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A Sample of Innovations from AUTOTESTCON 2013

Jointly presented by the IEEE Instrumentation & Measurement
and IEEE Aerospace & Electronic Systems Societies

President's Perspectives

Welcome to IEEE AUTOTEST 2014

Reza Zoughi, IEEE Instrumentation and Measurement Society President

On behalf of the IEEE Instrumentation and Measurement Society (IMS), it gives me great pleasure to welcome you to IEEE AUTOTEST 2014, being held in St. Louis, Missouri, USA, where it all started a half century ago. IEEE AUTOTEST is the focal event that brings those interested and involved in automated testing, product development, and ultimate users together under one roof. Events such as IEEE AUTOTEST are where people with the same interests and goals get together to discuss, learn, become aware of new technologies and ultimately collaborate.

We are extremely happy to continue our support of IEEE AUTOTEST 2014 along with the IEEE Aerospace and Electronic Systems Society (AESS). St. Louis is a wonderful venue for this event, as it is the Gateway to the West symbolized by the magnificent Arch. Now, during this event the city serves as the Gateway to New Automated Testing Technologies. St. Louis is also home to a large number of industries involved in automated testing, in particular as it relates to aerospace. It is a wonderful and friendly city, offering countless scenic venues for your enjoyment while attending the 2014 IEEE AUTOTEST including the magnificent Forest Park, the Missouri Botanical Garden, and the St. Louis Art Museum. We wish you enjoy your stay in St. Louis, and have a fruitful meeting at IEEE AUTOTEST 2014.

Reza

Robert P. Lyons, Jr., IEEE Aerospace and Electronic Systems Society President

On behalf of the IEEE Aerospace & Electronics Systems Society – one of the two sponsors of IEEE AUTOTEST – I would like to extend my warmest welcome to our industry and

government attendees to this exciting event. You may have noticed the name change, from AUTOTESTCON to IEEE AUTOTEST, to reflect our focus change to more of a technical interaction gathering featuring detailed technical sessions and product displays and demonstrations, designed to inform our attendees of the latest developments in automated test equipment and systems to support military operating systems and weapons. This is the 50th Anniversary year of this event, and in honor of that, we have returned to the city where it all started, 50 years ago, in St Louis, Missouri.

IEEE AUTOTEST remains the premier event in the US that brings together the developers and users of automated test systems, with product demonstrations, such that technical information may be exchanged to keep vendors and customers informed of latest technology and capability. The increased sophistication and capability of our military systems demands the latest in automated test capability to keep them operating properly and at peak efficiency, such that our warfighters can count on their systems to perform as designed, every single time. This keeps both them, and our country, safe and secure.

The Aerospace & Electronics Systems Society has long had a focus on military systems and their support structure, and this Conference serves as a major activity for all of those engaged in the myriad topics that form an integral part of the military equipment logistics and support environment. We hope you enjoy the event, and find it useful, informative, and exciting.

Robert

AUTOTEST 2013 Article Summaries

Versatile 20 GHz Wideband RF Digitizer for 6 Test and Measurement

(Summary)

*Nikhil Adnani, Mathieu Lamanque, Tarek Helaly,
Mohammad Farhan, Tim Hember, and Ian Ward*

This paper introduces the WSA5000, a cost-effective, high performance RF digitizer developed by ThinkRF that enables the acquisition, measurement and processing of RF signals in a variety of operating environments. This paper first discusses key considerations to be taken into account for the design of general-purpose signal analyzers. It briefly explains the three main radio

receiver front-end architectures. The paper then describes the architecture of the WSA5000 which is a reconfigurable software-defined radio receiver. Finally, it describes the software architecture of the platform including PyRF, a Python-based open application development framework. An application is also illustrated with a brief example.

This summary includes text from the introduction of the article.

RF Recording Techniques to Resolve Wireless Channel Interference Problems

(Summary)

David Murray

User environments for wireless devices are complex and include many sources of interference. As RF power is spread over wider bandwidths to increase data rates, wireless devices encounter increased interference. As designers look to create robust solutions that perform in these environments, it is essential to recreate those conditions in the lab. This article describes the problems associated with RF interference in modern wireless devices and techniques that can be used to analyze these interference issues.

