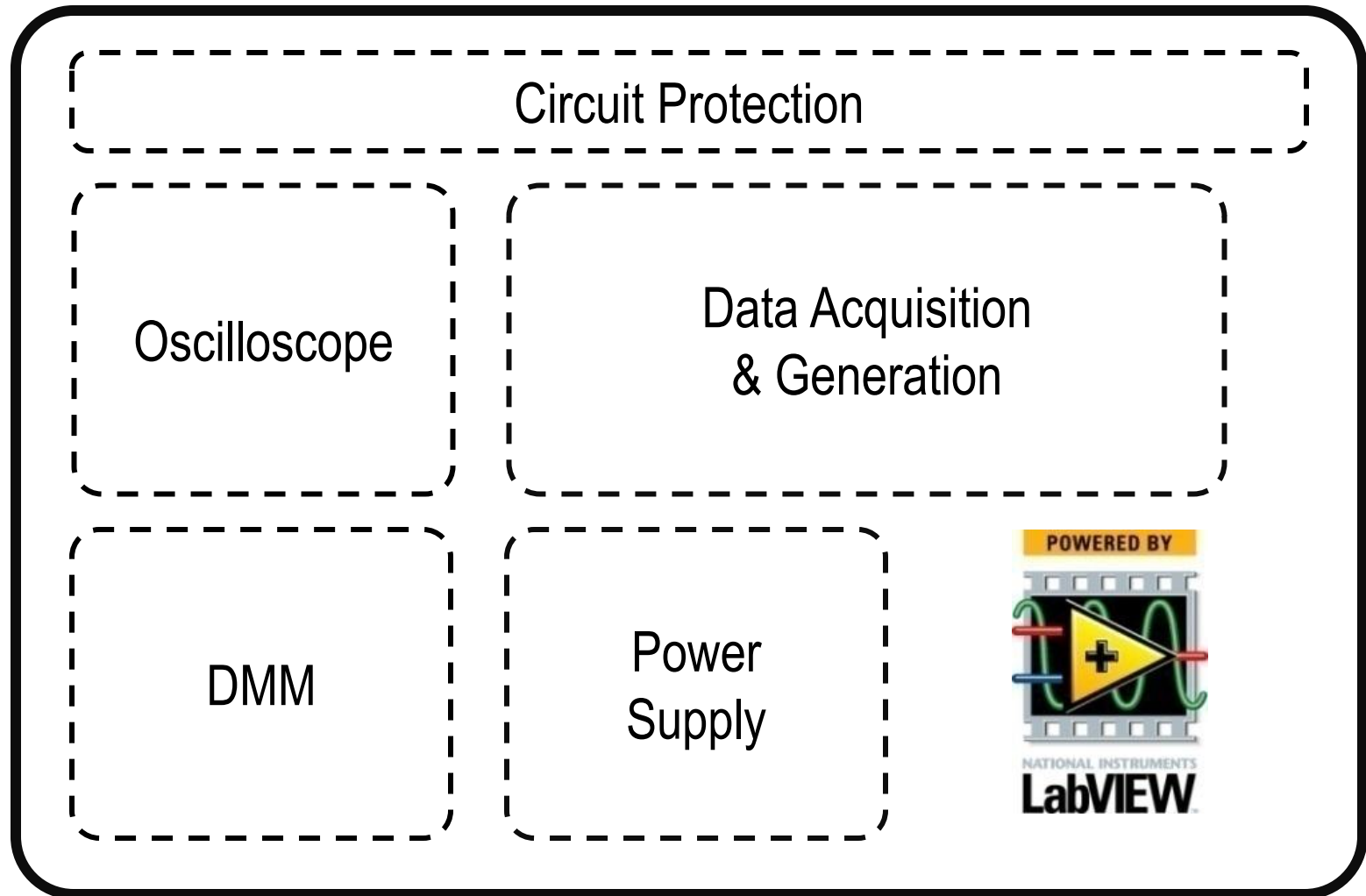




# HANDS-ON SESSION WITH NI ELVIS & MULTISIM

# What is NI ELVIS? | At the core...12 Instruments



# NI ELVIS Family



	NI ELVIS II	NI ELVIS II+
12 Instrument Suite	<input checked="" type="radio"/>	<input checked="" type="radio"/>
PCI/PCMCIA		
Multisim Integration	<input checked="" type="radio"/>	<input checked="" type="radio"/>
USB Plug-and-Play	<input checked="" type="radio"/>	<input checked="" type="radio"/>
DAQmx API /MAX Support	<input checked="" type="radio"/>	<input checked="" type="radio"/>
5½ Digit DMM (floating)	<input checked="" type="radio"/>	<input checked="" type="radio"/>
5M Hz Sine FGEN	<input checked="" type="radio"/>	<input checked="" type="radio"/>
100MS/s Oscilloscope	1.25MS/s	<input checked="" type="radio"/>

# NI ELVIS II | Hardware Specifications

## Oscilloscope

- 16-bit resolution
- 1.25 MS/s single channel, 500kS/s two channel aggregate
- 1 to 1.5 MHz Bandwidth
- 1x and 10x probe
- $\pm 10$  V input range
- AC/DC coupling

