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- Boundless possibilities: The many advantages of LEDs
- Decorative highlights for cars: New freedom in design
- Light for Africa’s roads: Durban making 30 percent energy saving with LED street lamps
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On the cover
Calog Instruments’ locally designed and manufactured range of portable process control calibrators incorporate the most modern component technology, comprehensive feature capabilities and tough package design, making the units ideal for use in servicing, repairs in workshops and in tough plant environments.

The range includes the Calog-TEMP temperature calibrator, Calog-LOOP II mA calibrator, Calog-PRESSURE II pressure calibrator and Calog–LC II load cell tester/calibrator. Learn more about them on page 12.

For more information contact Calog Instruments, +27 (0)11 462 1920.

... highlights
Agilent Technologies’ new 4000 X-Series digital-storage and mixed-signal oscilloscopes (page 14) feature a touch screen that gives users the ability to trigger on a signal by simply drawing a box around it.

With touch functionality finding its way into an ever increasing array of products, Microchip has rolled out a new family of multi-touch controllers that include proximity detection and haptic feedback. Learn more on page 22.
SOUTH AFRICA

• Cirtech Electronics attended the Gitex 2012 technology week in Dubai towards the end of last year as part of the Department of Trade and Industry group, and exhibited on the South Africa stand. The company was represented by National Sales Manager, Leon Poulton, and Factory Manager, Daniel Soobramoney.

• Locosys, a manufacturer of GNSS (global navigation satellite systems) technology, has appointed Electrocomp as its distributor for the South African market.

OVERSEAS

Business

• In line with its previously stated strategic plans, Texas Instruments announced it will reduce costs and focus investments in its wireless business on embedded markets with greater potential for sustainable growth. Cost reductions include the elimination of about 1700 jobs worldwide. As a result of these actions, the company expects annualised savings of about $450 million by the end of 2013. Total charges will be about $325 million, most of which will be accounted for in the current quarter.

• Analog Devices announced financial results for its fiscal fourth quarter and fiscal year 2012. For the quarter, revenue totalled $695 million, more than the previous quarter's $683 million but down on last year's fourth quarter at $716 million. Net income for the year was $651 million ($2.13 diluted earnings per share) based on revenue of $2.7 billion, compared to net income of $867 million ($2.81 diluted earnings per share) on revenue of $3 billion in 2011.

• Osram will be expanding its LED manufacturing capacity with planned investments in the ‘low three-digit million Euro’ range in its LED assembly plant in China. The company also announced, however, that it will be cutting some 4700 jobs by 2014, as part of a cost-saving strategy.

• Micron Technology announced results of operations for its first quarter of fiscal 2013, which ended 29 November 2012. For the first quarter, the company had a net loss attributable to Micron shareholders of $275 million, or $0.27 per diluted share, on net sales of $1.8 billion. These results compare to a net loss of $243 million, or $0.24 per diluted share, on net sales of $2.0 billion for the fourth quarter of fiscal 2012, and a net loss of $187 million, or $0.19 per diluted share, on net sales of $2.1 billion for the first quarter of fiscal 2012.

Companies

• EXFO has been honoured with two test industry awards. The first was a rating of four diamonds by Broadband Technology Report for the intelligent Optical Link Mapper (IOLM) product while the second award was from Frost & Sullivan for having the highest market share (36.7%) in the portable fibre-optic test equipment sector.

• RF Micro Devices hopes to accelerate growth in the entry-level smartphone segment thanks to its recent acquisition of Amalfi Semiconductor, a fabless semiconductor company specialising in RF and mixed-signal ICs for this market. Under the terms of the agreement, RFMD will acquire Amalfi with cash on hand for total consideration of around $47.5 million.

• Micron Technology announced results of operations for its first quarter of fiscal 2013, which ended 29 November 2012. For the quarter, the company had a net loss attributable to Micron shareholders of $275 million, or $0.27 per diluted share, on net sales of $1.8 billion.

Industry

• The global semiconductor market posted its best sales month of 2012 in November (December figures not yet being available at the time of this going to print), According to the Semiconductor Industry Association (SIA), worldwide sales of semiconductors reached $25.73 billion in November, a 2% increase over the prior month. Sales from November 2012 also topped the November 2011 total of $25.22 billion by 2%, marking the global industry’s first year-over-year gain of 2012.

• Atmel has become the newest member of the G3-PLC Alliance, an international organisation whose goal is to promote the G3-PLC communications standard that ensures interoperability of new smart grid ecosystems.

• IMS Research forecasts the market for cellular machine-to-machine (M2M) connectivity services to rise from approximately 107 million connections globally in 2011 to about 326 million connections by 2016. Mobile operators are intent on developing and expanding their activities in the cellular M2M market as a key growth opportunity in the face of increasing saturation and maturity of the core mobile voice/data services market.

• Texas Instruments has joined the Alliance for Wireless Power (A4WP). Incepted in April of last year, A4WP is a group of electronics companies, including Samsung, Qualcomm and others, focused on advancing the field of wireless power by delivering a specification that permits spatial freedom. The group officially released its A4WP specification, which is based on loosely coupled magnetic resonance technology, to simultaneously charge smartphones and other portable electronics with different power requirements.

• According to the EDA Consortium, global third quarter 2012 EDA revenues increased 4.9% compared to the same period in 2011 to reach $1619.9 million. The EMEA region’s revenues grew 3.8%.
**Technology**

- Sharp has achieved the world’s highest solar cell conversion efficiency of 37.7% using a triple-junction compound solar cell in which three photo-absorption layers are stacked together. To achieve this, the company developed a new cell which can efficiently absorb light from different wavelengths in sunlight and convert it into electricity. Sharp also increased the active area for converting light into electricity through optimal processing of the cell edges.

- Osram has established a new R&D record with a prototype infrared thin-film chip boasting 72% efficiency. At 930 mW from an operating current of 1 A, its light output under laboratory conditions is 25% higher than that of the chips currently available on the market. With a wavelength of 850 nm the chip has been designed in particular for infrared illumination applications.
Cause of tin whiskers identified

By Brett van den Bosch.

The whiskering phenomenon was noticed and documented as far back as the early 20th century during the era of valve technology. It was noted that when pure, or nearly pure, tin solder was used, small (often microscopic) metal strands or whiskers grew between solder pads, sometimes causing short circuits. It was this discovery that led to the introduction of solder compounds, which effectively eliminated whiskering.

Fast-forward to the early 21st century and the killer gets released on a technicality, as the widespread ban against lead in consumer electronic products, combined with the perpetual trend toward miniaturisation, has led (pun intended) to a re-emergence of the old problem. Some fear mongers have gone so far as to predict that it’s only a matter of time before miniature devices built after the ban start failing en masse.

A number of suspects have been proposed for the mechanism behind tin whisker formation, but Yong Sun, a mechanical engineer doctoral student at the USC’s College of Engineering and Computing, has obtained real forensic evidence against the culprit.

Sun used scanning electron microcopy (SEM) and a process called digital image correlation (DIC) to track the deformation of the surfaces and was able to prove that the growth of whiskers is caused by high-strain gradient built up inside the device. So what does this mean exactly?

While his research paper goes into some detail, most of it would best be understood by a materials scientist. Perhaps the most salient passage that gives an overview for the electronic engineer is this:

“From the DIC results, it is proposed that strain or stress gradient, instead of an overall compressive stress field is the key for whisker growth. Results from SEM and DIC analysis also indicate that the whisker growth is a continuously dynamic process, during which the subsequent whisker is triggered by the redistribution of strain or stress field after local strain relaxation. The findings have advanced the understanding of whisker growth mechanisms and may provide insight for developing whisker mitigation technology for lead-free solder alloys.”

Sun’s findings were published in the Scripta Materialia, a materials science journal, and he won the prestigious international Acta Student Award, one of only six to receive the honour.

The importance of Sun’s work goes well beyond extending the operating life of consumer electronics; NASA has verified multiple commercial satellite failures it attributes to tin whiskers. Missile systems, nuclear power stations and heart pacemakers have also fallen victim to tin whiskers over the past several decades and they are also considered a suspect in reported brake failures in Toyota vehicles.

This discovery is likely to prompt manufacturers of lead-free products to seek ways to diffuse and mitigate the particular stresses identified by the research.

Reutech to supply trackers for solar power plant

Reutech and Soitec, a world leader in the energy industry, recently signed a contract for the supply of solar trackers for a large Concentrated Photovoltaic (CPV) power plant near Touwsrivier in the Western Cape which, after completion, will become the largest CPV power plant in the world.

This plant forms part of government’s Renewable Energy Feed-In Tariff (REFIT) programme which adds 1400 Megawatts of renewable energy to the national grid.

These robust and highly accurate CPV trackers were designed and developed at Reutech’s facility in Stellenbosch. The first prototype was developed, built and installed at Touwsrivier after only two months of extensive mechanical design engineering.

Soitec was selected by the Department of Energy as one of the preferred bidders through the country’s Independent Power Producer (IPP) programme.

Reutech’s expertise also include wind loading analysis, stress and deformation analysis, field assembly and maintenance, fixed and single axis mountings for photovoltaic power plants and optimised mechanical structures for custom requirements.

For more information visit www.reutech.co.za

Actum acquires specialist instrumentation supplier

Actum Electronics has acquired Peter Jones Electronic Equipment, which will henceforth act as a subsidiary of Actum. The company was sold as a going concern and will continue to operate as a separate entity. Actum Electronics’ Greg Barron and Kevin Klaff have been appointed to the board of directors with immediate effect, while the current management and sales team will continue to be involved in the business.

Peter Jones Electronic Equipment is a leading supplier of diagnostic, analytical and process instrumentation, with over 40 years experience. The company specialises in the flow, gas and moisture arena, as well as many other disciplines within the field of process instrumentation and control. It is the South African representative for Flexim, Keyence, PhyMetrix, Graphotec, Gow-Mac and Kyowa.

For more information contact Peter Jones Electronic Equipment, +27 (0)11 608 2944.
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Engineers worldwide have used TI’s award-winning WEBENCH tools to create more than two million designs cost-free since its introduction by National Semiconductor in 1999. While the tools have simplified and sped the design process, the time for engineers to export a design to their licensed CAD development platform was tedious and time consuming.

Developed by TI in cooperation with the makers of the CAD development platforms, WEBENCH designs now exporting to leading EDA platforms such as Cadence OrCAD Capture CIS, Mentor Graphics DxDesigner and Altium formats such as Altium Designer.

WEBENCH tools can be accessed from www.ti.com/webench-pr.

Scientists at Wake Forest University in the USA have developed what they claim is a viable alternative to fluorescents and LEDs for large-scale lighting, with key advantages over both.

The technology, called FIPEL (field-induced polymer electroluminescent), is flicker-free, shatterproof and gives off soft, white light rather than the yellowish glint from fluorescents or bluish tinge from some LEDs. This new lighting solution is at least twice as efficient as compact fluorescent (CFL) bulbs and on par with LEDs.

This latest advance in FIPEL technology uses three layers of mouldable white-emitting polymer blended with a small amount of nanomaterials that glow when stimulated to create bright and perfectly white light. However, it can be made in any colour and any shape – from 2 x 4-foot sheets to replace office lighting to a bulb with Edison sockets to fit household lamps and light fixtures.

