

ELECTRONICS SOURCING UK | FEBRUARY 2023

ELECTRONICS

FEBRUARY 2023

# sourcing

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ECS COMPANY INSIGHTS  
FROM PAGE 31



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## On the cover – February 2023

ECS - 3 months to go!  
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# Editor's Word



### What price a battery?

Calling any readers with intimate knowledge of the full EV battery supply chain. I need your advice.

I have a saying 'show me the incentive and I'll show you the future'. Well around the world, governments are pushing people to switch to electric vehicles with a combination of legal and financial incentives, so it will happen.

I've always assumed that governments green flag these futuristic societal changes by simply giving what they think is sufficient notice for the market to develop, deploy and scale the required technologies. The timeframe to scale the EV move appears to be about a decade: some countries quicker, others slower.

The technology for designing and manufacturing the vehicles is obviously already fully available and we can probably jury-rig the infrastructure. I'm interested in knowing if the raw material providers for the battery packs can scale at the same rate.

I recently listened to a fascinating talk by a trusted source who said that the likes of lithium and graphite supply will need to increase tenfold in the next ten years. However, in our entire history, the best humankind has ever achieved in scaling raw material production is twofold in one decade. That appears to be a yawning supply and demand gulf.

Maybe new scalable battery technology will be developed, maybe governments will scale back their incentives, maybe hydrogen will leapfrog EV, maybe new recycling technology will evolve or maybe the price of batteries and EVs will skyrocket.

I'd be delighted to hear from lithium miners, battery producers and EV manufacturers.

*Jon Barrett*

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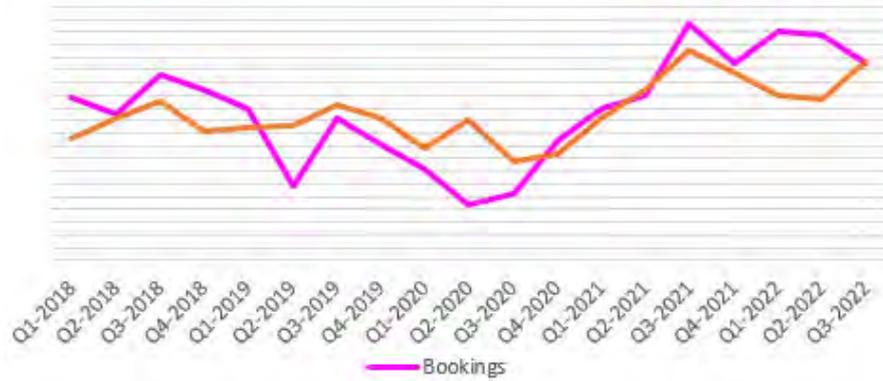
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## UK connectors bookings v billings



## UK connector sales up 10 per cent YoY

ITSA members have seen a 10 per cent overall growth in sales, despite a decline in mil/aero and mass transport markets.

However, while sales have grown, both revenues and the book-to-bill ratio are flat. Other key stats include: revenues remain eight per cent over pre-pandemic levels; all members' key markets show growth, with some exceptions; distribution remains a major contributor, well above pre-pandemic levels.

Most UK markets continue to perform well with communications, data processing, broadcast, utilities and industrial leading the way, all with significant double-digit growth. This is offset by decline in both mil/aero and mass transport.

Whilst the UK connector market faces challenges, it remains resilient and 2022 was an exceptional year for ITSA members.

[www.itsa.org.uk](http://www.itsa.org.uk)

## Accelerate IIoT applications

Mouser Electronics is shipping Qorvo's DWM3001C 6.5 and 8.0GHz ultra-wideband module, designed to accelerate IIoT applications for tags, access control, asset tracking and secure bubble environments. This integrated module streamlines UWB implementation in applications such as factory and warehouse automation and security systems and is engineered to provide high-precision, real-time location for healthcare staff and patient applications, retail security, connected home, navigation and more.

The DWM3001C is an integrated UWB module and certified (FCC, ETSI and IC) integrated modem solution to simplify

UWB implementation in systems using a standard low-power microcontroller. It features adjustable data rates from 850kbps to 6.8Mbps, with maximum packet lengths of 1023 bytes for high-data-throughput applications. The module integrates the DW3110 transceiver IC, Nordic Semiconductor nRF52833 Bluetooth Low Energy system-on-chip, a planar UWB antenna, accelerometer, power management and crystal.

[www.mouser.com](http://www.mouser.com)



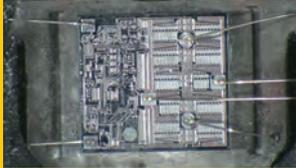
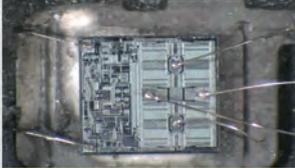
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### UNEXPECTED DIE

In the second instalment of *Princeps'* monthly counterfeit investigation, we look at a decapsulated component exposing an unexpected die

We return this month with another decapsulated part. In this case two samples of LM317AEMP taken from adjacent pockets on a tape received from a UK broker. A glance under a microscope was enough to see obvious red flags. However, looking at the silicon we see two completely different dice parts that



are purportedly from the same manufacturing lot. Manufacturers do make die revisions without notice, but not halfway through a production run. These

counterfeit parts have been removed from the supply chain and reported to the appropriate authorities.

[princeps.co.uk](http://princeps.co.uk)

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# Explore strategic obsolescence management

*IIOM returns to London for its 2023 International Conference and Exhibition, addressing the strategic side of obsolescence management over two days in October*

Proactive and reactive approaches to obsolescence management are now well understood, even if not fully implemented in all industry sectors. For through life support of long lifecycle assets in industries such as aerospace, defence, medical, nuclear and rail, obsolescence management needs to be strategic.

The latest version of the standard for obsolescence management, IEC 62402:2019, introduced the concept of strategic obsolescence management. It states that when obsolescence management is planned and implemented early in the life cycle, this strategic approach should

reduce the cost and detrimental impact on customer operations later in the life cycle.

At the 2023 Conference, delegates will explore when a strategic approach is appropriate and consider how technology refresh and upgrade can be planned during the system or product life cycle. In the call for conference papers, IIOM is looking for case studies describing how performing and planning obsolescence management activities earlier in the life cycle—and taking account of obsolescence management in designing systems—has led to better outcomes and lower life cycle cost.

The electronic component crisis of the last years has necessarily forced businesses to take urgent action to mitigate delivery and cashflow risk. The conference will also explore the lessons that can be learnt by applying the principles of obsolescence management so that businesses are less vulnerable to future supply chain shocks.

IIOM looks forward to welcoming obsolescence management professionals, solution providers, procurement specialists and academics from around the world to London on 25 and 26 October 2023 to share knowledge and build their network.

[www.theiiom.org](http://www.theiiom.org)



**Alstom's obsolescence director, Stuart Broadbent**

## The Strategic Side of Obsolescence Management

The International Institute of Obsolescence Management (IIOM) returns to London for its 2023 International Conference and Exhibition, addressing the strategic side of obsolescence management over two days in October. The electronic component crisis that has affected many industry sectors in the last couple of years has necessarily forced businesses to take urgent action to mitigate delivery and cashflow risk, the conference will also explore the lessons that can be learnt by applying the principles of obsolescence management so that businesses are less vulnerable to future supply chain shocks.

IIOM has been helping companies to address the problem of obsolescence in long life cycle industries since 1997, chapters are now operating in France, Germany, India, UK and USA. Its corporate members include asset owners & operators, manufacturers and obsolescence solution providers.

The short life-cycle of electronic components, driven by consumer markets, makes sustaining of long life cycle systems increasingly difficult, but it is not just about electronic components—globalisation and consolidation of the supply chain, supplier bankruptcy, and new regulations such as REACH affect electrical and mechanical components and equipment as well.



October  
**24 - 27**  
Tuesday Friday

### Date for your diary

IIOM International Conference London  
24th- 27th October 2023

To find out more visit our website [www.iiom.global](http://www.iiom.global)

# Assurance matters

*In the fight against counterfeits, Adaptix' fast, affordable, benchtop 3D inspection system is designed to tip the balance of power in favour of the buyer*

Imagine if some 15 per cent of electronics were counterfeit? Well, they are. Counterfeits affect sectors from military to medical. Approximately one in seven electronic parts in the US military were estimated to be counterfeit (according to the US Senate in 2011) and one in 12 medical devices being counterfeit (according to the WHO in 2010). As a result, standards such as ISO9000, AS9100, SAE AS5553 and IEC 62239-1 all state supply chain companies must have anti-counterfeit measures and management plans.

A post-pandemic surge in demand for electronic components has caused lead times to often exceed 52-weeks and corporate buyers are now scouring parts of the supply chain they would not have previously trusted. Counterfeiters have seized the chance to monetise the opportunity

and have become more sophisticated in doing so given the massive values at stake. The combination of these factors results in a scale and significance that many privately acknowledge but will not publicly speak of.

Counterfeiters 'pepper' good batches with around 10 per cent non-authentic components to drive yield and avoid detection, which works not least as a batch several times. Existing inspection protocols are not stopping the ingress and buyers are accepting downstream product failure as a cost of doing business. Understandable for a non-safety critical device, but problematic in a car, pacemaker, plane or missile guidance system.

AdaptixNDE sees a way to change the balance of power in the war on counterfeit.

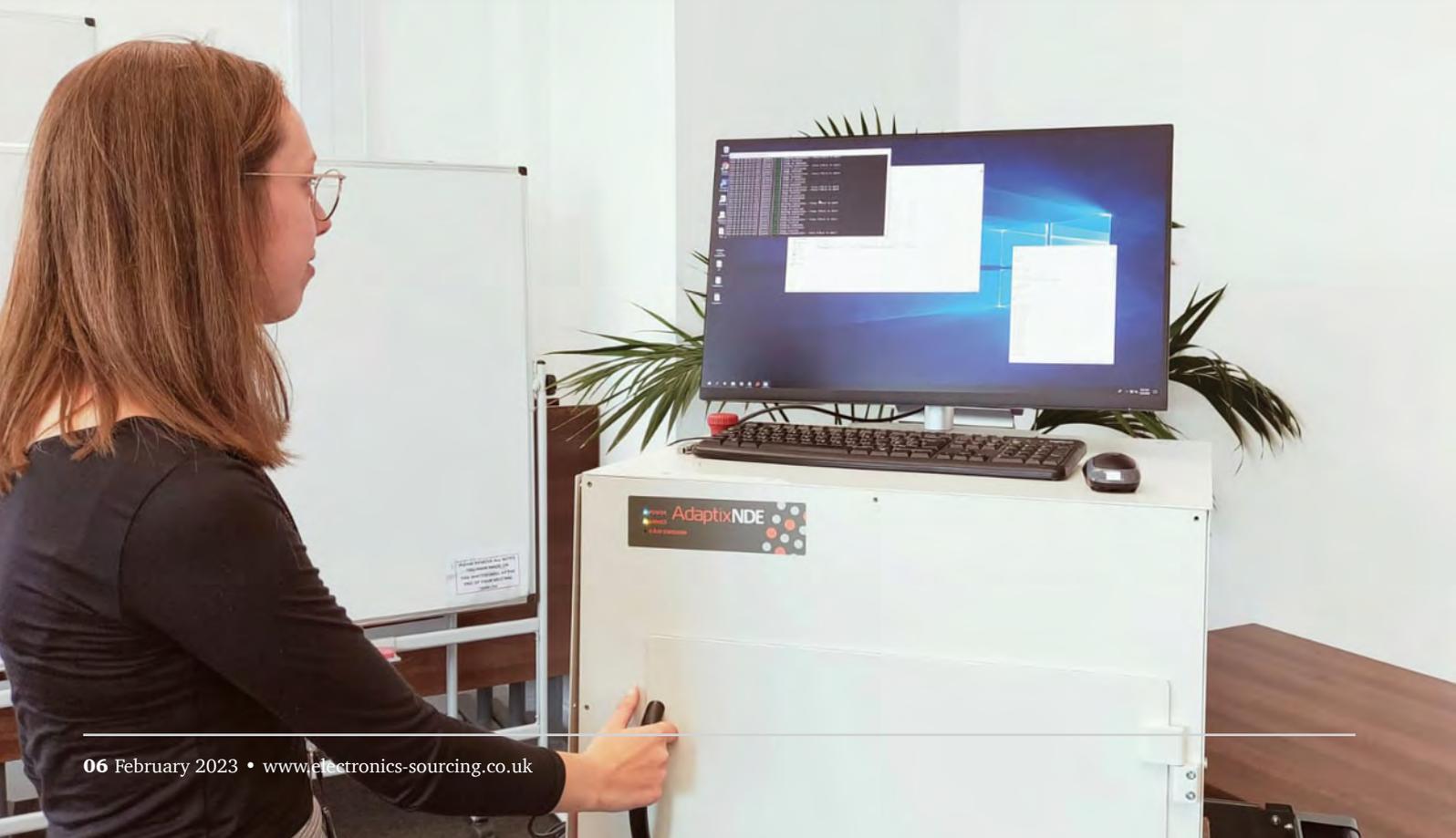
Initially this is about transforming the economics of testing: accelerating inspection workflow; increasing the productivity of skilled inspectors; and improving the sensitivity and diagnostic certainty with respect to counterfeit. This is achieved by bringing the external test house to the warehouse through putting affordable and deployable 3D imaging on the test bench to deliver 3D clarity in 60 seconds.

Conventionally 3D x-ray (typically via computed tomography) has been beyond the reach of many organisations because of the infrastructure (lead-lined radiation room), cost (hundreds of thousands), weight (the same as two Nissan Micras) and (crucially) the full workflow time it takes to acquire an image. Fast, affordable, fully shielded 3D is now

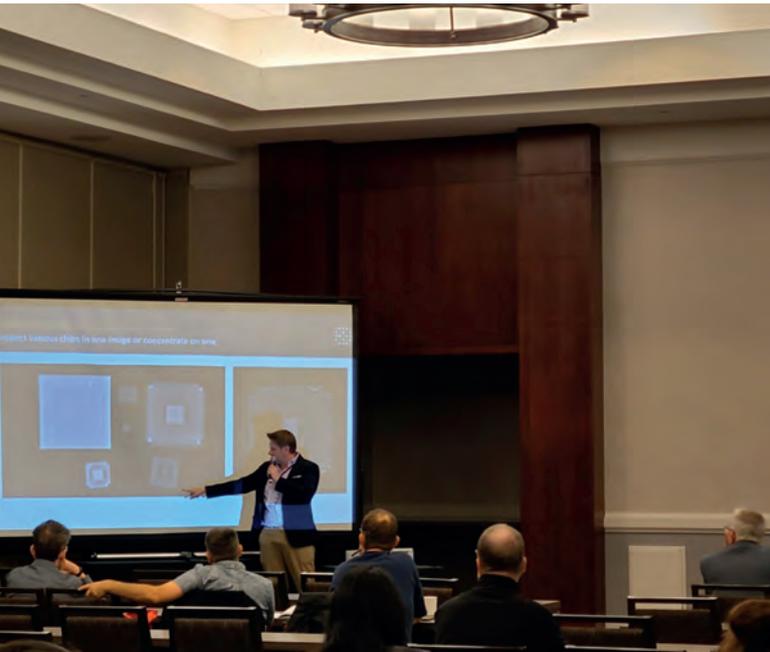
available for in-house routine use via Adaptix and it weighs just 85kg. This 'benchtop' 3D allows a rapid test for: coplanarity, while also visualising deformities (such as twisted chips or bent pins); uneven BGAs; missing or variants in dye; and seeing broken wires. All while in the box, allowing focussed selection of components for inspection.

Capability is important, but to 'move the needle' it is the economics that are important. On-site inspection: reduces component handling and transit; allows faster stock-turns to reduce working capital and stock-holding risk; and increases the throughput capacity for a test, storage or warehouse facility allowing the following advantages.

**Faster inventory turns:** In-house testing allows compression of the



## Obsolescence



inspection cycle from six-weeks to 60-seconds. Lower inventory holding periods due to not needing to wait for test results. Faster time to cash receipt from customers.

### Enhanced risk management:

Reduced risk from price fluctuations on price-volatile components. Reduced economic exposure when placing components into long-term storage.

**Reduced cost:** Reduced external test costs. Reduced handling, transit and administration costs. Removes capital cost of test equipment purchases.

