

ELECTRONICS

APRIL 2022

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ECS @ Kassam Stadium ■ Oxford ■ OX4 6DE
Thursday ■ 19th ■ May ■ 10:00am - 3:00pm

ECS PREVIEW: PAGE 28

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On the cover – April 2022

Electronics shows are go
page 28

Editor's Word



ECS: all roads lead to Oxford

On Thursday 19 May 2022, designers, manufacturing engineers and purchasing professionals from across the UK and beyond will make their way to Oxford's Kassam Stadium for the inaugural *Electronic Component Show*.

There they will engage in conversation with any number of the 66-plus exhibitors, discussing their design, technology, manufacturing and sourcing projects in a relaxed and engaging environment.

Products and services to explore cover every aspect of electronics from connectors and fans to PCB manufacturing and product assembly. Likewise, visitors represent all corners of the UK's manufacturing landscape, stretching from aerospace and defense to medical, automotive and marine.

Virtual meetings have their place, however face-to-face events like *ECS* offer visitors a unique opportunity to forge working relationships with future account managers, pose detailed technical questions to product experts and actually handle the products they may soon be purchasing.

In addition to the above benefits, *ECS* is also hosting a series of seminars on the following subjects: Collaborative robots offer big value in a small size (ABB Robotics UK); Avoiding counterfeit components with quality-led distribution (Charcroft Electronics); Tell-tale signs of successful companies who overcome design challenges (Anders); Obsolescence: Not the end of the World (Rochester Electronics); and Design/manufacturing considerations for new electronic products (Jaltek).

The whole *Electronics Sourcing* team will be on site, so feel free to search us out on Stand ECS7 where we can explore the electronics terrain for 2022 and beyond.

Jon Barrett

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NEWS



Battery centre
construction begins

04

FREQUENCY



Is this the big reset?

08

ENCLOSURES



Temperature vs equipment:
who will win?

22

ECS PREVIEW



The Electronic Component Show



51-pages of products
and services to see

28

BUYERS' GUIDE



All the facts and figures
to help you buy

78

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Construction of new battery distribution centre begins

Construction of GS Yuasa Battery Sales UK's new headquarters and distribution centre has begun. The 178,500ft² purpose-built facility is situated in Dorcan, Swindon. The site is expected to be fully operational summer 2023.

The facility will stock batteries and accessories to service all GS Yuasa's markets including automotive, motorcycle and industrial applications. It will have approximately 23,000 pallet spaces and stock hundreds of thousands of batteries for supply into UK and European markets including its three core brands GS Yuasa, Yuasa and GS products.

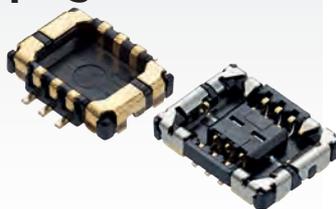
GS Yuasa Battery Sales UK's managing director, James Hylton, said: "The design of the site, coupled with state-of-the-art warehouse equipment and systems will enable us to offer significantly improved service levels for customers, ensuring that we continue to stay ahead of the competition."

The building will be constructed with a focus on ESG credentials, targeting BREEAM Excellent, an EPC A rating, 19 EV charging points, photovoltaic panels and use of recycled materials.

www.gs-yuasa.eu

5G mmWave connectors now shipping

Mouser is now stocking Molex' 5G15 Series 5G mmWave RF flex-to-board connectors. Designed for 5G applications requiring design flexibility, robust mating and minimal PCB space requirements, the connectors offer versatility and usability while delivering signal integrity performance up to 15GHz.



The connectors are available in two configurations: two-RF signal line with 1A power line and four RF signal lines with no power. Both are engineered using a receptacle centre shield, which isolates each row to provide signal integrity while enabling separation for EMI shielding. Other features include a 0.35mm alignment pitch for easy mating, overmold design to prevent pin pull-out and armoured split nail that protects connectors during mating and allows for dual use as power or ground.

5G communication applications include consumer, smart home, medical, surgical, wearables, AR/VR and industrial IoT.

The connectors can be combined with RF and other non-RF connection functions into a single connector to save PCB space/cost or replace multiple coaxial cables.

www.mouser.com



Clamp-on temperature sensor in stock

Farnell is now stocking Omega Engineering's HANI non-invasive clamp-on temperature sensor. The sensor is designed to offer accurate measurement of fluid inside a pipe without having to insert a probe. Applications include food, beverage, personal care, chemical production and pharmaceutical.

Farnell's global product segment leader sensors, Mike King, said: "The HANI is a truly unique solution as it can be mounted like a surface sensor in seconds, but it offers the performance of an invasive sensor. Customers don't have to worry about immersion depth, material compatibility, corrosion or contamination risks, and will benefit from reduced costs and maximised uptime when measuring fluids used in critical processes."

The sensor can be installed in seconds on metal pipes from one to four inch and incorporates temperature and heat flux sensors with a proprietary algorithm to deliver fast measurements, reducing downtime and installation costs. With a response time of 5s (t63) and 10s (t90), the sensor achieves $\pm 0.5^{\circ}\text{C}$ in sanitary applications and ± 0.5 to $\pm 1.0^{\circ}\text{C}$ in industrial installations.

www.element14.com

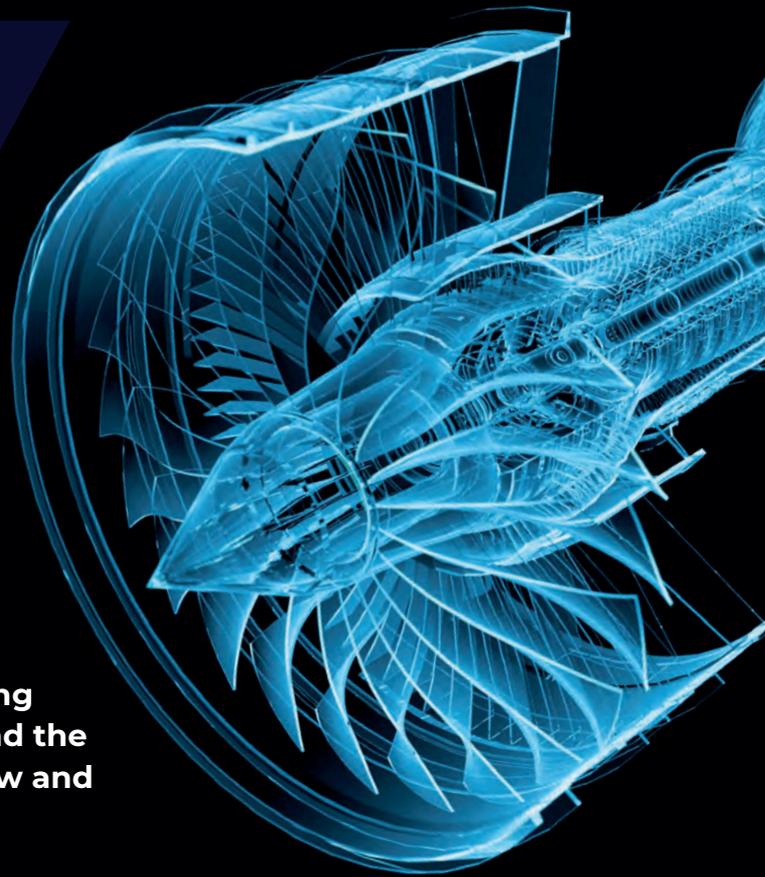
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Design doesn't stop – it's dynamic, forthright and exciting, and the IED is supporting the launch of the Design Engineering Expo to help showcase all of these elements and the outstanding work of the design community now and in the future."

— Libby Meyrick, Chief Executive at Institution of Engineering Designers

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In Brief

Battery company chooses South Yorkshire

The Ultimate Battery Company, based in Hyde, Manchester, has selected South Yorkshire for its new R&D and manufacturing facility. The company is developing technologies designed to remove obstacles to widespread electric vehicle uptake, including battery run times, travel range and costs. The aim is lithium-like performance at 35 per cent of the cost. theultimatebatteryco.com

Buying into FPGA

AMD has completed its acquisition of Xilinx which will become the Adaptive and Embedded Computing Group. AECG will remain focused on FPGA and adaptive SoC and embedded product roadmaps, now with the additional scale of the combined company and the ability to offer an expanded set of solutions, including AMD CPUs and GPUs. www.xilinx.com

Engineered for automotive

BEC Distribution has announced availability of Coilmaster's new range of ultra-small, high-current dual inductors meeting AEC-Q200 automotive reliability standards and engineered to withstand harsh automotive environments. The new inductors have also attained IATF16949 certification. Inductance range is 0.47µH to 1,000µH with a rated current up to 17.9A. www.bec.co.uk

Record price increase

Manufacturers are continuing to raise UK and export prices. According to the Make UK/BDO Q1 Manufacturing Outlook survey, UK prices rose from a balance of +52 per cent in Q4 2021 to +58 per cent. These are the highest balances in the survey's history and the fourth successive quarter where record numbers of companies increasing prices has been reached. www.makeuk.org

Availability of pulsed xenon light sources

Solid State Supplies can now supply pulsed xenon light sources from Excelitas, including the new µPAX-3 precision-aligned 2W module. They are compact, integrated light source solutions containing a flash lamp, trigger circuit and power supply in an EMI-suppressant enclosure. Applications include clinical diagnostic, in-vitro diagnostics, life sciences, drug discovery, proteomics and analytical instrumentation applications.

Excelitas' product manager, Mark Gaston, said: "µPAX-3 features guaranteed stability <1 per cent and precision arc alignment for easy integration and improved overall performance—all in a more robust and compact design compared to our µPAX-2.

"The µPAX-3 is an ideal solution for product designers and engineers developing small form factor analytical systems for point of care and field use applications such as



medical analytics, water quality monitoring, environmental analysis and more."

Solid State Supplies' Excelitas product manager, Lorna Lawson, added: "These miniaturised modules can offer significant advantages over LEDs in analytical instrumentation and similar applications, particularly with regard to the broad and continuous spectrum of the light output."

www.sssltd.com



New twist on switch ergonomics

With its REX128128D COG OLED module, Raystar has combined a rotary switch module and projected capacitive touch panel (PCAP). The 30mm diameter active area suits applications operated by rotation or touch, such as coffee machines, audio-visual equipment or smart home devices.

The OLED module uses a single-chip CMOS OLED/PLED driver with controller, specifically for organic/polymer light-emitting diode dot-matrix graphics display systems, which supports 4-pin SPI and I2C interfaces.

With a surface hardness of 6H (Mohs hardness scale), the PCAP touch panel acts through a controller with 24/13-channel capacitance sensors that supports both I2C interface and 1-point touch.

Resolution is 128 by 128px. Three luminous colours are white, yellow and sky blue. It also offers 4-bit grayscale, allowing 16 shades of gray that can inform, for example, about different intensities.

www.rutronik24.com



Global agreement for rad hard GaN-on-silicon

Digi-Key has secured a global distribution agreement with EPC Space's radiation hardened GaN-on-silicon transistors and ICs: packaged, tested and qualified for satellite and high-reliability applications. Devices span 40 to 300V.

EPC Space states its GaN devices are smaller, have lower resistance and many times superior switching performance compared to silicon solutions.

Digi-Key's vice president of global supplier management, David Stein, said: "The addition of EPC Space's rad hard gallium nitride-based power management products completes the entire EPC product portfolio through Digi-Key and brings intriguing next-generation breakthrough benefits to existing silicon-based solutions."

EPC Space's CEO, Bel Lazar, added: "Digi-Key's world-class distribution capabilities will translate into fast and easy service to our global customers who want to access the entire line of EPC's GaN power device products to replace their less-efficient, more costly silicon solutions."

Digi-Key will also distribute EPC Space's rad hard enhancement mode GaN drivers and power stages. The drivers are optimised to drive rad hard GaN transistors. Power stages integrate a high-speed gate drive circuit with power switches to provide a monolithic complete power stage in a tiny footprint for smaller, lower weight systems.

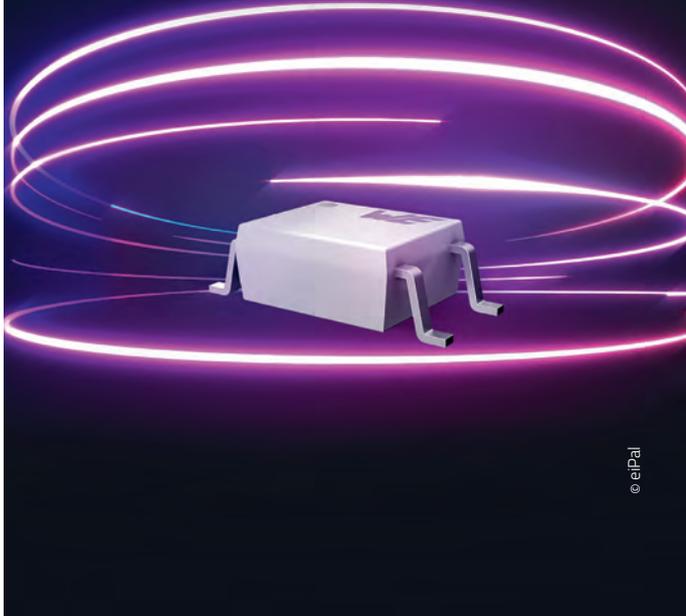
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Is this the big reset?

Euroquartz imagines a near future where the frequency sector experiences a significant reset, leading to the formation of new supply chains

For years the drive to force down crystal and oscillator prices has been all consuming. Factories in Asia have played their part driving down costs, often at the expense of profitability. As a small scale crystal and oscillator manufacturer, Euroquartz has long suspected this was unsustainable and eventually prices would rise to ensure manufacturers remained in business.

The Chinese business model has focussed almost exclusively on turnover and foreign exchange payments rather than profitability, creating almost total dependence of Western supply chains on the Chinese production base.

The current supply chain crisis is the culmination of a perfect storm combining the Covid pandemic, sudden upturn in 5G development in China and rapidly increased demand from recovering economies. The automotive sector, having virtually ground to a standstill during the pandemic, suddenly turned the supply taps on

while 5G manufacturers were ramping production, completely outstripping production capacity.

With demand so high, now is the perfect time to rebalance pricing more in favour of manufacturers, so raw material suppliers have raised prices which are reflected in end customer pricing. Lead-times of >52-weeks are being seen, with some common oscillators going to 32-weeks, due mainly to ceramic package and semiconductor shortages.

To underpin their own manufacturing, customers are placing orders for 12 to 18-months in advance. However, the difficulty is knowing what the unit price will be at the time of shipment, presenting a headache for suppliers who have no indication of the final price.

Furthermore, duplicate orders are potentially tying up capacity unnecessarily as desperate manufacturers place orders on several sources to try and get product from

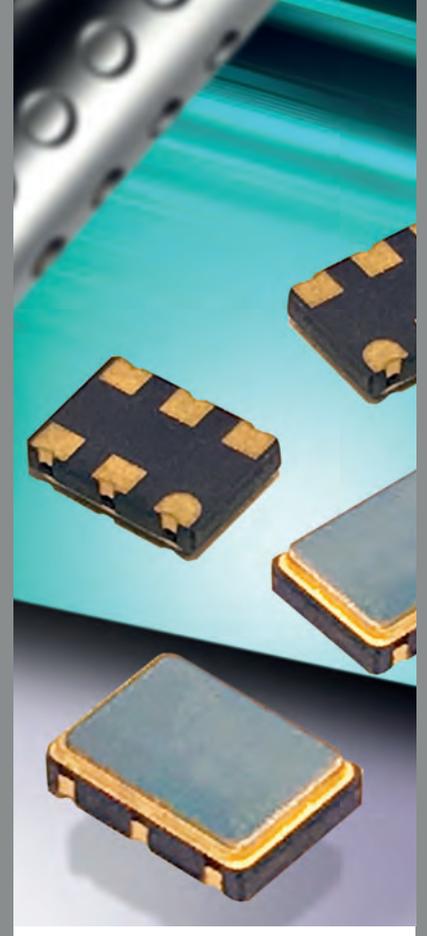
the first available supplier. Panic ordering, as such.

Thus, many order books are looking healthy, although shipments are not likely for six to 12-months leaving potential cashflow issues. With duplication likely leading to future cancellations, a further layer of uncertainty is baked into the supply chain.

Raw material suppliers are taking orders and, at the time of shipment, advising 30 to 50 per cent increases, leaving manufacturers with a choice of taking or leaving it.

Fluctuating exchange rates are, perhaps surprisingly, the lesser problem compared with sudden increases in unit costs. With energy costs also spiking upwards, there is potential for further pricing pressure.

With semiconductor houses at full stretch due to silicon wafer shortages and such high demand, they have started rationalising their product ranges. Many less profitable products are being axed, with high drive clock oscillator chipsets



JF high frequency ultra-low jitter oscillators



The Chinese business model has focussed almost exclusively on turnover and foreign exchange payments rather than profitability



@ComponentShow #ecs22

ECS

The Electronic Component Show

Kassam Stadium ■ Oxford ■ OX4 6DE

Thursday ■ 19th ■ May ■ 10:00am - 3:00pm

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for those who design and source components, and associated services

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ECS is a one-day tabletop event for those who design components & associated services. The event will bring together the industry's leading manufacturers and distributors with design engineers and purchasing professionals and will include valuable seminars for everyone.

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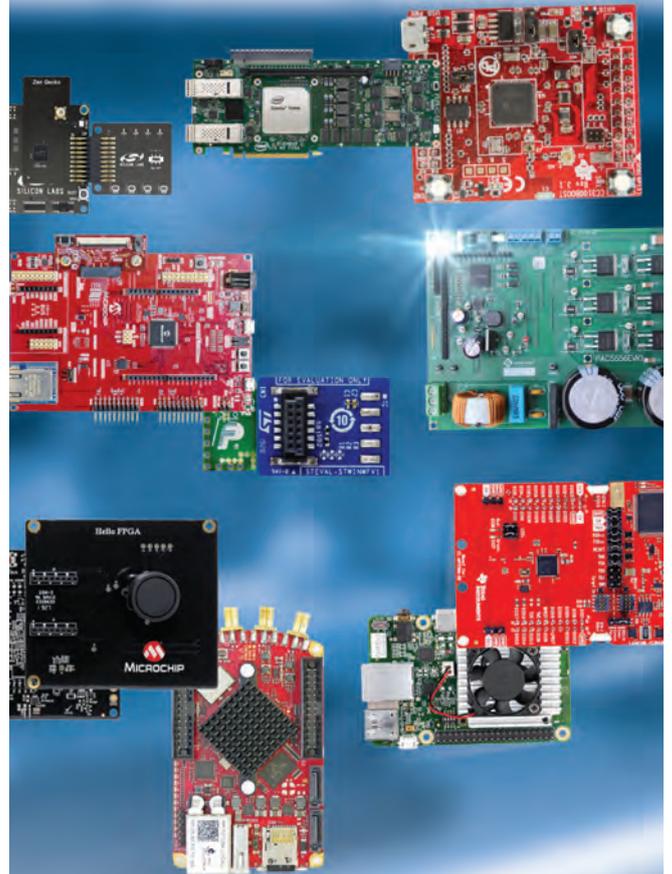
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offering a 50pF drive level being one prime example.

