

Real-Time Windows Target Release Notes

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Summary by Version

This table provides quick access to what's new in each version. For an explanation of the table, and instructions for using these release notes, see "About Release Notes" on page 2.

Version (Release)	New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Latest Version V3.0 (R2007b)	Yes Details	Yes Summary	Bug Reports Includes fixes	Printable Release Notes: PDF Current product documentation Supported I/O boards
V2.7 (R2007a)	Yes Details	No	Bug Reports Includes fixes	No
V2.6.2 (R2006b)	Yes Details	No	Bug Reports Includes fixes	No
V2.6.1 (R2006a)	No	No	Bug Reports	No
V2.6 (R14SP3)	Yes Details	No	Bug Reports	No
V2.5.2 (R14SP2)	Yes Details	Yes Summary	Bug Reports	No
V2.5.1 (R14SP1)	Yes Details	Yes Summary	No bug fixes	No
V2.5 (R14)	Yes Details	Yes Summary	Fixed Bugs	No
V2.2 (R13)	Yes Details	No	No bug fixes	V2.2 product documentation
V2.0 (R12)	Yes Details	Yes Summary	Fixed Bugs	No

About Release Notes

Use release notes when upgrading to a newer version to learn about new features and changes, and the potential impact on your existing files and practices. Release notes are also beneficial if you use or support multiple versions.

If you are not upgrading from the most recent previous version, review release notes for all interim versions, not just for the version you are installing. For example, when upgrading from V1.0 to V1.2, review the New Features and Changes, Version Compatibility Considerations, and Bug Reports for V1.1 and V1.2.

New Features and Changes

These include

- New functionality
- Changes to existing functionality
- Changes to system requirements (complete system requirements for the current version are at the MathWorks Web site)
- Any version compatibility considerations associated with each new feature or change

Version Compatibility Considerations

When a new feature or change introduces a reported incompatibility between versions, its description includes a **Compatibility Considerations** subsection that details the impact. For a list of all new features and changes that have reported compatibility impact, see the “Compatibility Summary for Real-Time Windows Target” on page 22.

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.

Fixed Bugs and Known Problems

MathWorks Bug Reports is a user-searchable database of known problems, workarounds, and fixes. The MathWorks updates the Bug Reports database as new problems and resolutions become known, so check it as needed for the latest information.

Access Bug Reports at the MathWorks Web site using your MathWorks Account. If you are not logged in to your MathWorks Account when you link to Bug Reports, you are prompted to log in or create an account. You then can view bug fixes and known problems for R14SP2 and more recent releases.

The Bug Reports database was introduced for R14SP2 and does not include information for prior releases. You can access a list of bug fixes made in prior versions via the links in the summary table.

Related Documentation at Web Site

Printable Release Notes (PDF). You can print release notes from the PDF version, located at the MathWorks Web site. The PDF version does not support links to other documents or to the Web site, such as to Bug Reports. Use the browser-based version of release notes for access to all information.

Product Documentation. At the MathWorks Web site, you can access complete product documentation for the current version and some previous versions, as noted in the summary table.

Version 3.0 (R2007b) Real-Time Windows Target

This table summarizes what's new and changed in Version 3.0 (R2007b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details	No	Bug Reports	Printable Release Notes: PDF Current product documentation Supported I/O boards

New Features and Changes

Frequency Output Block Is Available

A Frequency Output block is available in the Real-Time Windows Target library. The block generates a pulse-width-modulated square wave that alternates between low (0) and high (1) with a specified frequency and duty cycle. For details, see the “Frequency Output” block documentation.

I/O Blocks Support Non-Double Data Types to Conform to Simulink

Previously, all Real-Time Windows Target data input and output was of type double. Input blocks could produce only double data, and Output blocks could accept only double data. In R2007b, every Input and Output block supports all Simulink datatypes. See “I/O Blocks Reference” for details about each block.

