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COVER STORY




Who is Keysight Technologies?

On 19 September 2013, Agilent Technologies announced plans to separate into two publicly traded companies. The electronic measurement business was distributed to shareholders through a tax-free spinoff. The new electronics measurement company, Keysight Technologies, began operating as a wholly owned subsidiary of Agilent on 1 August 2014 with a full separation in November 2014.

The company has products in each category to help solve electronic measurement challenges. On the front cover are three products out of the company's range of over 5000 products. Keysight offers an extensive selection of signal/spectrum and vector network analysers from DC to 50 GHz, extendable to 1.1 THz with external mixers, for spectrum and vector network analysis measurements. Keysight's FieldFox handheld combination analysers are designed to withstand the toughest working conditions. The all-in-one field instrument's base function is a cable and antenna analyser and it can be configured to include a spectrum and network analyser. The analyser, with a frequency range of 4 GHz up to 26.5 GHz, can be ordered with additional capabilities: power meter, independent signal generator, vector voltmeter, interference analyser, variable DC source and built-in GPS receiver. In addition, whether you need real-time oscilloscopes, capacitive touch screen oscilloscopes or something a little more basic, Keysight has products in each category to help solve digital measurement challenges. The company has also expanded its test and measurement products to include the latest thermal imaging infrared camera.

Keysight Technologies Aust Pty Ltd
www.keysight.com





DISTRIBUTED MEASUREMENT SYSTEMS

THE CHANGING
ARCHITECTURE OF DATA
ACQUISITION SYSTEMS



In almost every industry, traditional centralised data acquisition systems are being replaced with a more distributed network of measurement devices. This trend has recently been combined with the evolution of computing into the cloud that will continue to change not only how we acquire data, but also how we store, access and analyse it.

The trends in the consumer electronics industry are affecting the way we interact with data. The benefits of these new architectures are numerous, including reduced capital, installation and maintenance costs; more powerful analytics; and the ability to access data from anywhere.

Historically, data acquisition systems were large and fragile. They had to be separated from the harsh environments that could be present around a device under test (DUT) or were just too large to be placed around a device. This drove the centralised architecture of data acquisition systems that has been traditionally used. In a centralised architecture, data acquisition equipment is stored in a central rack or control room, where there is ample space and it can be protected from the test. Sensor cables are then run (sometimes hundreds of metres) from this central location to sensors and actuators throughout the test fixture.

Distributed systems

As applications become more complex, these home-run sensor wiring approaches become more difficult and costly to implement. The cost of running sensor cable can often be the single largest line item for installing new data acquisition systems once labour and capital costs are included. The alternative approach to the traditional centralised data acquisition system is to fragment and distribute the data acquisition system around your application and run a single, inexpensive network cable for data transfer back to the server or control room. For example, in a wind turbine, any wire running from the blades into the central housing must first pass through a slip ring allowing the blades to spin freely. The more wires run out to the blades, the more complex the slip ring

system required, exponentially increasing points of failure and system cost.

These distributed systems break apart the data acquisition system into smaller subsystems that are placed around the DUT, often in the test environment and as close to the measurement sensor as possible. They interact with the DUT locally and receive commands from and send data for logging back to a central server where the test operator is located. Additionally, computing can also be distributed close to the DUT allowing for smart data reduction or localised control algorithms without the need to flood the network with data or commands.

Advantages of a distributed architecture

This architecture offers several advantages over a centralised system. By breaking the large centralised system into a modular, distributed system, you create smaller and cheaper subsystems that you can more easily maintain and replace, should one fail. A modular system is also much more flexible, as nodes can simply be added onto the network or swapped out if measurement needs change. This ease and low cost of repair means more uptime and higher reliability for a measurement system. In contrast, a centralised system would cause concerns about the need to replace, reinstall and rewire expensive capital expenditure equipment if the requirements of your measurement system were to change.

A distributed architecture also reduces wiring cost by running a single communication cable to the distributed subsystems rather than laying possibly hundreds of sensor wires throughout your test cell. This reduction in cabling can lower costs and, more importantly, increase measurement accuracy because the shorter sensor

wires to the distributed systems are less prone to noise, interference and signal loss. A sensor wire acts as an antenna as it travels to the data acquisition system, picking up electrical interference present in the room from fluorescent lights, motors and other seemingly benign sources. This interference can be combated with techniques like shielded cabling and twisted pairs wires, but these only serve to increase the cost of the cabling used.

As an example of the cost of sensor wiring, in aerospace structural test cells like those used at Boeing, Airbus and Embraer, wiring and cabling is often upwards of 25% of the total test cell hardware and software budget. By running standard ethernet cable instead of sensor wire, these large costs can easily be cut in half.

Finally, a distributed system can help offload processing from a main central computer. Many distributed data acquisition systems also have onboard intelligence that can be used to run analysis or reduce data to key values before uploading it to the central system. This architecture allows the creation of task-specific nodes in your system, with some of the analytics being done on the DAQ device, and the user interface (UI) being done by a separate computer. This means your central computer can be substantially cheaper and faster than in a centralised architecture because a lot of its processing has been offloaded and it can focus solely on UI and data storage.

Driven by smaller, cheaper and more powerful processing

Until recently, the benefits of implementing a distributed system were outweighed by the high cost of small and powerful enough hardware to embed through a test fixture. However, over the past decade, the cost and size of processing power has driven down the price of distributed data acquisition hardware and fuelled adoption of this more efficient and flexible architecture. As processors and analog to digital converters become smaller, cheaper and more capable, they can more easily be embedded into small subsystems. Data acquisition systems no longer need the large amount of space that can only be had in a large centralised system but can now be placed in packages small enough to distribute around a test. This allows the data acquisition system to take advantage of the inherent advantages of a distributed architecture and reduced sensor wiring.



MANY DISTRIBUTED DATA ACQUISITION SYSTEMS ALSO HAVE ONBOARD INTELLIGENCE THAT CAN BE USED TO RUN ANALYSIS OR REDUCE DATA TO KEY VALUES BEFORE UPLOADING IT TO THE CENTRAL SYSTEM.

Consumer trends

The advancements of processing, ADC power and size have been greatly accelerated in the past five years by the explosion of embedded consumer devices. Triggered by smartphones, embedded processors are now prevalent in most consumer products from thermostats to refrigerators. This massive increase in deployment has driven semiconductor manufacturers to further optimise their products for deployment in small, embedded systems. The same technological advancement can then be leveraged by data acquisition vendors that use common off-the-shelf parts to build more capable and cost-effective distributed products.

Additionally, this growth of embedded consumer devices is also changing our expectations about how we interact with electronic devices. Home computing tasks that used to be relegated to a single device - the family computer - are now distributed to different task-optimised products. Internet browsing is done on a tablet, pictures are stored on media servers or in the cloud, and videos and movies are watched on internet-capable TVs. By distributing the computing power, we have created task-specific products that are more efficient from both a productivity and cost perspective.

This trend is not staying at home either. As noted by Adam Richardson in Innovation X, business customer expectations are largely driven by the sum of a person's experiences, including those in the consumer world. As engineers, scientists and technicians become more accustomed to interacting with this more distributed style of computing, they will begin to expect it more and more in the lab and data acquisition companies are now, more than ever, capable of delivering on that expectation.

To the cloud

Recently, these trends have coupled with a new trend in both business and consumer technology that is beginning to take distributed data acquisition systems even further - cloud computing. By placing saved data in the cloud, whether on an internal and private cloud, or on a public one like Microsoft's

Azure, three advantages are gained: there is near infinite processing power and near infinite storage, and the data can be accessed from anywhere.

One of the key features of cloud computing is that it abstracts the idea of individual processors and thus can be seen by you and your data as a computer with infinite processor cores, capable of running analysis that could never be done on a single computer. This allows you to further optimise your distributed system by placing processing-intensive tasks in the cloud that would never be able to run on a distributed DAQ node, nor on the central computer. Analysis that formerly locked up a system for hours or days can now be offloaded, leaving the computer free to continue collecting data or perform more low processing calculations.

The main advantage of cloud computing, however, is the ability to store limitless amounts of data and then be able to access that data from anywhere. Rather than being relegated to only accessing data on the computer it was acquired on, you could envision a system where you scan a QR code on a wheel subassembly in a test cell with your smartphone and be able to see the entire test history of it instantly. Cloud computing has the potential to completely change the entire workflow of data acquisition to a much more efficient model.

A distributed future

The future will see embedded systems continue to drive down the price and size of data acquisition systems while increased consumer familiarity with smart devices and cloud computing will increase the expectation of task-specific nodes. Both of these trends will help push data acquisition systems further into the field - away from the old, centralised design and towards a more efficient and effective, distributed architecture. I would encourage you to begin evaluating your own data acquisition systems and consider if it is time to evolve into distributed measurement systems.

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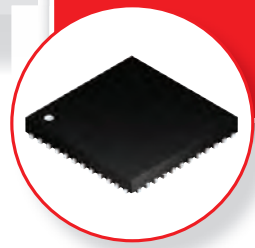
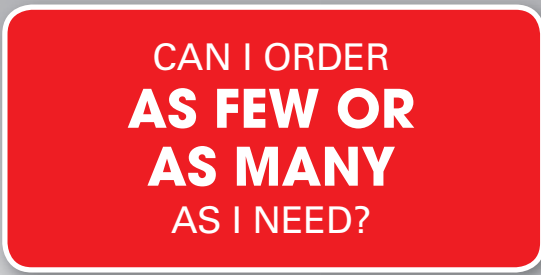
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SATELLITE NETWORK TERMINALS

M2M Connectivity is distributing SkyWave Mobile Communications' range of machine-to-machine (M2M) satellite products in Australia and New Zealand. The company's satellite, cellular and satellite-cellular products and applications are used in a broad range of applications for remote asset management in the transportation, maritime, oil and gas, mining and utilities sectors - from tracking trucks and vessels to monitoring fixed mining and SCADA equipment.

