

# 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

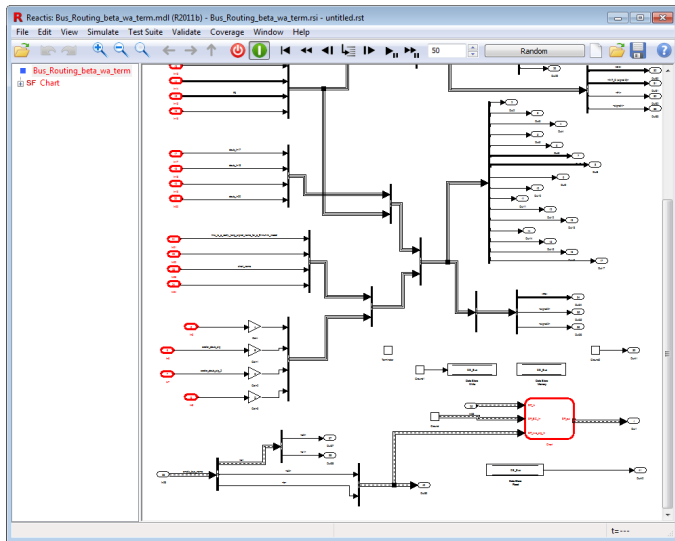
Library will be treated as a black box:

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

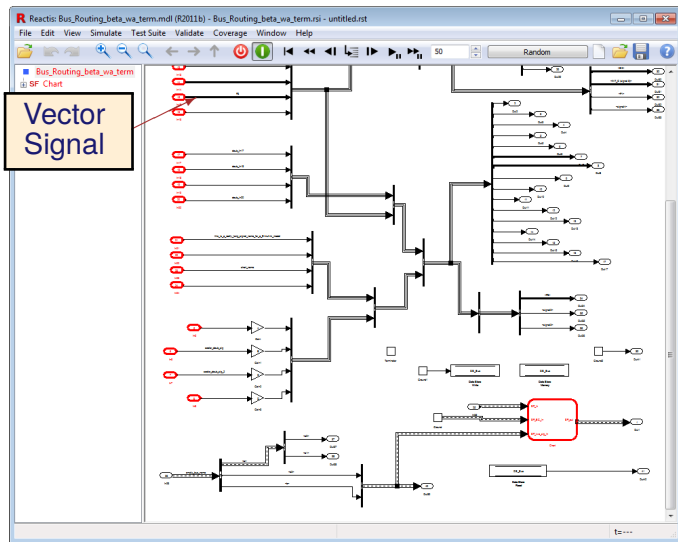
# Improved Support for Buses

- ▶ 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

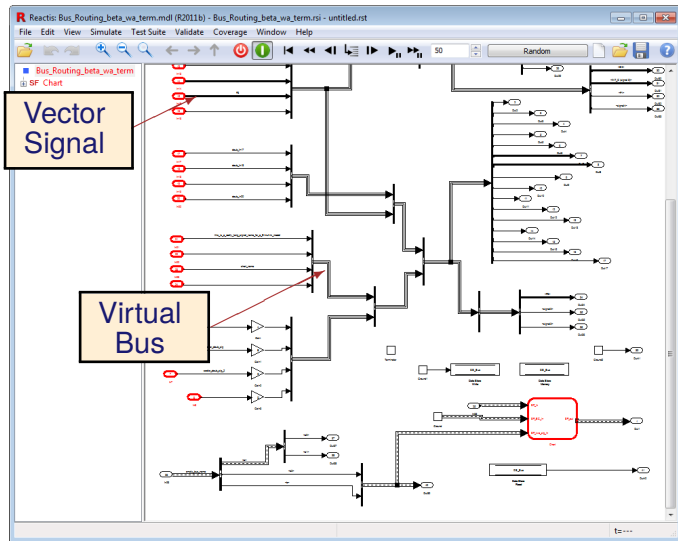


# Bus Signal Line Drawing

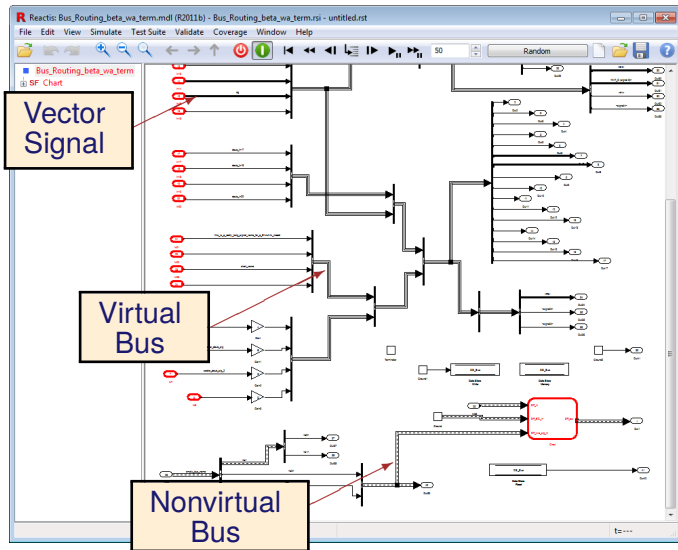




# Bus Signal Line Drawing



# Bus Signal Line Drawing



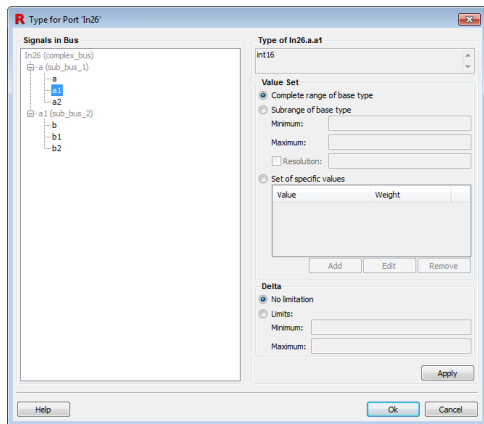
# Type Editor for Top-Level Bus Inputs

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

Type for Port 'In25'

