

MATLAB® & Simulink®

Release Notes for R2012a

**MATLAB®
& SIMULINK®**

How to Contact MathWorks



www.mathworks.com
comp.soft-sys.matlab
www.mathworks.com/contact_TS.html

Web
Newsgroup
Technical Support



suggest@mathworks.com
bugs@mathworks.com
doc@mathworks.com
service@mathworks.com
info@mathworks.com

Product enhancement suggestions
Bug reports
Documentation error reports
Order status, license renewals, passcodes
Sales, pricing, and general information



508-647-7000 (Phone)



508-647-7001 (Fax)



The MathWorks, Inc.
3 Apple Hill Drive
Natick, MA 01760-2098

For contact information about worldwide offices, see the MathWorks Web site.

Release Notes for R2012a

© COPYRIGHT 2012 by The MathWorks, Inc.

The software described in this document is furnished under a license agreement. The software may be used or copied only under the terms of the license agreement. No part of this manual may be photocopied or reproduced in any form without prior written consent from The MathWorks, Inc.

FEDERAL ACQUISITION: This provision applies to all acquisitions of the Program and Documentation by, for, or through the federal government of the United States. By accepting delivery of the Program or Documentation, the government hereby agrees that this software or documentation qualifies as commercial computer software or commercial computer software documentation as such terms are used or defined in FAR 12.212, DFARS Part 227.72, and DFARS 252.227-7014. Accordingly, the terms and conditions of this Agreement and only those rights specified in this Agreement, shall pertain to and govern the use, modification, reproduction, release, performance, display, and disclosure of the Program and Documentation by the federal government (or other entity acquiring for or through the federal government) and shall supersede any conflicting contractual terms or conditions. If this License fails to meet the government's needs or is inconsistent in any respect with federal procurement law, the government agrees to return the Program and Documentation, unused, to The MathWorks, Inc.

Trademarks

MATLAB and Simulink are registered trademarks of The MathWorks, Inc. See www.mathworks.com/trademarks for a list of additional trademarks. Other product or brand names may be trademarks or registered trademarks of their respective holders.

Patents

MathWorks products are protected by one or more U.S. patents. Please see www.mathworks.com/patents for more information.

Revision History

March 2012

Online only

New for Release 2012a

General Release Notes for R2012a

1

Highlights of R2012a	1-2
What's New in Release 2012a	1-2
MATLAB Product Family Highlights	1-2
Code Generation Products	1-3
System Toolboxes for Design in MATLAB and Simulink ..	1-3
Simulink Product Family Highlights	1-3
R2012a Products with License-Related Changes	1-3
System Requirements	1-4
Summary of Changes to Each Product	1-4
Summary of New Features	1-5
MATLAB 7.14	1-7
Simulink 7.9	1-8
Aerospace Blockset 3.9	1-10
Aerospace Toolbox 2.9	1-10
Bioinformatics Toolbox 4.1	1-10
Communications System Toolbox 5.2	1-11
Computer Vision System Toolbox 5.0	1-11
Control System Toolbox 9.3	1-12
Data Acquisition Toolbox 3.1	1-12
Database Toolbox 3.11	1-12
Datafeed Toolbox 4.3	1-12
DO Qualification Kit 1.6	1-13
DSP System Toolbox 8.2	1-13
Econometrics Toolbox 2.1	1-14
Embedded Coder 6.2	1-14
Financial Derivatives Toolbox 5.9	1-14
Financial Toolbox 4.2	1-15
Fixed-Income Toolbox 2.3	1-15
Fixed-Point Toolbox 3.5	1-15
HDL Coder 3.0	1-15
HDL Verifier 4.0	1-16
IEC Certification Kit 2.1	1-16
Image Acquisition Toolbox 4.3	1-17
Image Processing Toolbox 8.0	1-17
Instrument Control Toolbox 3.1	1-17

Mapping Toolbox 3.5	1-18
MATLAB® Builder™ EX 2.2 (for Microsoft® Excel®)	1-18
MATLAB® Builder™ JA 2.2.4	1-18
MATLAB® Builder™ NE 4.1.1	1-18
MATLAB® Coder™ 2.2	1-19
MATLAB® Compiler™ 4.17	1-19
MATLAB® Distributed Computing Server™ 6.0	1-19
MATLAB® Report Generator™ 3.12	1-20
Model Predictive Control Toolbox 4.1	1-20
Model-Based Calibration Toolbox 4.4	1-20
Optimization Toolbox 6.2	1-20
Parallel Computing Toolbox 6.0	1-21
Phased Array System Toolbox 1.2	1-21
Polyspace® Client™ for Ada 6.3	1-21
Polyspace® Client™ for C/C++ 8.3	1-21
Polyspace® Model Link™ SL 5.9	1-22
Real-Time Windows Target 4.0	1-22
RF Toolbox 2.10	1-22
Robust Control Toolbox 4.1	1-23
Signal Processing Toolbox 6.17	1-23
SimBiology 4.1	1-23
SimDriveline 2.2	1-24
SimElectronics 2.1	1-24
SimEvents 4.1	1-24
SimMechanics 4.0	1-24
SimPowerSystems 5.6	1-25
SimRF 3.2	1-25
Simscape 3.7	1-26
Simulink® 3D Animation™ 6.1	1-26
Simulink® Code Inspector™ 1.1	1-26
Simulink® Coder™ 8.2	1-27
Simulink® Control Design™ 3.5	1-27
Simulink® Design Optimization™ 2.1	1-27
Simulink® Design Verifier™ 2.2	1-27
Simulink® Fixed Point™ 7.1	1-28
Simulink® PLC Coder™ 1.3	1-28
Simulink® Report Generator™ 3.12	1-28
Simulink® Verification and Validation™ 3.3	1-29
Stateflow 7.9	1-29
Statistics Toolbox 8.0	1-29
Symbolic Math Toolbox 5.8	1-30
System Identification Toolbox 8.0	1-30
Vehicle Network Toolbox 1.6	1-31
Wavelet Toolbox 4.9	1-31

