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Requirements and Compatibility | Ordering Information | Detailed Specifications

For user manuals and dimensional drawings, visit the product page resources tab on ni.com.

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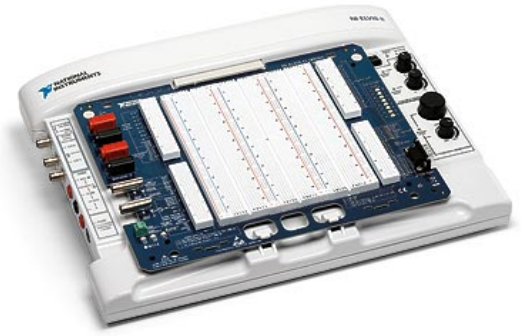
Integrated Suite of 12 Instruments for Hands-On, Multidiscipline Education

NI ELVIS II/II+



- Design and prototyping platform for measurement and instrumentation, circuits, controls, telecommunications, and embedded/MCU experiments
- Complete integration with Multisim for circuits and electronics
- Completely open and customizable in LabVIEW
- Express VIs for point-and-click configuration in LabVIEW and LabVIEW SignalExpress

Overview

The NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS) is a hands-on design and prototyping platform that integrates 12 of the most commonly used instruments – including the oscilloscope, DMM, function generator, and Bode analyzer – into a compact form factor ideal for the hardware lab or classroom. A 100 MS/s oscilloscope option is available on the NI ELVIS II+. Based on NI LabVIEW graphical system design software, NI ELVIS, with USB plug-and-play capabilities, offers the flexibility of virtual instrumentation and allows for quick and easy measurement acquisition and display. This hardware platform, used from first-year classes to advanced senior classes, helps educators teach a variety of concepts, including measurement and instrumentation, analog and digital circuits, controls and mechatronics, telecommunications, and embedded theory.

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Requirements and Compatibility

OS Information

Windows 7
Windows Vista
Windows XP

Driver Information

NI ELVISmx

Software Compatibility

LabVIEW
NI Circuit Design Suite
SignalExpress

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Comparison Tables

Features	NI ELVIS I	NI ELVIS II	NI ELVIS II+
12 integrated instruments	yes	yes	yes
PCI/PCMCIA	yes	no	no
Integrated USB	no	yes	yes
Isolated digital multimeter	no	yes	yes
NI-DAQmx software	no	yes	yes
True Multisim integration	no	yes	yes
100 MS/s oscilloscope	no	no	yes

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Application and Technology

NI Electronics Education Platform

NI ELVIS, an integral part of the NI electronics education platform, combines simulation and measurements from NI ELVIS inside the NI Multisim capture and SPICE simulation environment. Students transfer concepts taught in a textbook to Multisim, where they can learn through modeling circuit behavior and interactive circuits. They can compare simulation and real measurements with a single mouse click using NI ELVIS instruments inside the Multisim environment and achieve more complex analysis using LabVIEW or LabVIEW SignalExpress. For more information on the NI electronics education platform, visit ni.com/academic/eep.