**Improved efficiency:** More productive use of in-demand skilled inspectors to improve efficiency and effectiveness.

**Increased confidence:** Potential to increase sample size with same resource or give equal assurance at lower cost. Better data to refute false return claims

AdaptixNDE is delivering this value on a 'per-scan' basis with a small up-front and monthly fee to reduce the perceived risk of adoption and ensure that incentives are aligned. Just as in healthcare, from where the technology emanates, the key is 'quality up, cost down'. Again, as in healthcare, the technology is not standing still and the company has a product roadmap

that will further accelerate inspection and enhance assurance as the war against counterfeit will never be won. The pipeline of further innovations includes:

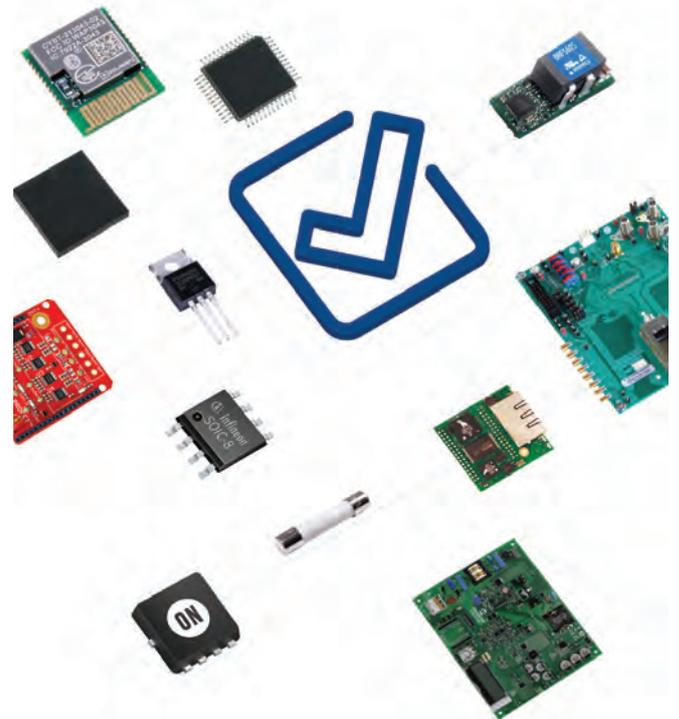
- Automated quantification
- Automated comparison with external data sets
- Multi-modal and multi-spectral inspection
- Automated oxidation detection
- Comparison with large data sets of known-good and known-bad

The future of counter-counterfeit is a strategy built on data and leveraging the lessons of anti-virus—the aggregation and dissemination of threat information to the benefit of all benign market participants by providing ever more certain characterisation and evaluation of components and devices. Adaptix' solution will extend to a complete solution that evolves as the threat develops to support reputable companies in their anti-counterfeiting management plan in line with ISO, AS, SAE and IEC requirements. Today AdaptixNDE can transform the economics of test, tomorrow the company aims to equip manufacturers and brokers in the war against the counterfeiters.

[www.adaptix.com](http://www.adaptix.com)

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# Weathering the obsolescence storm

*Rochester Electronics' product and technology solutions manager, Ken Greenwood, explains the value of a reliable supply chain regarding mission-critical obsolete components*

Semiconductor lifecycles continue to shrink and product discontinuation notices (PDNs) are on the rise. With recent supply constraints, original component manufacturers (OCMs) and the semiconductor manufacturing chain have been reassessing product profitability. Oftentimes the decision has been made to prune uneconomical lines.

Whether it is third party or OCM owned fabs cutting older geometries, packaging houses choosing to end support of older package styles (such as PLCCs or small-SOICs) or the withdrawal of tester platform support, PDNs are increasing and becoming more unpredictable.

Manufacturers must be able to track and anticipate the lifecycles of their core semiconductors. Component databases,

such as IHS and Z2Data, can predict the remaining life of a component and the anticipated end-of-life (EOL) dates. Premature PDNs are, by nature, not easily anticipated by standard algorithms.

Component discontinuations force customers to commit to a traditional last-time-buy, whereby finished components must be purchased all at once, to hopefully cover any future needs. Along with the capital tied up in the stock itself, there are additional costs for specialised IC storage. Under perfect conditions, these costs are unwelcome, but manageable. However, if market needs increase, in-service maintenance timescales are extended, or an unanticipated EOL is announced, what should be done?

It is a common misconception that after a PDN is announced, only non-

authorised sources can meet additional product needs. However, this route carries enormous risks and is patently untrue.

Any active component shortage or ongoing need for obsolete components provides 'incentives' for unscrupulous sources to exploit the situation and potentially contribute poor quality products or counterfeits into the market.

The risks of counterfeit and poor-quality components from unauthorised sources represent a significant risk to both production yields and mean time between failure rates (MTBR). Inferior or substandard testing by unauthorised third parties provides a false promise that authenticity can be tested. This testing is visual, x-ray or a poor partial copy of the original manufacturer's test processes. Full tri-temp testing can



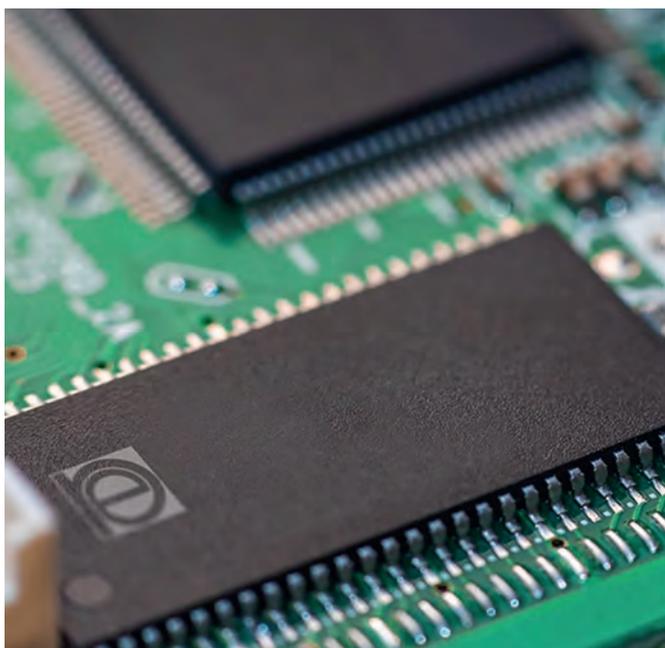
**Rochester Electronics' product and technology solutions manager, Ken Greenwood**

rarely be offered and the risk of commercial-grade components being re-marked as industrial, automotive or military parts is frightfully present.

There are also documented quality problems related to foreign chemicals. Cleaning chemicals used to recover, wash and re-mark used components, slowly migrate into the products, leading to the shorting and corroding of bond wires and pads alike. Superficial testing is not guaranteed to



## Obsolescence



find these faults. Unauthorised components may not only pass these tests, but also survive for a period of service. However, the components' inevitable failures will destroy MTBR figures, resulting in reduced reliability and damaged industry reputations.

Authorised aftermarket distributors and manufacturers, such as Rochester Electronics, provide a risk-free long-term source for semiconductors. They are an indispensable authorised partner supporting:

- Stock to overcome market shortages or long lead-times
- A trusted source for obsolete components
- Long-term manufacturing from wafer of selected product ranges

Rochester is 100 per cent authorised by over 70 leading semiconductor manufacturers. Its factory direct, AS6496-compliant, offering negates the need for expensive redesign, requalification and recertification.

Additionally, partnering with a licensed semiconductor manufacturer can mitigate the risks of component EOL. A licensed manufacturer can produce devices no longer supplied by the OCM. When

a component is discontinued, the remaining tested wafer and die, assembly processes and original test IP, are transferred to the licensed manufacturer by the OCM. This means that previously discontinued components are still available newly manufactured, and 100 per cent in compliance with the original specifications. No additional qualifications required or software changes.

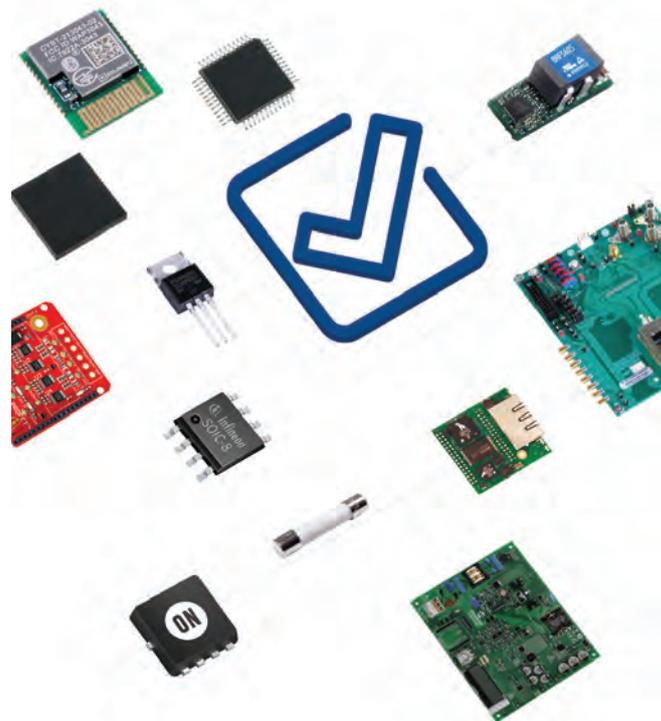
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**Manufacturers must be able to track and anticipate the lifecycles of their core semiconductors**

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# Custom sheet materials delivered fast

*Materials Direct's technical director, James Stratford, explains how to simplify the sourcing of complex, production representative technical sheet material parts*

There are many financial and marketing benefits for OEMs who deliver their new products to customers ahead of competitors. This means that during R&D, product development and early pre-production stages, there is significant pressure on purchasing professionals to get the parts they need as quickly as possible.

This article focusses on e-mech parts, specifically technical sheet materials used for gaskets, thermal interfaces, RFI shielding and electrical isolation barriers. Looking at the design and procurement process, what are the key factors and considerations?

**Fast, easy, online access:** Some supplier websites in the electronics B2B space now mirror those seen in B2C by supporting self-service selection and ordering. This gives buyers looking to source parts 24/7 access to choose and order that (with a well-designed UI/UX) can be an intuitive and fast end-to-end process. For many types of

products, the necessity for buyers to reach out to a nine-to-five manned sales office is becoming a thing of the past.

**Choice and availability:** If a supplier can offer access to a wide selection of materials, ideally from a choice of well-known brands, there is no need to search multiple supplier sites saving time and frustration, while alleviating the need for often lengthy and paperwork heavy set-up of multiple suppliers. Options shown on websites need to be backed by available stock of at least the most popular product lines and quick access to less accessed lines.

**Fully representative parts:** Ordering standard sheet materials is sometimes what buyers want—perhaps at the earliest stages of the design process/prototyping. However, as the project moves through the development stages and into pre-production, having 100 per cent production representative parts is an advantage, saving time and avoiding unexpected issues

that sometimes happen when stepping from hand-cut parts to tooled versions.

A further consideration is that while simple square, rectangular or circular parts are easy to cut from sheet in small volumes and with adequate repeatability, complex shapes are much more difficult, even impossible to hand-cut. Historically, the challenge with sourcing custom-shaped parts for small quantities created a procurement headache due to the wait and cost of tooling.

Fortunately, state-of-art, computer-controlled machinery can now produce complex parts quickly and accurately without tooling. For example, Materials Direct can manufacture and ship intricate, tooling free, custom parts as fast as 24-hours after the customer has entered their requirement and design information via the website.

Choice, speed, ease-of-use and high availability are cornerstones of a successful, modern self-service,

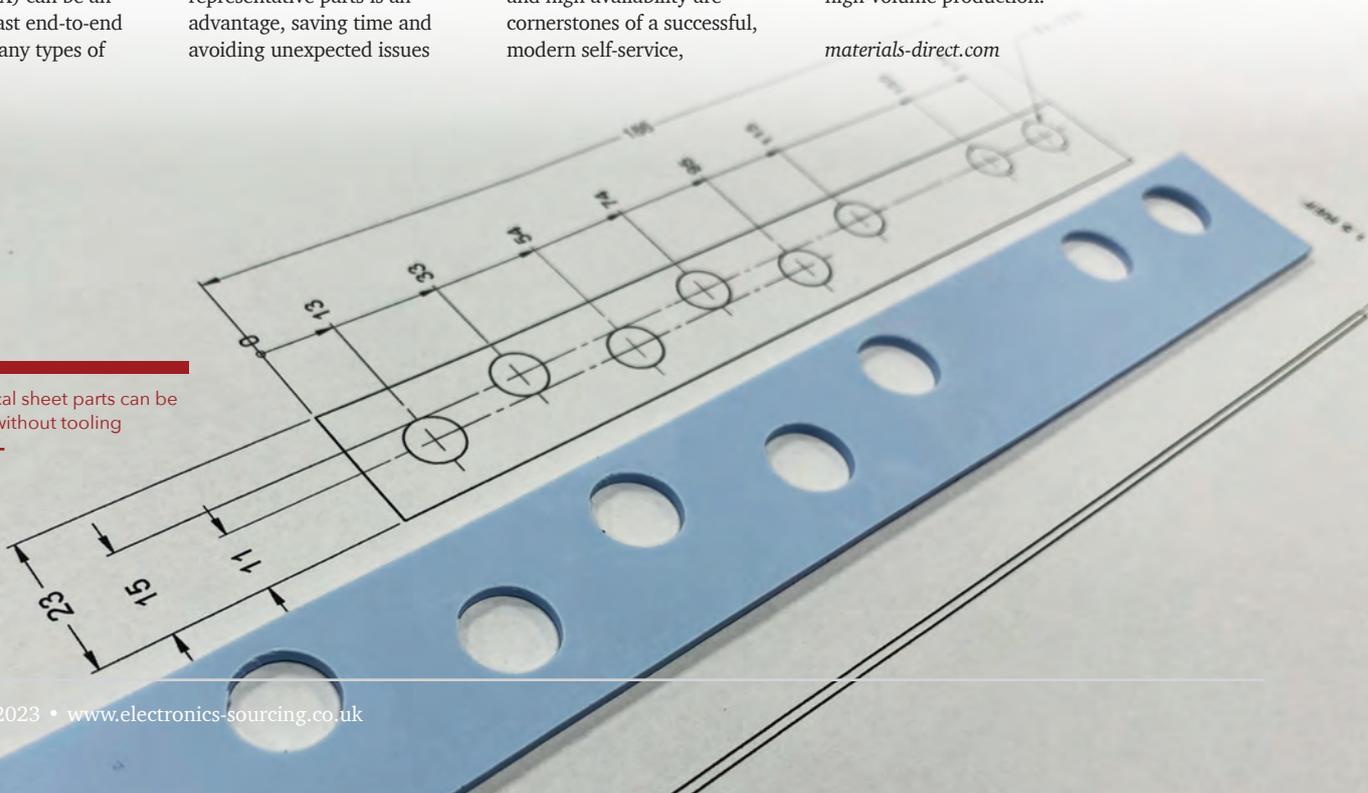


**Materials Direct's technical director, James Stratford**

transactional website. An online design interface with advanced manufacturing machines can supply custom pads and gaskets to exact requirements, with no tooling costs and a rapid turnaround which has benefits for those sourcing parts during product development phases and through to full-scale high-volume production.

[materials-direct.com](https://www.materials-direct.com)

Custom technical sheet parts can be manufactured without tooling





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# HARSH WORLD OF AVIATION CONNECTORS

Here, PEI-Genesis' SVP and MD Europe, Jonathan Parry, explains why reverse bayonet connectors are an excellent option for commercial aircraft

Connectors on commercial aircraft experience some of the harshest environments of all industrial applications. These connectors must perform flawlessly and remain mated when subjected to high altitudes, vibration, shock and fluctuating temperatures.

Despite a decline in passenger air travel over the course of the pandemic, the International Air Transport Association (IATA) expects the sector to return to profitability in 2022. As passenger traffic normalises, so will the demand for aircraft and their components—with the global aviation connector market estimated to be

worth \$6.8bn by 2027. There are six key areas on an aircraft where connectors are used: fuel management system, landing gear, airframe, galley/cabin, flight control panel and engine. Each area has its own set of requirements and challenges.

Connectors used in the fuel management system must be airtight, so they are hermetically sealed during manufacturing to allow them to perform reliably during use. Connectors used in the landing gear experience repeatedly high impact, vibration and shock, plus extreme fluctuating temperatures, so are typically designed

with a three-point bayonet coupling system.

Connectors used in the airframe must be environmentally sealed, electrically shielded and resistant to fluids and vibration. Those used in the galley and cabin are typically used for in-flight-entertainment and avionics, so must be lightweight, cost-effective and scoop-proof—featuring a longer shell on the receptacle that prevents the exposed pins from being damaged.

For the aircraft control panel, where space is limited, rack and panel type connectors are used that can be blind mated, [Continue on page 14 >](#)



PEI-Genesis' SVP and MD Europe, Jonathan Parry



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allowing the connector to be reliably mated while saving space. Finally, in the aircraft engines and boosters, anti-rotation connectors are used that feature a reduced elastomer barrier for use with newer and older generation wires. These connectors are also designed with shell-to-shell metal bottoming, improving shielding and providing a secure fit.

One of the best connector designs for aircraft use is the bayonet. Bayonet, and particularly reverse bayonet connectors, are a useful coupling mechanism that

allow the connector to be quickly locked and unlocked while maintaining a secure fit that prevents it from becoming dislodged in the face of extreme vibration. The reverse bayonet design features ramps built into the receptacle allowing the plug to be twisted and locked into position without the need for lock wires.

