model'});
setColTitles(ft, {'Index', 'Block Name'});
% Find all the blocks in the system and add them to a table.
allBlocks = find_system(system);
for inx = 2 : length(allBlocks)
    % Add information to the table
    addRow(ft, {inx-1,allBlocks(inx)});
end
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.Group.addTask

Purpose

Add task to folder

Syntax

```
addTask(group_obj, task_obj)
```

Description

`addTask(group_obj, task_obj)` adds a task, specified by `task_obj`, to the folder `group_obj`.`group_obj` is an instantiation of the `ModelAdvisor.Group` class.

Examples

Add three tasks to `MAG`.

```
MAG = ModelAdvisor.Group('com.mathworks.sample.GroupSample');
addTask(MAG, MAT1);
addTask(MAG, MAT2);
addTask(MAG, MAT3);
```

Purpose

Add task to procedure

Syntax

`addTask(procedure_obj, task_obj)`

Description

`addTask(procedure_obj, task_obj)` adds a task, specified by `task_obj`, to `procedure_obj`.`procedure_obj` is an instantiation of the `ModelAdvisor.Procedure` class.

Examples

Add three tasks to `MAP`.

```
MAP = ModelAdvisor.Procedure('com.mathworks.sample.ProcedureSample');

MAT1=ModelAdvisor.Task('com.mathworks.sample.task1');
MAT2=ModelAdvisor.Task('com.mathworks.sample.task2');
MAT3=ModelAdvisor.Task('com.mathworks.sample.task3');

addTask(MAP, MAT1);
addTask(MAP, MAT2);
addTask(MAP, MAT3);
```

cv.cvdatagroup.allNames

Purpose

Get names of all models associated with `cvdata` objects in `cv.cvdatagroup`

Syntax

```
models = allNames(cvdg)
```

Description

`models = allNames(cvdg)` returns a cell array of strings identifying all model names associated with the `cvdata` objects in `cvdg`, an instantiation of the `cv.cvdatagroup` class.

Examples

Add three `cvdata` objects to `cvdg` and return a cell array of model names:

```
a = cvdata;
b = cvdata;
c = cvdata;
cvdg = cv.cvdatagroup;
add (cvdg, a, b, c);
model_names = allNames(cvdg)
```

Purpose

Get names of all models associated with `cvtest` objects in `cv.cvtestgroup`

Syntax

```
models = allNames(cvtg)
```

Description

`models = allNames(cvtg)` returns a cell array of strings identifying all model names associated with the `cvtest` objects in `cvtg`, an instantiation of the `cv.cvtestgroup` class.

Examples

Add three `cvtest` objects to `cvtg` and return a cell array of model names:

```
d = cvtest;
e = cvtest;
f = cvtes;
cvtg = cv.cvtestgroup;
add (cvtg, d, e, f);
model_names = allNames(cvtg)
```

complexityinfo

Purpose

Cyclomatic complexity coverage information

Syntax

```
complexity = complexityinfo(cvdo, object)
```

Description

`complexity = complexityinfo(cvdo, object)` returns complexity coverage results from the `cvdata` object `cvdo` for the model component `object`.

Input Arguments

cvdo

`cvdata` object

object

The `object` argument specifies an object in the model or Stateflow® chart that received decision coverage. Valid values for `object` include the following:

Object Specification	Description
`BlockPath`	Full path to a model or block
`BlockHandle`	Handle to a model or block
`slObj`	Handle to a Simulink API object
`sfID`	Stateflow ID
`sfObj`	Handle to a Stateflow API object from a singly instantiated Stateflow chart
`{BlockPath, sfID}`	Cell array with the path to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

Object Specification	Description
`{BlockPath, sfObj}`	Cell array with the path to a Stateflow chart or subchart and a Stateflow object API handle contained in that chart or subchart
`[BlockHandle, sfID]`	Array with a handle to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

Output Arguments

complexity

If `cvdo` does not contain cyclomatic complexity coverage results for `object`, `complexity` is empty.

If `cvdo` contains cyclomatic complexity coverage results for `object`, `complexity` is a two-element vector of the form `[total_complexity local_complexity]`:

`total_complexity`	Cyclomatic complexity coverage for `object` and its descendants (if any)
`local_complexity`	Cyclomatic complexity coverage for `object`

If `object` has variable-size signals, `complexity` also contains the variable complexity.

Examples

Open the `sldemo_fuelsys` model and create the test specification object `testObj`. Enable decision, condition, and MCDC coverage for `sldemo_fuelsys` and execute `testObj` using `cvsim`. Use `complexityinfo` to retrieve cyclomatic complexity results for the Throttle subsystem. The Throttle subsystem itself does not record cyclomatic complexity coverage results, but the contents of the subsystem do record cyclomatic complexity coverage.

```
mdl = 'sldemo_fuelsys';
open_system(mdl);
testObj = cvtest(mdl)
testObj.settings.decision = 1;
testObj.settings.condition = 1;
testObj.settings.mcdc = 1;
data = cvsim(testObj);
blk_handle = get_param([mdl, ...
     '/Engine Gas Dynamics/Throttle & Manifold/Throttle'],...
     'Handle');
coverage = complexityinfo(data, blk_handle);
coverage
```

Alternatives

Use the Coverage Settings dialog box to collect and display cyclomatic complexity coverage results in the coverage report:

1. Open the model.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. Under **Coverage metrics**, select:
   - **Decision**
   - **Condition**
   - **MCDC**
5. On the **Reporting** tab, click **HTML Settings**.
6. In the HTML Settings dialog box, select:
   - **Include cyclomatic complexity numbers in summary**
   - **Include cyclomatic complexity numbers in block details**
7. Click **OK** to close the HTML Settings dialog box and save your changes.

8. Click **OK** to close the Coverage Settings dialog box and save your changes.

9. Simulate the model and review the results in the HTML report.

See Also

`conditioninfo` | `decisioninfo` | `cvsim` | `getCoverageInfo` | `mcdcinfo` | `sigrangeinfo` | `sigsizeinfo` | `tableinfo`

How To

- “Cyclomatic Complexity”

conditioninfo

Purpose

Collect condition coverage information for model object

Syntax

```
coverage = conditioninfo(cvdo, object)
coverage = conditioninfo(cvdo, object, ignore_descendants)
[coverage, description] = conditioninfo(cvdo, object)
```

Description

`coverage = conditioninfo(cvdo, object)` returns condition coverage results from the `cvdata` object `cvdo` for the model component specified by `object`.

`coverage = conditioninfo(cvdo, object, ignore_descendants)` returns condition coverage results for `object`, depending on the value of `ignore_descendants`.

`[coverage, description] = conditioninfo(cvdo, object)` returns condition coverage results and textual descriptions of each condition in `object`.

Input Arguments

cvdo

`cvdata` object

ignore_descendants

Logical value that specifies whether to ignore the coverage of descendant objects

`1` to ignore coverage of descendant objects
`0` (default) to collect coverage of descendant objects

object

An object in the Simulink model or Stateflow diagram that receives decision coverage. Valid values for `object` are as follows:

`BlockPath`	Full path to a Simulink model or block
`BlockHandle`	Handle to a Simulink model or block
`slObj`	Handle to a Simulink API object
`sfID`	Stateflow ID
`sfObj`	Handle to a Stateflow API object
`{BlockPath, sfID}`	Cell array with the path to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart
`{BlockPath, sfObj}`	Cell array with the path to a Stateflow chart or atomic subchart and a Stateflow object API handle contained in that chart or subchart
`[BlockHandle, sfID]`	Array with a handle to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

Output Arguments

coverage

The value of `coverage` is a two-element vector of form `[covered_outcomes total_outcomes]`. `coverage` is empty if `cvdo` does not contain condition coverage results for `object`. The two elements are:

`covered_outcomes`	Number of condition outcomes satisfied for `object`
`total_outcomes`	Total number of condition outcomes for `object`

description

A structure array with the following fields:

`text`	String describing a condition or the block port to which it applies
`trueCnts`	Number of times the condition was true in a simulation
`falseCnts`	Number of times the condition was false in a simulation

Examples

The following example opens the `slvnvdemo_cv_small_controller` example model, creates the test specification object `testObj`, enables condition coverage for `testObj`, and executes `testObj`. Then retrieve the condition coverage results for the Logic block (in the Gain subsystem) and determine its percentage of condition outcomes covered:

```
mdl = 'slvnvdemo_cv_small_controller';
open_system(mdl)
testObj = cvtest(mdl)
testObj.settings.condition = 1;
data = cvsim(testObj)
blk_handle = get_param([mdl, '/Gain/Logic'], 'Handle');
cov = conditioninfo(data, blk_handle)
percent_cov = 100 * cov(1) / cov(2)
```

Alternatives

Use the Coverage Settings dialog box to collect condition coverage for a model:

1. Open the model for which you want to collect condition coverage.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. Under **Coverage metrics**, select **Condition**.

5. On the **Results** and **Reporting** tabs, specify the output you need.
6. Click **OK** to close the Coverage Settings dialog box and save your changes.
7. Simulate the model and review the results.

See Also

`complexityinfo` | `cvsim` | `decisioninfo` | `getCoverageInfo` | `mcdcinfo` | `sigrangeinfo` | `sigsizeinfo` | `tableinfo`

How To

- "Condition Coverage (CC)"

Purpose

Collection of `cvdata` objects

Description

Instances of this class contain a collection of `cvdata` objects. For more information, see “Extracting Results from cv.cvdatagroup”.

Construction

cv.cvdatagroup	Create collection of `cvdata` objects for model reference hierarchy

Methods

allNames	Get names of all models associated with `cvdata` objects in `cv.cvdatagroup`
get	Get `cvdata` object
getAll	Get all `cvdata` objects

Properties

name	`cv.cvdatagroup` object name

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB® Programming Fundamentals documentation.

Purpose

Create collection of `cvdata` objects for model reference hierarchy

Syntax

```
cvdg = cv.cvdatagroup(cvdo1, cvdo2,...)
```

Description

`cvdg = cv.cvdatagroup(cvdo1, cvdo2,...)` creates an instantiation of the `cv.cvdatagroup` class (`cvdg`) that contains the `cvdata` objects `cvdo1`, `cvdo2`, etc. A `cvdata` object contains results of the simulation runs.

Examples

Create an instantiation of the `cv.cvdatagroup` class and add two `cvdata` objects to it:

```
a = cvdata;
b = cvdata;
cvdg = cv.cvdatagroup(a, b);
```

cv.cvtestgroup

Purpose

Collection of `cvtest` objects

Description

Instances of this class contain a collection of `cvtest` objects. For more information, see "Creating a Test Group with cv.cvtestgroup".

Construction

cv.cvtestgroup	Create collection of `cvtest` objects for model reference hierarchy

Methods

add	Add `cvtest` objects
allNames	Get names of all models associated with `cvtest` objects in `cv.cvtestgroup`
get	Get `cvtest` objects

Properties

name	`cv.cvtestgroup` object name

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

Purpose

Create collection of `cvtest` objects for model reference hierarchy

Syntax

```
cvtg = cv.cvtestgroup(cvto1, cvto2,...)
```

Description

`cvtg = cv.cvtestgroup(cvto1, cvto2,...)` creates an instantiation of the `cv.cvtestgroup` class (`cvtg`) that contains the `cvtest` objects `cvto1`, `cvto2`, etc. A `cvtest` object is a test specification object for a Simulink model.

Examples

Create an instantiation of the `cv.cvtestgroup` class and add two `cvtest` objects to it:

```
a = cvtest;
b = cvtest;
cvtg = cv.cvtestgroup(a, b);
```

See Also

`cvtest`

cvexit

Purpose Exit model coverage environment

Syntax

```
cvexit
```

Description `cvexit` exits the model coverage environment. Issuing this command closes the Coverage Display window and removes coloring from a block diagram that displays its model coverage results.

Purpose

Produce HTML report from model coverage objects

Syntax

```
cvhtml(file, cvdo)
cvhtml(file, cvdo1, cvdo2, ...)
cvhtml(file, cvdo1, cvdo2, ..., options)
cvhtml(file, cvdo1, cvdo2, ..., options, detail)
```

Description

`cvhtml(file, cvdo)` creates an HTML report of the coverage results in the `cvdata` or `cv.cvdatagroup` object `cvdo` when you run model coverage in simulation. `cvhtml` saves the coverage results in `file`. The model must be open when you use `cvhtml` to generate its coverage report.

`cvhtml(file, cvdo1, cvdo2, ...)` creates a combined report of several `cvdata` objects. The results from each object appear in a separate column of the HTML report. Each `cvdata` object must correspond to the same root model or subsystem. Otherwise, the function fails.

`cvhtml(file, cvdo1, cvdo2, ..., options)` creates a combined report of several `cvdata` objects using the report options specified by `options`.

`cvhtml(file, cvdo1, cvdo2, ..., options, detail)` creates a combined coverage report for several `cvdata` objects and specifies the detail level of the report with the value of `detail`.

Input Arguments

cvdo

A `cv.cvdatagroup` object

detail

Specifies the level of detail in the report. Set `detail` to an integer from `0` to `3`. Greater numbers for `detail` indicate greater detail.

Default: `2`

file

String specifying the HTML file in the MATLAB current folder where `cvhtml` stores the results

Default: `[]`

options

Specify the report options that you specify in `options`:

- To enable an option, set it to `1` (e.g., `'-hTR=1'`).
- To disable an option, set it to `0` (e.g., `'-bRG=0'`).
- To specify multiple report options, list individual options in a single `options` string separated by commas or spaces (e.g., `'-hTR=1 -bRG=0 -scm=0'`).

The following table lists all the options:

Option	Description	Default
`-aTS`	Include each test in the model summary	`on`
`-bRG`	Produce bar graphs in the model summary	`on`
`-bTC`	Use two color bar graphs (red, blue)	`off`
`-hTR`	Display hit/count ratio in the model summary	`off`
`-nFC`	Do not report fully covered model objects	`off`
`-scm`	Include cyclomatic complexity numbers in summary	`on`
`-bcm`	Include cyclomatic complexity numbers in block details	`on`
`-xEv`	Filter Stateflow events from report	`off`

Examples

Make sure you have write access to the default MATLAB folder. Create a cumulative coverage report for the `slvnvdemo_cv_small_controller` mode and save it as `ratelim_coverage.html`:

```
model = 'slvnvdemo_cv_small_controller';
open_system(model);
cvt = cvtest(model);
cvd = cvsim(cvt);
outfile = 'ratelim_coverage.html';
cvhtml(outfile, cvd);
```

Alternatives

Use the Coverage Settings dialog box to create a model coverage report in an HTML file:

1. Open the model for which you want a model coverage report.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. On the **Report** tab, select **Generate HTML report**.
5. Click **OK** to close the Coverage Settings dialog box and save your changes.
6. Simulate the model and review the generated report.

See Also

`cv.cvdatagroup` | `cvmodelview` | `cvsim`

How To

- "Creating HTML Reports with cvhtml"

cvload

Purpose

Load coverage tests and stored results into memory

Syntax

```
[cvtos, cvdos] = cvload(filename)
[cvtos, cvdos] = cvload(filename, restoretotal)
```

Description

`[cvtos, cvdos] = cvload(filename)` loads the tests and data stored in the text file `filename.cvt`. `cvtos` is a cell array of `cvtest` objects that are loaded. `cvdos` is a cell array of `cvdata` objects that are loaded. `cvdos` has the same size as `cvtos`, but if a particular test has no results, `cvdos` can contain empty elements.

`[cvtos, cvdos] = cvload(filename, restoretotal)` restores or clears the cumulative results from prior runs, depending on the value of `restoretotal`. If `restoretotal` is `1`, `cvload` restores the cumulative results from prior runs. If `restoretotal` is unspecified or `0`, `cvload` clears the model's cumulative results.

The following are special considerations for using the `cvload` command:

- If a model with the same name exists in the coverage database, the software loads only the compatible results that reference the existing model to prevent duplication.
- If the Simulink models referenced from the file are open but do not exist in the coverage database, the coverage tool resolves the links to the existing models.
- When you are loading several files that reference the same model, the software loads only the results that are consistent with the earlier files.

Examples

Store coverage results in `cvtest` and `cvdata` objects:

```
[test_objects, data_objects] = cvload(test_results, 1);
```

See Also

`cvsave`

How To

- "Loading Stored Coverage Test Results with cvload"

Purpose

Display model coverage results with model coloring

Syntax

`cvmodelview(cvdo)`

Description

`cvmodelview(cvdo)` displays coverage results from the `cvdata` object `cvdo` by coloring the objects in the model that have model coverage results.

Examples

Open the `slvnvdemo_cv_small_controller` example model, create the test specification object `testObj`, and execute `testObj` to collect model coverage. Run `cvmodelview` to color the model objects for which you collect model coverage information:

```
mdl = 'slvnvdemo_cv_small_controller';
open_system(mdl)
testObj = cvtest(mdl)
data = cvsim(testObj)
cvmodelview(data)
```

Alternatives

Use the Coverage Settings dialog box to display model coverage results by coloring objects:

1. Open the model.
2. Select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. On the **Results** tab, select **Display coverage results using model coloring**.
5. Click **OK** to close the Coverage Settings dialog box and save your changes.
6. Simulate the model and review the results.

See Also

`cvhtml` | `cvsim`

How To

- "Enable Coverage Highlighting"
- "Model Coverage Coloring"

Purpose

Save coverage tests and results to file

Syntax

```
cvsave(filename, model)
cvsave(filename, cvto1, cvto2, ...)
cvsave(filename, cell_array{ :})
```

Description

`cvsave(filename, model)` saves all the tests (`cvtest` objects) and results (`cvdata` objects) related to `model` in the text file `filename.cvt`. `model` is a handle to or name of a Simulink model.

`cvsave(filename, cvto1, cvto2, ...)` saves multiple `cvtest` objects in the text file `filename.cvt`. `cvsave` also saves information about any referenced models.

`cvsave(filename, cell_array{ :})` saves the test results stored in each element of `cell_array` to the file `filename.cvt`. Each element in `cell_array` contains test results for a `cvdata` object.

Input Arguments

filename

String containing the name of the file in which to save the data. `cvsave` appends the extension `.cvt` to the string when saving the file.

model

Handle to a Simulink model

cvto

`cvtest` object

cell_array

Cell array of `cvtest` objects

Examples

Save coverage results for the `slvnvdemo_cv_small_controller` model in `ratelim_testdata.cvt`:

```
model = 'slvnvdemo_cv_small_controller';
```

```
open_system(model);
cvt = cvtest(model);
cvd = cvsim(cvt);
cvsave('ratelim_testdata', model);
```

Save cumulative coverage results for the Adjustable Rate Limiter subsystem in the `slvnvdemo_ratelim_harness` model from two simulations:

```
% Open model and subsystem
mdl = 'slvnvdemo_ratelim_harness';
mdl_subsys = ...
 'slvnvdemo_ratelim_harness/Adjustable Rate Limiter';
open_system(mdl);
open_system(mdl_subsys);

% Create data files
t_gain = (0:0.02:2.0)';
u_gain = sin(2*pi*t_gain);
t_pos = [0;2];
u_pos = [1;1];
t_neg = [0;2];
u_neg = [-1;-1];
save('within_lim.mat','t_gain','u_gain','t_pos','u_pos', ...
 't_neg', 'u_neg');

t_gain = [0;2];
u_gain = [0;4];
t_pos = [0;1;1;2];
u_pos = [1;1;5;5]*0.02;
t_neg = [0;2];
u_neg = [0;0];
save('rising_gain.mat','t_gain','u_gain','t_pos','u_pos', ...
 't_neg', 'u_neg');

% Specify coverage options in cvtest object
```

```
testObj1 = cvtest(mdl_subsys);
testObj1.label = 'Gain within slew limits';
testObj1.setupCmd = 'load(''within_lim.mat'');';
testObj1.settings.mcdc = 1;
testObj1.settings.condition = 1;
testObj1.settings.decision = 1;

testObj2 = cvtest(mdl_subsys);
testObj2.label = ...
 'Rising gain that temporarily exceeds slew limit';
testObj2.setupCmd = 'load(''rising_gain.mat'');';
testObj2.settings.mcdc = 1;
testObj2.settings.condition = 1;
testObj2.settings.decision = 1;

% Simulate the model with both cvtest objects
[dataObj1,simOut1] = cvsim(testObj1);
[dataObj2,simOut2] = cvsim(testObj2,[0 2]);

cumulative = dataObj1+dataObj2;
cvsave('ratelim_testdata',cumulative);
```

As in the preceding example, save cumulative coverage results for the Adjustable Rate Limiter subsystem in the `slvnvdemo_ratelim_harness` model from two simulations. Save the results in a cell array and then save the data to a file:

```
% Open model and subsystem
mdl = 'slvnvdemo_ratelim_harness';
mdl_subsys = ...
 'slvnvdemo_ratelim_harness/Adjustable Rate Limiter';
open_system(mdl);
open_system(mdl_subsys);

% Create data files
t_gain = (0:0.02:2.0)';
```

```
u_gain = sin(2*pi*t_gain);
t_pos = [0;2];
u_pos = [1;1];
t_neg = [0;2];
u_neg = [-1;-1];
save('within_lim.mat','t_gain','u_gain','t_pos','u_pos', ...
 't_neg', 'u_neg');

t_gain = [0;2];
u_gain = [0;4];
t_pos = [0;1;1;2];
u_pos = [1;1;5;5]*0.02;
t_neg = [0;2];
u_neg = [0;0];
save('rising_gain.mat','t_gain','u_gain','t_pos','u_pos', ...
 't_neg', 'u_neg');

% Specify coverage options in cvtest object
testObj1 = cvtest(mdl_subsys);
testObj1.label = 'Gain within slew limits';
testObj1.setupCmd = 'load(''within_lim.mat'');';
testObj1.settings.mcdc = 1;
testObj1.settings.condition = 1;
testObj1.settings.decision = 1;

testObj2 = cvtest(mdl_subsys);
testObj2.label = ...
 'Rising gain that temporarily exceeds slew limit';
testObj2.setupCmd = 'load(''rising_gain.mat'');';
testObj2.settings.mcdc = 1;
testObj2.settings.condition = 1;
testObj2.settings.decision = 1;

% Simulate the model with both cvtest objects
[dataObj1,simOut1] = cvsim(testObj1);
[dataObj2,simOut2] = cvsim(testObj2,[0 2]);
```

```
% Save the results in the cell array
cov_results{1} = dataObj1;
cov_results{2} = dataObj2;

% Save the results to a file
cvsave('ratelim_testdata', cov_results{ :});
```

Alternatives

Use the Coverage Settings dialog box to save cumulative coverage results for a model:

1. Open the model for which you want to save cumulative coverage results.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. On the **Results** tab:
   a. Select **Save cumulative results in workspace variable**.
   b. Select **Save last run in workspace variable**.
5. Click **OK** to close the Coverage Settings dialog box and save your changes.
6. Simulate the model and review the results.

See Also

`cvload`

How To

- "Saving Test Runs to a File with cvsave"

Purpose

Simulate and return model coverage results for test objects

Syntax

```
cvdo = cvsim(cvto)
[cvdo,simOut] = cvsim(cvto,Name1,Value1,Name2,Value2,...)
[cvdo,simOut] = cvsim(cvto,ParameterStruct)
[cvdo1,cvdo2,...,simOut] = cvsim(cvto1,cvto2,...)
```

Description

`cvdo = cvsim(cvto)` simulates the model and returns the coverage results for the `cvtest` object, `cvto`. `cvsim` saves the coverage results in the `cvdata` object, `cvdo`. However, when recording coverage for multiple models in a hierarchy, `cvsim` returns the coverage results in a `cv.cvdatagroup` object.

`[cvdo,simOut] = cvsim(cvto,Name1,Value1,Name2,Value2,...)` specifies the model parameters and simulates the model. `cvsim` returns the coverage results in the `cvdata` object, `cvdo,` and returns the simulation outputs in the `Simulink.SimulationOutput` object, `simOut`.

`[cvdo,simOut] = cvsim(cvto,ParameterStruct)` sets the model parameters specified in a structure `ParameterStruct`, simulates the model, returns the coverage results in `cvdo`, and returns the simulation outputs in `simOut`.

`[cvdo1,cvdo2,...,simOut] = cvsim(cvto1,cvto2,...)` simulates the model and returns the coverage results for the test objects, `cvto1, cvto2, ...`. `cvdo1` contains the coverage results for `cvto1`, `cvdo2` contains the coverage results for `cvto2`, and so on.

Note Even if you have not enabled coverage recording for the model, you can execute the `cvsim` command to record coverage for your model.

Input Arguments

cvto

`cvtest` object that specifies coverage options for the simulation

Name-Value Pair Arguments

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

ParameterName

Name of the model parameter to be specified for simulation

ParameterValue

Value of the model parameter

Note For a complete list of model parameters, see “Model Parameters” in the Simulink documentation.

Output Arguments

cvdo

`cvdata` object

simOut

A `Simulink.SimulationOutput` object that contains the simulation outputs.

Examples

Open the `vdp` model, create the test object, set the model parameters, and simulate the model. `cvsim` returns the coverage data in `cvdo` and the simulation outputs in the `Simulink.SimulationOutput` object, `simOut`:

```
model = 'sldemo_fuelsys';
open_system(model);
testObj = cvtest(model);                    % Get test data
paramStruct.CovMetricSettings = 'dcm';
```

```
paramStruct.AbsTol            = '1e-5';
paramStruct.SaveState         = 'on';
paramStruct.StateSaveName     = 'xoutNew';
paramStruct.SaveOutput        = 'on';
paramStruct.OutputSaveName    = 'youtNew';
[cvdo,simOut] = cvsim(testObj,paramStruct); % Get coverage
```

See Also

cv.cvdatagroup | cvtest | sim

Purpose

Simulate and return model coverage results for referenced models

Syntax

```
cvdg = cvsimref(topModelName)
cvdg = cvsimref(topModelName, cvtg)
[cvdg,t,x,y] = cvsimref(topModelName, cvtg)
[cvdg,t,x,y] = cvsimref(topModelName, cvtg, timespan,
   options)
[cvdg1, cvdg2, ...] = cvsimref(topModelName, cvtg1, cvtg2,
   ...)
```

Description

`cvdg = cvsimref(topModelName)` simulates the top model and all referenced models in the hierarchy, collects model coverage data, and returns the results in the `cv.cvdatagroup` object `cvdg`. You do not have to enable model coverage reporting for any of the models in a model hierarchy to use the `cvsimref` command.

`cvdg = cvsimref(topModelName, cvtg)` simulates `topModelName` and collects model coverage data by executing the `cv.cvtestgroup` object `cvtg`. `cvtg` contains `cvtest` specifications for the top-level model and all the referenced models in the hierarchy. `cvsimref` returns the model coverage results in `cvdg`.

`[cvdg,t,x,y] = cvsimref(topModelName, cvtg)` returns the time vector `t`, matrix of state values `x`, and matrix of output values `y` from the simulation.

`[cvdg,t,x,y] = cvsimref(topModelName, cvtg, timespan, options)` overrides default simulation values with the values in `timespan` and `options`.

`[cvdg1, cvdg2, ...]  = cvsimref(topModelName, cvtg1, cvtg2, ...)` executes multiple `cv.cvtestgroup` objects and returns the results in a set of `cv.cvdatagroup` objects.

Input Arguments

cvtg

`cv.cvtestgroup` object that contains test specifications for the referenced models in the hierarchy

options

Optional simulation parameters specified as a structure.

timespan

Simulation start and stop time:

`tFinal`	Specify the stop time. The start time is `0`.
`[tStart tFinal]`	Specify the start and stop times.
`[tStart OutputTimes tFinal]`	Specify that `cvsimref` return the start and stop times and time points in `t`. Generally, `t` includes more time points. `OutputTimes` is equivalent to specifying **Configuration Parameters > Data Import/Export > Output options > Produce specified output only**.

topModelName

Name of the top-level model in the hierarchy

Output Arguments

cvdg

`cv.cvdatagroup` object

t

The simulation time vector

x

The simulation state matrix consisting of continuous states followed by discrete states

y

The simulation output matrix. Each column contains the output of a root-level Outport block, in port number order. If any Outport block has a vector input, its output has the associated number of columns.

Examples

Open and simulate the `slvnvdemo_ratelim_harness` model and its two subsystems:

```
topModel = 'slvnvdemo_cv_mutual_exclusion';
load_system(topModel);
% Make sure coverage is off for this run for the entire tree
set_param(topModel,'RecordCoverage','off');
set_param(topModel,'CovModelRefEnable','Off');
simObj = sim(topModel);                  % Normal data
allData = cvsimref(topModel);            % cvsimref data
```

See Also

`cv.cvdatagroup` | `cv.cvtestgroup` | `cvsim` | `cvtest`

How To

- “Create and Run Test Cases”
- “Using Model Coverage Commands for Referenced Models”

Purpose

Create model coverage test specification object

Syntax

```
cvto = cvtest(root)
cvto = cvtest(root, label)
cvto = cvtest(root, label, setupcmd)
```

Description

`cvto = cvtest(root)` creates a test specification object with the handle `cvto`. Simulate `cvto` with the `cvsim` command.

`cvto = cvtest(root, label)` creates a test object with the label `label`, which is used for reporting results.

`cvto = cvtest(root, label, setupcmd)` creates a test object with the setup command `setupcmd`.

Input Arguments

root

Name or handle for a Simulink model or a subsystem. Only the specified model or subsystem and its descendants are subject to model coverage testing.

label

Label for test object

setupcmd

Setup command for creating test object. The setup command is executed in the base MATLAB workspace just prior to running the simulation. This command is useful for loading data prior to a test.

Output Arguments

cvto

A test specification object with the following structure.

Field	Description
`id`	Read-only internal ID
`modelcov`	Read-only internal ID

Field	Description
`rootPath`	Name of system or subsystem for analysis
`label`	String used when reporting results
`setupCmd`	Command executed in base workspace prior to simulation
`settings.condition`	Set to `1` for condition coverage.
`settings.decision`	Set to `1` for decision coverage.
`settings.designverifier`	Set to `1` for coverage for Simulink Design Verifier blocks.
`settings.mcdc`	Set to `1` for MCDC coverage.
`settings.sigrange`	Set to `1` for signal range coverage.
`settings.sigsize`	Set to `1` for signal size coverage.
`settings.tableExec`	Set to `1` for lookup table coverage.
`modelRefSettings.enable`	• `'off'` — Disables coverage for all referenced models. • `'all'` or `on` — Enables coverage for all referenced models. • `'filtered'` — Enables coverage only for referenced models not listed in the `excludedModels` subfield.
`modelRefSettings.excludeTopModel`	Set to `1` to exclude coverage for the top model
`modelRefSettings.excludedModels`	String specifying a comma-separated list of referenced models for which coverage is disabled.

Field	Description
`emlSettings.enableExternal`	Set to 1 to enable coverage for external program files called by MATLAB functions in your model.
`options.forceBlockReduction`	Set to 1 to override the Simulink **Block reduction** parameter if it is enabled.

Examples

Create a `cvtest` object for the Adjustable Rate Limiter block in the `slvnvdemo_ratelim_harness` model and display its contents:

```
open_system('slvnvdemo_ratelim_harness');
testObj1 = cvtest(['slvnvdemo_ratelim_harness', ...
     '/Adjustable Rate Limiter']);
testObj1.label = 'Gain within slew limits';
testObj1.setupCmd = 'load(''within_lim.mat'');';
testObj1.settings.mcdc = 1;
testObj1                         % Display content of test object
```

See Also

`cv.cvtestgroup`

How To

- "Creating Tests with cvtest"
- "Creating a Test Group with cv.cvtestgroup"

Purpose

Display decision coverage information for model object

Syntax

```
coverage = decisioninfo(cvdo, object)
coverage = decisioninfo(cvdo, object, ignore_descendants)
[coverage, description] = decisioninfo(cvdo, object)
```

Description

`coverage = decisioninfo(cvdo, object)` returns decision coverage results from the `cvdata` object `cvdo` for the model component specified by `object`.

`coverage = decisioninfo(cvdo, object, ignore_descendants)` returns decision coverage results for `object`, depending on the value of `ignore_descendants`.

`[coverage, description] = decisioninfo(cvdo, object)` returns decision coverage results and text descriptions of decision points associated with `object`.

Input Arguments

cvdo

`cvdata` object

ignore_descendants

Specifies to ignore the coverage of descendant objects if `ignore_descendants` is set to `1`.

object

The `object` argument specifies an object in the model or Stateflow chart that received decision coverage. Valid values for `object` include the following:

Object Specification	Description
`BlockPath`	Full path to a model or block
`BlockHandle`	Handle to a model or block
`slObj`	Handle to a Simulink API object

Object Specification	Description
sfID	Stateflow ID
sfObj	Handle to a Stateflow API object from a singly instantiated Stateflow chart
{BlockPath, sfID}	Cell array with the path to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart
{BlockPath, sfObj}	Cell array with the path to a Stateflow chart or subchart and a Stateflow object API handle contained in that chart or subchart
[BlockHandle, sfID]	Array with a handle to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

Output Arguments

coverage

The value of `coverage` is a two-element vector of the form `[covered_outcomes total_outcomes]`.`coverage` is empty if `cvdo` does not contain decision coverage results for `object`. The two elements are:

covered_outcomes	Number of decision outcomes satisfied for `object`
total_outcomes	Number of decision outcomes for `object`

description

`description` is a structure array containing the following fields:

`decision.text`	String describing a decision point, e.g., `'U > LL'`
`decision.outcome.text`	String describing a decision outcome, i.e., `'true'` or `'false'`
`decision.outcome.` `executionCount`	Number of times a decision outcome occurred in a simulation

Examples

Open the `slvnvdemo_cv_small_controller` model and create the test specification object `testObj`. Enable decision coverage for `slvnvdemo_cv_small_controller` and execute `testObj` using `cvsim`. Use `decisioninfo` to retrieve the decision coverage results for the Saturation block and determine the percentage of decision outcomes covered:

```
mdl = 'slvnvdemo_cv_small_controller';
open_system(mdl)
testObj = cvtest(mdl)
testObj.settings.decision = 1;
data = cvsim(testObj)
blk_handle = get_param([mdl, '/Saturation'], 'Handle');
cov = decisioninfo(data, blk_handle)
percent_cov = 100 * cov(1) / cov(2)
```

Alternatives

Use the Coverage Settings dialog box to collect and display decision coverage results:

1. Open the model.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. Under **Coverage metrics**, select **Decision**.
5. On the **Results** and **Reporting** tabs, specify the output you need.

6. Click **OK** to close the Coverage Settings dialog box and save your changes.

7. Simulate the model and review the results.

See Also

`complexityinfo` | `conditioninfo` | `cvsim` | `getCoverageInfo` | `mcdcinfo` | `sigrangeinfo` | `sigsizeinfo` | `tableinfo`

How To

- "Condition Coverage (CC)"

Purpose

Get `cvdata` object

Syntax

```
get(cvdg, model_name)
```

Description

`get(cvdg, model_name)` returns the `cvdata` object in the `cv.cvdatagroup` object `cvdg` that corresponds to the model specified in `model_name`.

Examples

Get a `cvdata` object from the specified Simulink model:

```
get(cvdg, 'slvnvdemo_cv_small_controller');
```

cv.cvtestgroup.get

Purpose

Get `cvtest` objects

Syntax

```
get(cvtg, model_name)
```

Description

`get(cvtg, model_name)` returns the `cvtest` object in the `cv.cvtestgroup` object `cvtg` that corresponds to the model specified in `model_name`.

Examples

Get a `cvtest` object from the specified Simulink model:

```
get(cvtg, 'slvnvdemo_cv_small_controller');
```

See Also

`cvsimref` | `cvtest`

Purpose

Get all `cvdata` objects

Syntax

`getAll(cvdo)`

Description

`getAll(cvdo)` returns all `cvdata` objects in the `cv.cvdatagroup` object `cvdo`.

Examples

Return all `cvdata` object from the specified Simulink model:

```
getAll(cvdg, 'slvnvdemo_cv_small_controller');
```

Purpose

Coverage information for Simulink Design Verifier blocks

Syntax

```
[coverage, description] = getCoverageInfo(cvdo, object)
[coverage, description] = getCoverageInfo(cvdo, object,
   metric)
[coverage, description] = getCoverageInfo(cvdo, object,
   metric, ignore_descendants)
```

Description

`[coverage, description] = getCoverageInfo(cvdo, object)` collects Simulink Design Verifier coverage for *`object`*, based on coverage results in *`cvdo`*. *`object`* can be a handle to any block, subsystem, or Stateflow chart. `getCoverageData` returns coverage data only for Simulink Design Verifier library blocks in `object`'s hierarchy.

`[coverage, description] = getCoverageInfo(cvdo, object, metric)` returns coverage data for the block type specified in *`metric`*. If *`object`* does not match the block type, `getCoverageInfo` does not return any data.

`[coverage, description] = getCoverageInfo(cvdo, object, metric, ignore_descendants)` returns coverage data about *`object`*, omitting coverage data for its descendant objects if *`ignore_descendants`* equals `1`.

Input Arguments

cvdo

`cvdata` object

object

In the model or Stateflow chart, object that received Simulink Design Verifier coverage. The following are valid values for *`object`*.

`BlockPath`	Full path to a model or block
`BlockHandle`	Handle to a model or block
`slObj`	Handle to a Simulink API object

`sfID`	Stateflow ID from a singly instantiated Stateflow chart
`sfObj`	Handle to a Stateflow API object from a singly instantiated Stateflow chart
`{BlockPath, sfID}`	Cell array with the path to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart
`{BlockPath, sfObj}`	Cell array with the path to a Stateflow chart or atomic subchart and a Stateflow object API handle contained in that chart or subchart
`[BlockHandle, sfID]`	Array with a handle to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

metric

`cvmetric.Sldv` enumeration object with values that correspond to Simulink Design Verifier library blocks.

`test`	Test Objective block
`proof`	Proof Objective block
`condition`	Test Condition block
`assumption`	Proof Assumption block

ignore_descendants

Boolean value that specifies to ignore the coverage of descendant objects if set to `1`.

Output Arguments

coverage

Two-element vector of the form [*covered_outcomes total_outcomes*].

covered_outcomes	Number of test objectives satisfied for *object*
total_outcomes	Total number of test objectives for *object*

coverage is empty if *cvdo* does not contain decision coverage results for *object*.

description

Structure array containing descriptions of each test objective, and descriptions and execution counts for each outcome within *object*.

Examples

Collect and display coverage data for the Test Objective block named True in the `sldvdemo_debounce_testobjblks` model:

```
mdl = 'sldvdemo_debounce_testobjblks';
open_system(mdl)
testObj = cvtest(mdl)
testObj.settings.designverifier = 1;
data = cvsim(testObj)
blk_handle = get_param([mdl, '/True'], 'Handle');
getCoverageInfo(data, blk_handle)
```

Alternatives

Use the Coverage Settings dialog box to collect and display coverage results for Simulink Design Verifier library blocks:

1. Open the model.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. Under **Coverage metrics**, select **Simulink Design Verifier**.