xPC Target 5.2	1-31
R2012a Products with License-Related Changes	1-32
Computer Vision System Toolbox	1-32
EDA Simulator Link	1-32
Real-Time Windows Target	1-32
Simulink HDL Coder	1-32
System Requirements	1-33
Platform Support to Be Phased Out	1-33
Release Summary	1-34

General Release Notes for R2012a

- “Highlights of R2012a” on page 1-2
- “Summary of New Features” on page 1-5
- “R2012a Products with License-Related Changes” on page 1-32
- “System Requirements” on page 1-33
- “Release Summary” on page 1-34

Highlights of R2012a

In this section...

“What’s New in Release 2012a” on page 1-2

“MATLAB Product Family Highlights” on page 1-2

“Code Generation Products” on page 1-3

“System Toolboxes for Design in MATLAB and Simulink” on page 1-3

“Simulink Product Family Highlights” on page 1-3

“R2012a Products with License-Related Changes” on page 1-3

“System Requirements” on page 1-4

“Summary of Changes to Each Product” on page 1-4

What’s New in Release 2012a

Release 2012a includes new features in MATLAB®, Simulink®, and Polyspace® products, and updates and bug fixes to 77 other products. Subscribers to MathWorks® Software Maintenance Service can download product updates. Visit the License Center to download products, activate software, and manage your license and user information.

MATLAB Product Family Highlights

- MATLAB: Unified functions for 1-D, 2-D, and 3-D numerical integration and improved performance of basic math and interpolation functions
- MATLAB Compiler™: MATLAB Compiler Runtime (MCR) available for download, simplifying distribution of compiled applications and components
- Image Processing Toolbox™: Automatic image registration using intensity metric optimization
- Statistics Toolbox™: Enhanced interface for fitting, prediction, and plotting with linear, generalized linear, and nonlinear regression
- System Identification Toolbox™: Identification of continuous-time transfer functions

Code Generation Products

- HDL Coder™: New product that replaces Simulink HDL Coder and adds HDL code generation directly from MATLAB
- HDL Verifier™: New product that replaces EDA Simulator Link and adds Altera FPGA-in-the-loop support
- MATLAB Coder™: Code generation from user-defined System objects and automated generation of dynamic shared libraries
- Embedded Coder™: AUTOSAR 4.0 compatibility, reduced data copies, and linking of code generation reports with Simulink Web views

System Toolboxes for Design in MATLAB and Simulink

- Computer Vision System Toolbox™: Viola-Jones object detection, MSER feature detection, and CAMShift tracking
- Communications System Toolbox™: USRP radio support, LTE MIMO channel models, and GPU support for LDPC, turbo decoder, and other algorithms

Simulink Product Family Highlights

- Simulink: Run models directly from Simulink on target hardware including LEGO® MINDSTORMS® NXT™ and BeagleBoard™
- SimMechanics™: Second-generation multibody modeling and simulation technology with new 3-D visualization
- Real-Time Windows Target™: Real-time execution of models in Windows® using Simulink Normal mode

R2012a Products with License-Related Changes

Several products have license-related changes in R2012a.

For details, see “R2012a Products with License-Related Changes” on page 1-32.

System Requirements

See “System Requirements” on page 1-33 for information about System Requirements changes.

Summary of Changes to Each Product

See “Release Summary” on page 1-34 for a summary of what has changed for each product for R2012a, including whether the product has new features, bug fixes, and compatibility issues.

Summary of New Features

This section summarizes the major new features and enhancements introduced in R2012a for the following products.

“MATLAB 7.14” on page 1-7	“Simulink 7.9” on page 1-8
“Aerospace Blockset 3.9” on page 1-10	“Aerospace Toolbox 2.9” on page 1-10
“Bioinformatics Toolbox 4.1” on page 1-10	“Communications System Toolbox 5.2” on page 1-11
“Computer Vision System Toolbox 5.0” on page 1-11	“Control System Toolbox 9.3” on page 1-12
“Data Acquisition Toolbox 3.1” on page 1-12	“Database Toolbox 3.11” on page 1-12
“Datafeed Toolbox 4.3” on page 1-12	“DO Qualification Kit 1.6” on page 1-13
“DSP System Toolbox 8.2” on page 1-13	“Econometrics Toolbox 2.1” on page 1-14
“Embedded Coder 6.2” on page 1-14	“Financial Derivatives Toolbox 5.9” on page 1-14
“Financial Toolbox 4.2” on page 1-15	“Fixed-Income Toolbox 2.3” on page 1-15
“Fixed-Point Toolbox 3.5” on page 1-15	“HDL Coder 3.0” on page 1-15
“HDL Verifier 4.0” on page 1-16	“IEC Certification Kit 2.1” on page 1-16
“Image Acquisition Toolbox 4.3” on page 1-17	“Image Processing Toolbox 8.0” on page 1-17
“Instrument Control Toolbox 3.1” on page 1-17	“Mapping Toolbox 3.5” on page 1-18
“MATLAB® Builder™ EX 2.2 (for Microsoft® Excel®)” on page 1-18	“MATLAB® Builder™ JA 2.2.4” on page 1-18

