

Reactis V2012

Released June 14, 2012



New Simulink Support

- ▶ MATLAB R2012a
- ▶ Initial support for Embedded MATLAB

Simulink

- ▶ MATLAB Function block (previously called Embedded MATLAB Function block)
- ▶ Truth Table block

Stateflow

- ▶ MATLAB Functions
- ▶ Truth Table functions with MATLAB language option

Initial Embedded MATLAB Subset

- ▶ Types: double, single, logical
- ▶ Control flow
 - ▶ if statements
 - ▶ while loops
 - ▶ for loops
 - ▶ switch statements
- ▶ Logical operators
- ▶ Relational operators
- ▶ Math functions: +, -, *, /, ^, sin, cos, tan, asin, acos, atan, sinh, cosh, tanh, exp, log, log10, sqrt, fix, floor, ceil, round, sign, abs
- ▶ Matrix operations: transpose, addition, subtraction, multiplication, inv, zeros, ones, eye, diag
- ▶ Vector operations: size, min, max, length, sum, prod, dot
- ▶ Array indexing with scalars or vectors
- ▶ Colon notation: [min:max], [min:step:max]
- ▶ Functions and subfunctions
- ▶ Local and persistent variables

Faster Model Initialization

- ▶ Optimizations improve initialization speed for models with:
 - ▶ Large amounts of data in the workspace
 - ▶ Very large search paths
- ▶ One automotive OEM model went from 30 to 2 minutes

Use Precompiled C Libraries without Source Code

New feature will let you:

1. Compile a C library (using Reactis) (.rsls, .rslc)
2. Use the pre-compiled library in models without source code

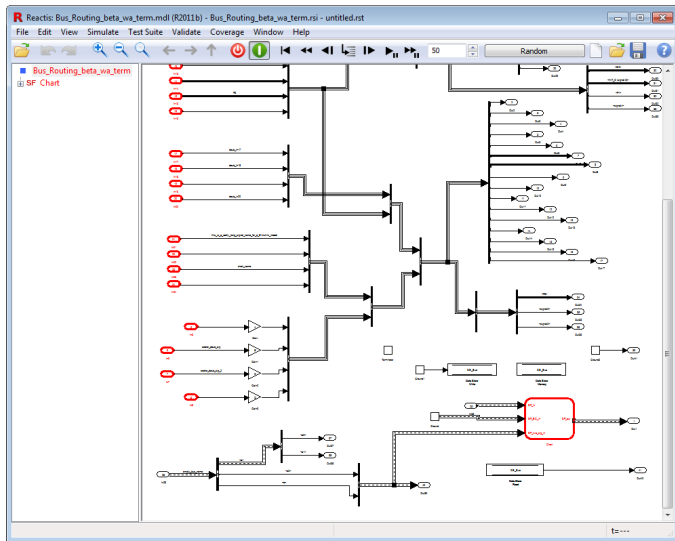
Library will be treated as a black box:

- ▶ No coverage tracking
- ▶ No stepping into C code

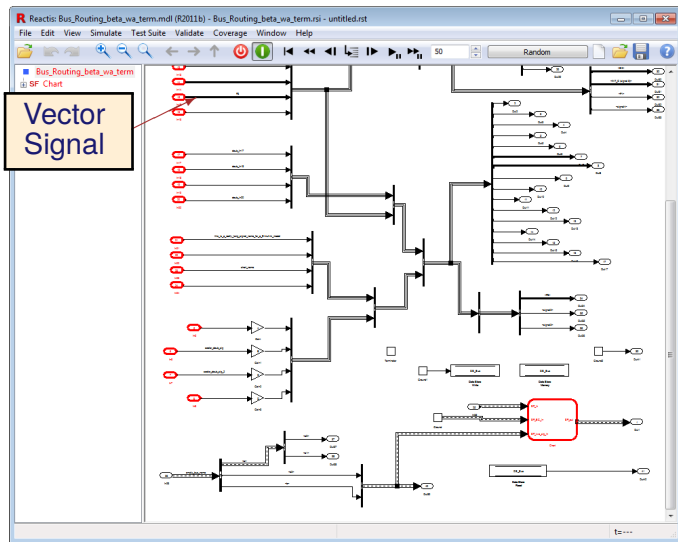
Improved Support for Buses

- ▶ Bus signal line drawing enhancements
- ▶ Graphical editor for constraints of top-level bus inputs
- ▶ Improved data monitoring:
 - ▶ See bus element names when hovering
 - ▶ Open watched variable or scope on bus element
- ▶ Improved import/export
 - ▶ CSV - bus (or vector) elements in separate columns
 - ▶ Import GUI to map bus elements
- ▶ runtests supports bus inputs
- ▶ Constant blocks with bus type