## Internal Circuit Protection

- Resettable fuses

## USB Connectivity

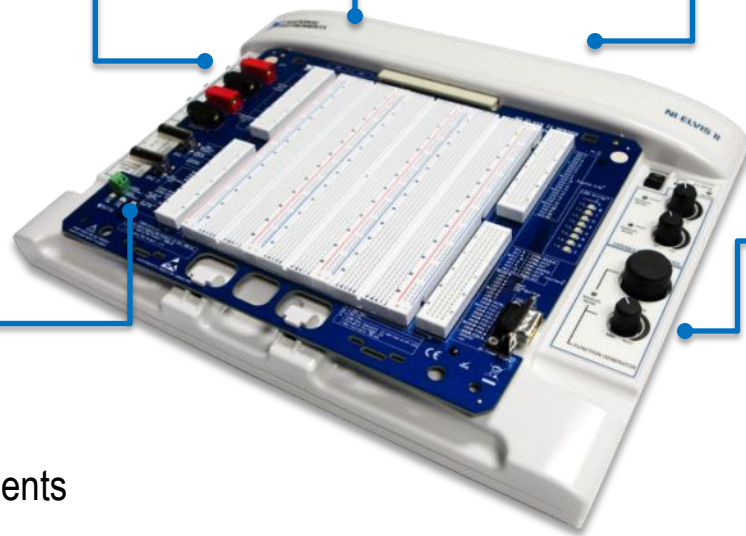
- Plug-and-play capability
- USB 2.0 Connection

## Function Generator

- 10 bit,  $\pm 5$ V range
- 0.2 Hz to 5 MHz Sine
- 0.2 Hz to 1 MHz Triangle/Square
- Software or manual control
- BNC or prototyping board connection

## Digital Multimeter

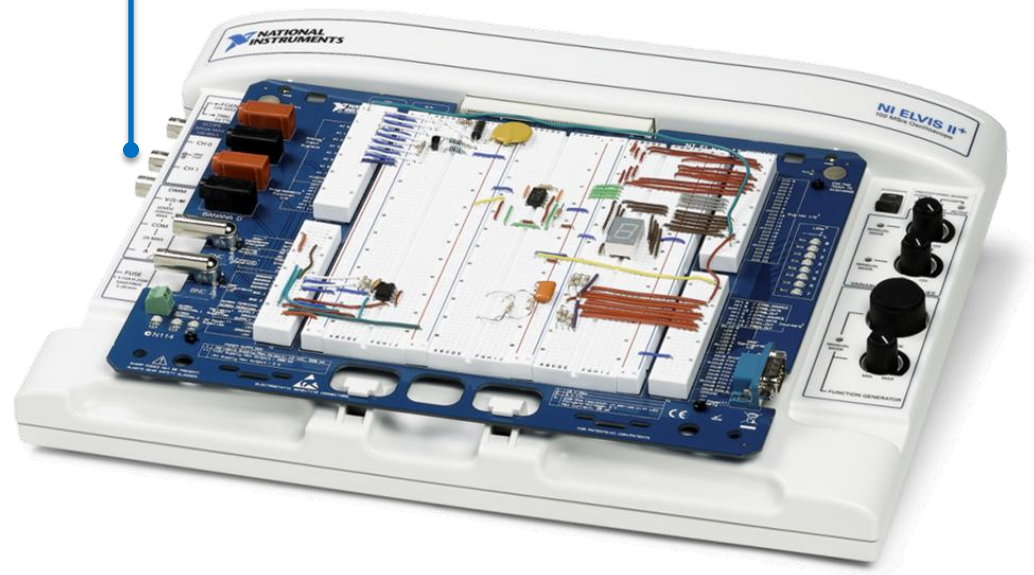
- Isolated measurements
- $5\frac{1}{2}$  digit resolution
- 60 VDC, 20Vrms, 2 ADC, 2 Arms, 100M $\Omega$



# NI ELVIS II+ Hardware | Oscilloscope

## NEW Oscilloscope

- 100MS/s Sampling Rate
- 50MHz Bandwidth(-3dB)
- 8-bit resolution
- 20 V max. input range
- AC/DC/GND coupling
- 20MHz Optional Noise Filter
- 1x and 10x probes
- BNC connection



# NI ELVIS II | Hardware Specifications

## Impedance Analyzer

- 0.2 Hz to 35 kHz Range
- NPN, PNP, Diode

## Other Analyzers:

- Bode Analyzer
- 2-wire Current Voltage Analyzer
- 3-Wire Current Voltage Analyzer

## Prototyping Board

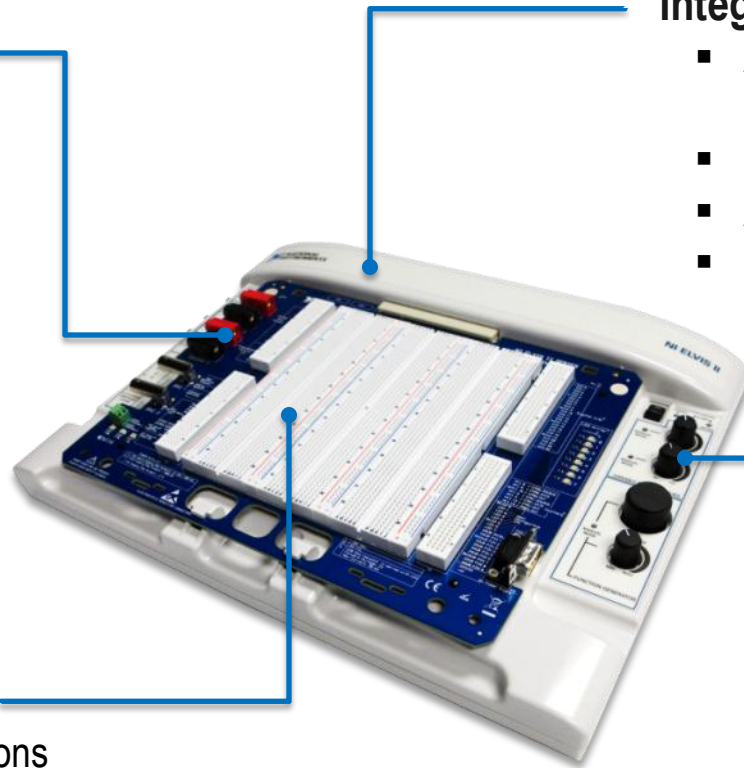
- Updated connections
- Detachable
- User-defined Banana Plugs, BNC, D-Sub connectors

