

LabWindows™/CVI™ Release Notes

Version 2010

These release notes introduce LabWindows™/CVI™ 2010. Refer to this document for system requirements, installation and activation instructions, and information about new features in LabWindows/CVI.

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Minimum System Requirements

To run LabWindows/CVI, you must have the following:

- Personal computer using a Pentium 1 GHz or higher microprocessor
- Microsoft operating systems:
 - Windows 7, including Starter Edition (32-bit and 64-bit)
 - Windows Vista (32-bit and 64-bit)
 - Windows XP (32-bit)
 - Windows Server 2008 R2 (64-bit)
 - Windows Server 2003 R2 (32-bit)



Note LabWindows/CVI supports only Windows Server R2 editions.

- 1024 × 768 resolution (or higher) video adapter
- Minimum of 128 MB of RAM, 512 MB recommended
- 1.1 GB free hard disk space for full installation, which includes the Interface to Win32 Application Programmatic Interface (API)
- Microsoft-compatible mouse

Installing LabWindows/CVI

The LabWindows/CVI Platform DVD includes LabWindows/CVI and the following modules and toolkits.

Modules

- Real-Time Module
- Vision Development Module

Toolkits

- Execution Profiler Toolkit
- PID Toolkit
- Real-Time Execution Trace Toolkit
- Signal Processing Toolkit
- SQL Toolkit

If you purchased any of these modules or toolkits, you can install them using the LabWindows/CVI Platform DVD. If you want to evaluate any of these modules or toolkits before purchasing them, you can install these add-ons from the LabWindows/CVI Platform DVD and try them for free for 30 days.



Caution Installing LabWindows/CVI 2010 replaces any previous version of the LabWindows/CVI Run-Time Engine with the LabWindows/CVI 2010 Run-Time Engine. To restore the previous Run-Time Engine, uninstall LabWindows/CVI 2010, the LabWindows/CVI 2010 Run-Time Engine, and any previous versions of LabWindows/CVI and the LabWindows/CVI Run-Time Engine on the computer. Then reinstall the LabWindows/CVI version you want to use, along with any additional National Instruments software you might have installed.

1. Insert the LabWindows/CVI media into the disk drive. If the media does not run automatically, open Windows Explorer, right-click the disk drive icon, and select **AutoPlay**.

2. On installation startup, the National Instruments LabWindows/CVI 2010 screen appears. Click **Install LabWindows/CVI, Modules, and Toolkits**.
3. Continue to follow the instructions on the screen.



Notes If you have a serial number for the product you want to install, enter the number during installation when you are prompted. If you do not enter a serial number during installation, you can enter the number the first time that you launch LabWindows/CVI.

Each product on the LabWindows/CVI Platform DVD has a different serial number.

4. If you selected **Device Drivers** in the **Product List**, the LabWindows/CVI installer prompts you to insert the National Instruments Device Drivers DVD after you install LabWindows/CVI and any selected modules and toolkits. Follow the instructions on the screen to install the device drivers.
5. To activate a National Instruments product, refer to the *Activating LabWindows/CVI* section of this document.

Activating LabWindows/CVI

If you entered a serial number during installation, LabWindows/CVI prompts you to confirm the activation when you launch LabWindows/CVI for the first time. If you did not enter a serial number during installation, click **Activate Products** in the License Status dialog box to launch the NI Activation Wizard.

Once you choose your activation method and launch the NI Activation Wizard, follow the instructions on the screen to activate LabWindows/CVI. For more information about activation, refer to the *Activating Your Software* topic in the *LabWindows/CVI Help*.



Note If you are unable to activate LabWindows/CVI, refer to the NI License Activation Web page at ni.com/activate.

What's New in LabWindows/CVI?

This section includes information about changes and enhancements in LabWindows/CVI 2010.



Note The Real-Time features require the LabWindows/CVI 2010 Real-Time Module.

Custom Build Configurations

In previous versions of LabWindows/CVI, project configurations were limited to predefined build configurations (debug/release, 32-bit/64-bit). You now can create build configurations with customized LabWindows/CVI build options. You can create multiple build configurations per project.

To create, edit, or remove a custom configuration, select **Build»Configuration»Manage Configurations**.

For more information about creating custom build configurations, refer to the *Using LabWindows/CVI»Managing Projects»Setting the Project Configuration* book in the *LabWindows/CVI Help*.

