

The background features a perspective view of a tunnel-like structure with curved walls and ceiling. The left side of the tunnel is illuminated with a warm, orange-red glow, while the right side transitions into a cool blue gradient. The walls and ceiling are covered with faint, technical-looking diagrams and lines, suggesting a complex system or infrastructure. The overall effect is one of depth and modernity.

# NIDays

WORLDWIDE GRAPHICAL SYSTEM DESIGN

# CONFERENCE



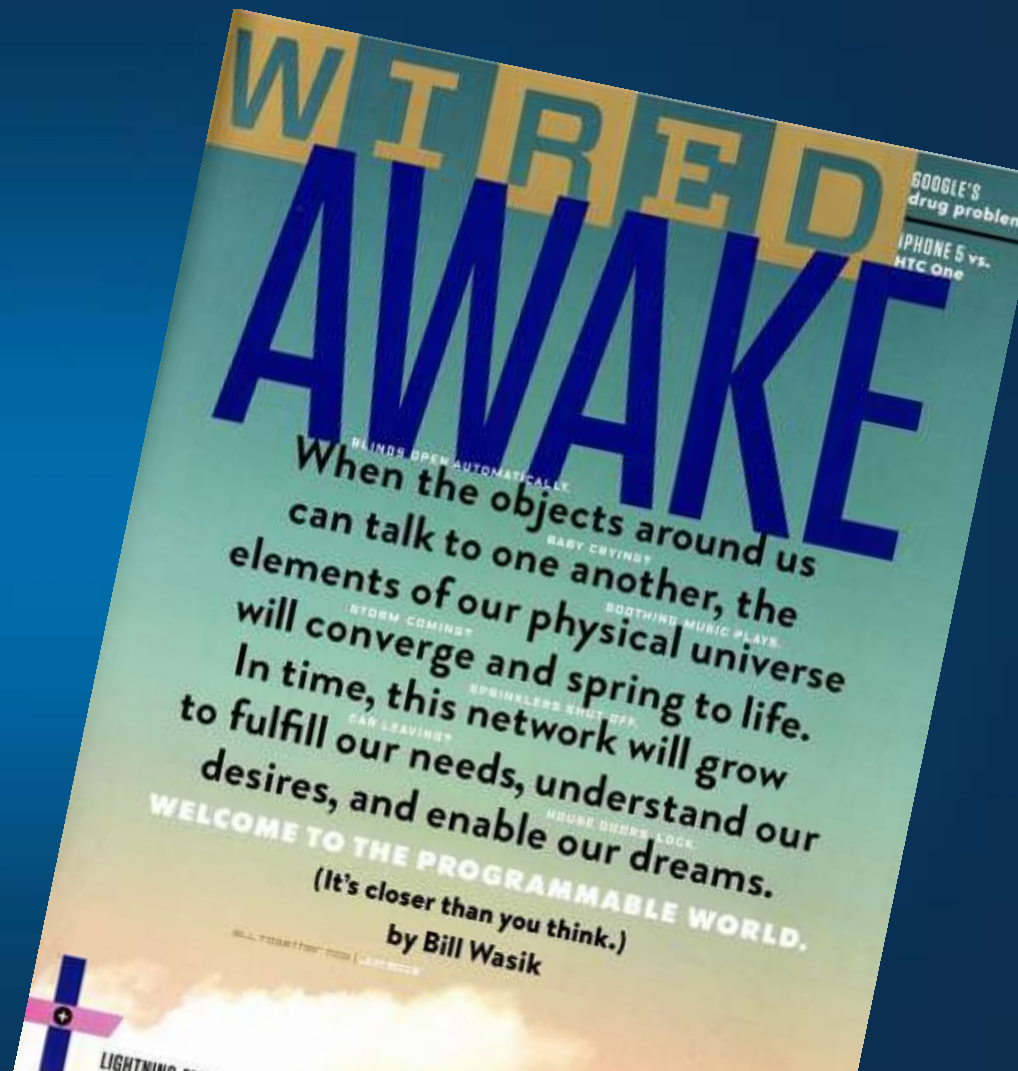
Georg Plasswilm  
Northern Region Manager



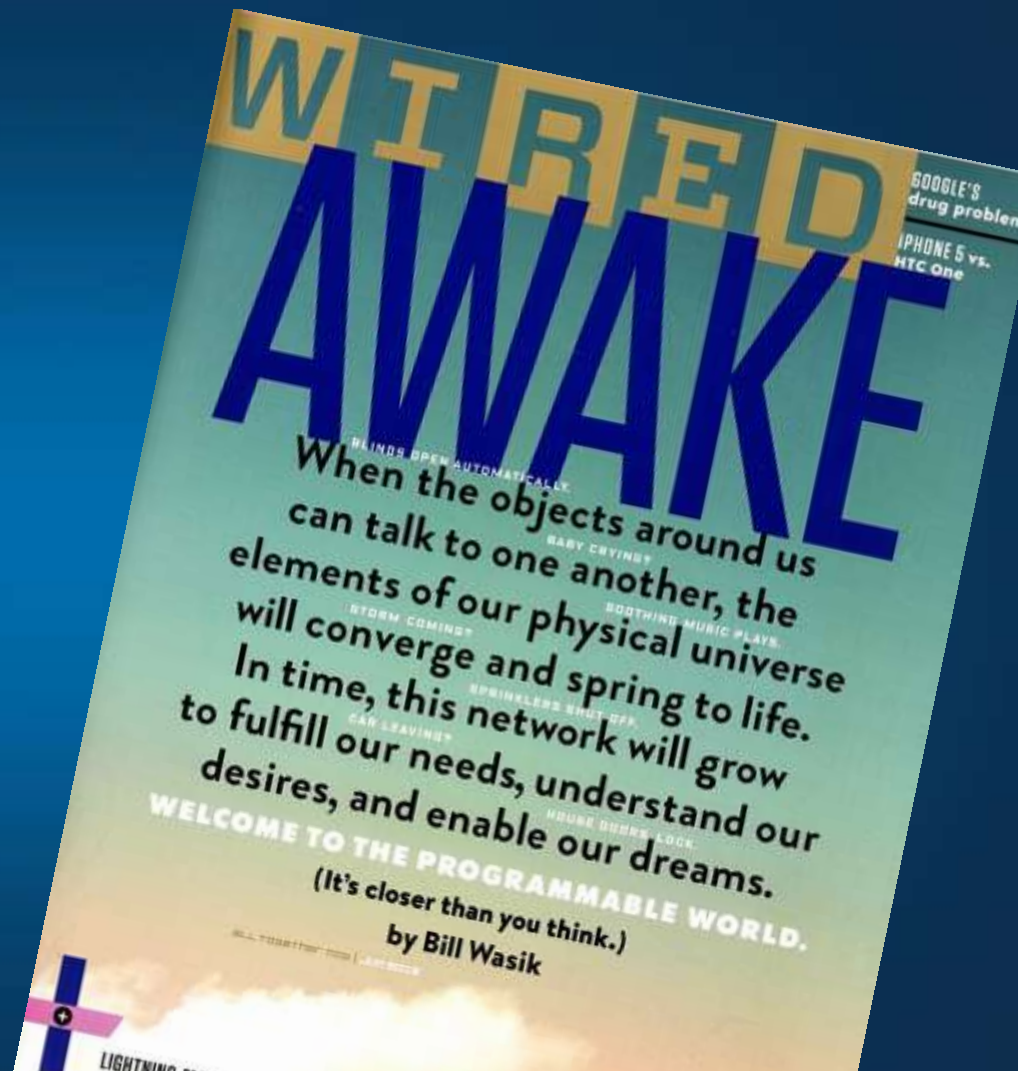
Charles Schroeder  
Director of Test Systems