## Integrated DAQ

- AI sampling rate 1.25 MS/s single channel, 500kS/s two channel
- 16-bit resolution
- AO 2.8 MS/s update rate
- 24 DIO lines, 15 PFI, 2 CTR

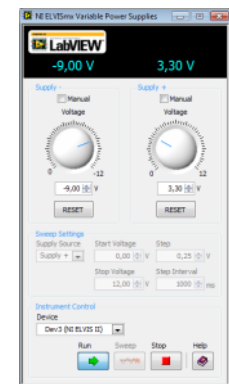
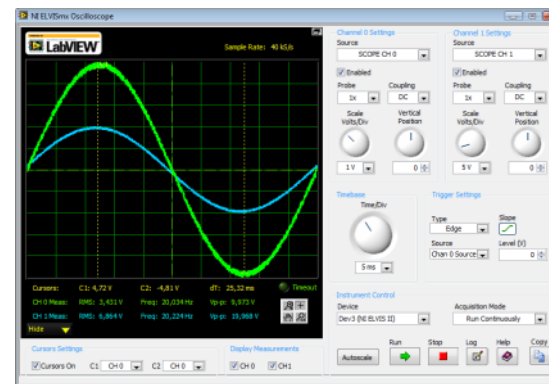
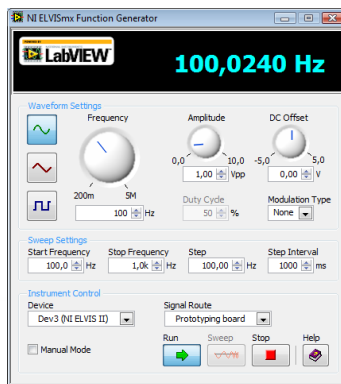
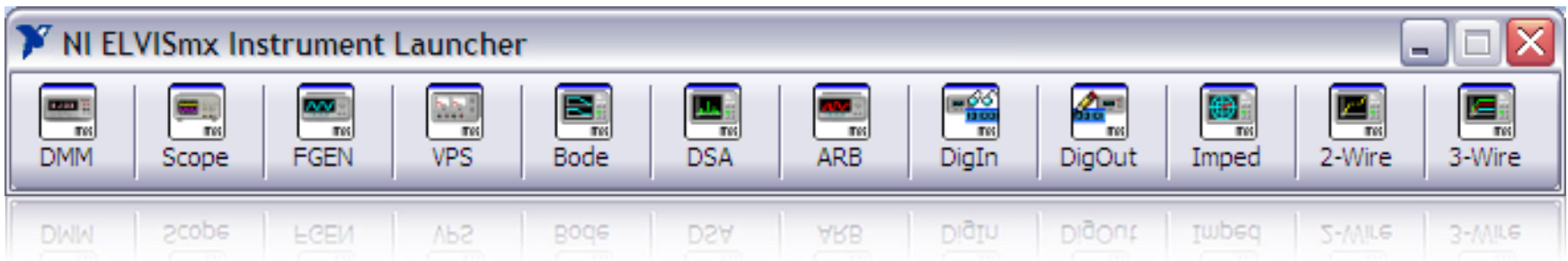
## Variable Power Supply

- 10-bit resolution
- 0 to +12V, 0 to -12V
- 500 mA current range



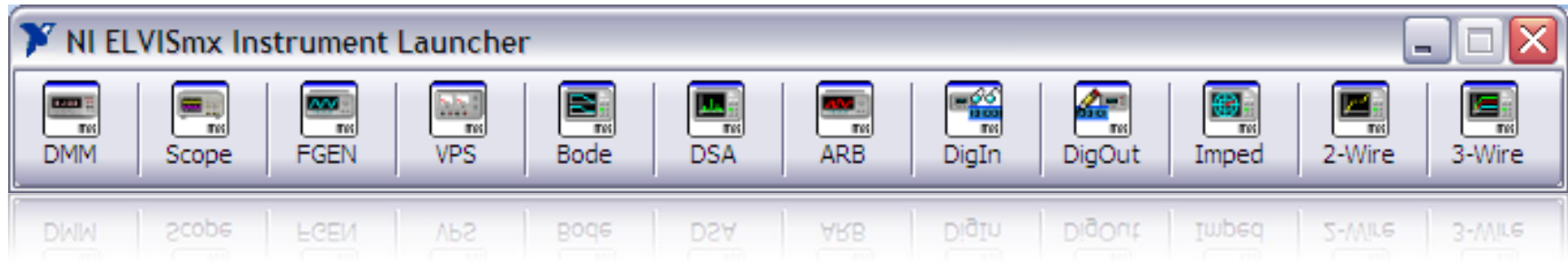
# NI ELVISmx Driver | Software Specifications

- Ready-to-use instruments – Soft Front Panels
- Customizable instruments





# NI ELVISmx Virtual Instruments



- Digital Multimeter
- Oscilloscope
- Function Generator
- Variable Power Supply
- Bode Analyzer
- Dynamic Signal Analyzer
- Arbitrary Waveform Generator
- Digital Reader
- Digital Writer
- Impedance Analyzer
- 2-wire Current-Voltage Analyzer
- 3-wire Current-Voltage Analyzer