As a supplier of bayonet connectors for use in everything from military, aerospace, rail and more, PEI-Genesis custom assembles a variety of reverse bayonet connectors

from the world's leading connector manufacturers including Amphenol and ITT Cannon. These are available in various sizes and contact configurations and are rated to the most demanding mil-spec and aviation standards.

As the world adjusts and the aviation sector returns to post-pandemic growth, aircraft manufacturers must ensure they can continue to deliver aircraft with components that perform in the harshest conditions.

[www.peigenesis.com](http://www.peigenesis.com)



**In the aircraft engines and boosters, anti-rotation connectors are used that feature a reduced elastomer barrier**

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# Changing role of materials purchasing

*UK Circuits and Electronics Solutions' Chris McTernan, walks readers through the role of procurement director and how the perception of purchasing, procurement and supply chain functions is changing*

What I love about procurement for manufacturing is the 'tangible factor'. I can negotiate the best price for a package of components and, within weeks, see the result on the shop floor—the end use of the procurement work. This gives me a wider perspective of how the company operates which helps me see where I can add real value to the business.

If one positive has emerged from the global upheaval of recent years, it's the fact we're now seeing a shift in perception of purchasing, procurement and supply chain functions from a simple administration role that can be 'churned out' by some of the least valued and most poorly rewarded people in the business. Providing we have the answers, the recognition

and reward will come. One of the big attractions for me at UK Circuits is that the procurement function is seen as equally important as sales and operations. I look at it as the three core functions—if you like, the three divisions—of the UK Circuits army, in the battle for growth and success.

## **Building relationships**

There are two things that drive me in my role. Firstly, it's the reward and recognition from the rest of the organisation—not for me but for and of the team that I lead. Secondly, developing relationships with suppliers. I always have, and will continue to enjoy, spending time at source with suppliers, growing relationships from the initial requests for information through to the first purchase order and then developing the PO demand

through to a contractual relationship, one with mutual value. I've had more engagement with people from vendor organisations, once they have come to realise that I understand their problems and demands and that I want to work with them.

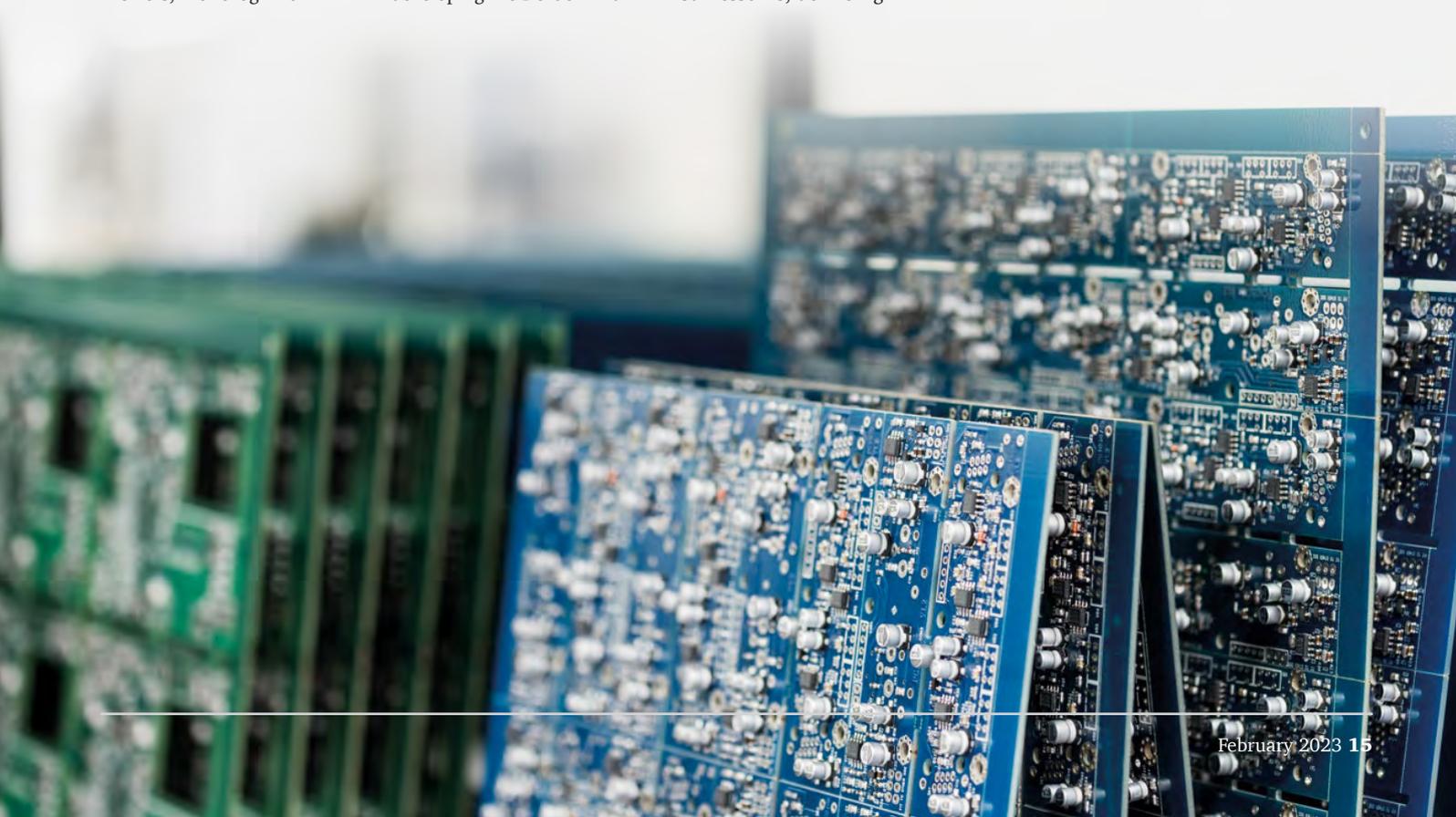
The most challenging aspect of my job is serving my internal customers and managing their demand properly. If I can get the procurement function to be strategically aligned to serving our internal customers and engaging effectively with the people within the business who load up the purchasing demand, then we have a real chance of sustained success.

## **Making change right**

The most important advice I'd give my successor is, do the right



**UK Circuits' procurement director, Chris McTernan**



thing. It's a very simple sentence that works in almost all the judgement calls that must be made. If you're going to make a change, launch something radically new or ask people to do something differently, make sure that you're doing it for the right reasons and that it sits right with you in your heart and not just your head. Especially in a smaller organisation, where failed initiatives are remembered for much longer. This comes from my experience over the years. I'm an enthusiastic campaign leader, but I always make sure the campaign is the right thing to do.

If I could go back, I'd tell my 21-year-old self to stop assuming the grass is greener on the other side. Make the most of current circumstances. My analogy is, the grass you're standing on will

be green, if you water it. Also, if you're talking to yourself, tell the truth. Be honest with yourself.

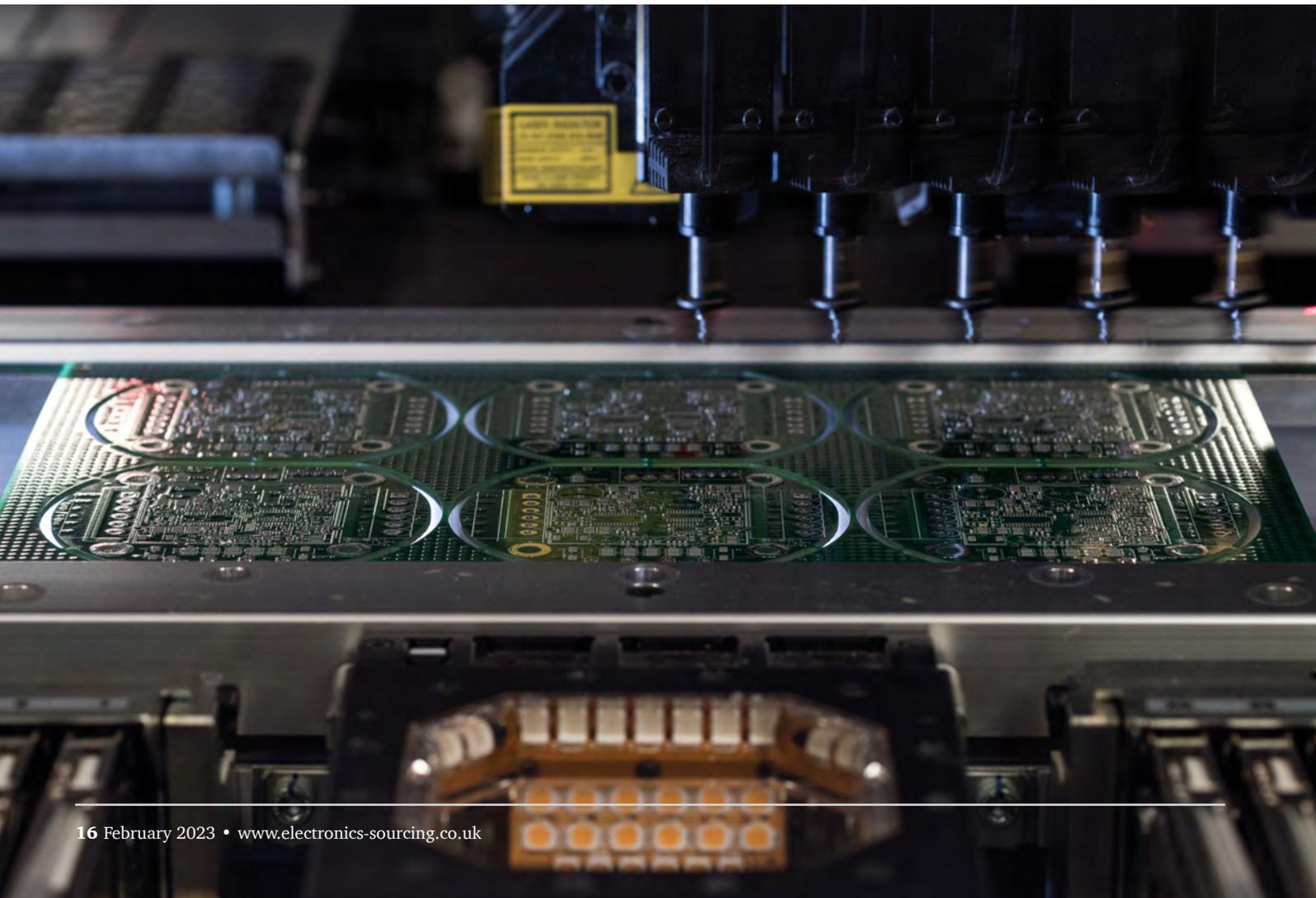
### **An active contribution**

I'd describe the culture where I work as 'actively contribute, shake things up, add value'. I'm pretty sure that I was hired on that mandate. It's been made very clear to me that the procurement function at UKC can be just as instrumental in effecting change and growth as any other. I'm given a share of the microphone at business' decision-making events. This is exciting to me, and something which all UK manufacturing businesses should embrace more. The Board at UKC seems very open to innovative and different approaches to solve problems. There's no hiding behind pretentious glossy corporate soundbites here. It's immediacy

and efficacy that counts, and I like that.

### **Changing face of procurement**

The demands of procurement have changed significantly since I started my career almost two decades ago. The fact that just one container ship running aground in the Suez Canal and threatening almost every supply chain has brought about some of the biggest changes I've seen in the last 15-years. It's finally exposed the fragility of the just-in-time replenishment model and the 'smoke and mirrors' myth that it is. It's also shown that being dependent on a globalised supply chain is completely unsustainable. When I worked in oil and gas construction procurement, having materials at arm's length in the period before you needed them was the key to success.

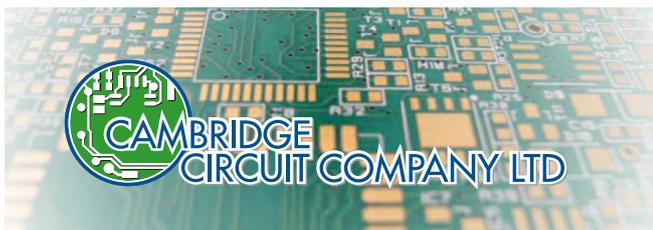


## PCB Sourcing



For the foreseeable future, I think manufacturing must revert to having arm's length supply of materials and components. This means a different way of working than we've been told over the last 20-years, from the multitude of macro distributors. Distributors that can mould themselves around the customer demand or fragment into bespoke service providers and are prepared to hold stock and consign stock for the SME market, will be key to successful operations. The UK SME manufacturing market share is massive and the assurance and demand are there, if suppliers, distributors and service providers are able to see the wood from the trees.

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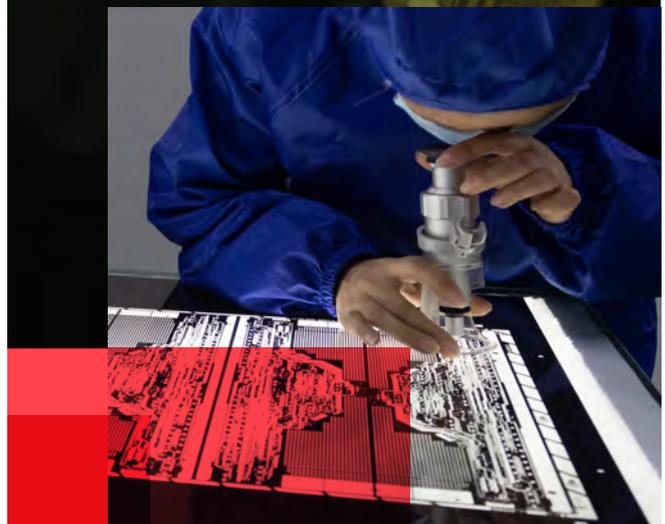


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# Heads-up on standards revisions

*ART will have staff on hand at Southern Manufacturing and Electronics to discuss new revisions to IPC standards and associated training programmes*

Advanced Rework Technology has been busy working with industry members and the IPC on the release of new and revised IPC documents and standards to maintain the quality of products and services offered to the electronics industry.

ART's MD, Debbie Wade, believes the company offers the best possible training solution as the organisation is an active member of many IPC committees. This elevates ART's IPC Trainers as they can fully explain why a change was made and where it is applicable, supported by change data.

Debbie herself chairs many IPC committees including: Vice Chair of Technical Activities Executive Council; Vice Chair of Product Assurance; and Chair of both IPC European Standards Development and IPC European Training committees.

New revisions recently released include:

IPC-WHMA-A-620 Revision E released Oct 2022, describes materials, methods, tests and acceptance criteria for producing crimped, mechanically secured and soldered interconnections and the related assembly activities associated with cable and harness assemblies.

IPC J-STD-001 Revision HS space and military addendum, released May 2021, supplements or replaces specifically identified requirements of IPC J-STD-001H requirements for soldered electrical and electronic assemblies that must survive the vibration and thermal cyclic environments of getting to and operating in space and military applications.

IPC J-STD-001/IPC-A-610 Revision HS, released October 2021, is the automotive addendum to J-STD-001H and IPC-A-610H. It provides criteria to ensure the reliability of soldered automotive

electrical and electronic assemblies in the field under harsh environments and considers automated high-volume production.

IPC-A-640, Revision A, released March 2022, Acceptance Requirements for Optical Fibre, Optical Cable and Hybrid Wiring Harness Assemblies standard provides acceptance requirements and technical insight for cable and wire harness assemblies incorporating optical fibre, optical cable and hybrid wiring technology.

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**The company offers the best possible training solution as the organisation is an active member of many IPC committees**



## SITES NOW IN UK AND ITALY





As an Authorized Training Center, A.R.T Ltd can offer Certified Training to the IPC Standards listed below. A.R.T Ltd are the only training center in the UK able to offer CID PCB Design and IPC6012 training and Space Addendum training for J-STD-001 and IPC-A-620.



Acceptability of Electronic Assemblies



Requirements for Soldering Electrical and Electronic Assemblies



Repair Rework and Modification of Electronic Assemblies



Requirements and Acceptance for Cable and Wire Harnesses



Qualification and Performance Specification for Rigid PCB's



Acceptability of Printed Boards

# Go-to event for diverse sourcing requirements

*Southern Manufacturing & Electronics explains how the event's broad technology offering provides buyers with a one-stop purchasing shop*

This year's *Southern Manufacturing & Electronics*, which runs from 7 to 9 February at the Farnborough International Exhibition and Conference Centre will offer electrical, electronic, mechanical and production engineering in equal measure.

The event will showcase exhibitors from the UK, Ireland, continental Europe and beyond. This exhibitor diversity

offers a go-to place to efficiently address multiple sourcing requirements. The show organiser, European Trade & Exhibition Services, states the event is a sell-out, with over 600 firms attending. There are no barriers between the different areas so visitors can move freely between the engineering disciplines and perhaps discover unfamiliar technologies and services not on their original shopping list.

