



JJJ-Automaatio Oy



Teuvo Kinnunen

NI Electronics Education Platform

Electronics Education Platform

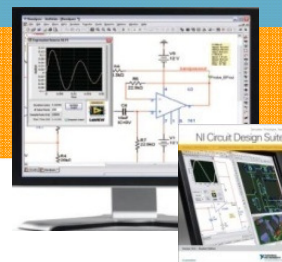
THEORY

Concepts & Textbooks



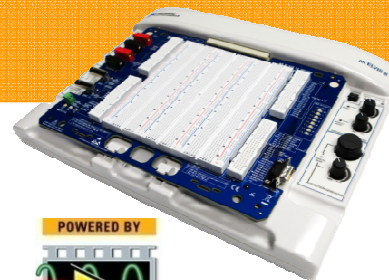
DESIGN

Circuit Capture & Simulation



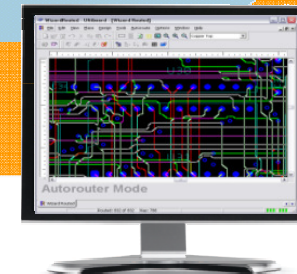
PROTOTYPE

Hands-on Circuit Design



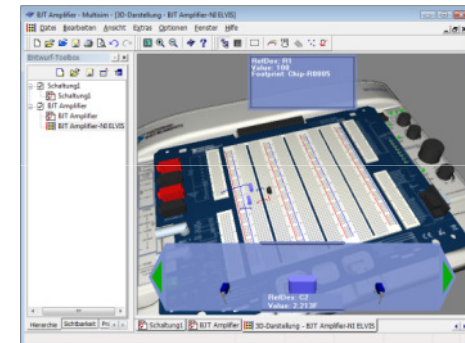
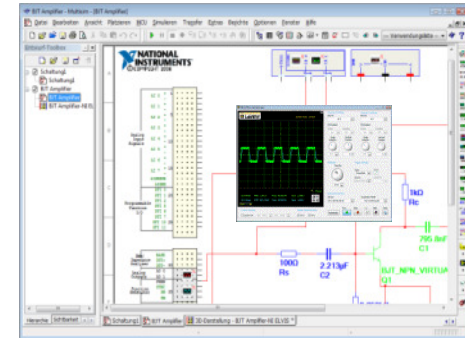
DEPLOY

PCB Routing and Layout



Multisim Teaching Environment

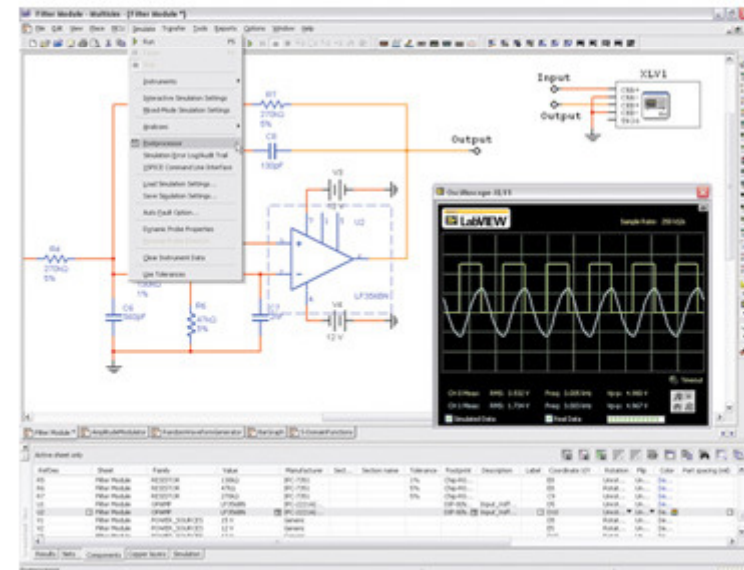
- NI Multisim
 - SPICE-based simulation
 - Analog, digital, mixed
 - Interactive parts
 - Virtual instruments
 - Circuit faults and restrictions
- Integration with NI ELVIS II/II+
 - 3D virtual breadboard
 - NI ELVIS instruments
 - Input/output of real-world signals



Multisim Environment for Professionals

- The premier circuit capture and simulation environment
- Optimize design behavior with 20 advanced analyses and 22 virtual instruments
- Comprehensive database of more than 17,500 devices and simulation models
- Advanced integration with real measurement data for custom design verification
- Advanced project management; includes project packing, version control, advanced spreadsheet view
- Integrated with NI Ultiboard layout for complete and streamlined prototyping

