

MATLAB® & Simulink®

Release Notes for R2008a



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& SIMULINK®

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Release Notes for R2008a

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Revision History

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Release Notes for R2008a

1

Highlights of R2008a	1-2
What's New in Release 2008a	1-2
New Capabilities for the MATLAB® Product Family	1-2
New Capabilities for the Simulink® Product Family	1-3
New Products	1-3
Renamed Products	1-3
Summary of Changes to Each Product	1-4
Summary of New Features	1-5
MATLAB® 7.6	1-7
Simulink® 7.1	1-9
Aerospace Blockset™ 3.1	1-12
Aerospace Toolbox 2.1	1-12
Bioinformatics Toolbox™ 3.1	1-12
Communications Blockset™ 4.0	1-13
Communications Toolbox™ 4.1	1-13
Data Acquisition Toolbox™ 2.12	1-14
Embedded IDE Link™ CC 3.2	1-14
Embedded IDE Link™ MU 1.0.1	1-14
Embedded IDE Link™ TS 1.3	1-14
Embedded IDE Link™ VS 2.0	1-15
Filter Design HDL Coder™ 2.2	1-15
Filter Design Toolbox™ 4.3	1-15
Financial Derivatives Toolbox™ 5.2	1-16
Financial Toolbox™ 3.4	1-16
Fixed-Income Toolbox™ 1.5	1-16
Fixed-Point Toolbox™ 2.2	1-16
GARCH Toolbox™ 2.4	1-17
Genetic Algorithm and Direct Search Toolbox™ 2.3	1-17
Image Acquisition Toolbox™ 3.1	1-17
Image Processing Toolbox™ 6.1	1-17
Instrument Control Toolbox™ 2.6	1-18
Mapping Toolbox™ 2.7	1-18
MATLAB® Builder™ NE 2.2.2	1-18
MATLAB® Compiler™ 4.8	1-18
MATLAB® Distributed Computing Server™ 3.3	1-19

Model-Based Calibration Toolbox™ 3.4	1-19
Neural Network Toolbox™ 6.0	1-19
Optimization Toolbox™ 4.0	1-20
Parallel Computing Toolbox™ 3.3	1-20
PolySpace™ Products	1-21
Real-Time Windows Target™ 3.1	1-21
Real-Time Workshop® 7.1	1-21
Real-Time Workshop® Embedded Coder™ 5.1	1-22
RF Blockset™ 2.2	1-22
RF Toolbox™ 2.3	1-22
Robust Control Toolbox™ 3.3.1	1-23
Signal Processing Blockset™ 6.7	1-23
Signal Processing Toolbox™ 6.9	1-24
SimBiology® 2.3	1-24
SimDriveline™ 1.5	1-24
SimEvents® 2.2	1-25
SimHydraulics® 1.3	1-25
SimMechanics™ 2.7.1	1-25
SimPowerSystems™ 4.6	1-25
Simscape™ 2.1	1-26
Simulink® Control Design™ 2.3	1-26
Simulink® Design Verifier™ 1.2	1-26
Simulink® Fixed Point™ 5.6	1-27
Simulink® HDL Coder™ 1.3	1-27
Simulink® Report Generator™ 3.3	1-27
Simulink® Verification and Validation™ 2.3	1-28
Stateflow® 7.1	1-28
Stateflow® Coder™ Stateflow® Coder™ 7.1	1-29
Statistics Toolbox™ 6.2	1-29
System Identification Toolbox™ 7.2	1-29
SystemTest™ 2.1	1-30
Target Support Package™ FM5 2.2.1	1-30
Target Support Package™ IC1 1.5.1	1-30
Target Support Package™ TC2 3.0	1-30
Target Support Package™ TC6 3.4	1-31
Video and Image Processing Blockset™ 2.5	1-31
Virtual Reality Toolbox™ 4.7	1-31
Wavelet Toolbox™ 4.2	1-32
xPC Target™ 3.4	1-32
New Products	1-33
EDA Simulator Link™ DS (for Synopsys® Discovery™) ..	1-33
Embedded IDE Link™ MU (for Green Hills® MULTI®) ...	1-34

Renamed Products	1-36
Installation and Activation	1-37
Activation	1-37
Default License File Search Path Has Changed	1-37
Compatibility Considerations	1-38
R2008a Compatibility	1-38
Compatibility for Each Product	1-40
Compatibility Considerations for New Functions and Models	1-41
System Requirements	1-42
Platforms No Longer Available for New Releases	1-42
Linux glibc Requirement	1-42
Release Summary	1-43

Release Notes for R2008a

- “Highlights of R2008a” on page 1-2
- “Summary of New Features” on page 1-5
- “New Products” on page 1-33
- “Renamed Products” on page 1-36
- “Installation and Activation” on page 1-37
- “Compatibility Considerations” on page 1-38
- “System Requirements” on page 1-42
- “Release Summary” on page 1-43

Highlights of R2008a

In this section...

“What’s New in Release 2008a” on page 1-2

“New Capabilities for the MATLAB® Product Family” on page 1-2

“New Capabilities for the Simulink® Product Family” on page 1-3

“New Products” on page 1-3

“Renamed Products” on page 1-3

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

What’s New in Release 2008a

Release 2008a includes new features in MATLAB® and Simulink®, two new products, and updates and bug fixes to 81 other products. Subscribers to MathWorks™ Software Maintenance Service can download product updates.

Beginning with R2008a, the MATLAB and Simulink product families will require activation. R2008a will also introduce the License Center, a new online tool that addresses common license administration needs.

New Capabilities for the MATLAB® Product Family

- State-of-the-art object-oriented programming in MATLAB, including full support for classes and objects, inheritance, methods, properties, events and packages
- Interior point solver and parallel computing support in Optimization Toolbox™
- Linear Complementarity Program (LCP) for mean-variance portfolio optimization in Financial Toolbox™
- Full support for PBS Pro® and TORQUE schedulers with Parallel Computing Toolbox™
- Cross validation, feature selection, quasi-random numbers, and partial least squares in Statistics Toolbox™

New Capabilities for the Simulink® Product Family

- Redesigned, multiplatform Library Browser in Simulink
- AUTOSAR-compliant code generation in Real-Time Workshop® Embedded Coder™
- Code checking of Embedded MATLAB™ language subset functions in the M-Lint Code Analyzer and Simulink® Design Verifier™
- IEC 61508 style guideline checks for safety-critical systems in Simulink® Verification and Validation™
- Fixed-Point Advisor for automated conversion of floating-point models in Simulink® Fixed Point™
- Fixed-point support for modulator, demodulator, encoder, and decoder functions in Communications Blockset™
- Embedded IDE Link™ MU, a new product that deploys code generated by Simulink to Green Hills® MULTI® development environment

New Products

R2008a contains two new products.