Another product suffering is the 7 by 5mm ceramic package which is seen as less profitable than the smaller sizes, with companies normally using 200,000 pieces per month only receiving 40,000pcs for instance.

Also, many products' built-in obsolescence has led to a repeatedly high component demand which is reaching a very high peak in today's market.

Knock-on effects of the above are being felt across the electronics industry leading to cashflow issues especially at EMS companies who are left with partially full assembly kits while awaiting one or two components before product can be built, shipped and invoiced.

Shortages also open the door for counterfeit products and inferior quality parts to enter the supply chain which introduces potential for added costs to verify parts or, even worse, failures in the field.

The most concerning aspect of the current crisis is that nobody has a clear indication of when things will improve, with most optimistic forecasts suggesting sometime in 2023.

In the meantime, companies are under great pressure to procure components at all costs to build their products, creating frustration

all round. The truth is that despite suppliers' best efforts there is little that can be done as the global market is beyond the influence of all but the largest companies.

Over dependence on Asian suppliers has led to a reality check as to how hamstrung the West has become and serious discussions are taking place to re-investigate re-shoring and build more supply chain resilience.

From a security perspective, many military commercial off-the-shelf (COTS) programmes are in precarious positions since they lack the high-volume requirements to influence suppliers. It takes considerable time and resources to qualify COTS parts and more manufacturers are trying to avoid Asian sources where possible. Unfortunately, so great is the dependence on China, this is almost impossible.

It remains to be seen if more production returns to Europe—there are signs that semiconductor production may become more prevalent in Europe—but these are long term aspirations that will not solve the current difficulties overnight.

So, what does all this mean for the future? The cost base will certainly change as it is hard to imagine unit prices falling back to pre-pandemic levels. There may be more production returning to the UK and Europe if the

respective governments provide incentives. Given the current environmental imperative, we may see more repairable equipment being produced to reduce the waste mountain. On this point, the startling statistic is that only approximately 12.5 per cent of electronic waste is recycled regardless of all the WEEE legislation.

Despite these problems product can keep flowing but it takes good planning and supply chain information. Forward visibility of supplies is poor with suppliers unable to predict delivery time schedules and in some cases not accepting orders for certain products.

Investigating alternative design solutions to replace existing components is technically challenging for engineers and suppliers alike, as well as time consuming. This also requires product knowledge and engineering skills.

Customers and suppliers are working closely to overcome these problems and the situation is likely to continue well into 2022 and possibly 2023.

When we consider the issues raised in this article, it is not a wild speculation to suggest that a big reset is taking place and practices and supply chains are going to look very different in the future.

www.euroquartz.co.uk



From a security perspective, many military commercial off-the-shelf (COTS) programmes are in precarious positions since they lack the high-volume requirements to influence suppliers

Euroquartz ceramic oscillators



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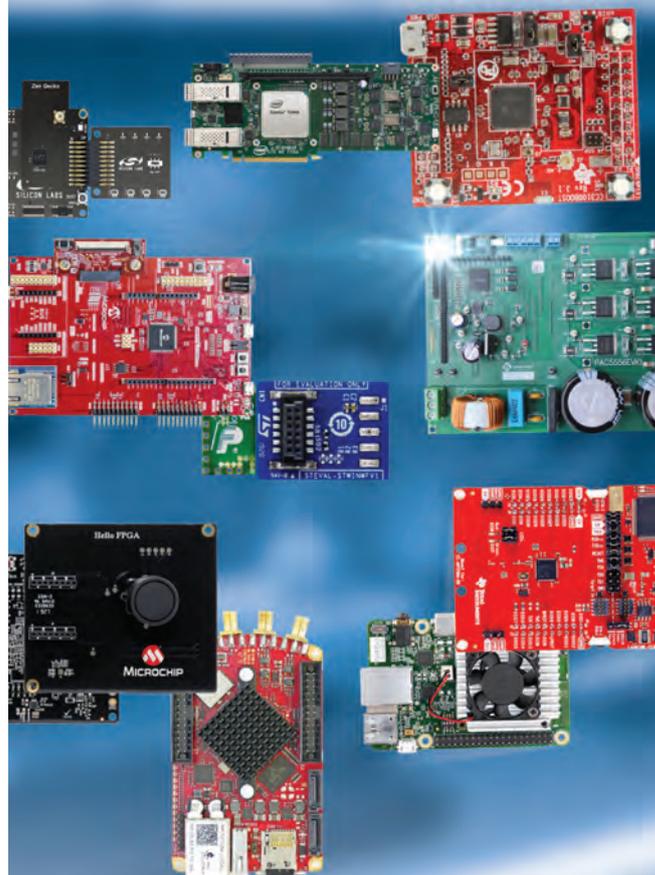


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Buyers' guide to GaN

As increasing numbers of applications deploy GaN technology, Electronics Sourcing asked Innoscience Europe's GM, Dr Denis Marcon, for a purchasing overview

Q GaN technology is gaining footholds in new applications. Where is the demand coming from and why does the market need this capacity now?

GaN is a more efficient switching technology than silicon. The only reason it has not been widely implemented before was a perceived difficulty in using it and product availability. New GaN-based solutions are as easy to use as silicon-based devices. Demand is coming from chargers/adapters, mobile phones, automotive, lighting, appliances, LLC converters, data centres—anywhere efficiency and power density are valued.

Q What component technologies will GaN push aside?

GaN will gradually replace Si power transistors and, once GaN is suitable for higher voltages, will also take over the SiC power transistor market.

Q Purchasers will start seeing GaN components on their BoMs for the first time. What will this supply chain look like and will it differ from GaN's predecessors?

There is no reason why the supply chain should look any different from silicon. New names will appear—Innoscience being one of them—but many familiar brands will likely remain, having switched partially (or fully) from silicon to GaN. GaN components are still semiconductor devices, processed on the same manufacturing line used for silicon. They are familiar in function but extraordinary in performance.

Q How can purchasers trust new suppliers when using them for the first time?

Purchasers must employ due diligence as with any new supplier. Innoscience is well funded with backing from international names such as ARM, SK Hynix, CMB International and CATL. The company's 8in GaN-on-Si fabs are certified; the Zhuhai fab already has IATF 16949:2016 certification for automotive device design and manufacturing; and the Suzhou fab will be IATF qualified soon.

Moreover, Innoscience's devices are qualified to JEDEC and the company performs

advanced reliability tests (DHTOL, SALT etc) to assure quality. Innoscience has passed several customer quality inspections and has shipped over 30M devices worldwide to customers including Anker, Hesai, ugreen and more. All manufacturing is in-house: epi-growth, device design, processing and qualification.

Q How are buyers protected from obsolescence in this fast moving sector?

Innoscience guarantees continued device manufacturing for several years. The company believes in strong relationships, consulting customers before making products obsolete and giving an agreed notice period for last-time-buy or suggesting alternatives where possible.

Q How is this high value sector combatting counterfeiting?

Innoscience is building a network of trusted supply chain partners which we will soon be announcing. These will include some of the biggest names in global distribution. Buyers should only purchase directly from Innoscience or one of its

supply chain partners to be assured of genuine product.

Q What would a first-time GaN buyer's purchasing check-list read like?

In short:

Security of Supply: does the manufacturer own/control its epi-growth and manufacturing facility? What is the maximum capacity? What percentage is in use and foreseen in coming five years? How many devices/wafers can it guarantee over five years? What are capacity expansion plans? Does it operate business lines that might jeopardize GaN attention? Does it hold relevant stock?

Device quality: Which reliability tests are performed? Are accelerated tests used for lifetime extraction?

Price: What is the price scaling in volume?

Support: What level of application design support is offered?

www.innoscience.com





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Catherine Read, HR Manager



“If your mind is filled with ideas, with new ways of doing things then you are creative. By accomplishing these ideas, you are innovative. By expressing these ideas awakens similar thinking in others and collectively improvements can be made or a new product invented. There is no creativity without failure, so keep trying and the best way to predict the future is to create it, so go do!”

Andrew Parker, Applications Engineer



“It’s the energy concentrated in the service of a particular goal. Anything that interferes with focus dissipates energy. Distractions are all around us, focus is key to our wellbeing and achieving our objectives. The more focus we give, makes for clarity, and takes away the stresses associated with that work. Managing focus creates an even workflow and enables growth not only towards your goals but that of your mindset too.”

Harj Handa, Supply Chain Specialist



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Each of us is built differently. Yet there are certain characteristics that connect the people of Astute.

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We are passionate about our people, our customers, and our suppliers. All three are equally as important.

To be innovative, you must create a landscape in which new ideas can be welcomed. We foster a culture that supports ideas and talent.

A focused business understands the customers’ market and their needs. We take care to fully understand our customers and how to serve them best.

We met the challenge of COVID with great tenacity and now, armed with these values: being Passionate, Innovative, and Focused - we are ready to take on the challenges of 2022.

We are looking for new people who share our values and want to be part of this journey. Get in touch to discover roles across multiple departments including Marketing, Finance, Sales and more.



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SHORTAGES

FEEL LIKE AN UPHILL BATTLE?

With no clear end in sight, OEMs are really feeling the pressure when it comes to component shortages. The last couple of years have been plagued with a bombardment of macro-environmental challenges from staff shortages caused by covid to more recent raw material shortages effecting the manufacture of semiconductors caused by the Ukraine crisis. Astute are no strangers to adversity. Our team has the expertise and determination to find real solutions that work for you. Our in-house test lab, certified to aerospace and defence standards works to mitigate the risk of counterfeit material entering your supply. Our global sourcing team can locate and secure stock the moment it becomes available. If you are struggling to find stock contact us today. Let us take the weight.

SPEAK TO US ABOUT YOUR SHORTAGES

Sourcing the correct display

There are many types of display technology, so what should buyers consider to select the correct display for a specific application?

Application value

If an application features a high-end price point, consider a quality display to match the design. For example, a TFT display with IPS technology (high quality all-round viewing angles) and high brightness, will ensure the product looks visually impressive.

Type of information

A simple character LCD or OLED may be appropriate for displaying a basic level of information, such as a security panel simply stating 'armed'. However, a promotional application deserves an eye-catching display, such as a TFT offering full colour, graphic, image or video.

Environment

For outdoor applications, consider how the display will perform in direct sunlight. Reflective displays work well in this situation and modules can be enhanced to cope with such environments. Also, extreme temperatures can cause displays to experience failure or issues. Some technologies

can cope better in harsh, cold or hot temperatures.

Enhancement

If an end product requires user interaction, consider touch screen technology. TFT suits touch screen applications, with some OLEDs also capable. Displays can also be enhanced by adding cover glass which can improve durability and sunlight readability.

Budget

Display technology costs vary. Monochrome LCDs suit low-cost applications displaying basic character or graphic information. TFTs are the most expensive option, however, this depends on specification. Smaller, less technical TFTs have become more economical as technology developed.

The following breaks down the four main display technologies.

Monochrome LCD: The oldest technology but still a valuable option. Easy to interface, with simple character and graphic options available. Mostly used in

low-cost applications, such as fire and security panels.

TFT LCD: This technology is improving all the time. These displays cover a range of markets and are generally considered 'premium'. High bright displays, IPS all-round viewing angles, touch screen technology and high-definition resolutions are key features.

OLED: Often described as a much-improved LCD, although a completely different technology. Offers brighter text/graphics on a true black background and viewable from all angles.

E-Paper: A relatively new technology, ideal for ultra-low power applications. The bi-stable technology lets the display retain the image, even when power is disconnected. Most recognisable application is shelf-edge labelling.

www.midasdisplays.com



4.0" IPS TFT Display



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Magic touch

Innolux has created a multi-haptic control panel, with Zytronic providing the tactile dimension. The concept incorporates a 13in customised ZyBrid multitouch sensor with 3D surface features machined in the 4mm thick toughened glass to guide the user's fingertips to the appropriate screen position. Zytronic's ZXY500 controller delivers the multitouch functionality and supports gestures including contactless hover touch, plus palm rejection, noise immunity and millisecond operation.

Using a 5-axis CNC, Zytronic machined polished dimples, grooves and a dial into the glass. Precision machining

the tactile finger guides into the glass surface, rather than drilling through and mounting physical dials, buttons and sliders means it is easier to create a waterproof, hygienic user interface with fewer exposed moving parts, enhancing reliability.

Innolux's section manager, Ming Huang Chen, said: "We integrated touch-driven vibrotactile actuators behind the distinguishing glass structures for versatile haptic feedback, making it more intuitive to use."

www.zytronic.co.uk

UK stock of 43in sunlight readable displays

Buyers tired of waiting for high brightness 43in TFT LCD displays will be pleased to hear Display Technology has stock of Litemax 4309-B series sunlight readable, high bright TFT displays.

The display is one of the company's most sought after sizes and the 4309-B series offers a high specification including brightness from 1,800 to 3,500nits. Display Technology states the low power consumption and wide operating temperature mean the display suits 24-hour operation and offers a BL MTBF of 100,000 hours.

The display comes with Hi-Tni 110°C technology designed to stop screen blackening in direct sunlight, while still offering a resolution of 1,920 by 1,080 which is applicable for outdoor applications where content doesn't need to be 4K.

www.displaytechnology.co.uk



Medium-size TFT built for tough environments

Review Display Systems has announced availability of a new Tianma 6.5in TFT display module featuring Super Fine TFT technology, a 4:3 classic aspect ratio and VGA (640 by 480px) resolution. Tianma P-series displays are designed to resist temperature extremes, vibration and mechanical shock in challenging operating environments.

Typical applications include medical devices, marine instrumentation, industrial process control and in-vehicle systems.

Wide viewing angles of 85deg are supported in all directions. The white LED

backlight has a 100k hour half-brightness lifetime and provides a 1200cd/m² brightness. Contrast ratio is 900:1.

RDS' display division manager, Justin Coleman, said: "The new 6.5in P-series display should prove to be a popular addition to the Tianma display portfolio. The compact size, resolution and aspect ratio of the display combined with the excellent optical characteristics, deliver a highly versatile display module that will find use in many different applications and environments."

www.review-displays.co.uk



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NEARSHORING A STRATEGIC RESPONSE TO THE CURRENT SUPPLY CHAIN MODEL

Introduced in the 1960s, offshoring became a primary cost-savings business strategy for industries to outsource manufacturing operations to Asia. However, as supply chain constraints intensified within the past couple of years, many businesses have considered transferring operations back to nearby countries. This practice, known as nearshoring, has emerged to create a buffer against supply chain disruptions.

As a result of offshoring, the US now only domestically manufactures 12% of the chips it designs. Comparatively, Taiwan manufactures over 60% of the world's chips. The lack of varied resources within the electronic component industry has caused bottlenecks within the global supply chain. Diversifying resources would add necessary support and reduce the impact of shocks and shortages.

According to an April 2020 Thomas survey, 64% of North American manufacturers reported they are likely to bring manufacturing production and sourcing back to the Americas. Latin America, specifically Mexico, is poised to profit the most from this developing trend. More recently, Latin America saw a 156% increase in hiring from foreign companies, particularly for software engineers.

European, Middle Eastern and African companies have been looking to neighboring countries in Central and Eastern Europe and North Africa as nearshoring options. In response to COVID-19, Ernst & Young conducted flash research and found that in Europe, 88% of respondents were contemplating nearshoring over low-cost areas outside of EMEA. Sixty-one percent were seeking to reduce reliance on dominant source countries like China.

Despite its attractiveness, nearshoring is costly, and it will take years to move operations. The total cost for US and European companies to move manufacturing out of China would come to \$1 trillion over the next five years. Relocating to a new country also adds pressure to the local economy. If a company were to withdraw just one percent from China and nearshore to a country like Poland, Poland would have to increase its production by 25%. The cost, compounded by how long these changes could take, is enough to make some companies wary.

Even with the concerns associated with nearshoring, many companies have already begun transitioning their operations closer to home. A prime example is Samsung Electronics, which has set the goal of becoming the world's biggest semiconductor firm by 2030. To assist the growth of its business, Samsung has prioritized local partnerships with domestic parts manufacturers and local material suppliers. With moves like this, Samsung and others that opt for a nearshoring business model will bolster their local economies and offer essential flexibility in the supply chain.



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1,000VDC automotive protection

Littelfuse has announced its new EV1K series fuses, said to be the first automotive grade fuse with a 1,000VDC rating. They are designed and tested to meet the overcurrent circuit protection needs of the e-mobility market, specifically electric vehicle applications including on-board chargers, battery distribution units, battery packs, DC/DC converters, traction motor inverters and auxiliary loads.

Littelfuse's VP business development xEV/AEB, Juergen Scheele, said: "There is demand for more robust safety solutions as the e-mobility market transitions from 500VDC to 800VDC pack voltages. EV1K series fuses are designed to withstand severe automotive environments, providing 1,000VDC rated automotive grade solutions with amperages from 60 to 125A. Fuses up to 600A are also under development."

Specifications include: interrupting rating of 30,000A; 25 by 73mm body with end caps incorporating integrated bolt-down terminals; -55 to 125°C operating temperature; and RoHS compliant, halogen-free design.

littelfuse.com



EMC filter for fast charging

Schaffner has announced the new FN2220 EMC filter designed to meet the requirements of EV fast charging systems.

When fast charging an electric vehicle electrical safety and EMC compliant currents are required to protect the user, EV and grid. This filter series tackles this challenge on the vehicle side of the charging station. It cleans the power going into the car to ensure a safe charging experience.

The filter can be integrated into new charging station designs without having to perform additional compliance testing, reducing development time and costs. The series is designed to perform safely with the industry-specific charging voltages of up to 1,000VDC and provides a wide power range from 75kW to 600kW.

The filter meets IEC/EN 61851-23 Electric Vehicle Conductive Charging System and UL 2202 Electric Vehicle (EV) Charging System Equipment.

The FN2220 filter series is available in current ratings from 150 to 600A.

www.schaffner.com



TOLL MOSFETs target EV applications

Diodes Incorporated has introduced a portfolio of automotive MOSFETs packaged in the space saving, thermally-efficient TOLL package. Capable of operating to 175°C, the 100V and 80V-rated devices are said to occupy 20 per cent less PCB area than the TO263.

These devices feature an off board profile of 2.4mm, suiting high reliability power applications such as energy recuperation, integrated starter alternators and DC-DC converters in battery-equipped vehicles.

