Simulink® Fixed Point™ 6
Reference

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Simulink® Fixed Point™ Reference

Revision History

March 2009	Online only	New for Version 6.1 (Release 2009a)
September 2009	Online only	Revised for Version 6.2 (Release 2009b)

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Function Reference

Purpose

Automatically change scaling of fixed-point data types

Syntax

```
autofixexp
```

Description

The `autofixexp` script automatically changes the scaling for model objects that specify fixed-point data types. However, if an object's **Lock output data type setting against changes by the fixed-point tools** parameter is selected, the script refrains from scaling that object.

This script collects range data for model objects, either from design minimum and maximum values that objects specify explicitly, or from logged minimum and maximum values that occur during simulation. Based on these values, the tool changes the scaling of fixed-point data types in a model so as to maximize precision and cover the range.

You can specify design minimum and maximum values for model objects using parameters typically titled **Output minimum** and **Output maximum**. See "Blocks That Allow Signal Range Specification" in *Simulink® User's Guide* for a list of Simulink blocks that permit you to specify these values. In the autoscaling procedure that the `autofixexp` script executes, design minimum and maximum values take precedence over the simulation range.

If you intend to scale fixed-point data types using simulation minimum and maximum values, the script yields meaningful results when exercising the full range of values over which your design is meant to run. Therefore, the simulation you run prior to using `autofixexp` must simulate your design over its full intended operating range. It is especially important that you use simulation inputs with appropriate speed and amplitude profiles for dynamic systems. The response of a linear dynamic system is frequency dependent. For example, a bandpass filter will show almost no response to very slow and very fast sinusoid inputs, whereas the signal of a sinusoid input with a frequency in the passband will be passed or even significantly amplified. The response of nonlinear dynamic systems can have complicated dependence on both the signal speed and amplitude.

Note If you already know the simulation range you need to cover, you can use an alternate autoscaling technique described in the `fixptbestprec` reference page in the *Simulink Reference*.

To control the parameters associated with automatic scaling, such as safety margins, use the Fixed-Point Tool.

For more information, see “Overview of the Fixed-Point Tool”.

To learn how to use the Fixed-Point Tool, refer to “Tutorial: Feedback Controller”.

See Also

`fxptdlg`

fixpt_instrument_purge

Purpose

Remove corrupt fixed-point instrumentation from model

Note `fixpt_instrument_purge` will be removed in a future release.

Syntax

```
fixpt_instrument_purge
fixpt_instrument_purge(modelName, interactive)
```

Description

The `fixpt_instrument_purge` script finds and removes fixed-point instrumentation from a model left by the Fixed-Point Tool and the fixed-point autoscaling script. The Fixed-Point Tool and the fixed-point autoscaling script each add callbacks to a model. For example, the Fixed-Point Tool appends commands to model-level callbacks. These callbacks make the Fixed-Point Tool respond to simulation events. Similarly, the autoscaling script adds instrumentation to some parameter values that gathers information required by the script.

Normally, these types of instrumentation are automatically removed from a model. The Fixed-Point Tool removes its instrumentation when the model is closed. The autoscaling script removes its instrumentation shortly after it is added. However, there are cases where abnormal termination of a model leaves fixed-point instrumentation behind. The purpose of `fixpt_instrument_purge` is to find and remove fixed-point instrumentation left over from abnormal termination.

`fixpt_instrument_purge(modelName, interactive)` removes instrumentation from model `modelName`. `interactive` is `true` by default, which prompts you to make each change. When `interactive` is set to `false`, all found instrumentation is automatically removed from the model.

See Also

`autofixexp`, `fxptdlg`

Purpose

Show overflows from most recent fixed-point simulation

Note `showfixptsimerrors` will be removed in a future release. Use `fxptdlg` instead.

Syntax

```
showfixptsimerrors
```

Description

The `showfixptsimerrors` script displays any overflows from the most recent fixed-point simulation. This information is also visible in the Fixed-Point Tool.

See Also

`autofixexp`, `fxptdlg`

showfixptsimranges

Purpose

Show logged maximum values, minimum values, and overflow data from fixed-point simulation

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Note `showfixptsimranges` will be removed in a future release. Use `fxptdlg` instead.

Syntax

```
showfixptsimranges
showfixptsimranges(action)
```

Description

`showfixptsimranges` displays the logged maximum values, minimum values, and overflow data from the most recent fixed-point simulation in the MATLAB® Command Window.

`showfixptsimranges(action)` stores the logged maximum values, minimum values, and overflow data from the most recent fixed-point simulation in the workspace variable `FixPtSimRanges`. If `action` is `'verbose'`, the logged data also appears in the MATLAB Command Window. If `action` is `'quiet'`, no data appears.

See Also

`autofixexp`, `fxptdlg`

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