NDIA ATC Meeting
Commercial Liaison Report

Christer Ljungdahl

March 26th, 2019

AGENDA

- News (Mergers/Acquisitions/Spin Offs/Announcements)

- Technology Trends

- PXI, VXI, AXIe, LXI Updates

NEWS -Trends

Keysight Technologies, Inc. (NYSE: KEYS), a leading technology company that helps enterprises, service providers, and governments accelerate innovation to connect and secure the world, announced that the company has extended its collaboration with China Telecom to accelerate commercial deployment of 5G technology.

Viavi Solutions Inc. (VIAVI) (NASDAQ: VIAV) today announced the launch of CellAdvisor 5G, the next-generation base station analyzer used by mobile service providers globally, which is capable of validating and troubleshooting 5G radio access.

Teradyne, Inc. (NYSE:TER), a leading supplier of automated test solutions, announced today the release of the UltraSerial60G, the industry's first test solution with the ability to test 60Gbps serial interfaces in 5G, automotive and networking.

NEWS - Trends

Rohde & Schwarz and Prisma Telecom Testing demonstrate 5G standalone mode testing at MWC 2019. Test and measurement specialist Rohde & Schwarz and Prisma Telecom Testing, a leading supplier of performance testing solutions, have successfully completed the verification of a 5G NR standalone registration including data transfer.

Radisys and NI Collaborate on End-to-End 5G Platform today announced the joint delivery of an end-to-end 5G platform that enables mobile operators and chipset manufacturers to validate and begin monetizing their 5G solutions now. The solution integrates Radisys' 5G protocol stack with NI's test equipment with 5G PHY and New Radio (NR) that connects over the air in millimeter and sub-6 GHz radio bands.

Keysight Technologies, Intel Mobile Communications Denmark, Telenor Denmark, and Aalborg University Complete Project Virtuoso Aimed at Trialing New 5G Technologies. Keysight's virtual drive testing tools help research partners benchmark base stations and mobile devices in field-realistic lab environment

NEWS - Trends

Rohde & Schwarz and Huawei successfully perform LTE-V interoperability tests to make connected vehicles reality. Rohde & Schwarz and Huawei have successfully tested the interoperability of LTE-V connected vehicles with the R&S CMW500 wideband radio communication tester using the embedded Huawei Balong 765 IC as an LTE-V UE.

Keysight Technologies, Nordsys Combine V2X/C-V2X Testing Solutions. Keysight Technologies, Inc. (NYSE: KEYS), a leading technology company that helps enterprises, service providers and governments accelerate innovation to connect and secure the world, today announced a new alliance with Nordsys GmbH to combine the two companies cellular vehicle-to-everything (C-V2X) and testing competences.

Rohde & Schwarz collaborates with Vector to deliver Cellular-V2X end-to-end application layer test solution
Rohde & Schwarz has announced a collaboration with automotive E/E networking specialist Vector on a state-of-the-art cellular vehicle-to-everything (C-V2X) application layer test solution.

NEWS - Trends

Keysight Technologies, CharIN Collaborate to Accelerate the Combined Charging System for Battery Powered Electric Vehicles. Keysight Technologies, Inc. (NYSE: KEYS), a leading technology company that helps enterprises, service providers, and governments accelerate innovation to connect and secure the world, is now a member of the CharIN e.V. association which speeds the advancement of the Combined Charging System (CCS) for battery powered vehicles.

National Instruments and ETAS Set-up Joint Venture to Meet Evolving Needs in Automotive Electronics Software Validation National Instruments (Nasdaq: NATI) and ETAS GmbH have signed definitive agreements to jointly design, build, and service pre-integrated Hardware-in-the-Loop (HiL) systems. By pooling their strengths both companies strive for improving test and validation of software in automotive electronics, including electronic control units (ECUs) and sensors, to meet current and future customer requirements. Each company will own 50 percent of the joint venture, which will be headquartered in Stuttgart, Germany.

NEWS – New Products

New Dual-Channel Multimeter from Tektronix Combines Highest Density with Industry Leading Performance. Tektronix, Inc., a leading worldwide provider of measurement solutions, today introduced the Keithley DMM7512 dual channel 7½-digit sampling multimeter that packs two independent and identical digital multimeters into a low profile 1U high, full rack width space-saving enclosure.

Rohde & Schwarz presents VNAs with multiport architecture for measurements from 100 kHz to 40 GHz. The new R&S ZNBT40 from Rohde & Schwarz is the first vector network analyzer (VNA) with a broad frequency range from 100 kHz to 40 GHz and up to 24 integrated test ports. Developers can use it for applications such as measurements on 5G antenna arrays.

Keysight Technologies Launches First Integrated Dual Channel 44 GHz Vector Signal Generator with 2 GHz Bandwidth. Keysight Technologies,…, today launched the first dual-channel microwave signal generators that support up to 44 gigahertz (GHz) signals and 2 GHz radio frequency (RF) modulation bandwidth in a single instrument.