“MATLAB® Builder™ NE 4.1.1” on page 1-18	“MATLAB® Coder™ 2.2” on page 1-19
“MATLAB® Compiler™ 4.17” on page 1-19	“MATLAB® Distributed Computing Server™ 6.0” on page 1-19
“MATLAB® Report Generator™ 3.12” on page 1-20	“Model Predictive Control Toolbox 4.1” on page 1-20
“Model-Based Calibration Toolbox 4.4” on page 1-20	“Optimization Toolbox 6.2” on page 1-20
“Parallel Computing Toolbox 6.0” on page 1-21	“Phased Array System Toolbox 1.2” on page 1-21
“Polyspace® Client™ for Ada 6.3” on page 1-21	“Polyspace® Client™ for C/C++ 8.3” on page 1-21
“Polyspace® Model Link™ SL 5.9” on page 1-22	“Real-Time Windows Target 4.0” on page 1-22
“RF Toolbox 2.10” on page 1-22	“Robust Control Toolbox 4.1” on page 1-23
“Signal Processing Toolbox 6.17” on page 1-23	“SimBiology 4.1” on page 1-23
“SimDriveline 2.2” on page 1-24	“SimElectronics 2.1” on page 1-24
“SimEvents 4.1” on page 1-24	“SimMechanics 4.0” on page 1-24
“SimPowerSystems 5.6” on page 1-25	“SimRF 3.2” on page 1-25
“Simscape 3.7” on page 1-26	“Simulink® 3D Animation™ 6.1” on page 1-26
“Simulink® Code Inspector™ 1.1” on page 1-26	“Simulink® Coder™ 8.2” on page 1-27
“Simulink® Control Design™ 3.5” on page 1-27	“Simulink® Design Optimization™ 2.1” on page 1-27
“Simulink® Design Verifier™ 2.2” on page 1-27	“Simulink® Fixed Point™ 7.1” on page 1-28
“Simulink® PLC Coder™ 1.3” on page 1-28	“Simulink® Report Generator™ 3.12” on page 1-28

“Simulink® Verification and Validation™ 3.3” on page 1-29	“Stateflow 7.9” on page 1-29
“Statistics Toolbox 8.0” on page 1-29	“Symbolic Math Toolbox 5.8” on page 1-30
“Vehicle Network Toolbox 1.6” on page 1-31	“Wavelet Toolbox 4.9” on page 1-31
“xPC Target 5.2” on page 1-31	

MATLAB 7.14

Development Environment

- Sorting and transposing matrices and selecting noncontiguous parts of a matrix in the Variable Editor
- Text markup option to enable syntax highlighting for commented MATLAB code in published scripts
- Improved rendering of HTML in the MATLAB Web Browser, especially on 64-bit Windows

Language and Programming

- List of allowed classes to control access to class properties, methods, and events
- List of allowed classes to control subclassing of a class using the `AllowedSubClasses` attribute

Mathematics

- Numerical integration functions (`integral`, `integral2`, `integral3`) with additional algorithms, options, and improper integrals
- Improved performance of arithmetic operators and other basic math functions for integer, single, and double data types

- Improved performance of interpolation functions: `interp2`, `interp3`, and `interpn`

File I/O and External Interfacing

- Reading of Excel® .xlsx files on Mac® and Linux® with `xlsread`, including the ability to specify sheet and range
- Creation of MPEG-4 H.264 files for Web video publishing with `VideoWriter` on Windows 7
- `fitswrite` function for writing FITS files
- Access to remote netCDF files with the OPenDAP protocol

For details, see the product-specific release notes.

Simulink 7.9

Connection to Educational Hardware

- Run models directly from Simulink on target hardware including LEGO® MINDSTORMS® NXT™ and BeagleBoard™

Project and File Management

- Export to Zip capability to package and share project files
- Dependency analysis graph view to visualize project file dependencies
- Simulink Projects enabled for MATLAB workers (using Parallel Computing Toolbox™)
- Extended source control support using the Source Control Adapter SDK for developing integrations with third-party tools
- Next-generation Simulink file format SLX (optional in R2012a)

Component-Based Modeling

- Enhanced signal label propagation, including propagation out of Model blocks
- Signal Hierarchy Viewer to graphically display signal hierarchies at edit time
- Improved data transfer for concurrent execution, including a minimum delay mode
- Live library links that update with changes to library

Data Management

- Simulink data classes extendable using MATLAB class syntax
- Control over default package for data classes in Model Explorer and other GUIs
- Improved traceability of workspace variables in Configuration Sets with `Simulink.findVars`

Block Enhancements

- Support for bus signals in To File, From File, To Workspace and From Workspace blocks
- Bus and variable-size signal support for the Delay block data input port
- External reset and time-varying filter coefficients for the Discrete Filter and Discrete Transfer Fcn blocks

User Interface

- In-model reporting of Model Advisor results, indicating which blocks did not pass specific checks

- Simulation Data Inspector enhanced to optionally show details of both model and data structure
- Legends for identification of displayed signals in Scope
- Dockable MATLAB Function editor window

Performance

- Port Values highlighting, with improved simulation performance

For details, see the product-specific release notes.