SkyWave terminals utilise Inmarsat satellite communications for M2M applications. Inmarsat is a provider of global mobile satellite communications for M2M and other applications, providing service over land, sea and air through a versatile satellite network.

IsatData Pro is a service that teams SkyWave's range of terminals with Inmarsat's global L-band satellite network. It is claimed to offer the highest payload and lowest latency of any L-band satellite store-and-forward service. IsatData Pro offers 99.9% network availability and a ubiquitous, resilient and flexible solution for remote, unmanned locations.

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www.m2mconnectivity.com.au

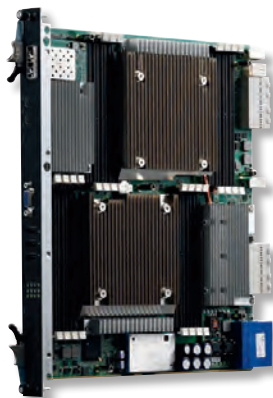
PROCESSOR BLADE

ADLINK Technology has announced its AdvancedTCA (ATCA) carrier-grade product, the aTCA-9710, which features the dual 12-core Intel Xeon processor E5-2600 v3 paired with the Intel Communications Chipset 8920 series. The device offers 16 channels of DDR4-2133 VLP RDIMMS, enabling high clock and data transfer rates.

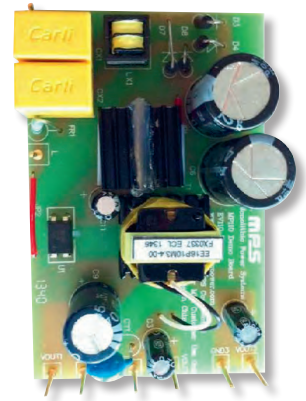
The processor blade delivers high performance while keeping a thermal envelope under 105 W due to the adoption of Intel Node Manager 3.0, a power management technology. It is suitable for carrier-grade servers, data centres and networking, and also DPI, SDN and NFV applications. The processor delivers energy efficiency, enhanced security and advanced monitoring and management capabilities that enable a high level of automation and orchestration. The product gains additional performance from the ADLINK PacketManager, a software suite that includes support for the Intel Data Plane Development Kit (DPDK), a set of libraries and drivers for improved packet processing on x86 platforms running Linux, as well as a management API for implementing network connections between server and client. It also comes with ADLINK's Embedded Power Management Agent (EPMA), a software solution to allow data centre managers to confidently set upper limits on server power to maximise rack density without exceeding the rack power budget.

ADLINK Technology Inc

www.adlinktech.com



FLYBACK REGULATOR AND EVALUATION BOARD



Monolithic Power Sys-

tems (MPS) has announced the MP110, a monolithic 900 V flyback regulator that is designed specifically for electronic meters, supporting wireless communication. The product offers robustness, ease-of-use, and smart-home and building compatibility.

The device features the robust performance of MPS 900 V process technology. In addition to a low ohmic switching FET that supports over 8 W of output power, the technology also features a rugged 900 V start-up depletion FET for low no load power dissipation. The 900 V monolithic integrated solution enables overtemperature protection that is on the same silicon of the 900 V power FET, offering precise thermal protection. It also offers a full suite of protection features.

The product is designed to minimise electromagnetic interference for wireless communication in home and building automation applications. The operating frequency is externally programmed with a single resistor so that the power supply's radiated energy can be designed to avoid the wireless frequency transmission. The integration of the 900 V switching FET and its switching characteristic simplifies the power stage design. The optimised internal blanking, along with built-in soft start, simplifies the design and lowers component count.

Its features are suitable for any ACDC application that requires high reliability, including large appliances, medical, industrial controls, and any product that is sold where the power grid is not stable.

The EV110-P-00A evaluation board is designed to demonstrate the capabilities of the MP110 and is also designed for offline high input voltage (85-420 VAC) application with triple outputs (13.5 V/300 mA, 8 V/50 mA, 8 V/50 mA). The 8 V output rail can power the LDO for MCU power supply.

The board meets EN55022 conducted EMI requirements with its frequency jittering function. It has overtemperature protection, VCC under voltage lockout, overload protection, overvoltage protection, short-circuit protection and built-in PRO pin for extra protection setting.

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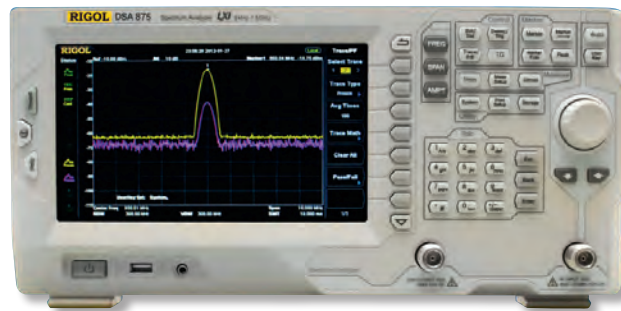
OKW's Carrytec range of portable enclosures is designed for portable electronics equipment and is available with optional docking stations for charging and data transfer when the equipment is not being carried. Applications include medical and wellness equipment, data recording and monitoring, communications technology, measuring instruments, and agricultural and forest management electronics.

The company has added a larger size 'L' model to the existing size 'M' and 'S' versions. The 'L' models have external dimensions of 348 x 303 x 117 mm and are offered in two standard materials: ABS (UL 94 HB) in off-white for indoor use and fibreglass-reinforced polyamide (PA GV) in lava grey for tougher outdoor use. An IP54 sealing kit is also available.

The top, bottom and handle grip mouldings are assembled by five security screws. The handle grip is moulded in soft-touch TPE material for comfortable carrying. The top section has a recessed area for membrane keypads, displays and touch screens. Inset flat sections on the underside are designed for mounting connectors or control switches. Screw pillars are provided in the top and bottom for fitting PCBs, displays and assemblies.

ROLEC OKW Australia New Zealand Pty Ltd

www.rolec-okw.com.au



SPECTRUM ANALYSERS

The Rigol DSA800 Spectrum Analyzers Series enable precise direct measurements of higher frequency signals and systems, complete with built-in tracking generators. The ability to make measurements up to 7.5 GHz is critical for seeing third harmonics of 2.4 GHz wireless designs, while resolution bandwidth settings down to 10 Hz means precise visualisation of low-power RF signals.

Features include a VSWR measurement toolkit for configuring and evaluating antennas and an advanced measurement kit that enables additional measurement functions such as channel boundaries and signal-to-noise ratio. Accessories include the 8 GHz VSWR bridge or directional coupler and attenuator sets for higher power work (6, 10 or 30 dB high-power attenuators).

The EMI-DSA800 option provides EMI RBW settings, as well as a quasi-peak filter across the entire spectrum of interest for compliance and immunity testing. Low power issues can be investigated by adding an optional preamplifier. The displayed average noise level (DANL) normalised to 1 Hz is specified as low as -161 dBm (typical) from 5 MHz to 3.2 GHz.

Whether debugging an RF transceiver set, designing layout and configuration changes to maximise efficiency or testing a system in noisy environments, the analysers help to quickly and easily identify and analyse areas of RF concern.

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Ceramics now play a key role in positioning systems that require high accuracy and efficiency from DC motor and gearhead driven systems. The maxon motor ceramic linear drives feature a specially developed ceramic glide surface (CGS) that gives longer lifespans in automation systems with dynamic sliding movements. The linear systems with ceramic components are suitable in areas of strong electric fields or vacuum.

The hardness and surface structure of the CGS improves wear resistance over traditional materials. Ceramic materials are advantageous in applications such as power transmission or chemically aggressive environments, cleanrooms and high ambient temperatures.

The zirconia shares many properties with steel such as elasticity and expansion. Because of this, it can be used within the gearhead alongside traditional steels and even the DC motor shaft is often ceramic, enabling commutation components to be embedded into the nonconductive material, providing smaller and more robust systems.

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TAIWAN'S ELECTRONICS MARKET CONTINUES TO SOAR

Mansi Gandhi

The face of Taiwan's electronics industry is changing. In the past, the island nation, with the same population size as Australia, has focused on original equipment manufacturing and original design manufacturing. The focus is now shifting towards a more service-oriented electronics industry.

The business leaders and governments of the world's largest electronics exporter believe that continued wealth generation requires a new industrial model that is less dependent on primary energy and material inputs. This change in strategy was evident at Taitronics, the electronics show that featured over 500 exhibitors and attracted around 45,000 people from over 90 countries. Some of the buzzwords at the show were the Internet of Things (IoT), wearable electronics, smart home and cloud technology, e-commerce and green electronics.

The nation's IC design industry is adjusting and adapting to global trends - the country's most important product line is gradually shifting from chipsets for smartphone and tablets to the IoT, according to Taiwan's non-profit research and development organisation Industrial Technology Research Institute (ITRI) and Industrial Economics & Knowledge Center. "Currently, the advanced process is 32 and 28 nm, and it is moving toward 20 nm. The chipsets for smart handheld devices are still the largest component of the industry's top line, but 4G and cloud will continue to drive demand growth for mobile device and wearables." The nation's IC design industry is expected to generate a turnover of NT\$557.5 billion this year, up 15.9% from 2013.

Taiwan is still the world's largest producer of tablets, but the growth momentum is expected to weaken because of the lower demand. The local companies, therefore, intend to strengthen investment in components and improve manufacturing capabilities. Taiwan's tablet industry

is expected to achieve revenue of NT\$928.6bn this year.

The other key market that the nation's electronics businesses intend to tap into is wearable devices. The hardware architecture of wearable devices is similar to smart handheld and IoT devices and Taiwan's OEM/ODMs are hoping to get a bigger piece of this market over the next few years. The local suppliers have already launched components, including microprocessors/baseband, sensors, displays and batteries for the wearables market. Similarly, local device manufacturers have introduced smart glasses, smart watches, clothes and bands.