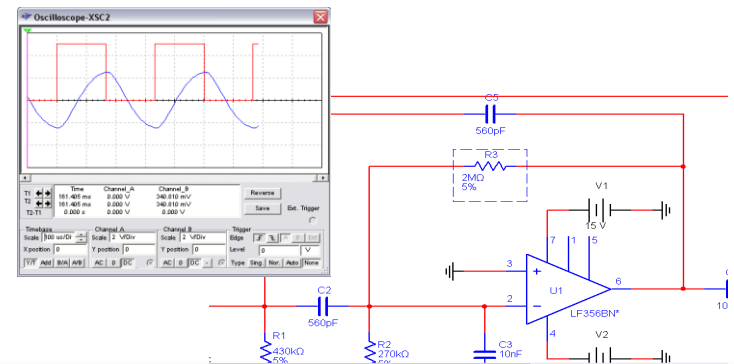
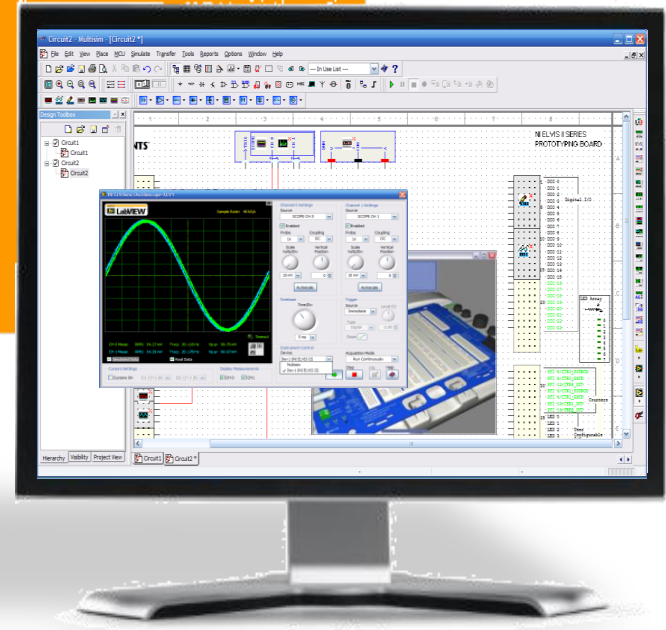


# NI Multisim

## NI Multisim

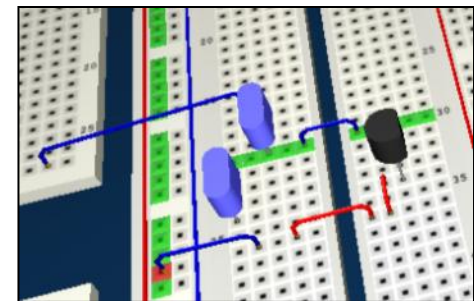
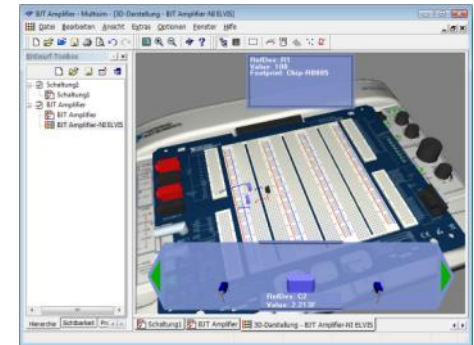
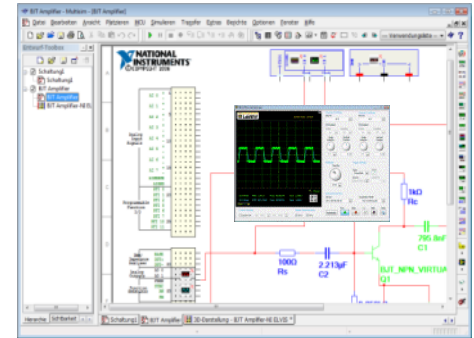
Teaching environment to foster student learning

- Engage students with interactive components and change-on-the-fly simulations
- Gain intuition through dynamic visualization using simulation-driven instruments
- Bridge gap between theory and real-world measurement