Attach the LabWindows/CVI Debugger to Programs

You can attach the LabWindows/CVI debugger to currently running programs, which allows you to start debugging without restarting the program from the debugger. To receive the most useful debugging information, build the DLL or EXE you want to debug in LabWindows/CVI 2010 or later and in debug configuration.

To attach to a running process, select **Run»Attach to Process**.

Additionally, you can debug crashed programs with the LabWindows/CVI just-in-time debugger, which is installed and registered as the default just-in-time debugger when you install LabWindows/CVI. If you later install software that registers a different just-in-time debugger, you can re-register the LabWindows/CVI just-in-time debugger by selecting **Tools»Register Just-In-Time Debugger**.

For more information about attaching the LabWindows/CVI debugger to running processes, refer to the *Using LabWindows/CVI»Debugging Tools»Debugging Processes* topic in the *LabWindows/CVI Help*.

Arrays of User Interface Controls

Arrays of controls provide convenient programmatic access to controls. For example, you can iterate through each control in the array, perform batch operations on all controls in the array, and so on. You can create arrays of controls programmatically and interactively.

For more information about arrays of controls, refer to the *Library Reference»User Interface Library»Control Arrays* book in the *LabWindows/CVI Help*.

User Interface Browser

The User Interface Browser contains a tree view of the user interface objects, such as panels, controls, and menu bars, related to the selected `.uir`. When you select or open a `.uir` file, the User Interface Browser appears to the right of the User Interface Editor. Double-clicking a control or panel highlights the object in the User Interface Editor and LabWindows/CVI displays the attributes of the object in the Attribute Browser. If you double-click an array of controls, LabWindows/CVI highlights the controls in the User Interface Browser and displays the common attributes of the controls in the array. The User Interface Browser is the primary resource for interactively editing arrays of controls.

For more information about the User Interface Browser, refer to the *Using LabWindows/CVI»LabWindows/CVI Workspace»Workspace Window Overview»User Interface Browser* topic in the *LabWindows/CVI Help*.

Updated Win32 API

LabWindows/CVI 2010 includes the Windows 7 version of the Microsoft Interface to Win32 Application Programmatic Interface (API) headers and libraries. The Interface to Win32 API provides programmatic access to all of the latest features of Microsoft Windows.

Distribution Patching

You can create patches for distributions that you create with LabWindows/CVI 2010 or later. With a distribution patch, you can make minor updates to an existing distribution installation. Patches contain only files that must be updated, making the patch smaller and more convenient to distribute. Patches do not include NI drivers.

When you create a patch, you automatically can include files that have been updated since you built the distribution on which you are basing the patch. You can specify most of the same options in a patch that you specify in a new distribution. For example, you can include new files and modify and add registry keys.

For more information about distribution patching, refer to *Using LabWindows/CVI»Managing Projects»Building a Project»Distributing Applications»Creating Patches for Distributions* topic in the *LabWindows/CVI Help*.

FPGA Interface C API Generator

The **Tools** menu contains the **FPGA Interface C API Generator** item, which you can use to create a C program that interacts with LabVIEW FPGA VIs without using LabVIEW. You must have the FPGA Interface C API Generator, which is available on ni.com, installed to use this tool. The FPGA Interface C API Generator is optimized for use with LabWindows/CVI.

Backing Up, Restoring, and Replicating RT Targets via USB Thumb Drive (Real-Time)

You can use RT target disk images to back up, restore, and replicate RT targets. An RT target disk image is a copy of the primary RT target hard drive. You can use an RT Desktop PC Utility USB drive to create and apply RT target disk images.

Web-Based Monitoring and Configuration (Real-Time)

The Real-Time Module includes support for NI Web-Based Monitoring and Configuration. When you install NI Web-Based Monitoring and Configuration on an RT target, you can use a Web browser to monitor and configure the RT target.

Lower CPU Overhead for Hard Drives in AHCI Mode (Real-Time)

The ETS AHCI driver now has lower CPU overhead because it uses Message Signaled Interrupts (MSIs) instead of polling.

Improved Support for RT Desktop PC Targets (Real-Time)

The Real-Time Module 2010 includes the following improvements for RT desktop PC targets.

- **Expanded Support for IDE-Compatible Hard Drives**—The ETS RTOS now detects all IDE-compatible hard drive controllers. You now can use native IDE mode for SATA hard drive controllers that do not support AHCI mode.
- **Improved Support for USB Booting**—You now can boot an RT desktop PC target using a wider range of USB drives.
- **Improved RT Desktop PC Evaluator Tool**—The USB-based RT desktop PC Evaluator tool now more accurately diagnoses potential hardware compatibility issues.

