

RELEASE NOTES

LabVIEW™ DSP Module

Version 2.0

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Introduction

The LabVIEW DSP Module supports the design, implementation, and analysis of digital signal processor-based algorithms and systems. You can apply the concepts of digital signal processing techniques, such as spectral analysis or filtering, with the DSP Module and one of the following evaluation boards:

- National Instruments SPEEDY-33
- Spectrum Digital 6416 DSK
- Spectrum Digital 6713 DSK
- Texas Instruments 6711 DSK

The DSP Module adds features and VIs to LabVIEW that focus on creating signal processing applications that run on embedded digital signal processors (DSPs). With the DSP Module and LabVIEW you can focus on concepts and results rather than on implementation details.

System Requirements

The DSP Module has the following requirements:

- A desktop computer with Windows 2000/XP SP 2 or later
- LabVIEW 8.2 Full or Professional Edition
- One of the following evaluation boards and corresponding driver:
 - National Instruments SPEEDY-33
 - Spectrum Digital 6416 DSK
 - Spectrum Digital 6713 DSK
 - Texas Instruments 6711 DSK

Refer to the *LabVIEW Release Notes*, available by selecting **Start»All Programs»National Instruments»LabVIEW»LabVIEW Manuals** and opening `LV_Release_Notes.pdf`, for standard LabVIEW development system requirements.

Installation

Complete the following steps to install the DSP Module. After you install the DSP Module, you must install the driver(s) for the DSP target.

1. Log on as an administrator or as a user with administrator privileges.
2. Insert the LabVIEW DSP Module CD and follow the instructions that appear on the screen.



Note The DSP Module installation process installs the NI SPEEDY-33 driver by default.

Installing the Drivers

You must install the appropriate driver for the DSP target.

- National Instruments SPEEDY-33—Install the SPEEDY-33 driver during the DSP Module installation process.
- Spectrum Digital 6416 DSK—Refer to the 6416 DSK documentation from Spectrum Digital for information about installing the drivers.
- Spectrum Digital 6713 DSK—Refer to the 6713 DSK documentation from Spectrum Digital for information about installing the drivers.
- Texas Instruments 6711 DSK—Refer to the *Setting Up the Texas Instruments 6711 DSK Target* document, available by selecting **Start»All Programs»National Instruments»LabVIEW»LabVIEW Manuals** and opening `DSP_6711DSK_Setup.pdf`, for information about setting up the 6711 DSK target.

Setting Up the Hardware

Refer to the documentation that came with your DSP hardware for information about setting up and configuring the hardware. You can use the default configuration for the DSP Module.

(6711 DSK Only) Refer to the *Setting Up the Texas Instruments 6711 DSK Target* document, available by selecting **Start»All Programs»National Instruments»LabVIEW»LabVIEW Manuals** and opening `DSP_6711DSK_Setup.pdf`, for information about setting up the 6711 DSK target.

New Features in the DSP Module 2.0

The 2.0 version of the DSP Module includes the following new features:

- **LabVIEW projects and the Project Explorer window**—Helps you manage and implement the components of a DSP application. Refer to the [Managing DSP Targets and VIs in LabVIEW Projects](#) section for more information about using LabVIEW projects.
- **New DSP Project Wizard**—Facilitates the creation of projects for new and existing DSP VIs.
- **6416 DSK support**—Allows you to target the Spectrum Digital 6416 DSK hardware as well as the National Instruments SPEEDY-33, Texas Instruments 6711 DSK, and the Spectrum Digital 6713 DSK.
- **Multiple target support**—Allows you to simultaneously run DSP applications on multiple targets including Windows and supported DSP targets.
- **Multiple NI SPEEDY-33 support**—Allows you to connect multiple SPEEDY-33 devices to the host computer and simultaneously run DSP applications on SPEEDY-33 targets.
- **New VIs and functions**—Provide more timing and signal processing capabilities. The DSP Module now supports Tick Count (ms), Tick Count, Wait (ms), Wait, and Peak Detect.
- **Basic Test and Test Panel for DSP hardware**—Verifies that LabVIEW can connect to the DSP target and checks the I/O resources on the DSP hardware. To test basic connectivity and analog and digital output, right-click the DSP target in the **Project Explorer** window and select **Basic Test** from the shortcut menu. To test the switches, LEDs, and analog input, right-click the DSP target in the **Project Explorer** window and select **Utilities»Test Panel** from the shortcut menu.
- **Analog input synchronization capability**—Verifies that the analog input buffer contains new data and that the new data is available for subsequent processing. Use the AI Property Node in applications that use an Analog Input Elemental I/O Node to check for new data.

DSP Module Documentation

The DSP Module includes the following documentation in addition to this document:

- The readme file—Available by selecting **Start»All Programs»National Instruments»LabVIEW»Readme** and opening `readme_DSP.html`, contains known issues.
- The *Getting Started with the LabVIEW DSP Module* manual—Available by selecting **Start»All Programs»National Instruments»LabVIEW»LabVIEW Manuals** and opening `DSP_Getting_Started.pdf`, contains examples that walk you through creating, building, downloading, and running DSP applications.
- **Context Help** window—Available by selecting **Help»Show Context Help**, displays basic information about LabVIEW objects when you move the cursor over each object.
- DSP-specific VI reference—Available in the *LabVIEW Help* by selecting **Help»Search the LabVIEW Help**. In the **Contents** tab of the *LabVIEW Help*, expand the **VI and Function Reference** book. The DSP Module VI reference is in the **DSP Module VIs** book.
- Examples—Available in `labview\examples\EmbeddedDSP` directory, can help you get started creating DSP VIs.
- *Getting Started with LabVIEW* manual—Available by selecting **Start»All Programs»National Instruments»LabVIEW»LabVIEW Manuals** and opening `LV_Getting_Started.pdf`, contains exercises to teach you basic LabVIEW concepts.

