

Latest Features in Fixed-Point Designer

September 2016

R2016b

Single-Precision Conversion

Automatically convert double-precision systems to use single-precision data types in Simulink

- Automatically convert Simulink models from double-precision to single-precision using the Single Precision Converter
- Applies to block settings, Stateflow chart settings, signal objects, and bus objects

The screenshot shows the Simulink Single Precision Converter interface. The top window displays a Simulink model diagram for 'ex_fuel_rate_calculation'. A red box highlights the 'Fixed-Point Tool' and 'Single Precision Converter' options in the 'Analysis' menu. Below the model, the 'Single Precision Converter' tool window is open, showing a progress bar with three green checkmarks for 'Check compatibility', 'Convert', and 'Verify'. The 'Check for compatibility' section lists locked blocks. The 'Changes made to the model' section includes a table of solver settings changes.

System	Original	Current
ex_fuel_rate_calculation	Variable-step	Fixed-step

The 'Convert system to single' section contains a table of data type conversions:

Block path	Compiled data type	Proposed data type
ex_fuel_rate_calculation/F//A Norm	double	single
ex_fuel_rate_calculation/F//A Rich	double	single
ex_fuel_rate_calculation/Shutdown	double	single
ex_fuel_rate_calculation/Switchable Compensation/Multiport Switch2	double	single
ex_fuel_rate_calculation/Switchable Compensation/Signal Specification1	double	single
ex_fuel_rate_calculation/limit output	double	single

The 'Verify converted system' section states: 'The model updated successfully after conversion'.

Float to Fixed Conversion of MATLAB Function Blocks

Automatically generate fixed-point versions of floating-point MATLAB function blocks

- Inspect type information of the MATLAB variables in the context of the code
- Code view provides a similar workflow to the Fixed-Point Converter app in MATLAB