5 Click **OK** to close the Coverage Settings dialog box and save your changes.

6 Simulate the model and review the results.

See Also

`complexityinfo` | `conditioninfo` | `cvsim` | `decisioninfo` | `mcdcinfo` | `sigrangeinfo` | `sigsizeinfo` | `tableinfo`

How To

- “Simulink Design Verifier Coverage”

ModelAdvisor.Table.getEntry

Purpose

Get table cell contents

Syntax

`content = getEntry(table, row, column)`

Description

`content = getEntry(table, row, column)` gets the contents of the specified cell.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`row`	An integer specifying the row
`column`	An integer specifying the column

Output Arguments

`content`	An element object or object array specifying the content of the table entry

Examples

Get the content of the table cell in the third column, third row:

```
table1 = ModelAdvisor.Table(4, 4);
.
.
.
content = getEntry(table1, 3, 3);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Check.getID

Purpose
Return check identifier

Syntax

```
id = getID(check_obj)
```

Description
`id = getID(check_obj)` returns the ID of the check `check_obj`. `id` is a unique string that identifies the check.

You create this unique identifier when you create the check. This unique identifier is the equivalent of the `ModelAdvisor.Check ID` property.

See Also
"Model Advisor Customization"

How To
- "Define Custom Checks"
- "Authoring Checks"

mcdcinfo

Purpose

Collect modified condition/decision coverage information for model object

Syntax

```
coverage = mcdcinfo(cvdo, object)
coverage = mcdcinfo(cvdo, object, ignore_descendants)
[coverage, description] = mcdcinfo(cvdo, object)
```

Description

`coverage = mcdcinfo(cvdo, object)` returns modified condition/decision coverage (MCDC) results from the `cvdata` object `cvdo` for the model component specified by `object`.

`coverage = mcdcinfo(cvdo, object, ignore_descendants)` returns MCDC results for `object`, depending on the value of `ignore_descendants`.

`[coverage, description] = mcdcinfo(cvdo, object)` returns MCDC results and text descriptions of each condition/decision in `object`.

Input Arguments

cvdo

`cvdata` object

ignore_descendants

Logical value specifying whether to ignore the coverage of descendant objects

- `1` — Ignore coverage of descendant objects
- `0` — Collect coverage for descendant objects

object

The `object` argument specifies an object in the Simulink model or Stateflow diagram that receives decision coverage. Valid values for `object` include the following:

Object Specification	Description
BlockPath	Full path to a model or block
BlockHandle	Handle to a model or block
slObj	Handle to a Simulink API object
sfID	Stateflow ID
sfObj	Handle to a Stateflow API object
{BlockPath, sfID}	Cell array with the path to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart
{BlockPath, sfObj}	Cell array with the path to a Stateflow chart or atomic subchart and a Stateflow object API handle contained in that chart or subchart
[BlockHandle, sfID]	Array with a handle to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

Output Arguments

coverage

Two-element vector of the form `[covered_outcomes total_outcomes]`. `coverage` is empty if `cvdo` does not contain modified condition/decision coverage results for `object`. The two elements are:

covered_outcomes	Number of condition/decision outcomes satisfied for `object`
total_outcomes	Total number of condition/decision outcomes for `object`

description

A structure array containing the following fields:

`text`	String denoting whether the condition/decision is associated with a block output or Stateflow transition
`condition.text`	String describing a condition/decision or the block port to which it applies
`condition.achieved`	Logical array indicating whether a condition case has been fully covered
`condition.trueRslt`	String representing a condition case expression that produces a true result
`condition.falseRslt`	String representing a condition case expression that produces a false result

Examples

Collect MCDC coverage for the `slvnvdemo_cv_small_controller` model and determine the percentage of MCDC coverage collected for the Logic block in the Gain subsystem:

```
mdl = 'slvnvdemo_cv_small_controller';
open_system(mdl)
%Create test specification object
testObj = cvtest(mdl)
%Enable MCDC coverage
testObj.settings.mcdc = 1;
%Simulate model
data = cvsim(testObj)
%Retrieve MCDC results for Logic block
blk_handle = get_param([mdl, '/Gain/Logic'], 'Handle');
cov = mcdcinfo(data, blk_handle)
%Percentage of MCDC outcomes covered
```

```
percent_cov = 100 * cov(1) / cov(2)
```

Alternatives

Use the Coverage Settings dialog box to collect MCDC coverage for a model:

1. Open the model.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. Under **Coverage metrics**, select **MCDC**.
5. On the **Results** and **Reporting** tabs, specify the output you need.
6. Click **OK** to close the Coverage Settings dialog box and save your changes.
7. Simulate the model and review the MCDC coverage results.

See Also

`complexityinfo` | `conditioninfo` | `cvsim` | `decisioninfo` | `getCoverageInfo` | `sigrangeinfo` | `sigsizeinfo` | `tableinfo`

How To

- "Modified Condition/Decision Coverage (MCDC)"
- "MCDC Analysis"

ModelAdvisor.Action

Purpose

Add actions to custom checks

Description

Instances of this class define actions you take when the Model Advisor checks do not pass. Users access actions by clicking the **Action** button that you define in the Model Advisor window.

Construction

ModelAdvisor.Action	Add actions to custom checks

Methods

setCallbackFcn	Specify action callback function

Properties

Description	Message in **Action** box
Name	Action button label

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

Examples

```
% define action (fix) operation
myAction = ModelAdvisor.Action;
myAction.Name='Fix block fonts';
myAction.Description=...
   'Click the button to update all blocks with specified font';
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Add actions to custom checks

Syntax

```
action_obj = ModelAdvisor.Action
```

Description

`action_obj = ModelAdvisor.Action` creates a handle to an action object.

Note

- Include an action definition in a check definition.
- Each check can contain only one action.

Examples

```
% define action (fix) operation
myAction = ModelAdvisor.Action;
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Create custom checks

Description

The `ModelAdvisor.Check` class creates a Model Advisor check object. Checks must have an associated `ModelAdvisor.Task` object to be displayed in the Model Advisor tree.

You can use one `ModelAdvisor.Check` object in multiple `ModelAdvisor.Task` objects, allowing you to place the same check in multiple locations in the Model Advisor tree. For example, **Check for implicit signal resolution** is displayed in the **By Product > Simulink** folder and in the **By Task > Model Referencing** folder in the Model Advisor tree.

When you use checks in task definitions, the following rules apply:

- If you define the properties of the check in the check definition and the task definition, the task definition takes precedence. The Model Advisor displays the information contained in the task definition. For example, if you define the name of the check in the task definition using the `ModelAdvisor.Task.DisplayName` property and in the check definition using the `ModelAdvisor.Check.Title` property, the Model Advisor displays the information provided in `ModelAdvisor.Task.DisplayName`.
- If you define the properties of the check in the check definition but not the task definition, the task uses the properties from the check. For example, if you define the name of the check in the check definition using the `ModelAdvisor.Check.Title` property, and you register the check using a task definition, the Model Advisor displays the information provided in `ModelAdvisor.Check.Title`.
- If you define the properties of the check in the task definition but not the check definition, the Model Advisor displays the information as long as you register the task with the Model Advisor instead of the check. For example, if you define the name of the check in the task definition using the `ModelAdvisor.Task.DisplayName` property instead of the `ModelAdvisor.Check.Title` property, and you register the check using a task definition, the Model Advisor displays the information provided in `ModelAdvisor.Task.DisplayName`.

Construction

ModelAdvisor.Check	Create custom checks

Methods

getID	Return check identifier
setAction	Specify action for check
setCallbackFcn	Specify callback function for check
setInputParameters	Specify input parameters for check
setInputParametersLayoutGrid	Specify layout grid for input parameters

Properties

CallbackContext	Specify when to run check
CallbackHandle	Callback function handle for check
CallbackStyle	Callback function type
EmitInputParametersToReport	Display check input parameters in the Model Advisor report
Enable	Indicate whether user can enable or disable check
ID	Identifier for check
LicenseName	Product license names required to display and run check
ListViewVisible	Status of button
Result	Results cell array
supportExclusion	Set to support exclusions
SupportLibrary	Set to support library models

Title	Name of check
TitleTips	Description of check
Value	Status of check
Visible	Indicate to display or hide check

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

Examples

```
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose Create custom checks

Syntax

```
check_obj = ModelAdvisor.Check(check_ID)
```

Description

`check_obj = ModelAdvisor.Check(check_ID)` creates a check object, `check_obj`, and assigns it a unique identifier, `check_ID`. `check_ID` must remain constant. To display checks in the Model Advisor tree, checks must have an associated `ModelAdvisor.Task` or `ModelAdvisor.Root` object.

Note You can use one `ModelAdvisor.Check` object in multiple `ModelAdvisor.Task` objects, allowing you to place the same check in multiple locations in the Model Advisor tree. For example, **Check for implicit signal resolution appears** in the **By Product > Simulink folder** and in the **By Task > Model Referencing** folder in the Model Advisor tree.

Examples

```
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
```

See Also "Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.FactoryGroup

Purpose

Define subfolder in **By Task** folder

Description

The `ModelAdvisor.FactoryGroup` class defines a new subfolder to add to the **By Task** folder.

Construction

ModelAdvisor.FactoryGroup	Define subfolder in **By Task** folder

Methods

addCheck	Add check to folder

Properties

Description	Description of folder
DisplayName	Name of folder
ID	Identifier for folder
MAObj	Model Advisor object

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

Examples

```
% --- sample factory group
rec = ModelAdvisor.FactoryGroup('com.mathworks.sample.factorygroup');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.FactoryGroup

Purpose

Define subfolder in **By Task** folder

Syntax

`fg_obj = ModelAdvisor.FactoryGroup(fg_ID)`

Description

`fg_obj = ModelAdvisor.FactoryGroup(fg_ID)` creates a handle to a factory group object, `fg_obj`, and assigns it a unique identifier, `fg_ID`. `fg_ID` must remain constant.

Examples

```
% --- sample factory group
rec = ModelAdvisor.FactoryGroup('com.mathworks.sample.factorygroup');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.FormatTemplate

Purpose

Template for formatting Model Advisor analysis results

Description

Use the `ModelAdvisor.FormatTemplate` class to format the result of a check in the analysis result pane of the Model Advisor for a uniform look and feel among the checks you create. There are two formats for the analysis result:

- Table
- List

Construction

ModelAdvisor.FormatTemplate	Construct template object for formatting Model Advisor analysis results

Methods

addRow	Add row to table
setCheckText	Add description of check to result
setColTitles	Add column titles to table
setInformation	Add description of subcheck to result
setListObj	Add list of hyperlinks to model objects
setRecAction	Add Recommended Action section and text
setRefLink	Add See Also section and links
setSubBar	Add line between subcheck results
setSubResultStatus	Add status to check or subcheck result
setSubResultStatusText	Add text below status in result

setSubTitle	Add title for subcheck in result
setTableInfo	Add data to table
setTableTitle	Add title to table

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

Examples

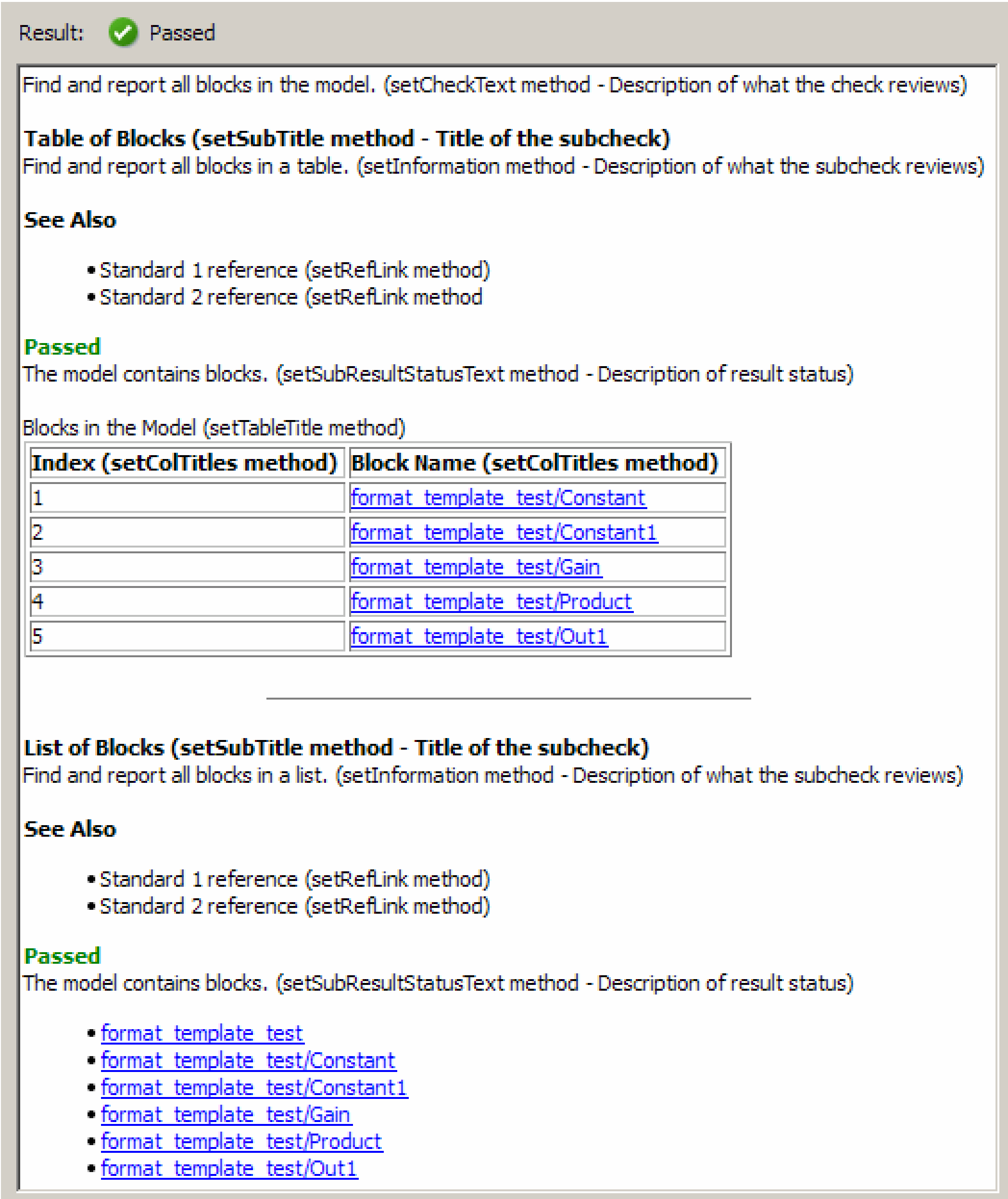
The following code creates two template objects, `ft1` and `ft2`, and uses them to format the result of running the check in a table and a list. The result identifies the blocks in the model. The graphics following the code display the output as it appears in the Model Advisor when the check passes and fails.

```
% Sample Check With Subchecks Callback Function
function ResultDescription = SampleStyleOneCallback(system)
mdladvObj = Simulink.ModelAdvisor.getModelAdvisor(system); % get object

%Initialize variables
ResultDescription={};
ResultStatus = false; % Default check status is 'Warning'
mdladvObj.setCheckResultStatus(ResultStatus);

% Create FormatTemplate object for first subcheck, specify table format
ft1 = ModelAdvisor.FormatTemplate('TableTemplate');

% Add information describing the overall check
setCheckText(ft1, ['Find and report all blocks in the model. '...
    '(setCheckText method - Description of what the check reviews)']);

% Add information describing the subcheck
setSubTitle(ft1, 'Table of Blocks (setSubTitle method - Title of the subcheck)');
setInformation(ft1, ['Find and report all blocks in a table. '...
    '(setInformation method - Description of what the subcheck reviews)']);

% Add See Also section for references to standards
```

```
setRefLink(ft1, {{'Standard 1 reference (setRefLink method)'},
    {'Standard 2 reference (setRefLink method'}});

% Add information to the table
setTableTitle(ft1, {'Blocks in the Model (setTableTitle method)'});
setColTitles(ft1, {'Index (setColTitles method)',
    'Block Name (setColTitles method)'});

% Perform the check actions
allBlocks = find_system(system);
if length(find_system(system)) == 1
    % Add status for subcheck
    setSubResultStatus(ft1, 'Warn');
    setSubResultStatusText(ft1, ['The model does not contain blocks. '...
        '(setSubResultStatusText method - Description of result status)']);
    setRecAction(ft1, {'Add blocks to the model. '...
        '(setRecAction method - Description of how to fix the problem)'});
    ResultStatus = false;
else
    % Add status for subcheck
    setSubResultStatus(ft1, 'Pass');
    setSubResultStatusText(ft1, ['The model contains blocks. '...
        '(setSubResultStatusText method - Description of result status)']);
    for inx = 2 : length(allBlocks)
        % Add information to the table
        addRow(ft1, {inx-1,allBlocks(inx)});
    end
    ResultStatus = true;
end

% Pass table template object for subcheck to Model Advisor
ResultDescription{end+1} = ft1;

% Create FormatTemplate object for second subcheck, specify list format
ft2 = ModelAdvisor.FormatTemplate('ListTemplate');

% Add information describing the subcheck
```

```
setSubTitle(ft2, 'List of Blocks (setSubTitle method - Title of the subcheck)');
setInformation(ft2, ['Find and report all blocks in a list. '...
    '(setInformation method - Description of what the subcheck reviews)']);

% Add See Also section for references to standards
setRefLink(ft2, {{'Standard 1 reference (setRefLink method)'},
    {'Standard 2 reference (setRefLink method)'}});

% Last subcheck, supress line
setSubBar(ft2, false);

% Perform the subcheck actions
if length(find_system(system)) == 1
    % Add status for subcheck
    setSubResultStatus(ft2, 'Warn');
    setSubResultStatusText(ft2, ['The model does not contain blocks. '...
        '(setSubResultStatusText method - Description of result status)']);
    setRecAction(ft2, {'Add blocks to the model. '...
        '(setRecAction method - Description of how to fix the problem)'});
    ResultStatus = false;
else
    % Add status for subcheck
    setSubResultStatus(ft2, 'Pass');
    setSubResultStatusText(ft2, ['The model contains blocks. '...
        '(setSubResultStatusText method - Description of result status)']);
    % Add information to the list
    setListObj(ft2, allBlocks);
end

% Pass list template object for the subcheck to Model Advisor
ResultDescription{end+1} = ft2;
% Set overall check status
mdladvObj.setCheckResultStatus(ResultStatus);
```

The following graphic displays the output as it appears in the Model Advisor when the check passes.



Result: Passed

Find and report all blocks in the model. (setCheckText method - Description of what the check reviews)

Table of Blocks (setSubTitle method - Title of the subcheck)
Find and report all blocks in a table. (setInformation method - Description of what the subcheck reviews)

See Also

- Standard 1 reference (setRefLink method)
- Standard 2 reference (setRefLink method

Passed
The model contains blocks. (setSubResultStatusText method - Description of result status)

Blocks in the Model (setTableTitle method)

Index (setColTitles method)	Block Name (setColTitles method)
1	format_template_test/Constant
2	format_template_test/Constant1
3	format_template_test/Gain
4	format_template_test/Product
5	format_template_test/Out1

List of Blocks (setSubTitle method - Title of the subcheck)
Find and report all blocks in a list. (setInformation method - Description of what the subcheck reviews)

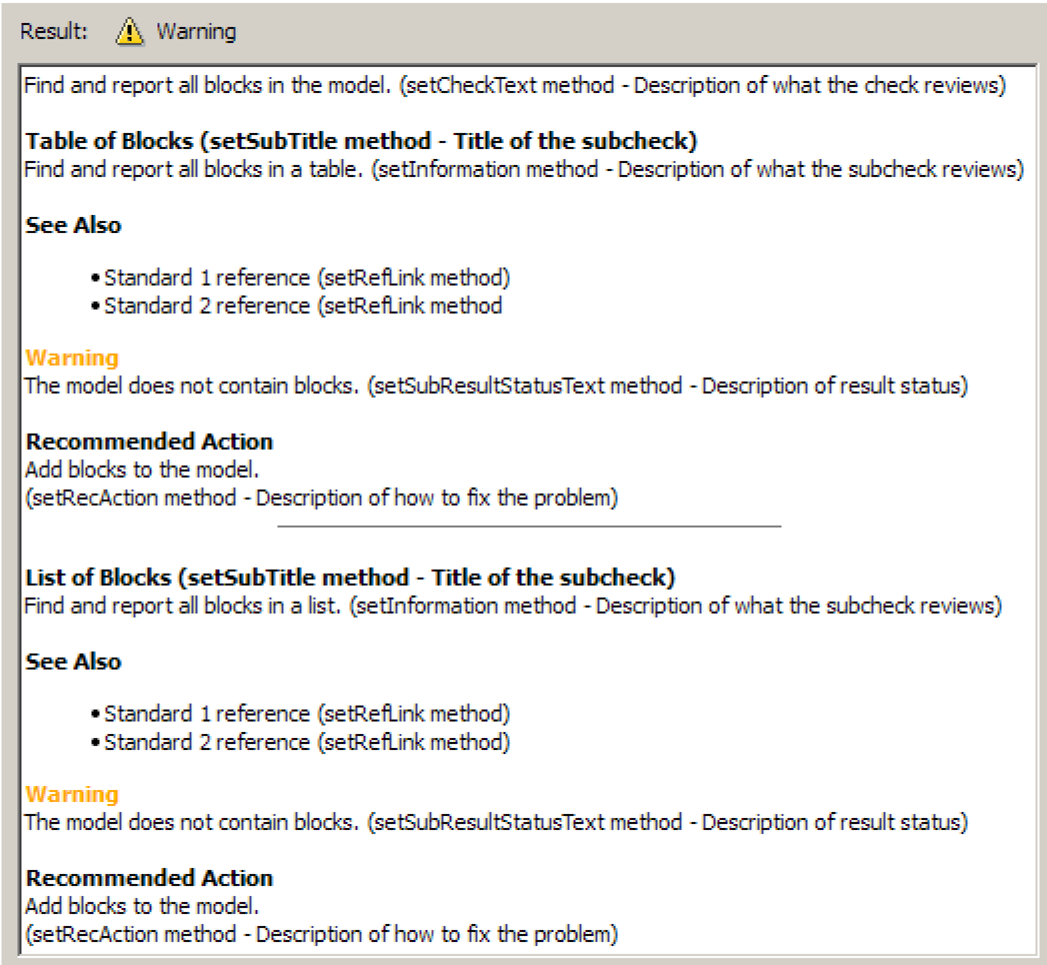
See Also

- Standard 1 reference (setRefLink method)
- Standard 2 reference (setRefLink method)

Passed
The model contains blocks. (setSubResultStatusText method - Description of result status)

- format_template_test
- format_template_test/Constant
- format_template_test/Constant1
- format_template_test/Gain
- format_template_test/Product
- format_template_test/Out1

The following graphic displays the output as it appears in the Model Advisor when the check fails.



Alternatives

Use the Model Advisor Formatting API to format check analysis results. However, use the `ModelAdvisor.FormatTemplate` class for a uniform look and feel among the checks you create.

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.FormatTemplate

Purpose

Construct template object for formatting Model Advisor analysis results

Syntax

`obj = ModelAdvisor.FormatTemplate('type')`

Description

obj = `ModelAdvisor.FormatTemplate('`*type*`')` creates a handle, *obj*, to an object of the `ModelAdvisor.FormatTemplate` class. *type* is a string identifying the format type of the template, either list or table. Valid values are `ListTemplate` and `TableTemplate`.

You must return the result object to the Model Advisor to display the formatted result in the analysis result pane.

Note Use the `ModelAdvisor.FormatTemplate` class in check callbacks.

Examples

Create a template object, `ft`, and use it to create a list template:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.Group

Purpose

Define custom folder

Description

The `ModelAdvisor.Group` class defines a folder that is displayed in the Model Advisor tree. Use folders to consolidate checks by functionality or usage.

Construction

ModelAdvisor.Group	Define custom folder

Methods

addGroup	Add subfolder to folder
addProcedure	Add procedure to folder
addTask	Add task to folder

Properties

Description	Description of folder
DisplayName	Name of folder
ID	Identifier for folder
MAObj	Model Advisor object

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

See Also

“Model Advisor Customization”

How To

- “Authoring Checks”

Purpose

Define custom folder

Syntax

`group_obj = ModelAdvisor.Group(group_ID)`

Description

`group_obj = ModelAdvisor.Group(group_ID)` creates a handle to a group object, `group_obj`, and assigns it a unique identifier, `group_ID`. `group_ID` must remain constant.

Examples

```
MAG = ModelAdvisor.Group('com.mathworks.sample.GroupSample');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Image

Purpose

Include image in Model Advisor output

Description

The `ModelAdvisor.Image` class adds an image to the Model Advisor output.

Construction

ModelAdvisor.Image	Include image in Model Advisor output

Methods

setHyperlink	Specify hyperlink location
setImageSource	Specify image location

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Include image in Model Advisor output

Syntax

```
object = ModelAdvisor.Image
```

Description

`object = ModelAdvisor.Image` creates a handle to an image object, `object`, that the Model Advisor displays in the output. The Model Advisor supports many image formats, including, but not limited to, JPEG, BMP, and GIF.

Examples

```
image_obj = ModelAdvisor.Image;
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.InputParameter

Purpose

Add input parameters to custom checks

Description

Instances of the `ModelAdvisor.InputParameter` class specify the input parameters a custom check uses in analyzing the model. Access input parameters in the Model Advisor window.

Construction

ModelAdvisor.InputParameter	Add input parameters to custom checks

Methods

setColSpan	Specify number of columns for input parameter
setRowSpan	Specify rows for input parameter

Properties

Description	Description of input parameter
Entries	Drop-down list entries
Name	Input parameter name
Type	Input parameter type
Value	Value of input parameter

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Add input parameters to custom checks

Syntax

`input_param = ModelAdvisor.InputParameter`

Description

`input_param = ModelAdvisor.InputParameter` creates a handle to an input parameter object, `input_param`.

Note You must include input parameter definitions in a check definition.

Examples

Note The following example is a fragment of code from the `sl_customization.m` file for the example model, `slvnvdemo_mdladv`. The example does not execute as shown without the additional content found in the `sl_customization.m` file.

```
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
rec.setInputParametersLayoutGrid([3 2]);
% define input parameters
inputParam1 = ModelAdvisor.InputParameter;
inputParam1.Name = 'Skip font checks.';
inputParam1.Type = 'Bool';
inputParam1.Value = false;
inputParam1.Description = 'sample tooltip';
inputParam1.setRowSpan([1 1]);
inputParam1.setColSpan([1 1]);
inputParam2 = ModelAdvisor.InputParameter;
inputParam2.Name = 'Standard font size';
inputParam2.Value='12';
inputParam2.Type='String';
inputParam2.Description='sample tooltip';
inputParam2.setRowSpan([2 2]);
inputParam2.setColSpan([1 1]);
inputParam3 = ModelAdvisor.InputParameter;
inputParam3.Name='Valid font';
inputParam3.Type='Combobox';
inputParam3.Description='sample tooltip';
inputParam3.Entries={'Arial', 'Arial Black'};
inputParam3.setRowSpan([2 2]);
inputParam3.setColSpan([2 2]);
rec.setInputParameters({inputParam1,inputParam2,inputParam3});
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Insert line break

Description

Use instances of the `ModelAdvisor.LineBreak` class to insert line breaks in the Model Advisor outputs.

Construction

ModelAdvisor.LineBreak	Insert line break

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.LineBreak

Purpose Insert line break

Syntax `ModelAdvisor.LineBreak`

Description `ModelAdvisor.LineBreak` inserts a line break into the Model Advisor output.

Examples Add a line break between two lines of text:

```
result = ModelAdvisor.Paragraph;
addItem(result, [resultText1 ModelAdvisor.LineBreak resultText2]);
```

See Also "Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.List

Purpose

Create list class

Description

Use instances of the `ModelAdvisor.List` class to create list-formatted outputs.

Construction

ModelAdvisor.List	Create list class

Methods

addItem	Add item to list
setType	Specify list type

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.List

Purpose

Create list class

Syntax

`list = ModelAdvisor.List`

Description

`list = ModelAdvisor.List` creates a list object, `list`.

Examples

```
subList = ModelAdvisor.List();
setType(subList, 'numbered')
addItem(subList, ModelAdvisor.Text('Sub entry 1', {'pass','bold'}));
addItem(subList, ModelAdvisor.Text('Sub entry 2', {'pass','bold'}));
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Add list view parameters to custom checks

Description

The Model Advisor uses list view parameters to populate the Model Advisor Result Explorer. Access the information in list views by clicking **Explore Result** in the Model Advisor window.

Construction

ModelAdvisor.ListViewParameter	Add list view parameters to custom checks

Properties

Attributes	Attributes to display in Model Advisor Report Explorer
Data	Objects in Model Advisor Result Explorer
Name	Drop-down list entry

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

Examples

Note The following example is a fragment of code from the `sl_customization.m` file for the example model, `slvnvdemo_mdladv`. The example does not execute as shown without the additional content found in the `sl_customization.m` file.

```
mdladvObj = Simulink.ModelAdvisor.getModelAdvisor(system);
mdladvObj.setCheckResultStatus(true);

% define list view parameters
myLVParam = ModelAdvisor.ListViewParameter;
myLVParam.Name = 'Invalid font blocks'; % the name appeared at pull down filter
myLVParam.Data = get_param(searchResult,'object')';
```

```
myLVParam.Attributes = {'FontName'}; % name is default property
mdladvObj.setListViewParameters({myLVParam});
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Add list view parameters to custom checks

Syntax

`lv_param = ModelAdvisor.ListViewParameter`

Description

`lv_param = ModelAdvisor.ListViewParameter` defines a list view, `lv_param`.

Note Include list view parameter definitions in a check definition.

See Also

"Model Advisor Customization"

How To

- "Define Model Advisor Result Explorer Views"
- "Authoring Checks"
- "Batch-Fix Warnings or Failures"
- "Customization Example"
- "getListViewParameters"
- "setListViewParameters"

ModelAdvisor.lookupCheckID

Purpose

Look up Model Advisor check ID

Syntax

`NewID = ModelAdvisor.lookupCheckID('OldCheckID')`

Description

`NewID = ModelAdvisor.lookupCheckID('OldCheckID')` returns the check ID of the check specified by `OldCheckID`. `OldCheckID` is the ID of a check prior to R2010b.

Input Arguments

OldCheckID

`OldCheckID` is the ID of a check prior to R2010b.

Output Arguments

NewID

Check ID that corresponds to the previous check ID identified by `OldCheckID`.

Examples

Look up the check ID for **By Product > Simulink Verification and Validation > Modeling Standards > DO-178C/DO-331 Checks > Check safety-related optimization settings** using the previous ID `DO178B:OptionSet`:

```
NewID = ModelAdvisor.lookupCheckID('DO178B:OptionSet');
```

Alternatives

"Archive and View Results"

See Also

`ModelAdvisor.run`

How To

- "Archive and View Results"

Purpose

Create and format paragraph

Description

The `ModelAdvisor.Paragraph` class creates and formats a paragraph object.

Construction

ModelAdvisor.Paragraph	Create and format paragraph

Methods

addItem	Add item to paragraph
setAlign	Specify paragraph alignment

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

Examples

```
% Check Simulation optimization setting
ResultDescription{end+1} = ModelAdvisor.Paragraph(['Check Simulation '...
'optimization settings:']);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.Paragraph

Purpose Create and format paragraph

Syntax `para_obj = ModelAdvisor.Paragraph`

Description `para_obj = ModelAdvisor.Paragraph` defines a paragraph object `para_obj`.

Examples

```
% Check Simulation optimization setting
ResultDescription{end+1} = ModelAdvisor.Paragraph(['Check Simulation '...
'optimization settings:']);
```

See Also "Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Define custom procedures

Description

The `ModelAdvisor.Procedure` class defines a procedure that is displayed in the Model Advisor tree. Use procedures to organize additional procedures or checks by functionality or usage.

Construction

ModelAdvisor.Procedure	Define custom procedures

Properties

Description

Provides information about the procedure. Details about the procedure are displayed in the right pane of the Model Advisor.

Default: `'  '` (null string)

Name

Specifies the name of the procedure that is displayed in the Model Advisor.

Default: `'  '` (null string)

ID

Specifies a permanent, unique identifier for the procedure.

Note

- You must specify this field.
- The value of `ID` must remain constant.
- The Model Advisor generates an error if `ID` is not unique.
- Procedure definitions must refer to other procedures by `ID`.

MAObj

Specifies a handle to the current Model Advisor object.

Methods

addProcedure	Add subprocedure to procedure
addTask	Add task to procedure

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

See Also

"Model Advisor Customization"

How To

- "Overview of Procedural-Based Model Advisor Configurations"
- "Create Procedures"
- "Create a Procedural-Based Configuration"
- "Authoring Checks"

Purpose

Define custom procedures

Syntax

```
procedure_obj = ModelAdvisor.Procedure(procedure_ID)
```

Description

`procedure_obj = ModelAdvisor.Procedure(procedure_ID)` creates a handle to a procedure object, `procedure_obj`, and assigns it a unique identifier, `procedure_ID`. `procedure_ID` must remain constant.

Examples

```
MAP = ModelAdvisor.Procedure('com.mathworks.sample.ProcedureSample');
```

See Also

"Model Advisor Customization"

How To

- "Overview of Procedural-Based Model Advisor Configurations"
- "Create Procedures"
- "Create a Procedural-Based Configuration"
- "Authoring Checks"

ModelAdvisor.Root

Purpose

Identify root node

Description

The `ModelAdvisor.Root` class returns the root object.

Construction

ModelAdvisor.Root	Identify root node

Methods

publish	Publish object in Model Advisor root
register	Register object in Model Advisor root

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Identify root node

Syntax

```
root_obj = ModelAdvisor.Root
```

Description

`root_obj = ModelAdvisor.Root` creates a handle to the root object, `root_obj`.

Examples

```
mdladvRoot = ModelAdvisor.Root;
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Run Model Advisor checks on systems

Syntax

```
SysResultObjArray =
ModelAdvisor.run(SysList,CheckIDList,Name,
   Value)
SysResultObjArray =
ModelAdvisor.run(SysList,'Configuration',
   FileName,Name,Value)
```

Description

`SysResultObjArray = ModelAdvisor.run(SysList,CheckIDList,Name,Value)` runs the Model Advisor on the systems provided by `SysList` with additional options specified by one or more optional `Name,Value` pair arguments. `CheckIDList` contains cell array of check IDs to run.

`SysResultObjArray = ModelAdvisor.run(SysList,'Configuration',FileName,Name,Value)` runs the Model Advisor on the systems provided by `SysList`. The list of checks to run is specified using a Model Advisor configuration file, specified by `FileName`.

Tips

- If you have a Parallel Computing Toolbox™ license and a multicore machine, you can run the Model Advisor on multiple systems in parallel. Start a MATLAB pool using the `matlabpool` function.

Input Arguments

SysList

Cell array of systems to run.

CheckIDList

Cell array of check IDs to run. For details on how to find check IDs, see “Finding Check IDs”.

`CheckIDList` optionally can include input parameters for specific checks using the following syntax; `{'CheckID','InputParam',{'IP','IPV'}}`, where `IP` is the input parameter name and `IPV` is the corresponding input parameter value. You can specify several input parameter name and value pair arguments in any order as `IP1,IPV1, ,IPN,IPVN`.

FileName

Name of the Model Advisor configuration file. For details on creating a configuration file, see "Organize Checks and Folders Using the Model Advisor Configuration Editor".

Name-Value Pair Arguments

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

DisplayResults

Setting `DisplayResults` to `'Summary'` displays a summary of the system results in the Command Window. Setting `DisplayResults` to `'Details'` displays the following in the Command Window:

- Which system the Model Advisor is checking while the run is in progress.
- For each system, the pass and fail results of each check.
- A summary of the system results.

Setting `DisplayResults` to `'None'` displays no information in the Command Window.

Default: `'Summary'`

Force

Setting `Force` to `'On'` removes existing `modeladvisor/`*`system`* folders. Setting `Force` to `'Off'` prompts you before removing existing `modeladvisor/`*`system`* folders.

Default: `'Off'`

TempDir

Setting TempDir to 'On' runs the Model Advisor from a temporary working folder, to avoid concurrency issues when running using a MATLAB pool. For more information, see “Resolving Data Concurrency Issues”. Setting TempDir to 'Off' runs the Model Advisor in the current working folder.

Default: 'Off'

ShowExclusions

Setting ShowExclusions to 'On' lists Model Advisor check exclusions in the report. Setting ShowExclusions to `Off' does not list Model Advisor check exclusion in the report.

Default: 'On'

Output Arguments

SysResultObjArray

Cell array of ModelAdvisor.SystemResult objects, one for each model specified in SysList. Each ModelAdvisor.SystemResult object contains an array of CheckResultObj objects. Save SysResultObjArray to review results at a later time without having to rerun the Model Advisor (see “Understanding the Save and Load Process”).

CheckResultObj

Array of ModelAdvisor.CheckResult objects, one for each check that runs.

Examples

Runs the Model Advisor checks **Check model diagnostic parameters** and **Check for fully defined interface** on the sldemo_auto_climatecontrol/Heater Control and sldemo_auto_climatecontrol/AC Control subsystems:

```
% Create list of checks and models to run.
CheckIDList ={'mathworks.maab.jc_0021',...
```

```
    'mathworks.iec61508.RootLevelInports'};
SysList={'sldemo_auto_climatecontrol/Heater Control',...
    'sldemo_auto_climatecontrol/AC Control'};

% Run the Model Advisor.
SysResultObjArray = ModelAdvisor.run(SysList,CheckIDList);
```

Runs the Model Advisor configuration file `slvnvdemo_mdladv_config.mat` on the `sldemo_auto_climatecontrol/Heater Control` and `sldemo_auto_climatecontrol/AC Control` subsystems:

```
% Identify Model Advisor configuration file.
% Create list of models to run.
fileName = 'slvnvdemo_mdladv_config.mat';
SysList={'sldemo_auto_climatecontrol/Heater Control',...
    'sldemo_auto_climatecontrol/AC Control'};

% Run the Model Advisor.
SysResultObjArray = ModelAdvisor.run(SysList,'Configuration',fileName);
```

Alternatives

- Use the Model Advisor GUI to run each system, one at a time.
- Create a script or function using the `Simulink.ModelAdvisor` class to run each system, one at a time.

See Also

`ModelAdvisor.summaryReport` | `view` | `viewReport` | `ModelAdvisor.lookupCheckID`

Tutorials

- “Workflow for Checking Systems Programmatically”
- “Check Multiple Systems in Parallel”
- “Create a Function for Checking Multiple Systems in Parallel”

How To

- “Automating Check Execution”

- "Finding Check IDs"
- "Organize Checks and Folders Using the Model Advisor Configuration Editor"
- "Understanding the Save and Load Process"

ModelAdvisor.summaryReport

Purpose

Open Model Advisor Command-Line Summary report

Syntax

`ModelAdvisor.summaryReport(SysResultObjArray)`

Description

`ModelAdvisor.summaryReport(SysResultObjArray)` opens the Model Advisor Command-Line Summary report in a web browser. `SysResultObjArray` is a cell array of `ModelAdvisor.SystemResult` objects returned by `ModelAdvisor.run`.

Input Arguments

SysResultObjArray

Cell array of `ModelAdvisor.SystemResult` objects returned by `ModelAdvisor.run`.

Examples

Opens the Model Advisor Command-Line Summary report after running the Model Advisor:

```
% Identify Model Advisor configuration file.
% Create list of models to run.
fileName = 'slvnvdemo_mdladv_config.mat';
SysList={'sldemo_auto_climatecontrol/Heater Control',...
    'sldemo_auto_climatecontrol/AC Control'};

% Run the Model Advisor.
SysResultObjArray = ModelAdvisor.run(SysList,'Configuration',fileName);

% Open the Model Advisor Command-Line Summary report.
ModelAdvisor.summaryReport(SysResultObjArray)
```

Alternatives

"View Results in Model Advisor Command-Line Summary Report"

See Also

`ModelAdvisor.run` | `view` | `viewReport`

Tutorials

- "Workflow for Checking Systems Programmatically"
- "Check Multiple Systems in Parallel"
- "Create a Function for Checking Multiple Systems in Parallel"

How To

- "Automating Check Execution"
- "Archive and View Model Advisor Run Results"

Purpose

Create table

Description

Instances of the `ModelAdvisor.Table` class create and format a table. Specify the number of rows and columns in a table, excluding the table title and table heading row.

Construction

ModelAdvisor.Table	Create table

Methods

getEntry	Get table cell contents
setColHeading	Specify table column title
setColHeadingAlign	Specify column title alignment
setColWidth	Specify column widths
setEntries	Set contents of table
setEntry	Add cell to table
setEntryAlign	Specify table cell alignment
setHeading	Specify table title
setHeadingAlign	Specify table title alignment
setRowHeading	Specify table row title
setRowHeadingAlign	Specify table row title alignment

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Create table

Syntax

```
table = ModelAdvisor.Table(row, column)
```

Description

`table = ModelAdvisor.Table(row, column)` creates a table object (`table`). The Model Advisor displays the table object containing the specified number of rows (`row`) and columns (`column`).

Examples

In the following example, you create two table objects, `table1` and `table2`. The Model Advisor displays `table1` in the results as a table with 1 row and 1 column. The Model Advisor display `table2` in the results as a table with 2 rows and 3 columns.

