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JULY 2023

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**AUTOMATION
WHERE NEXT?**
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On the cover – July 2023

Automation, where next?
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Editor's Word



Automation, where next?

If there is one area of engineering where I have spent most of my time, both professionally and as a maker, it is automation. Interestingly, if the definition of automation is 'reduce human intervention in processes' my work with both physical machines and software applications must count towards my automation experience.

Everywhere I look I see opportunities to automate. However, for the electronics industry to implement an effective long-term supply chain strategy for automation technology it needs to know where future growth will originate. Here are some guesses.

Firstly, as populations age and birth rates fall, logically, the number of older, isolated individuals will increase. Social robots could ride to the rescue. Regardless of their form—human, animal or machine—they could act as a companion, helper, nurse, shopper and more. In fact, at a recent university open day I witnessed just such a project.

Secondly, I can visualise a future where domestic micro manufacturing allows households to become productive assets for the benefit of families and the state. This will be based around additive manufacturing and cobots.

Thirdly, as more businesses confront their Scope 1 and 2 emissions targets, they will need to improve their productivity while simultaneously reducing their energy consumption. This will require the wholesale replacement of old, dumb, energy hungry automation with new generations of smart, efficient systems.

I could go on. These three examples are the tip of a coming automation iceberg, pushed along by diverse individual, local, national and global goals. My guess is that any distributor with a finger in the automation pie is looking at a rosy future.

Jon Barrett

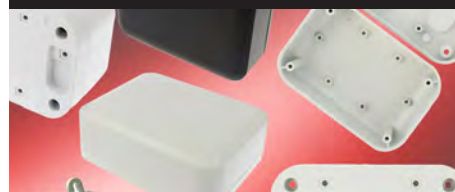
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Contact

EDITORIAL

Managing Editor: Jon Barrett
jonb@electronics-sourcing.co.uk
Contributing Editor: Amy Barker
amyb@electronics-sourcing.co.uk

ADVERTISING

Director of Sales: Emma Evernden
emma.evernden@electronics-sourcing.co.uk
Sales Executive: Alex Mosqueda
alex.mosqueda@electronics-sourcing.co.uk

PRODUCTION & DESIGN

Production Manager: Jo McCarthy
jo.mccarthy@mmgpublishing.com
Creative Artworker: Tom Claydon-Smith
tom.claydon-smith@electronics-sourcing.co.uk

ELECTRONICS

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PUBLISHING

CIRCULATION

Circulation Account Manager: Liz Poole
liz.poole@electronics-sourcing.co.uk
Data & Software Analyst: Thomas Smart
thomas.smart@mmgpublishing.co.uk

PUBLISHER

Mark Leary
mark.leary@electronics-sourcing.co.uk
Director of Operations: Denise Pattenden
denise.pattenden@mmgpublishing.co.uk

Issue 205, Vol.19 No.07

Published 12 times per year
by MMG Publishing Limited
ANNUAL SUBSCRIPTION:
EU Countries £60 Rest of World £90

MMG PUBLISHING LTD
Suite 2, 1-3 Warren Court, Park Road,
Crowborough, East Sussex TN6 2QX
Tel: +44 (0)1892 613400
Fax: +44 (0)1892 613402
@Electrosourcing

Printed by: Pensord Press Ltd
Electronics Sourcing is printed on
sustainably sourced paper stock
ISSN 2043-9504
© 2023 MMG Publishing Ltd



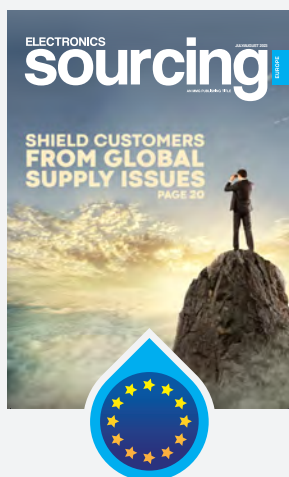
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Acquisition enhances interconnect offering

PEI-Genesis has acquired Czech Republic-based Bel Stewart s.r.o., a manufacturer and supplier of passive systems for data and telecommunication interconnection. The company will now be known as PEI-Genesis.

PEI-Genesis' president and CEO, Steven Fisher, said: "We consider ourselves to be the industry's trusted advisors, focused on solving our customers' interconnect problems. This acquisition enhances that capability, further encouraging our customers to partner with us for a broader range of products and services."

Bel Stewart comprises two divisions, one operating as a distributor of connectivity products and solutions, while the other is a manufacturer of copper and fibre cable

assemblies, serving sectors including telecommunications, networking, banking and public administration.

PEI-Genesis states both companies share common core values, integrating integrity, excellence, service and commitment to customers into every decision.

The division will be championed by PEI-Genesis' senior vice president and MD Europe, Jonathan Parry. Catherine Deswarte will remain as MD to help grow and integrate its operations into PEI-Genesis.

www.peigenesis.com



IoT antennas now shipping

Mouser Electronics is now shipping 5G Phantom 'no ground plane required' antennas from TE Connectivity/Laird External Antennas. The antennas provide manufacturers with a versatile global cellular antenna option for IoT, freight, transportation and public safety applications.

The products cover either the 617 to 7125MHz or 698 to 7125MHz frequency bands without needing a fixed ground plane, even for regions where lower 600MHz bands are required. These antennas offer global cellular coverage in a tamper-resistant, direct-mount, threaded stud with integrated N-female connector, for tamper-resistant installation.

The antennas' direct coaxial connection provides consistent performance, even at higher frequencies, avoiding performance losses of other mounting methods. Minimum gain ripple around horizon and uniform azimuth patterns reduce the chance of signal dropouts, while offering consistency and minimal shifting gain. The series delivers over 95 per cent efficiency up to 4200MHz and gain up to 8.0-dBi. These antennas also feature a tamper-resistant IP67-rated enclosure and UL94 flammability rating.

www.mouser.com

Investing in kitting and supply chain solutions

Easby Group has acquired Matrix Electronics, an electronics kitting and supply chain solutions provider. The deal was completed on 24 May by subsidiary business, Delta Impact. Easby Group states this is a major milestone in its strategic development to become the independent technical distribution partner of choice, for a full range of added value services across electronics supply chains.

Delta Impact's MD, Eamon Francis, said: "This is a significant step in our goal to be the electronics industry leader in kitting and tailored solutions that help customers to optimise their electronics supply chain performance."

Matrix Electronics' MD, David Piddington, added: "The Matrix and Delta Impact businesses are highly complementary and the merger of skills, knowledge and shared values in our new combined facilities will take us to new heights and create the next chapter in our growth story."

Easby Group chairman, Jonathan Simpson-Dent, concluded: "We are excited to bring together two dynamic and focused businesses under Eamon and David's joint stewardship. This is an important step on our journey to expand Easby Group into a real market leader in electronics supply chain solutions."

easby.com

Mitigating the risk of counterfeit components entering the supply chain

The Value of Using an Authorised Distributor

In the current market, design engineers frustrated by interruptions to their supply chain may resort to sourcing components from unfamiliar distribution sources. However, this decision is fraught with risk because some unauthorised distributors choose to source their components from the “grey market.” The provenance of such parts is often unknown, meaning their authenticity cannot be determined. It can be difficult to distinguish a counterfeit component from the genuine part because they are deliberately packaged to appear identical — featuring the same manufacturer branding and part number. Determining if a part is fake or genuine can only be done by carefully examining the internals of the package, a task that requires the use of an X-ray machine and specific testing skills.

A major concern associated with counterfeit components is that there is a high probability that they have not undergone the same rigorous levels of testing and quality control procedures that genuine parts have been subjected to. This means that they are more likely to exhibit inferior levels of performance, or even fail, in the field. Engineers who use counterfeit components could be exposed to legal actions relating to product

faults. With chip shortages still occurring with some products, individuals and OEMs are advised to only source components from authorised distributors with systems in place that allow them to trace their components back to the point of manufacture. This is especially important for components intended for use in medical or aerospace applications, which must have relevant documents and certification.

Mouser Electronics was the industry's first authorised distributor to be accredited with AS6496, the aerospace industry's high standard for anti-counterfeit measures in authorised electronic component distribution.

The AS6496 aerospace standard sets requirements for the avoidance, detection, mitigation, and disposition of counterfeit products in the authorised distribution supply chain. This international standard requires authorised distributors to have a counterfeit mitigation policy and a counterfeit electronics parts control plan. AS6496 is geared for all industries and individuals looking to reduce the risk of counterfeit electronic parts entering the supply chain.

Mouser is also registered to AS9100D, ISO 9001:2015, and ANSI/ESD S20.20-

2014, the industry's gold standards for quality, control, and electrostatic discharge (ESD). Registration to these standards lets customers know that Mouser is an authorised distributor of the highest quality components by providing traceability, risk management, process control, customer support, product availability and document control.

Mouser has rigorous processes in place to prevent counterfeit products entering its supply chain, so customers can be confident that the components they purchase are genuine.

In addition to product integrity, Mouser also assists its customers through real-time stock updates and obsolescence management and offers a variety of technical tools and resources to assist the design engineer.

Today, Mouser has 27 support locations worldwide, offering localised service for more than 650,000 customers in their local language, currency and time zone. Inside Mouser's vast Global Distribution Centre, you will find the industry's widest selection of products from over 1,200 manufacturer brands, with new products being added on a daily basis — all authorised, of course.

www.mouser.co.uk/quality



Mark Patrick
Technical Marketing Manager
EMEA Marketing

As Mouser Electronics' Technical Marketing Manager for EMEA, Mark Patrick is responsible for the creation and circulation of technical content within the region — content that is key to Mouser's strategy to support, inform and inspire its engineering audience.

Prior to leading the Technical Marketing team, Patrick was part of the EMEA Supplier Marketing team and played a vital role in establishing and developing relationships with key manufacturing partners.

In addition to a variety of technical and marketing positions, Patrick's previous roles include eight years at Texas Instruments in Applications Support and Technical Sales.

A “hands-on” engineer at heart, with a passion for vintage synthesizers and motorcycles, he thinks nothing of carrying out repairs on either. Patrick holds a first class Honours Degree in Electronics Engineering from Coventry University.