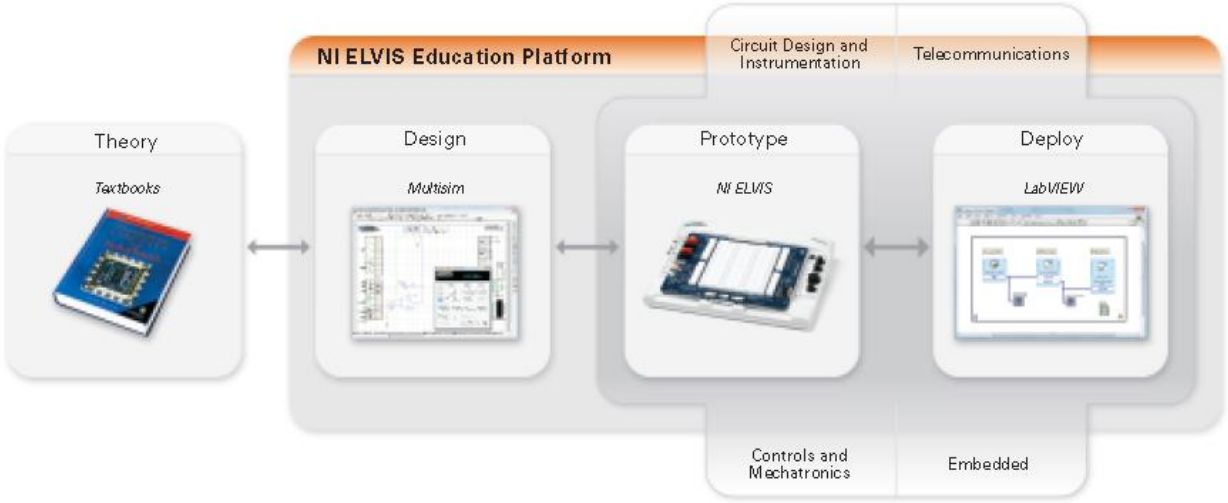

Figure 1. The NI ELVIS Education Platform

NI-ELVISmx Driver and LabVIEW Accessibility

With the NI-ELVISmx driver, students can access their suite of 12 instruments through the NI-ELVISmx instrument launcher. These virtual instruments with their soft front panels provide an interactive interface to configure instruments. NI ELVIS virtual instruments are open-sourced and customizable in LabVIEW. With the installation of the driver, students can use LabVIEW Express VIs and LabVIEW SignalExpress steps to program their devices. This provides point-and-click configuration capabilities for the individual instruments, so they can achieve customized and more complex analysis of acquired data in LabVIEW. Those who are familiar with the DAQmx API can program general analog input, analog output, and timing functionality on NI ELVIS using NI-DAQmx.

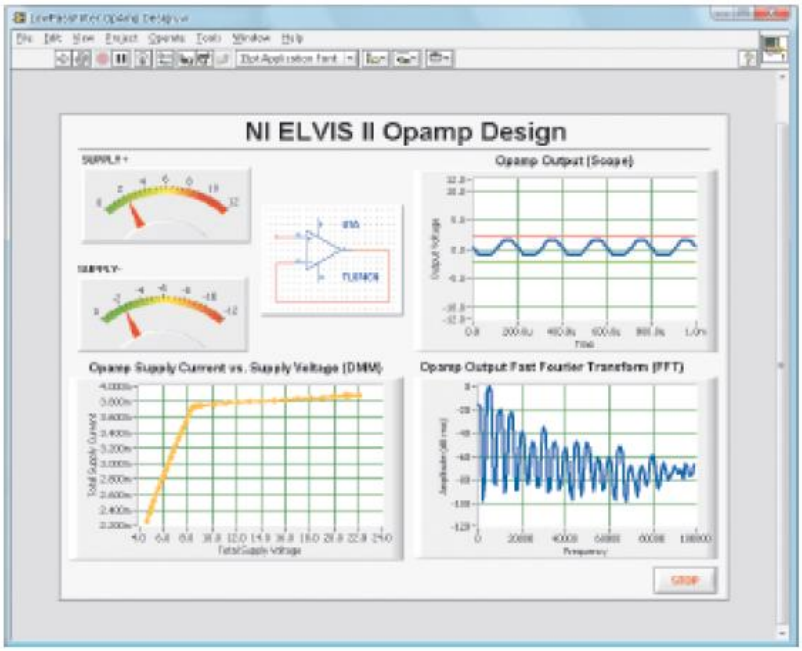

Figure 2. Integration with NI LabVIEW

Teach a Variety of Disciplines with Plug-In Boards

Educaters can extend their labs beyond instrumentation and circuits with NI ELVIS plug-in boards and courseware from third-party collaborators such as Emona, Freescale Semiconductor, and Quanser to teach telecommunications, microcontroller, and control concepts. National Instruments also now provides introduces a digital electronics and field-programmable gate array (FPGA) plug-in board for the platform.

NI ELVIS is an open architecture, which helps leading teaching solution providers take advantage of the platform. The following plug-in boards are available from the following companies.