```
table1 = ModelAdvisor.Table(1,1);
table2 = ModelAdvisor.Table(2,3);
```

See Also

“Model Advisor Customization”

How To

- “Authoring Checks”

Purpose

Define custom tasks

Description

The `ModelAdvisor.Task` class is a wrapper for a check so that you can access the check with the Model Advisor.

You can use one `ModelAdvisor.Check` object in multiple `ModelAdvisor.Task` objects, allowing you to place the same check in multiple locations in the Model Advisor tree. For example, **Check for implicit signal resolution** is displayed in the **By Product > Simulink** folder and in the **By Task > Model Referencing** folder in the Model Advisor tree.

When adding checks as tasks, the Model Advisor uses the task properties instead of the check properties, except for `Visible` and `LicenseName`.

Construction

ModelAdvisor.Task	Define custom tasks

Methods

setCheck	Specify check used in task

Properties

Description	Description of task
DisplayName	Name of task
Enable	Indicate if user can enable and disable task
ID	Identifier for task
LicenseName	Product license names required to display and run task
MAObj	Model Advisor object
Value	Status of task
Visible	Indicate to display or hide task

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

Examples

```
MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
MAT2 = ModelAdvisor.Task('com.mathworks.sample.TaskSample2');
MAT3 = ModelAdvisor.Task('com.mathworks.sample.TaskSample3');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Define custom tasks

Syntax

`task_obj = ModelAdvisor.Task(task_ID)`

Description

`task_obj = ModelAdvisor.Task(task_ID)` creates a task object, `task_obj`, with a unique identifier, `task_ID`. `task_ID` must remain constant. If you do not specify `task_ID`, the Model Advisor assigns a random `task_ID` to the task object.

You can use one `ModelAdvisor.Check` object in multiple `ModelAdvisor.Task` objects, allowing you to place the same check in multiple locations in the Model Advisor tree. For example, **Check for implicit signal resolution appears** in the **By Product > Simulink folder** and in the **By Task > Model Referencing** folder in the Model Advisor tree.

When adding checks as tasks, the Model Advisor uses the task properties instead of the check properties, except for `Visible` and `LicenseName`.

Examples

In the following example, you create three task objects, `MAT1`, `MAT2`, and `MAT3`.

```
MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
MAT2 = ModelAdvisor.Task('com.mathworks.sample.TaskSample2');
MAT3 = ModelAdvisor.Task('com.mathworks.sample.TaskSample3');
```

See Also

“Model Advisor Customization”

How To

- “Authoring Checks”

ModelAdvisor.Text

Purpose

Create Model Advisor text output

Description

Instances of `ModelAdvisor.Text` class create formatted text for the Model Advisor output.

Construction

ModelAdvisor.Text	Create Model Advisor text output

Methods

setBold	Specify bold text
setColor	Specify text color
setHyperlink	Specify hyperlinked text
setItalic	Italicize text
setRetainSpaceReturn	Retain spacing and returns in text
setSubscript	Specify subscripted text
setSuperscript	Specify superscripted text
setUnderlined	Underline text

Copy Semantics

Handle. To learn how this affects your use of the class, see Copying Objects in the MATLAB Programming Fundamentals documentation.

Examples

```
t1 = ModelAdvisor.Text('This is some text');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Create Model Advisor text output

Syntax

```
text = ModelAdvisor.Text(content, {attribute})
```

Description

`text = ModelAdvisor.Text(content, {attribute})` creates a text object for the Model Advisor output.

Input Arguments

`content`	Optional string specifying the content of the text object. If *`content`* is empty, empty text is output.
`attribute`	Optional cell array of strings specifying the formatting of the content. If no attribute is specified, the output text has default coloring with no formatting. Possible formatting options include: • `normal` (default) — Text is default color and style. • `bold` — Text is bold. • `italic` — Text is italicized. • `underline` — Text is underlined. • `pass` — Text is green. • `warn` — Text is yellow. • `fail` — Text is red. • `keyword` — Text is blue. • `subscript` — Text is subscripted. • `superscript` — Text is superscripted.

Output Arguments

`text`	The text object you create

Examples

```
text = ModelAdvisor.Text('Sub entry 1', {'pass','bold'})
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Publish object in Model Advisor root

Syntax

```
publish(root_obj, check_obj, location)
publish(root_obj, group_obj)
publish(root_obj, procedure_obj)
publish(root_obj, fg_obj)
```

Description

`publish(root_obj, check_obj, location)` specifies where the Model Advisor places the check in the Model Advisor tree. `location` is either one of the subfolders in the **By Product** folder, or the name of a new subfolder to put in the **By Product** folder. Use a pipe-delimited string to indicate multiple subfolders. For example, to add a check to the **Simulink Verification and Validation > Modeling Standards** folder, use the following string: `'Simulink Verification and Validation|Modeling Standards'`.

`publish(root_obj, group_obj)` specifies the `ModelAdvisor.Group` object to publish as a folder in the **Model Advisor Task Manager** folder.

`publish(root_obj, procedure_obj)` specifies the `ModelAdvisor.Procedure` object to publish.

`publish(root_obj, fg_obj)` specifies the `ModelAdvisor.FactoryGroup` object to publish as a subfolder in the **By Task** folder.

Examples

```
% publish check into By Product > Demo group.
mdladvRoot.publish(rec, 'Demo');
```

How To

- “Define Where Custom Checks Appear”
- “Define Where Tasks Appear”
- “Define Where Custom Folders Appear”

ModelAdvisor.Root.register

Purpose

Register object in Model Advisor root

Syntax

```
register(MAobj, obj)
```

Description

`register(MAobj, obj)` registers the object, *`obj`*, in the root object `MAobj`.

In the Model Advisor memory, the `register` method registers the following types of objects:

- `ModelAdvisor.Check`
- `ModelAdvisor.FactoryGroup`
- `ModelAdvisor.Group`
- `ModelAdvisor.Procedure`
- `ModelAdvisor.Task`

The `register` method places objects in the Model Advisor memory that you use in other functions. The `register` method does not place objects in the Model Advisor tree.

Examples

```
mdladvRoot = ModelAdvisor.Root;

MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
MAT1.DisplayName='Example task with input parameter and auto-fix ability';
MAT1.setCheck('com.mathworks.sample.Check1');
mdladvRoot.register(MAT1);

MAT2 = ModelAdvisor.Task('com.mathworks.sample.TaskSample2');
MAT2.DisplayName='Example task 2';
MAT2.setCheck('com.mathworks.sample.Check2');
mdladvRoot.register(MAT2);

MAT3 = ModelAdvisor.Task('com.mathworks.sample.TaskSample3');
MAT3.DisplayName='Example task 3';
MAT3.setCheck('com.mathworks.sample.Check3');
```

```
mdladvRoot.register(MAT3)
```

Purpose

Interact programmatically with Requirements Management Interface

Syntax

```
rmi setup
reqlinks = rmi('createempty')
reqlinks = rmi('get', object)
reqlinks = rmi('get', object, group)
rmi('report', object)
rmi('set', object, reqlinks)
rmi('set', object, reqlinks, group)
rmi('cat', object, reqlinks)
cnt = rmi('count', object)
rmi('clearall', object)
rmi('clearAll', object, 'deep')
rmi register linktypename
rmi unregister linktypename
rmi linktypelist
cmdstr = rmi('navCmd', object)
[cmdstr, objPath] = rmi('navCmd', object)
guidstr = rmi('guidget', object)
object = rmi('guidlookup', model, guidstr)
rmi('highlightModel', object)
rmi('unhighlightModel', object)
rmi('view', object, index)
dialog = rmi('edit', object)
number_problems = rmi('checkdoc', reqtsDocName)
rmi('doorssync', object)
rmi('setDoorsLabelTemplate', newTemplate)
rmi('getDoorsLabelTemplate')
rmi('updateDoorsLabels', model)
rmi('doorsLabel', moduleID, objectID)
rmi('httpLink')
```

Description

`rmi setup` configures RMI for use with your MATLAB software and installs the interface for use with the Telelogic® DOORS software.

`reqlinks = rmi('createempty')` creates an empty instance of the requirement links data structure.

`reqlinks = rmi('get', object)` returns the requirement links data structure for `object`. `object` is the name or handle of a Simulink or Stateflow object with which requirements can be associated.

`reqlinks = rmi('get', object, group)` returns the requirement links data structure for the Signal Builder group specified by the index `group`. In this case, `object` is the name or handle of a Signal Builder block whose signal groups are associated with requirements.

`rmi('report', object)` creates an HTML report that describes the requirements in `object`.

`rmi('set', object, reqlinks)` sets the requirement links data structure `reqlinks` to `object`.

`rmi('set', object, reqlinks, group)` sets the requirement links data structure `reqlinks` to the Signal Builder group specified by the index `group`. In this case, `object` is the name or handle of a Signal Builder block whose signal groups you want to associate with requirements.

`rmi('cat', object, reqlinks)` appends the requirement links data structure `reqlinks` to the end of the existing structure associated with `object`. If no structure exists, RMI sets `reqlinks` to `object`.

`cnt = rmi('count', object)` returns the number of requirement links associated with `object`.

`rmi('clearall', object)` removes the requirement links data structure associated with `object`, deleting its requirements.

`rmi('clearAll', object, 'deep')` deletes all requirements links in the model containing `object`.

`rmi register linktypename` registers the custom link type specified by the function `linktypename`.

`rmi unregister linktypename` removes the custom link type specified by the function `linktypename`.

`rmi linktypelist` displays a list of the currently registered link types. The list indicates whether each link type is built-in or custom, and provides the path to the function used for its registration.

`cmdstr = rmi('navCmd', object)` returns the MATLAB command string used to navigate to `object`.

`[cmdstr, objPath] = rmi('navCmd', object)` returns the MATLAB command string `cmdstr` and the title string `titlestr` that provides descriptive text for `object`.

`guidstr = rmi('guidget', object)` returns the globally unique identifier for `object`. A globally unique identifier is created for `object` if it lacks one.

`object = rmi('guidlookup', model, guidstr)` returns the object name in `model` that has the globally unique identifier `guidstr`.

`rmi('highlightModel', object)` highlights all of the objects in the parent model of `object` that have requirement links.

`rmi('unhighlightModel', object)` removes highlighting of objects in the parent model of `object` that have requirement links.

`rmi('view', object, index)` accesses the requirement numbered `index` in the requirements document associated with `object`. `index` is an integer that represents the *n*th requirement linked to `object`.

`dialog = rmi('edit', object)` displays the Requirements dialog box for `object` and returns the handle of the dialog box.

`number_problems = rmi('checkdoc', reqtsDocName)` validates links in a Microsoft® Word, Microsoft Excel®, or IBM Rational DOORS requirements document to Simulink models. `rmi` returns the total count of detected problems in `number_problems` and generates an HTML report. If the `rmi` function detects a navigation object in the requirements document that points to multiple model objects, you have the option to split the navigation object, as described in "When Multiple Objects Have Links to the Same Requirement".

`rmi('doorssync', object)` opens the DOORS synchronization settings dialog box, where you can customize the synchronization settings and synchronize your model with an open project in an IBM Rational DOORS database. See `rmi.doorssync` for information about synchronizing your model with DOORS at the MATLAB command line.

`rmi('setDoorsLabelTemplate', newTemplate)` specifies a new custom template for labels of requirements links to IBM Rational DOORS. The default label template contains the section number and object heading for the DOORS requirement link target. To revert the link label template back to the default, enter `rmi('setDoorsLabelTemplate', '')` at the MATLAB command prompt.

`rmi('getDoorsLabelTemplate')` returns the currently specified custom template for labels of requirements links to IBM Rational DOORS.

`rmi('updateDoorsLabels', model)` updates all IBM Rational DOORS requirements links labels in `model` according to the current template.

`rmi('doorsLabel', moduleID, objectID)` generates a label for the requirements link to the IBM Rational DOORS object specified by `objectID` in the DOORS module specified by `moduleID`, according to the current template.

`rmi('httpLink')` starts the internal MATLAB HTTP server. This enables HTTP navigation to Simulink objects from external applications.

Input Arguments

group

Signal Builder group index

guidstr

Globally unique model identifier

index

Integer that represents the *n*th requirement linked to `object`

model

Name or handle of a Simulink model

object

Name or handle of a Simulink or Stateflow object with which requirements can be associated

reqlinks

Requirement links are represented using a MATLAB structure array with the following fields:

`doc`	String identifying requirements document
`id`	String defining location in requirements document. The first character specifies the identifier type:

First Character	Identifier	Example
`?`	Search text, the first occurrence of which is located in requirements document	`'?Requirement 1'`
`@`	Named item, such as bookmark in a Microsoft Word file or an anchor in an HTML file	`'@my_req'`
`#`	Page or item number	`'#21'`
`>`	Line number	`'>3156'`
`$`	Worksheet range in a spreadsheet	`'$A2:C5'`

`linked`	Boolean value specifying whether the requirement link is accessible for report generation and highlighting: `1` (default). Highlight model object and include requirement link in reports. `0`
`description`	String describing the requirement
`keywords`	Optional string supplementing `description`
`reqsys`	String identifying the link type registration name; `'other'` for built-in link types

reqtsDocName

Path name to a Microsoft Word or IBM Rational DOORS requirements document or a DOORS module ID

newTemplate

String specifying template labels of links to requirements in IBM Rational DOORS

You can use the following format specifiers to include the associated DOORS information in your requirements links labels:

`%h`	Object heading
`%t`	Object text
`%p`	Module prefix
`%n`	Object absolute number
`%m`	Module ID
`%P`	Project name
`%M`	Module name

`%U`	DOORS URL
%<ATTRIBUTE_NAME>	Other DOORS attribute you specify

moduleID

Unique DOORS module ID

objectID

Locally unique ID for a DOORS object in the DOORS module specified by `moduleID`

Output Arguments

cmdstr

MATLAB command string

cnt

Number of requirement links associated with `object`

dialog

Handle for `object`

guidstr

Globally unique model identifier

number_problems

Integer representing the number of invalid links in a requirements document

object

Name or handle of a Simulink or Stateflow object with which requirements can be associated

reqlinks

Requirement links are represented using a MATLAB structure array. See "Input Arguments" on page 3-123 for details.

objPath

A string that identifies `object`

Examples

Get a requirement associated with a block in the `slvnvdemo_fuelsys_htmreq` model, change its description, and save the requirement back to that block:

```
slvnvdemo_fuelsys_htmreq;
blk_with_req =  ['slvnvdemo_fuelsys_htmreq/fuel rate' 10 'controller/...
   Airflow calculation'];
reqts = rmi('get', blk_with_req);
reqts.description = 'Mass airflow estimation';
rmi('set', blk_with_req, reqts);
rmi('get', blk_with_req);
```

Add a new requirement to the block in the previous example:

```
new_req = rmi('createempty');
new_req.doc = 'fuelsys_requirements2.htm';
new_req.description = 'A new requirement';
rmi('cat',blk_with_req, new_req);
```

Create an HTML requirements report for the `slvnvdemo_fuelsys_htmreq` model:

```
rmi('report', 'slvnvdemo_fuelsys_htmreq');
```

Specify a new label template for requirements links to IBM Rational DOORS so that new links to DOORS objects are labeled with the corresponding module ID, object absolute number, and the value of the 'Backup' attribute.

```
rmi('setDoorsLabelTemplate', '%m:%n [backup=%<Backup>]');
```

Update existing DOORS requirements link labels to match the new specified template in your model `example_model`. When updating labels, DOORS must be running and all linked modules must be accessible for reading.

```
rmi('updateDoorsLabels', example_model);
```

See Also

`rmi.objinfo` | `rmi.doorssync` | `rmidocrename` | `rmiobjnavigate` | `rmitag` | `RptgenRMI.doorsAttribs` | `rmidata.default` | `rmidata.map`

How To

- "Links Between Models and Requirements"
- "Navigation from Requirements Documents"

Purpose

Specify default requirements storage location for new models

Syntax

```
rmidata.default(storage_setting)
```

Description

`rmidata.default(storage_setting)` specifies whether information about linked requirements for new Simulink models is stored in the model file or in an external file. This function does not affect models that already have saved information about linked requirements.

Input Arguments

storage_setting

String that specifies where information about linked requirements is stored:

- `'internal'` — Store requirements information in the model file.
- `'external'` — Store requirements in a separate file. The default name for this file is *`model_name`*`.req`.

Examples

Specify to store requirements information in the model file:

```
rmidata.default('internal');
```

Specify to store requirements information in an external file:

```
rmidata.default('external);
```

Alternatives

To set the storage location from the Model Editor:

1. Select **Analysis > Requirements > Settings**.
2. Select the **Storage** tab.
3. Select one of the following options:
   - **Store internally (embedded in a model file)**
   - **Store externally (in a separate *.req file)**

See Also

rmi | rmidata.export | rmidata.map

Purpose

Move requirements information to external file

Syntax

```
[total_linked,total_links] = rmidata.export
[total_linked,total_links] = rmidata.export(model)
```

Description

`[total_linked,total_links] = rmidata.export` moves any requirements information associated with the current Simulink model to an external file named *`model_name`*`.req`. `rmidata.export` saves the file in the same folder as the model. `rmidata.export` deletes the requirements information stored in the model and saves the modified model.

`[total_linked,total_links] = rmidata.export(model)` moves any requirements information associated with `model` to an external file named *`model_name`*`.req`. `rmidata.export` saves the file in the same folder as `model`. `rmidata.export` deletes the requirements information stored in the model and saves the modified model.

Input Arguments

model

Name or handle of a Simulink model

Output Arguments

total_linked

Integer indicating the number of objects in the model that have linked requirements.

total_links

Integer indicating the total number of requirements links in the model.

Examples

Move the requirements information from the `slvnvdemo_fuelsys_officereq` model to an external file:

```
rmidata.export('slvnvdemo_fuelsys_officereq');
```

See Also

`rmi` | `rmidata.default` | `rmidata.map`

rmidata.map

Purpose

Associate external requirements information with model

Syntax

```
rmidata.map(model,reqts_file)
rmidata.map(model,'undo')
rmidata.map(model,'clear')
```

Description

`rmidata.map(model,reqts_file)` associates the requirements information from `reqts_file` with the Simulink model, `model`.

`rmidata.map(model,'undo')` removes from the `.req` file associated with `model` the requirements information that was most recently saved in the `.req` file.

`rmidata.map(model,'clear')` removes from the `.req` file associated with `model` all requirements information.

Input Arguments

model

Name, handle, or full path for a Simulink model

reqts_file

Full path to the `.req` file that contains requirements links for the model

Alternatives

To load a file that contains requirements information for a model:

1 Open the model.

2 Select **Analysis > Requirements > Load Links**.

Note The **Load Links** menu item appears only when your model is configured to store requirements data externally. To specify external storage of requirements data for your model, in the Requirements Settings dialog box under **Storage > Default storage location for requirements links data**, select **Store externally (in a separate *.req file)**.

---

3. Browse to the `.req` file that contains the requirements links.

4. Click **OK**.

Examples

Associate an external requirements information file with a Simulink model. After associating the information with the model, view the objects with linked requirements by highlighting the model.

```
open_system('slvnvdemo_powerwindowController');
reqFile = fullfile(matlabroot, 'toolbox', 'slvnv', ...
    'rmidemos', 'powerwin_reqs', ...
    'slvnvdemo_powerwindowRequirements.req');
rmidata.map('slvnvdemo_powerwindowController', reqFile);
rmi('highlightModel', 'slvnvdemo_powerwindowController');
```

To clear the requirements you just associated with that model, run this `rmidata.map` command:

```
rmidata.map('slvnvdemo_powerwindowController','clear');
```

See Also

`rmi` | `rmidata.default` | `rmidata.export`

Purpose

Update model requirements document paths and file names

Syntax

```
rmidocrename(model_handle, old_path, new_path)
rmidocrename(model_name, old_path, new_path)
```

Description

`rmidocrename(model_handle, old_path, new_path)` collectively updates the links from a Simulink model to requirements files whose names or locations have changed. `model_handle` is a handle to the model that contains links to the files that you have moved or renamed. `old_path` is a string that contains the existing full or partial file or path name. `new_path` is a string with the new full or partial file or path name.

`rmidocrename(model_name, old_path, new_path)` updates the links to requirements files associated with `model_name`. You can pass `rmidocrename` a model handle or a model file name.

When using the `rmidocrename` function, make sure to enter specific strings for the old document name fragments so that you do not inadvertently modify other links.

Examples

For the current Simulink model, update all links to requirements files that contain the string `'project_0220'`, replacing them with `'project_0221'`:

```
rmidocrename(gcs, 'project_0220', 'project_0221')
Processed 6 objects with requirements, 5 out of 13 links were modified.
```

Alternatives

To update the requirements links one at a time, for each model object that has a link:

1. For each object with requirements, open the Requirements dialog box by right-clicking and selecting **Requirements > Edit/Add Links**.

2. Edit the **Document** field for each requirement that points to a moved or renamed document.

3. Click **Apply** to save the changes.

See Also

rmi

rmi.doorssync

Purpose

Synchronize model with DOORS surrogate module

Syntax

```
rmi.doorssync(model_name)
rmi.doorssync(model_name, settings)
current_settings = rmi.doorssync(model_name, 'settings')
current_settings = rmi.doorssync(model_name, [])
default_settings = rmi.doorssync([])
```

Description

`rmi.doorssync(model_name)` opens the DOORS synchronization settings dialog box. Select the options for synchronizing `model_name` with an IBM Rational DOORS surrogate module and click **Synchronize**.

Synchronizing a Simulink model with a DOORS surrogate module is a user-initiated process that creates or updates a surrogate module in a DOORS database. A surrogate module is a DOORS formal module that is a representation of a Simulink model hierarchy. When you first synchronize a model, the DOORS software creates a surrogate module. Depending on your synchronization settings, the surrogate module contains a representation of the model.

`rmi.doorssync(model_name, settings)` synchronizes `model_name` with a DOORS surrogate module using the options that `settings` specifies.

`current_settings = rmi.doorssync(model_name, 'settings')` returns the current settings for `model_name`, but does not synchronize the model with the DOORS surrogate module.

`current_settings = rmi.doorssync(model_name, [])` performs synchronization with current settings known for model_name. If the RMI has not synchronized the model previously, `rmi.doorssync` uses the default settings.

`default_settings = rmi.doorssync([])` returns a `settings` object with the default values.

Input Arguments

model_name

Name or handle of a Simulink model

settings

Structure with the following fields.

Field	Description
`surrogatePath`	Path to a DOORS project in the form `'/PROJECT/FOLDER/MODULE'`.) The default, `'./$ModelName$'`, resolves to the given model name under the current DOORS project.
`saveModel`	Saves the model after synchronization. **Default**: `1`
`saveSurrogate`	Saves the modified surrogate module. **Default**: `1`
`slToDoors`	Copies links from Simulink to the surrogate module. **Default**: `0`
`doorsToSl`	Copies links from the surrogate module to Simulink. If both `doorsToSl` and `slToDoors` are set to `1`, an error occurs. **Default**: `0`
`purgeSimulink`	Removes unmatched links in Simulink (ignored if `doorsToSl` is set to `0`). `rmi.doorssync` ignores `purgeSimulink` if `doorsToSl` is set to `0`. **Default**: `0`

Field	Description
purgeDoors	Removes unmatched links in the surrogate module (ignored if slToDoors is set to 0). **Default**: 0
detailLevel	Specifies which objects with no links to DOORS to include in the surrogate module. Valid values are 1 through 6. 1 includes only objects with requirements, for fast synchronization. 6 includes all model objects, for complete model representation in the surrogate. **Default**: 1

Output Arguments

current_settings

The current values of the synchronization settings

default_settings

The default values of the synchronization settings

Examples

Before running this example:

1. Start the DOORS software.
2. Create a new DOORS project or open an existing DOORS project.

After you complete the preceding steps, open the `slvnvdemo_fuelsys_officereq` model, specify to copy the links from the model to DOORS, and synchronize the model to create the surrogate module:

```
slvnvdemo_fuelsys_officereq;
settings = rmi.doorssync('slvnvdemo_fuelsys_officereq', ...
 'settings');
```

```
settings.slToDoors = 1;
setting.purgeDoors = 1;
rmi.doorssync('slvnvdemo_fuelsys_officereq', settings);
```

Alternatives

Instead of using `rmi.doorssync`, you can synchronize your Simulink model with a DOORS surrogate module from the Model Editor:

1. Open the model.
2. Select **Analysis > Requirements > Synchronize with DOORS**.
3. In the DOORS synchronization settings dialog box, select the desired synchronization settings.
4. Click **Synchronize**.

See Also

`rmi`

How To

- "IBM Rational DOORS Surrogate Model Synchronization"

rmi.objinfo

Purpose

Return navigation information for model object

Syntax

`[navCmd, dispString] = rmi.objinfo(obj)`

Description

`[navCmd, dispString] = rmi.objinfo(obj)` returns navigation information for the Simulink model object `obj`.

Input Arguments

obj

Name or handle of a Simulink or Stateflow object.

Output Arguments

navCmd

String that contains the MATLAB command that navigates to the model object `obj`. Pass this command to the MATLAB Automation server to highlight `obj`.

dispString

String that contains the name and path to the model object `obj`.

Examples

Open the `slvnvdemo_fuelsys_officereq` example model, get the unique identifier for the MAP Sensor block, and navigate to that block using the `rmiobjnavigate` function:

```
slvnvdemo_fuelsys_officereq;                % Open example model
gcb = ...
  'slvnvdemo_fuelsys_officereq/MAP sensor';  % Make current block
[navCmdString, objPath] = rmi.objinfo(gcb);  % Get rmiobjnavigate command
                                             % and path
```

See Also

`rmi` | `rmiobjnavigate`

Purpose

Navigate to model objects using unique Requirements Management Interface identifiers

Syntax

```
rmiobjnavigate(modelPath, guId)
rmiobjnavigate(modelPath, guId, grpNum)
```

Description

`rmiobjnavigate(modelPath, guId)` navigates to and highlights the specified object in a Simulink model.

`rmiobjnavigate(modelPath, guId, grpNum)` navigates to the signal group number `grpNum` of a Signal Builder block identified by `guId` in the model `modelPath`.

Input Arguments

modelPath

A full path to a Simulink model file, or a Simulink model file name that can be resolved on the MATLAB path.

guId

A unique string that the RMI uses to identify a Simulink or Stateflow object.

grpNum

Integer indicating a signal group number in a Signal Builder block

Examples

Open the `slvnvdemo_fuelsys_officereq` example model, get the unique identifier for the MAP Sensor block:

```
slvnvdemo_fuelsys_officereq;                % Open example model
gcb = ...
  'slvnvdemo_fuelsys_officereq/MAP sensor';  % Make current block
navCmdString = rmi.objinfo(gcb)             % Get rmoobjnavigate command
                                            % with model name and object ID
```

`rmi.objinfo` returns the following value for `navCmdString`:

```
navCmdString =
```

```
rmiobjnavigate('slvnvdemo_fuelsys_officereq.mdl', ...
 'GIDa_9fc2c968_6068_49c6_968d_b08e363248b9');
```

Navigate to that block using the `rmiobjnavigate` command that `rmi.objinfo` returned:

```
eval(navCmdString);                          % Execute rmiobjnavigate command
```

See Also

`rmi` | `rmi.objinfo`

How To

- "Using the rmiobjnavigate Function"

Purpose

Insert links to models into requirements documents

Syntax

```
[total_links, total_matches,
   total_inserted] = rmiref.insertRefs(model_name,
doc_type)
```

Description

`[total_links, total_matches, total_inserted] = rmiref.insertRefs(model_name, doc_type)` inserts ActiveX® controls into the open, active requirements document of type `doc_type`. These controls correspond to any links from `model_name` to the document. With these controls, you can navigate from the requirements document to the model.

Input Arguments

model_name

Name or handle of a Simulink model

doc_type

A string that indicates the requirements document type:

- `'word'`
- `'excel'`

Examples

Remove the links in an example requirements document, and then reinsert them:

1 Open the example model:

```
slvnvdemo_fuelsys_officereq
```

2 Open the example requirements document:

```
open([matlabroot strcat('/toolbox/slvnv/rmidemos/fuelsys_req_docs/',...
 'slvnvdemo_FuelSys_DesignDescription.docx')])
```

3 Remove the links from the requirements document:

```
rmiref.removeRefs('word')
```

4 Enter y to confirm the removal.

5 Reinsert the links from the requirements document to the model:

```
[total_links, total_matches, total_inserted] = ...
 rmiref.insertRefs(gcs, 'word')
```

See Also

rmiref.removeRefs

Purpose

Remove links to models from requirements documents

Syntax

`rmiref.removeRefs(doc_type)`

Description

`rmiref.removeRefs(doc_type)` removes all links to models from the open, active requirements document of type `doc_type`.

Input Arguments

doc_type

A string that indicates the requirements document type:

- `'word'`
- `'excel'`
- `'doors'`

Examples

Remove the links in this example requirements document:

```
open([matlabroot strcat('/toolbox/slvnv/rmidemos/fuelsys_req_docs/', ...
    'slvnvdemo_FuelSys_DesignDescription.docx')])
rmiref.removeRefs('word')
```

See Also

`rmiref.insertRefs`

Purpose

Manage user tags for requirements links

Syntax

```
rmitag(model, 'add', tag)
rmitag(model, 'add', tag, doc_pattern)
rmitag(model, 'delete', tag)
rmitag(model, 'delete', tag, doc_pattern)
rmitag(model, 'replace', tag, new_tag)
rmitag(model, 'replace', tag, new_tag, doc_pattern)
rmitag(model, 'clear', tag)
rmitag(model, 'clear', tag, doc_pattern)
```

Description

`rmitag(`*`model`*`, 'add', `*`tag`*`)` adds a string *`tag`* as a user tag for all requirement links in *`model`*.

`rmitag(`*`model`*`, 'add', `*`tag`*`, `*`doc_pattern`*`)` adds *`tag`* as a user tag for all links in *`model`*, where the full or partial document name matches the regular expression *`doc_pattern`*.

`rmitag(`*`model`*`, 'delete', `*`tag`*`)` removes the user tag, *`tag`*, from all requirements links in *`model`*.

`rmitag(`*`model`*`, 'delete', `*`tag`*`, `*`doc_pattern`*`)` removes the user tag, *`tag`*, from all requirements links in model, where the full or partial document name matches *`doc_pattern`*.

`rmitag(`*`model`*`, 'replace', `*`tag`*`, `*`new_tag`*`)` replaces *`tag`* with *`new_tag`* for all requirements links in *`model`*.

`rmitag(`*`model`*`, 'replace', `*`tag`*`, `*`new_tag`*`, `*`doc_pattern`*`)` replaces *`tag`* with *`new_tag`* for links in *`model`*, where the full or partial document name matches the regular expression *`doc_pattern`*.

`rmitag(`*`model`*`, 'clear', `*`tag`*`)` deletes all requirement links that have the user tag, *`tag`*.

`rmitag(`*`model`*`, 'clear', `*`tag`*`, `*`doc_pattern`*`)` deletes all requirement links that have the user tag, *`tag`*, and link to the full or partial document name specified in *`doc_pattern`*.

Input Arguments

model

Simulink model name or handle

tag

String

doc_pattern

Regular expression to match in the linked requirements document name

new_tag

String that indicates the name of a user tag for a requirements link. Use this argument when replacing an existing user tag with a new user tag.

Examples

Open the `slvnvdemo_fuelsys_officereq` example model; add the user tag `tmptag` to all objects with requirements links:

```
open_system('slvnvdemo_fuelsys_officereq');
rmitag(gcs, 'add', 'tmptag');
```

Remove the user tag `test` from all requirements links:

```
open_system('slvnvdemo_fuelsys_officereq');
rmitag(gcs, 'delete', 'test');
```

Delete all requirements links that have the user tag `design`:

```
open_system('slvnvdemo_fuelsys_officereq');
rmitag(gcs, 'clear', 'design');
```

Change all instances of the user tag `tmptag` to `safety requirement`, where the document filename extension is `.docx`:

```
open_system('slvnvdemo_fuelsys_officereq');
rmitag(gcs, 'replace', 'tmptag', ...
       'safety requirements', '\.docx');
```

See Also

`rmi` | `rmidocrename`

How To

- “User Tags and Requirements Filtering”

Purpose

IBM Rational DOORS attributes in requirements report

Syntax

`RptgenRMI.doorsAttribs (action,attribute)`

Description

`RptgenRMI.doorsAttribs (action,attribute)` specifies which DOORS object attributes to include in the generated requirements report.

Input Arguments

action

String that specifies the desired action for what content to include from a DOORS record in the generated requirements report. Valid values for this argument are as follows.

Value	Description
`'default'`	Restore the default settings for the DOORS system attributes to include in the report. The default configuration includes the **Object Heading** and **Object Text** attributes, and all other attributes, except: • **Created Thru** • System attributes with empty string values • System attributes that are false
`'show'`	Display the current settings for the DOORS attributes to include in the report.

Value	Description
`'type'`	Include or omit groups of DOORS attributes from the report. If you specify `'type'` for the first argument, valid values for the second argument are: • `'all'` — Include all DOORS attributes in the report. • `'user'` — Include only user-defined DOORS in the report. • `'none'` — Omit all DOORS attributes from the report.
`'remove'`	Omit specified DOORS attributes from the report.
`'all'`	Include specified DOORS attributes in the report, even if that attribute is currently excluded as part of a group.
`'nonempty'`	Enable or disable the empty attribute filter: • Enter `RptgenRMI.doorsAttribs('nonempty', 'off')` to omit all empty attributes from the report. • Enter `RptgenRMI.doorsAttribs('nonempty', 'on')` to include empty user-defined attributes. The report never includes empty system attributes.

attribute

String that qualifies the `action` argument.

Output Arguments

result

- True if `RptgenRMI.doorsAttribs` modifies the current settings.
- For `RptgenRMI.doorsAttribs('show')`, this argument is a cell array of strings that indicate which DOORS attributes to include in the requirements report, for example:

```
>> RptgenRMI.doorsAttribs('show')

ans =

    'Object Heading'
    'Object Text'
    '$AllAttributes$'
    '$NonEmpty$'
    '-Created Thru'
```

  - The **Object Heading** and **Object Text** attributes are included by default.
  - `'$AllAttributes$'` specifies to include all attributes associated with each DOORS object.
  - `'$Nonempty$'` specifies to exclude all empty attributes.
  - `'-Created Thru'` specifies to exclude the **Created Thru** attribute for each DOORS object.

Examples

Limit the DOORS attributes in the requirements report to user-defined attributes:

```
RptgenRMI.doorsAttribs('type', 'user');
```

Omit the content of the **Last Modified By** attribute from the requirements report:

```
RptgenRMI.doorsAttribs('remove', 'Last Modified By');
```

Include the content of the **Last Modified On** attribute in the requirements report, even if system attributes are not included as a group:

```
RptgenRMI.doorsAttribs('add', 'Last Modified On');
```

Include empty system attributes in the requirements report:

```
RptgenRMI.doorsAttribs('nonempty', 'off');
```

Omit the **Object Heading** attribute from the requirements report. Use this option when the link label is always the same as the **Object Heading** for the target DOORS object and you do not want duplicate information in the requirements report:

```
RptgenRMI.doorsAttribs('remove', 'Object Heading');
```

See Also

`rmi`

Purpose

Specify action for check

Syntax

`setAction(check_obj, action_obj)`

Description

`setAction(check_obj, action_obj)` returns the action object `action.obj` to use in the check `check_obj`. The `setAction` method identifies the action you want to use in a check.

See Also

`ModelAdvisor.Action` | "Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Paragraph.setAlign

Purpose Specify paragraph alignment

Syntax

```
setAlign(paragraph, alignment)
```

Description `setAlign(paragraph, alignment)` specifies the alignment of text. Possible values are:

- `'left'` (default)
- `'right'`
- `'center'`

Examples

```
report_paragraph = ModelAdvisor.Paragraph;
setAlign(report_paragraph, 'center');
```

See Also “Model Advisor Customization”

How To

- “Authoring Checks”

Purpose

Specify bold text

Syntax

`setBold(text, mode)`

Description

`setBold(text, mode)` specifies whether `text` should be formatted in bold font.

Input Arguments

`text`	Instantiation of the ModelAdvisor.Text class
`mode`	A Boolean value indicating bold formatting of text: • `true` — Format the text in bold font. • `false` — Do not format the text in bold font.

Examples

```
t1 = ModelAdvisor.Text('This is some text');
setBold(t1, 'true');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Action.setCallbackFcn

Purpose

Specify action callback function

Syntax

`setCallbackFcn(action_obj, @handle)`

Description

`setCallbackFcn(action_obj, @handle)` specifies the handle to the callback function, `handle`, to use with the action object, `action_obj`.

Examples

Note The following example is a fragment of code from the `sl_customization.m` file for the example model, `slvnvdemo_mdladv`. The example does not execute as shown without the additional content found in the `sl_customization.m` file.

```
rec = ModelAdvisor.Check('mathworks.example.optimizationSettings');
% Define an automatic fix action for this check
modifyAction = ModelAdvisor.Action;
modifyAction.setCallbackFcn(@modifyOptmizationSetting);
modifyAction.Name = 'Modify Settings';
modifyAction.Description = ['Modify model configuration optimization' ...
                            ' settings that can impact safety'];
modifyAction.Enable = true;
rec.setAction(modifyAction);
```

See Also

"Model Advisor Customization"

How To

- "Define Check Actions"
- "Authoring Checks"
- "setActionenable"

Purpose

Specify callback function for check

Syntax

`setCallbackFcn(check_obj, @handle, *context*, *style*)`

Description

`setCallbackFcn(check_obj, @handle, context, style)` specifies the callback function to use with the check, `check_obj`.

Input Arguments

`check_obj`	Instantiation of the `ModelAdvisor.Check` class
`handle`	Handle to a check callback function
`context`	Context for checking the model or subsystem: • `'None'` — No special requirements. • `'PostCompile'` — The model must be compiled.
`style`	Type of callback function: • `'StyleOne'` — Simple check callback function, for formatting results using template • `'StyleTwo'` — Detailed check callback function • `'StyleThree'` — Check callback functions with hyperlinked results

Examples

```
% --- sample check 1
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
rec.Title = 'Check Simulink block font';
rec.TitleTips = 'Example style three callback';
rec.setCallbackFcn(@SampleStyleThreeCallback,'None','StyleThree');
```

See Also

"Model Advisor Customization"

How To

- “Create Callback Functions and Results”
- “Authoring Checks”

ModelAdvisor.Task.setCheck

Purpose

Specify check used in task

Syntax

`setCheck(task, check_ID)`

Description

`setCheck(task, check_ID)` specifies the check to use in the task.

You can use one `ModelAdvisor.Check` object in multiple `ModelAdvisor.Task` objects, allowing you to place the same check in multiple locations in the Model Advisor tree. For example, **Check for implicit signal resolution** appears in the **By Product > Simulink folder** and in the **By Task > Model Referencing** folder in the Model Advisor tree.

When adding checks as tasks, the Model Advisor uses the task properties instead of the check properties, except for `Visible` and `LicenseName`.

Input Arguments

`task`	Instantiation of the `ModelAdvisor.Task` class
`check_ID`	A unique string that identifies the check to use in the task

Examples

```
MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
setCheck(MAT1, 'com.mathworks.sample.Check1');
```

ModelAdvisor.FormatTemplate.setCheckText

Purpose

Add description of check to result

Syntax

`setCheckText(ft_obj, text)`

Description

`setCheckText(ft_obj, text)` is an optional method that adds text or a model advisor template object as the first item in the report. Use this method to add information describing the overall check.

Input Arguments

ft_obj

A handle to a template object.

text

A string or a handle to a formatting object.

Valid formatting objects are: `ModelAdvisor.Image`, `ModelAdvisor.LineBreak`, `ModelAdvisor.List`, `ModelAdvisor.Paragraph`, `ModelAdvisor.Table`, and `ModelAdvisor.Text`.

`text` appears as the first line in the analysis result.

Examples

Create a list object, `ft`, and add a line of text to the result:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
setCheckText(ft, ['Identify unconnected lines, input ports,'...
    'and output ports in the model']);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Specify table column title

Syntax

`setColHeading(table, column, heading)`

Description

`setColHeading(table, column, heading)` specifies that the column header of `column` is set to `heading`.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`column`	An integer specifying the column number
`heading`	A string, element object, or object array specifying the table column title

Examples

```
table1 = ModelAdvisor.Table(2, 3);
setColHeading(table1, 1, 'Header 1');
setColHeading(table1, 2, 'Header 2');
setColHeading(table1, 3, 'Header 3');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Specify column title alignment

Syntax

`setColHeadingAlign(table, column, alignment)`

Description

`setColHeadingAlign(table, column, alignment)` specifies the alignment of the column heading.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`column`	An integer specifying the column number
`alignment`	Alignment of the column heading. *`alignment`* can have one of the following values: • `left` (default) • `right` • `center`

Examples

```
table1 = ModelAdvisor.Table(2, 3);
setColHeading(table1, 1, 'Header 1');
setColHeadingAlign(table1, 1, 'center');
setColHeading(table1, 2, 'Header 2');
setColHeadingAlign(table1, 2, 'center');
setColHeading(table1, 3, 'Header 3');
setColHeadingAlign(table1, 3, 'center');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Specify text color

Syntax

`setColor(text, *color*)`

Description

`setColor(text, *color*)` sets the `text` color to *`color`*.

Input Arguments

`text`	Instantiation of the `ModelAdvisor.Text` class
`color`	An enumerated string specifying the color of the text. Possible formatting options include: • `normal` (default) — Text is default color. • `pass` — Text is green. • `warn` — Text is yellow. • `fail` — Text is red. • `keyword` — Text is blue.

Examples

```
t1 = ModelAdvisor.Text('This is a warning');
setColor(t1, 'warn');
```

ModelAdvisor.InputParameter.setColSpan

Purpose

Specify number of columns for input parameter

Syntax

`setColSpan(input_param, [start_col end_col])`

Description

`setColSpan(input_param, [start_col end_col])` specifies the number of columns that the parameter occupies. Use the `setColSpan` method to specify where you want an input parameter located in the layout grid when there are multiple input parameters.

Input Arguments

`input_param`	Instantiation of the `ModelAdvisor.InputParameter` class
`start_col`	A positive integer representing the first column that the input parameter occupies in the layout grid
`end_col`	A positive integer representing the last column that the input parameter occupies in the layout grid

Examples

```
inputParam2 = ModelAdvisor.InputParameter;
inputParam2.Name = 'Standard font size';
inputParam2.Value='12';
inputParam2.Type='String';
inputParam2.Description='sample tooltip';
inputParam2.setRowSpan([2 2]);
inputParam2.setColSpan([1 1]);
```

Purpose

Add column titles to table

Syntax

`setColTitles(`*`ft_obj`*`, {`*`col_title_1`*`, `*`col_title_2`*`, ...})`

Description

`setColTitles(`*`ft_obj`*`, {`*`col_title_1`*`, `*`col_title_2`*`, ...})` is method you must use when you create a template object that is a table type. Use it to specify the titles of the columns in the table.

Note Before adding data to a table, you must specify column titles.

Input Arguments

ft_obj

A handle to a template object.

col_title_N

A cell of strings or handles to formatting objects, specifying the column titles.

Valid formatting objects are: `ModelAdvisor.Image`, `ModelAdvisor.LineBreak`, `ModelAdvisor.List`, `ModelAdvisor.Paragraph`, `ModelAdvisor.Table`, and `ModelAdvisor.Text`.

The order of the *`col_title_N`* inputs determines which column the title is in. If you do not add data to the table, the Model Advisor does not display the table in the result.

Examples

Create a table object, `ft`, and specify two column titles:

```
ft = ModelAdvisor.FormatTemplate('TableTemplate');
setColTitles(ft, {'Index', 'Block Name'});
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

- “Format Model Advisor Results”

Purpose

Specify column widths

Syntax

```
setColWidth(table, column, width)
```

Description

`setColWidth(table, column, width)` specifies the `column`.

