

# 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

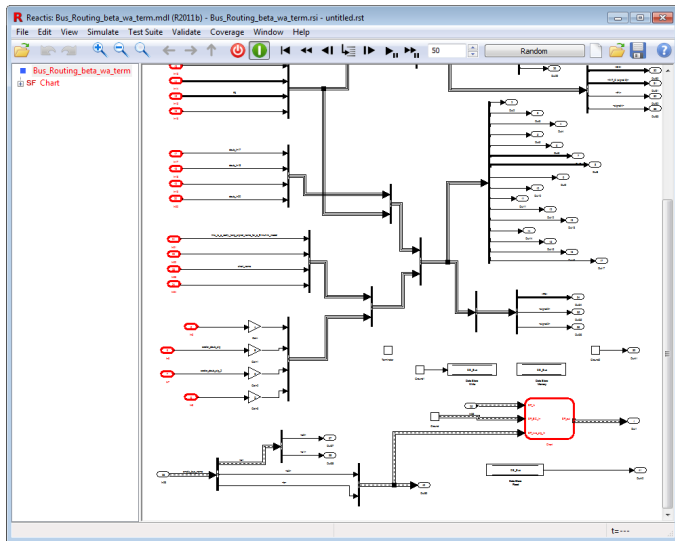
Library will be treated as a black box:

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

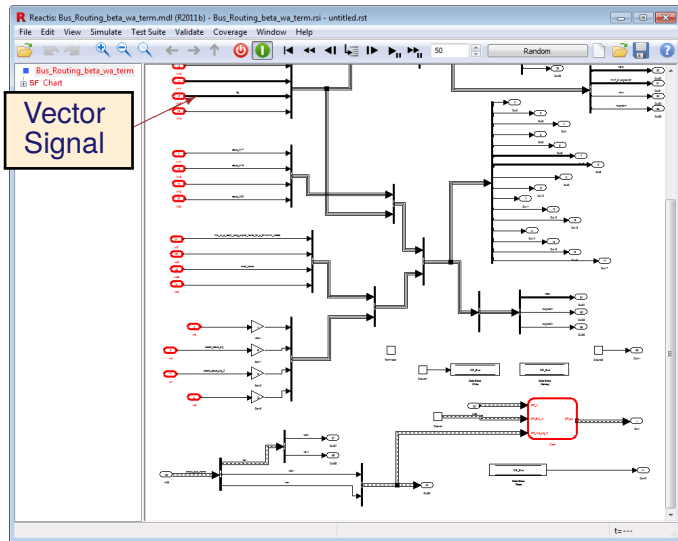
# Improved Support for Buses

- ▶ 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

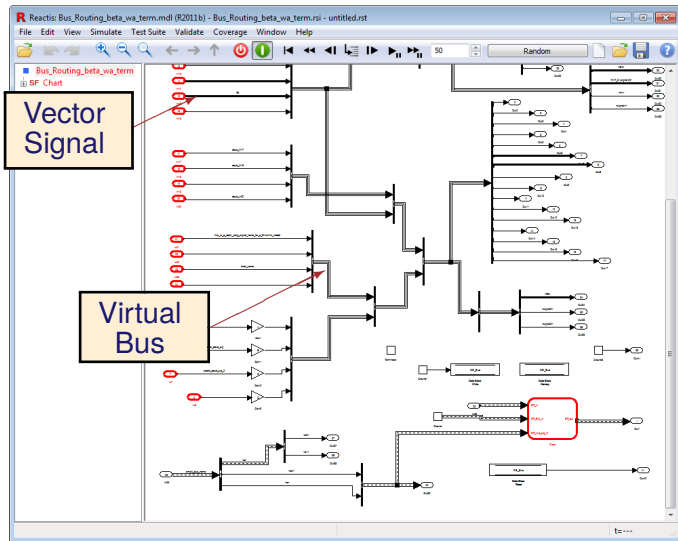


# Bus Signal Line Drawing

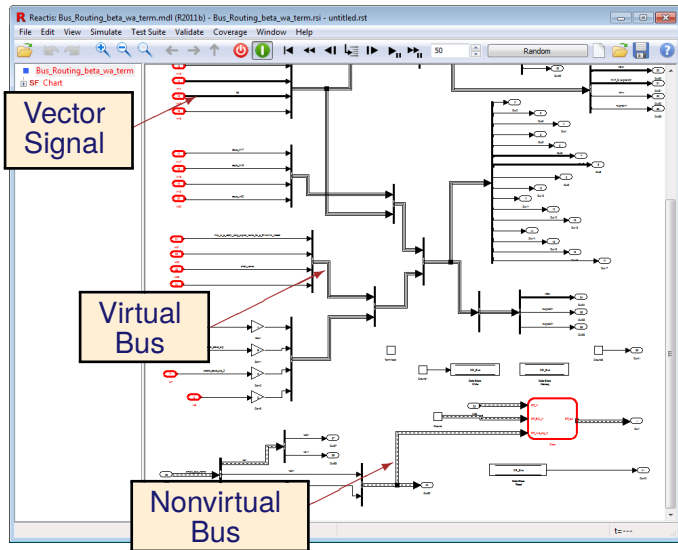




# Bus Signal Line Drawing



# Bus Signal Line Drawing

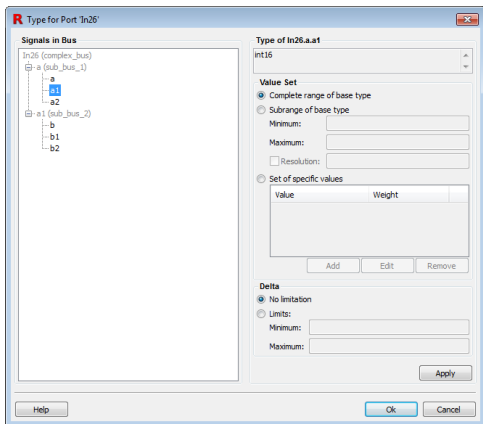


# Type Editor for Top-Level Bus Inputs

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

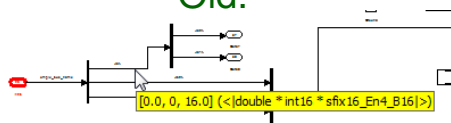
```
Type for Port 'In25'  
complex_bus : {a:sub_bus_1 : {a:double, a1:int16, a2:sfix16_En4_B8X5}, b1:sub_bus_2 : {b:double, b1:int16, b2:sfix16_En3}}
```

V2012 introduces graphical editor:

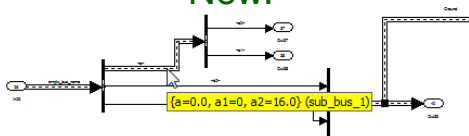


# Improved Hover Display

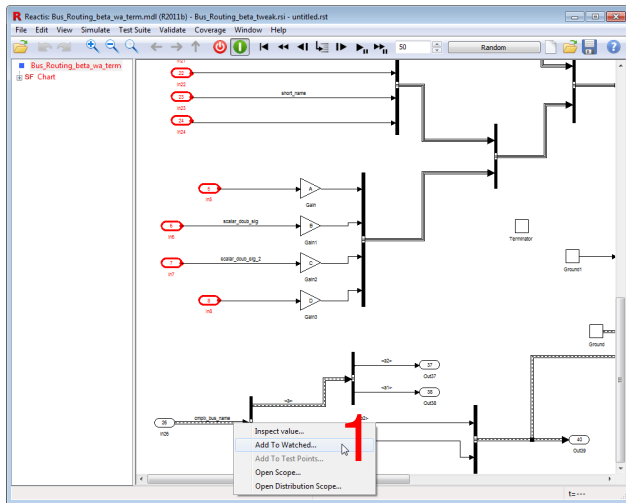
Old:



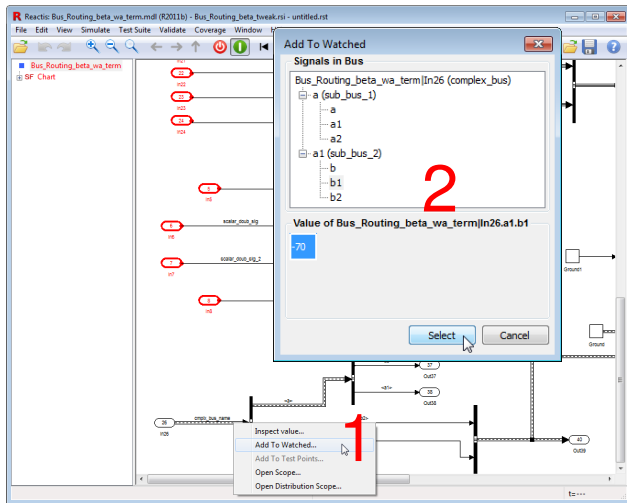
New:



# Add Individual Bus Elements to Watch List



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# Add Individual Bus Elements to Watch List

The screenshot shows a logic simulator interface with a circuit diagram and a variable table. A dialog box titled "Add To Watched" is open, displaying a tree view of signals in a bus. The tree shows a complex bus structure with sub-buses and individual elements. A red "2" is overlaid on the tree view. Below the tree, the "Value of Bus\_Routing\_beta\_wa\_term|In26.a1.b1" is shown as "-70". The dialog has "Select" and "Cancel" buttons. A red "1" is overlaid on the "Add To Watched..." button in the context menu. A red "3" is overlaid on the variable table at the bottom of the simulator.

Variable	Value	Type
Bus_Routing_beta_wa_term In26.a1.b1	-70	int16

# 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 selected element.

Variable	Value
Bus_Routing_beta_wa_term In26.a1.b1	-35

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 structure of signals in a bus. The selected signal is "a1.b1" with a value of "-35".

**Inspect value**

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

-35

Close

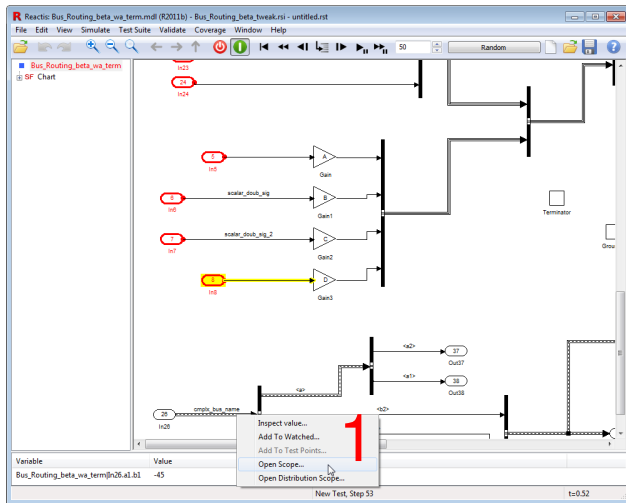
Variable | Value

Bus_Routing_beta_wa_term In26.a1.b1	-35
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Inspect value...  
Add To Watched...  
Add To Test Points...  
Open Scope...  
Open Distribution Scope...

New Test, Step 3 t=0.02

# Open Scopes on Individual Bus Elements



# 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. Below the tree, the 'Value of Bus\_Routing\_beta\_wa\_term[In26.a1.b1]' is displayed as '-45'. The dialog box has 'Select' and 'Cancel' buttons.

At the bottom of the screenshot, a table shows the current value of the selected signal:

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 the following components:

- Main Window:** Shows a circuit diagram with various components like 'In23', 'In24', 'In2', 'In3', 'In4', 'In5', 'In6', 'In7', and 'In8'. A red '2' is overlaid on the 'Open Scope' dialog box.
- Open Scope Dialog:** A dialog box titled 'Open Scope' with 'Signals in Bus' listed as:
  - Bus\_Routing\_beta\_wa\_term[In26 (complex\_bus)
    - a (sub\_bus\_1)
      - a
      - a1
      - a2
    - a1 (sub\_bus\_2)
      - b
      - b1
      - b2The 'Value of Bus\_Routing\_beta\_wa\_term[In26.a1.b1]' is shown as -45. A red '2' is overlaid on this dialog.
- Scope Window:** A window titled 'Bus\_Routing\_beta\_wa\_term[In26.a1.b1]' showing a waveform plot. A red '3' is overlaid on the plot.
- Variable Table:** A table at the bottom left showing the current value of the variable:

Variable	Value
Bus_Routing_beta_wa_term[In26.a1.b1	-45
- Context Menu:** A context menu is open over the variable table, with 'Open Scope...' selected. A red '1' is overlaid on this menu.

# 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.