This summary includes text from the introduction of the article.

LXI in Satellite System Testing

(Summary)

Jochen Wolle

The performance of satellite systems crucially depends on achieving constant magnitude and linear phase versus frequency of the transmission coefficient within the useful band. Measuring the phase linearity and the group delay of such a system is vital. Test engineers must find a reliable way to measure group delay where the transmitters and receivers are geographically separated from one another, as well as from their controller, by significant distances. This paper describes how to measure group delay on a transmission system by means of two LXI based network analyzers, one at the transmitting end and the other at the receiving end, that communicate with one another using LXI peer-to-peer LAN messages. Based upon widely used standards such as Ethernet and the Web, the LXI standard enables the connection of intelligent

instrumentation which supports distributed processing of measurement data and provides a high bandwidth interconnect system for supporting applications with high data demands.

This summary includes text from introduction of the article.

Considerations in the Design of a Boundary Scan Runtime Library

(Summary)

Terry Borroz

Boundary scan, often called Joint Test Action Group or JTAG, is a technique in which special standardized circuitry is included in an IC to facilitate testing and data transfer. Since its introduction, boundary scan has become widely used for detecting and diagnosing basic device pin faults, shorts, and opens in digital circuitry during manufacturing test. Electronic assemblies are now routinely designed to support boundary scan testing. This paper introduces the concept of a boundary scan runtime library for such a system that would provide a standardized Application Programming Interface for these capabilities in which boundary scan vendors could then add a relatively small amount of code to their existing software suites that would execute their tests using this runtime library as an alternative to their proprietary hardware. Since proposing such a system in 2011, the author's workgroup has worked toward implementing these ideas. The rest of this paper discusses some of the considerations related to such an effort.

This summary includes text from the introduction of the article.

Additional Article Summaries

Reconfigurable Real-Time Hardware-in-the-Loop Environment for Automotive Electronic Control Unit Testing and Verification

(Summary)

Krisztian Enisz, Denes Fodor, Istvan Szalay, and Laszlo Kovacs

To satisfy the ever-increasing needs for safety, comfort, and environment protection of today's vehicles, the Electronic Control Units (ECU) and various sensors are getting more and more

complex. Therefore, developing new control algorithms and cost efficient verification tools for a new generation of ECUs and sensors has become a highly important issue. This paper deals with the design and implementation of a versatile automated Hardware-in-the-Loop (HIL) test environment, which facilitates the development of control algorithms, calibration, and verification of *state of the art* sensors and ECUs. The environment is able to emulate the vehicles' dynamic behavior, reduces the time required for development and testing, and eliminates the need for using expensive real vehicles for testing purposes.

This summary includes text from the introduction of the article.

The Mathematical Theory of Evidence and Measurement Uncertainty

Simona Salicone

Editor's Note: This paper is the first contribution of a series of three papers written by Dr. Simona Salicone focusing on mathematical theory of evidence and measurement uncertainty. Besides giving an introduction to the theory of evidence and random-fuzzy variables, these papers show the readers how measurement uncertainty can be propagated through a measurement procedure and taken into account during decision-making. Methods are provided to take into account the nature and the possible correlations between uncertainty contributions.

Wendy van Moer

This Editor's Note is taken from the article and summarizes the three papers in the series.

The Smartphone-Enabled DMM

(Summary)

Daniel Brateris, Dwight Bedford, David Calhoun,
Aaron Johnson, Nickolas Kowalski, Thomas Mukalian,
Justin Reda, Anthony Samaritano and Robert R. Krchnavek

The digital multimeter (DMM) is pervasive among technicians, engineers, and do-it-yourselfers. For a very small amount of money, one can obtain an instrument that measures dc and ac voltage, current, and resistance. DMMs have seen modest improvement since the original instruments, with advances in accuracy and improved features due primarily to advances in

microelectronic integration. With the advent of smartphones, we see another possibility for advancement in DMMs. The two primary advantages of a smartphone-enabled DMM are compact size due to using the smartphone as the display and the opportunity for customized user interfaces for specific applications. In this article, the authors introduce a prototype pen-style DMM that uses Bluetooth to communicate with an Apple iPhone.