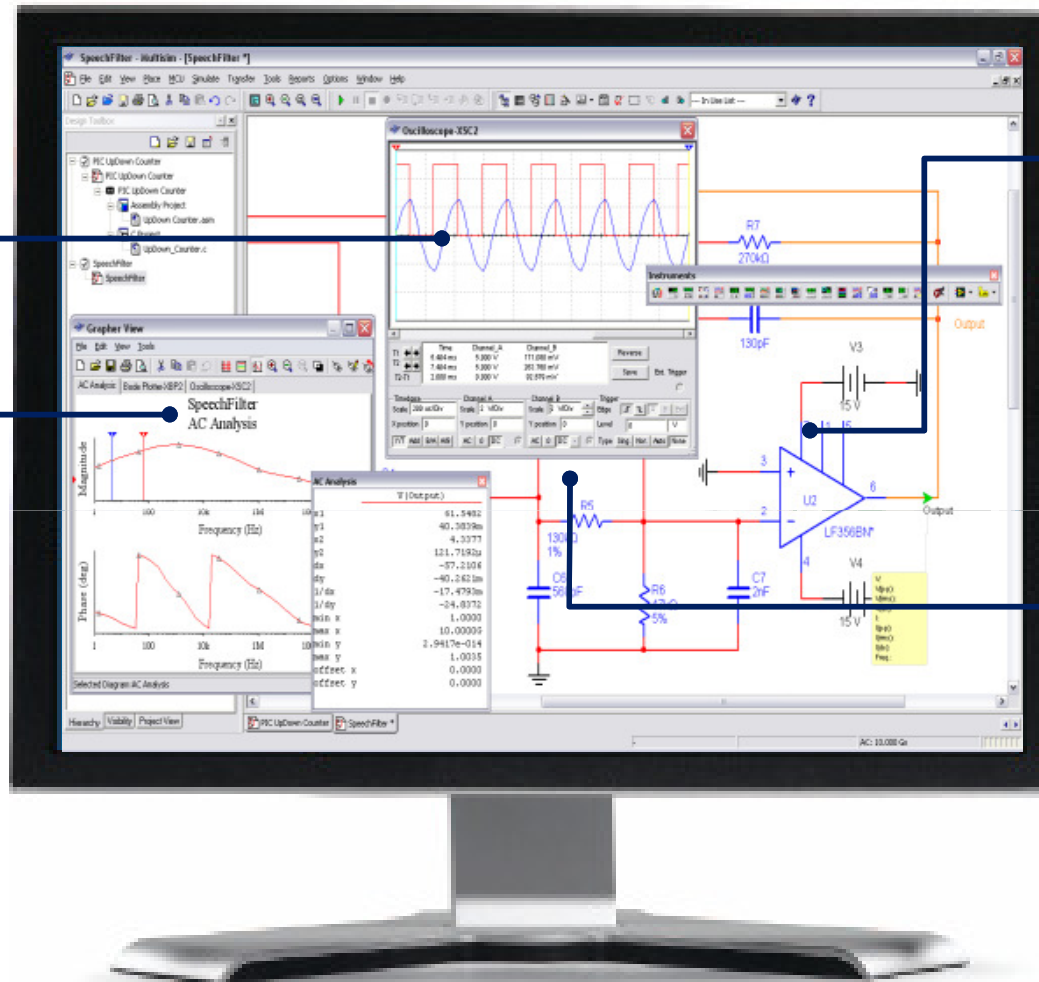
Three versions:
Base, Full and Power Pro



Core NI Multisim EDU/Base/Full/PowerPro Features

22 Virtual Instruments behaving like real-world counterparts

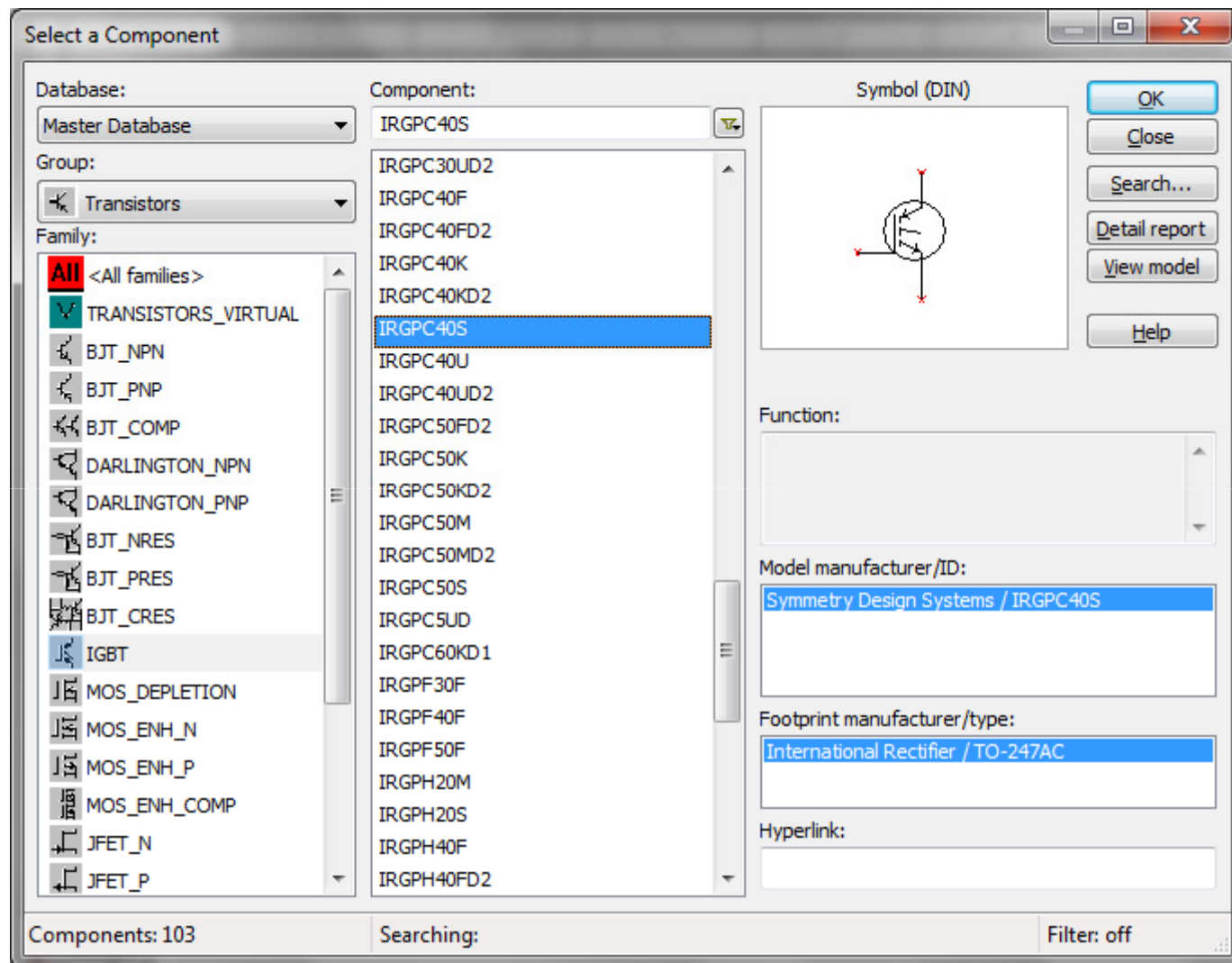
20 Advanced Analyses to investigate circuit characteristics