Digital Electronics with National Instruments

NI Digital Electronics FPGA Board based on Xilinx Spartan-3E FPGA

Embedded/MCU Design with Freescale

Embedded/MCU design with Freescale Microcontroller Student Learning Kit (SLK)

Figure 3. NI Digital Electronics FPGA Board and NI ELVIS II

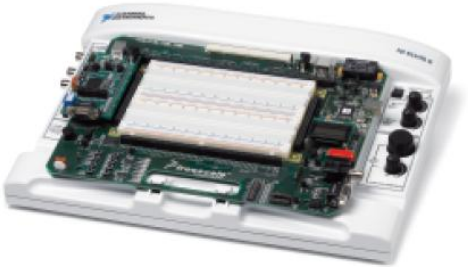

Figure 5. Freescale Microcontroller SLK and NI ELVIS II

Control and Simulation with Quanser

QNET-010 DC motor control
QNET-011 rotary inverted pendulum
QNET-012 HVAC system
QNET-013 Vertical Take-Off and Landing (VTOL) actuator
QNET-014 mechatronics sensor 1

Figure 4. Quanser QNET Plants and NI ELVIS II

Telecommunications and Fiber Optics with Emona

Telecommunications with Emona DATEx
Fiber optics with Emona FOTEx

Figure 6. Emona FOTEx Fiber Optics Board and NI ELVIS II+

Other Companion Products

Circuits – NI electronics education platform with Multisim
Embedded/DSP – Analog Devices ADSP-BF537 Blackfin Processor
Sensors – Vernier sensor adapters for NI ELVIS

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Ordering Information

For a complete list of accessories, visit the product page on ni.com.

Products	Part Number	Recommended Accessories	Part Number
Bundles			
NI ELVIS II+ Circuit Design Bundle	780379-02	No accessories required.	
NI ELVIS II Circuit Design Bundle (Includes NI ELVIS workstation, Multisim, LabVIEW, LabVIEW SignalExpress, and user manual.)	780379-01	No accessories required.	
NI ELVIS II+ Basic Bundle	780378-02	No accessories required.	
NI ELVIS II prototyping board (Used with NI ELVIS II and NI ELVIS II+)	188432-01	No accessories required.	
NI ELVIS II+ instrumentation design and training platform	780380-02	No accessories required.	
NI ELVIS II instrumentation design and training platform (Includes NI ELVIS workstation only and user manual for industry and vocational training.)	780380-01	No accessories required.	
NI ELVIS II Basic Bundle (Includes NI ELVIS workstation, LabVIEW, LabVIEW SignalExpress, and user manual.)	780378-01	No accessories required.	

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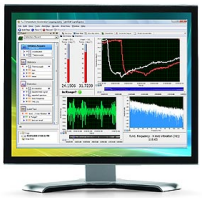
Software Recommendations

NI LabVIEW Full Development System for Windows

Fully integrated graphical system design software
Support for a wide range of measurement hardware, I/O, and buses
Custom, event-driven user interfaces for measurement and control
Extensive signal processing, analysis, and math functionality
Advanced compiler to ensure high-performance execution and code optimization

SignalExpress for Windows



Quickly configure projects without programming
Control over 400 PC-based and stand-alone instruments
Log data from more than 250 data acquisition devices
Perform basic signal processing, analysis, and file I/O
Scale your application with automatic LabVIEW code generation
Create custom reports or easily export data to LabVIEW, DIAdem or Microsoft Excel

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Support and Services

System Assurance Programs

NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at ni.com/advisor to find a system assurance program to meet your needs.

Calibration

NI measurement hardware is calibrated to ensure measurement accuracy and verify that the device meets its published specifications. To ensure the ongoing accuracy of your measurement hardware, NI offers basic or detailed recalibration service that provides ongoing ISO 9001 audit compliance and confidence in your measurements. To learn more about NI calibration services or to locate a qualified service center near you, contact your local sales office or visit ni.com/calibration.

Technical Support

Get answers to your technical questions using the following National Instruments resources.

Support - Visit ni.com/support to access the NI KnowledgeBase, example programs, and tutorials or to contact our applications engineers who are located in NI sales offices around the world and speak the local language.
Discussion Forums - Visit forums.ni.com for a diverse set of discussion boards on topics you care about.
Online Community - Visit community.ni.com to find, contribute, or collaborate on customer-contributed technical content with users like you.

Repair

While you may never need your hardware repaired, NI understands that unexpected events may lead to necessary repairs. NI offers repair services performed by highly trained technicians who quickly return your device with the guarantee that it will perform to factory specifications. For more information, visit ni.com/repair.

Training and Certifications

The NI training and certification program delivers the fastest, most certain route to increased proficiency and productivity using NI software and hardware. Training builds the skills to more efficiently develop robust, maintainable applications, while certification validates your knowledge and ability.