In Brief

Tiny IoT solution

Insight SiP's ISP2053 dual-core Bluetooth 5.2 module complements Rutronik's wireless portfolio. Measuring 8 by 8 by 1mm, the LGA module builds on the nRF5340 chip from Nordic Semiconductor and features dual-core Cortex-M33 CPUs, plus flash and RAM memory. The module suits medical, industrial and other complex IoT applications. www.rutronik24.com

Efficiency and power density

Farnell is now stocking a 1kW analogue bridgeless power factor correction device using BARBI topology from ST Microelectronics and Würth Elektronik. BARBI is designed to improve efficiency and power density. Despite being bridgeless, it can be controlled with an analog controller and doesn't require a complex transistor driving circuit since the switches are driven with LS gate-drivers. www.farnell.com

Very low acceleration sensitivity

Euroquartz has introduced two ranges of temperature-compensated crystal oscillators from Greenray Industries, offering very low acceleration sensitivity and tight temperature stability. The T58 and T56 offer a choice of CMOS or clipped sinewave output with frequencies between 10 and 52MHz over an operating temperature range from -40 to 85°C with ± 0.05 ppm temperature stability. www.euroquartz.co.uk

Efficient battery production

To address growing demand for batteries, a new joint venture company called Honda GS Yuasa EV Battery R&D Co Ltd will research and develop lithium-ion batteries and battery production methods. The company will strive to establish a supply chain for key raw materials and a highly-efficient battery production system. www.gs-yuasa.eu

Distribution deal for low power ICs

Distirelec is adding Japanese low power IC design specialist Torex to its portfolio. Torex is an analogue CMOS professional group that specialises in analogue power supply ICs. Stated as ultra-low power, space-saving and versatile, the company's components suit applications including industrial, automation, EV/green energy, IoT and wearable.

Over recent weeks, Distirelec has introduced 395 different Torex products to its website. Customers can place orders online for a variety of discrete semiconductors and integrated circuits: micro DC/DC converters,

LDO voltage regulators and power distribution switches are readily available.

Distirelec's product manager for semiconductors, passive components and optoelectronics, Lucy Henshaw, said: "This is great news for both Distirelec and Torex. It's a sound commercial match and we are thrilled to provide the European market with a range of high-quality low power semiconductor solutions at an attractive price point."

www.distirelec.com

Novel board-to-board connector hits the market

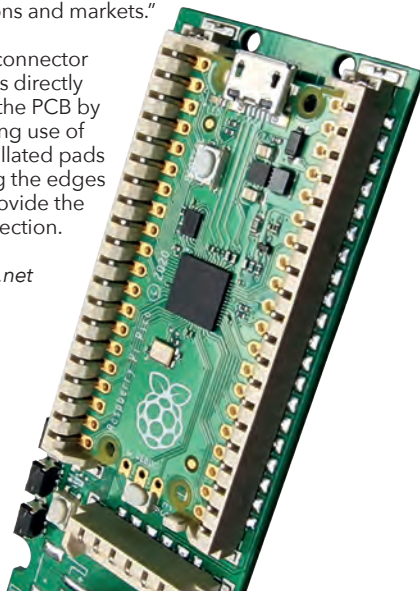
EDAC and OpenLX SP have launched Clipzin board-to-board connection technology. The patent-pending PCB-mounted edge connector allows simple fixing of single board modules, such as the Raspberry Pi Pico, to a host PCB.

As a surface mount connector, Clipzin simplifies manufacture and facilitates easy, rapid connection and disconnection of sub modules, while the retention clip ensures nothing shakes free during use. Thus, Clipzin suits development and mass production environments.

EDAC's sales director, Chrissy Cooper, said: "The creative minds at OpenLX together with our own engineering and manufacturing expertise has brought to market a simple, yet hugely flexible solution that can not only accelerate new product design but will revolutionise how production manufacturers can expand the capabilities of their own equipment, allowing effortless customisation for different functions, regions and markets."

The connector mates directly with the PCB by making use of castellated pads along the edges to provide the connection.

edac.net



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First customer shipments of stacked batteries

Ilika has made a number of first customer shipments of stacked Stereax M300 batteries from its UK manufacturing facility. These shipments are the first of a series to customers including CubeWorks, (developer of millimeter-scale smart sensing solutions for IoT) and Lura Health (developer of wearable intraoral biosensors for salivary diagnostics). Stereax batteries can be stacked, letting customers adapt capacity for their applications.

CubeWorks CEO, Gyouho Kim, said: "We are thrilled to start integrating Ilika's breakthrough battery technology to further enhance our CubiSens product line up. Batteries have traditionally been one of the major bottlenecks in IoT, and Ilika's battery technology offers a unique balance of form factor and performance that can complement our ultra-efficient SoC solution to achieve exciting new products."

Lura Health's CEO, Daniel Weinstein, added: "Small form factor is important in the design of Lura Health's salivary diagnostics sensor. We are looking forward to qualifying Ilika's technology and understanding its potential benefits to our future product road map."

www.ilika.com

HIGHLY ILLOGICAL

This month, Princeps' counterfeit investigation confirms that as components become harder to locate via trusted sources, the likelihood of encountering fake parts often increases

Figure 1 shows four apparently identical UV erasable programmable logic devices. This device was made obsolete in 2007, with no like-for-like replacement. Since the part had no availability from traceable sources, the device range had nearly 30 reported suspected counterfeit parts, several resulting in GIDEP (Government-Industry Data Exchange Program) alerts, plus a very high counterfeit risk score of almost 90 per cent.

The first stage of any physical examination is

optical microscopy, via which Princeps observed several different markings on the die through the glass window (Figure 2). This was followed up with decapsulation to take a closer look at the die—and found four differing die topographies (examples in Figures 3 and 4).

These kinds of changes would not typically occur during a single shift, so the presence of four different types of die within the sample confirms these are a variety of old parts, fraudulently presented as a single lot. The lot was reported to the ERAI (Electronic Resellers Association International) and removed from the supply chain.

www.princeps.co.uk

Figure 1 - UV erasable PLDs



Figure 2 - Through the window

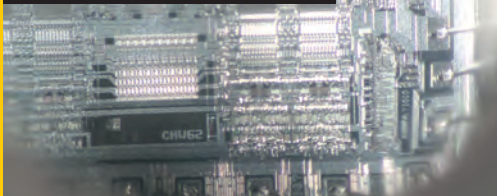


Figure 3 - Differing die topographies

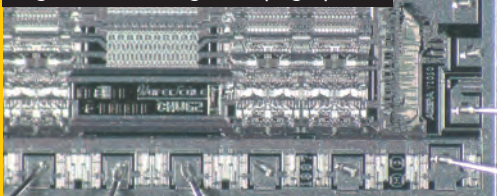


Figure 4 - Differing die topographies



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Design Flexibility and Innovation

by **Tim Carroll**, vice president, marketing and eCommerce at **DigiKey**



Often in our monthly columns for Electronics Sourcing, we share ideas and information about the digital tools and resources DigiKey offers procurement professionals, engineers and designers to make their jobs more efficient and flexible. DigiKey is continually innovating so we can accelerate progress for every engineer, designer and builder. Recently, we've also been working on design flexibility and innovation within our own brand and thinking about the way we're seen around the world.

The Updated "DigiKey"

To this end, DigiKey recently unveiled an update to its brand system including a refreshed logo, updated color palette and typeface, tagline, simplified name and updated brand voice.

The updated logo and brand system is an evolution of the company's historic look that

allows for design flexibility across digital platforms while reinforcing an engineered feel in a more modern, timeless way. It was designed to emphasize progress and connection with suppliers and customers while reflecting DigiKey's digital-first, forward-looking perspective. The refreshed brand identity also features a simplified company name to better reflect its deep technical product and digital solutions portfolio.

For 50 years, our focus has centered on accelerating progress for engineers, designers, makers and procurement professionals. DigiKey's updated look and feel reflects that inspirational progress, our leadership position in the industry and our commitment to digital experiences and solutions that move goods and ideas forward.

We Get Technical

DigiKey's brand refresh

combines its legacy of success with the vision for future opportunities and growth to support the core business and creates paths for bolder moves within an innovative industry. At DigiKey, we get technical because the technical aren't just who we serve, it's who we are.

DigiKey's commerce and logistics lead the industry by continually raising the bar on our operations, and the solutions we provide our clients. We build and apply a deep understanding of the market that translates into meaningful service for all. DigiKey delivers frictionless interactions to move people forward towards next-generation solutions, business growth and operational efficiency. Our new brand system reflects these deliverables that have always been at the core of who we are.

The timing for our design refresh also seems serendipitous. We've recently seen a rejuvenation from companies stressing the focus on new designs. The amount of engineering activity is extremely strong – companies now have the engineering resources at their disposal to focus on the products and designs of tomorrow and we're proud to help them accelerate that progress.

We're still the same DigiKey, we'll just start to look different. You'll see the refreshed DigiKey look on our website, on our boxes and shipping tape, at tradeshow and in magazines like Electronics Sourcing as we roll out our updated branding over the next year. We're excited to share our design innovations with you.

www.digikey.co.uk

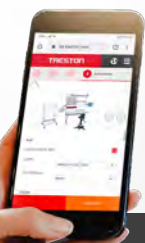
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Go anywhere enclosures now in customised versions



OKW's new Mini-Data-Box plastic enclosures for 'go-anywhere' miniaturised electronics are now available in customised versions.

Applications include IoT/IIoT, automation, security/surveillance, environmental monitoring, measurement/control, smart logistics, peripherals, interfaces and ICT.

Enclosures are delivered ready for the installation of electronic components which simplifies the supply chain.

Customisation services include machining, lacquering, printing, laser marking, EMC shielding and assembly of accessories.

Digital printing lets OKW add legends, logos and photo-quality graphics. Laser marking is ideal for consecutive numbering and small, machine-readable QR codes, barcodes and Data Matrix codes.