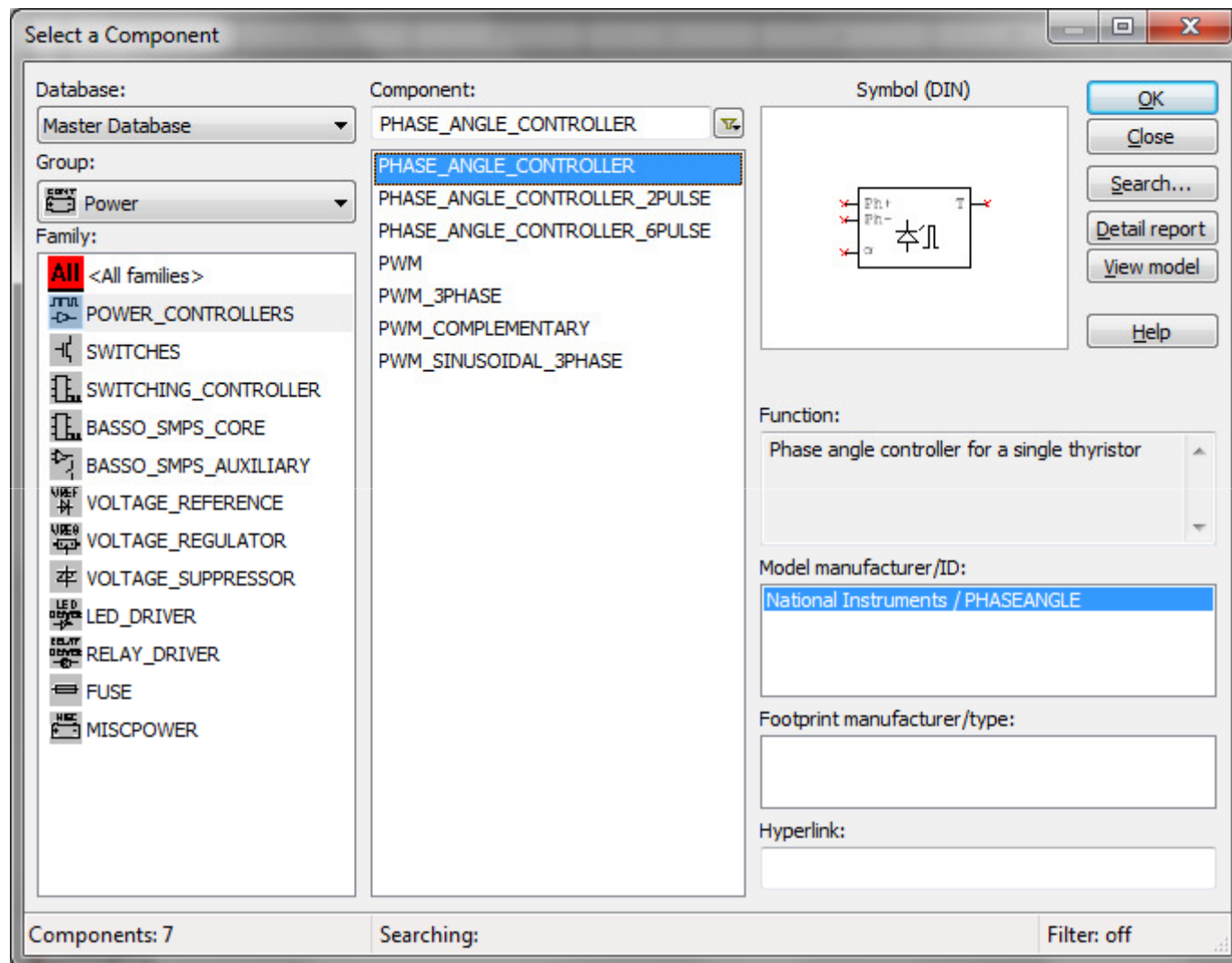
Up to 17500 Components to reinforce theory

