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On the cover – July 2022

Robotics drive BoM evolution
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Editor's Word



Crisis, what crisis?

I guess I could be described a wordsmith. Whether it's the written word or software code, words are my day. That's why I get upset when people abuse words. The most abused is 'crisis'. In fact, I use some code to scan the internet for the word 'crisis' and add the latest crisis to my database. I might publish it one day.

Today's crisis is inflation. This time, I'm happy with the application. I'm of an age where I just about remember proper inflation, the 25 per cent type. It made the power go out and I had to go to bed cold by candlelight.

In my book inflation only requires two ingredients: an oversupply of money and an undersupply of goods. The result is that everyone's earnings and savings will be worth less tomorrow than they were today. I've known this for a while so when the pandemic triggered money printing and factory closures I ignored the financial experts and started planning for inflation.

What does this mean for electronics purchasing? Apart from the obvious—less parts availability and higher prices—its going to make production planning very difficult. When an OEM is uncertain about sales it loses the ability to accurately determine forward production capacity. This makes it impossible for purchasing to know how much to buy. Due to inconsistent orders, component manufacturers then find it difficult to calculate infrastructure investments.

Everything should resettle in a few years. In the meantime, I suggest promoting any member of staff with an accurate crystal ball, innate foresight, demonstrable planning ability or deep skills using spreadsheet formulas.

Jon Barrett

NEWS



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Issue 194, Vol.18 No.07

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

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

Printed by: Pensord Press Ltd
Electronics Sourcing is printed on
sustainably sourced paper stock
ISSN 2043-9504
© 2022 MMG Publishing Ltd



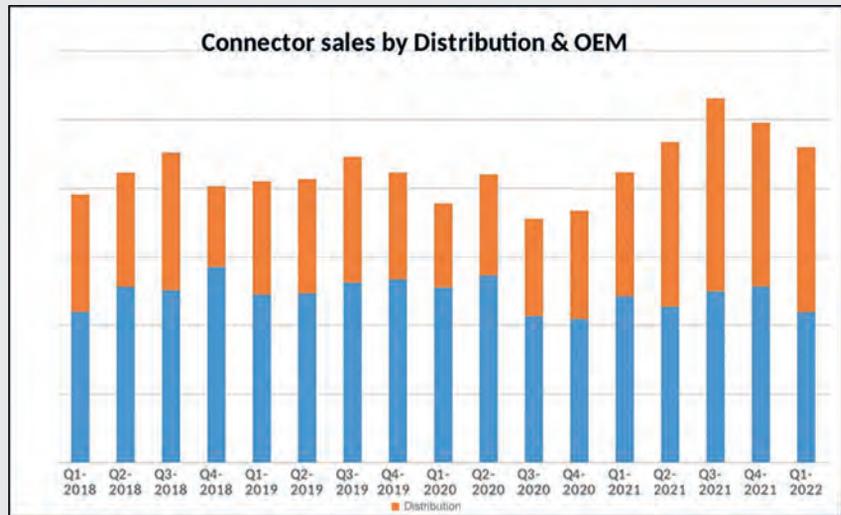
ELECTRONICS SOURCING IS INDEPENDENTLY ABC AUDITED 2005/2021



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Connector sales growth slows but orders accelerate

Without exception, all ITSA members reported a bumper order intake Q1 2022 and although revenue growth slowed compared to Q4 of 2021 some members saw sales increase in excess of 40 per cent over the same period in 2021. Bookings were also outstanding with members reporting orders up 60 per cent plus. Book-to-bill was 1.22:1. Buoyant markets include medical, security, data centres and telecom.

As reported last quarter all members are now significantly above 2019 (pre pandemic) levels but with this exceptional growth comes supply chain issues. Problems in the global supply chain of raw materials, components and in particular cables means that lead times

are increasing with 12-weeks seeming the norm (one member reported an instance of a three-year lead time). Costs are increasing everywhere, on everything and while members have tried to contain this it has resulted in price increases being passed on to customers.

There continues to be high-level investment taking place by members and/or their corporate headquarters including acquisitions and developing new facilities. This follows on from the positive trend of investment that has happened over the past two years despite the pandemic.

itsa.org.uk

Location accuracy at purchasers' fingertips

Mouser is stocking Bosch's BMP390 barometric pressure sensor. The product is described as an ultra-small, low-power and low-noise 24-bit absolute barometric pressure sensor with vertical (z-axis) capabilities that enable accurate indoor localisation with smartphones in case of emergencies.