This summary includes text from the article.

Columns

Basic Metrology

(Summary)

Bryan Kibble and Ian Robinson

Stop that Interference!

It is possible, by paying attention to the basic principles of interference resistance, to improve sensitive circuitry and greatly lessen dependence on expensive and bandwidth-limiting signal processing and extraction instruments. The authors of this paper discuss how coaxial networks have a remarkable attribute besides their utility for comparing standard impedances, as they are to all intents and purposes, completely immune to sources of external noise and interference because the inner conductors and components exist in their own localized and isolated universe.

This summary includes text from the article.

Behind the Scenes

Kristen M. O'Donnell

The Membership Development Committee

I have been involved in the IMS AdCom for some years now, starting as an appointed Graduate Student Representative, and transitioning to an elected member in 2012. Throughout my involvement, I have been a part of the Membership Development Committee, or MDCCom, as we (the members of the team) affectionately call ourselves. As a result, I consider MDCCom the

committee that I grew up on within IMS, allowing me to experience the many facets of MDCCom, and ultimately preparing me to serve as MDCCom's Chair in 2013 and 2014.

MDCCom serves an important purpose within the IMS AdCom, and this purpose is best expressed through our committee mission. Our mission is to:

- provide the link between the Society and the members, understanding the needs of the membership and pass them on to the relevant standing committees,
- facilitate other committees, including Membership, to provide the most comprehensive and high-quality services to our members and related professionals,
- be an incubator to develop, promote, and stimulate membership-related activities in the I&M fields, and
- advise the AdCom of membership trends, composition, and needs.

MDCCom oversees many of our membership-related activities and support programs including the Chapter Funding program and the annual Outstanding Chapter Award. In fact, one position within MDCCom, the IMS Chapter Chair Liaison, is dedicated to the support of our Chapters, including assistance with chapter formation for new chapters. As VP of MDCCom, I support the work of the Chapter Chair Liaison to ensure we provide the best service we can to our new and well-established Chapters.

MDCCom also includes two student members of the AdCom, the Undergraduate, and Graduate Student Representatives. These positions are quite important to MDCCom (and the AdCom overall), as the students provide us with ideas and feedback from a students' perspective. Similarly, MDCCom also includes an IEEE Young Professionals Representative to ensure we are aware of the needs of our recently graduated industry members. As VP, I am in regular contact with these individuals in order to build new and relevant programs to support our student and recently graduated members.

Other important focus areas of MDCCom include continued evaluation and improvement of our student support programs (where input from our student representatives is invaluable), improved support of our members in under-represented regions within IMS, and continued and improved support of our members from industry.

Ultimately, our members provide the foundation upon which IMS is built. As VP, it has been my pleasure to work with the members of MDCOM to ensure that IMS continues to provide the most relevant and comprehensive services to our members while facilitating the same for the other standing committees within the IMS AdCom.

Departments

New Products

Robert Goldberg

Oscilloscopes Provide Ease of Use Combined With Powerful Analysis Tools

Rohde & Schwarz (R&S) RTE digital oscilloscopes offer fast and reliable solutions for everyday test and measurement tasks such as embedded design development, power electronics analysis and general debugging. Users benefit from features such as high sampling and acquisition rates and good signal fidelity. The new R&S RTE from Rohde & Schwarz is available with bandwidths from 200 MHz to 1 GHz. An acquisition rate of more than one million waveforms per second helps users find signal faults quickly. The scope's highly accurate digital trigger system with virtually no trigger jitter delivers highly precise results. The single-core A/D converter with more than seven effective bits (ENOB) almost completely eliminates signal distortion. With a sampling rate of 5 GS/s and a maximum memory depth of 50 MS/channel, the R&S RTE can accurately record the long signal sequences required when analyzing the data content of serial protocols such as I2C and CAN.

Users performing complex tasks will especially appreciate the high measurement speed of the R&S RTE. Mask tests, for example, quickly return statistically conclusive results. The highly responsive, spectrum-analyzer-like FFT reliably detects even sporadic signals, making the R&S RTE ideal for EMI debugging during product development. Thanks to the high-resolution 10.4 in (26.4 cm) XGA touchscreen, users can intuitively perform their daily T&M tasks. For instance, they only have to swipe the screen to access saved instrument setups. In addition, they can simply *drag and drop* waveforms to arrange them on the screen. Realtime miniature views of the signals on the edge of the screen allow users to always see what is happening.