The `setColWidth` method specifies the table column widths relative to the entire table width. If column widths are [1 2 3], the second column is twice the width of the first column, and the third column is three times the width of the first column. Unspecified columns have a default width of 1. For example:

```
setColWidth(1, 1);
setColWidth(3, 2);
```

specifies [1 1 2] column widths.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`column`	An integer specifying column number
`width`	An integer or array of integers specifying the column widths, relative to the entire table width

Examples

```
table1 = ModelAdvisor.Table(2, 3)
setColWidth(table1, 1, 1);
setColWidth(table1, 3, 2);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Table.setEntries

Purpose

Set contents of table

Syntax

```
setEntries(content)
```

Description

```
setEntries(content)
```

Input Arguments

`content`	A 2–D cell array containing the contents of the table. Each item of the cell array must be either a string or an instance of ModelAdvisor.Element. The size of the cell array must be equal to the size of the table specified in the ModelAdvisor.Table constructor.

Examples

```
table = ModelAdvisor.Table(4,3);
contents = cell(4,3); % 4 by 3 table
for k=1:4
    for m=1:3
      contents{k,m} = ['Contents for row-' num2str(k) ' column-' num2str(m)];
    end
end
table.setEntries(contents);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Table.setEntry

Purpose

Add cell to table

Syntax

```
setEntry(table, row, column, string)
setEntry(table, row, column, content)
```

Description

`setEntry(table, row, column, string)` adds a string to a cell in a table.

`setEntry(table, row, column, content)` adds an object specified by `content` to a cell in a table.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`row`	An integer specifying the row
`column`	An integer specifying the column
`string`	A string representing the contents of the entry
`content`	An element object or object array specifying the content of the table entries

Examples

Create two tables and insert `table2` into the first cell of `table1`:

```
table1 = ModelAdvisor.Table(1, 1);
table2 = ModelAdvisor.Table(2, 3);
.
.
.
setEntry(table1, 1, 1, table2);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Table.setEntryAlign

Purpose

Specify table cell alignment

Syntax

`setEntryAlign(table, row, column, alignment)`

Description

`setEntryAlign(table, row, column, alignment)` specifies the cell alignment of the designated cell.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`row`	An integer specifying row number
`column`	An integer specifying column number
`alignment`	A string specifying the cell alignment. Possible values are: • `left` (default) • `right` • `center`

Examples

```
table1 = ModelAdvisor.Table(2,3);
setHeading(table1, 'New Table');
.
.
.
setEntry(table1, 1, 1, 'First Entry');
setEntryAlign(table1, 1, 1, 'center');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Specify table title

Syntax

`setHeading(table, title)`

Description

`setHeading(table, title)` specifies the table title.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`title`	A string, element object, or object array that specifies the table title

Examples

```
table1 = ModelAdvisor.Table(2, 3);
setHeading(table1, 'New Table');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Table.setHeadingAlign

Purpose

Specify table title alignment

Syntax

```
setHeadingAlign(table, alignment)
```

Description

`setHeadingAlign(table, alignment)` specifies the alignment for the table title.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`alignment`	A string specifying the table title alignment. Possible values are: • `left` (default) • `right` • `center`

Examples

```
table1 = ModelAdvisor.Table(2, 3);
setHeading(table1, 'New Table');
setHeadingAlign(table1, 'center');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Specify hyperlink location

Syntax

`setHyperlink(image, url)`

Description

`setHyperlink(image, url)` specifies the target location of the hyperlink associated with `image`.

Input Arguments

`image`	Instantiation of the `ModelAdvisor.Image` class
`url`	A string specifying the target URL

Examples

```
matlab_logo=ModelAdvisor.Image;
setHyperlink(matlab_logo, 'http://www.mathworks.com');
```

See Also

“Model Advisor Customization”

How To

- “Authoring Checks”

ModelAdvisor.Text.setHyperlink

Purpose

Specify hyperlinked text

Syntax

```
setHyperlink(text, url)
```

Description

`setHyperlink(text, url)` creates a hyperlink from the text to the specified URL.

Input Arguments

`text`	Instantiation of the `ModelAdvisor.Text` class
`url`	A string that specifies the target location of the URL

Examples

```
t1 = ModelAdvisor.Text('MathWorks home page');
setHyperlink(t1, 'http://www.mathworks.com');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Image.setImageSource

Purpose

Specify image location

Syntax

`setImageSource(image_obj, source)`

Description

`setImageSource(image_obj, source)` specifies the location of the image.

Input Arguments

`image_obj`	Instantiation of the `ModelAdvisor.Image` class
source	A string specifying the location of the image file

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.FormatTemplate.setInformation

Purpose

Add description of subcheck to result

Syntax

`setInformation(ft_obj, text)`

Description

`setInformation(ft_obj, text)` is an optional method that adds text as the first item after the subcheck title. Use this method to add information describing the subcheck.

Input Arguments

ft_obj

A handle to a template object.

text

A string or a handle to a formatting object, that describes the subcheck.

Valid formatting objects are: `ModelAdvisor.Image`, `ModelAdvisor.LineBreak`, `ModelAdvisor.List`, `ModelAdvisor.Paragraph`, `ModelAdvisor.Table`, and `ModelAdvisor.Text`.

The Model Advisor displays *`text`* after the title of the subcheck.

Examples

Create a list object, `ft`, and specify a subcheck title and description:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
setSubTitle(ft, ['Check for constructs in the model '...
    'that are not supported when generating code']);
setInformation(ft, ['Identify blocks that should not '...
    'be used for code generation.']);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Specify input parameters for check

Syntax

`setInputParameters(check_obj, params)`

Description

`setInputParameters(check_obj, params)` specifies `ModelAdvisor.InputParameter` objects (`params`) to be used as input parameters to a check (`check_obj`).

Input Arguments

`check_obj`	Instantiation of the `ModelAdvisor.Check` class
`params`	A cell array of `ModelAdvisor.InputParameters` objects

Examples

```
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
inputParam1 = ModelAdvisor.InputParameter;
inputParam2 = ModelAdvisor.InputParameter;
inputParam3 = ModelAdvisor.InputParameter;
setInputParameters(rec, {inputParam1,inputParam2,inputParam3});
```

See Also

`ModelAdvisor.InputParameter` | "Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Check.setInputParametersLayoutGrid

Purpose Specify layout grid for input parameters

Syntax

```
setInputParametersLayoutGrid(check_obj, [row col])
```

Description `setInputParametersLayoutGrid(check_obj, [row col])` specifies the layout grid for input parameters in the Model Advisor. Use the `setInputParametersLayoutGrid` method when there are multiple input parameters.

Input Arguments

`check_obj`	Instantiation of the `ModelAdvisor.Check` class
`row`	Number of rows in the layout grid
`col`	Number of columns in the layout grid

Examples

```
% --- sample check 1
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
rec.Title = 'Check Simulink block font';
rec.TitleTips = 'Example style three callback';
rec.setCallbackFcn(@SampleStyleThreeCallback,'None','StyleThree');
rec.setInputParametersLayoutGrid([3 2]);
```

See Also `ModelAdvisor.InputParameter` | "Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Italicize text

Syntax

`setItalic(text, *mode*)`

Description

`setItalic(text, mode)` specifies whether `text` should be italicized.

Input Arguments

`text`	Instantiation of the `ModelAdvisor.Text` class
`mode`	A Boolean value indicating italic formatting of text: • `true` — Italicize the text. • `false` — Do not italicize the text.

Examples

```
t1 = ModelAdvisor.Text('This is some text');
setItalic(t1, 'true');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.FormatTemplate.setListObj

Purpose

Add list of hyperlinks to model objects

Syntax

`setListObj(`*`ft_obj`*`, {`*`model_obj`*`})`

Description

`setListObj(`*`ft_obj`*`, {`*`model_obj`*`})` is an optional method that generates a bulleted list of hyperlinks to model objects. *`ft_obj`* is a handle to a list template object. *`model_obj`* is a cell array of handles or full paths to blocks, or model objects that the Model Advisor displays as a bulleted list of hyperlinks in the report.

Examples

Create a list object, `ft`, and add a list of the blocks found in the model:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');

% Find all the blocks in the system
allBlocks = find_system(system);

% Add the blocks to a list
setListObj(ft, allBlocks);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.FormatTemplate.setRecAction

Purpose

Add Recommended Action section and text

Syntax

`setRecAction(ft_obj, {text})`

Description

`setRecAction(ft_obj, {text})` is an optional method that adds a Recommended Action section to the report. Use this method to describe how to fix the check.

Input Arguments

ft_obj

A handle to a template object.

text

A cell array of strings or handles to formatting objects, that describes the recommended action to fix the issues reported by the check.

Valid formatting objects are: `ModelAdvisor.Image`, `ModelAdvisor.LineBreak`, `ModelAdvisor.List`, `ModelAdvisor.Paragraph`, `ModelAdvisor.Table`, and `ModelAdvisor.Text`.

The Model Advisor displays the recommended action as a separate section below the list or table in the report.

Examples

Create a list object, `ft`, find Gain blocks in the model, and recommend changing them:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
% Find all Gain blocks
gainBlocks = find_system(gcs, 'BlockType','Gain');

% Find Gain blocks with expression evaluates to 1
for idx = 1:length(gainBlocks)
    gainObj = get_param(gainBlocks(idx), 'Object');
    resGain = slResolve(gainObj.Gain, gainObj.getFullName);
    if ~isempty(resGain)
        % Find the first index that computes to 1
```

```
        if ~isempty(find(resGain == 1, 1))
            setRecAction(ft, {'If you are using these blocks '...
                'as buffers, you should replace them with '...
                'Signal Conversion blocks'});
        end
    end
end
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Add See Also section and links

Syntax

```
setRefLink(ft_obj, {{'standard'}})
setRefLink(ft_obj, {{'url', 'standard'}})
```

Description

`setRefLink(`*`ft_obj`*`, {{'`*`standard`*`'}})` is an optional method that adds a See Also section above the table or list in the result. Use this method to add references to standards. *`ft_obj`* is a handle to a template object. *`standard`* is a cell array of strings that you want to display in the result. If you include more than one cell, the Model Advisor displays the strings in a bulleted list.

`setRefLink(`*`ft_obj`*`, {{'`*`url`*`', '`*`standard`*`'}})` generates a list of links in the See Also section. *`url`* is a string that indicates the location to link to. You must provide the full link including the protocol. For example, `http:\\www.mathworks.com` is a valid link, while `www.mathworks.com` is not a valid link. You can create a link to a protocol that is valid URL, such as a web site address, a full path to a file, or a relative path to a file.

Note `setRefLink` expects a cell array of cell arrays for the second input.

Examples

Create a list object, `ft`, and add a related standard:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
setRefLink(ft, {{'IEC 61508-3, Table A.3 (3) ''Language subset'''}});
```

Create a list object, `ft`, and add a list of related standards:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
setRefLink(ft, {
    {'IEC 61508-3, Table A.3 (2) ''Strongly typed programming language'''},...
    {'IEC 61508-3, Table A.3 (3) ''Language subset'''}});
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Retain spacing and returns in text

Syntax

`setRetainSpaceReturn(text, mode)`

Description

`setRetainSpaceReturn(text, mode)` specifies whether the text must retain the spaces and carriage returns.

Input Arguments

`text`	Instantiation of the `ModelAdvisor.Text` class
`mode`	A Boolean value indicating whether to preserve spaces and carriage returns in the text: • `true` (default) — Preserve spaces and carriage returns. • `false` — Do not preserve spaces and carriage returns.

Examples

```
t1 = ModelAdvisor.Text('MathWorks home page');
setRetainSpaceReturn(t1, 'true');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Table.setRowHeading

Purpose

Specify table row title

Syntax

`setRowHeading(table, row, heading)`

Description

`setRowHeading(table, row, heading)` specifies a title for the designated table row.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`row`	An integer specifying row number
`heading`	A string, element object, or object array specifying the table row title

Examples

```
table1 = ModelAdvisor.Table(2,3);
setRowHeading(table1, 1, 'Row 1 Title');
setRowHeading(table1, 2, 'Row 2 Title');
setRowHeading(table1, 3, 'Row 3 Title');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Specify table row title alignment

Syntax

`setRowHeadingAlign(table, row, alignment)`

Description

`setRowHeadingAlign(table, row, alignment)` specifies the alignment for the designated table row.

Input Arguments

`table`	Instantiation of the `ModelAdvisor.Table` class
`row`	An integer specifying row number.
`alignment`	A string specifying the cell alignment. Possible values are: • `left` (default) • `right` • `center`

Examples

```
table1 = ModelAdvisor.Table(2, 3);
setRowHeading(table1, 1, 'Row 1 Title');
setRowHeadingAlign(table1, 1, 'center');
setRowHeading(table1, 2, 'Row 2 Title');
setRowHeadingAlign(table1, 2, 'center');
setRowHeading(table1, 3, 'Row 3 Title');
setRowHeadingAlign(table1, 3, 'center');
```

See Also

"Model Advisor Customization"

How To

• "Authoring Checks"

ModelAdvisor.InputParameter.setRowSpan

Purpose

Specify rows for input parameter

Syntax

```
setRowSpan(input_param, [start_row end_row])
```

Description

`setRowSpan(input_param, [start_row end_row])` specifies the number of rows that the parameter occupies. Specify where you want an input parameter located in the layout grid when there are multiple input parameters.

Input Arguments

`input_param`	The input parameter object
`start_row`	A positive integer representing the first row that the input parameter occupies in the layout grid
`end_row`	A positive integer representing the last row that the input parameter occupies in the layout grid

Examples

```
inputParam2 = ModelAdvisor.InputParameter;
inputParam2.Name = 'Standard font size';
inputParam2.Value='12';
inputParam2.Type='String';
inputParam2.Description='sample tooltip';
inputParam2.setRowSpan([2 2]);
inputParam2.setColSpan([1 1]);
```

Purpose

Add line between subcheck results

Syntax

`setSubBar(ft_obj, value)`

Description

`setSubBar(ft_obj, value)` is an optional method that adds lines between results for subchecks. *`ft_obj`* is a handle to a template object. *`value`* is a boolean value that specifies when the Model Advisor includes a line between subchecks in the check results. By default, the value is `true`, and the Model Advisor displays the bar. The Model Advisor does not display the bar when you set the value to `false`.

Examples

Create a list object, `ft`, turn off the subbar:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
setSubBar(ft, false);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.FormatTemplate.setSubResultStatus

Purpose

Add status to check or subcheck result

Syntax

`setSubResultStatus(ft_obj, 'status')`

Description

`setSubResultStatus(ft_obj, 'status')` is an optional method that displays the status in the result. Use this method to display the status of the check or subcheck in the result. *ft_obj* is a handle to a template object. *status* is a string identifying the status of the check. Valid strings are:

```
Pass
Warn
Fail
```

Examples

Create a list object, `ft`, and add a passing status:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
setSubResutlStatus(ft, 'Pass');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.FormatTemplate.setSubResultStatusText

Purpose

Add text below status in result

Syntax

`setSubResultStatusText(`*`ft_obj`*`, `*`message`*`)`

Description

`setSubResultStatusText(`*`ft_obj`*`, `*`message`*`)` is an optional method that displays text below the status in the result. Use this method to describe the status.

Input Arguments

ft_obj

A handle to a template object.

message

A string or a handle to a formatting object that the Model Advisor displays below the status in the report.

Valid formatting objects are: `ModelAdvisor.Image`, `ModelAdvisor.LineBreak`, `ModelAdvisor.List`, `ModelAdvisor.Paragraph`, `ModelAdvisor.Table`, and `ModelAdvisor.Text`.

Examples

Create a list object, `ft`, add a passing status and a description of why the check passed:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
setSubResutlStatus(ft, 'Pass');
setSubResultStatusText(ft, ['Constructs that are not supported when '...
    'generating code were not found in the model or subsystem']);
```

See Also

"Model Advisor Customization"

How To

- "Model Advisor Customization"
- "Format Model Advisor Results"

ModelAdvisor.Text.setSubscript

Purpose Specify subscripted text

Syntax

```
setSubscript(text, mode)
```

Description `setSubscript(text, mode)` indicates whether to make `text` subscript.

Input Arguments

`text`	Instantiation of the `ModelAdvisor.Text` class
`mode`	A Boolean value indicating subscripted formatting of text: • `true` — Make the text subscript. • `false` — Do not make the text subscript.

Examples

```
t1 = ModelAdvisor.Text('This is some text');
setSubscript(t1, 'true');
```

See Also "Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Specify superscripted text

Syntax

`setSuperscript(text, *mode*)`

Description

`setSuperscript(text, *mode*)` indicates whether to make `text` subscript.

Input Arguments

`text`	Instantiation of the `ModelAdvisor.Text` class
`mode`	A Boolean value indicating superscripted formatting of text: • `true` — Make the text superscript. • `false` — Do not make the text superscript.

Examples

```
t1 = ModelAdvisor.Text('This is some text');
setSuperscript(t1, 'true');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.FormatTemplate.setSubTitle

Purpose

Add title for subcheck in result

Syntax

`setSubTitle(ft_obj, title)`

Description

`setSubTitle(ft_obj, title)` is an optional method that adds a subcheck result title. Use this method when you create subchecks to distinguish between them in the result.

Input Arguments

ft_obj

A handle to a template object.

title

A string or a handle to a formatting object specifying the title of the subcheck.

Valid formatting objects are: `ModelAdvisor.Image`, `ModelAdvisor.LineBreak`, `ModelAdvisor.List`, `ModelAdvisor.Paragraph`, `ModelAdvisor.Table`, and `ModelAdvisor.Text`.

Examples

Create a list object, `ft`, and add a subcheck title:

```
ft = ModelAdvisor.FormatTemplate('ListTemplate');
setSubTitle(ft, ['Check for constructs in the model '...
    'that are not supported when generating code']);
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Add data to table

Syntax

`setTableInfo(ft_obj, {data})`

Description

`setTableInfo(ft_obj, {data})` is an optional method that creates a table. *`ft_obj`* is a handle to a table template object. *`data`* is a cell array of strings or objects specifying the information in the body of the table. The Model Advisor creates hyperlinks to objects. If you do not add data to the table, the Model Advisor does not display the table in the result.

Note Before creating a table, you must specify column titles using the `setColTitle` method.

Examples

Create a table object, `ft`, add column titles, and add data to the table:

```
ft = ModelAdvisor.FormatTemplate('TableTemplate');
setColTitle(ft, {'Index', 'Block Name'});
setTableInfo(ft, {'1', 'Gain'});
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

ModelAdvisor.FormatTemplate.setTableTitle

Purpose

Add title to table

Syntax

`setTableTitle(ft_obj, title)`

Description

`setTableTitle(ft_obj, title)` is an optional method that adds a title to a table.

Input Arguments

ft_obj

A handle to a template object.

title

A string or a handle to a formatting object specifying the title of the table.

Valid formatting objects are: `ModelAdvisor.Image`, `ModelAdvisor.LineBreak`, `ModelAdvisor.List`, `ModelAdvisor.Paragraph`, `ModelAdvisor.Table`, and `ModelAdvisor.Text`.

The title appears above the table. If you do not add data to the table, the Model Advisor does not display the table and title in the result.

Examples

Create a table object, `ft`, and add a table title:

```
ft = ModelAdvisor.FormatTemplate('TableTemplate');
setTableTitle(ft, 'Table of fonts and styles used in model');
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"
- "Format Model Advisor Results"

Purpose

Specify list type

Syntax

`setType(list_obj, listType)`

Description

`setType(list_obj, listType)` specifies the type of list the `ModelAdvisor.List` constructor creates.

Input Arguments

`list_obj`	Instantiation of the `ModelAdvisor.List` class
`listType`	Specifies the list type: • `numbered` • `bulleted`

Examples

```
subList = ModelAdvisor.List();
subList.setType('numbered')
subList.addItem(ModelAdvisor.Text('Sub entry 1', {'pass','bold'}));
subList.addItem(ModelAdvisor.Text('Sub entry 2', {'pass','bold'}));
```

See Also

"Model Advisor Customization"

How To

- "Authoring Checks"

ModelAdvisor.Text.setUnderlined

Purpose Underline text

Syntax

```
setUnderlined(text, mode)
```

Description `setUnderlined(text, mode)` indicates whether to underline `text`.

Input Arguments

`text`	Instantiation of the `ModelAdvisor.Text` class
`mode`	A Boolean value indicating underlined formatting of text: • `true` — Underline the text. • `false` — Do not underline the text.

Examples

```
t1 = ModelAdvisor.Text('This is some text');
setUnderlined(t1, 'true');
```

See Also "Model Advisor Customization"

How To

- "Authoring Checks"

Purpose

Collect signal range coverage information for model object

Syntax

```
[min, max] = sigrangeinfo(cvdo, object)
[min, max] = sigrangeinfo(cvdo, object, portID)
```

Description

`[min, max] = sigrangeinfo(cvdo, object)` returns the minimum and maximum signal values output by the model component `object` within the `cvdata` object `cvdo`.

`[min, max] = sigrangeinfo(cvdo, object, portID)` returns the minimum and maximum signal values associated with the output port `portID` of the Simulink block `object`.

Input Arguments

cvdo

`cvdata` object

object

An object in the model or Stateflow chart that receives signal range coverage. Valid values for `object` include the following:

Object Specification	Description
`BlockPath`	Full path to a model or block
`BlockHandle`	Handle to a model or block
`slObj`	Handle to a Simulink API object
`sfID`	Stateflow ID
`sfObj`	Handle to a Stateflow API object
`{BlockPath, sfID}`	Cell array with the path to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

Object Specification	Description
`{BlockPath, sfObj}`	Cell array with the path to a Stateflow chart or atomic subchart and a Stateflow object API handle contained in that chart or subchart
`[BlockHandle, sfID]`	Array with a handle to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

portID

Output port of the block `object`

Output Arguments

max

Maximum signal value output by the model component `object` within the `cvdata` object, `cvdo`. If `object` outputs a vector, `min` and `max` are also vectors.

min

Minimum signal value output by the model component `object` within the `cvdata` object, `cvdo`. If `object` outputs a vector, `min` and `max` are also vectors.

Alternatives

Use the Coverage Settings dialog box to collect signal range coverage for a model:

1. Open the model for which you want to collect signal range coverage.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. Under **Coverage metrics**, select **Signal Range**.

5. On the **Results** and **Reporting** tabs, specify the output you need.

6. Click **OK** to close the Coverage Settings dialog box and save your changes.

7. Simulate the model and review the results.

Examples

Collect signal range data for the Product block in the `slvnvdemo_cv_small_controller` model:

```
mdl = 'slvnvdemo_cv_small_controller';
open_system(mdl)
%Create test spec object
testObj = cvtest(mdl)
%Enable signal range coverage
testObj.settings.sigrange = 1;
%Simulate the model
data = cvsim(testObj)
blk_handle = get_param([mdl, '/Product'], 'Handle');
%Get signal range data
[minVal, maxVal] = sigrangeinfo(data, blk_handle)
```

See Also

`complexityinfo` | `conditioninfo` | `cvsim` | `decisioninfo` | `getCoverageInfo` | `mcdcinfo` | `sigsizeinfo` | `tableinfo`

sigsizeinfo

Purpose

Collect signal size coverage information for model object

Syntax

```
[min, max, allocated] = sigsizeinfo(cvdo, object)
[min, max] = sigsizeinfo(cvdo, object, portID)
```

Description

`[min, max, allocated] = sigsizeinfo(cvdo, object)` returns the minimum, maximum, and allocated signal sizes for the outputs of the model component `object` within the `cvdata` object `cvdo`.

`[min, max] = sigsizeinfo(cvdo, object, portID)` returns the minimum and maximum signal sizes associated with the output port `portID` of the model component `object`.

Input Arguments

cvdo

`cvdata` object

object

An object in the model or Stateflow chart that receives signal size coverage. Valid values for `object` include the following:

Object Specification	Description
`BlockPath`	Full path to a Simulink model or block
`BlockHandle`	Handle to a Simulink model or block
`slObj`	Handle to a Simulink API object
`sfID`	Stateflow ID
`sfObj`	Handle to a Stateflow API object
`{BlockPath, sfID}`	Cell array with the path to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

Object Specification	Description
{BlockPath, sfObj}	Cell array with the path to a Stateflow chart or atomic subchart and a Stateflow object API handle contained in that chart or subchart
[BlockHandle, sfID]	Array with a handle to a Stateflow chart or atomic subchart and the ID of an object contained in that chart or subchart

portID

Output port of the block `object`

Output Arguments

max

Maximum signal size output by the model component `object` within the `cvdata` object, `cvdo`. If `object` outputs a vector, `min` and `max` are also vectors.

min

Minimum signal size output by the model component `object` within the `cvdata` object, `cvdo`. If `object` outputs a vector, `min` and `max` are also vectors.

allocated

Allocated signal size output by the model component `object` within the `cvdata` object, `cvdo`. If `object` outputs a vector, `min` and `max` are also vectors.

Examples

Collect signal size coverage data for the Switch block in the `sldemo_varsize_basic` model:

```
mdl = 'sldemo_varsize_basic';
open_system(mdl);
```

```
%Create test spec object
testObj = cvtest(mdl);
%Enable signal size coverage
testObj.settings.sigsize=1;
%Simulate the model
data = cvsim(testObj);
%Set the block handle
blk_handle = get_param([mdl, '/Switch'], 'Handle');
%Get signal size data
[minVal, maxVal, allocVal] = sigsizeinfo(data, blk_handle);
```

Alternatives

Use the Coverage Settings dialog box to collect signal size coverage for a model:

1. Open the model for which you want to collect signal size coverage.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. Under **Coverage metrics**, select **Signal Size**.
5. On the **Results** and **Reporting** tabs, specify the output you need.
6. Click **OK** to close the Coverage Settings dialog box and save your changes.
7. Simulate the model and review the results.

See Also

`complexityinfo` | `conditioninfo` | `cvsim` | `decisioninfo` | `mcdcinfo` | `sigrangeinfo` | `tableinfo`

Purpose

Extract subsystem or subchart contents into new model for analysis

Syntax

```
newModel = slvnvextract(subsystem)
newModel = slvnvextract(subchart)
newModel = slvnvextract(subsystem, showModel)
newModel = slvnvextract(subchart, showModel)
```

Description

`newModel = slvnvextract(subsystem)` extracts the contents of the Atomic Subsystem block `subsystem` and creates a new model. `slvnvextract` returns the name of the new model in `newModel`. `slvnvextract` uses the subsystem name for the model name, appending a numeral to the model name if that model name already exists.

`newModel = slvnvextract(subchart)` extracts the contents of the atomic subchart `subchart` and creates a new model. `subchart` should specify the full path of the atomic subchart. `slvnvextract` uses the subchart name for the model name, appending a numeral to the model name if that model name already exists.

Note If the atomic subchart calls an exported graphical function that is outside the subchart, `slvnvextract` creates the model, but the new model will not compile.

`newModel = slvnvextract(subsystem, showModel)` and `newModel = slvnvextract(subchart, showModel)` open the extracted model if you set `showModel` to `true`. The extracted model is only loaded if `showModel` is set to `false`.

Input Arguments

subsystem

Full path to the atomic subsystem

subchart

Full path to the atomic subchart

showModel

Boolean indicating whether to display the extracted model

Default: `True`

Output Arguments

newModel

Name of the new model

Examples

Extract the Atomic Subsystem block, Bus Counter, from the `sldemo_mdlref_conversion` model and copy it into a new model:

```
open_system('sldemo_mdlref_conversion');
newmodel = slvnvextract('sldemo_mdlref_conversion/Bus Counter', true);
```

Extract the Atomic Subchart block, Sensor1, from the `sf_atomic_sensor_pair` model and copy it into a new model:

```
open_system('sf_atomic_sensor_pair');
newmodel = ...
 slvnvextract('sf_atomic_sensor_pair/RedundantSensors/Sensor1', true);
```

Purpose

Generate default options for `slvnvmakeharness`

Syntax

`harnessopts = slvnvharnessopts`

Description

`harnessopts = slvnvharnessopts` generates the default configuration for running `slvnvmakeharness`.

Output Arguments

harnessopts

A structure whose fields specify the default configuration for `slvnvmakeharness`. The `harnessopts` structure can have the following fields. Default values are used if not specified.

Field	Description
`harnessFilePath`	Specifies the file path for creating the harness model. If an invalid path is specified, `slvnvmakeharness` does not save the harness model, but it creates and opens the harness model. If this option is not specified, `slvnvmakeharness` generates a new harness model and saves it in the MATLAB current folder. Default: `''`
`modelRefHarness`	Generates the test harness model that includes `model` in a Model block. When `false`, the test harness model includes a copy of `model`. Default: `true`

Field	Description
usedSignalsOnly	When `true`, the Signal Builder block in the harness model has signals only for input signals used in the model. The Simulink Design Verifier software must be available, and `model` must be compatible with the Simulink Design Verifier software to detect the used input signals. Default: `false`
systemTestHarness	When `true`, generates a SystemTest™ harness. This option requires `dataFile` path in addition to `model`. Default: `false`

Examples

Create a test harness for the `sldemo_mdlref_house` model using the default options:

```
open_system('sldemo_mdlref_house');
harnessOpts = slvnvharnessopts;
[harnessfile] = slvnvmakeharness('sldemo_mdlref_house',...
      '', harnessOpts);
```

See Also

`slvnvmakeharness`

Purpose

Log simulation input port values

Syntax

```
data = slvnvlogsignals(model_block)
data = slvnvlogsignals(harness_model)
data = slvnvlogsignals(harness_model, test_case_index)
```

Description

`data = slvnvlogsignals(model_block)` simulates the model that contains `model_block` and logs the input signals to the `model_block` block. `model_block` must be a Simulink Model block. `slvnvlogsignals` records the logged data in the structure `data`.

`data = slvnvlogsignals(harness_model)` simulates every test case in `harness_model` and logs the input signals to the Test Unit block in the harness model. You must generate `harness_model` using the Simulink Design Verifier analysis, `sldvmakeharness`, or `slvnvmakeharness`.

`data = slvnvlogsignals(harness_model, test_case_index)` simulates every test case in the Signal Builder block of the `harness_model` specified by `test_case_index`. `slvnvlogsignals` logs the input signals to the Test Unit block in the harness model. If you omit `test_case_index`, `slvnvlogsignals` simulates every test case in the Signal Builder.

Input Arguments

model_block

Full block path name or handle to a Simulink Model block

harness_model

Name or handle to a harness model that the Simulink Design Verifier software, `sldvmakeharness`, or `slvnvmakeharness` creates

test_case_index

Array of integers that specifies which test cases in the Signal Builder block of the harness model to simulate

Output Arguments

data

Structure that contains the logged data

Examples

Simulate the `sldemo_mdlref_bus` model and log the input signals to the Model block CounterA in `logged_data`:

```
open_system('sldemo_mdlref_bus')
logged_data = slvnvlogsignals('sldemo_mdlref_bus/CounterA')
```

Use the logged data to create a harness model in order to visualize the data:

1. Simulate the CounterB Model block, which references the `sldemo_mdlref_counter` model, in the context of the `sldemo_mdlref_basic` model and log the data:

   ```
   open_system('sldemo_mdlref_basic');
   data = slvnvlogsignals('sldemo_mdlref_basic/CounterB');
   ```

2. Create a harness model for `sldemo_mdlref_counter` using the logged data and the default harness options:

   ```
   load_system('sldemo_mdlref_counter');
   harnessOpts = slvnvharnessopts
   [harnessFilePath]  = ...
       slvnvmakeharness('sldemo_mdlref_counter', data, ...
                        harnessOpts);
   ```

See Also

`sldvmakeharness` | `slvnvruncgvtest` | `slvnvruntest` | `slvnvmakeharness`

Purpose

Generate Simulink Verification and Validation harness model

Syntax

```
[harnessFilePath] = slvnvmakeharness(model)
[harnessFilePath] = slvnvmakeharness(model, dataFile)
[harnessFilePath] = slvnvmakeharness(model, dataFile,
   harnessOpts)
```

Description

`[harnessFilePath] = slvnvmakeharness(model)` generates a test harness from `model`, which is a handle to a Simulink model or a string with the model name. `slvnvmakeharness` returns the path and file name of the generated harness model in `harnessFilePath`. `slvnvmakeharness` creates an empty harness model; the test harness includes one default test case that specifies the default values for all input signals.

`[harnessFilePath] = slvnvmakeharness(model, dataFile)` generates a test harness from the data file `dataFile`.

`[harnessFilePath] = slvnvmakeharness(model, dataFile, harnessOpts)` generates a test harness from `model` using the `dataFile` and `harnessOpts`, which specifies the harness creation options. Requires `''` for `dataFile` if `dataFile` is not available.

Input Arguments

model

Handle to a Simulink model or a string with the model name

dataFile

Name of the file containing the data.

Default: `''`

harnessOpts

A structure whose fields specify the configuration for `slvnvmakeharness`:

Field	Description
`harnessFilePath`	Specifies the file path for creating the harness model. If an invalid path is specified, `slvnvmakeharness` does not save the harness model, but it creates and opens the harness model. If this option is not specified, the `slvnvoptions` object is used. If this option is not specified, `slvnvmakeharness` generates a new harness model and saves it in the MATLAB current folder. Default: `''`
`modelRefHarness`	Generates the test harness model that includes `model` in a Model block. When `false`, the test harness model includes a copy of `model`. Default: `true` **Note** If your model contains bus objects and you set `modelRefHarness` to `true`, in the **Configuration Parameters > Diagnostics > Connectivity** pane, you must set the **Mux blocks used to create bus signals** parameter to `error`.

Field	Description
usedSignalsOnly	When true, the Signal Builder block in the harness model has signals only for input signals used in the model. The Simulink Design Verifier software must be available, and model must be compatible with the Simulink Design Verifier software to detect the used input signals. Default: false
systemTestHarness	When true, generates a SystemTest harness. This option requires dataFile path in addition to model. Default: false

Note To create a default harnessOpts object, use slvnvharnessopts.

Output Arguments

harnessFilePath

String containing the path and file name of the generated harness model

Examples

Create a test harness for the sldemo_mdlref_house model using the default options:

```
open_system('sldemo_mdlref_house');
[harnessfile] = slvnvmakeharness('sldemo_mdlref_house', '', harnessOpts);
```

See Also

slvnvharnessopts | slvnvmergeharness

slvnvmergedata

Purpose

Merge test case data

Syntax

`merged_data = slvnvmergedata(data1,data2,...)`

Description

`merged_data = slvnvmergedata(data1,data2,...)` combines two or more test cases and counterexamples `data` into a single test case data structure `merged_data`.

Input Arguments

data

Structure that contains test case or counterexample data. Generate this structure by running `slvnvlogsignals`, or by running a Simulink Design Verifier analysis.

Output Arguments

merged_data

Structure that contains the merged test cases or counterexamples

Examples

Open the `sldemo_mdlref_basic` model, which contains three Model blocks that reference the model `sldemo_mdlref_counter`. Log the input signals to the three Model blocks and merge the logged data using `slvnvmergedata`. Simulate the referenced model, `sldemo_mdlref_counter`, for coverage with the merged data and display the coverage results in an HTML file.

```
sldemo_mdlref_basic;
data1 = slvnvlogsignals('sldemo_mdlref_basic/CounterA');
data2 = slvnvlogsignals('sldemo_mdlref_basic/CounterB');
data3 = slvnvlogsignals('sldemo_mdlref_basic/CounterC');
merged_data = slvnvmergedata(data1, data2, data3);
open_system('sldemo_mdlref_counter');
runOpts = slvnvruntestopts;
runOpts.coverageEnabled = true;
[ outData, initialCov ] = slvnvruntest('sldemo_mdlref_counter', ...
     merged_data, runOpts);
cvhtml('Initial coverage', initialCov);
```

See Also

`sldvrun` | `slvnvlogsignals` | `slvnvmakeharness` | `slvnvruncgvtest` | `slvnvruntest`

slvnvmergeharness

Purpose

Merge test cases and initializations into one model

Syntax

```
status = slvnvmergeharness(name, models,
   initialization_commands)
```

Description

`status = slvnvmergeharness(name, models, initialization_commands)` collects the test data and initialization commands from each test harness model in `models`. `slvnvharnessmerge` saves the data and initialization commands in `name`, which is a handle to the new model.

`initialization_commands` is a cell array of strings the same length as `models`. It defines parameter settings for the test cases of each test harness model.

If `name` does not exist, `slvnvmergeharness` creates it as a copy of the first model in `models`. `slvnvmergeharness` then merges data from other models listed in `models` into this model. If you create `name` from a previous `slvnvmergeharness` run, subsequent runs of `slvnvmergeharness` for `name` maintain the structure and initialization from the earlier run. If `name` matches an existing Simulink model, `slvnvmergeharness` merges the test data from `models` into `name`.

`slvnvmergeharness` assumes that `name` and the rest of the models in `models` have only one Signal Builder block on the top level. If a model in `models` does not meet this restriction or its top-level Signal Builder block does not have the same number of signals as the top-level Signal Builder block in `name`, `slvnvmergeharness` does not merge that model's test data into `name`.

Input Arguments

name

Name of the new harness model, to be stored in the default MATLAB folder

models

A cell array of strings that represent harness model names

initialization_commands

A cell array of strings the same length as `models`. `initialization_commands` defines parameter settings for the test cases of each test harness model.

Output Arguments

status

If the function saves the data and initialization commands in `name`, `slvnvmergeharness` returns a `status` of `1`. Otherwise, it returns `0`.