NEWS – New Products

Astronics Test Systems received an Innovators Award for its ATS-6100 WFT (Wire Fault Tester) from Military & Aerospace Electronics Magazine. Introduced in September 2018, the ATS-6100 WFT received platinum level honors in the test equipment category. Combining patented low energy, high voltage (LEHV) and spread spectrum time domain reflectometer (SSTDR) technologies, it safely and precisely locates both hard and soft faults in wiring and insulation.

Marvin Test Solutions Expands User-Programmable PXIe FPGA Product Line
The GX3800e employs the Altera Cyclone V FPGA, which supports data rates up to 3.125 Gb/s and features over 300,000 logic elements and 12.2 Kb of user memory. The GX3800e uses a daughter card for the I/O physical layer and these cards can be commercial off the shelf VITA 57 FMC (FPGA Mezzanine Card) modules,

NI (Nasdaq: NATI), the provider of a software-defined platform that helps accelerate the development and performance of automated test and automated measurement systems, today announced the FPGA-enabled PXIe-5785 FlexRIO transceiver,which aims to shorten the design cycle for advanced radar applications in aerospace and defense.
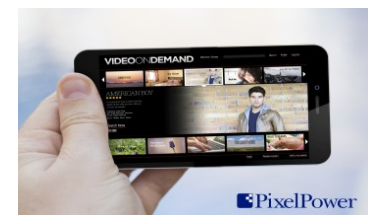
NEWS - Acquisitions

Astronics Corporation Completes the Sale of its Semiconductor System Level Test Technology Astronics Corporation (Nasdaq:ATRO), a leading provider of advanced technologies for the global aerospace, defense, and semiconductor industries, announced today that it has closed the previously announced sale of the intellectual property and certain assets associated with its semiconductor test product line to Advantest Corporation

Teradyne and Lemsys Announce Teradyne's Acquisition of Lemsys SA, Leading Provider of Test Equipment for High Power Semiconductor Industry. Teradyne, Inc. (NASDAQ:TER) and the shareholders of Lemsys SA ("Lemsys") today announced the acquisition of privately held Lemsys of Geneva, Switzerland. The 21-person company will remain in Geneva with current management and staffing.

Rohde & Schwarz has acquired Pixel Power Ltd., a technology leader in television branding, graphics, automation, master control and playout. With this acquisition Rohde & Schwarz is executing its plan to expand further in broadcast playout while taking ownership of a company with significant technological leader- ship. The subsidiary will be renamed "Pixel Power Ltd. - A Rohde & Schwarz Company".

NEWS – Acquisitions

Teledyne to Acquire Scientific Imaging Businesses of Roper Technologies
Teledyne Technologies Incorporated (NYSE:TDY) ("Teledyne") and Roper Technologies, Inc. (NYSE:ROP) ("Roper") jointly announced today that they have entered into a definitive agreement under which Teledyne will acquire the Scientific Imaging businesses of Roper for $225 million in cash. The Scientific Imaging businesses include Princeton Instruments, Photometrics and Lumenera, as well as other brands.

NEWS

Keysight Technologies to replace CA on S&P 500

Keysight Technologies Inc. KEYS, -0.44% will become the newest addition to the S&P 500 index next week, according to S&P Dow Jones Indices late Tuesday. Electronics design and testing company Keysight will replace CA Inc. CA, -5.66% on the index on Nov. 6, when CA's acquisition by Broadcom Inc. AVGO, -0.42% is expected to close.

Tektronix Launches Certified Amazon Package Testing Service

Tektronix, Inc., …, today announced that it has received certification to provide ISTA 6-Amazon.com package testing for products being sold on Amazon.com. Certified package testing from Tektronix helps manufacturers reduce overall packaging costs, minimize shipping damage, and delight their customers with intuitive and easy-to-remove packaging.