Innovative tools help users boost their productivity. The QuickMeas function simultaneously performs several measurements on a signal. Fingertip zoom allows users to simply swipe a signal's zoom area to quickly view signal details. Tools are selected from a configurable toolbar. Rohde & Schwarz also offers a wide range of dedicated application solutions for the R&S RTE, including trigger and decoder options for serial protocols, a mixed-signal option with 16 additional digital channels and a power analysis option.

For more information, visit <http://www.scope-of-the-art.com/ad/press/rte>.

Handheld Analyzers Provide Easier, More Cost-Effective, Complete Solution for Precision Radar Performance Validation in the Field

Agilent Technologies Inc. has announced that its FieldFox handheld combination analyzers offer an easier, more cost-effective solution than bench top instruments, with the accuracy and functionality required for performing precision radar system performance validation, including maintenance and repair in the field. FieldFox analyzers have a track record of reducing cost-of-test while also increasing the uptime of mission-critical systems, critical capabilities for modern radar systems. Such systems are typically classified as ground-based, airborne, ship-based, or space-borne and have numerous applications including civilian air-traffic control, meteorology, traffic enforcement, and military.

The easier, more cost-effective FieldFox combination analyzer solution for radar system performance validation includes:

- An all-in-one combination analyzer that functions as a basic cable and antenna analyzer with spectrum and vector network analysis capabilities;
- A built-in power meter and vector voltmeter;
- LRU-level measurements, including a full pulse analysis capability to 40 GHz using the U2022XA Peak Power Sensor and relative timing measurement of transmitter main to auxiliary pulses;
- Support for Stable Local Oscillator phase alignment via vector voltmeter mode;
- Compliance with IEC/EN 60529 IP53 requirements for protection from dust and water; and
- Compliance with U.S. MIL-PRF-28800F Class 2 requirements.

The Agilent FieldFox combination analyzers deliver bench top-instrument accuracy in field-test environments. This performance, coupled with their ability to operate in harsh conditions and hard-to-reach locations, allows radar maintainers to use them for all their radar ground station installation and maintenance measurement needs.

More information on the FieldFox combination analyzers is available at http://www.agilent.com/find/FieldFoxradar_images. Go to <http://www.agilent.com/find/FieldFoxradar> to watch a video, download application notes, and listen to the on-demand webinar on Precision Validation of Radar System Performance in the Field.

Test Systems Add Support for Aggregation of Three Component Carriers

Aeroflex Limited has announced that the TM500 LTE-A Test Mobile and the E500 Capacity Test System now both support the aggregation of three component carriers (3 CC). Carrier aggregation of 3 CC allows mobile network operators to achieve data rates of up to 450 Mb/s on their LTEA networks.

3 CC carrier aggregation enables network operators with limited contiguous frequency allocations to maximize 4G data speeds by combining these spectrum bands. The E500 Capacity Test system is the chosen platform in use by leading network operators to prove that new network features such as 3 CC aggregation fully deliver as promised on their network, enabling them to offer the best possible user experience to their subscribers.

Aeroflex's TM500 infrastructure customers have had the benefit of being able to develop and test LTE-A carrier aggregation for well over two years. Now for the first time they can do this with three component carriers, allowing mobile operators to accelerate the time-to-market of 3 CC services for LTE-A subscribers. Aeroflex provides the tools for leading network infrastructure vendors and operators to roll out the high bandwidth services promised by successive releases of the 3GPP LTEA standard. Aeroflex's LTE market-leading product line includes a complete range of end-to-end test systems that cover R&D, performance, service, and manufacturing test applications for LTE-A TDD and FDD network equipment and terminals.

Aeroflex is also a founding member of the 5GIC (5G Innovation Centre) technology research program led by the University of Surrey in the UK.

For more information, contact your local Aeroflex sales office by calling Aeroflex Sales at +1 800 835-2352 [US] or +44(0)1438 742200 [UK] or by emailing info-test@aeroflex.com.