*Continue on page 22 >*



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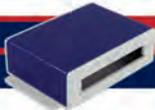


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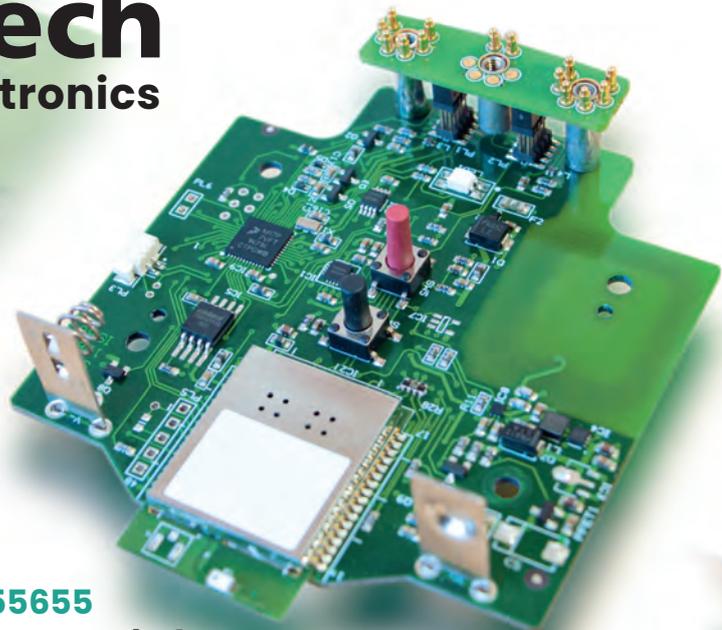
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Highlighted over the three days will be an array of mechanical, electrical, electronic, optoelectronic, electromechanical, hydraulic and pneumatic components and assemblies, PCBs, cables, connectors and sensors, plus drives, rotary encoders, linear scales, fasteners, pressings, wireforms, springs, plastic, rubber mouldings and more. Visitors will also see automation equipment, plant for electronics production and assembly, mechanical systems and workshop equipment.

There will be suppliers of machine tools and tooling, workholding systems, metrology equipment for both tactile and non-contact measurement and inspection, test and inspection systems, finishing machines, laser cutting and marking equipment, additive manufacturing machines and consumables, industrial hardware, production and planning aids, and engineering and business software.

Industry 4.0 solutions will be in evidence alongside controls, displays, HMIs, data acquisition systems, augmented, mixed, and virtual reality, robot and cobot machine tending and other automation solutions. Other diverse and no less essential products and services on offer will encompass oil and coolant supply, workshop equipment, dust



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and fume extraction, humidity control, workplace storage systems, bespoke case and foam manufacture, plastic packaging and injection moulding, hand tools, adhesives, industrial flooring, waste removal and recycling, training and financial services.

Providers of electrical and electronic engineering subcontract services specialising in SMT, PCB production and box build, cable assembly, test and inspection will promote their businesses alongside others producing metal and plastic machined parts, sheet metal components and fabrications. Traditional subtractive machining specialists will be joined by bureaux concentrating on 3D printing. Business consultancies will similarly outline how they can help industrial companies to maintain momentum and profitability throughout 2023.

Alongside the exhibition and demonstration zones, there will be an extensive technical seminar programme. It will give visitors and exhibitors alike valuable learning opportunities, with a particular focus on the technical, managerial and environmental issues facing manufacturers today. There will be two programmes, one covering electrical and electronic engineering and the other the mechanical sector.

*Southern Manufacturing & Electronics 2023* will co-locate with *AutoAero*, a specialist theme within the exhibition devoted to aerospace and automotive engineering. There is a regular, free bus service between Farnborough's main and North Camp railway stations and the show. Admission and parking are also free.

[www.industrysouth.co.uk](http://www.industrysouth.co.uk)



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# Let's talk menopause

Against the backdrop of an ageing UK workforce, Nano Electronic Services encourages businesses to create menopause friendly working environments

Menopause like menstruation, sex and mental health are still taboo subjects. Maybe because people are embarrassed. Maybe because they were shown during childhood that these subjects were secretive, something that was whispered about. Maybe because we do not know enough about the subject. The way to change this is to start talking.

### Demographics

The workforce is ageing so more woman going through this stage in life are working and affected by the symptoms.

**47%**

of the global work force are women

**66%**

of women aged between 50 and 64 are in the workplace

**51**

is the average age to start perimenopause in the UK. It is usually between 45 and 55 and can be any time up to mid-60s

Can start due to a medical treatment such as chemotherapy

### Symptoms

There are over thirty physical and psychological symptoms

- Unlikely to experience all symptoms
- Some women may not notice any major changes
- Three in four women experience symptoms  
One in four serious
- One in four women consider leaving their workplace due to their symptoms
- One in ten women leave the workplace due to the impact
- Symptoms usually last between four to eight-years, sometimes longer
- Symptoms can be managed

### Five major symptoms can be impacted by the workplace

 Hot flushes

 Fatigue

 Focus and concentration

 Anxiety and worry

 Insomnia

### Employment law

The menopause is not a specific protected characteristic under the Equality Act 2010 but if an employee or worker is put at a disadvantage and treated less favourably because of their menopause symptoms, this could be discrimination if related to a protected characteristic, for example: age, disability, gender reassignment and sex.

The number of tribunal cases citing menopause increased by 44 per cent in 2021. Menopause-related employment tribunal claims nearly doubled over the past year. Analysis of court records by Menopause Experts Group found that of those 23 cases cited the menopause in 2021. Of the 23 cases, 16 included claims for disability discrimination, 14 included claims for unfair dismissal and 10 included claims for sex discrimination. In addition, mentions of the word 'menopause' increased by 75 per cent in tribunal documents.

### Examples of reasonable adjustments

**Hot flushes:** Consider temperature and lighting to help women manage their body temperature. Make desk fans easily available. Consider uniforms or dress code.



**Companies now offer training and support for health and well being in the workplace**

**Sleeping/tiredness/fatigue:** Could start and finish times be adjusted. Informal arrangements or flexible working. Flexibility around breaks or increased breaks during the working day.

**Heavy bleeding/flooding:** Facilities for women to change clothes during the working day. Access to sanitary products.

**Anxiety/panic attacks:** Regular one-to-one discussions. Referral to counselling services.



A number of companies now offer training and support for health and well being in the workplace. Nano Electronic Services work closely with BMR Healthcare who are offering *Electronics Sourcing* readers 10% off their training course with the code NANO10

**What can be done to be more menopause friendly?**

Be clear how the organisation supports menopause at work

Create a culture where menopause can be discussed openly

Provide training and support

Review existing support

Menopause friendly workwear

Menopause friendly workplace

Supporting menopause at work is the right thing to do for organisations and colleagues. It helps retain talent within an organisation and creates an inclusive, supportive work environment. Colleagues' wellbeing is placed centre stage, showing an organisation is a wonderful place to work, in turn changing lives for the better today and for generations to come.

Menopause affects people differently and for those who experience symptoms, it can be a huge relief to know their employer will support them. Although things are improving, stigma still exists around menopause. What employers can do is what one would expect of any employer who wants to attract and retain a diverse and inclusive workforce. This starts with creating the environment to talk about menopause openly and without embarrassment.

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# Switches disinfect themselves

*In this article, SCHURTER introduces switches with antimicrobial coatings which inhibit or kill microorganisms, ideal for medical, sanitation and food applications*



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Antimicrobial substances inhibit the growth of microorganisms or even kill them. This approach is not new and consequently various solutions coexist on the market. All disinfectants, for example, are classified as antimicrobial. However, there are also surface structures that have an antimicrobial effect through the disinfecting action of silver and copper or by means of titanium dioxide nanostructures.

A large number of infectious diseases are transmitted via contaminated surfaces. This is called smear infection. Antimicrobial coatings, varnishes and paints can be applied to surfaces, ideal for facilities where high standards of hygiene are required. Examples include hospitals, food facilities, schools, kindergartens and retirement homes. Depending on the particular pathogen, microorganisms can remain active for up to 16-months on surfaces such as door handles, computer keyboards and pay stations.

In cooperation with a German manufacture of paints and varnishes for specialised

applications, SCHURTER put a coating to the test. The effect of coating—which works via the photodynamic principle—was tested on switches.

Photodynamics is based on the excitation of a photocatalyst by light waves in the visible spectral range (400 to 700nm). Energy transfer to the ambient oxygen produces singlet oxygen ( $^1O_2$ ). This reactive oxygen species kills microorganisms by oxidation.

The results were convincing. All sealed switches (piezoelectric, capacitive or ToF) suit the upgrade. Only switches with a circumferential groove (with a mechanical stroke) proved more difficult to coat since the coating could flow into the switch's interior. For these, the coating can be applied before assembly and limited to the actuator.

SCHURTER is now offering this upgrade as a customer-specific variant. Switches are a common human/machine interface, making it important to find the ideal switch for a given application.

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# How to move from manual to Digital Solutions

By **Stéphane Ratelet**, Director Business Development / Digital Solutions – EMEA & **Nathan Pray**, Manager, Digital Technology Office - B2B



Stéphane Ratelet

Nathan Pray

**A**s time passes, the world is more and more willing to digitalize and automate processes. Whether within internal processes or related to external interactions with suppliers and customers, Digi-Key understands how many processes can be positively impacted by automation. Fortunately, new technologies can help the supply chain, quoting activities and more.

## Look to Autonomous Cars for the Roadmap

When it comes to the journey towards digital transformation, some may struggle with figuring out where to start. By looking at autonomous driving levels, you can visualize a roadmap of the steps and order to follow.

SAE International charts out autonomous driving levels from 0 (no automation/human-driven) to 5 (automation driven/no human involvement). What is important to understand in this example is that the next levels can't be reached until the previous levels are completed. Much like the adaptive cruise control that needs a digital speedometer and real-time information about the distance to the car ahead, you can't have an assisted quoting process until you digitalize prices, delays and stock availability.

Before reaching a fully autonomous supply chain, there will be an "assisted" supply chain. To start building an automation-assisted supply chain, the first step is to clean data by digitalizing all relevant steps in the procurement process.

This idea can be applied to all independent processes and gives a first impression of your current level of automation, and what the next steps are to move toward higher levels of automation.

## Path to Digital Transformation

As a distributor, Digi-Key understands the need for options in the procurement process and how critical it is for your digital transformation. Therefore, we provide a set of digital connectivity solutions to achieve the first step in the process.

Over the past several years, purchasing has become increasingly more digital and automated. Digital solutions like Digi-Key's APIs, EDI and Punchout Catalog bring data in faster, helping purchasers make better supply chain and procurement decisions.

Some purchasers may be intimidated by the idea of automation, but what it ultimately comes down to is bringing in a digital machine-to-machine connection and letting computers do what they do

best – make simple, tactical decisions – thus freeing up valuable time for humans to take on more critical and creative thinking, connecting with business partners, and ideation.

## How to Get Started

Procurement professionals can begin by reviewing which digital solutions might be best to implement for their business. To get started with Digi-Key's digital solutions:

- Identify the processes you want to improve and automate.
- Consider your current technology infrastructure and resources.
- Evaluate the return on investment with tools such as the API Solutions Calculator.
- Get in touch with any questions!

## Digi-Key Solutions

The supply chain is brimming with data, and strategic, digital procurement processes can leverage that data to optimize outcomes. Digi-Key offers a variety of digital solutions designed to reduce costs and errors, and increase efficiency, accuracy and time to market.

Learn more at [www.digikey.co.uk/digitalsolutions](http://www.digikey.co.uk/digitalsolutions)





## Wider view reduces sensing costs

Panasonic Industry's new 90° lens Grid-Eye sensor offers a wider field of view and reduces the number of sensors required to cover a given area.

Panasonic Industry product manager, Chetan Joshi, said: "Different industries want to understand and optimize how their buildings are being used, especially businesses in retail, hospitality and healthcare. With many markets suddenly interested in people tracking, the holy grail of such solutions has always been finding the right balance between scalability and cost-effectiveness. Solutions designed around Grid-Eye 90° deliver on both."

The new wide-angle lens allows Grid-Eye to have a wider field of view, improving on previous sensors which offer a 36 and 60° FoV. With the launch of Grid-Eye 90°, system designers can capture the IR signature of a larger area, leading to fewer sensors required to cover a given area. This leads to capex improvements deploying people tracking/counting devices in indoor environments.

[www.industry.panasonic.eu](http://www.industry.panasonic.eu)



## Higher density in small form factor

Cincon's CBM101S series of high efficiency, high density full brick, fanless AC/DC power modules is now available from Relec Electronics. The single output modules have a profile height of 17mm. The design offers continuous short-circuit, over-voltage and over-temperature protection. They suit space-constrained industrial applications, including automation equipment, test and measurement instrumentation, telecom and network devices.

The supplies have a universal input range from 90 to 264VAC with outputs of 12, 24, 28, 36 or 48V. The supplies are capable of 100W (120W for five seconds). In-rush current is below 8.5A, with a low leakage current of 0.25mA and no-load input power consumption is <0.5W. Efficiency is up to 94.5 per cent.

Despite its size, the CBM101S integrates EMI filters, bulk capacitors and output capacitors, meaning that no external components are required to pass EMI class. This contributes to the small form factor and reduces the bill-of-materials.

Ambient temperature range is -40 to 85°C and the modules have an operating altitude of 5,000m.

[www.relec.co.uk](http://www.relec.co.uk)



## GRP enclosures now in eight sizes

Rolec's polyDOOR hinged-lid enclosures for industrial electronics are now available in eight sizes—either with or without a transparent window for displays.

Weather-resistant (IP66) polyDOOR enclosures suit challenging industrial and outdoor applications where equipment must be inspected or serviced regularly, such as processing, machine control, safety monitoring or marine electronics. These easy-access GRP (UL94V-0) enclosures also suit applications where chemicals are a risk.

Integrated hinges allow lid removal in a few seconds. The lid is locked with polyamide fixings, either standard slotted

screw heads, triangular or square heads (to prevent tampering) or hand screws for rapid access. Threaded pillars are provided for mounting PCBs, terminal rails and component assemblies.

Sizes range from 140 by 120 by 100mm to 320 by 200 by 120mm. The standard colour is similar to RAL7032 pebble grey.

Accessories and options include the choice of lid fixings, external mounting brackets, a silicon gasket, mounting plate, cable glands, cross rails and DIN rails for terminal block assemblies.

[www.rolec-enclosures.co.uk](http://www.rolec-enclosures.co.uk)

## Assemble more efficiently

Crimp variants of Binder's M16 series simplify wiring in small quantities on site and also automatically in larger batches. In addition to letting users quickly and easily wire connectors on site, crimping technology is also characterised by its mechanical robustness, corrosion resistance and advantageous electrical properties.

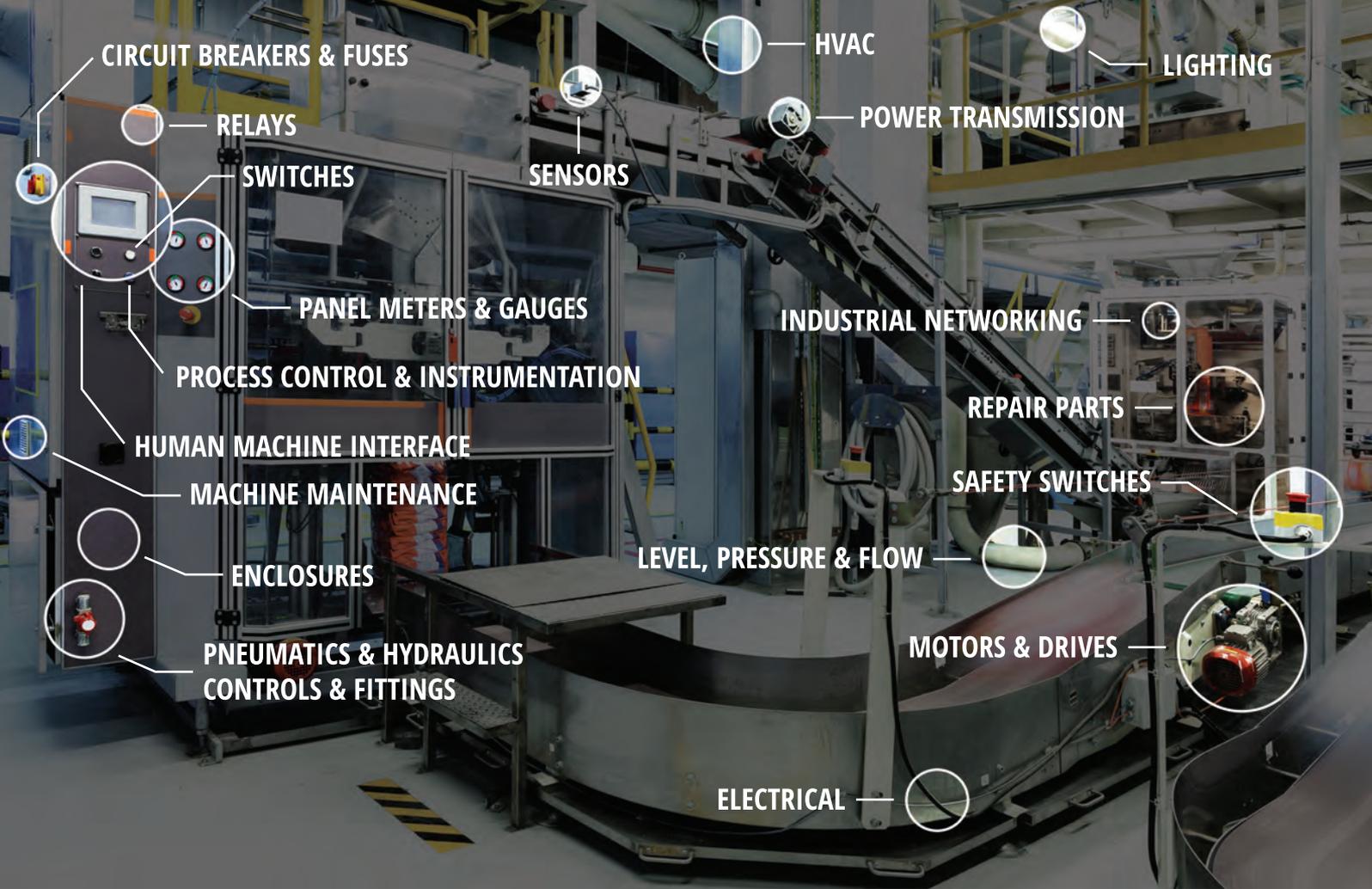
M16 connectors with crimp termination meet growing demand for modular connectivity regarding signals, data and electrical power. Thanks to specific properties, such as tensile strength/conductivity and time-saving

assembly, they are used in industrial applications such as the installation and replacement of gas meters.

