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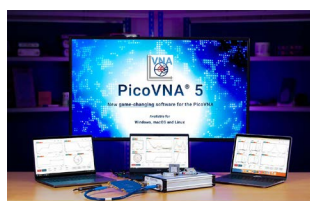
USB Vector Network Analyzer

Known as PicoVNA 5 software, Pico Technology Ltd. has launched a new software platform for its USB-controlled PicoVNA vector network analyzers. Cross-platform and light footprint, PicoVNA 5 will run at speed on Linux, Windows, and macOS; it also functions on PCs, Macs, and embedded systems, including Raspberry Pi 3.

Whatever your VNA application, PicoVNA 5 brings a live presentation of your measurements, your instrument status, and your controls, with a crisp, clean focus to provide an optimum results area with minimal clutter. Using an innovative drag and snap viewport grid, arrange your measurement plots, single or dual axes across as many individually sized, shaped, and positioned plot channels as you wish. At any monitor size and resolution, you can keep a user-configured eye to all the live and stored trace plots that you need, and if required, maintain a mix of frequency and time domain plots.

On-plot parameter controls give direct intuitive access to sensitivities, offsets, reference positions, and sweep or time domain parameters. Even the plot type (Log, lin, Smith, polar, phase, etc.) can be changed as you focus on a particular view. Handy on-trace cursor readouts present under mouse or touch hover, allowing precise trace marker drop with a single click for a more permanent readout. Simply drag or click the marker again to access precise editing of the marker, its type, its position, its grouping, and the multi-parameter or delta readouts that you need from it.

The PicoVNA 5 first release is conceived as a full-function foundation for a market-leading Vector Network Analysis



software, and it is based upon best principles and architecture of Agile accelerated development. Quite deliberately, and to gain user feedback and priorities, full functional parity with its predecessor PicoVNA 3 software has not yet been fully implemented. Worry not, PicoVNA 3 remains available and fully supported.

More information on Pico Technology can be found at: <http://www.picotech.com>.

Enhanced Signal Analyzer MS2840A for More Efficient Pulse Radar Measurements

Anritsu Company has introduced the Pulse Radar Measurement Function MX284059B software for its Signal Analyzer MS2840A that



creates a single-instrument solution for automated pulse radar measurements to dramatically reduce cost-of-test and test time on the production line and in the field. The MS2840A, when equipped with the new software and the USB Peak Power Sensor MA24406A/18A/40A, supports tests of Tx characteristics that typically required a spectrum analyzer, oscilloscope, power meter, and frequency counter.

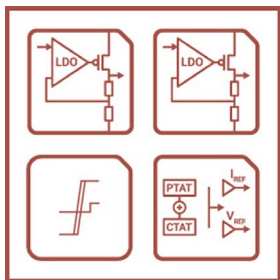
The MX284059B software has a wider pulse-width measurement range than previously available with the MS2840A and supports new interlocked control of the USB Peak Power Sensor MA24406A/18A/40A for automatic high-accuracy Tx power and pulse-width measurements. The single-instrument solution can accurately test high-performance radar, including aerospace and maritime applications, using short pulses. It also supports long-range radar using long-repetition cycles.

S-, C-, X-, and Ku-band (3 to 15 GHz band) pulse-radar Tx tests can be conducted with the Signal Analyzer MS2840A-based solution. Automatic tests of Tx power and frequency, pulse width, pulse rise/fall times, repetition frequency, and spurious emissions can be made. Spurious emissions test results are evaluated based on Recommendation ITU-R SM.329, SM.1541, and M.1177 using masks superimposed on MS2840A test trace display.

To learn more, visit <http://www.anritsu.com>.