Additional LabWindows/CVI Enhancements

LabWindows/CVI 2010 includes the following additional enhancements. Refer to the *LabWindows/CVI Help* for more information about these features.

Functions

The following functions are new in LabWindows/CVI 2010.

Advanced Analysis Library

- `CxMultipleToneInfo`
- `CxMultipleToneSignal`
- `CxSingleToneInfo`
- `CxSingleToneSignal`
- `MultipleToneInfo`
- `MultipleToneSignal`
- `SingleToneInfo`
- `SingleToneSignal`
- `ZeroPhaseFiltering`

Utility Library

- `CmtGetLockEx`
- `CmtWaitForThreadPoolFunctionCompletionEx`

LabWindows/CVI ActiveX Server Interface

- `AttachDebuggerToProcess`
- `DetachDebugger`

Attributes

The following attributes are new in LabWindows/CVI 2010.

User Interface

- `ATTR_CHART_HSCROLL_OFFSET`
- `ATTR_HORIZONTAL_BAR_COLOR`

Events

The following event is new in LabWindows/CVI 2010:

- `EVENT_CTRL_MENU`

Menus and Context Menu Changes

- In the Memory Display window, select a contiguous memory range, right-click and select **Add Memory Watch Expression** from the shortcut menu to add a memory-specific expression to the Watch window.
- In the line icon area of the Source window, you can select the **Disable Breakpoint** and **Edit Breakpoint** options.
- Use the **Root Drive** context menu item in the **Installation Files & Directories** browser in the Edit Installer dialog box to specify a drive letter as the base installation location for distributions.
- The Editable Cell Tree custom control is no longer available in the **Create** menu of the User Interface Editor. However, the Editable Cell Tree instrument driver (`editableCellTree.fp`) is still installed. If you want to add a tree to your user interface, use the native LabWindows/CVI tree control.
- The **Enable 'O' Option** context menu item for source files in the Project Tree is now called **Enable .Obj Option**.
- The **View»Library Tree/Attribute Browser** menu item is now **View»Library Tree**. The Attribute Browser is displayed when a `.uir` file is open.
- The **Specific Type** context menu item for arrays in the Variables and Watch windows is now **Specific Type of Elements**. Use this menu item to specify the conceptual type for all elements in the array.

Dialog Box Changes

- The **Minimum Operating System Version** option in the **Advanced** tab of the Edit Installer dialog box no longer includes Windows 2000. The minimum operating system version you can specify is Windows XP.
- Select Windows Server 2003 or Windows Server 2008 as the minimum or maximum operating system versions for distributions.
- The Environment dialog box contains a new option for saving your projects, **Save changes before compiling**.

- The options in the Build Options dialog box are divided among two tabs, **Configuration Options** and **Build Process Options**.
- The Save File As dialog box for `.uir` files includes an option to save a `.uir` file in LabWindows/CVI 2010 format.
- The **Make ‘O’ option compatible with CVI 5.0.1** option in the Build Options dialog box has been renamed to **Make .obj option compatible with CVI 5.0.1**.
- The **Auto hide Project Tree and Library Tree/Attribute Browser** option in the Environment dialog box is now the **Auto Hide Project Tree and Library Tree** option. The Attribute Browser is displayed when a `.uir` file is open.
- The **Active Compiler** option in the Build Options dialog box is replaced by two options: **Active 32-bit compiler** and **Active 64-bit compiler**.
- The **Release Configuration** button in the Edit Project dialog box is replaced by two buttons: **32-Bit Release Configurations** and **64-bit Release Configurations**.

Additional Features

- Compile LabWindows/CVI code with Clang as the external optimizing compiler.
- Specify a third-party compiler for 64-bit projects.
- Use new special variables in build steps for distributions and projects:
 - `%CVITARGETFILEVER%` to specify the target file version
 - `%CVITARGETPRODVER%` to specify the product version
- Use new predefined macros for versioning:
 - `__TARGET_FILE_VERSION__`, which is defined as the value in the **File Version** option in the Version Info dialog box.
 - `__TARGET_PRODUCT_VERSION__`, which is defined as the value in the **Product Version** option in the Version Info dialog box.
- Use the `%configname` variable in the Version Info dialog box to specify a configuration for your application.
- Use the `-config` argument to specify a custom configuration in the command line interface.
- LabWindows/CVI supports hexadecimal floating point literals per the C99 specification.
- LabWindows/CVI supports the following `math.h` macros:
 - `HUGE_VAL`
 - `HUGE_VALF`
 - `INFINITY`
 - `NAN`
 - `FP_INFINITE`
 - `FP_NAN`
 - `FP_NORMAL`
 - `FP_SUBNORMAL`
 - `FP_ZERO`
- The LabWindows/CVI compiler recognizes `$` as a valid character in a symbol identifier.
- The LabWindows/CVI compiler recognizes the `##` token.
- LabWindows/CVI supports empty parameter lists for variable argument macros.

