

## Virtual Instrumentation-based Distance Learning

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## Agenda

National Instruments Background

Virtual Instrumentation

ELVIS

LabVIEW

Distance Learning with Distributed Instruction



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## National Instruments

- Leaders for 30 years in Computer-Based Measurement and Automation
- Direct Operations in 40 Countries
- 1,500 Engineers work for NI, 3800 Employees
- Corporate Headquarters in Austin, Texas
- Over 600 Alliance Partners
- Long History of Financial Success



FORTUNE  
100 BEST  
COMPANIES  
TO WORK FOR  
2007  
7 Years

2005 Revenue  
\$572 Million



★ Direct Sales Offices  
● Distributors



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## Widespread Adoption:

Industries, Applications, and Geographies

- More than 25,000 companies in 90 countries
- >90% of Fortune 500 manufacturing companies
- No customer represents more than 3% of revenue

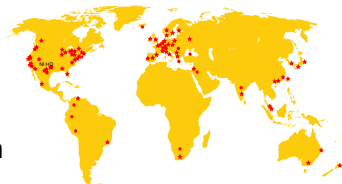


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## National Instruments in Academia

- 110 Countries
- 5000+ Classrooms
- Used in all engineering and science disciplines
- Over 1000 schools in the U.S. using LabVIEW

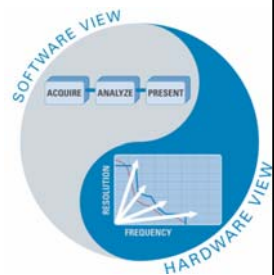


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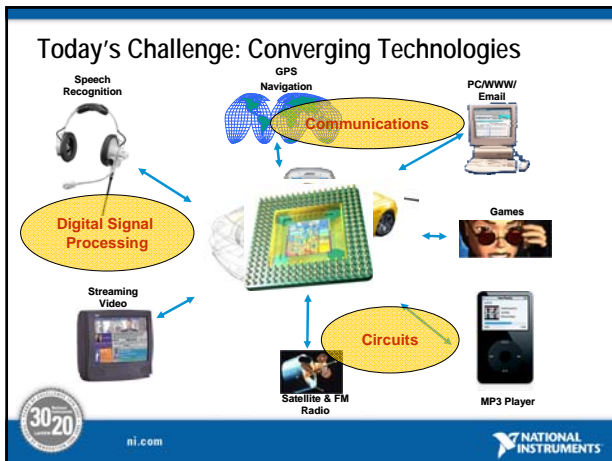
## Virtual Instrumentation

- SOFTWARE IS THE INSTRUMENT!
- Leverage commercial technology – e.g. PC
- Combine flexible SW with variety of modular HW



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

3 Oscilloscope, DMM, Function Generator, ARB, Bode Analyzer, DSA, Power Supply

NI ELVIS is...

Workstation and Protoboard, NI USB Data Acquisition Board, LabVIEW™

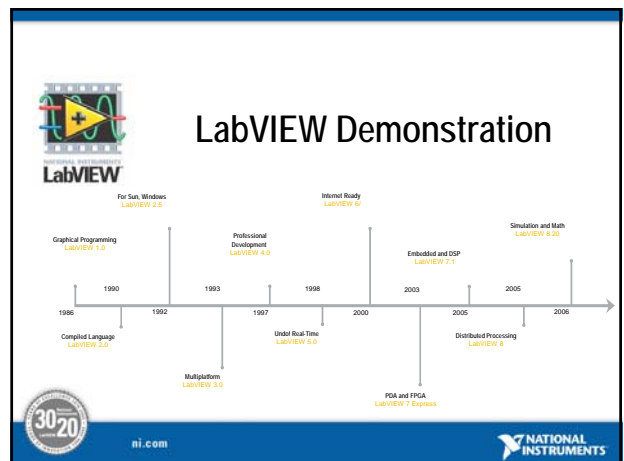
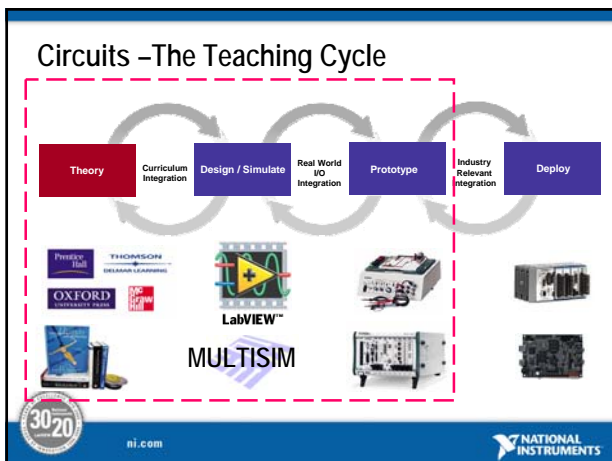
Instrumentation, Circuits, Signal Processing, Control Design, Communications, Mechatronics

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### Unique Benefits

- Ideal distance learning platform
- One system, multiple courses
  - Multiple courses in engineering
- Lower system cost
- Combine laboratory / lecture
- Small footprint
  - More stations, more students

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## Remote/Virtual Labs

- Students can access laboratories after hours
- Enhance lecture with live demonstration
- Implemented with built-in functionality in LabVIEW – no added cost
- Use general web browser from *any* PC connected to the web
- Control hardware and software remotely



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## Remote/Virtual Labs

Publish online using built-in Web Server

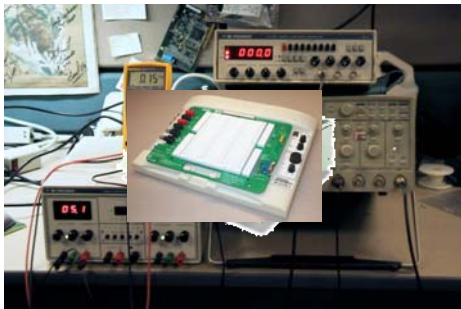
Use Internet Explorer from ANYWHERE to control lab hardware AND software



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## Compact Multi-instrument Functionality



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## Curriculum Resources



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## Multisim and NI ELVIS Labs

### Practical Teaching Ideas

- Over 100 pre-built circuits labs using Multisim
- ~25 labs integrated with ELVIS
- Authored by electronics professor

### ELVIS & LabVIEW Courseware

- Introduction to NI ELVIS
- Introduction to LabVIEW in 3 hours
- Professor submitted experiments

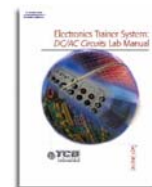


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## Teaching AC/DC Circuits – Curriculum

- 32 DC/AC experiments
- Interactive help
- Students learn circuit fault / troubleshooting skills










[www.delmarlearning.com/etcb](http://www.delmarlearning.com/etcb)



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## Educational Providers Incorporating NI ELVIS

Physics/ Chemistry	Circuits (EE, Physics, Biomed)	Microcontroller, DSP (EE)	Controls (ME, EE)
 Vernier PRECISION. FLEXIBILITY. LASTING.	 Electronics A NATIONAL INSTRUMENTS COMPANY	 freescale SEMICONDUCTOR	 TI DIGITAL SIGNAL PROCESSORS
 PASCO	 TECHNISONIC DESIGN. LEARNING.	 ANALOG DEVICES	



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## Academic Continuum



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**LEGO** MINDSTORMS  
NXT



POWERED BY  
NATIONAL INSTRUMENTS  
**LabVIEW**



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## Questions / Discussion

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