Digitally Wrapped Analog IP Subsystems

Agile Analog has launched its first range of analog subsystems, covering power management, PVT sensing, and



sleep management. These innovative, digitally wrapped subsystems significantly reduce the effort required to integrate multiple analog IPs into any ASIC by allowing the IP to be dropped straight into a digital design flow and connected via a standard peripheral bus, such as AMBA

APB. The subsystems look just like a normal block of digital IP with the standard interfaces that engineers would expect, making them easy to understand and handle. As a result, time to market, costs and risk are radically reduced.

Initially, the company is introducing three subsystems: agilePMU for power management, agilePVT - PVT sensor, and agileSMU for sleep management.

The IP blocks within a subsystem are all from Agile Analog's existing portfolio of customizable analog IP. This allows each block within the subsystem to be customized to the customer's exact requirements while sitting within the overall digital wrapper.

Agile Analog's subsystems are supplied with a full set of supporting collateral, including System Verilog models for easy integration into customers' existing digital verification flows.

Find More Information at <http://www.agileanalog.com>.

Battery Emulation and Profiling Solution for IoT Devices

Keysight Technologies, Inc. has introduced the Keysight E36731A Battery Emulator and Profiler, a complete emulation solution that identifies the impact of variables affecting the battery drain of internet of things (IoT) devices to enable development engineers to improve their device designs.



International Data Corporation (IDC) estimates that there will be 41.6 billion connected IoT devices in use by 2025, many of which will be portable, battery-operated devices requiring advanced battery management techniques. To ensure these devices perform well in the field, development engineers need to design for peak battery performance and validate those designs against real-life performance. However, testing the run time of a physical battery in a device is a challenging and time-consuming task that can slow time-to-market.

The Battery Emulator and Profiler works with the Keysight PathWave BenchVue Advanced Battery Test and Emulation Software to provide a complete solution that:

- Generates Battery Profiles – By generating battery profiles, the solution allows designers to establish known,

good references with consistent properties that can be used over and over to simulate battery drain. Profiles can be linked to factors such as age and temperature.

- Increases Battery Profile Accuracy – By using the simulated current drain of a device to generate battery profiles, engineers can enhance the accuracy of profiles compared to using generic manufacturer models, which leads to better device designs.
- Speeds Testing with Battery Emulation – An emulated battery allows development engineers to instantly transition a battery's charge state and gain real-time insight into current drain. This increases efficiency and allows engineers to optimize designs for longer run time.
- Automates Battery Run-Down and Cycle Testing – By automating these tests, engineers can more accurately estimate battery run time and aging effects.
- Offers Flexibility – The solution provides power up to 200 W, 30 V, 20 A and offers a wide dynamic measurement range from microamps to amps.

Learn more at <http://www.keysight.com>.

Miniature, High Frequency Low-Outgassing ICP® Triaxial Accelerometer with TEDS

PCB Piezotronics (PCB®) has introduced their new Model 356A19, a Low-Outgassing ICP® triaxial accelerometer designed to make accurate high frequency measurements to 13 kHz ($\pm 5\%$). It is the latest addition to our family of miniature, triaxial accelerometers in a 0.4" (10.2 mm) cubicle package.



Model 356A19 miniature, ICP® triaxial ceramic shear accelerometer features:

- Wide frequency range of 1 to 13 kHz ($\pm 5\%$)
- Resonant frequency ≥ 55 kHz
- Sensitivity of 10 mV/g
- Measurement range of ± 500 g pk
- TEDS capability

The Transducer Electronic Data Sheet, which complies with IEEE 1451.4, is located within the sensor and includes data such as the serial number, sensitivity, and the last calibration date.

For more information, visit <https://www.pcb.com/products?m=356a19>. For technical inquiries and application support, please contact info@pcb.com or call +1(800) 828-8840.

Magnetic Levitation Nanopositioning Stage Technology Demonstrator

PI has developed a high-precision, maglev-based technology demonstrator. Magnetic levitation is frictionless motion

technology that employs magnetic fields to levitate and propel objects. Mag-Lev technology is used in various applications, best



known from high-speed trains and magnetic bearings, and has great benefits in precision motion control and nanopositioning applications.