Binder's 423 series crimp terminated M16 connectors are specified for 32 to 150V at 5 or 6A, depending on the number of pins. Two to eight-pin versions are available. Depending on the contact surface (silver or gold), they achieve a mechanical lifetime of at least 500 or 1,000 mating cycles, respectively. The products feature screw locking and are designed for protection to IP67.

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# IT'S TIME FOR THE AUTOMOTIVE INDUSTRY TO HIT THE BRAKES ON LEGACY TECHNOLOGY

## Top of Form

Supply of electronic components is finally starting to match demand within some verticals, but the automotive industry is still feeling the pressure of shortages. Three million vehicles have been cut from global production levels, and estimates indicate that this number could reach 3.8 million before year end. While some businesses are managing inflated inventories, why is automotive still dealing with the consequences of the chip shortage?

Car builds heavily rely on legacy technology. However, the cons for legacy tech are growing and one point is becoming incontestable: Automotive manufacturers cannot afford to play the waiting game any longer when it comes to innovation. To move the automotive industry forward and out of the ongoing shortage, car manufacturers will need to work alongside chipmakers to increase supply and modernize vehicles where possible.

## The Pros of Legacy Technology

In 1965, Gordon Moore, co-founder and chairman emeritus of Intel Corporation, hypothesized what is now known as Moore's Law. This theory stated that the number of transistors on a microchip would double every year. The theory has proven true over the years, as technology like cell phones and computers have gotten smaller, and therefore necessitated advanced process technologies run on fewer nodes.

As nodes have gotten smaller, their output in performance, and power reduction changes. The size of the wafer's geometry directly relates to a semiconductor's memory, yield and reliability.

Thanks to their larger size, legacy process nodes have better refresh performance, improved yields with lower failure rates, higher temperature tolerance, fewer fabrication-related issues and superior reliability. These are all very important for performance and safety, which are among the main priorities for the automotive industry's customer base.

## The Cons of Legacy Technology

While the automotive industry prefers legacy technology because of its reliability, they are not the only ones; 40nm - 65nm process nodes, used for MCUs, ASICs, and image sensors, are also popular with industries like consumer electronics, industrial manufacturers, smart home and infrastructure as well the Internet of Things. These industries are growing faster and placing larger orders, which means automotive customers often find themselves in long queues for parts.

Prior to the pandemic's effects on the supply chain, booking windows for car makers were about 12 weeks. Within a year, that window stretched to at least 12 months, with some OEMs forced to book capacity at tier-2 foundries as much as two years in advance. We have already seen how this has affected production levels via substantial cuts to forecasts, but it has also pushed pricing higher.

The components around these aging systems are advancing, which means that the infrastructure of the software needs consistent repair maintenance. Car dealerships have reported that 60 – 80% of IT budgets go towards upkeep for the legacy tech. If the automotive industry phases out legacy technology, the money once used for maintenance could go towards innovation.

According to Intel's CEO, semiconductors will account for around 20% of a vehicle's bill of materials by 2030. As these expenses trickle down to the consumer, car makers run the risk of demand suffering.

## Innovation Stalls Within the Automotive Industry

In accordance with Moore's law, legacy technology manufacturing is continuously being replaced with newer, faster versions. Despite the sourcing difficulties that can come from using analog-based components, many vehicles still utilize them for a variety of applications. In some cases, you can find process nodes in today's cars that were once used in PC chips as far back as 2005.

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## What is ECS?

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

**EXHIBITOR INSIGHTS  
INSIDE FROM PAGE 32-69**

# All roads lead to ECS

The *Electronic Component Show* returns to the Kassam Stadium, Oxfordshire on Thursday 25 May, as the must attend event for purchasing professionals and design engineers

With 100 per cent of stands sold, *ECS* provides visitors with the opportunity to discuss their design and purchasing needs with 67 exhibitors and attend presentations from the seminar program.

MMG Publishing's publisher and founder, Mark Leary, said: "Last year's *ECS* was a very busy one-day show and based on feedback visitors liked the location, free car parking, complimentary drinks and snacks, seminar program and luxury football stadium setting.

"Visitors also liked the wide spread of exhibitors under one roof, providing a time effective opportunity to meet with existing, new or alternative suppliers. A significant proportion of exhibitors are usually found at much larger shows in

Europe and North America, so their attendance at *ECS* is ideal for UK-based visitors."

*ECS* 2023 includes more first-time international exhibitors including: Ozdisan (Turkey); Smiths, IBS Electronics and Microsc (USA); Winsource (China); Atlantys Technology (France); TME (Poland); SOS Elektronik and Suyin Europe (Germany).

Other confirmed exhibitors include APC Technology, Azego, Powell, Lincoln Binns, SAS, Phoenix Contact, Cupio, Luso Electronics, Nicab, Harwin, Midas Displays, NCAB, G-English, Incap, Yamaichi Connectors, ODU, Electron Electronics, ETL, Lemo, Adaptix Imaging, Nicomatic, Hamamatsu, Solid State Supplies, Pacer Components, European Circuits, Anders, Phoenix

Dynamics, Evaluate 2000, CML, Rochester Electronics, Würth, Review Display Systems, Rapid Electronics, Ashlea Components, Simms, Rebound, Camden Boss, ART, Winslow AdaptICS, Hammond Enclosures, Cliff Electronics, Mouser, EAO, M-TEK, CT Production, Hitaltech, APC Technology, QPE, Component Sense, Binder Connectors, Retronix, Princeps, Samtec Connectors, Bulgin, Cornelius, Flex Connection, Nano Electronics and Inteltek.

The seminar series will be announced in next month's issue of *Electronics Sourcing*.

Registration for *ECS* 2023 is open at [www.electronic-component-show.co.uk](http://www.electronic-component-show.co.uk). Opening hours are 10am to 3pm. In addition to the opportunity to meet 67 well-known exhibitors,

visitor benefits include: free car parking; free entrance to exhibition and seminar programme; free refreshments including snacks; £5 food voucher for the catering truck; and networking/meeting spaces.

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VISIT NCAB AT STAND 04

# Reliable PCBs produced responsibly

Visitors to NCAB's stand can explore the company's PCB knowledge spanning multilayer, flexible, rigid-flex, semi-flex and double sided boards

As one of the fastest growing PCB producers, NCAB Group's focus is on customer and market presence. With customers valuing on-time delivery with zero defects, NCAB's approach includes long-term thinking and shows how cost, quality and environmental issues go hand-in-hand.

The company's sustainability strategy defines its long-term goals and focus areas. With clear priorities the strategy guides NCAB in the right direction to gain sustainable business growth and helps it achieve the positive changes it wants to see in the industry.

The ISO26000 standard has been used to identify the

issues that are most important to NCAB, based on impact, stakeholder expectations and improvements that can be achieved.

NCAB implemented its first sustainability strategy in 2014, with a latest update in February 2022. The strategy specifies long-term goals and focus areas, from which the company sets concrete actions. Through its sustainability work, together with stakeholders, NCAB is working towards achieving the Sustainable Development Goals (SDGs) and contributing mainly to eight out of the 17 goals. Sales experts will be at Stand 04 to discuss visitors' PCB projects and answer PCB questions. Visitors

are welcome to explore the company's knowledge on multilayer, flexible, rigid-flex, semi-flex, double sided boards and see how PCB design tools can provide support: PCB design guidelines; PCB design mistakes tool; and PCB design checklist.

Whether visitors are focussing on cost savings, logistics or a sustainable approach, NCAB offers an abundance of knowledge.

[www.ncabgroup.com](http://www.ncabgroup.com)



## Lincoln Binns Product Range

Lincoln Binns manufacture and modify a large range of enclosures



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### U-Case Range



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VISIT ROCHESTER AT STANDS 33 & 34

# Semiconductor lifecycle solutions

Join Rochester Electronics on its ECS stand to learn about its authorised distribution, licensed manufacturing and product replication solutions

Rochester Electronics provides the world's largest continuous source of semiconductors, 100 per cent authorised by over 70 leading semiconductor manufacturers including NXP Semiconductors, Infineon Technologies, Texas Instruments, Analog Devices, ONSEMI, Ampleon and more.

As an original manufacturer stocking distributor, Rochester has over 15 billion devices in stock encompassing more than 200,000 part numbers, providing the world's most extensive range of end-of-life (EoL) semiconductors and broadest range of active semiconductors.

As a licensed semiconductor manufacturer, Rochester has manufactured over 20,000 device types. With over 12 billion die in stock, Rochester has the capability to manufacture over 70,000 device types.

Rochester offers a full range of manufacturing services including design, wafer processing, assembly, test, reliability and IP archiving providing single solutions through to full turnkey manufacturing, enabling faster time-to-market.

With direct sales and support staff in all major markets, complemented by a network of regional and global authorised channel

partners, Rochester aims to meet customers' needs over the phone or via our e-commerce platforms anytime, anywhere.

Rochester's growing product and service portfolio continues to provide an authorised source of supply to customers around the world directly, in partnership with our authorised distribution network and through our leading-edge e-commerce platforms.

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Some of our technical partners:



VISIT SIMMS AT STAND 43

# Meet the memory masters

Drop by Simms' stand to explore all things memory and storage including flash, DRAM, embedded peripherals, embedded DRAM and embedded flash

Simms International is exhibiting at the Electronic Component Show for the first time and is looking forward to showcasing its range of memory and storage solutions from manufacturers including Innodisk, ATP, Intelligent Memory, Exascend and Kingston Technology. Products on display will include the latest flash and DRAM solutions as well as embedded peripherals, embedded DRAM and embedded flash.

Simms aims to make memory easy to understand, easy to select and easy to source—something it has

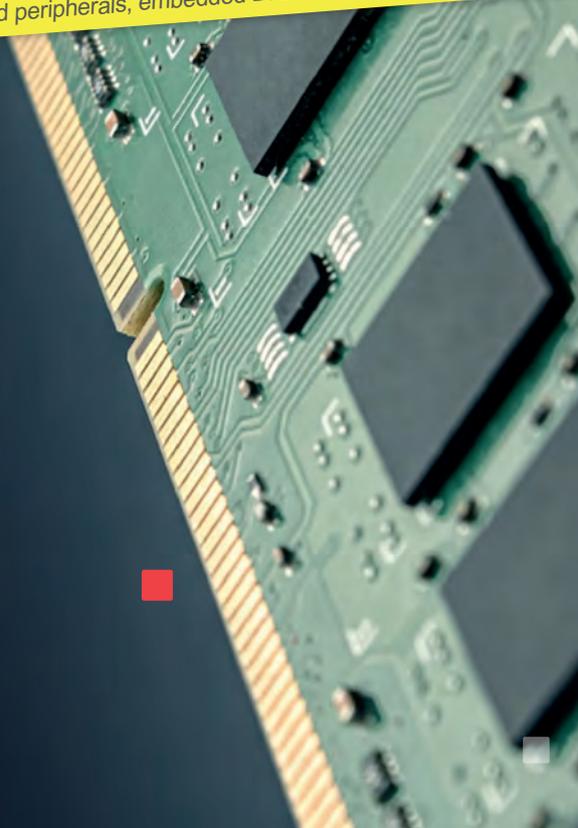
been doing successfully for the past 32-years. Whether it's a new project or issue with a current selection, Simms' team can help.

Navigating memory can be a tricky business. Get it right by partnering with an expert and it can be easy. Get it wrong and it can be a costly mistake for an OEM and its customers. Engaging the right memory partner makes life much easier. Simms works with leading manufacturers and confidently offers a choice of solutions to save customers time, money and resource.

Simms' knowledgeable team will be available to discuss all things memory and storage, so stop by to discover what is going on in an industry that is constantly changing.

To add some extra fun to their day, visitors are offered the chance to win a £100 Amazon voucher by guessing the correct amount of memory modules in a jar.

[www.simms.co.uk](http://www.simms.co.uk)



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**Knowledge**

ETL customers can call on an impressive bank of knowledge and expertise. We offer complimentary advice at all levels on procurement channels, design for manufacture, design for test, production processes, quality procedures, logistics and more besides. This ensures cost effective production, optimum product reliability and shorter development cycles.

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**VISIT US: STAND 50**



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VISIT LUSO AT STAND 53

# Recommended power solutions

Discover how Luso Electronics' factory trained specialists help its customers choose the optimum power technologies from its globe spanning array of manufacturers

Luso Electronics is a specialist technically led distributor of switch mode power supplies, DC/DC converters and associated products. The company aims to save customers time and cost through expertise and quality of service.

From a globe spanning array of manufacturers, Luso's experienced factory trained product specialists can assist and recommend solutions for power requirements.

Solutions range from 0.25W DC/DC converters to 3kW stackable programmable switch mode power supplies, with application specific products for rail, medical, military and specialist

industrial requirements. Luso also offers modular configurable supplies with its own UK-based configuration centre offering quick turn response for small quantities. Other solutions include critical power products such as UPS systems and inverters.

Luso's stand will showcase: the latest range of power supplies from N2 Power; examples of medical and rail specific DC/DC solutions from P-Duke; industrial and medical products from Delta Electronics; configurable units from Enedo Power; high voltage components from HVM Technology; and magnetics from Elec&Eltek among others.

With years of experience, Luso's factory trained specialists are available to help select a power supply for a new design and throughout the design cycle offering support where required and a local link to the factory.

The company offers technical and commercial support to customers large and small throughout the UK and Ireland. Visit Luso's stand to discover how the company can help with power requirements.

[www.lusoelectronics.com](http://www.lusoelectronics.com)



## Distribution and Beyond Stand 15

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VISIT BULGIN AT STAND 28

# Conquering harsh environment interconnect

Engineers seeking robust interconnect solutions for harsh environment applications are well advised to engage with the Bulgin support team

Bulgin is widely regarded as a leading manufacturer of environmentally sealed connectors and components. As an industry innovator with 100-years' experience, the company continues to develop products for its global base across a range of markets.

Bulgin's focus has been on design engineers and the challenges they face working on harsh environment applications. The Buccaneer circular connector range is known for reliability and robustness in challenging applications. The company continues to develop its full line of connectors, switches and more to ensure that systems perform at their

peak regardless of the environmental conditions. All products come in a selection of IP ratings, including IP69K.

At ECS, Bulgin will present its whole product line, including Buccaneer connectors, Arcoelectric switches and more. Staff will be available to talk about the most recent products, such as the company's selection of Expanded Beam fibre connections. The Bulgin team looks forward to meeting engineers searching for application-specific support.

[www.bulgin.com](http://www.bulgin.com)



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VISIT SOS ELECTRONIC AT STAND 46

# Tap into 30-years' distribution experience

Whether OEMs are sketching a new idea or in production, SOS electronic offers rapid distribution of electronic components across multiple product categories

For over 30-years, SOS electronic has been part of the European distribution market for electronic components. Whether customers are in the product development phase, in the process of purchasing components, testing or just sketching an idea, SOS electronic is ready to help.

Professional services include: help choosing suitable products; technical support; information on the current availability of chosen products; free samples of particular manufacturers; borrowing of selected products; and development kits. As a subsidiary of the

Conrad Group and based on its financial indicators, SOS electronic can be considered a reliable, stable partner that fulfils its obligations. The company's European logistics centre, located in Slovakia (city Košice), allows safe and rapid shipments.

Applications for components supplied by SOS electronic can be found in space, the deep sea, waste management, medical devices, security systems and more.

SOS electronic has direct relationships with many manufacturers allowing it to introduce new products ahead of

time. The company is using ECS to present hot news from world-known manufacturers. The stand will focus on sensors (Sensirion), communication modules (Quectel, 2J Antenna) and power supply (Traco Power, Myrra) and electromechanical components.