Examples

Log the input signals to the three Model blocks in the `sldemo_mdlref_basic` example model that all reference the same model. Make three test harnesses using the logged signals and merge the three test harnesses:

```
open_system('sldemo_mdlref_basic');
data1 = slvnvlogsignals('sldemo_mdlref_basic/CounterA');
data2 = slvnvlogsignals('sldemo_mdlref_basic/CounterB');
data3 = slvnvlogsignals('sldemo_mdlref_basic/CounterC');
open_system('sldemo_mdlref_counter');
harness1FilePath = slvnvmakeharness('sldemo_mdlref_counter', data1);
harness2FilePath = slvnvmakeharness('sldemo_mdlref_counter', data2);
harness3FilePath = slvnvmakeharness('sldemo_mdlref_counter', data3)
[~, harness1] = fileparts(harness1FilePath);
[~, harness2] = fileparts(harness2FilePath);
[~, harness3] = fileparts(harness3FilePath);
slvnvmergeharness('new_harness_model',{harness1, harness2, harness3});
```

See Also

`slvnvlogsignals` | `slvnvmakeharness`

slvnvruncgvtest

Purpose

Invoke Code Generation Verification (CGV) API and execute model

Syntax

```
cgvObject = slvnvruncgvtest(model, dataFile)
cgvObject = slvnvruncgvtest(model, dataFile, runOpts)
```

Description

`cgvObject = slvnvruncgvtest(model, dataFile)` invokes the Code Generation Verification (CGV) API methods and executes the `model` using all test cases in `dataFile`. `cgvObject` is a `cgv.CGV` object that `slvnvruncgvtest` creates during the execution of the `model`. `slvnvruncgvtest` sets the execution mode for `cgvObject` to`'sim'` by default.

`cgvObject = slvnvruncgvtest(model, dataFile, runOpts)` invokes CGV API methods and executes the `model` using test cases in `dataFile`. `runOpts` defines the options for executing the test cases. The settings in `runOpts` determine the configuration of `cgvObject`.

Tips

To run `slvnvruncgvtest`, you must have a Embedded Coder™ license.

If your model has parameters that are not configured for executing test cases with the CGV API, `slvnvruncgvtest` reports warnings about the invalid parameters. If you see these warnings, do one of the following:

- Modify the invalid parameters and rerun `slvnvruncgvtest`.
- Set `allowCopyModel` in `runOpts` to be `true` and rerun `slvnvruncgvtest`. `slvnvruncgvtest` makes a copy of your model configured for executing test cases, and invokes the CGV API.

Input Arguments

model

Name of the Simulink model to execute

dataFile

Name of the data file or a structure that contains the input data. Data can be generated either by:

- Analyzing the model using the Simulink Design Verifier software.

- Using the `slvnvlogsignals` function.

runOpts

A structure whose fields specify the configuration of `slvnvruncgvtest`.

Field Name	Description
`testIdx`	Test case index array to simulate from `dataFile`. If `testIdx` = `[]` (the default), `slvnvruncgvtest` simulates all test cases.
`allowCopyModel`	Specifies to create and configure the model if you have not configured it for executing test cases with the CGV API. If `true` and you have not configured your `model` to execute test cases with the CGV API, `slvnvruncgvtest` copies the model, fixes the configuration, and executes the test cases on the copied model. If `false` (the default), an error occurs if the tests cannot execute with the CGV API. **Note** If you have not configured the top-level model or any referenced models to execute test cases, `slvnvruncgvtest` does not copy the model, even if `allowCopyModel` is `true`. An error occurs.

Field Name	Description
cgvCompType	Defines the software-in-the-loop (SIL) or processor-in-the-loop (PIL) approach for CGV: • 'topmodel' (default) • 'modelblock'
cgvConn	Specifies mode of execution for CGV: • 'sim' (default) • 'sil' • 'pil'

Note runOpts = slvnvruntestopts('cgv') returns a runOpts structure with the default values for each field.

Output Arguments

cgvObject

cgv.CGV object that slvnvruncgvtest creates during the execution of model.

slvnvruncgvtest saves the following data for each test case executed in an array of Simulink.SimulationOutput objects inside cgvObject.

Field	Description
tout_slvnvruncgvtest	Simulation time
xout_slvnvruncgvtest	State data

Field	Description
yout_slvnvruncgvtest	Output signal data
logsout_slvnvruncgvtest	Signal logging data for: • Signals connected to outports • Signals that are configured for logging on the model

Examples

Open the sldemo_mdlref_bus example model and log the input signals to the CounterA Model block. Create the default configuration object for slvnvruncgvtest, and allow the model to be configured to execute test cases with the CGV API. Using the logged signals, execute slvnvruncgvtest—first in simulation mode, and then in Software-in-the-Loop (SIL) mode—to invoke the CGV API and execute the specified test cases on the generated code for the model. Use the CGV API to compare the results of the first test case:

```
open_system('sldemo_mdlref_bus');
load_system('sldemo_mdlref_counter_bus');
loggedData = slvnvlogsignals('sldemo_mdlref_bus/CounterA');
runOpts = slvnvruntestopts('cgv');
runOpts.allowCopyModel = true;
cgvObjectSim = slvnvruncgvtest('sldemo_mdlref_counter_bus', ...
     loggedData, runOpts);
runOpts.cgvConn = 'sil';
cgvObjectSil = slvnvruncgvtest('sldemo_mdlref_counter_bus', ...
     loggedData, runOpts);
simout = cgvObjectSim.getOutputData(1);
silout = cgvObjectSil.getOutputData(1);
[matchNames, ~, mismatchNames, ~ ] = ...
        cgv.CGV.compare(simout, silout);
fprintf('\nTest Case: %d Signals match, %d Signals mismatch', ...
        length(matchNames), length(mismatchNames));
```

See Also

cgv.CGV | slvnvlogsignals | slvnvruntest | slvnvruntestopts

slvnvruntest

Purpose

Simulate model using input data

Syntax

```
outData = slvnvruntest(model, dataFile)
outData = slvnvruntest(model, dataFile, runOpts)
[outData, covData] = slvnvruntest(model, dataFile, runOpts)
```

Description

`outData = slvnvruntest(model, dataFile)` simulates `model` using all the test cases in `dataFile`. `outData` is an array of `Simulink.SimulationOutput` objects. Each array element contains the simulation output data of the corresponding test case.

`outData = slvnvruntest(model, dataFile, runOpts)` simulates `model` using all the test cases in `dataFile`. `runOpts` defines the options for simulating the test cases.

`[outData, covData] = slvnvruntest(model, dataFile, runOpts)` simulates `model` using the test cases in `dataFile`. When the `runOpts` field `coverageEnabled` is `true`, the Simulink Verification and Validation software collects model coverage information during the simulation. `slvnvruntest` returns the coverage data in the `cvdata` object `covData`.

Tips

The `dataFile` that you create with a Simulink Design Verifier analysis or by running `slvnvlogsignals` contains time values and data values. When you simulate a model using these test cases, you might see missing coverage. This issue occurs when the time values in the `dataFile` are not aligned with the current simulation time step due to numeric calculation differences. You see this issue more frequently with multirate models—models that have multiple sample times.

Input Arguments

model

Name or handle of the Simulink model to simulate

dataFile

Name of the data file or structure that contains the input data. You can generate `dataFile` using the Simulink Design Verifier software, or by running the `slvnvlogsignals` function.

runOpts

A structure whose fields specify the configuration of `slvnvruntest`.

Field	Description
`testIdx`	Test case index array to simulate from `dataFile`. If `testIdx` is `[]`, `slvnvruntest` simulates all test cases. **Default:** `[]`
`signalLoggingSaveFormat`	Specifies signal logging data format for: • Signals connected to the outports of the model • Intermediate signals that are already configured for logging Valid values are: • `'Dataset'` (default) — `slvnvruntest` stores the data in `Simulink.SimulationData.Dataset` objects. • `'ModelDataLogs'` — `slvnvruntest` stores the data in `Simulink.ModelDataLogs` objects.

Field	Description
`coverageEnabled`	If `true`, specifies that the Simulink Verification and Validation software collect model coverage data during simulation. **Default:** `false`
`coverageSetting`	`cvtest` object for collecting model coverage. If `[]`, `slvnvruntest` uses the existing coverage settings for `model`. **Default:** `[]`

Output Arguments

outData

An array of `Simulink.SimulationOutput` objects that simulating the test cases generates. Each `Simulink.SimulationOutput` object has the following fields.

Field Name	Description
`tout_slvnvruntest`	Simulation time
`xout_slvnvruntest`	State data
`yout_slvnvruntest`	Output signal data
`logsout_slvnvruntest`	Signal logging data for: • Signals connected to outports • Signals that are configured for logging on the model

covData

`cvdata` object that contains the model coverage data collected during simulation.

Examples

Analyze the `sldemo_mdlref_bus` model and log the input signals to the CounterA Model block. Then, using the logged signals, simulate the model referenced in the Counter block (`sldemo_mdlref_counter_bus`). Examine the output data from the first test case using the Simulation Data Inspector:

```
open_system('sldemo_mdlref_bus');
loggedData = slvnvlogsignals('sldemo_mdlref_bus/CounterA');
runOpts = slvnvruntestopts;
runOpts.coverageEnabled = true;
open_system('sldemo_mdlref_counter_bus');
[ outData ] = slvnvruntest('sldemo_mdlref_counter_bus',...
    loggedData, runOpts);
Simulink.sdi.createRun('Test Case 1 Output', 'namevalue',...
    {'output'}, {outData(1).find('logsout_slvnvruntest')});
Simulink.sdi.view;
```

See Also

`cvsim` | `cvtest` | `sim` | `slvnvruntestopts`

slvnvruntestopts

Purpose

Generate simulation or execution options for `slvnvruntest` or `slvnvruncgvtest`

Syntax

```
runOpts = slvnvruntestopts
runOpts = slvnvruntestopts('cgv')
```

Description

`runOpts = slvnvruntestopts` generates a `runOpts` structure for `slvnvruntest`.

`runOpts = slvnvruntestopts('cgv')` generates a `runOpts` structure for `slvnvruncgvtest`.

Output Arguments

runOpts

A structure whose fields specify the configuration of `slvnvruntest` or `slvnvruncgvtest`. `runOpts` can have the following fields. If you do not specify a field, `slvnvruncgvtest` or `slvnvruntest` uses the default value.

Field Name	Description
`testIdx`	Test case index array to simulate or execute from `dataFile`. If `testIdx` = `[]` (default), all test cases are simulated or executed.
`outputFormat`	Specifies format of output values: • `'TimeSeries'` (the default) — `slvnvruntest`/`slvnvruncgvtest` stores the output values in time-series format. • `'StructureWithTime'` — `slvnvruntest`/`slvnvruncgvtest` stores the output values in the `Structure with time` format.

Field Name	Description
`coverageEnabled`	Available only for `slvnvruntest`. If `true`, `slvnvruntest`collects model coverage data during simulation. **Default:** `false`
`coverageSetting`	Available only for `slvnvruntest`. `cvtest` object to use for collecting model coverage. If `coverageSetting` is `[]`, `slvnvruntest` uses the coverage settings for the model specified in the call to `slvnvruntest`. **Default:** `[]`
`allowCopyModel`	Available only for `slvnvruncgvtest`. Specifies to create and configure the model if you have not configured it to execute test cases with the CGV API. If `true` and you have not configured the `model` to execute test cases with the CGV API, `slvnvruncgvtest` copies the model, fixes the configuration, and executes the test cases on the copied model. If `false` (the default), an error occurs if the tests cannot execute with the CGV API. **Note** If you have not configured the top-level model or any referenced models to execute test cases, `slvnvruncgvtest` does not copy the model, even if `allowCopyModel` is `true`. An error occurs.

Field Name	Description
cgvComType	Available only for slvnvruncgvtest. Defines the software-in-the-loop (SIL) or processor-in-the-loop (PIL) approach for CGV: • 'topmodel' (default) • 'modelblock'
cgvConn	Only available for slvnvruncgvtest. Specifies mode of execution for CGV: • 'sim' (default) • 'sil' • 'pil'

Examples

Create runOpts objects for slvnvruntest and slvnvruncgvtest:

```
%Create options for slvnvruntest
runtest_opts = slvnvruntestopts;
%Create options for slvnvruncgvtest
runcgvtest_opts = slvnvruntestopts('cgv')
```

Alternatives

Create a runOpts object at the MATLAB command line.

See Also

slvnvruncgvtest | slvnvruntest

Purpose

Display lookup table coverage information for model object

Syntax

```
coverage = tableinfo(cvdo, object)
coverage = tableinfo(cvdo, object, ignore_descendants)
[coverage, exeCounts] = tableinfo(cvdo, object)
[coverage, exeCounts, brkEquality] = tableinfo(cvdo, object)
```

Description

`coverage = tableinfo(cvdo, object)` returns lookup table coverage results from the `cvdata` object `cvdo` for the model component `object`.

`coverage = tableinfo(cvdo, object, ignore_descendants)` returns lookup table coverage results for `object`, depending on the value of `ignore_descendants`.

`[coverage, exeCounts] = tableinfo(cvdo, object)` returns lookup table coverage results and the execution count for each interpolation/extrapolation interval in the lookup table block `object`.

`[coverage, exeCounts, brkEquality] = tableinfo(cvdo, object)` returns lookup table coverage results, the execution count for each interpolation/extrapolation interval, and the execution counts for breakpoint equality.

Input Arguments

cvdo

`cvdata` object

ignore_descendants

Logical value specifying whether to ignore the coverage of descendant objects

`1` — Ignore coverage of descendant objects
`0` — Collect coverage for descendant objects

object

Full path or handle to a lookup table block or a model containing a lookup table block.

Output Arguments

brkEquality

A cell array containing vectors that identify the number of times during simulation that the lookup table block input was equivalent to a breakpoint value. Each vector represents the breakpoints along a different lookup table dimension.

coverage

The value of `coverage` is a two-element vector of form `[covered_intervals total_intervals]`, the elements of which are:

`covered_intervals`	Number of interpolation/extrapolation intervals satisfied for `object`
`total_intervals`	Total number of interpolation/extrapolation intervals for `object`

`coverage` is empty if `cvdo` does not contain lookup table coverage results for `object`.

execounts

An array having the same dimensionality as the lookup table block; its size has been extended to allow for the lookup table extrapolation intervals.

Examples

Collect lookup table coverage for the `slvnvdemo_cv_small_controller` model and determine the percentage of interpolation/extrapolation intervals coverage collected for the Gain Table block in the Gain subsystem:

```
mdl = 'slvnvdemo_cv_small_controller';
open_system(mdl)
%Create test spec object
testObj = cvtest(mdl)
%Enable lookup table coverage
```

```
testObj.settings.tableExec = 1;
%Simulate the model
data = cvsim(testObj)
blk_handle = get_param([mdl, '/Gain/Gain Table'], 'Handle');
%Retrieve l/u table coverage
cov = tableinfo(data, blk_handle)
%Percent MC/DC outcomes covered
percent_cov = 100 * cov(1) / cov(2)
```

Alternatives

Use the Coverage Settings dialog box to collect lookup table coverage for a model:

1. Open the model.
2. In the Model Editor, select **Analysis > Coverage > Settings**.
3. On the **Coverage** tab, select **Coverage for this model**.
4. Under **Coverage metrics**, select **Lookup Table**.
5. On the **Results** and **Reporting** tabs, specify the output you need.
6. Click **OK** to close the Coverage Settings dialog box and save your changes.
7. Simulate the model and review the results.

See Also

`complexityinfo` | `conditioninfo` | `cvsim` | `decisioninfo` | `getCoverageInfo` | `mcdcinfo` | `sigrangeinfo` | `sigsizeinfo`

How To

- “Lookup Table Coverage”

ModelAdvisor.ListViewParameter.Attributes property

Purpose

Attributes to display in Model Advisor Report Explorer

Values

Cell array

Default: `{}` (empty cell array)

Description

The `Attributes` property specifies the attributes to display in the center pane of the Model Advisor Results Explorer.

Examples

```
% define list view parameters
myLVParam = ModelAdvisor.ListViewParameter;
myLVParam.Name = 'Invalid font blocks'; % the name appeared at pull down filter
myLVParam.Data = get_param(searchResult,'object')';
myLVParam.Attributes = {'FontName'}; % name is default property
```

Purpose Specify when to run check

Values

'PostCompile'
'None' (default)

Description The `CallbackContext` property specifies the context for checking the model or subsystem.

'None'	No special requirements for the model before checking.
'Postcompile'	The model must be compiled.

ModelAdvisor.Check.CallbackHandle property

Purpose

Callback function handle for check

Values

Function handle.

An empty handle `[ ]` is the default.

Description

The `CallbackHandle` property specifies the handle to the check callback function.

Purpose

Callback function type

Values

'StyleOne' (default)
'StyleTwo'
'StyleThree'

Description

The CallbackStyle property specifies the type of the callback function.

'StyleOne'	Simple check callback function
'StyleTwo'	Detailed check callback function
'StyleThree'	Check callback function with hyperlinked results

ModelAdvisor.Check.EmitInputParametersToReport property

Purpose

Display check input parameters in the Model Advisor report

Values

`'true'` (default)
`'false'`

Description

The `EmitInputParametersToReport` property specifies the display of check input parameters in the Model Advisor report.

`'true'`	Display check input parameters in the Model Advisor report
`'false'`	Do not display check input parameters in the Model Advisor report

ModelAdvisor.ListViewParameter.Data property

Purpose

Objects in Model Advisor Result Explorer

Values

Array of Simulink objects

Default: `[]` (empty array)

Description

The `Data` property specifies the objects displayed in the Model Advisor Result Explorer.

Examples

```
% define list view parameters
myLVParam = ModelAdvisor.ListViewParameter;
myLVParam.Name = 'Invalid font blocks'; % the name appeared at pull down filter
myLVParam.Data = get_param(searchResult,'object')';
```

ModelAdvisor.Action.Description property

Purpose Message in **Action** box

Values String

Default:`''` (null string)

Description The `Description` property specifies the message displayed in the Action box.

Examples

```
% define action (fix) operation
myAction = ModelAdvisor.Action;
%Specify a callback function for the action
myAction.setCallbackFcn(@sampleActionCB);
myAction.Name='Fix block fonts';
myAction.Description=...
   'Click the button to update all blocks with specified font';
```

Purpose

Description of folder

Values

String

Default: `''` (null string)

Description

The `Description` property provides information about the folder. Details about the folder are displayed in the right pane of the Model Advisor.

Examples

```
% --- sample factory group
rec = ModelAdvisor.FactoryGroup('com.mathworks.sample.factorygroup');
rec.Description='Sample Factory Group';
```

ModelAdvisor.Group.Description property

Purpose Description of folder

Values String

Default: `''` (null string)

Description The `Description` property provides information about the folder. Details about the folder are displayed in the right pane of the Model Advisor.

Examples

```
MAG = ModelAdvisor.Group('com.mathworks.sample.GroupSample');
MAG.Description='This is my group';
```

ModelAdvisor.InputParameter.Description property

Purpose

Description of input parameter

Values

String.

Default: `''` (null string)

Description

The `Description` property specifies a description of the input parameter. Details about the check are displayed in the right pane of the Model Advisor.

Examples

```
% define input parameters
inputParam2 = ModelAdvisor.InputParameter;
inputParam2.Name = 'Standard font size';
inputParam2.Value='12';
inputParam2.Type='String';
inputParam2.Description='sample tooltip';
```

ModelAdvisor.Task.Description property

Purpose

Description of task

Values

String

Default: `''` (null string)

Description

The `Description` property is a description of the task that the Model Advisor displays in the **Analysis** box.

When adding checks as tasks, the Model Advisor uses the task `Description` property instead of the check `TitleTips` property.

Examples

```
MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
MAT1.DisplayName='Example task 1';
MAT1.Description='This is the first example task.'

MAT2 = ModelAdvisor.Task('com.mathworks.sample.TaskSample2');
MAT2.DisplayName='Example task 2';
MAT2.Description='This is the second example task.'

MAT3 = ModelAdvisor.Task('com.mathworks.sample.TaskSample3');
MAT3.DisplayName='Example task 3';
MAT3.Description='This is the third example task.'
```

ModelAdvisor.FactoryGroup.DisplayName property

Purpose

Name of folder

Values

String

Default: `''` (null string)

Description

The `DisplayName` specifies the name of the folder that is displayed in the Model Advisor.

Examples

```
% --- sample factory group
rec = ModelAdvisor.FactoryGroup('com.mathworks.sample.factorygroup');
rec.DisplayName='Sample Factory Group';
```

ModelAdvisor.Group.DisplayName property

Purpose

Name of folder

Values

String

Default:`''` (null string)

Description

The `DisplayName` specifies the name of the folder that is displayed in the Model Advisor.

Examples

```
MAG = ModelAdvisor.Group('com.mathworks.sample.GroupSample');
MAG.DisplayName='My Group';
```

ModelAdvisor.Task.DisplayName property

Purpose

Name of task

Values

String

Default: `''` (null string)

Description

The `DisplayName` property specifies the name of the task. The Model Advisor displays each custom task in the tree using the name of the task. Therefore, you should specify a unique name for each task. When you specify the same name for multiple tasks, the Model Advisor generates a warning.

When adding checks as tasks, the Model Advisor uses the task `DisplayName` property instead of the check `Title` property.

Examples

```
MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
MAT1.DisplayName='Example task with input parameter and auto-fix ability';

MAT2 = ModelAdvisor.Task('com.mathworks.sample.TaskSample2');
MAT2.DisplayName='Example task 2';

MAT3 = ModelAdvisor.Task('com.mathworks.sample.TaskSample3');
MAT3.DisplayName='Example task 3';
```

ModelAdvisor.Check.Enable property

Purpose Indicate whether user can enable or disable check

Values

`true` (default)
`false`

Description The `Enable` property specifies whether the user can enable or disable the check.

`true`	Display the check box control
`false`	Hide the check box control

Purpose

Indicate if user can enable and disable task

Values

`true` (default)
`false`

Description

The `Enable` property specifies whether the user can enable or disable a task.

`true` (default)	Display the check box control for task
`false`	Hide the check box control for task

When adding checks as tasks, the Model Advisor uses the task `Enable` property instead of the check `Enable` property.

Examples

```
MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
MAT1.Enable ='false';
```

ModelAdvisor.InputParameter.Entries property

Purpose Drop-down list entries

Values Depends on the value of the `Type` property.

Description The `Entries` property is valid only when the `Type` property is one of the following:

- `Enum`
- `ComboBox`
- `PushButton`

Examples

```
inputParam3 = ModelAdvisor.InputParameter;
inputParam3.Name='Valid font';
inputParam3.Type='Combobox';
inputParam3.Description='sample tooltip';
inputParam3.Entries={'Arial', 'Arial Black'};
```

Purpose

Identifier for check

Values

String

Default: `''` (null string)

Description

The `ID` property specifies a permanent, unique identifier for the check. Note the following about the `ID` property:

- You must specify this property.
- The value of `ID` must remain constant.
- The Model Advisor generates an error if `ID` is not unique.
- Tasks and factory group definitions must refer to checks by `ID`.

ModelAdvisor.FactoryGroup.ID property

Purpose Identifier for folder

Values String

Description The `ID` property specifies a permanent, unique identifier for the folder.

Note

- You must specify this field.
- The value of `ID` must remain constant.
- The Model Advisor generates an error if `ID` is not unique.
- Group definitions must refer to other groups by `ID`.

Purpose Identifier for folder

Values String

Description The `ID` property specifies a permanent, unique identifier for the folder.

Note

- You must specify this field.
- The value of `ID` must remain constant.
- The Model Advisor generates an error if `ID` is not unique.
- Group definitions must refer to other groups by `ID`.

ModelAdvisor.Task.ID property

Purpose

Identifier for task

Values

String

Default: `''` (null string)

Description

The `ID` property specifies a permanent, unique identifier for the task.

Note

- The Model Advisor automatically assigns a string to `ID` if you do not specify it.
- The value of `ID` must remain constant.
- The Model Advisor generates an error if `ID` is not unique.
- Group definitions must refer to tasks using `ID`.

Examples

```
MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
MAT1.ID='Task_ID_1234';
```

ModelAdvisor.Check.LicenseName property

Purpose

Product license names required to display and run check

Values

Cell array of product license names

`{}`(empty cell array) (default)

Description

The `LicenseName` property specifies a cell array of names for product licenses required to display and run the check.

When the Model Advisor starts, it tests whether the product license exists. If you do not meet the license requirements, the Model Advisor does not display the check.

The Model Advisor performs a checkout of the product licenses when you run the custom check. If you do not have the product licenses available, you see an error message that the required license is not available.

Tip To find the text for license strings, type `help license` at the MATLAB command line.

ModelAdvisor.Task.LicenseName property

Purpose

Product license names required to display and run task

Values

Cell array of product license names

Default: `{}` (empty cell array)

Description

The `LicenseName` property specifies a cell array of names for product licenses required to display and run the check.

When the Model Advisor starts, it tests whether the product license exists. If you do not meet the license requirements, the Model Advisor does not display the check.

The Model Advisor performs a checkout of the product licenses when you run the custom check. If you do not have the product licenses available, you see an error message that the required license is not available.

If you specify `ModelAdvisor.Check.LicenseName`, the Model Advisor displays the check when the union of both properties is true.

Tip To find the text for license strings, type `help license` at the MATLAB command line.

ModelAdvisor.Check.ListViewVisible property

Purpose

Status of **Explore Result** button

Values

`false` (default)
`true`

Description

The `ListViewVisible` property is a Boolean value that sets the status of the **Explore Result** button.

`true`	Display the **Explore Result** button.
`false`	Hide the **Explore Result** button.

Examples

```
% add 'Explore Result' button
rec.ListViewVisible = true;
```

ModelAdvisor.FactoryGroup.MAObj property

Purpose Model Advisor object

Values Handle to a `Simulink.ModelAdvisor` object

Description The `MAObj` property specifies a handle to the current Model Advisor object.

Purpose Model Advisor object

Values Handle to `Simulink.ModelAdvisor` object

Description The `MAObj` property specifies a handle to the current Model Advisor object.

ModelAdvisor.Task.MAObj property

Purpose Model Advisor object

Values Handle to a `Simulink.ModelAdvisor` object

Description The `MAObj` property specifies the current Model Advisor object.

When adding checks as tasks, the Model Advisor uses the task `MAObj` property instead of the check `MAObj` property.

cv.cvdatagroup.name property

Purpose `cv.cvdatagroup` object name

Values `name`

Description The `name` property specifies the name of the `cv.cvdatagroup` object.

Examples

```
cvdg = cvsimref(topModelName, cvtg);
cvdg.name = 'My_Data_Group';
```

cv.cvtestgroup.name property

Purpose `cv.cvtestgroup` object name

Value `name`

Description The `name` property specifies the name of the `cv.cvtestgroup` object.

Examples

```
cvto1 = cvtest('TopModel');
cvto2 = cvtest('SubModel1');
cvto3 = cvtest('SubModel2');
cvtg = cv.cvtestgroup(cvto1, cvto2, cvto3);
cvtg.name = 'My_Test_Group';
```

See Also `cvtest`

ModelAdvisor.Action.Name property

Purpose Action button label

Values String

Default: `''` (null string)

Description The `Name` property specifies the label for the action button. This property is required.

Examples

```
% define action (fix) operation
myAction = ModelAdvisor.Action;
%Specify a callback function for the action
myAction.setCallbackFcn(@sampleActionCB);
myAction.Name='Fix block fonts';
```

ModelAdvisor.InputParameter.Name property

Purpose

Input parameter name

Values

String.

Default: `''` (null string)

Description

The `Name` property specifies the name of the input parameter in the custom check.

Examples

```
inputParam2 = ModelAdvisor.InputParameter;
inputParam2.Name = 'Standard font size';
inputParam2.Value='12';
inputParam2.Type='String';
inputParam2.Description='sample tooltip';
```

ModelAdvisor.ListViewParameter.Name property

Purpose Drop-down list entry

Values String

Default: `''` (null string)

Description The `Name` property specifies an entry in the **Show** drop-down list in the Model Advisor Result Explorer.

Examples

```
% define list view parameters
myLVParam = ModelAdvisor.ListViewParameter;
myLVParam.Name = 'Invalid font blocks'; % the name appeared at pull down filter
```

ModelAdvisor.Check.Result property

Purpose Results cell array

Values Cell array

Default: `{}` (empty cell array)

Description The `Result` property specifies the cell array for storing the results that are returned by the callback function specified in `CallbackHandle`.

Tip To set the icon associated with the check, use the `Simulink.ModelAdvisor` `setCheckResultStatus` and `setCheckErrorSeverity` methods.

ModelAdvisor.Check.supportExclusion property

Purpose

Set to support exclusions

Values

Boolean value specifying that the check supports exclusions.

`true` The check supports exclusions.
`false` (default). The check does not support exclusions.

Description

The `supportExclusion` property specifies whether the check supports exclusions.

`'true'`	Check supports exclusions.
`'false'`	Check does not support exclusions.

Examples

```
% specify that a check supports exclusions
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
rec.supportExclusion = true;
```

ModelAdvisor.Check.SupportLibrary property

Purpose

Set to support library models

Values

Boolean value specifying that the check supports library models.

`true`. The check supports library models.
`false` (default). The check does not support library models.

Description

The `SupportLibrary` property specifies whether the check supports library models.

`'true'`	Check supports library models.
`'false'`	Check does not support library models.

Examples

```
% specify that a check supports library models
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
rec.SupportLibrary = true;
```

Purpose

Name of check

Values

String

Default: `''` (null string)

Description

The `Title` property specifies the name of the check in the Model Advisor. The Model Advisor displays each custom check in the tree using the title of the check. Therefore, you should specify a unique title for each check. When you specify the same title for multiple checks, the Model Advisor generates a warning.

Examples

```
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
rec.Title = 'Check Simulink block font';
```

ModelAdvisor.Check.TitleTips property

Purpose

Description of check

Values

String

Default: `''` (null string)

Description

The `TitleTips` property specifies a description of the check. Details about the check are displayed in the right pane of the Model Advisor.

Examples

```
rec = ModelAdvisor.Check('com.mathworks.sample.Check1');
rec.Title = 'Check Simulink block font';
rec.TitleTips = 'Example style three callback';
```

Purpose

Input parameter type

Values

String.

Default: `''` (null string)

Description

The `Type` property specifies the type of input parameter.

Use the `Type` property with the `Value` and `Entries` properties to define input parameters.

Valid values are listed in the following table.

Type	Data Type	Default Value	Description
`Bool`	Boolean	`false`	A check box
`ComboBox`	Cell array	First entry in the list	A drop-down menu • Use `Entries` to define the entries in the list. • Use `Value` to indicate a specific entry in the menu or to enter a value not in the list.
`Enum`	Cell array	First entry in the list	A drop-down menu • Use `Entries` to define the entries in the list. • Use `Value` to indicate a specific entry in the list.

Type	Data Type	Default Value	Description
`PushButton`	N/A	N/A	A button When you click the button, the callback function specified by `Entries` is called.
`String`	String	`''` (null string)	A text box

Examples

```
% define input parameters
inputParam1 = ModelAdvisor.InputParameter;
inputParam1.Name = 'Skip font checks.';
inputParam1.Type = 'Bool';
inputParam1.Value = false;
```

Purpose Status of check

Values

`'true'` (default)
`'false'`

Description The `Value` property specifies the initial status of the check.

`'true'`	Check is enabled
`'false'`	Check is disabled

Examples

```
% hide all checks that do not belong to Demo group
if ~(strcmp(checkCellArray{i}.Group, 'Demo'))
    checkCellArray{i}.Visible = false;
    checkCellArray{i}.Value = false;
end
```

ModelAdvisor.InputParameter.Value property

Purpose

Value of input parameter

Values

Depends on the `Type` property.

Description

The `Value` property specifies the initial value of the input parameter. This property is valid only when the `Type` property is one of the following:

- `'Bool'`
- `'String'`
- `'Enum'`
- `'ComboBox'`

Examples

```
% define input parameters
inputParam1 = ModelAdvisor.InputParameter;
inputParam1.Name = 'Skip font checks.';
inputParam1.Type = 'Bool';
inputParam1.Value = false;
```

Purpose

Status of task

Values

`'true'` (default) — Initial status of task is enabled
`'false'` — Initial status of task is disabled

Description

The `Value` property indicates the initial status of a task—whether it is enabled or disabled.

When adding checks as tasks, the Model Advisor uses the task `Value` property instead of the check `Value` property.

Examples

```
MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
MAT1.Value ='false';
```

Purpose

View Model Advisor run results for checks

Syntax

`view(CheckResultObj)`

Description

`view(CheckResultObj)` opens a web browser and displays the results of the check specified by `CheckResultObj`. `CheckResultObj` is a `ModelAdvisor.CheckResult` object returned by `ModelAdvisor.run`.

Input Arguments

CheckResultObj

`ModelAdvisor.CheckResult` object which is a part of a `ModelAdvisor.SystemResult` object returned by `ModelAdvisor.run`.

Examples

View the Model Advisor run results for the first check in the `slvnvdemo_mdladv_config` configuration file:

```
% Identify Model Advisor configuration file.
% Create list of models to run.
fileName = 'slvnvdemo_mdladv_config.mat';
SysList={'sldemo_auto_climatecontrol/Heater Control',...
    'sldemo_auto_climatecontrol/AC Control'};

% Run the Model Advisor.
SysResultObjArray = ModelAdvisor.run(SysList,'Configuration',fileName);

% View the 'Identify unconnected...' check result.
view(SysResultObjArray{1}.CheckResultObjs(1))
```

Alternatives

"View Model Advisor Report"

See Also

`ModelAdvisor.run` | `ModelAdvisor.summaryReport` | `viewReport`

Tutorials

- "Workflow for Checking Systems Programmatically"
- "Check Multiple Systems in Parallel"
- "Create a Function for Checking Multiple Systems in Parallel"

How To

- “Automating Check Execution”
- “Archive and View Model Advisor Run Results”

viewReport

Purpose

View Model Advisor run results for systems

Syntax

```
viewReport(SysResultObjArray)
viewReport(SysResultObjArray,'MA')
viewReport(SysResultObjArray,'Cmd')
```

Description

`viewReport(SysResultObjArray)` opens the Model Advisor Report for the system specified by `SysResultObjArray`. `SysResultObjArray` is a `ModelAdvisor.SystemResult` object returned by `ModelAdvisor.run`.

`viewReport(SysResultObjArray,'MA')` opens the Model Advisor and displays the results of the run for the system specified by `SysResultObjArray`.

`viewReport(SysResultObjArray,'Cmd')` displays the Model Advisor run summary in the Command Window for the systems specified by `SysResultObjArray`.

Input Arguments

SysResultObjArray

`ModelAdvisor.SystemResult` object returned by `ModelAdvisor.run`.

Examples

Open the Model Advisor report for `sldemo_auto_climatecontrol/Heater Control`.

```
% Identify Model Advisor configuration file.
% Create list of models to run.
fileName = 'slvnvdemo_mdladv_config.mat';
SysList={'sldemo_auto_climatecontrol/Heater Control',...
    'sldemo_auto_climatecontrol/AC Control'};

% Run the Model Advisor.
SysResultObjArray = ModelAdvisor.run(SysList,'Configuration',fileName);

% Open the Model Advisor report.
viewReport(SysResultObjArray{1})
```

Open Model Advisor and display results for `sldemo_auto_climatecontrol/Heater Control`.

```
% Identify Model Advisor configuration file.
% Create list of models to run.
fileName = 'slvnvdemo_mdladv_config.mat';
SysList={'sldemo_auto_climatecontrol/Heater Control',...
    'sldemo_auto_climatecontrol/AC Control'};

% Run the Model Advisor.
SysResultObjArray = ModelAdvisor.run(SysList,'Configuration',fileName);

% Open the Model Advisor and display results.
viewReport(SysResultObjArray{1}, 'MA')
```

Display results in the Command Window for `sldemo_auto_climatecontrol/Heater Control`.

```
% Identify Model Advisor configuration file.
% Create list of models to run.
fileName = 'slvnvdemo_mdladv_config.mat';
SysList={'sldemo_auto_climatecontrol/Heater Control',...
    'sldemo_auto_climatecontrol/AC Control'};

% Run the Model Advisor.
SysResultObjArray = ModelAdvisor.run(SysList,'Configuration',fileName);

% Display results in the Command Window.
viewReport(SysResultObjArray{1}, 'Cmd')
```

Alternatives

- “View Model Advisor Report”
- “View Results in Model Advisor GUI”
- “View Results in Command Window”

See Also

`ModelAdvisor.run` | `ModelAdvisor.summaryReport` | `view`

Tutorials

- “Workflow for Checking Systems Programmatically”
- “Check Multiple Systems in Parallel”
- “Create a Function for Checking Multiple Systems in Parallel”

How To

- “Automating Check Execution”
- “Archive and View Model Advisor Run Results”

Purpose

Indicate to display or hide check

Values

`'true'` (default)
`'false'`

Description

The `Visible` property specifies whether the Model Advisor displays the check.

`'true'`	Display the check
`'false'`	Hide the check

Examples

```
% hide all checks that do not belong to Demo group
if ~(strcmp(checkCellArray{i}.Group, 'Demo'))
    checkCellArray{i}.Visible = false;
    checkCellArray{i}.Value = false;
end
```

ModelAdvisor.Task.Visible property

Purpose

Indicate to display or hide task

Values

`'true'` (default) — Display task in the Model Advisor
`'false'` — Hide task

Description

The `Visible` property specifies whether the Model Advisor displays the task.

Caution

When adding checks as tasks, you cannot specify both the task and check `Visible` properties, you must specify one or the other. If you specify both properties, the Model Advisor generates an error when the check `Visible` property is `false`.

Examples

```
MAT1 = ModelAdvisor.Task('com.mathworks.sample.TaskSample1');
MAT1.Visible ='false';
```

4

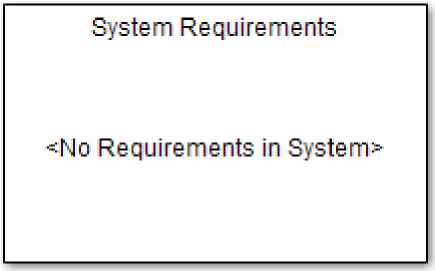
Block Reference

System Requirements

Purpose List system requirements in Simulink diagrams

Library Simulink Verification and Validation

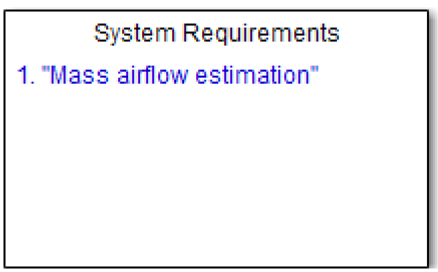
Description



The System Requirements block lists all the system requirements associated with the model or subsystem depicted in the current diagram. It does not list requirements associated with individual blocks in the diagram.

You can place this block anywhere in a diagram. It is not connected to other Simulink blocks. You can only have one System Requirements block in a diagram.

When you drag the System Requirements block from the Library Browser into your Simulink diagram, it is automatically populated with the system requirements, as shown.

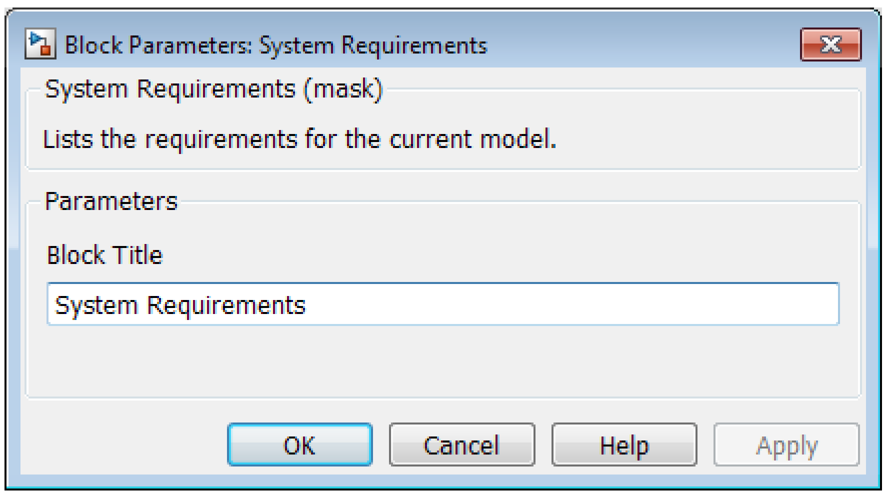


Each of the listed requirements is an active link to the actual requirements document. When you double-click on a requirement name, the associated requirements document opens in its editor window, scrolled to the target location.

If the System Requirements block exists in a diagram, it automatically updates the requirements listing as you add, modify, or delete requirements for the model or subsystem.