EDA Simulator Link™ DS (for Synopsys® Discovery™)	Co-simulate and verify VHDL and Verilog using Synopsys Discovery VCSMX
Embedded IDE Link™ MU (for Green Hills MULTI)	Build, test, and optimize code for embedded microprocessors using Green Hills® MULTI®

For details, see “New Products” on page 1-33.

Renamed Products

There are 15 products that have been renamed for R2008a.

For details, see “Renamed Products” on page 1-36.

Summary of Changes to Each Product

See “Release Summary” on page 1-43 for a summary of what has changed for each product for R2008a, including whether the product has new features, bug fixes, and compatibility issues.

Summary of New Features

Note For information about potential issues for upgrading from R2007b, see “Compatibility Considerations” on page 1-38.

This section summarizes the major new features and enhancements introduced in R2008a for the following products:

“MATLAB® 7.6” on page 1-7	“Simulink® 7.1” on page 1-9
“Aerospace Blockset™ 3.1” on page 1-12	“Aerospace Toolbox 2.1” on page 1-12
“Bioinformatics Toolbox™ 3.1” on page 1-12	“Communications Blockset™ 4.0” on page 1-13
“Communications Toolbox™ 4.1” on page 1-13	“Data Acquisition Toolbox™ 2.12” on page 1-14
“Embedded IDE Link™ CC 3.2” on page 1-14	“Embedded IDE Link™ MU 1.0.1” on page 1-14
“Embedded IDE Link™ TS 1.3” on page 1-14	“Embedded IDE Link™ VS 2.0” on page 1-15
“Filter Design HDL Coder™ 2.2” on page 1-15	“Filter Design Toolbox™ 4.3” on page 1-15
“Financial Derivatives Toolbox™ 5.2” on page 1-16	“Financial Toolbox™ 3.4” on page 1-16
“Fixed-Income Toolbox™ 1.5” on page 1-16	“Fixed-Point Toolbox™ 2.2” on page 1-16
“GARCH Toolbox™ 2.4” on page 1-17	“Genetic Algorithm and Direct Search Toolbox™ 2.3” on page 1-17
“Image Acquisition Toolbox™ 3.1” on page 1-17	“Image Processing Toolbox™ 6.1” on page 1-17
“Instrument Control Toolbox™ 2.6” on page 1-18	“Mapping Toolbox™ 2.7” on page 1-18

“MATLAB® Builder™ NE 2.2.2” on page 1-18	“MATLAB® Compiler™ 4.8” on page 1-18
“MATLAB® Distributed Computing Server™ 3.3” on page 1-19	“Model-Based Calibration Toolbox™ 3.4” on page 1-19
“Neural Network Toolbox™ 6.0” on page 1-19	“Optimization Toolbox™ 4.0” on page 1-20
“Parallel Computing Toolbox™ 3.3” on page 1-20	“Real-Time Windows Target™ 3.1” on page 1-21
“Real-Time Workshop® 7.1” on page 1-21	“Real-Time Workshop® Embedded Coder™ 5.1” on page 1-22
“RF Blockset™ 2.2” on page 1-22	“RF Toolbox™ 2.3” on page 1-22
“Robust Control Toolbox™ 3.3.1” on page 1-23	“Signal Processing Blockset™ 6.7” on page 1-23
“Signal Processing Toolbox™ 6.9” on page 1-24	“SimBiology® 2.3” on page 1-24
“SimDriveline™ 1.5” on page 1-24	“SimEvents® 2.2” on page 1-25
“SimHydraulics® 1.3” on page 1-25	“SimMechanics™ 2.7.1” on page 1-25
“SimPowerSystems™ 4.6” on page 1-25	“Simscape™ 2.1” on page 1-26
“Simulink® Control Design™ 2.3” on page 1-26	“Simulink® Design Verifier™ 1.2” on page 1-26
“Simulink® Fixed Point™ 5.6” on page 1-27	“Simulink® HDL Coder™ 1.3” on page 1-27
“Simulink® Report Generator™ 3.3” on page 1-27	“Simulink® Verification and Validation™ 2.3” on page 1-28
“Stateflow® 7.1” on page 1-28	“Stateflow® Coder™ Stateflow® Coder™ 7.1” on page 1-29
“Statistics Toolbox™ 6.2” on page 1-29	“System Identification Toolbox™ 7.2” on page 1-29
“SystemTest™ 2.1” on page 1-30	“Target Support Package™ FM5 2.2.1” on page 1-30

“Target Support Package™ IC1 1.5.1” on page 1-30	“Target Support Package™ TC2 3.0” on page 1-30
“Target Support Package™ TC6 3.4” on page 1-31	“Video and Image Processing Blockset™ 2.5” on page 1-31
“Virtual Reality Toolbox™ 4.7” on page 1-31	“Wavelet Toolbox™ 4.2” on page 1-32
“xPC Target™ 3.4” on page 1-32	

MATLAB® 7.6

MATLAB® Version 7.6, part of R2008a, offers a broad range of improvements in the following areas, including a major update to object-oriented programming capabilities.

Language and Programming

- Major enhancements to object-oriented programming capabilities allowing easier development and maintenance of large applications and data structures. Many new features, including:
 - New `classdef` keyword enabling you to define properties, methods, and events in a class definition file
 - New `handle` class with reference behavior, aiding the creation of data structures such as linked lists
 - Events and listeners allowing the monitoring of object property changes and actions
 - JIT/Accelerator support providing significantly improved object performance over previous releases
 - Several enhancements to the development environment to support developing and using classes including improved support for objects in the variable editor and M-lint warnings specific to classes
- Ability to manage namespace by placing classes and functions in packages
- New `clearvars` function for clearing or keeping specified variables

- New `onCleanup` function to specify any cleanup tasks that need to be performed by MATLAB when a function completes

Development Environment

- Ability to customize and rearrange the MATLAB Desktop and Editor toolbars
- Expanded code-folding support in the Editor, providing the ability to collapse cells and language constructs (including `for`, `if`, `switch`, and more)
- Enhanced inspection of structures and objects with the Variable Editor, previously known as the Array Editor
- File comparison tool expanded to allow comparison of directories, MAT-files and binary files
- Several enhancements to automatic M-file publishing, including support for functions and the ability to define configurations on a per-file basis
- M-Lint code checker support for Embedded MATLAB™ features

Mathematics

- Ability to insert custom FFTW and LAPACK libraries
- New algorithms for `ldl`, `logm`, and `funm` based on recent numerical methods research

Graphics and GUI Building

- Ability to link plots to workspace variables, synchronizing displays of changing data
- Support for "brushing" (interactively selecting) data in plots for analysis and manipulation
- Brushed variables in one plot also will highlight in other plots linked to the same workspace data
- New control `uitable`, accessible from GUIDE, enabling the display and editing of tabular information in graphical user interfaces

File I/O and External Interfacing

- MEX support for Microsoft® Visual Studio® 2008, OpenWATCOM 1.7, and Intel® FORTRAN 10.1 software
- mmreader multimedia reader expanded to support QuickTime video on the Apple® Macintosh® platform (previously released on Microsoft® Windows® platforms)

Performance and Large Data Set Handling

- New memory function providing memory information such as largest block available, providing diagnostics of memory problems on Windows platforms
- JIT/Accelerator support enhanced to statements executed at the MATLAB command line and in cell mode in the editor, providing improved performance in these environments
- Automatic multithreaded computation providing improved performance of supported functions on computers with multiple processors
- Significant speed improvement in multiplication of sparse matrices

For details, see the product-specific release notes.