New Blocks and Drivers Provide Serial Port and UDP Support

Four new blocks, Packet Input, Packet Output, Stream Input, and Stream Output provide serial port and UDP support. For serial port support, use the blocks with the new driver **Standard Devices > Serial Port**. For UDP support, use the blocks with the new driver **Standard Devices > UDP Protocol**. See the documentation of the new blocks in “I/O Blocks Reference”.

New Counter Input Block Demo

Real-Time Windows Target now includes a demo that shows the operation of the Counter Input block. To see this demo, type `rtcounter` in the Matlab Command Window, or launch Matlab Online Help and choose **Demos > Simulink > Real-Time Windows Target > Real-Time Counter**.

Open Watcom Version 1.6 Is the Standard Bundled Compiler

Real-Time Windows Target now uses Version 1.6 of the Open Watcom C/C++ Compiler. The Open Watcom source code is available under the terms of the Open Watcom License. For more information, visit <http://www.openwatcom.org>.

Link and Target Products Regrouped in New Start, Help, and Demos Category

A new product category, Links and Targets, now contains all MathWorks products that link, target, or cosimulate code.

Compatibility Considerations

This change impacts you in the following ways:

- Finding and viewing these products through the MATLAB Desktop **Start** button and in the Help browser **Contents** and **Demos** panes.
- Using the `demo` command to access the product demos.

For more about this new product category, see “Demos and Help Browser Contents Now Include New Category for Links and Targets”, in the *MATLAB Release Notes*.

Version 2.7 (R2007a) Real-Time Windows Target

This table summarizes what's new and changed in Version 2.7 (R2007a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details	No	Bug Reports	No

New Features and Changes

Enhanced External Mode Communication Protocol

The External Mode communication protocol has been reworked and streamlined. The upgrade increases communication reliability and removes some capacity-related restrictions. Existing applications do not require any changes in order to take advantage of these improvements.

Additional Supported I/O Boards

The V2.7 I/O library supports these boards in addition to those previously documented in Real-Time Windows Target release notes and documentation:

- Measurement Computing PC104-DI48
- Measurement Computing PCI-DAS6013
- Measurement Computing PCI-DAS6014
- Measurement Computing PCI-DAS6023
- Measurement Computing PCI-DAS6025
- Measurement Computing PCI-DAS6030
- Measurement Computing PCI-DAS6031
- Measurement Computing PCI-DAS6032
- Measurement Computing PCI-DAS6033
- Measurement Computing PCI-DAS6034

- Measurement Computing PCI-DAS6035
- Measurement Computing PCI-DAS6036
- Measurement Computing PCI-DAS6040
- Measurement Computing PCI-DAS6052
- Measurement Computing PCI-DAS6070
- Measurement Computing PCI-DAS6071
- Measurement Computing PCI-DAS6402-12
- Measurement Computing PCI-DAS6402-16
- Measurement Computing PCI-DIO24LP
- Measurement Computing PCI-DIO24S
- Measurement Computing PCI-PDISO16
- Measurement Computing PCI-PDISO8
- Measurement Computing PCIDAS64-M1-16
- Measurement Computing PCIDAS64-M2-16
- Measurement Computing PCIDAS64-M3-16

For a complete list of supported I/O boards, see Real-Time Windows Target Supported I/O Boards.

Version 2.6.2 (R2006b) Real-Time Windows Target

This table summarizes what's new and changed in Version 2.6.2 (R2006b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details	No	Bug Reports	No

New Features and Changes

Additional Supported I/O Boards

The V2.6.2 I/O library supports these boards in addition to those previously documented in Real-Time Windows Target release notes and documentation:

- National Instruments M-series boards for analog and digital I/O, but not for counters:
 - National Instruments PCI-6220
 - National Instruments PCI-6221
 - National Instruments PCI-6221 37-pin
 - National Instruments PCI-6224
 - National Instruments PCI-6225
 - National Instruments PCI-6229
 - National Instruments PCI-6250
 - National Instruments PCI-6251
 - National Instruments PCI-6254
 - National Instruments PCI-6259
 - National Instruments PCI-6280
 - National Instruments PCI-6281
 - National Instruments PCI-6284

