NIDays

WORLDWIDE GRAPHICAL SYSTEM DESIGN

CONFERENCE

NATIONAL INSTRUMENTS™

Welcome

Branch Manager NI Norway

Vidar Grønås

Do More Innovation with Graphical System Design

Everyone is talking about the financial crises
and ash…

Engineering Grand Challenges

Cancer Detection

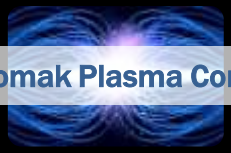
Advance health informatics

Hadron Collider

Engineer the tools of scientific discovery

Infant Brain Scans

Reverse-engineer the brain



Tokomak Plasma Control

Provide energy from fusion

IV Drift Pump

Engineer better medicines

Advanced Purification

Provide access to clean water

Xbox Testing

Enhance virtual reality

Olympic Stadium Safety

Restore and improve urban infrastructure

CO_2 Storage

Develop carbon sequestration methods

Distance Learning

Advance personalized learning

Cheap Solar Panels

Make solar energy economical

Material Monitoring

Prevent nuclear terror

Spectral Monitoring

Secure cyberspace

Costa Rica Rain Forest

Manage the nitrogen cycle

Source: National Academy of Engineering

“Engineering is Tomorrow’s Future
along with the solution
for Today’s Problems”

[EDN]

A Partnership in Innovation

Your Domain Knowledge
and
Graphical System Design
Tools of Innovation

DESIGN → PROTOTYPE → DEPLOY

Do More

[with NI LabVIEW]

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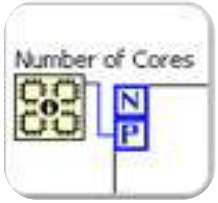
LabVIEW™ 2009



Multicore Processors

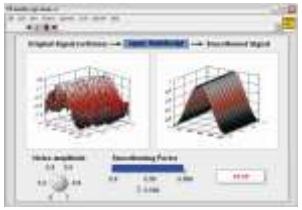
Personal Supercomputing

FPGA Technology

Rapid Embedded Design and Prototyping

Wireless Systems

Intelligent Distributed Systems



Real-Time Math

Deterministic Algorithm Deployment

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Fixed-Point Casting Functions

Data Value References

New Dynamic Data Express VI

Command-Line Differencing

Using Xpath to Query XML Documents

Group Digital Signals Express VI

TDMS and NI-DAQmx Logging Integration

RSS-Driven Getting Started Window

VI Snippets

Guaranteed Downcasting of Classes

Enhanced Curve-Fitting Functionality

LabVIEW DataFinder Toolkit

New System Directory VIs

New VI Analyzer Tests

Sound VIs on Mac

Native Recursion

New Signal Processing VIs

Enhanced Icon Editor

SSL Security for Web Services

CPU Information Palette

VI Hierarchy Window Enhancements

Quick Drop Improvements

Bus/Line Configuration in Digital Waveform Graph

Partial Differential Equation Palette

Generate .NET Interop Assemblies

Domain Account Manager Enhancements

Probe Watch Window

New In-Place Element Structure I/O Nodes

New Matrix Functions

Feedback Node Configuration Options

LabVIEW MathScript RT Module

Parallel For Loops

New 2D and 3D Plots

TDMS File Format Improvements

Search Algorithm Enhancements

Enhanced Block Diagram Cleanup

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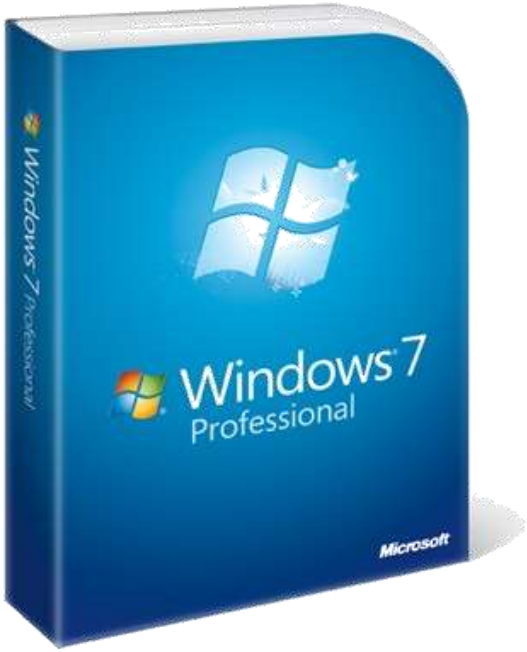
Supporting the Next OS: Windows 7

- Tested LabVIEW 2009/driver support
- Increased USB DAQ throughput
- Improved multicore/multitasking
- Enhanced performance with 64-bit



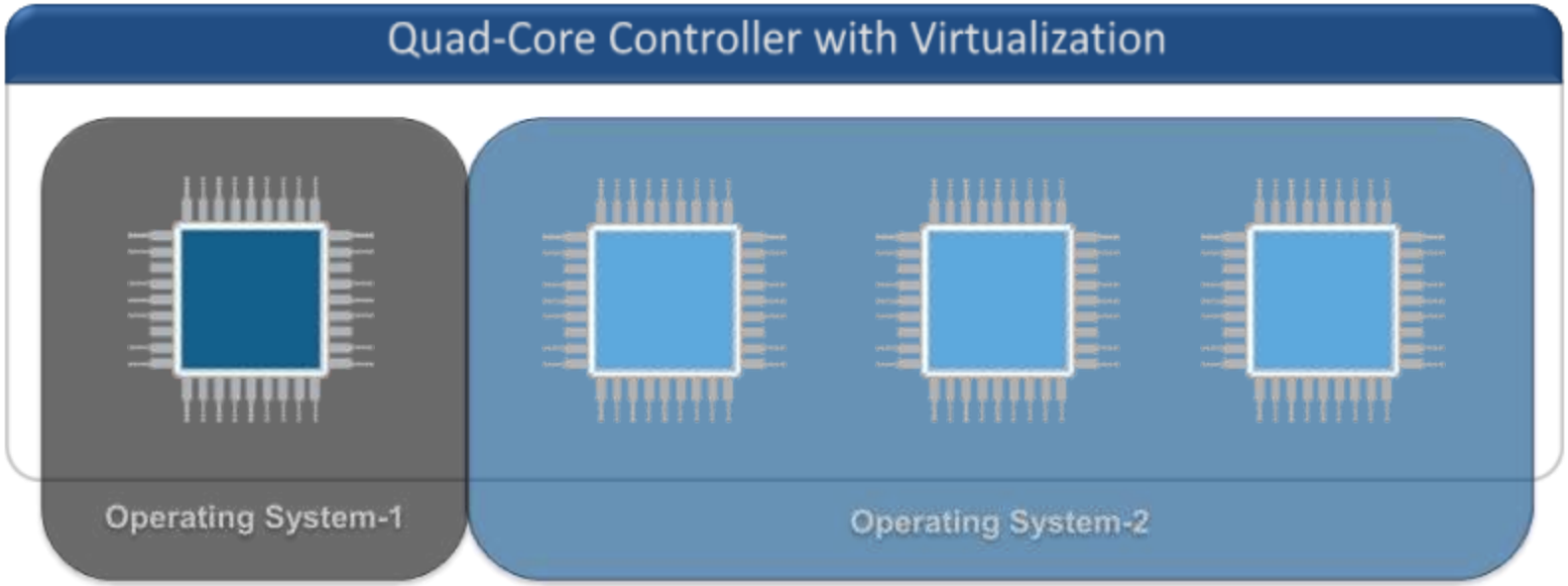
Graphical Scripting for LabVIEW

Espen Ringnes and David Ek

Do More

[Multicore]

