Integrated Suite of 12 Instruments for Interactive, Cost-Effective, Multidisciplinary, Hands-On Learning

**NI ELVIS II NEW!**

- Design and prototyping platform for circuit design, control, instrumentation, telecommunications, and embedded/MCU experiments
- Complete integration with Multisim for circuits and electronics
- Hi-Speed USB plug-and-play interface
- Virtual instrumentation suite includes oscilloscope, digital multimeter (DMM), function generator, variable power supply, Bode analyzer, arbitrary waveform generator, dynamic signal analyzer (DSA), voltage/current analyzer with LabVIEW source code
- Completely open and customizable in LabVIEW graphical system design environment
- Express VIs for point-and-click configuration of customized instruments in LabVIEW and LabVIEW SignalExpress

**Workstation Features**

- New, sleek design with an open connector architecture for third-party boards
- Isolated DMM for better signal integrity
- Short-circuit and high-voltage protection with resettable fuse board
- Variable power supplies – manual or programmatic control
- Function generator – manual or programmatic control
- ±15 and ±5 V supply available

**Overview**

NI ELVIS, an educational design and prototyping platform based on NI LabVIEW graphical system design software, is a leading tool for teaching concepts in areas such as instrumentation, circuits, control, communication, and embedded design in a hands-on, interactive manner. It features a new design and an integrated suite of the 12 most commonly used instruments in a compact, rugged, laboratory-friendly form factor. NI ELVIS II includes a Hi-Speed USB interface that delivers a complete design and prototyping platform you can use from lower-division freshman classes to advanced senior classes to help students learn concepts from circuit design to telecommunications.

<table>
<thead>
<tr>
<th>Features</th>
<th>NI ELVIS I</th>
<th>NI ELVIS II</th>
</tr>
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<tbody>
<tr>
<td>12 integrated instruments</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>PCI/PCMCIA</td>
<td>✓</td>
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<tr>
<td>Integrated USB</td>
<td>–</td>
<td>✓</td>
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<td>Isolated digital multimeter</td>
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<td>✓</td>
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<tr>
<td>NI-DAGmx software</td>
<td>–</td>
<td>✓</td>
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<td>True Multisim integration</td>
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<td>✓</td>
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Table 1. NI ELVIS I versus NI ELVIS II

NI ELVIS II is a primary component of the NI electronics education platform along with NI Multisim, a leading tool for SPICE simulation and schematic capture in academia, and the NI LabVIEW graphical system design platform. Students can simulate theoretical concepts in Multisim, prototype the actual circuit with NI ELVIS II, and compare the simulation with real-world measurements using LabVIEW and LabVIEW SignalExpress. With NI ELVIS II and Multisim 10.1, learning circuits becomes more interactive using features such as 3D NI ELVIS II as well as the ability to access NI ELVIS II instruments inside the Multisim environment and switch from simulated data to real-world data with a single mouse click. For more information on the NI electronics education platform, visit [ni.com/eep](http://ni.com/eep).

![NI ELVIS Education Platform](image)

Figure 1. The NI ELVIS Education Platform
LabVIEW Accessibility
NI ELVIS II is completely customizable in LabVIEW and includes Express VIs for each of the 12 instruments in its virtual instrumentation suite. This provides point-and-click configuration capabilities for the individual instruments, which makes building customizable instruments very easy. You also can use NI ELVIS II with LabVIEW SignalExpress to help students compare simulated data from Multisim and real-world data from NI ELVIS and create interactive reports for class assignments.

Embedded/MCU design with Freescale Microcontroller Student Learning Kit (SLK) featuring the following application modules:
- 8-bit HCS08
- 16-bit HCS12/HCS12X/DSP
- 32-bit ColdFire processor
- RF transceiver

Open Architecture with Plug-In Boards for Multidisciplinary Education
NI ELVIS II is an open architecture, which helps leading teaching solution providers take advantage of the platform. Plug-in boards for NI ELVIS II are available from the following companies:
- Control design with Quanser trainers
  - Quanser QNET DC motor
  - Quanser QNET inverted pendulum
  - Quanser QNET HVAC system
- Embedded/MCU design with Freescale Microcontroller SLK
- Telecommunications with Emona DATEx telecommunications trainer for NI ELVIS
- Other Companion Products
  - Circuits – Electronics education platform with Multisim
  - Embedded/DSP – Analog Devices ADSP-BF537 Blackfin Processor
  - Sensors – Vernier sensor adapters for NI ELVIS

Ordering Information
Bundles
NI ELVIS II Circuit Design Bundle ........................................780379-01
Includes NI ELVIS II, Multisim, LabVIEW, LabVIEW SignalExpress, and user manuals.
NI ELVIS II Basic Bundle ...................................................... 780378-01
Includes NI ELVIS II workstation, NI ELVIS II prototyping board, NI LabVIEW (required), and user manuals.
NI ELVIS II instrumentation design and training platform....780380-01
NI ELVIS II prototyping board ................................................188432-01

BUY NOW!
For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to ni.com/EEP.
Specifications
Performance is typical at 25 °C unless otherwise specified.