The square and rectangular enclosures are available with/without flanges for screws and cable ties. This allows quick, easy mounting to walls, ceilings and rails. Bevelled lid corners reduce weight and give the enclosures a smart 'diamond cut' appearance.

Four plan sizes are available 40 by 40, 50 by 50, 60 by 40 and 70 by 50mm in two heights 15 and 20mm. IP65 sealing is optional.

www.okw.co.uk



Reduced enclosure price point

Hammond's new 14 strong ABS 1556 family was inspired by the recently launched IP68 polycarbonate 1557 series. It follows the same rounded corners and top face styling, while introducing rectangular versions to complement the square format versions derived from the 1557 series.

IP54 sealed for general purpose indoor use, the ABS material offers a lower price point than polycarbonate which is designed for outdoor and aggressive environments. Self-tapping screws secure the lid, ideal for applications where repeated opening and closing is not required. There are multiple PCB mounting standoffs in the lid and base.

Four square plan sizes range from 80 by 80mm to 200 by 200mm. Three rectangular designs range from 120 by 80mm to 200 by 160mm. All sizes are available in two heights, 45 and 60mm for the smallest size and 45 and 70mm for the larger ones.

All sizes are available in black, RAL 7035 grey and white.

www.hammondmfg.com

Guiding light for enclosure sourcing

Searching for the right enclosure can be challenging. Where should buyers start and where will they find their solution? In this article, Enclosure Solutions guides the way

When sourcing enclosures, buyers could spend time trawling through multiple manufacturers' websites and searching through countless enclosures, before finding something even remotely suitable. To resolve this, Enclosure Solutions has developed a new web-based tool offering a comprehensive search engine, over 5,700 standard enclosure choices, plus modification/ bespoke manufacturing options and an in-house turn-key production facility.

The website is built around a parametric search engine where users start by populating the search criteria with options to specify size, colour, IP rating, material, shape, mounting type, and special features. The site then returns enclosures best suited to the application.

Visually appealing enclosures help attract customers and

make products stand out from competitors. Enclosure modification is a way to enhance a standard, off-the-shelf enclosure. Enclosure Solutions' website includes a



SLIM-CASE



BODY-CASE



CONNECT



STYLE-CASE



HANDHELD ENCLOSURES

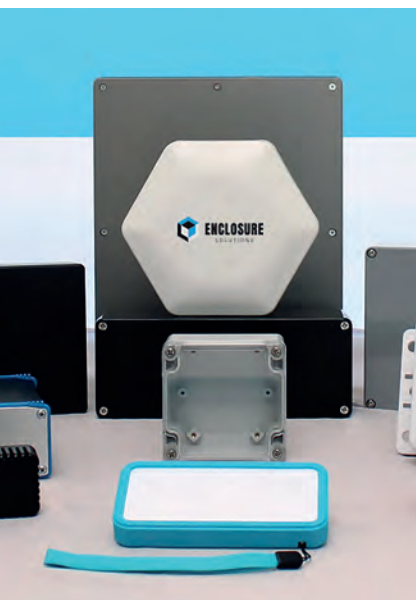
Take a look at our all new handheld and wearable cases for today's personal electronics, instrumentation and medical equipment. They are moulded in UV-stable FR (V-0) plastic, and sealed up to IP 65 for indoor and outdoor applications.

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modification form, which requests the required information and returns a quotation to the buyer's inbox. Modifications include machining, surface coating, RFI shielding, printing and engraving. Some buyers may not find a standard enclosure which fits their requirements or maybe looking for a tailored product. Enclosure Solutions' website offers bespoke enclosures, which let customers design and build an enclosure from scratch. Colour, IP and design are customisable. Options range from fabricated low/medium volume enclosures (with no tooling charge) to injection mouldings for higher volume cost savings.

Enclosure Solutions operates an in-house EMS manufacturing subsidiary, K2A Electronic Manufacturing Services, offering clients a turnkey, fully functional plug-and-

play production straight out of the box. This can include PCB assembly, cable assembly, internal wiring, programming, test and final packaging. Turnkey solutions ensure customers get their products to market quickly and efficiently, saving time and money.

www.enclosuresolutions.co.uk



Visually appealing enclosures help attract customers and make products stand out from competitors



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Product development from an engineering and purchasing perspective

As Inelco Hunter explains, buyers are increasingly working alongside engineering, marketing and manufacturing, to explore technology, cost, reliability and product integrity

The frequency of new product introductions has increased to keep pace with technological change, making shorter lead times and fast product development essential. Purchasing professionals need a non-technical overview of design options at early planning meetings. Indeed, some corporates are now looking to recruit purchasing managers with technical backgrounds.

An example of an overview-type understanding involves the move from individual components to modular solutions integrating multiple components and even software. This will affect future product design, from corporates to SMEs, with modules offering ready-to-go solutions.

Vendor reduction and rapid time-to market are probably the two big wins. Cost-savings from reducing development time by many months will outweigh extra costs in purchasing modules rather than individual components.

One way to obtain a technical overview is partnering with a vendor providing technical advice that offers a general overview and answers questions, no matter how non-technical they may seem. Inelco Hunter offers technical support to engineers and buyers, tailoring answers to technical or non-technical enquiries.

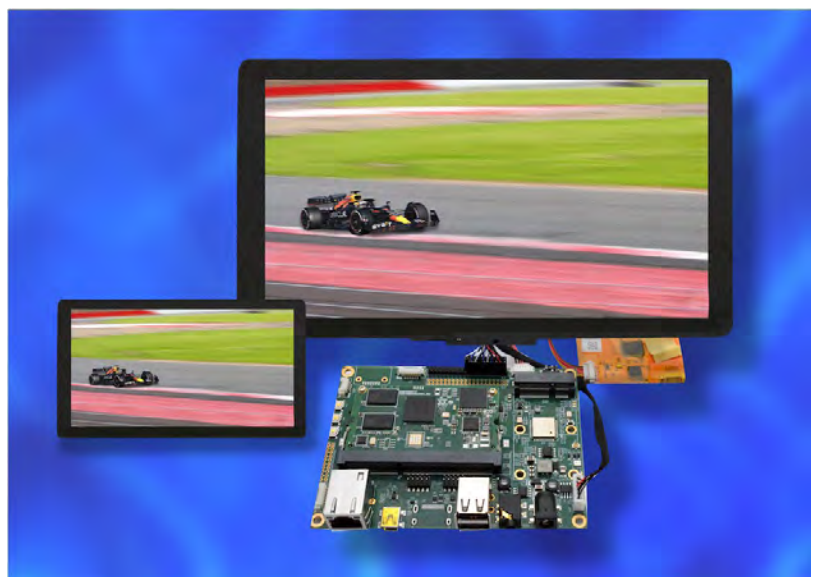
To make the understanding and decision-making process even easier, Inelco Hunter offers product ranges that are simple to understand at an overview level. For example, the Powertip range of touch screen modules takes a straightforward three-level approach.

At the simplest level the Powertip Smart UART family of three-wire smart touch screens features plug-and-play software to speed the design of the graphics interface. From a purchasing viewpoint, as well as being a good start point for new products, the three-wire approach means legacy character-based products can be upgraded to modern touch screens.

The next-level suits more demanding applications. The Powertip MCU range incorporates an STMicroelectronics chip providing the performance required for rapid response times and smooth graphics. From an overview perspective, instrumentation products for example, can quickly plot jitter-free graphs.

Where ultimate power is needed, Inelco Powertip MPU displays utilise NXP or Rockchip quad core processors, providing blindingly fast response times and the ultimate smooth 2D/3D graphics.

www.inelcohunter.co.uk



Understanding LED life and performance

In this article, CML walks buyers through the life and performance of LEDs, explaining how carefully balancing brightness and current can improve life expectancy

The lifespan of an LED can range from 80,000 to about 120,000 hours depending on materials and manufacturing method. Generally, these estimates are based on perfect conditions. However, in reality the harsher the use the less the life expectancy. Eighty thousand hours equates to a little over 20-years if operating the device eight hours a day. Most products would be obsolete by the time a complete or catastrophic failure occurs.

Increasing demand for brighter LEDs is playing a role in life reduction. More and more we see a drive for daylight visibility in certain ranges of parts, products and components. If there is one thing directly impacting an LED's life expectancy it is current draw. Operating an LED at reduced current extends its life even further. At significantly reduced levels, an LED can last almost indefinitely. However, should it see current above the nominal rating its life will be much shorter. Unfortunately, the relationship between

LED life and current is not linear unlike the relationship between current and brightness.

LED lighting can last a long time. However, that does not mean users should keep the lighting as long as there is not a catastrophic failure. Light output and colour will degrade over time, with the application generally determining the level of acceptance.

LED technology has developed rapidly in recent years and should continue to. Innovations and improvements occur continuously. Good design and careful manufacturing techniques help increase the life and general performance of lamps.

CML's latest lamp products are available with data sheets that accurately reflect life and performance. They can be requested directly from the customer services team or by contacting CML's list of authorised distributors.

www.cml-it.com



CML Innovative Technologies Ltd.

69/70 Eastern Way,
Bury St Edmunds, Suffolk,
IP32 7AB, United Kingdom

Tel: +44 (0) 1284 714700
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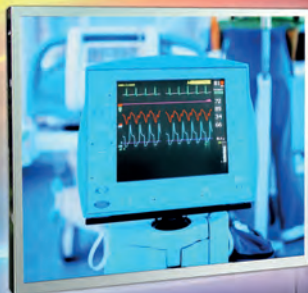


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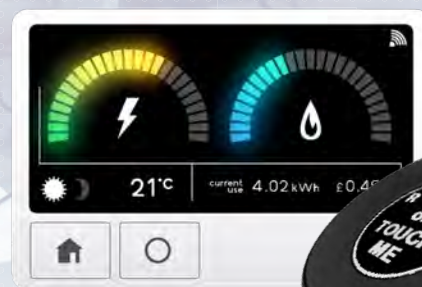
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Reshoring: benefits of bringing electronics manufacturing home

FermionX' technical sales manager, Gary Rice, explores the benefits of working with a UK-based manufacturer, from improved communications to a reduced carbon footprint

As the world becomes more complex and interconnected, many companies have outsourced their manufacturing processes to other countries. Original electronic manufacturers are prepared to put many miles between them and their suppliers to reduce costs—known as offshoring. However, in recent years, more businesses have started to consider the benefits of reshoring—bringing electronics manufacturing back home.