The research group is believed to be the first to make a large-scale FIPEL that can replace current office lighting and is based on natural white light. Beyond office and home lighting, it sees potential uses for large display lighting, from store marquees to signs on busses and subway cars.

Wake Forest is working with a company to manufacture the technology and plans to have it ready for consumers in the next year.

Suntronika joins the Mobicon family

Towards the end of last year, the Mobicon Group, listed on the Hong Kong stock exchange, acquired the business of Suntronika through its South African subsidiary Mantech.

Founded in the late ‘70s by the Sun family, Suntronika has grown to become a significant player in the distribution of passives, switches, relays, transformers, semiconductors and other electronic components. Over the years, customers have enjoyed excellent service and supply continuity from famous brands such as Piher, Magnetics, Power-One, Fischer Connectors, Meggitt, Bussmann, Taiyo-Yuden, LSI and others.

Now that Suntronika enjoys the benefits of belonging to the marketing machine that is the Mobicon group, its customers can experience immediate, hassle-free access to the hundreds of thousands of product lines that the group has on offer. Additionally, through the Cape and KZN branches of Mantech, Suntronika will be able to raise its service levels to all its customers in those regions.

From a purely economic point of view, Suntronika is now also poised in a more price competitive position and should be able to offer its customers attractive savings on their electronic component purchases.

For more information contact Suntronika, +27 (0)11 403 3420.
IEEE has announced updates to four wireless communications technologies in the 802 family of standards, as well as a new IEEE 802 standards development project. The new standards support the global utility industry’s needs for smart grid data communications infrastructure and build on the IEEE Standards Association (IEEE-SA) portfolio of more than 100 active IEEE standards or standards in development pertaining to the smart grid.

The new standards include the following:

- **IEEE 802.15.4g-2012** – IEEE Standard for Local and Metropolitan Area Networks – Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs) Amendment 3: Physical Layer (PHY) Specifications for Low-Data-Rate, Wireless, Smart Metering Utility Networks – is a global standard that provides carrier-grade wireless communications connectivity for very large-scale smart metering applications and advanced metering infrastructure used in smart grids. It supports geographically diverse networks with minimal infrastructure that can potentially connect millions of end points. The new standard, an amendment to IEEE 802.15.4, offers the communications range, robustness and coexistence characteristics required for these types of applications and deployments that fit the general objectives of IEEE 802.15 but were not covered by the existing standard.

- **IEEE 802.16-2012** – IEEE Standard for Air Interface for Broadband Wireless Access Systems. This standard supports worldwide deployment of innovative, cost-effective, interoperable and multi-vendor broadband wireless access (BWA) products, with Ethernet as well as IP interfaces, that utilities can use for machine-to-machine smart grid applications. The standard specifies the air interface, including the medium access control and physical layers (MAC and PHY), of combined fixed and mobile point-to-multipoint BWA systems. The standard updates the WirelessMAN-OFDMA air interface designated by the ITU as IMT-2000. Further enhancement relevant to smart grid applications are provided in IEEE 802.16p-2012, an amendment providing “Enhancements to Support Machine-to-Machine Applications.”

- **IEEE 802.16.1-2012** – IEEE Standard for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems – provides an enhanced air interface and improved capacity for metropolitan-area networks that utilities can use for smart grid machine-to-machine communications, as well as mobile voice-based applications, with support for Ethernet as well as IP interfaces. IEEE 802.16.1-2012 is a new standalone version of the technology first specified in IEEE 802.16m-2011 and designated by the ITU as IMT-Advanced. Further enhancements relevant to smart grid applications are provided in IEEE 802.16.1b-2012, an amendment providing “Enhancements to Support Machine-to-Machine Applications.”

In addition, the IEEE-SA has approved development of a new standard that is intended to enable the handover of groups of wireless data connections between different types of networks in a heterogeneous network. Utilities will be able to use the standard to allow large groups of devices to hand over from one network to another to ensure continuous connectivity and service reliability if a part of the network loses connectivity.

- **IEEE P802.21d** – Standard for Local and Metropolitan Area Networks—Part 21: Media Independent Handover Services Amendment: Multicast Group Management – is intended to amend IEEE 802.21-2008 by adding support for simultaneous handovers of multiple users.

For more information or to purchase the standards visit www.ieee.org
Windows Embedded Server 2012

Microsoft’s Windows Embedded Server 2012 offers a proven, robust, highly available and reliable operating system for OEMs for embedded applications in server appliances in a wide variety of industries where long-term product availability is essential, particularly in Intelligent Systems architectures.

Being binary-identical to Windows Server, Windows Embedded Server helps increase hardware utilisation and optimise data storage efficiency with scale and performance advantages. Developers can build server appliances that run Microsoft SQL Server 2012 for embedded systems databases for enhanced business intelligence, interoperate with client computers and connect to the cloud.

Software licensing for Windows Server 2012 for embedded systems has been made simpler. The number of editions has been reduced and the Standard Edition gets failover clustering and has all the benefits that previously used to be only part of the higher-end editions.

New and improved networking features in the latest iteration include significant changes to the Server Message Block (SMB) file- and print-sharing protocol and network interface card (NIC) support, which helps improve server appliance performance and reliability.

Windows Server 2008 for embedded systems introduced a new installation mode, Windows Server Core, which installs only the files needed to support a designated server role. Server Core installation generally requires less maintenance and updating than a full Windows Server installation because fewer components are installed and running on the server.

Agilent updates RF design software

Agilent Technologies announced the availability of a new installation mode, Windows Server Core, which installs only the files needed to support a designated server role. Server Core installation generally requires less maintenance and updating than a full Windows Server installation because fewer components are installed and running on the server.

Hence, fewer components are exposed to attack over the network, making servers running the Server Core installation more secure, as they are less vulnerable to viruses, data theft or other compromises. Furthermore, Server Core delivers better uptime, as patching can be reduced, and Server Core continues to be an installation option in Windows Server 2012 for embedded systems.

Microsoft SQL Server 2012 for embedded systems is supported on Server Core. Server appliances running Microsoft SQL Server 2012 for embedded systems databases on server core thus have a smaller footprint, are more secure and deliver better uptime, compared with appliances running Microsoft SQL Server 2012 for embedded systems databases on the full Windows Server installation.

Hyper-V is a powerful virtualisation technology that enables businesses to take advantage of virtualisation’s benefits, for developers’ intelligent systems.

Applications for Windows Embedded Server 2012 include medical imaging, security and surveillance, industrial automation, streaming media server and telecommunications (PBX server).

For more information contact Mark Bohmer, Arrow Altech Distribution, +27 (0)11 923 9600.
New enhancements for Atollic’s IDE

Atollic recently released the latest version of its integrated development environment (IDE), TrueSTUDIO.

Believed to be the world’s first embedded IDE to include professional static source code analysis tools, the IDE’s analysis and metrics functions include checking for compliance against the MISRA-C:2004 coding standard and code metrics features such as code complexity analysis.

By following the MISRA-C coding standard, developers are more able to tackle the challenges often associated with using the C language and are guided to improve code portability, ease of maintainability and application reliability. TrueSTUDIO v3.3 follows the MISRA-C coding standard rigorously, ensuring that embedded developers can be assured their code is validated to the highest standards possible.

By using the built-in code metrics analysis tools, developers can easily measure important statistics like code complexity or commenting level of the source code. This empowers developers by providing them with the necessary tools to rewrite and improve their code. For example, reliability and maintainability is typically improved if overly complex C functions are re-factored or rewritten into simpler coding style.

TrueSTUDIO also provides a rich GUI for visualization and navigation of the MISRA-C and code metrics analysis results, including a report generator that produces test reports in a variety of popular file formats. Embedded developers have the capability to code, compile, debug and perform source code analysis all within a single development environment.

In addition to incorporating the inspection and analysis tools, TrueSTUDIO v3.3 now also includes native support for kernel-aware debugging of embedded applications developed using Micrium’s uC/OS-III real-time kernel.

TrueSTUDIO’s debugger provides docking windows that indicate the internal RTOS state during debugging. This is accomplished providing highly informative windows into task control blocks (TCBs), semaphores, mutexes, timers and more.

The new software version also significantly improves the range of microcontroller targets supported and includes support for many new devices from Energy Micro, STMicrowirelectronics, Toshiba, NXP and Infineon. Other tool enhancements in the new version include several debugger improvements such as a new memory fill function, added support for Multilink and OSJTAG debug probes and the Freescale OpenSDA interface.

For more information contact Avnet Kopp, +27 (0)11 319 8600.

Texas Instruments releases open-source RTOS

Texas Instruments is enabling microcontroller (MCU) developers to spend more time focusing on their unique applications, having developed TI-RTOS, a complete real-time operating system (RTOS) based on preemptive multithreading kernel, for its MCU platform.

TI has taken its expertise in its RTOS components, including the popular SYS/BIOS real-time kernel and network developer kit (NDK) TCP/IP stack, and integrated them to create a complete microcontroller RTOS. This new OS enables much faster software development by eliminating the need for designers to write and maintain complex system software, including schedulers, protocol stacks and low-level drivers.

Unique to the market, TI-RTOS provides a consistent platform also benefits TI Design Network software ecosystem partners by providing a free, widely used software platform without proprietary constraints.

TI-RTOS provides a complete, mature and stable embedded operating environment that provides full middleware and driver enablement to add more product functionality.

Components of the environment include a deterministic, real-time multitasking kernel (SYS/BIOS); TCP/IP stack, including network applications; USB, EMAC, MMC/SD host and device stacks and class drivers; FAT-compatible file system fully integrated with C RTFS file I/O functions; Ethernet, USB, UART, I2C and SD device drivers; and low overhead core-to-core communication mechanism for dual-core devices.

The software can be downloaded for free from www.ti.com
**Update to Altera’s FPGA design package**

Altera announced the release of its Quartus II software version 12.1, the company’s design suite for CPLD, FPGA, SoC FPGA and HardCopy ASIC designs.

Quartus II software version 12.1 bolsters its support for high-level design flows with the inclusion of an SDK for OpenCL and enhancements to both its Qsys system integration tool and DSP Builder model-based design environment.

Also included in the latest software release are several enhancements, such as a partial reconfiguration design flow, new intellectual property (IP) cores and expanded support for 28 nm FPGAs and SoC FPGAs.

The high-level design tools Altera offers include system-level C-based, IP-based and model-based design entry systems. These tools support and simplify the development of today’s advanced programmable systems, which include CPU cores, digital signal processing (DSP) blocks and multiple IP subsystems.

The addition of an SDK for OpenCL allows system developers and programmers familiar with C to quickly and easily develop high-performance, power-efficient FPGA-based applications using an open high-level programming language. The SDK for OpenCL reduces hardware design complexities and allows software programmers familiar with C to target FPGAs.

Enhancements made to Altera’s Qsys system integration tool and DSP Builder tool provide further design productivity and system performance benefits to users.

Qsys features expanded support for industry-standard ARM AXI3 and AXI4 protocols, while DSP Builder provides expanded support for seven different floating point precisions, including IEEE 754 half, single and double precision support.