Simulink® 7.1

Simulink® Library Browser Enhancements

- Now runs on all platforms supported by Simulink® software
- Improved performance for browsing and searching of libraries, by allowing these operations to proceed without actually loading the libraries
- Enhanced search finds all blocks and displays search results in a separate tab
- New option to display library blocks in a compact grid layout that conserves screen space

Simulation Performance

- Improved Rapid Accelerator `sim` command performance when running long simulations of small models on Windows platforms
- Additional zero-crossing algorithm with adaptive detection and adjustable threshold limits improves simulation performance

Component-Based Modeling

- Accelerator mode now supports an unlimited number of referenced models on all platforms, including 32-bit Windows
- Improved model compilation time when using models referenced in accelerator mode by rebuilding parent models only when the interface to a referenced model changes

Embedded MATLAB™

- Support for nontunable MATLAB structure parameters in Embedded MATLAB Function blocks

Data Management

- Enhanced Data Type Assistant display of status and details of fixed-point data type
- Enhanced signal range checking for both real and imaginary parts of a complex number
- Enhanced Bus Editor importing/exporting of data from MAT-files and M-files, defining bus elements with the Data Type Assistant, and expanding bus hierarchies
- Simulink Editor graphical indication of signals that must resolve to signal objects
- In models with asynchronous function calls, correct assignment of generic sample times instead of triggered sample times by some virtual blocks
- Changes to nontunable parameters during simulation ignored, matching the behavior in generated code

- Enhanced data logging on 64-bit platforms, providing the ability to save more than 2 GB of simulation data

File Management

- New autosave option for automatically saving models before updating or simulating
- New option to notify when loading a model saved in a previous version of Simulink
- Enhanced model dependencies manifest tools now also detect TLC files required by S-functions, .fig files created by GUIDE, and files referenced by common data loading functions

Block Enhancements

- New Discrete FIR Filter block replaces the Weighted Moving Average block for faster simulation and improved code generation
- Rate Transition block output port sample time now can be specified as multiple of input port sample time
- Enhanced auto-insertion options for the Rate Transition block to control the level of data transfer determinism, allowing reduced latency for models that do not require determinism
- Auto-insertion of Rate Transition block now supported for additional rate transitions, such as sample times with nonzero offset, and between non-integer-multiple sample times
- Enhanced Lookup Table (n-D) block supports all data types, complex table data, and nonscalar inputs
- Expanded Sum block dialog box displays new parameters for specifying the accumulator data type and its minimum and maximum values

User Interface Enhancements

- New unified Simulink Preferences window for configuring default settings
 - Enhanced controls in the Solver pane of the Configuration Parameters dialog box
 - Enhanced Model Advisor with improved GUI navigation and report production
 - Context-sensitive help available for Configuration Parameters dialog box
- For details, see the product-specific release notes.

Aerospace Blockset™ 3.1

- Support for quaternion functions in Embedded MATLAB Function block, including `quatconj`, `quatinv`, `quatmod`, `quatmultiply`, `quatdivide`, `quatnorm`, and `quatnormalize`
- For details, see the product-specific release notes.

Aerospace Toolbox 2.1

- Support for 1999 version of Datcom
- For details, see the product-specific release notes.

Bioinformatics Toolbox™ 3.1

- Illumina® BeadStudio™ microarray data support
- Expanded clustergram feature with more flexible clustering analysis and additional annotation and export functionality
- Expanded Ramachandran plotting with more accessible residue information and ability to display reference regions and plot multiple chains and models
- Expanded array—based comparative genomic hybridization (aCGH) visualization with frequency plot
- Gene Expression Omnibus (GEO) SOFT data support expanded to allow the retrieval of Data Set (GDS) data

- Improved performance of pairwise sequence alignment
- New demo on analyzing metagenomic data

For details, see the product-specific release notes.

Communications Blockset™ 4.0

- Fixed-Point data type support added to: Integrate and Dump, OQPSK Demodulator, General QAM Demodulator, and Gold Sequence Generator blocks
- New default `Inherit via internal rule` mode added to the `Output` data type parameter on many blocks in the Utility library
- Asynchronous signal support added for all blocks
- New parameters for specifying bit ordering and signed or unsigned integer formatting added to the `Bit to Integer Converter` and `Integer to Bit Converter` blocks
- New demos added for fixed-point equalization and passband modulation

For details, see the product-specific release notes.

Communications Toolbox™ 4.1

- Eye diagram measurements can now be generated from the histogram data of eye diagram objects
- New `EyeScope` tool shows both the eye diagram figure and measurement results in a unified, graphical user environment
- New CRC generator and detector objects
- The `bchdec`, `bchenc`, `rsdec`, and `rsenc` functions have been upgraded to objects that can now perform erasure decoding
- New demo for MIMO systems using spatial multiplexing

For details, see the product-specific release notes.

Data Acquisition Toolbox™ 2.12

- New Simulink blocks to acquire and send single samples between a Simulink model and an analog device
- Support for additional National Instruments® data acquisition devices, including PXI-4496, PXI-4498, USB-6225, USB-6255, SCXI-1102, SCXI-1104, SCXI-1120, and SCXI-1125
- Support for additional Measurement Computing™ data acquisition devices: USB-1608HS, USB-1608HS-2AO, USB-1616HS, USB-1616HS-2, USB-1616HS-4, and AI-EXP48

For details, see the product-specific release notes.

Embedded IDE Link™ CC 3.2

- Profiling stack usage
- Support for TMS3202833x processor
- Context-sensitive help available for Configuration Parameters dialog box

For details, see the product-specific release notes.

Embedded IDE Link™ MU 1.0.1

- Context-sensitive help available for Configuration Parameters dialog box

For details, see the product-specific release notes.

Embedded IDE Link™ TS 1.3

- Infineon® TriCore® Optimized Code: Support for ISO/IEC 9899:1999 Math Library
- New Supported Altium Limited TASKING® Toolsets for Infineon® C166®, Infineon TriCore, and Arm Limited ARM® processors
- Limitation removed: multidimensional signals now supported at the PIL component Boundary

- Context-sensitive help available for Configuration Parameters dialog box
For details, see the product-specific release notes.