- The command line interface for the LabWindows/CVI Real-Time File Copy Utility provides an option to reboot the RT target.
- The following white papers are no longer installed as PDFs with LabWindows/CVI. The content for these white papers is integrated into the *LabWindows/CVI Help*.

White Paper	Table of Contents Path in <i>LabWindows/CVI Help</i>
Multithreading in LabWindows/CVI	Programmer Reference»Creating Multithreaded Applications
Programming for Multibyte Character Sets in LabWindows/CVI	Programmer Reference»Programming for Multibyte Character Sets in LabWindows/CVI
Building ActiveX Servers in LabWindows/CVI	Library Reference»ActiveX Library»Building ActiveX Servers in LabWindows/CVI
Building Networked Applications with the LabWindows/CVI TCP Support Library	Library Reference»TCP Support Library»Building Networked Applications with the LabWindows/CVI TCP Support Library
Using LabWindows/CVI DLLs in LabVIEW Real-Time Applications	Programmer Reference»Creating and Downloading DLLs to Real-Time Targets»Creating and Downloading Real-Time DLLs via LabVIEW

Deprecated Features

- National Instruments no longer supports Windows 2000.
- The **Object File Format** option in the Advanced Compiler Options dialog box is no longer available because LabWindows/CVI no longer supports the Borland compatibility mode.
- LabWindows/CVI no longer installs the help for the Interface to Win32 API. National Instruments recommends that you view the latest version of this documentation at www.msdn.com. For more information, visit ni.com/info and enter the Info Code `msdn`.

LabWindows/CVI Resources

How do I get started?

Read the *Getting Started with LabWindows/CVI* manual, which provides a tutorial for learning basic LabWindows/CVI program development techniques.

Are there known issues or late-breaking information?

Refer to the *LabWindows/CVI Readme*, which you can access from **Start»All Programs»National Instruments»LabWindows CVI 2010»LabWindows CVI 2010 Readme**. The readme file contains information about known issues.

Where can I find reference information?

The *LabWindows/CVI Help* contains complete reference information. The help file includes the following sections:

- *Using LabWindows/CVI* describes the LabWindows/CVI development environment and features.
- *Library Reference* provides information about functions you can call in LabWindows/CVI.
- *Programmer Reference* provides information to help you develop applications.
- *Tools Library* provides information about the LabWindows/CVI Toolslib controls.

- *LabWindows/CVI Real-Time Module Help* includes an introduction to the LabWindows/CVI Real-Time Module, programming considerations for RT applications, and function reference information for the LabWindows/CVI Real-Time Utility Library. You must have the LabWindows/CVI Real-Time Module installed to view this help file.

Use the **Search** tab in the *LabWindows/CVI Help* to quickly locate specific information. For information about how to use the search functionality, refer to the *Using Help»Searching Help* topic of the *LabWindows/CVI Help*.

Where can I find examples?

Find examples with the NI Example Finder, which you can access by selecting **Help»Find Examples**.

LabWindows/CVI example programs are located in the following location on Windows 7/Vista/Server 2008: `C:\Users\Public\Documents\National Instruments\CVI2010\samples`.

On Windows XP/Server 2003, example programs are located in the following location:

`C:\Documents and Settings\All Users\Documents\National Instruments\CVI2010\samples`.

Is there a list of LabWindows/CVI documentation?

The *Guide to LabWindows/CVI Documentation* topic describes documentation available for new users and upgrade users. In addition, this topic provides links to LabWindows/CVI documentation, including manuals and web resources. You can access the *Guide to LabWindows/CVI Documentation* topic through the *LabWindows/CVI Help*.

Where else can I go for LabWindows/CVI information?

Visit the LabWindows/CVI Web site and NI Developer Zone at ni.com for the most up-to-date information about LabWindows/CVI.

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