Further simplifying system design, the latest Quartus II software release includes a 100G Interlaken IP core to enable high-speed chip-to-chip packet transfers and a new video trace monitor IP core for video processing applications.

Included in the Quartus II software version 12.1 is the first production release of Altera’s new partial reconfiguration design flow for Stratix V FPGAs. Partial reconfiguration provides the flexibility to change the device’s core functionality on the fly while other portions of the FPGA design are still running.

Designers store different functions in external memory and load them into the FPGA as needed, allowing customers to reduce the size of the FPGA used in their system, save board space and reduce power consumption.

The latest software version also includes a variety of additional enhancements, including support for new devices. Several new 28 nm Stratix V, Arria V and Cyclone V FPGAs and SoC FPGAs are supported in this release, including full support for Arria V GZ FPGAs.

For more information contact EBV Electrolink, +27 (0)21 402 1940.

**GUI development board**

Microchip’s new PIC32 GUI Development Board with Projected-Capacitive Touch (DM320015) makes it easy for designers to add the combination of multi-touch projected-capacitive interfaces and high-quality, 16-bit colour graphics to WVQGA displays in any application.

The board’s 32-bit PIC32 microcontroller can directly drive LCDs, eliminating the cost and complexity of an external graphics controller. The onboard MTC6301 is a turnkey projected-capacitive touch controller that simplifies the integration of popular multi-touch and gestures.

In combination with Microchip’s free graphics and multi-touch software, this board enables rich, modern user interfaces for cost-sensitive designs in a broad range of markets, such as consumer, industrial and medical.

The development board enables bezel mounting and connections between LCD displays and most of the PIC32’s on-chip peripherals. The board also provides ready-to-use PCB pads for common serial and analog connections. Additionally, the PIC32 has processing power to spare for additional tasks, such as communication, control and audio.

The MTC6301 controller’s sophisticated combination of self and mutual capacitive scanning for XY touchscreens and touchpads enables a host of features, including single and dual-touch drawing, the reporting of 11 single-finger gestures and the detection of up to 10 touches.

Additionally, the IC supports sensor designs with up to 13 x 18 channels and cover lenses up to 5 mm.

For more information contact Avnet Kopp, +27 (0)11 319 8600.
New from GainSpan is a dual-band 802.11 a/b/g/n Wi-Fi solution that utilises both the 2.4 GHz and 5.0 GHz spectra, enabling customers to access cleaner spectrum for applications requiring relatively interference-free bandwidth.

The new GS1550M/MD family provides reliable wireless connections, particularly in challenging environments such as healthcare facilities and industrial applications.

The new product family consists of two modules: the GS1550M which supports a dual-band stamped antenna and the GS1550MD which supports two dual-band external antennas for antenna diversity.

The modules feature two UART and SPI interfaces for ease of integration with any 8/16/32-bit microcontroller, and come preloaded with serial to Wi-Fi firmware for communication with the MCU and complete Wi-Fi functionality.

They offer advanced networking features and capabilities such as easy provisioning from a smartphone or web browser, over-the-air firmware updates, personal and enterprise wireless security, embedded DHCP, DNS and HTTP(S) servers/client software, XML parser, advanced mDNS/DNS-SD based device and service discovery, and more.

The modules support data rates up to 150 Mbps, can operate in infrastructure or limited AP mode and are fully compliant with 802.11a/b/g/n specifications. They provide support for peer-to-peer networking, allowing devices to connect to one another without an access point.

With both a sleep and deep sleep option, the modules can be rapidly put to sleep to reduce power consumption without loss of data and can then recover from the deep sleep state back to full operation in a few milliseconds. They also support a very low-power standby mode, which reduces power consumption to a few microamperes.

For more information contact CST Electronics, +27 (0)11 608 0070.
Portable process control calibrators

Models are available for mA loop, temperature, pressure and strain gauge load cells.

**Calog-TEMP temperature calibrator**
The high-precision, multifunctional temperature calibrator, Calog-TEMP, measures milliamp, millivolt, thermocouple, ohm and resistance temperature detector (RTD) in a single device. The temperature ranges are isolated from the mA and can be displayed simultaneously. Injecting thermocouple millivolts (or RTD ohms) into a transmitter while measuring the output (mA) simplifies field or workshop calibration.

All commonly used thermocouples types K, J, T, B, R, S, E, N, U, L and RTD types Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100 and Ni120 are covered in the easy-to-use menu. The thermocouple ranges have automatic internal cold junction or manual or external temperature compensation.

The ohms and RTD measurements are selectable for 2-, 3- or 4-wire connection and sourcing of ohms and RTDs is in 2-wire form. The milliamp measurement can be passive or active with a 24 V power supply in the measurement line for 2-wire transmitters.

A plug-in extender is supplied with spring terminals for bare wire connection directly to thermocouple wires or compensating cables. Cold junction correction is built into this unit. The backlit LCD display can be selected for measurement in a clear, precise numeric display or as a graph for use when logging temperature or milliamps over longer periods. This is ideal for monitoring ovens or optimising PID control.

**Calog-LOOP II mA calibrator**
Launched as the first calibrator in the Calog range in 2005, the Calog-LOOP II is now in its second generation. Using the latest ARM processor, it becomes a powerful field instrument with the added features of data-logging and plug-in memory card.

This unit’s specialty is milliamp loop powered instruments which can measure, source and simulate 4 – 20 mA control and measurement signals. Sourcing can be increment, step, ramp or valve stroking, and 0 – 32 V d.c. voltage and circuit continuity can be measured.

A trend logging feature with programmable time base is selectable for long-term loop monitoring. The Calog – LOOP II can display values of 0 – 24 mA and 0,005% full scale for inputs of 0 – 32 V.

The instrument’s logging facility stores data on the SD card which is easily downloaded directly to a PC via the onboard USB port; the data can then be opened within most spreadsheet programs.

**Calog-PRESSURE II pressure calibrator**
Also in its second generation is this instrument for testing, measuring and calibration of all pressure-based systems. In addition, the instrument contains functions to install and maintain all powered and non-powered milliamp loops.

This high-precision calibrator is suitable for the process industry and apart from pressure measurement, can also measure DC voltage, milliamps and circuit continuity, and will source and simulate milliamps.

The Calog – PRESSURE II uses the Keller series PA-33x digital pressure sensors which are easily plugged into the calibrator via the Binder connector.

The ‘source milliamp and measure pressure’ function can be used for pressure transmitter calibration.

The ‘source milliamp and measure pressure’ function can be used for I/P converter testing or calibration. With tracking switched on, the milliamp output will follow the measured pressure, making it perfect for recording, data-logging or in place of a pressure transmitter in an emergency.

**Calog–LC II load cell tester/calibrator**
The latest feature-enhanced instrument released by Calog is the strain gauge load cell tester/calibrator, Calog LC II, which now offers load cell indication and data logging via the USB port or SD cards.

An important feature is that there is no need for the user in the field to remove the load cells from the weighing scale to send back to the supplier for testing; they can simply be connected one at a time to the calibrator to get a readout of the status of the cell wiring and gauges.

If a load cell has been overloaded, the zero balance will be out. If the cell has water penetration, this will be indicated via the insulation test when connecting additional leads to the screen and housing. The recommended 50 V is used to measure the insulation, displayed onscreen with low readings highlighted.

The load cell test automatically checks whether the wiring is four- or six-wire and that all connections are sound. A three- or five-wire connection would indicate a fault condition.

The test then powers up the load cell and measures the no-load mV to read the bridge balance. It then connects the strain gauge bridge in turn from input, output and balance measuring resistance in each case. The test takes less than ten seconds and gives a summary on the backlit graphic LCD.

Due to the efficiency of the Lithium-Ion
Cabling and installation costs can often exceed the cost of the actual data acquisition and control modules on a distributed site; the disruption of operations can also be costly. Wireless modules make the installation of data acquisition and control systems much quicker and less costly.

Advantech has now released a new series of wireless modules with external power or battery operation and ranges from 110 to 1000 metres, suitable for use in factories, building control systems, parking systems and more. The range includes modules for digital and analog input, temperature and humidity sensors, and includes a router and gateway.

The devices communicate over the 2.4 GHz ISM band and support data rates up to 250 Kbps with star, tree and mesh topologies.

For more information contact Henry Hugo, Centurion Micro Electronics, +27 (0)21 851 4904.

Wireless DAQ modules

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For more information contact Henry Hugo, Centurion Micro Electronics, +27 (0)21 851 4904.

batteries, it is possible to use the handheld Calog calibrator as a load cell indicator for a reasonable period of time. For longer periods, such as with a cattle scale, auxiliary power can be supplied via an external 12 V or car cigarette lighter socket.

To display mass, force, strain or torque from load cells, Calog LC II allows the user to set the sensitivity in mV/V, range, decimal points and units. Zero trim can offset deadweight and span trim is available to increase the reading accuracy with the help of calibrated weights. Selections of software functions such as tare are included. The indicator can be used for one 350 Ω or three 1000 Ω load cells with a fixed 5 V excitation.

By using the 4 mm sockets and leads, it is possible to calibrate a load cell amplifier by injecting a known mV value and simultaneously measuring the corresponding mA output. In order to carry out this function safely and without ground loops, the mA measurement is isolated from the mV source.

Alternatively, the user can simply select the sensitivity and ranges, then set a mV value which shows the equivalent mass or set mass and it will show and source the correct mA.

The Calog LC II can simulate a load cell transmitter by sourcing mA into a load cell display or scada system. The display can be in mA or set to display mass and output the mA equivalent.

Instrotech supplies the Calog LC II Calibrator with a comprehensive operating manual and the calibrator includes a help menu to show the user how to connect the unit for various applications.

Features common to all four calibrators include:
- Quick-source value setup using the ‘key-per-digit’ numeric setting, enabling the user to scroll each digit up or down.
- Graphic display can be selected to display the measured value or trend with programmable time base.
- Compact dimensions of 86 x 155 x 43 mm (with the protective rubber cover), IP54 rating (dust and splash proof).
- Data logging with SD Card or downloaded to a PC via USB port.
- Programmable auto-off and selectable date and time.
- Lithium ion battery with temperature sensing.
- Battery run life approximately 8 hours, measure and source.
- 128 x 64 backlit LCD graphic display.
- Battery charger, carry case, protective non-slip rubber cover and safety leads supplied as standard.
- 2 year guarantee against faulty material and workmanship.

For more information contact Calog Instruments, +27 (0)11 462 1920.
Oscilloscopes boast touch triggering

Agilent Technologies has premiered the InfiniiVision 4000 X-Series digital-storage and mixed-signal oscilloscopes. This new series establishes high levels of flexibility and ease of use among units that use an embedded operating system.

The new lineup offers bandwidths from 200 MHz to 1.5 GHz and features which include an update rate of one million waveforms per second with standard segmented memory, which uses patented MegaZoom IV smart memory technology. They have a 12-inch capacitive touch screen and the exclusive, all-new InfiniiScan Zone touch-triggering capability.

With the high-speed waveform update rate, operation is always fast, even with digital channels, protocol decoding, math functions or measurements activated. Speed also translates into a high probability of capturing random or intermittent events that often go undetected by scopes with lower update rates.