Aerospace Blockset 3.9

- Bidirectional communication between Simulink and running FlightGear Flight Simulator via UDP packets
- Enhanced actuator blocks with improved dynamic behavior and more control over initial conditions

For details, see the product-specific release notes.

Aerospace Toolbox 2.9

- Support for reading file types 6, 21, and 42 for DATCOM 2011

For details, see the product-specific release notes.

Bioinformatics Toolbox 4.1

- No file size limits when constructing BioIndexedFile, BioRead, and BioMap objects
- Data import from SAM and BAM files containing multiple references in the NGS Browser

- Performance improvements for BioMap objects containing tens of millions of short reads
- MATLAB code examples for methylation analysis of short-read data

For details, see the product-specific release notes.

Communications System Toolbox 5.2

- MATLAB System objects for MIMO fading channel and LTE MIMO fading channel
- Multi-h CPM modulation and demodulation that allows design work for ARTM, JTRS, and MIL-STD-188-181C standards
- Additional GPU support for MATLAB System objects: turbo decoder, convolutional encoder, PSK demodulator, convolutional interleaver, and convolutional deinterleaver
- HDL code generation for CRC generator block
- Examples for MIMO precoding with spatial multiplexing, LTE transport channel processing, OFDMA air interface (including variable sizing), 802.11 packet communication, and QPSK receiver reference design

For details, see the product-specific release notes.

Computer Vision System Toolbox 5.0

- Viola-Jones object detection
- MSER feature detection, extraction, and matching
- CAMShift object tracking
- Integral image computation and filtering
- MATLAB Compiler support for detectSURFFeatures and disparity functions

For details, see the product-specific release notes.

Control System Toolbox 9.3

- No requirement to convert models from System Identification Toolbox to LTI models for analysis and compensator design
- Frequency analysis commands for calculating peak gain and finding gain-crossover frequencies of LTI models

For details, see the product-specific release notes.

Data Acquisition Toolbox 3.1

- Synchronization and triggering functions using session-based interface
- Support for IEPE microphone measurements on National Instruments® devices using session-based interface
- Expanded support for IEPE measurements on National Instruments devices using session-based interface
- Example that illustrates characterization and testing of digital signals acquired from a data acquisition device

For details, see the product-specific release notes.

Database Toolbox 3.11

- .SQL file input to `runsqlscript` function for executing SQL commands on a connected database

For details, see the product specific release notes.

Datafeed Toolbox 4.3

- Functions for accessing data and placing orders through Trading Technologies® X_TRADER®
- Broker buy and sell codes added to Bloomberg® intraday output

- 64-bit support for Haver Analytics® data

For details, see the product specific release notes.

DO Qualification Kit 1.6

- Simulink Code Inspector™ qualification support
- Qualification artifacts for R2012a release of supported verification products
- *Model-Based Design Workflow for DO-178B* document with detailed tool descriptions
- Extended coverage of full and partial credit descriptions for DO-178B objectives

For details, see the product-specific release notes.

DSP System Toolbox 8.2

- ASIO™ (Audio Stream Input/Output) driver support for low-latency audio applications
- Time Scope enhancements: signal statistics and waveform measurement panels, complex data support, multiple axes, stair plots, and graphical property editor
- MIDI Controls block, enabling use of knobs and sliders on MIDI controllers to interact with Simulink models
- Signal measurement System objects for peak-to-peak, peak-to-RMS, state-level estimation, and bilevel waveform metrics
- System objects for streaming data from and to MAT-files
- Integration of System objects into filter design workflow via `fdesign`, `FDATool`, and `filterbuilder` functions

For details, see the product-specific release notes.

Econometrics Toolbox 2.1

- Seasonal ARIMA, GARCH, EGARCH, and GJR model objects for modeling univariate time series data
- Colinearity and stationarity tests for static time series models
- Correlation and recession plots
- Historical credit default and U.S. recession data sets

For details, see the product-specific release notes.

Embedded Coder 6.2

- AUTOSAR Release 4.0 support
- Code efficiency improvements including reduced data copies
- Code report Web views, post-build report creation, interface and code replacement reports, and search window
- LDRA Testbed® integration that includes PIL support and code coverage annotations
- Simplified identifiers for model reference code and more robust name mangling

For details, see the product-specific release notes.

Financial Derivatives Toolbox 5.9

- Swaption pricing using Black model
- Pricing functions for amortizing swaps, bonds, and floating-rate notes
- Holiday and business conventions included in bond pricing functions

For details, see the product-specific release notes.

Financial Toolbox 4.2

- Dollar-neutral and 130-30 portfolio optimization examples
- Turnover constraint and transaction cost portfolio optimization examples
- Sharpe ratio maximization portfolio optimization examples
- Global search heuristic added to `xirr` function to enhance robustness

For details, see the product-specific release notes.

Fixed-Income Toolbox 2.3

- Pricing functions for agency collateralized mortgage obligations (CMOs)

For details, see the product-specific release notes.

Fixed-Point Toolbox 3.5

- Range usage measurement and out-of-range reporting
- Proposed data types based on min/max instrumentation
- Printable instrumentation report
- Slope/bias input to quantizer
- Scaled doubles for code generation and min/max instrumentation

For details, see the product-specific release notes.