Embedded IDE Link™ VS 2.0

- Profiling stack usage
- Support for additional Analog Devices® Blackfin®, SHARC®, and TigerSHARC® processors
- Support for Analog Devices™ VisualDSP++® Version 5.0
- Context-sensitive help available for Configuration Parameters dialog box
For details, see the product-specific release notes.

Filter Design HDL Coder™ 2.2

- Code generation support for multirate Farrow sample rate converter filters (standalone or within a cascade)
- Support for multfile test-bench generation: option to generate separate files for test bench code, helper functions, and test bench data
For details, see the product-specific release notes.

Filter Design Toolbox™ 4.3

- `fdesign` support for highpass halfband filters
- `fdesign` support for Farrow sample rate converters
- `realizemd1` support for polyphase and Farrow sample rate converters
- Input quantization added to models generated by the block method
For details, see the product-specific release notes.

Financial Derivatives Toolbox™ 5.2

- Support for actual/365 (ISDA)
- Support for pricing callable and puttable bonds

For details, see the product-specific release notes.

Financial Toolbox™ 3.4

- Support for actual/365 (ISDA)
- Enhanced mean-variance portfolio optimization based on linear complementarity programming
- Support for `ret2tick` or `tick2ret` functions for financial time series objects
- Support for additional descriptive statistics functions for financial times series objects
- Support for new chart types

For details, see the product-specific release notes.

Fixed-Income Toolbox™ 1.5

- Support for actual/365 (ISDA)

For details, see the product-specific release notes.

Fixed-Point Toolbox™ 2.2

- Enhanced memory management of the `fi` object
- New rounding functions for `fi` objects and Embedded MATLAB subset include `ceil`, `convergent`, `fix`, `floor`, `nearest`, and `round`
- New bitwise operator `bitreplicate` and new syntax for bitwise operator `bitconcat`
- `ndgrid` function support for fixed-point inputs
- New `fi` constructor syntax

For details, see the product-specific release notes

GARCH Toolbox™ 2.4

- Support for Monte Carlo simulation of stochastic differential equations, which enables modeling of dependent financial and economic variables such as interest rates and equity prices

For details, see the product-specific release notes.

Genetic Algorithm and Direct Search Toolbox™ 2.3

- New parallel computing support in genetic algorithm and pattern search solvers to allow simultaneous exploration of local solution space
- New automatic population generator for genetic algorithm solvers to provide well-dispersed initial populations satisfying linear constraints
- Genetic algorithm and pattern search GUIs combined into the existing Optimization Tool GUI
- Simulated annealing, threshold acceptance, and multiobjective genetic algorithms are now accessible through Optimization Tool GUI

For details, see the product-specific release notes.

Image Acquisition Toolbox™ 3.1

- Support for additional Hamamatsu device: C9100-13
- Support for RTSI functionality in National Instruments boards supported by the toolbox

For details, see the product-specific release notes.

Image Processing Toolbox™ 6.1

- New `makehdr` and `hdrwrite` functions to create high dynamic range (HDR) images and write them to files
- Getting information about properties of grayscale images, using `regionprops` function
- Display of large images using `imshow` with the new 'reduce' parameter

For details, see the product-specific release notes.

Instrument Control Toolbox™ 2.6

- New Simulink blocks to send and receive data over a serial port in a Simulink model.
- Improved throughput in Instrument Control Serial interface and TCP/IP Receive blocks
- Enhanced capability for discovery of VISA-USB and VISA TCP/IP (VXI-11) instruments in the TMTTOOL
- New instrument drivers available on MATLAB Central

For details, see the product-specific release notes.

Mapping Toolbox™ 2.7

- Three new functions for working with geographic quadrangles
- Enhancements to the `angl2str`, `avhrrgoode`, and `closePolygonParts` functions

For details, see the product-specific release notes.

MATLAB® Builder™ NE 2.2.2

- Improved error diagnostics available through printing of `mstack` traces

For details, see the product-specific release notes

MATLAB® Compiler™ 4.8

- Support added for Microsoft Visual Studio 2008 compiler
- CTF archives now embedded in a single binary executable for convenient deployment

For details, see the product-specific release notes

MATLAB® Distributed Computing Server™ 3.3

- MATLAB pool jobs allow noninteractive use of parfor-loops
- New batch command provides a simple way to run your MATLAB scripts on computers in a cluster or in the background on your desktop if you have a multi-core computer
- New Administration GUI helps test your cluster and diagnose possible failures when using the job manager scheduler
- Full support for Altair Grid Technologies, L.L.C.PBS Pro® and TORQUE schedulers
- Significant increase in the size limit on files and data that can be passed between clients and workers

For details, see the product-specific release notes.

Model-Based Calibration Toolbox™ 3.4

- New command-line functionality for creating space-filling, optimal, classical, or custom experimental designs
- New Sobol and Halton sequence space-filling design types for generating highly uniform experimental designs
- New contour and surface views of optimization output that aid in assessment of results for generating optimal lookup tables
- New parallel computing support for fitting multiple models to experimental data
- Enhanced generation of multiple starting conditions to help detect global optima with gradient-based optimization algorithms

For details, see the product-specific release notes.

Neural Network Toolbox™ 6.0

- New pattern recognition GUI, network, plots and analysis functions
- New clustering GUI, plots, and faster initialization and training

- New network diagram viewer that generates a network architecture graphic from any neural network object
- New training window that offers rich feedback and animated visualization plots during the training process
- Enhanced neural network fitting GUI that includes automatic generation of Simulink models, sample data sets, and new visualization plots

For details, see the product-specific release notes.

Optimization Toolbox™ 4.0

- New parallel computing support for accelerating gradient estimation in selected constrained nonlinear solvers
- New general large-scale nonlinear programming algorithm in `fmincon` with improved bound constraint management
- New interface to KNITRO®, a third-party nonlinear programming solver

For details, see the product-specific release notes.

Parallel Computing Toolbox™ 3.3

- MATLAB pool jobs allow noninteractive use of `parfor`-loops
- New batch command provides a simple way to run your MATLAB scripts on computers in a cluster or in the background on your desktop if you have a multi-core computer
- New Administration GUI helps test your cluster and diagnose possible failures when using the job manager scheduler
- Full support for Altair Grid Technologies, L.L.C. PBS Pro and TORQUE schedulers
- Significant increase in the size limit on files and data that can be passed between clients and workers

For details, see the product-specific release notes.

PolySpace™ Products

- Removed dependency on Cygwin for Windows platforms, to simplify the installation process while improving performance and robustness
- Enhanced and simplified installer for all PolySpace™ products
- Added support for Solaris 2.10
- Added support for Windows XP x64 (32-bit mode)
- Enhanced exploring capability in the viewer to provide more precise information
- New Generic Target option for C++, to allow custom target processors
- New support for the GNU compiler (GCC 3.4) for C++
- Added support for Telelogic Rhapsody® Version 7.1
- Added support for C language in Rhapsody

Real-Time Windows Target™ 3.1

- Memory for storing local variables increased from 4 KB to 1 MB
- Support for Measurement Computing PCI-DDA series boards
- Improved support for large lookup tables and user-written functions

For details, see the product-specific release notes.