[www.soselectronic.com](http://www.soselectronic.com)



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VISIT TME AT STAND 47

# Cable properties explained

For buyers looking for proven, safe and reliable control cables, TME recommends exploring the properties of Alpha Wire's Pro-Met and Pro-Tekt series

To keep electrical resistance as low as possible, Alpha Wire uses copper or tinned copper as the core material, which also makes soldering easier. Copper also resists stretching and bending without damage. Depending on the application, the manufacturer offers cables with two to twelve cores in the Pro-Met series and two to eight in the Pro-Tekt series.

Regarding insulation materials, both series are protected with polyvinyl chloride (PVC). This insulation ensures proper cable flexibility and protects

the user from contacting live conductors. On rated voltage, Pro-Met and Pro-Tekt cables work at 300/500V and 300V respectively.

Operating temperature limit is -30 to 70°C for the Pro-Met series and up to 105°C for the Pro-Tekt series.

Alpha Wire cables are protected from chemical substances such as oils (including mineral) and UV radiation. Likewise, Alpha Wire offers cores with and without protection. Protective cores makes it possible for the cable to be used in installations operating

in humid rooms and spaces exposed to contact with water.

Alpha Wire offers standard or shielded cables to protect signals from external interference. The shield also provides additional protection against electric shock and short circuits. Regarding fire-resistant properties, both series do not cause the spread of fire along the installation.

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Visit [tme.eu](http://tme.eu) and LEARN MORE about Alpha Wire cables



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Kanban Items Held  
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**400,000**  
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Cables Delivered

**250**  
Additional Pallet  
Spaces Created

**15**  
Countries  
Served

**60,000**  
Vacuum Formed  
Moldings Supplied

**26 MILLION**  
Components  
Sourced

**5.5 MILLION**  
Metres Of Wire  
Processed

VISIT PHOENIX CONTACT AT STAND 70

# Tough enclosures suit extreme environments

New for 2023, Phoenix Contact is introducing OCS series electronics housings, designed for autonomous device systems in extreme environments

OCS outdoor housings are internationally certified UV-stabilised polycarbonate empty enclosures for electronics and industrial control devices that can operate under extreme ambient conditions.

Thanks to robust properties, they help ensure the reliable operation of mobile data and control systems in various locations. A PUR seal enables IP69 protection against water and other harmful substances. A 4mm panel thickness provides high impact resistance and IK10 protection, providing stability under heavy mechanical strain within a temperature range of -35 to 40°C.

OCS housings suit numerous industries including transportation infrastructure, public monitoring, water management and agriculture (smart farming) and are used in demanding applications such as monitoring systems, signalling systems, control engineering and weather stations.

The large-volume plastic housings can be customised and extended with accessories. Numerous features provide customers with a high degree of flexibility when planning and implementing an application, including the option of wall or mast mounting. Further accessories are offered to seal and lock the enclosures

to protect and secure the components within the enclosure. Integrated mounting bolts secure heavy components within the enclosure or on to the PCB.

The OCS housing system is currently available in three sizes: 8 by 6 by 4in, 10 by 8 by 6in and 12 by 10 by 6in, each available with either a transparent or opaque lid.

[www.phoenixcontact.com](http://www.phoenixcontact.com)



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VISIT INCAP AT STAND 39

# Turn-key production close to European market

Visit Incap UK's ECS stand to see how its specialist electronic manufacturing services offer a flexible and cost effective solution to product manufacturing requirements

As a trusted partner and full-service provider of electronics manufacturing services, visitors to Incap UK's ECS stand will have the opportunity to meet the company's manufacturing experts and explore its services. Incap's customers range from large multinationals and mid-size companies to small start-ups. As a part of the international Incap Corporation, Incap UK offers state-of-the-art technology, backed by an entrepreneurial culture and highly qualified personnel.

Incap's Newcastle under Lyme-based UK factory provides full turn-key product supply including PCBAs, electro-mechanical

assembly, cable and wire harness assembly, alongside a dedicated standalone rapid prototyping facility (Fast Track) and maintain, repair and overhaul services (MRO).

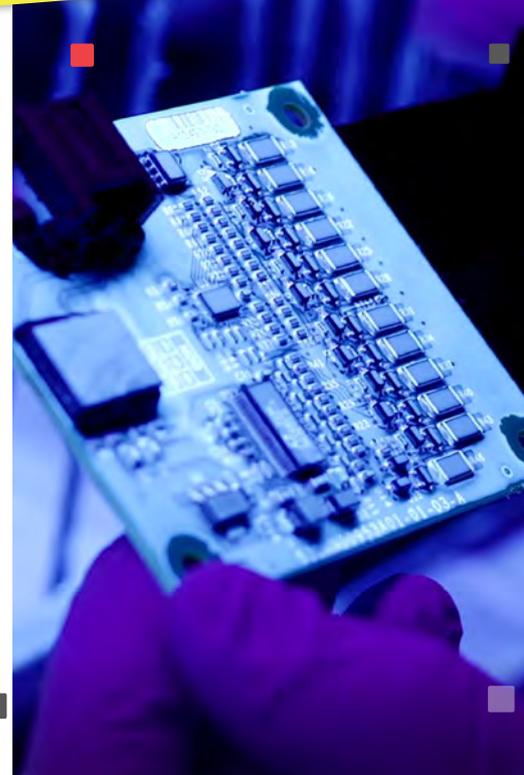
Incap's UK factory has been manufacturing since 1974. Customers include global companies with operations in Europe, Asia and North America. The facility boasts over 20-years' experience in the defence, security and aerospace markets.

In the UK, Incap's 4,400m<sup>2</sup> factory has grown rapidly by responding to customer needs and providing specialist, niche PCB assembly, complete product build and

electromechanical assemblies. The factory brings together the high-level technical capabilities and leading-edge production technologies that are normally associated with multinationals, with an approach to customer service that is based on partnership and personal service.

Customers enjoy the benefits of a dedicated account support team which seeks to fully understand the customers' business and products to optimise the delivery of specialist electronic manufacturing services and solutions that are both flexible and cost effective.

[www.incapcorp.com](http://www.incapcorp.com)



Electronic Component Show ECS,  
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VISIT COMPONENT SENSE AT STAND 2

# Obsolete inventory solutions

Component Sense is using ECS to launch its BoM matching tool which is designed to provide customers with cost reductions averaging 30 per cent

Established in 2001, Component Sense offers innovative excess and obsolete inventory solutions for electronic components. Headquartered in Livingston, Scotland, the business has grown to include international locations and a dynamic, global team.

Component Sense's focus is simple: lead electronic manufacturers towards zero waste and reduce the environmental impact of the electronics industry. By purchasing directly from tier one OEMs and EMSs, the company works to reduce overproduction and limit the number of electronic components destined for landfill. Furthermore,

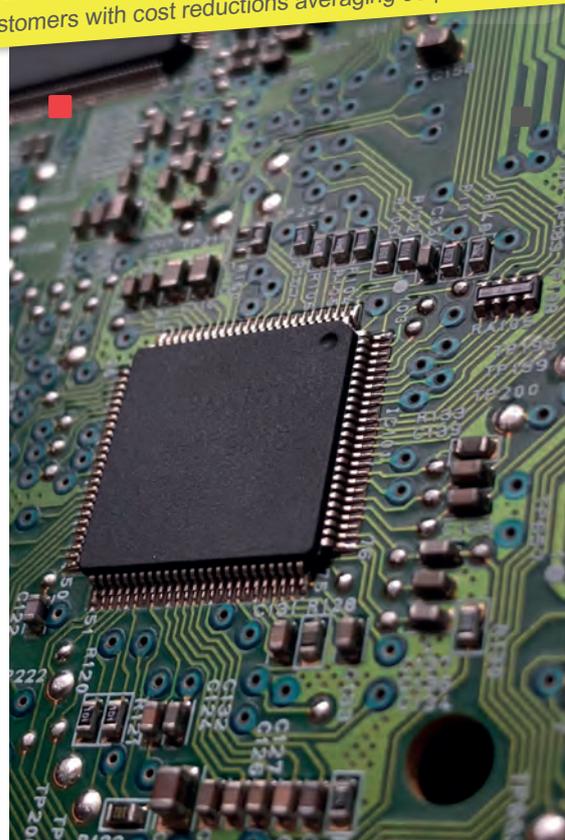
longstanding OEM/EMS relationships lets Component Sense guarantee the quality, traceability and reliability of components.

Component Sense is committed to its EPIC values. This means being enterprising, positive and working with integrity and clarity. The company brings this EPIC approach to all its interactions and efforts, whether internally or with customers. Consistently recognised for its exceptional customer service, Component Sense was recently named a 'Best Customer Service' finalist at the Electronic Industry Awards.

Component Sense is excited to announce it will be launching

its new BoM matching tool at ECS 2023. This technology will provide customers—including smaller businesses—access to tier one component pricing. Stay tuned to find out how this forward-thinking tool can provide businesses with cost reductions averaging 30 per cent, live insights at buyers' fingertips and the knowledge that users are helping to improve sustainability within the electronics industry.

[www.componentsense.com](http://www.componentsense.com)



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The Electronic Component Show

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VISIT MIDAS DISPLAYS AT STAND 68

# Lighting up display options

Midas Displays invites visitors to its ECS stand where they can explore display technologies including LCD, OLED, TFT and E-Paper

As the TFT manufacturing process has been refined the technology has become a more affordable solution. A wide range of value added additions is also available to improve the technology and customer experience including cover glass, touch screens, custom flex, 'smart' displays, embedded products and more.

Monochrome LCD displays offer a simple, cost-effective solution for applications showing basic information. These displays are easy to interface, with simple character and graphic options. They are often used in low-cost applications, such as fire and security panels.

OLED displays perform the same role as LCD displays, but have brighter characters/graphics, on a true black background, which offers users a better contrast and all-round viewing angles. Midas offers new rotary switch 'dial' OLEDs, offering user input through the capacitive touch screen and rotary switch module. This sleek design provides a dual interface and removes the need for push buttons, leaving one component to control the entire application.

E-Paper is a relatively new technology, ideal for ultra-low power applications. The bi-stable technology lets displays retain an

image, even when the power is disconnected. A recognisable application is shelf-edge labelling.

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

[www.midasdisplays.com](http://www.midasdisplays.com)



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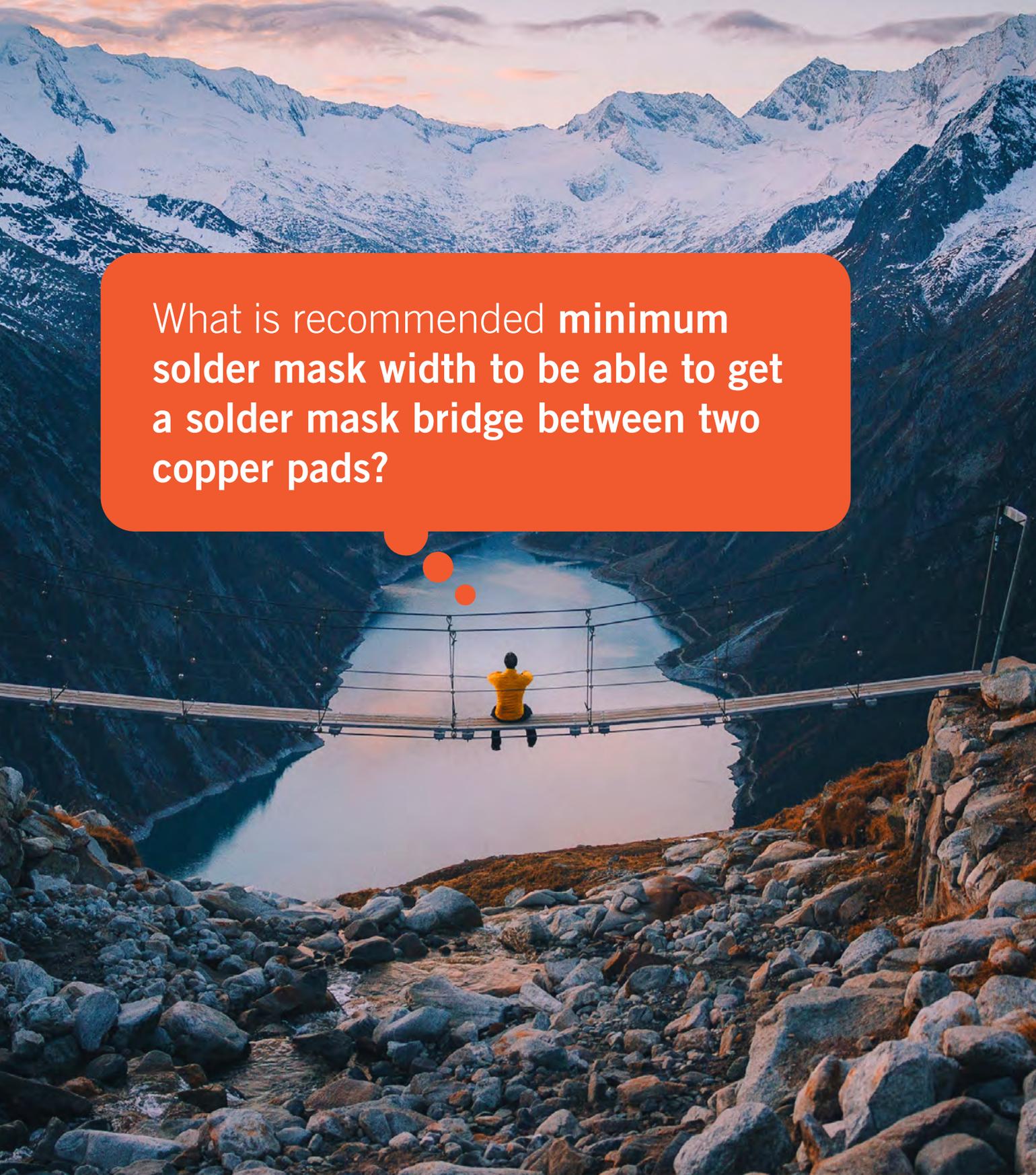
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A person in a yellow shirt is sitting on a suspension bridge that spans a deep valley. The valley floor is covered in large, grey rocks. In the background, there are majestic, snow-capped mountains under a soft, hazy sky. The bridge is made of wooden planks and is supported by several thick cables. The overall scene is serene and scenic.

What is recommended **minimum solder mask width** to be able to get a solder mask bridge between two copper pads?

PCBs are complex products which demand a significant amount of time, knowledge and effort to become reliable. As it should be, because they are used in products that we all rely on in our daily life. And we expect them to work. But how do they become reliable? And what determines reliability? Is it the copper thickness, or the IPC Class that decides?

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VISIT EUROPEAN CIRCUITS AT STAND 35

# Investing in precision PCB assembly

European Circuits Limited is proud to discuss its recent investment in game changing technology for the manufacture of high quality printed circuit board assemblies

European Circuits Limited is one of the few UK companies genuinely offering PCB fabrication and assembly from a single location, plus services including cable assembly, product build and test. Established in 1999, ECL is a privately owned company based in Glasgow.

In November 2022, ECL took delivery of a Mycronic YPro Series MY700 jet printer/dispenser and Mycronic MY300LX pick-and-place.

As quality requirements increase, batch sizes shrink and component complexity grows, jet printing of solder paste has become a reliable alternative to screen printing for

manufacturers concerned about PCB defects.

Mycronic jet printing allows solder dispensing for the most challenging circuit boards and components, with micrometre accuracy, maximum speed and perfect quality solder joints.

Software-driven and stencil-free, with complete solder paste volume control, the MY700 ensures consistently perfect solder joints. From pin-in-paste to package-on-package, flexible substrates and board cavities, the MY700 controls solder paste deposit size, volume, shape and position.

ECL's new MY300LX is designed to deliver SMT

pick-and-place at next level precision and flexibility in a fast, small and smart format. It combines three programmable light sources with 2k resolution components down to 0.15mm pitch. This lets ECL deliver precise on-the-fly positioning and inspection for any component.

ECL's MD, Mark Briscoe, said: "The investment in the

Mycronic equipment was described by one customer as a gamechanger for ECL. It absolutely is and demonstrates our commitment to supplying high quality printed circuit board assemblies produced right here in the UK for a whole range of industries throughout the UK, Europe and beyond."

[www.european-circuits.co.uk](http://www.european-circuits.co.uk)



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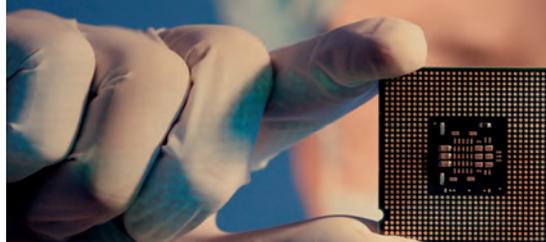
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Stand 40



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VISIT ETL AT STAND 51

# Integrity underpins customer service

Discover how ETL's honesty, integrity and flexible approach to manufacturing provides its OEM customers with a distinct competitive advantage

Established 40-years ago, Wimborne-based Electronic Technicians offers contract electronic manufacturing services from its modern facility.