# Innovating in a Platform-Based World

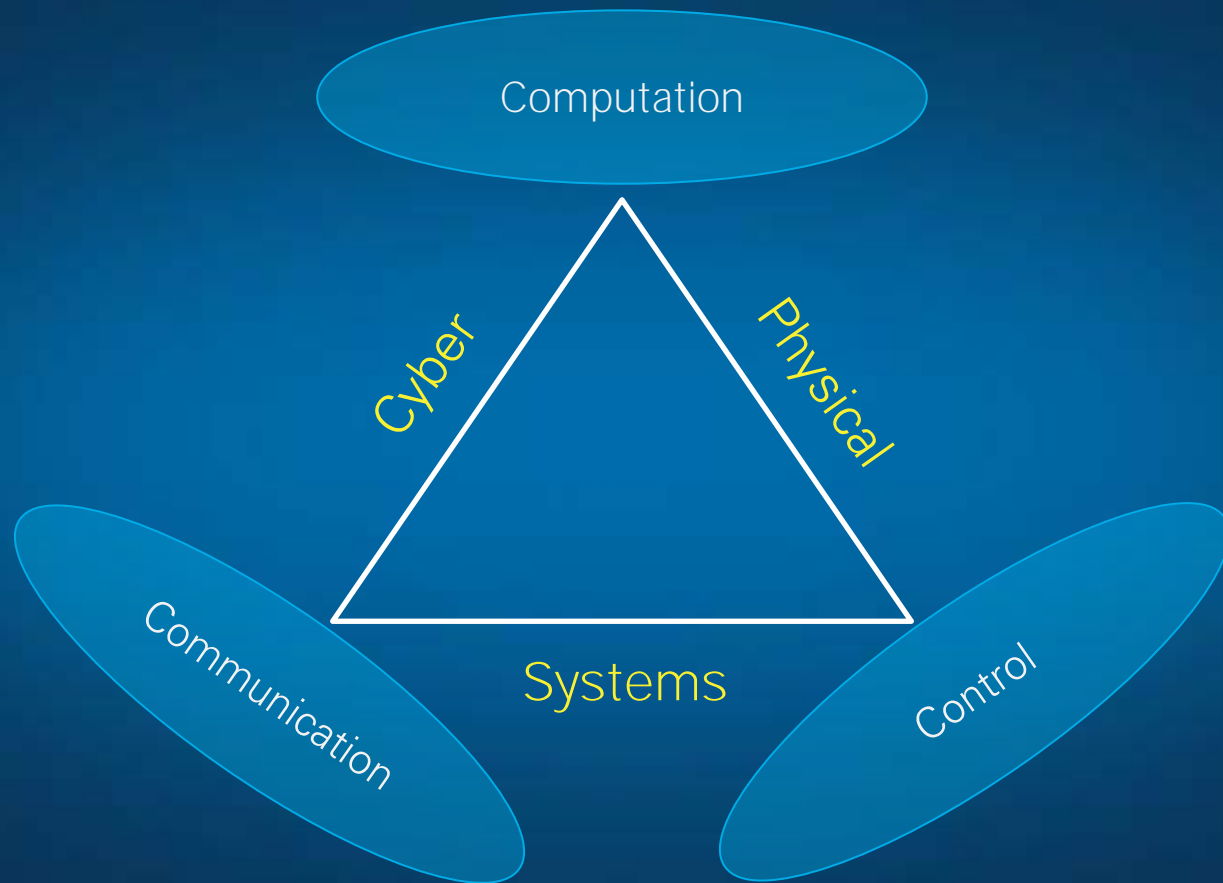
## The Programmable World



Industrie 4.0  
Internet of Things  
Big Analog Data™ Solutions  
Intelligent Systems  
Smart Factory  
M2M  
Industrial Internet









Computation

“Cyber-physical systems (CPSs) will transform entire industrial sectors, including transportation, healthcare, energy, manufacturing, and agriculture. There is an urgent need to develop design methodologies that will provide real-time, guaranteed performance.”

–Vijay Kumar, Assistant Director for Robotics and Cyber-Physical Systems,  
Office of Science and Technology Policy at the White House



Extra equipment needed.





Are You Wearing a Watch?



3G



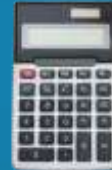
# 8:30

Tuesday, 6 August

## Instruments



## Physical Embedded Systems



## Virtual Instruments



## Platform-Based Embedded Systems



# PC Platform





# Web Platform



# Mobile Platform



# Graphical System Design



Measurement



Test



Monitoring



Embedded



Control



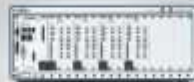
Desktops and  
Laptops



NI CompactDAQ



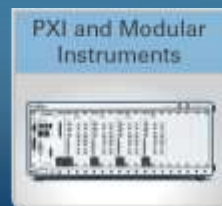
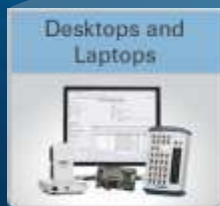
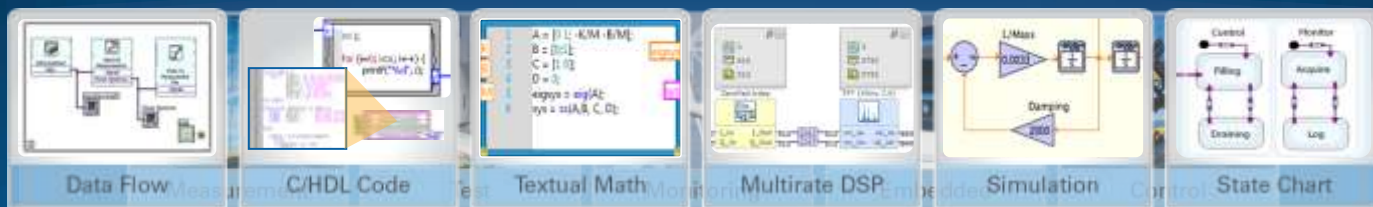
PXI and Modular  
Instruments



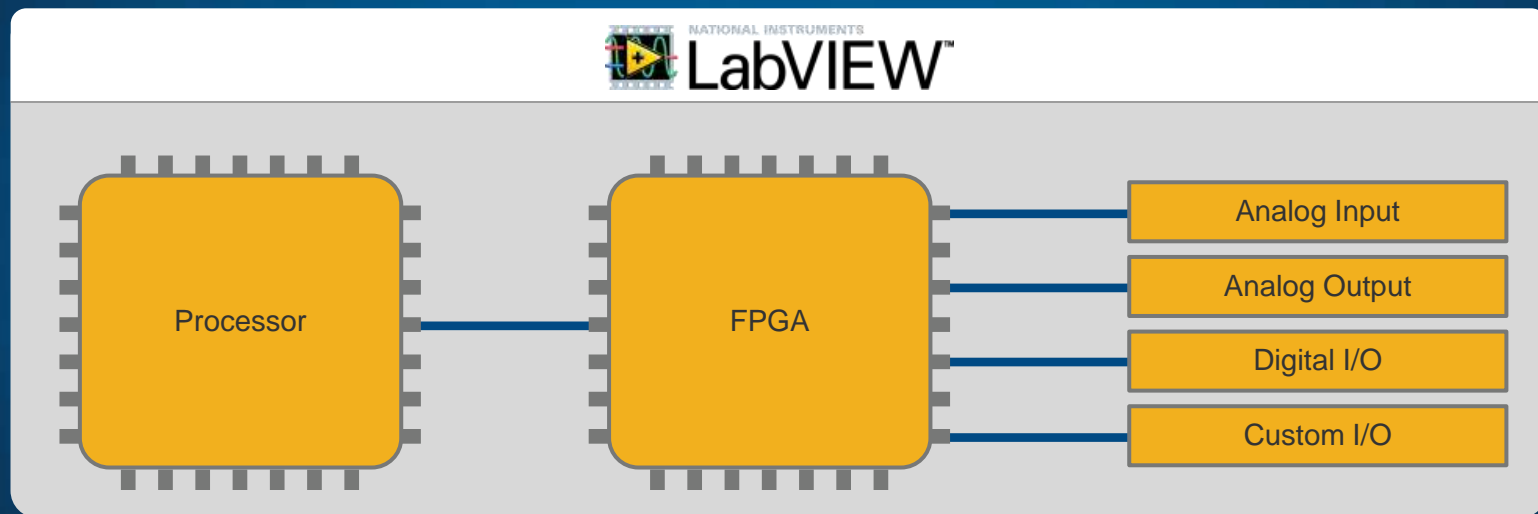
NI CompactRIO



# Graphical System Design



# LabVIEW RIO Architecture





# Graphical System Design



Measurement



Test



Monitoring



Embedded



Control



Desktops and  
Laptops



NI CompactDAQ



PXI and Modular  
Instruments



NI CompactRIO





“In the past year I have been struck again and again by how important measurement is to improving the human condition.”