- National Instruments PCI-6289
- National Instruments PCIe-6251
- National Instruments PCIe-6259
- National Instruments PXI-6220
- National Instruments PXI-6221
- National Instruments PXI-6224
- National Instruments PXI-6225
- National Instruments PXI-6229
- National Instruments PXI-6250
- National Instruments PXI-6251
- National Instruments PXI-6254
- National Instruments PXI-6259
- National Instruments PXI-6280
- National Instruments PXI-6281
- National Instruments PXI-6284
- National Instruments PXI-6289
- Two new Humusoft boards:
 - Humusoft AD622
 - Humusoft MF624

For a complete list of supported I/O boards, see Real-Time Windows Target Supported I/O Boards.

Version 2.6.1 (R2006a) Real-Time Windows Target

This table summarizes what's new and changed in Version 2.6.1 (R2006a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
No	No	Bug Reports	No

Version 2.6 (R14SP3) Real-Time Windows Target

This table summarizes what's new and changed in Version 2.6 (R14SP3):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details	No	Bug Reports	No

New Features and Changes

C++ Code Generation

Version 2.6 supports generating C++ code, which previous versions did not.

Version 2.5.2 (R14SP2) Real-Time Windows Target

This table summarizes what's new and changed in Version 2.5.2 (R14SP2):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details	Yes Summary	Bug Reports	No

New Features and Changes

Bidirectional Counters

Version 2.5.2 supports bidirectional counters for National Instruments 60XX and 67XX boards.

Compatibility Considerations

C++ Code Generation

Although Real-Time Workshop® V6.2 supports generating C++ code, Real-Time Windows Target V2.5.2 does not.

Version 2.5.1 (R14SP1) Real-Time Windows Target

This table summarizes what's new and changed in Version 2.5.1 (R14SP1):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details	Yes Summary	No bug fixes	No

New Features and Changes

Additional Supported I/O Boards

The V2.5.1 I/O library supports these boards in addition to those previously documented in Real-Time Windows Target release notes and documentation:

- National Instruments PC-DIO-96PnP
- National Instruments PCI-6503
- National Instruments PCI-6711
- National Instruments PCI-6713
- National Instruments PCI-6731
- National Instruments PCI-6733
- National Instruments PCI-DIO-96
- National Instruments PXI-6508
- National Instruments PXI-6711
- National Instruments PXI-6713
- National Instruments PXI-6733

Compatibility Considerations

Techniques for Pausing Simulation

In V2.5.1, opening a source block dialog box during simulation causes Simulink® to pause. You can edit parameter values while Simulink is paused. Simulink remains paused as long as the dialog remains open. When you close the dialog box, the changes take effect Simulink resumes simulation.

Version 2.5 (R14) Real-Time Windows Target

This table summarizes what's new and changed in Version 2.5 (R14):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details	Yes Summary	Fixed Bugs	No

New Features and Changes

Updated Compiler Support

In V2.5, Real-Time Windows target applications are compiled with the Open Watcom C/C++ compiler. For your convenience, this compiler is shipped with Real-Time Windows Target. Third-party compilers are no longer necessary.

Default Configuration Set

Version 2.5 provides a default configuration set. This configuration set quickly configures a Simulink model for default Real-Time Windows Target behavior. See the Simulink documentation for additional information on configuration sets.

SimMechanics Support

Real-Time Windows Target V2.5 supports SimMechanics.

USB Joystick Support

In V2.5, the Microsoft Windows Joystick driver supports USB joysticks, including force-feedback joysticks.