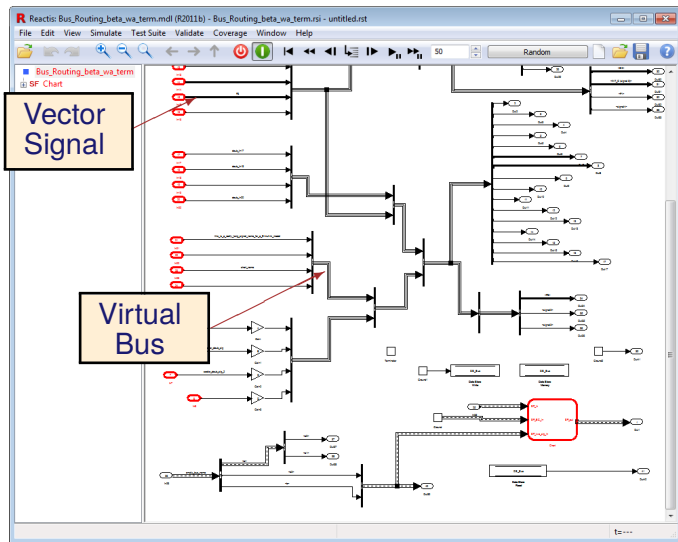
Bus Signal Line Drawing



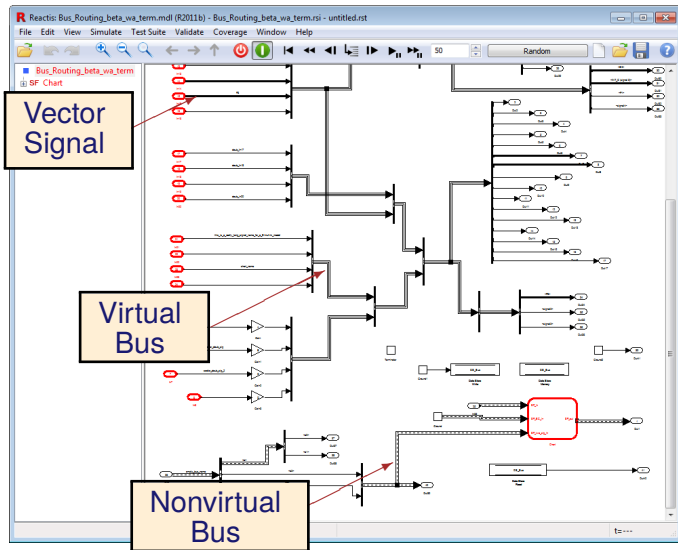
Bus Signal Line Drawing



Bus Signal Line Drawing



Bus Signal Line Drawing



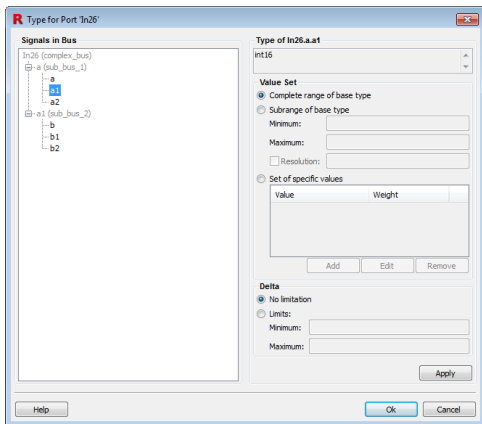
Type Editor for Top-Level Bus Inputs

Pre-V2012 had to edit bus inputs using text notation:

Type for Port 'In25'

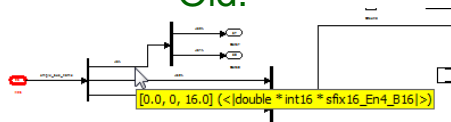
```
complex_bus : {a:sub_bus_1 : {a:double, a1:int16, a2:sfix16_En4_B8X5}, b1:sub_bus_2 : {b:double, b1:int16, b2:sfix16_En3}}
```

V2012 introduces graphical editor:

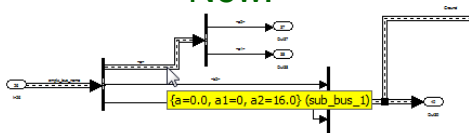


Improved Hover Display

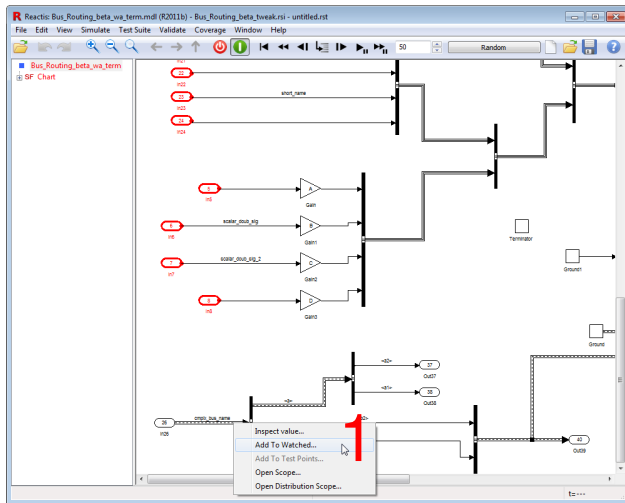
Old:



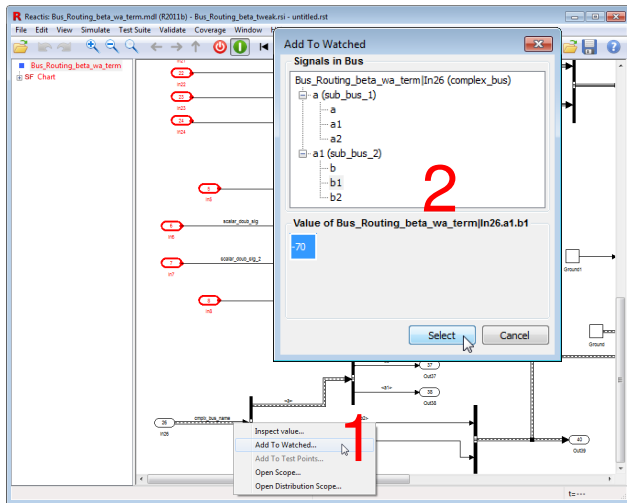
New:



Add Individual Bus Elements to Watch List



Add Individual Bus Elements to Watch List



Add Individual Bus Elements to Watch List

The screenshot shows a logic analyzer window titled "Reactis: Bus_Routing_beta_wa_term.mdl (R2011b) - Bus_Routing_beta_tweak.rst". The main window displays a circuit diagram with various bus signals. A dialog box titled "Add To Watched" is open, showing a tree view of signals in the bus. The tree view shows the following structure:

```
Bus_Routing_beta_wa_term|In26 (complex_bus)
├── a (sub_bus_1)
│   ├── a
│   ├── a1
│   └── a2
├── a1 (sub_bus_2)
│   ├── b
│   ├── b1
│   └── b2
```

The value of the selected signal, `Bus_Routing_beta_wa_term|In26.a1.b1`, is shown as `-70`. The dialog has "Select" and "Cancel" buttons. A red "2" is overlaid on the tree view.

Below the dialog, a context menu is open over a signal, with the "Add To Watched..." option highlighted. A red "1" is overlaid on this option.

At the bottom of the window, a variable table is visible:

Variable	Value	Type
<code>Bus_Routing_beta_wa_term In26.a1.b1</code>	<code>-70</code>	<code>int16</code>

A red "3" is overlaid on the variable table.

Inspect Value Dialog

Inspect current bus element values

The screenshot shows a simulation window titled "Reactis: Bus_Routing_beta_wa_term.mdl (R2011b) - Bus_Routing_beta_tweak.rsi - untitled.rst". The interface includes a menu bar (File, Edit, View, Simulate, Test Suite, Validate, Coverage, Window, Help), a toolbar with simulation controls, and a main workspace displaying a circuit diagram. The circuit features several input nodes (In23, In24, In5, In6, In7, In8) connected to gain blocks (Gain, Gain1, Gain2, Gain3). A bus element labeled "omplx bus name" is highlighted, and a context menu is open over it, listing options: "Inspect value...", "Add To Watched...", "Add To Test Points...", "Open Scope...", and "Open Distribution Scope...". A data table at the bottom left shows the current value of the bus element.

Variable	Value	Type
Bus_Routing_beta_wa_term In26.a1.b1	-35	int16

At the bottom of the window, it indicates "New Test, Step 3" and "t=0.02".

Inspect Value Dialog

Inspect current bus element values

The screenshot shows the Reactis IDE interface. The main window displays a circuit diagram with various components and signals. A dialog box titled "Inspect value" is open, showing a tree view of signals in a bus. The tree structure is as follows:

- Bus_Routing_beta_wa_term[In26 (complex_bus)
 - a (sub_bus_1)
 - a
 - a1
 - a2
 - a1 (sub_bus_2)
 - b
 - b1
 - b2

The value of the selected signal, Bus_Routing_beta_wa_term[In26.a1.b1, is displayed as -35.

