

LabVIEW™ Real-Time Module Release and Upgrade Notes

Version 8.6

This document provides system requirements, installation instructions, descriptions of new features, and information about upgrade and compatibility issues for version 8.6 of the LabVIEW Real-Time Module.

Refer to the *Getting Started with the LabVIEW Real-Time Module* manual for exercises you can complete to familiarize yourself with the Real-Time Module.

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System Requirements

Table 1 describes the system requirements to run version 8.6 of the Real-Time Module. The Real-Time Module system requirements are in addition to the LabVIEW system requirements listed in the *LabVIEW Release Notes*.

Table 1. System Requirements for the Real-Time Module 8.6

Platform	Media and System Requirements	Important Notes
Windows 2000/XP/Vista	National Instruments recommends that you have at least 300 MB of disk space for the minimum Real-Time Module installation or 750 MB of disk space for the complete Real-Time Module installation, which includes the Real-Time and Embedded drivers from the National Instruments Device Drivers media.	<p>You might need more memory than the LabVIEW-recommended 1 GB of RAM depending on the size of the application you design in LabVIEW on the host computer.</p> <p>To view and control the front panel of a VI running on an RT target remotely using a Web browser, National Instruments recommends Internet Explorer 5.5 with Service Pack 2 or later.</p>

Installing the Real-Time Module 8.6

This section includes information about installing the Real-Time Module on a development, or host, computer from the CD included in the Real-Time Module kit. If you installed the Real-Time Module from the LabVIEW 8.6 Platform DVD, you do not need to reinstall the Real-Time Module from the CD.



Note You must install LabVIEW 8.6 before attempting to install the Real-Time Module 8.6. Refer to the *LabVIEW Release Notes* for the LabVIEW installation instructions.

Complete the following steps to install the Real-Time Module on the host computer.

1. Disable any automatic virus detection programs before you install. Some virus detection programs interfere with the installation program.
2. Log on as an administrator or as a user with administrator privileges.
3. Insert the LabVIEW Real-Time Module installation CD into the CD-ROM drive. The LabVIEW Real-Time Module installation program runs automatically.
4. Follow the instructions that appear on the screen. The prompt directs you to install the Real-Time Module and activate your Real-Time Module license. Refer to the *Activating the Real-Time Module* section of this document for more information about activating the Real-Time Module.
5. Install the Real-Time and Embedded drivers and any other drivers that you require from the National Instruments Device Driver media.

Activating the Real-Time Module

Refer to the *Activation Instructions for National Instruments Software* for information about activation. You also can activate software at ni.com/activate.

RT Target Configuration

Use Measurement & Automation Explorer (MAX) to configure RT targets and to install software and drivers on targets.

- **Networked RT Targets**—Refer to the **Max Remote Systems Help** book in the *Measurement & Automation Explorer Help*, available by selecting **Help»MAX Help** from MAX, for information about configuring networked RT targets.
- **Desktop PC Targets**—Refer to the *Using Desktop PCs as RT Targets with the LabVIEW Real-Time Module* document for information about configuring a desktop PC as a networked RT target. You can access the document from Windows by selecting to install the Real-Time Module documentation when you install the Real-Time Module. Select **Start»All Programs»National Instruments»LabVIEW 8.6»LabVIEW Manuals** to open the `labview\manuals` directory and then double-click `RT_Using_PC_as_RT_Target.pdf` to open the document.

New Real-Time Module 8.6 Features

The Real-Time Module 8.6 includes the following new features. Refer to the *LabVIEW Help*, available by selecting **Help»Search the LabVIEW Help**, for more information about the following new features.

CompactRIO Scan Mode Support

The Real-Time Module 8.6 supports the new CompactRIO Scan Mode features. Refer to the *Getting Started with CompactRIO and LabVIEW: Scan Mode Edition* manual for an introduction to using the new CompactRIO Scan Mode features.

NI Scan Engine Support

The Real-Time Module 8.6 includes support for the NI Scan Engine. The NI Scan Engine enables efficient access to coherent sets of I/O channels using a scan that stores data in a global memory map and updates all values at a single rate. Refer to the **Real-Time Module»Real-Time Module Concepts»Accessing I/O with the NI Scan Engine»Using the NI Scan Engine** topic on the **Contents** tab of the *LabVIEW Help* for more information about the NI Scan Engine and related features.

I/O Variable Support

If you have an RT target with the NI Scan Engine installed, you can take advantage of the I/O variable, a new variable type that simplifies I/O access. LabVIEW automatically detects I/O modules connected to targets with the NI Scan Engine installed, and creates an I/O variable in the **Project Explorer** window for each connected I/O channel. Refer to the **Real-Time Module»Real-Time Module Concepts»Accessing I/O with the NI Scan Engine»Using I/O Variables** topic on the **Contents** tab of the *LabVIEW Help* for more information about I/O variables.