Evolution of Multicore



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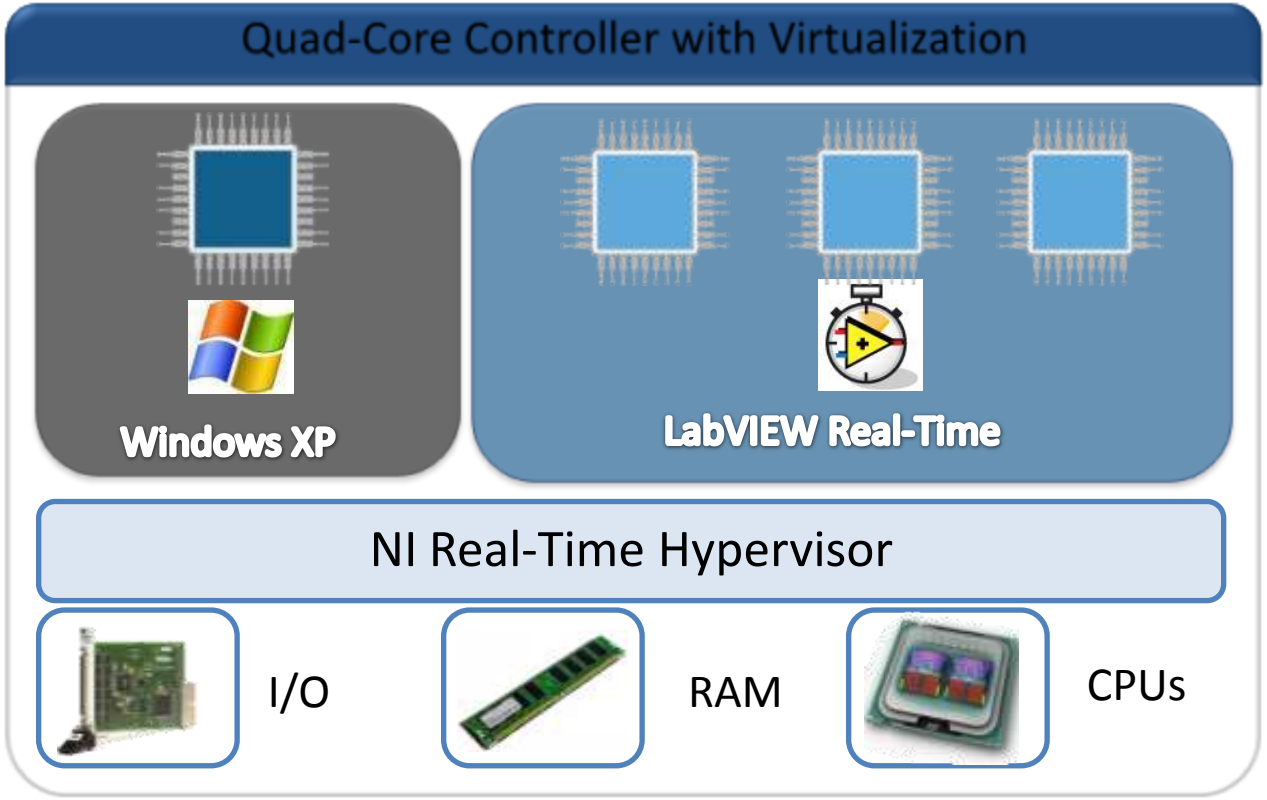
NI Real-Time Hypervisor

Run LabVIEW RealTime and Windows XP simultaneously



Available on multicore PXI and industrial controllers

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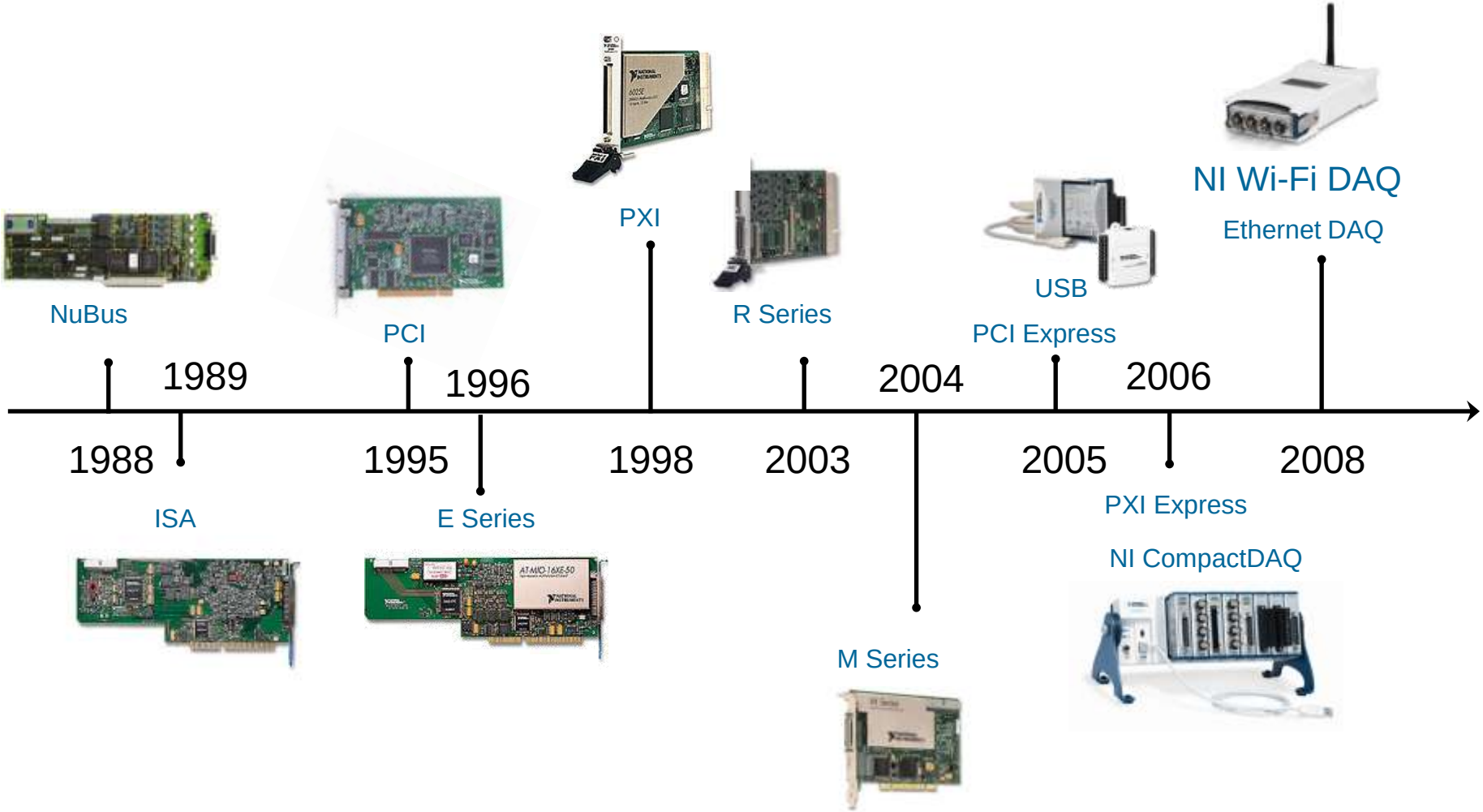
Do More

[Data Acquisition]

20 Years | NI Data Acquisition



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New Products | NI X Series Multifunction DAQ

- 16 PCI Express and PXI Express devices
- Enhanced **NI-STC3**
  - 4 enhanced counters
  - **100 MHz** timebase
  - Independent analog/digital timing engines
- Higher throughput and lower latency
  - Native x1 **PCI/PXI Express** interface
  - **8 DMA channels** for parallel data stream

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X Series Data Acquisition Demo