HDL Coder 3.0

- Automated fixed-point HDL Code generation from MATLAB code and System objects
- Code generation from subsystems containing Xilinx® System Generator blocks
- Turnkey workflow for Altera® boards

- Instantiation of Xilinx and Altera floating-point IP
- Code generation from any level of hierarchy with user-controllable flattening
- Code generation for programmable coefficient and multiclock filters
- Code generation for HDL CRC Generator, Bus Creator, and Bus Selector Blocks

For details, see the product-specific release notes.

HDL Verifier 4.0

- FPGA-in-the-Loop for Altera boards
- System object for HDL cosimulation with MATLAB
- Automated generation of cosimulation System object from existing HDL code
- Use of FPGA board as Source block with FPGA-in-the-Loop
- HDL cosimulation compatibility with Simulink Design Verifier™

For details, see the product-specific release notes.

IEC Certification Kit 2.1

- ISO® 26262 tool prequalification by TÜV SÜD of R2012a versions of supported products
- IEC 61508 tool certification by TÜV SÜD of R2012a versions of supported products
- Software tool validation tests for Polyspace products
- *Model-Based Design for ISO 26262 and ISO 26262 Tool Listing* documents

For details, see the product-specific release notes.

Image Acquisition Toolbox 4.3

- Image acquisition System object with support for C code generation
- Support for GenTL producer drivers
- 64-bit Windows support for DCAM cameras
- Support for NI-IMAQ version 4.5

For details, see the product-specific release notes.

Image Processing Toolbox 8.0

- Automatic registration of two images using intensity-metric optimization
- `imfuse`, `imshowpair` functions for visually comparing image pairs
- `imfindcircles`, `viscircles` functions for finding and visualizing circles in an image
- Performance improvements in `imlimcomb` function

For details, see the product-specific release notes.

Instrument Control Toolbox 3.1

- I2C bus support for connecting to circuit boards and sensors using I2C protocol
- `fgen` function for simplified control of a function generator or arbitrary waveform generator
- Test & Measurement Tool enhancements for visualization of IVI-C drivers
- AC Power IVI-class support

For details, see the product-specific release notes.

Mapping Toolbox 3.5

- `gpxread` function for importing GPS waypoints, routes, and track logs from GPX files
- `geopoint` vector class for geographic point data with metadata and dynamic properties
- Reference spheroid objects for standard and user-specified earth models

For details, see the product-specific release notes.

MATLAB Builder EX 2.2 (for Microsoft Excel)

- MATLAB Compiler Runtime (MCR) available for download from MathWorks Web site, simplifying distribution of compiled applications and components
- Structure array that maps across Microsoft® Excel spreadsheet cells using the Function Wizard

For details, see the product-specific release notes.

MATLAB Builder JA 2.2.4

- MATLAB Compiler Runtime (MCR) available for download from MathWorks Web site, simplifying distribution of compiled applications and components

For details, see the product-specific release notes.

MATLAB Builder NE 4.1.1

- MATLAB Compiler Runtime (MCR) available for download from MathWorks Web site, simplifying distribution of compiled applications and components

For details, see the product-specific release notes.

MATLAB Coder 2.2

- Code generation for user-authored System objects
- Automatic definition of input types by running example code
- Test files to verify MEX function behavior
- Automatic generation of shared libraries (DLLs)
- Dynamic memory allocation based on size for finer control over stack memory usage

For details, see the product-specific release notes.

MATLAB Compiler 4.17

- MATLAB Compiler Runtime (MCR) available for download from MathWorks Web site, simplifying distribution of compiled applications and components

For details, see the product-specific release notes.

MATLAB Distributed Computing Server 6.0

- GPU computing support for full family of FFT functions for all syntaxes
- More GPU-enabled MATLAB functions and improved `arrayfun` function
- API for launching parallel MATLAB computations and managing associated settings
- Profile Manager tool to manage execution of parallel MATLAB computations

For details, see the product-specific release notes.

MATLAB Report Generator 3.12

- Table creation and formatting components for including images, hyperlinks, text color and alignment, background colors, and cells that span multiple columns and rows
- Style sheet elements for controlling the content, layout, and format of the front and back of report title pages
- Subscript and superscript for Text components
- Additional option to specify comparison type in `visdiff` function

For details, see the product-specific release notes.

Model Predictive Control Toolbox 4.1

- Run-time preview of reference and measured disturbance signals

For details, see the product-specific release notes.

Model-Based Calibration Toolbox 4.4

- Up to 95% file-size reduction of CAGE and Model Browser files for point-by-point projects
- CAGE project storage of last-used settings for tables, models, data, and optimizations for feature filling

For details, see the product-specific release notes.

Optimization Toolbox 6.2

- Enhanced robustness in `fminunc` medium-scale algorithm due to failure recovery in objective function evaluation and gradient estimation

For details, see the product-specific release notes.

Parallel Computing Toolbox 6.0

- GPU computing support for full family of FFT functions for all syntaxes
- More GPU-enabled MATLAB functions and improved `arrayfun` function
- API for launching parallel MATLAB computations and managing associated settings
- Profile Manager tool to manage execution of parallel MATLAB computations

For details, see the product-specific release notes.

Phased Array System Toolbox 1.2

- System objects for replicated subarrays and partitioned array apertures
- Stretch processing of high-bandwidth linear frequency modulation (FM) waveform
- Visualization of radiation patterns in u/v space

For details, see the product-specific release notes.

Polyspace Client for Ada 6.3

- Predefined compilation environment templates
- No requirement to review Non Terminating Call/Loop checks resulting from Red checks

For details, see the product-specific release notes.