At the bottom of the IDE, a variable table is visible:

Variable	Value	Type
Bus_Routing_beta_wa_term[In26.a1.b1	-35	int16

A context menu is open over the variable table, showing options: "Inspect value...", "Add To Watched...", "Add To Test Points...", "Open Scope...", and "Open Distribution Scope...".

Open Scopes on Individual Bus Elements

The screenshot displays the Reactis software interface for a circuit simulation. The main window shows a circuit diagram with several input elements (In23, In24, In25, In26, In27, In28) connected to gain blocks (Gain, Gain1, Gain2, Gain3). A context menu is open over a bus element, with the 'Open Scope...' option highlighted. A large red number '1' is overlaid on the menu. The bottom status bar indicates 'New Test, Step 53' and 't=0.52'.

Reactis: Bus_Routing_beta_wa_term.mdl (R2011b) - Bus_Routing_beta_tweak.rst - untitled.rst

File Edit View Simulate Test Suite Validate Coverage Window Help

50 Random

Bus_Routing_beta_wa_term

SF Chart

In23

In24

In25

In26

In27

In28

Gain

Gain1

Gain2

Gain3

Terminator

Group

Out27

Out28

Inspect value...

Add To Watched...

Add To Test Points...

Open Scope...

Open Distribution Scope...

1

Variable Value

Bus_Routing_beta_wa_term|n26.a1.b1 -45

New Test, Step 53

t=0.52

Open Scopes on Individual Bus Elements

The screenshot shows a simulation tool interface with a circuit diagram. A context menu is open over a signal element, with the 'Open Scope...' option highlighted. A red number '1' is placed over this menu. An 'Open Scope' dialog box is also open, showing a tree view of signals in the bus. The tree view is as follows:

```
Bus_Routing_beta_wa_term[In26 (complex_bus)
├── a (sub_bus_1)
│   ├── a
│   ├── a1
│   └── a2
└── a1 (sub_bus_2)
    ├── b
    ├── b1
    └── b2
```

A red number '2' is placed over the 'a1 (sub_bus_2)' node in the tree view. Below the tree view, the 'Value of Bus_Routing_beta_wa_term[In26.a1.b1]' is displayed as '-45'. The dialog box has 'Select' and 'Cancel' buttons.

The circuit diagram shows a signal element 'In26' with a value of '-45'. A context menu is open over it, with the 'Open Scope...' option highlighted. The menu items are:

- Inspect value...
- Add To Watched...
- Add To Test Points...
- Open Scope...
- Open Distribution Scope...

The variable table at the bottom of the window shows:

Variable	Value
Bus_Routing_beta_wa_term[In26.a1.b1	-45

The status bar at the bottom indicates 'New Test, Step 53' and 't=0.52'.

Open Scopes on Individual Bus Elements

The screenshot displays a simulation environment with a circuit diagram on the right. A context menu is open over a component labeled 'In26', with the 'Open Scope...' option highlighted. A large red number '1' is placed over this menu. In the center, an 'Open Scope' dialog box is open, showing a tree view of signals under 'Bus_Routing_beta_wa_term|In26 (complex_bus)'. The signal 'a1 (sub_bus_2)' is selected, and its value is shown as '-45'. A large red number '2' is placed over this dialog. On the left, a 'Bus Chart' window shows a signal waveform with a large red number '3' overlaid on it. The chart's y-axis ranges from -80 to 80, and the x-axis ranges from 0 to 0.6. At the bottom, a variable table shows the value of 'Bus_Routing_beta_wa_term|In26.a1.b1' as '-45'. The status bar at the bottom indicates 'New Test, Step 53' and 't=0.52'.

Open Scope

Signals in Bus

- Bus_Routing_beta_wa_term|In26 (complex_bus)
 - a (sub_bus_1)
 - a
 - a1
 - a2
 - a1 (sub_bus_2)
 - b
 - b1
 - b2

Value of Bus_Routing_beta_wa_term|In26.a1.b1

-45

Select Cancel

Inspect value...
Add To Watched...
Add To Test Points...
Open Scope...
Open Distribution Scope...

Variable Value
Bus_Routing_beta_wa_term|In26.a1.b1 -45

New Test, Step 53 t=0.52

Settings Reorganization

Global

- ▶ General tool settings, e.g. language used in GUI and documentation, license configuration.

Model-Specific

- ▶ Settings that affect model execution or testing, e.g. short-circuiting, flagging integer overflow or NaN.
- ▶ Model-specific settings stored in .rsi file, edited via Info File Editor.

Other Enhancements

- ▶ When using the Reactis for C Plugin, faster loading of S-Functions when source code does not change.
- ▶ Support Stateflow graphical functions that return multiple values.
- ▶ Specify fixed values for configuration variables during import.