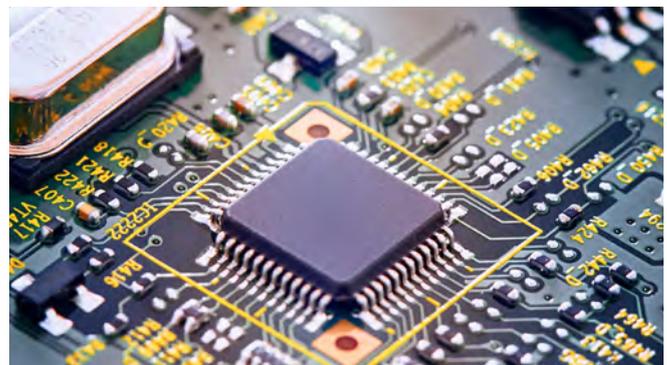
The TOLL package uses clip bonding to achieve low package resistance and reduced parasitic package inductance letting the three part numbers achieve typical on-resistances of 1.3, 1.4 and 1.68mΩ respectively at a gate drive of 10V.

With a solder contact area 50 per cent bigger than the TO263, the TOLL package allows a junction-case thermal impedance of 0.65°C/W, letting these MOSFETs handle up to 270A. These MOSFETs are qualified to AEC-Q101, PPAP capable and are manufactured in IATF 16949 certified facilities.

www.diodes.com



www.jaltek.com



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Three Digital Transformation Considerations for Procurement Professionals

by Nathan Pray, manager, digital technology office – B2B, and Stephane Ratelet, digital solutions manager – EMEA, at Digi-Key Electronics



Stephane Ratelet, digital solutions manager – EMEA

The past two years have accelerated a digital revolution in the procurement industry. The transformation has been so profound that Digi-Key has invested in further development of its suite of digital solutions and tools for procurement professionals and also released an eBook on digital transformation in the procurement space.

As companies continue making the shift to digital, here are three takeaways to jumpstart your organization's digital transformation.

There are three major digital solutions, and it's important to select the one that will best serve your organization. Options include:

EDI (Electronic Data Interchange) – EDI provides a standardized format for sending purchase orders, acknowledgements, what's on hand, etc. Organizations can now use EDI to effectively manage their inventory, purchasing and forecasting all at once. EDI is most widely adopted by larger organizations, universities and NPI engineering companies, since it requires an organization to have proper EDI infrastructure prior to use.

Punchouts – A Punchout solution streamlines the purchasing process by making it easier for users to create accurate and detailed purchase orders through an automated process. Punchouts use an organization's existing technology to procure goods and services. These are most popular among medium to large B2B organizations and are even becoming a requirement for many RFPs.

APIs (Application Programming Interfaces) – APIs are a newer digital solution, but they're quickly gaining popularity because of how customizable they are for organizations of every size. Digi-Key's APIs are free to use and digitally connect customers' systems with Digi-Key's system to provide automated, real-time product search, price and availability, quoting and ordering, barcoding, product change notifications and more. Customers who use APIs have a competitive advantage, because they can receive critical information on products they need at lightning speed due to the automated connection.

A digital transformation improves the role of a procurement buyer.

One of the biggest misconceptions about digital solutions is that they eliminate the role of a procurement buyer, but this is simply not true. Embracing digital solutions for procurement elevates your role – making it more strategic by reducing time spent on tedious tasks. A digital transformation simply helps you “work smarter, not harder,” as the adage goes.

The easiest way to get started with digital solutions is by setting up a quoting process.

A quoting process alone represents a major timesaver for whoever handles your organization's quotes. Establishing a quoting process will also show you the power and speed of digital solutions. In addition to efficiency, procurement professionals will be motivated by the ROI that accompanies digital solutions.

Take the first step toward streamlining your processes for efficiency by visiting Digi-Key's updated Digital Solutions site at www.digikey.co.uk/digitalsolutions, and get ready to experience the success and speed that accompany automation.



Nathan Pray, manager, digital technology office – B2B





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Temperature vs equipment: who will win?

Rittal UK's product manager for climate control, Karl Lycett, highlights the damaging effects of rising enclosure temperatures and offers a solution

In the battle of rising temperature vs electrical equipment, who will win? The answer is easy. Temperature always wins in the long run. PLCs, drives and transformers are built for stressful conditions, but they have limits.

Enclosure temperature can make a drastic difference to equipment performance. PLC or drive manuals should present a chart showing rated output compared with operating temperature. Typically, as the temperature rises, maximum output reduces and quickly it drops off a cliff. This means new equipment may

never actually achieve its maximum designed output because of the environment. If specific performance goals are set, equipment would need to be over specified, resulting in higher costs and wasted budget.

There is also a strong correlation between an electrical component's lifespan compared to its operating conditions. As temperature rises, the lifetime reduces.

There may be instances where equipment toughs it out for a few extra years, struggling in the heat, but what happens the day it

finally fails? It's the middle of summer, production is in full flow to meet demand and suddenly everything grinds to a halt. Costs start piling up and engineers are scrambling to find the issue before they can even begin to consider fixing it.

So, having painted that happy picture, what can be done to prevent it?

Rittal can help as a specialist in enclosure climate control products and trusted advisor. With our RiAssure service, one of Rittal's trained staff can visit a site and provide a free cooling review. This starts with a

visual inspection of existing enclosures and cooling equipment. From this, Rittal can ascertain the next best step for the equipment and provide ongoing, best practice suggestions so that the operations benefit from increased longevity, life and profit.

Equipment operators shouldn't put it out of their mind, thinking it will be ok and leaving it until it's too late. Deal with this head on and rest easy during the summer knowing the equipment is happy and working to its full potential.

www.rittal.co.uk

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Sourcing EV charger enclosures

CamdenBoss encourages EV charger manufacturers to explore their enclosure options which include off-the-shelf, custom moulded and plastic fabrication

As the UK moves towards the government's net zero goals, including abolishing petrol and diesel car sales by 2030 and integrating almost 400,000 charging points, there are important factors for EV charging point manufacturers to consider.

Firstly, each manufacturer must ask why a customer, whether domestic or commercial, would choose their product? Will they be manufacturing slower AC chargers targeting homes, offices and long-stay carparks or faster DC chargers situated in food courts and service stations? These choices will impact the components utilized.

It is also important to offer target customers USPs. For example, does the charger perform particularly well in certain environments

such as wetter or sunnier areas, while ensuring longevity? Additionally, a manufacturer may decide their charger needs to provide QOL aspects such as smart features providing future-proofed control and monitoring methods.

Capital investment is always important with a pivotal point being the casing housing the electronics. For example, assume it's a wall box. Suitable enclosure options can be found as off-the-shelf or custom moulded solutions. Both are equally viable, however can have varying cost implications. Another popular option is plastic fabrication. This gives complete design freedom without the upfront costs of a mould tool. Generally, a fabricated design allows prototyping and

testing with potentially unlimited design changes, before committing to moulding the product.

While there are many other things to consider regarding their design and manufacture, EV chargers are a relatively large investment for the consumer market and designs need to be competitive. So, manufacturers should explore their options, understand their position in the market and accelerate towards a greener future.

www.camdenboss.com



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Smart-Panel enclosures

Sourcing plastic enclosures for touchscreen applications

OKW Enclosures' director of marketing, Robert Cox, walks readers through their purchasing options when sourcing enclosures for touchscreen-based products

Touchscreens are everywhere but housing them can be challenging. Until recently there were few dedicated standard enclosures for touch displays. But smart new standard enclosures are changing that. They suit a broad spectrum of applications and they can be customised quickly and cost-effectively, even in smaller volumes.

Touchscreens are tactile so their enclosures must be ergonomic, whether handheld, wall-mounted or desktop. That means soft contours and other desirable features such as: ingress protection to IP65; UV stability; choice of model versions and sizes; tamperproof assembly (especially for medical applications) and plenty of customisation options.

Users expect a handheld touchscreen device to be as good as their mobile phone. However, what if the electronics won't fit a mobile-sized case? OKW has created Slim-Case, a mobile touchscreen enclosure that's bigger than it first appears.

Viewed from above, it looks like a mobile phone housing: low profile, virtually frameless design and a soft-touch TPE intermediate ring. Closer inspection reveals a sculpted rear section that offers more space and makes the enclosure more comfortable to hold. The operating panel can be flat (for displays, buttons and LEDs), 1.6mm recess for a touchscreen or membrane keypad, or 1.0mm recess for thinner product labels.

For larger products, the company's Carrytec

is a small, medium or large attaché case for monitoring, diagnostics, communications and data collection. It can be carried, docked in a charging station, clipped to a hospital bedrail or mounted on a suspension arm. An outdoor version is available in UV-stable ASA+PC-FR for agriculture and forestry applications.

For building control applications, OKW's Smart-Panel flush-fits into standard-sized cavity wall boxes, leaving just the top to frame a touchscreen. Screwless assembly means no visible fixings. The product's creator, polyform Industrie Design's Martin Nußberger, said: "Only a narrow frame surrounds the user interface and the base of the enclosure blends in. Nothing is revealed

about how this enclosure is screwed on to the wall—no fixing points, no joints."

These UV-stable ASA+PC-FR enclosures can also be specified for desktop electronics by adding non-slip feet.

Desktop enclosures must be easy to view and operate but touchscreens more so because they can be prone to glare. OKW's Protec square control centre has a 20deg sloping front for easy viewing and operation. Three versions offer either: a large rear recess for connectors; a flush-fit cover that hides the recess; or an extra-deep cover that doubles as a desk stand.

Another desktop enclosure, Evotec, is available with a flat or sloping top. The soft-contoured large

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What is ECS?

ECS is a one-day tabletop event for those who design components & associated services. The event aims to bring together the industry's leading manufacturers and distributors with design engineers and purchasing professionals and will include valuable seminars for everyone. This one-day is the place where ideas will be shared, meaningful conversations will be had and business relationships can start or be strengthened.

Exhibitor insights inside from page 28 - 77 →

operating area is inclined by 12deg, ideal for desktop applications and also for wall mounting.

For maximum flexibility, OKW's modular Interface-Terminal lets customers specify their perfect enclosure by selecting the preferred pieces. Choose the bottom section and cover, then add a front/glass panel (if required), seal and installation kit (for flush-mounting in walls).

Using the same model for different roles, ensures design continuity and creates cost efficiencies by ordering larger numbers of the same enclosure sections.

By partnering with an enclosures manufacturer that provides the full range of customisation services (machining, finishing, digital printing and laser marking etc), customised housings can be shipped straight to the production line ready for component installation.

OKW Enclosures' director of marketing, Robert Cox, said: "One expert manufacturer is fully accountable for the consistent quality of your enclosures from start to finish. You'll get peace of mind and a more streamlined order process."

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ECS visitors looking for support with lighting applications can benefit from almost 100-years of lighting experience on the CML stand

Working with light since 1931, CML is a specialist in the field of miniature lighting for thousands of customers globally. As one of the first companies to introduce LED lamps, nearly 30-years ago, CML has become a manufacturer and supplier with one of the broadest ranges of miniature lighting products in sectors including automotive, aviation, aerospace, marine, telecoms, panel building, gaming and more.

Offering standard and customised products and

solutions, the company's on-site technical support, design and development team helps ensure customers' requests are met in a cost effective and timely way. Detailed drawings, specifications, quotations and, where required, samples/prototypes are services customers have grown accustomed to.

CML's flexibility and programme of continuous improvement, supported by a motivated, multi-skilled team ensures that innovation remains a key

focus without compromise. CML states that one thing that remains unchanged over almost 100-years of lighting the world is the focus on customer service, where quality is considered as standard, not an optional extra.

www.cml-it.com



Detailed drawings, specifications, quotations and, where required, samples/prototypes are services customers have grown accustomed to

Investing in customer support

In this article, Mouser highlights its investments in technical resources, tools and state-of-the-art automation

Mouser's expanding Technical Resource Centre is updated with new technical articles, blogs and eBooks. Alongside this content repository, the company also features its monthly EIU magazine and award-winning Empowering Innovation Together series, which features podcasts, blogs and infographics. Mouser's goal is to help engineers and purchasers find the product and application information they need in one place.

Regarding services and tools, Mouser has invested in tools to improve speed

and efficiency when placing orders, such as the Forte BoM tool, Price & Availability Assistant and API integration. The company offers basket-sharing functionality, an ECAD design library and range of conversion calculators—plus a global support network with 27 locations.

Mouser continues to invest in automation in its global distribution centre to increase order processing, accuracy and speed, helping customers reduce time-to-market. The company has installed 120 vertical lift modules (VLMs),

the largest VLM installation in the world. VLMs are essentially giant vertical filing cabinets, complete with shelves and an automated extractor to bring the components to the employee's workstation.

The Centre also features multiple Ultipack and I-Pack machines—an automated system for sealing and labelling shipments that can process up to 14 orders per minute. This ensures orders are packed and shipped to customers in record time.

www.mouser.co.uk





SHORTAGES FEEL LIKE AN UPHILL BATTLE?

With no clear end in sight, OEMs are really feeling the pressure when it comes to component shortages. The last couple of years have been plagued with a bombardment of macro-environmental challenges from staff shortages caused by covid to more recent raw material shortages effecting the manufacture of semiconductors caused by the Ukraine crisis. Astute are no strangers to adversity. Our team has the expertise and determination to find real solutions that work for you. Our in-house test lab, certified to aerospace and defence standards works to mitigate the risk of counterfeit material entering your supply. Our global sourcing team can locate and secure stock the moment it becomes available. If you are struggling to find stock contact us today. Let us take the weight.



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The world is going electric, be part of it

Join Phoenix Contact at ECS to explore applications and solutions from renewable energy generation to domestic and commercial consumption

As the grid becomes increasingly dependent on renewable energy, management of supply and demand is critical. Grid balancing requires intelligent solutions and technology to manage the timing of activities such as electric vehicle charging. This market sector requires a combination of power and data connectivity with a focus on ease of installation and data security.

Electric vehicles are becoming more common on our roads, covering a range of solutions from personal transport to last mile delivery and large-scale commercial. Regardless of vehicle type, charging infrastructure is important to the transition to a more sustainable economy. Device connection requirements cover both connection to the vehicle and internal electronics within the charging unit itself.

With more dependency on renewable energy, energy storage is becoming a critical utility in helping balance the grid and provide electricity when required: not just when the wind is blowing. This sector covers large-scale grid storage and small scale commercial/domestic storage with differing requirements for device connectivity.

Renewable energy generation covers technologies including wind power, solar and hydro-electric and is set to become a significant proportion of the energy mix in the coming decade. Device connectivity often requires robust connection and enclosure solutions with protection from the weather.

phoe.co/ecs-power-to-connect

Standard or custom, the choice is yours

Lincoln Binns is exhibiting its range of stock enclosures and showcasing its customisation capabilities including CNC milling and full colour digital printing

Lincoln Binns works with customers from initial product idea, through a process of consultation, enclosure/panel design, prototyping and manufacturing of the final enclosure or panel ready for product launch. However, customers can jump into the process at any point.

Customisation services include: CNC milling, punching, laser cutting, folding, anodising, powder coating, laser etching and full colour digital printing.

Lincoln Binns' E-Case is a range of closed box section

extrusion to suit 55, 100 or 160mm wide PCBs. Stocked in pre-anodised silver or black and a range of lengths. Accessories include, bezels, surface mounting options, plus DIN rail and VESA mount.

The Combi-Case range comprises two-part U-section extrusion to fit a 100mm wide PCB in three height variants. Stocked in pre-anodised silver or black and a range of lengths.

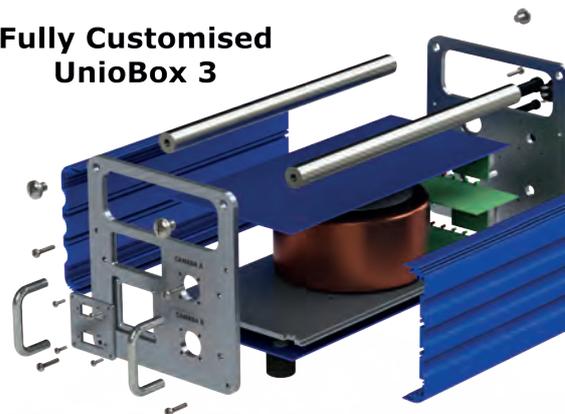
U-Case is a six-piece enclosure kit that consists of two side extrusions 1U in height. Enclosures

can be manufactured to different widths and lengths. Available in set sizes in pre-anodised silver.

The UnioBox six-piece enclosure kit consists of two side extrusions 1.5U (66mm), 2U and 3U in height. Enclosures can be manufactured to different widths and lengths. Available in set sizes in pre-anodised silver.

19in rack panels and enclosures comprise 19in rack enclosures, extruded and flat blanking panels. Enclosures are

Fully Customised UnioBox 3



stocked with powder coated front in black and dawn mist grey. The extruded and flat blanking panels are stocked in pre-anodised silver and black.

Lincoln Binns is an authorised distributor for Hammond Manufacturing and Bopla's Alubos range.

www.lincolnbinns.com

Brilliance of UK manufacturing

Step onto QPE's stand to discuss how 40-years of British manufacturing experience underpins production of quality PCBs and assemblies

Founded in 1983, QPE is a Fife-based business providing turnkey services and solutions to the electronic assembly sector. The company specialises in PCB prototyping, assembly, box-build and testing. Using surface-mount and through-hole technology, QPE provides manufacturing services designed to ensure customers' requirements are fulfilled from the moment they make contact. With over 30-years' experience, the company prides itself on its innovative, high-tech and high-integrity approach to versatile customer requirements.

Specialising in low to medium volume production batches, QPE's suite of state-of-the-art equipment and experienced, knowledgeable team consistently deliver expert SMT and PTH solutions. The company invests in innovative and high-technology solutions to guarantee processes are optimised and produce the highest quality PCBs and assemblies.

QPE is exhibiting at ECS for the first time, bringing nearly 40-years of in-depth knowledge and expertise. The company is proud to be a British manufacturer, following an unprecedented two-years of volatility as a result of the Covid-19 pandemic, and wants to emphasise the importance and brilliance of the UK manufacturing landscape.

www.qpe.co.uk



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Make ideas real



Connectors meet high density expectations

At this year's ECS, Harwin will exhibit its new Archer .5 and Archer .8 compact mezzanine connectors optimised for modern high-density electronic systems

Smart factories, industrial IoT, machine vision, environment monitoring, building automation, data centre infrastructure and EV battery management are driving demand for a new breed of connectors capable of supporting data transfer speeds above 10Gbps. Reliability and limited space mean they must also be compact and robust.

Harwin's Archer .5 and Archer .8 (0.5 and 0.8mm pitch respectively) compact mezzanine connectors offer low stack heights (8 and 5mm respectively),

allowing boards to be placed close to each other.