Real-Time Workshop® 7.1

- Removed static libraries `rtwlib_*` to simplify code integration
- New API for registering hardware device vendor and type
- More cases supported for automatic Rate Transition Block insertion
- Removed limitations for number of referenced models built
- Enhanced BuildInfo API to contain a composite Model Reference description
- MATLAB Editor syntax highlighting for Target Language Compiler (TLC) code

- Context-sensitive help available for Configuration Parameters dialog box
For details, see the product-specific release notes.

Real-Time Workshop® Embedded Coder™ 5.1

- New AUTOSAR compliant code generation capability and demos
- Bidirectional traceability for Stateflow® charts and Embedded MATLAB functions
- More optimized inlining between Simulink blocks and Stateflow charts
- More optimized code for Bus Assignment, Bus Creator, and Bus Selector blocks
- Function prototype control supports model reference and has `getPreview` command
- Improved MISRA-C compliance for matrix math utilities and lookup block utilities
- Context-sensitive help available for Configuration Parameters dialog box
For details, see the product-specific release notes.

RF Blockset™ 2.2

- Two new parameters enhance user control of baseband-equivalent modeling
- Upgraded “Touchstone Data File for 2-Port Passive Network” demo to use more realistic data
- Upgraded existing demos to show passband frequency values on the Spectrum Scope block

For details, see the product-specific release notes.

RF Toolbox™ 2.3

- New group delay, voltage gain, and stability factor computation and visualization from `calculate` and `plot` methods

- Alternate port arrangements now available in s2sdd, s2sdc, s2scd, and s2scc functions
 - New gammams and gammaml functions for computing source and load reflection coefficients required for simultaneous conjugate match
 - New z2gamma function for converting impedance values to reflection coefficients
 - New “Writing a Touchstone File” demo and upgraded existing demos to reflect newest features
 - Upgraded M-file help for objects and packages
- For details, see the product-specific release notes.

Robust Control Toolbox™ 3.3.1

- Ability to use the loopmargin command to analyze robustness of a nonlinear Simulink model

For details, see the product-specific release notes.

Signal Processing Blockset™ 6.7

- N-D support added to many blocks, including several blocks in the Statistics library
- Block parameter edit boxes support any built-in MATLAB data type other than Boolean and char
- From Audio Device and To Audio Device blocks generate code on platforms other than Windows
- FIR Interpolation uses less memory and is more efficient for frame-based signals in “Maintain input frame rate” mode
- Delay Line block support for selective enabling of output for increased efficiency

For details, see the product-specific release notes.

Signal Processing Toolbox™ 6.9

- New `marcumq` function
- New `mag2db` and `db2mag` functions
- Enhanced `pmtm` function with ability to keep or drop last taper

For details, see the product-specific release notes.

SimBiology® 2.3

Note SimBiology® 2.2, which was released via the Web after R2007b but before R2008a, included these new features. Version 2.3 did not add any major new features.

- Support for compartmental modeling
- Support for simulation events
- Enhanced support for performing tasks on the SimBiology desktop, such as ensemble runs, sensitivity analysis, parameter scans, custom analysis, and conserved cycle calculations
- Ability to generate reports for projects on the desktop
- New functions for applying alternate parameter or initial condition values to a model during simulation

For details, see the product-specific release notes.

SimDriveline™ 1.5

- New Fundamental Friction Clutch block enables customized clutch modeling

For details, see the product-specific release notes.

SimEvents® 2.2

- Initial Value block for setting a signal value before the first event occurs
- Vector and matrix support for event-based computations involving dense payloads
- Seed management for random number generators
- Diagnostics to advise you of race conditions

For details, see the product-specific release notes.

SimHydraulics® 1.3

- New Cartridge Valve Insert and Hydraulic Cartridge Valve Actuator blocks
- Additional configurations for the Centrifugal Pump block
- Six predefined fluids, including water and three automotive brake fluids, added to the Hydraulic Fluid block

For details, see the product-specific release notes.

SimMechanics™ 2.7.1

- Context-sensitive help available for all parameters in Simulink Configuration Parameters dialog box, including those on Simscape and SimMechanics panes

For details, see the product-specific release notes.

SimPowerSystems™ 4.6

- New Fuel Cell Stack block
- Ability to specify initial conditions for the PM Synchronous Machine block
- Multiple discretization rates within a model now available with certain blocks

For details, see the product-specific release notes.

Simscape™ 2.1

- Finding and managing operating points by trimming Simscape™ models now available
- Thermal unit conversions now supported
- New Gyration block in the Electrical Elements library
- New PS Abs block in the Physical Signals library returns absolute value of input signal
- Enhancements to simulation algorithms, for improved robustness and reliability
- Context-sensitive help available for all parameters in Simulink Configuration Parameters dialog box, including those on Simscape pane

For details, see the product-specific release notes.

Simulink® Control Design™ 2.3

- New diagnostic summary for troubleshooting linearization results
- Ability to compute steady-state operating points for Simscape models

For details, see the product-specific release notes.

Simulink® Design Verifier™ 1.2

- New support for the Embedded MATLAB Function block in Simulink and Stateflow Embedded MATLAB functions
- New support for the Stateflow Truth Table block and Embedded MATLAB truth tables
- New option for collecting test case simulation outputs in MAT-file
- New test generation strategy that is optimized for large models
- Improved input data values for detecting errors

For details, see the product-specific release notes.

Simulink® Fixed Point™ 5.6

- Fixed-Point Tool enhanced to provide autoscaling based on specified design minimum and maximum values
- New Fixed-Point Advisor facilitates converting a floating-point model or subsystem to an equivalent fixed-point representation
- Lookup Table (n-D) block now supports fixed-point data types
- Accumulator data type of the Sum block can be specified using any data type supported by Simulink, including fixed-point data types

For details, see the product-specific release notes.

Simulink® HDL Coder™ 1.3

- Complex data type is now supported for many blocks, including Embedded MATLAB Function block and Stateflow chart
- Numerous additional blocks supported for code generation, including Discrete-time Integrator, NCO, PN Sequence Generator, CIC and FIR Decimation Filters
- Enhanced pipelining support includes input pipelining for most blocks and automatic pipeline insertion for Embedded MATLAB Function block and Stateflow chart
- Enhanced test bench options include automatic generation of HDL Cosimulation blocks for use with the EDA Simulator Link™ IN, EDA Simulator Link MQ, or EDA Simulator Link DS products

For details, see the product-specific release notes.

