

Where to Start with the NI ELVIS™ II Series

The National Instruments Educational Laboratory Virtual Instrumentation Suite II Series (NI ELVIS II Series) is a LabVIEW-based design and prototyping environment for university science and engineering laboratories. This document explains how to set up and configure NI ELVIS II Series.

NI ELVIS II Series has the following features:

- USB-based workstation with a removable prototyping board for use in circuit development and experimentation.
- Integrated instruments for computer-based measurement and control including the following:
 - Multi-channel data acquisition capabilities including both analog and digital I/O
 - Digital multimeter (DMM)
 - 2-channel oscilloscope
 - NI ELVIS II—1.25 MS/s sampling rate
 - NI ELVIS II+—100 MS/s sampling rate
 - Function generator
 - Fixed and variable power supplies
 - 2- and 3-wire impedance analyzer
- NI ELVISmx 4.0 or later software provides the following:
 - User-friendly instrument soft front panels
 - LabVIEW Express VIs
 - SignalExpress steps
 - Ability to use the soft front panel instruments within NI Multisim



Note NI ELVISmx 4.1 or later software is required for NI ELVIS II+.

Conventions

The following conventions are used in this document:

» The » symbol leads you through nested menu items and dialog box options to a final action. The sequence **File»Page Setup»Options** directs you to pull down the **File** menu, select the **Page Setup** item, and select **Options** from the last dialog box.



This icon denotes a note, which alerts you to important information.



This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash.

bold Bold text denotes items that you must select or click in the software, such as menu items and dialog box options. Bold text also denotes parameter names and hardware labels.

italic Italic text denotes variables, emphasis, a cross-reference, or an introduction to a key concept. Italic text also denotes text that is a placeholder for a word or value that you must supply.

monospace Text in this font denotes text or characters that you should enter from the keyboard, sections of code, programming examples, and syntax examples. This font is also used for the proper names of disk drives, paths, directories, programs, subprograms, subroutines, device names, functions, operations, variables, filenames, and extensions.

NI ELVIS II Series NI ELVIS II Series refers to both the NI ELVIS II and the NI ELVIS II+.

What You Need to Get Started

To set up and use NI ELVIS II Series, you need the following items:

- Hardware
 - NI ELVIS II Series Workstation
 - NI ELVIS II Series Prototyping Board
 - AC/DC power supply
 - High-speed USB 2.0 cable
 - Components to build your circuits
 - Cabling and sensors as required for your application
 - Computer

- ❑ Software
 - NI ELVIS II
 - NI ELVISmx 4.0 or later media
 - NI-DAQmx 8.7.1 or later, which is installed with the NI ELVISmx software
 - NI ELVIS II+
 - NI ELVISmx 4.1 or later media
 - NI-DAQmx 8.9 or later, which is installed with the NI ELVISmx software
- ❑ Documentation
 - *Read Me First: Safety and Radio-Frequency Interference*
 - *Where to Start with NI ELVIS II Series*
 - *NI Educational Virtual Instrumentation Suite II Series (NI ELVIS II Series) Hardware User Manual*
 - Documentation for your software



Note If you are using the NI ELVISmx SFP in NI Multisim, refer to the *NI Multisim User Manual*, *NI Multisim for Education*, or *Multisim Help* (Help only available from the Multisim software menu).

- ❑ Tools
 - Wire cutter
 - Wire stripper

You can download NI documents from ni.com/manuals.

Unpacking

The NI ELVIS II Series Workstation and the NI ELVIS II Series Prototyping Board ship in antistatic packages to prevent electrostatic damage. Electrostatic discharge can damage several components on the NI ELVIS II Series hardware.



Caution *Never* touch the exposed pins of connectors.

To avoid such damage in handling the workstation and prototyping board, take the following precautions:

- Ground yourself using a grounding strap or by holding a grounded object.
- Touch the antistatic package to a metal part of the computer chassis before removing the workstation or prototyping board from the package.