Additional Supported I/O Boards

The V2.5 I/O library supports these boards in addition to those previously documented in Real-Time Windows Target release notes and documentation:

- Humusoft AD612
- Humusoft MF614
- Meilhaus Electronic ME-2000
- Meilhaus Electronic ME-2600
- National Instruments DAQCard-6036E
- National Instruments PCI-6013
- National Instruments PCI-6014
- National Instruments PCI-6036E
- National Instruments PCI-6703
- National Instruments PCI-6704
- National Instruments PXI-6704

Compatibility Considerations

System Target File Name

In V2.5 the system target file name was changed from `rtwintmf` to `rtwin.tmf`. Using the Simulink model **Configuration Parameters** dialog box, you should reconfigure existing Real-Time Windows Target models (prior to Release 14, Real-Time Windows Target 2.5) before building them.

Fixed Bugs

Version 2.5 includes some bug fixes that are described online at

http://www.mathworks.com/access/helpdesk/bug_reports/bugfixes_rtwin_2-5.html

Version 2.2 (R13) Real-Time Windows Target

This table summarizes what's new and changed in Version 2.2 (R13):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details	No	No bug fixes	V2.2 product documentation

New Features and Changes

Visual C/C++ Support

V2.2 supports Microsoft Visual C/C++ Version 7.0.

Counter Input and Encoder Input Blocks

The V2.2 documentation includes a description of the Counter Input block and the Encoder Input block. These Real-Time Windows Target blocks allow you to select and connect specific counter and encoder input channels to your Simulink model.

Additional Supported I/O Boards

The V2.2 I/O library supports I/O boards in addition to those previously documented. See the Real-Time Windows Target documentation

Version 2.0 (R12) Real-Time Windows Target

This table summarizes what's new and changed in Version 2.0 (R12):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details	Yes Summary	Fixed Bugs	No

New Features and Changes

I/O Device Driver Architecture

Version 2.0 includes a new I/O device driver architecture that simplifies the use of I/O blocks in Simulink block diagrams. After installing a new I/O board in your PC, you place a device driver block in your model and specify board-specific settings (e.g., board address) for this board.

Once you have added a new I/O board to your PC and you have used the device driver dialog box to specify board information, the board information is retained for future sessions. When you add additional blocks, you select an I/O board from a list of installed boards. You do not have to re-enter the same board information for each driver block.

You can use multiple I/O boards in your computer. When doing so, the driver blocks show a list of installed boards for you to choose. This reduces the need to search through a growing list of device drivers.

New I/O drivers allow you to use either normalized units for analog inputs and outputs, or allow you to directly specify units as voltage.

I/O driver blocks now provide a separate I/O block for digital inputs, digital outputs, analog inputs, and analog outputs. This avoids any confusing signal indexing required to specify a combination of analog and digital I/O.

C Compiler Support

Version 2.0 supports Microsoft Visual C/C++ version 5.0 and 6.0.

Additional Supported I/O Boards

The V2.0 I/O library supports these boards in addition to those previously documented in Real-Time Windows Target release notes and documentation:

- ComputerBoards PCI-DAS1000
- ComputerBoards PCI-DAS1001
- ComputerBoards PCI-DAS1002
- ComputerBoards PCI-DAS1200
- ComputerBoards PCI-DAS1200/JR
- ComputerBoards PCI-DAS1602/12
- ComputerBoards PCI-DAS1602/16
- ComputerBoards PCI-DAS1602/16-JR
- ComputerBoards PCM-DAC08
- ComputerBoards PCM-DAS16S/330
- ComputerBoards PCM-DAS16D/12
- ComputerBoards PCM-DAS16S/12
- ComputerBoards PCM-DAS16D/16
- ComputerBoards PCM-DAS16S/16
- ComputerBoards CIO-QUAD02
- ComputerBoards CIO-QUAD04
- National Instruments Lab-PC-1200
- National Instruments Lab-PC-1200AI
- National Instruments PCI-1200
- National Instruments PXI-6025E
- National Instruments PXI-6031E

- National Instruments PXI-6040E
- National Instruments PXI-6052E
- National Instruments PXI-6070E
- National Instruments PXI-6071E
- Technology 80 5312B