Simulink® Report Generator™ 3.3

- Faster viewing of Web views of large Simulink models
- Faster loading of the Show All Layers view in Web views
- Support for exporting information contained in Simulink model DocBlocks to Web views

- Support for embedded URLs in Simulink Annotations, which enable the Web page with the specified URL to be launched when the Annotation is clicked in a Web view
- Support for Embedded MATLAB Function blocks in Web views, which allow M-code contained in a given block to be displayed in a Web view

For details, see the product-specific release notes.

Simulink® Verification and Validation™ 2.3

- Model coverage for referenced models enhanced to provide new graphical user interface for enabling coverage and new summary report for displaying coverage results
- New submenu on Model Explorer context menu for access to the Requirements Management Interface
- New Model Advisor IEC 61508 Standard check for safety-critical applications
- Enhanced Model Advisor check for MathWorks Automotive Advisory Board guidelines
- Model Advisor API enhanced to extend customization capabilities

For details, see the product-specific release notes.

Stateflow® 7.1

- Support for data with complex data types
- Support for graphical functions with multiple outputs
- New temporal logic notation for defining absolute time periods
- New "temporalCount" operator for counting occurrences of events

For details, see the product-specific release notes.

Stateflow® Coder™ Stateflow® Coder™ 7.1

- Bidirectional traceability and navigation between generated code and states, transitions, truth tables, and Embedded MATLAB functions (requires Real-Time Workshop® Embedded Coder™ software)

For details, see the product-specific release notes.

Statistics Toolbox™ 6.2

- New cross-validation functions for regression, classification, and clustering
- New sequential feature selection for regression and classification
- New quasi-random numbers for space-filling designs and Monte Carlo integration
- New partial least-squares regression for multicollinear data
- New nonnegative matrix factorization for dimension reduction

For details, see the product-specific release notes.

System Identification Toolbox™ 7.2

- New support for simulating nonlinear black-box models in Simulink
- Ability to linearize nonlinear black-box models at user-specified operating points
- Ability to estimate models using weighted sum of least-squares minimization criterion
- Improved handling of initial states for linear and nonlinear models

For details, see the product-specific release notes.

SystemTest™ 2.1

- Support for mapping test signals to individual Simulink inport blocks using the Simulink element in SystemTest™ software.
- Test results now available in a dataset array that can be accessed from the MATLAB command line, for comparing the results of separate test runs and post-processing of test results
- The new Spreadsheet Data test vector type for reading data from a Microsoft® Excel® spreadsheet or CVS file into the SystemTest environment

For details, see the product-specific release notes.

Target Support Package™ FM5 2.2.1

- Context-sensitive help available for Configuration Parameters dialog box

For details, see the product-specific release notes.

Target Support Package™ IC1 1.5.1

- Context-sensitive help available for Configuration Parameters dialog box

For details, see the product-specific release notes.

Target Support Package™ TC2 3.0

- New support and demos for the 2833x DSP chip
- New support for C280x Inter-Integrated Circuit (I2C) Transmit and Receive
- Expanded control of on-chip peripherals using Qualification Type and Sampling Period
- Expanded control of Pulse Width Modulation (PWM) using interrupts
- New watchdog timer support for the C280x, C281x, and C2833x DSPs

For details, see the product-specific release notes.

Target Support Package™ TC6 3.4

- New video workflow demo
- New video capture and display blocks for DM6437 EVM
- New demo for DM6437 EVM audio driver blocks (codec blocks)
- New support on DM6437 for EVM CAN Send and Receive blocks
- New support on DM6437 for EVM video OSD block
- New DM6437EVM block: Draw Rectangles
- New Custom Device Driver Integration via Legacy Code Tool Demo for DM6437EVM AIC33 codec
- New “Can Loopback Testing” and “Video Stabilization” demos for DM6437EVM

For details, see the product-specific release notes.

Video and Image Processing Blockset™ 2.5

- New Estimate Geometric Transformation block with RANSAC and Least Median of Squares algorithms
- N-D support added to several blocks in the Statistics library
- Enhanced “Video Mosaicking” and “Disparity Estimation for Stereo Vision” demos

For details, see the product-specific release notes.

Virtual Reality Toolbox™ 4.7

- Support for matrix-type data input for the VR Sink block, enabling both MATLAB and Simulink interfaces to support matrices (MFxx fields)

For details, see the product-specific release notes.

Wavelet Toolbox™ 4.2

- True color images now supported
- Wavelet families display added
- Extension modes for Continuous Wavelets added
- New norms calculations
- New demos for multiscale principal component analysis and for multivariate denoising

For details, see the product-specific release notes.

xPC Target™ 3.4

- Support for the target PC to interface to the Vector CAN Application Environment (CANape) using Universal Calibration Protocol (XCP)
- Support for Simulink models that contain multidimensional signals and parameters
- Support for booting a target PC from a host PC within a dedicated network
- xPC Target Device Driver Authoring Tool, a new GUI for creating templates for simple custom xPC Target™ device drivers
- Arbitrarily sized target application (DLM) files can now be loaded in BootFloppy and DOSLoader modes

For details, see the product-specific release notes.

New Products

R2008a contains two new products.

“EDA Simulator Link™ DS (for Synopsys® Discovery™)” on page 1-33	Co-simulate and verify VHDL and Verilog using Synopsys Discovery VCSMX
“Embedded IDE Link™ MU (for Green Hills® MULTI®)” on page 1-34	Build, test, and optimize code for embedded microprocessors using Green Hills® MULTI®

EDA Simulator Link™ DS (for Synopsys® Discovery™)

EDA Simulator Link™ DS is a cosimulation interface that provides a fast bidirectional link between MATLAB® and Simulink® software and the Synopsys® Discovery™ VCSMX® family of simulators. This product enables you to use MATLAB and Simulink with Synopsys Discovery for efficient validation of HDL code. It provides native cosimulation support for Verilog, VHDL, and mixed-language designs.

Using the EDA Simulator Link DS product, you can use MATLAB as a test bench providing stimulus and analyzing the response from an HDL component. MATLAB M-files can also be incorporated as components in a Discovery simulation model, enabling simulation of the complete system before all the HDL design elements are available.

EDA Simulator Link DS provides full two-way support for cosimulation using Simulink. You can substitute HDL implementations for blocks in a Simulink diagram or use Simulink models as test benches for HDL blocks from a Discovery simulation.

Key Features

- Full VHDL, Verilog, and mixed-language cosimulation support
- MATLAB test bench capability, enabling the use of MATLAB code to stimulate HDL code and check its response

- MATLAB component capability, enabling simulation of MATLAB code in place of entities not yet coded in HDL
- User-selectable shared-memory and TCP/IP-socket communications modes
- Interactive or batch mode cosimulation, debugging, testing, and verification of HDL

For details, see the product-specific release notes.