A main benefit of reshoring is improved quality control. When manufacturing is

done overseas, it can be difficult to maintain the same level of quality and consistency expected in Western markets. By bringing manufacturing back home, companies have more control over the production process, ensuring their products meet the highest standards, leading to improved product quality.

FaceTime, collaboration platforms and social media will never replace the bonds forged by face-to-face meetings with suppliers. Trust built through regular communication and adequate information

distribution is pivotal for success.

FermionX' technical sales manager, Gary Rice, explained: "When manufacturing is outsourced to overseas suppliers, lack of communication and collaboration can stifle confidence for manufacturers in their supplier. By reshoring, not only does it close the gap between time differences, it enables manufacturers to build a better bond with suppliers and work more closely and efficiently with them. Well-coordinated teams deliver better results."



FermionX' technical sales manager, **Gary Rice**



While it may seem counterintuitive, manufacturing in the UK or other Western countries can be more cost-effective long term. Historically, outsourcing was driven by the reduced cost of international labour. However, whether it's shipping slowdowns or extensive manufacturer backlogs, the increasing instability of global supply chains has been uncovered. Although UK manufacturing engages with global supply chains, reshoring means boards are unlikely to be stuck in transit on ships or planes, risking production deadlines. Simultaneously, recent years have seen concerns about the working conditions and environmental impact of outsourcing production. Products must be shipped long distances to reach their destination. This transportation can result

in high levels of carbon emissions, contributing to climate change. By switching production to the UK and reducing the distance products travel, manufacturers can reduce their carbon footprint. Doing so, manufacturers demonstrate their commitment to ethical and sustainable production practices, improving their reputation among consumers and stakeholders.

Reshoring can also benefit the local economy. When manufacturing is done overseas, jobs are lost in the home country and economies suffer as a result. By reversing this, companies create jobs in their local communities and help strengthen the economy.

At UK-based electronic contract manufacturer FermionX, customers meet the team that makes their

products. The company invites current and potential customers to visit its West Sussex-based design and manufacturing plant to discuss the benefits that working with a UK supplier can offer.

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Minimising PCB assembly costs

In this article, Corintech's head of operations, Jack Dayeh, explores practical tips to help buyers save on PCB assembly costs without sacrificing product quality and reliability

Focusing on design for manufacturing (DFM) principles during the design phase is a good start. Optimising a design for efficient assembly reduces failures and material waste, while simplifying value-added processes such as programming and testing. Partnering with an experienced electronics manufacturer—with in-house engineering capabilities—early in the design process can unlock potential design improvements and long-term cost-saving opportunities.

The cost of a PCB assembly is largely influenced by the components making up the bill-of-materials (BoM). The following strategies can help reduce costs. Firstly, collaborate with the manufacturer to explore lower-cost alternative components that meet the specifications. Drawing on its engineering expertise and supplier network, the manufacturer can help find cost-effective options without sacrificing quality. Secondly, consider consolidating component orders and negotiating with

suppliers to secure better pricing based on higher volumes. Substantial cost savings can be achieved by leveraging economies of scale.

Production volume plays a crucial role in cost optimisation. To maximise efficiency, consider the following strategies. First, accurate demand forecasting is key to avoiding overproduction or stockouts, thereby optimising costs and minimising inventory holding expenses. Leverage historical data, market trends and customer insights to forecast demand effectively. Second, implement flexible production planning which easily scales up or down in response to demand fluctuations. This ensures efficient resource allocation, cost optimisation and the ability to swiftly meet customers' needs.

Carefully choosing the manufacturing location can significantly impact PCB assembly costs. Opting for offshore manufacturing in regions with lower labour and operational costs can result in substantial cost

savings. However, factors such as shipping expenses, lead times and potential quality control issues must be considered. Alternatively, local manufacturing offers shorter lead times, easier communication and more direct quality control, albeit at potentially higher labour and operational costs. Carefully weighing these factors is crucial in determining the most cost-effective manufacturing location. Choosing an electronics manufacturing partner offering local and offshore services offers the best of both worlds.

To achieve these cost-saving benefits, partner with an experienced electronics manufacturer who understands the requirements and can provide expert guidance throughout the process. By taking proactive steps and implementing the strategies outlined, OEMs can not only stay competitive in the market but also maximise cost-efficiency in their PCB assembly supply chain.

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Corintech's head of operations, Jack Dayeh



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Benefits of early engagement

Pektron explains how early engagement in the development process can help purchasing professionals achieve the best results for their manufacturing businesses

It all starts with a close relationship with the engineering team. Engineering should be coming to purchasing early, with a wish list or specific required part. The purchasing department should never see a part on a BoM they don't already know about.

A wish list is a great opportunity to go to the market using experience and knowledge to engage with suppliers—new and existing—and present back a range of options.

With enough time, this approach gives the purchasing function the scope to explore: new technological developments; alternative options; availability/

potential exclusivity; pricing structures; obsolescence/long-term supply; and due diligence, particularly regarding new suppliers.

Consider using applications that help engineering identify and select parts. With so many new components entering the market, options can be overwhelming and keeping up-to-date challenging. Apps such as Silicon Expert can help engineers shortlist components. Engaging engineers this way shortens the list of potential parts that purchasing needs to investigate. This approach has contributed to making the component selection process much quicker and slicker in Pektron's business.

If engineering has designed in a specific part or has a specific part in mind, early engagement remains important. In this situation there may be a limited number of suppliers the company hasn't worked with before and require more due diligence, looking at: availability, reliability, sourcing and more.

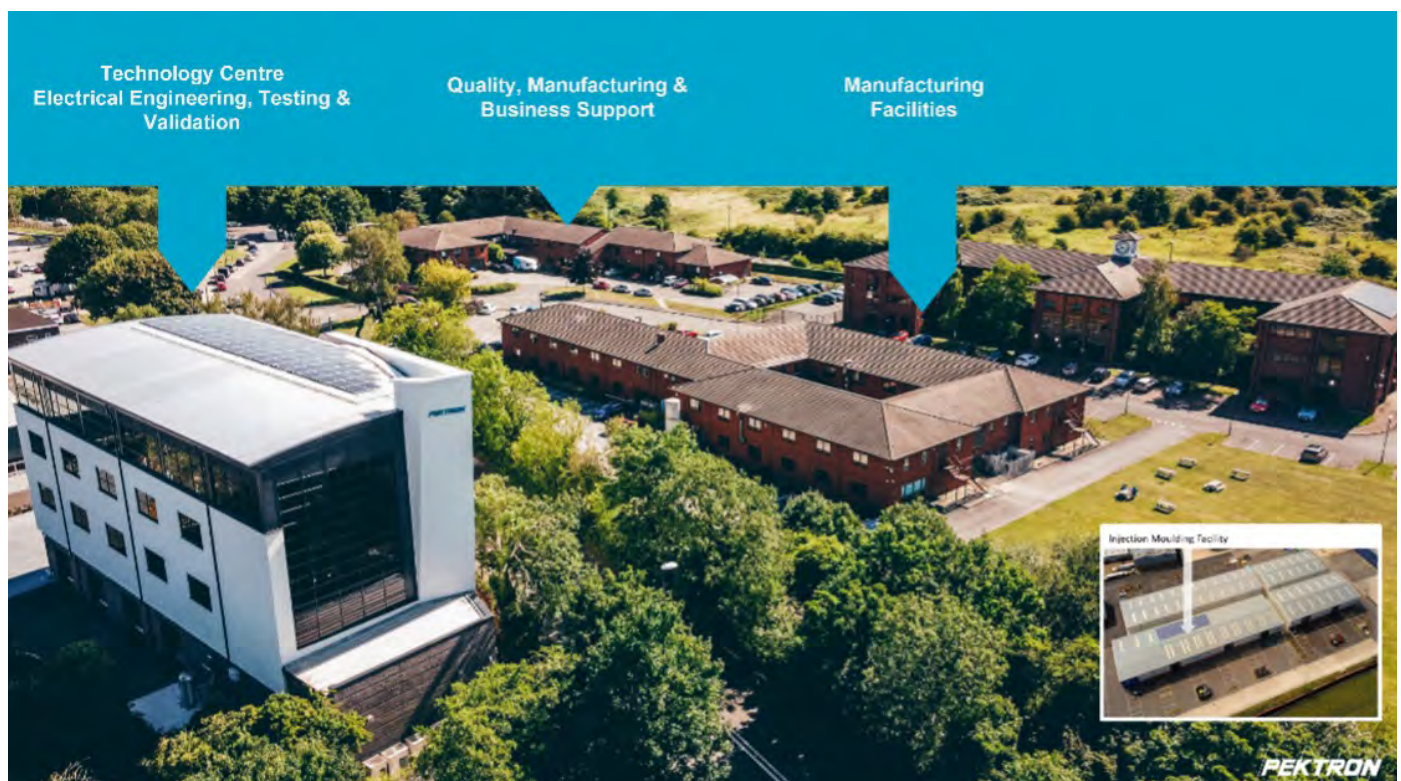
How long all this takes varies from a day to a month, depending on experience and the part required. Sometimes it's a quick call to a known contact who can turn it around in a day. In other circumstances buyers might be looking for something specific, that they haven't worked with before and that known

suppliers can't help with. This highlights the importance of early engagement.

Establishing and maintaining a positive relationship with suppliers is equally important. They will also appreciate early engagement and, as well as helping structure deals and reliable supply, can also influence product development based on desired part functionality.

It would be remiss not to acknowledge recent and current supply shortages. In a way it has become the new normal and highlights the need for even earlier engagement.

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Enhancing purchasing efficiency and agility

Incap encourages purchasing professionals to explore key trends shaping the electronics industry and discover how to stay ahead in this ever-evolving field

As the electronics industry evolves, purchasing professionals face opportunities and challenges in their quest for better buying decisions. By understanding current trends and adapting their strategies accordingly, buyers can enhance their purchasing efficiency and make informed sourcing decisions.

