

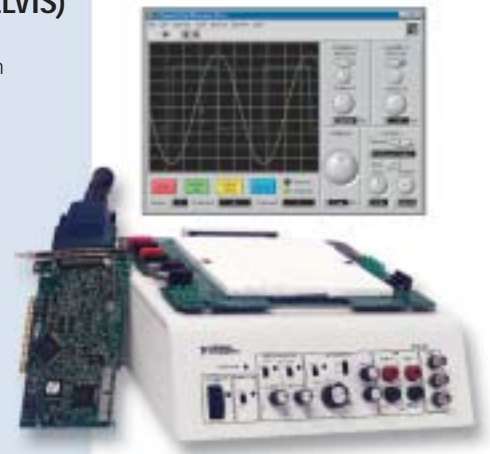
# Integrated Tools for University Laboratories

## NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS)

- Offers integrated, multi-instrument functionality
- Combines instrumentation, data acquisition and prototyping station
- Virtual Instrument Suite
  - Oscilloscope, DMM, Function Generator, Variable Power Supply, Bode Analyzer, Arbitrary Waveform Generator, DSA, Voltage/Current Analyzer
  - LabVIEW source code provided
  - Completely open and customizable in the LabVIEW environment
  - Data storage in Excel or HTML

### Workstation

- Short-circuit and High-voltage protection
- Variable power supplies
  - Manual or programmatic control
- Function generator
  - Manual or programmatic control
- $\pm 15$  V and +5 V supply available
- BNC inputs for DMM and scope
- Detachable, customizable prototyping board
  - Affordable for student ownership
  - Designed for 2 or 3-ring binder transport



## Overview

The National Instruments Educational Laboratory Virtual Instrumentation Suite (NI ELVIS) is a LabVIEW-based design and prototyping environment for university science and engineering laboratories. NI ELVIS consists of LabVIEW-based virtual instruments, a multifunction data acquisition device and a custom-designed benchtop workstation and prototyping board. This combination provides a ready-to-use suite of instruments found in all educational laboratories. Because it is based on LabVIEW and provides complete data acquisition and prototyping capabilities, the system is ideal for academic coursework from lower-division classes to advanced project-based curriculum.

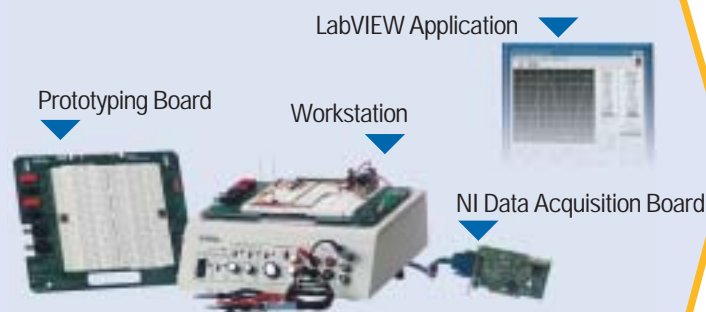
## Applications:

- Circuit design and analysis for learning analog and digital electronics
- Measurements in mechanical, electrical, biomedical, and physics laboratories
- Teaching data acquisition and signal conditioning
- Live demonstration of concepts in a lecture hall
- Communications and control applications for Electrical and Mechanical Engineering
- Hands-on LabVIEW training

## NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS)

### LabVIEW VIs

- Oscilloscope
- DMM
- Function Generator
- Arbitrary Waveform Generator
- Bode Analyzer
- Dynamic Signal Analyzer
- Power Supply



## Curriculum Applications

Instrumentation  
Circuit Design  
Signal Processing  
Communication  
Controls  
Mechatronics

# Integrated Tools for University Laboratories

## Ordering Information

NI ELVIS workstation, protoboard,  
LabVIEW drivers .....778606-03  
NI ELVIS 6070E Bundle – includes workstation,  
protoboard PCI-6070E DAQ board,  
2M shielded cable, LabVIEW drivers .....778748-01