The sensor offers a pressure range of 300hPa to 1250hPa at zero to 65°C with typical relative accuracy of ± 0.03 hPa. Power consumption is 3.2 μ A at 1Hz and the 2.0 by 2.0 by 0.75mm form factor suits altitude-tracking applications in smartphone and wearable devices. Through its vertical-specific position capabilities and accuracy, the sensor helps mobile phone designers meet upcoming FCC requirements for location accuracy.

The BMP390 enhances design flexibility, allowing easy integration into existing and developing applications, including Internet of Things devices, smartphones, GPS modules, wearables, hearables and drones.

www.mouser.com

Price quotes now included

Digi-Key Electronics has enhanced its myLists tool to include price quotes. MyLists is a parts list management tool that consolidates bills-of-materials, price/availability lists and quotes. Quote integration lets users upload lists of up to 1,000 parts to check stock, instantly secure pricing for 30-days, collaborate with colleagues and place orders: all in one place.

New features include: interface to convert lists to quotes; set preferences for preferred package types; duplicate an expired quote to update pricing; and quote six quantities per part number.

Digi-Key's executive vice president of operations, Linda Johnson, said: "We are excited to introduce a unified list experience for Digi-Key's myLists users. Digi-Key customers can now work smarter, not harder, by using myLists' quoting functionality to keep everything in one convenient location, create multiple quotes from one list of parts and easily convert quotes to online orders."

www.digikey.com

COMBATING DELAYS TO ACCELERATE TIME TO MARKET

In the electronic supply chain, time to market (TTM) is increasingly challenging as the needs of technology evolve and manufacturers struggle to meet demand. Delayed production, unreliable supply and global economic inflation has caused unpredictable delivery schedules and price increases. While supply chain obstacles are unavoidable, how can customers combat continuously expanding lead times and establish best practices to stabilize TTM?

There are strategies to lessen the blow of supply chain disruptions. Proactively adjusting TTM methods with adaptable design, buy and management processes can better ensure a successful product lifecycle.

Design

In a healthy supply chain, customers would easily be able to design a product, order parts from a preferred vendor and commence manufacturing. However, today's market can be disturbed by workforce shutdowns, end-of-life notices or shortages in necessary materials. While the supply chain dictates what components are available, companies must plan to incorporate alternative electronic builds and employ multiple manufacturers in order to mitigate risk.

The scales between supply and demand tip quickly and without warning, even for the largest manufacturers. If allocation becomes difficult for engineering electronic builds, companies must compare and forge alternative supply channels as backups. Having multiple suppliers will help companies stay ahead of the curve.

Additionally, the testing process is vital and shouldn't be sacrificed for faster TTM. When Samsung pushed the 2016 Galaxy Note to market too quickly, valuable procedures were omitted. It was later discovered that there wasn't enough room for the device's battery to expand when it overheated. The results were phones spontaneously catching fire and being banned from certain airlines.

Buy

Navigating the supply chain purposefully is crucial to solving market volatility. While manufacturers try to forecast, resources are not guaranteed. Inflexibility can lead to delays that impact revenue, so adaptability is essential for success.

Purchasing buffer stock can alleviate some of the pressure on supply lines, but it cannot safeguard against future interruptions. It can take between 16 – 18 weeks to manufacture

components. Average lead times for delivery can be over 90 days, sometimes reaching 12 – 16 weeks depending on freight method. When lead times extend beyond the forecasted window, it results in costly manufacturing setbacks.

When suppliers cannot secure allocation, companies must navigate the open market. In these instances, it is important to have reliable connections that ensure quantity with quality. An effective way to maintain quality standards is to partner with a certified test house. Fusion Worldwide recently acquired Prosemi, Singapore's largest testing facility. Customers are now able to cut lead times in half by partnering with Fusion since the supplier can directly control and expedite the component testing process.

Vertically integrating testing services grants Fusion power over workflow and delivery schedules. While other distributors are forced to quote 4 – 6-week lead times, Fusion can confidently quote 4 – 5-day turn times.

Manage

To develop effective lead time strategies and secure supply, companies must be transparent when working with suppliers. Remaining up to date on market trends allows companies to make informed decisions and create a robust forecasting and sourcing plan.