High Integrity Interface to VPC

JTAG Technologies announces the release of a new JTAG/boundary-scan hardware interface product compatible with the Virginia Panel (VPC) mass interconnect system. The JT 2147/VPC is a signal conditional module that allows 'ideal world' connections from JTAG Technologies PXI and PXIe DataBlasters to the VPC connection system. Based on the highly successful QuadPod architecture from JTAG Technologies, the JT 2147/VPC has been specifically designed for connection into G20x or G14x 192 pin Quadra- Paddle connectors and is compatible with the VPC "pull thru" system. By integrating the JT 2147/VPC, test system builders will greatly simplify their wiring task and, at the same time, retain the excellent signal integrity assured by the QuadPod's active interface.

The JT2147/VPC features four independent JTAG Test Access Ports (TAPs) along with 16 static DIO channels and 64 dynamic DIOS channels. Each TAP can be programmed to operate through a range of voltage levels to suit various logic families.

JTAG/boundary-scan applications prepared using JTAG Technologies ProVision or Classic software tools may be executed on this PXI platform with driver package ATEasy and a number of generic language compilers (e.g. .NET framework, C++ and VB). The VPC adapters utilize standard QuadraPaddle connector modules, providing a wide variety of contact types. The connection between the PXI(e) instrument and receiver module is accomplished using either a passive printed circuit board, active signal condition module (as with the JT 2147/ VPC) or flex circuit, with each providing optimum connectivity performance while reducing wiring cost.

Find more information at www.jtag.com.

New Array Microphone Ideal for Locating Noise Sources

PCB Piezotronics launches new ¼ in (6.4 mm) high-amplitude array microphone designed to enable research engineers to locate noise sources in appliances, industrial tools, machinery, aircraft and more. The microphone measures acoustic signals in the audible range of the human ear and offers an extended dynamic and frequency range often found on more expensive condenser microphones. This all-in-one, prepolarized microphone and preamplifier has a 30 dBA

low noise floor and a 143 dB upper range, making it one of the highest dynamic ranges available in array class microphones.

The flat frequency range up to 20 kHz allows noise sources to be analyzed more accurately. Powered by ICP® or any 2-20 mA constant current supply, the microphone is interchangeable within existing setups for ICP® accelerometers, load, force, strain and pressure sensors. Standard with TEDS v1.0 and a very competitive price, Model 130A23 is especially suitable for large channel count applications such as acoustic holography, sound pressure mapping, beam-forming or applications where reducing noise or meeting a standard specification is a concern for original equipment manufacturers.

For additional information, please visit www.pcb.com/arraymicstest.

Pre-Configured Instrument Grade System Racks Provide ATE Core Building Blocks

VTI introduces the CMX-9138, a part of its CreatEX series of 42U pre-engineered ATE system racks that come complete with power distribution, cooling fans, filtering, shelves, and blanking panels. CreatEX configurations provide ATE architects core building blocks wrapped into one part number, saving considerable time, money and documentation.

The CMX-9138 leverages VTI's experience as both an instrument provider and system integrator to produce the optimal rack assembly for precision instrumentation needs. The CMX-9138 configuration includes the following:

- Power Control: ensures safety of instruments and UUTs;
- Rear door with lock, vented for optimized airflow;
- Locking, removable side panels to simplify equipment installation and cabling;
- Power strips/PDU simplify power routing to instruments;
- Bus-bar with single point grounding;
- Selectable, pre-installed cooling system; and
- Heavy-duty caster for portability.

Users also have the option of adding any of the following to their rack systems:

- Blowers,
- Mass Interconnect/Receiver Interfaces, and
- Manufactured cable assemblies switching and accessories.

For more information on the CMX-9138, please visit:

<http://marketing.vtiinstruments.com/e/12672/nd-Enclosures.aspx-searchtext-/ltz4g/488663535>.

PCI and PXI Programmable Resistors

Pickering Interfaces is expanding its range of PCI and PXI Programmable Resistors. The existing PCI High-Density Precision Resistor Card (model 50-297) and PXI High-Density Precision Resistor Module (model 40-297) have been expanded to increase the versions offered from 6 to 42, and each version offers users the choice of the number of resistor channels, resistance range and the resistance setting resolution. Depending on the version, the resolution is from 0.125 Ω to 2 Ω and resistor channel counts from 3 to 18. Resistor values up to 1.51 M Ω can be simulated.