# Multisim Teaching Environment

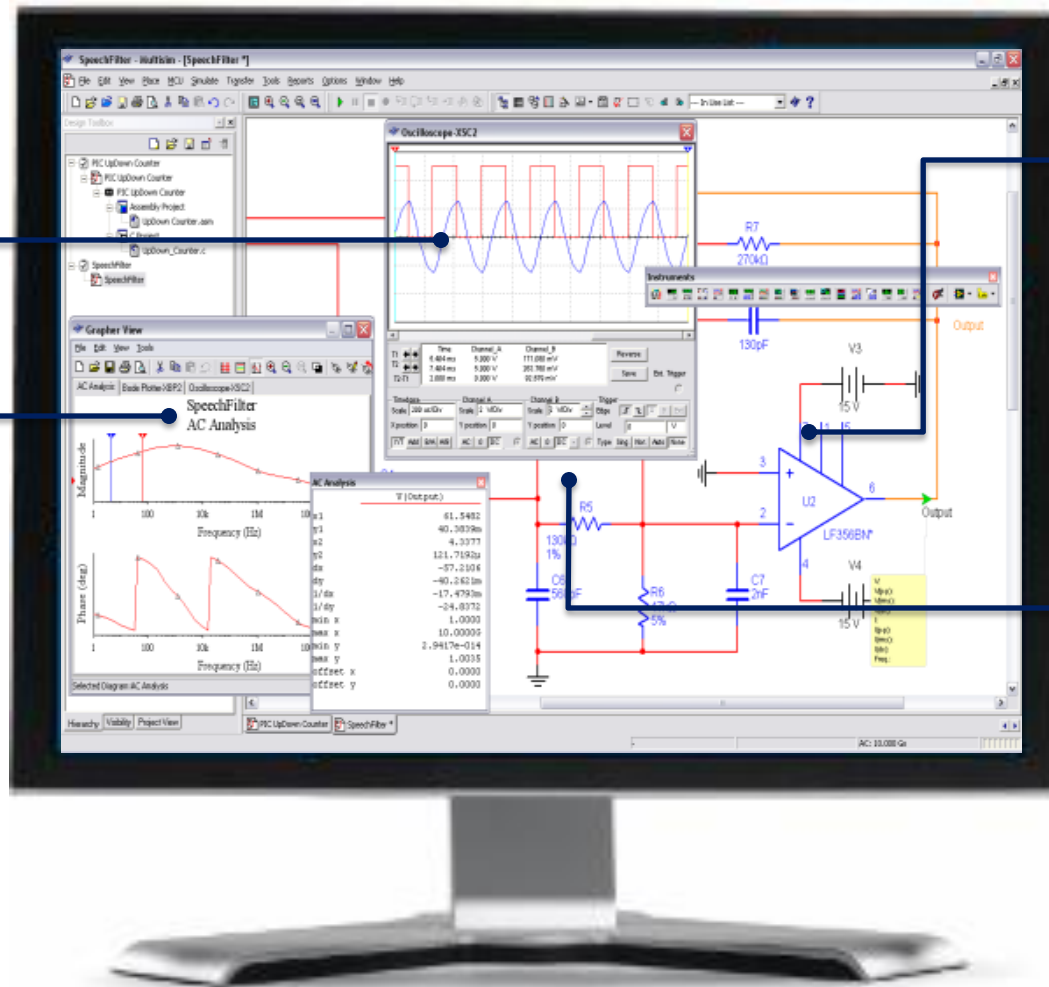
- NI Multisim
  - SPICE-based simulation
  - Analog, digital, mixed
  - Interactive parts
  - Virtual instruments
  - Circuit faults and restrictions
- Integration with NI ELVIS II/II+
  - 3D virtual breadboard
  - NI ELVIS instruments
  - Input/output of real-world signals



# Core NI Multisim Educational Features

**22 Virtual Instruments** behaving like real-world counterparts

**Advanced Analyses** to investigate circuit characteristics

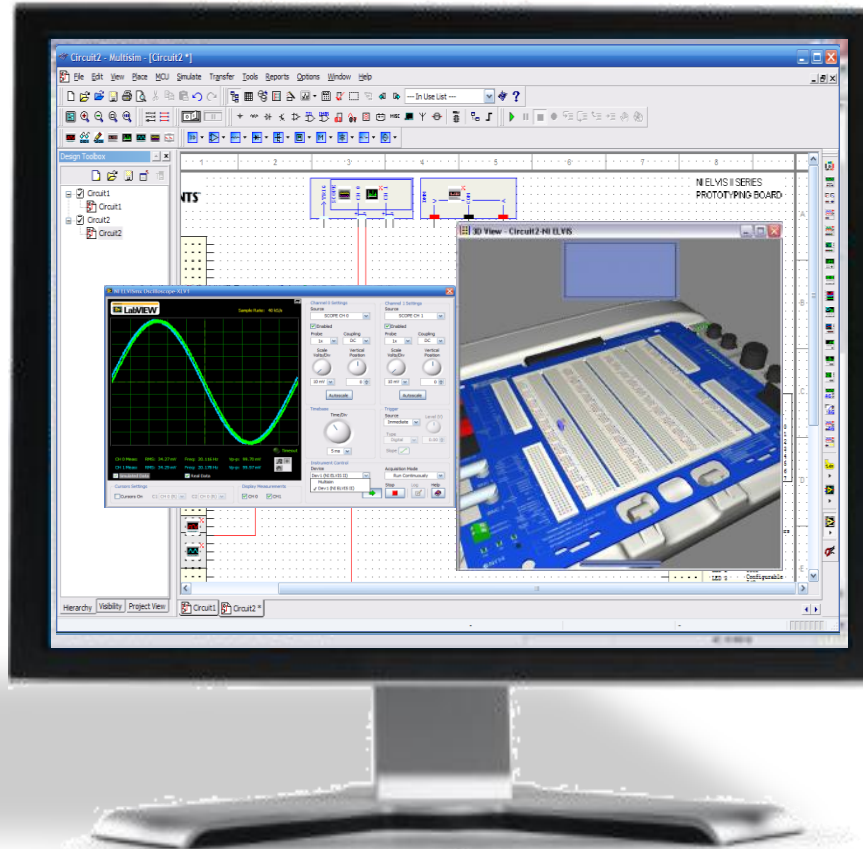


**15,000+ Components** to reinforce theory

**Teach troubleshooting** with circuit restrictions and hidden faults

# NI ELVIS Instruments Inside Multisim

NI ELVIS Instruments –  
Access them from the  
toolbar in addition to other  
Multisim instruments

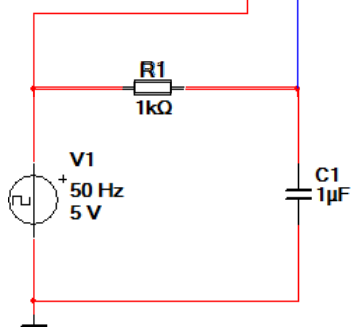
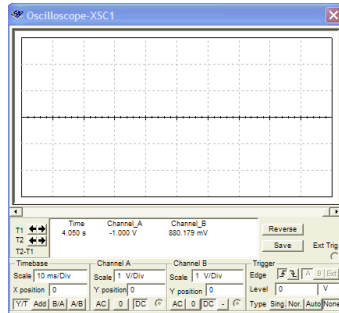


NI ELVIS Schematic –  
Click NI ELVIS II icons on  
the schematic to access  
NI ELVIS instruments