Upgrading to the DSP Module 2.0

If you created DSP VIs using the DSP Module 1.0, you must create projects and update the VIs for use with LabVIEW 8.2 and the DSP Module 2.0.



Caution National Instruments recommends you back up your files before you begin updating your VIs for use with the DSP Module 2.0. For example, DSP-specific Express VIs and Elemental I/O Nodes are not backwards-compatible so you cannot save DSP VIs that use those items in a previous version of LabVIEW.

Managing DSP Targets and VIs in LabVIEW Projects

LabVIEW 8.2 features the **Project Explorer** window and the LabVIEW project to manage applications that include multiple VIs and resources, such as DSP targets. The DSP Module 2.0 uses the **Project Explorer** window to manage the components of a DSP application, including DSP VIs and Elemental I/O items.



Note You must create projects to create DSP VIs. You can use the New DSP Project Wizard, available by selecting **DSP Project** from the **Targets** pull-down menu in the **Getting Started** window, if you want to create a new project that includes a DSP target.

Adding I/O to the Project

You first must add Elemental I/O items to the DSP project to use the analog input and output resources available on the DSP target or to access the LEDs and switches on the DSP target.

You can add Elemental I/O items to a project when you create the project using the New DSP Project Wizard. The New DSP Project Wizard adds all available I/O resources by default, as shown in Figure 1.

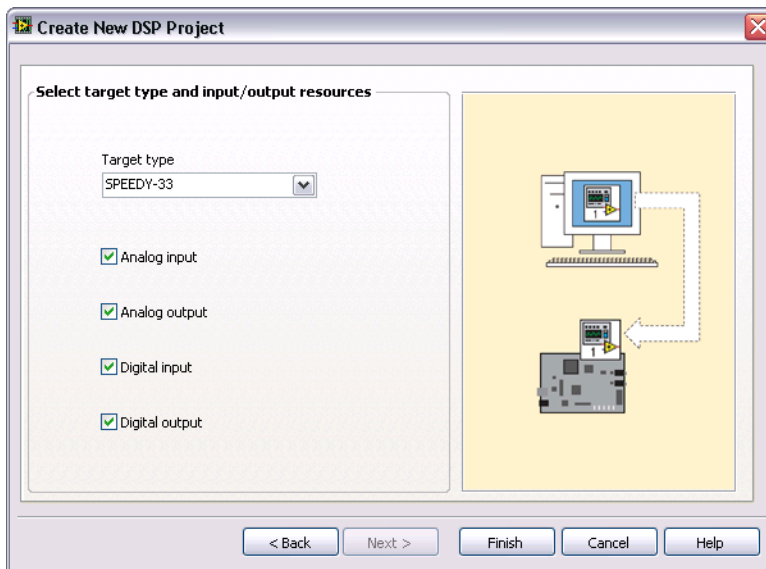


Figure 1. Adding I/O Resources through the Wizard



Tip You also can add Elemental I/O items by right-clicking a DSP target in the **Project Explorer** window and selecting **New»Elemental I/O** from the shortcut menu.

To use the Elemental I/O item in a DSP VI, place an Elemental I/O Node on the block diagram of a DSP VI. To configure the Elemental I/O Node, right-click the terminal name in the Elemental I/O Node and select **Properties**.



Tip You can use the same Elemental I/O Node on the block diagram to access all of the Elemental I/O items in the **Project Explorer** window. Refer to the *LabVIEW Help* for more information about using Elemental I/O Nodes.

Where to Go for Support

The National Instruments Web site is your complete resource for technical support. At ni.com/support you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs. For telephone support in the United States, create your service request at ni.com/support and follow the calling instructions or dial 512 795 8248. For telephone support outside the United States, contact your local branch office:

Australia 1800 300 800, Austria 43 0 662 45 79 90 0,
Belgium 32 0 2 757 00 20, Brazil 55 11 3262 3599,
Canada 800 433 3488, China 86 21 6555 7838,
Czech Republic 420 224 235 774, Denmark 45 45 76 26 00,
Finland 385 0 9 725 725 11, France 33 0 1 48 14 24 24,
Germany 49 0 89 741 31 30, India 91 80 41190000,
Israel 972 0 3 6393737, Italy 39 02 413091, Japan 81 3 5472 2970,
Korea 82 02 3451 3400, Lebanon 961 0 1 33 28 28,
Malaysia 1800 887710, Mexico 01 800 010 0793,
Netherlands 31 0 348 433 466, New Zealand 0800 553 322,
Norway 47 0 66 90 76 60, Poland 48 22 3390150,
Portugal 351 210 311 210, Russia 7 095 783 68 51,
Singapore 1800 226 5886, Slovenia 386 3 425 4200,
South Africa 27 0 11 805 8197, Spain 34 91 640 0085,
Sweden 46 0 8 587 895 00, Switzerland 41 56 200 51 51,
Taiwan 886 02 2377 2222, Thailand 662 278 6777,
United Kingdom 44 0 1635 523545

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