Embedded IDE Link™ MU (for Green Hills® MULTI®)

Note Embedded IDE Link™ MU was released via the Web after R2007b but before R2008a.

Embedded IDE Link MU software automatically deploys code generated from Simulink® models into the Green Hills MULTI integrated development environment (IDE). The code can be executed on a wide range of microprocessors supported by MULTI, including Freescale™ MPC5554 and MPC7447, NEC® V850, and Analog Devices® Blackfin®.

With the Embedded IDE Link MU product, you can run processor-in-the-loop simulation tests in MULTI using your Simulink model as the test harness. You can also use MATLAB software to interactively graph and analyze results while you test and debug code within MULTI, regardless of whether the code was manually written or generated from a Simulink model.

Key Features

- Connects MATLAB and Simulink to Green Hills® MULTI® using high-speed interfaces
- Supports PowerPC® and other popular microprocessors from Freescale, NEC and Analog Devices™
- Enables processor-in-the-loop (PIL) testing for object code verification
- Creates projects and downloads them automatically to instruction-set simulators or embedded hardware

- Offers real-time support for popular microprocessors including Freescale™ MPC5554 and Analog Devices® Blackfin®

For details, see the product-specific release notes.

Renamed Products

Previous Name	New Name
Distributed Computing Toolbox™	Parallel Computing Toolbox™
Excel® Link™	Spreadsheet Link™ EX
Link for Analog Devices VisualDSP++®	Embedded IDE Link™ VS
Link for Cadence® Incisive®	EDA Simulator Link™ IN
Link for Code Composer Studio™	Embedded IDE Link™ CC
Link for ModelSim®	EDA Simulator Link™ MQ
Link for TASKING®	Embedded IDE Link™ TS
MATLAB® Builder for Excel®	MATLAB® Builder™ EX
MATLAB® Builder for Java™	MATLAB® Builder™ JA
MATLAB Builder for .NET	MATLAB Builder NE
MATLAB® Distributed Computing Engine™	MATLAB® Distributed Computing Server™
Target for Freescale™ MPC5xx	Target Support Package™ FM5
Target for Infineon C166®	Target Support Package™ IC1
Target for TI C2000™	Target Support Package™ TC2
Target for TI C6000™	Target Support Package™ TC6

Installation and Activation

In this section...
“Activation” on page 1-37
“Default License File Search Path Has Changed” on page 1-37

Activation

Beginning with R2008a, all products in the MATLAB® and Simulink® product families will require activation. For more information, see Activation Overview.

Default License File Search Path Has Changed

MATLAB no longer looks for the License File in `matlabroot\bin\win32` or `matlabroot\bin\win64` on Microsoft® Windows® systems, or `matlabroot/etc` on UNIX®, Linux®, and Macintosh® systems. (`matlabroot` represents the name of your MATLAB installation directory, as returned by the `matlabroot` command.)

MATLAB now looks for the License File in a directory associated with a particular user:

- For UNIX:

```
$HOME/.matlab/R2008a_licenses/
```

- For Windows:

```
$USERPROFILE\Application Data\MathWorks\MATLAB\R2008a_licenses
```

If it cannot find the License File there, MATLAB looks in the `matlabroot\licenses` directory.

UNIX is a registered trademark of The Open Group. Linux is a registered trademark of Linus Torvald. Macintosh is a registered trademark of Apple Inc.

Compatibility Considerations

These topics summarize potential compatibility considerations when upgrading from R2007b to R2008a.

In this section...
“R2008a Compatibility” on page 1-38
“Compatibility for Each Product” on page 1-40
“Compatibility Considerations for New Functions and Models” on page 1-41

R2008a Compatibility

This table highlights some important potential compatibility issues when upgrading from R2007b to R2008a. Refer to product-specific release notes for details on these and other product-specific compatibility considerations.

Compatibility issues that are reported after the product has been released are added to Bug Reports at the MathWorks Web site. Because bug fixes can sometimes result in incompatibilities, also review fixed bugs in Bug Reports for any compatibility impact.

Product and Area	Compatibility Consideration	Potential Impact	Recommended Actions
Simulink®	Only changes made to tunable variables and parameters during simulations take effect immediately. Changes to other variables or parameters do not take effect until the next simulation begins.	You may see different results from previous releases because changing nontunable variables or parameters will have no effect until the next simulation begins.	Redefine any nontunable variable or parameter to be tunable if you want to see the effects of changes immediately during simulation. For information, see “Tuning a Block Parameter” in the Simulink documentation.

Product and Area	Compatibility Consideration	Potential Impact	Recommended Actions
Simulink	Fixed-point data types that require scaling, but have none specified, are now considered incomplete. In previous versions, these data types defaulted to integer types with the specified word length.	Models with incompletely defined fixed-point data types will not compile and will generate a compile-time error.	Redefine any incompletely specified fixed-point data type to be an integer type or to have the appropriate scaling for its value range. See “Using the Data Type Assistant” in the Simulink documentation for information on fixed-point data type scaling.
MATLAB® – Math	<p>The following functions have been removed:</p> <p>quad8 table1 table2 bessela</p> <p>The beta function no longer allows three inputs.</p>	<p>If you attempt to use any of the removed functions, MATLAB displays this error message: Undefined function or variable.</p> <p>If you attempt to pass three inputs to the beta function, MATLAB displays this error message: Too many input arguments.</p>	<p>Use the following replacement functions:</p> <p>For removed quad8, use quadl. For removed table1, use interp1 or interp1q. For removed table2, use interp2. For removed bessela, use besselj.</p>

Product and Area	Compatibility Consideration	Potential Impact	Recommended Actions
Optimization Toolbox™	The option PrecondBandWidth has changed from 0 (preconditioned conjugate gradients) to inf (Cholesky factorization). This affects the large-scale algorithms in fsolve, lsqcurvefit, and lsqnonlin.	High-dimensional problems may exhibit slower performance.	Changing PrecondBandWidth to a finite value using optimset may improve performance. Set PrecondBandWidth to 0 to obtain the same behavior as in previous releases.
Optimization Toolbox	Solvers fmincon, fminimax, fgoalattain, and fseminf have a new option: TolConSQP. This option exposes a parameter that was fixed at eps in previous releases.	Some problems might yield different results from previous releases.	Use optimset to set TolConSQP to eps to obtain the previous behavior.

Compatibility for Each Product

To see if any reported compatibility considerations exist for your product, see “Release Summary” on page 1-43. If the table shows that there are reported compatibility considerations for any of your products, follow the link to the product’s release notes and refer to the summary table of compatibility considerations. From this table you can link to details. If you are upgrading from a release before R2007b, also see the entries in the table for earlier versions.