Remove the hardware from the package and inspect it for loose components or any sign of damage. Contact NI if the hardware appears damaged in any way.

Store the workstation and the prototyping board in the antistatic envelopes when not in use.

Installing NI ELVIS II Series

This section describes how to install LabVIEW and NI-DAQmx, and the NI ELVIS II Series software and hardware.

Installing Software

Complete the following steps:

1. If you are using LabVIEW, install LabVIEW 8.2 or later according to the instructions on the media and the *LabVIEW Release Notes*.
2. NI ELVIS II—Install NI ELVISmx 4.0 or later, and NI-DAQmx 8.7.1, which is installed with NI ELVISmx, according to the installation instructions on the media.

or

NI ELVIS II+—Install NI ELVISmx 4.1 or later, and NI-DAQmx 8.9, which is installed with NI ELVISmx, according to the installation instructions on the media.

You are now ready to install the NI ELVIS II Series hardware.

Installing the NI ELVIS II Series Hardware

Refer to Figure 1 as you complete the hardware installation process.

1. Ensure that the power switch on the back of the workstation is switched to the off position.
2. Use the USB cable to connect the workstation to the computer.
3. Connect the AC/DC power supply to the NI ELVIS II Series Workstation, and then plug the power supply into a wall outlet and power on the workstation power switch.
4. Install the prototyping board by completing the following steps:
 - a. Position the opening in the prototyping board over the prototyping board mounting bracket.
 - b. Slide the edge connector of the prototyping board into the receptacle on the workstation.
 - c. Gently rock the board to ease it into place. It may be a tight fit, but *do not* force the board into place. Slide the prototyping board into the prototyping board mounting bracket.

5. Power on the prototyping board power switch on the workstation. The three DC Power Supply LEDs on the prototyping board should be lit.



Note If the LEDs are not lit, the device may not be receiving power. Check that the power cord is connected and that the power source is functioning properly.