I/O Forcing Support

I/O variables support forcing for debugging and manual control of I/O. Use the NI Distributed System Manager to force and unforce I/O values manually. Use the Forcing VIs on the NI Scan Engine palette to force and unforce I/O values programmatically. Refer to the **VI and Function Reference»Measurement I/O VIs and Functions»NI Scan Engine VIs»Forcing VIs** book on the **Contents** tab of the *LabVIEW Help* for more information about the Forcing VIs.

Scan Engine Faults

RT targets with the NI Scan Engine installed use faults to address asynchronous error conditions. Refer to the **Real-Time Module»Real-Time Module Concepts»Accessing I/O with the NI Scan Engine»Scan Engine Faults** topic on the **Contents** tab of the *LabVIEW Help* for more information about faults.

Scan Engine VIs

The Real-Time Module 8.6 installs the new NI Scan Engine palette as a subpalette of the Measurement I/O palette. You can use the NI Scan Engine VIs to programmatically interface with the scan engine running on the target. Refer to the **VI and Function References»Measurement I/O VIs and Functions»NI Scan Engine VIs** book on the **Contents** tab of the *LabVIEW Help* for more information about the NI Scan Engine VIs.

Project & System Comparison Dialog

The Real-Time Module 8.6 includes a new **Project & System Comparison** dialog box that you can use to resolve conflicts that result from project configuration or hardware changes involving targets with the NI Scan Engine installed.

Function Blocks

The Real-Time Module 8.6 includes standard function blocks defined in the IEC 1131-3 specification. The functionality of the Real-Time function blocks partially overlaps with functionality provided by LabVIEW VIs and functions. Use function blocks if you want to publish parameter values with shared variables or if you want to use the IEC 1131-3 function block programming paradigm. Refer to the **Real-Time Module»Real-Time VIs»Function Blocks** book on the **Contents** tab of the *LabVIEW Help* for more information about using function blocks in LabVIEW.

NI Distributed System Manager Support

You can use the new NI Distributed System Manager to monitor and manage variables, faults, scan engine modes, and system resources on RT targets. From LabVIEW, select **Tools»Distributed System Manager** to launch the NI Distributed System Manager. Refer to the *NI Distributed System Manager Help* for information about using the NI Distributed System Manager.

New VIs for Managing Memory and CPU Resources

The Real-Time Module 8.6 includes new Real-Time Utilities VIs you can use to monitor target CPU and memory usage programmatically. The Real-Time Module also includes new SMP CPU Utilities VIs you can use to specify the set of CPUs available for automatic load balancing on a multi-CPU target with the NI RT Extensions for SMP installed. Refer to the **Real-Time Module»Real-Time VIs»Real-Time Utilities VIs** book on the **Contents** tab of the *LabVIEW Help* for information about the Real-Time Utilities VIs. Refer to the **Real-Time Module»Real-Time VIs»SMP CPU Utilities VIs** book on the **Contents** tab of the *LabVIEW Help* for information about the SMP CPU Utilities VIs.

Reliance™ File System Support

The Reliance™ file system provides fast disk access and data preservation in the event of a power interruption. Refer to the *Using Desktop PCs as RT Targets with the LabVIEW Real-Time Module* document for information about installing the Reliance™ file system on an RT Desktop PC target.

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Software-Triggered Timing Sources

The Real-Time Module 8.6 supports software-triggered timing sources. You can use software-triggered timing sources to trigger timed structures based on software-defined or user-defined events, rather than a hardware clock. Refer to the **Fundamentals»Loops and Structures»Concepts»Timed Structures»Selecting a Timing Source for a Timed Structure** topic on the **Contents** tab of the *LabVIEW Help* for information about creating and using software-triggered timing sources.

Easier IP Address Setup for RT Targets

RT targets with the Real-Time Module 8.6 installed include automatic network connection capabilities. When you plug an RT 8.6 target into a network and turn the target on, the target uses the target name to attempt a DHCP network connection. If the target is unable to initiate a DHCP connection, the target connects to the network with a link-local IP address.

TDMS Support for VxWorks Targets

The Real-Time Module 8.6 includes TDMS support for VxWorks targets. Refer to the **VI and Function Reference»Programming VIs and Functions»File I/O VIs and Functions»TDM Streaming VI and Functions** book on the **Contents** tab of the *LabVIEW Help* for information about the TDM Streaming VI and functions.

Improved Ethernet Compatibility

The Real-Time Module 8.6 includes expanded Ethernet chipset support for RT Desktop PCs. Refer to the National Instruments Web site at ni.com/info and enter the info code `etspc` for more information about which Ethernet chipsets are compatible with RT Desktop PCs.