Espen Ringnes

New Products | NI CompactDAQ

- Three AI timing engines
- Built-in BNC triggers
- Four counters
- Locking USB cable
- 9 to 30 VDC power
- Four-slot option

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Introducing| SC Express

High Channel Count DAQ Systems

1 Increased Accuracy

- Up to 24-bit resolution
- Delta-Sigma A/D converters
- Anti-aliasing filters per channel

2 High Bandwidth

- PCI Express - Dedicated bandwidth/device
- Dynamic strain measurements
- ADC per channel

3 Best-in-Class Synchronization

- 100 MHz reference clock built-in chassis
- ns synchronization with DAQmx Multi-Device
- Automatic synchronization with DSA & X Series

4 Easy to Use

- Same DAQmx driver as DAQ & DSA
- New Bridge Channel Type in DAQmx
- Modules & Terminal Blocks auto-recognized

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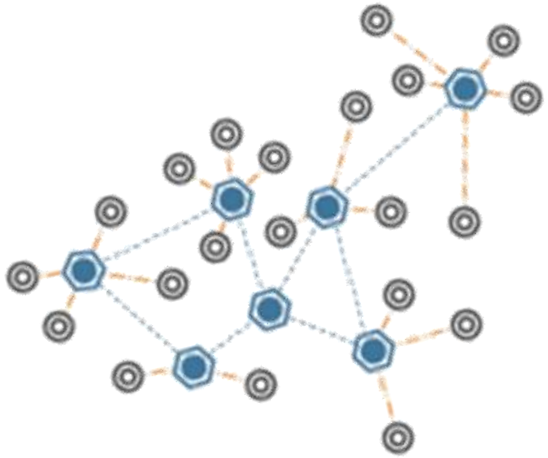
Do More

[Wireless Measurements]

Leif Johansson

NI Wireless Sensor Networks

Low Power. Reliable.



- 16-bit voltage input node
- 24-bit thermocouple node
- Up to 3-year battery life
- 2.4 GHz, IEEE 802.15.4 radio
- Programmable nodes

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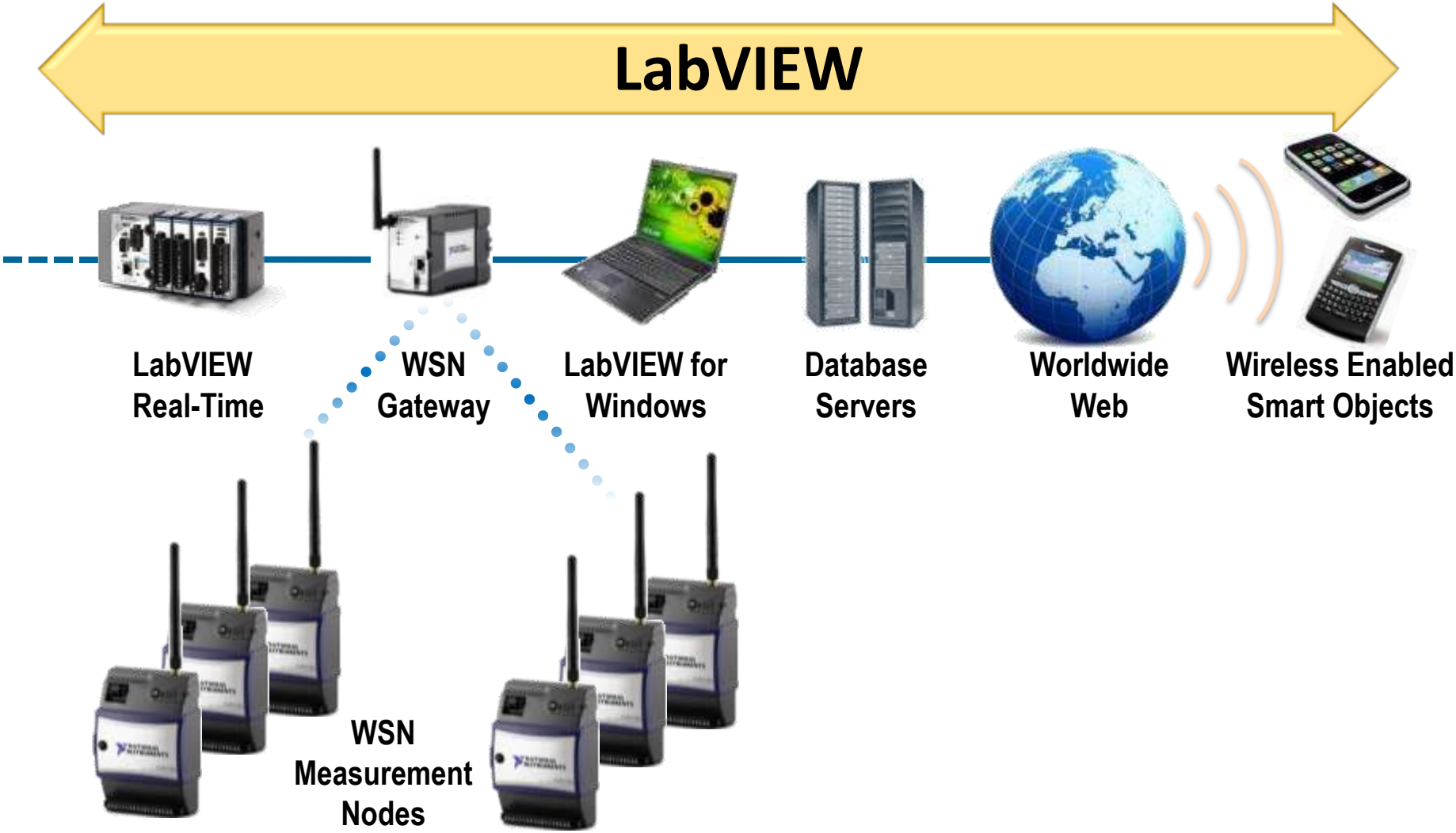
WSN System Architecture