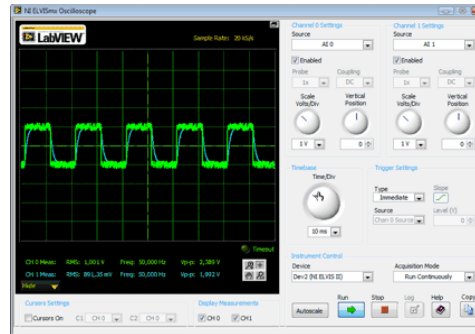


3D NI ELVIS – Updated  
3D model and  
components that allow  
students to prototype in a  
safe environment

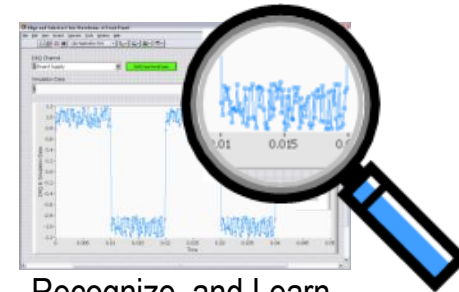
# Teaching Circuits



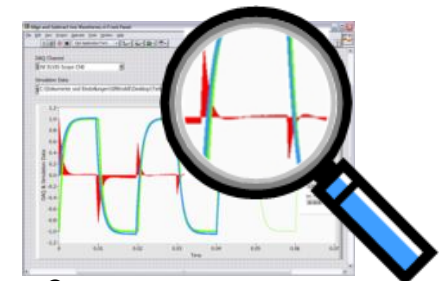
**Step 1:** Capture, Simulate and improve a design in NI Multisim