Green electronics is also a big focus. A number of new products are launched each year, leaving behind a large number of unwanted and unused products. "The manufacturing of new products places an enormous burden on the environment. An estimated 80% of the environmental impacts of an electronic product are determined in the design phase from the consumption of energy and other resources, such as water to waste generation and the release of hazardous substances. The resource consumption associated with creating a new electronic device is far greater than any gains from more efficient design," according to The Taiwan External Trade Development Council, TAITRA.

More than US\$1 trillion a year is expected to be generated globally by 2025 and 100,000 new jobs created over the next five years, if companies encourage the building up of circular supply chains to increase the rate of recycling, re-use and remanufacturing, according to TAITRA.



Taiwan's economy relies heavily on exports, particularly electronics. The country's export orders reached \$43.3 billion in September 2014, a YOY increase of around 12%. The total electronics exports - the largest export industry - increased by 19.4% to US\$11.5bn in September 2014. China is Taiwan's largest export market that accounts for 40% of the island's total exports, followed by the US, Europe, Japan and Southeast Asia. The sheer size of the Chinese market and comparatively low costs has attracted a number of Taiwanese electronics businesses to set up a manufacturing base in mainland China. One such company is Taiwan-listed manufacturer of terminals, connectors and wiring accessories, KS Terminals. The company, with a turnover of US\$90 million, has manufacturing facilities in China as well as Taiwan. While the products manufactured in China are primarily sold in China, the products made in Taiwan are sold in Taiwan and exported all over the world.

While China remains the preferred factory of the world, some Taiwanese companies are moving manufacturing back to Taiwan. The world's largest contract chip manufacturer, Taiwan Semiconductor Manufacturing Company, is considering moving production back to Taiwan. The labour costs in Taiwan are currently higher compared to China but the company hopes to achieve cost efficiency in the long term. Manufacturing locally will also provide the company a far better control of the entire process and quality.

TSMC has manufacturing experience of 30 years and revenue of US\$83 billion. The company is focused on telecom, consumer, automotive, military and industrial markets. It is also working on IoT-related solutions. It recently announced its "first and most comprehensive ultralow-power technology platform aimed at a wide range of applications for the IoT and wearable device markets that require a wide spectrum of technologies to best serve these diverse applications. In this platform, TSMC offers multiple processes to provide significant power reduction benefits for IoT and wearable products and a compre-

hensive design ecosystem to accelerate time to market for customers." Connected devices are changing the world and the way the companies do business. Chunghwa Telecom, Taiwan's largest telecommunications provider, expects huge opportunities from the IoT and smart devices. Chunghwa also signed a deal with Intel for development of IoT-related technology in mid-2014.

GW Instek, founded in 1975, is a Taiwanese manufacturer of electrical and electronic test and measurement instruments. The company claims to be the largest manufacturer and developer of test and measurement instruments in Taiwan. GW Instek's latest compact oscilloscope GDS-300/200 series won the gold award at 2014 Taitronics Technical Innovation Awards. These oscilloscopes introduce a 7" capacitive full touch panel LCD that can be positioned in portrait and landscape display. The recharging-battery design makes the series easy to operate for field operations. The oscilloscopes are suitable for use in laboratories, research and development, large electric system tests, power product tests, motor tests, solar power battery inspection and repair, and for maintenance personnel who are always on field assignments. The series, with two analog signal input channels, have advanced and standard models which come with 70, 100 and 200 MHz bandwidth. The maximum sample rate per channel is 1 GSa/s and memory depth is 5 Mpts. The GDS-300 series oscilloscopes are equipped with 50,000 counts DMM and the GDS-200 with 5000 counts DMM that can simultaneously measure and monitor AC and DC voltage and current, and temperature.

GW Instek's test and measurement products are sold across the world - in Australia, China, US, Europe, Japan, Korea and Southeast Asia. Another company that has been sheltered from attention but has a substantial customer base in Australia is Taiwanese test and measurement company Standard Electric Works, established in 1973. The company sells its products in Australia through CapTech, Nesco, Wattmasters, Power Parameters and Wavecom. Its most popular products in Australia include insulation testers, cable tracers and non-contactable voltage detectors. With a strong focus on innovation, the company introduces around 5-10 products each year.

The country's businesses and government place a strong emphasis on research and development. With increasing global competition for business and talent, the Taiwanese government has made it a top priority to devise policies to spur greater innovation and recruit more professionals, according to Premier Jiang Yi-huah.

Some businesses have expressed concerns that the R&D expenditure tax credits do not benefit those companies that have not started making profits. "Other businesses bemoan the huge loss of talent to overseas firms offering higher salaries," Ministry of Economic Affairs (MOEA) officials said. "To help businesses retain talented employees and encourage them to introduce new and more competitive technologies, the MOEA has drafted this amendment, allowing the deferral of income tax payments (under certain conditions) for employees that are rewarded with stocks, or technology patent owners that form partnerships with companies as stakeholders."

To summarise, the global electronics market is in the midst of a massive transformation and Taiwanese businesses seem to be ready to capture the opportunities and take the challenges head on. What could Australia learn from Taiwan? Refocus on design and innovation, seize opportunities before it is too late, manufacture low-volume products locally and outsource high-volume manufacturing to overseas suppliers in comparatively cheaper markets such as Taiwan.

What's New in Electronics attended Taitronics 2014 courtesy of the Taiwan External Trade Development Council (TAITRA).

PLC DEVELOPMENT KIT

The Systec PLCcore-9263 development kit is a complete package, based on a compact PLC with integrated target visualisation, which enables users to develop their own custom HMI devices.

The kit ensures quick and problem-free commissioning of the PLCcore-9263. Therefore, it combines all hardware and software components that are necessary to create HMI applications: the PLCcore-9263 SoM, the corresponding development board containing a QVGA LCD, I/O ports; ethernet interface; CAN interface; four push-buttons and four LEDs as control elements for digital inputs and outputs; and a scroll wheel and connector for a 4 x 4 matrix keypad.

Signals that are available from plug connectors on the SoM are linked to pin header connectors and enables easy connection of custom peripherals. Also included is the OpenPCS IEC 61131 programming system and the SpiderControl HMI Editor for the creation of web pages.

The development board included in the kit facilitates quick commissioning of the SoM and simplifies the design of prototypes for user-specific HMI applications.

Embedded Logic Solutions

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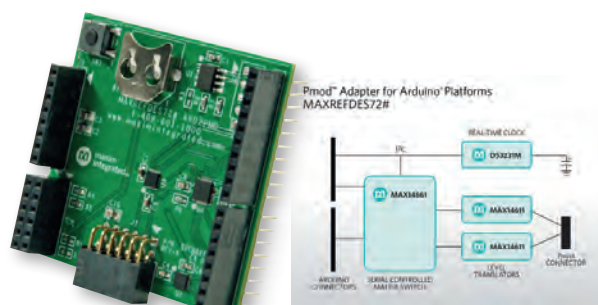
Moxa has announced the AWK-1131A, an 802.11n wireless AP/client that features a small housing with advanced EMS protection technology, enabling continuous wireless connections for the user's industrial applications.

The product is designed with galvanic isolation technology to protect devices from the electrical disturbances commonly found in industrial environments. It supports 802.11n MIMO technology to reduce multipath effects and increase data rates up to 300 Mbps for bandwidth-hungry applications, and features millisecond-level roaming to minimise packet loss for seamless connections with mobile applications.

The series features 802.11n technology, which is suitable for video surveillance applications that require up to a 300 Mbps data rate and Gigabit wired transmissions. The palm-sized solution can be easily installed in space-restricted locations.

MOXA Inc

www.moxa.com



PMOD-COMPATIBLE REFERENCE DESIGN BOARDS

Design engineers looking to extend the capabilities of FPGA/CPLD boards with mixed-signal/analog integration for rapid development will be interested in the Analog Devices PMOD-compatible reference design boards.

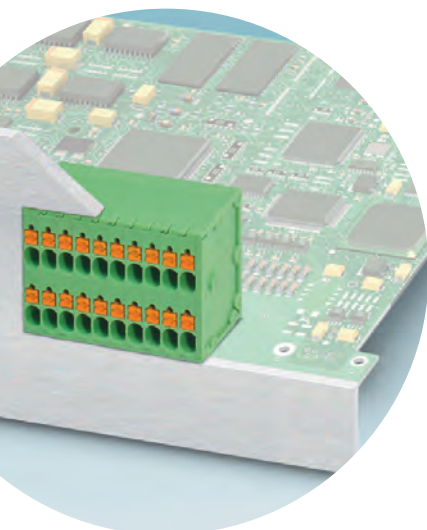
PMODs are small I/O interface boards that offer a way to extend the capabilities of FPGA/CPLD boards. The PMOD-compatible peripheral modules offer a wide variety of solutions that provide quick and easy access to analog and mixed-signal reference designs.

The peripheral modules plug directly into any FPGA/CPU port for rapid development or can be used with the SDP-PMD-1B1Z interposer board and plugged into the EVAL-SDP-CB1Z platform for performance evaluation.

Applications include: field instruments/smart transmitters; programmable logic controllers/distributed control systems; weigh scales; instrumentation; chemical analysis; industrial/commercial sensor nodes; building control and automation; rollover/stability control; avionics; servos and robotics; temperature controllers.

element14

au.element14.com



DOUBLE-ROW PCB TERMINAL BLOCK

The PCB terminal blocks in the SPTD 1,5 series from Phoenix Contact enable users to connect conductors with cross sections up to 1.5 mm² with ferrule in an easy and space-saving way on two levels. They are designed for currents up to 10 A as well as voltages up to 200 V and are suitable for applications in railway and home electronics.