Pickering is introducing the new PCI Programmable Resistor & Relay Card (model 50-293) and the new PXI Programmable Resistor & Relay Module (model 40-293) that offer lower densities and cost solutions (compared to similar products) for simulating resistors with 12 versions available, having resolution from 0.25 Ω to 2 Ω and channel resistor channel counts of either two or four. In addition, each of the 12 versions has the option of adding 8 SPDT relays which can be used for other switching functions within a test system, and their use potentially saves the addition of further switching products within a test system.

All of these PCI and PXI resistors are programmed by the use of resistance calls from the driver, where the driver uses calibration data from the module to give the best setting available to the user and can also return to the user the theoretical value of the resistor. Basic accuracy is 0.2% \pm resolution for the 40-297 and 50-297 and 1% \pm resolution for the 40-293 and 50-293.

By offering the programmable resistors in different form/ factors with the same options Pickering Interfaces allows users to choose the most appropriate platform for their test system. Information is supplied on Pickering's web site: <http://www.pickeringtest.com>.

Cost Effective 16 Bit Digitizer

Spectrum GmbH has released two new models of its mid-speed 16-bit digitizer line. The new versions M2i.4960 and M2i.4961 are available for PCI/PCI-X and PCI Express and offer two or four synchronous channels with 60 MS/s sampling speed and a bandwidth of 30 MHz.

Each channel can be individually switched between single-ended and true differential input mode. This allows users to acquire single-ended and differential signals with just one digitizer at the same time.

Each input channel can be software-programmed for proper termination, user offset and input range and also includes an on-board calibration. Different acquisition modes like segmented acquisition (Multiple Recording), gated acquisition (Gated Sampling) or the streaming mode (FIFO), together with the versatile clock and trigger section, allow the card to adapt to a wide variety of different applications.

Multiple cards can be internally synchronized to get more synchronous channels or to directly synchronize to arbitrary and digital waveform generators or digital waveform capture cards. A completely newly designed digital input option enables up to 32 synchronous digital input channels to be acquired by multiplexing them into the analog data in different ways. Each 16 digital inputs can either completely replace one analog channel or each 2/4 digital inputs can be stored together with the A/D sample by reducing its resolution.

All of the features of the new card are fully supported by Spectrum's own software SBench 6. SBench 6 has been optimized to handle several Gbyte large signals and is running natively under Windows and Linux, both 32-bit and 64-bit. This makes SBench 6 the first out-of-the-box measurement software with full Linux support. The internal software structure with separation between streaming engine and user interface makes it possible to take advantage of the full hardware performance, easily allowing a constant transfer rate to hard disk RAID array of more than 200 MB/s.

Customers who want to write their own software can use the proven SPCM API for all 32-bit and 64-bit Windows and Linux which are included in the delivery. A set of standard programming examples is provided to illustrate the main signal capture functions.

Further information can be found at <http://spectrum-instrumentation.com/en/news/cost-effective-16-bit-digitizer-4-x-60-mss>.

Arbitrary Waveform Generator Provides 18-Bit Resolution

Applicos announces the availability of AWG18, a new arbitrary waveform generator for the company's ATX-series test systems. The product features 18-bit resolution at a 300 MS/s data rate. Additionally, the user may select interpolated oversampling at 600 MS/s or 1.2 GS/s. Testing analog systems with high-speed 14 and 16-bit data converters requires extremely clean signals to be applied. The traditional approach of filtering away the harmonics is simply insufficient when dealing with a high signal-to-noise ratio (SNR), maintaining a high spurious-free dynamic range (SFDR), or when a low *close-in carrier noise* is important. In these cases, the extra precision afforded by dealing with 18-bit signal values can mean the difference between reliable test stand operation and one that experiences seemingly random failures.

In addition, many applications need to make additional time domain measurements with signals other than sine waves. To accommodate this, the AWG18 has two signal paths: the first starts at DC for time domain and general-purpose measurements that require a high-level accuracy and good step response, and the other runs from 10 MHz to 100 MHz, optimized for dynamic signal generation in this frequency range.