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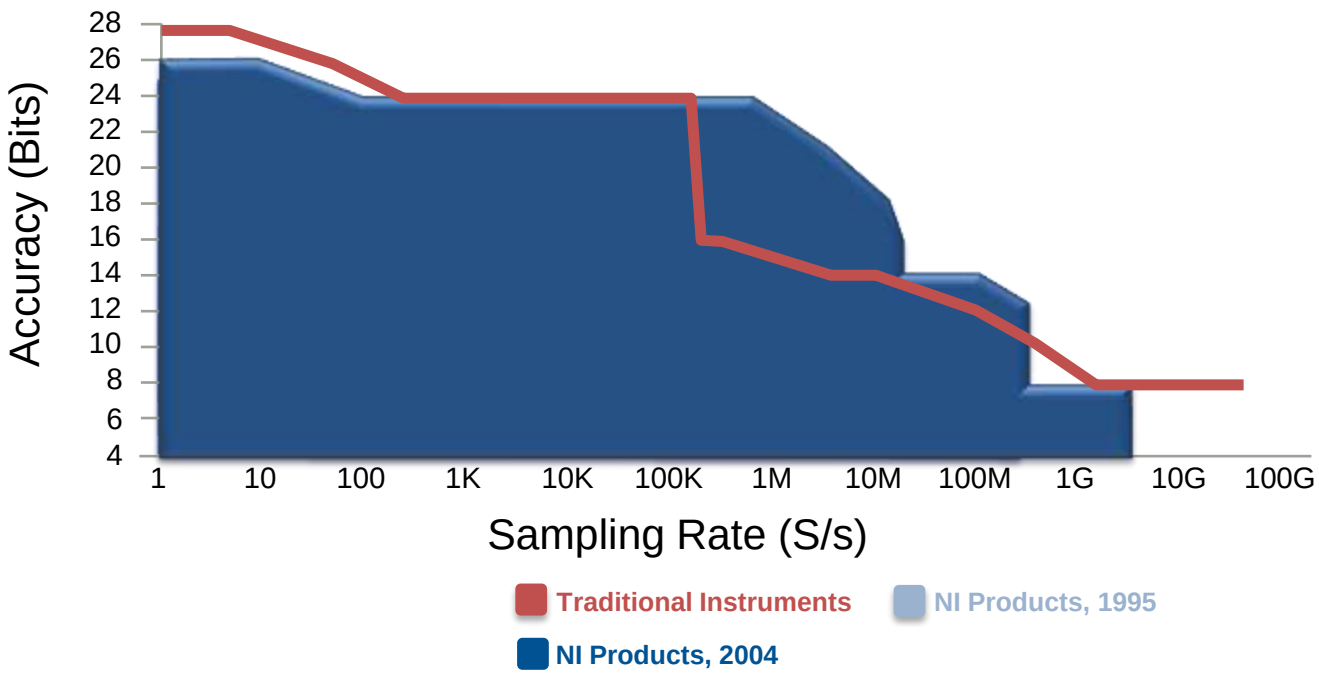
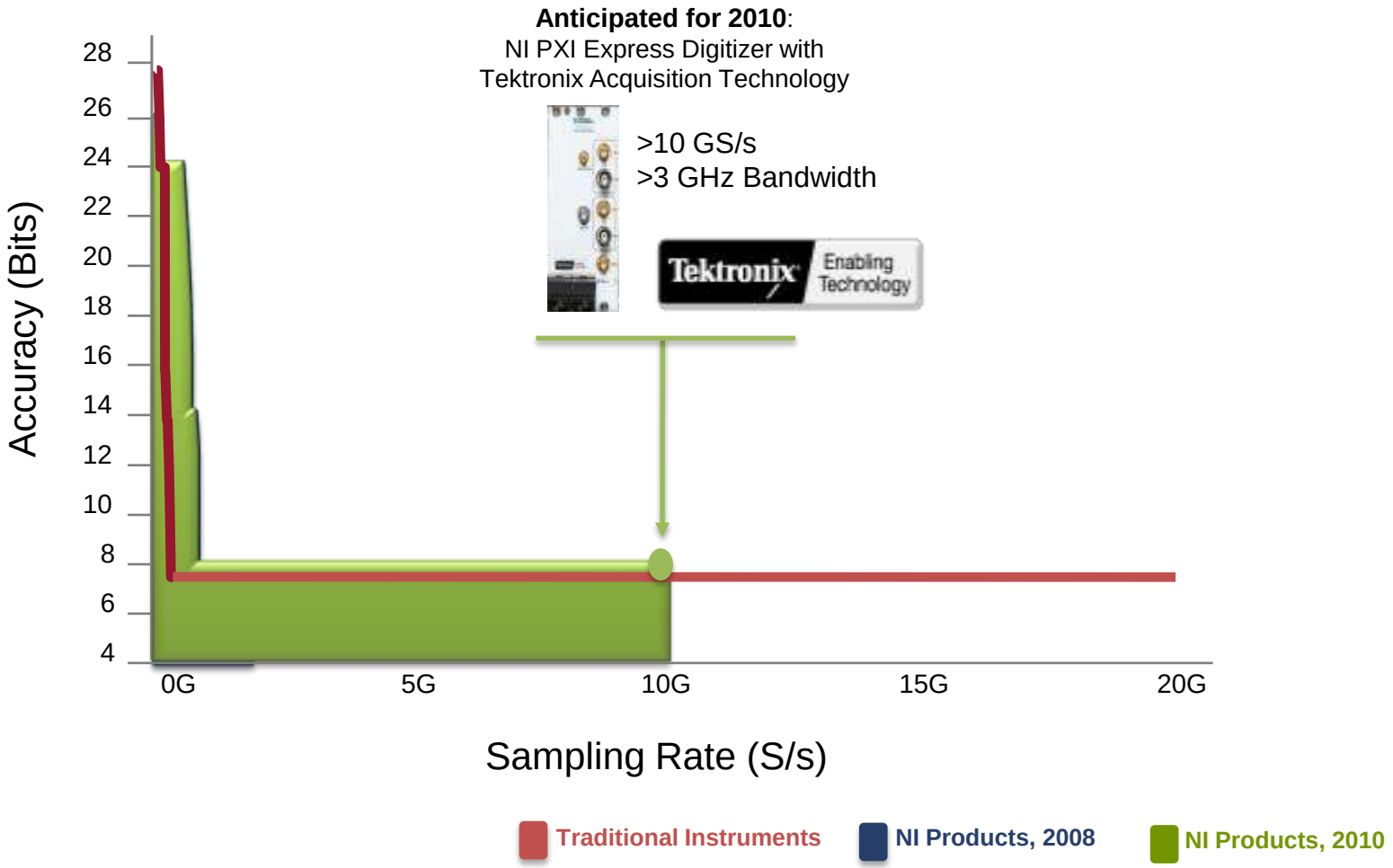
Do More

[Automated test]

Expanding Measurement Capabilities



Expanding Measurement Capabilities



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NI PXI Semiconductor Suite

Source Measure Unit

High-Speed Signal Insertion Switch

High-Speed Digital I/O

RF 6.6 GHz VSA/VSG

WGL/STIL Importing Software

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New Source Measure Unit | Semiconductor Test

Features:

- 10pA measurement sensitivity
- Up to +/-100V and up to +/-100mA
- 4-quadrant operation
- Remote (4-wire) sense, guarding

Recommended applications

- Leakage test on discrete components
- Parametric measurements on semiconductor chips
- IV characterization and other physical measurements

NI PXI -4132

Precision Source Measure Unit

NATIONAL INSTRUMENTS

New Digital Instruments | Semiconductor Test

Features

- 100/200 MHz Maximum Clock Rates
- 32 bidirectional digital lines (SW controlled)
- Selectable Voltages of 1.2, 1.5, 1.8, 2.5, and 3.3V
- x4 PXIe streaming bandwidth (Up to 660MB/s)
- Onboard High Precision clock with sub-Hertz resolution (DC to 200 MHz)

NI PXI -6544/45

200 MHz Digital Waveform Analyzer/Generator

NATIONAL INSTRUMENTS

New Digital Instruments | Semiconductor Test

Differences from 6544/45:

- 200/400 Mbps maximum data rates
- Selectable Voltages of 1.2 - 3.3V (100mV steps) 22 voltage levels
- Per channel, per cycle state control (1, 0, Z, L, H, X)
- Onboard Hardware Compare
- Peer to Peer Streaming
- Serial Triggering