Due to their compact design, the terminal blocks can be easily integrated into the front panel of a device. The arrangement of the solder pins ensures a high level of stability when space is restricted.

The terminal blocks have an integrated spring lever with push-in connection. An additional test connection and marking areas in the front area increase operating convenience.

Phoenix Contact Pty Ltd

www.phoenixcontact.com.au

WI-FI DEVICE FOR MCUS

The CC3100 BoosterPack is a Wi-Fi device that simplifies the implementation of internet connectivity and delivers the flexibility to add Wi-Fi to any microcontroller (MCU), providing users with all they need to easily create IoT solutions - security, quick connection, cloud support and more. The product can run on two AA batteries for over a year. It gives users the flexibility to use any MCU, with the device subsequently helping to reduce development time, lower manufacturing costs, save board space, ease certification and minimise RF expertise required.

The product comes with driver support and SimpleLink Wi-Fi software SDK with 25+ sample applications and documentation needed to use the SDK. It also contains the Flash Programmer, a Command Line Tool for flashing SW, configuring network and software parameters, and system and user files.

Texas Instruments Australia Ltd
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new PRODUCTS

WIRED SWITCHING REGULATOR

RECOM has introduced its wired switching regulator, the R-78W series. The wired version of the R-78 is intended for use in applications which use few or no printed circuit boards. In LED lighting solutions, a constant voltage for a fan can be generated by connecting the switching regulator in parallel with the LED driver. In prototyping and in many areas of electrical engineering, wired regulators are advantageous.

Output voltages of 5, 9, or 12 V with an output current of up to 500 mA are available. The module offers not only a wide input voltage range of 6.5 to 32 V but is also short-circuit protected (shutdown with automatic restart) and has an operating temperature range of -40 to +85°C. A protection diode is integrated into the module in order to prevent damage from reverse currents when switching off.

Due to its compact design (17.5 x 11.5 x 8.5 mm), the product is suitable for use in portable and battery-operated devices. No heat sink is required due to its high efficiency of up to 96%; this saves board space and lowers the mounting costs. The series is certified in accordance with EN 60950-1 and is RoHS 6/6 and REACH compliant.

RECOM Asia Pte Ltd
www.recomasia.com



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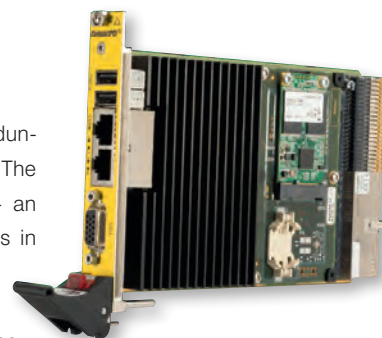
The F75P is a CompactPCI PlusIO SBC featuring onboard dual redundancy as well as a safe BSP for QNX, with PikeOS on request. The SBC forms the basis for the MEN Train Control System (MTCS) - an application-ready system platform that can manage single functions in a train as well as the control of the complete train.

Whether used in the MTCS with safe peripheral cards and robust power supplies or as a single card with or without a safe BSP, the product is available with SIL 4 certification. The board's pre-certified hardware components and QNX operating system seamlessly integrate with FlexiSafe, the safe firmware from infoteam Software.

The FlexiSafe programming system is certified to IEC 61508 SIL3, EN 50128 SIL4 and EN ISO 13849-1 up to PLe and works with all IEC 61131 programming languages as well as the C programming language. It enables safe and non-safe hardware and software to be combined in one project.

With the SBC's integrated safety functions, such as comparing and supervising CPU results or synchronising, developers can focus completely on the programming of the project-specific functions. The safety requirements are fulfilled by the complete package consisting of the safe hardware, BSP and firmware.

OEM Technology Solutions
www.oem.net.au



EXTREME INPUT VOLTAGE DC/DC CONVERTERS

The URB1D_LD series extreme input voltage range 40-160 VDC are available in 6, 10, 15 and 20 W. The converters feature 1.5 kVDC isolation; regulated, shielded package; full protection; and good EMC performance for railway or applications requiring ultrawide input voltages.

DLPC is the Master Distributor in ANZ for Mornsun Power Products, with official distributors in Victoria and South Australia (Fairmont Marketing) and in Auckland (Fero).

DLPC Pty Ltd
www.dlpc.com.au

COMPUTER-ON-MODULE

ADLINK's Express-HL is a COM Express COM.0 R2.1 Basic Size Type 6 module supporting the 64-bit 4th Generation Intel Core i7/i5/3 or Celeron processor, with CPU, memory controller and graphics processor on the same chip. It is designed for users who need high-level processing and graphics performance in a long product-life solution.



The product supports Intel Hyper-Threading Technology (up to four cores, eight threads) and DDR3 dual-channel memory at 1333/1600 MHz to provide good overall performance. Intel Flexible Display Interface and Direct Media Interface (DMI) provide high-speed connectivity to the Intel QM77 or HM86 Express chipset.

ADLINK Technology Inc
www.adlinktech.com

MOTOR

The electronically commutated EC-4pole 32 HD motor is designed for rough operating conditions, particularly applications in deep drilling.

The different versions of the product are designed for operation in air or oil. The power rating depends on the surrounding medium and amounts to 220 W in air and, due to the much higher heat flow, 480 W in oil. They are designed for ambient temperatures of more than 200°C and atmospheric pressures of up to 1700 bar.

The 32 mm diameter motors are able to withstand vibrations of up to 25 grms as well as impacts of up to 1000 g. The motors feature high efficiency, making them suitable for use in battery-operated applications. With their detent-free running properties, they have good control characteristics and are suitable for high-precision positioning tasks in outer space, even at low speeds.

The motor is suitable for use in environments with extreme temperatures, subject to high vibration or under ultrahigh vacuum. They can be used in aerospace applications such as gas turbine starters, the generators of jet engines, regulating combustion engines or exploration robots.

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FUSE TERMINAL BLOCK RANGE

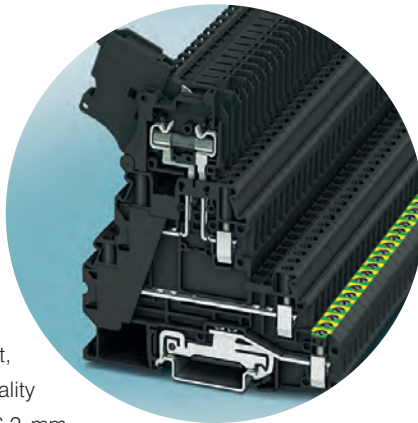
The UT 4-PE/L/HESI fuse terminal block range with screw connection, from Phoenix Contact, offers a high degree of functionality on three levels with a pitch of 6.2 mm.

The double bridge shaft on each level allows all tasks for potential infeed and distribution to be implemented quickly and easily.

For switching tasks, especially in MCR technology, an isolating plug, feed-through metal, component connector for the solder-free installation of electronic components or a fuse plug for 5 x 20 and 6.3 x 32 glass tube fuses can be used in the disconnect zone of the disconnect terminal blocks, depending on the application. Feed-through terminal blocks of the same shape complete the range.

All modular terminal blocks in the UT screw terminal block series use the cross-system accessories of the Cline complete modular terminal block system. In addition to using the same bridge system, marking and testing is identical for push-in, spring-cage, Combi and IDC fast-connection technology.

Phoenix Contact Pty Ltd
www.phoenixcontact.com.au



ONE-CHIP MICROCONTROLLER FOR SMART METERS

Toshiba has announced a one-chip microcontroller for smart meters, the TMPM411F20XBG, as the latest addition to its TX04 series ARM Cortex-M4F core-based microcontrollers. The device is also suitable for devices with sensing and communication functions (Internet of Things). A typical smart meter controller consists of an electricity calculation unit that measures current and voltage; a communication control unit that transmits and receives data with external equipment; and a display unit that outputs information to the display. The product features two independent bus-matrices for the measurement unit and communication unit.

The device incorporates two Cortex-M4F cores to enable independent control of the measurement and communication units on one chip and reduce board space. In addition, security functions required for network communications - AES, SHA and ESG - are implemented. Tamper detection and interrupt detection at power failure are also implemented with low consumption power.

The device has a maximum operation frequency of 80 MHz and a standby current of 1 μ A or less. RTC operation, interrupt/tamper detection and data backup can be operated in standby mode.

Toshiba (Australia) Pty Ltd
www.toshiba.com.au

DIGITAL ATTENUATOR



Macom Technology Solutions has announced the MAAD-011021 wideband, 6-bit digital attenuator. The product is offered in both bare die and a 3 mm PQFN package, operating from DC-40 GHz and DC-30 GHz.

The device provides up to 31.5 dB of attenuation in 0.5 dB steps, with attenuation error typically less than ± 0.5 dB and RMS phase error less than 5° at 20 GHz. It features integrated TTL digital control and is fully matched across the bandwidth of operation, enabling simple and fast implementation. It is suited for broadband applications, including military radar and radio systems, test equipment and commercial microwave radio and satellite links.

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new
PRODUCTS

100 MHz FOUR-CHANNEL POWERSCOPE

Available to rent, the Tektronix TPS2014 is suitable for engineers and technicians looking to speed up the design, installation, maintenance and troubleshooting of power control circuits that require floating or differential measurements. Applications include motor controllers, industrial equipment and uninterruptible power supplies.

The product boasts 100 MHz bandwidth and four isolated channels for floating measurements. The digital storage power oscilloscope comes with a colour screen and is battery operated, allowing for up to 8 h use away from an AC power source. The user can measure current and voltage distortion (and their spectral content), harmonics, instantaneous power, power factor and switching loss, as well as a range of automatic waveform measurements. Current probes are available as an option. Other features include: 1 GS/s sampling; sensitivity 2 mV to 5 V/div (bandwidth limited to 20 MHz when <5 mV/div); fast fourier transform (FFT) analysis; a power analysis package with low- and high-voltage probes.