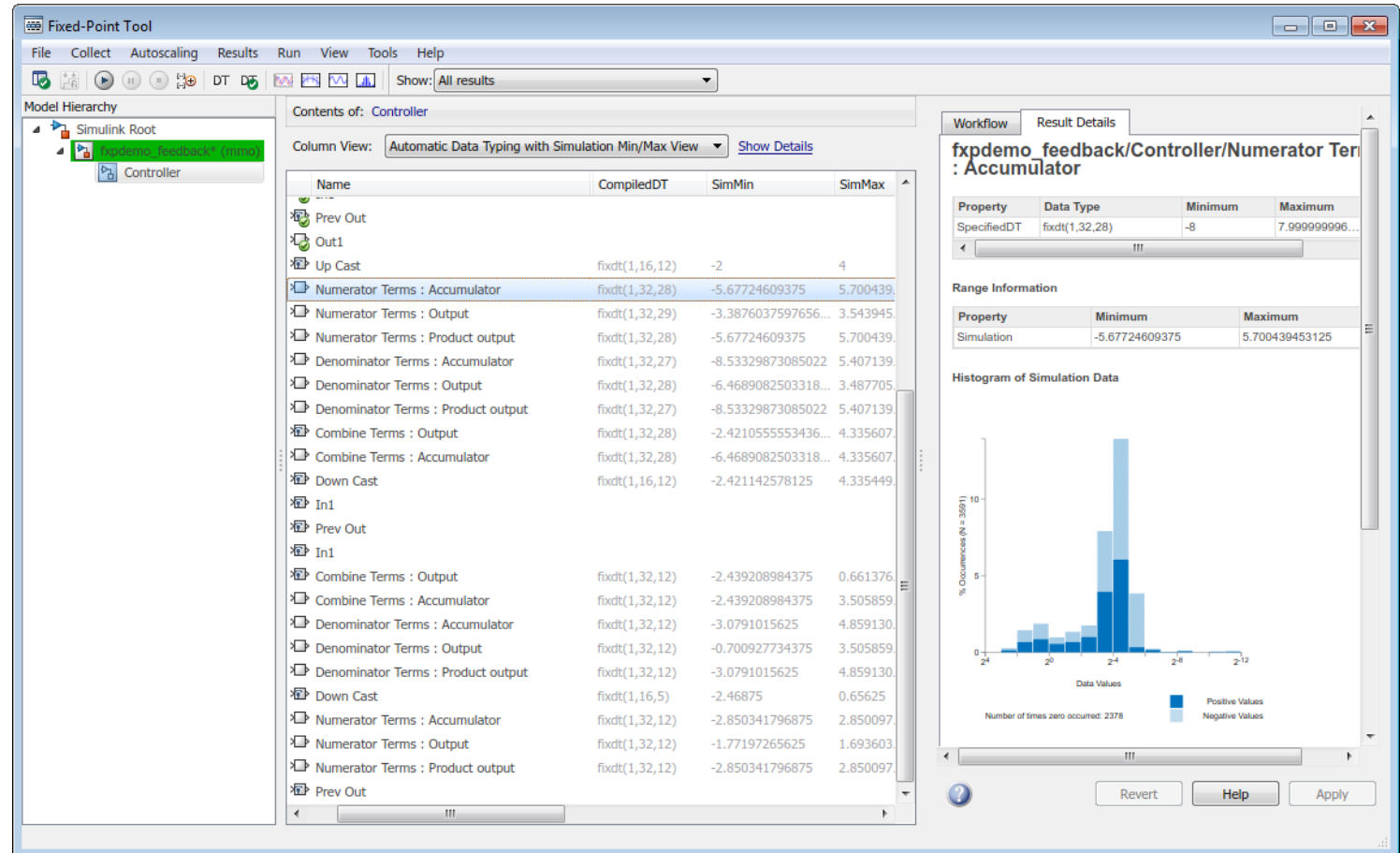
The screenshot displays the 'Fixed Point Tool - MATLAB Function Block Converter' interface for a block named 'symmetric_fir'. The 'Code view' shows the MATLAB function code for 'sfir'. The 'Automatic data typing' dialog is open, showing options for 'Propose' (Signedness, Word length, Fraction length), 'Propose for' (Inherited, Floating point), 'Default word length' (16), 'When proposing types use' (All collected ranges), and 'Safety margin for simulation min/max (%)' (0). A table at the bottom shows simulation results for various variables.

Sim Min	Sim Max	Proposed Type
	-1	1 numerictype(1, 16, 14)
	-0.13	-0.13 numerictype(1, 16, 17)
	-0.08	-0.08 numerictype(1, 16, 18)
	0.2	0.2 numerictype(0, 16, 18)
	0.41	0.41 numerictype(0, 16, 17)

Histogram Instrumentation in Simulink

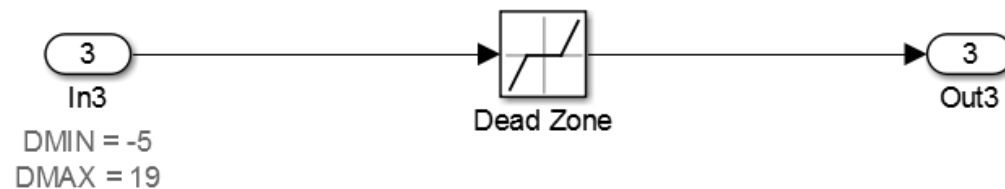
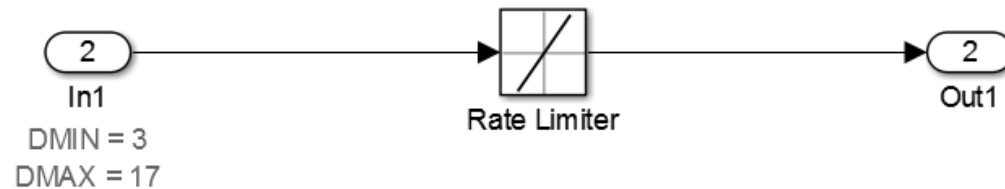
Generate log2 histograms of Simulink signals and blocks from simulation data