Because the 4000 X-Series was designed specifically for touch operation, engineers can select targets naturally and quickly. For example, InfiniiScan Zone makes triggering as easy as finding the signal of interest and drawing a box around it; if users can see a signal, they can trigger on it.

To further improve productivity, the interface includes an alphanumeric touchpad that replaces tedious knob-based operation, and touch-based interaction that enables greater flexibility in displaying measurement information.

The high level of integration starts with the capabilities of five instruments on one unit: oscilloscope, digital channels (MSO), protocol analysis, digital voltmeter and dual-channel WaveGen function/arb wave generator.

The 4000 X-Series also supports a wide range of popular optional applications: MIL-STD 1553 and ARINC 429; I²S; CAN/LIN; FlexRay; RS-232/422/485/UART; I²C/ SPI; and USB 2.0 hi-speed, full-speed and low-speed triggering and analysis.

The product range includes 200 MHz, 350 MHz, 500 MHz, 1 GHz and 1.5 GHz models. The standard configuration for all models includes 4 Mpts of memory and segmented memory.

For more information contact Concilium Technologies, +27 (0)12 678 9200.

Digital radio test set gets 4x2 MIMO support

Aeroflex has added support for 4x2 multi-input multi-output (MIMO) to the 7100 digital radio test set for the R&D testing of LTE user equipment (UE) being designed with this feature.

4x2 MIMO is used adaptively to offer improved throughput in good signal conditions, and improved resilience in poor signal conditions. When the signal-to-noise ratio (SNR) at the UE is good, the device can make use of spatial multiplexing, where multiple information streams are transmitted simultaneously to improve throughput.

When the SNR is poor then transmit diversity is employed. This is where a single information stream is distributed across separately encoded antenna ports to reduce the variations in SNR experienced by the UE, thus improving the cell coverage. Measurements are made both at the base station and at the UE, and these are used to determine how many streams can be supported in the prevailing signal conditions.

4x2 MIMO measurements on LTE in FDD mode with bandwidths of 10 MHz, 15 MHz and 20 MHz. It is planned that 1.4 MHz, 3 MHz and 5 MHz bandwidths will be added in due course.

Fading and Additive White Gaussian Noise (AWGN) measurements are supported, using the optional integral fading and AWGN generator, with configurable cross-correlation between streams.

This new release of the software supports 4x2 MIMO measurements on LTE in FDD mode with bandwidths of 10 MHz, 15 MHz and 20 MHz. It is planned that 1.4 MHz, 3 MHz and 5 MHz bandwidths will be added in due course.

Fading and Additive White Gaussian Noise (AWGN) measurements are supported, using the optional integral fading and AWGN generator, with configurable cross-correlation between streams.

This release of the software supports open loop spatial multiplexing, with closed loop planned to be included in the next release.

For more information contact Measuretest, +27 (0)12 452 0400.
Programmable bench-top power supply

K Measure has introduced its first ever programmable bench-top power supply to complement its range of test and measurement equipment. In Hantek's PP-S2118A, the company has found a product that it feels delivers the innovative features and value for money required by the South African market.

The unit is aesthetically appealing with a slim profile and it runs completely silently, with the automatic fan only coming on for short times when high currents are drawn. Voltage and current are adjustable from 0 – 32 V, 0 – 5 A.

The interface is completely digital, which provides some important advantages over the normal analog adjustment. For instance, one can set the voltage and current to new values on the display and only at the final press of a button will the actual output be adjusted. This means if the user changes the voltage from 5 V to 12 V it can be done in a very clean and instant switchover.

Another advantage of the digital interface is that five preset configurations are available that can be restored at the touch of a button. It also provides the ability to change the voltage/current increment values when adjusting them with the knob, locking the values so they can't be changed accidentally.

The PPS2116A includes a USB port and comes with software that enables the user to monitor the voltage and current, to control it from a PC, and to log the voltage and current.

The USB interface provides for handy applications, for instance in the accompanying graph the PSU was programmed to step the output voltage from 0 V to 30 V in 5 V increments and log the current that was drawn by a 40 Ω resistor. The logged voltage and current values can be exported to a CSV file for inclusion in reports.

The PPS2116A is a single-channel PSU, but its small size and low price means that two units can be placed next to each other to form a dual-channel power supply.

K Measure assures that it keeps stock, delivery is free and orders are shipped within 24 hours.

For more information contact K Measure, +27 (0)12 333 5105.

DDS function generators

The digimess FG300 series of general purpose Direct Digital Synthesis (DDS) function generators provides frequencies to 3 MHz (FG303) and 8 MHz (FG308) with 100 mHz resolution. Frequency setting is by keypad entry or rotary control, and the combination of soft touch buttons and rotary controls for the remaining features result in an easy to use instrument.

The generators have a 6-digit frequency display for internal or external signals and a 4-digit output amplitude display. They also have an output on/off switch and a variable TTL/CMOS amplitude control. Further features include LED indicators for frequency, amplitude and attenuation ranges as well as the selected waveform shape.

The instruments are capable of producing sine, square and triangle waveforms at levels from 20 mV to 20 V peak-to-peak. DC offset is adjustable to ±10 V and duty cycle from 20% to 80%.

For more information contact Electrocomp Express, 0860 10 20 20.
Of the current test methods for testing FTTx (Fibre to the ‘x’, with x being a placeholder for various end-points) and PON (passive optical network) installations, OLTS, using an optical loss test set (optical power meter and light source) to characterise a link is easy; however it has one major limitation: it cannot locate the problems on the link. Furthermore, an OLTS requires 2 units and 2 technicians, thus increasing OPEX.

The most popular test method during construction and in certifying FTTX/PON installations is an OTDR (optical time domain reflectometer). A well trained and skilled optical technician can identify and locate problems on a link, using multiple acquisitions with different OTDR test settings and after various manual OTDR trace comparisons.

The shift from copper to fibre and the explosion of fibre deployments has created a shortage of skilled and experienced technicians. Combine this with budget constraints, lack of credible training facilities, practical experience and the result is an increased risk of improper testing, misdiagnoses, unusable OTDR results and repeat repairs/truck rolls.

The complexity of a PON/FTTx network requires skilled optical technicians to set different acquisition parameters on the OTDR to get the required information. Single OTDR measurement and auto test settings on today’s OTDRs are incapable of fully characterising this type of network.

To overcome this limitation, skilled technicians perform multiple additional acquisitions on the OTDR with other parameters to fully characterise the link.

**Portable applications**

EXFO’s new test solution is an ‘intelligent’ OTDR. Essentially it is a software application that runs on the test unit that is able to set and take multiple and variable acquisitions, then analyse the information to generate a detailed linear diagram about every element on the link, in a single-button operation, providing maximum simplicity for expert-level link characterisation.
This new test method makes every technician a fibre-optics expert, whether they are testing in the field or from the central office. Plus, it does not require the parameter settings used in traditional OTDR testing, which means no distance, pulse width or averaging time setting with detection threshold setting required.

IOLM (intelligent Optical Link Mapper) technology stems from the need to create optimal testing technology for PON networks, as this is the most challenging network to test because of its short link lengths and many closely spaced elements, such as splices, connectors and splitters.

As shown in Table 1, the maximum IL difference between IOLM and the reference method (PM/LS) is 0.64 dB, which compares favourably to the OLTS method. Based on the PM/LS and the OLTS results, an experienced technician could have suspected a macrobend on the line because the difference in loss is more than 1 dB between 1310 and 1550 nm.

However, he would have no clue as to the location of the macrobend. He could therefore use an OTDR and a different combination of pulse widths to find the macrobend himself. With IOLM any technician will be able to clearly see that there is a macrobend immediately after the splitter (see Figure 5 showing a test conducted from ONT to OLT).

The test method is a one-end, single-unit testing method with the ability to provide clear diagnostics and discovered elements in a single view.

Comparing ORL measurements (Table 2), the maximum difference between the ORL meter and IOLM is 0.84 dB, which is small enough to locate any ORL problem.

So what is causing an ORL issue on the line?
This is caused by connector reflectance, but according to the ORL results, we are below the 32 dB threshold. Now, if we look at the results in Figure 6, we can see that there is one highly reflective connector that needs to be fixed (exceeds the -55 dB threshold).

This is what we are looking for when testing with an ORL meter (or OLTS) in both directions. We want to know the direction of the high ORL because that’s where the high reflective connector is. Obviously, we would have missed it with the ORL meter or the OLTS, providing a clear advantage for the IOLM.

For more information contact Chris Nel, Lambda Test Equipment, +27 (0)12 349 1341.

Table 1. IL test results from the different methods.

<table>
<thead>
<tr>
<th>IL</th>
<th>ONT TO OLT</th>
<th>OLT TO ONT</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Test Method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iOLM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IL (dB)</td>
<td>1310 nm</td>
<td>1550 nm</td>
</tr>
<tr>
<td></td>
<td>18.98</td>
<td>20.21</td>
</tr>
<tr>
<td>Δ IL with PM/LS (dB)</td>
<td>-0.14</td>
<td>-0.22</td>
</tr>
<tr>
<td>PM/LS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IL (dB)</td>
<td>19.12</td>
<td>20.44</td>
</tr>
<tr>
<td>ORL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IL (dB)</td>
<td>18.76</td>
<td>20.24</td>
</tr>
<tr>
<td>Δ IL with PM/LS (dB)</td>
<td>-0.36</td>
<td>-0.20</td>
</tr>
</tbody>
</table>

Table 2. Table showing the different ORL test results.

<table>
<thead>
<tr>
<th>ORL</th>
<th>ONT TO OLT</th>
<th>OLT TO ONT</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Test Method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORL (dB)</td>
<td>39.78</td>
<td>41.67</td>
</tr>
<tr>
<td>Δ ORL with ORL meter (dB)</td>
<td>0.84</td>
<td>0.57</td>
</tr>
<tr>
<td>OLT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORL (dB)</td>
<td>38.94</td>
<td>41.1</td>
</tr>
<tr>
<td>Δ ORL with ORL meter (dB)</td>
<td>0.20</td>
<td>0.16</td>
</tr>
</tbody>
</table>
Cold plate performance tester

The iFLOW-200 system from Advanced Thermal Solutions assesses the thermal and hydraulic characteristics of cold plates in electronics cooling. It measures the coolant’s temperature at inlet and outlet, fluid flow rate and pressure drop, and surface temperature.

The machine can be used to simulate a wide range of conditions to optimise a cold plate’s performance before it is commercialised, or prior to its use in an actual application. It measures coolant temperature from 0-70°C with an accuracy of ±1°C. Differential pressure of the coolant in the cold plate is measured up to 103 000 Pa (15 psi). Distilled water is the reference coolant. For test comparisons, the system’s coolingVIEW software can also calculate thermal resistance and pressure drop as a function of flow rate for selected liquids.

The instrument system includes a pair of K-type thermocouples for measuring temperature changes on the cold plate surface. Temperatures are monitored on the coolingVIEW interface.

The system features easy setup and operation to save time when evaluating different cold plate models. Designed for accuracy and convenience, it simply requires setting the starting and ending coolant flow rates, and choosing the dwell time, pumping power and other parameters. These are easily done on any PC using the system’s user-friendly application program.