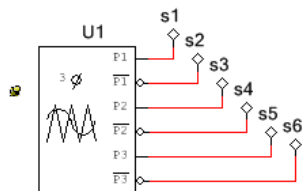
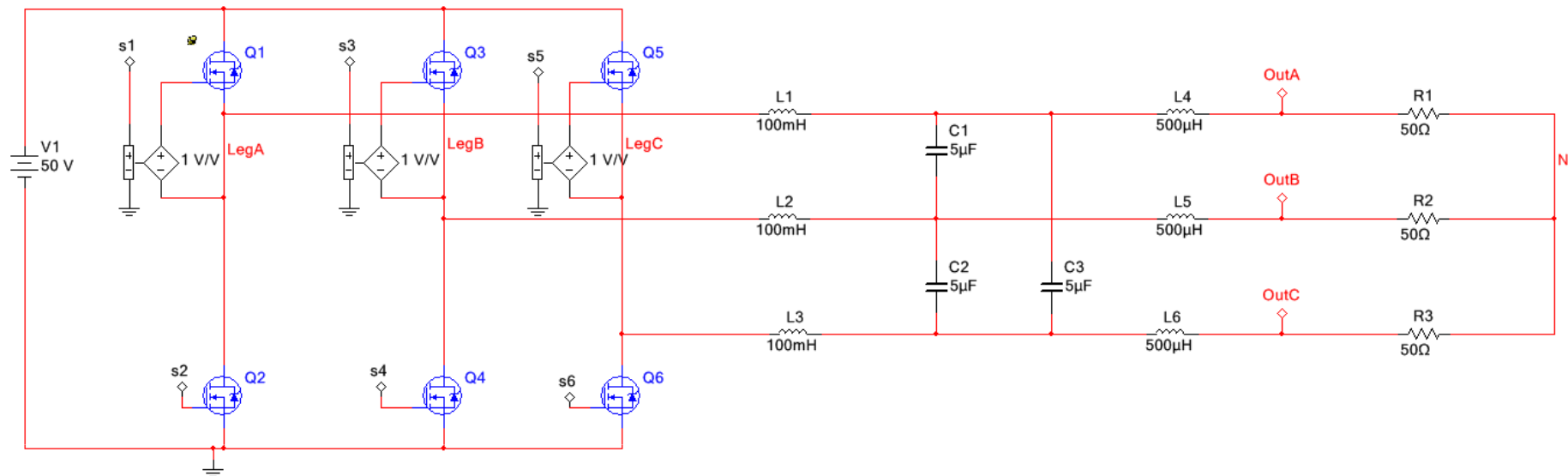
Teach troubleshooting (only in EDU) with circuit restrictions and hidden faults

More advanced components



Continue...





National Instruments
801-111 Peter Street
Toronto, ON M5V 2H1
(416) 977-5550



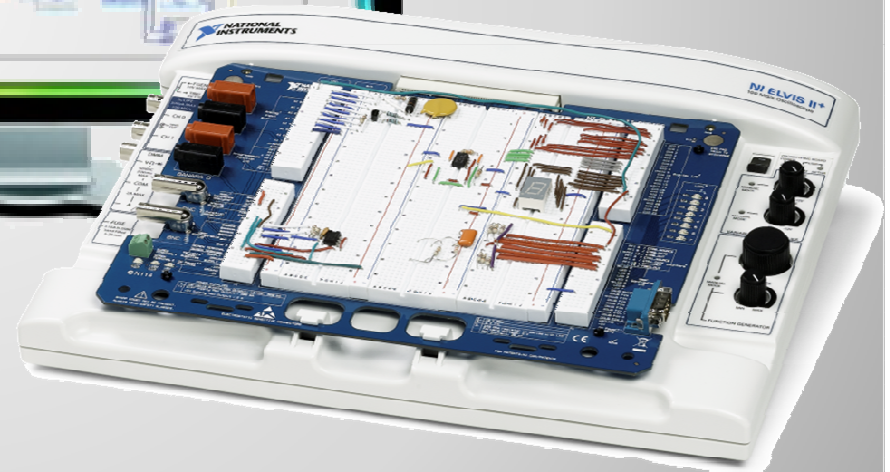
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Designed by:	Document No: 0001	Revision: 1.0
Checked by:	Date: 31.10.2012	Size: B
Approved by:	Sheet 1 of 1	