–Bill Gates

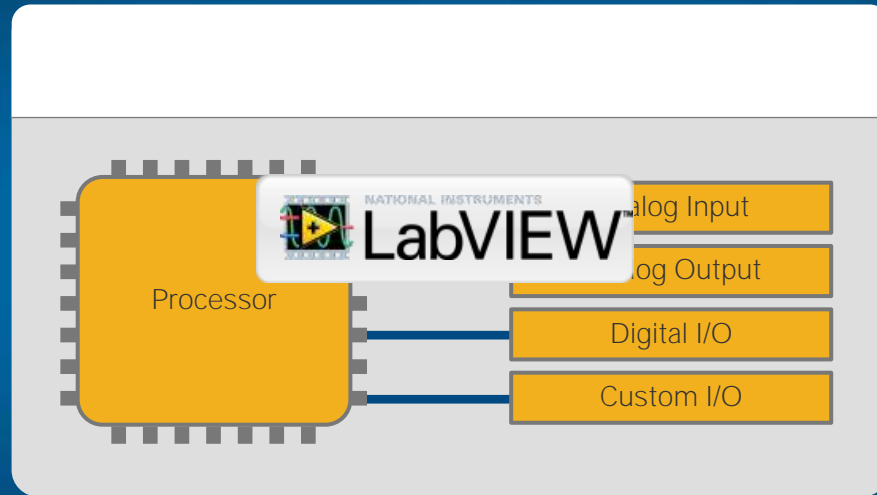
PCI Express

USB

PXI Express

Ethernet

WiFi



Voltage

Temperature

Strain

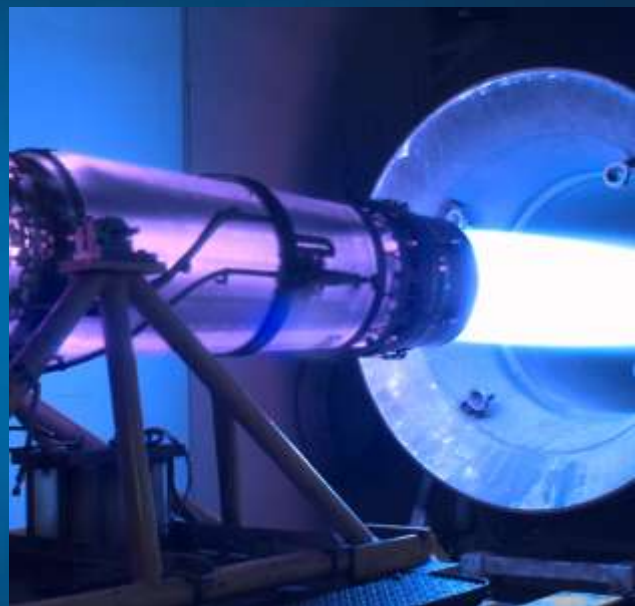
Acceleration

Motion



Rik Prins

Application Engineer Specialist, NI





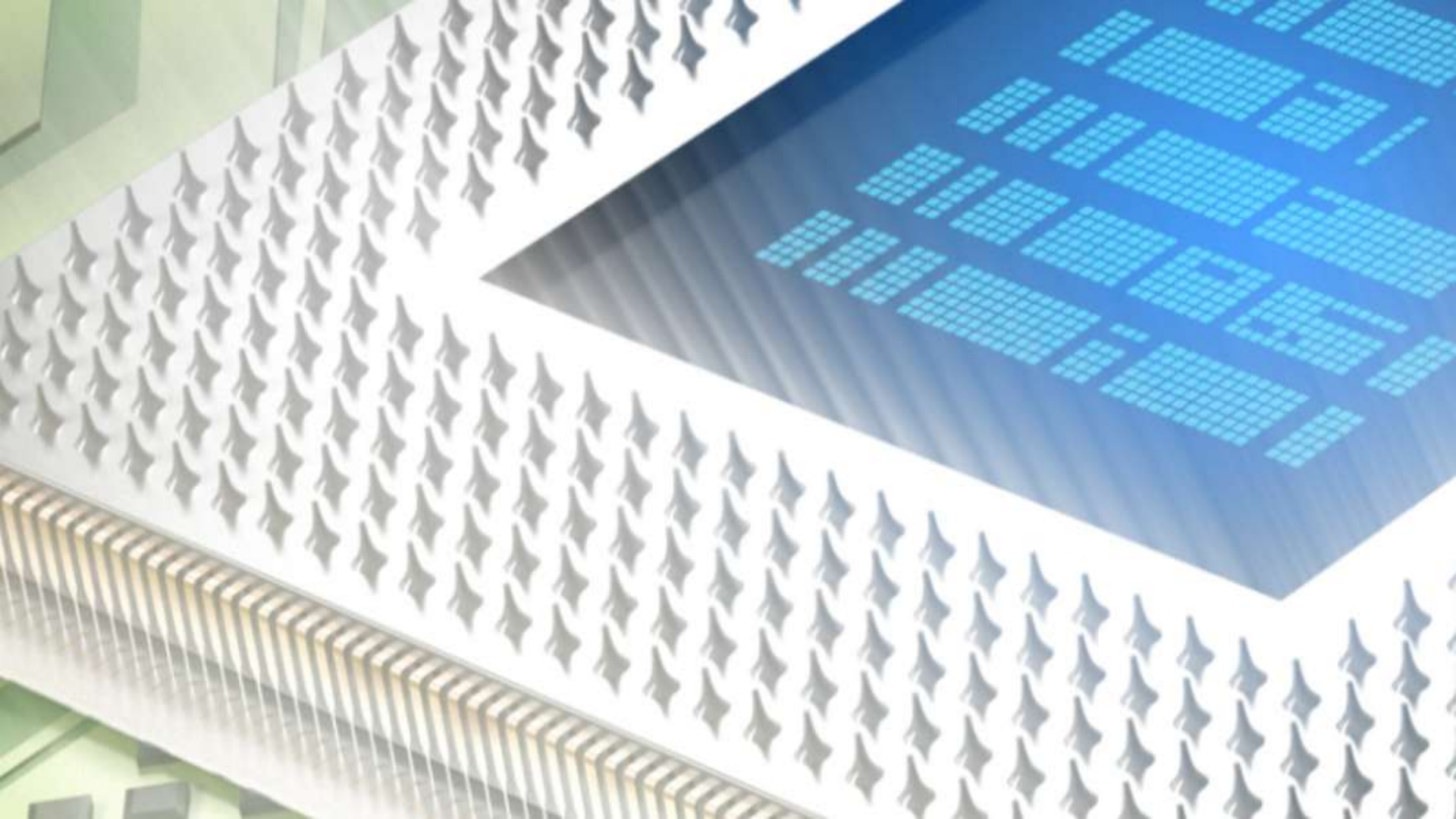
# NI CompactDAQ



# Rugged Ethernet Chassis

NI cDAQ-9188XT







***ISA  
BUS***

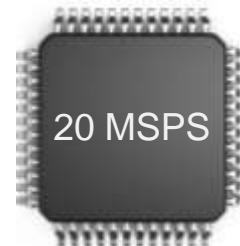
Data Bus



Processors