Classroom training in cities worldwide - the most comprehensive hands-on training taught by engineers.
On-site training at your facility - an excellent option to train multiple employees at the same time.
Online instructor-led training - lower-cost, remote training if classroom or on-site courses are not possible.
Course kits - lowest-cost, self-paced training that you can use as reference guides.
Training memberships and training credits - to buy now and schedule training later.

Visit ni.com/training for more information.

Extended Warranty

NI offers options for extending the standard product warranty to meet the life-cycle requirements of your project. In addition, because NI understands that your requirements may change, the extended warranty is flexible in length and easily renewed. For more information, visit ni.com/warranty.

OEM

NI offers design-in consulting and product integration assistance if you need NI products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Alliance

Our Professional Services Team is comprised of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 700 independent consultants and integrators. Services range from start-up assistance to turnkey system integration. Visit ni.com/alliance.

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Detailed Specifications

For complete specifications, see the NI ELVIS II series user manual at ni.com/manuals.

Performance is typical at 25 °C unless otherwise specified.

Analog Input	
Channels	8 differential or 16 single-ended
ADC resolution	16 bits
Input frequency	50/60 Hz
Absolute accuracy	Refer to NI ELVIS II
Maximum sampling rate	1.25 MS/s single channel; 1.00 MS/s multichannel (aggregate)
Input range	±10, ±5, ±2, ±1, ±0.5, ±0.2, and ±0.1 V
Maximum working voltage for analog inputs (signal + common mode)	±11 V of AIGND
Input impedance	
Device on – AI+ or AI- to AIGND	>10 GΩ || 100 pF
Device off – AI+ or AI- to AIGND	820Ω
Small signal bandwidth (-3 dB)	1.2 MHz

Analog Triggers	
Number of triggers	1
Source	AI<0..15>, and available on NI ELVIS II only, ScopeCH0, ScopeCH1
Functions	Start trigger, reference trigger, pause trigger, sample clock, convert clock, sample clock timebase
Source level	±Full scale
Resolution	10 bits
Modes	Analog edge triggering, analog edge triggering with hysteresis, and analog window triggering
Arbitrary Waveform Generator/Analog Output	
Channels	2
DAC resolution	12 bits
Maximum update rate	
1 channel	2.8 MS/s
2 channel	2.0 MS/s
Timing resolution	50 ns
Output range	±10 V, ±5 V
Slew rate	20 V/µs
Digital I/O and PFI	
Channels	24 DIO,15 PFI
Direction control	Each line individually programmable as input or output
Pull-down resistor	50 kΩtyp, 20 kΩmin
General-Purpose Counter/Timers	
Counter/timers	2
Resolution	32 bits

Counter measurements	Edge counting, pulse, semiperiod, period, two-edge separation
Position measurements	X1, X2, X4 quadrature encoding with Channel Z reloading; two-pulse encoding
Output applications	Pulse, pulse train with dynamic updates, frequency division, equivalent time sampling
External base clock frequency	0 to 20 MHz
Base clock accuracy	50 ppm
Maximum frequency	1 MHz
Inputs	Gate, source, HW_Arm, Aux, A, B, Z, Up_Down
Frequency Generator	
Channels	1
Base clock	10 MHz, 100 kHz
Divisors	1 to 16
Maximum frequency	1 MHz
Base clock accuracy	50 ppm
External Digital Triggers	
Source	TRIG BNC or any PFI
Polarity	Software-selectable for most signals
Analog input function	Start trigger, reference trigger, pause trigger, sample clock, convert clock, sample clock timebase
Analog output function	Start trigger, pause trigger, sample clock, sample clock timebase
Counter/timer function	Gate, source, HW_Arm, Aux, A, B, Z, Up_Down
Digital Multimeter (DMM)	
Isolated functions	DC voltage, AC voltage, DC current, AC current, resistance, diode
Isolation level	60 VDC/20 Vrms, Installation Category I
Resolution	5 1/2 digits
Input Impedance	11 MΩ
Nonisolated functions	Capacitance, inductance
Voltage Measurement	
DC ranges	100 mV, 1 V, 10 V, 60 V
AC ranges	200 mVrms, 2 Vrms, 20 Vrms
Accuracy	Refer to NI ELVIS II
Current Measurement	
DC range	2 A
AC range	500 mA_{rms}, 2 A_{rms}
Shunt Resistor	0.1 Ω
Burden voltage	<0.6 V
Accuracy	Refer to NI ELVIS II
Input resolution	F 3.15 A 250 V, fast-acting user-replaceable fuse
Resistance Measurement	
Ranges	100Ω, 1 kΩ, 10 kΩ, 100 kΩ, 1 MΩ, 100 MΩ