TechRentals

www.techrentals.com.au



CONSTANT-CURRENT LED DRIVERS

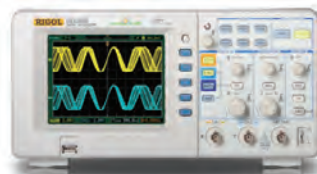
The Mean Well PLM series constant-current LED drivers are suitable for many indoor applications, such as domestic lighting, commercial and retail lighting and decorative lighting applications. The PLM-12 and PLM-25 have a single output (12 and 25 W) and an efficiency rating of up to 87%.

The PLM-40 features the company's three-step analog dimming function. This allows the user to dim the LED light fitting using a standard wall-fitting light switch. Turn on the light for 100% output; turn off and switch back on within 2.5 s and the light will dim to 40%. Repeat that and the light will dim to 10%.

The series will be available with Australian Safety Approvals and C-Tick.

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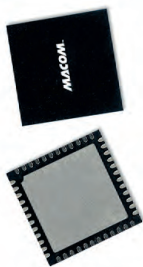
M/A-COM Technology Solutions has released the MAAM-011186 75Ω reverse-path variable gain amplifier (VGA). The integrated, two-stage, differential amplifier operates from 5 to 300 MHz, with an embedded digital step attenuator (DSA) for CATV reverse-path applications.

The device delivers 36 dB modulation error ratio (MER) performance for 64 QAM modulation and is loaded with 39 channels at 52 dBmV per channel. It is optimised for high output power and low current from 8 V bias but can also be operated from 5 V bias with flexibility to adjust DC current with external components.

Key features include: 39 dB gain; 31.5 dB, 0.5 dB steps, 6-bit DSA; 3 dB noise figure; serial or parallel attenuator control; differential input and output; low harmonics; power down mode. The VGA is offered in a lead-free 7 mm 48-lead PQFN package, making it suitable for high-density cards and compact system amplifiers.

Wireless Components

www.wirelesscomponents.com.au



CABLE AND ANTENNA ANALYSER

Available to rent, the Anritsu Site Master S331L



Cable and Antenna Analyser is suitable for work with legacy networks, as well as installations of newer 3G and 4G networks.

With a frequency range of 2 MHz to 4 GHz, it is suitable for cable/antenna installation and maintenance for wireless service providers and contractors, as well as applications in the military, aerospace, defence and public-safety fields.

The device features a built-in power meter and will measure return loss, voltage standing wave ratio (VSWR), cable loss and distance to fault (DTF). Other benefits include 8+ h battery life; internal storage for over 1000 data points; and weight under 2 kg.

Features include: built-in InstaCal module for fast, one-connection calibration; one calibration for all frequencies; power meter 50 MHz to 4 GHz, -33 to +20 dBm; S331D and S331E emulation modes.

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IT'S ALL ABOUT FINDING YOUR NICHE

Mansi Gandhi

The Australian electronics industry may not be dying but it is definitely changing. Australia's distance from other countries, technological advancements, high labour costs and growing competition from cheaper markets have forced businesses to adapt to change or shut shops.

Against all odds, a Queensland-based designer and manufacturer of integrated electronics systems, Hetech, has found success. The company's key strengths are: quality, strong design team and a fast turnaround time to meet requirements. The company realises that now, more than ever, the market demands high quality and cost-effective products. To achieve this, Hetech designs products in Australia, sources components from diverse suppliers, manufactures low-volume products in Australia and outsources high-volume manufacturing to overseas companies. Cost is one of the key drivers why manufacturers go offshore. However, there are many other factors to consider before taking the big leap. Mark Steiner, general manager of Hetech, recently spoke to *What's New in Electronics* about manufacturing offshore and building a business in tough times.

What are the common mistakes that Australian businesses make when looking to manufacture offshore?

Most Australian companies just look at the price of the actual product. They need to consider many other factors such as quality assurance, logistics, approvals and local support. It is important for businesses to understand that outsourcing is not a simple exercise. Many companies approach it without a plan - they do not consider all the potential risks and eventually fail.

There is a common belief that anything can be outsourced - that is not the case ... far from it. Most Australian companies usually require between 100-1000 units per lot per year - that is not large enough for outsourcing to other countries.

What are your top tips for manufacturing overseas?

Have a plan and stick to it; ask for help - use overseas agents; make sure the cost analysis incorporates all costs such as freight, insurance, taxes and redundancy; have at least one Australian backup supplier.

Where do you see the biggest opportunities?

It is all about finding a niche, adding value and fulfilling specific market requirements. As labour costs have continued to increase, there is more pressure on profits - we need to be more innova-

tive in adding value to the supply chain. Ordinary products do not bring extraordinary success.

Many companies such as Hetech have diversified their product range. Hetech has created Techome, a company that provides wireless control products and customised automation solutions and liner actuators to businesses and home owners. This is one way of protecting the company from the volatility and competition in the market. Electronics manufacturers and designers could also consider offering products and services such as cabling, cable looms, design services and membranes.

How has the electronics industry changed? What are the greatest strengths and weaknesses of Australian businesses?

The electronics industry has undergone a process of consolidation for over 10 years and it continues to shrink. The niche companies that have survived are lean and mean. I do not expect any further consolidation in the Australian electronics design and manufacturing industry.

Australia has over 1.2 million small and medium businesses - these small businesses have some distinct advantages and they can easily beat overseas companies on quality, speed and flexibility. However, Australia is transitioning from high-volume manufacturing to niche manufacturing. The shift presents challenges for the workforce, business owners and the industry. Additionally, Australian businesses are small in a global context. These small and medium businesses do not have the financial wherewithal and they should share their knowledge and resources, help each other and collaborate more. Unfortunately, Australian businesses tend not to trust each other and there is a lot of reluctance in investing and collaborating in the early stage. Hetech has tried to collaborate with many different companies but the feedback has not been encouraging and there is no support or encouragement from the various industry bodies and government agencies. There is a genuine disconnect between electronics businesses and government. This could be due to the limited understanding of the value, drivers and mechanisms of the electronics industry.

Hetech
www.hetech.com.au



MULTIPOINT VECTOR NETWORK ANALYSER

The R&S ZNB8 is claimed to be the first multiport vector network analyser offering up to 24 integrated test ports. The instrument can simultaneously test multiple DUTs or measure one DUT with up to 24 ports. The device offers short measurement times even in scenarios with a large number of ports. Other highlights include a wide dynamic range; high output power levels; and inputs featuring high power handling. The instrument operates in a frequency range from 9 kHz to 8.5 GHz. These features make the product suitable for applications in the mobile radio, wireless communications and electronic goods industries.

The instrument is primarily used in the development and production of active and passive multiport components, such as GPS, WLAN, Bluetooth and front-end modules for multiband mobile phones. However, its performance even allows efficient analysis of base-station filters and associated demanding devices. The product is said to offer superior performance over switch matrices. Its high integration density provides a compact solution for analysing components for up to 24 ports, occupying the same rack space as an R&S ZNB. The convenient user interface makes it easy to handle even complex multiport measurements.

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DESKTOP COATING SYSTEM

Rainbow Technology Systems has introduced a version of its desktop coating system said to offer even greater functionality and ease of use. The product features an alignment system, which means the copper panel and phototool can be lined up with accuracy. A camera system mounted on an overhead gantry means that the operator can manually adjust the position of the phototool until it is aligned. Back-to-front alignment also means that double-sided panels can be processed.

The Desktop Coater incorporates coating, laminating, imaging and UV curing in one compact unit and is designed for use in laboratories and research environments for the production of prototypes and small-scale circuit board manufacture. Fine line detailing of 20 μ m is possible on boards up to 460 x 305 mm.

Adapt Australia

www.adaptaust.com.au



NETWORK TRANSPORT TESTER

As network operators install technologies such as OTN, MPLS-TP and Ethernet in their metro and backhaul networks, the operator needs to support fibre channel links while continuing to maintain legacy PDH and SDH networks.

The Network Master Pro MT1000A brings these network test requirements

to a portable device, making it a suitable tool for field testing. The product has a compact and lightweight design for maximum portability in the field. The modular platform provides high performance in a small form factor.

The all-in-one field transport tester supports testing from 1.5 Mbps to 10 Gbps. It provides metro and core network OTN installation and maintenance; Carrier-Class Ethernet installation and troubleshooting; mobile backhaul installation and verification; powerful storage area networking (SAN) testing; quick and easy testing of SDH/SONET/PDH/DSn networks; and testing of client signals mapped into OTN.

Other features include an easy and intuitive GUI; dual port at all rates; WLAN/Bluetooth/LAN connectivity; PDF and XML report generation for documentation of test results; remote operation and remote control (scripting).

Anritsu Pty Ltd
www.anritsu.com


new
PRODUCTS

CPU RANGE


Imagination Technologies has announced the MIPS I-class I6400 CPU range, claimed to be the first IP cores to combine a 64-bit architecture and hardware virtualisation with scalable performance through multithreading, multicore and multicluster coherent processing. The cores are suitable for applications including embedded, mobile, digital consumer, advanced communications, networking and storage.

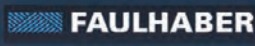
The product can be implemented across a range of performance, power and area operating points and achieves high frequencies in aggressive implementations. Hardware multithreading technology supports up to four hardware threads per core, leading to higher CPU efficiency.