Dialog Box and Parameters

To access the Block Parameters dialog box for the System Requirements block, right-click on the System Requirements block and, from the context menu, select **Mask Parameters**. The Block Parameters dialog box opens, as shown.



The Block Parameters dialog box for the System Requirements block contains one parameter.

Block Title

The title of the system requirements list in the diagram. The default title is `System Requirements`. You can type a customized title, for example, `Engine Requirements`.

5

Model Advisor Checks

Simulink Verification and Validation Checks

In this section...
“Simulink® Verification and Validation™Checks Overview” on page 5-2
“Modeling Standards Checks Overview” on page 5-2

Simulink Verification and ValidationChecks Overview

Simulink Verification and Validation checks facilitate designing and troubleshooting models from which code is generated for applications that must meet safety or mission-critical requirements, modeling guidelines, or requirements consistency.

The Model Advisor performs a checkout of the Simulink Verification and Validation license when you run the Simulink Verification and Validation checks.

For descriptions of the modeling standards checks, see

- “DO-178C/DO-331 Checks” on page 5-4
- “IEC 61508 and ISO 26262 Checks” on page 5-75
- “MathWorks Automotive Advisory Board Checks” on page 5-101

For descriptions of the requirements consistency checks, see “Requirements Consistency Checks” on page 5-165.

See Also

- “Consult the Model Advisor” in the Simulink documentation
- “Simulink Checks” in the Simulink reference documentation
- “Embedded Coder Checks” in the Simulink Coder™ documentation

Modeling Standards Checks Overview

Modeling standards checks facilitate designing and troubleshooting models from which code is generated for applications that must meet safety or mission-critical requirements or MathWorks® Automotive Advisory Board (MAAB) modeling guidelines.

The Model Advisor performs a checkout of the Simulink Verification and Validation license when you run the modeling standards checks.

For descriptions of the modeling standards checks, see

- “DO-178C/DO-331 Checks” on page 5-4
- “IEC 61508 and ISO 26262 Checks” on page 5-75
- “MathWorks Automotive Advisory Board Checks” on page 5-101

See Also

- “Consult the Model Advisor” in the Simulink documentation
- “Simulink Checks” in the Simulink reference documentation
- “Embedded Coder Checks” in the Simulink Coder documentation

DO-178C/DO-331 Checks

In this section...

In this section...

DO-178C/DO-331 Checks Overview

DO-178C/DO-331 checks facilitate designing and troubleshooting models from which code is generated for applications that must meet safety or mission-critical requirements.

The Model Advisor performs a checkout of the Simulink Verification and Validation license when you run the DO-178C/DO-331 checks.

See Also

- "Consult the Model Advisor" in the Simulink documentation
- "Simulink Checks" in the Simulink reference documentation
- "Embedded Coder Checks" in the Simulink Coder documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related optimization settings

Check model configuration for optimization settings that can impact safety.

Description

This check verifies that model optimization configuration parameters are set optimally for generating code for a safety-related application. Although highly optimized code is desirable for most real-time systems, some optimizations can have undesirable side effects that impact safety.

Results and Recommended Actions

Condition	Recommended Action
Block reduction optimization is selected. This optimization can remove blocks from generated code, resulting in requirements without associated code and violations for traceability requirements. (See DO-331, Section MB.6.3.4.e—Source code is traceable to low-level requirements.)	Clear the **Block reduction** check box on the **Optimization** pane of the Configuration Parameters dialog box or set the parameter `BlockReduction` to `off`.
Implementation of logic signals as Boolean data is cleared. Strong data typing is recommended for safety-related code. (See DO-331, Section MB.6.3.1.e—High-level requirements conform to standards, DO-331, Section MB.6.3.2.e—Low-level requirements conform to standards, and MISRA-C:2004, Rule 12.6.)	Select **Implement logic signals as boolean data (vs. double)** on the **Optimization** pane of the Configuration Parameters dialog box or set the parameter `BooleanDataType` to `on`.

Condition	Recommended Action
The model includes blocks that depend on elapsed or absolute time and is configured to minimize the amount of memory allocated for the timers. Such a configuration limits the number of days the application can execute before a timer overflow occurs. Many aerospace products are powered on continuously and timers should not assume a limited lifespan. (See DO-331, Section MB.6.3.1.g—Algorithms are accurate, DO-331, Section MB.6.3.2.g—Algorithms are accurate, and MISRA-C:2004, Rule 12.11.)	Set **Application lifespan (days)** on the **Optimization** pane of the Configuration Parameters dialog box or set the parameter `LifeSpan` to `inf`.
The optimization that suppresses the generation of initialization code for root-level inports and outports that are set to zero is selected. For safety-related code, you should explicitly initialize all variables. (See DO-331, Section MB.6.3.3.b—Software architecture is consistent and MISRA-C:2004, Rule 9.1.)	If you have a Embedded Coder license, and you are using an ERT-based system target file, clear the **Remove root level I/O zero initialization** check box on the **Optimization** pane of the Configuration Parameters dialog box or set the parameter `ZeroExternalMemoryAtStartup` to `on`. Alternatively, integrate external, hand-written code that initializes all I/O variables to zero explicitly.
The optimization that suppresses the generation of initialization code for internal work structures, such as block states and block outputs that are set to zero, is selected. For safety-related code, you should explicitly initialize every variable. (See DO-331, Section MB.6.3.3.b—Software architecture is consistent and MISRA-C:2004, Rule 9.1.)	If you have a Embedded Coder license, and you are using an ERT-based system target file, clear the **Remove internal data zero initialization** check box on the **Optimization** pane of the Configuration Parameters dialog box or set the parameter `ZeroInternalMemoryAtStartup` to `on`. Alternatively, integrate external, hand-written code that initializes every state variable to zero explicitly.

Condition	Recommended Action
The optimization that suppresses generation of code resulting from floating-point to integer conversions that wrap out-of-range values is cleared. You must avoid overflows for safety-related code. When this optimization is off and your model includes blocks that disable the **Saturate on overflow** parameter, the code generator wraps out-of-range values for those blocks. This can result in unreachable and, therefore, untestable code. (See DO-331, Section MB.6.3.1.g—Algorithms are accurate, DO-331, Section MB.6.3.2.g—Algorithms are accurate, and MISRA-C:2004, Rule 12.11.)	If you have a Simulink Coder license, select **Remove code from floating-point to integer conversions that wraps out-of-range values** on the **Optimization** pane of the Configuration Parameters dialog box or set the parameter `EfficientFloat2IntCast` to `on`.
The optimization that suppresses generation of code that guards against division by zero for fixed-point data is selected. You must avoid division-by-zero exceptions in safety-related code. (See DO-331, Section MB.6.3.1.g—Algorithms are accurate, DO-331, Section MB.6.3.2.g—Algorithms are accurate, and MISRA-C:2004, Rule 21.1.)	If you have a Embedded Coder license, and you are using an ERT-based system target file, clear the **Remove code that protects against division arithmetic exceptions** check box on the **Optimization** pane of the Configuration Parameters dialog box or set the parameter `NoFixptDivByZeroProtection` to `off`.
The optimization that uses the specified minimum and maximum values for signals and parameters to optimize the generated code is selected. This might result in requirements without traceable code. (See DO-331 Section MB.6.3.4.e - Source code is traceable to low-level requirements.)	If you have a Embedded Coder license, and you are using an ERT-based system target file, clear the **"Optimize using the specified minimum and maximum values"** check box on the **Optimization** pane of the Configuration Parameters dialog box.

Action Results

Clicking **Modify Settings** configures model optimization settings that can impact safety.

See Also

- "Optimization Pane: General" in the Simulink graphical user interface documentation
- "Optimizing Generated Code" in the Simulink Coder documentation
- "Optimize Generated Code Using Specified Minimum and Maximum Values" in the Embedded Coder documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for solvers

Check model configuration for diagnostic settings that apply to solvers and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to solvers are set optimally for generating code for a safety-related application.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic for detecting automatic breakage of algebraic loops is set to `none` or `warning`. The breaking of algebraic loops can affect the predictability of the order of block execution. For safety-related applications, a model developer needs to know when such breaks occur. (See DO-331, Section MB.6.3.3.e – Software architecture conforms to standards.)	Set **Algebraic loop** on the **Diagnostics > Solver** pane of the Configuration Parameters dialog box or set the parameter `AlgebraicLoopMsg` to `error`. Consider breaking such loops explicitly with Unit Delay blocks so that the execution order is predictable. At a minimum, verify that the results of loops breaking automatically are acceptable.
The diagnostic for detecting automatic breakage of algebraic loops for Model blocks, atomic subsystems, and enabled subsystems is set to `none` or `warning`. The breaking of algebraic loops can affect the predictability of the order of block execution. For safety-related applications, a model developer needs to know when such breaks occur. (See DO-331, Section MB.6.3.3.e – Software architecture conforms to standards.)	Set **Minimize algebraic loop** on the **Diagnostics > Solver** pane of the Configuration Parameters dialog box or set the parameter `ArtificialAlgebraicLoopMsg` to `error`. Consider breaking such loops explicitly with Unit Delay blocks so that the execution order is predictable. At a minimum, verify that the results of loops breaking automatically are acceptable.

Condition	Recommended Action
The diagnostic for detecting potential conflict in block execution order is set to `none` or `warning`. For safety-related applications, block execution order must be predictable. A model developer needs to know when conflicting block priorities exist. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set **Block priority violation** on the **Diagnostics > Solver** pane of the Configuration Parameters dialog box or set the parameter `BlockPriorityViolationMsg` to `error`.
The diagnostic for detecting whether a model contains an S-function that has not been specified explicitly to inherit sample time is set to `none` or `warning`. These settings can result in unpredictable behavior. A model developer needs to know when such an S-function exists in a model so it can be modified to produce predictable behavior. (See DO-331, Section MB.6.3.3.e – Software architecture conforms to standards.)	Set **Unspecified inheritability of sample times** on the **Diagnostics > Solver** pane of the Configuration Parameters dialog box or set the parameter `UnknownTsInhSupMsg` to `error`.
The diagnostic for detecting whether the Simulink software automatically modifies the solver, step size, or simulation stop time is set to `none` or `warning`. Such changes can affect the operation of generated code. For safety-related applications, it is better to detect such changes so a model developer can explicitly set the parameters to known values. (See DO-331, Section MB.6.3.3.e – Software architecture conforms to standards.)	Set **Automatic solver parameter selection** on the **Diagnostics > Solver** pane of the Configuration Parameters dialog box or set the parameter `SolverPrmCheckMsg` to `error`.
The diagnostic for detecting when a name is used for more than one state in the model is set to `none`. State names within a model should be unique. For safety-related applications, it is better to detect name clashes so a model developer can fix them. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set **State name clash** on the **Diagnostics > Solver** pane of the Configuration Parameters dialog box or set the parameter `StateNameClashWarn` to `warning`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to solvers and that can impact safety.

See Also

- “Diagnostics Pane: Solver” in the Simulink graphical user interface documentation
- “Diagnose Simulation Errors” in the Simulink documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for sample time

Check model configuration for diagnostic settings that apply to sample time and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to sample times are set optimally for generating code for a safety-related application.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic for detecting when a source block, such as a Sine Wave block, inherits a sample time (specified as -1) is set to `none` or `warning`. The use of inherited sample times for a source block can result in unpredictable execution rates for the source block and blocks connected to it. For safety-related applications, source blocks should have explicit sample times to prevent incorrect execution sequencing. (See DO-331, Section MB.6.3.3.e – Software architecture conforms to standards.)	Set **Source block specifies -1 sample time** on the **Diagnostics > Sample Time** pane of the Configuration Parameters dialog box or set the parameter `InheritedTslnSrcMsg` to `error`.
The diagnostic for detecting whether the input for a discrete block, such as the Unit Delay block, is a continuous signal is set to `none` or `warning`. Signals with continuous sample times should not be used for embedded real-time code. (See DO-331, Section MB.6.3.3.e – Software architecture conforms to standards.)	Set **Discrete used as continuous** on the **Diagnostics > Sample Time** pane of the Configuration Parameters dialog box or set the parameter `DiscreteInheritContinuousMsg` to `error`.

Condition	Recommended Action
The diagnostic for detecting invalid rate transitions between two blocks operating in multitasking mode is set to `none` or `warning`. Such rate transitions should not be used for embedded real-time code. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set **Multitask rate transition** on the **Diagnostics > Sample Time** pane of the Configuration Parameters dialog box or set the parameter `MultiTaskRateTransMsg` to `error`.
The diagnostic for detecting subsystems that can cause data corruption or nondeterministic behavior is set to `none` or `warning`. This diagnostic detects whether conditionally executed multirate subsystems (enabled, triggered, or function-call subsystems) operate in multitasking mode. Such subsystems can corrupt data and behave unpredictably in real-time environments that allow preemption. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set **Multitask conditionally executed subsystem** on the **Diagnostics > Sample Time** pane of the Configuration Parameters dialog box or set the parameter `MultiTaskCondExecSysMsg` to `error`.
The diagnostic for checking sample time consistency between a Signal Specification block and the connected destination block is set to `none` or `warning`. An over-specified sample time can result in an unpredictable execution rate. (See DO-331, Section MB.6.3.3.e – Software architecture conforms to standards.)	Set **Enforce sample times specified by Signal Specification blocks** on the **Diagnostics > Sample Time** pane of the Configuration Parameters dialog box or set the parameter `SigSpecEnsureSampleTimeMsg` to `error`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to sample time and that can impact safety.

See Also

- "Diagnostics Pane: Sample Time" in the Simulink graphical user interface documentation
- "Diagnose Simulation Errors" in the Simulink documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for signal data

Check model configuration for diagnostic settings that apply to signal data and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to signal data are set optimally for generating code for a safety-related application.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that specifies how the Simulink software resolves signals associated with `Simulink.Signal` objects in the MATLAB workspace is set to `Explicit and implicit` or `Explicit and warn implicit`. For safety-related applications, model developers should be required to define signal resolution explicitly. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set **Signal resolution** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `SignalResolutionControl` to `Explicit only`. This provides predictable operation by requiring users to define each signal and block setting that must resolve to `Simulink.Signal` objects in the workspace.
The Product block diagnostic that detects a singular matrix while inverting one of its inputs in matrix multiplication mode is set to `none` or `warning`. Division by a singular matrix can result in numeric exceptions when executing generated code. This is not acceptable in safety-related systems. (See DO-331, Section MB.6.3.1.g –	Set **Division by singular matrix** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `CheckMatrixSingularityMsg` to `error`.

Condition	Recommended Action
Algorithms are accurate, DO-331, Section MB.6.3.2.g – Algorithms are accurate, and MISRA-C:2004, Rule 21.1.)	
The diagnostic that detects when the Simulink software cannot infer the data type of a signal during data type propagation is set to `none` or `warning`. For safety-related applications, model developers must verify the data types of signals. (See DO-331, Section MB.6.3.1.e – High-level requirements conform to standards, and DO-331, Section MB.6.3.2.e – Low-level requirements conform to standards.)	Set **Underspecified data types** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `UnderSpecifiedDataTypeMsg` to `error`.
The diagnostic that detects whether the value of a signal or parameter is too large to be represented by the signal or parameter's data type is set to `none` or `warning`. Undetected numeric overflows can result in unexpected application behavior. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate, DO-331, Section MB.6.3.2.g – Algorithms are accurate, and MISRA-C:2004, Rule 21.1.)	Set **Detect overflow** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `IntegerOverflowMsg` to `error`.
The diagnostic that detects when the value of a block output signal is `Inf` or `NaN` at the current time step is set to `none` or `warning`. When this type of block output signal condition occurs, numeric exceptions can result, and numeric exceptions are not acceptable in safety-related applications. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate, DO-331, Section MB.6.3.2.g – Algorithms are accurate, and MISRA-C:2004, Rule 21.1.)	Set **Inf or NaN block output** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `SignalInfNanChecking` to `error`.

Condition	Recommended Action
The diagnostic that detects Simulink object names that begin with `rt` is set to `none` or `warning`. This diagnostic prevents name clashes with generated signal names that have an `rt` prefix. (See DO-331, Section MB.6.3.1.e – High-level requirements conform to standards, and DO-331, Section MB.6.3.2.e – Low-level requirements conform to standards.)	Set **"rt" prefix for identifiers** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `RTPrefix` to `error`.
The diagnostic that detects simulation range checking is set to `none` or `warning`. This diagnostic detects when signals exceed their specified ranges during simulation. Simulink compares the signal values that a block outputs with the specified range and the block data type. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate, DO-331, Section MB.6.3.2.g – Algorithms are accurate, and MISRA-C:2004, Rule 21.1.)	Set **Simulation range checking** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `SignalRangeChecking` to `error`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to signal data and that can impact safety.

See Also

- "Diagnostics Pane: Data Validity" in the Simulink graphical user interface documentation
- "Diagnose Simulation Errors" in the Simulink documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for parameters

Check model configuration for diagnostic settings that apply to parameters and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to parameters are set optimally for generating code for a safety-related application.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that detects when a parameter downcast occurs is set to `none` or `warning`. A downcast to a lower signal range can result in numeric overflows of parameters, resulting in unexpected behavior. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate, DO-331, Section MB.6.3.2.g – Algorithms are accurate, and MISRA-C:2004, Rule 21.1.)	Set **Detect downcast** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `ParameterDowncastMsg` to `error`.
The diagnostic that detects when a parameter underflow occurs is set to `none` or `warning`. When the data type of a parameter does not have enough resolution, the parameter value is zero instead of the specified value. This can lead to incorrect operation of generated code. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate, DO-331, Section MB.6.3.2.g – Algorithms are accurate, and MISRA-C:2004, Rule 21.1.)	Set **Detect underflow** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `ParameterUnderflowMsg` to `error`.

Condition	Recommended Action
The diagnostic that detects when a parameter overflow occurs is set to `none` or `warning`. Numeric overflows can result in unexpected application behavior and should be detected and fixed in safety-related applications. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate, DO-331, Section MB.6.3.2.g – Algorithms are accurate, and MISRA-C:2004, Rule 21.1.)	Set **Detect overflow** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `ParameterOverflowMsg` to `error`.
The diagnostic that detects when a parameter loses precision is set to `none` or `warning`. Not detecting such errors can result in a parameter being set to an incorrect value in the generated code. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate, DO-331, Section MB.6.3.2.g – Algorithms are accurate, and MISRA-C:2004, Rules 10.1, 10.2, 10.3, and 10.4.)	Set **Detect precision loss** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `ParameterPrecisionLossMsg` to `error`.
The diagnostic that detects when an expression with tunable variables is reduced to its numerical equivalent is set to `none` or `warning`. This can result in a tunable parameter unexpectedly not being tunable in generated code. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate and DO-331, Section MB.6.3.2.g – Algorithms are accurate.)	Set **Detect loss of tunability** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `ParameterTunabilityLossMsg` to `error`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to parameters and that can impact safety.

See Also

- "Diagnostics Pane: Data Validity" in the Simulink graphical user interface documentation
- "Diagnose Simulation Errors" in the Simulink documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C, Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for data used for debugging

Check model configuration for diagnostic settings that apply to data used for debugging and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to debugging are set optimally for generating code for a safety-related application.

See

- DO-331, Section MB.6.3.1.e – High-level requirements conform to standards
- DO-331, Section MB.6.3.2.e – Low-level requirements conform to standards

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that enables model verification blocks is set to `Use local settings` or `Enable all`. Such blocks should be disabled because they are assertion blocks, which are for verification only. Model developers should not use assertions in embedded code.	Set **Model Verification block enabling** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `AssertControl` to `Disable All`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to data used for debugging and that can impact safety.

See Also

- "Diagnostics Pane: Data Validity" in the Simulink graphical user interface documentation
- "Diagnose Simulation Errors" in the Simulink documentation

- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for data store memory

Check model configuration for diagnostic settings that apply to data store memory and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to data store memory are set optimally for generating code for a safety-related application.

See DO-331, Section MB.6.3.3.b – Software architecture is consistent.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that detects whether the model attempts to read data from a data store in which it has not stored data in the current time step is set to a value other than `Enable all as errors`. Reading data before it is written can result in use of stale data or data that is not initialized.	Set **Detect read before write** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `ReadBeforeWriteMsg` to `Enable all as errors`.
The diagnostic that detects whether the model attempts to store data in a data store, after previously reading data from it in the current time step, is set to a value other than `Enable all as errors`. Writing data after it is read can result in use of stale or incorrect data.	Set **Detect write after read** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `WriteAfterReadMsg` to `Enable all as errors`.

Condition	Recommended Action
The diagnostic that detects whether the model attempts to store data in a data store twice in succession in the current time step is set to a value other than `Enable all as errors`. Writing data twice in one time step can result in unpredictable data.	Set **Detect write after write** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `WriteAfterWriteMsg` to `Enable all as errors`.
The diagnostic that detects when one task reads data from a Data Store Memory block to which another task writes data is set to `none` or `warning`. Reading or writing data in different tasks in multitask mode can result in corrupted or unpredictable data.	Set **Multitask data store** on the **Diagnostics > Data Validity** pane of the Configuration Parameters dialog box or set the parameter `MultiTaskDSMMsg` to `error`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to data store memory and that can impact safety.

See Also

- "Diagnostics Pane: Data Validity" in the Simulink graphical user interface documentation
- "Diagnose Simulation Errors" in the Simulink documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for type conversions

Check model configuration for diagnostic settings that apply to type conversions and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to type conversions are set optimally for generating code for a safety-related application.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that detects Data Type Conversion blocks used where there is not type conversion is set to `none`. The Simulink software might remove unnecessary Data Type Conversion blocks from generated code. This might result in requirements without corresponding code. The removal of such blocks need to be detected so model developers can remove the unnecessary blocks explicitly. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate and DO-331, Section MB.6.3.2.g – Algorithms are accurate.)	Set **Unnecessary type conversions** on the **Diagnostics > Type Conversion** pane of the Configuration Parameters dialog box or set the parameter `UnnecessaryDatatypeConvMsg` to `warning`.
The diagnostic that detects vector-to-matrix or matrix-to-vector conversions at block inputs is set to `none` or `warning`. When the Simulink software automatically converts between vector and matrix dimensions, unintended operations or unpredictable behavior can occur. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate and	Set **Vector/matrix block input conversion** on the **Diagnostics > Type Conversion** pane of the Configuration Parameters dialog box or set the parameter `VectorMatrixConversionMsg` to `error`.

Condition	Recommended Action
DO-331, Section MB.6.3.2.g – Algorithms are accurate.)	
The diagnostic that detects when a 32-bit integer value is converted to a floating-point value is set to `none`. This type of conversion can result in a loss of precision due to truncation of the least significant bits for large integer values. (See DO-331, Section MB.6.3.1.g – Algorithms are accurate and DO-331, Section MB.6.3.2.g – Algorithms are accurate, and MISRA-C:2004, Rules 10.1, 10.2, 10.3, and 10.4.)	Set **32-bit integer to single precision float conversion** on the **Diagnostics > Type Conversion** pane of the Configuration Parameters dialog box or set the parameter `Int32ToFloatConvMsg` to `warning`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to type conversions and that can impact safety.

See Also

- "Diagnostics Pane: Type Conversion" in the Simulink graphical user interface documentation
- Data Type Conversion block in the Simulink reference documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for signal connectivity

Check model configuration for diagnostic settings that apply to signal connectivity and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to signal connectivity are set optimally for generating code for a safety-related application.

See

- DO-331, Section MB.6.3.1.e – High-level requirements conform to standards
- DO-331, Section MB.6.3.2.e – Low-level requirements conform to standards

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that detects virtual signals that have a common source signal but different labels is set to `none` or `warning`. This diagnostic pertains to virtual signals only and has no effect on generated code. However, signal label mismatches can lead to confusion during model reviews.	Set **Signal label mismatch** on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box or set the parameter `SignalLabelMismatchMsg` to `error`.
The diagnostic that detects when the model contains a block with an unconnected input signal is set to `none` or `warning`. This must be detected because code is not generated for unconnected block inputs.	Set **Unconnected block input ports** on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box or set the parameter `UnconnectedInputMsg` to `error`.

Condition	Recommended Action
The diagnostic that detects when the model contains a block with an unconnected output signal is set to `none` or `warning`. This must be detected because dead code can result from unconnected block output signals.	Set **Unconnected block output ports** on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box or set the parameter `UnconnectedOutputMsg` to `error`.
The diagnostic that detects unconnected signal lines and unmatched Goto or From blocks is set to `none` or `warning`. This error must be detected because code is not generated for unconnected lines.	Set **Unconnected line** on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box or set the parameter `UnconnectedLineMsg` to `error`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to signal connectivity and that can impact safety.

See Also

- “Diagnostics Pane: Connectivity” in the Simulink graphical user interface documentation
- Signal Basics“Signal Basics” in the Simulink documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for bus connectivity

Check model configuration for diagnostic settings that apply to bus connectivity and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to bus connectivity are set optimally for generating code for a safety-related application.

See DO-331, Section MB.6.3.3.b – Software architecture is consistent.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that detects whether a Model block's root Outport block is connected to a bus but does not specify a bus object is set to `none` or `warning`. For a bus signal to cross a model boundary, the signal must be defined as a bus object for compatibility with higher level models that use a model as a reference model.	Set **Unspecified bus object at root Outport block** on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box or set the parameter `RootOutportRequireBusObject` to `error`.
The diagnostic that detects whether the name of a bus element matches the name specified by the corresponding bus object is set to `none` or `warning`. This diagnostic prevents the use of incompatible buses in a bus-capable block such that the output names are inconsistent.	Set **Element name mismatch** on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box or set the parameter `BusObjectLabelMismatch` to `error`.
The diagnostic that detects when some blocks treat a signal as a mux/vector, while other blocks treat the signal as a bus, is set to `none` or `warning`. When the Simulink software automatically converts a muxed signal to a bus, it is possible for	• Set **Mux blocks used to create bus signals** on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box to `error`, or set the parameter `StrictBusMsg` to `ErrorOnBusTreatedAsVector`.

Condition	Recommended Action
an unintended operation or unpredictable behavior to occur.	• Set "Bus signal treated as vector" on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box to `error`, or the parameter `StrictBusMsg` to `ErrorOnBusTreatedAsVector`. You can use the Model Advisor or the `slreplace_mux` utility function to replace all Mux block used as bus creators with a Bus Creator block.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to bus connectivity and that can impact safety.

See Also

- "Diagnostics Pane: Connectivity" in the Simulink graphical user interface documentation
- `Simulink.Bus` in the Simulink reference documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings that apply to function-call connectivity

Check model configuration for diagnostic settings that apply to function-call connectivity and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to function-call connectivity are set optimally for generating code for a safety-related application.

DO-331, Section MB.6.3.3.b – Software architecture is consistent.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that detects incorrect use of a function-call subsystem is set to `none` or `warning`. If this condition is undetected, incorrect code might be generated.	Set **Invalid function-call connection** on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box or set the parameter `InvalidFcnCallConMsg` to `error`.
The diagnostic that specifies whether the Simulink software has to compute inputs of a function-call subsystem directly or indirectly while executing the subsystem is set to `Use local settings` or `Disable all`. This diagnostic detects unpredictable data coupling between a function-call subsystem and the inputs of the subsystem in the generated code.	Set **Context-dependent inputs** on the **Diagnostics > Connectivity** pane of the Configuration Parameters dialog box or set the parameter `FcnCallInpInsideContextMsg` to `Enable all`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to function-call connectivity and that can impact safety.

See Also

- "Diagnostics Pane: Connectivity" in the Simulink graphical user interface documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for compatibility

Check model configuration for diagnostic settings that affect compatibility and that might impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to compatibility are set optimally for generating code for a safety-related application.

See

- DO-331, Section MB.6.3.3.b – Software architecture is consistent
- MISRA-C:2004, Rule 9.1

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that detects when a block has not been upgraded to use features of the current release is set to `none` or `warning`. An S-function written for an earlier version might not be compatible with the current version and generated code could operate incorrectly.	Set **S-function upgrades needed** on the **Diagnostics > Compatibility** pane of the Configuration Parameters dialog box or set the parameter `SFcnCompatibilityMsg` to `error`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that affect compatibility and that might impact safety.

See Also

- "Diagnose Simulation Errors" in the Simulink documentation
- "Diagnostics Pane: Compatibility" in the Simulink graphical user interface documentation

- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for model initialization

In the model configuration, check diagnostic settings that affect model initialization and might impact safety.

Description

This check verifies that model diagnostic configuration parameters for initialization are optimally set to generate code for a safety-related application.

See:

- DO-331, Section MB.6.3.3.b – Software architecture is consistent
- MISRA-C:2004, Rule 9.1

Results and Recommended Actions

Condition	Recommended Action
In the Configuration Parameters dialog box, on the **Diagnostics > Data Validity** pane, the **"Underspecified initialization detection"** diagnostic is set to `Classic`, ensuring compatibility with previous releases of Simulink. The **"Check undefined subsystem initial output"** diagnostic is cleared. This diagnostic specifies whether Simulink displays a warning if the model contains a conditionally executed subsystem, in which a block with a specified initial condition drives an Outport block with an undefined initial condition. A conditionally executed subsystem could have an output that is not initialized. If undetected, this condition can produce behavior that is nondeterministic.	Do one of the following: • In the Configuration Parameters dialog box, on the **Diagnostics > Data Validity** pane, set **"Underspecified initialization detection"** to `Simplified`. • In the Configuration Parameters dialog box, on the **Diagnostics > Data Validity** pane, set **"Underspecified initialization detection"** to `Classic` and select **"Check undefined subsystem initial output"**. • Set the parameter `CheckSSInitialOutputMsg` to `on`.
In the Configuration Parameters dialog box, on the **Diagnostics > Data Validity**	Do one of the following:

Condition	Recommended Action
pane, the **“Underspecified initialization detection”** diagnostic is set to `Classic`, ensuring compatibility with previous releases of Simulink. The **“Check preactivation output of execution context”** diagnostic is cleared. This diagnostic detects potential initial output differences from earlier releases. A conditionally executed subsystem could have an output that is not initialized. If undetected, this condition can produce behavior that is nondeterministic.	• In the Configuration Parameters dialog box, on the **Diagnostics > Data Validity** pane, set **“Underspecified initialization detection”** to `Simplified`. • In the Configuration Parameters dialog box, on the **Diagnostics > Data Validity** pane, set **“Underspecified initialization detection”** to `Classic` and select **“Check preactivation output of execution context”**. • Set the parameter `CheckExecutionContextPreStartOutputMsg` to `on`.
In the Configuration Parameters dialog box, on the **Diagnostics > Data Validity** pane, the **“Underspecified initialization detection”** diagnostic is set to `Classic`, ensuring compatibility with previous releases of Simulink. The **“Check runtime output of execution context”** diagnostic is cleared. This diagnostic detects potential output differences from earlier releases. A conditionally executed subsystem could have an output that is not initialized and feeds into a block with a tunable parameter. If undetected, this condition can cause the behavior of the downstream block to be nondeterministic.	Do one of the following: • In the Configuration Parameters dialog box, on the **Diagnostics > Data Validity** pane, set **“Underspecified initialization detection”** to `Simplified`. • In the Configuration Parameters dialog box, on the **Diagnostics > Data Validity** pane, set **“Underspecified initialization detection”** to `Classic` and select **“Check runtime output of execution context”**. • Set the parameter `CheckExecutionContextRuntimeOutputMsg` to `on`.

Action Results

To configure the diagnostic settings that affect model initialization and might impact safety, click **Modify Settings**.

See Also

- "Diagnose Simulation Errors" in the Simulink documentation
- "Diagnostics Pane: Data Validity" in the Simulink graphical user interface documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for model referencing

Check model configuration for diagnostic settings that apply to model referencing and that can impact safety.

Description

This check verifies that model diagnostic configuration parameters pertaining to model referencing are set optimally for generating code for a safety-related application.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that detects a mismatch between the version of the model that creates or refreshes a Model block and the current version of the referenced model is set to `error` or `warning`. The detection occurs during load and update operations. When you get the latest version of the referenced model from the software configuration management system, rather than an older version that was used in a previous simulation, if this diagnostic is set to `error`, the simulation is aborted. If the diagnostic is set to `warning`, a warning message is issued. To resolve the issue, the user must resave the model being simulated, which may not be the desired action. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set **Model block version mismatch** on the **Diagnostics > Model Referencing** pane of the Configuration Parameters dialog box or set the parameter `ModelReferenceVersionMismatchMessage` to `none`.
The diagnostic that detects port and parameter mismatches during model loading and updating is set to `none` or `warning`. If undetected, such mismatches can lead to incorrect simulation results because the parent and referenced models have different	Set **Port and parameter mismatch** on the **Diagnostics > Model Referencing** pane of the Configuration Parameters dialog box or set the parameter `ModelReferenceIOMismatchMessage` to `error`.

Condition	Recommended Action
interfaces. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	
The **Model configuration mismatch** diagnostic is set to `none` or `error`. This diagnostic checks whether the configuration parameters of a model referenced by the current model match the current model's configuration parameters or are inappropriate for a referenced model. Some diagnostics for referenced models are not supported in simulation mode. Setting this diagnostic to `error` can prevent simulations from running. Some differences in configurations can lead to incorrect simulation results and mismatches between simulation and target code generation. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set **Model configuration mismatch** on the **Diagnostics > Model Referencing** pane of the Configuration Parameters dialog box or set the parameter `ModelReferenceCSMismatchMessage` to `warning`.
The diagnostic that detects invalid internal connections to the current model's root-level Inport and Outport blocks is set to `none` or `warning`. When this condition is detected, the Simulink software might automatically insert hidden blocks into the model to fix the condition. The hidden blocks can result in generated code without traceable requirements. Setting the diagnostic to `error` forces model developers to fix the referenced models manually. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set **Invalid root Inport/Outport block connection** on the **Diagnostics > Model Referencing** pane of the Configuration Parameters dialog box or set the parameter `ModelReferenceIOMessage` to `error`.
The diagnostic that detects whether To Workspace or Scope blocks are logging data in a referenced model is set to `none` or `warning`. Data logging is not supported for To Workspace and Scope blocks in referenced models. (See DO-331, Section MB.6.3.1.d –	Set **Unsupported data logging** on the **Diagnostics > Model Referencing** pane of the Configuration Parameters dialog box or set the parameter `ModelReferenceDataLoggingMessage` to `error`. To log data, remove the blocks and log the

Condition	Recommended Action
High-level requirements are verifiable and DO-331, Section MB.6.3.2.d – Low-level requirements are verifiable.)	referenced model signals. For more information, see “Logging Referenced Model Signals”.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to model referencing and that can impact safety.

See Also

- “Diagnose Simulation Errors” in the Simulink documentation
- “Diagnostics Pane: Model Referencing” in the Simulink graphical user interface documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards
- “Logging Referenced Model Signals” in the Simulink documentation

Check safety-related model referencing settings

Check model configuration for model referencing settings that can impact safety.

Description

This check verifies that model configuration parameters for model referencing are set optimally for generating code for a safety-related application.

Results and Recommended Actions

Condition	Recommended Action
The referenced model is configured such that its target is rebuilt whenever you update, simulate, or generate code for the model, or if the Simulink software detects changes in known dependencies. These configuration settings can result in unnecessary regeneration of the code, resulting in changing only the date of the file and slowing down the build process when using model references. (See DO-331, Section MB.6.3.1.b – High-level requirements are accurate and consistent and DO-331, Section MB.6.3.2.b – Low-level requirements are accurate and consistent.)	Set "Rebuild" on the **Model Referencing** pane of the Configuration Parameters dialog box or set the parameter `UpdateModelReferenceTargets` to `Never` or `If any changes detected`.
The diagnostic that detects whether a target needs to be rebuilt is set to `None` or `Warn if targets require rebuild`. For safety-related applications, an error should alert model developers that the parent and referenced models are inconsistent. This diagnostic parameter is available only if **Rebuild** is set to `Never`. (See DO-331, Section MB.6.3.1.b – High-level requirements are accurate and consistent and DO-331, Section MB.6.3.2.b – Low-level requirements are accurate and consistent.)	Set "Never rebuild diagnostic" on the **Model Referencing** pane of the Configuration Parameters dialog box or set the parameter `CheckModelReferenceTargetMessage` to `error`.

Condition	Recommended Action
The ability to pass scalar root input by value is on. This capability should be off because scalar values can change during a time step and result in unpredictable data. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set "Pass fixed-size scalar root inputs by value for code generation" on the **Model Referencing** pane of the Configuration Parameters dialog box or set the parameter `ModelReferencePassRootInputsByReference` to `off`.
The model is configured to minimize algebraic loop occurrences. This configuration is incompatible with the recommended setting of **Single output/update function** for embedded systems code. (See DO-331, Section MB.6.3.3.b – Software architecture is consistent.)	Set "Minimize algebraic loop occurrences" on the **Model Referencing** pane of the Configuration Parameters dialog box or set the parameter `ModelReferenceMinAlgLoopOccurrences` to `off`.

Action Results

Clicking **Modify Settings** configures model referencing settings that can impact safety.

See Also

- "Analyze Model Dependencies" in the Simulink documentation
- "Model Referencing Pane" in the Simulink graphical user interface documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related code generation settings

Check model configuration for code generation settings that can impact safety.

Description

This check verifies that model configuration parameters for code generation are set optimally for a safety-related application.

Results and Recommended Actions

Condition	Recommended Action
The option to include comments in the generated code is cleared. Comments provide good traceability between the code and the model. (See DO-331, Section MB.6.3.4.e – Source code is traceable to low-level requirements.)	Select **Include comments** on the **Code Generation > Comments** pane of the Configuration Parameters dialog box or set the parameter `GenerateComments` to `on`.
The option to include comments that describe the code for blocks is cleared. Comments provide good traceability between the code and the model. (See DO-331, Section MB.6.3.4.e – Source code is traceable to low-level requirements.)	Select **Simulink block / Stateflow object comments** on the **Code Generation > Comments** pane of the Configuration Parameters dialog box or set the parameter `SimulinkBlockComments` to `on`.
The option to include comments that describe the code for blocks eliminated from a model is cleared. Comments provide good traceability between the code and the model. (See DO-331, Section MB.6.3.4.e – Source code is traceable to low-level requirements.)	Select **Show eliminated blocks** on the **Code Generation > Comments** pane of the Configuration Parameters dialog box or set the parameter `ShowEliminatedStatement` to `on`.
The option to include the names of parameter variables and source blocks as comments in the model parameter structure declaration in *`model`*`_prm.h` is cleared. Comments provide good traceability between the code and the model. (See DO-331, Section MB.6.3.4.e – Source code is traceable to low-level requirements.)	Select **Verbose comments for SimulinkGlobal storage class** on the **Code Generation > Comments** pane of the Configuration Parameters dialog box or set the parameter `ForceParamTrailComments` to `on`.

Condition	Recommended Action
The option to include requirement descriptions assigned to Simulink blocks as comments is cleared. Comments provide good traceability between the code and the model. (See DO-331, Section MB.6.3.4.e – Source code is traceable to low-level requirements.)	Select **Requirements in block comments** on the **Code Generation > Comments** pane of the Configuration Parameters dialog box or set the parameter `ReqsInCode` to `on`.
The option to generate nonfinite data and operations is selected. Support for nonfinite numbers is inappropriate for real-time embedded systems. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer and DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer.)	Clear **Support: non-finite numbers** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box or set the parameter `SupportNonFinite` to `off`.
The option to generate and maintain integer counters for absolute and elapsed time is selected. Support for absolute time is inappropriate for real-time safety-related systems. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer and DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer.)	Clear **Support: absolute time** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box or set the parameter `SupportAbsoluteTime` to `off`.
The option to generate code for blocks that use continuous time is selected. Support for continuous time is inappropriate for real-time safety-related systems. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer and DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer.)	Clear **Support: continuous time** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box or set the parameter `SupportContinuousTime` to `off`.

Condition	Recommended Action
The option to generate code for noninlined S-functions is selected. This option requires support of nonfinite numbers, which is inappropriate for real-time safety-related systems. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer and DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer.)	Clear **Support: non-inlined S-functions** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box or set the parameter `SupportNonInlinedSFcns` to `off`.
The option to generate model function calls compatible with the main program module of the pre-R2012a GRT target is selected. This option is inappropriate for real-time safety-related systems. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer and DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer.)	Clear **Classic call interface** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box or set the parameter `GRTInterface` to `off`.
The option to generate the *`model`*`_update` function is cleared. Having a single call to the output and update functions simplifies the interface to the real-time operating system (RTOS) and simplifies verification of the generated code. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer and DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer.)	Select **Single output/update function** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box or set the parameter `CombineOutputUpdateFcns` to `on`.