The basic principle of magnetic levitation is that like magnetic poles repel each other. To achieve magnetic levitation in its most simple form, two magnets are used; one magnet is placed in the object that needs to be levitated, and the other magnet is placed beneath it.

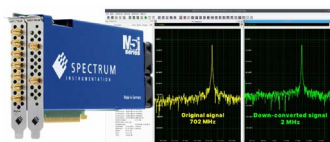
To make this principle useful for nanopositioning and precision motion control, for example in linear translation stages, the magnets in the base must be electrically controllable coils; it takes more than just a pair to also control lateral motion, vertical motion and pitch, yaw, and roll. A high-resolution position sensing system is also required for feedback to the motion controller. Since no mechanical bearings restrict the motion of the linear stage platform, all six degrees of freedom are available to correct any bearing insufficiencies, with a powerful multi-axis controller.

Applications of maglev nanopositioning systems can be found in semiconductor test and metrology, photonics, optics and high-resolution microscopy to name a few. Advantages are the absence of particle generation (cleanroom compatible), zero-wear and zero maintenance, multi-dimensional controllable motion in a compact package and virtually unlimited service life. In contrast to air bearing stages, no supply of compressed air is required.

Find more information at <http://www.pi-usa.us>.

DDC Processing Converts RF Signals Down to Baseband Signals

Spectrum Instrumentation's complete line of PCIe digitizer cards can now perform Digital Down Conversion (DDC) thanks to a low-



cost option that uses an external GPU-card for continuous "on-the-fly" processing. DDC is a powerful technique that is commonly used in a wide range of communication systems, like digital radio, radar, mobile telephony, space or satellite communications. In the DDC process, RF or Microwave signals are converted to baseband, which contains the signal of interest. The conversion dramatically reduces the resultant data set while also improving signal quality and measurement accuracy. Spectrum Instrumentation has 48 different PCIe-based digitizers (with sampling speeds from 5 MS/s to 10 GS/s) that can run the new DDC function,

so customers can select the "Perfect-Fit" model for their application.

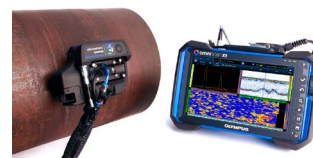
Most digitizer DDC implementations use on-board Field Programmable Gate Array (FPGA) technology. The incoming analog signals are converted to digital data before being passed to the FPGA for down conversion. The approach is fast and efficient but comes with limitations. It needs large and expensive FPGA technology as well as purposely created firmware. Customizing the firmware is also a challenge, requiring specialist firmware development knowledge and costly software tools.

The approach from Spectrum Instrumentation removes these hurdles. By using the company's SCAPP (Spectrum's CUDA Access for Parallel Processing) software development kit, the data acquired by the digitizer can be streamed over the digitizer's PCIe bus directly to a CUDA-based GPU. The Spectrum Instrumentation digitizer line-up includes PCIe cards in three different platforms (M2p, M4i and M5i). These offer sampling rates from as low as 5 MS/s up to an ultrafast 10 GS/s, with resolutions from 8 to 16 bit, and bandwidths from 2.5 MHz to over 3 GHz.

More information about Spectrum can be found at <http://www.spectrum-instrumentation.com>.

Scanner is an Optimized Corrosion Mapping Solution

Building on the field-proven design of its predecessor, the next-generation HydroFORM™ scanner is a two-axis encoding corrosion mapping solution that is easy



to deploy and optimized for one-person operation. Equipped with an innovative ScanDeck™ module and an integrated index axis encoder, the improved HydroFORM scanner eases and increases the efficiency of phased array (PA) scanning. It also addresses a wider range of inspection applications thanks to an improved water column and bubble management system.