One key trend is faster time-to-market. With technological advancements occurring at a rapid pace, companies are under pressure to bring their products to market quickly. Purchasers need to find ways to streamline their supply chain and optimise their manufacturing processes to meet these demands.

At the same time, product complexity is increasing. As electronics advances, products often require a combination of different components and technologies. This complexity

adds a layer of challenges for purchasers who must ensure the necessary components are sourced and integrated seamlessly.

Additionally, there is growing need for flexible manufacturing. The ability to scale production up or down quickly and adapt to changing market demands is crucial. Purchasers must consider manufacturing partners that offer agile solutions to support their evolving needs.

Below are some key actions buyers should consider when making purchasing decisions.

Embrace partnerships with trusted providers:

Purchasers can benefit from establishing relationships with reliable EMS providers which offer access to state-of-the-art technology, skilled personnel and extensive industry experience. Collaborating with trusted partners

helps ensure smooth, efficient manufacturing.

Streamline the supply chain:

With increasing manufacturing complexity, purchasers should focus on optimising their supply chain. By partnering with turn-key suppliers like Incap UK, they can eliminate heavy investments in raw materials, technology and labour. Streamlining enhances efficiency and reduces time-to-market.

Leverage rapid prototyping and small-batch assembly:

Incap UK's Fast Track facility provides purchasers with a rapid prototyping and small-batch assembly solution. This enables swift evaluation of prototypes and pre-production builds, allowing for quicker decision-making and iteration cycles. This facility, equipped with flying probe test and on-site x-ray technology, ensures fast, accurate and reliable service, with

turnaround times ranging from three to seven working days. This accelerates product development.

Embrace electromechanical assembly:

Incap UK offers services including prototype production, testing and inspection to enhance product quality and reliability. Incorporating such services helps ensure superior performance and customer satisfaction.

Expertise in MRO services:

Incap UK understands the challenges associated with end-of-life products and upgrades. Its MRO services encompass repair, refurbishment, obsolescence management and reverse engineering, providing comprehensive support to purchasers in managing product lifecycles.

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Investing in European production

Escatec's executive director and director of strategic development, Charles-Alexandre Albin, explains how the company is responding to increasing nearshoring demand



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Requests to nearshore cost-effective production in Europe has prompted electronics manufacturing services (EMS) provider Escatec to establish a new production facility in Plovdiv, Bulgaria. The company states the 4,000m² facility is operational with equipment, processes and a skilled workforce to vertically integrate plastic moulding and electronics assembly.

Escatec's executive director and director of strategic development, Charles-Alexandre Albin, said: "Escatec Bulgaria is an important new site in Escatec's portfolio as we move to complete our global manufacturing footprint. Customers of Escatec can expect that we deliver a best-value solution, regardless of region, as we continue to harness the benefits of our multi-site strategy.

"Escatec remains committed to expanding its global production footprint and capabilities to cater to customers that are in the process of bringing new technologies and products to market. Across the Group, Escatec offers a complete and integrated value chain of EMS services, from D&D to product certification to mass manufacturing and after-sales services, ranging across electronics, electro-mechanical, MOEMS, box build and plastic moulding."

The company states it firmly believes in the importance of continuous training and providing career pathways for its employees, with Albin attributing the Group's rapid growth to its committed and highly skilled workforce: "We continue to grow and build more opportunities for our staff and are eager to see people take up international challenges and build their careers in new and exciting ways."

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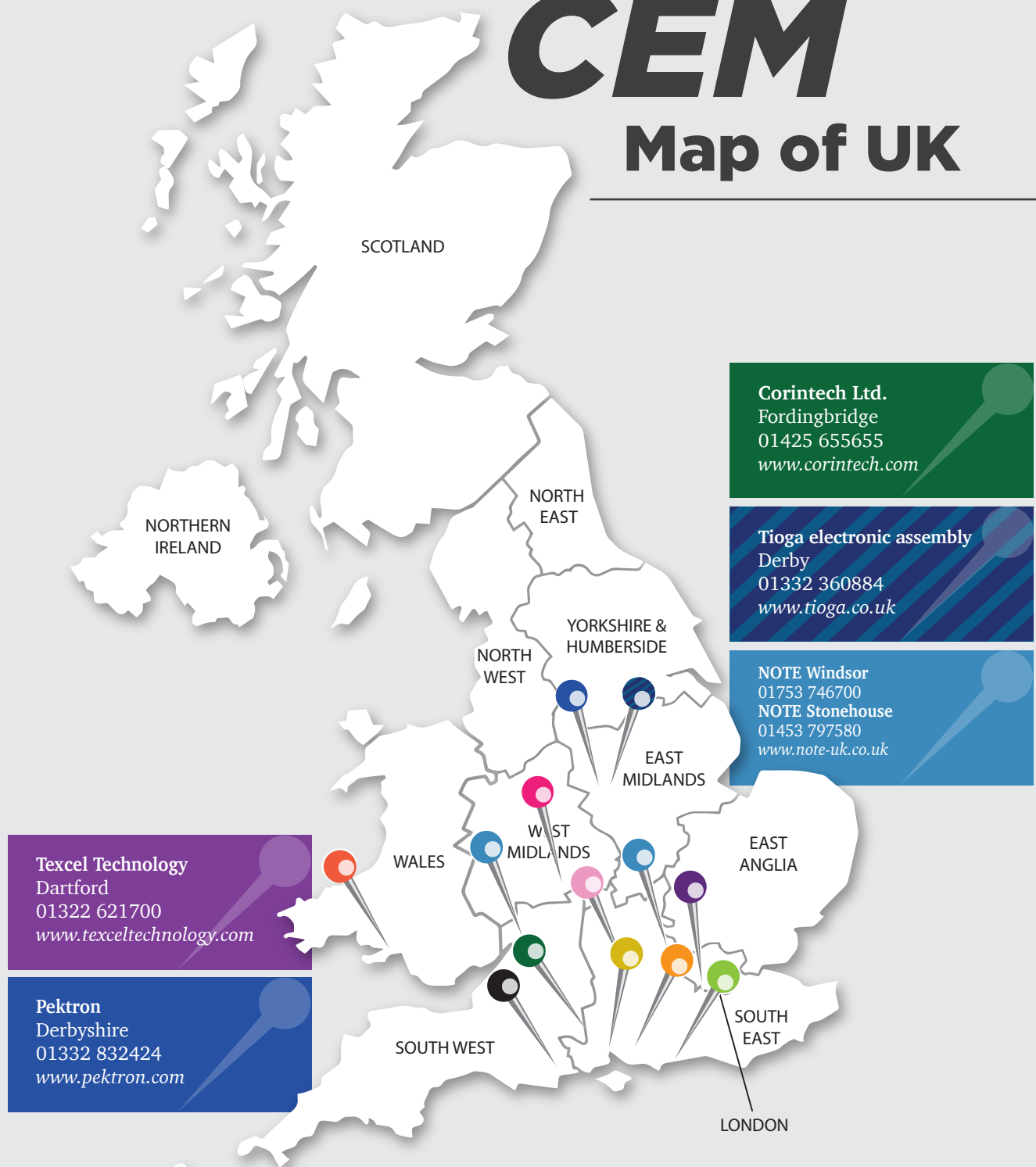
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Western distributors walk tightrope as China & US bicker on boles

As Western governments tighten export restrictions on China, component distributors similarly jack up compliance activities. They cannot afford to be caught, even unwittingly, in violation of export regulations

Staying out of Russia was easy. There just wasn't too much at stake in dollar terms or long-term relationships for Western component distributors. Moscow is a bit player in the electronics and high-tech market and serving Russia has never been a big interest of the world's leading distributors. Plus, the stance of the American government about engaging with Russian OEMs had been clear for decades. It was not encouraged. Stay-away-and-don't-engage-even-through-third-parties just about sums it up.

The Chinese electronics market is a different ball game, though. Market consulting and researcher Statista puts the value of the Chinese electronics market at a projected \$375.7 billion for 2023, growing to \$763 billion by 2027. By contrast, the Russian electronics market—though growing at a fast-rate—is valued at \$12.5 billion for this year and projected to increase to \$19 billion in the next four years. Furthermore, the number of consumers using electronics in China is projected to hit 1.1 billion by 2027 vs. 66.2 million for Russia. Clearly, these are two different markets, and the attraction varies widely for the global electronics supply chain.

The figures show why Western electronics companies—OEMs, chipmakers, IP&E suppliers, EMS providers and component distributors—are more gung-ho about China than Russia. All the major Western distributors are in China, supporting thousands of OEM customers who began shifting manufacturing activities to the communist country and surrounding Asian nations decades ago. The OEMs

either outsourced production to contract manufacturers in the region or established their own production plants and wanted the same level of services they enjoyed back in Europe and North America from supply chain partners. With the initial support of politicians and regulators at the beginning, distributors eagerly poured into China, establishing warehouses and other support infrastructure.

Recent geo-political changes are altering the landscape, however. China remains a significant player in the electronics manufacturing ecosystem but restrictions on what can be done in the country or sold there by Western enterprises are being tightened by national governments concerned about military, security and economic issues. The leading worry of governments in the US and Europe is that China's growing economic clout is also turning the country into a major military power that can rival the United States, the world's No. 1 superpower. They have, as a result, expanded oversight of trading activities between the West and China, increasing the range of services and products that foreigners trading in the country must monitor to avoid tripping over regulatory hurdles.

In general, distributors have mostly avoided regulatory tripwires regarding China. But that task is getting more complicated, according to industry executives and observers. For example, the list of electronics components that cannot be sold to China without explicit clearance from regulators have lengthened, adding to control functions

“BIS’s ability to determine whether a party is in compliance with our export control rules is a core tenet of our enforcement program”



Matthew Axelrod, Assistant Secretary for Export Enforcement, Bureau of Industry and Security, U.S. Department of Commerce

and paperwork at distributors, they said. Distributors that used to add technical resources to support product development primarily have extended this to the regulatory side, beefing up both automated computing applications and human expertise for assuring avoidance of export control problems. Industry experts said the biggest distributors are closely monitoring regulatory rules because of their presence in all the major electronics production and assembly regions.