NI PXI -6546/47

400 Mbps Digital Waveform Analyzer/Generator

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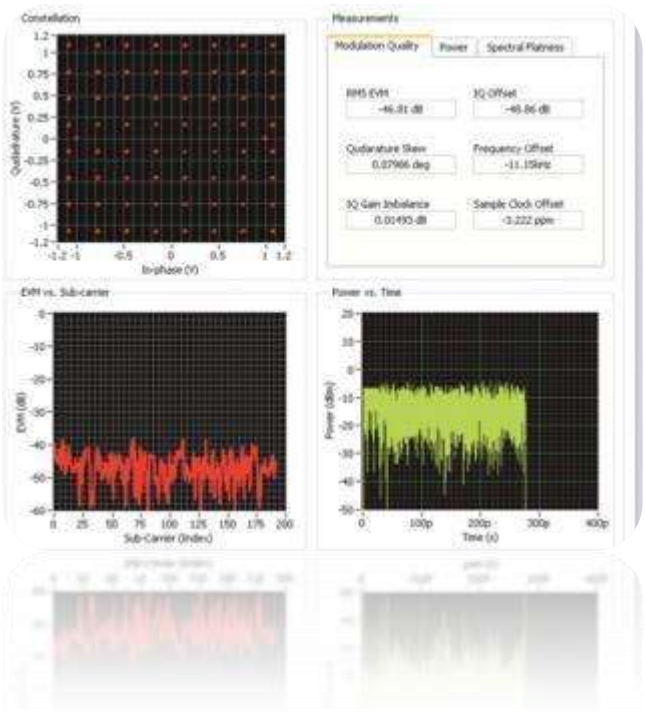
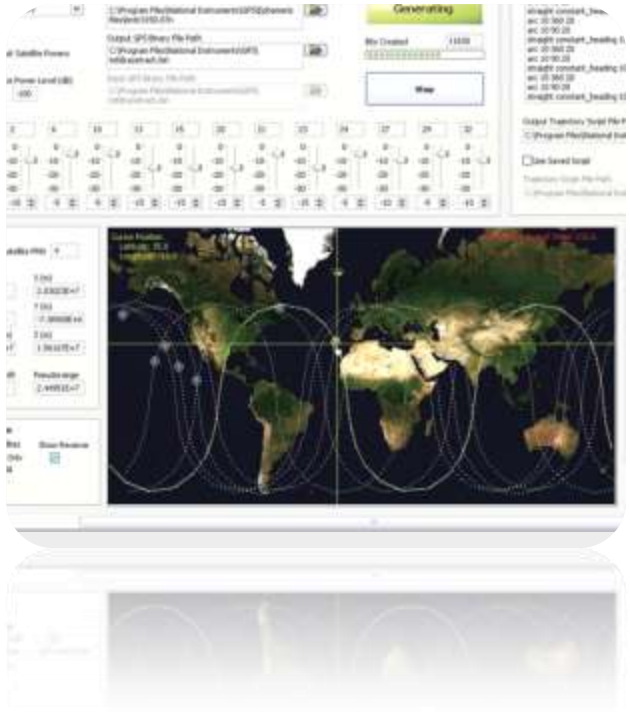
New RF Toolkits | LabVIEW and LabWindows™/CVI

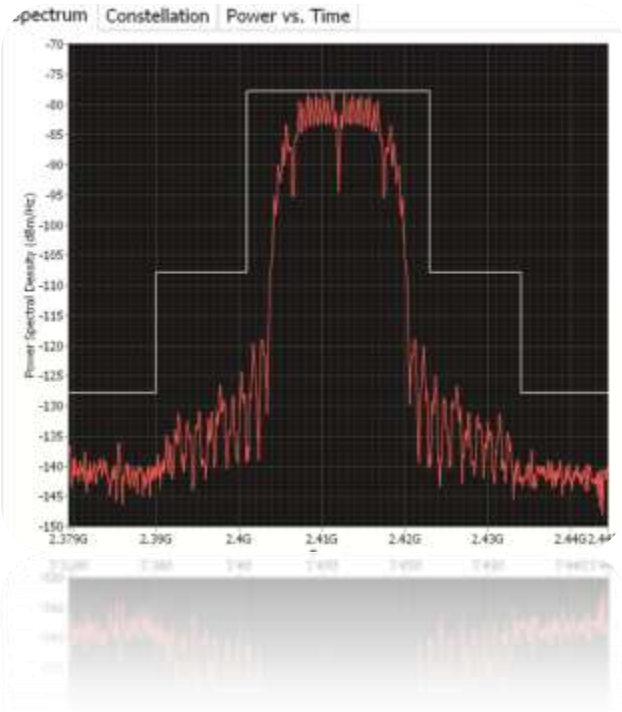
WLAN Toolkit



GPS Simulation Toolkit



WiMAX Toolkit



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NI FlexRIO | Reconfigurable FPGAs for Test

Announced November 2008

Announced February 2010

NI PXI-795x PCI-based FlexRIO FPGA Modules

- Virtex-5 **LX** Series FPGAs
- **128 MB** onboard DRAM

NI PXIe-796x PCI Express-based FlexRIO Modules

- Virtex-5 **SXT** Series FPGAs
- **512 MB** onboard DRAM
- **Co-processing** for other instruments

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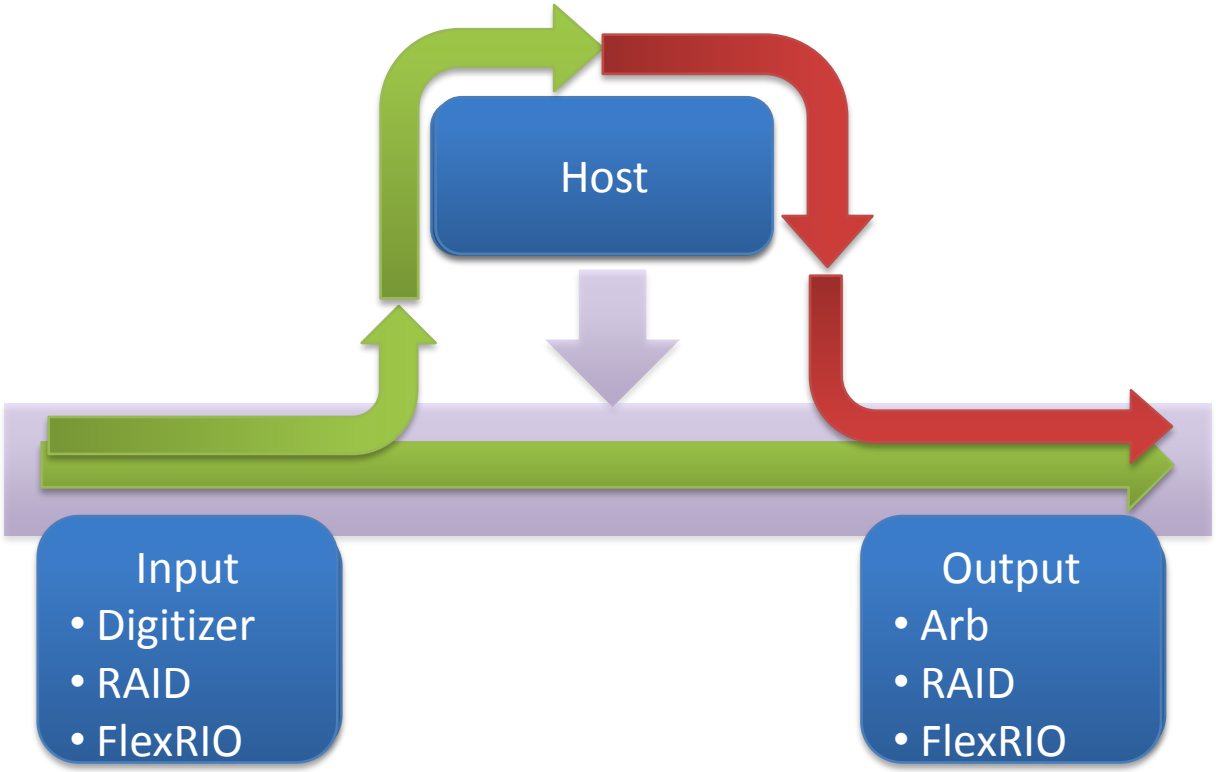
Data Streaming | Traditional Model

Peer to Peer Streaming | The NI Model



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Peer-to-Peer Streaming demo

Espen Ringnes

NI FlexRIO | New Adapter Modules for Test

NI 5752 32-Channel Digitizer Adapter module

Optimized for nondestructive test and ultrasound applications:

- 50 MS/s with 12-bit resolution on all channels
- 100 Ω differential inputs
- AC coupling
- Selectable antialias filters
- Programmable time-variable gain control