Polyspace Client for C/C++ 8.3

- Merger of Coding Rules and Run-Time Checks perspectives
- Predefined compilation environment templates
- No requirement to review Non Terminating Call/Loop checks resulting from Red checks

- Guidance for simplifying and speeding run-time error resolution
- Checking of obligatory MISRA® AC AGC rules
- Decreased number of Orange checks due to absolute address

For details, see the product-specific release notes.

Polyspace Model Link SL 5.9

- Verification of model reference code from top model
- Improved automatic data-range specification for code generated from Embedded Coder

For details, see the product-specific release notes.

Real-Time Windows Target 4.0

- Simulink normal mode real-time simulation without code generation
- 64-bit Windows support for Simulink normal mode real-time simulation
- Variable-step solver support during Simulink normal mode real-time simulation

For details, see the product-specific release notes.

RF Toolbox 2.10

- Graphical tool for frequency planning
- General multiport mixed-mode S-parameter conversion
- Improved rational fit for S-parameter data
- Signal integrity examples

For details, see the product-specific release notes.

Robust Control Toolbox 4.1

- Faster calculations and parallel computing support for `looptune` and `hinfstruct` functions
- Faster and more accurate H-infinity norm computation using SLICOT algorithms

For details, see the product-specific release notes.

Signal Processing Toolbox 6.17

- Transition metrics, including rise time, fall time, mid cross, slew rate, overshoot, undershoot, and settling time
- Pulse metrics, including pulse width, pulse separation, pulse period, and duty cycle
- State level estimation of bilevel waveforms using histogram method
- Signal statistics, including root mean squared (RMS), root sum squared (RSS), peak-to-peak, and peak-to-RMS (crest factor) measurements
- Example illustrating analysis and characterization of digital signals acquired from a data acquisition device

For details, see the product-specific release notes.

SimBiology 4.1

- Configurable output times for simulation and parameter estimation
- Simultaneous fits using nonlinear regression for heterogeneously dosed patients
- Interactive Simulation Viewer to explore the effect of initial parameter, species, or compartment values on simulation results
- Weighted least squares fitting
- Support for SBML level 2 version 4

For details, see the product-specific release notes.

SimDriveline 2.2

- Rope Drum, Chain Drive, Belt Drive, and Belt Pulley blocks
- Additional tire blocks: Simple and Friction Parameterized
- Four-Wheel Drive demonstration model that uses variant subsystems

For details, see the product-specific release notes.

SimElectronics 2.1

- Optional thermal ports available for actuator blocks and Solar Cell block
- Fully Differential Op-Amp, Transmission Line, and Power Sensor blocks
- Exponential Diode block now models charge dynamics
- Controlled PWM Voltage block now allows adding turn-on delay and turn-off advance

For details, see the product-specific release notes.

SimEvents 4.1

- Implicit event duplication prevention
- Fixed-step solver for better integration with Simulink
- Time-Based Function-Call Generator block
- Model Advisor checks for upgrading models built prior to R2011b

For details, see the product-specific release notes.

SimMechanics 4.0

- Second-generation technology for multibody mechanical systems modeling
- Continued first-generation technology support
- Redesigned graphical language for block diagrams, with ports and nodes mapping directly to frames

- 3-D visualization via Mechanics Explorer, with multiple simultaneous views and tree browser for navigating model
- Animation controls, including adjusting animation speed and replaying without rerunning simulation
- Automatic calculation of mass and inertia from body geometries
- Initial condition options, including priority settings for specified initial conditions
- Improved integration with Simscape™, including units and Physical Signals

For details, see the product-specific release notes.

SimPowerSystems 5.6

- Optional Simscape mechanical rotational port for SimPowerSystems™ machine models
- `power_PMSynchronousMachineParams` function that computes electrical parameters of Permanent Magnet synchronous machine based on standard manufacturer data

For details, see the product-specific release notes.

SimRF 3.2

- Frequency-domain option for fast circuit-envelope simulation of S-parameter blocks
- Transmission line block in SimRF™ circuit-envelope library
- Example for SimRF noise simulation

For details, see the product-specific release notes.

Simscape 3.7

- Simscape language to enable modeling of delays for continuous variables
- Two library blocks for modeling delays: PS Constant Delay and PS Variable Delay
- Simscape language to enable 1-D and 2-D interpolation
- Speed and efficiency improvements for simulation of linear systems

For details, see the product-specific release notes.

Simulink 3D Animation 6.1

- Projection plane and projection point in VR Tracer Block for visualization of object's projected 3D motion
- Coordinate-grid templates in 3D World Editor for better understanding of object orientation
- Editing of PROTO and EXTERNPROTO definitions with improved 3D scene refresh performance in 3D World Editor
- 3D animation video recording that uses MATLAB VideoWriter technology for creation of files larger than 2 GB, with option for platform-independent Motion JPEG compression support

For details, see the product-specific release notes.

Simulink Code Inspector 1.1

- Inlined atomic and enabled subsystems and 1-2D lookup tables
- Enumerated types
- Inspection of nonencapsulated C++ code
- Traceability matrix generation
- DO-178 qualification support (using DO Qualification Kit)

For details, see the product-specific release notes.

Simulink Coder 8.2

- Simplified call interface for generated code
- Incremental code generation for top-level models
- Minimal header file dependencies with packNGo command
- ASAP2 enhancements for model referencing and structured data
- External mode enhancements for performance and serial communication

For details, see the product-specific release notes.