**Analog Input**
- Channels: 8 differential or 16 single-ended
- ADC resolution: 16 bits
- Absolute accuracy: Refer to NI ELVIS II Specifications at ni.com/manuals
- Maximum sampling rate: 1.25 MS/s single channel, 1.00 MS/s multichannel (aggregate)
- Input range: ±10 V, ±5 V, ±2 V, ±1 V, ±0.5 V, ±0.2 V, ±0.1 V
- Maximum working voltage for analog inputs (signal + common mode): ±11 V of AIGND
- CMRR (DC to 60 Hz): 90 dB
- Input impedance
  - Device on – AI+ or AI- to AIGND: >10 GΩ II 100 pF
  - Device off – AI+ or AI- to AIGND: 820 Ω
- Input bias current: ±100 pA
- Crosstalk @100 kHz
  - (adjacent channel): -70 dB
  - (nonadjacent channel): -80 dB
- Small signal bandwidth (-3 dB): 1.2 MHz
- Input FIFO size: 4095 samples
- Scan list memory: 4095 entries
- Data transfers: USB signal stream, programmed I/O
- Overvoltage protection (AI±, AISENSE)
  - Device on: ±25 V for up to four lines
  - Device off: ±15 V for up to four lines
- Input current during overvoltage condition: ±20 mA max per line

**Analog Triggers**
- Number of triggers: 1
- Source: Al<0..15>, 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: 16 bits
- Maximum update rate
  - 1 channel: 2.8 MS/s
  - 2 channels: 2.0 MS/s
- Timing resolution: 50 ns
- Output range: ±10 V, ±5 V
- Data transfer: USB signal stream, programmed I/O
- AO waveform modes: Nonperiodic waveform, periodic waveform regeneration from onboard FIFO, periodic waveform regeneration from host buffer including dynamic update
- Slew rate: 20 V/μs

**Digital I/O and PFI**
- Channels: 24 DIO (Port 0), 15 PFI (ports 1 and 2)
- Direction control: Each line individually programmable as input or output
- Pull-down resistor: 50 kΩ typ, 20 kΩ min
- Input voltage protection: ±20 V on up to two pins

**PFI/Port 1/Port 2 Functionality**
- Functionality: Static digital input, static digital output, timing input, timing output
- Debounce filter settings
- Overvoltage protection (AI±, AISENSE)

**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
- Internal base clocks: 80, 20, 0.1 MHz
- 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 clocks: 10 MHz, 100 kHz
- Divisors: 1 to 16
- Maximum frequency: 1 MHz
- Base clock accuracy: 50 ppm
- Default output line: PFI 14/FREQ_OUT

**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
- Input coupling: DC (DC voltage, DC current, resistance, diode), AC (AC voltage, AC current)

### Nonisolated Functions
- Capacitance, inductance

## Voltage Measurement
### DC Ranges
- 100 mV, 1 V, 10 V, 60 V
- Accuracy: Refer to NI ELVIS II Specifications at ni.com/manuals
- Input frequency range (AC mode): 40 Hz to 20 kHz

### AC Ranges
- 200 mVrms, 2 Vrms, 20 Vrms
- Accuracy: Refer to NI ELVIS II Specifications at ni.com/manuals

## Current Measurement
### DC Range
- 2 A
- Accuracy: Refer to NI ELVIS II Specifications at ni.com/manuals
- Input frequency range (AC mode): 40 Hz to 5 kHz
- Input protection: Fast 3.15 A 250 V, fast-acting user-replaceable fuse

### AC Ranges
- 500 mA rms, 2 A rms
- Accuracy: Refer to NI ELVIS II Specifications at ni.com/manuals

## Resistance Measurement
### Ranges
- 100 Ω, 1 kΩ, 10 kΩ, 100 kΩ, 1 MΩ, 100 MΩ
- Accuracy: Refer to NI ELVIS II Specifications at ni.com/manuals

## Diode Measurement
### Range
- 1 V

## Capacitance Measurement
### Range
- 50 pF to 500 uF

### Accuracy
- 1%

## Inductance Measurement
### Range
- 100 µH to 100 mH

### 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 Vp

### 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

### SIN + DISTORTION
- -40 dB max 
- 3 MHz-3 dB to 5 MHz

### Modulation
- 2 (AM and FM)
- ±10 V
- 10%/V
- 20%/V

## Oscilloscope
### Channels
- 2

### Input Coupling
- AC or DC

### Input Impedance
- 1 MΩ || 25 pF

### Bandwidth (-3 dB)
- 1.7 MHz

### DC Accuracy
- Refer to NI ELVIS II Specifications at ni.com/manuals

## Dynamic Signal Analyzer
### Accuracy
- Refer to NI ELVIS II Specifications at ni.com/manuals

### Frequency Resolution
- Software-controllable

### Bode Analyzer
### Accuracy
- Refer to NI ELVIS II Specifications at ni.com/manuals

### Phase Accuracy
- 1 Hz to 200 kHz

## Two-Wire Current-Voltage Analyzer
### Current Range
- ±40 mA

### Voltage Sweep Range
- ±10 V

## Integrated Suite of 12 Instruments for Interactive, Cost-Effective, Multidisciplinary, Hands-On Learning
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

Negative 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
- USB signal stream: 4 streams; can be used for analog input, analog output, and counter/timers

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 only): 2

Safety and Compliance

Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:
- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

Note: For UL and other safety certifications, refer to the product label or visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:
- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

Note: For EMC compliance, operate this device according to product documentation.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:
- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Note: Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Waste Electrical and Electronic Equipment (WEEE)

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