FPGAs



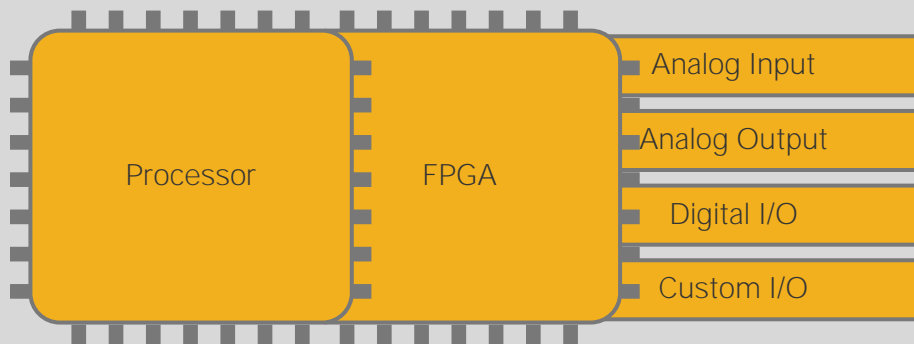
Converters



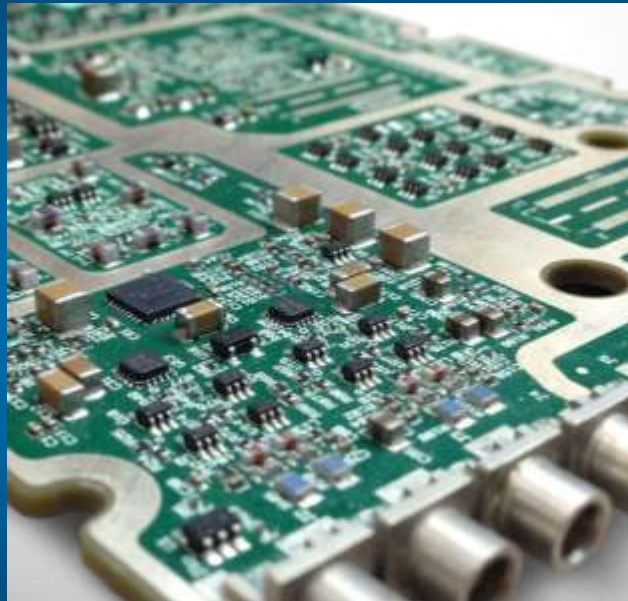


NATIONAL INSTRUMENTS

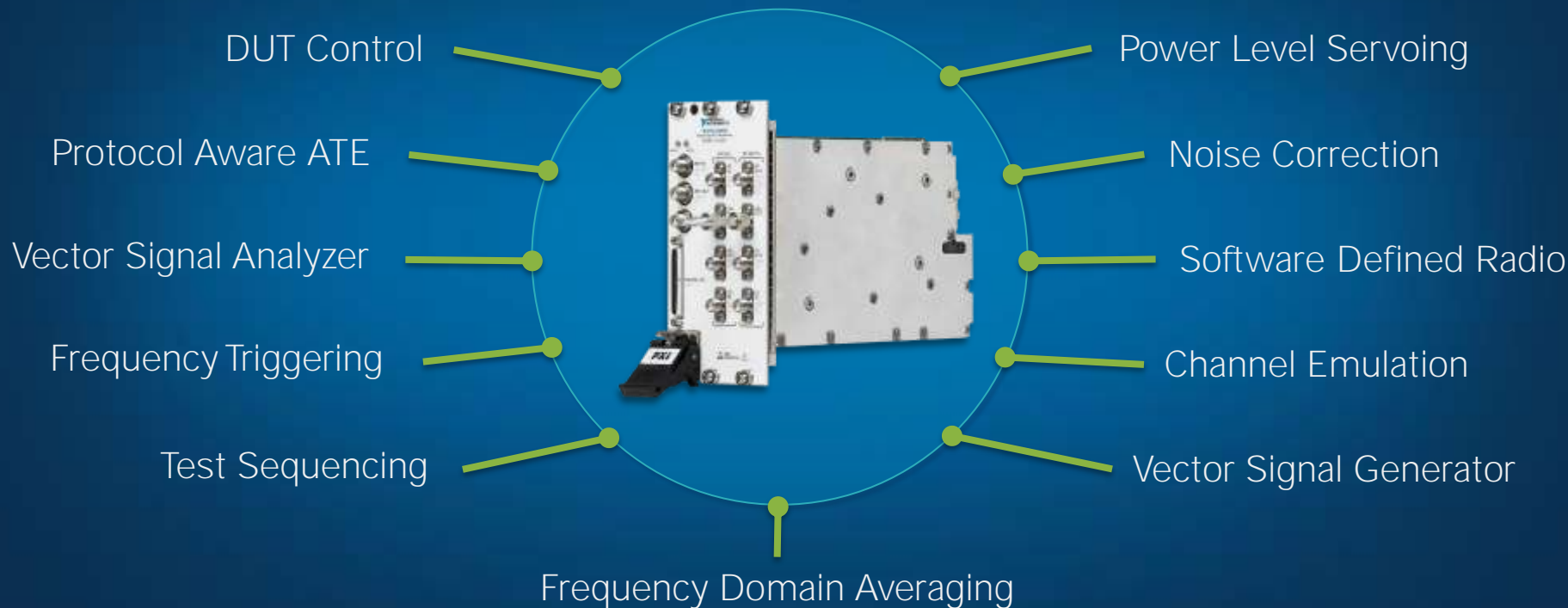
LabVIEW™



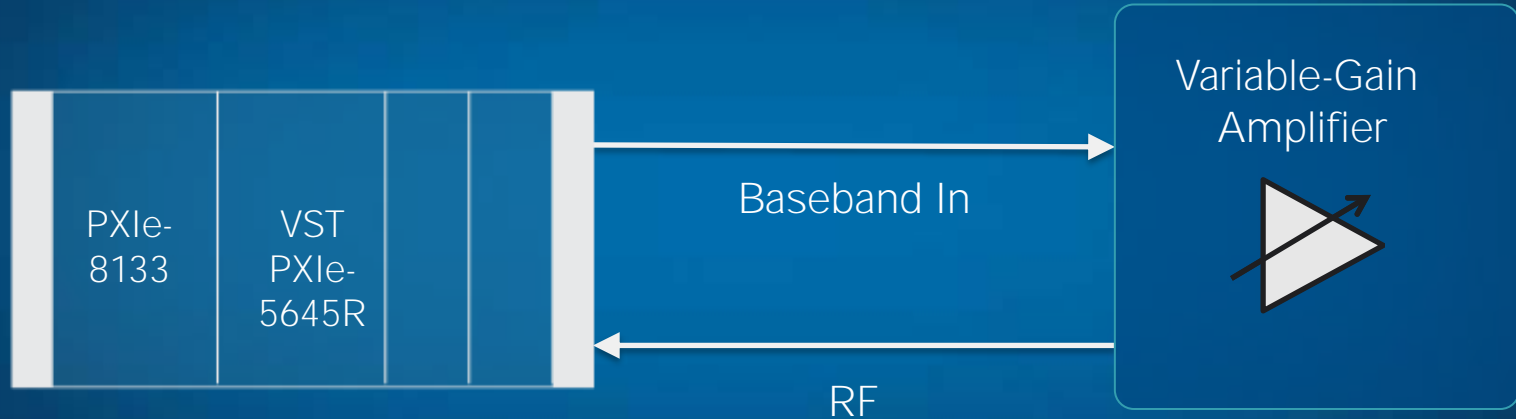




# Vector Signal Transceiver



# Testing Modern RF Transmitter Front Ends



# Two Programming Options for NI VSTs

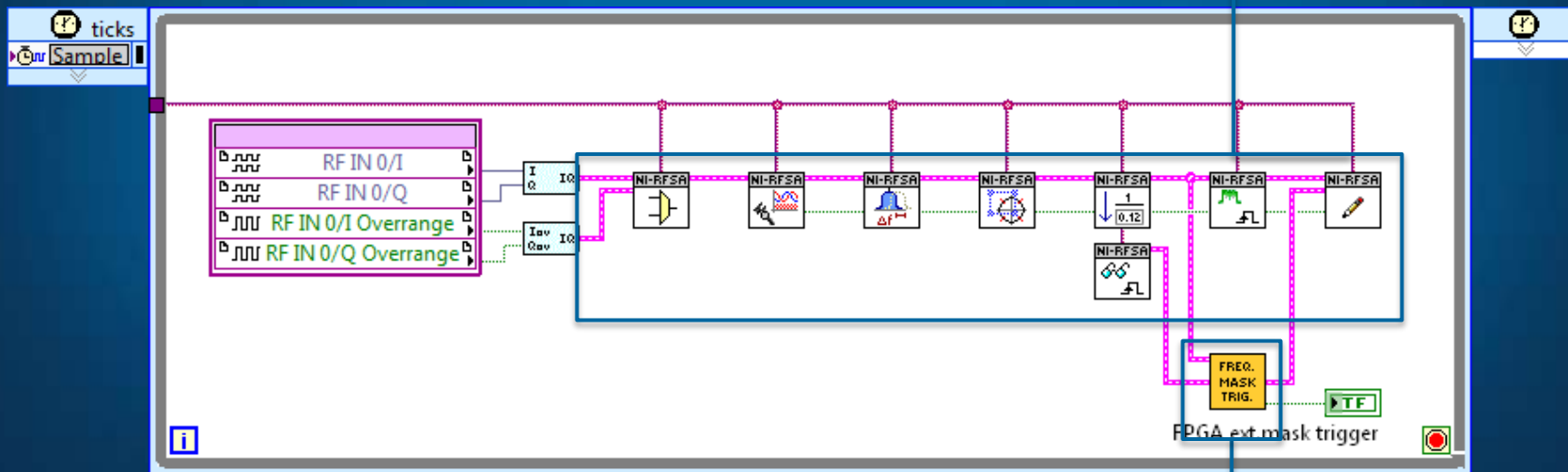
The *compatibility* of industry-standard instrument drivers