**Step 2:** Build circuit and measure Real-world signals with NI ELVIS



Recognize and Learn

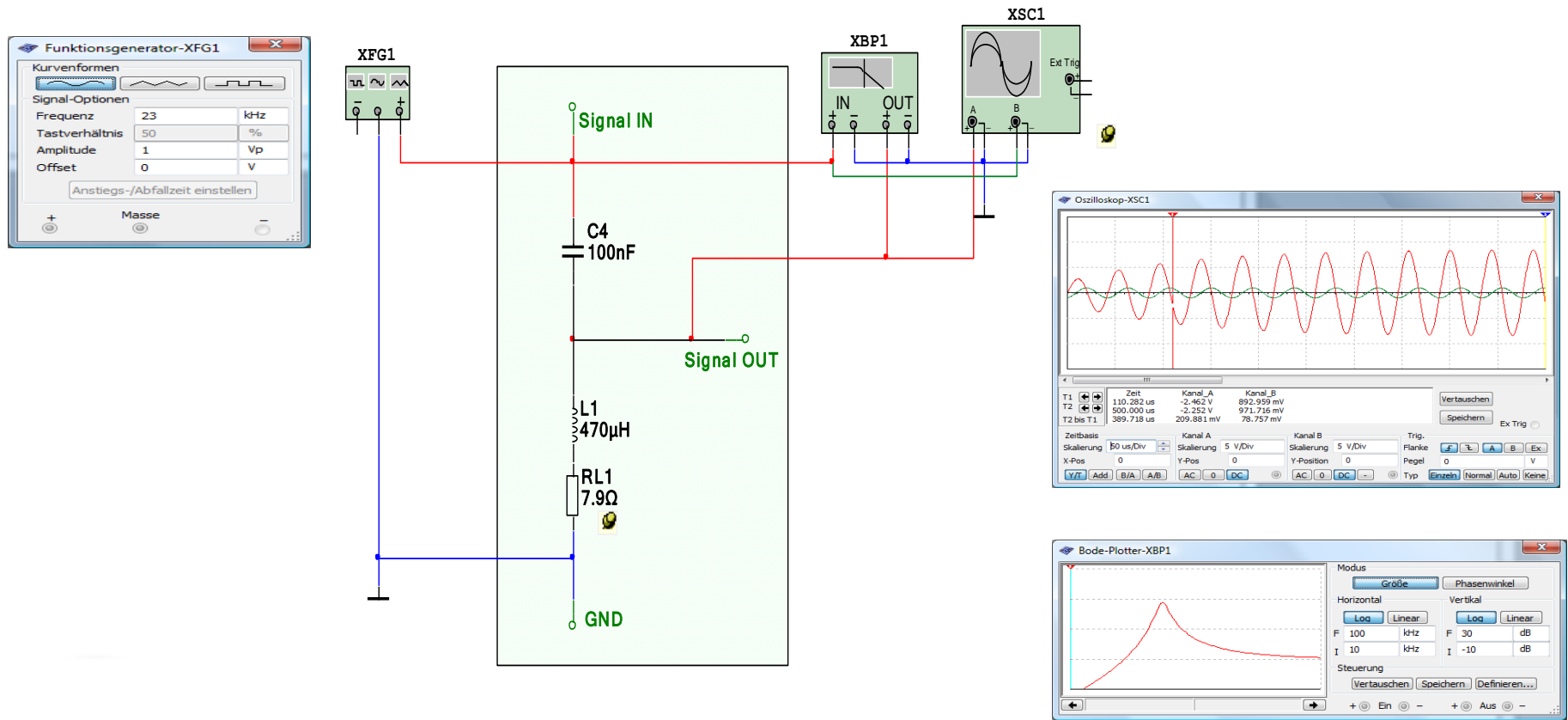


Compare

**Step 3:** Compare *Simulated* vs. *Real* Measurement Data

# Teaching Circuits | Series RLC

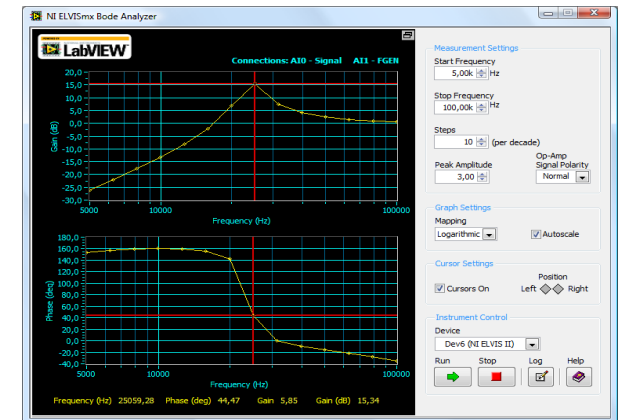
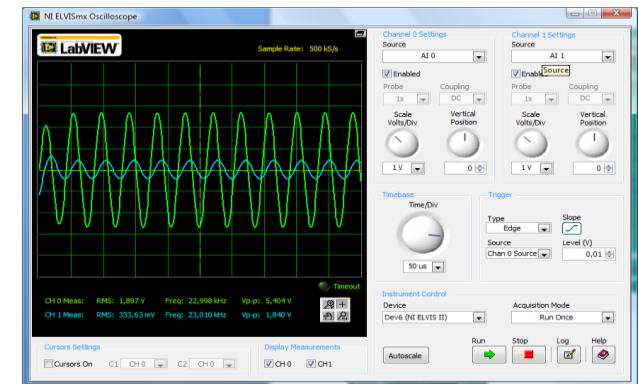
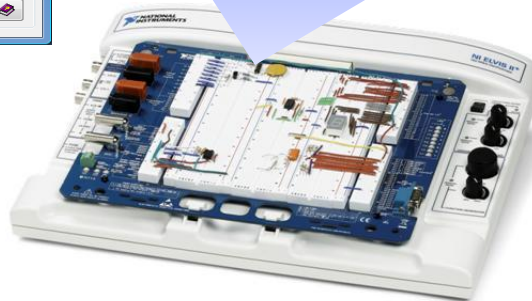
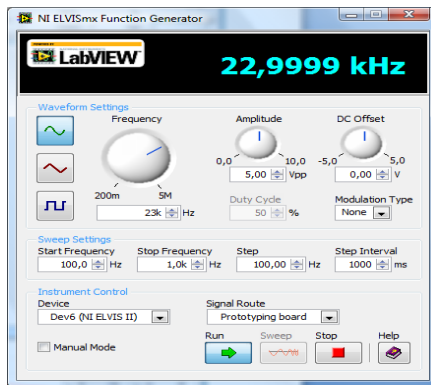
## Step 1: Capture, Simulate and understand a design in NI Multisim





# Teaching Circuits | Series RLC

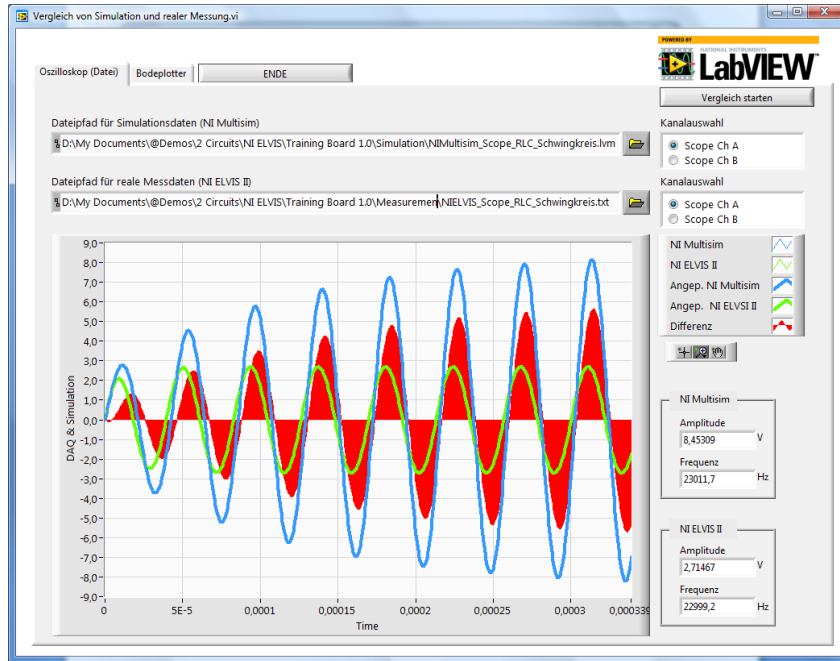
## Step 2: Build circuit and measure Real-world signals with NI ELVIS