Imagination Technologies
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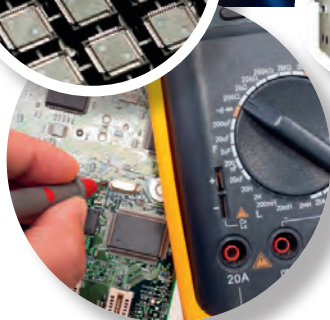
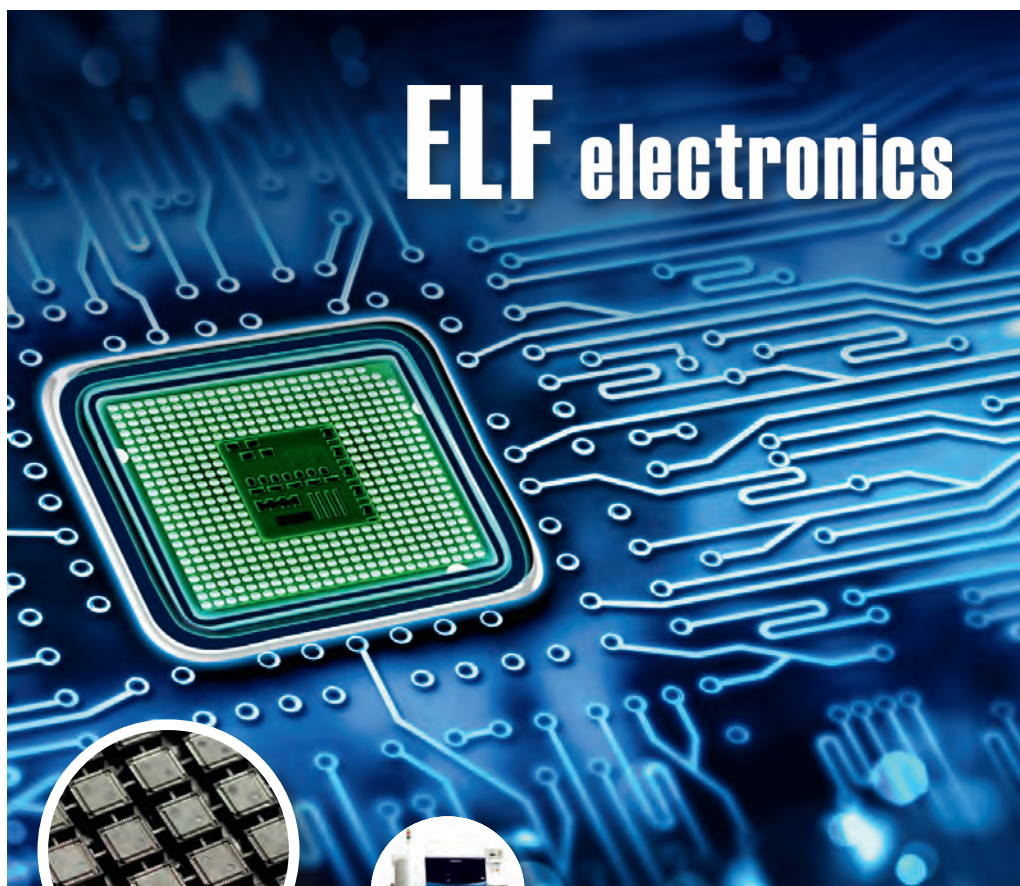
FLAT-BEZEL PANEL PC

IEI Technology has released the AFL2-W10A-N28 10" AFOLUX Generation II Flat-Bezel Panel PC. Powered by an Intel Atom Cedarview N2800 Dual Core 1.86 GHz processor, the PC can support up to 4 GB DDR3 SO-DIMM. The PC is slim and stylish and provides two types of touch options: resistive and projected capacitive. The full function LCD panel PC features an RFID reader, Wi-Fi 802.11b/g/n, 2 MP camera, two built-in speakers, a microphone and wide-voltage 9-36 power input.

The device has an LED backlit front panel that meets IP64-rated resistance to dust and liquid ingress, as well as auto-dimming control. The multifunction panel PC can be used in various applications including industrial, commercial, medical, entertainment systems and hospitality.

ICP Electronics Australia Pty Ltd

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SEALED UNMATED POWER JACKS

Switchcraft has introduced a power jack that is sealed to IP68 when unmated. It is robust and can withstand a wide temperature range of -40 to +105°C.

The design offers a current rating up to 13 A when mated with the S10 series of high-amperage power plugs. The product is available as sealed only but can be used with the S10 in both sealed and non-sealed applications. It is recommended that locking plug versions are used to keep plugs connected to the jack.

The unsealed power plugs go to 24 V AC/DC and are available with straight or right-angle solder terminals. They are suitable for any sealed data transmission, military or industrial GPS location devices, LED and low-voltage lighting, medical equipment, marine applications, transportation and power supplies.

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THE CHANGING WORLD OF CONNECTORS

Mike Smyth,
specialist technical writer

The once humble plug and socket has now been promoted to the rank of interconnect and with it come all the responsibilities that rank involves.

To meet the changing industry requirements, today's connectors are expected to be smaller, capable of carrying faster signals at an even greater bandwidth, be very reliable, offer next to nothing in the way of contact resistance and in addition have a quick-release system that eliminates the need for special tools and above all be highly cost competitive.

As a result, the industry is adapting and adopting new strategies for dealing with the advance in miniaturisation that has swept into all areas of electronic equipment - from oil exploration rigs and robotics to washing machines and home theatres to applications in medicine, space and defence.

Industry representatives talk about computing, consumer devices and communications as being the growth driving force behind the next generation of connectors. However, progress is already being made.

Compressing a lot into a small space is a key aim of the electronics industry and ruggedised micro-D connectors are fulfilling part of this aim that often also requires higher operating temperatures and a greater current carrying capacity.

This is evident in the D subminiature connectors that need a pin spacing of 2.54 mm and do not fit in current systems. These connectors are being replaced with a micro-size 1.27 mm device and nanoconnectors at 0.635 mm that are better able to handle today's technology.

In some applications, currents and voltages are now in the microvolt and milliamp range but the working speed of the connector has increased. As the electronics get smaller, so the space for routing signals becomes more limited and the weight of the interconnect has to be kept to a minimum. Analog signals, although thought of as yesterday's technology, are still very much with us but they often require high voltages and thicker wire. This can become a challenge to the connector maker, who must be capable of producing products for both analog and digital use.

The latching micro-D system has emerged as versatile in that it is already a proved design and can be adapted for board and panel mount and wiring configurations and pin counts. It may include metal back shells as EMI protection and strain relief to reduce wear on the cable interface. These connectors are suitable for a wide range of cable types, including open wiring, jacketed cable sets and EMI shielded braid to prevent signal noise or signal intrusion into adjoining circuits.

A simple squeeze and pull disconnects the device and an adapter can be used with existing micro-D connectors, allowing current instruments to use the latch on cable already in a system. With contact counts from nine to 51, the connector shells are made of an aluminium alloy with nickel plating. A one-piece beryllium copper flex pin and a plating of nickel and gold gives the robustness that allows operating temperatures between -55

and 125°C and a special version that is rated at 200°C. While bandwidth may be close to the top of the list for connectors, a close second is the demand for smaller and lighter devices for the growing numbers of mobile equipment.

Specialised connectors such as active cable interconnects are coming into increasing use. Small ICs are embedded at each end of the cable to restore signal strength that might have become attenuated over the cable length. The additional cost of these devices is making the consumer market hesitant to adopt them but the market may eventually have to use them as size and signal density become all-important.

Another direction in which interconnects are moving is with optical fibres that can handle much higher bandwidths. The technology is also seen as a method of linking computers with mobile devices and within computers. One computer manufacturer has evolved a prototype interconnect that uses wavelength division multiplexing (WDM). This multiplexes several signals onto a single optical fibre using different wavelengths (colours) of laser light.

The technique allows bidirectional communication over a single fibre strand and much greater capacity. This could produce the first computer capable of performing a billion computations.



ANOTHER DIRECTION IN WHICH INTERCONNECTS ARE MOVING IS OPTICAL FIBRES THAT CAN HANDLE MUCH HIGHER BANDWIDTH.

Beyond the conventional interconnects, manufacturers are looking at ways to integrate the board connection into the cable and lessen the influence the connector has on signals as they move from the printed wiring board (PWB) to the connector and then on to the copper or optical cable.

Thunderbolt is a technology gathering momentum because it supports high-resolution displays and fast data transmission via a single port. Again, cost and power issues are holding back its universal adoption. Thunderbolt is not alone. There are other technologies in the wings such as VERA DP 1.2, HDMI 2 and PCIe OCuLink that are poised to take centre stage. Even with a mix of new and old technology, manufacturers, especially in Europe, see a bright future for their industry, according to a report by US company Bishop & Associates. The company's survey says billings up to May this year were 10.7% higher and bookings increased by nearly 9%. The automotive industry showed strongest growth with industrial while telecommunications equipment showed a slight fall.

Elsewhere in the world, the Asia/Pacific region, including Australia, is showing good growth, which augers well for the new technologies coming online.

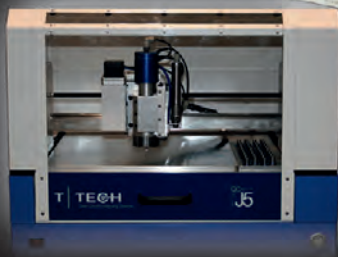
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DIGITAL SIGNAGE PLAYER

iBase Technology's SI-12 ultraslim digital signage player measures only 1.95 mm thick. The media player enables the retail, food and hospitality segments to deliver content in dual high-definition HDMI displays to targeted audiences.

The digital signage player has been tested to pass extended operating temperatures (-30 to +60°C) to meet extreme system reliability requirements that allow its deployment in a wide range of harsh indoor and outdoor environments. The unit offers a fanless design by using the lower-power, high-performance 1.91 GHz Intel Atom E3845 quad-core processor with built-in Intel HD graphics. It has two dual-channel DDR3L-1333 sockets to provide up to 8 GB memory and an optional 64 GB mSATA solid state drive for fast system boot and low heat emission.