The *flexibility* of the LabVIEW RIO architecture

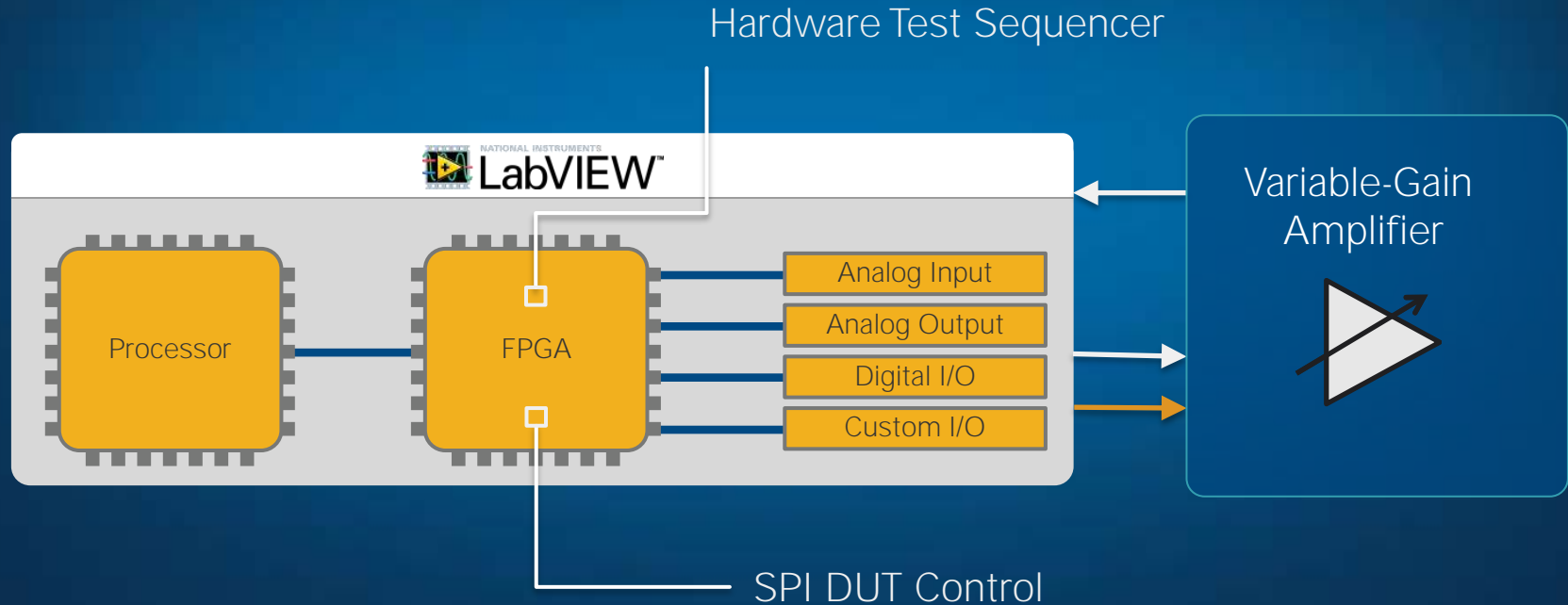
# Instrument Driver FPGA Extensions

NI Instrument Driver FPGA VIs



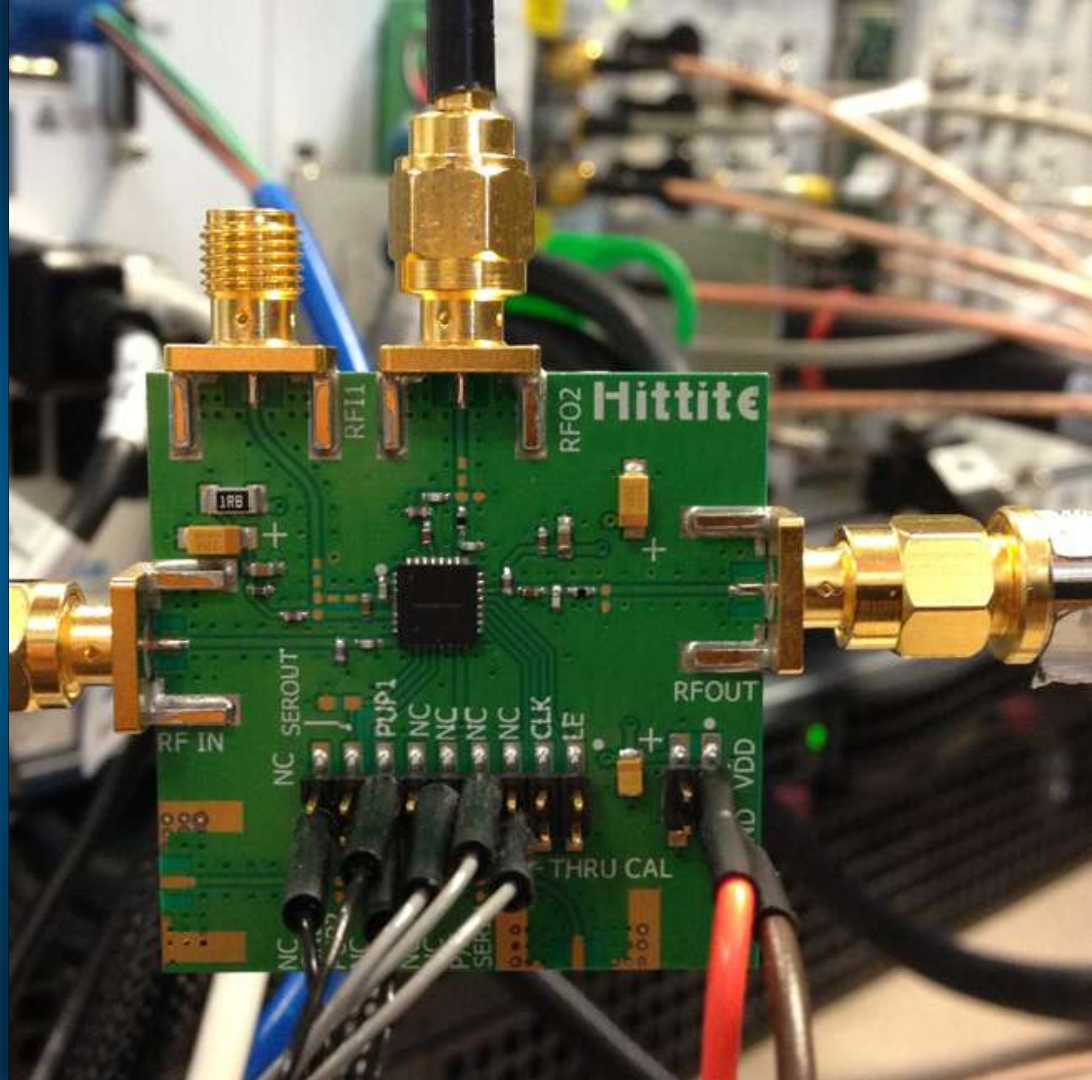
Application or User FPGA VI

# Test System With Instrument Driver FPGA Extensions



# RFIC Production Test Application

- Using instrument driver FPGA extensions
- 30X lower test times
- Increased test coverage