The iFLOW-200 features separate controller and hydraulics enclosures with USB connections. The hydraulic package includes a fluid level indicator, coolant inlets/outlets from/to the cold plate under test, ports for surface temperature thermocouples, and a fluid cooling system for its internal heat exchanger.

For more information visit www.qats.com

High-current clip and test probe

With its new HL-541 6063 high-current clip for round posts (Ø 6,0 to 6,3 mm), Ingun makes it possible to transfer continuous currents of up to 130 A without damaging or scratching the posts.

This is achieved by use of a contacting method similar to a collet chuck, i.e. the spring-loaded elements of the clip are pressed on laterally. For safe operation of the clip, the installation of a pneumatic connector approach mechanism is recommended.

Also new is the screw-in HSS-621 M high-current probe – a market driven development to test increasingly smaller power components. They can safely transfer up to 75 A at a grid of 6,35 mm.

With its robust construction, the probe is ideally suited for harsh environmental conditions. It is assembled in a receptacle and can be wired by either a thread for ring eyelets or solder connection.

For more information contact Electronic Industry Supplies, +27 (0)11 726 6758.
**MIL-STD-1553 network analyser**

The GE Intelligent Platforms R15-USB is the latest generation of analyser for MIL-STD-1553A/B Notice II using a high-speed USB 2.0 interface with either one or two dual-redundant channels.

Available in -40°C to +75°C temperature version (with relays) and a ruggedised version (without relays), the device includes an advanced API (application programming interface) that reduces application development time.

Standard features include IRIG-B signal receiver (AM or DC/TTL) / generator (DC/TTL), software selectable transformer or direct coupling, 2 MBytes of RAM, 64-bit nanosecond message time tagging, input and output triggers for each 1553 channel, extensive BC and RT link-list structures, error injection and detection, 8 bidirectional avionics level discretes, automatic and manual RT status bit and mode code responses, along with advanced BC functionality.

The R15-USB Bus Monitor provides extensive error detection and 100% monitoring of fully loaded buses.

In multi-function mode, the device operates simultaneously as a bus controller, with up to 31 remote terminals and bus monitor, while in dual-function mode it operates simultaneously as either a bus monitor and bus controller, or a bus monitor with up to 31 remote terminals.

Further features include IRIG-B receiver (AM or DC/TTL) and generator (DC/TTL) standard, 64-bit nanosecond resolution time tagging (virtually unlimited time stamping), complete message programmability and flexible message generation, I/O triggering and error injection/detection.

For more information contact Rugged Interconnect Technologies, +27 (0)21 975 4524.

**Vector signal generator supports 12,75 GHz**

Rohde & Schwarz has enhanced its SGS100A vector signal generator by adding a model for I/Q modulated signals from 80 MHz to 12,75 GHz. Combined with an I/Q baseband generator, the instrument can be used to generate test signals for all radio standards in this frequency range.

As a result, it is ideal for X-band signals from 8 GHz to 12 GHz for radar and satellite communications.

The I/Q modulator’s wide RF bandwidth of 1 GHz makes it possible to generate pulses with high chirp bandwidths and steep pulse edges. Designed for use in automatic test systems, the compact system (one unit high and half of 19" in width) delivers excellent performance across the entire frequency range up to 12,75 GHz.

All models can switch between the wanted frequency and level settings in only 280 μs. They offer a high output level of +22 dBm as standard and have an electronic step attenuator covering the entire frequency range. The generator boasts high reference frequencies of 100 MHz and 1 GHz, which ensures excellent phase stability for phase-coupled applications involving multiple signal generators.

For more information contact Trevor Grundlingh, Protea Electronics, +27 (0)11 719 5700.
Universal magnetic encoder

The KMA36 from Measurement Specialties is a universal magnetic encoder for precise rotational or linear measurement. It features system-on-chip technology that combines a magneto-resistive element along with analog-to-digital converter and signal processing.

By employing anisotropic magneto-resistive (AMR) technology, the device is able to contactlessly determine the magnetic angle of an external magnet over 360°, as well as the incremental position on a magnetic pole strip with 5 mm pole length. Its sleep and low-power modes, as well as automatic wakeup over I2C, make the KMA36 ideal for many battery-powered applications.

Position data can be transmitted using a PWM or two-wire (SDA, SCL) communication bus. Using the programmable parameters, the user has access to a wide range of configuration options to ensure design freedom and functionality.

Used as both a linear position sensor or a rotary position sensor, the sensor is insensitive to magnetic drift due to mechanical tolerances, changes in temperature or thermal stress. Its maintenance-free operation and high bandwidth make it a good choice for dynamic applications in harsh environments.

For more information contact Tobie Muller, Accutronics, +27 (0)11 782 8728.

Integrated burst testing for Ethernet services

JDSU has developed a complete test coverage approach for ‘bursty’ data applications, which comprise the majority of today’s network traffic. The company has integrated burst testing enhancements into RFC 2544 and Y.1564 SamComplete automated test procedures for its T-BERD/MTS platforms as well as its Ethernet Service Assurance solution, NetComplete.

This critical test helps service providers identify buffer provisioning issues and verify committed burst sizes (CBSs) now specified in many service-level agreements (SLAs). In combination with JDSU’s TrueSpeed RFC 6349 test suite, service providers can verify correct provisioning of the expected buffers to reduce frame loss as well as verify performance and experience their network like their customers do.

By providing full automation and ease of use, the system reduces complexity and operational expense through automated tools that minimise technician time and expedite time to revenue. It relies on standards-based test procedures such as RFC 2544, Y.1564 or RFC 6349 with clear pass/fail results for service providers based on the new MEF 23.1 recommendations.

For more information contact Concilium Technologies, +27 (0)12 678 9200.

Hardware probe assures end-user QoE

EXFO announced the launch of the BV-110, a next-generation hardware probe designed for validating transport service-level agreements at customer premises and cell sites while measuring end-user quality of experience (QoE) for data, voice, video and mobile services.

Part of the overall Brix solution, the instrument enables service providers and mobile network operators to assure the quality of their services, reduce mean-time-to-repair (MTTR) and avoid unnecessary truck rolls, resulting in significant cost savings.

The latest building block in the EXFO family of verifiers, the BV-110 increases the service assurance power of EXFO’s Brix System. The system features multifunction, simultaneous measurements, patented HW time stamping technology and evolutionary design.

The BV-110 monitors transport performance and allows fixed and mobile network operators to simultaneously measure the true end-user QoE over both wireline and wireless segments.

The new BV-110 Verifier is a true multiplay solution designed for simultaneous assurance of data, voice, video and mobile services. It delivers network to application layer performance, with extensive QoE monitoring. This new monitoring tool provides the visibility and details that are essential for network administrators to troubleshoot performance issues that affect end users’ QoE.

For more information contact Chris Nel, Lambda Test Equipment, +27 (0)12 349 1341.
18-bit digital-to-analog converter

Maxim’s new MAX5318 is an 18-bit data converter that integrates all the external circuitry to make a high-precision voltage source for industrial test and measurement, factory automation and process control.

The digital-to-analog converter (DAC) integrates an output and reference buffer amplifier, essential functions that consume as many as three extra, external components in competitive designs. It features accuracy of ±2 LSB over the -40°C to +105°C temperature range. A negative supply option allows full INL and DNL performance down to 0 V, while high-precision signalling is ensured with a 3 μs settling time.

For more information contact CST Electronics, +27 (0)11 608 0070.

LED drivers for long strings and multi-chip arrays

With input voltages up to 60 V d.c. and constant-current outputs of 350, 500, 700 and 1200 mA, Recom’s new RCD-48 family of LED drivers offer device power ratings up to 70 W for long LED strings and multi-chip arrays.

The drivers are dimmable down to zero with external digital (PWM) or analog control; the PWM control input can be directly connected to a microcontroller. Efficiency is rated at 96%, with an operating temperature range -40°C and +85°C.

The modules are available with pins for PCB mounting or with flying leads for non-PCB applications. Whilst the powerful 1200 mA version features a metal case, the smaller models are designed in plastic cases.

For more information contact Brabek, +27 (0)21 706 3162.

Chipset authenticates peripheral devices

Maxim is sampling a new chipset that claims to provide the strongest levels of security when authentication of peripherals is necessary. As part of the manufacturer’s DeepCover security lineup, the chipset comprises the DS2465 secure coprocessor with integrated 1-Wire master and the DS28E15/DS28E22/DS28E25 1-Wire secure authenticators.

This secure chipset protects a revenue stream by ensuring that only licensed peripherals are used with OEM equipment. Many applications in consumer, medical, industrial and communications markets can benefit from this security.

OEMs can ensure that the peripherals used with their equipment are genuine and meet their performance and quality standards. The DS2465 coprocessor, used with any of the 1-Wire secure authenticators, quickly identifies unlicensed after-market peripherals that are not approved for a system.

An example application is a medical system for patient monitoring that uses replaceable sensors and peripherals. Using this DeepCover solution, the medical device will verify that the attached medical sensors are authentic and approved by the device manufacturer, and thus deliver the performance and safety requirements demanded by the application.

For more information contact Avnet Kopp, +27 (0)11 319 8600.

NFC interface chip

Implementing high-speed Near Field Communication (NFC) between two independent devices has been made easier with the introduction of the AS3953 interface chip from ams. The IC offers a high data-rate, bi-directional interface between an NFC device such as a smartphone and any host microcontroller with a standard Serial Peripheral Interface (SPI).

Operating on energy harvested from an NFC reader’s RF emissions, the AS3953 NFC (Near Field Communications interface chip) requires no external power source and at most one external component (a capacitor). The device is fully compliant with NFC Forum specifications (NFCIP-1 target at 106 Kbps) and the ISO14443A industry standard (up to 848 Kbps, to Level 4). This means that it can be used in contactless smart cards and as an NFC Forum-compatible interface tag, and can establish instant communication with any NFC-enabled phone in close proximity (<10 cm).

The AS3953 is expected to find uses in a wide variety of applications, including contactless passive programming of MCU-based systems, smart cards with displays, smart retail shelf labels, sensors and ultra low-power data loggers, medical devices and secured NFC Bluetooth pairing.

It can also enable innovative new approaches to system designs by using an NFC-enabled smartphone as a display host and system controller for normally stand-alone devices, eliminating the requirement for the slave device to have its own display and processor.

The IC features a configurable wake-up interrupt, enabling a zero-power system design while shut down. It also contains a complete analog front end, 1 KB of internal EEPROM, and a 4-wire SPI with a 32-Byte FIFO.

The device can draw up to 5 mA of harvested energy from the external magnetic field, and includes an internal power management circuit that can supply harvested energy to the application. This makes it ideal for use with battery-powered and portable microcontroller-based devices.

For more information contact Gary de Klerk, NuVision Electronics, +27 (0)11 608 0144.
Multi-touch controllers

Microchip announced the expansion of its mTouch Sensing Solutions portfolio, with four turnkey controllers for multi-touch projected-capacitive touchscreens and touchpads, proximity detection and haptic touch feedback.

The MTCH6301 is a turnkey projected-capacitive touch controller that allows designers to add popular multi-touch and gesture interfaces, eliminating the learning curve and time for creating a design from scratch.

This controller’s sophisticated combination of self and mutual capacitive scanning for XY touchscreens and touchpads enables a host of features including single- and dual-touch drawing, the reporting of 11 single-finger gestures and the detection of up to 10 touches.