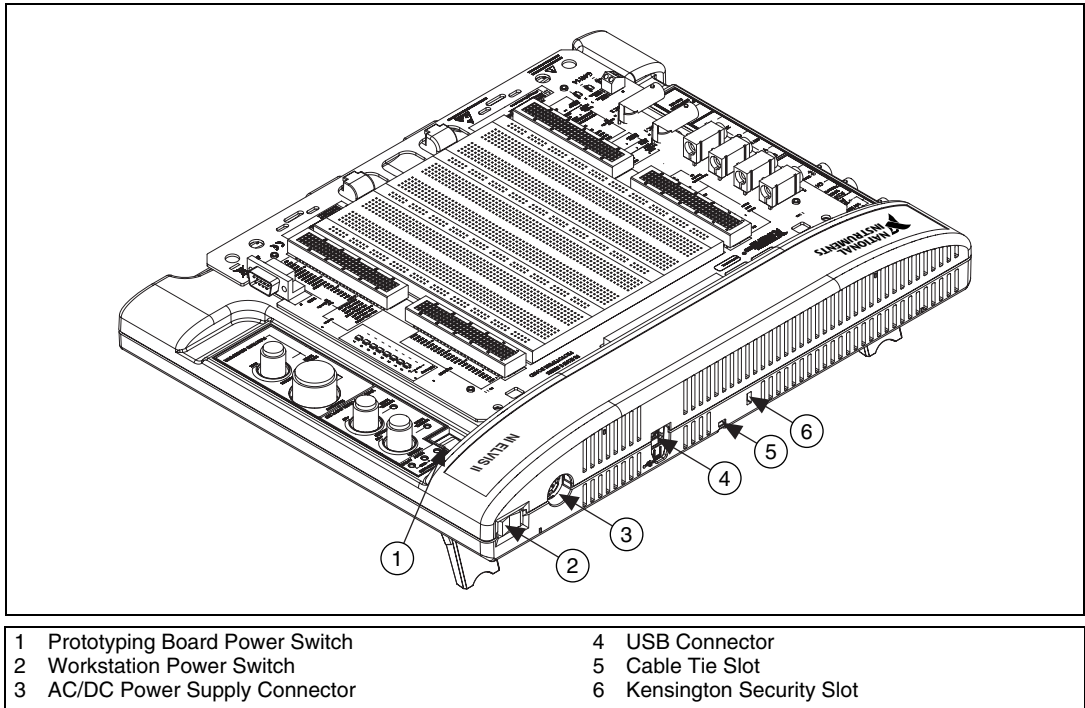


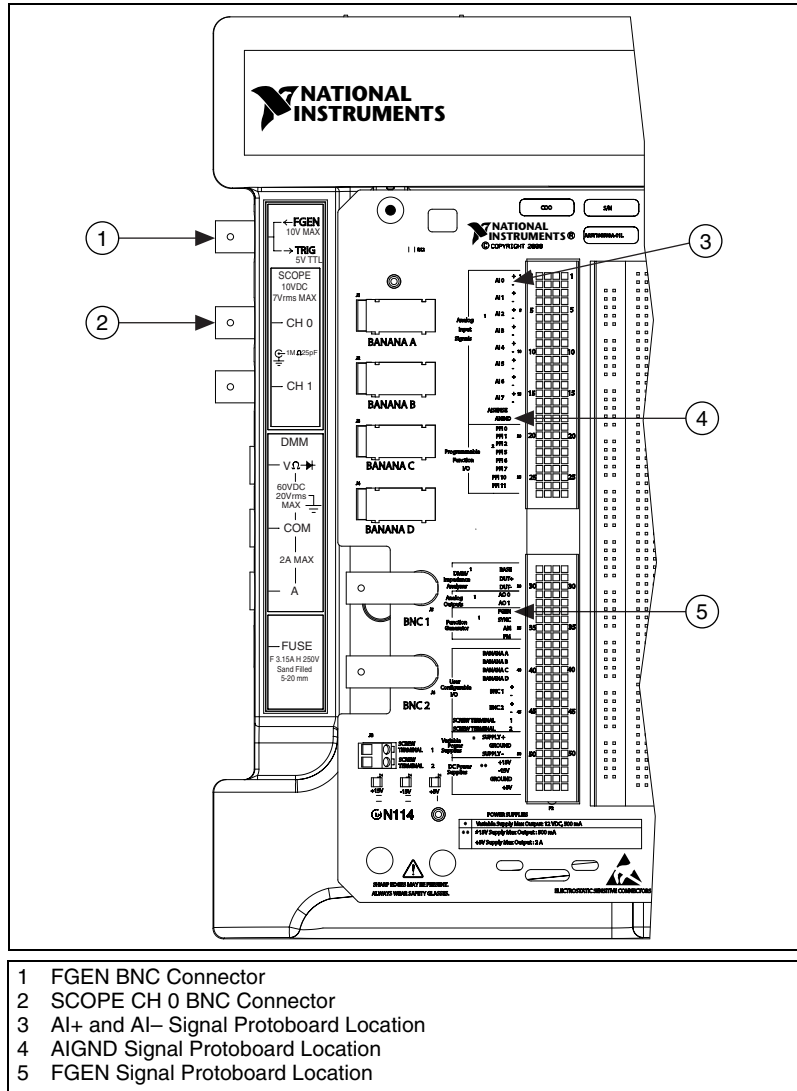
Figure 1. Rear View of NI ELVIS II Workstation (NI ELVIS II shown)

Testing the NI ELVIS II Series

The NI ELVISmx software includes a set of software instruments referred to as the NI ELVISmx soft front panel (SFP) instruments. Also included are LabVIEW Express VIs and SignalExpress steps to program NI ELVISmx in these environments, as well as NI ELVIS instruments integrated into NI Multisim.