Accuracy	Refer to NI ELVIS II
Diode Measurement	
Range	10 V
Nominal test current	100 µA (10 V range)
Capacitance Measurement	
Range	50 pF to 500 µF
Accuracy	1%
Inductance Measurement	
Range	50 pF to 500 µF
Accuracy	1%
Function Generator	
Channels	1
Output waveform type	Sine, square, triangle
Frequency range	0.186 Hz to 5 MHz (sine); 0.186 Hz to 1 MHz (square and triangle)
Frequency resolution	0.186 Hz
Waveform amplitude range	10 V_{pp}
Waveform amplitude resolution	10 bits
Waveform amplitude accuracy	1% ±15 mV
Waveform offset range	±5 V
Duty cycle range	0 to 100%
Output impedance	50
Maximum output current	100 mA
Modulation	
Inputs	2 (AM and FM)
Modulation input range	±10 V
Amplitude modulation factor	10%/V
Frequency modulation factor	20%/V
Oscilloscope (NI ELVIS II)	
Channels	2
Input coupling	AC and DC
Input impedance	1 MΩ || 25 pF
Bandwidth (-3 dB)	1.7 MHz
AC coupling cutoff frequency (-3 dB)	10 MHz
Resolution	10 bits
Maximum sampling rate	1.25 MS/s (single channel); 500 kS/s (two channels)
DC accuracy	Refer to NI ELVIS II
Oscilloscope (NI ELVIS II+)	
Channels	2

Input coupling	AC and DC
Input impedance	1 MΩ || 21 pF
Bandwidth (-3 dB)	35 MHz (40 mVpp range); 50 MHz (all other ranges)
Optional noise filter	20 MHz
AC coupling cutoff frequency (-3 dB)	12 Hz
Resolution	8 bits
Maximum sampling rate	100 MS/s (two channels)
Timebase accuracy	50 ppm
Waveform memory	16384 samples per channel
DC accuracy	Refer to NI ELVIS II
Dynamic Signal Analyzer	
Frequency resolution	Software-controllable (200, 400, 800, 1600, 3200 lines)
Accuracy	Refer to NI ELVIS II
Bode Analyzer	
Frequency resolution	1 Hz to 200 kHz (ELVIS II); 1 Hz to 5 MHz (ELVIS II+)
Accuracy	Refer to NI ELVIS II
Two-Wire Current-Voltage Analyzer	
Current range	±40 mA
Voltage sweep range	±10 V
Three-Wire Current-Voltage Analyzer	
Supported devices	NPN and PNP transistors
Minimum base current increment	0.48 µA
Maximum collector current	±40 mA
Maximum collector voltage	±10 V
Impedance Analyzer	
Measurement frequency range	1 Hz to 35 kHz
Power Supplies	
+15 V Supply	
Output voltage (no load)	+15 V ±5%
Maximum output current	500 mA
Short circuit protection	Resettable circuit breaker
-15 V Supply	
Output voltage (no load)	-15 V ±5%
Maximum output current	500 mA
Short circuit protection	Resettable circuit breaker
+5 V Supply	
Output voltage (no load)	+5 V ±5%
Maximum output current	2 A
Short circuit protection	Resettable circuit breaker

Positive Variable Supply	
Output voltage	0 to +12 V
Voltage setpoint resolution	10 bits
Voltage accuracy (no load)	100 mV
Maximum output current	500 mA
Short circuit protection	Self-resetting current limiter
Calibration	
Recommended warm-up time	15 minutes
Calibration interval	1 year
Communication	
Bus interface	Hi-Speed USB
Physical	
Dimensions	34.3 by 28.0 by 7.6 cm; (14.5 by 11 by 3 in.)
Weight (with prototyping board)	1.9 kg (4.2 lb)
Environmental	
Operating temperature	10 to 35 °C
Storage temperature	65 °C
Humidity	10 to 90% relative humidity, noncondensing
Maximum altitude	2000 m
Pollution degree (indoor use only0	2

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