NI ELVIS | Circuits

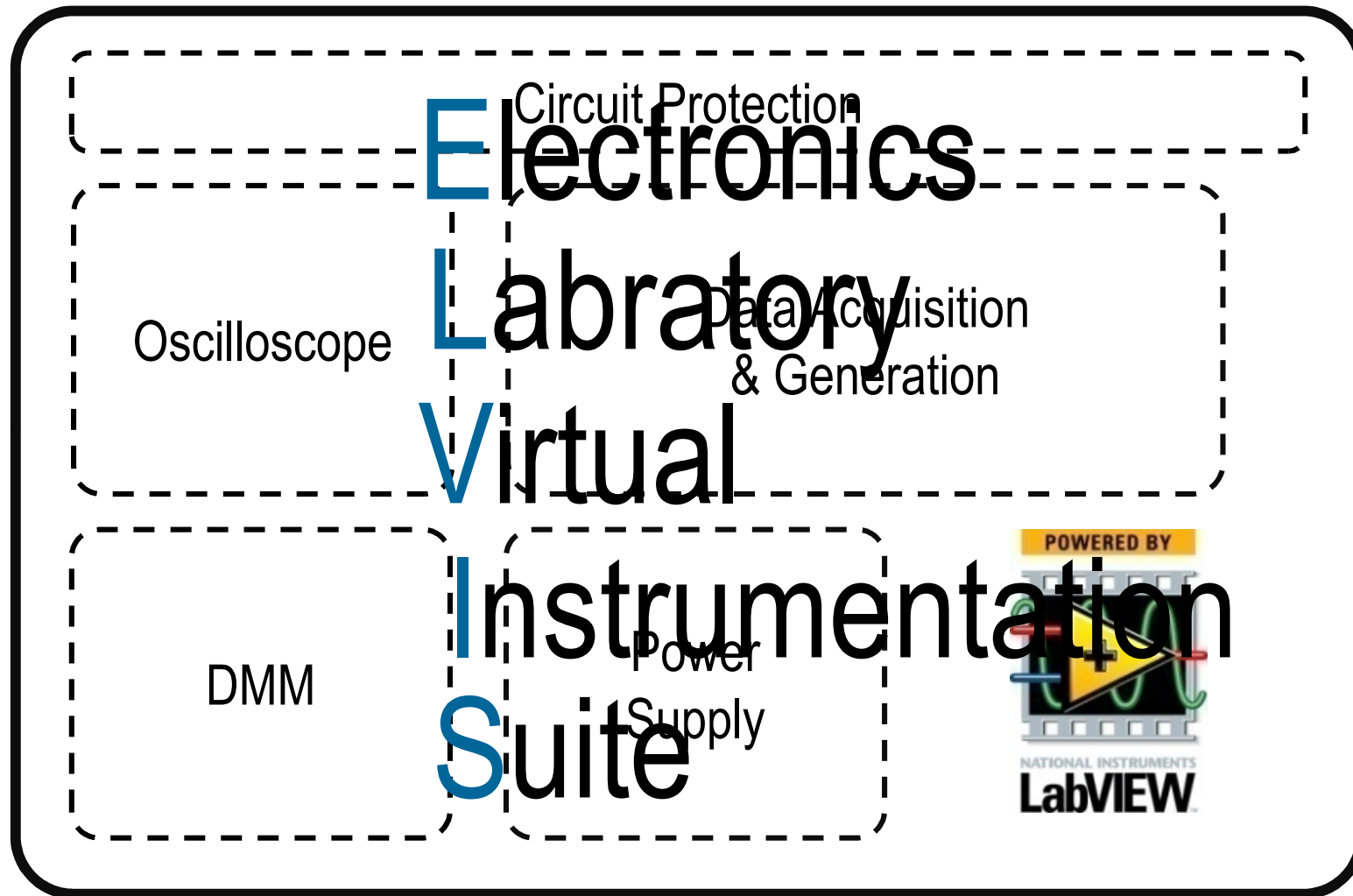


National Instruments
Electronics Education Platform

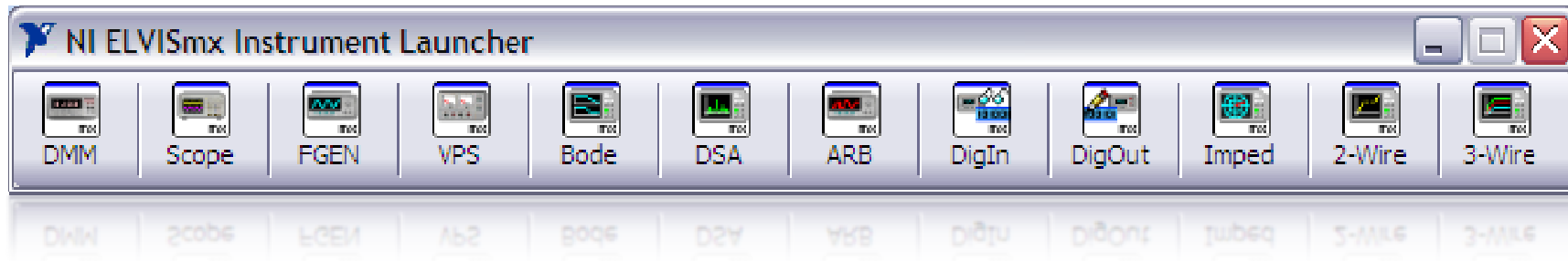
- NI Multisim
- NI ELVIS
- NI LabVIEW
- NI Ultiboard