Compatibility Considerations

Reinstall the Real-Time Windows Kernel

When upgrading from an earlier release, first uninstall the Real-Time Windows Target kernel. In the MATLAB® Command Window, type

```
rtwintgt -uninstall
```

After you install MATLAB R12 products, including Real-Time Windows Target 2.0, install the new Real-Time Windows Target kernel. In the MATLAB window, type

```
rtwintgt -install
```

Depending on which version of Windows you are using on your PC, you may need to reboot your PC before using Real-Time Windows Target. If a reboot is required, a message appears indicating a reboot is needed.

Enter New External Mode Interface Filename

The name of the external mode interface file was changed from `win_tgt` to `rtwinext`. If you create a new Simulink model, the new filename is entered correctly. If you have Simulink models where you used Real-Time Windows Target 1.0 or 1.5, you need to change the filename using the following procedure:

- 1** In the Simulink window, and from the **Tools** menu, click **External mode control panel**.
- 2** On the External Mode Control Panel dialog box, click the **Target interface** button.

- 3** In the External Target Interface dialog box, and in the **MEX-file for external mode** box, enter:

```
rtwinext
```

- 4** Click **OK**.

Remove I/O Adapter Blocks from Your Simulink Model

I/O Adapter blocks have been eliminated from Real-Time Windows Target 2.0. You need to remove all I/O Adapter blocks from your Simulink model. Before removing these blocks, we recommend that you record board and connectivity information.

You now enter specific board information in the individual driver blocks. However, you only have to do this once. After entering information in the first block, you can select your board from a pull-down list in subsequent blocks.

Replace I/O Driver Blocks in Your Simulink Model

Real-Time Windows Target V1.0 and V1.5 had only two driver blocks: RT Input and RT Output. In Real-Time Windows Target V2.0, the drivers are divided into Analog Input (A/D), Analog Output (D/A), Digital Input, Digital Output, and others.

Remove all Real-Time Windows Target V1.0 and V1.5 blocks from your Simulink model and replace them with V2.0 blocks. Replace RT Input blocks with Analog Input and Digital Input blocks, and replace RT Output blocks with Analog Output and Digital Output blocks. If you had a block with both analog input and digital input, you must replace this block with two new blocks.

Fixed Bugs

External Mode Interface

Minor changes and bug fixes have been made to the V2.0 external mode interface. These ensure that data is displayed at the end of a simulation even when the number of points collected differs from the specified buffer size.

Compatibility Summary for Real-Time Windows Target

This table summarizes new features and changes that might cause incompatibilities when you upgrade from an earlier version, or when you use files on multiple versions. Details are provided in the description of the new feature or change.

Version (Release)	Version Compatibility Considerations
Latest Version V3.0 (R2007b)	See Compatibility Considerations for this new feature or change: <ul style="list-style-type: none"> • Link and Target Products Regrouped in New Start, Help, and Demos Category
V2.7 (R2007a)	None
V2.6.2 (R2006b)	None
V2.6.1 (R2006a)	None
V2.6 (R14SP3)	None
V2.5.2 (R14SP2)	See Compatibility Considerations for this new feature or change: <ul style="list-style-type: none"> • C++ Code Generation
V2.5.1 (R14SP1)	See Compatibility Considerations for this new feature or change: <ul style="list-style-type: none"> • Techniques for Pausing Simulation
V2.5 (R14)	See Compatibility Considerations for this new feature or change: <ul style="list-style-type: none"> • System Target File Name

Version (Release)	Version Compatibility Considerations
V2.2 (R13)	None
V2.0 (R12)	See Compatibility Considerations for each of these new features or changes: <ul style="list-style-type: none">• Reinstall the Real-Time Windows Kernel• Enter New External Mode Interface Filename• Remove I/O Adapter Blocks from Your Simulink Model• Replace I/O Driver Blocks in Your Simulink Model