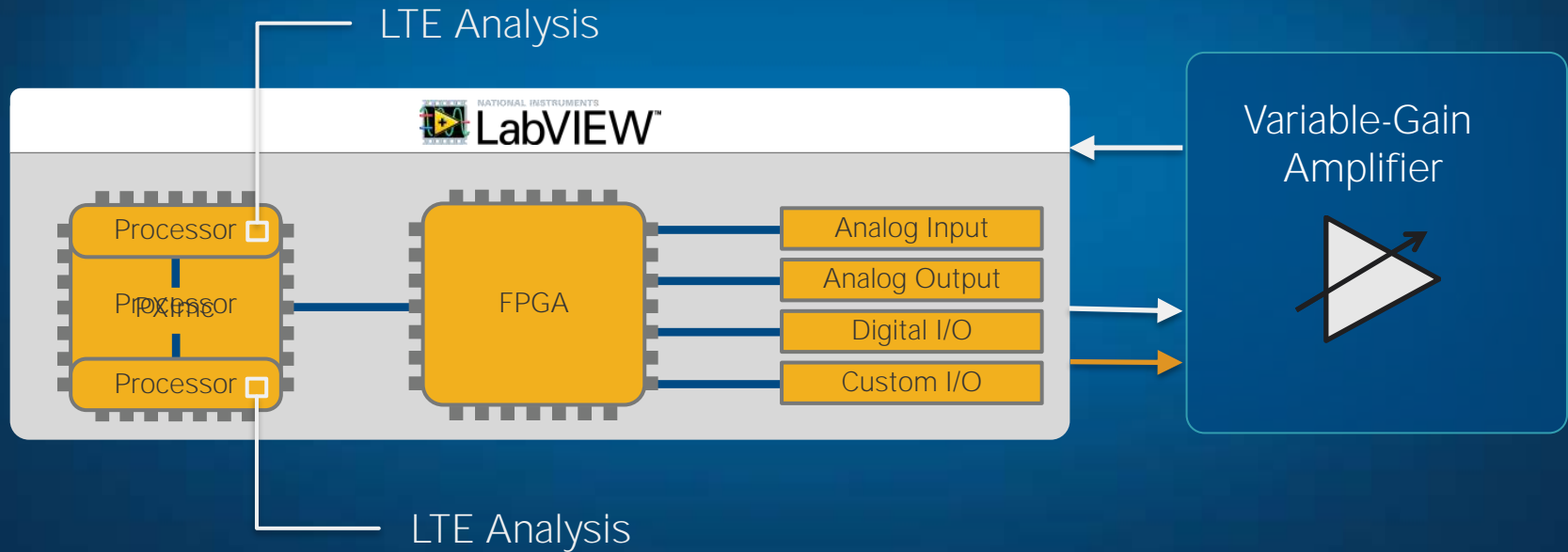
# Industry's First PXImc Adapter Module

NI PXIe-8383mc





# Test System With PXI MultiComputing



Anteverta-mw B.V.

## Test Equipment for RF Power Amplifier Design

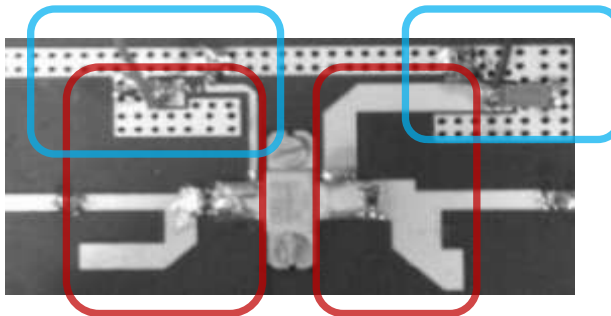
Mauro Marchetti



# Load-Pull Measurements

A typical microwave amplifier circuit

Bias circuits (baseband)

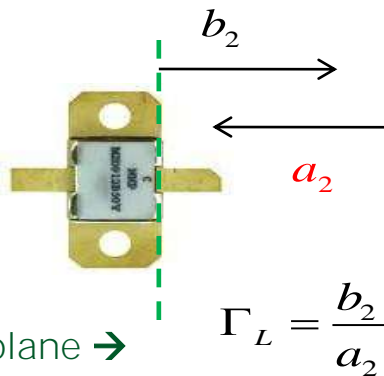


Input match @  $f_0$ ,  $2f_0$ , etc

Output match @  $f_0$ ,  $2f_0$ , etc

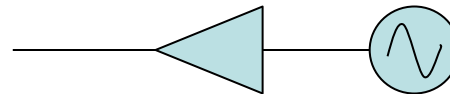
Load-Pull

→ Provides the same test conditions to the device  
**“without the need to actually build the circuit”**



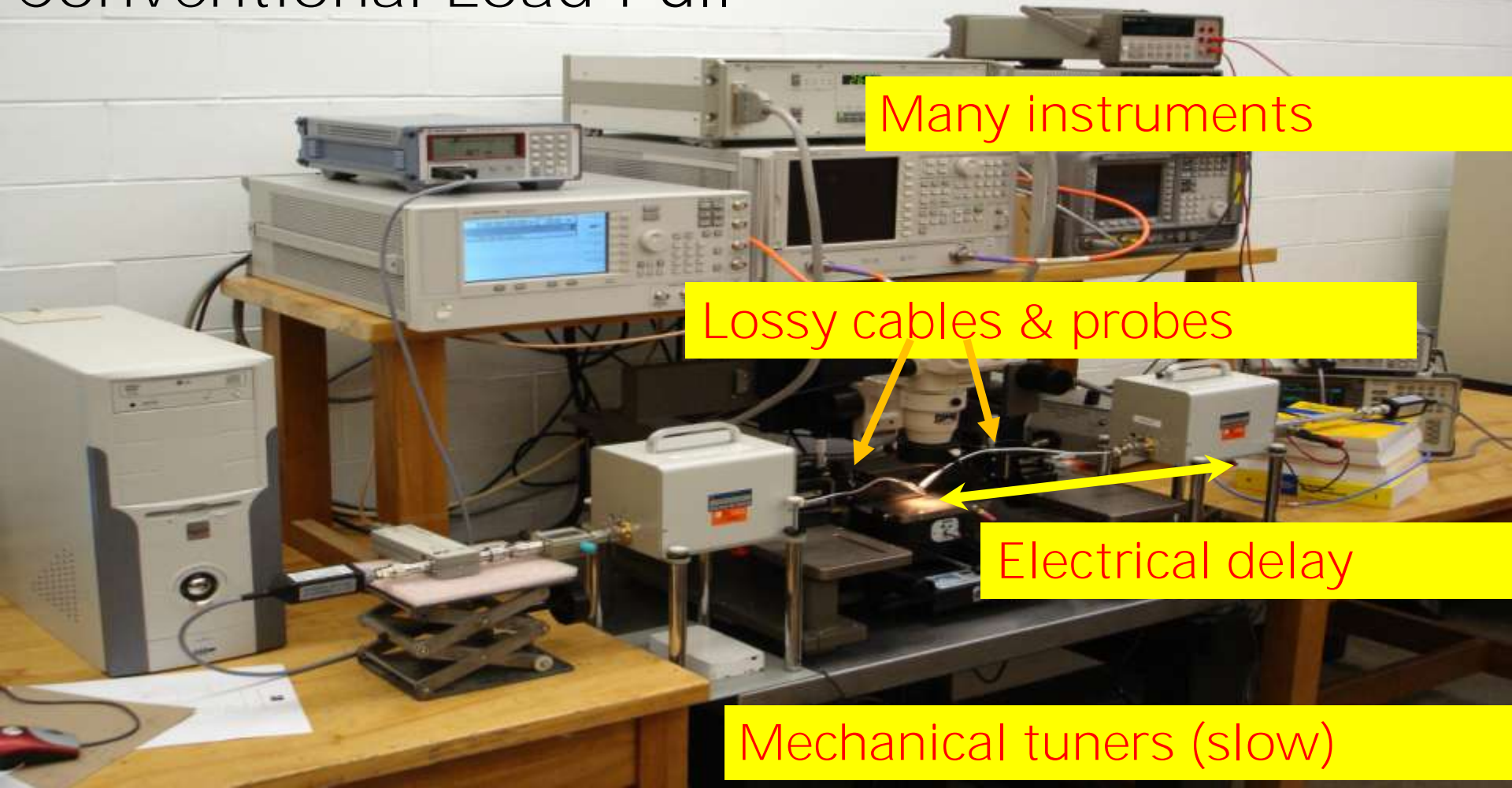
Passive tuners

Active signal injection..?