The product has a superslim chassis that can be fitted into tight spaces behind displays. An array of connectivity options include a Gigabit Ethernet, audio, USB 3.0 and 2.0 ports, and two HDMI 1.4a interface to support high video resolutions beyond 1080p systems. Powered by a 60 W adaptor, the device also has a Mini PCI-E slot to accommodate optional Wi-Fi, Bluetooth, 3G and TV tuner functions.

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COMPUTER WITH SMALL FORM FACTOR

The Intel Edison is a small yet powerful computer, about the size of a postage stamp. It is designed to lower the barriers to entry for the next generation of consumer products by providing a full-featured, low-power computer in a form factor small enough to fit almost anywhere. The product is powered by a 22 nm Intel Atom SoC that includes a dual-core, dual-threaded CPU running at 500 MHz and a 32-bit Quark MCU running at 100 MHz. Measuring 35.5 x 25 x 3.7 mm, it includes 1 GB of RAM and 4 GB of Flash and supports dual-band 801.11 a/b/g/n Wi-Fi as well as Bluetooth 4.0 and 2.1 EDR.

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IoT: MORE THAN JUST A BUZZWORD

IoT may have reached the hype peak but this decade-old term is a lot more than a buzzword.

The global Internet of Things (IoT) output is expected to reach \$600 billion in 2016, according to Market Intelligence & Consulting Institute (MIC). Taiwan wants a big slice of this market. The Taiwanese government is strongly encouraging local businesses to embrace new technologies and capture the global IoT market.

Not surprisingly, IoT was a hot topic at the country's biggest annual electronics show, Taitronics. The nation's IoT market is expected to grow to \$290 million in 2017 from \$148 million in 2013 to \$290 million in 2017, with a compound annual growth rate of 19%, according to IDC. Multimedia telecommunications, government and logistics industries are expected to witness fastest growth - estimated to account for 5% of the overall market size.

Taitronics featured an IoT pavilion that showcased future smart home technologies. Below are some highlights from the pavilion.

Access control technology

iiKey is an access control system that enhances security by combining three biometrics authentication technologies. These include: face recognition, iris identification and eye tracking, to verify user identity. To complete a valid authentication, each user must pass all three verifications. The eye-tracking technology (Brain ID) allows the user to enter passwords with their eyes and the face recognition technology captures information and measures distinctive features of the face to identify individuals by matching them against a list saved in the database. Iris identification extracts iris information from the user and compares it against the user list in the database.

The multibiometrics system of iiKey helps prevent the falsification, enhance security and strengthen safety. Other features include: silent call for help - an eye-triggering silent call-for-help function is embedded in iiKey for a user to notify security guards unobtrusively when in danger; intention driven identification - an unconscious person will not be able to enter the password with their eyes, thus the person cannot pass the eye-tracking verification; multibiometrics helps prevent falsification; proof of life: the iris pattern changes when a person dies, thus, a dead person or a disembodied eye will not have valid iris information to pass the verification.

Driver behaviour technology

Applying the image processing technology, the Intelligent Co-Pilot (ICP) evaluates driver behaviour, vehicle condition and driving environment to determine whether it is safe to stay on the road. The system will generate real-time alerts to a control centre through 3G when critical events occur, which allows faster response to traffic emergency. The efficiency of fleet management can be enhanced with the assistance of ICP.

Features include: embedded GPS, speed reminder, overspeed alarm, fatigue detection, 3G communication, Bluetooth and Wi-Fi communication.

Eye-controlled computer

SpringTrack is an eye-controlled computer that allows people with communication difficulties to express freely through gaze interaction. The technology provides accurate measurements of every eye gaze and movement. By simply looking or blinking at the screen, the users can control the cursor by their eyes to execute each command. SpringTrack allows communication-challenged users to engage in daily interactions through writing emails, reading the news, surfing the net or even controlling the environment.

Non-invasive glucose monitor

The non-invasive glucose monitor detects how the glucose inside the eye's anterior chamber responds to low-power infrared light that is gleamed on the liquid inside the chamber. A relative body glucose concentration reading can be derived by measuring the glucose concentration of the aqueous humour. The detector provides continuous inspection and causes no pain, bleeding or infection and no consumable materials are required. It's a convenient device for diabetics to use at home.

Musical bulb

Ace Victory Energy's LED bulb not only lights up a room but can play music. It can also connect to other LED lighting products through Bluetooth. The bulb offers lighting output of 800 to 2500 lm.



TRANSFORMER PROTECTION PANELS

Boval Engineering has designed and built a number of specialised cabinets to suit electrical

contractors' requirements, including Transformer Protection Panels. The units house relay protection relays, as well as terminal and electric current transformers. The panels provide transformer protection against internal electrical faults while also protecting the electrical network infrastructure. This is achieved by the unit taking the force of the problem and shutting down the main system before oils and fuels can ignite. This prevents further damage to the mains relay and other surrounding property. Common causes of unexpected occurrences include lightning strikes, earthquakes, car accidents and fire. The units are typically utilised in underground distribution substations and also some above-ground substations. Benefits include: solid construction; powder-coated for durability; custom sizes available for project requirements; lockable; available in a range of colours; products can be optioned to meet users' requirements.

Boval Engineering

www.bovalengineering.com.au

new
PRODUCTS

NETWORK APPLIANCE

The FWS-7810 Network Appliance has been released by Aaeon. Network appliances are dedicated computer systems featuring multiple network interfaces. They provide the necessary hardware infrastructure allowing developers to build custom firewall, intrusion detection/prevention systems (IDPS/IPS), load balancing, network access control, web filter and anti-spam/virus applications. The product is housed in a 1RU rackmount chassis and features an Intel LGA1150 4th Gen Core/Xeon Processor, up to 32 GB of ECC DDR3 1333/1600 MHz memory, eight 10/100/1000Base-TX Ethernet ports, one RJ45 console port, two USB 3.0 ports and an LCD display.

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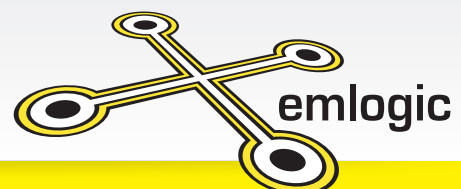
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MOSFET

The SiA446DJ, from Vishay Intertechnology, is claimed to be the industry's first 150 V N-channel MOSFET in a thermally enhanced PowerPAK SC-70 package. It features low on-resistance at 10 V in the 2 x 2 mm footprint area.

The product is suitable for a wide range of space-constrained applications, such as isolated DC/DC converters; boost converters in LED backlighting; and synchronous rectification and load switching for power management applications in Power over Ethernet (PoE) PD switches, telecom DC/DC bricks and portable electronic devices. It has been designed to increase efficiency by reducing conduction and switching losses.

element14
au.element14.com

SAFETY SENSOR WITH RFID TECHNOLOGY

The RSS260 safety sensor combines the detection principle of RFID technology and a high switching distance in a compact design. The various actuators allow optimal integration of the safety sensors in the surrounding architecture of removable, hinged and sliding covers and doors. All variants offer a high level of tamper resistance as the RFID-based sensor technology permits individual actuator coding. In the basic version, the sensor accepts any suitable RSS260 family target. A second version for increased tamper resistance only responds to an individually assigned target. There is a third version available for the highest level of tamper resistance, which only accepts the target presented at initial powerup. In addition to the standard actuator, which is suitable for assembly on the normal aluminium profile systems, additional actuator designs can be selected. There is a compact rectangular target and a flat, elongated actuator, which is suitable for design-oriented machines and plants, as well as for being mounted on polycarbonate safety gates. Another feature includes the ability to connect up to 31 of the sensors in series and evaluate them with a single safety module without compromising the safety level and the diagnostic capability. This also applies when combining the product with other Schmersal electronic safety switching devices, such as the solenoid interlocking AZM300 and light curtains such as the SLC440.

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PRIVACY

- A BURNING ISSUE FOR UAV OPERATORS

Ken Taylor, Managing Director

Unmanned aerial vehicles (UAVs) are getting a lot more exposure these days. Unfortunately, the public perception is largely negative due to the use of 'drones' in warfare. These military drones are large and fully packed with surveillance equipment and munitions. People in Australia are extremely unlikely to see anything like this unless they go to places like Avalon.

Aircraft face constant battle with their weight. UAVs are no different. Civilian UAVs are still largely multirotors, generally electrically powered from batteries. These systems are limited in flight times and have a small payload capacity.

The Civil Aviation Safety Authority regulates all the aircraft operating in Australia, even model aircraft and UAVs. There are particular rules which permit use of these classes of aircraft without an overbearing approach by the authorities but it is not correct to suggest they are 'unregulated'.

CASA has these main considerations for safe use of a UAV:

- It must remain within line-of-sight.

- It must not be flown over populous areas, such as beaches, parks, other people's backyards or sporting events.

- It must remain less than 120 m high.

- It must not be flown within 5.5 km of an airfield.

- It's illegal to fly for money or other economic reward if you do not have a CASA Operators' Certificate.

From the above list you can see that there are significant restrictions on UAVs. There have been high-profile cases of UAVs crashing into iconic bridges or into runners; they have intruded on crime scenes and bushfire sites; they have also been seen at a high altitude. Prosecutions have been undertaken in many of these instances.

Anecdotally, FPV (first-person view) operators, who use goggles to watch from their craft's onboard camera, appear most likely to lose control of their craft because they are not taking note of where the craft is until it has gone out of control range or crashed. Cheaper, less capable or incorrectly set up craft have flown out of range and been lost, resulting in possible hazards to people and aviation. UAVs can be seen to offer people a means to peer into others' lives in a way which was unthinkable not too

long ago. However, the rules and regulations prevent most of this from occurring, if these rules are obeyed. However, some people are ignorant of, or decide to simply ignore, such rules.