The MTCH6301 supports sensor designs with up to 13 x 18 channels and cover lenses up to 5 mm. Additionally, Microchip offers its free Projected Capacitive Configuration Utility with automatic tuning, enabling fast customisation for different screen sizes and top-layer thicknesses. Microchip also provides designers with the firmware library, so they can make further customisations.

The MTCH101 and MTCH112 are turnkey controllers in small packages that provide an easy way to add robust proximity detection with a range of up to 20 cm. Additionally, these low-cost controllers extend battery life with power consumption as low as 5 μA.

The MTCH101/112 also provide advanced noise avoidance and cancelling technology, and can operate standalone or connected to any microcontroller via I²C, making it easy to add touchless operation or user detection to any design.

The MTCH810 is the first in a family of controllers based on Microchip’s licence of Immersion’s TouchSense haptic feedback technology. This controller enables the easy addition of haptic tactile feedback to any capacitive-touch button or slider interface. It integrates a single-channel haptic driver output with an industry-standard I²C slave interface that connects to any MCU, all in a small 8-pin package. Designers can differentiate their products while improving the user experience by utilising any of the 14 different haptic effects that are pre-programmed into the controller, such as single vibrate and double vibrate.

The MTCH6301 projected-capacitive controller is available in 44-pin QFN and TQFP packages; the MTCH101 is offered in a 6-pin, SOT-23 package; the MTCH112 is packaged in the 8-pin SOIC and DFN, and the MTCH810 haptic-feedback controller is available in a 3 x 3 mm, 8-pin DFN package.

For more information contact Tempe Technologies, +27 (0)11 452 0530.

Wideband LNAs

Hittite has launched two new wideband LNA (low-noise amplifier) products which are targeted at microwave radios, VSAT, Satcom and test instrumentation applications.

The HMC1049LPSE is a GaAs MMIC pHEMT LNA which operates between 300 MHz and 20 GHz and employs a novel topology which maintains a low noise figure of 1.8 dB at low frequencies. It also delivers 15 dB of small signal gain and output IP3 of +29 dBm, while requiring only 70 mA from a +7 V supply.

P1dB output power of +14.5 dBm enables the LNA to function as an effective LO driver for balanced, I/Q or image reject mixers. Supplied in a leadless QFN 5 x 5 mm surface-mount package, the HMC1049LPSE features I/Os that are internally matched to 50 Ohms.

The HMC1049 is the die version of the HMC1049LPSE. It also operates between 300 MHz and 20 GHz and provides 16 dB of small signal gain, 1.7 dB noise figure, and output IP3 of 27 dBm. The HMC1049 features P1dB output power of 16 dBm. Internally matched to 50 Ohms, the compact size and simplified biasing of the HMC1049 make it ideal for wide-band multi-chip-module and subsystem applications.

For more information contact Andrew Hutton, RF Design, +27 (0)21 555 8400.

High-voltage line driver

ZMDI has introduced the ZIOL2211 WL-CSP driver IC with a high-voltage I/O channel that meets the physical layer requirements of sensor and actuator systems used in factory and process automation applications.

Compliant to the IO-Link standard, the device provides a wide range of configurable system features, and is fully programmable for settings ranging from slew rate and current to diagnostics features. The new IC is also supported by ZMDI’s existing IO-Link tools.

The ZIOL2401 Starter and Lab Kit are suitable for all ZIOL2xxx ICs including the ZIOL2211 WL-CSP. The application kit includes an evaluation board and a Windows-based configuration tool, with a USB interface between the user’s PC and the board.

Developers can easily evaluate configurations and save the results. In-system programming using the SPI standard is also supported, allowing for full customisation after manufacturing.

The ZIOL2211 WL-CSP’s operating temperature range is -40°C to +85°C, and it comes in a space-saving 2.5 x 2.5 mm WL-CSP package.

For more information contact MB Silicon Systems, +27 (0)11 728 4757.
New 8-bit Microcontrollers with integrated configurable logic in 6- to 20-pin packages

Microchip’s new PIC10F/LF32X and PIC12/16F/LF150X 8-bit microcontrollers (MCUs) let you add functionality, reduce size, and cut the cost and power consumption in your designs for low-cost or disposable products, with on-board Configurable Logic Cells (CLCs), Complementary Waveform Generator (CWG) and Numerically Controlled Oscillator (NCO).

The Configurable Logic Cells (CLCs) give you software control of combinational and sequential logic, to let you add functionality, cut your external component count and save code space. Then the Complementary Waveform Generator (CWG) helps you to improve switching efficiencies across multiple peripherals; whilst the Numerically Controlled Oscillator (NCO) provides linear frequency control and higher resolution for applications like tone generators and ballast control.

PIC10F/LF32X and PIC12/16F/LF150X MCUs combine low current consumption, with an on-board 16 MHz internal oscillator, ADC, temperature-indicator module, and up to four PWM peripherals. All packed into compact 6- to 20-pin packages.

Go to www.microchip.com/get/eunew8bit to find out more about low pin-count PIC® MCUs with next-generation peripherals
Non-volatile digital potentiometers

A new series of non-volatile single-, dual- and quad-channel digital potentiometers (digiPOTS) is available from Analog Devices to improve component matching in industrial and communication control systems by featuring resistance tolerance of ±1%.

The 11 new devices in the ADS51x series also feature a 3 MHz bandwidth to enable faster system response times. They offer low temperature coefficient performance over the temperature range of -40°C to 125°C.

The non-volatile digiPOT series meets a wide range of system-level requirements in single, dual, or quad, 256-tap or 128-tap, SPI or I²C interfaces, leaded and leadless packaging, all featuring 4 kV ESD protection.

For more information contact Avnet Kopp, +27 (0)11 319 8600.

Digital phase shifter

M/A COM Technology Solutions Aerospace & Defence product group has developed a new digital phase shifter for use in L-band applications from 1.2–1.4 GHz.

The MAPS-011007 is a 6-bit device targeted toward international customers using the 1.2–1.4 GHz frequency band for communications antennas and commercial and military phased array radar applications. It maintains low phase error and low attenuation variation over the full 360 degrees and frequency range.

The 360 degree phase shift is broken down to steps of 5.6 degrees. The device offers 3.8 dB insertion loss with a ±0.5 dB attenuation variation and a ±2.0 degree phase accuracy over the operating band. It has a built-in CMOS driver that allows for serial or parallel control and low power consumption.

The MAPS-011007 is packaged in a 4 x 4 mm, 24-lead PQFN package.

For more information contact M/A COM Technology Solutions, +27 (0)11 908 6679.

Low-noise 16-bit ADCs

New from Linear Technology are three low-power 16-bit, 20 MSPs analog-to-digital converters (ADCs) – the LTC2269, LTC2270 and LTC2271 – offering very low input-referred noise and tight integral non-linearity error (INL) for very high-precision DC measurements.

With only 46 μV p-p input noise and maximum guaranteed INL error of ±2.3 LSB, these ADCs are suitable for very low-noise, high-linearity sampling applications such as digital X-ray, infrared and medical imaging, pachymeters, spectrometry and cytometry.

These devices achieve signal-to-noise ratio (SNR) performance of 84 dB and SFDR of 99 dB at baseband. High AC performance and low noise is achieved using a well designed 2,1 Vp-p front end, which also significantly lowers the power required by the ADC driver circuitry.

The ADCs themselves consume approximately 80 mW/channel. Further power savings can be achieved by placing the devices in standby (12 mW) or shutdown (0.5 mW), making them ideal for handheld test and measurement applications.

The LTC2269 and LTC2270 are single-channel and two-channel simultaneous sampling parallel ADCs, respectively, offering a choice of full-rate CMOS or double data rate (DDR) CMOS/LVDS digital outputs with programmable digital output timing, programmable LVDS output current and optional LVDS output termination.

The LTC2271 includes two-channel, simultaneous sampling ADCs with serial LVDS outputs. They include Linear Technology’s digital output randomiser and alternate bit polarity (ABP) mode that minimise digital feedback in the application.

Available in compact QFN packages, designers can benefit from the flexible choice of interfaces to minimise pin count and ease routing to FPGAs.

For more information contact Arrow Altech Distribution, +27 (0)11 923 9600.
ESD wipes and clothing

Cleantex supplies a range of specialty clothing and accessories for manufacturing ESD and clean room environments. Included in this range are ESD wipes and ESD coats for protecting sensitive components from electrostatic discharge and fields by diverting static electricity from the body of the worker.

The long ESD coats feature fastening press studs, three pockets and sleeves finished with snap fasteners. They are available for men and women.

ESD clothes and wipes for cleaning are supplied as 25 x 25 cm squares of antistatic fabric and come in packs of 100. They are ideal for cleaning delicate components, films, instruments, printed circuits and optical lenses. The wipes can be used in all electronic manufacturing and clean room applications, ensuring there is no abrasion or static generation.

For more information contact Kevin Klaff, Actum Electronics, +27 (0)11 608 3001.

Hybrid PPTC/MOV device

TE Circuit Protection recently introduced the 2Pro AC, a hybrid device that offers designers an integrated, resettable approach to protect sensitive downstream electronics against damage from over-current and over-voltage events.

The part combines a PPTC (polymeric positive temperature coefficient) device and a thermally enhanced MOV (metal-oxide varistor) into one package. As a result, it is well suited to low-current applications such as LED lighting, smart meters, appliances and power supplies.

By integrating a resettable PPTC device with an MOV, the hybrid configuration of the 2Pro AC device offers benefits over typical approaches currently used in low-current applications to help prevent thermal runaway.

These include using an MOV with a fuse, which must be replaced when blown; placing the PPTC device and MOV next to each other on the board, which can lead to thermal instability and design complexity; or employing a thermal fuse integrated with an MOV, which is a one-use solution that trips without allowing resettability.

In contrast, the 2Pro AC device has thermally coupled components, is resettable, and provides stability by maintaining a varistor surface temperature of less than 150ºC. It can help manufacturers meet industry requirements such as IEC61000-4-5 and IEC60950, and can help simplify UL60950 testing and compliance. It is also RoHS-compliant and halogen free.

For more information contact TE Connectivity, +27 (0)41 503 4500.

High-speed transient voltage suppressors

New from ON Semiconductor are three transient voltage suppression devices for high-speed data lines. The ESD7008, MG2040 and ESD7104 provide electrostatic discharge (ESD) protection for high-speed data and video lines while offering low capacitance, high signal integrity and low clamping voltages.

Designed to protect up to four high-speed differential pairs (eight lines), the ESD7008 delivers industry ESD protection with extremely low I/O to ground capacitance of 0.12 pF. It is housed in a flow-through UDFN18 package that supports easy PCB layout and matched trace lengths necessary to maintain consistent impedance for high-speed lines.

Emerging applications for the ESD7008 include USB 3.0 where it protects three high-speed pairs plus Vcc and Iden lines for a fully integrated solution, V-by-One and Thunderbolt (Light Peak). Other popular applications where the device is relevant include HDMI, DisplayPort and LVDS.