NI 5781 Baseband Transceiver Adaptor Module

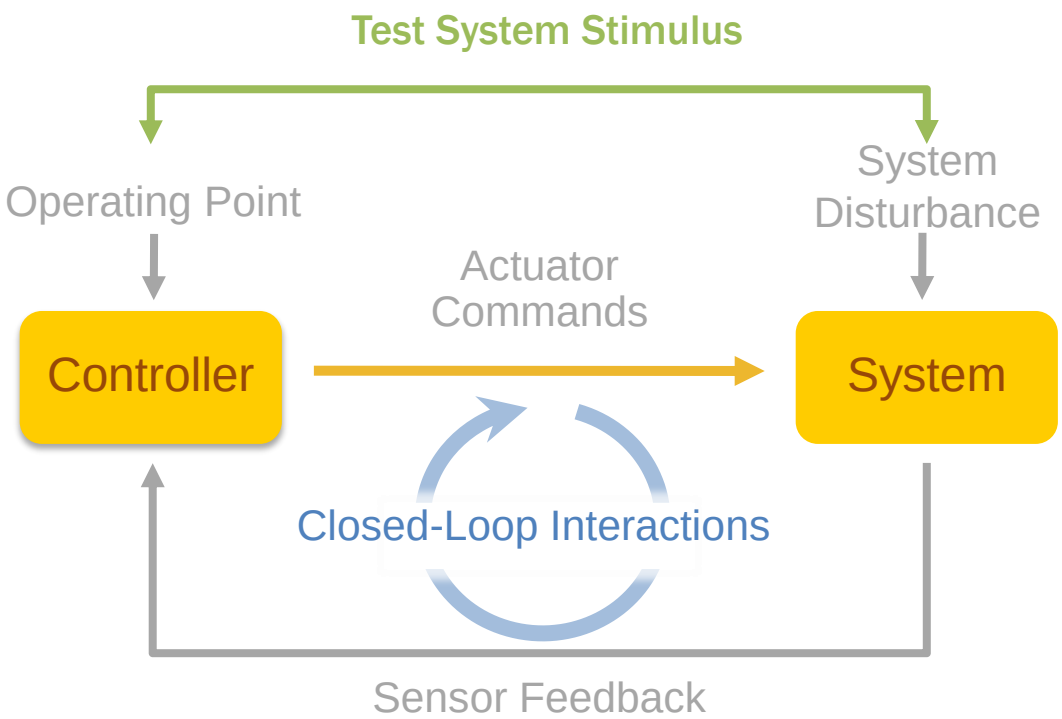
Implement custom RF modulation and demodulation, channel emulation, bit error rate testing, or spectral monitoring and jamming.

- Two 100 MS/s, 14-bit, differential, DC-coupled inputs and outputs (outputs 16-bit)
- 40 MHz bandwidth (-3 dB)

Do More

[Real-Time Test]

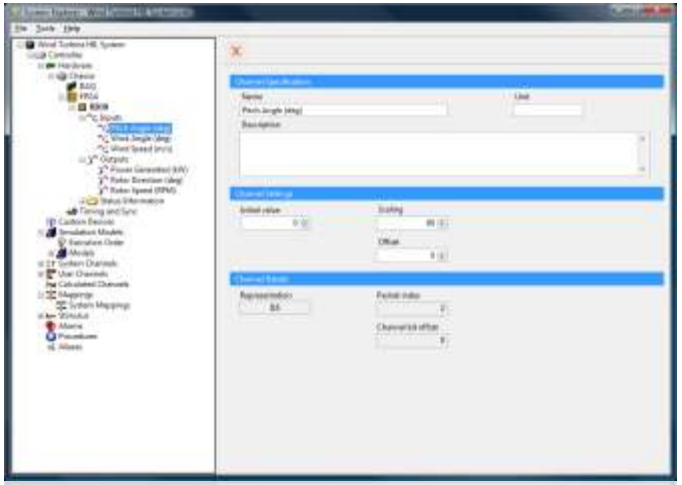
Real-Time Testing and Simulation



NI VeriStand™

Real-Time Testing and Simulation Software

- Hardware I/O
- Models
- Stimulus Profiles
- Data Logging
- Calculated Channels
- Alarming



Ready to configure and use

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VeriStand demo

Jimmie Adolph

Do More

[Embedded Control]

NI RIO Technology Platform

Processor

- Enet
- USB
- RTOS
- Analysis
- Control
- Logging
- Comm

FPGA

- Analysis IP
- Control IP
- Timing IP
- Comm IP
- IPNet
- 3rd party IP

I/O

- Analog I/O
- Digital I/O
- Comm I/O
- Motion I/O
- 3rd party I/O

NATIONAL INSTRUMENTS LabVIEW™

NI RIO Hardware

Packaged

Board-Level

CompactRIO Evolution | Hardware & Software

cRIO 9023 and cRIO 9025

New Rugged Performance RT Controllers

cRIO 911x

Virtex-5 LX family CompactRIO Reconfigurable Chassis

- Real Time Mathscript
- Vision Capabilities
- File I/O througput
- Model execution
- Math IP Fixed point
- Signal Processing and measurements
- MXI-Express RIO for high channel count

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Delta Robot Demo

David Ek

Do More

[Robotics]

LabVIEW and Robotics World

LabVIEW Robotics 2009

LEGO® MINDSTORMS®
NXT LabVIEW Module

ImagingLab Library
for DENSO

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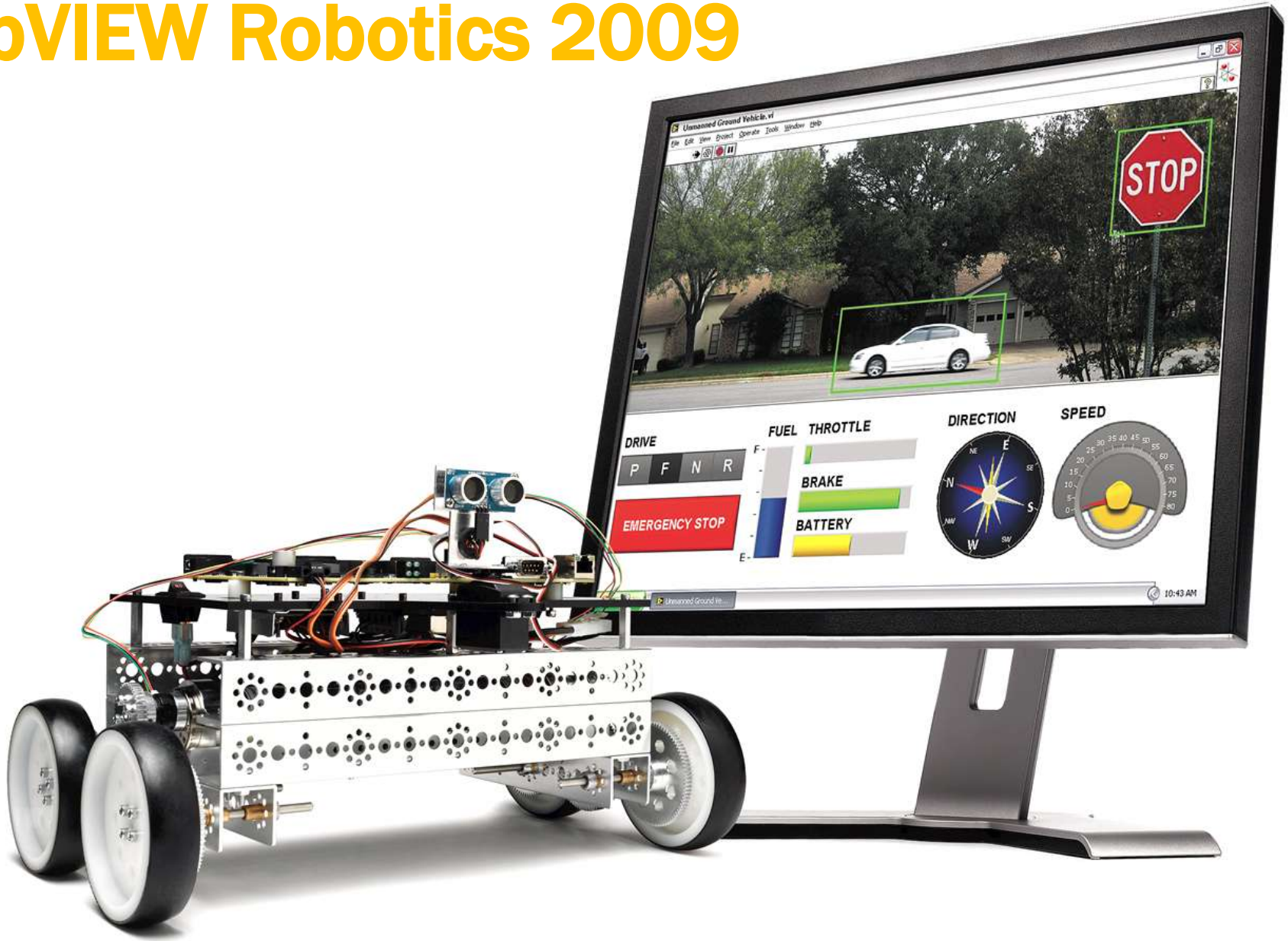
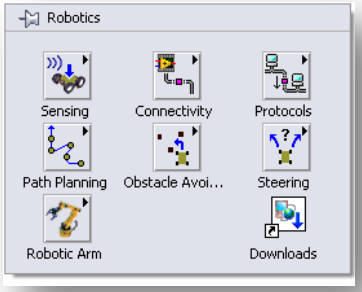
LabVIEW Robotics 2009