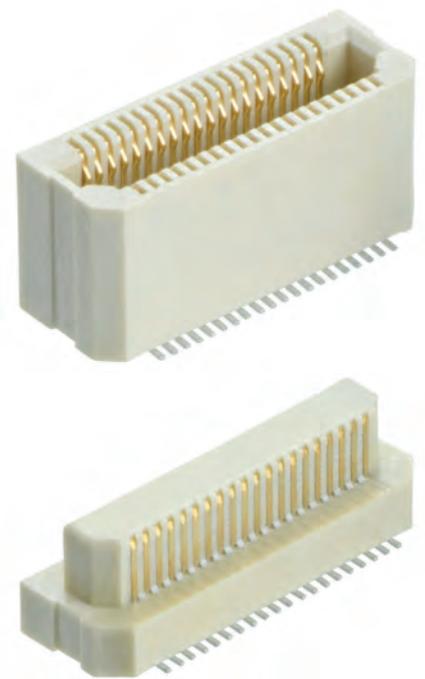
Regarding pin counts, 30, 40, 80 and 100-pin versions are available for both connector series, offering maximum implementation flexibility. Archer .8 also offers 60 and 120-pin versions. The phosphor bronze pins handle 0.5A per contact.

Supporting operational temperature ranges of -55 to 85°C for .5mm and -40 to 125°C for .8mm, both can be used in harsh industrial settings. Polarisation helps with correct alignment and

prevents mis-mating, while shrouded housings protect contacts from damage.

Supplied taped and reeled the connectors make assembly simple and cost effective. Locating pegs on the .8mm helps with automated production and PCB alignment. Both designs comply with RoHS and REACH SVHC requirements and are halogen-free.

www.harwin.com



Archer .5

DESIGN: Getting it right from the start

Visit NCAB to discover how the design-for-excellence process can have a significant positive impact on a product's cost, manufacturability and reliability

If a product's design is perfected from the start, cost savings and manufacturability are assured. Perhaps most importantly, the design can be adapted for reliability, leaving a seamless transition from prototype to production. The question is how to get the design right first time?

NCAB helps by supporting the customer's PCB designer.

Feedback must flow from designer to assembly house, all the way to the PCB fabricator. Most costs are built into the product at an early stage of the chain—before either the EMS company or PCB factory has seen the design.

Some 80 to 90 per cent of the cost originates here. This also applies to manufacturability and reliability. Simple



suggestions like base materials, surface finish and copper weights can have a major impact on ease of build and product longevity. OEMs should involve their PCB manufacturer at the concept stage to help ensure the right questions are raised and answered.

This is all part of the concept of design for excellence, DFx. Approximately 50 to 60

NCAB offers free design guidelines via their website to help improve reliability and reduce time to market

per cent of the cost is related to (or built in) by the PCB design. When customers are involved in DFx analysis, problems can be found and corrected much earlier. The later a problem is discovered, the more cost and cycle will be impacted.

www.ncabgroup.com

World of interconnect solutions

Lane Electronics offers designers and buyers over 50-years' interconnect experience covering industry sectors from motorsport and defence to broadcast and entertainment



Lane Electronics is a distributor and value-added partner for electrical and electronic connector products, offering interconnection solutions from connector manufacturers including Lemo, Eaton, Huber+Suhner, Positronic, Nicomatic, Glenair, Neutrik, HellermannTyton and sister Lodge Group company, Weald Electronics.

Connector types covered include multi-pin circular, high power circular, data circular, filtered, fibre-optic, RF/coaxial, D-sub miniature, multi-pin rectangular, IDC/DIN, PCB, edge, backshells

and adaptors and connectors for rack and panel applications. Established for over 50 years, Lane's approvals include IECQ – CECC, ISO, QPL and ISO 9001:2015 for manufacturing, test, assembly and product/component stockholding. Lane is also a member of JOSCAR and the ADS Group, the UK trade association representing companies in the aerospace, defence, security and space industries.

Thanks to the number and variety of connector products supplied, plus a multi-million-

pound connector/parts stockholding, Lane is a preferred source across sectors including industrial, military/marine, aerospace/avionics, motorsport, broadcast/entertainment, communication, test/measurement and geophysical.

Specialist division, Lane Motorsport, provides all autosport and motorsport sectors with a comprehensive, high-performance connector/accessory package combined with in-depth knowledge to give customers a competitive edge. Light-weight connector

accessories, tooling, adhesives and dispensers are also offered.

Lane Electronics and Lane Motorsport share the same stock, technical support and commercial accessibility with an on-line store, providing customers with resources like on-line stock checks and purchases, 3D models, manufacturer cross-references and PDF catalogues.

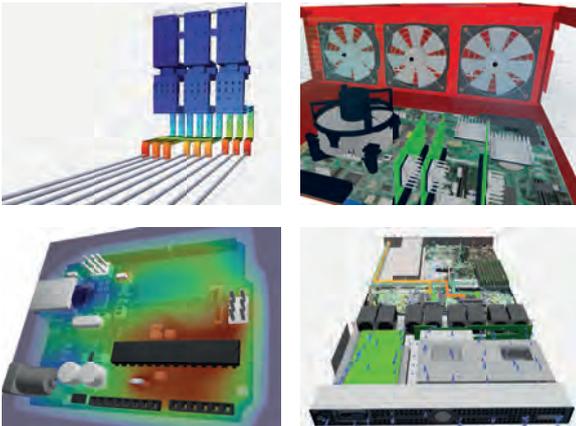
Next-day delivery is offered on over 90 per cent of Lane's standard offering.

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Managing component shortages

Visitors to Azego's ECS stand will meet experienced account managers collectively totalling over 50-years of knowledge within the electronic component market

Azego is an AS9120B accredited independent distributor of electronic components offering global sourcing and strategic supply chain solutions. The company partners with some of the world's largest OEM and EMS companies, working with managing directors, purchasing managers and buyers to source and supply quality assured electronic components, manage excess inventory and reduce purchase prices.

With purchasing teams in mainland Europe, Asia and America, Azego has built

inhouse local support around the globe that gets the company closer to suppliers, all of which are visited and audited before trading and throughout the relationship. Azego searches the globe to locate components customers need.

Azego has recently doubled the size of its warehouse and invested in new inspection equipment, further enhancing its rigid inspection procedure in which all products (without exception) are photographed and traceable from receipt to sales order dispatch.

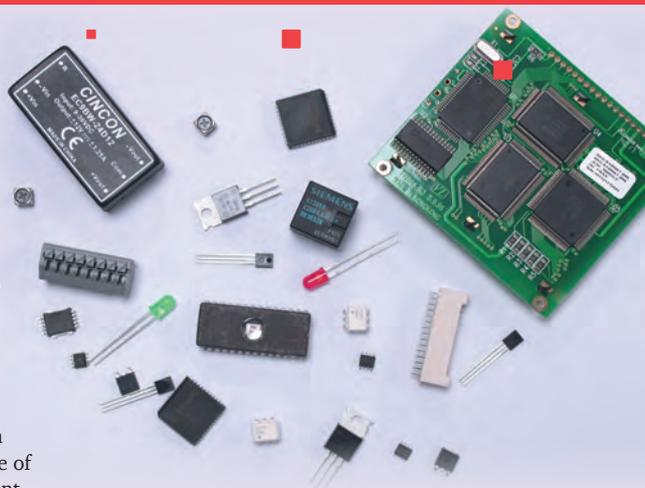
Azego works closely with the International Institute of Obsolescence Management to proactively monitor customers' needs regarding component availability. The company has been a member of ERAI since launching in 2007. All requirements are checked against the counterfeit database minimising the risk of problem parts entering the supply chain.

Visitors to Azego's stand can learn more about the company's flexible and customer-focused approach, stringent quality

systems, unrivalled global presence and list of trusted vendors worldwide.

Azego positions itself as a winning combination of specialists in supply chain solutions, shortage management and excess management, offering a range of services designed to improve business efficiency.

www.azego.co.uk



Recovering value and prolonging product life

Component reclaim, laser reballing, counterfeit detection and more are all topics for discussion on Retronix' ECS stand

Retronix offers technologies for the refurbishment and repair of electronic components throughout the supply chain, from sectors including high reliability, automotive, military and semiconductor. The company is upping its investment in people, premises, processes and equipment to meet growing demand.

Retronix has been recovering, refurbishing and returning electronic components to like-new condition for 30-years. Operating to IPC standards, the company's technology

meets the manufacturer specification of maximum reflow cycles allowed on an electronic component, adhered to extensively by both OEMs and CEMs.

Component reclaim provides a solution to problems including obsolescence, allocation, long lead times, e-waste and component shortage.

Retronix is the only company to offer a laser reballing service, mitigating the need for additional reflow and protecting the device. The system provides

repeatable technology for BGAs, optoelectronic devices, MEMS, sensors, CLCCs, CSPs and more.

As a result of the semiconductor shortage, Retronix has seen a spike in requirements for testing services and, alarmingly, the number of counterfeit chips and suspicious components being detected. The company's test department is dedicated to identifying counterfeit parts, offering a variety of options for testing ICs and passive components in all formats.

Retronix' robotic hot solder dip process covers applications including converting alloy on devices, refreshing oxidised alloy, tin whisker mitigation and double dip tinning for solder joints operating in harsh environments. The most recent development—micro device hot solder dip—is an automated, patent pending, process for tinning micro components including 0402s, 0603s and SOTs to GEIA Standard.

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Focus on quality, reliability and safety

Visit Schurter's ECS stand to discover how the company is making the interface between human and machine ever easier in sectors ranging from aerospace to medical

Schurter manufactures and distributes components for circuit protection, plus connectors, switches and EMC products. Working with customers, the company develops and manufactures input systems and also offers services regarding PCB assembly. The Business Unit Solutions coordinates project planning for the manufacture of end products.

In the industrial arena, Schurter offers a range of internationally approved components for industrial equipment. Over 20,000 products are available worldwide. For the medical

sector, the company's components suit high-grade medical equipment when certified and safe solutions are required. Products include power supplies and user interfaces.

Automotive electronic controls and power supply depend on components' reliability and long-term stability. Chip Fuse are precise, reliable, temperature resistant and robust against vibrations. These characteristics suit automotive applications.

Specifications in space and avionics are significantly higher than regular

international standards. Schurter offers zero defect solutions to meet the specific requirements of electronic systems used on aircraft, satellites and spacecraft.

In the data and communication sector, consistent, high-quality components are required during the creation of data center systems. In the energy industry, uninterrupted electricity supply represents a key competence in the 21st century.

With a focus on providing safe, clean power, Schurter's aim is to make the interface between human and



machine ever easier. Based on customer requirements, Schurter Electronics develops, manufactures and provides value added services over a professional network of worldwide affiliates and distributors.

Schurter Electronics is part of the Schurter Group, a Swiss family company certified to international standards.

www.schurter.com

M8 connector range continues to grow

Binder's ECS stand will showcase its full connector range, including its industrial sensor connectors. Features include a key addition to its M8 sensor connector portfolio

Binder is a family-owned business, shaped by traditional values. Based in Neckarsulm, Germany, it specialises in circular connectors. The company has been synonymous with quality since 1960. Binder works with 45 distribution partners on five continents and employs 1,800 staff worldwide. The Binder group comprises its headquarters, 16 affiliated companies, two systems providers and an Innovation Centre.

M8 signal cable connectors support efficient and reliable

installations in sensor and actuator applications. Featuring snap-in quick locking and now offered with three to six pins, they prove themselves in industrial applications that require reliable signal transmission and are subject to installation space constraints.

Binder is adding further straight overmoulded M8 snap-in connectors to the 718 product series. In addition to three and four pins, these are now also available in five and six pin versions. They are

available with either PUR or PVC cables up to 2m or 5m standard length. Customised lengths can also be realised on request. Since the locking mechanism does not require rotating elements, these connectors are particularly easy to handle and efficient in use.

Cable assembled and overmoulded M8 snap-in connectors in the 718 series are now available with three to six pins.

www.binder-connector.com



M8 signal cable connectors support efficient and reliable installations in sensor and actuator applications

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The widest selection of the
newest products™



Benefits of sub-contracting cable assembly

This article summarises Nicab's guide to sub-contracting cable assemblies. Visit the team on its ECS stand to discuss cable assembly in more detail

Time: Inhouse cable assembly is time consuming. Time is required for: finding, employing and training staff; raising orders for individual connectors, contacts, cable etc; purchasing, raising and chasing orders; production and quality; booking in parts; and administrating invoices and payments. Outsourcing offers one order, one delivery date and one invoice.

Tooling: The vast range of interconnection products means tools and lots of them. First the OEM

needs to decide on hand or automated tooling, then budget for it, bearing in mind cheap tooling could cause production bottlenecks. Outsourcing eliminates tooling costs as specialist cable assembly companies invest in tooling for efficient production.



Delivery speed: What does an OEM do if an urgent order arrives but its workshop is running at capacity? Sub-contracting out some orders to a trusted supplier means the OEM reduces pressure on its own production department and because the supplier is paid to help it will undoubtedly work hard to do so.

Skill sets: Specialist cable assembly sub-contractors painstakingly research the best manufacturing techniques to ensure products are assembled correctly. This is one benefit of using a specialist cable assembly

company. OEMs can be sure their cables are manufactured to a high standard, reducing concerns about field failures or costly returns.

Testing: Cable assembly companies are always looking for ways to enhance testing processes, including investment in specialist test equipment that can identify good cables and test against criteria including crosses, shorts, resistance and impedance. Crimp testing using force gauges ensures crimps remain in place and provide good connections.

nicab.co.uk

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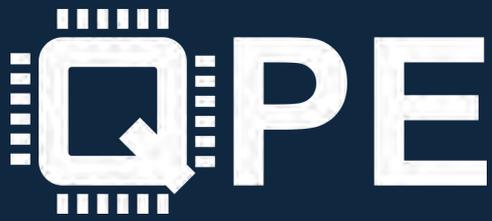
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Demonstrating the benefits of miniature blowers

Micronel will showcase its latest ranges of high pressure and high suction miniature DC blowers, including live product demonstrations

Micronel's latest product introductions are designed to meet the needs of two global challenges: continuing pandemic disruption; and the climate/energy emergency.

Regarding Coronavirus, Micronel high pressure medical blowers suit the needs of medical and scientific equipment requiring air movement. Applications such as breathing therapy, ventilators, respirators, personal protection, ICU hospital beds, air purification, indoor disinfection, air sampling,

laboratory, diagnostic and test all require some form of air movement with significant pressure or suction to force air through tubes or chambers or overcome system/filter resistance.

For energy saving, Micronel industrial blowers are an alternative to bulky and power-hungry side channel blowers and compressed air sources. The 24VDC low wattage brushless motors use a fraction of the power of larger side channel blowers and have lower running costs compared to compressed air

systems (one of the most expensive forms of energy).

In most factory applications, Micronel blowers pay for themselves after a few months' operation through reduced energy costs. The new compact 100mm square U100H4 blower features a rugged aluminium IP67 housing and generates over 180mBar and free air flow over 900 litres per minute.

Micronel fan and blower products are used in applications including medical, electronics cooling, personal protection,



Micronel medical blower

packaging, gas analysis, laboratory, transportation, process control and more. Micronel offers ultra-slim fans, axial fans and high pressure radial blowers from UK stock, plus design support for modified/specific designs.

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Dual Slim metal feed through



RJ45 Jack

Growing feed through connector range

Cliff Electronics is using its ECS stand to introduce its connector technology, with a focus on new products being seen for the first time at an exhibition

Cliff Electronics will be exhibiting its feed through connector range which is frequently specified thanks to the wide offering of types often used in audio, broadcast and data centre applications. The company's ECS stand will showcase additions to these British made feed throughs that are available in three frame materials: plastic, metal and black metal.

Alongside USB, BNC, RJ45 and fibre optic types, Cliff will present the US Conec MTP (multifibre termination push), LC Duplex OM3 - OM4 - APC and SC

Simplex APC (angled physical contact) versions. Accessories include fibre optic cleaner pens to ensure correct connector function after installation.

A new CAT5e, RJ45, IP65 feed through has been added to the range to solve water ingress issues for customers wishing to deploy RJ45 CATe connections in outdoor applications or environments where water is present.

For the first time at any exhibition, Cliff will be showing its new Slim feed

throughs. Developed to complement the existing XLR mount range, Slim versions allow more feed through connectors mounted side-by-side in a 1U panel, up from 16 to 20.

Slims are available in plastic, metal and black metal frames, also front-mount only and dual-mount (front and rear mounting). For dusty environments, Cliff offers multi coloured dust covers, for easy identification of location or connector type.

www.cliffuk.co.uk



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Benefit from decades of PCB experience

From rapid, small batch production to just-in-time stockholding and delivery, Photronix' ECS stand will be dedicated to everything PCB

Photronix offers PCB technologies including flexible, semi-flex, flex rigid and HDI, plus standard boards from one to 50 layers.

Based on the South Coast of England, Photronix combines a team of UK-based PCB experts with the latest PCB technologies available from the company's Chinese manufacturing partners.

Photronix' fast-track service suits rapid, small batch requirements.

Whether needs are quick turn or large volume, customers can benefit from Photronix' proven track record of competitive pricing, reliable deliveries and great customer service.

The company offers flexible payment terms and stock holding facility for just-in-time delivery. An invoice is only issued when stock is released, helping customers manage their cash flow.

With support from 12 Chinese factories,

Photronix has the capability to offer the best fit for customers' specific PCB requirements and technologies.

photronix.co.uk

Whether needs are quick turn or large volume, customers can benefit from Photronix' proven track record of competitive pricing, reliable deliveries and great customer service

X-ray and CSAM inspection for failure analysis

Step onto Cupio's ECS stand where team members will be on hand to explain how x-ray and CSAM are used to analyse PCBA failures

Failure modes such as delamination, voiding or solder bridging occur internally, yet opening a failed product may be impractical or destroy the fault evidence. Thus, non-destructive inspection that generates high-resolution fault images is essential.

Two complementary approaches exist: x-ray inspection and Confocal Scanning Acoustic Microscopy (CSAM). Broadly, CSAM reveals air gaps, voids and delamination that x-ray

cannot see such as PCB delamination. Conversely, BGA ball voids are easy to see with x-ray.

Nordson Dage's GEN7 is a CSAM system. It can scan anything from a small part to a 350mm wafer chuck. With five independent motors, it offers six times the acquisition rate of earlier models, with 23 per cent greater scanning area to accommodate larger samples.

Nordson Dage's Quadra 7 is an x-ray inspection

machine providing 2D, CT and tomosynthesis modes. It has built-in tomosynthesis with a quick change to CT and supports high resolution imaging with a 4k image of 100nm resolution.

The machine's Aspire FP detector captures 6.7MP images at 30fps. Images are shown on two 4k UHD monitors, as conventional HD monitors lack the required resolution.