The MG2040 transient voltage suppressor is designed specifically to provide full functionality integrated ESD protection for up to 14 lines serving all active pins of HDMI and DisplayPort interfaces. Ultra-low capacitance of 0.35 pF typical (I/O to GND), flow-through package design, and a low ESD clamping voltage make the device ideal for protecting voltage sensitive high-speed data lines.

Housed in a space efficient UDFN10 package, the ESD7104 allows easy layout and matched trace lengths between high-speed differential lines in applications such as USB3.0, HDMI, eSATA 3.0 and DisplayPort. It provides low-capacitance ESD protection for up to four lines and has a typical I/O to GND capacitance of 0.3 pF.

All three new transient voltage suppressors have an operating junction temperature range of -55ºC to +125ºC. They also exceed the protection requirements of IEC 61000-4-2 (Level 4) by protecting over 15 kV contact and air discharge.

For more information contact Andrew Athanasiou, Arrow Altech Distribution, +27 (0)21 555 1884.
Fault management chip for LED lighting

LED lights for critical applications such as vehicle lights, streetlamps and emergency lights can be more dependable and long-lasting thanks to a new fault management chip from STMicroelectronics.

The new LBP01 can be used in lamps that comprise multiple channels, each containing several LEDs. The IC bypasses failed LEDs so that the lamp can continue producing near-maximum illumination. This improves performance and safety, and can yield valuable savings for operators such as city authorities.

By offering the flexibility to use one bypass for every two LEDs, the device enables designers to reduce bill-of-materials costs. It also provides built-in surge protection to help prevent LED failures occurring. The LBP01 can also be used to enhance LED backlight longevity in LCD panels for a wide variety of applications.

Housed in a 3.95 x 5.6 mm SMB or 3 x 3.05 mm SOT23-5 package, the LBP01 features 100 nA leakage current and can be used with LED channel current up to 1 A. Unidirectional (LBP01-0803SC5) and bidirectional (LBP01-0810B) variants are available.

For more information contact Avnet Kopp, +27 (0)11 319 8600.

Surface-mount TVS

Vishay has introduced a new series of surface-mount PAR transient voltage suppressors (TVS) in the SMC DO-214AB package. For automotive and telecom applications, SKASMC series devices feature high surge capability to 5 kW at 10/1000 μs and an operating junction temperature range from −65°C to +185°C.

The new devices claim to offer 233% higher surge capability than conventional 1.5 kW devices in SMC packages, increasing design flexibility and compatibility. In addition, their high operating junction temperatures and new low-stress, symmetric lead frame designs provide the high reliability required for automotive applications.

Designed to protect sensitive electronic equipment against voltage transients induced by system inductive load switching and lightning, the AEC-Q101-qualified devices are suitable for secondary automotive load dump protection and telecom infrastructure DC power bus lightning surge protection.

The SKASMC series consists of 16 TVS devices with stand-off voltages from 10 V to 43 V. They offer a peak pulse power current from 294.1 A to 72 A, maximum clamping voltage from 17 V to 69.4 V, very fast response times and low incremental surge resistance.

For more information contact EBV Electrolink, +27 (0)21 402 1940.

Transient current suppressors

Bourns announced the release of new TCS (transient current suppressor) high-speed protectors, designed to provide enhanced protection for very high data rate differential lines. The TCS-DL series helps protect Gigabit Ethernet (GbE) and VDSL applications against faults caused by short circuits, induction and lightning surges, by limiting the maximum current to a safe level.

The devices are typically used in conjunction with low-capacitance transient voltage suppressor (TVS) devices to form an extremely low-leak-through energy barrier to excessive voltages or currents during surge events, which may damage high-speed, low-voltage driver and receiver components.

The DL series products contain a dual, well-matched, low-resistance, bidirectional and very high-speed TCS device. They meet industry standard requirements such as RoHS and lead-free solder reflow profiles, and are provided in surface mount DFN packages.

For more information contact Electrocomp, +27 (0)11 458 9000.

Surge arrestors for DC PV applications

The rapidly growing PV (photovoltaic) industry, now generating at DC voltages of 600 and 1000 V, has placed exceptional demands on the present and previously available surge protection devices intended to protect system components such as inverters, arrays or combiner box components from the effects of lightning induced surges and transients.

Responding to this demand, DEHN has developed and introduced a new product specifically designed to function under the issues associated with these DC voltages. The new DEHNguard M YPV and PV-SCI addresses these issues by incorporating a switched fused circuit in parallel to the MOV discharge circuit, permitting the disconnect to operate arc free.

These SPD products are available for 150 V, 600 V, 1000 V, 1200 V and 1500 V DC applications and are configured in both a “Y” (three-pole) configuration for floating systems, and a two-pole design for grounded systems.

For more information contact Surgetek, +27 (0)11 792 1303.
Low-current fuses

AVX has extended the current rating of its Accu-Guard II low-current series to include 200 mA, 150 mA, 125 mA, 100 mA, 75 mA, 62.5 mA and 50 mA versions in a 0603 package. The miniature fuse utilises thin film and land grid array (LGA) technologies to enable precise control of the component’s electrical and physical characteristics.

The UL E141069-approved, RoHS-compliant Accu-Guard series is ideal for handheld devices including cell phones, PDAs, two-way radios and video/digital cameras, as well as hard disk drives (HDD), LCD screens, computers, instrumentation, battery chargers and rechargeable battery packs.

The fuses feature a fusing resistance >1 MΩ.

EMI shielding gaskets

Laird Technologies is supplying ElectroMet oriented wire gaskets for EMI shielding and sealing. Monel or aluminium wires, embedded in the elastomer and oriented perpendicular to the mating surfaces, provide EMI sealing.

Solid or sponge silicone provides the weather sealing; however, solid silicone weather seals are recommended for high-pressure applications. Silicone-based oriented wire composites are capable of withstanding temperature ranges -56°C to 260°C. Oriented wire materials are available in sheet or strip form with a minimum thickness of 0.8 mm.

ElectroMet impregnated wire mesh and expanded metal gaskets are available in thin sheet form. EMI shielding is provided by woven aluminium mesh or expanded metals. Pressure sealing is provided by neoprene or silicone elastomer impregnated in the mesh. Fluorosilicone is also available for specific applications that require resistance to oils, hydraulic fluids and hydrocarbon fuels.

For more information contact Actum Electronics, +27 (0)11 608 3001.

High-voltage surge stopper

Linear Technology’s LT4363 is an over-voltage protection controller that provides over-voltage and over-current protection to high-availability electronic systems.

Supply voltages surge whenever currents flowing through long inductive power buses change abruptly. Also, automotive batteries experience a condition known as load-dump, where the voltage can stay elevated for many milliseconds.

Traditional protection circuitry relies on bulky inductors, capacitors, fuses and transient voltage suppressors. Instead, the LT4363 creates a robust, adaptable and space-efficient design with single control of an N-channel MOSFET. Only the controller and the MOSFET suffer the high voltage surge; downstream components can afford lower voltage ratings, thereby saving costs.

The LT4363 builds on Linear’s popular first-generation LT4356 device by extending over-voltage protection capabilities beyond 100 V without sacrificing over-current protection. The IC reacts quickly to over-current and short circuit faults at the load, limiting the current to a safe value set by a sense resistor.

Armed with a 100 V maximum rating and operational capability down to 4 V (cold-crack), the LT4363 makes for an ideal barrier against badly behaving supplies. A simple clamp on the controller supply extends protection beyond the native 100 V.

It even survives reversed battery connections to -60 V. During voltage surges, the output is regulated to a voltage set by a resistive divider, allowing the load to operate safely and smoothly through transient events.

Over-voltage and under-voltage comparator inputs ensure that the LT4363 remains off outside a user-defined voltage range. To limit the thermal stress on the power MOSFET, the device uses a VDS-accelerated fault timer. If the fault persists, a warning is issued before the MOSFET is shut off.

By limiting the MOSFET gate slew rate with a resistive-capacitive (RC) network, the controller can be adapted for intrashort control in hot swap applications. In the shutdown state the LT4363 sips just 7 μA of supply current, preserving battery life. A built-in thermal shutdown occurs around 150°C.

The LT4363 is available in two options: the LT4363-1 latches off after a fault, whereas the LT4363-2 will retry after a long cool-down period. Specified over the full commercial and industrial temperature ranges, the ICs are offered in 12-pin DFN (4 x 3 mm) and MSOP packages, and a 16-pin SO package with enhanced high-voltage pin spacing.

For more information contact Arrow Altech Distribution, +27 (0)11 923 9600.
Mean Well has improved on its SP-200 series of 200 W enclosed power supplies to create the RSP-200. The new low-profile (1U or 30 mm) AC-DC units are 24.7% smaller in size and 6 – 19% more efficient than the previous generation, and they extend the operating temperature range to -30°C to +70°C.

The single-output RSP-200 series incorporates power factor correction and boast up to 90% efficiency, allowing it to be cooled by free air convection from -30°C to +45°C ambient temperature under full load condition, and up to +70°C by suitable derating.

In order to work in humid and dusty environments, the new series includes optional conformal coating models (RSP-200-CC), which have moisture and dust resistance at the PCB level.

To fulfill the low profile and low output voltage demands from LED display manufacturers, the RSP-200 series provides 2.5 V/3.3 V/4 V/5 V (40 A) models. Built-in functions include short circuit, overload, over-voltage and over-temperature protections. The power supplies comply with UL, CUL, TUV, CB, and CE regulations.

Applications include industrial automation systems, mechanical and electrical industry, instruments, LED displays or any systems that require 1U low-profile installations.

For more information contact Current Automation, +27 (0)11 462 4253.

Ultralife Batteries has released a new 9 V lithium-ion battery that it claims provides an average five times longer lifespan than competing alkaline batteries.

With a conventional 9 V form factor, the U9VL provides 1200 mAH of battery life. At an average discharge rate of 27 mAH to a voltage of 7.2 V, a standard 9 V alkaline battery will last around 8 hours, while the U9VL will last around 40 hours.

Common applications include carbon monoxide detectors, wireless security devices, medical devices, multimeters and smoke alarms, amongst others.

The new devices provide regulated, isolated power, adjustable between 3.15 V and 5.25 V. The ADuM5010 and ADuM521x use proprietary isoPower isolated DC-to-DC converter technology to deliver 150 mW of output power while using less board space than competing module-based solutions.

The ADuM521x and ADuM621x also integrate two channels of iCoupler data isolation technology to reduce board space by up to 75% compared to optocoupler-based alternatives.

For more information contact Avnet Kopp, +27 (0)11 319 8600.

Analog Devices has premiered what it claims are the industry’s smallest isolated DC-to-DC converters.

The ADuM5010, ADuM6010, ADuM521x and ADuM621x use proprietary isoPower isolated DC-to-DC converter technology to deliver 150 mW of output power while using less board space than competing module-based solutions.

The ADuM521x and ADuM621x also integrate two channels of iCoupler data isolation technology to reduce board space by up to 75% compared to optocoupler-based alternatives.

For more information contact Avnet Kopp, +27 (0)11 319 8600.
XP Power announced the CCH400 and CCH600 series of compact, single-output, baseplate-cooled 400 W and 600 W AC-DC power supplies suited to harsh environment applications.