NI ELVIS prototyping board .....188429-01

## Virtual Instruments

### Analyzers

#### Oscilloscope

Two channels  
Data storage, cursors, auto scaling  
Max input bandwidth..... 50 kHz\*  
Max sampling rate ..... 500 kHz / channel\*  
Range ..... ±10 V  
Input resolution..... 12 or 16 bits

#### Bode Analyzer

Frequency and phase plots  
Frequency range and step control  
Logarithmic or linear frequency spacing  
Data storage, cursors, auto scaling  
Frequency range ..... 5 Hz – 35 kHz\*

#### Dynamic Signal Analyzer

Input range..... ±10 V  
Input resolution ..... 12 or 16 bits

#### Impedance Analyzer

Measurement frequency range ..... 5 Hz to 35 kHz

#### Two Wire Current Voltage Analyzer

Voltage range ..... ±10 V  
Current range ..... ±10 mA

#### Three Wire Current Voltage Analyzer

NPN BJT transistor only  
Data storage, cursors, auto scaling  
Maximum Collector Voltage..... 10 V  
Minimum base increment..... 15 µA

### Digital Multimeter

#### Resistance

Accuracy..... 1%  
Range ..... 5 Ω to 3 MΩ

#### DC Voltage

Accuracy ..... 0.3%  
Range ..... ±20 V  
Input impedance..... 1MΩ

#### AC Voltage

Accuracy ..... 0.3%  
Range ..... ±14 V<sub>rms</sub>

#### Current

DC accuracy ..... 0.25% ±3 mA\*\*  
AC accuracy ..... 0.25% ±3 mA\*\*  
Range ..... ±250 mA  
Shunt resistance ..... 0.5 Ω  
Maximum common mode voltage ..... ±20 V  
Common mode rejection ..... 70 dB

#### Capacitance

Accuracy ..... 2%  
Range ..... 50 pF to 500 µF  
Test voltage range ..... 1V p-p

#### Continuity

Resistance threshold ..... 15 Ω max

#### Inductance

Accuracy ..... 1%  
Range ..... 100 µH to 100 mH  
Test frequency ..... 950 Hz  
Test frequency voltage..... 1 V p-p

### Source

#### Function Generator

Manual or software control  
Sine, triangle, square waveforms  
Frequency sweep  
TTL sync pulse out  
AM, FM modulation  
Frequency range ..... 5 Hz to 250 kHz  
Frequency accuracy ..... 3%  
Output amplitude ..... ±2.5 V  
Software amplitude resolution..... 8 bits  
Offset range..... ±5 V  
AM voltage ..... 10 V max  
Amplitude modulation ..... Up to 100%  
FM Voltage..... 10 V max  
Amplitude flatness  
To 50 kHz..... 0.5 dB  
To 250 kHz..... 3 dB

#### Arbitrary Waveform Generator

Two channels  
One-shot or continuous generation  
Waveform editor  
Amplitude..... ±10 V  
Frequency range ..... DC – 100 kHz \*  
Output drive current ..... 25 mA max  
Output impedance: ..... 1  
Slew rate:..... 1.5V/µs

### Power Supplies

#### ±15 V Supply

Output current ..... Fused at 500 mA  
Ripple and noise ..... 1%  
Line regulation ..... 0.5% max

#### 5 V Supply

Output current ..... Fused at 2 A  
Ripple and noise ..... 1%  
Line regulation ..... 0.5% max

#### Variable power supplies

0 to +12 V and -12 V  
Ripple and noise ..... 0.25%  
Software resolution ..... 7 bits  
Current limiting..... 0.5 V at 130 mA, 5 V at 275 mA,  
12 V at 450 mA

#### Digital I/O

Digital input resolution..... 8 bits  
Digital output resolution ..... 8 bits  
Digital addressing ..... 4 bits

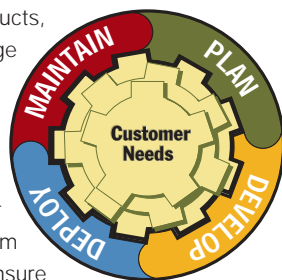
\* Specification depends on Data Acquisition device functionality.

\*\* Proper null correction at the common mode voltage can reduce ±3 mA error to 200 µA noise.

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