“The large distributors or multinational companies are international in nature,” said Dale Ford, chief analyst at the Electronics Components Industry Association. “They have facilities and store houses around the world. So, they must balance competing interests. [For them] it is not just a matter of reliability of supply. You’ve

got geopolitical dynamics that come into play as well.”

Not alone

Western governments have not left distributors and members of the electronics supply chain to wade through the thickets of exports legislations by themselves, however. Distributors have held meetings with government officials in the US, according to Ford, who said the ECIA Council has hosted representatives from the key security agencies involved in monitoring and assuring compliance. These include officials and agents from federal departments such as Homeland Security, Commerce and the Federal Bureau of Investigation (FBI). “They visited us to have a discussion about how they would like companies in our industry to work together with them, to prevent parts from winding up where they



shouldn't be in Russia and elsewhere," Dale said.

In addition to meeting with and providing direct guidance to exporters, the US government and the EU have also been active in publishing details of curbs on exports and enforcement requirements. Take the pronouncement in late 2022 of new exports controls on advanced computing and semiconductor manufacturing items on China. The Bureau of Industry and Security at the U.S. Department of Commerce sent out statements explaining why the government had imposed the restrictions and detailed the specific items that were forbidden from export to China. It also clarified the terms of the restrictions, including when they were supposed to go into effect. The list of foreign companies that were impacted was also updated, making it easier for electronics manufacturers to revise their own information technology systems.

"BIS's ability to determine whether a party is in compliance with our export control rules is a core tenet of our enforcement program," said Matthew Axelrod, assistant secretary of commerce for export enforcement at the BIS, in a statement announcing the new restrictions. "Where BIS is prevented by a host government from conducting our end-use checks in a timely manner, we will add parties to the Unverified List, and if the delay is extreme enough, the Entity List, to prevent the risk of diversion of any U.S. technology that could undermine our national security interests."

The Commerce Department said in the same statement that it would "work closely with industry as we implement all elements of the Administration's semiconductor agenda, to include ensuring compliance with these measures."

Limited exposure

While the regulatory environment has dramatically changed over the last several years, the burden on the distribution market is not as heavy as what governments have imposed on semiconductor

equipment manufacturers, chipmakers and suppliers of associated software applications. Since distributors do not manufacture any of these devices, the first line of defense rests with semiconductor suppliers. The government has also made compliance easier for distributors by naming specific components and their manufacturers. In its statement last October for example, the BIS warned manufacturers and their distributors from exporting to China certain semiconductor components, including "logic chips with non-planar transistor architectures (i.e., FinFET or GAAFET) of 16nm or 14nm, or below; DRAM memory chips of 18nm half-pitch or less; NAND flash memory chips with 128 layers or more."

That level of specificity benefits distributors as they can then work with suppliers to ensure the items are not included in shipments to China, according to industry executives. But while direct exports to restricted countries and regions can be easily curbed, reshipments from approved locations and partners to non-approved buyers have been known to happen. This is one reason why some companies have come under government radar when components manufactured by chipmakers end up in OEM devices sold in places like Russia that were under explicit government shipping restrictions. Suppliers like Advanced Micro Devices take all necessary actions to avoid this kind of scenario and often warn their distributors to remain vigilant about unapproved third-party shipments.

"Delivery of AMD cryptographic products does not imply third-party authority to import, distribute, or use restricted and non-restricted encryption," the company warned, in a statement on its website. "Importers, distributors, customers, and users are responsible for compliance with U.S. and local country export laws and regulations."

Chip suppliers lean on their supply chain partners for assistance in meeting these export restrictions. This is



Dale Ford, chief analyst, ECIA

"The large distributors or multinational companies are international in nature"

because distributors, for example, often have a presence in more locations than their suppliers. This explains the ECIA's active involvement in efforts to publicize and seek clarifications on export restrictions. In addition to holding meetings with the government to secure necessary support and clarification, it has also organized information sessions about defense laws, licensing and export controls for suppliers and distributors. In May, for example, the ECIA fielded a webinar on shipments to Russia and "other bad actors," for its members. The webinar featured presentations by Axelrod from the US Commerce Department who shared "the latest intelligence on tactics used by Russia to subvert US export controls on electronic components to support their missile and UAV (Unmanned Aerial Vehicle) programs," the ECIA said, in a statement. "Modern warfare is increasingly dependent on electronics and our industry must quickly step up its efforts to stop Russia and its allies from obtaining the technology to continue this terrible aggression."

These activities help demonstrate to the government that ECIA members are taking all necessary steps to comply with the export restrictions despite the negative impact on sales, according to Ford. Still, distributors, as well as the rest of the electronics supply chain, have found themselves juggling multiple rules and regulations imposed by various national

and regional bodies. As they compile US rules, they must also stay on top of regulations in the EU, Japan and South Korea. Compliance with the rules of their home governments may not suffice, though. What if the Chinese government starts to pile pressure on foreign distributors operating in its territory in an indirect effort to remove some of the challenges facing local manufacturers? Is it possible, for example, that China could warn foreign distributors against holding back on the distribution of components it deem essential for electronics production in its territory? This would put distributors in a catch-22 position where they will have to determine whether the China business is still worth the hassle.

"At the end of the day, nobody wants to get in the crosshairs of a government agency [because] they can make your life very, very difficult," said the ECIA's Ford. "Our members want to be sure that the government sees them as cooperative in their efforts. There's no desire to be in any kind of an adversarial relationship with the government. But, by the same token, they need to be seen as cooperative with the EU, they need to be seen as cooperative with South Korea and Japan. And so, they have a challenge on their hands of being politically adept in this environment that we're moving into. That's one of the big issues now."

Positioned for success in dynamic automotive landscape

In this article, Memory Protection Devices guides purchasing professionals in making informed decisions while procuring automotive products

In today's fast-paced automotive industry, purchasing professionals face challenges selecting automotive-related products. With ever-evolving technologies, fluctuating market dynamics, and a myriad of suppliers, purchasing professionals must develop a comprehensive buying strategy.

Prioritise quality and reliability: For automotive products, quality and reliability should be at the forefront of purchasing decisions. Seek suppliers with a track record of delivering high-quality products and are renowned for reliability. Look for certifications and industry standards compliance as indicators of a supplier's commitment to quality.

Embrace technological advancements: The automotive industry is experiencing rapid technological advancements, such as electric vehicles, autonomous driving systems and connected car

technologies. To stay competitive, purchasing professionals must keep abreast of these developments and understand how they impact the products they procure. Collaborate with suppliers who are at the forefront of innovation and can provide cutting-edge solutions.

Foster strong supplier relationships: Nurturing strong supplier relationships is essential in the automotive industry. Suppliers who understand buyers' business requirements and align with their long-term goals are invaluable. Regularly engage with suppliers to stay updated on market trends, negotiate favourable terms and explore potential cost-saving opportunities.

Conduct thorough supplier assessments: Performing comprehensive supplier assessments is vital for mitigating risks and ensuring consistent product quality.

Evaluate suppliers based on factors including financial stability, manufacturing capabilities and adherence to ethical and sustainability standards. Additionally, consider their ability to handle potential disruptions, such as natural disasters.

Optimise cost and value: While cost is a significant factor in procurement decisions, purchasing professionals should not focus on the lowest-priced products. Instead, strive for a balance between cost and value. Consider the total cost of ownership, including maintenance, durability and efficiency. Conduct a cost-benefit analysis and assess suppliers based on their ability to provide long-term value.

Embrace sustainability: Sustainability has become a critical aspect of the automotive industry. Customers and stakeholders increasingly prioritize environmentally friendly practices. Purchasing professionals should seek suppliers committed to sustainable manufacturing processes, ethical materials sourcing and responsible waste

management. Collaborate with suppliers who share sustainability values.

Emphasize supply chain resilience: Covid-19 highlighted the importance of a resilient supply chain. Evaluate suppliers based on their ability to manage disruptions, maintain consistent production and provide timely deliveries. Diversify the supplier base to minimise dependencies and actively monitor potential supply chain risks.

In the automotive industry, purchasing professionals play a pivotal role in driving success. By adopting a comprehensive buying strategy, centred on quality, innovation, supplier relationships and sustainability, professionals can navigate the market more effectively. Prioritise thorough supplier assessments, optimise cost and value and emphasise supply chain resilience to make informed decisions that benefit the organisation in the long run. By doing so, buyers can position their company for success in the dynamic automotive landscape.

memoryprotectiondevices.com





Boosting IIoT connectivity

Fischer Connectors has released ultra-robust single pair Ethernet (SPE) and USB 3.2 Gen 2 connectivity solutions to meet the requirements of Industrial Internet of Things (IIoT) applications in rugged environments.

Single pair Ethernet solutions from the Fischer Core and UltiMate series allow for 1Gbit/s data transfer per IEEE 802.3bp–1000Base-T1. Exceptionally rugged by market standards, they are said to outperform other suppliers' SPE solutions regarding security, durability and environmental/mechanical performance.

Fischer SPE is compliant with MIL-STD norms through UltiMate, offering 10,000 mating cycles, three locking mechanisms, hermetic sealing and IP68/ IP69 ratings. SPE is also featured in the ultra-miniature Fischer MiniMax connector in size 06 (10mm receptacle).

The demand for USB 3.0+ protocol is high in Industry 4.0 operations, thanks to: high data transfer rates with low latency; nearly twice the power output of USB 2.0A; better power efficiency due to lower consumption in idle state; and larger bandwidth. Fischer MiniMax connectors with USB 3.2 Gen 2 allow for 10Gbit/s data transfer and power contacts up to 8A.

www.fischerconnectors.com

Enhancing robotics and automation knowledge

Distrelec has released the second part of its *Robotics and Automation Guide*. This three-part eBook, penned by Distrelec executives and industry experts, delivers valuable insights to help companies automate manufacturing processes and workflows.

