

Simulink[®] Response Optimization Release Notes

Chapter 1, “Simulink Response Optimization 2.3 Release Notes” discusses the following topics:

- “New Features” on page 1-2
- “Major Bug Fixes” on page 1-3
- “Known Software and Documentation Problems” on page 1-4

Chapter 2, “Simulink Response Optimization 2.2 Release Notes” discusses the following topics:

- “New Features” on page 2-2

Chapter 3, “Simulink Response Optimization 2.1 Release Notes” discusses the following topics:

- “Major Bug Fixes” on page 3-2

Chapter 4, “Simulink Response Optimization 2.0 Release Notes” discusses the following topics:

- “Introduction to Simulink Response Optimization” on page 4-2
- “Upgrading from the Nonlinear Control Design Blockset” on page 4-4

Printing the Release Notes. If you would like to print the Release Notes, you can link to a PDF version.

Simulink Response Optimization 2.3 Release Notes

1

New Features	1-2
Major Bug Fixes	1-3
Known Software and Documentation Problems	1-4

Simulink Response Optimization 2.2 Release Notes

2

New Features	2-2
---------------------------	------------

Simulink Response Optimization 2.1 Release Notes

3

Major Bug Fixes	3-2
------------------------------	------------

Simulink Response Optimization 2.0 Release Notes

4

Introduction to Simulink Response Optimization	4-2
About Simulink Response Optimization	4-2

Features	4-3
Major Enhancements	4-3
Upgrading from the Nonlinear Control Design	
Blockset	4-4

Simulink Response Optimization 2.3 Release Notes

New Features

Simulink Response Optimization Version 2.3 introduces the following new features:

- Automatically search for response optimization solutions that lie further inside the constraint region, rather than stopping after finding the first feasible solution which typically lies at the edge of the region (the default behavior). See “Selecting Optimization Termination Options” for more information.
- Use the **Shift** key to easily and precisely align constraint segments horizontally or vertically. See “Moving Constraints” for more information.

Major Bug Fixes

To view major bug fixes made in R14SP3 for Simulink Response Optimization, use the Bug Reports interface on the MathWorks Web site.

Note If you are not already logged in to Access Login, when you link to the Bug Reports interface (see below), you will be prompted to log in or create an Access Login account.

After you are logged in, use this Bug Fixes link. You will see the bug report for Simulink Response Optimization. The report is sorted with fixed bugs listed first, and then open bugs. If you are viewing these release notes in PDF form on the MathWorks Web site, you can refer to the HTML form of the release notes on the MathWorks Web site and use the link provided.

For bug fixes added prior to R14SP2, see “Major Bug Fixes” on page 3-2 in the Simulink Response Optimization Version 2.1 release notes.

Known Software and Documentation Problems

At publication time, Simulink Response Optimization had no significant known open bugs. The Bug Fixes interface on the MathWorks Web site will be updated if any important bugs become known to the MathWorks after the publication of these release notes.

Simulink Response Optimization 2.2 Release Notes

New Features

Simulink Response Optimization Version 2.2 introduces several new features:

- Manipulate signal constraints more easily due to their enhanced graphical representation
- Start response optimization at a nonzero start time
- Save response optimization projects to the model workspace as well as MAT-files and the MATLAB workspace
- View the number of simulations performed at each step of a response optimization

Simulink Response Optimization 2.1 Release Notes

Major Bug Fixes

Simulink Response Optimization 2.1 includes several bug fixes made since Version 2.0. You can see a list of the particularly important Version 2.1 bug fixes.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site and use the link provided.

Simulink Response Optimization 2.0 Release Notes

Introduction to Simulink Response Optimization

This section provides a brief overview of Simulink Response Optimization, which is being introduced in Release 14.

About Simulink Response Optimization

Simulink Response Optimization provides a graphical user interface (GUI) to assist in design of control systems and physical systems. With this product, you can tune parameters within a nonlinear Simulink model to meet time-domain performance requirements by graphically placing constraints within a time-domain window or tracking and closely matching a reference signal. You can tune any number of Simulink variables including scalars, vectors, and matrices by entering the variable name into the appropriate dialog box. In addition, you can place uncertainty bounds on other variables in the model for robust design. Simulink Response Optimization makes attaining performance objectives and optimizing tuned parameters an intuitive and easy process.

To use Simulink Response Optimization, you need only to include a special block, the Signal Constraint block, in your Simulink diagram. Just connect the block to any signal in the model to signify that you want to place some kind of constraint on the signal. Simulink Response Optimization automatically converts time-domain constraints into a constrained optimization problem and then solves the problem using optimization routines taken from the Optimization Toolbox and Genetic Algorithm and Direct Search Toolbox. The constrained optimization problem formulated by Simulink Response Optimization iteratively calls for simulations of the Simulink system, compares the results of the simulations with the constraint objectives, and uses gradient methods to adjust tuned parameters to better meet the objectives.

In previous releases, Simulink Response Optimization was called the Nonlinear Control Design Blockset (NCD). Simulink Response Optimization includes and improves upon the functionality of NCD. To upgrade your NCD models for use with Simulink Response Optimization, see “Upgrading from the Nonlinear Control Design Blockset” on page 4-4.

Features

Key features of Simulink Response Optimization include the ability to

- Optimize signals or design criteria in any Simulink model by tuning selected model parameters
- Constrain signals to lie within time-domain signal bounds
- Closely track a reference, or desired, signal
- Optimize responses for systems that include physical actuation limits and constraints on state/variable values
- Optimize responses for noisy systems by including uncertainty in your parameter values
- Compute the continuous and digital cumulative root mean square values of signals with the CRMS and DRMS blocks. Use these blocks with the Signal Constraint block to optimize the cumulative root mean square of signals in your models.

Major Enhancements

Simulink Response Optimization features several major enhancements to the Nonlinear Control Design Blockset. These major enhancements include

- Support for discrete and hybrid models
- Support for stopping and restarting an optimization
- Ability to undo or redo optimization of parameter values
- Support for three different optimizers, offering more robust optimization algorithms
- Ability to constrain any signal in the model hierarchy
- Support for vector-valued signals

Upgrading from the Nonlinear Control Design Blockset

In previous releases, Simulink Response Optimization was called the Nonlinear Control Design Blockset (NCD). Models that were created using NCD will not work with Simulink Response Optimization. To convert your NCD models for use with Simulink Response Optimization, use the `ncdupdate` function which is described in the Simulink Response Optimization Function Reference.