Simulink Control Design 3.5

- Creation of linearization input and output sets in the Linear Analysis Tool

For details, see the product-specific release notes.

Simulink Design Optimization 2.1

- Formulation and solving of response optimization problems that have frequency-domain requirements without adding blocks to the Simulink model
- Spider plot for comparing design variables before and after optimization

For details, see the product-specific release notes.

Simulink Design Verifier 2.2

- Dead logic analysis added to design error detection
- Model coverage filtering applied for test generation analysis
- Improved property-proving performance for lookup tables

For details, see the product-specific release notes.

Simulink Fixed Point 7.1

- NumericTypeScope function for visualizing dynamic range fixed-point data types
- Derived range analysis for subsystems and subcharts levels
- Range analysis results for Stateflow® data with local scope

For details, see the product-specific release notes.

Simulink PLC Coder 1.3

- Absolute time temporal logic for Rockwell Automation® RSLogix™ 5000 IDE
- Structured text generation for Rockwell Automation RSLogix 5000 IDE using RSLogix routines
- Global tunable parameters for Rockwell Automation RSLogix 5000 IDE and Phoenix Contact® PC WORX™ IDE
- Integration of user-defined function blocks, data types, and global variables into generated structured text

For details, see the product-specific release notes.

Simulink Report Generator 3.12

- Table creation and formatting components for including images, hyperlinks, text color and alignment, background colors, and cells that span multiple columns and rows
- Display of changes in Configuration Parameters dialog box options in the Simulink XML Comparison report
- Improved speed and filtered results in printable XML Comparison report

For details, see the product-specific release notes.

Simulink Verification and Validation 3.3

- Model coverage for saturation on integer overflow
- Exclusion of selected model objects from Model Advisor
- Highlighting of Model Advisor results in the model window
- Requirements linking between Simulink objects
- Direct hyperlink navigation from external documents to Simulink, replacing insertion of navigation objects in documents

For details, see the product-specific release notes.

Stateflow 7.9

- API enhancements for highlighting chart objects and specifying transition destination endpoints
- Structures and enumerated data types for inputs and outputs of exported graphical functions

For details, see the product-specific release notes.

Statistics Toolbox 8.0

- Enhanced interface for fitting, prediction, and plotting with linear, generalized linear, and nonlinear regression
- Viewing, editing, and plotting dataset arrays in the MATLAB Variable Editor
- Regularization and shrinkage for logistic regression and other generalized linear models

- k-Nearest Neighbor classification
- Random subspace ensembles for reducing data dimensionality, working with missing data, and estimating the importance of predictors
- Linear discriminant analysis with regularization of the covariance matrix and thresholding of predictor differences

For details, see the product-specific release notes.

Symbolic Math Toolbox 5.8

- MATLAB symbolic equations and functions definition for use with `solve`, `dsolve`, `ezplot`, and other functions
- `odeToVectorField` function for converting second-order and higher-order differential equations to systems of first-order differential equations
- MATLAB symbolic special functions: `airy`, `beta`, `erfinv`, `erfcinv`, `factorial`, `nchoosek`, `whittakerM`, and `whittakerW`
- MATLAB symbolic vector analysis functions: `curl`, `divergence`, `laplacian`, `potential`, and `vectorPotential`
- MATLAB symbolic functions for setting (`assume`), adding (`assumeAlso`), and showing (`assumptions`) assumptions on symbolic variables

For details, see the product-specific release notes.

System Identification Toolbox 8.0

- Continuous-time transfer function identification from time-domain and frequency-domain data
- Time series modeling and forecasting, including generation of ARIMA models
- Estimation of multi-output polynomial and process models
- Interactive response plots with better look and feel

- No requirement to convert identified models to LTI models for analysis and compensator design with Control System Toolbox™
- Improved reliability of numerical computations

For details, see the product-specific release notes.

Vehicle Network Toolbox 1.6

- `discard` function for clearing all available messages on a CAN channel without restarting the channel
- `UserData` property for attaching custom information to a CAN channel, message, or database
- Enhanced sampling time field in Simulink blocks, allowing use of MATLAB variables
- Support for additional Kvaser CAN interface devices

For details, see the product-specific release notes.

Wavelet Toolbox 4.9

- Matching pursuit for sparse representation of signals with varying time-frequency and time-scale characteristics
- Matching pursuit dictionary generation
- Interactive tool for matching pursuit

For details, see the product-specific release notes.

xPC Target 5.2

- Next generation xPC Target Explorer for 32-bit and 64-bit MATLAB
- Support for Speedgoat IO312 and IO314 FPGA I/O modules
- Vector signals and DMA for FPGA data transfers

For details, see the product-specific release notes.

R2012a Products with License-Related Changes

Several products have license-related changes in R2012a. To use the latest version of each product, you must have a subscription to MathWorks Software Maintenance Service (SMS) as of R2012a.

Computer Vision System Toolbox

As of R2012a, Computer Vision System Toolbox no longer requires Signal Processing Toolbox™ and DSP System Toolbox™.

EDA Simulator Link

As of R2012a, EDA Simulator Link has been renamed HDL Verifier.

Real-Time Windows Target

As of R2012a, Real-Time Windows Target no longer requires MATLAB Coder and Simulink Coder.

Simulink HDL Coder

As of R2012a, Simulink HDL Coder has been renamed HDL Coder. This product now requires MATLAB Coder and no longer requires Simulink.