Condition	Recommended Action
The option to generate the `model_terminate` function is selected. This function deallocates dynamic memory, which is unsuitable for real-time safety-related systems. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer and DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer.)	Clear **Terminate function required** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box or set the parameter `IncludeMdlTerminateFcn` to `off`.
The option to log or monitor error status is cleared. If you do not select this option, the Simulink Coder product generates extra code that might not be reachable for testing. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer and DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer.)	Select **Suppress error status in real-time model data structure** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box or set the parameter `SuppressErrorStatus` to `on`.
MAT-file logging is selected. This option adds extra code for logging test points to a MAT-file, which is not supported by embedded targets. Use this option only in test harnesses. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer and DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer.)	Clear **MAT-file logging** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box or set the parameter `MatFileLogging` to `off`.

Condition	Recommended Action
The option that specifies the style for parenthesis usage is set to `Minimum (Rely on C/C++ operators precedence)` or to `Nominal (Optimize for readability)`. For safety-related applications, explicitly specify precedence with parentheses. (See DO-331, Section MB.6.3.1.c – High-level requirements are compatible with target computer, DO-331, Section MB.6.3.2.c – Low-level requirements are compatible with target computer, and MISRA-C:2004, Rule 12.1.)	Set **Parenthesis level** on the **Code Generation > Code** pane of the Configuration Parameters dialog box or set the parameter `ParenthesesLevel` to `Maximum (Specify precedence with parentheses)`.
The option that specifies whether to preserve operand order is cleared. This option increases the traceability of the generated code. (See DO-331, Section MB.6.3.4.e – Source code is traceable to low-level requirements.)	Select **Preserve operand order in expression** on the **Code Generation > Code** pane of the Configuration Parameters dialog box or set the parameter `PreserveExpressionOrder` to `on`.
The option that specifies whether to preserve empty primary condition expressions in `if` statements is cleared. This option increases the traceability of the generated code. (See DO-331, Section MB.6.3.4.e – Source code is traceable to low-level requirements.)	Select **Preserve condition expression in if statement** on the **Code Generation > Code** pane of the Configuration Parameters dialog box or set the parameter `PreserveIfCondition` to `on`.
The option that specifies whether to generate preprocessor conditional directives is set to generate code for nonactive variants. This might result in generating code that does not trace to the active variant of a variant model block or a variant subsystem. (See DO-331 Section MB.6.3.4.e — Source code is traceable to low-level requirements.)	Set **"Generate preprocessor conditionals"** on the **Code Generation > Interface** pane of the Configuration Parameters dialog box to `Disable All`.
The minimum number of characters specified for generating name mangling strings is less than four. You can use this option to minimize the likelihood that	Set **Minimum mangle length** on the **Code Generation > Symbols** pane of the Configuration Parameters dialog box or the

Condition	Recommended Action
parameter and signal names will change during code generation when the model changes. Use of this option assists with minimizing code differences between file versions, decreasing the effort to perform code reviews. (See DO-331, Section MB.6.3.4.e – Source code is traceable to low-level requirements.)	parameter `MangleLength` to a value of 4 or greater.

Action Results

Clicking **Modify Settings** configures model code generation settings that can impact safety.

Limitations

This check requires a Embedded Coder license and an ERT-based system target file.

See Also

- “Code Generation Pane: Comments”“Code Generation Pane: Comments” in the Simulink Coder reference documentation
- “Code Generation Pane: Symbols” in the Simulink Coder reference documentation
- “Code Generation Pane: Interface” in the Simulink Coder reference documentation
- “Code Generation Pane: Code Style” in the Embedded Coder reference documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

Check safety-related diagnostic settings for saving

Check model configuration for diagnostic settings that apply to saving model files

Description

This check verifies that model configuration parameters are set optimally for saving a model for a safety-related application.

See DO-331, Section MB.6.3.3.b - Software architecture is consistent.

Results and Recommended Actions

Condition	Recommended Action
The diagnostic that detects whether a model contains disabled library links before the model is saved is set to `none` or `warning`. If this condition is undetected, incorrect code might be generated.	Set **Block diagram contains disabled library links** on the **Diagnostics > Saving**> pane of the Configuration Parameters dialog box or set the parameter `SaveWithDisabledLinkMsg` to `error`.
The diagnostic that detects whether a model contains library links that are using parameters not in a mask before the model is saved is set to `none` or `warning`. If this condition is undetected, incorrect code might be generated.	Set **Block diagram contains parameterized library links** on the **Diagnostics > Saving**> pane of the Configuration Parameters dialog box or set the parameter `SaveWithParameterizedLinkMsg` to `error`.

Action Results

Clicking **Modify Settings** configures model diagnostic settings that apply to saving a model file.

See Also

- “Disable Links to Library Blocks” in the Simulink documentation
- “Identify disabled library links” in the Simulink documentation
- “Save a Model” in the Simulink documentation

- "Model Parameters" in the Simulink documentation
- "Diagnostics Pane: Saving" in the Simulink documentation

Check for blocks that do not link to requirements

Check whether Simulink blocks and Stateflow objects link to a requirements document.

Description

This check verifies whether Simulink blocks and Stateflow objects link to a document containing engineering requirements for traceability.

This check supports library models.

See

- DO-331, Section MB.6.3.1.f - High-level requirements trace to system requirements
- DO-331, Section MB.6.3.2.f - Low-level requirements trace to high-level requirements

Results and Recommended Actions

Condition	Recommended Action
Blocks do not link to a requirements document.	Link to requirements document. See “Workflows for Creating Links Using Selection-Based Linking”.

Capabilities and Limitations

- You can run this check on your library models.
- When you run this check, the Model Advisor does not follow library links or look under masks.

Tip

Run this check from the top model or subsystem that you want to check.

See Also

“Requirements Traceability”

Check usage of Math blocks

Check whether math operators require nonfinite number support.

Description

This check verifies that Math Function blocks do not use math operations that need nonfinite number support with real-time embedded targets.

See

- DO-331, Sections MB.6.3.1.g and MB.6.3.2.g - Algorithms are accurate
- MISRA-C:2004, Rule 21.1

Results and Recommended Actions

Condition	Recommended Action
Math Function blocks using `log` (natural logarithm), `log10` (base 10 logarithm), and `rem` (Remainder) operators that require nonfinite number support.	When using the Math Function block with a `log` or `log10` function, you must protect the input to the block in the model such that it is not less then or equal to zero. Otherwise, the output can produce a `NaN` or `-Inf` and result in a run-time error in the generated code. When using the Math Function block with a `rem` function, you must protect the second input to the block such that it is not equal to zero. Otherwise the output can produce a `Inf` or `-Inf` and result in a run-time error in the generated code.

Capabilities and Limitations

You can run this check on your library models.

Tips

With embedded systems, you must take care when using blocks that could produce nonfinite outputs such as `NaN`, `Inf` or `-Inf`. Your design must protect the inputs to these blocks in order to avoid run-time errors in the embedded system.

See Also

Math Function block in the Simulink documentation

Check state machine type of Stateflow charts

Identify whether Stateflow charts are all Mealy or all Moore charts.

Description

Compares the state machine type of all Stateflow charts to the type that you specify in the input parameters.

This check supports library models.

See

- DO-331, Section MB.6.3.1.b - High-level requirements are accurate and consistent
- DO-331, Section MB.6.3.1.e - High-level requirements conform to standards
- DO-331, Section MB.6.3.2.b - Low-level requirements are accurate and consistent
- DO-331, Section MB.6.3.2.e - Low-level requirements conform to standards
- DO-331, Section MB.6.3.3.b - Software architecture is consistent
- DO-331, Section MB.6.3.3.e - Software architecture conform to standards

Input Parameters

Common
: Check whether charts use the same state machine type, and are all Mealy or all Moore charts.

Mealy
: Check whether all charts are Mealy charts.

Moore
: Check whether all charts are Moore charts.

Results and Recommended Actions

Condition	Recommended Action
The input parameter is set to `Common` and charts in the model use either of the following: • Classic state machine types. • Multiple state machine types.	For each chart, in the Chart Properties dialog box, specify **State Machine Type** to either `Mealy` or `Moore`. Use the same state machine type for all charts in the model.
The input parameter is set to `Mealy` and charts in the model use other state machine types.	For each chart, in the Chart Properties dialog box, specify **State Machine Type** to `Mealy`.
The input parameter is set to `Moore` and charts in the model use other state machine types.	For each chart, in the Chart Properties dialog box, specify **State Machine Type** to `Moore`.

Capabilities and Limitations

You can run this check on your library models.

See Also

- "hisf_0001: Mealy and Moore semantics"
- "Overview of Mealy and Moore Machines"
- "Chart Properties"
- "Chart Architecture"

Check Stateflow charts for ordering of states and transitions

Identify Stateflow charts that have **User specified state/transition execution order** cleared.

Description

Identify Stateflow charts that have **User specified state/transition execution order** cleared, and therefore do not use explicit ordering of parallel states and transitions.

See

- DO-331, Section MB.6.3.3.b - Software architecture is consistent
- DO-331, Section MB.6.3.3.e - Software architecture conform to standards

Results and Recommended Actions

Condition	Recommended Action
Stateflow charts have **User specified state/transition execution order** cleared.	For the specified charts, in the Chart Properties dialog box, select **User specified state/transition execution order**.

Capabilities and Limitations

You can run this check on your library models.

Action Results

Clicking **Modify** selects **User specified state/transition execution order** for the specified charts.

See Also

- "hisf_0002: User-specified state/transition execution order"

“Transition Testing Order in Multilevel State Hierarchy” in the Stateflow documentation.

- “Execution Order for Parallel States” in the Stateflow documentation.
- “Chart Properties”
- “Chart Architecture”

Check Stateflow debugging settings

Identify whether Stateflow debugging options are cleared.

Description

Identify whether the following debugging options are cleared, which might lead to unreachable code and indeterminate execution time:

- **Enable debugging/animation**
- **Enable overflow detection (with debugging)**
- **State Inconsistency**
- **Transition Conflict**
- **Data Range**
- **Detect Cycles**

See

- DO-331, Section MB.6.3.1.b - High-level requirements are accurate and consistent
- DO-331, Section MB.6.3.1.e - High-level requirements conform to standards
- DO-331, Section MB.6.3.2.b - Low-level requirements are accurate and consistent
- DO-331, Section MB.6.3.2.e - Low-level requirements conform to standards

Results and Recommended Actions

Condition	Recommended Action
Any of the following debugging options are cleared: • **Enable debugging/animation** • **Enable overflow detection (with debugging)** • **State Inconsistency**	Select the debugging options. In the Configuration Parameters dialog box, select: • **Simulation Target > General > Enable debugging/animation**

Condition	Recommended Action
• **Transition Conflict** • **Data Range** • **Detect Cycles**	• **Simulation Target > General > Enable overflow detection (with debugging)** In the Stateflow Debugging dialog box, select: • **State Inconsistency** • **Transition Conflict** • **Data Range** • **Detect Cycles**

Action Results

Clicking **Modify** selects the specified debugging options.

See Also

- "hisf_0011: Stateflow debugging settings"
- "Chart Properties"
- "Chart Architecture"

Check usage of lookup table blocks

Check for lookup table blocks that do not generate out-of-range checking code.

Description

This check verifies that the following blocks generate code to protect against inputs that fall outside the range of valid breakpoint values:

- 1-D Lookup Table
- 2-D Lookup Table
- n-D Lookup Table
- Prelookup

This check also verifies that Interpolation Using Prelookup blocks generate code to protect against inputs that fall outside the range of valid index values.

See

- DO-331, Sections MB.6.3.1.g and MB.6.3.2.g - Algorithms are accurate

Results and Recommended Actions

Condition	Recommended Action
The lookup table block does not generate out-of-range checking code.	Change the setting on the block dialog box so that out-of-range checking code is generated. • For the 1-D Lookup Table, 2-D Lookup Table, n-D Lookup Table, and Prelookup blocks, clear the check box for **Remove protection against out-of-range input in generated code**. • For the Interpolation Using Prelookup block, clear the check box for **Remove protection against out-of-range index in generated code**.

Action Results

Clicking **Modify** verifies that lookup table blocks are set to generate out-of-range checking code.

Capabilities and Limitations

You can run this check on your library models.

See Also

- n-D Lookup Table block in the Simulink documentation
- Prelookup block in the Simulink documentation
- Interpolation Using Prelookup block in the Simulink documentation

Check for inconsistent vector indexing methods

Identify blocks with inconsistent indexing method.

Description

Using inconsistent block indexing methods can result in modeling errors. You should use a consistent vector indexing method for all blocks. This check identifies blocks with inconsistent indexing methods. The indexing methods are zero-based, one-based or user-specified.

This check supports library models.

See

- DO-331, Section MB.6.3.2.b - Low-level requirements are accurateand consistent

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains blocks with inconsistent indexing methods. The indexing methods are zero-based, one-based or user-specified.	Modify the model to use a single consistent indexing method.

Capabilities and Limitations

You can run this check on your library models.

See Also

- “hisl_0021: Consistent vector indexing method”

Check Stateflow charts for uniquely defined data objects

Identify Stateflow charts that include data objects that are not uniquely defined.

Description

This check searches your model for local data in Stateflow charts that is not uniquely defined.

See

- DO-331, Section MB.6.3.2.b - Low-level requirements are accurate and consistent
- MISRA-C: 2004, Rule 5.6

Results and Recommended Actions

Condition	Recommended Action
The Stateflow chart contains a data object identifier defined in two or more scopes.	For the identified chart, do one of the following: • Create a unique data object identifier within each of the scopes. • Create a unique data object identifier within the chart, at the parent level.

Capabilities and Limitations

You can run this check on your library models.

See Also

- "hisl_0061: Unique identifiers for clarity"

Check usage of Math Operations blocks

Identify usage of Math Operation blocks that might impact safety.

Description

This check inspects the usage of:

- Absolute Value blocks
- Gain blocks

See

- DO-331 Section MB.6.3.1.d – High-level requirements are verifiable
- DO-331 Section MB.6.3.2.d – Low-level requirements are verifiable
- MISRA-C:2004, Rule 14.1
- MISRA-C:2004, Rule 21.1

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains an Absolute Value block that is operating on a Boolean or an unsigned input data type. This condition results in unreachable simulation pathways through the model and might result in unreachable code.	For the identified block, do one of the following: • Change the input of the Absolute Value block to a signed input type. • Remove the Absolute Value block from the model.
The model or subsystem contains an Absolute Value block that is operating on a signed integer value, and the **Saturate on integer overflow** check box is not selected. For signed data types, the absolute value of the most negative value is problematic because it is not	In the **Block Parameters > Signal Attributes** dialog box, select the **Saturate on integer overflow** check box.

Condition	Recommended Action
representable by the data type. This condition results in an overflow in the generated code.	
The model or subsystem contains Gain blocks with a of value 1.	If you are using Gain blocks as buffers, consider replacing them with Signal Conversion blocks.

Check usage of Signal Routing blocks

Identify usage of Signal Routing blocks that might impact safety.

Description

This check identifies model or subsystem Switch blocks that might generate code with inequality operations (~=) in expressions that contain a floating-point variable or constant.

See

- DO-331, Sections MB.6.3.1.g and MB.6.3.2.g - Algorithms are accurate
- MISRA-C:2004, Rule 13.3

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains a Switch block that might generate code with inequality operations (~=) in expressions where at least one side of the expression contains a floating-point variable or constant. The Switch block might cause floating-point inequality comparisons in the generated code.	For the identified block, do one of the following: • For the control input block, change the **Data type** parameter setting. • Change the Switch block **Criteria for passing first input** parameter setting. This might change the algorithm.

Check usage of Logic and Bit Operations blocks

Identify usage of Logical Operator and Bit Operations blocks that might impact safety.

Description

This check inspects the usage of:

- Blocks that compute relational operators, including Relational Operator, Compare To Constant, Compare To Zero, and Detect Change blocks
- Logical Operator blocks

See

- DO-331, Sections MB.6.3.1.g and MB.6.3.2.g - Algorithms are accurate
- MISRA-C:2004, Rule 13.3

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains a block computing a relational operator that is operating on different data types. The condition can lead to unpredictable results in the generated code.	On the **Block Parameters > Signal Attributes** pane, set the **Output data type** to `boolean` for the specified blocks.
The model or subsystem contains a block computing a relational operator that uses the == or ~= operator to compare floating-point signals. The use of these operators on floating-point signals is unreliable and unpredictable because of floating-point precision issues. These operators can lead to	For the identified block, do one of the following: • Change the signal data type. • Rework the model to eliminate using == or ~= operators on floating-point signals.

Condition	Recommended Action
unpredictable results in the generated code.	
The model or subsystem contains a Logical Operator block that has inputs or outputs that are not Boolean inputs or outputs. The block might result in floating-point equality or inequality comparisons in the generated code.	• Modify the Logical Operator block so that all inputs and outputs are Boolean. On the **Block Parameters > Signal Attributes** pane, consider selecting **Require all inputs to have the same data type** and setting **Output data type** to `boolean`. • In the Configuration Parameters dialog box, on the **Optimization** pane, consider selecting the **Implement logic signals as boolean data (vs. double)**.

See Also

- "hisl_0016: Usage of blocks that compute relational operators"
- "hisl_0017: Usage of blocks that compute relational operators (2)"

Check usage of Ports and Subsystems blocks

Identify usage of Ports and Subsystems blocks that might impact safety.

Description

This check inspects the usage of:

- For Iterator blocks
- While Iterator blocks
- If blocks
- Switch Case blocks

See

- DO-331, Section MB.6.3.3.b—Software architecture is consistent
- DO-331, Sections MB.6.3.1.g and MB.6.3.2.g - Algorithms are accurate
- DO-331, Section MB.6.3.1.e – High-level requirements conform to standards
- DO-331, Section MB.6.3.2.e – Low-level requirements conform to standards
- MISRA-C:2004, Rule 13.6
- MISRA-C:2004, Rule 14.10
- MISRA-C:2004, Rule 15.3
- MISRA-C:2004, Rule 21.1

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains a For Iterator block that has variable iterations. This condition can lead to unpredictable execution times or infinite loops in the generated code.	For the identified For Iterator blocks, do one of the following: • Set the **Iteration limit source** parameter to `internal`.

Condition	Recommended Action
	• If the **Iteration limit source** parameter must be `external`, use a Constant, Probe, or Width block as the source. • Clear the Set next **i (iteration variable) externally** check box. • Consider selecting the **Show iteration variable** check box and observe the iteration value during simulation.
The model or subsystem contains a While Iterator block that has unlimited iterations. This condition can lead to infinite loops in the generated code.	For the identified While Iterator blocks: • Set the **Maximum number of iterations (-1 for unlimited)** parameter to a positive integer value. • Consider selecting the **Show iteration number port** check box and observe the iteration value during simulation.
The model or subsystem contains an If block with an If expression or Elseif expressions that might cause floating-point equality or inequality comparisons in generated code.	Modify the expressions in the If block to avoid floating-point equality or inequality comparisons in generated code.
The model or subsystem contains an If block using Elseif expressions without an Else condition.	In the If block **Block Parameters** dialog box, select **Show else condition**. Connect the resulting Else output port to an If Action Subsystem block.

Condition	Recommended Action
The model or subsystem contains an If block with output ports that do not connect to If Action Subsystem blocks.	Verify that output ports of the If block connect to If Action Subsystem blocks.
The model or subsystem contains an Switch Case block without a default case.	In the Switch Case block **Block Parameters** dialog box, select **Show default case**. Connect the resulting default output port to a Switch Case Action Subsystem block.
The model or subsystem contains a Switch Case block with an output port that does not connect to a Switch Case Action Subsystem block.	Verify that output ports of the Switch Case blocks connect to Switch Case Action Subsystem blocks.

See Also

- "hisl_0010: Usage of If blocks and If Action Subsystem blocks"
- "hisl_0011: Usage of Switch Case blocks and Action Subsystem blocks"

Display model version information

Display model version information in your report.

Description

This check displays the following information for the current model:

- Version number
- Author
- Date
- Model checksum

Results and Recommended Actions

Condition	Recommended Action
Could not retrieve model version and checksum information.	This summary is provided for your information. No action is required.

See Also

- "Reports for Code Generation" in the Simulink Coder documentation
- Radio Technical Commission for Aeronautics (RTCA) for information on the DO-178C Software Considerations in Airborne Systems and Equipment Certification and related standards

IEC 61508 and ISO 26262 Checks

In this section...

IEC 61508 and ISO 26262 Checks Overview

IEC 61508 and ISO 26262 checks facilitate designing and troubleshooting models, subsystems, and the corresponding generated code for applications to comply with IEC 61508-3 or ISO 26262–6.

The Model Advisor performs a checkout of the Simulink Verification and Validation license when you run the IEC 61508 or ISO 26262 checks.

Tips

If your model uses model referencing, run the IEC 61508 or ISO 26262 checks on all referenced models before running them on the top-level model.

See Also

- IEC 61508–3 Functional safety of electrical/electronic/programmable electronic safety-related systems — Part 3: Software requirements
- ISO 26262–6 Road vehicles — Functional safety — Part 6: Product development: Software level
- “IEC 61508 Standard” in the Embedded Coder documentation
- “ISO 26262 Standard” in the Embedded Coder documentation
- “Consult the Model Advisor” in the Simulink documentation
- “Simulink Checks” in the Simulink reference documentation
- “Embedded Coder Checks” in the Simulink Coder documentation

Display model metrics and complexity report

Display number of elements and name, level, and depth of subsystems for the model or subsystem.

Description

The IEC 61508 and ISO 26262 standards recommend the usage of size and complexity metrics to assess the software under development. This check provides metrics information for the model. The provided information can be used to inspect whether the size or complexity of the model or subsystem exceeds given limits. The check displays:

- A block count for each Simulink block type contained in the given model.
- The maximum subsystem depth of the given model.
- A count of Stateflow constructs in the given model (if applicable).
- Name, level, and depth of the subsystems contained in the given model (if applicable).

See

- IEC 61508-3, Table A.9 (5) – Software complexity metrics
- ISO 26262-6, Table 1 (1a) - Enforcement of low complexity, Table 4 (1a) - Hierarchical structure of software components, Table 4 (1b) - Restricted size of software components, and Table 4 (1c) - Restricted size of interfaces

Results and Recommended Actions

Condition	Recommended Action
N/A	This summary is provided for your information. No action is required.

Capabilities and Limitations

You can run this check on your library models.

See Also

- `sldiagnostics` in the Simulink documentation
- "Cyclomatic Complexity" in the Stateflow documentation

Check for unconnected objects

Identify unconnected lines, input ports, and output ports in the model.

Description

Unconnected objects are likely to cause problems propagating signal attributes such as data, type, sample time, and dimensions.

Ports connected to Ground or Terminator blocks pass this check.

See

- IEC 61508-3, Table A.3 (3) — Language subset
- ISO 26262-6, Table 1 (1b) - Use of language subsets, Table 1 (1d) - Use of defensive implementation techniques

Results and Recommended Actions

Condition	Recommended Action
There are unconnected lines, input ports, or output ports in the model or subsystem.	• Double-click an element in the list of unconnected items to locate the item in the model diagram. • Connect the objects identified in the results.

Capabilities and Limitations

You can run this check on your library models.

See Also

"Signal Basics"

Check for fully defined interface

Identify root model Inport blocks that do not have fully defined attributes.

Description

Using root model Inport blocks that do not have fully define dimensions, sample time, or data type can lead to undesired simulation results. Simulink back-propagates dimensions, sample times, and data types from downstream blocks unless you explicitly assign these values.

See

- IEC 61508-3, Table B.9 (5) – Fully defined interface
- ISO 26262-6, Table 1 (1f) - Use of unambiguous graphical representation

Results and Recommended Actions

Condition	Recommended Action
The model has root-level Inport blocks that have undefined attributes, such as an inherited sample time, data type, or port dimension.	Explicitly define root-level Inport block attributes identified in the results. Double-click an element from the list of underspecified items to locate the condition.

Capabilities and Limitations

You can run this check on your library models.

Tips

The following configurations pass this check:

- Inport blocks with inherited port dimensions in conjunction with the usage of bus objects
- Inport blocks with automatically inherited data types in conjunction with bus objects

- Inport blocks with inherited sample times in conjunction with the **Periodic sample time constraint** menu set to `Ensure sample time independent`

See Also

- "Data Types" in the Simulink documentation
- "Determine Output Signal Dimensions" in the Simulink documentation
- "Specify Sample Time" in the Simulink documentation

Check for questionable constructs

Identify blocks not supported by code generation or not recommended for deployment.

Description

This check partially identifies model constructs that are not suited for code generation or not recommended for production code generation as identified in the Simulink Block Support tables for Simulink Coder and Embedded Coder. If you are using blocks with support notes for code generation, review the information and follow the given advice.

See

- IEC 61508-3, Table A.3 (3) – Language subset
- ISO 26262-6, Table 1 (1b) - Use of language subsets

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains blocks that should not be used for code generation.	Consider replacing the blocks listed in the results. Double-click an element from the list of questionable items to locate condition.
The model or subsystem contains blocks that should not be used for production code deployment.	Consider replacing the blocks listed in the results. Double-click an element from the list of questionable items to locate condition.
The model or subsystem contains Gain blocks whose value equals 1.	If you are using Gain blocks as buffers, consider replacing them with Signal Conversion blocks. Double-click an element from the list of questionable items to locate condition.

Capabilities and Limitations

You can run this check on your library models.

Limitation

This check might not identify all instances of noncompliance with the Simulink Coder and Embedded Coder “Simulink Built-In Blocks That Support Code Generation” tables.

See Also

- “Simulink Built-In Blocks That Support Code Generation” tables in the Simulink Coder documentation for Simulink Coder and Embedded Coder
- “Model Architecture and Design”

Check usage of Stateflow constructs

Identify usage of Stateflow constructs that might impact safety.

Description

This check identifies instances of Stateflow software being used in a way that can impact an application's safety, including:

- Use of strong data typing
- Port name mismatches
- Scope of data objects and events
- Formatting of state action statements
- Ordering of states and transitions
- Unreachable code
- Indeterminate execution time

Results and Recommended Actions

Condition	Recommended Action
A Stateflow chart is not configured for strong data typing on boundaries between a Simulink model and the Stateflow chart. (See "hisf_0009: Strong data typing (Simulink and Stateflow boundary)" IEC 61508-3 Table A.3 (2) - Strongly typed programming language, ISO 26262-6, Table 1 (1c) - Enforcement of strong typing, and MISRA-C:2004, Rules 10.1, 10.2, 10.3, and 10.4)	In the Chart properties dialog box, select **Use Strong Data Typing with Simulink I/O** for the Stateflow chart. When you select this check box, the Stateflow chart accepts input signals of any data type that Simulink models support, provided that the type of the input signal matches the type of the corresponding Stateflow input data object.
Signals have names that differ from those of their corresponding Stateflow ports. (See IEC 61508-3, Table A.3 (3)- Language subset and	• Check whether the ports are connected and, if not, fix the connections.

Condition	Recommended Action
ISO 26262-6, Table 1 (1b) - Use of language subsets)	• Change the names of the signals or the Stateflow ports so that the names match.
Local data is not defined in the Stateflow hierarchy at the chart level or below. (See IEC 61508-3, Table A.3 (3)- Language subset and ISO 26262-6, Table 1 (1b) - Use of language subsets)	Define local data at the chart level or below.
A new line is missing from a state action after: • An `entry` (`en`), `during` (`du`), or `exit` (`ex`) statement • The semicolon (;) at the end of an assignment statement (See IEC 61508-3, Table A.3 (3)- Language subset and ISO 26262-6, Table 1 (1b) - Use of language subsets)	Add missing new lines.
Stateflow charts have **User specified state/transition execution order** cleared. (See "hisf_0002: User-specified state/transition execution order", IEC 61508-3, Table A.3 (3) - Language subset, and ISO 26262-6, Table 1 (1b) - Use of language subsets, Table 1 (1f) - Use of unambiguous graphical representation)	For the specified charts, in the Chart Properties dialog box, select **User specified state/transition execution order**.

Condition	Recommended Action
Any of the following debugging options are cleared: • **Enable debugging/animation** • **Enable overflow detection (with debugging)** • **State Inconsistency** • **Transition Conflict** • **Data Range** • **Detect Cycles** (See “hisf_0011: Stateflow debugging settings”, IEC 61508-3, Table A.7 (2) - Simulation/modeling, and ISO 26262-6 Table 1 (1d) - Use of defensive implementation techniques)	Select the debugging options. In the Configuration Parameters dialog box, select: • **Simulation Target > General > Enable debugging/animation** • **Simulation Target > General > Enable overflow detection (with debugging)** In the Stateflow Debugging dialog box, select: • **State Inconsistency** • **Transition Conflict** • **Data Range** • **Detect Cycles**
The Stateflow chart contains a data object identifier defined in two or more scopes. (See “hisl_0061: Unique identifiers for clarity”, IEC 61508-3, Table A.3 (3) - Language subset, Table A.4 (5) - Design and coding standards, ISO 26262-6, Table 1 (1b) - Use of language subsets, Table 1 (1e) - Use of established design principles, Table 1 (1h) - Use of naming conventions and MISRA-C:2004, Rule 5.6)	For the identified chart, do one of the following: • Create a unique data object identifier within each of the scopes. • Create a unique data object identifier within the chart, at the parent level.

Capabilities and Limitations

This check does not support charts that use MATLAB as the action language.

See Also

See the following topics in the Stateflow documentation:

- "Strong Data Typing with Simulink I/O"
- "Property Fields"
- "How Events Work in Stateflow Charts"
- "Adding Data"
- "Labeling States"

See

- "Chart Properties"
- "Chart Architecture"

Check state machine type of Stateflow charts

Identify whether Stateflow charts are all Mealy or all Moore charts.

Description

Compares the state machine type of all Stateflow charts to the type that you specify in the input parameters.

See

- IEC 61508-3,Table A.7 (2) - Simulation/modeling
- ISO 26262-6, Table 1 (1b) - Use of language subsets

Input Parameters

Common
: Check whether charts use the same state machine type, and are all Mealy or all Moore charts.

Mealy
: Check whether all charts are Mealy charts.

Moore
: Check whether all charts are Moore charts.

Results and Recommended Actions

Condition	Recommended Action
The input parameter is set to `Common` and charts in the model use either of the following: • Classic state machine types.	For each chart, in the Chart Properties dialog box, specify **State Machine Type** to either `Mealy` or

Condition	Recommended Action
• Multiple state machine types.	`Moore`. Use the same state machine type for all charts in the model.
The input parameter is set to `Mealy` and charts in the model use other state machine types.	For each chart, in the Chart Properties dialog box, specify **State Machine Type** to `Mealy`.
The input parameter is set to `Moore` and charts in the model use other state machine types.	For each chart, in the Chart Properties dialog box, specify **State Machine Type** to `Moore`.

Capabilities and Limitations

You can run this check on your library models.

See Also

- "hisf_0001: Mealy and Moore semantics"
- "Overview of Mealy and Moore Machines" in the Stateflow documentation.
- "Chart Properties"
- "Chart Architecture"

Check for model objects that do not link to requirements

Check whether Simulink blocks and Stateflow objects link to a requirements document.

See

- IEC 61508-3, Table A.1 (1) - Computer-aided specification tools, Table A.2 (8) - Computer-aided specification tools, and Table A.8 (1) - Impact analysis
- ISO 26262-6, Table 8 (1a) - Documentation of the software unit design in natural language

Description

This check verifies whether Simulink blocks and Stateflow objects link to a document containing engineering requirements for traceability.

Results and Recommended Actions

Condition	Recommended Action
Blocks do not link to a requirements document.	Link to requirements document. See "Workflows for Creating Links Using Selection-Based Linking".

Capabilities and Limitations

- You can run this check on your library models.
- When you run this check, the Model Advisor does not follow library links or look under masks.

Tip

Run this check from the top model or subsystem that you want to check.

See Also

"Requirements Traceability"

Check for inconsistent vector indexing methods

Identify blocks with inconsistent indexing method.

Description

Using inconsistent block indexing methods can result in modeling errors. You should use a consistent vector indexing method for all blocks. This check identifies blocks with inconsistent indexing methods. The indexing methods are zero-based, one-based or user-specified.

See

- IEC 61508–3, Table A.3 (3) ’Language subset’
  IEC 61508–3, Table A.4 (5) ’Design and coding standards’
- ISO 26262-6, Table 1 (b) ’Use of language subsets’
  ISO 26262-6, Table 1 (f) ’Use of unambiguous graphical representation’

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains blocks with inconsistent indexing methods. The indexing methods are zero-based, one-based or user-specified.	Modify the model to use a single consistent indexing method.

Capabilities and Limitations

You can run this check on your library models.

See Also

- “hisl_0021: Consistent vector indexing method”

Check usage of Math Operations blocks

Identify usage of Math Operation blocks that might impact safety.

Description

This check inspects the usage of:

- Absolute Value blocks
- Gain blocks

See

- IEC 61508-3, Table A.3 (3) – Language subset, IEC 61508-3, Table A.4 (3) – Defensive programming, Table B.8 (3) – Control Flow Analysis
- ISO 26262-6, Table 1 (1b) - Use of language subsets, Table 1 (1d) - Use of defensive implementation techniques, Table 7 (1f) - Control flow analysis
- MISRA-C:2004, Rule 21.1

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains an Absolute Value block that is operating on a Boolean or an unsigned input data type. This condition results in unreachable simulation pathways through the model and might result in unreachable code.	For the identified block, do one of the following: • Change the input of the Absolute Value block to a signed input type. • Remove the Absolute Value block from the model.
The model or subsystem contains an Absolute Value block that is operating on a signed integer value, and the **Saturate on integer overflow** check box is not selected. For signed data types, the absolute value of the most negative value is problematic because it is not	In the **Block Parameters > Signal Attributes** dialog box, select the **Saturate on integer overflow** check box.

Condition	Recommended Action
representable by the data type. This condition results in an overflow in the generated code.	
The model or subsystem contains Gain blocks with a of value 1.	If you are using Gain blocks as buffers, consider replacing them with Signal Conversion blocks.

Check usage of Signal Routing blocks

Identify usage of Signal Routing blocks that might impact safety.

Description

This check identifies model or subsystem Switch blocks that might generate code with inequality operations (~=) in expressions that contain a floating-point variable or constant.

See

- IEC 61508-3, Table A.3 (3) – Language subset, Table A.4 (3) – Defensive programming
- ISO 26262-6, Table 1 (1b) - Use of language subsets, Table 1 (1d) - Use of defensive implementation techniques
- MISRA-C:2004, Rule 13.3

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains a Switch block that might generate code with inequality operations (~=) in expressions where at least one side of the expression contains a floating-point variable or constant. The Switch block might cause floating-point inequality comparisons in the generated code.	For the identified block, do one of the following: • For the control input block, change the **Data type** parameter setting. • Change the Switch block **Criteria for passing first input** parameter setting. This might change the algorithm.

Check usage of Logic and Bit Operations blocks

Identify usage of Logical Operator and Bit Operations blocks that might impact safety.

Description

This check inspects the usage of:

- Blocks that compute relational operators, including Relational Operator, Compare To Constant, Compare To Zero, and Detect Change blocks
- Logical Operator blocks

See

- IEC 61508-3, Table A.3 (2) – Strongly typed programming language, Table A.3 (3) – Language subset, Table A.4 (3) - Defensive programming
- ISO 26262-6, Table 1 (1c) - Enforcement of strong typing, Table 1 (1b) - Use of language subsets
- MISRA-C:2004, Rule 13.3

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains a block computing a relational operator that is operating on different data types. The condition can lead to unpredictable results in the generated code.	On the **Block Parameters > Signal Attributes** pane, set the **Output data type** to `boolean` for the specified blocks.
The model or subsystem contains a block computing a relational operator that uses the == or ~= operator to compare floating-point signals. The use of these operators on floating-point signals is unreliable and unpredictable because of floating-point precision issues.	For the identified block, do one of the following: • Change the signal data type. • Rework the model to eliminate using == or ~= operators on floating-point signals.

Condition	Recommended Action
These operators can lead to unpredictable results in the generated code.	
The model or subsystem contains a Logical Operator block that has inputs or outputs that are not Boolean inputs or outputs. The block might result in floating-point equality or inequality comparisons in the generated code.	• Modify the Logical Operator block so that the inputs and outputs are Boolean. On the **Block Parameters > Signal Attributes** pane, consider selecting **Require all inputs to have the same data type** and setting **Output data type** to `boolean`. • In the Configuration Parameters dialog box, on the **Optimization** pane, consider selecting the **Implement logic signals as boolean data (vs. double)**.

See Also

- "hisl_0016: Usage of blocks that compute relational operators"
- "hisl_0017: Usage of blocks that compute relational operators (2)"

Check usage of Ports and Subsystems blocks

Identify usage of Ports and Subsystems blocks that might impact safety.

Description

This check inspects the usage of:

- For Iterator blocks
- While Iterator blocks
- If blocks
- Switch Case blocks

See

- IEC 61508-3, Table A.3 (3) - Language subset, Table A.4 (3) - Defensive programming
- ISO 26262-6, Table 1 (1b) - Use of language subsets, Table 1 (1d) - Use of defensive implementation techniques
- MISRA-C:2004, Rule 13.6, Rule 14.10, Rule 15.3, Rule 21.1

Results and Recommended Actions

Condition	Recommended Action
The model or subsystem contains a For Iterator block that has variable iterations. This condition can lead to unpredictable execution times or infinite loops in the generated code.	For the identified For Iterator blocks, do one of the following: • Set the **Iteration limit source** parameter to `internal`. • If the **Iteration limit source** parameter must be `external`, use a Constant, Probe, or Width block as the source. • Clear the Set next **i (iteration variable) externally** check box.

Condition	Recommended Action
	• Consider selecting the **Show iteration variable** check box and observe the iteration value during simulation.
The model or subsystem contains a While Iterator block that has unlimited iterations. This condition can lead to infinite loops in the generated code.	For the identified While Iterator blocks: • Set the **Maximum number of iterations (-1 for unlimited)** parameter to a positive integer value. • Consider selecting the **Show iteration number port** check box and observe the iteration value during simulation.
The model or subsystem contains an If block with an If expression or Elseif expressions that might cause floating-point equality or inequality comparisons in generated code.	Modify the expressions in the If block to avoid floating-point equality or inequality comparisons in generated code.
The model or subsystem contains an If block using Elseif expressions without an Else condition.	In the If block **Block Parameters** dialog box, select **Show else condition**. Connect the resulting Else output port to an If Action Subsystem block.
The model or subsystem contains an If block with output ports that do not connect to If Action Subsystem blocks.	Verify that output ports of the If block connect to If Action Subsystem blocks.

Condition	Recommended Action
The model or subsystem contains an Switch Case block without a default case.	In the Switch Case block **Block Parameters** dialog box, select **Show default case**. Connect the resulting default output port to a Switch Case Action Subsystem block.
The model or subsystem contains a Switch Case block with an output port that does not connect to a Switch Case Action Subsystem block.	Verify that output ports of the Switch Case blocks connect to Switch Case Action Subsystem blocks.

See Also

- "hisl_0010: Usage of If blocks and If Action Subsystem blocks"
- "hisl_0011: Usage of Switch Case blocks and Action Subsystem blocks"

Display configuration management data

Display model configuration and checksum information.

Description

This informer check displays the following information for the current model:

- Model version number
- Model author
- Date
- Model checksum

See

- IEC 61508-3, Table A.8 (5) – Software configuration management
- ISO 26262-8, Clause 7.4.2

Results and Recommended Actions

Condition	Recommended Action
Could not retrieve model version and checksum information.	This summary is provided for your information. No action is required.

See Also

- “How Simulink Helps You Manage Model Versions” in the Simulink documentation
- Model Change Log in the Simulink Report Generator™ documentation
- Simulink.BlockDiagram.getChecksum in the Simulink documentation
- Simulink.SubSystem.getChecksum in the Simulink documentation

MathWorks Automotive Advisory Board Checks

In this section...

In this section...

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MathWorks Automotive Advisory Board Checks Overview

MathWorks Automotive Advisory Board (MAAB) checks facilitate designing and troubleshooting models from which code is generated for automotive applications.

The Model Advisor performs a checkout of the Simulink Verification and Validation license when you run the MAAB checks.