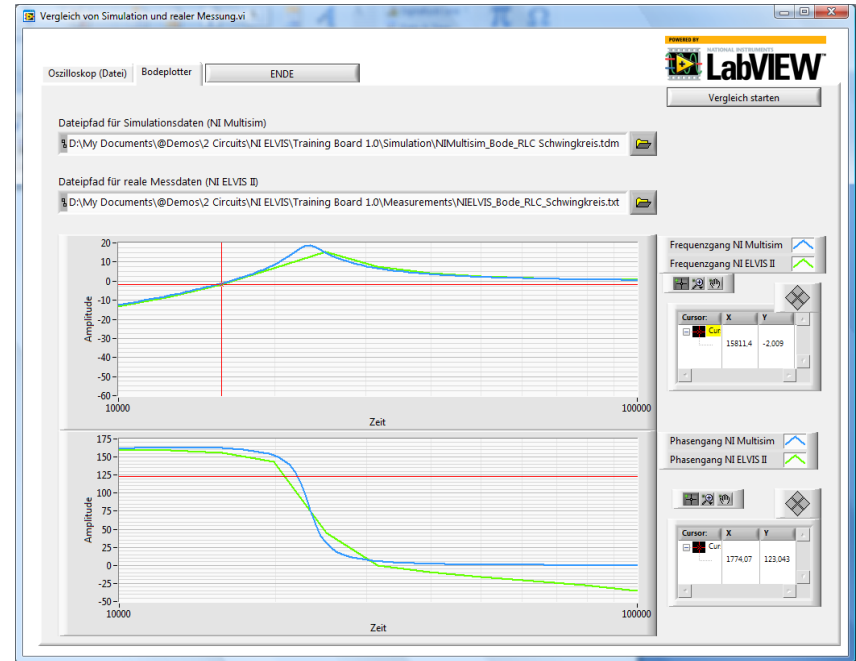


# Teaching Circuits | Series RLC

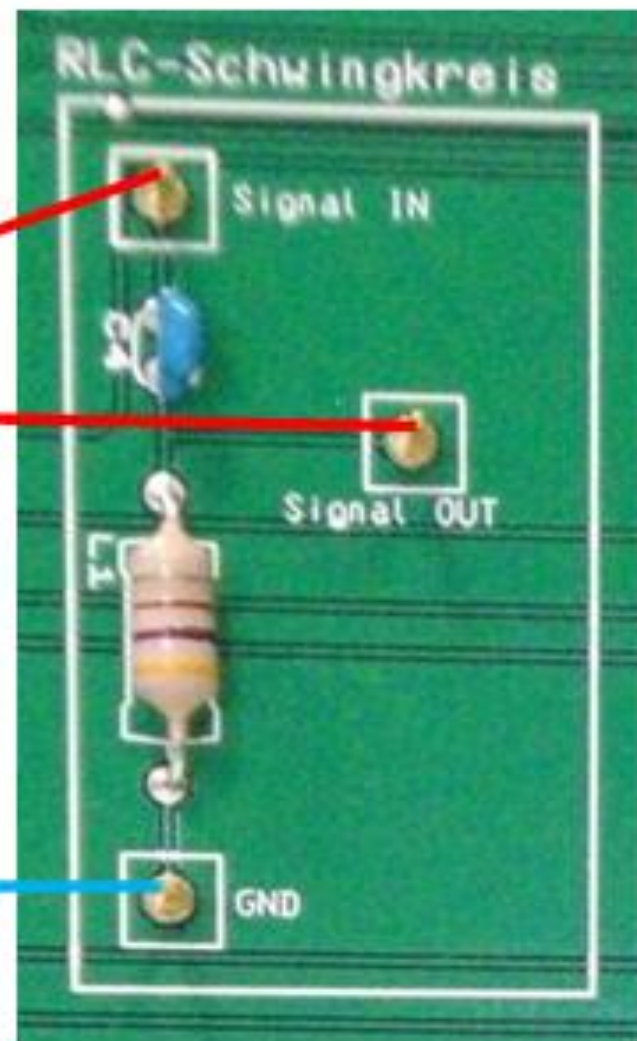
## Step 3. Compare *Simulated* vs. *Real* Measurement Data



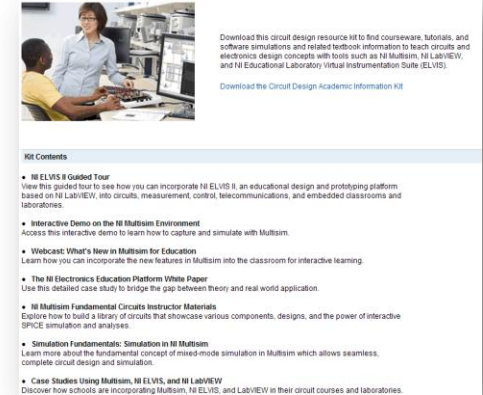
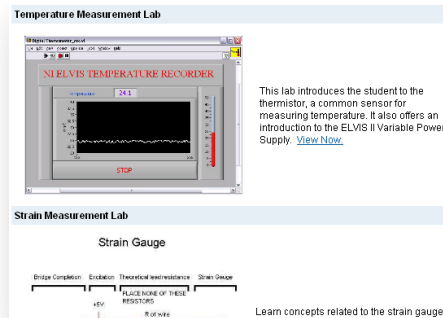
Compare Oscilloscope data



Compare Bodeplotter data



# Online Resources

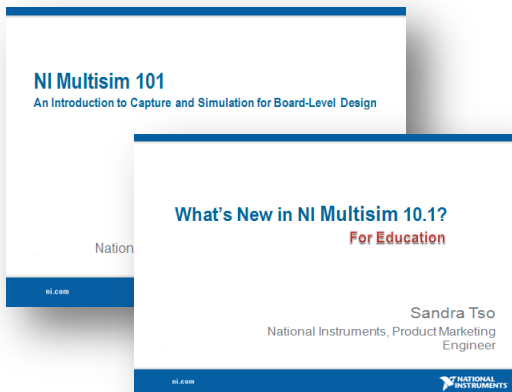


NI ELVIS II Guided Tour

Courseware

Download  
Resource Kits

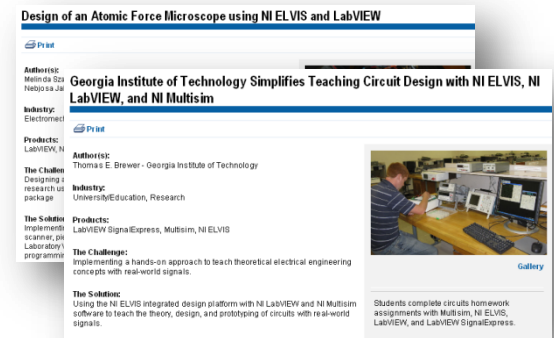
ni.com/nielvis



Webcast



Textbook  
Resources



Case Studies &  
White Papers