The first part, released earlier this year, featured a brief history of robotics, plus information about robot types, applications, Industry 5.0 and cobots. The second part looks beyond manufacturing and explores sectors that can benefit from smart automation like agriculture. It also provides valuable input to overcome financial obstacles to automation.

Editor-in-chief, Justyna Matuszak, said: "Our *Robotics and Automation Guide* was written with today's factory engineers firmly in mind. Improving production efficiencies and sustainable manufacturing are some of the greatest challenges of our time. You'll be able to discover in our guide how robotics is a key part of the industrial revolution through network connectivity and how robots can be embedded into certain workflows and ecosystems to simplify the process and increase efficiency."

www.distrelec.com

Enhanced camera block commercially available



Sony ISS' next generation FCB-EV9520L camera block has gone into production. The unit supports 1080p/60 resolution and offers a 30x optical zoom and a 64deg horizontal viewing angle.

The company states an innovative cell structure allows elevated levels of sensitivity. The photodiode layer in each cell is deeper than conventional optoelectronic arrangements, resulting in extended light path length and accentuating the absorption efficiency of longer wavelengths.

Consequently, the camera has better near-infra-red (NIR) performance and

is capable of working in ultra-low light conditions–0.009lx or even 0.00008lx when IR cut-filter removal (ICR) is activated.

The camera can be used in applications including infrastructure inspection work, surveillance/security, livestock monitoring and aquaculture. It has particular value in providing visual data to help control aerial drones, underwater remotely operated vehicles (ROVs) and automated mobile robots (AMRs). Each of these block cameras has an LVDS interface incorporated for easy system integration.

www.image-sensing-solutions.eu

Focus on drag chain and robot cable

Having recognised increasing demand for end-to-end Ethernet (IIoT), down to sensor and actuator level, SAB Bröckses has developed rugged, economical solutions including a new cable range called CATLine SPE.

SAB's focus is on two single pair Ethernet cables, specially developed for increasing data transmission rates in automation. In addition to the CATLine C-Track, a drag chain-compatible cable, the company has also developed a robot-compatible SPE cable with UL recognition, the CATLine SPE Robot.

The drag chain or robot-compatible SPE cables are designed to ensure safe and reliable data transmission over a bandwidth up to 600MHz. These cables are also PWIS non-critical, oil resistant, UL recognised and RoHS compliant.

SAB's manufacturing capabilities extend from basic types and standard dimensions to special cables designed according to each customer's requirements. Production can also be carried out in small batch sizes, useful for small and pilot series.

www.sab-kabel.de





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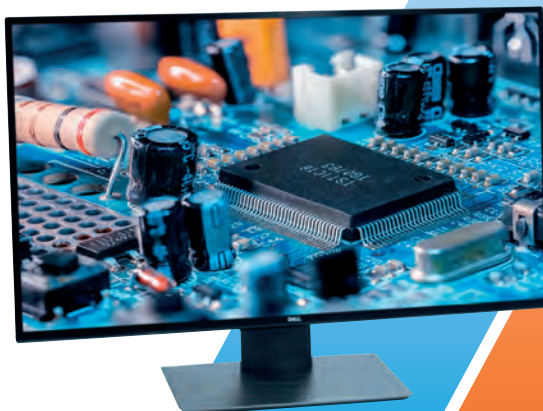
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IoT and ERP unite

In this article, Syscom sets the scene regarding the implementation of an IoT and ERP ecosystem and the key benefits it offers such as raw-to-finished goods tracking

The Internet of Things (IoT) is a network of smart, web-connected devices that collect and share data over the Internet with other devices and systems. It is used interchangeably with the term Industry 4.0 to describe physical machines embedded with software and sensors in an IoT ecosystem. It is predicted there will be 75.44 billion IoT-connected devices by 2025. Enterprise Resource Planning (ERP) and IoT integration can be the first investment into a dependable future for businesses, providing data that makes the difference to ROI.

What are the benefits of the IoT?

IoT makes industrial machines and devices smarter by connecting them to the web. IoT solutions can enhance connectivity and ultimately invigorate the automation of operations. Traditionally

challenging tasks can be tempered with smart IoT solutions that strategically supervise resourcing and procurement processes and policies to align operations with business goals.

What can ERP and IoT integration yield?

Business insights in real-time: Benefits of the IoT include a continuous, real-time stream of data from sensors automatically identifying patterns and detecting anomalies in operations. Within this ecosystem, employees get accurate, real-time, actionable insights to improve decision-making. With these insights, businesses can tweak their operations to get the most significant outcome.

Refine demand forecasting: Proper demand forecasting can produce precise, short-term demand forecasts. ERP with IoT can simplify complex

demand forecasting to establish a direct link between production and consumption. An IoT ecosystem can analyse real-time data to determine the popularity of products and let predictive analytics adjust to changing trends to reduce costs and disruptions.

Resource and asset management: IoT solutions can monitor high-value assets, materials or equipment and provide real-time information about their status. This can notify employees of vulnerabilities. IoT sensors help scheduled maintenance, while monitoring assets helps utilise resources more methodically.

Outstanding operational efficiency: IoT solutions can automate control over multiple operation areas such as inventory management and shipping. Raw-to-finished goods

tracking can be made much easier and production lines can be monitored 24/7.

Manual barcode scanning can be bypassed as the IoT traces and routinely updates the status of reordering, restocking, inventory updates and missed deliveries in the ERP system.

Upgrading legacy systems to a cloud-based ERP model united with IoT has its challenges, but securing a future for your business is undoubtedly worth the effort.

www.syscom.co.uk



SHOW REVIEW

What a show, what a day!

Electronics Sourcing's publisher, Mark Leary, reviews the 2023 Electronic Component Show and introduces readers to two events planned for 2024

ECS 2023 took place on 25 May in Oxford, attracting nearly double the visitors compared to the previous year's show. Featuring 69 exhibitors, the event provided design engineers and supply chain professionals with the opportunity to meet current, new or alternative suppliers.

The seminar program proved popular, including a presentation by Jaguar Land Rover's Daniel Grundy.

With added benefits including complimentary tea and coffee, £5 food voucher, pick-and-mix sweet trolley and afternoon ice pops, visitors and exhibitors enjoyed the welcoming added touches.

With growing visitor numbers, plus a sold-out event in record time, 2024 will see two ECS one-day shows. The first event takes place on Thursday 23 May 2024 at the Imperial War Museum, Duxford, Cambridge, followed by the second gathering on Thursday 19 September 2024 at the Kassam stadium, Oxford. *Electronics Sourcing's* publisher, Mark Leary, said: "When looking at the geographical locations of readers we have two notable regions located within two hours' drive of Cambridge and Oxford. Post show feedback from visitors and exhibitors proves they like the one-day format and the ECS team has already started work planning the two events for 2024 to ensure we provide the best one-day show for the industry."

www.electronic-component-show.co.uk



One of our highly attended seminars, hosted by Daniel Grundy from Jaguar Land Rover





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Understanding connector ingress protection

As more applications call for ingress protection, SCHURTER walks buyers through IP classes which define the degree of protection against contact, foreign objects and water

The Ingress Protection (IP) class comprises two digits. The first stands for protection against foreign objects or contact. The second indicates protection against moisture. For example: IP65, where 6 means 'dust-tight' and 5 means protection against 'strong jets of water'. So, the higher the digits, the higher the protection.

The range of possible IP levels is high, from IP00 to IP69k. With connectors, users should primarily focus on the plugged-in state, when the device plug and cable socket are connected to each other. In the unplugged state, higher IP protection ratings can be achieved but often do not represent the actual application.

Stricter equipment standards and increasing customer requirements are leading equipment manufacturers to demand products with higher IP ratings. In modern industrial plant—where moisture and dust are to be expected—IP54 is often installed today but only IP20 in protected control cabinets. Examples include cobots which assist operators in harsh environments.

In the medical field, a high IP ratings is almost always mandatory. This is due to the need to regularly clean and disinfect medical devices that come into contact with liquids and sterilize them if necessary. Such applications require IP54, sometimes IP65 or higher. An example application is medical laboratories, where work is constantly carried out with liquids.

In addition to the medical sector, reliable Ingress Protection is an important feature for food processing equipment. One example

application is large bakeries, where flour and similar particles float in the air.

In conclusion, protection against dust and moisture is important in today's technological landscape. Understanding IP classes and selecting the appropriate level for specific applications is crucial. Industries such as manufacturing, medical and food processing require reliable IP protection to ensure equipment durability and safe operation.

Advancements in cord retention systems, such as the V-Lock, offer more elegant solutions to prevent accidental disconnections. With continuous innovations in IP54 protection, companies like SCHURTER are paving the way for enhanced device connections and improved protection against dust and moisture for various industries.

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ELECTRONIC COMPONENTS

What is different about sourcing passives?

According to Charcroft Electronics' director, Roger Tall, continuity of supply for capacitors and resistors needs specialist technical and commercial support

The component market is seeing a resolution to some of the shortages experienced after 2020 but the picture is not consistent. Some passives have seen a dramatic reduction in minimum lead time, while others are offering lead times which are reduced but still extended.

The picture is mixed even for different types of capacitors/resistors in the same technology. For example, ceramic chip capacitors in larger cases have dropped to one week lead time, while 0201 capacitors remain on allocation. Tantalum capacitors also differ, with some surface-mount polymer dropping significantly, while others remain steady and radial moulded tantalums continue on allocation.

The need for some sectors to use passive components which are qualified or released to the highest levels of reliability can also add to the issues of availability.

So, what can be done to streamline supply for passives on long lead times or allocation? The most important factor is that the distributor delivers specialist passive technical and commercial knowledge, plus the resources to deliver solutions.

A key difference between sourcing a semiconductor and passive is the complexity of the passive's part number. A capacitor or resistor's part number is built by combining the different elements in the specification, including value, case size, voltage, termination and tolerance.

So, a single family of passive components can have 250 different part numbers. For sectors relying on high levels of reliability, passive part numbers must also show the part has the appropriate qualification or release.

Finding an available alternative for a difficult to source passive starts with considering the full specification of the original design. Specialist expertise is used to identify a passive which could offer the same parameters on a shorter lead time. For extreme supply issues, it may be possible to justify a different technology option or a complete custom solution.