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

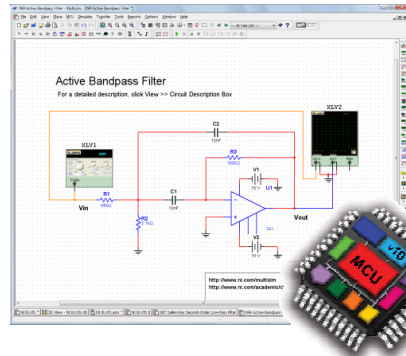


NI ELVISmx Virtual Instruments

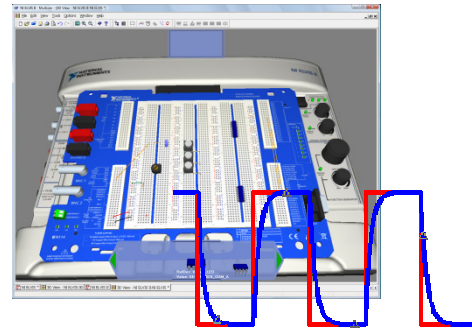


- Digital Multimeter
- Oscilloscope
- Function Generator
- Variable Power Supply
- Bode Analyzer
- Dynamic Signal Analyzer
- Arbitrary Waveform Generator
- Digital Reader
- Digital Writer
- Impedance Analyzer
- 2-wire Current-Voltage Analyzer
- 3-wire Current-Voltage Analyzer

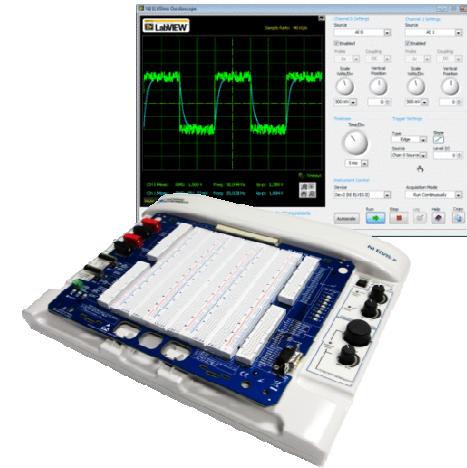
Teaching | Circuit Design Flow



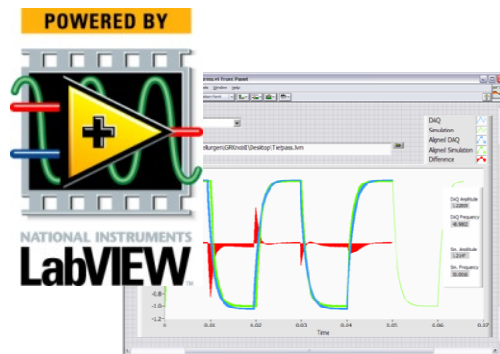
Step 1: Capture, Simulate and improve a design in NI Multisim



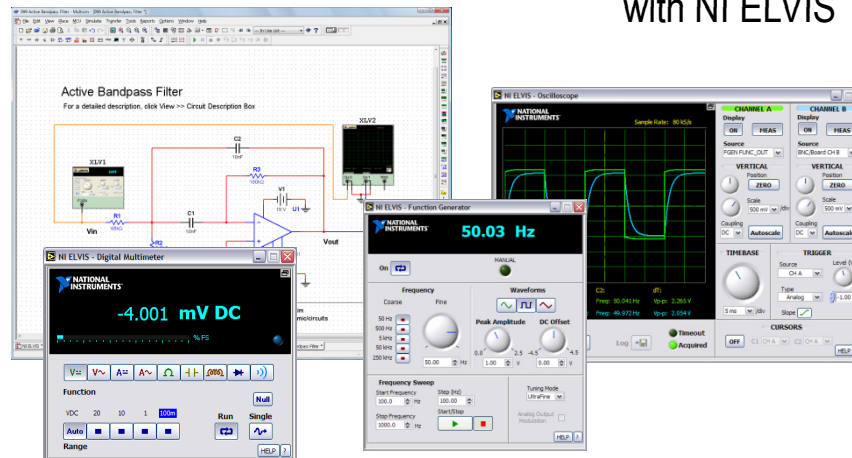
Step 2: Pre-lab in 3D breadboarding environment