Real-Time Execution Trace Toolkit 2.0.1

The LabVIEW 8.6 Real-Time Module includes a 30-day full-featured evaluation of the Real-Time Execution Trace Toolkit 2.0.1. The Real-Time Execution Trace Toolkit includes the Real-Time Execution Trace Tool and the Execution Trace Tool VIs. You can use the Execution Trace Tool VIs to capture the timing and execution data of VI and thread events for applications running on an RT target. The Real-Time Execution Trace Tool displays the timing and event data, or trace session, on the host computer. In LabVIEW, select **Tools»Real-Time Module»Execution Trace Tool** to display the Real-Time Execution Trace Tool.

Refer to the **Real-Time Execution Trace Toolkit** book in the *LabVIEW Help* for information about using the Real-Time Execution Trace Toolkit to debug real-time applications. Select **Help»Search the LabVIEW Help** to display the *LabVIEW Help*. In the *LabVIEW Help*, browse to **Toolkits»Real-Time Execution Trace Toolkit** to view the **Real-Time Execution Trace Toolkit** book.

Activating the Real-Time Execution Trace Toolkit

Refer to the *Activation Instructions for National Instruments Software* for information about activation. You also can activate software at ni.com/activate.

Upgrade and Compatibility Issues

Upgrading from RT Module 8.5.x

You might encounter the following compatibility issue when upgrading to the Real-Time Module 8.6 from the Real-Time Module 8.5.x.

Floppy Disk Support Discontinued

The Real-Time Module no longer includes updated versions of the PXI and Desktop PC Floppy Disk Utilities. You can still use Measurement & Automation Explorer (MAX) to create previous versions of the RT floppy disks, which will continue to work with newer versions of the Real-Time Module. However, older versions of the RT floppy disks do not support device drivers added to subsequent versions of the Real-Time Module. If you need to use the latest device drivers, you must use MAX to create an RT 8.6 USB Utility drive.

FieldPoint 20x0 Support Discontinued

The Real-Time Module no longer supports FP-20x0 and cFP-20x0 targets. You can still use FP-20x0 and cFP-20x0 targets with LabVIEW, but you cannot install the Real-Time Module 8.6 on FP-20x0 and cFP-20x0 targets.

Upgrading from RT Module 8.2.x and Earlier

You might encounter the following compatibility issues when upgrading to the Real-Time Module 8.6 from the Real-Time Module 8.2.x and earlier.

RTX Support Discontinued

The Real-Time Module no longer supports RTX desktop targets and no longer contains the Shared Memory VIs. Refer to the *Using Desktop PCs as RT Targets with the LabVIEW Real-Time Module* document for information about configuring a PC as an ETS RT target.

IrDA Support Discontinued

The Real-Time Module no longer supports the IrDA protocol and no longer contains the associated IrDA VIs.

Timed Loop Priority Restriction

The Timed Loop does not support **Priority** values greater than 65,535.

Compatibility with VxWorks 6.1

When you install the Real-Time Module 8.6 on the host computer, you also must install version 8.6 of the Real-Time Module software on cRIO-901x targets. The Real-Time Module 8.6 updates the operating system on cRIO-901x targets from VxWorks 6.1 to VxWorks 6.3. Some functions in VxWorks 6.3 are not compatible with VxWorks 6.1. If you use custom C code in a LabVIEW application running on a cRIO-901x target, you must recompile the .OUT files for VxWorks 6.3. Refer to the NI Web site at ni.com/info and enter the info code `rtvx` for more information.

Front Panel:Open Method Error

In the Real-Time Module 8.2.1 and earlier, the Front Panel:Open method failed without returning an error. The FP.Open method now returns error 53.

Real-Time Module Examples

Use the NI Example Finder, available by selecting **Help»Find Examples** from LabVIEW, to browse or search for RT example VIs. You also can access example VIs from the `labview\examples\Real-Time` directory.

Known Issues with the Real-Time Module 8.6

Refer to the `readme_RT.html` file on the LabVIEW 8.6 Real-Time Module installation CD for information about known issues with the Real-Time Module 8.6.

You also can launch the `readme_RT.html` file from Windows after you install the Real-Time Module. Complete the following steps to access the `readme_RT.html` file from Windows.

1. Select **Start»All Programs»National Instruments»LabVIEW 8.6»Readme** to open the `labview\readme` directory.

The `labview\readme` directory contains the HTML readme files for LabVIEW and any installed LabVIEW modules and add-ons.

2. Double-click `readme_RT.html` to open the *LabVIEW Real-Time Module Readme*.

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