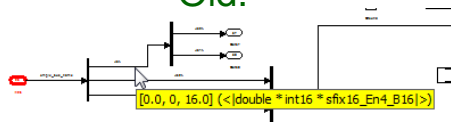
```
complex_bus : {a:sub_bus_1 : {a:double, a1:int16, a2:sfix16_En4_B8X5}, b1:sub_bus_2 : {b:double, b1:int16, b2:sfix16_En3}}
```

V2012 introduces graphical editor:

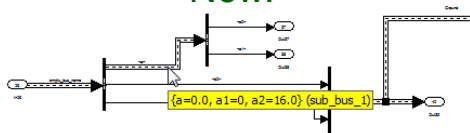


# Improved Hover Display

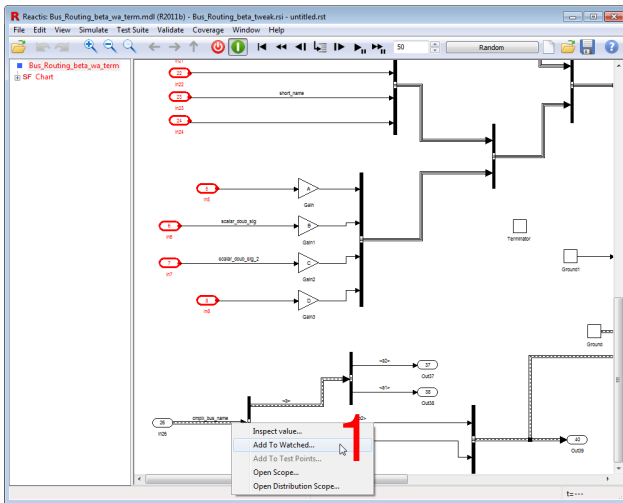
Old:



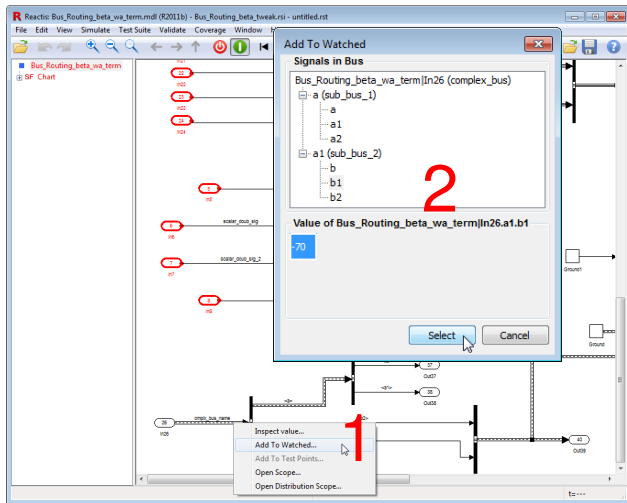
New:



# Add Individual Bus Elements to Watch List



# Add Individual Bus Elements to Watch List



# Add Individual Bus Elements to Watch List

**2**

**1**

**3**

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 diagram 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

Reactis: Bus\_Routing\_beta\_wa\_term.mdl (R2011b) - Bus\_Routing\_beta\_tweak.rsi - 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  
In29

scalar\_flow  
scalar\_flow

Terminator  
Group

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

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

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

New Test, Step 3

t=0.02

# 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 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 and a variable table. A context menu is open over the variable table, and an 'Open Scope' dialog box is displayed over the circuit diagram.

**Context Menu (1):**

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

**Open Scope Dialog (2):**

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

Variable Value

Bus_Routing_beta_wa_term[In26.a1.b1	-45
-------------------------------------	-----

New Test, Step 53 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 and signals. A context menu is open over a signal, with the "Open Scope..." option highlighted. A red number "1" is placed over this menu.
- Open Scope Dialog:** A dialog box titled "Open Scope" is open, showing a tree view of signals in the bus "Bus\_Routing\_beta\_wa\_term|In26 (complex\_bus)". The signal "a1 (sub\_bus\_2) | b1" is selected. Below the tree, the "Value of Bus\_Routing\_beta\_wa\_term|In26.a1.b1" is shown as "-45". A red number "2" is placed over the dialog.
- Scope Window:** A window titled "Bus\_Routing\_beta\_wa\_term|In26.a1.b1" displays a waveform chart. The y-axis ranges from -80 to 80, and the x-axis ranges from 0 to 0.6. A red number "3" is placed over the chart.
- Variable Table:** A table at the bottom left shows the current value of the selected signal: 

Variable	Value
Bus_Routing_beta_wa_term In26.a1.b1	-45

# 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.