Step 3: Build circuit and make measurement with NI ELVIS



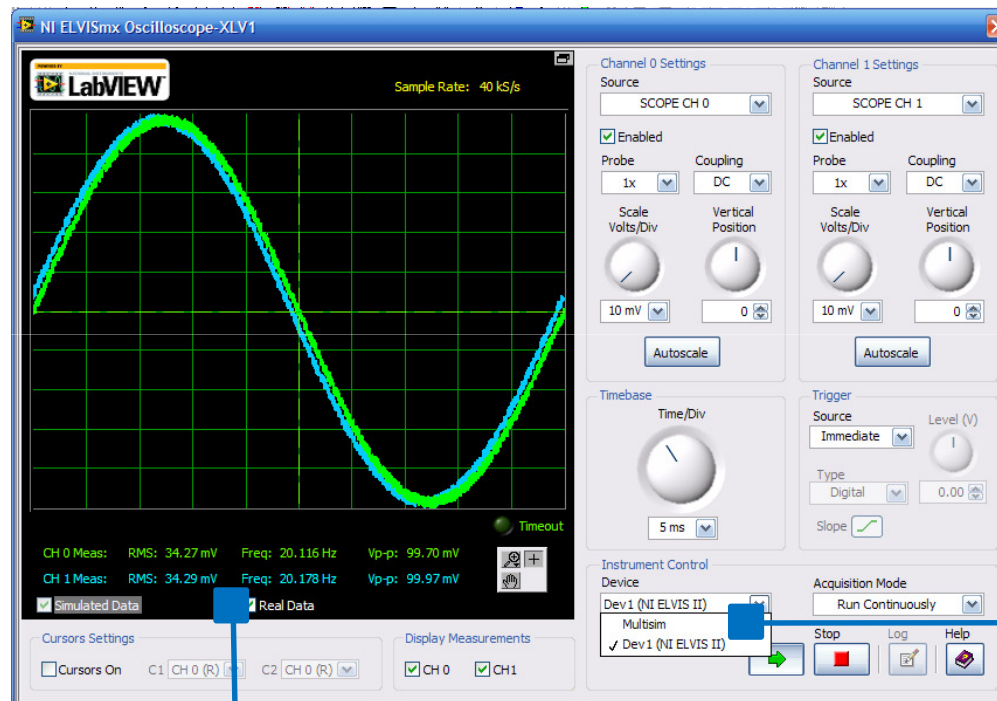
Step 5: Customization and complex analysis with LabVIEW



Step 4. Compare *simulated* data and *real* measurements

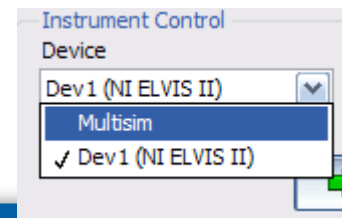
Theory and Measurement

Compare simulated data and measured signal on the same instrument



Access NI ELVIS hardware With one click switch between simulated signals and acquiring signals from your NI ELVIS II hardware

NI ELVIS II Instruments Compare simulated Multisim data with measured signals from NI ELVIS II within Multisim



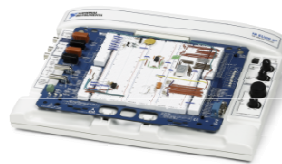
Controls and Mechatronics



Telecommunications



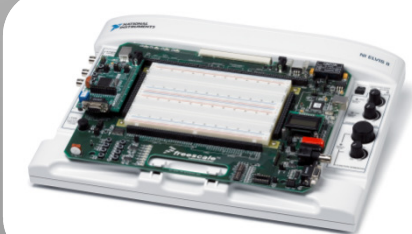
NATIONAL INSTRUMENTS™ NI ELVIS Platform



Circuits and Measurements



Digital Electronics

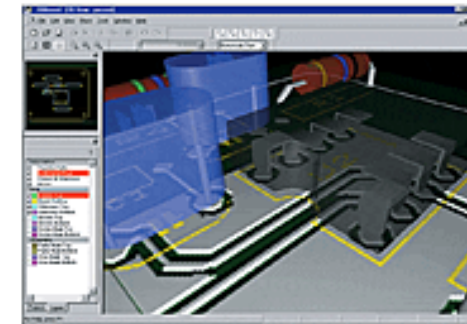
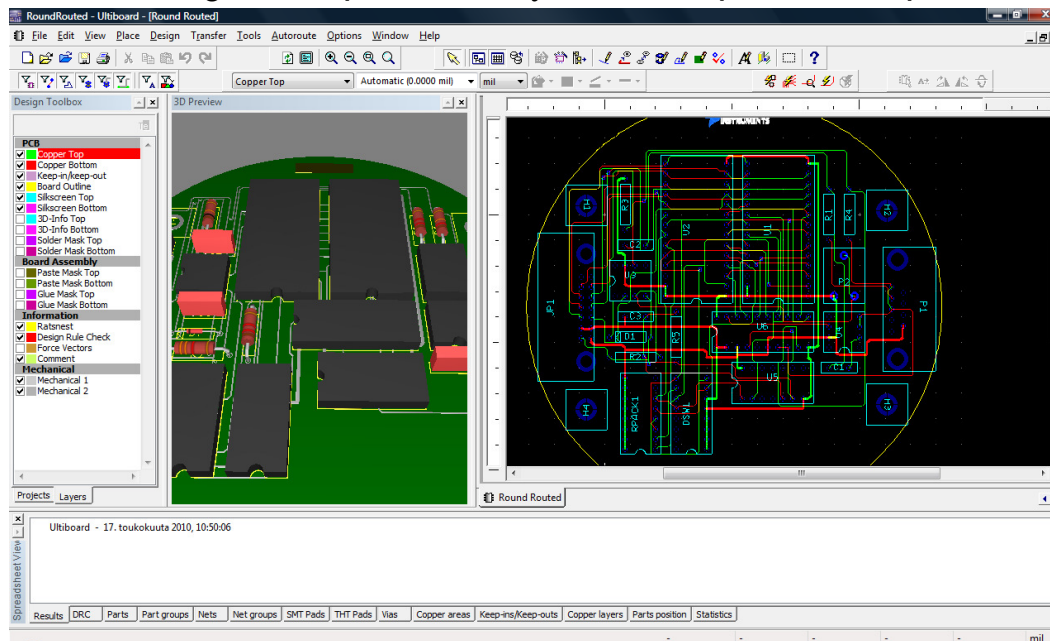