There are laws in place in all states protecting privacy, such as the Privacy Acts and the likes of the Surveillance Devices Act in NSW, but these may not apply where individuals are performing the acts; it is a source of hot debate in the legal fraternity.

Realistically, do we need to do anything at all? Just as paparazzi have intruded on other peoples' lives for years, so now could an errant UAV operator. But then, so could someone with binoculars or a telescope - do we ban everything that may intrude? With the UAVs commonly in use today it is relatively easy to find the operator if the UAV is seen.

It would be pointless to try to ban UAVs. Anyone with an ounce of DIY skill could put one together in their garage. Making a UAV smart enough to be safe is another task again; however, banning them would more likely make unsafe equipment flourish and not necessarily improve safety or privacy.

The answer is a more concerted campaign of education, which CASA has been engaged in, but support needs to be gained from the likes of model flying clubs, trade and hobby magazines, and probably even in schools. Even then it will not prevent potential or actual invasions of privacy, but a few high-publicity prosecutions for incorrect operation of UAVs would go a long way in the education process.

The results of the abovementioned incidents have not been made public by the authorities. People need to realise that public safety and personal privacy go hand in hand and more support for the regulatory regime is warranted.

We can't go back to the 'good old days' before UAVs were freely available, but a suitable combination of commonsense operation, consideration for other people's privacy and publicised prosecution of the errant user will go a long way towards minimising physical and privacy risks for the general public.

For further reading, check out Roger Clarke's piece: <http://www.rogerclarke.com/SOS/Drones-BP.html>

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DLPC is the Master Distributor in ANZ for Mornsun Power Products, with official distributors in Victoria and South Australia (Fairmont Marketing) and in Auckland (Fero).

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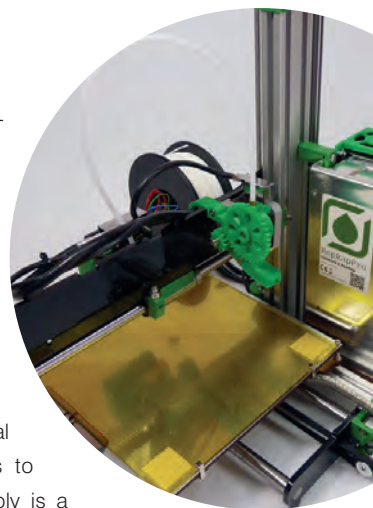
3D PRINTER

The RepRapPro Ormerod 2 is a single-colour 3D printing machine. It is easy to expand in functionality, fast to replicate and fast to assemble. Compared to the original Ormerod, the printer is said to have much simpler and more integrated assembly, with improved instructions and wiring looms for simple plug-in connection and no soldering necessary.

The design offers easier adjustment of the bed level; improved y-axis belt location and retention; and a bed probe which features a 4-wire differential device, as well as providing much easier access to the extruder for cleaning purposes. The power supply is a 100-240 V worldwide input power supply and is a dedicated 12 V supply, rather than being an adapted supply, and is more compact with its integration into the machine with no trailing wires. EMI emissions have been reduced, resulting from a fully shielded design that meets the Class A CE mark.

Specifications include: build volume and speed of 200 x 200 x 200 mm and 1800 mm/min, respectively; a deposition rate of 33 cm³/h; accuracy and layer resolution of 0.1 and 0.01 mm, respectively; and ability to print using either PLA or ABS thermoplastic materials. The open-source software designed to run the machine will run on a relatively low-powered computer running Windows, Linux/Ubuntu or Mac OS.

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IO-LINK REFERENCE DESIGNS

Subsystem reference designs from Maxim Integrated provide accurate, low-power optical proximity sensing and enhance distributed control with a compact digital-input hub. The subsystems integrate the IO-Link standard for industrial applications. The MAXREFDES27# IO-Link subsystem reference design lets operators tune and calibrate an optical proximity sensor with up to 14-bit resolution. Integrated DC-DC low-power conversion increases system efficiency. The design is tunable and can be calibrated for different surfaces and light levels.

The board integrates the DC-DC converter, an IO-Link transceiver, the proximity sensor and a Renesas RL78 microcontroller. The robust IO-Link performance provides self-configuration, efficient two-way communication between sensor and control module and several protection mechanisms. The product fits on an 8.2 x 31.5 mm PCB and consumes 150 mW.

The MAXREFDES36# IO-Link subsystem merges 16 digital inputs into its hub and eliminates 15 cables connected to the PLC. It consumes 235 mW of power and fits in a standard DIN rail PCB holder. The digital hub lets manufacturers fit more digital inputs into each system controller.

The product features a DC-DC power converter, two 8-channel digital-input serialisers, an IO-Link transceiver and a Renesas RL78 microcontroller on one board. Robust IO-link performance provides self-configuration, short-circuit and shutdown protection, thermal warnings and drive capability.

Avnet Electronics Marketing
www.avnet.com.au

PRECISION-MEASUREMENT DMM/POWER SUPPLY



Keithley has released the Model 2280S precision-measurement DMM/power supply. The Model 2280S-32-6 can output up to 32 V at up to 6 A, while the Model 2280S-60-3 can output up to 60 V at up to 3.2 A. The product provides 100 nA to 6 A measurement with high accuracy. It can measure voltage and current with 6.5-digit resolution. The device can capture dynamic load currents as short as 140 μ s. Its output is up to 192 W of low-noise, linear-regulated power. The power supply's programmable rise and fall times eliminate voltage overshoot and undershoot transients. Built-in graphing simplifies analysing trends or displaying voltage or current waveforms. A high-resolution TFT display and soft-key/icon-based user interface simplify power supply operation.

The unit's programmable output sequences reduce test times. It features digital I/O for direct communication with other devices and instruments. GPIB, USB and LAN interfaces are included.

The device's built-in web page simplifies automated control/monitoring. Tests are automated easily with Kick-Start start-up software.

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the GRUMPY page

Mike Smyth, specialist technical writer

It all started when a fern that had been sitting quite comfortably in the centre of a terracotta pot for a number of years started migrating towards the side of the pot as if desperate to salve its loneliness by joining the friendly miniature roses and large bird of paradise plants in a nearby bed.

Up with this I would not put and decided on a repotting and recentring exercise for the recalcitrant fern. So trotting round to the shed and digging out the wheelbarrow to load up with potting mix and other plant goodies was the first step. However, through neglect and winter the barrow had gone to a better place, suffering from a terminal hole in the tyre and walls that were cracked beyond redemption.

A quick search of that shopping centre of the air, the internet, revealed a new wheel and tyre would cost around \$70 while a new barrow would cost around \$47 - complete with brand new wheel and a sound tyre. On visiting the shop, I discovered that this barrow was a flat pack requiring full assembly at home.

Well, I thought, in this day of electronically controlled machine tools and laser-cutting accuracy down to one micron and some basic but information-laden instructions, assembly would be simple and I would be sitting down and admiring my handiwork over a cup of tea in about an hour without taxing the grey matter unduly. How wrong can you be?

Going first for the instructions, I discovered a single sheet of paper on which was an expanded drawing of the barrow's components, obviously drawn by a child with no knowledge whatsoever of perspective. While the parts were listed, there was no mention of the two main shafts that on one side were plain but on the other were dimpled round the holes. Which way up did they go? Nothing mentioned to help the hapless assembler. Take a punt and hope you are right. As it turned out I was wrong, or I think I was, and halfway through I had second thoughts and turned the shafts the other way up.

Then, unpacking the box of bolts, nuts and washers revealed several different lengths and nowhere did the instructions give up their secret of saying which went where. Past experience of assembling Chinese equipment came into play and by a process of elimination, coupled with intuition and a few choice words, we progressed. Then the instructions told the assembler to ensure certain component holes aligned and if they didn't you were expected to reverse them until they did.

The brace for the legs had to be 'slotted in' and turned a quarter of a turn. Which side and which way? No clues from the inscrutable. I forced it in, removing paint from the legs and brace, enough to start a rust run. However, it braced!

The legs bolted to the shafts and the elongated holes in the legs were a struggle to align. In fact, the only way of doing it was to offset the legs so that they did not sit parallel with the shafts, making the assembly look untidy. The saving grace was that both legs were offset by about the same amount. It looked odd but at least it was more or less symmetrical.

When it came to assembling the axle and wheel, the instructions gave options. Paraphrased, it said if it doesn't fit one way then try it the other way round. Presumably if this didn't work, you had a wheelbarrow without a wheel, useful for growing plants in and sitting at the front door!

A day and a half later, a wheelbarrow did emerge despite the confusion of the instructions and the misalignments of the parts. I would have expected better from modern industry but perhaps that is the penalty for paying just \$47. Force against matter indeed but as Confucius might have wryly said, "Where there's a wheel there's a way."



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- 2 Management - Specialist
- 18 Analyst/Researcher
- 20 Business Owner
- 21 Comms Tech/Engineer
- 13 Consultant
- 14 Contractor/Tradesperson
- 16 Education/Training
- 3 Engineer - Electrical
- 4 Engineer - Electronics
- 5 Engineer - Process
- 6 Engineer - Project
- 15 OHS/EHS
- 22 Postgrad Student
- 7 Purchasing/Procurement
- 19 Sales/Marketing
- 12 Scientific Officer - QA
- 11 Scientific Officer - R&D
- 17 Student - Undergrad/Apprentice
- 10 Technical Officer
- 9 Technician - IT
- 8 Technician - Maintenance/Service

INDUSTRY

(please choose one only)

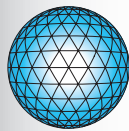
- 1 Agriculture/Rural
- 47 Biotech
- 2 Building/Construction
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- 34 Processing
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- 38 Testing/Certification (eg NATA)
- 39 Utilities

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(please choose one only)

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- 2 100 - 250
- 3 251 - 500
- 4 Over 500

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