Customers can access both technologies without buying capital equipment,

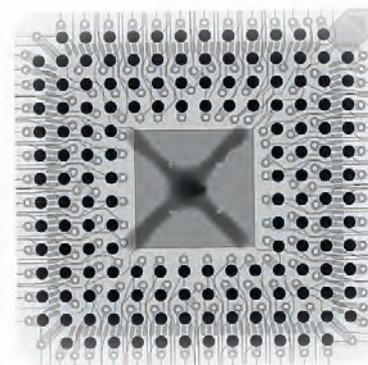


Image taken from Quadra 7

by using an inspection and test house like Cupio. The company operates the latest equipment, backed by expertise on both technologies and how to apply them.

www.cupio.co.uk

Quality, reliability and continuity of supply

Visit RDS' stand to explore a world of embedded computing, display technology and design services and solutions

Review Display Systems specialises in embedded computing, display solutions and system integration. Established alliances with global supply partners and manufacturers ensure RDS has access to a comprehensive range of embedded computing, display technology and system support peripherals—resulting in product designs with unique features, high reliability and continuity of supply.

Established in 1982, Review Display Systems engages and develops partnerships with

electronics engineers, system architects and purchasing professionals in industry sectors including industrial controls, instrumentation, medical, facilities management, factory automation, in-vehicle systems, point-of-information, process control and more.

The company can provide design and development support including project management, 3D modelling, firmware design, plastic/metalwork design, approval prototypes and sub-assemblies through to full

system production and sub-contract manufacture.

Review Display Systems' commitment to environmental responsibility and quality is reinforced with accreditation to the latest internationally recognised quality standards including ISO14001, ISO9001-2015 and ISO13485:2016 for the design and manufacture of medical technology devices.

During 2022 Review Display Solutions celebrates its 40th anniversary. Throughout this time, the company

has successfully navigated challenging business conditions supporting UK-based business with products, systems and services in diverse industry sectors.

Engaging with Review Display Systems as a design and manufacturing partner offers access to the latest technology, product portfolios and technical support in embedded computing, display technology and design services and solutions.

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Self-service assembly drives cost savings

Speed Assembly Services is DVR's new fast turnaround prototyping facility with all assemblies manufactured at the UK-based facility in Basildon, Essex

SAS offers a low-cost, fast-turnaround PCB assembly manufacturing service for new electronic designs required at the pre-production benchtop stage. The organisation's focus is providing a fast prototyping and lower volume PCB assembly service, to complement design engineers' needs for rapidly assessing new and innovative electronic concepts. Customers can order up to 100-off assemblies, single or double-sided.

SAS lets engineers directly order and manage the

supply of prototype PCBs without the expensive input of additional resources required for production volumes. This lets SAS drive down pre-production assembly costs, with savings passed directly to the customer.

A little like self-checkouts at supermarkets, customers upload their BoM and use their on-line ordering tool, which empowers engineers to self-service and control all aspects of the ordering process, all while having multiple customisation options and minimising quoting and ordering times.

SAS is backed by DVR, one of the UK's leading contract electronic manufacturers with over 35-years' experience. SAS starts with all the expertise from its established parent company.

www.saspcb.co.uk



Customers can order up to 100-off assemblies, single or double-sided

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Supporting legacy applications

Discover how Force implements programs that ensure all semiconductor devices on a BoM are accounted for and have long-term sustainability

Force Technologies is a Wiltshire-based company which, together with a worldwide network of contracted strategic partners and independent representatives, manages turnkey design and manufacture of EoL and obsolete electronic component replacements for a global customer base.

For over 30-years Force has supported legacy applications worldwide with a range of design, manufacturing and test services across all sectors and reliability levels. Whether customers are looking for a sustainable

manufactured, tested or re-engineered solution (or a questionable product verified to AS6081), Force's engineering team is ready to help.

At this year's ECS, Force will discuss optimal ways to future proof applications. The company recognises the problems EoL components cause customers, and its ethos is simple: to not only solve the current obsolescence problem but also ensure indefinite support for future legacy applications.

Whether companies are struggling with obsolescence in the commercial, industrial,

automotive, defence or aerospace markets, Force can implement a comprehensive program to ensure all semiconductor devices on the BoM are accounted for and have long-term sustainability.

Force is proud to provide solutions to the highest quality standards. The company's policy is to meet customer requirements and enhance their satisfaction with products and overall service by operating all processes under controlled conditions, with Force holding ISO 9001:2015, AS9100 Rev D Aerospace certification.

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- Fix costs on Cable Assemblies
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Distributors must go above and beyond

Visitors to Farnell's stand can discover how the company's commitment to support and solutions positions it as a design and distribution partner for today, tomorrow and the future

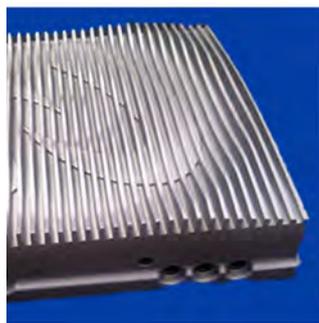
Over the last two-years, supply chain disruptions, component shortages, extended lead times

and the pandemic have created new challenges across the electronics market. These are driving

a transformation of consumer buying habits, accelerating the shift to digital marketplaces.



The trend towards a digital-first market has increased rapidly



Customers have new expectations and high service distributors must adapt. This means focusing on far more than simply shipping parts but in adding value at every stage so customers are equipped for success.

A fundamental improvement from high service distributors is their online offering. The trend towards a digital-first market has increased rapidly. For distributors such as Farnell, online operations are a key part of supporting customers' journeys. The majority of customers begin their research online, with over 70 per cent of Farnell's global orders placed through eCommerce avenues.

To best serve its customers, Farnell has invested in hundreds of website enhancements over the past two-years to support this digital transformation including search and site speed, web stability, self-service and order tracking, with millions of pounds of further investments planned throughout 2022.

Farnell customers can also access a product portfolio approaching one million units from thousands of world-leading manufacturers. Support is provided through a multifunctional, multi-lingual team, in-person or online, to best suit customers' requirements. Farnell also offers in-house technical experts specialising in key areas of electronics design.

uk.farnell.com

A photograph of several surgeons in an operating room, illuminated by bright overhead lights. The surgeons are wearing blue scrubs and masks, and are focused on a patient lying on the operating table.

Because failure is not an option.

In your daily life you are dependent on a lot of products. The car you drive, the airplane you fly in or the ECG equipment measuring your heart. You expect them to work – because they have to.

All electronic products have a PCB inside. At first sight they may all look the same. But it could be a world of difference between a normal and a High Reliability PCB. It all comes down to details, and thoroughness.

It starts with the design, the right specification and choosing the right production partner. It also includes logistics, delivery precision and making the whole process as sustainable as possible.

High Reliability PCBs.

Because failure is not an option.

Aerco positions for further growth in 2022

Visit Aerco's ECS stand to discover how its recruitment drive and investment in stock are supporting its growing order book

Aerco is a stockist and distributor of electrical components, supplying manufacturers and service companies within the aerospace, defence, medical, industrial, rail and transportation markets throughout the world.

While the company has not escaped the increased costs of logistics, administrative costs of Brexit and delays/uncertainty due to increasing component lead times, Aerco is finding that customers' underlying needs are sound and its confidence in the business environment is supporting significant

investment plans. In response, Aerco has created a strategy to significantly increase stock commitments to guarantee on-time delivery performance.

Aerco maintains franchised partnerships with world-class manufacturers positioning the company as a trusted and valued partner for supplier reduction programmes. The company's design support service helps customers benefit from its product knowledge, minimising design engineers' product selection effort. As Aerco seeks to grow its team it is discovering promotion

and training from within is a great way to continue delivering service levels it is committed to.

The company's product range includes: cable, wire/accessories, circuit breakers, coaxial products, connectors/accessories, crystals/oscillators, data acquisition, fans, fuses, optoelectronics/indicators, PCB accessories, relays/bases, RFI/EMI, sensors, solenoids, switches and terminals. The company also offers a specialist in-house connector and cable assembly service.

www.aerco.co.uk



Aerco is finding that customers' underlying needs are sound and its confidence in the business environment is supporting significant investment plans

AlphaWire at Short Lead-Times

Aerco now offers custom spooled lengths of AlphaWire products from stock

All with UL approval

As the premier distributor for AlphaWire in the UK, Aerco are able to offer access to the complete range of AlphaWire products.



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Display innovations on show

Visitors to Midas' ECS stand will have the opportunity to explore a range of display products including new RGB any colour LCDs, rotary switch dial OLEDs and IPS TFTs

RGB LCDs display an appearance of black characters (or dots) on an RGB backlight, which lets the user choose any single colour for the backlight. LCDs are traditionally offered as one colour text or graphic, on one colour background. These new displays give the user more freedom with how the display will look, as the backlights are full colour RGB. The ability to choose any single colour as the backlight also gives the user the option to use the display to suggest application status, such as hot or cold.

Dial OLEDs give the user input through both the

capacitive touch screen and rotary switch module. This sleek design gives the user dual interface and removes the need for additional push buttons, leaving one component to control the entire application.

In-plane switching (IPS) technology solves the limitations of strong viewing angle dependence that exists in much display technology. The display actively arranges and switches the orientation of the molecules of the liquid crystal layer, creating fantastic all-round viewing angles.



Midas supports the design-in process via its UK-based engineering team, which lets the company support technical and commercial enquiries. The team is looking forward to helping customers with their designs using existing and new display technology.

www.midasdisplays.com

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Optimising thermal performance

6SigmaET electronics thermal simulation is designed to help engineers quickly solve complex models, reducing solve times from hours to minutes

6SigmaET performs calculations to seamlessly create identical models of electronic equipment. The tool can identify temperature and airflow inside electronics equipment, helping thermal engineers mitigate thermal design risks, saving businesses valuable time and money.

Designed with efficiency in mind, 6SigmaET is proven to deliver results 35 percent faster than other tools—faster model creation, grid generation and solve times—accelerating solve times for complex model simulations. The software can understand object placement and

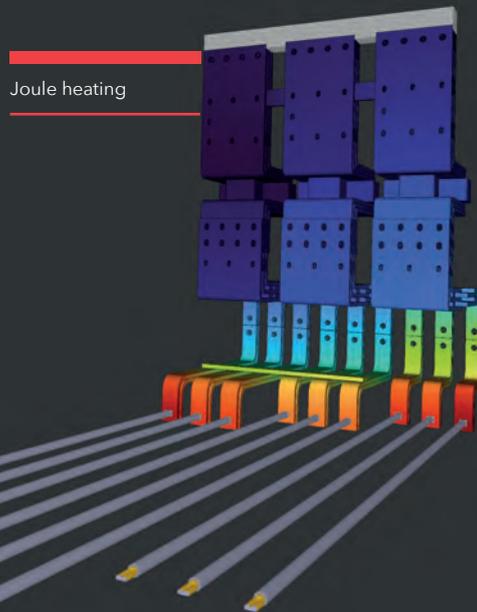
behaviour, whilst also providing object-specific thermal simulation results.

6SigmaET helps teams collaborate effectively and efficiently to reduce modelling time by connecting to existing design tools. Engineers can import mechanical CAD and ECAD directly into models.

The software's automatic grid generation adapts to model changes, providing fast, reliable gridding while also checking for collisions and modelling errors, saving engineers valuable design time.

Thermal simulation is a key element of the engineering design process. 6SigmaET helps teams create and solve models quickly, verify electronic designs before manufacturing and optimise the best thermal performance while reducing time-to-market. This level of intelligence and automation lets engineers spend more time on design and less time on software operations.

www.6sigmaet.info



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Rebound's ECS stand offers visitors to the show the opportunity to explore the company's real-time global market intelligence and data driven supply chain solutions

Rebound offers its customers real-time market insight and trends. The company's scale and data centric platform ensures it is well-placed to secure the best price and availability for the trusted electronic components customers need to maintain production and competitiveness.

Real-time global market intelligence mitigates risk, creating PPV cost saving opportunities and providing scalable supply chain solutions.

Rebound holds several accreditations that endorse its quality management systems, including AS9120 and ISO13485. The company is particularly proud of achieving SC21 Silver Award which is for 21st Century Supply Chain Excellence in the aerospace and defence industry. Held by just 700 companies, it is rare within the electronics distribution market and proof of Rebound's industry-leading quality control.

Operating from 38 offices in 22 countries, Rebound's dedicated procurement hubs in Asia, Europe and the UK offer enhanced inspection and logistics facilities. The company positions itself wherever its customers need it to be to keep their supply chain moving.

From its global offices, Rebound uses its expertise and reach to offer customers trusted products and proactive service to support their business. Rebound has invested in a worldwide supply chain to support customers with

new sources and availability without compromising quality. Features include a multi-layered procurement strategy, eight regional managers and over 60 sourcing specialists.

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Buying into 35-years interconnect experience

GCT specialises in PCB level interconnect products and custom overmolded cable assemblies, backed by over 35-years' experience and more than a billion products sold

USB connectors have been a GCT focus over recent years, resulting in one of the broadest ranges of USB products available: 60 variants and more in the pipeline. The series includes full size (Type-A), micro and Type-C, all available in male and female types with vertical, horizontal and mid-mount orientations.

Agility is one of GCT's differentiators, adapting designs to solve market challenges quickly, such as form factor, quality and price point. Connectors are engineered to offer multi-shell stake lengths

on many products to suit different PCB thicknesses—unlike traditional parts designed for 1.6mm PCBs.

Other examples include the development of 6 and 16-pin USB Type-C connectors for applications where a 24-pin Type-C is traditionally over specified and overpriced. GCT's 16-pin products are value engineered to deliver USB2.0 specification allowing use in place of a micro USB, while 6 pin products are designed to be used in applications requiring power only.

GCT's range also includes micro USB connectors rated to IP67 and USB 3.0 parts rated to 20,000 mating cycles.

Other connector products manufactured by GCT include board-to-board, FFC, memory card, SIM card and overmolded cable assemblies.

gct.co

GCT range overview




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Come and join us and talk to our team who will be available to discuss these and other latest products

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Being different is special

Distribution needs to be different to supply the high-reliability components needed by harsh and mission-critical sectors, according to Debbie Rowland

It takes a different kind of distributor to support manufacturers operating in demanding sectors. Such companies must rely on a distributor to have a deep and long-term knowledge of the sector and of supplying high-reliability components.

The distributor must also have the commitment, skill and resources to deliver high service levels and quality parts used in relatively low volumes. Sectors include space, oil/gas, industrial, instrumentation, specialist transport, defence and aerospace. As an independent, UK-based distributor, Charcroft has focussed on these sectors for over 45-years.

A key difference is that Charcroft does not follow the conventional semiconductor-led line-card but focusses on high-reliability passives and other components including hi-rel semiconductors, power supplies, precision electromechanical, optoelectronics, RF and microwave: all franchised from global and niche manufacturers.

All inventory is held in the UK and supported by robust, quality-led processes including holding an archive of all certificates of conformity (CoC) for each customer shipment to ensure long-term component traceability.

To go beyond conventional distribution, the UK-based manufacturing facility builds custom passive assemblies as prototypes or in low volume, as well as offering the usual value-added services. Precision and audio resistors, silver mica and multi-layer ceramic capacitors are also manufactured in the UK.

By being an independent distributor and manufacturer, Charcroft delivers a different approach as well as responsive solutions for the most challenging sectors.

www.charcroft.com



Charcroft Electronics director,
Debbie Rowland

Connectors, cables, switches and more

Nicomatic's ECS stand will showcase its ranges of miniature rectangular connectors, switching solutions and more

Nicomatic will feature miniature connectors including the 1.27mm pitch EMM series, which meets the performance requirements of MIL 83513, DMM and DLMM connectors with superior EMI protection and CMM 2mm pitch modular connectors with LF, HF and HP contacts. Other products on show include Crimpflex connectors and FFC, Switch'air domes and LEDs.

Nicomatic will also be showing a range of new products. New 1mm AMM series connectors suit demanding space-constrained applications in

harsh environments. Capable of carrying up to 4.8A (PCB to cable, 20 pins at 25°C) or 2.5A (PCB to PCB, 20 pins at 25°C), the miniature connectors can withstand vibrations of 15G and shock of 100G. Devices handle up to 1,000 mating cycles and operate between -65 and 200°C.

Also new is Optimus, an EN4165-compliant, modular, rectangular I/O connector series. This low-profile interconnect solution is user-configurable and acts as an equipment interface to a harness or as a robust

rack and panel solution. Optimus connectors are modular, waterproof and offer EMI protection.

Nicomatic has developed a new FFC cable designed for use in space applications, which is RoHS compliant, UL approved and meets industry quality standards. It achieves millions of cycles in high-flexing environments, offers EMI/RFI protection and meets NASA outgassing specifications for vacuum conditions.

www.nicomatic.com





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Quality products at economic prices

ODU-UK invites ECS visitors to its stand where they can witness the company's latest connector developments

ODU supplies connector solutions to markets including military electronics, medical equipment, instrumentation, factory automation, robotics and more. As a problem-solving partner, ODU works with its OEM customers to develop connectors and customised cable assemblies, providing cost-effective solutions to the problems of modern-day electronics.

On show will be the latest additions to the Advanced Military Connector (AMC) range. The AMC SeriesT now offers three locking variants in one connector. The 'T' stands for three-in-one or triple, as

three locking variants of plug can fit the same receptacle: push-pull, break-away or screw locking—a built-in trapezoidal thread with serration ensures additional safety.

Now OEMs have a free choice of appropriate locking mechanism at each connection point, while retaining the same bulkhead connector across the equipment.

A new 7-pole insert is available for the ODU-AMC high-density series. In a size O shell, but with a larger 0.7mm contact for higher robustness, the 7-pole configuration offers a future-proof alternative to other 6-pole NETT-Warrior connectors,

together with a significant performance increase.

To support faster military electronics equipment innovation, suppliers need a wide range of standard products, while being fast and responsive when a customer-specific solution is required.

At ODU all technologies are under one roof, from design and development through to volume production of connectors, cable assemblies and mechanical sub-assemblies making it possible to offer quality products at economic prices.

odu-uk.co.uk



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Charcroft dives deeper to cut leadtimes



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- Actively planning inventory based on potential demand
- Minimising inventory liability and procurement risk for customers
- Strong linecard of global and specialist franchises

For engineers

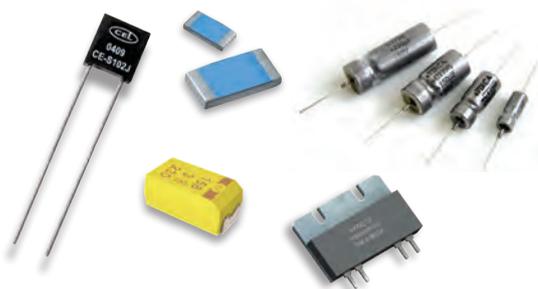
- Auditing availability during parts selection
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Director
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Roger Tall
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Design health check explained

DSL operates an electronic design process that it knows leads to successful delivery of projects and outcomes for clients. Visit the company's ECS stand to discover more

DSL's clients often have demanding and challenging project objectives regarding quality, cost and time and the company has developed a tried and tested design and delivery process to ensure it meets these goals in a smooth and timely way.