If you are:	
Subscribed to SMS as of R2012a for Simulink HDL Coder	Your license will be updated to include MATLAB Coder 2.2 at no initial cost; it will appear on future SMS renewal invoices.
Not Subscribed to SMS as of R2012a for Simulink HDL Coder	Your license will be updated to include MATLAB Coder at no initial cost. You will need to renew your SMS subscription to access the updated product.

System Requirements

There are no major system requirements changes for R2012a.

For more information on system requirements, visit [Platforms & Requirements](#).

Platform Support to Be Phased Out

R2012a is the last release of MATLAB and Simulink products for 32-bit Linux platforms. MathWorks will continue to provide support for 64-bit Linux. For more information on planned changes to supported platforms, visit [Platform Road Map](#).

Release Summary

An asterisk (*) after a product name indicates the product has had a Web release since R2011b.

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
MATLAB	Yes	Yes	Yes
Simulink	Yes	Yes	Yes
Aerospace Blockset™	Yes	Yes	No
Aerospace Toolbox	Yes	Yes	No
Bioinformatics Toolbox™	Yes	Yes	Yes
Communications System Toolbox	Yes	Yes	Yes
Computer Vision System Toolbox	Yes	Yes	Yes
Control System Toolbox	Yes	No	Yes
Curve Fitting Toolbox™	No	Yes	Yes
Data Acquisition Toolbox™	Yes	Yes	No
Database Toolbox™	Yes	No	No
Datafeed Toolbox™	Yes	Yes	No
DO Qualification Kit	Yes	Yes	No
DSP System Toolbox	Yes	Yes	Yes
Econometrics Toolbox™	Yes	No	No
Embedded Coder	Yes	Yes	Yes
Filter Design HDL Coder™	No	Yes	No
Financial Derivatives Toolbox™	Yes	No	No
Financial Toolbox™	Yes	No	No
Fixed-Income Toolbox™	Yes	Yes	No
Fixed-Point Toolbox™	Yes	Yes	Yes

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
Fuzzy Logic Toolbox™	No	Yes	No
Gauges Blockset™	No	Yes	No
Global Optimization Toolbox	No	Yes	No
HDL Coder	Yes	Yes	Yes
HDL Verifier	Yes	Yes	Yes
IEC Certification Kit	Yes	No	No
Image Acquisition Toolbox™	Yes	Yes	Yes
Image Processing Toolbox	Yes	Yes	Yes
Instrument Control Toolbox™	Yes	Yes	No
Mapping Toolbox™	Yes	No	Yes
MATLAB Builder™ EX	Yes	Yes	Yes
MATLAB Builder JA	Yes	Yes	Yes
MATLAB Builder NE	Yes	Yes	Yes
MATLAB Coder	Yes	Yes	Yes
MATLAB Compiler	Yes	Yes	Yes
MATLAB Distributed Computing Server™	Yes	Yes	Yes
MATLAB Report Generator™	Yes	Yes	Yes
Model Predictive Control Toolbox™	Yes	No	Yes
Model-Based Calibration Toolbox™	Yes	Yes	No
Neural Network Toolbox™	No	Yes	No
OPC Toolbox™	Yes	Yes	Yes
Optimization Toolbox™	Yes	Yes	Yes
Parallel Computing Toolbox	Yes	Yes	Yes
Partial Differential Equation Toolbox™ (no release notes)	No	Yes	No

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
Phased Array System Toolbox™	Yes	No	Yes
Polyspace Client™ for Ada	Yes	Yes	Yes
Polyspace Server™ for Ada	Yes	Yes	No
Polyspace Client for C/C++	Yes	Yes	Yes
Polyspace Server for C/C++	Yes	Yes	No
Polyspace Model Link™ SL	Yes	Yes	No
Polyspace Model Link TL	No	No	No
Polyspace UML Link™ RH	Yes	Yes	No
Real-Time Windows Target	Yes	No	Yes
RF Toolbox™	Yes	No	No
Robust Control Toolbox™	Yes	No	No
Signal Processing Toolbox	Yes	Yes	No
SimBiology®	Yes	Yes	Yes
SimDriveline™	Yes	No	No
SimElectronics®	Yes	No	No
SimEvents®	Yes	Yes	Yes
SimHydraulics®	No	Yes	No
SimMechanics	Yes	No	Yes
SimPowerSystems	Yes	Yes	No
SimRF	Yes	Yes	No
Simscape	Yes	Yes	Yes
Simulink 3D Animation™	Yes	No	No
Simulink Code Inspector	Yes	Yes	No
Simulink Coder	Yes	Yes	Yes
Simulink Control Design™	Yes	Yes	No

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
Simulink Design Optimization™	Yes	No	No
Simulink Design Verifier *	Yes	Yes	No
Simulink Fixed Point™	Yes	No	Yes
Simulink PLC Coder™	Yes	No	No
Simulink Report Generator	Yes	Yes	No
Simulink Verification and Validation™	Yes	Yes	Yes
Spreadsheet Link™ EX	No	Yes	No
Stateflow	Yes	Yes	Yes
Statistics Toolbox	Yes	Yes	Yes
Symbolic Math Toolbox™	Yes	Yes	Yes
System Identification Toolbox	Yes	Yes	Yes
SystemTest™	No	Yes	No
Vehicle Network Toolbox™	Yes	Yes	Yes
Wavelet Toolbox™	Yes	Yes	No
xPC Target™	Yes	Yes	Yes