- Using the Fixed-Point Tool, view a histogram of bits used by each object in your system under design
- The bit weights are displayed along the X-axis, and the percentage of occurrences along the Y-axis
- Each bin in the histogram corresponds to a bit in the binary word



Range Analysis Support for FIR filters, Dead Zone, and Rate Limiter Blocks

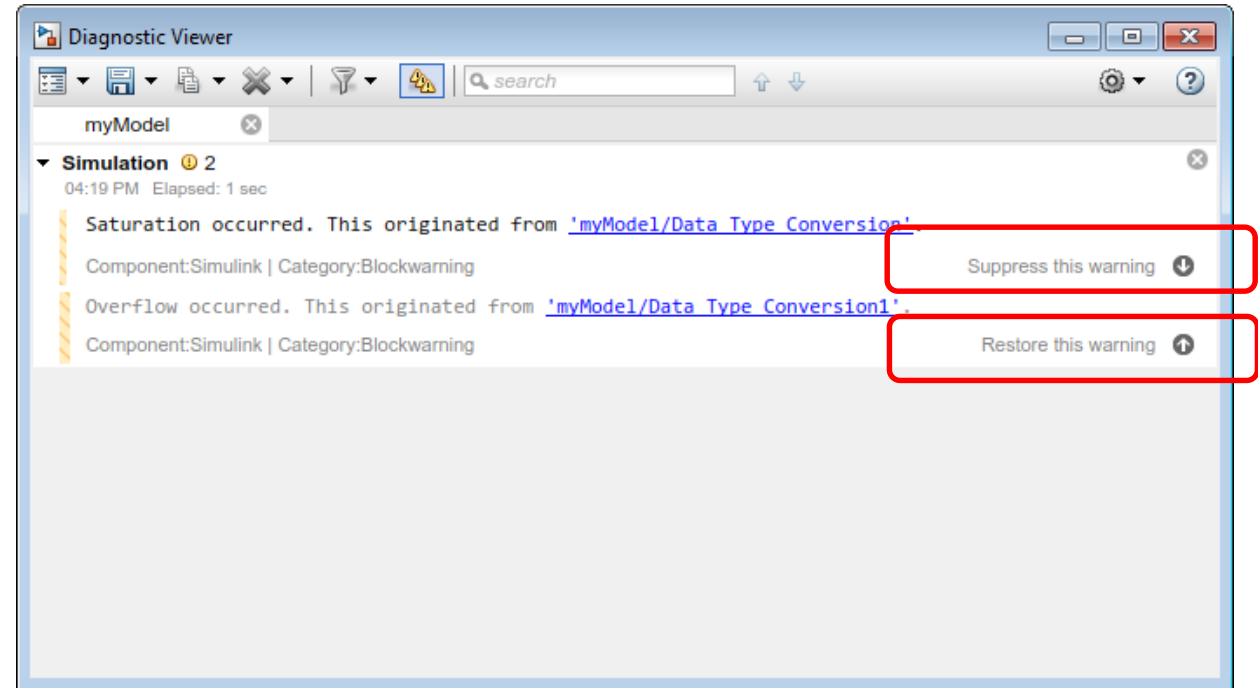
- Using the Fixed-Point Tool, you can now derive ranges for models that use Discrete FIR Filter, Dead Zone, and Rate Limiter blocks



Simulink Diagnostic Suppressor

Suppress certain diagnostics in Simulink with Diagnostic Viewer

- Enables you to suppress warnings for specific objects in your model.
- Click the **Suppress this warning** button next to the warning in the Diagnostic Viewer to suppress the warning from the specified source. You can restore the warning from the source by clicking **Restore this warning**.
- Programmatically control the suppressions from the command line.



```
>> Simulink.suppressDiagnostic
>> Simulink.restoreDiagnostic
```