The global chips and components shortage has presented a challenge for most product development and manufacturing companies. As a leading UK industrial computing and electronics

specialist, DSL has been working closely with suppliers and customers to alleviate some of the practical implications of the shortage so everyone is better prepared.

DSL's complimentary Design Health Check service was created to resolve poor yield and reliability issues in customers' existing PCB designs. This is now being used to 'health check' impossible to source (or crazy lead time/price) components.

The complimentary Design Health Check comprises three steps:

1. Client provides their design files and other relevant documentation under NDA
2. DSL undertakes a summary complimentary investigation
3. DSL provides the client with a complimentary report and recommendations, which fall under one of the three following categories

Category 1: DSL has identified the issue and solution within the allotted time for the summary investigation and here is the solution.

Category 2: DSL has confidence it can identify the issue and solution but it will exceed the allotted time and here is the proposal.

Category 3: DSL does not have confidence it can identify the issue and solution (perhaps it lacks the right equipment or skillset) and here is how it recommends the client progress this to a solution.

So, if visitors to ECS have niggling electronics issues they would love to see resolved, drop onto DSL's stand and explore what the Design Health Check service can offer.

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Designing around component shortages

Powell's ECS stand will include a focus on designing around component shortages using suppliers with short lead times, stocked solutions and collaboration with application engineers

Powell Electronics is a design consultancy and distribution company centered around connectors, sensors and EMC solutions. Powell's stand will showcase many of its niche suppliers, plus the design support the company offers for more standard military connectors. Examples include Quell EMC products, miniature RF solutions, high power/waterproof connectors, enclosures to IP69K, cable assemblies and flex cables.

Powell specialises in high reliability, harsh environment connector design, manufacturing and supply. The company's 70,000ft²

connector manufacturing facility based in Swedesboro, NJ, USA is certified to ISO9001 and AS9100.

This year, Powell Electronics is relocating its European operations to new premises in Dublin, Ireland, employing more technical staff to support design-in activities and signing new franchise agreements with Glenair, Harwin, Amphenol Aerospace, Quell, AB Connectors, Conesys, Positronic and more.

This lets Powell address a broad range of demanding connector applications with products that range

from miniature PCB-mount devices to high voltage, high current, hi-rel solutions.

Powell offers a diverse range of solutions, covering multiple end applications, and is ready to support customers regarding their design, technical, distribution and logistical needs. Powell offers automated engineering solutions and connector ODM services. The company is an authorized, QPL'ed distributor for over 50 military specifications and is ISO9120 certified.

www.powell.com



Powell's stand will showcase many of its niche suppliers, plus the design support the company offers for more standard military connectors



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Stand
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One-stop manufacturing shop

European Circuits' invites ECS visitors to share their PCB requirements with its on-stand team and discover how the company can help reduce costs and administration

UK-based European Circuits offers PCB fabrication and assembly from a single location, alongside other services including cable assemblies, test and product build. This privately owned, Glasgow-based company was established in 1999 and supplies industries including medical, security, broadcast, automotive and more throughout the UK, Europe and beyond.

European Circuits' goal is simple: to provide customers with assistance and advice about their PCB requirements and produce these requirements to a high quality, on time and with excellent customer service, from prototype PCBs to production volumes.

The company is continually investing in new equipment and over the last 18-months

has installed equipment in the manufacturing and assembly areas. Investment exceeding £350,000 includes new CNC drill/routing machine, additional ATE tester, solder paste inspection systems, several pick and place machines and a 3D AOI system. European Circuits continues to look at other equipment to improve and expand its processes.

One European Circuits customer stated: "We looked at several companies for our PCB and final assembly solutions. We found ECL not only cost effective but the level of professionalism and service has been faultless. They have provided a seamless manufacturing experience that saves us both time and money."

www.european-circuits.co.uk



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Demonstrating sensors for smart home and building automation

Demonstrations of Omron's D6T-32L thermal sensor with people detection algorithm will be taking place on the company's ECS stand

Omron Electronic Components Europe will be showcasing solutions for smart home and building automation, including next generation sensor solutions for ventilation, lighting and access control. The team will be available to provide information and answer questions about its expanding sensor range.

Omron will be offering live demonstrations of its D6T-32L thermal sensor with people detection algorithm. This device is designed to

reliably detect people and objects in a wide area across its 90 by 90deg field of view.

These characteristics, combined with facial recognition features of the HVC-P2 and 'mechanical eye' capabilities of the TOF sensor module, offer advanced possibilities in lighting and access control, plus occupancy monitoring for infection control inside buildings.

Visitors to Omron's stand will also find detailed

information about digital pressure and environment sensors such as the D6F-PH digital pressure and 2JCIE environment sensors. Combined with the D6T-32L, these sensors can help customers enhance the quality and efficiency of HVAC systems through accurate sensing of air flow, temperature, humidity and human presence.

components.omron.com/eu-en



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People behind the screen

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Anders works with its customers across markets including e-mobility, healthcare, smart automation and industrial control. The company has helped them adapt their technology to ensure that it meets their user's engagement type for current and future demands.

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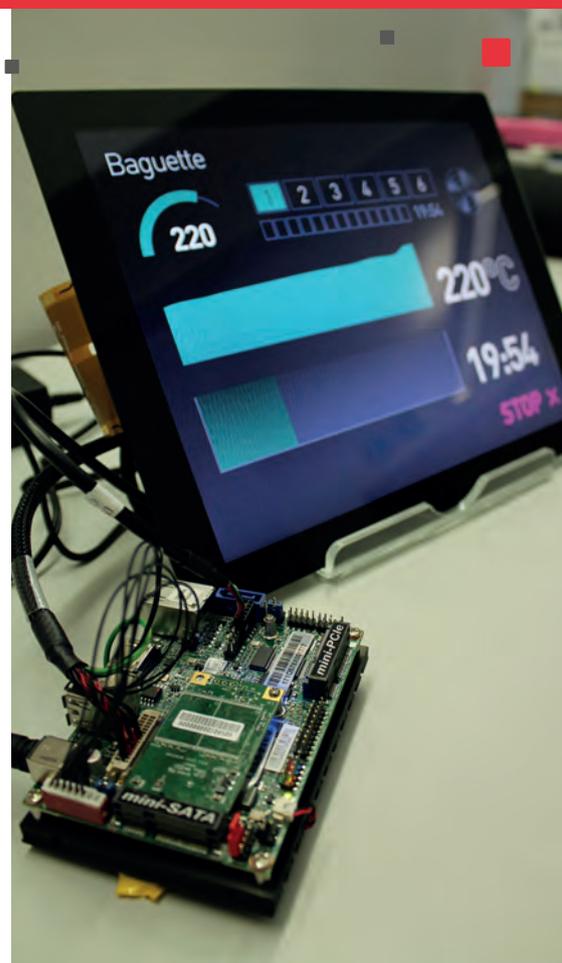
usage etc and you've got the world that we live in as Anders look to deliver a total solution for the design and development of world class displays and embedded systems.

Anders' collaborative approach means they can provide a solution that meets the demands of the application, environment, and end user. Services include hardware design such as PCB layout and custom driver boards, custom coverlens solutions, cable assembly,

mechanical design and software integration.

If visitors to ECS design products with display or embedded requirements, then Anders on-stand team is ready to help them navigate the journey from seed to scale.

www.andersdx.com



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Almost a century of manufacturing experience provides the foundation of Dold Industries' product portfolio which ranges from motor control to key interlocks

Dold Industries is the UK subsidiary of E Dold & Söhne. The switchgear specialist is ISO9001 certified and a leading European manufacturer of safety relays and associated control/monitoring solutions.

This privately owned company has produced relay products for some 90-years and currently employs over 400 people, many of whom have been with the company for over two decades

and associate themselves with the organisation's quality driven policies.

Operating its own tool and form production, plastic moulding department and up-to-date manufacturing plant, Dold ensures flexibility, efficiency and a direct influence on delivery times, as required by customers. This depth of production control and optimisation of electronic and mechanical components ensures the quality standards expected

of Dold products are consistently maintained.

In addition, this design and manufacturing control supports production of custom-built relay products to directly meet customers' individual requirements. Dold's product quality and reliability means it is a respected supplier of measuring relay and safety control products across a broad range of industry sectors including the nuclear,

power generation, water and railway industries.

With direct input from its head office, Dold Industries UK can supply and support the full product range including: motor control solutions, measuring relays, safety relays, timers, annunciators, text displays, enclosures, trapped key interlock systems, modular safety controllers, and safety rated wireless e-stop control systems.

www.dold.co.uk







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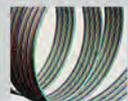
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Exploring interconnect options

Yamaichi Electronics offers ECS visitors interconnect product expertise and support across a range of application fields from industrial and automotive to data networking

To highlight the diversity of Yamaichi's interconnect offering, the following summarises some of its connector series.

The company's new SPE single pair Ethernet series (Y-SPE) is offered in standard and custom versions for industrial, automotive (Y-HDE high-speed data Ethernet) and other applications.

Regarding push-pull circular metallic connectors, the company offers the Y-Circ P

The M12 series (Y-Circ M) includes the M12 push-pull, first internationally IEC

standardised M12 push-pull with space-saving inner locking mechanism. It is designed to offer customers a slim, fast and reliable solution.

The company's Y-Con RJ45 features unique (optional) integrated 3.1A power contacts in plug and jack. CAT.6A high-speed versions, IP20 to IP69K protection rating and polymer/metal protection covers are offered. A new ruggedised push-pull metal cover version (IP69K) is also available.

Other offerings include: Y-Lock Pullforce non-ZIF for industrial FFC/FPC cables;

Y-FFC flexible flat cables made in Europe (Germany); Y-FLEX patented flexible flat cable featuring LCP substrate; microSD and microSIM card connectors; and various high-speed, automotive and data networking products.

Yamaichi Electronics manufactures products in its European production facility, thus ensuring fast delivery times.

www.yamaichi.co.uk



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Safe and secure



Nexus' ECS stand will feature live demonstrations of how its Flexxon's X-PHY AI cyber secure SSD protects against cyber-attacks

Nexus challenges the way customers think about data access, data storage and security by introducing them to specialist products designed specifically for industrial systems and information security, which address the pain points that widely available products do not.

Flexxon's X-PHY, the world's first all-in-one AI cyber secure SSD monitors for threats in real-time and locks down the moment a threat is detected. Flexxon is an internationally recognised manufacturer of secure memory ICs, cards and modules.

Datakey CryptoAuthentication memory tokens are ideal for the transfer of passwords, security keys, sensitive data or system configuration files. Nexus is the exclusive UK partner for Datakey, supporting engineers in all major prime contractors, supplying memory tokens into the UK defence industry for over 34-years. These are extensively used as CIK's within secure communication and weapon ignition systems.

www.nexusindustrialmemory.com

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STAND 32

Lighting up optoelectronic design

Hamamatsu Photonics is using its ECS stand to showcase a range of product innovations and introduce visitors to the support offered by its Rapid Design Group

Hamamatsu Photonics is a specialist manufacturer of optoelectronic components and systems. The company's corporate philosophy stresses the advancement of society through the use of photonics and looks to achieve this via research to yield products regarded state-of-the-art. Hamamatsu products allow work within the entire optical spectrum, providing solutions for applications including analytical, consumer, industrial and medical instrumentation.

The company offers a range of components and systems designed to support

development of cutting-edge technologies driving the future of industry. From component level image sensors to integrated spectrometers and cameras, Hamamatsu offers products for all levels of integration.

At this year's ECS Hamamatsu will showcase a range of optoelectronic components including photo ICs, LEDs, silicon + InGaAs photodiodes and silicon photomultipliers (MPPCs). These technologies can be used across a range of applications. However, if a product specification does not meet a customer's

needs, Hamamatsu's in-house manufacturing capabilities allow customised solutions for specific requirements.

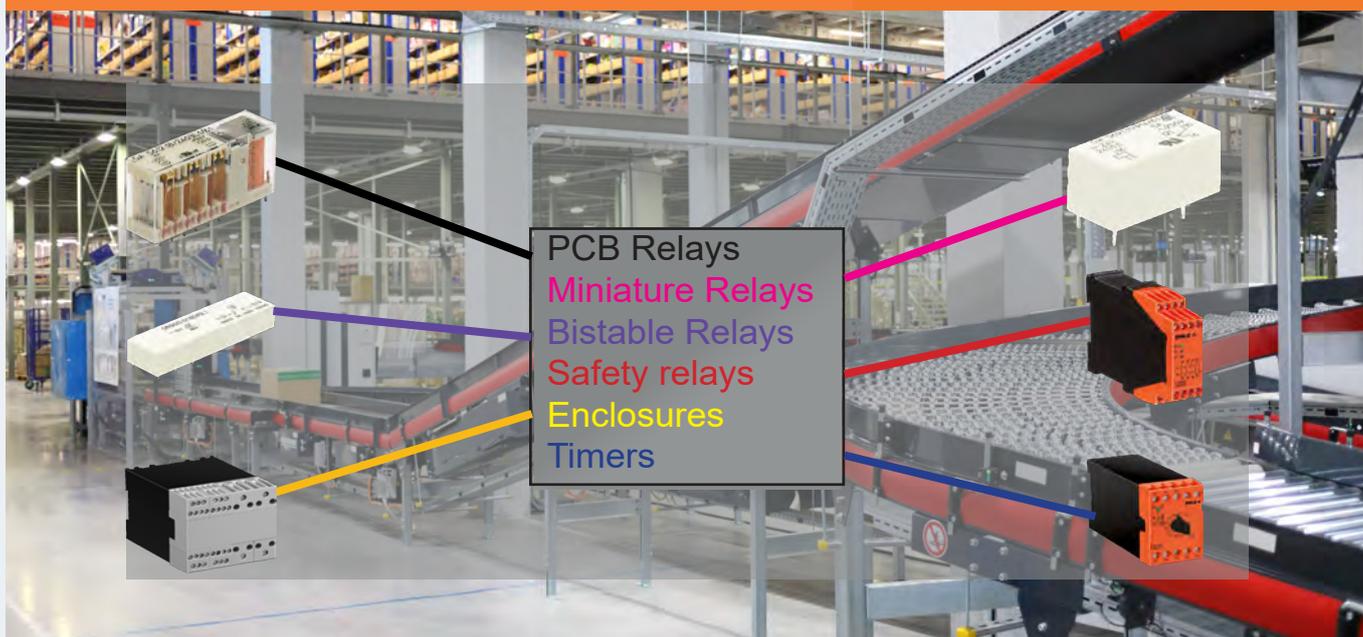
Engineers will be on hand to provide insight into the recently established Rapid Design Group (RDG), a dedicated team of technical experts offering customers design-in support and rapid prototype development of modules.

www.hamamatsu.com



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Imaging, display and embedded advice

Visit Pacer's ECS stand to compare and contrast different imaging and display techniques, embedded technologies and low light level detection solutions

Mitsubishi's electric diode infrared sensor (MeDIR) delivers high-pixel, high-thermal-resolution images. Espros' TOF imager chips, modules and miniaturised 3D cameras are based on the principle of time-of-flight. OmniVision's CMOS image sensor technology enables image sensors and miniaturised camera modules. See them in action and compare results.

Embedded display solutions range from small high brightness OLED, smart TFT and transparent EL displays to medical and military monitors and large public display solutions.

Pacer's team can advise on standalone v integrated solutions and commercial v industrial grade products. Pacer can provide bespoke display assemblies via its UK Custom Solutions Centre, partnering OEMs on projects involving displays, photonics, optics and sensing. Pacer's engineers have experience applying these technologies to engineering problems in the medical, military, industrial and scientific sectors.

ASUS Tinker Boards are energy-efficient single board computers that, despite their ultra-small form factor, offer performance improvements in key areas found lacking

on many SBC boards. Featuring quad and hex-core ARM-based processors they support Linux and Android, next-generation graphics and GPU computing APIs.

Excelitas Technologies specialises in photonic innovation with a photonics technology portfolio designed to meet customers' needs across lighting, optronic, detection and optical technology applications. Explore Excelitas' defence and aerospace photodiodes, low light level detection modules and thermal infrared sensors.

www.sssltd.com

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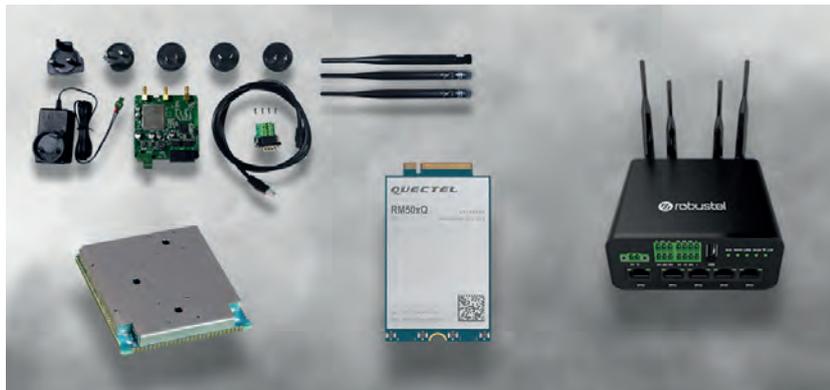
Stand 15

Communication Technologies
High-Performance Processor Solutions
AI, Machine Learning & IoT



AI, Machine Learning and IoT Demo's

Solid State Supplies' engineering team will demonstrate how AI, machine learning and IoT are addressing applications from location monitoring to object recognition



Silicon Labs has in-depth expertise in IoT wireless protocols, such as Bluetooth and Matter running on Thread and Wi-Fi. It is also driving Matter protocol development via its Connectivity Standards Alliance membership. Solid State Supplies will demonstrate how SiLabs deploys RF technologies for 3D location monitoring using angle-of-arrival detection and analysis.

Quectel Wireless Solutions specialises in 5G, LTE,

LTE-A, LPWA, NB-IoT, WiFi/Bluetooth, automotive, Android Smart modules, UMTS/HSPA(+), GSM/GPRS and GNSS modules. Demo boards feature Quectel modems and antennas using the latest cellular technologies.

Digi International provides processor and wireless solutions for secure connected IoT applications. Digi system-on-module solutions (SoMs) provide an integrated hardware and software

platform designed for rapid development and time-to-market. An AI-enabled application will run on Digi's ConnectCore 8X (CC8x) SoM fitted with a camera and LCD display, recognising arm gestures to direct shots from a cannon on a pirate ship.

Robustel's range of industrial 4G routers is positioned as one of the most competitively priced on the market. These rugged routers suit applications including

security, manufacturing, agriculture, transport, utilities, smart cities, smart retail, PoS and vending.