See Also

- "Consult the Model Advisor" in the Simulink documentation
- "Simulink Checks" in the Simulink reference documentation
- "Embedded Coder Checks" in the Simulink Coder documentation
- "MAAB Control Algorithm Modeling" guidelines
- The MathWorks Automotive Advisory Board on the MathWorks Web site, which lists downloads for the latest version of *Control Algorithm Modeling Guidelines Using MATLAB, Simulink, and Stateflow*

Check font formatting

Check for difference in font and font sizes.

Description

With the exception of free text annotations within a model, text elements, such as block names, block annotations, and signal labels, must have the same font style and font size. Select a font style and font size that is legible and portable (convertible between platforms), such as Arial or Helvetica 12 point.

See MAAB guideline db_0043: Simulink font and font size.

Input Parameters

Font Name
: Apply the specified font to all text elements. Available fonts include `Helvetica` (default), `Arial`, `Arial Black`, `Mangal`, or `Modern`.

Font Size
: Apply the specified font size to all text elements. Available sizes include `-1`, `6`, `8`, `9`, `10` (default), `12`, `14`, `16`, `18`, `20`, `22`, and `24`.

Font Angle
: Apply the specified font angle to all text elements. Available angles include `auto` (default), `normal`, `italic`, and `oblique`.

Font Weight
: Apply the specified font weight to all text elements. Available weights include `auto` (default), `normal`, `light`, `demi` , and `bold`.

Results and Recommended Actions

Condition	Recommended Action
The fonts or font sizes for text elements in the model are not consistent or portable.	Specify values for the font parameters and click **Modify all Fonts**, or manually change the fonts and font sizes of text elements in the model such that they are consistent and portable.

Capabilities and Limitations

You can run this check on your library models.

Action Results

Clicking **Modify all Fonts** changes the font and font size of all text elements in the model according to the values you specify for the font parameters.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check Transition orientations in flowcharts

Check transition orientations in flow charts.

Description

The following rules apply to transitions in flow charts:

- Draw transition conditions horizontally.
- Draw transitions with a condition action vertically.

Loop constructs are exceptions to these rules.

See MAAB guideline db_0132: Transitions in Flowcharts.

Results and Recommended Actions

Condition	Recommended Action
The model includes a transition with a condition that is not drawn horizontally or a transition action that is not drawn vertically.	Modify the model.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for nondefault block attributes

Identify blocks that use nondefault block parameter values that are not displayed in the model diagram.

Description

Model diagrams should display block parameters that have values other than default values. One way of displaying this information is by using the **Block Annotation** tab in the Block Properties dialog box.

See MAAB guideline db_0140: Display of basic block parameters.

Results and Recommended Actions

Condition	Recommended Action
Block parameters that have values other than default values, and the values are not in the model display.	In the Block Properties dialog, use the **Block Annotation** tab to add block parameter annotations.

Capabilities and Limitations

You can run this check on your library models.

Tip

If you use the `add_block` function with `'built-in/`*`blocktype`*`'` as a source block path name for Simulink built-in blocks, some default parameter values of some blocks are different from the defaults that you get if you added those blocks interactively using Simulink.

See Also

- For a list of block parameter default values, see “Block-Specific Parameters” in the Simulink documentation.
- “MAAB Control Algorithm Modeling” guidelines
- `add_block` in the Simulink documentation

Check signal line labels

Check the labeling on signal lines.

Description

You should use a label to identify:

- Signals originating from the following blocks (the block icon exception noted below applies to all blocks listed, except Inport, Bus Selector, Demux, and Selector):

  Bus Selector block (tool forces labeling)
  Chart block (Stateflow)
  Constant block
  Data Store Read block
  Demux block
  From block
  Inport block
  Selector block
  Subsystem block

  Block Icon Exception If a signal label is visible in the display of the icon for the originating block, you do not have to display a label for the connected signal unless the signal label is required elsewhere due to a rule for signal destinations.

- Signals connected to one of the following destination blocks (directly or indirectly with a basic block that performs an operation that is not transformative):

  Bus Creator block
  Chart block (Stateflow)
  Data Store Write block
  Goto block
  Mux block
  Outport block
  Subsystem block

- Any signal of interest.

See MAAB guideline na_0008: Display of labels on signals.

Results and Recommended Actions

Condition	Recommended Action
Signals coming from Bus Selector, Chart, Constant, Data Store Read, Demux, From, Inport, or Selector blocks are not labeled.	Double-click the line that represents the signal. After the text cursor appears, enter a name and click anywhere outside the label to exit label editing mode.

Capabilities and Limitations

You can run this check on your library models.

See Also

- "Signal Labels" in the Simulink documentation
- "MAAB Control Algorithm Modeling" guidelines

Check for propagated signal labels

Check for propagated labels on signal lines.

Description

You should propagate a signal label from its source rather than enter the signal label explicitly (manually) if the signal originates from:

- An Inport block in a nested subsystem. However, if the nested subsystem is a library subsystem, you can explicitly label the signal coming from the Inport block to accommodate reuse of the library block.
- A basic block that performs a nontransformative operation.
- A Subsystem or Stateflow Chart block. However, if the connection originates from the output of an instance of the library block, you can explicitly label the signal to accommodate reuse of the library block.

See MAAB guideline na_0009: Entry versus propagation of signal labels.

Results and Recommended Actions

Condition	Recommended Action
The model includes signal labels that were entered explicitly, but should be propagated.	Use the open angle bracket (<) character to mark signal labels that should be propagated and remove the labels that were entered explicitly.

Capabilities and Limitations

You can run this check on your library models.

See Also

- “Signal Labels” in the Simulink documentation
- “MAAB Control Algorithm Modeling” guidelines

Check default transition placement in Stateflow charts

Check default transition placement in Stateflow charts.

Description

In a Stateflow chart, you should connect the default transition at the top of the state and place the destination state of the default transition above other states in the hierarchy.

See MAAB guideline jc_0531: Placement of the default transition.

Results and Recommended Actions

Condition	Recommended Action
The default transition for a Stateflow chart is not connected at the top of the state.	Move the default transition to the top of the state chart.
The destination state of a Stateflow chart's default transition is lower than other states in the same hierarchy.	Adjust the position of the default transition's destination state such that the state is above other states in the same hierarchy.

Capabilities and Limitations

You can run this check on your library models.

See Also

- "C Syntax for States and Transitions"
- "MAAB Control Algorithm Modeling" guidelines

Check return value assignments of graphical functions in Stateflow charts

Identify graphical functions with multiple assignments of return values in Stateflow charts.

Description

The return value from a Stateflow graphical function must be set in only one place.

See MAAB guideline jc_0511: Setting the return value from a graphical function.

Results and Recommended Actions

Condition	Recommended Action
The return value from a Stateflow graphical function is assigned in multiple places.	Modify the specified graphical function so that its return value is set in one place.

Capabilities and Limitations

- This check does not support charts that use MATLAB as the action language.
- You can run this check on your library models.

See Also

- “When to Use Reusable Functions in State Charts” in the Stateflow documentation
- “MAAB Control Algorithm Modeling” guidelines

Check entry formatting in State blocks in Stateflow charts

Identify missing line breaks between entry action (`en`), during action (`du`), and exit action (`ex`) entries in states. Identify missing line breaks after semicolons (`;`) in statements.

Description

Start a new line after the `entry`, `during`, and `exit` entries, and after the completion of a statement "`;`".

See MAAB guideline jc_0501: Format of entries in a State block.

Results and Recommended Actions

Condition	Recommended Action
An `entry` (`en`) is not on a new line.	Add a new line after the `entry`.
A `during` (`du`) is not on a new line.	Add a new line after the `during`.
An `exit` (`ex`) is not on a new line.	Add a new line after the `exit`.
Multiple statements found on one line.	Add a new line after each statement.

Capabilities and Limitations

- This check does not support charts that use MATLAB as the action language.
- You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check usage of return values from a graphical function in Stateflow charts

Identify calls to graphical functions in conditional expressions.

Description

Do not use the return value of a graphical function in a comparison operation.

See MAAB guideline jc_0521: Use of the return value from graphical functions.

Results and Recommended Actions

Condition	Recommended Action
Conditional expressions contain calls to graphical functions.	Assign return values of graphical functions to intermediate variables. Use these intermediate variables in the specified conditional expressions.

Capabilities and Limitations

- This check does not support charts that use MATLAB as the action language.
- You can run this check on your library models.

See Also

- "When to Use Reusable Functions in State Charts" in the Stateflow documentation
- "Graphical Functions for Reusing Logic Patterns" in the Stateflow documentation
- "MAAB Control Algorithm Modeling" guidelines

Check for pointers in Stateflow charts

Identify pointer operations on custom code variables.

Description

Pointers to custom code variables are not allowed.

See MAAB guideline jm_0011: Pointers in Stateflow.

Results and Recommended Actions

Condition	Recommended Action
Custom code variables use pointer operations.	Modify the specified chart to remove the dependency on pointer operations.

Capabilities and Limitations

- This check does not support charts that use MATLAB as the action language.
- You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for event broadcasts in Stateflow charts

Identify undirected event broadcasts that might cause recursion during simulation and generate inefficient code.

Description

Event broadcasts in Stateflow charts must be directed.

See MAAB guideline jm_0012: Event broadcasts

Results and Recommended Actions

Condition	Recommended Action
Event broadcasts are undirected.	Rearchitect the diagram to use directed event broadcasting. Use the send syntax or qualified event names to direct the event to a particular state. Use multiple send statements to direct an event to more than one state.

Capabilities and Limitations

- This check does not support charts that use MATLAB as the action language.
- You can run this check on your library models.

See Also

- “Broadcasting Events to Synchronize States” in the Stateflow documentation
- “MAAB Control Algorithm Modeling” guidelines

Check transition actions in Stateflow charts

Identify missing line breaks between transition actions.

Description

For readability, start each transition action on a new line.

See MAAB guideline db_0151: State machine patterns for transition actions.

Results and Recommended Actions

Condition	Recommended Action
Multiple transition actions are on a single line.	Verify that each transition action begins on a new line.

Capabilities and Limitations

- This check does not support charts that use MATLAB as the action language.
- You can run this check on your library models.

See Also

- "C Syntax for States and Transitions"
- "MAAB Control Algorithm Modeling" guidelines

Check for MATLAB expressions in Stateflow charts

Identify Stateflow objects that use MATLAB expressions that are not suitable for code generation.

Description

Do not use MATLAB functions, instructions, and operators in Stateflow objects.

See MAAB guideline db_0127: MATLAB commands in Stateflow.

Results and Recommended Actions

Condition	Recommended Action
Stateflow objects use MATLAB expressions.	Replace MATLAB expressions in Stateflow objects.

Capabilities and Limitations

- This check does not support charts that use MATLAB as the action language.
- You can run this check on your library models.

See Also

- “Access Built-In MATLAB Functions and Workspace Data” in the Stateflow documentation
- “MAAB Control Algorithm Modeling” guidelines

Check for indexing in blocks

Check for blocks that do not use one-based indexing.

Description

One-based indexing ([1, 2, 3,...]) is used for the following:

Product	Items
MATLAB	• Workspace variables and structures • Local variables of MATLAB functions • Global variables
Simulink	• Signal vectors and matrices • Parameter vectors and matrices • S-function input and output signal vectors and matrices in MATLAB-code • S-function parameter vectors and matrices in MATLAB-code • S-function local variables in MATLAB-code

Zero-based indexing ([0, 1, 2, ...]) is used for the following:

Product	Items
Simulink	• S-function input and output signal vectors and matrices in C code • S-function input parameters in C code • S-function parameter vectors and matrices in C code • S-function local variables in C code
Stateflow	• Input and output signal vectors and matrices • Parameter vectors and matrices • Local variables

Product	Items
	• Variables and structures in custom C code
C code	• Local variables and structures • Global variables

See MAAB guideline db_0112: Indexing.

Results and Recommended Actions

Condition	Recommended Action
Blocks in your model are not configured for one-based indexing.	Using block parameters, configure all blocks for one-based indexing.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check file names

Checks the names of all files residing in the same folder as the model

Description

See MAAB guideline ar_0001: Filenames.

Results and Recommended Actions

Condition	Recommended Action
The file name contains illegal characters.	Rename the file. Allowed characters are a–z, A–Z, 0–9. and underscore (_).
The file name starts with a number.	Rename the file.
The file name starts with an underscore ("_").	Rename the file.
The file name ends with an underscore ("_").	Rename the file.
The file extension contains one (or more) underscores.	Change the file extension.
The file name has consecutive underscores.	Rename the file.
The file name contains more than one dot (".").	Rename the file.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check folder names

Checks model directory and subdirectory names for invalid characters.

Description

See MAAB guideline ar_0002: Directory names.

Results and Recommended Actions

Condition	Recommended Action
The directory name contains illegal characters.	Rename the directory. Allowed characters are a–z, A–Z, 0–9. and underscore (_).
The directory name starts with a number.	Rename the directory.
The directory name starts with an underscore ("_").	Rename the directory.
The directory name ends with an underscore ("_").	Rename the directory.
The directory name has consecutive underscores.	Rename the directory.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for prohibited blocks in discrete controllers

Check for prohibited blocks in discrete controllers.

Description

You cannot include continuous blocks in controller models.

See MAAB guideline jm_0001: Prohibited Simulink standard blocks inside controllers.

Results and Recommended Actions

Condition	Recommended Action
Continuous blocks — Derivative, Integrator, State-Space, Transfer Fcn, Transfer Delay, Variable Time Delay, Variable Transport Delay, and Zero-Pole — are not permitted in models representing discrete controllers.	Replace continuous blocks with the equivalent blocks discretized in the s-domain by using the Discretizing library, as explained in "Discretize Blocks from the Simulink Model" in the Simulink documentation.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for prohibited sink blocks

Check for prohibited Simulink sink blocks.

Description

You must design controller models from discrete blocks. Sink blocks, such as the Scope block, are not allowed.

See MAAB guideline hd_0001: Prohibited Simulink sinks.

Results and Recommended Actions

Condition	Recommended Action
Sink blocks are not permitted in discrete controllers.	Remove sink blocks from the model.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check positioning and configuration of ports

Check whether the model contains ports with invalid position and configuration.

Description

In models, ports must comply with the following rules:

- Place Inport blocks on the left side of the diagram. Move the Inport block right only to prevent signal crossings.
- Place Outport blocks on the right side of the diagram. Move the Outport block left only to prevent signal crossings.
- Avoid using duplicate Inport blocks at the subsystem level if possible.
- Do not use duplicate Inport blocks at the root level.

See MAAB guideline db_0042: Port block in Simulink models.

Results and Recommended Actions

Condition	Recommended Action
Inport blocks are too far to the right and result in left-flowing signals.	Move the specified Inport blocks to the left.
Outport blocks are too far to the left and result in right-flowing signals.	Move the specified Output blocks to the right.
Ports do not have the default orientation.	Modify the model diagram such that signal lines for output ports enter the side of the block and signal lines for input ports exit the right side of the block.
Ports are duplicate Inport blocks.	• If the duplicate Inport blocks are in a subsystem, remove them where possible. • If the duplicate Inport blocks are at the root level, remove them.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for matching port and signal names

Check for mismatches between names of ports and corresponding signals.

Description

Use matching names for ports and their corresponding signals.

See MAAB guideline jm_0010: Port block names in Simulink models.

Prerequisite

Prerequisite MAAB guidelines for this check are:

- db_0042: Port block in Simulink models
- na_0005: Port block name visibility in Simulink models

Results and Recommended Actions

Condition	Recommended Action
Ports have names that differ from their corresponding signals.	Change the port name or the signal name to match the name for the signal.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check whether block names appear below blocks

Check whether block names appear below blocks.

Description

If shown, the name of the block should appear below the block.

See MAAB guideline db_0142: Position of block names.

Results and Recommended Actions

Condition	Recommended Action
Blocks have names that do not appear below the blocks.	Set the name of the block to appear below the blocks.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for mixing basic blocks and subsystems

Check for systems that mix primitive blocks and subsystems.

Description

You must design each level of a model with building blocks of the same type, for example, only subsystems or only primitive (basic) blocks. If you mask your subsystem and set MaskType to a non-empty string, the subsystem is seen as a basic block.

See MAAB guideline db_0143: Similar block types on the model levels.

Results and Recommended Actions

Condition	Recommended Action
A level in the model includes both subsystem blocks and primitive blocks.	Move nonvirtual blocks into the subsystem.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for unconnected ports and signal lines

Check whether model has unconnected input ports, output ports, or signal lines.

Description

Unconnected inputs should be connected to ground blocks. Unconnected outputs should be connected to terminator blocks.

See MAAB guideline db_0081: Unconnected signals, block inputs and block outputs.

Results and Recommended Actions

Condition	Recommended Action
Blocks have unconnected inputs or outputs.	Connect unconnected lines to blocks specified by the design or to Ground or Terminator blocks.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check position of Trigger and Enable blocks

Check the position of Trigger and Enable blocks.

Description

Locate blocks that define subsystems as conditional or iterative at the top of the subsystem diagram.

See MAAB guideline db_0146: Triggered, enabled, conditional Subsystems.

Results and Recommended Actions

Condition	Recommended Action
Trigger , Enable, and Action Port blocks are not centered in the upper third of the model diagram.	Move the Trigger, Enable, and Action Port blocks to the upper third of the model diagram.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check use of tunable parameters in blocks

Check whether tunable parameters specify expressions, data type conversions, or indexing operations.

Description

To make a parameter tunable, you must enter the basic block without the use of MATLAB calculations or scripting. For example, omit:

- Expressions
- Data type conversions
- Selections of rows or columns

See MAAB guideline db_0110: Tunable parameters in basic blocks.

Results and Recommended Actions

Condition	Recommended Action
Blocks have a tunable parameter that specifies an expression, data type conversion, or indexing operation.	In each case, move the calculation outside of the block, for example, by performing the calculation with a series of Simulink blocks, or precompute the value in the base workspace as a new variable.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check Stateflow data objects with local scope

Check whether Stateflow data objects with local scope are defined at the chart level or below.

Description

You must define local data of a Stateflow block on the chart level or below in the object hierarchy. You cannot define local variables on the machine level; however, parameters and constants are allowed at the machine level.

See MAAB guideline db_0125: Scope of internal signals and local auxiliary variables.

Results and Recommended Actions

Condition	Recommended Action
Local data is not defined in the Stateflow hierarchy at the chart level or below.	Define local data at the chart level or below.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for Strong Data Typing with Simulink I/O

Check whether labeled Stateflow and Simulink input and output signals are strongly typed.

Description

Strong data typing between Stateflow and Simulink input and output signals is required.

See MAAB guideline db_0122: Stateflow and Simulink interface signals and parameters.

Results and Recommended Actions

Condition	Recommended Action
A Stateflow chart does not use strong data typing with Simulink.	Select the **Use Strong Data Typing with Simulink I/O** check box for the specified block.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check usage of exclusive and default states in state machines

Check states in state machines.

Description

In state machines:

- There must be at least two exclusive states.
- A state cannot have only one substate.
- The initial state of a hierarchical level with exclusive states is clearly defined by a default transition.

See MAAB guideline db_0137: States in state machines.

Prerequisite

A prerequisite MAAB guideline for this check is db_0149: Flowchart patterns for condition actions.

Results and Recommended Actions

Condition	Recommended Action
A system is underspecified.	Validate that the intended design is represented in the Stateflow diagram.
Chart has only one exclusive (OR) state.	Make the state a parallel state, or add another exclusive (OR) state.
Chart does not have a default state defined.	Define a default state.
Chart has multiple default states defined.	Define only one default state. Make the others nondefault.
State has only one exclusive (OR) substate.	Make the state a parallel state, or add another exclusive (OR) state.

Condition	Recommended Action
State does not have a default substate defined.	Define a default substate.
State has multiple default substates defined.	Define only one default substate, make the others nondefault.

Capabilities and Limitations

- This check does not support charts that use MATLAB as the action language.
- You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check Implement logic signals as Boolean data (vs. double)

Check the optimization parameter for Boolean data types.

Description

Optimization for Boolean data types is required

See MAAB guideline jc_0011: Optimization parameters for Boolean data types.

Prerequisite

A prerequisite MAAB guideline for this check is na_0002: Appropriate implementation of fundamental logical and numerical operations.

Results and Recommended Actions

Condition	Recommended Action
Configuration setting for **Implement logic signals as boolean data (vs. double)** is not set.	Select the **Implement logic signals as boolean data (vs. double)** check box in the Configuration Parameters dialog box **Optimization** pane.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check model diagnostic parameters

Check the model diagnostics configuration parameter settings.

Description

You should enable the following diagnostics:

Algebraic loop
Minimize algebraic loop
Inf or NaN block output
Duplicate data store names
Unconnected block input ports
Unconnected block output ports
Unconnected line
Unspecified bus object at root Outport block
Mux blocks used to create bus signals
Element name mismatch
Invalid function-call connection

Diagnostics not listed in the Results and Recommended Actions section below can be set to any value.

See MAAB guideline jc_0021: Model diagnostic settings.

Results and Recommended Actions

Condition	Recommended Action
Algebraic loop is set to `none`.	Set **Algebraic loop** on the **Diagnostics > Solver** pane of the Configuration Parameters dialog box to `error` or `warning`. Otherwise, Simulink might attempt to automatically break the algebraic loops, which can impact the execution order of the blocks.
Minimize algebraic loop is set to `none`.	Set **Minimize algebraic loop** on the **Diagnostics > Solver** pane of the Configuration Parameters dialog box to `error` or `warning`. Otherwise, Simulink

Condition	Recommended Action
	might attempt to automatically break the algebraic loops for reference models and atomic subsystems, which can impact the execution order for those models or subsystems.
Inf or NaN block output is set to `none`, which can result in numerical exceptions in the generated code.	Set **Inf or NaN block output** on the **Diagnostics > Data Validity > Signals** pane of the Configuration Parameters dialog box to `error` or `warning`.
Duplicate data store names is set to `none`, which can result in nonunique variable naming in the generated code.	Set **Duplicate data store names** on the **Diagnostics > Data Validity > Signals** pane of the Configuration Parameters dialog box to `error` or `warning`.
Unconnected block input ports is set to `none`, which prevents code generation.	Set **Unconnected block input ports** on the **Diagnostics > Data Validity > Signals** pane of the Configuration Parameters dialog box to `error` or `warning`.
Unconnected block output ports is set to `none`, which can lead to dead code.	Set **Unconnected block output ports** on the **Diagnostics > Data Validity > Signals** pane of the Configuration Parameters dialog box to `error` or `warning`.
Unconnected line is set to `none`, which prevents code generation.	Set **Unconnected line** on the **Diagnostics > Connectivity > Signals** pane of the Configuration Parameters dialog box to `error` or `warning`.
Unspecified bus object at root Outport block is set to `none`, which can lead to an unspecified interface if the model is referenced from another model.	Set **Unspecified bus object at root Outport block** on the **Diagnostics > Connectivity > Buses** pane of the Configuration Parameters dialog box to `error` or `warning`.
Mux blocks used to create bus signals is set to `none`, which can lead to an unintended bus being created in the model.	Set **Mux blocks used to create bus signals** on the **Diagnostics > Connectivity > Buses** pane of the Configuration Parameters dialog box to `error` or `warning`.

Condition	Recommended Action
Element name mismatch is set to `none`, which can lead to an unintended interface in the generated code.	Set **Element name mismatch** on the **Diagnostics > Connectivity > Buses** pane of the Configuration Parameters dialog box to `error` or `warning`.
Invalid function-call connection is set to `none`, which can lead to an error in the operation of the generated code.	Set **Invalid function-call connection** on the **Diagnostics > Connectivity > Function Calls** pane of the Configuration Parameters dialog box to `error` or `warning`, since this condition can lead to an error in the operation of the generated code.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check the display attributes of block names

Check the display attributes of block names.

Description

Block names should be displayed when providing descriptive information. Block names should not be displayed if the block function is known from its appearance.

See MAAB guideline jc_0061: Display of block names.

Results and Recommended Actions

Condition	Recommended Action
Block name is not descriptive.	These block names should be modified to be more descriptive or not be shown.
Block name is not displayed.	These block names should be shown since they appear to have a descriptive name.
Block name is obvious.	These block names should not be displayed.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check display for port blocks

Check the **Icon display** setting for Inport and Outport blocks.

Description

The **Icon display** setting is required.

See MAAB guideline jc_0081: Icon display for Port block.

Results and Recommended Actions

Condition	Recommended Action
The **Icon display** setting is not set.	Set the **Icon display** to `Port number` for the specified Inport and Outport blocks.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check subsystem names

Check whether subsystem block names include invalid characters.

Description

The names of all subsystem blocks are checked for invalid characters.

See MAAB guideline jc_0201: Usable characters for Subsystem names.

Results and Recommended Actions

Condition	Recommended Action
The subsystem name contains illegal characters.	Rename the subsystem. Allowed characters include a–z, A–Z, 0–9, underscore (_), and period (.).
The subsystem name starts with a number.	Rename the subsystem.
The subsystem name starts with an underscore ("_").	Rename the subsystem.
The subsystem name ends with an underscore ("_").	Rename the subsystem.
The subsystem name has consecutive underscores.	Rename the subsystem.
The subsystem name has blank spaces.	Rename the subsystem.

Capabilities and Limitations

You can run this check on your library models.

Tips

Use underscores to separate parts of a subsystem name instead of spaces.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check port block names

Check whether Inport and Outport block names include invalid characters.

Description

The names of all Inport and Outport blocks are checked for invalid characters.

See MAAB guideline jc_0211: Usable characters for Inport blocks and Outport blocks.

Results and Recommended Actions

Condition	Recommended Action
The block name contains illegal characters.	Rename the block. Allowed characters include a–z, A–Z, 0–9, underscore (_), and period (.).
The block name starts with a number.	Rename the block.
The block name starts with an underscore ("_").	Rename the block.
The block name ends with an underscore ("_").	Rename the block.
The block name has consecutive underscores.	Rename the block.
The block name has blank spaces.	Rename the block.

Capabilities and Limitations

You can run this check on your library models.

Tips

Use underscores to separate parts of a block name instead of spaces.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check character usage in signal labels

Check whether signal line names include invalid characters.

Description

The names of all signal lines are checked for invalid characters.

See MAAB guideline jc_0221: Usable characters for signal line names.

Results and Recommended Actions

Condition	Recommended Action
The signal line name contains illegal characters.	Rename the signal line. Allowed characters include a–z, A–Z, 0–9, underscore (_), and period (.).
The signal line name starts with a number.	Rename the signal line.
The signal line name starts with an underscore ("_").	Rename the signal line.
The signal line name ends with an underscore ("_").	Rename the signal line.
The signal line name has consecutive underscores.	Rename the signal line.
The signal line name has blank spaces.	Rename the signal line.
The signal line name has control characters.	Rename the signal line.

Capabilities and Limitations

You can run this check on your library models.

Tips

Use underscores to separate parts of a signal line name instead of spaces.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check character usage in block names

Check whether block names include invalid characters.

Description

The block names are checked for invalid characters.

This guideline does not apply to subsystem blocks.

See MAAB guideline jc_0231: Usable characters for block names.

Prerequisite

A prerequisite MAAB guideline for this check is jc_0201: Usable characters for Subsystem names.

Results and Recommended Actions

Condition	Recommended Action
The block name contains illegal characters.	Rename the block. Allowed characters include a–z, A–Z, 0–9, underscore (_), and period (.).
The block name starts with a number.	Rename the block.
The block name has blank spaces.	Rename the block.
The block name has double byte characters.	Rename the block.

Capabilities and Limitations

You can run this check on your library models.

Tips

Carriage returns are allowed in block names.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check Trigger and Enable block names

Check Trigger and Enable block port names.

Description

Block port names should match the name of the signal triggering the subsystem.

See MAAB guideline jc_0281: Naming of Trigger Port block and Enable Port block.

Results and Recommended Actions

Condition	Recommended Action
Trigger block does not match the name of the signal to which it is connected.	Match Trigger block names to the connecting signal.
Enable block does not match the name of the signal to which it is connected.	Match Enable block names to the connecting signal.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for Simulink diagrams using nonstandard display attributes

Check model appearance setting attributes.

Description

Model appearance settings are required to conform to the guidelines when the model is released.

See MAAB guideline na_0004: Simulink model appearance.

Results and Recommended Actions

Condition	Recommended Action
Diagrams do not have white backgrounds.	Select **Diagram > Format > Canvas Color > White**.
Diagrams do not have zoom factor set to 100%.	Select **View > Normal (100%)**.
The toolbar is not visible.	Select **View > Zoom > Toolbar**.
Block backgrounds are not white.	Blocks should have black foregrounds with white backgrounds. Click the specified block and select **Format > Foreground Color > Black** and **Format > Background Color > White**.
Wide Nonscalar Lines is cleared.	Select **Display > Signals & Ports > Wide Nonscalar Lines**.
Viewer Indicators is cleared.	Select **Display > Signals & Ports > Viewer Indicators**.
Testpoint Indicators is cleared.	Select **Display > Signals & Ports > Testpoint & Logging Indicators**.

Condition	Recommended Action
Port Data Types is selected.	Clear **Display > Signals & Ports > Port Data Types**.
Storage Class is selected.	Clear **Display > Signals & Ports > Storage Class**.
Signal Dimensions is selected.	Clear **Display > Signals & Ports > Signal Dimensions**.
Model Browser is selected.	Clear **View > Model Browser > Show Model Browser**.
Sorted Execution Order is selected.	Clear **Display > Blocks > Sorted Execution Order**.
Model Block Version is selected.	Clear **Display > Blocks > Block Version for Referenced Models**.
Model Block I/O Mismatch is selected.	Clear **Display > Blocks > Block I/O Mismatch for Referenced Models**.
Library Links is set to **Disabled**, **User Defined** or **All**.	Select **Display > Library Links > None**.
Linearization Indicators is cleared.	Select **Display > Signals & Ports > Linearization Indicators**.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check visibility of block port names

Check the visibility of port block names.

Description

An organization applying the MAAB guidelines must select one of the following alternatives to enforce:

- The name of port blocks are not hidden.
- The name of port blocks must be hidden.

See MAAB guideline na_0005: Port block name visibility in Simulink models.

Input Parameters

All Port names should be shown (Format/Show Name)
Select this check box if all ports should show the name, including subsystems.

Results and Recommended Actions

Condition	Recommended Action
Blocks do not show their name and the **All Port names should be shown (Format/Show Name)** check box is selected.	Change the format of the specified blocks to show names according to the input requirement.
Blocks show their name and the **All Port names should be shown (Format/Show Name)** check box is cleared.	Change the format of the specified blocks to hide names according to the input requirement.
Subsystem blocks do not show their port names.	Set the subsystem parameter **Show port labels** to a value other than `none`.
Subsystem blocks show their port names.	Set the subsystem parameter **Show port labels** to `none`.

Capabilities and Limitations

- You can run this check on your library models.
- This check does not look in masked subsystems.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check orientation of Subsystem blocks

Check the orientation of subsystem blocks.

Description

Subsystem inputs must be located on the left side of the block, and outputs must be located on the right side of the block.

See MAAB guideline jc_0111: Direction of Subsystem.

Results and Recommended Actions

Condition	Recommended Action
Subsystem blocks are not using the right orientation	Rotate the subsystem so that inputs are on the left side of block and outputs are on the right side of the block.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check configuration of Relational Operator blocks

Check the position of Constant blocks used in Relational Operator blocks.

Description

When the relational operator is used to compare a signal to a constant value, the constant input should be the second, lower input.

See MAAB guideline jc_0131: Use of Relational Operator block.

Results and Recommended Actions

Condition	Recommended Action
Relational Operator blocks have a Constant block on the first, upper input.	Move the Constant block to the second, lower input.

Capabilities and Limitations

You can run this check on your library models.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check use of Switch blocks

Check use of Switch blocks.

Description

This check verifies that the Switch block's control input (the second input) is a Boolean value and that the block is configured to pass the first input when the control input is nonzero.

See MAAB guideline jc_0141: Use of the Switch block.

Results and Recommended Actions

Condition	Recommended Action
The Switch block's control input (second input) is not a Boolean value.	Change the data type of the control input to Boolean.
The Switch block is not configured to pass the first input when the control input is nonzero.	Set the block parameter **Criteria for passing first input** to u2 ~=0.

See Also

- See the description of the Switch block in the Simulink documentation.
- "MAAB Control Algorithm Modeling" guidelines

Check for signal bus and Mux block usage

Check all signal busses and Mux block usage.

Description

This check verifies the usage of signal buses and Mux blocks.

See MAAB guideline na_0010: Grouping data flows into signals.

Results and Recommended Actions

Condition	Recommended Action
The individual scalar input signals for a Mux block do not have common functionality, data types, dimensions, and units.	Modify the scalar input signals such that the specifications match.
The output of a Mux block is not a vector.	Change the output of the Mux block to a vector.
All inputs to a Mux block are not scalars.	Make sure that all input signals to Mux blocks are scalars.
The input for a Bus Selector block is not a bus signal.	Make sure that the input for all Bus Selector blocks is a bus signal.

See Also

- "Composite Signals"
- "MAAB Control Algorithm Modeling" guidelines

Check for bitwise operations in Stateflow charts

Identify bitwise operators (&, |, and ^) in Stateflow charts. If you select **Enable C-bit operations** for a chart, only bitwise operators in expressions containing Boolean data types are reported. Otherwise, all bitwise operators are reported for the chart.

Description

Do not use bitwise operators in Stateflow charts, unless you enable bitwise operations.

See MAAB guideline na_0001: Bitwise Stateflow operators.

Results and Recommended Actions

Condition	Recommended Action
Stateflow charts with **Enable C-bit operations** selected use bitwise operators (&, |, and ^) in expressions containing Boolean data types.	Do not use Boolean data types in the specified expressions.
The Model Advisor could not determine the data types in expressions with bitwise operations.	To allow Model Advisor to determine the data types, consider explicitly typecasting the specified expressions.
Stateflow charts with **Enable C-bit operations** cleared use bitwise operators (&, |, and ^).	To fix this issue, do either of the following: • Modify the expressions to replace bitwise operators. • If not using Boolean data types, consider enabling bitwise operations. In the Chart properties dialog box, select **Enable C-bit operations**.

Capabilities and Limitations

This check does not support charts that use MATLAB as the action language.

See Also

- "Binary and Bitwise Operations" in the Stateflow documentation
- "MAAB Control Algorithm Modeling" guidelines

Check for comparison operations in Stateflow charts

Identify comparison operations with different data types in Stateflow objects.

Description

Comparisons should be made between variables of the same data types.

See MAAB guideline na_0013: Comparison operation in Stateflow

Results and Recommended Actions

Condition	Recommended Action
Comparison operations with different data types were found.	Revisit the specified operations to avoid comparison operations with different data types.
The Model Advisor could not determine the data types in expressions with comparison operations.	To allow Model Advisor to determine the data types, consider explicitly typecasting the specified expressions.

Capabilities and Limitations

This check does not support charts that use MATLAB as the action language.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for unary minus operations on unsigned integers in Stateflow charts

Identify unary minus operations applied to unsigned integers in Stateflow objects.

Description

Do not perform unary minus operations on unsigned integers in Stateflow objects.

See MAAB guideline jc_0451: Use of unary minus on unsigned integers in Stateflow

Results and Recommended Actions

Condition	Recommended Action
Unary minus operations are applied to unsigned integers in Stateflow objects.	Modify the specified objects to remove dependency on unary minus operations.
The Model Advisor could not determine the data types in expressions with unary minus operations.	To allow Model Advisor to determine the data types, consider explicitly typecasting the specified expressions.

Capabilities and Limitations

This check does not support charts that use MATLAB as the action language.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for equality operations between floating-point expressions in Stateflow charts

Identify equal to operations (==) in expressions where at least one side of the expression is a floating-point variable or constant.

Description

Do not use equal to operations with floating-point data types. You can use equal to operations with integer data types.

See MAAB guideline jc_0481: Use of hard equality comparisons for floating point numbers in Stateflow

Results and Recommended Actions

Condition	Recommended Action
Expressions use equal to operations (==) where at least one side of the expression is a floating-point variable or constant.	Modify the specified expressions to avoid equal to operations between floating-point expressions. If an equal to operation is required, a margin of error should be defined and used in the operation.
The Model Advisor could not determine the data types in expressions with equality operations.	To allow Model Advisor to determine the data types, consider explicitly typecasting the specified expressions.

Capabilities and Limitations

This check does not support charts that use MATLAB as the action language.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check for mismatches between names of Stateflow ports and associated signals

Check for mismatches between Stateflow ports and associated signal names.

Description

The name of Stateflow input and output should be the same as the corresponding signal.

See MAAB guideline db_0123: Stateflow port names.

Results and Recommended Actions

Condition	Recommended Action
Signals have names that differ from those of their corresponding Stateflow ports.	Change the names of either the signals or the Stateflow ports.

See Also

"MAAB Control Algorithm Modeling" guidelines

Check scope of From and Goto blocks

Check the scope of From and Goto blocks.

Description

You can use global scope for controlling flow. However, From and Goto blocks must use local scope for signal flows.

See MAAB guideline na_0011: Scope of Goto and From blocks.

Results and Recommended Actions

Condition	Recommended Action
From and Goto blocks are not configured with local scope.	• Make sure the ports are connected • Change the scope of the specified blocks to local.

See Also

"MAAB Control Algorithm Modeling" guidelines

Requirements Consistency Checks

In this section...

Identify requirement links with missing documents

Verify that requirements link to existing documents.

Description

You used the Requirements Management Interface (RMI) to associate a design requirements document with a part of your model design and the interface cannot find the specified document.

Results and Recommended Actions

Condition	Recommended Action
The requirements document associated with a part of your model design is not accessible at the specified location.	Open the Requirements dialog box and fix the path name of the requirements document or move the document to the specified location.

Tips

If your model has links to a DOORS requirements document, to run this check, the DOORS software must be open and you must be logged in.

See Also

"Maintaining Requirements Links"

Identify requirement links that specify invalid locations within documents

Verify that requirements link to valid locations (e.g., bookmarks, line numbers, anchors) within documents.

Description

You used the Requirements Management Interface (RMI) to associate a location in a design requirements document (a bookmark, line number, or anchor) with a part of your model design and the interface cannot find the specified location in the specified document.

Results and Recommended Actions

Condition	Recommended Action
The location in the requirements document associated with a part of your model design is not accessible.	Open the Requirements dialog box and fix the location reference within the requirements document.

Tips

If your model has links to a DOORS requirements document, to run this check, the DOORS software must be open and you must be logged in.

If your model has links to a Microsoft Word or Microsoft Excel document, to run this check, those applications must be closed on your computer.

See Also

"Maintaining Requirements Links"

Identify selection-based links having descriptions that do not match their requirements document text

Verify that descriptions of selection-based links use the same text found in their requirements documents.

Description

You used selection-based linking of the Requirements Management Interface (RMI) to label requirements in the model's **Requirements** menu with text that appears in the corresponding requirements document. This check helps you manage traceability by identifying requirement descriptions in the menu that are not synchronized with text in the documents.

Results and Recommended Actions

Condition	Recommended Action
Selection-based links have descriptions that differ from their corresponding selections in the requirements documents.	If the difference reflects a change in the requirements document, click **Update** in the Model Advisor results to replace the current description in the selection-based link with the text from the requirements document (the external description). Alternatively, you can right-click the object in the model window, select **Edit/Add Links** from the **Requirements** menu, and use the Requirements dialog box that appears to synchronize the text.

Tips

If your model has links to a DOORS requirements document, to run this check, the DOORS software must be open and you must be logged in.

If your model has links to a Microsoft Word or Microsoft Excel document, to run this check, those applications must be closed on your computer.

See Also

"Links Between Models and Requirements"

Identify requirement links with path type inconsistent with preferences

Check that requirement paths are of the type selected in the preferences.

Description

You are using the Requirements Management Interface (RMI) and the paths specifying the location of your requirements documents differ from the file reference type set as your preference.

Results and Recommended Actions

Condition	Recommended Action
The paths indicating the location of requirements documents use a file reference type that differs from the preference specified in the Requirements Settings dialog box, on the **Selection Linking** tab.	Change the preferred document file reference type or the specified paths by doing one of the following: • Click **Fix** to change the current path to the valid path. • In the model window, select **Analysis > Requirements > Settings**, select the **Selection Linking** tab, and change the value for the **Document file reference** option.

Linux Check for Absolute Paths

On Linux® systems, this check is named **Identify requirement links with absolute path type**. The check reports warnings for requirements links that use an absolute path.

The recommended action is:

1. Right-click the model object and select **Requirements > Edit/Add Links**.
2. Modify the path in the Document field to use a path relative to the current working folder or the model location.

See Also

"Links Between Models and Requirements"

Index

P

R