Teledyne LiDAR Reveals Extensive Maya Civilization

February 6, 2018 – Lost Treasures of The Maya Snake Kings will premiere on National Geographic. The one-hour documentary will describe how airborne LiDAR (Light Detection and Ranging) surveys revealed a civilization far more vast than previously believed. The LiDAR surveys were conducted with Teledyne Optech's Titan airborne remote sensing system.
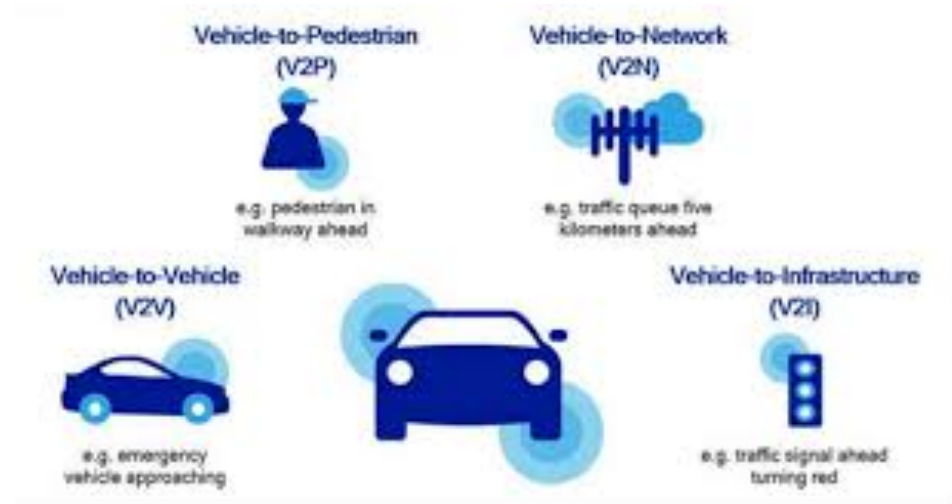
Technology Drivers:
Higher Data Throughput
- Streaming
- Storage
- Bandwidth

µWave/mmWave
- Higher Ch Density
- Greater BW
- Antennas

Industry Drivers:
- Large Ecosystem
- Interoperability
- Speed of Development
- Collaboration/Partnerships

AXIe, LXI, VXI, PXI Update

AXIe and LXI Update

AXIe Consortium (www.axiestandard.org (:

- 13 Members
- Specifications

AXIe-CR: AXIe Compliance Requirements and Trademark Usage Rev 1.0

AXIe-0: Low Cost Instrumentation and Switch Architecture

AXIe 1: AXIe Base Arch Spec, Rev 3.1

AXIe 2: AXIe Software Spec, Rev 2.2

AXIe 3: AXIe Zone 3 Mechanical

AXIe 3.1: Semiconductor Test Extension,Rev 1.0

LXI Consortiu
- 53 Membe
- Specificatio

Version 1.5 L
- (1) a core *Specificat* Devices m
- (2) a set o Features, choose to required t Extended conform.

VXI and PXI Update

- VXI Bus Consortium:
  - 13 Members
  - > 1500 Products
  - 394 Mfg. ID's issued
  - VXI 1 Revision 4.0
  - http://www.vxibus.org
    - Products at http://vxibus.org/products.html

- PXI Systems Alliance (www.pxisa.org):
  - 67 Members (11/28/2018)
- Specifications:

PXI-1 PXI Hardware Spec. Revision 2.3

PXI-2 PXI Software Spec. Revision 2.5

PXI-4 PXI Module Description File Spec. Rev. 1.2

PXI-5 PXI Express Hardware Spec. Rev.1.1

PXI-6 PXI Express Software Speci. Rev. 1.3

PXI-8 PXI MultiComputing SW Spec Rev. 1.1

PXI-9 PXI /PXIeTrigger Mgm't Spec. Rev. 1.1

9/28/19 - Updated Specifications to Include Support for Linux Operating System, Multi-Slot Modules and Higher Power PXI/PXIe Modules

PXI Systems Alliance

9/28/18 - Updated Specifications to Include Support for Linux Operating System, Multi-Slot Modules and Higher Power PXI/PXIe Modules

LXI Consortium

Feb 2019 - LXI Security Working Group

LXI Security Overview rev 1.91

ANNOUNCEMENTS

Pax River Test Equipment Expo
- May 7th, 2019
- Rivers Edge Conference Center
- 9:00 – 15:00

Contact Charles Verget, CV Associates, for more information

Charles.verget@cvassociates.us
(703) 955-1616

Pax River Test Equipment Expo

May 7, 2019 Rivers Edge Conference Center
0900 - 1500 hours

The Pax River Test Equipment Expo was created to serve our local technical community. During the early years of the show it was just about impossible to get travel approved to visit a large national show in places like Las Vegas and Disneyland etc.

Our mission is and has been to staff the show with direct company staff. Why? So you can bring your challenging test and measurement problems and talk directly with knowledgeable people who may be able to help.

The show is now entering its tenth year here at Pax. Each year we find new technology via new exhibitors along with a great attendance by the many engineers and technicians continues its success. We work hard to put the show together but, it can only return with good attendance and for that I again please request everyone to help get the word out and attend.

This event is FREE and open to all interested in test and measurement.

Be one of the first 20 attendee's and you will find something extra in your literature bag. If you are here during the lunch buffet hours at Rivers Edge ask us for a lunch buffet ticket.

We have drawings at 1100, 1300, 1400 and 1500 for small test instruments. Mark your calendar now for May 7, 2019 and come see us at the Rivers Edge. Show Hours: 0900 to 1500

Here is who you will find at this year's event:

Please RSVP to: charles.verget@cvassociates.us | (703) 955 1616