Embedded Design

NI Ultiboard

Intuitive PCB Layout and Routing Software for Education

- Prepares students for professional design activities with integrated layout and routing
- Combine with NI Multisim to simplify transfer of designs from schematic to layout
- Helps students produce their first PCBs with pick-and-place components and follow-me routing
- Exports to standard formats including Gerber to give students an understanding of industry practices
- Creates designs of up to four layers with up to 1,000 pins



NI Ultiboard

Intuitive PCB Layout and Routing Software for Professionals

- Intuitive, user-friendly layout and routing tools to easily define PCBs
- Flexible environment optimized for accurate or quick part and copper placement
- Seamless integration with Multisim to ensure easy transfer of design iterations
- Easy export to industry-standard Gerber or DXF formats for prototyping and fabrication
- Pin number limit 2000/unlimited
- Creates designs of up to 64 layers

Two versions:

Full

Power Pro

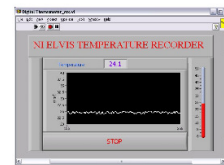


Online Resources



Guided Tours

Temperature Measurement Lab



This lab introduces the student to the thermistor, a common sensor for measuring temperature. It also offers an introduction to the ELVIS II Variable Power Supply. [View Now](#)

Strain Measurement Lab

Strain Gauge



Learn concepts related to the strain gauge.

Courseware



Download this circuit design resource kit to find courseware, tutorials, and software simulations and related textbook information to teach circuits and electronics design concepts with tools such as NI Multisim, NI LabVIEW, and NI Educational Laboratory Virtual Instrumentation Suite (ELVIS).

[Download the Circuit Design Academic Information Kit](#)

Kit Contents

- **NI ELVIS II Guided Tour**
View this guided tour to see how you can incorporate NI ELVIS II, an educational design and prototyping platform based on NI LabVIEW, into circuits, measurement, control, telecommunications, and embedded classrooms and laboratories.
- **Interactive Demo on the NI Multisim Environment**
Access this interactive demo to learn how to capture and simulate with Multisim.
- **Webcast: What's New in Multisim for Education**
Learn how you can incorporate the new features in Multisim into the classroom for interactive learning.
- **The NI Electronics Education Platform White Paper**
Use this detailed case study to bridge the gap between theory and real world application.
- **NI Multisim Fundamental Circuits Instructor Materials**
Explore how to build a library of circuits that showcase various components, designs, and the power of interactive SPICE simulation and analyses.
- **Simulation Fundamentals: Simulation in NI Multisim**
Learn more about the fundamental concept of mixed-mode simulation in Multisim which allows seamless, complete circuit design and simulation.
- **Case Studies Using Multisim, NI ELVIS, and NI LabVIEW**
Discover how schools are incorporating Multisim, NI ELVIS, and LabVIEW in their circuit courses and laboratories.

Download Resource Kits

NI Multisim 101

An Introduction to Capture and Simulation for Board-Level Design

What's New in NI Multisim 10.1? For Education

Nation

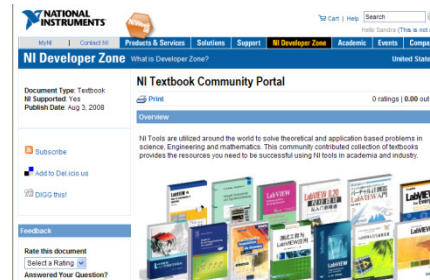
ni.com

Sandra Tso
National Instruments, Product Marketing Engineer

ni.com



Webcast



Textbook Resources

Design of an Atomic Force Microscope using NI ELVIS and LabVIEW

Print

Georgia Institute of Technology Simplifies Teaching Circuit Design with NI ELVIS, NI LabVIEW, and NI Multisim

Print

Products:

LabVIEW, NI

Author(s):

Thomas E. Brewer - Georgia Institute of Technology

The Challenge:

Designing a

research i

package

The Solution:

Implement

scanner, or

Laboratory

programm

The Challenge:

Implementing a

hands-on approach to teach theoretical electrical engineering

concepts with real-world signals.

The Solution:

Using the NI ELVIS

integrated design platform with NI LabVIEW and NI Multisim

software to teach the theory, design, and prototyping of circuits with real-world

signals.



Students complete circuits homework assignments with Multisim, NI ELVIS, LabVIEW, and LabVIEW SignalExpress.

Case Studies & White Papers

In practice...

Questions?

More information

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