To verify that the NI ELVIS II Series is properly configured, refer to Figure 2 while completing the following steps:

1. Connect a BNC cable between the FGEN and SCOPE CH 0 BNC connectors on the left side of the NI ELVIS II workstation.



- 1 FGEN BNC Connector
- 2 SCOPE CH 0 BNC Connector
- 3 AI+ and AI- Signal Protoboard Location
- 4 AIGND Signal Protoboard Location
- 5 FGEN Signal Protoboard Location

Figure 2. Connections for Measurements (NI ELVIS II shown)

2. Connect wires on the prototyping board between FGEN and AI 0+, and between AIGND and AI 0-.
3. Start the NI ELVISmx Instrument Launcher by selecting **Start» Programs»National Instruments»NI ELVISmx»NI ELVISmx Instrument Launcher.**

4. Select the Function Generator (FGEN) instrument.
5. Refer to Figure 3 while configuring the FGGEN to output as follows:
 - Function: Sine
 - Frequency: 100 Hz
 - Amplitude: 2.00 V_{pp}
 - Signal Route: FGGEN BNC

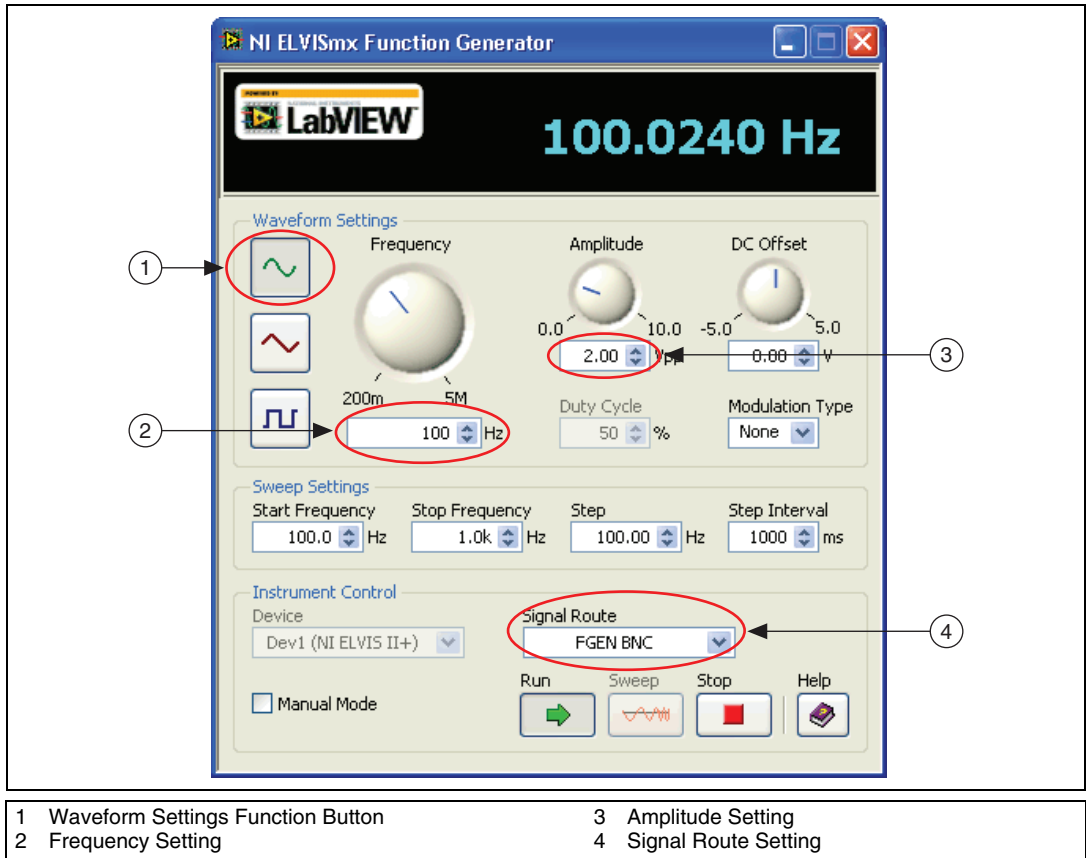


Figure 3. Function Generator Settings

6. Click **Run** to start the function generator.
7. Select the Scope instrument from the NI ELVISmx Instrument launcher.
8. Refer to Figure 4 while configuring the Scope as follows:
 - Channel 0 Source: SCOPE CH 0
 - Channel 0 Enabled
 - Channel 0 Scale Volts/Div: 1 V
 - Timebase Time/Div: 5 ms