To show how low power FPGAs can be used for machine vision and AI applications, an AI engine running on a Microchip Polarfire FPGA will inspect a live video input, with objects identified, tagged and displayed in real-time.

www.sssltd.com

Turn-key product supply close to European market

From PCBAs to 'maintain, repair and overhaul' services, Incap UK prides itself on its turn-key service. Learn more at ECS

As a full-service electronics manufacturing company, Incap UK will use its ECS stand to introduce visitors to its experts and present the services it provides to customers around the world. Incap's customers include multinationals, mid-size companies and start-ups. As a part of the international Incap Corporation, Incap UK's state-of-the-art technology is backed by entrepreneurial culture and qualified personnel.

Based in Newcastle-under-Lyme, Incap's factory provides

turn-key product supply including: PCBAs; electro-mechanical assembly; cable and wire harness assembly; dedicated standalone rapid prototyping; (Fast Track); and maintain, repair and overhaul services (MRO).

The UK factory's manufacturing experience dates from 1974. The facility has 4,400m² floor space and serves customers with operations in Europe, Asia and North America. The plant also has over 20-years' experience in the defence, security and aerospace markets.

Incap's UK factory has grown rapidly by responding to customer needs and providing specialist, niche PCB assembly, complete product build and electromechanical assemblies. The factory brings together technical capabilities and production technologies normally associated with multinationals, with an approach to customer service based on partnership and personal service.

Customers enjoy the benefits of a dedicated account support team who seek to fully understand customers'

business and products to optimise the delivery of specialist electronic manufacturing services and solutions that are flexible and cost effective.

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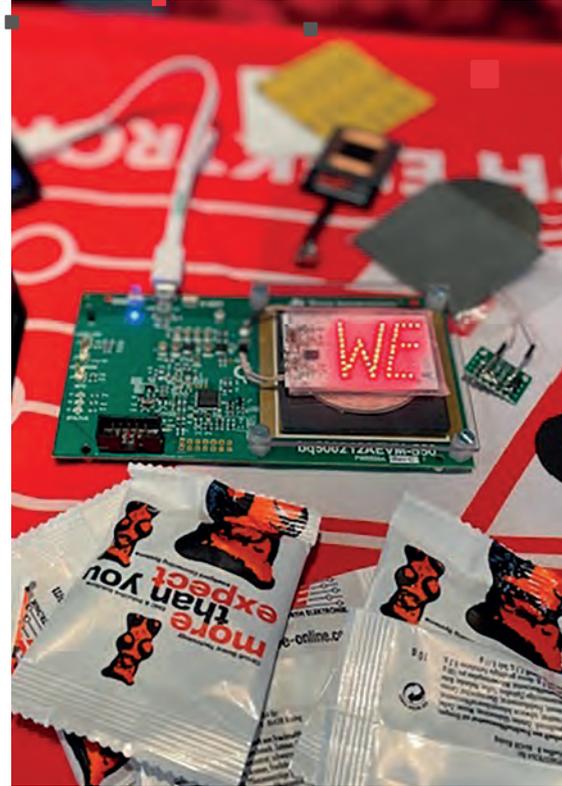
From EMC components to RF modules and switches, Würth Electronics' product portfolio comes with technical expertise and commercial advice

Würth Electronics specialises in the European electronic and electromechanical components market. The company's product portfolio includes: EMC components, capacitors, inductors, RF inductors/LTCC components, transformers, circuit protection components, power modules, LEDs, connectors, switches and power elements.

At ECS, business managers and field application

engineers will be on hand to offer technical support for projects and products visitors are working on. The company's business managers offer detailed knowledge of their product ranges, while field application engineers use their in-depth specialist engineering backgrounds to support customer enquiries. From a free sample service for prototyping to high volume purchasing for production batches, WE's business managers are available to help with sourcing requirements.

Over recent years WE has expanded and now offers a range of catalogue products from its Wireless Connectivity Division. As a leading supplier for low power ISM/SRD products in Europe, the division supplies compact short range RF modules for rapid implementation of cable-free data links. These find application in home/building automation, automatic meter reading solutions, sensor networks, IoT, logistics, environmental monitoring, access control and healthcare.



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Empowering electronics manufacturers

Vision Engineering presents visitors with its stereo microscopes, ideal for tasks ranging from goods-in and final inspection to component identification and fault detection

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Lynx EVO is ideal for inspection and rework and offers generous space for working with tools. No eyepieces to set up for different users, with focusing and illumination controlled by simple dials. The optional oblique

and direct viewer provides an angled view of the subject, letting users rotate their view around the point of interest.

The DRV-Z1 (Deep Reality Viewer) is the world's first and only digital stereo inspection system which creates full 3D HD images, which 'float' in front of users' eyes. No special glasses or unpleasant side effects. Just view high definition 3D images, with outstanding depth perception.

Ideal for inspection and manufacturing applications, the award-winning DRV-Z1

combines the capabilities of an optical stereo microscope with digital measuring technology, in a single unique system.

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Sourcing, BOM Management and more

Visit SeSemi Electronics' ECS stand to discover how the company is helping manufacturers navigate their way through the huge disruption impacting the electronics sector

SeSemi Electronics is a UK-based distributor of electronic components, working with OEMs and CEMs worldwide, in all sectors of electronic design and manufacturing. The company provides services including component sourcing, product kitting and BoM management.

The electronics market is currently going through huge disruption, with allocation causing havoc to industries around the globe. According to experts, this disruption looks set to continue throughout the year and possibly beyond. Finding a sourcing partner has become a key factor for many businesses and SeSemi states its component sourcing service has become integral for many of its customers.

SeSemi has longstanding relationships with suppliers worldwide, design

registered parts stocked globally and a live insight to everchanging stock availability. The company has supported its customers daily throughout this challenging market and helped to keep production lines up and running.

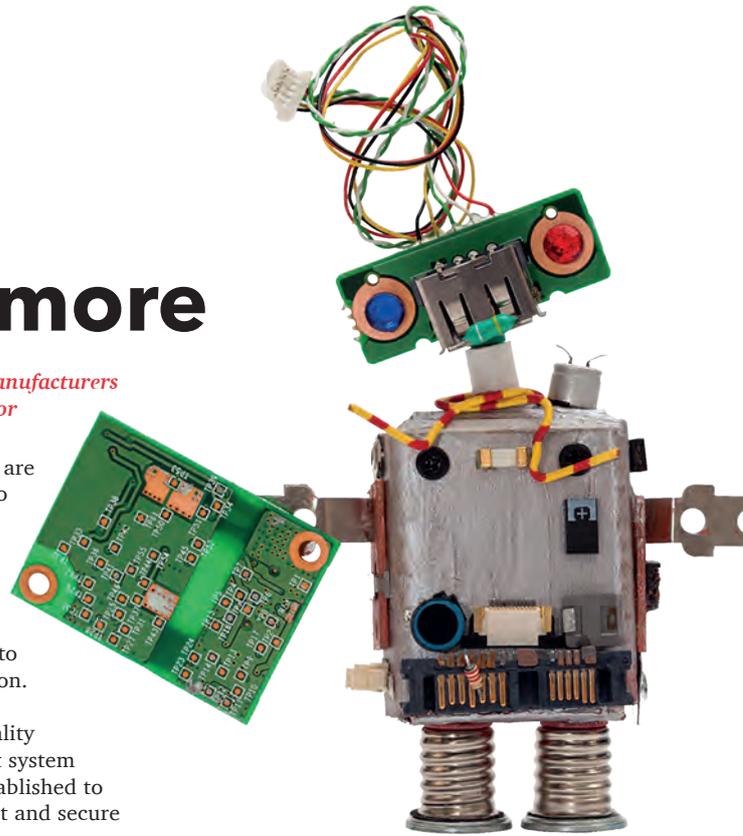
The BoM management service has proven a useful resource with the planning of new and existing projects, providing customers with up-to-date information on each component's lifecycle and availability. SeSemi analyses the BoM's overall risk factor, reporting back any obsolescence, as well as providing lead times and availability status.

The company works with an array of franchise partners offering a range of products and technologies, including high temperature memory devices, crystals, capacitors and connectors.

Components are distributed to customers globally, offering continued support from design to full production.

SeSemi's quality management system has been established to create a strict and secure supply chain program. Risk management is a key part within the company purchasing structure and is taken extremely seriously. Whilst the industry is going through such a big disruption, it is paramount for this process to remain of upmost importance. SeSemi is certified to ISO9001 and dedicated to adhering to the goals and high standards set within the QMS.

www.sesemi.co.uk



The electronics market is currently going through huge disruption, with allocation causing havoc to industries around the globe



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As quality data is important, the range is supported with accurate user information and approvals

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As a specialist in electronic engineering, Alpha 3 Manufacturing supports customers across multiple industries with harnesses, components and complex assemblies

Alpha 3 Manufacturing has two UK facilities. Scunthorpe-based DEM Manufacturing is dedicated to EMC filters, electronic enclosures and panel building, while Stoke-On-Trent-based Tekdata Interconnections designs and produces bespoke interconnection solutions and cable harnesses.

With its wide-ranging capabilities, the company can take projects from concept to production, including drawing support, design advice, testing and component sourcing to help customers cut costs and save time. The engineering team can also support project objectives such as cost reduction or quality improvement to meet customers' needs.

Whether customers require a waterproof enclosure, machined, painted and assembled for rail communication systems, cable harnesses for forensic science equipment or ribbon cables to meet size constraints within satellites, Alpha 3 Manufacturing offers itself as a reliable, proven and trusted partner.

Alpha 3 Manufacturing can also meet the stringent requirements of the aviation, defence and space industries with AS9100D accreditation. The company has over 50-years' experience supplying cryogenic cables for low temperature and ultra-low temperature detectors, plus solutions for ground support systems, seating and galley

units, flight monitoring equipment and more.

Alpha 3 Manufacturing's ECS stand will feature a selection of products which demonstrate the services on offer, from ribbon cables and bespoke overmoulding, to waterproof enclosures and EMC filters. Representatives will be on hand to discuss current or future project needs.

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Solving technology challenges for a sustainable world

TT Electronics' ECS stand will showcase technologies ranging from medical power supplies and IoT frameworks to human machine interfaces for demanding environments

TT Electronics will be showcasing its industrial and medical AC/DC power supply solutions which are designed with an understanding of market demands and regulatory approvals for clinical and home healthcare environments.

TT's engineers work with customers through concept development, specifications, electrical and mechanical design, prototype build, testing, DVT, EMC, safety approvals and certification support. To ensure the highest levels of safety and reliability, the company's engineering and

manufacturing teams utilise DFMEA and PFMEA processes and the manufacturing facilities are ISO9001, ISO13485 and ISO14001 certified.

Exhibits will also include the S-2Connect range, an end-to-end IoT framework designed to seamlessly deliver hardware, connectivity, infrastructure and user experience solutions. By streamlining the secure connection of products and systems, users can achieve tangible results such as improving efficiencies, eliminating unnecessary maintenance, reducing

carbon footprint and enabling data-led business decisions.

TT's human machine interface team will also be at ECS. TT's involvement in customised human machine interface technologies stretches over 30-years, partnering with customers to deliver HMI solutions engineered to improve user experience, enhance communications and boost productivity. With a history of developing innovative solutions for demanding environments (including patented thin film backlighting, capacitive

touch technology, integral RFI screening and flexible illumination techniques) the company is a trusted value-added partner to global OEMs in the aerospace, military, medical, industrial and transportation industries.

TT Electronics Connectors specialises in the design and manufacture of complex circular connectors and interconnect systems for defence, industrial and rail applications.

www.ttelectronics.com



Industry wide connectivity

Fischer Connectors designs, develops and deploys connectivity solutions for applications ranging from defence and medical to industrial automation

High speeds in ever smaller footprints: 3 new configurations launched in the Fischer MiniMax™ Series

Tested for ruggedness, sealing, data transmission and miniaturization, Fischer Connectors' interconnect solutions include connectors, cable assemblies and electronic solutions for power, signal and data requirements.

Engineered for easy integration/use and designed with human factors and system-level engineering in line with SWaP (size, weight and power) requirements, more than

30,000 references of low/high voltage, coax/triax, hybrid, fibre optic, push-pull, circular and fluid/gas connectors are available in five product lines. Features and benefits include high data speeds, high density, IP68/69 sealing and resistance to extreme temperatures, shock and vibration.

Cable assembly capabilities include design assistance, technical drawings and 100 per cent electrical and sealing testing for high-speed data transmission, single pair Ethernet, miniature, silicone, fibre optic, rugged and optimised cabled solutions.

Electronic solutions include: tailored flex circuits for military radio units, nuclear control instruments and racing car dashboards; adapter modules for USB-Ethernet radios, computer peripherals and medical scanners; unmanaged PoE+ switches and managed switches with Time Sensitive Networking (TSN) technology for military, industrial and maritime applications; rugged flash drives for ruggedized computers, motorsports, UAVs, dismounted soldier systems; visible low-light cameras for security, vehicle identification and emergency services applications; tactical power

and data hubs for sights, radios, displays and batteries body-worn by dismounted soldiers and security officers.

Fischer Connectors' key benefits include a tailored, program management, single-sourcing approach based on customer specifications with the entire chain of experts, responsiveness, fast prototyping, reduced time-to-market and quick production turnaround through global footprint.

www.fischerconnectors.com

Buyers' Guide

Manufacturer	Distributor	Telephone	Website	Franchised Distributor	No. of Lines for Principal	Stock Value for Principal	Minimum Order Value	% Lead Free for Principal Range	No. of Technical Support Staff	Total No. of Staff	Buffer Stock Facility
CABLE ASSEMBLY & HARNESSING											
Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,000	N/A	0 €	N/A	50	2,500+	Y
FTDI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	50	N/A	0 €	N/A	50	2,500+	Y
Harwin	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,550	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
CIRCUIT PROTECTION											
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,800	N/A	0 €	N/A	50	2,500+	Y
EPICOS/TKD	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,950	N/A	0 €	N/A	50	2,500+	Y
Littelfuse	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	11,450	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,150	N/A	0 €	N/A	50	2,500+	Y
ENCLOSURES											
Bud Industries	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,600	N/A	0 €	N/A	50	2,500+	Y
Hammond	Switch Electronics	01482 862255	switchelectronics.co.uk	Y	500	N/A	£0	70%	2	6	Y
Hammond	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,350	N/A	0 €	N/A	50	2,500+	Y
Metcase Enclosures	OKW Enclosures	01489 583858	www.metcase.co.uk	N	288	£40,000	£0	N/A	5	22	Y
New Age Enclosures	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
OKW Enclosures Ltd	OKW Enclosures	01489 583858	www.okw.co.uk	N	1,955	£40,000	£0	N/A	5	22	Y
Rolec Enclosures	OKW Enclosures	01489 583858	www.rolec-enclosures.co.uk	Y	935	£40,000	£0	N/A	5	22	Y
Teko Enclosures	OKW Enclosures	01489 583858	www.teko.co.uk	Y	1,860	£40,000	£0	N/A	5	22	Y
FREQUENCY MANAGEMENT											
ABRACON	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,750	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
ECS	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,050	N/A	0 €	N/A	50	2,500+	Y
Epson	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	900	N/A	0 €	N/A	50	2,500+	Y
Golledge Electronics Ltd	Golledge Electronics Ltd	01460 256 100	www.golledge.com	N	N/A	£800,000	£0	100%	12	24	Y

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IQD Frequency Products	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,500	N/A	0 €	N/A	50	2,500+	Y
Jauch Quartz	Digi-Key Electronics	0800 587 0991	www.digkey.co.uk	Y	500	£250,000	0	100%	15	130	Y
Kyocera	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	950	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
TXC Corporation	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
HEATSINKS											
Aavid	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
ICs & SEMICONDUCTORS											
Alliance Memory	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18,700	N/A	0 €	N/A	50	2,500+	Y
	Avant Electronics LTD	01449 774247	www.avantelectronics.co.uk	N	5000	N/A	£100	N/A	2	10	Y
Broadcom Limited	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Central Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,250	N/A	0 €	N/A	50	2,500+	Y
Cirrus Logic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Cree, Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Diodes Incorporated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	8,200	N/A	0 €	N/A	50	2,500+	Y
FTDI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	100	N/A	0 €	N/A	50	2,500+	Y
Infineon	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	8,300	N/A	0 €	N/A	50	2,500+	Y
Intel	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,750	N/A	0 €	N/A	50	2,500+	Y
Maxim Integrated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	14,050	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	24,200	N/A	0 €	N/A	50	2,500+	Y
Micron Technology	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
Monolithic Power Systems (MPS)	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	850	N/A	0 €	N/A	50	2,500+	Y
Nexperia	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,600	N/A	0 €	N/A	50	2,500+	Y
Nordic Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	60	N/A	0 €	N/A	50	2,500+	Y
NXP	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
ON Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18,700	N/A	0 €	N/A	50	2,500+	Y
Power Integrations	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	750	N/A	0 €	N/A	50	2,500+	Y
Qorvo	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	700	N/A	0 €	N/A	50	2,500+	Y
Renesas Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,550	N/A	0 €	N/A	50	2,500+	Y
ROHM Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,900	N/A	0 €	N/A	50	2,500+	Y
Semtech	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	350	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
Skyworks	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
STMicroelectronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10,050	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	39,050	N/A	0 €	N/A	50	2,500+	Y
Toshiba	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,050	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10,850	N/A	0 €	N/A	50	2,500+	Y
Xilinx	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,900	N/A	0 €	N/A	50	2,500+	Y
INTERCONNECTION											
3M	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,750	N/A	0 €	N/A	50	2,500+	Y
Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	33,200	N/A	0 €	N/A	50	2,500+	Y
Cinch Connectivity Solutions	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,250	N/A	0 €	N/A	50	2,500+	Y
FCI / Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,850	N/A	0 €	N/A	50	2,500+	Y
HARTING	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,800	N/A	0 €	N/A	50	2,500+	Y
Harwin	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,950	N/A	0 €	N/A	50	2,500+	Y
Hellermann Tyton	Lane Electronics	01403 790661	www.fclane.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	Y
Hirose Electric	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,850	N/A	0 €	N/A	50	2,500+	Y
Huber+Suhner	Lane Electronics	01403 790661	www.fclane.com	Y	766	£116,000	£0	100%	6	38	Y
Intelliconnect (Europe) Ltd		01245 347145	www.intelliconnect.co.uk	N/A	N/A	N/A	N/A	100%	5	30	
ITW McMurdo	Lane Electronics	01403 790661	www.fclane.com	Y	866	£219,000	£0	100%	6	38	Y
JAE Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	23,600	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	17,150	N/A	0 €	N/A	50	2,500+	Y
Polamco	Lane Electronics	01403 790661	www.fclane.com	Y	218	£146,000	£0	100%	6	38	Y
Positronic	Lane Electronics	01403 790661	www.fclane.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	Y
Radiall	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y
Samtec	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	16,300	N/A	0 €	N/A	50	2,500+	Y
Souriau	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,300	N/A	0 €	N/A	50	2,500+	Y
Souriau	Lane Electronics	01403 790661	www.fclane.com	Y	1,929	£806,000	£0	100%	6	38	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	41,850	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,650	N/A	0 €	N/A	50	2,500+	Y