The typical total harmonic distortion (THD) for frequencies up to 50 MHz is better than 100 dBc. For ensured operational reliability, much attention has been paid in the design to minimizing clock jitter in order to avoid bin leakage and SNR reduction. The total jitter from the clock input to a 100 MHz analog output signal is typically less than 0.2 ps.

For more information, please visit <http://www.applicos.com>.

Rapid Product Development System for Video Processing Technology

RFEL has launched the Rapid Product Development System (RPDS) for its HALO video processing solution. HALO products provide low power, military standard, real-time, video processing at the source for image-based surveillance in defense and security and industrial applications.

In addition to real-time, high definition video enhancement, HALO can also handle the camera control interface for Pan Tilt Zoom (PTZ) making it an all-in-one solution for CCTV control and image processing. HALO delivers even in the most challenging of visual environments by using use of enhancement suite of state-of-the-art video processing solutions including digital stabilization, adaptive contrast enhancement, and multi-band fusion.

User designs, in FPGA and/or software domains, can be integrated into the system with ease. FPGA video data frameworks, using AXI based interfacing and documented APIs and drivers, along with a fast integration workflow, make accessing the power of HALO a quick and easy proposition for developers wishing to incorporate their own IP. Since Linux is a key enabling technology of IQFabric, product developers can also take advantage of the Linux eco-system of applications, network enabled capabilities, security, and ruggedness that this widely used operating system provides.

Find more information at <http://rfel.com>.

Online Fuse Design and Selection Tool

Littelfuse, Inc. introduces the Littelfuse iDesign Online Fuse Design and Selection Tool, a robust, web-based tool designed to help circuit designers identify the optimal electronic fuses for their projects. The Littelfuse Design tool was developed in response to requests from Littelfuse customers. It offers a fast, intuitive way to identify the best component for an application, find parts documentation, and order part samples for prototyping, all in one convenient package. To use the Littelfuse iDesign tool, simply register to create a free online account at the iDesign Login.

Unlike the simple parametric search tools or catalog-based selection charts many other circuit protection component suppliers provide, the Littelfuse iDesign tool walks users through a fuse selection process that quickly narrows the available options based on the inputs provided. The iDesign tool currently supports electronic, board mounted fuses used in a wide variety of applications. The iDesign tool's flexibility will allow Littelfuse to incorporate additional circuit protection devices in the future, so users should check back frequently for the latest additions.

With the Littelfuse iDesign tool, what was once a pretty complex process is now a quick and intuitive procedure that users at all levels of circuit design sophistication can understand easily.

To view a short online tutorial on using the Littelfuse iDesign tool, visit <http://vimeo.com/90118164> or visit the website at <http://www.littelfuse.com>.

Small LED Products for the Wearable Electronics Market

Plessey announces the launch of its smallest packaged MaGIC LED (Manufactured on GaN-on-Si I/C) aimed at the wearable electronics market. The PLW138003 is a white LED in a 1005

SMT package designed specifically for the demand for ever smaller LED components producing highly collimated light. Plessey's dotLEDs weighing 0.2 mg and a profile of 0.2 mm are an industry-leading option for any wearable application with LED content.

The 1005-size of the PLW138003 (1.0 mm x 0.5 mm) is a standard electronic component size, handled by the common surface-mount machines used in high volume consumer electronics. The Plessey dotLED is 0.2 mm in height and designed specifically for applications that demand low profile electronic components.

This first product in Plessey's dotLED family is the PLW138003, delivering up to 0.7 Lm of white light with a 130° viewing angle from a 5 mA drive current. A blue version, the PLB138003 is also available. Further additions to the dotLED family will be color variants and a series in the larger 1608 footprint. Plessey also provides a range of blue LED die for customers needing a further breakthrough in size: the PLB030003 ultra-thin die is just 200 um x 200 um x 75 um.

Find datasheets and additional information on the Plessey website:

<http://www.plesseysemiconductors.com/ledplessey-semiconductors.php>. For sample requests, please visit the Plessey website, <http://www.plesseysemiconductors.com> or send an email to enquiries@plesseysemi.com.