A UK-manufactured custom passive component or assembly can provide a form-fit-function alternative to fit legacy dimensions and/or provide higher specification by considering modern materials and manufacturing methods.

Some customers are using the specialist commercial support offered by long-term stabilised price agreements to maintain continuity of supply. In these agreements, a stabilised price is agreed with the customer and Charcroft holds UK inventory for the agreement's duration.

Being a private, independent UK-based distributor gives Charcroft the ability to address global supply issues by offering sourcing solutions which are innovative and developed to support customers' individual needs.

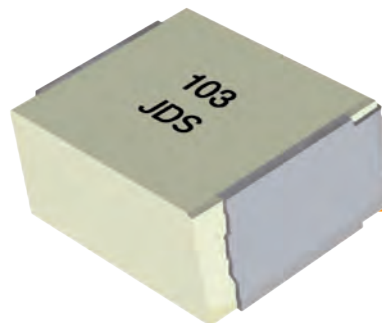
www.charcroft.com



Charcroft Electronics' director, Roger Tall



Lead time for some ceramic chips is now down to one week



Some PPS film capacitors have moved from allocation to 10-weeks



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Expect deep knowledge and an understanding of passive components developed over 45 years of specialist distribution. As a technically proficient specialist, Charcroft is franchised to deliver the latest capacitors, resistors, and magnetics for harsh and high-end applications. Offering an active partnership with flexible sourcing solutions and the ability to offer alternatives against difficult to source or obsolete components.

The long-term partnership offered by Charcroft helps you to resolve even the most demanding procurement issues, supporting programmes from initial concept to end-of-life.

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Chris Leek

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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
EPCOS/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
DISPLAYS											
Midas Displays		01493 602602	www.midasdisplays.com	N	3,300	N/A	£0	100%	10	17+	Y
ENCLOSURES											
Bud Industries	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,600	N/A	0 €	N/A	50	2,500+	Y
CamdenBoss	CamdenBoss	01638-716101	www.camdenboss.com	N	1,199	N/A	£0	N/A	10	106	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
Phoenix Mecano Ltd	BOPLA Enclosures & Accessories	01296 611660	www.bopla-enclosures.co.uk	Y	150	N/A	£0	N/A	3	2,000+	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

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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
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
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.digikey.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
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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
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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
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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
Hirose Electric	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,850	N/A	0 €	N/A	50	2,500+	Y
Intelliconnect (Europe) Ltd		01245 347145	www.intelliconnect.co.uk	N/A	N/A	N/A	N/A	100%	5	30	
JA 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
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

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
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	41,850	N/A	0 €	N/A	50	2,500+	Y
Wurth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,650	N/A	0 €	N/A	50	2,500+	Y
OBSOLESCENCE / 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
POWER & BATTERIES											
FRIWO 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

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
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

CamdenBoss	CamdenBoss	01638-716101	www.camdenboss.com	N	930	N/A	£0	N/A	10	106	Y
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
Multiple Manufacturers	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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Contract Manufacturers Buyers' Guide

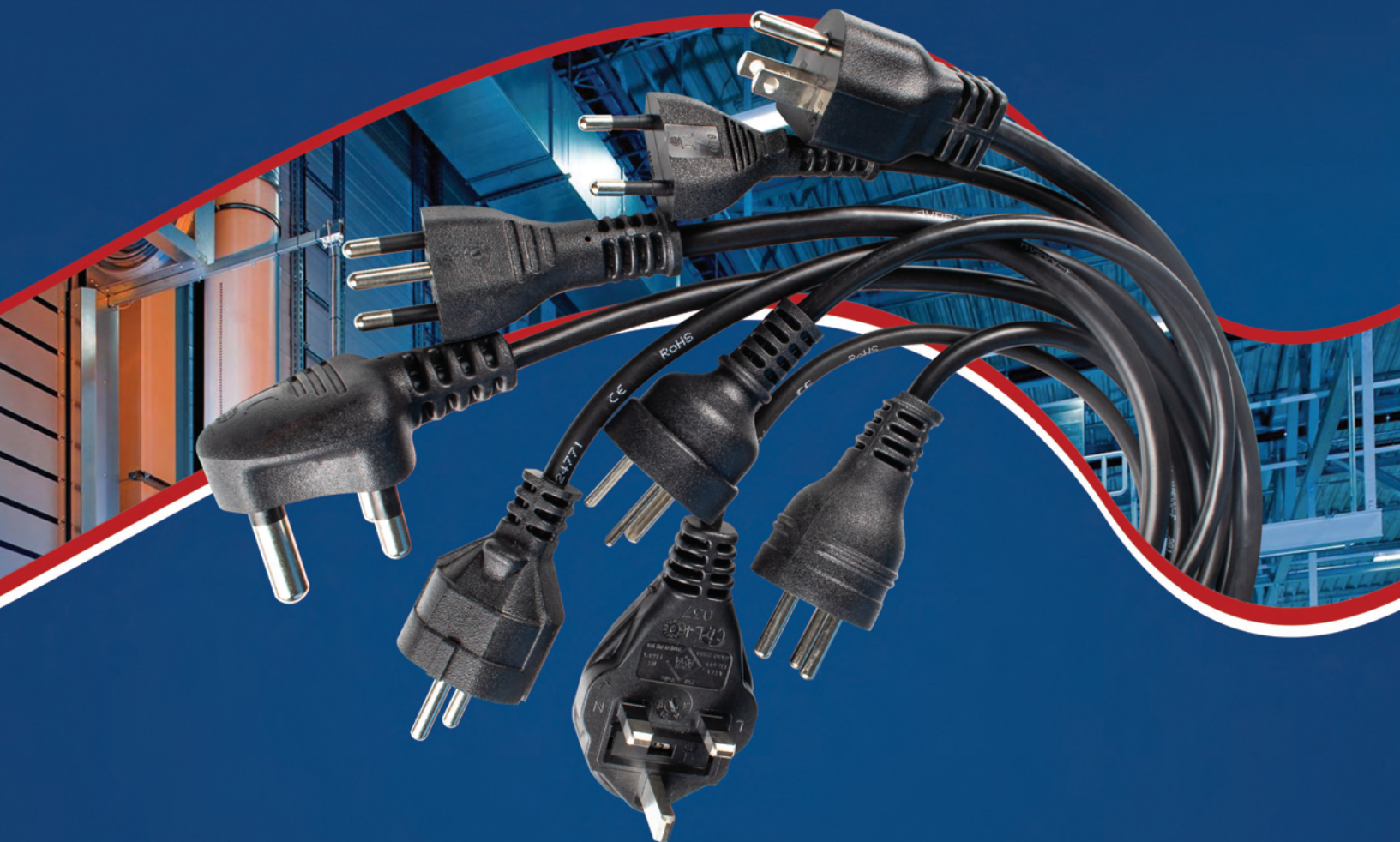
Manufacturer	Telephone	Website	Turnover	Location	Employees	Number of Surface Mount Lines	Approvals	BGA Capacity	Lead Free Manufacturer	Prototyping	Design Capability	Full Turnkey	Cables and Harnessing
Alan Anderson Manufacturing Ltd	+44 (0) 333 322 7222	www.aa-manufacturing.co.uk	£21m	Hertfordshire UK	40	2	ISO9001:2015, IPC-A-610	Y	Y	Y	Y	Y	Y
Challenger Solutions Ltd	01245 325252	www.challengersolutions.com	£14m	Essex/SE	85	12	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	£16.9m	UK & Far East	80	6	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.etluc.co.uk	£3.7m	SE	50	2	AS9100, ISO9001, ISO14001, IPC610/620 Class 3	Y	Y	Y	Y	Y	Y
FermionX Ltd	+44(0)1903 524600	www.fermionx.com	£6.5m	Worthing, W. Sussex	56	3	ISO9001:2015, ISO4001:2015, IPC-A-610 Class 2 & 3, IPC-J-STD-001	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
GSPK Design Ltd	01423 798254	www.gspkdesign.ltd.uk/	£1m	North Yorkshire, UK	12	2	ISO 13485:2016, ISO 9001:2015, GS ATEX 7422	Y	Y	Y	Y	Y	Y
Hallmark Electronics Ltd	01782 562255	www.hallmarkelectronics.com	£4.1m	Staffordshire	27	2	ISO9001:2015, IPC-A-610 to Class 3, UL	Y	Y	Y	Y	Y	Y
Icon Electronics Limited	01423 449080	www.iconelectronics.co.uk	£8.5m	Hampshire & Yorkshire	75	6	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	£169.8m	UK, Slovakia, Estonia & India	2,500	22	ISO9100, ISO14001, ISO13485, AS9100D, ISO45001 & IATF16949	Y	Y	Y	Y	Y	Y
Industrial Electronic Wiring Ltd.	+44(0)1793 694033	www.iew.co.uk	£5.5m	Swindon, UK	60	N/A	ISO9001:2015, IPC610, IPC620	N	Y	Y	N	Y	Y
Jaltek	01582578170	jaltek.com	£15m	UK	105	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
Nano Electronic Services Ltd	01388 247152	www.nanoelectronicservices.com	£1M	County Durham	2	15	ISO13485, ISO9001:2015 & IPC610 to Class 3	Y	Y	Y	Y	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	£18m	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 (ie Boarder, Manufacture &/or Repair)	Location	Approvals	Volume - Small, Medium, Large	Double-sided	Multi-layer 4-10/10-20-20-30	Metal PCBs	Ceramic PCBs	Heavy Copper PCBs	Flex / Flex-Rigid	Obsolescence Solutions	Modifications	Prototyping
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, JOSCAR	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	IS 9001:2015, IATF 16949:2016, EN (AS) 9100, Joscar	SML	Y	4-34	Y	Y	Y	Y	Y	Y	Y
Stevenage Circuits Ltd	01438 761811	www.stevenagecircuits.co.uk	M/B	UK/China	ISO 9001:2015, EN 9100:2018, EN 9104:2013, UL796, ISO 14001:2015	SML	Y	4-44+	Y	N/A	N/A	F, F/R	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

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