When used with an OmniScan™ X3 flaw detector, the ScanDeck module provides important feedback and remote functionality that minimize an operator's interactions with the instrument. Directly in the operator's eyeline while scanning, status lights indicate which encoder is active (index axis or scan axis), when the optimum index position has been reached, whether the coupling is sufficient and if the maximum scan speed is exceeded. It also enables the HydroFORM operator to remotely start the data acquisition on the OmniScan unit. This information and remote-control capability not only reduce time-consuming tasks, but also improve the quality and reliability of the acquired PA data.

With the optional integrated index axis encoder, the HydroFORM scanner facilitates raster scanning, offering a complete 2-axis corrosion mapping solution without the need for an auxiliary scanner. Smooth indexing magnetic wheels and improved bubble management expand the HydroFORM scanner's capabilities to vertical and inverted scanning applications, such as corrosion monitoring of tank walls.

The improved HydroFORM scanner is a comprehensive 2D corrosion mapping solution that enables solo inspectors to efficiently scan flat parts and pipes 4 inch OD and greater. Highly versatile, it can be used as an indexer-clicker style manual scanner, a guided 2-axis encoding scanner, or mounted on compatible semiautomated and automated auxiliary scanners for complex, large-area, and remote inspections.

For additional information on the HydroFORM scanner, go to www.olympus-ims.com/en/corrosion-solutions/hydroform/.

Stand-Alone Active EMI Filter ICs

Texas Instruments has debuted the industry's first stand-alone active electromagnetic interference (EMI) filter integrated circuits (ICs), enabling engineers to implement smaller, lighter EMI filters, to enhance system functionality at reduced system cost while simultaneously meeting EMI regulatory standards.

As electrical systems become increasingly dense and interconnected, mitigating EMI is a critical system design consideration for engineers. With innovative developments from Kilby Labs, TI's research and development labs for new concepts and breakthrough ideas, the new portfolio of stand-alone active EMI filter ICs can sense and cancel common-mode EMI by as much as 30 dB at frequencies between 100 kHz and 3 MHz in single- and three-phase AC power systems. This capability enables designers to reduce the size of chokes by 50%, compared to purely passive filter solutions, and meet stringent EMI requirements.

One of the main challenges when designing high-density switching regulators is how to implement a compact and efficient design of the EMI input filter. Through capacitive amplification, these new active EMI filter ICs enable engineers to shrink the inductance value of common-mode chokes by as much as 80%, helping to cost-effectively achieve improved mechanical reliability and increased power density.

The new active EMI filter ICs incorporate sensing, filtering, gain, and injection stages. Offered in a SOT-23 14-pin package, the IC integrates compensation and protection circuitry to

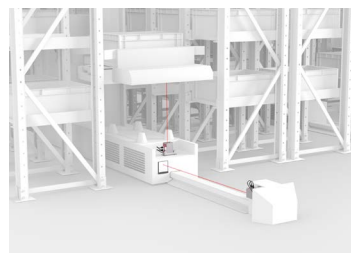
further reduce the implementation complexity and minimize the number of external components.

TI's active EMI filter ICs meet IEC 61000-4-5 surge immunity requirements, thus minimizing the need for external protection components, such as transient voltage suppression (TVS) diodes. With supporting tools, such as PSpice® for TI simulation models and quick-start calculators, designers can easily select and implement the optimal components for their system. To learn more about designing with this new family of active EMI filter ICs, read the technical article, "How a stand-alone active EMI filter IC shrinks common-mode filter size."

Learn more at <http://www.ti.com/AEF>.

Compact Positioning System

The AMS 100i from Leuze is one of the smallest laser positioning systems available on the market. This makes it the perfect solution for tight installations spaces.



Whether on the stacker crane, automated guided vehicle, or lifting system: in automated intralogistics, the sensors used for positioning applications must be able to operate on a small footprint in many cases. The new AMS 100i from Leuze is up to the task without sacrificing performance. With its small dimensions of 105 × 68 × 75 mm, it is one of the most compact laser positioning systems on the market. The sensor works with very high accuracy: With the AMS 100i, users can position with millimeter accuracy for up to 120 meters.