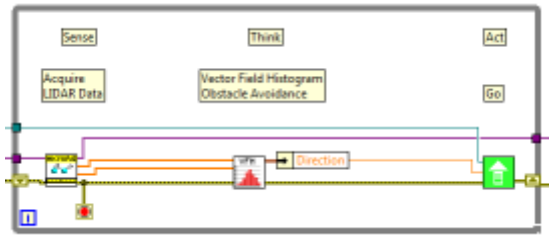


LabVIEW Robotics Key Offerings

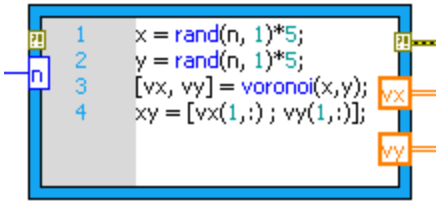
IP for navigation, steering, kinematics and more



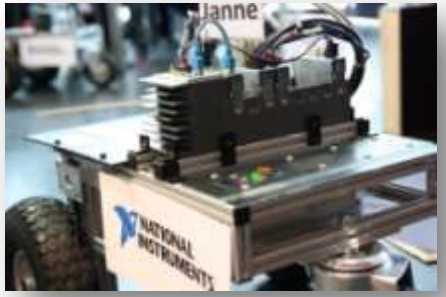
High-level **graphical programming**



Tools for integrating **text-based algorithms**

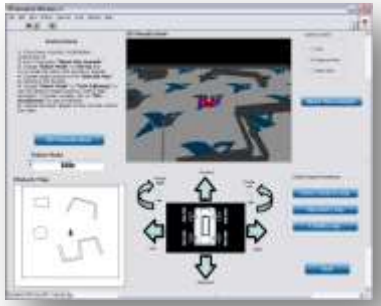


Deployment to Real-Time and FPGA hardware



Connectivity to sensors and actuators from top vendors

Examples of real-world applications



LabVIEW and Robotics World

LabVIEW Robotics 2009

LEGO® MINDSTORMS ®
NXT LabVIEW Module

ImagingLab Library
for DENSO

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Advanced Robotics Applications