Reference plane →

# Conventional Load-Pull



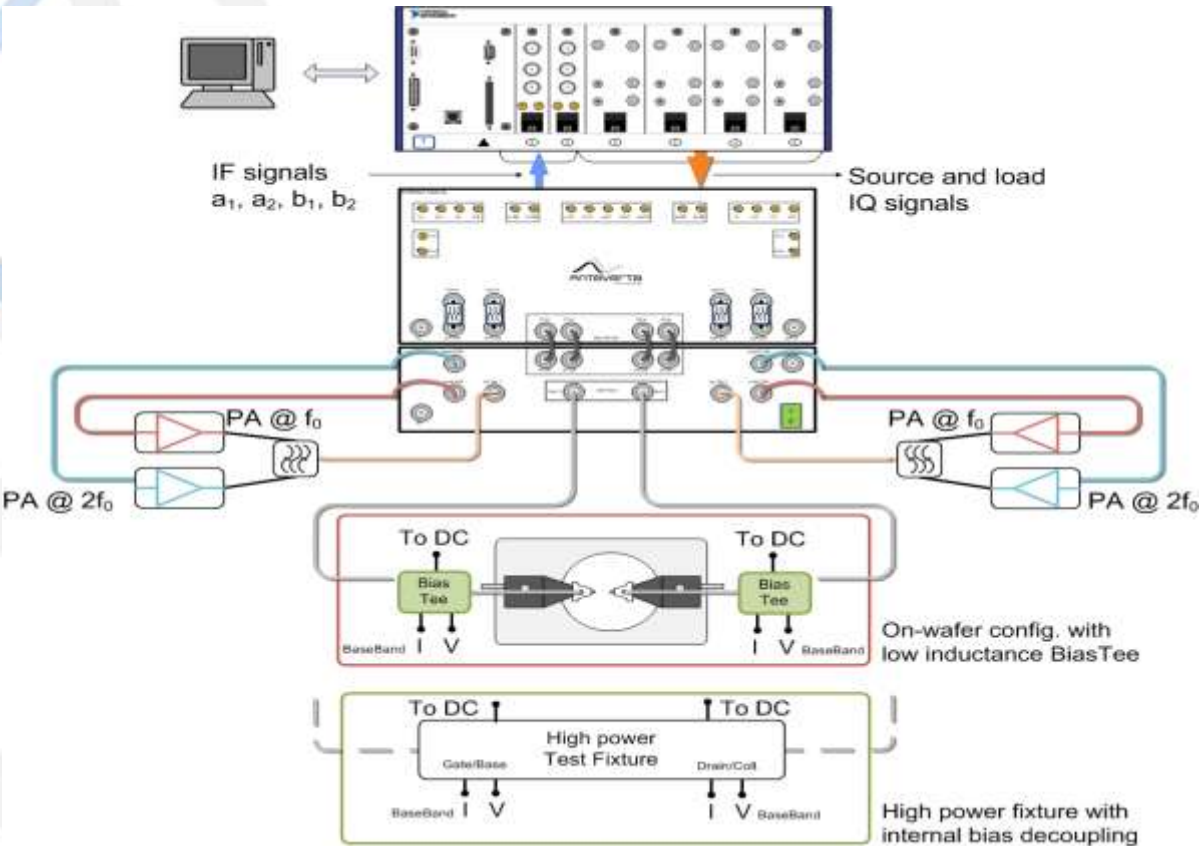
Many instruments

Lossy cables & probes

Electrical delay

Mechanical tuners (slow)


# System



- 4x PXIe-5450 AWGs to generate wideband signals
- 3x PXIe-5122 A/D converters + digital signal processing to measure wideband reflection coefficients
- Up to 240 MHz modulation bandwidth.
- The RF test-set up-converts the baseband signals to RF frequency and down-converts the a and b waves for S-parameters measurements
- Available in 0.4 – 18 GHz , 0.5 – 26 GHz and 0.5 – 40 GHz frequency bands.





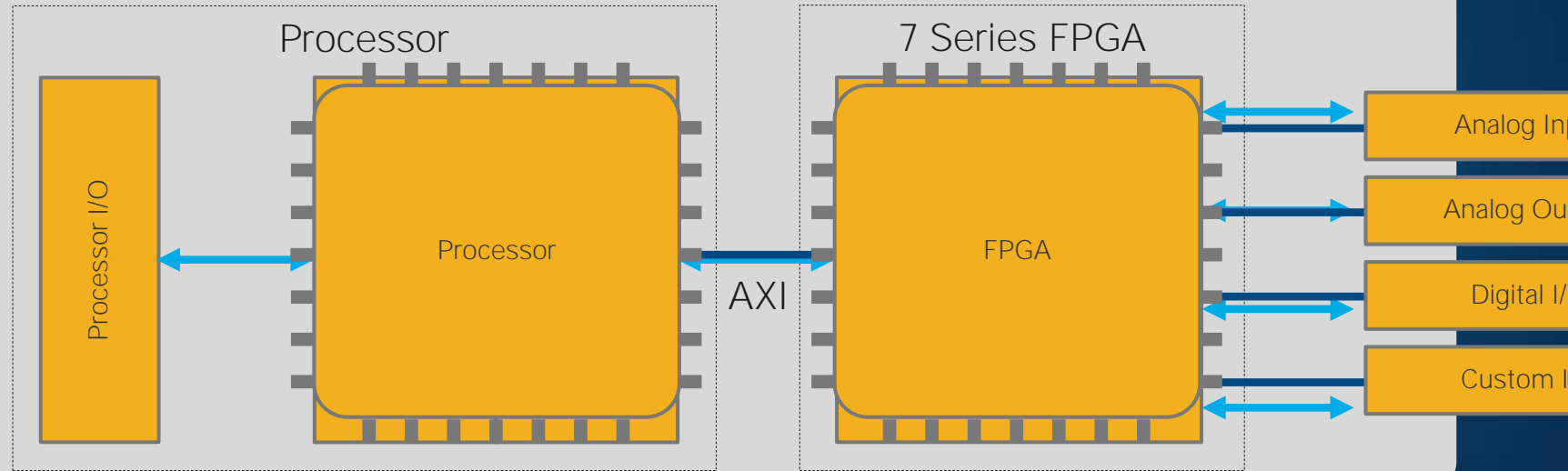


“Abbott buys laser cataract specialist OptiMedica for \$400M.”

*—optics.org*



# Zynq All Programmable SoC





# Software-Designed Controller

## NI cRIO-9068



# Software-Designed Controller

## NI cRIO-9068



# NI Real-Time OS History



1999

Phar Lap  
ETS



2004

RTX



2006

VxWorks



2007

NI ETS on  
Multicore



2009

NI Hypervisor



2013

NI Linux  
Real-Time

# Linux Community



Database

Raima  
MySQL  
SQLite  
MongoDB  
CouchDB



Security

OpenVPN  
IPTables  
System Logging  
fail2ban  
denyhost



Code Reuse

C/C++  
Shell Scripting  
Python  
Ruby  
Perl



Connectivity

Isshd  
IPv6  
SNMP  
NTP  
netstat



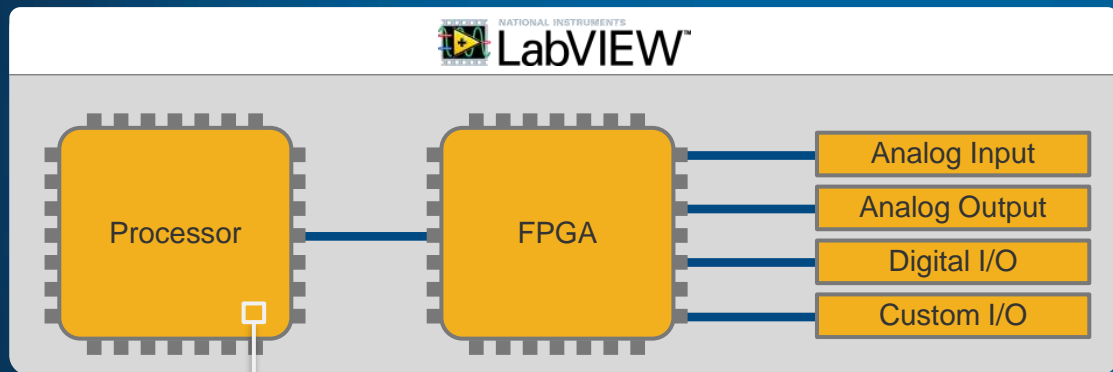
eclipse



C/C++



NI cRIO-9068

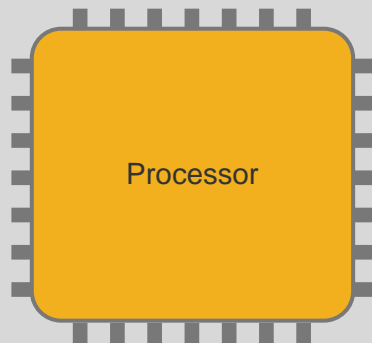


LabVIEW Tools  
Network Add-Ons

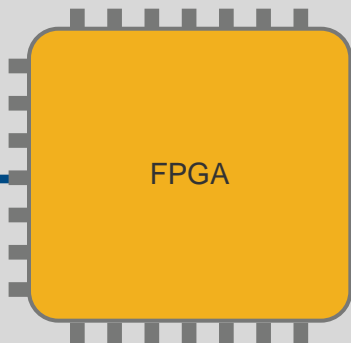


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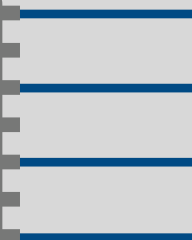
LabVIEW™