The AMS 100i has been developed with a minimum blind zone of only 100 mm. This enables positioning applications right up to the sensor. The available space is used efficiently. Modular assembly options and easy alignment facilitate flexible and quick installation.

The AMS 100i can also be used to determine the height of the extendable forks of an automated guided vehicle. Compared to mechanical distance sensors, the optical system does not wear out. The sensor also only measures the actual distance to the relevant target. Another advantage, it does not output any faulty positions for load carriers or packaging materials that protrude into the measurement path.

Find more information at <http://www.leuze.com/en-us>.

Customizable RISC-V IP Cores Ideal for Handling Large Amounts of Data

Semidynamics claims the world's first, fully customizable, 64-bit RISC-V family of cores that are ideal for handling large amounts of data for applications such as AI, Machine Learning (ML) and High-Performance Computing (HPC). The cores





are process agnostic with versions already being supplied down to 5 nm.

The first in the family, which is available for licensing now, is the Atrevido™ core. This has Out-of-Order scheduling that is combined with the company's proprietary Gazzillion™ technology so that it can handle highly sparse data with long latencies and with high bandwidth memory systems that are typical of current machine learning applications. Effectively, Gazzillion technology removes the latency issues that can occur when using CXL technology to enable far away memory to be accessed at the supercharged rates that it was designed to deliver.

The Gazzillion technology is specifically designed for Recommendation Systems that are a key part of Data Centre Machine Learning. By supporting over a hundred misses per core, an SoC can be designed that delivers highly sparse data to the compute engines without a large silicon investment. In addition, the core can be configured from 2-way up to 4-way to help accelerate the not-so-parallel portions of Recommendation Systems.

For the most demanding workloads, such as HPC, the Atrevido core supports large memory capacities with its 64-bit native data path and 48-bit physical address paths.

Find more information at <http://www.semidynamics.com>.

Autonomous Control AI Service for Use with Edge Controllers

Yokogawa Electric Corporation has announced the launch of a reinforcement learning service for edge controllers. Edge controllers collect data from various field devices and serve as a bridge to an information system network, such as computers and clouds, in the upper layer. This autonomous control service for OpreX™ Realtime OS-based Machine Controllers (e-RT3 Plus) utilizes the Factorial Kernel Dynamic Policy Programming (FKDPP) reinforcement learning AI algorithm and consists of packaged software and an optional consulting service and/or a training program, depending

on end user requirements. This software is being released globally, while consulting and the training program will be provided first in Japan, then in other markets.

With the new service that Yokogawa has announced, customers can create AI control models using the FKDPP algorithm and install them on edge controllers. This service has the following features and merits:

- ▶ Thanks to simplification of the AI model creation process, even non-AI experts can create an autonomous control AI model and install it on an e-RT3 edge controller.
- ▶ Retrofit of edge controllers with the installation of the autonomous control AI can be performed while other facilities remain in use.
- ▶ Supports control cycles as short as 0.01 seconds and is optimal for device control applications that require a quick response.

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

Robert Goldberg (r.goldberg@ieee.org) has over 35 years' experience with over 25 years in management of the design and development of hardware and software for a broad range of military electronic products involving digital, RF/Microwave, electro-optical and electromechanical systems. He is retired from ITT Aerospace Communications Division in Clifton, NJ, where he was responsible for Sensor Communication programs utilizing the application of sensor radios developed by ITT as a result of work with DARPA on the Small Unit Operations Situation Awareness System (SUOSAS). Prior to joining ITT, he held positions in systems test and systems engineering with Northrop Grumman in programs related to RF and IR electronic warfare systems. He is a Fellow of the IEEE and is currently chairman of the Fellows Evaluation Committee of the IEEE Instrumentation and Measurement Society.