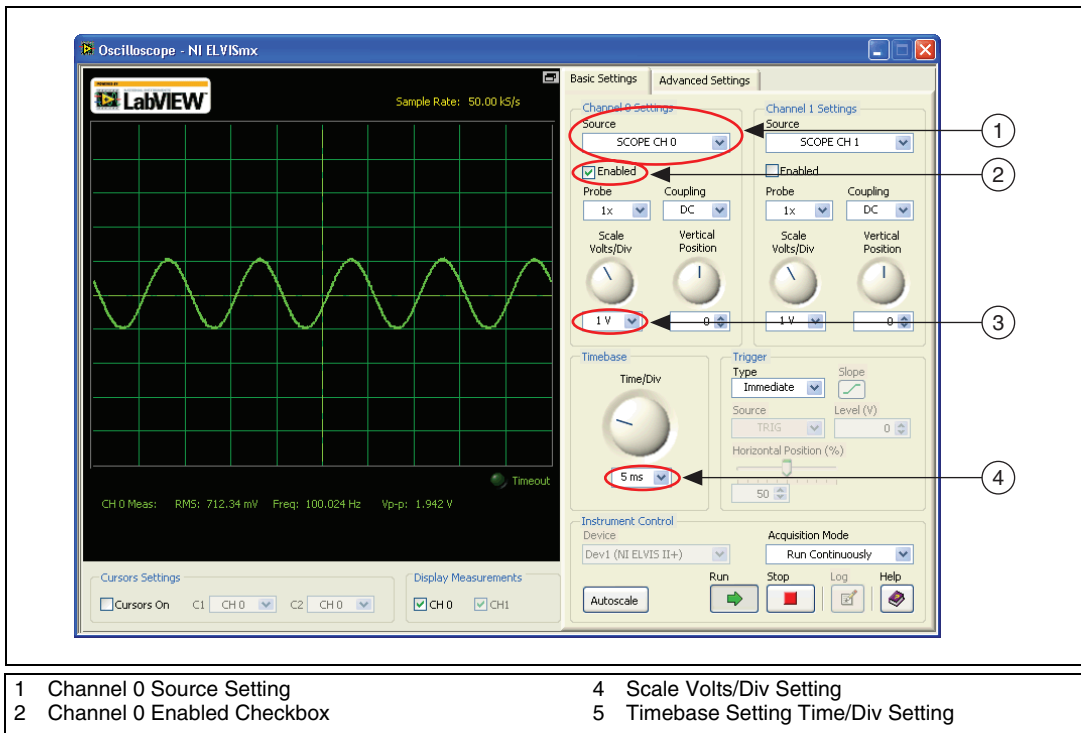


Figure 4. Oscilloscope Settings

9. Click **Run** to start the oscilloscope. You should see a 100 Hz sine wave on the scope display.
10. On the NI ELVISmx Function Generator SFP, change the Signal Route from FGEN BNC to Prototyping Board.
11. On the NI ELVISmx Oscilloscope, change the Source from Scope CH 0 to AI 0.
12. You should see a 100 Hz sine wave on the scope display.

Refer to the *NI ELVISmx Online Help* and *NI Educational Virtual Instrumentation Suite II Series (NI ELVIS II Series) Hardware User Manual* for more information about using the NI ELVIS II Series instruments within LabVIEW, SignalExpress, or NI Multisim, or for more information about NI ELVIS II Series features.

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