- **Pick & Place**

Assembly
Lab Automation
Flexible Manufacturing

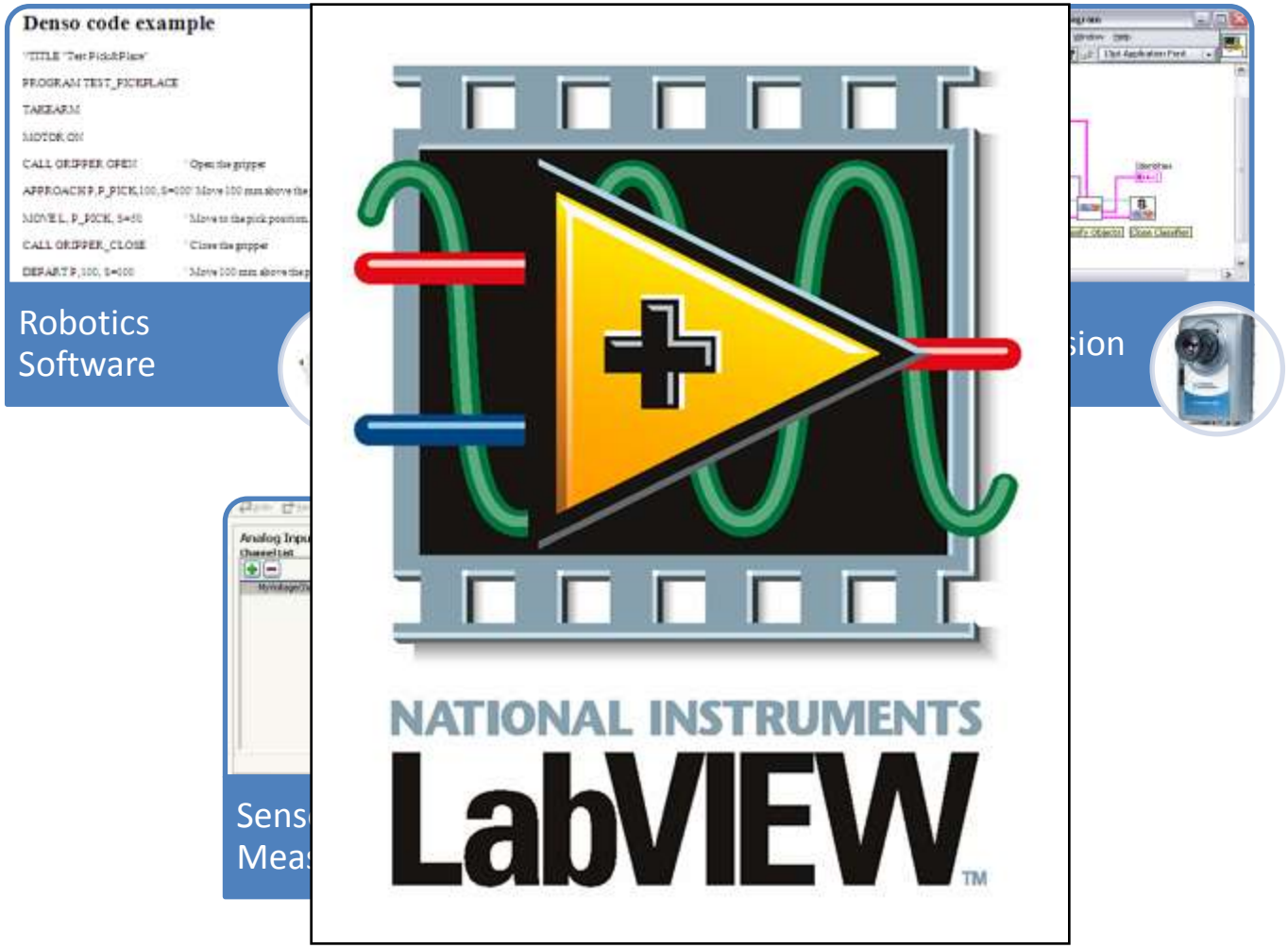
- **Test**

Automated Test
Visual Inspection
Multiple Measurements

- **Material Work**

Polishing
Deburring
Machining

Advanced Robotics Requires a Lot Software



Delivering Innovation Together

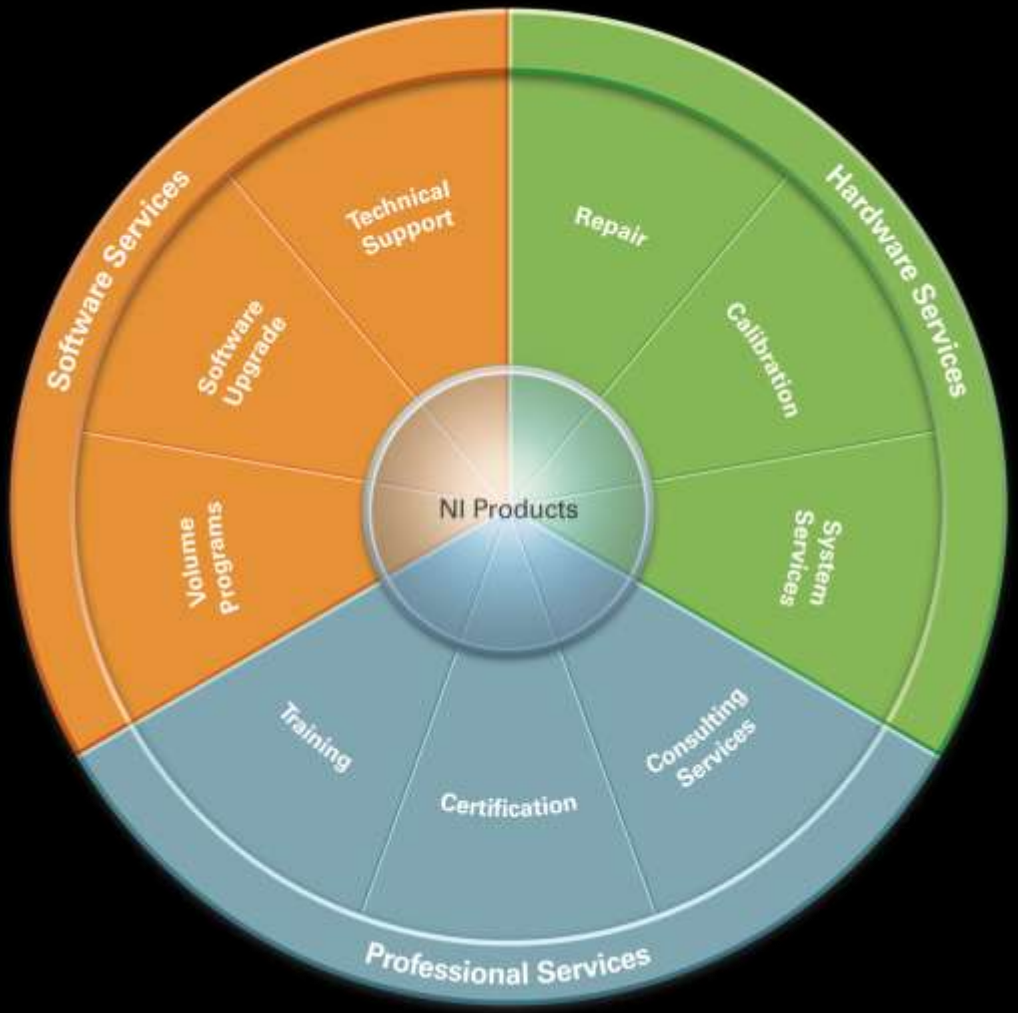
Your Domain Knowledge

and

Graphical System Design
Tools of Innovation

DESIGN → PROTOTYPE → DEPLOY

Ensuring Complete System Success



Do More

[with Graphical System Design]

Partner Introductions

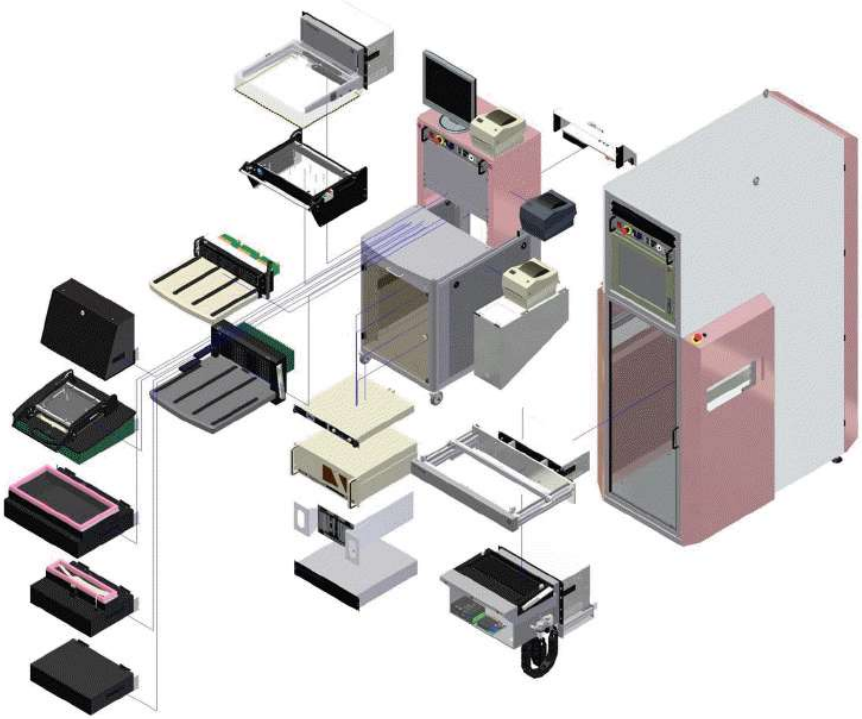
COLUMBIA

Your Partners in True-Flexible, Reliable, Modular, Re-usable Test Solutions & Mass Interconnect Systems.

NI - Partnerpresentation
15h45 – Grey track

6TL´s true modular test systems save money and time

By 6TL Engineering and SA Sistel



CIM Industrial Systems A/S

Danish Company specializing in Software Solutions and Test Solutions.

The NI Certification Program

"Best in Europe"

CLA certifications
Europe
5 of 27

FLEXSTAND

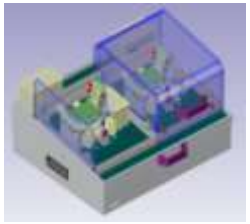
New TestStand Operator Interface.

Win an iPod - fill in the form and deliver to CIM in the exhibition area

CIM Industrial Systems A/S

Devotek

DSE TEST SOLUTIONS



DSE Test Solutions – when test really matters….

GOPEL electronic
Intelligent Boundary Scan Solutions®
Alliance Partner

NATIONAL INSTRUMENTS™
Certified Alliance Partner

Marin-Innovasjon AS

- Hovedkontor i Bergen (Laksevåg)
- Nytt regionskontor i Oslo

Kjerneområder

- Kontrollsystemer
- Sanntidssystemer
- Datalogging
- Elektronikkdesign

Achilles

NATIONAL INSTRUMENTS Alliance Member

Norwegian Centres of Expertise NCE Subsea

MARINE INNOVATION Electronics and Control systems

Maskindynamikk

NATIONAL INSTRUMENTS™
Select Alliance Partner

Prevas

As a Select Alliance Partner
of National Instruments we are
Committed to your success

What Virinco do...

...we specialize in:

- Automatic Test Equipment
- NI TestStand
- Test Data Management

...helping customers to:

- Organize test & repair data
- Improve production **YIELD**
- Improve product **QUALITY**

virinco