With a design providing up to 90% efficiency, the CCH series generates little waste heat, making it suitable for use in sealed box applications. All heat-generating components are attached to the baseplate, allowing heat dissipation through the sealed box chassis or heatsink; no forced air cooling is required.

Measuring 214 x 102 x 43 mm, both the 400 W and 600 W series accommodate the full universal input range of 90 to 264 V a.c. without derating, making them suitable for designs used worldwide. They are available with the popular nominal output voltages of +12, +24, +28 or +48 V d.c.

Compliance to MIL-STD-461 for emissions and MIL-STD-810 for shock/vibration ensure the CCH series is suitable for use in COTS military applications in addition to a broad range of industrial and commercial equipment used in outdoor and harsh environments.

The units also comply with the internationally recognised safety standard EN/UL 60950-1 for IT equipment and meet EN55022 level B conducted and level A radiated emissions.

A fully featured signal set includes remote on/off, remote sense, AC OK and over-temperature warning and shutdown. A +5 V d.c. standby output is also provided, while current sharing capability allows for parallel sharing of the load across up to three CCH units.

For more information contact Edwin Brown, Vepac Electronics, +27 (0)11 609 7122.

Skyworks’ SMP1330-085LF is a surface mountable, low-capacitance silicon PIN limiter diode designed as a shunt connected PIN diode for high-power limiter applications from 10 MHz to over 6 GHz.

Maximum resistance at 10 mA is 2 Ω and maximum capacitance at 0 V is 1.0 pF. The combination of low junction capacitance, low parasitic inductance, low thermal resistance and nominal 3 μm I-region width, makes the device useful in large signal limiter applications. The threshold level is +10 dBm, nominal.

For more information contact Marinus Rudman, Hi-Q Electronics, +27 (0)21 595 1307.
**Wideband LTE antennas**

Taoglas recently unveiled a range of ultra-wideband LTE antennas with through-hole, adhesive and connector mounting as well as internal, surface mount, on-board and off-board, flexible polymer antennas.

The new TG.30 Apex, FXUB.66 Maximus and PA.710A Warrior wideband antennas cover all working frequencies in the 700–6000 MHz spectrum including 2G/3G/4G cellular, Wi-Fi, ISM, GPS and AGPS.

The TG30 Apex is a dipole terminal connector-mount antenna with an efficiency of up to 90%. The PA.710A Warrior surface-mount antenna is delivered on tape and reel, and is mounted via the production reflow process to the main PCB.

The FXUB.66 Maximus is an ultra-thin, flexible polymer antenna measuring 120.4 x 50.4 x 0.2 mm. It is assembled by a simple peel-and-stick process, attaching securely to non-metal surfaces via 3M adhesive. The antenna employs a hybrid design which displays good efficiency at lower frequencies, while maintaining high performance across the entire bands.

For more information contact Andrew Hutton, RF Design, +27 (0)21 555 8400.

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**SMT precision oscillators**

Euroquartz has introduced a new range of high-performance surface-mount clock oscillators offering high precision and high temperature stability.

Offering frequencies from 1.0 to 56.0 MHz, the new XOR91 series exhibits phase noise performance of -145 dBc/Hz at 10 kHz and -150 dBc/Hz at 100 kHz, and integrated phase jitter of 300 fs typical, 12 kHz to 20 MHz.

Housed in a 7 x 5 mm SMD package, the new oscillators operate from 1.8 V, 2.5 V or 3.3 V supply and offer frequency stability from ±7 ppm over the commercial temperature range (-10°C to +70°C) to ±15 ppm over the industrial temperature range (-40°C to +85°C).

Specifications include output logic LVCMOS, output load of 15 pF, rise/fall time of 2 ns typical, startup time 0.6 ms typical (1 ms maximum), output symmetry of 50% ±5%, tristate function implemented as standard and ageing of ±2 ppm/year maximum for first year. Storage temperature range is -55°C to +150°C. The parts are available on tape and reel and feature a maximum process temperature of 260°C for 10 seconds.

For more information contact Jeva Narian, Arrow Altech Distribution, +27 (0)11 923 9600.

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**Reflective optical sensor**

Vishay’s new TCNT2000 is a reflective optical sensor with transistor output in a miniature SMD package. Measuring just 3.4 by 2.7 by 1.5 mm, it offers a detection range from 0.2 mm to 5 mm for consumer, industrial and computer applications.

By utilising Vishay’s high-efficiency 940 nm emitter chip, the sensor provides a typical CTR of 4, providing designers with the option of increasing the detection range or driving the device at lower drive currents to reduce power consumption without incurring performance losses.

The TCNT2000 features a compact construction with its emitting light source and silicon phototransistor detector arranged in the same plane. The sensor’s analog output signal is triggered by detection of reflected infrared light from objects 0.2 mm to 5 mm away (within >20% of peak collector current).

The device offers a built-in day-light blocking filter, which greatly suppresses disturbing ambient light to increase the signal-to-noise ratio, while keeping the maximum spectral sensitivity at the operating wavelength of 940 nm.

The TCNT2000 is designed for optical encoding and switching in industrial metering systems, computer disk drives and consumer devices such as DVD players. In addition, it serves as an accurate position sensor for shaft encoders and is suitable for office equipment such as copy machines, printers and fax machines.

The sensor offers a typical output current under test of 0.8 mA. It operates over a temperature range of -40°C to +85°C and is lead-free reflow solderable according to J-STD-020 profile. The device is RoHS compliant.

For more information contact EBV Electrolink, +27 (0)21 402 1940.
**Ku-band TWT amplifier**

The MT2400 TWT amplifier is the newest addition to MCL’s outdoor product line. Specifically designed for SATCOM on the move and SNG (Satellite News Gathering) applications, this compact, weather-resistant package is available for Ku-band applications (13.75 – 14.50 GHz) at 400 Watts peak (240 Watts CW). Depending on options, the unit weights approximately 14.5 kg.

The amplifier is designed to meet MIL-188-164A, and features extensive diagnostic capabilities, along with a continuously variable attenuator adjustment and Ethernet interface. It can also be customised to include such options as an input L-band block up-converter, input amplifier (SSA) or internal lineariser.

For more information contact Tobie Muller, Accutronics, +27 (0)11 782 8728.

**Board-to-board connectors**

The modular tooling used for its MicroCon housings allows ERNI Electronics to provide pin counts from 12 to 140 for board-to-board connectors. A unique feature for this miniaturised device size is the double-sided spring contact; these highly reliable contacts are based on a proven and patented principle which ERNI scaled down for smaller dimensions.

The connectors are available in 0.8 mm pitch with SMT or IDC termination. They support board-to-board heights from 5 to 10 mm in mezzanine, orthogonal, co-planar and cable connector applications. Each contact is rated to 2.3 A.

For more information contact Actum Electronics, +27 (0)11 608 3001.

**High-density I/O cables**

Samtec’s new Eye Speed HD I/O cable system features HyperTransport HT 3.1 performance and a space saving design. It is said to be the industry’s densest I/O cable system and is designed for HT networking with easy product configurability and integration.

The cable system is targeted at data storage applications including servers, blade servers, server clusters and embedded systems, and it provides modularity latitude between systems and subsystems.

The Eye Speed HD cable (HDLSP series) boasts 48 signal pairs in a 28 x 14 mm panel opening. The system is designed to be stacked and mated with a right angle PCB connector and cage (HDI6 and HDC series). With a 0.635 mm pitch design, this system fits the full height of a PCIe card (6x 8-bit links) to support 3D-Torus/Mesh HT NICs and switches.

The cable is available in 1 m and 2 m lengths of #32 AWG low skew pair cable with performance up to 6.44 GHz and 2.56 GHz, respectively (at 7 dB insertion loss).

The cable system provides enhanced signal integrity and routing with 100 Ω differential pair signalling for in-system and system-wide applications. Each signal pair is individually shielded with a smooth insertion loss profile. Eye Speed HD cable is also equipped with a rugged latching system for heavy-duty handling.

For more information contact Barry Culligan, Otto Marketing, +27 (0)11 791 1033.
Hittite has launched a fully programmable dual-channel asynchronous linear equaliser that operates with data rates up to 32 Gbps and is ideal for a wide range of networking and fibre-optic applications including 40G/100G DQPSK direct detection receivers, 16G and 32G Fibre Channel, 14G FDR & 28G EDR Infiniband, 12G SAS/SATA, 100G-LR4/ER4 and 100GQE (CEI-28G MR & CEI-25G LR) line cards. The HMC6545LPSE is protocol and data rate agnostic and can operate on the transmit path to pre-distort transmitted signals in order to invert channel distortion. It consists of an integrated automatic gain control (AGC), DC offset correction circuitry, 9-tap 1.8 ps spaced feed forward equaliser (FFE), summing node and a linear programmable output driver.

Texas Instruments introduced a bidirectional isolator family compatible with I2C interfaces that consumes as much as 38% less power than competitive devices. Both of the new ICs can replace a typical implementation of 16 or more discrete devices to isolate the I2C signal in industrial applications. In addition, the ISO1540 and ISO1541 offer better transient immunity and faster switching times than optocouplers. This performance provides longer-lasting isolation in a variety of applications, such as power supplies, networking, telecommunications, Power over Ethernet (PoE) and battery management systems. The ISO1540 is targeted at applications that have multiple masters while the ISO1541 is for single-master applications.

Microchip has given a 25% performance boost to its 32-bit PIC32MX1/MX2 microcontrollers (MCUs), bringing their speed to 50 MHz or 83 DMIPS. The PIC32MX1/MX2 series includes Microchip’s smallest 32-bit MCU, with sizes down to 5 x 5 mm and a 0.5 mm pitch, as well as the lowest-cost PIC32 MCUs. These devices include up to 128 KB Flash and 32 KB RAM, and integrate peripherals for touch sensing, audio processing and advanced control applications. They also feature an 8-bit Parallel Master Port (PMP) interface for graphics or external memory, a 10-bit 1 MSPS 13-channel analogue-to-digital converter and serial communications peripherals. The MX2 series also adds USB On-the-Go (OTG) capabilities.

Linear Technology’s LT3761 is a 60 V DC-DC controller designed to operate as a constant-current source and constant-voltage regulator. Its internal PWM dimming generator makes it ideal for driving high-current LEDs, but it also has features making it suitable for charging batteries and supercapacitors. The IC’s 4.5 V to 60 V input voltage range makes it ideal for a wide variety of applications, including automotive, industrial and architectural lighting. It can drive up to fifteen 1 A white LEDs from a nominal 12 V input, delivering in excess of 50 Watts. The LT3761 has an internal PWM generator that delivers dimming ratios as high as 50:1 or it can utilise an external PWM signal, delivering dimming ratios of up to 3000:1.

Cypress Semiconductor introduced the CY8C20xx7/5 CapSense and CapSense Plus touch sense controllers with Cypress’s new QuietZone™ technology to combat noise. They feature QuietZone technology, which provides elevated immunity to radiated and conducted noise. Its high sensitivity can determine changes in finger capacitance as low as 0.1 pF. The ICs devices feature SmartSense autotuning that automatically sets and monitors the performance of each sensor and dynamically compensates for noise and environmental variations during runtime. Proximity detection up to 30 cm is possible, while low power enables proximity designs in battery-powered applications, such as ‘wake-on-approach’ designs.

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