Processor



FPGA

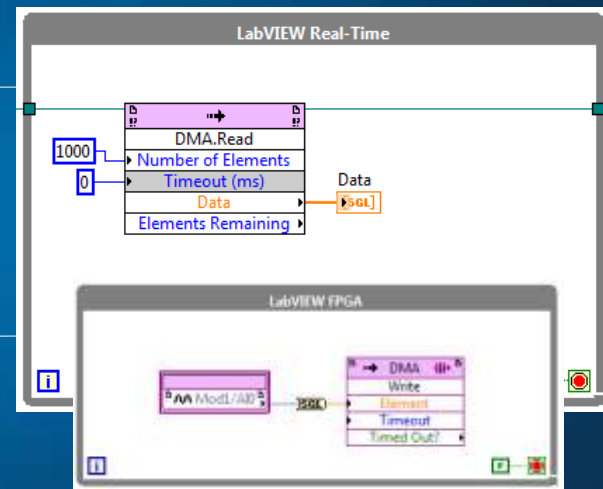
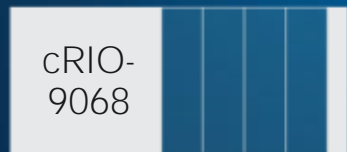
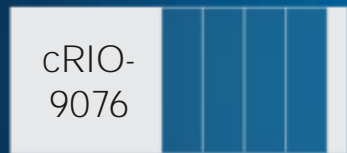
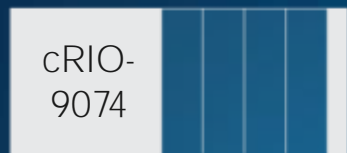


Analog Input

Analog Output

Digital I/O

Custom I/O







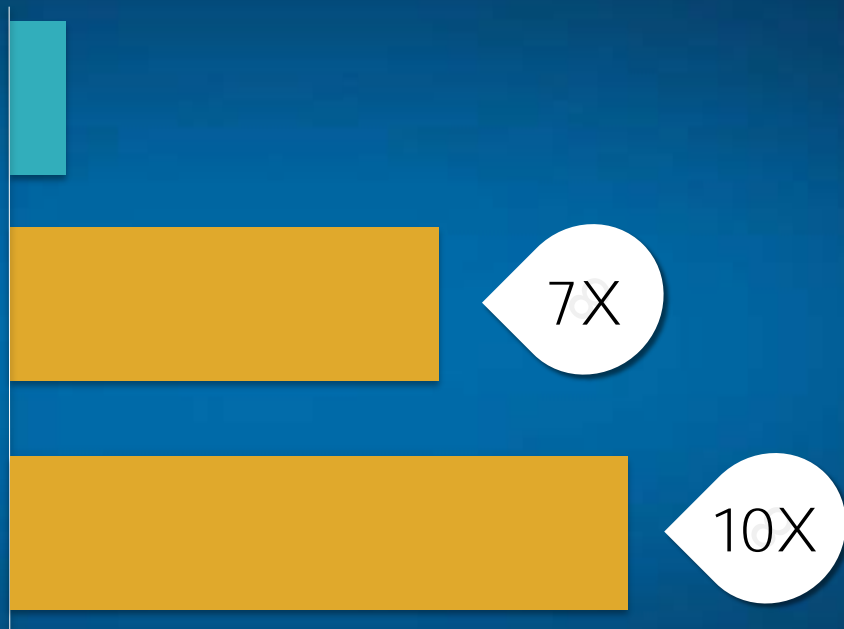
Competitor

cRIO-9074

cRIO-9068

7X

10X



# Graphical System Design



Measurement



Test



Monitoring



Embedded



Control



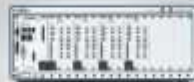
Desktops and  
Laptops



NI CompactDAQ



PXI and Modular  
Instruments



NI CompactRIO





William Baars  
Area Sales Manager, NI

# NI Supports Your Success

Through extensive services and Alliance Partner networks

Your Solution

Your Team

Engineering, Services, and More

Alliance Partners

Integration and Consulting

NI Services

Training, Calibration, Maintenance, and More

NI Products

Ecosystem and Community

Users, IP, Add-Ons, and More

A world map with a dark blue background. The landmasses are shown in a lighter blue/white color. Numerous red circular pins are scattered across the map, indicating locations. There is a high concentration of pins in North America (USA and Canada), Europe, and Australia. Smaller clusters are visible in South America, Africa, and Asia.

700+ Alliance Partners  
1,000+ Locations, 60+ Countries

# NI Alliance Partners



Consulting



Integration



Product Ecosystem





# Carya Automatisering

10 JAAR Delft



- Test- en Meetopstellingen
- Projecten en ondersteuning
- Meedenken, oplossingsgericht
- Ondersteuning in product- ontwikkeling, prototyping
- Pilot plants: chemie, farmacie
- Turnkey, van sensor tot en met bedrade kast



1 oktober 2013

Logistics

Healthcare

Automotive

Industrial Automation

Machine & Systems

Energy



- High-end Software engineering company
- ~78 mio EUR turnover (2012)
- ~780 fte in Netherlands, Germany and Poland
- Highly educated, number of expertise fields
- Founded in 1978, listed since 1997 (NYSE Euronext Amsterdam)



# **Test & Measurement Solutions**



Test and Quality Data Management  
In the cloud

**FREE  
TRIAL**

Plug in with NI TestStand or LabView – Collect, store and  
analyze test data in the cloud

**Support others with  
Test Data**



- ✓ Support and consultancy in the area of measurement and automation applications based on LabVIEW and/or TestStand
- ✓ Custom LabVIEW software development
- ✓ Automated Test and Measurements Systems
- ✓ Machine Vision and Motion
- ✓ Machine automation
- ✓ Training in LabVIEW (object oriented) software architecture
- ✓ LabVIEW Realtime, FPGA



[www.vi-tech.nl](http://www.vi-tech.nl)





# fastATE

Do not start the design of your ATE from scratch anymore!

Develop your ATE using intelligent high level blocks (modules!)



fastATE<sup>®</sup> Technology

6TL

INVENTING THE FUTURE OF ATE INTEGRATION

Reduce the wiring of your ATE!

Same software platform for everything involved in your ATE



Reduce your overall ATE development time by 70%



THE 10 MOST FREQUENTLY MADE MISTAKES,  
WHEN DESIGNING AND BUILDING A TURN-KEY  
PRODUCTION TEST PLATFORM FOR PCB'S



## ROMEX



NI – PARTNER PRESENTATION  
15H35-16H20 – TRACK C



Virginia Panel Corporation

# Thank you!



Test & Measurement  
Solutions

 **PCB** PIEZOTRONICS<sup>INC.</sup>

**VIT** echnologies

ingun<sup>®</sup>

  
**ROMEX**  
 

 Klein Wolterink / automation

  
**CARYA**  
AUTOMATISERING

**WIRE**  
*flow*  
wireflow.nl

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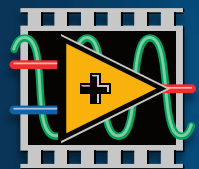
**INCDA**  
COMPUTERS

**avans**  
hogeschool

**ICT** Automatisering

 **Fontys**





NATIONAL INSTRUMENTS

LabVIEW™ 2013



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