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MEDICAL CERTIFIED											
Review Display Systems		01959 563 345	www.review-displays.co.uk				£100				
OBSCOLESCENCE / HARD TO FIND											
	Cyclops Electronics	01904 415 415	www.cyclops-electronics.com	N/A	177,232	£12m	£100	75%	3	78	Y
Rochester Electronics	Rochester Electronics	+44.1480.408400	www.rocelec.com	Y	299	N/A	\$250	N/A	10	400+	Y
OPTO ELECTRONICS											
Broadcom Limited	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,300	N/A	0 €	N/A	50	2,500+	Y
Cree, Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,800	N/A	0 €	N/A	50	2,500+	Y
Intel	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	20	N/A	0 €	N/A	50	2,500+	Y
Osram Opto Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,300	N/A	0 €	N/A	50	2,500+	Y
Toshiba	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	450	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y
PASSIVES											
AVX	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	17850	N/A	0 €	N/A	50	2,500+	Y
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	15,100	N/A	0 €	N/A	50	2,500+	Y
Coilcraft	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,750	N/A	0 €	N/A	50	2,500+	Y
EPCOS / TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,450	N/A	0 €	N/A	50	2,500+	Y
KEMET	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	23,650	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18700	N/A	0 €	N/A	50	2,500+	Y
Ohmite	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,550	N/A	0 €	N/A	50	2,500+	Y
Panasonic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25,450	N/A	0 €	N/A	50	2,500+	Y
Taiyo Yuden	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,100	N/A	0 €	N/A	50	2,500+	Y
TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	13,050	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	11,500	N/A	0 €	N/A	50	2,500+	Y
TT Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,050	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	43850	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,750	N/A	0 €	N/A	50	2,500+	Y
Yageo	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	21,450	N/A	0 €	N/A	50	2,500+	Y
PASSIVES ALTERNATIVES											
BEC Distribution Ltd		01844 275824	www.bec.co.uk		5,000	N/A	£0	100%	3	5	Y
POWER & BATTERIES											
FRIVO Gerätebau GmbH	Haredata Electronics	01423 796240	www.haredata.co.uk	Y	250 - 500	€1M	£250	100%	7	14	Y
Jauch Quartz		01276 605900	www.jauch.com			£500,000	0	95	15	130	Y
Mean Well	Ecopac (UK) Power Ltd	01844 204420	www.ecopacpower.co.uk	Y	6,000	£2M	£0	100%	8	30	Y
Bel Power Solutions	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
CUI Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
MEAN WELL	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,400	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1500	N/A	0 €	N/A	50	2,500+	Y
RECOM	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,150	N/A	0 €	N/A	50	2,500+	Y
TDK-Lambda	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,900	N/A	0 €	N/A	50	2,500+	Y
TRACO Power	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,000	N/A	0 €	N/A	50	2,500+	Y
Vicor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,300	N/A	0 €	N/A	50	2,500+	Y
XP Power	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
SENSORS											
ams	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	300	N/A	0 €	N/A	50	2,500+	Y
Bosch	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25	N/A	0 €	N/A	50	2,500+	Y
Honeywell	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
Maxim Integrated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	350	N/A	0 €	N/A	50	2,500+	Y
NXP	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	300	N/A	0 €	N/A	50	2,500+	Y
Sensirion	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	80	N/A	0 €	N/A	50	2,500+	Y
STMicroelectronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	75	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	650	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	850	N/A	0 €	N/A	50	2,500+	Y
SWITCHES & KEYBOARDS											
Apem	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,850	N/A	0 €	N/A	50	2,500+	Y
C&K Switches	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,550	N/A	0 €	N/A	50	2,500+	Y
E-Switch	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y
EAO	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,800	N/A	0 €	N/A	50	2,500+	Y

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Honeywell	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
NKK Switches	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,000	N/A	0 €	N/A	50	2,500+	Y
Omron	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
Panasonic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,350	N/A	0 €	N/A	50	2,500+	Y
TERMINAL BLOCKS											
Marathon Special Products	Global Supply Services	01904 436 488	www.global-supply-services.com	Y	8,000	£800,000	£100	100%	3	11	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,850	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	13,550	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,750	N/A	0 €	N/A	50	2,500+	Y
THERMAL MANAGEMENT											
Bergquist Company	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	250	N/A	0 €	N/A	50	2,500+	Y
Delta Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	700	N/A	0 €	N/A	50	2,500+	Y
ebm-papst	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
EMI Thermal	EMI Thermal	01992 510000	www.emithermal.com	N	800	N/A	£20	100%	12	200	Y
Materials Direct	Materials Direct	+44 (0)1908 222 211	www.materials-direct.com	N/A	N/A	£1,000,000	£0	N/A	5	55	Y
Sanyo Denki	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Sunon	G.English Electronics Ltd	0208 855 0991	www.gelec.co.uk	Y	3,500	£1,000,000+	£0	100%	10	28	Y
Sunon	Thermaco Ltd	01684 566163	www.thermaco.co.uk	Y	3,500	£450,000	£100	100%	7	15	Y
Universal Science	Universal Science	+44 (0)1908 222 211	www.universal-science.com	N/A	N/A	£1,000,000	£0	N/A	5	55	Y
TRANSFORMERS & INDUCTORS											
Best Windings	Best Windings	0044 (0)1394 448424	www.bestwindings.co.uk	N	300	N/A	£100	N/A	2	24	Y
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,900	N/A	0 €	N/A	50	2,500+	Y
Coilcraft	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,500	N/A	0 €	N/A	50	2,500+	Y
EPCOS / TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,300	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,900	N/A	0 €	N/A	50	2,500+	Y
TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,050	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,200	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,400	N/A	0 €	N/A	50	2,500+	Y
WIRELESS SOLUTIONS											
DIGI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Espressif	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	30	N/A	0 €	N/A	50	2,500+	Y
Laird Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	100	N/A	0 €	N/A	50	2,500+	Y
Lantronix	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	30	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	20	N/A	0 €	N/A	50	2,500+	Y
u-blox	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10	N/A	0 €	N/A	50	2,500+	Y

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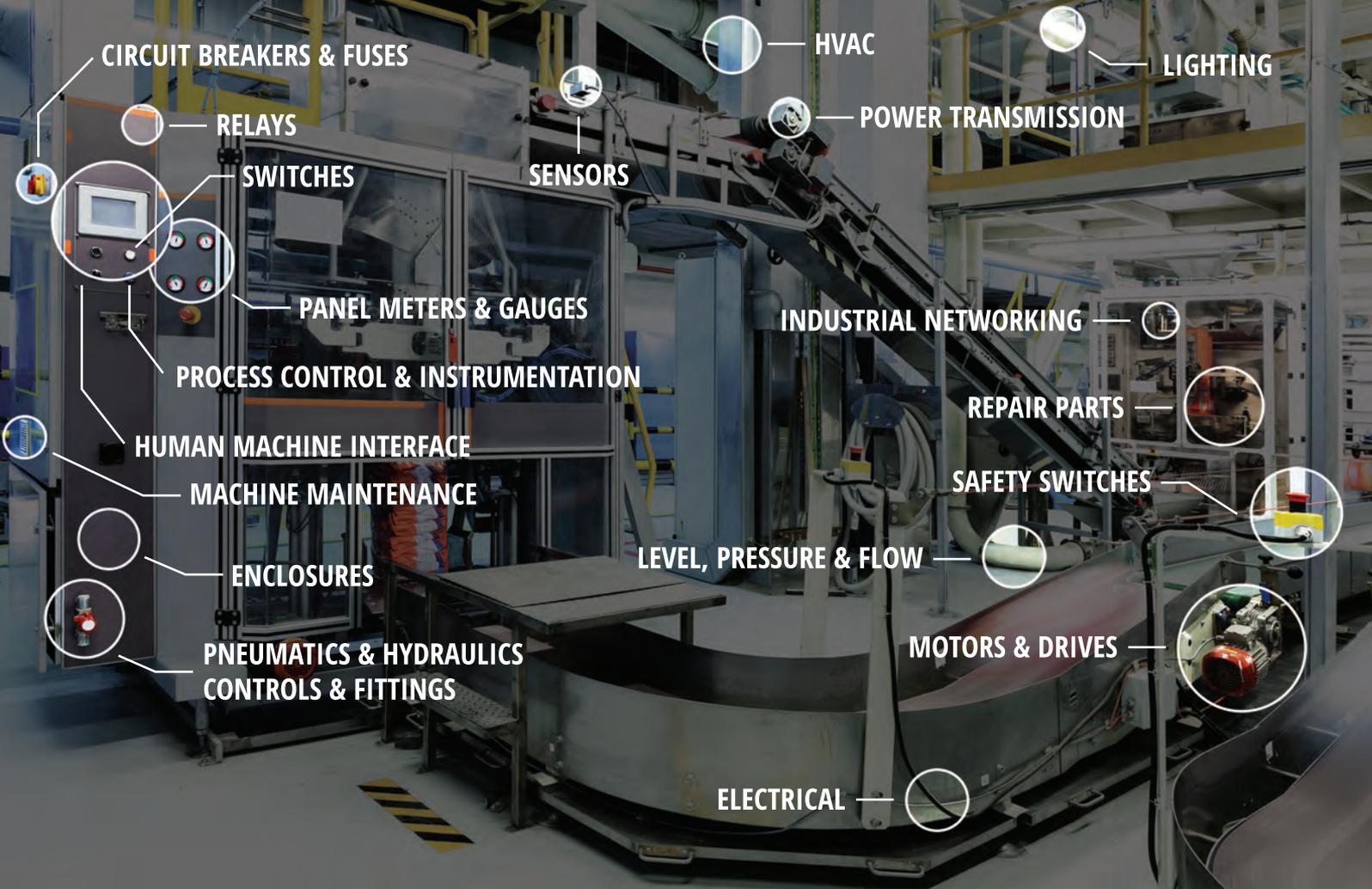
Manufacturer	Telephone	Website	Turnover	Location	Employees	Number of Surface Mount Lines	Approvals	BGA Capacity	Lead Free Manufacturer	Prototyping	Design Capability	Full Turnkey	Cables and Harnessing
Challenger Solutions Ltd	01245 325252	www.challengersolutions.com	£10m	Essex/SE	70	9	AS9100 Rev D, ISO9001:2015, ISO 140001:2015, UL, CCC, IPC-610-G Class 3, TUV	Y	Y	Y	Y	Y	Y
CML Innovative Technologies (uk) Ltd	01284 714700	www.cml-it.com	£12M	UK/EU/China	65		ISO9001, TS16949, UL ISO9001 2015, IATF 16949 2016	N	Y	Y	Y	Y	Y
Corintech Ltd	+44 (0)1425 655655	www.corintech.com	£12.5m	UK & Far East	72	10	AS9100, ISO9001, IPC-A-610 Class 3, J-STD-001	Y	Y	Y	Y	Y	Y
Custom Interconnect Ltd	01264 321321	www.cil-uk.co.uk	£18.6m	Andover (Hampshire)	130	6	AS9100 ISO13485 ISO9001 IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y
Electronic Technicians Ltd	01202 897722	www.etl.co.uk	£3.7m	SE	50	2	AS9100, ISO9001, ISO14001, IPC610/620 Class 3	Y	Y	Y	Y	Y	Y
Esprit Electronics Ltd	02380 455411	www.espritelectronics.com	£11m	Hampshire	80	4	ISO9001:2008, IPC610 to Class 3	Y	Y	Y	Y	Y	Y
FermionX Ltd	+44(0)1903 524600	www.fermionx.com	£5m	Worthing, W. Sussex	40	4	ISO9001:2015, ISO14001:2015, IPC 610 A Class 2 & 3	Y	Y	Y	Y	Y	Y
G&B Electronic Designs Ltd	01420 474188	www.gandbelectronics.co.uk	£4.6m	Hampshire	60	2	ISO9001, ISO13485, IPC-A-610, IPC-J-STD-001, IPC 7711/7721	Y	Y	Y	N	Y	N
Hallmark Electronics Ltd	01782 562255	www.hallmarkelectronics.com	£2.4m	Staffordshire	26	2	ISO9000/UL, IPC610/D	Y	Y	Y	Y	Y	Y
Icon Electronics Limited	01423 449080	www.iconelectronics.co.uk	£6.5m	Hampshire & Yorkshire	70	5	AS9100, ISO9001, BS EN ISO/IEC 80079-34:2018 ATEX, IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y
Incap Electronics UK Limited	01782 753200	www.incapcorp.com	£113m+	UK, Slovakia, Estonia & India	2,000	20	ISO9100, ISO14001, ISO13485, AS9100D, ISO45001 & IATF16949	Y	Y	Y	Y	Y	Y
Industrial Electronic Wiring Ltd.	+44(0)1793 694033	www.iwew.co.uk	£5.5m	Swindon, UK	60	N/A	ISO9001:2015, IPC610, IPC620	N	Y	Y	N	Y	Y
Jaltek	01582578170	jaltek.com	£10m	UK	90	3	AS9100, ISO9001, ISO13485, IPC-A-610 Class 3, Certified IPC Trainer (IPC-A-610, J-STD-001 & J-STD-001 Space Addendum)	Y	Y	Y	Y	Y	Y
KEY-TECH ELECTRONIC SYSTEMS	01592 597711	www.key-tech.co.uk	£7m	Scotland	65	2	ISO9001:2015, J-STD-001, IPC-610/620 CLASS 3, IPC-7711, BS EN ISO13485:2016, ISO 13485	Y	Y	Y	N	Y	Y
Nemco Limited	01438 346600	www.nemco.co.uk	£15.9m	SE	120	6	AS9100, ISO9001:2008, IPC610/620 to Class 3, ISO14001-2004, SC21	Y	Y	Y	Y	Y	Y
NOTE Group	01753 746700	www.note-uk.co.uk	£207m	UK/EU/China	1,200	20	IPC610 to Class 3, ISO9001:2015, 13485, 14001, 18001	Y	Y	Y	Y	Y	Y
M-TEK (Assembly) Ltd	01189 455377	www.mtek.co.uk	£2.4m	SE	30	4	ISO9001, ISO14001, IPC-A-610 Class 3, IPC-7711/7721, WHMA-3620, Certified IPC Trainer	Y	Y	Y	Y	Y	Y
Pektron	01332 832424	www.pektron.com	£50m	E-Midlands	350	8	ISO9001, ISO14001, TS16949, BEAB, VCA, TUV, UL	Y	Y	Y	Y	Y	Y
Simtek EMS Ltd	01843 233120	www.simtekems.co.uk	£8.2m	SE	77	3	ISO9001:2008, ISO13485, IPC-A-610 Class 3 & IPC-7711	Y	Y	Y	Y	Y	Y
TEXCEL TECHNOLOGY PLC	+44(0)1322621700	www.texceltechnology.com	£15.5m	SE	131	7	ISO9001, ISO14001, IPC610 Class 3,	Y	Y	Y	Y	Y	Y
Tioga Limited	01332 360884	www.tioga.co.uk	£16m	Derby	130	6	ISO 9001, ISO 13485, ISO14001, IPC 610, 620, 7711/7721	Y	Y	Y	Y	Y	Y
Wilson Process Systems	01424 722222	www.wps.co.uk	£12m	SE	100	5	ISO9001:2015, IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y

PCB Buyers' Guide

Manufacturer	Telephone	Website	Service Provided (e-Block, Manufacture &/or Repair)	Location	Approvals	Volume - Small, Medium, Large	Double-sided	Multi-Layer 4-10/10-20-30	Metal PCBs	Ceramic PCBs	Heavy Copper PCBs	Flex / Flex-Rigid	Obsolescence Solutions	Modifications	Prototyping
ABL Circuits Ltd	01462 894312	www.ablcircuits.co.uk	M	SE	ISO9000: 2015	SML	Y	4-10	Y	N/A	N/A	Y	Y	Y	Y
Cambridge Circuit Company Ltd	01223 423100	www.cambridge-circuit.co.uk	M	SE	ISO9001:2015, UL, ISO 14001:2015	SML	Y	4-16	Y	N/A	N/A	Y	Y	Y	Y
DK-Daleba Printed Circuit Boards	01992 510000	www.dk-daleba.co.uk	M	UK, Europe, Asia	ISO 9001:2015, UL, TS16949, IOSCAR	SML	Y	4-58	Y	Y	Y	Y	Y	Y	Y
GSPK Circuits Ltd	+44 (0)1423 798 740	www.gspkcircuits.ltd.uk	M/R	UK, Europe, Asia	ISO 9001:2015, IATF 16949:2016, EN (AS) 9100, Joscscar	SML	Y	4-34	Y	Y	Y	Y	Y	Y	Y
Tate Circuit Industries Ltd	01543 622 435	www.tatecircuits.com	M/B	UK/China	ISO 9001:2015, UL	SML	Y	4-20	Y	N/A	N/A	Y	Y	Y	Y

Advert Index

Advert	Page	Advert	Page
4Most Electronics	49	Lemo UK Ltd	62
Aerco	48	Lincoln Bins	65
Alpha 3 Manufacturing	64	Luso Electronics	59
Anders	51	ODU	72
Anglia Components Ltd	BC	OKW Enclosures	27
Astute	14, 15 & 29	Omron	53
Azogo	63	Micronel	40
Best Windings Limited	81	Micross	43
Binder	60	Midas Displays	16 & 76
CamdenBoss	24 & 61	Mouser Electronics	9, 11 & 37
Charcroft Electronics	57	M-TEK	51
Cliff Electronic Components	64	NCAB	47
CML Innovative Technologies LTD	17 & 35	Nicab	45
Cupio Services	75	Nicomatic	59
Design Engineering Expo	5	Pacer	75
Digi-Key Electronics	FC & IFC	Phoenix Dynamics	61
DOLD Industries	68	Phoenix Contact	41
DSL	41	Photronic	56
eBOM.com	11	Powell	44
ECIA (Trusted Partners)	13 & 21	QPE	39
EDAC	45	Rapid	38
Electronic Component Show (ECS)	9 & 26	Review Display Systems (RDS)	43
Esprit Electronics Limited	58	Rebound Electronics UK	7 & 65
European Circuits Ltd	53	Retronix	38
Farnell	50	Rhode & Schwarz	31
FC Lane Electronics	74	Rittal	22 & 23
FermionX Ltd	66	RJS Electronics	60
Fischer Connectors	67	Rochester Electronics	55
Force Technologies	73	Schurter Electronic Components	33
Future Facilites	33	SeSemi Electronics	72
Galco	IBC	Soild State Supplies	69
GELEC	46	Speed Assembly Services	53
Hamamatsu	58	Switchtec	66
Hammond Electronics	25	TT Electronics	66
Harwin	52	Vision Engineering	71
InCap	65	Würth Elektronik	7 & 65
Jaltek Systems	19	Yamachi Electronics	67



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