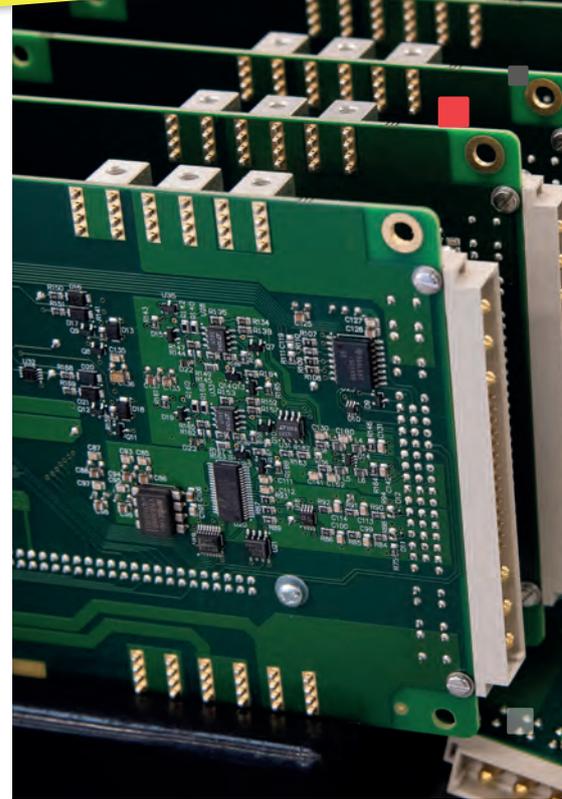
The company states two things underscore its success over the years: total quality culture, practised company-wide across all business disciplines; and an excellent team which brings expertise, focus and dedication to everything it does. This commitment is highlighted by formal accreditations including ISO9001:2015, ISO14001:2015 and the prestigious AS9100 - Rev D international standard for aerospace suppliers.

ETL's production capabilities cover a broad range of manufacturing applications including: cable harness assembly; mixed technology PCB assembly; conformal coating and encapsulation; final product cabinet build; and test/repair. Through these resources, the company offers a comprehensive CEM service tailored to customers' exact needs, including fast track prototyping, project management and full turnkey manufacture.

ETL puts timely and effective customer communications at the centre of its business. It's a key part of its ethical business philosophy that demands honesty and

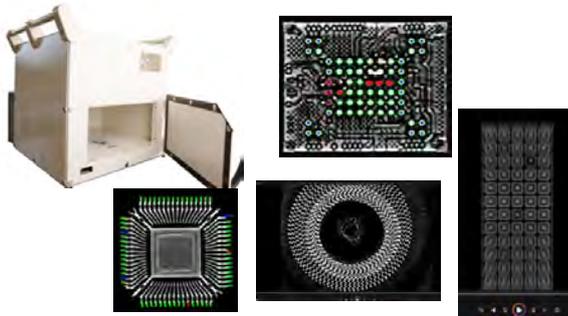
integrity to deliver the best customer service. The organisation also applies this to its dealings with supply chain partners. With continuing investments in equipment, business tools, services and of course people.

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Stand  
**64**

VISIT EAO AT STAND 57

# Switching, cooling, thermal management and more

Visitors to EAO's stand will have the opportunity to investigate the company's switch technologies and Sanyo Denki cooling and motion control systems

EAO is an HMI switch manufacture and Sanyo Denki thermal management and motion control product manufacturer's agent. The company holds extensive local UK stock and offers added value engineering and inventory solutions. EAO provides expert advice to engineers on HMI switch designs, thermal management and motion control systems using its team of experienced sales engineers.

At the Electronic Component Show, EAO will be showcasing its latest industrial and automotive/switches and CAN bus keypads, plus Sanyo Denki motion control and thermal management products.

Visitors will be able to see the latest additions to EAO's switches range, now including IP67 vandal resistant metal switches with illuminated legends and versions with integrated M12 connectors and food grade 316L stainless steel construction. For vehicle applications the Series 09 range includes RGB halo and symbol illuminated two, six and eight way keypads with CAN bus or hardwired interfaces and interchangeable legends, along with individual single pushbuttons with any illuminated ISO7000 or custom symbol allowing for easy integration and configuration of vehicle interiors.

Regarding Sanyo Denki equipment cooling and motion control systems, EAO will feature the latest high airflow and static pressure, axial, counter-rotating and centrifugal fans for demanding cooling applications, along with IP68 rated waterproof, ultra-long-life, high temperature range and shock-proof fans for use in challenging environments. The Sanyo Denki Sanmotion stepper motors and drivers now include motors from 14 to 106mm frame sizes and next generation 56 and 42mm motors delivering up to 40 per cent higher torque.

[www.eao.com](http://www.eao.com)



EAO CANbus Keypads



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Sanyo Denki Equipment Cooling Fans



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SEE US ON STAND 14

VISIT ODU AT STAND 41

# Quality connectors at economic prices

As a problem solving partner, ODU welcomes visitors to its ECS stand where they can discuss cost-effective connectors and customized cable assemblies

ODU supplies connector solutions to markets including military electronics, medical equipment, instrumentation, factory automation, robotics and more. The company will be using its ECS stand to showcase its latest developments.

Mobile command posts require scalable solutions that ensure data, signal and power transmission. The new Expanded Beam version of the AMC Series T combines the advantages of classic expanded beam (insensitivity to dirt, scratching and shock) with the high-performance of a physical contact.

Compared to conventional expanded beam technology, the design offers three to four times the number of optical fibres in the same space. Also, the innovative 3-in-1 locking mechanism gives OEMs a choice of plug locking mechanism at each connection point, whilst retaining the same bulkhead connector across the equipment.

ODU Mini-Snap connectors are designed to ensure secure, stable connections. With a 6.4mm interface diameter they can be installed in small spaces. Inserts are available to comply with user and patient protection prescribed by IEC 60601-1

(2 MOOP/ 2 MOPP), suiting them to medical applications requiring a circular connector with a metal housing.

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

[odu-connectors.com](http://odu-connectors.com)



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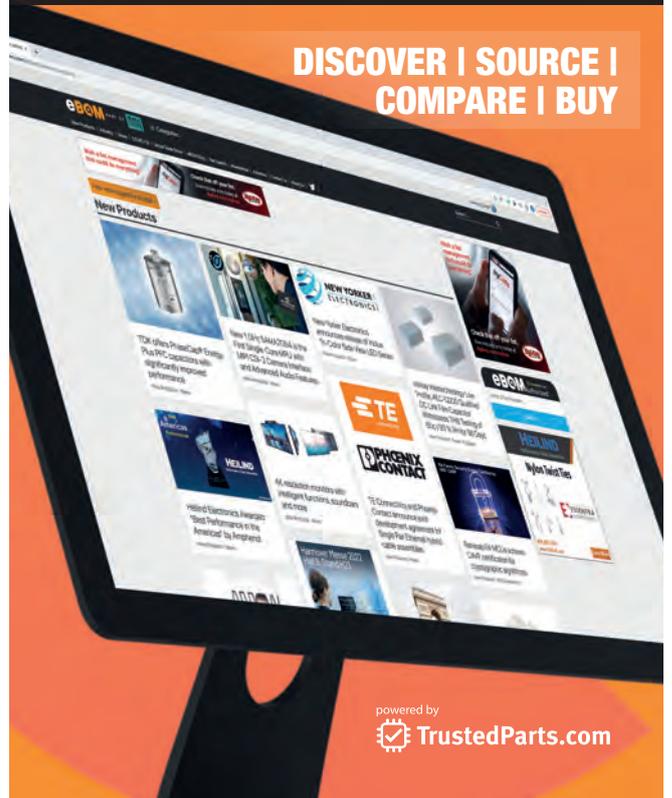


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## The Smith Advantage

# Powering innovation and connecting supply chains



Smith has **decades of experience** navigating every segment of the global electronics market. With this foundation, we **keep your supply chain moving** by connecting you to the **electronic components, services, and insights you need.**

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We have shipped more than 9.5 billion parts in the last five years, 350% more than the previous five years.

## \$12.5B Revenue

We have earned more than \$12.5 billion in revenue in the last five years, a 200% increase over the previous five years.

## 100 Countries

Smith serves customers in 100 countries around the world.

## 2K Manufacturers

In 2022, Smith sold parts from nearly 2,000 manufacturers.

**Founded:** 1984

**Worldwide headquarters:** Houston, TX

**Number of global offices:** 18



[smithweb.com](http://smithweb.com)



VISIT SAMTEC AT STAND 65

# Interconnect innovation

Drop by Samtec's ECS stand to investigate the benefits of a variety of interconnect innovations including the company's latest micro, high-power solutions

Founded in 1976, connector specialist Samtec puts people first and is committed to exceptional service, quality products and innovative technologies. This is enabled by the company's fully integrated business model which allows for collaboration and innovation without the limits of traditional business models.

Samtec offers a host of programs and free web tools such as its Solutionator tool that lets customers build mated connector sets or design full cable assemblies via user-defined search parameters

and filters, view specs and order samples in Samtec's online design tools. The company also offers immediate and unlimited access to the documentation customers need to select the right solution for their application including 3D models, prints, footprints, test reports, white papers and more.

Samtec's stand will feature its newest power product mPOWER. This micro, high-power solution offers design flexibility for power-only or power/signal applications. Due to the variety of stack heights available, mPOWER can be added to new or existing

architectures alongside one of Samtec's high-speed connector systems for a unique two-piece power and signal/ground solution.

Also featuring is the URSA I/O system which includes a hyperboloid-type contact with four points of contact for reliable connection and high mating cycles. Available as cable-to-cable and cable-to-board, with up to 40 positions per row on a micro 1.00mm pitch, this rugged power I/O system also features EMI shielding to limit signal degradation.

Visitors can also explore AcceleRate HD which features high-speed Edge



Rate contacts designed for high-speed, high-cycle applications. A dense four-row design with a low profile 5mm stack height.

[www.samtec.com](http://www.samtec.com)



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VISIT NICAB AT STAND 60

# Reasons to outsource cable assembly

Join Nicab at ECS to explore the benefits of outsourced cable manufacturing including time savings, cost reductions, speed of delivery and more

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

**Tooling:** The vast range of interconnection products means lots of tools. First the OEM needs to decide on hand or automated tooling, then budget for it, bearing in mind cheap tooling could cause production bottlenecks. Outsourcing eliminates tooling costs.

**Delivery speed:** What does an OEM do if an urgent order arrives, but its workshop is running at capacity? Sub-contracting some orders to a trusted supplier means the OEM reduces pressure on its own production department.

**Skills:** Specialist cable assembly sub-contractors painstakingly research the best manufacturing techniques to ensure products are assembled correctly. This is one benefit of using a specialist cable assembly company. OEMs can be sure their cables are manufactured to a high standard, reducing concerns about field failures or costly returns.

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

[www.nicab.co.uk](http://www.nicab.co.uk)



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VISIT RETRONIX AT STAND 25

# Unrelenting commitment to quality

Retronix explains how it plays a fundamental role in key supply chains, offering services ranging from component recovery and laser reballing to IC counterfeit testing

Products are reaching the end of their functional life far sooner than anyone expected. This reality is creating problems for manufacturers, consumers and the environment alike. For instance, the lack of secondary markets has created massive stockpiles of discarded devices that often go directly to landfills or incinerators.

With over 30-years expertise in component recovery and component preparation services Retronix has been at the forefront of the circular economy model for the electronics industry. This model is designed to re-use materials, introduce them back into the production

cycle and increase operational efficiency.

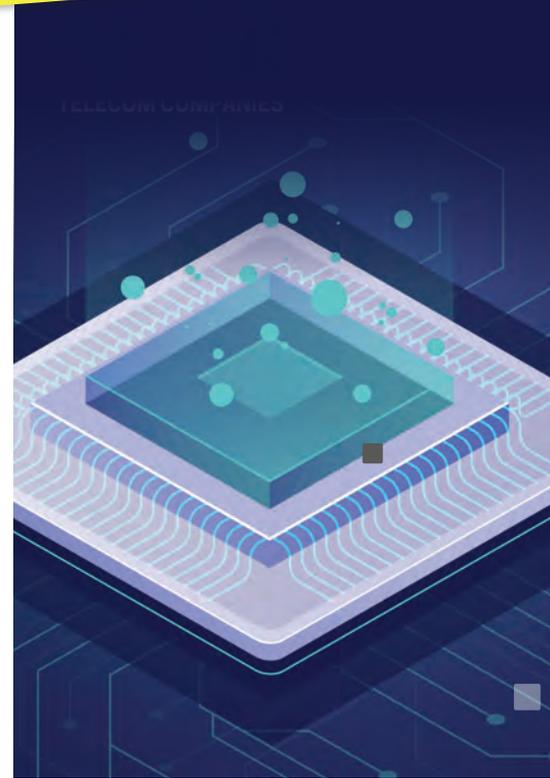
Retronix' component recovery solution meets the component manufacturer's specifications of maximum reflow cycles allowed on an electronic component, adhered to extensively by both OEMs and CEMs. This offering not only reduces the amount and cost of scrap going to landfill but as a bonus, seriously damages the counterfeit industry.

As a business, Retronix is committed to reducing customers' impact on the environment and supporting stakeholders looking to adopt the circular economy ethos. Our sustainability

agenda incorporates environmental, social and governance (ESG) considerations that affect the success of the business.

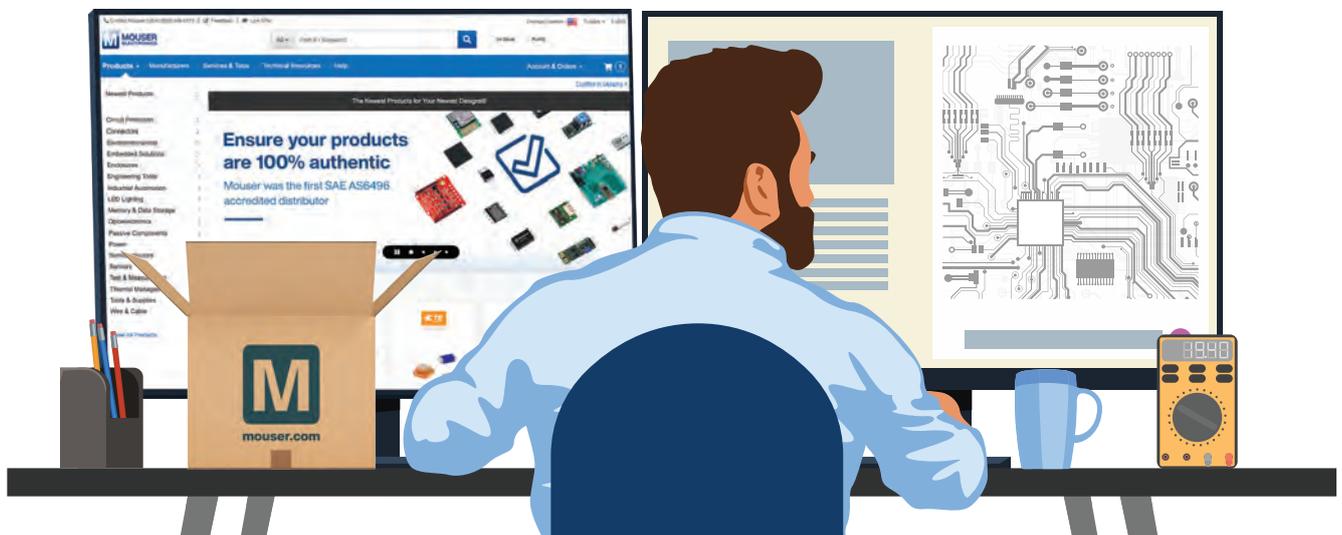
Retronix has an unrelenting commitment to quality and delivering results in everything it makes and does. With industry leading technology solutions like component recovery, laser reballing, retinning, alloy conversion, IC counterfeit testing, PCB services and many more, Retronix plays a fundamental role in key supply chains for the sectors it operates in.

[www.retronix.com](http://www.retronix.com)



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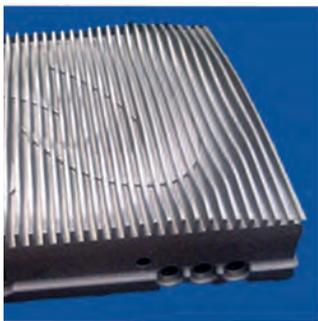
[mouser.co.uk/new](http://mouser.co.uk/new)



VISIT ASHLEA AT STAND 54

# Second sourcing options

Buyers looking to sidestep extended lead times, material shortages and increased pricing should visit Ashlea Components' stand to discuss second sourcing options



[www.gelec.co.uk](http://www.gelec.co.uk)  
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Prompt, accurate and competitive quotes are the hallmark of Ashlea Components, an independent and franchised distributor of current, obsolete and hard to find electronic components and electro-mechanical products.