Compatibility Considerations for New Functions and Models

The introduction of new functions and models could cause a conflict with any of your own M-files, models, and variables having the same names. To identify and address name conflicts, see these topics in the MATLAB Programming documentation:

- Don't Use Function Names for Variables
- Naming a Function Uniquely

System Requirements

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

Platforms No Longer Available for New Releases

As of R2008a, new releases from The MathWorks will no longer be available on:

- Apple® Macintosh® OS X for PowerPC® processors
- Microsoft® Windows® 2000

UNIX is a registered trademark of The Open Group. Macintosh is a registered trademark of Apple Inc.

Linux glibc Requirement

R2008a on Linux® requires glibc 2.3.6 or later.

Linux is a registered trademark of Linus Torvald.

Release Summary

An asterisk (*) after a product name indicates the product has had a Web release since R2007b.

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
MATLAB®	Yes	Yes	Yes
Simulink®	Yes	Yes	Yes
Aerospace Blockset™	Yes	No	No
Aerospace Toolbox	Yes	No	No
Bioinformatics Toolbox™	Yes	Yes	Yes
Communications Blockset™	Yes	Yes	Yes
Communications Toolbox™	Yes	No	No
Control System Toolbox™	No	No	No
Curve Fitting Toolbox™	No	No	No
Data Acquisition Toolbox™	Yes	No	No
Database Toolbox™	No	Yes	No
Datafeed Toolbox™	No	Yes	No
Distributed Computing Toolbox (renamed Parallel Computing Toolbox™)	Yes	No	Yes
EDA Simulator Link™ DS (see “New Products” on page 1-33)	No	No	No

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
EDA Simulator Link™ IN	No	No	No
EDA Simulator Link™ MQ	No	No	No
Embedded IDE Link™ CC	Yes	Yes	No
Embedded IDE Link™ Mu (see “New Products” on page 1-33)*	Yes	No	No
Embedded IDE Link TS	Yes	No	Yes
Embedded IDE Link VS	Yes	No	No
Excel® Link™ (renamed Spreadsheet Link™ EX)	No	No	No
Extended Symbolic Math Toolbox™	No	No	No
Filter Design HDL Coder™	Yes	Yes	Yes
Filter Design Toolbox™	Yes	No	Yes
Financial Derivatives Toolbox™	Yes	Yes	No
Financial Toolbox™	Yes	No	No
Fixed-Income Toolbox™	Yes	Yes	No
Fixed-Point Toolbox™	Yes	Yes	No
Fuzzy Logic Toolbox™	No	Yes	No

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
GARCH Toolbox™	Yes	No	No
Gauges Blockset™	No	No	No
Genetic Algorithm and Direct Search Toolbox™	Yes	Yes	Yes
Image Acquisition Toolbox™	Yes	Yes	Yes
Image Processing Toolbox™	Yes	Yes	Yes
Instrument Control Toolbox™	Yes	Yes	No
Link for Analog Devices VisualDSP++® (renamed Embedded IDE Link VS)	Yes	No	No
Link for Cadence® Incisive® (renamed EDA Simulator Link IN)	No	No	No
Link for Code Composer Studio™ (renamed Embedded IDE Link CC)	Yes	Yes	No
Link for ModelSim® (renamed EDA Simulator Link MQ)	No	No	No
Link for TASKING® (renamed Embedded IDE Link TS)	Yes	No	Yes
Mapping Toolbox™	Yes	Yes	Yes

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
MATLAB® Builder™ EX	No	No	No
MATLAB® Builder for Excel® (renamed MATLAB Builder EX)	No	No	No
MATLAB® Builder for Java™ (renamed MATLAB Builder JA)	No	Yes	No
MATLAB Builder for .NET (renamed MATLAB Builder NE)	Yes	Yes	No
MATLAB Builder JA	No	Yes	No
MATLAB Builder NE	Yes	Yes	No
MATLAB® Compiler™	Yes	Yes	Yes
MATLAB® Distributed Computing Engine™ (renamed MATLAB® Distributed Computing Server™)	Yes	No	Yes
MATLAB Distributed Computing Server	Yes	No	Yes
MATLAB® Report Generator™	No	Yes	No
Model-Based Calibration Toolbox™	Yes	Yes	No
Model Predictive Control Toolbox™	No	No	No
Neural Network Toolbox™	Yes	Yes	Yes
OPC Toolbox™	No	No	No

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
Optimization Toolbox™	Yes	Yes	Yes
Partial Differential Equation Toolbox (no release notes)	No	No	No
Parallel Computing Toolbox	Yes	No	Yes
Real-Time Windows Target™	Yes	Yes	No
Real-Time Workshop®	Yes	Yes	Yes
Real-Time Workshop® Embedded Coder™	Yes	Yes	No
RF Blockset™	Yes	Yes	No
RF Toolbox™	Yes	Yes	No
Robust Control Toolbox™	Yes	No	No
Signal Processing Blockset™	Yes	Yes	Yes
Signal Processing Toolbox™	Yes	Yes	No
SimBiology®*	Yes	No	Yes
SimDriveline™	Yes	Yes	No
SimEvents®	Yes	Yes	No
SimHydraulics®	Yes	Yes	No
SimMechanics™	Yes	No	No
SimPowerSystems™	Yes	Yes	Yes
Simscape™	Yes	Yes	No
Simulink® Control Design™	Yes	Yes	No

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
Simulink® Design Verifier™	Yes	No	No
Simulink® Fixed Point™	Yes	Yes	No
Simulink® HDL Coder™	Yes	Yes	Yes
Simulink® Parameter Estimation™	No	No	No
Simulink® Report Generator™	Yes	Yes	No
Simulink® Response Optimization™	No	Yes	No
Simulink® Verification and Validation™	Yes	No	No
Spline Toolbox™	No	No	No
Spreadsheet Link EX	No	No	No
Stateflow® and Stateflow® Coder™	Yes	Yes	Yes
Statistics Toolbox™	Yes	Yes	Yes
Symbolic Math Toolbox™	No	No	No
System Identification Toolbox™	Yes	No	Yes
SystemTest™	Yes	Yes	Yes
Target for Freescale™ MPC5xx (renamed Target Support Package™ FM5)	Yes	Yes	Yes

Product (Links to Release Notes)	New Features	Bug Fixes	Compatibility Considerations
Target for Infineon C166® (renamed Target Support Package IC1)	Yes	No	No
Target for TI C2000™ (renamed Target Support Package TC2)	Yes	Yes	No
Target for TI C6000™ (renamed Target Support Package TC6)	Yes	No	No
Target Support Package FM5	Yes	Yes	Yes
Target Support Package™ IC1	Yes	No	No
Target Support Package™ TC2	Yes	Yes	No
Target Support Package TC6	Yes	No	No
Video and Image Processing Blockset™	Yes	Yes	Yes
Virtual Reality Toolbox™	Yes	No	No
Wavelet Toolbox™	Yes	Yes	No
xPC Target™	Yes	Yes	Yes