The company has recently been appointed UK distributor for GaPtec and HVC Capacitors. These additions join other franchised and authorised lines including JB Capacitors, Lyontek, Rose and Bopla, Solentec and Vigortronix. Ashlea Components' franchised lines offer alternatives to other manufacturers giving customers more freedom of choice, supporting them from designing and prototyping, right through to production.

Gaptec Electronics offers over 30-years' experience in the global power supply market, specialising in isolated and non-isolated voltage transformers (AC/DC, DC/DC, PoL and LED drivers). A selected product portfolio guarantees quality standards (UL62368, UL60950, EN50155, UL60601) and maximum flexibility, offering short lead times at low cost. Target markets include railway, industrial, medical and telecom amongst others.

Founded in 1999, HVC Capacitor specialises in high voltage components such as high voltage ceramic capacitor and high voltage resistor custom production. HV Ceramic Capacitors can be directly cross referred to Murata or Vishay parts. They also have a strong line of high voltage resistors and diodes offering alternatives to Ohmite, HVCA, TDK and AVX.

Allocation issues (leading to extended lead times, material shortages and increased pricing) have highlighted the importance of second sourcing component requirements. Ashlea also holds over 19,000 lines of stock.

[www.ashlea.co.uk](http://www.ashlea.co.uk)



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25th May!

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VISIT PRINCEPS AT STAND 14

# Access to rare anti-counterfeit accreditation

Discover how AS6081-certified distributor Princeps is expanding its anti-counterfeiting facilities to supply fully traceable difficult-to-source and obsolete components

Princeps, a specialist distributor of obsolete and difficult-to-source electronic, electrical and e-mech components has received renewed AS6081 accreditation following its relocation to larger premises. One of less than five and probably as few as two UK distributors to hold AS6081 certification, Princeps specialises in sourcing fully-traceable components for customers in industries including aerospace, defence, energy and transportation.

The AS6081 standard was created in 2012 by the global engineering association SAE International in response to a significant and increasing volume of

fraudulent or counterfeit electronic parts entering the supply chain. It standardises practices to identify reliable sources, mitigate the risk of distributing fraudulent or counterfeit parts and control and report those suspect or confirmed items to the relevant authorities and potential users.

Following its recent relocation to larger premises, Princeps has invested further in its laboratory facilities and renewed its existing AS6081 certification to reflect its new location as required by the association.

Princeps' sales director, David Nash, said: "The risks that counterfeit or fraudulent

electronic components pose cannot be underestimated, and this continues to be a significant and increasing problem to procurement managers, especially in times of component shortages.

"We have invested heavily in our laboratory, recently adding a further £150,000 worth of new equipment since our move here a few weeks ago. When sourcing through Princeps, our customers are assured through a range of risk mitigation solutions, including fully bespoke test and inspection plans following AS6081, AS6171 or any of the other methodologies available."

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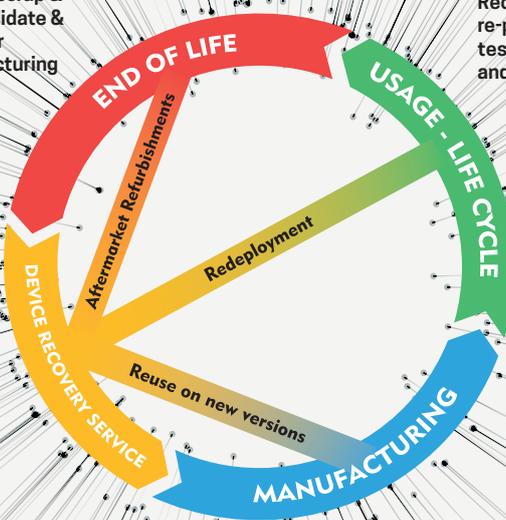


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VISIT HAMMOND AT STAND 67

# In-house enclosure modifications

Buyers interested in customised enclosures will be pleased to hear that Hammond Manufacturing is using its ECS stand to feature its in-house modification capabilities

Standard products are great: low cost, readily available and field-proven in many different applications. However, they will always need to be configured to suit project requirements. Hammond has thousands of standard enclosure designs in different materials and sizes. In-house modifications by the original manufacturer eliminates scrap and design interpretation of customer requirements. Orders can be as low as 25 units.

Hammond's in-house modification capabilities include: precision CNC milling of holes, cut-outs, pockets, tapping and countersinking; UV digital

and silk screen printing; engraving of logos and text in both plastic and metal; and pressed in hardware including nuts, studs and standoffs.

In addition (subject to a minimum order quantity) all ABS, flame retardant ABS and polycarbonate enclosures can be moulded in any custom colour. Plastic and metal enclosures can be powder coated in either smooth or textured finish in any chosen colour.

Hammond's stand will also showcase new products. The IP68 1557 family features multiple options for surface mounting, desktop use and pole mounting

for outdoor installations. Extensions to the 1551 miniature enclosure family include the IP68 1551W, the 1551V range with ventilated covers for housing sensors and its sister range, the 1551SNAP with solid covers. Additional sizes and options have been added to many product families.

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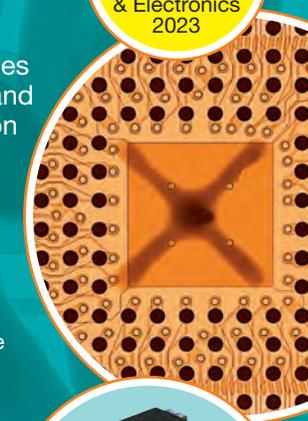
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VISIT POWELL AT STAND 19

# Buying into connectors, sensors and EMC

Powell Electronics is offering distribution, logistical and technical design support for OEM customers looking to source connectors, sensors and EMC solutions

Powell Electronics is a well-established distribution company with a focus on connectors, sensors and EMC solutions. The company's ECS attendance will include a focus on designing around component shortages. This includes using suppliers with short lead times, stocked solutions and how to collaborate with application engineers to speed up component sourcing.

Powell will showcase many of its niche suppliers and explain the design support offered for more standard military connectors. Technologies and services on display will include: Quell EMC solutions, miniature RF solutions, high power connectors, waterproof

connectors, enclosures up to IP69K, plus cable assemblies and flex cables.

Powell specializes in high reliability, harsh environment connector design, manufacturing and supply chain. In the USA, Powell has 70,000ft<sup>2</sup> of connector manufacturing capabilities at its Swedesboro, NJ facility, which is certified to ISO9001 and AS9100.

In Europe, Powell Electronics operates from headquarters in Dublin, Ireland and other European locations, employing technical staff to support design-in activities and signing new franchise agreements with Glenair, Harwin, Amphenol Aerospace,

Quell, AB Connectors, Conesys, Positronic and more.

This lets Powell address the broad range of demanding connector applications with products that range from miniature PCB-mount devices to high voltage, high current hi-rel solutions.

Powell supports customers' needs from distribution and logistical support to technical design support. Powell offers automated engineering solutions and connector ODM services. The company is an authorized, QPL'ed distributor for over 50 military specifications and is ISO9120 certified.

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# Tailored supply chain support

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Smith's Intelligent Distribution™ model is designed to deliver comprehensive solutions to complex electronic component supply chain challenges. Backed by nearly four decades of industry expertise and trusted market relationships, Smith has developed the tools, resources and processes needed to provide customers with the seamless supply chain support they've come to expect from the world's leading independent distributor.

Smith ensures its services and products meet the highest standards using its systems-based approach to semiconductor distribution. The company's end-to-end

processes—from stringent supplier screening and best-in-class testing and inspection facilities to ESD-safe packaging and premier global logistics services—account for all details in Smith's operations to provide unwavering reliability across its 17 offices and four distribution hubs around the world.

The company offers numerous program models that are customizable to meet each project's unique needs. With the largest supplier network in the world, unique financing options and proprietary software, Smith can combine and tailor existing programs to mitigate its customers' supply chain challenges.

Smith's investments in continuous improvement let the company evolve and innovate to meet its customers' everchanging needs. Using decades of historical data from its global market outlook, Smith helps its customers develop and implement smart and effective procurement strategies.

The company's in-house development team creates and continually updates IT solutions and applications to improve operational efficiency for customers and employees alike. Customizable, digital supply chain solutions—such as customer portals, virtual warehouses and online forecast management and real-time reporting

tools—provide global visibility and up-to-the-minute market insights.

Smith has also heavily invested in expansion and automation and increased its worldwide operational footprint by more than 70 per cent in the last year. This new space, paired with new equipment and software investments, has allowed the company to substantially increase throughput across its global distribution hubs to meet the ever-increasing demand for electronic components.

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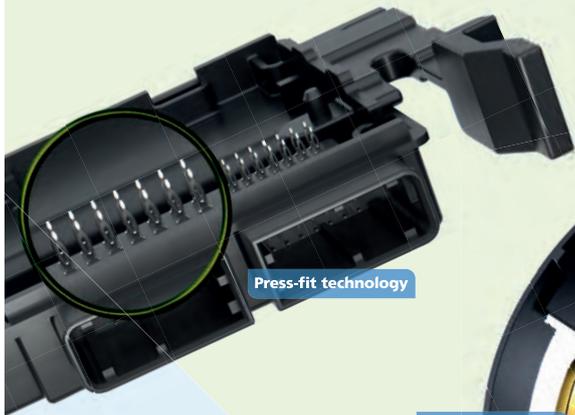


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Manufacturer	Distributor	Telephone	Website	Franchised Distributor	No. of Lines for Principal	Stock Value for Principal	Minimum Order Value	% Lead Free for Principal Range	No. of Technical Support Staff	Total No. of Staff	Buffer Stock Facility
<b>CABLE ASSEMBLY &amp; HARNESSING</b>											
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
<b>CIRCUIT PROTECTION</b>											
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,800	N/A	0 €	N/A	50	2,500+	Y
EPCOS/TDK	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
<b>DISPLAYS</b>											
Midas Displays		01493 602602	www.midasdisplays.com	N	3,300	N/A	£0	100%	10	17+	Y
<b>ENCLOSURES</b>											
Bud Industries	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,600	N/A	0 €	N/A	50	2,500+	Y
Hammond	Switch Electronics	01482 862255	switchelectronics.co.uk	Y	500	N/A	£0	70%	2	6	Y
Hammond	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,350	N/A	0 €	N/A	50	2,500+	Y
Metcase Enclosures	OKW Enclosures	01489 583858	www.metcase.co.uk	N	288	£40,000	£0	N/A	5	22	Y
New Age Enclosures	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
OKW Enclosures Ltd	OKW Enclosures	01489 583858	www.okw.co.uk	N	1,955	£40,000	£0	N/A	5	22	Y
Rolec Enclosures	OKW Enclosures	01489 583858	www.rolec-enclosures.co.uk	Y	935	£40,000	£0	N/A	5	22	Y
Teko Enclosures	OKW Enclosures	01489 583858	www.teko.co.uk	Y	1,860	£40,000	£0	N/A	5	22	Y
<b>FREQUENCY MANAGEMENT</b>											
ABRACON	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,750	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
ECS	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,050	N/A	0 €	N/A	50	2,500+	Y
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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
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

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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	
JAE Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	23,600	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	17,150	N/A	0 €	N/A	50	2,500+	Y
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
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	41,850	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,650	N/A	0 €	N/A	50	2,500+	Y

# 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
<b>OBSOLESCENCE / HARD TO FIND</b>											
	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
<b>OPTO ELECTRONICS</b>											
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
<b>PASSIVES</b>											
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
<b>PASSIVES ALTERNATIVES</b>											
BEC Distribution Ltd		01844 275824	www.bec.co.uk		5,000	N/A	£0	100%	3	5	Y
<b>POWER &amp; BATTERIES</b>											
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
<b>SENSORS</b>											
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
<b>SWITCHES &amp; KEYBOARDS</b>											
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

## 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
EAO	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,800	N/A	0 €	N/A	50	2,500+	Y
Honeywell	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
NKK Switches	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,000	N/A	0 €	N/A	50	2,500+	Y
Omron	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
Panasonic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,350	N/A	0 €	N/A	50	2,500+	Y

### TERMINAL BLOCKS

Marathon Special Products	Global Supply Services	01904 436 488	www.global-supply-services.com	Y	8,000	£800,000	£100	100%	3	11	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,850	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	13,550	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,750	N/A	0 €	N/A	50	2,500+	Y

### THERMAL MANAGEMENT

Bergquist Company	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	250	N/A	0 €	N/A	50	2,500+	Y
Delta Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	700	N/A	0 €	N/A	50	2,500+	Y
ebm-papst	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
EMI Thermal	EMI Thermal	01992 510000	www.emithermal.com	N	800	N/A	£20	100%	12	200	Y
Materials Direct	Materials Direct	+44 (0)1908 222 211	www.materials-direct.com	N/A	N/A	£1,000,000	£0	N/A	5	55	Y
Sanyo Denki	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Sunon	G.English Electronics Ltd	0208 855 0991	www.gelec.co.uk	Y	3,500	£1,000,000+	£0	100%	10	28	Y
Sunon	Thermaco Ltd	01684 566163	www.thermaco.co.uk	Y	3,500	£450,000	£100	100%	7	15	Y
Universal Science	Universal Science	+44 (0)1908 222 211	www.universal-science.com	N/A	N/A	£1,000,000	£0	N/A	5	55	Y

### TRANSFORMERS & INDUCTORS

Best Windings	Best Windings	0044 (0)1394 448424	www.bestwindings.co.uk	N	300	N/A	£100	N/A	2	24	Y
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,900	N/A	0 €	N/A	50	2,500+	Y
Coilcraft	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,500	N/A	0 €	N/A	50	2,500+	Y
EPCOS / TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,300	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,900	N/A	0 €	N/A	50	2,500+	Y
TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,050	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,200	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,400	N/A	0 €	N/A	50	2,500+	Y

### WIRELESS SOLUTIONS

DIGI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Espressif	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	30	N/A	0 €	N/A	50	2,500+	Y
Laird Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	100	N/A	0 €	N/A	50	2,500+	Y
Lantronix	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	30	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	20	N/A	0 €	N/A	50	2,500+	Y
u-blox	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10	N/A	0 €	N/A	50	2,500+	Y

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## 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
Challenger Solutions Ltd	01245 325252	www.challengersolutions.com	£10m	Essex/SE	70	9	AS9100 Rev D, ISO9001:2015, ISO 14001:2015, 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.etluk.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
Hallmark Electronics Ltd	01782 562255	www.hallmarkelectronics.com	£2.4m	Staffordshire	26	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.iiew.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
KEY-TECH ELECTRONIC SYSTEMS	01592 597711	www.key-tech.co.uk	£7m	Scotland	65	2	ISO9001:2015, J-STD-001, IPC-610/620 CLASS 3, IPC-7711, BS EN ISO13485:2016, ISO 13485	Y	Y	Y	N	Y	Y
Nemco Limited	01438 346600	www.nemco.co.uk	£15.9m	SE	120	6	AS9100, ISO9001:2008, IPC610/620 to Class 3, ISO14001-2004, SC21	Y	Y	Y	Y	Y	Y
NOTE Group	01753 746700	www.note-uk.co.uk	£207m	UK/EU/China	1,200	20	IPC610 to Class 3, ISO9001:2015, 13485, 14001, 18001	Y	Y	Y	Y	Y	Y
M-TEK (Assembly) Ltd	01189 455377	www.mtek.co.uk	£2.4m	SE	30	4	ISO9001, ISO14001, IPC-A-610 Class 3, IPC-7711/7721, WHMA-3620, Certified IPC Trainer	Y	Y	Y	Y	Y	Y
Pektron	01332 832424	www.pektron.com	£50m	E-Midlands	350	8	ISO9001, ISO14001, TS16949, BEAB, VCA, TUV, UL	Y	Y	Y	Y	Y	Y
Simtek EMS Ltd	01843 233120	www.simtekems.co.uk	£8.2m	SE	77	3	ISO9001:2008, ISO13485, IPC-A-610 Class 3 & IPC-7711	Y	Y	Y	Y	Y	Y
TEXCEL TECHNOLOGY PLC	+44(0)1322621700	www.texceltechnology.com	£15.5m	SE	131	7	ISO9001, ISO14001, IPC610 Class 3,	Y	Y	Y	Y	Y	Y
Tioga Limited	01332 360884	www.tioga.co.uk	£16m	Derby	130	6	ISO 9001, ISO 13485, ISO14001, IPC 610, 620, 7711/7721	Y	Y	Y	Y	Y	Y
Wilson Process Systems	01424 722222	www.wps.co.uk	£12m	SE	100	5	ISO9001:2015, IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y

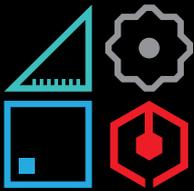
## PCB Buyers' Guide

Manufacturer	Telephone	Website	Service Provided (ie. Broker, Manufacture &/or Repair)	Location	Approvals	Volume - Small, Medium, Large	Double-sided	Multi-layer 4-10/10-20-30	Metal PCBs	Ceramic PCBs	Heavy Copper PCBs	Flex / Flex-Rigid	Obsolescence Solutions	Modifications	Prototyping
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	ISO 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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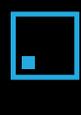
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