Obsolescence is a common challenge and a perfect example of why planning is essential. Working with an independent distributor to develop strategies can prevent delays in TTM by securing supply. Using a trusted network of distributors versus a single supplier helps manufacturers be prepared, instead of struggling to fill supply gaps.

Companies shouldn't wait for supply chain management plans to break before assessing risk. Injecting flexibility into builds and purchasing, plus working with a company like Fusion to shorten lead times and to receive real-time market intel, creates a TTM strategy that is prepared to overcome market challenges.

www.fusionww.com



In Brief

Increasing pricing dimensions

Responding to electronics supply chain disruptions, Supplyframe's chief marketing officer and SaaS sales leader, Richard Barnett, said: "The implications of lockdowns in China will far outlast the crisis itself. This aligns with Supplyframe's forecast, which expects 76 per cent of all pricing dimensions to increase and 77 per cent of all lead time dimensions to extend in calendar quarter Q3." supplyframe.com

Investing in shielding

TE Connectivity has acquired Kemtron. Vice president and general manager of TE's Performance Materials business, Nick Jones, said: "Combining TE's expertise in heat shrink tubing, manufacturing scale and distribution with Kemtron's reputation for providing quality and market-leading EMI/RFI solutions, we can significantly enhance the value we bring to our customers." www.kemtron.co.uk

Chip resistors in stock

Farnell is now stocking the latest Panasonic chip resistors, helping customers accelerate their new product development-to-market programmes, with full confidence in fast and reliable sourcing. Applications include inverters, battery management systems, ADAS, LiDAR, radar, lighting, on-board chargers, industrial robots and a range of automotive systems. uk.farnell.com

IPC establishes European subsidiary

To better support European members' interests, IPC has formed IPC Electronics Europe GmbH. IPC's president Europe and South Asia, Sanjay Huprikar, said: "We are very excited about the prospects of actively participating in significant consortiums and working groups in the EU to help drive newer standards, education and advocacy solutions that will be vital in transforming the continent's factories of the future." ipc.org

Batteries certified for wind turbines

GS Yuasa's NP batteries have received TÜV certification, allowing them to maintain pitch motors in wind turbines.

To keep the power output of wind turbines constant, the blade pitch angle is automatically adjustable, usually achieved using electrically operated pitch adjustment motors. The TÜV-certified batteries provide a backup should power fail. Each motor has its own battery. The batteries must cope with short autonomy discharges of very high currents, often many times the rated Ah capacity of the battery.

The Yuasa 12V NP suits this application. They are designed to tolerate vibrations/shocks and quickly recover after deep discharge. Their lead-calcium grids ensure long life, important in offshore wind turbine applications.

GS Yuasa Battery Europe's general manager engineering and technical for industrial batteries, Peter Stevenson, said: "We're delighted to have been given TÜV certification for our industry leading NP batteries. Having a product that is certified by such a trusted and respected organisation is testament to the high quality and safety our batteries offer."

www.gs-yuasa.eu



Multiprotocol module in stock

Rutronik is stocking iVativ's RENO multiprotocol module which

suits smart homes, asset trackers, smart fitness, healthcare, IIoT sensors/control and mobile payments. Based on the Nordic nRF52840 SoC, the module supports Bluetooth 5.0, Thread/ZigBee/ANT and NFC-A.

Integrating analog front-ends, antennas and crystals, the 10 by 1.5 by 1.5mm module offers low power consumption. Features include advanced security and integrated wireless/network stacks, while application APIs offload the host processor and reduce time-to-market.

RENO ensures secure connectivity and data protection through Bluetooth Low Energy 5.0 (BLE) and supports UART and SPI as interfaces to the user's MCU. The module is FCC, IC and CE certified. It is available with either an integrated PCB antenna or an MHF4 antenna connector.

iVativ uses an ARM CryptoCell 310 crypto accelerator and AES 128-bit encryption. APIs and AT commands make the module usable on all popular MCUs with little or no porting effort.

www.rutronik24.com



Bluetooth and multi-protocol SoC available now

Solid State Supplies is now supplying Silicon Labs' BG24 and MG24 series of 2.4GHz wireless SoCs for Bluetooth and multiple-protocol operations, respectively. Matter-ready, the ultra-low-power series supports multiple wireless protocols and incorporates PSA Level 3 Secure Vault protection, ideal for smart home, medical and industrial applications.

Solid State Supplies' product group manager, Matt Cook, said: "The BG24 and MG24 families from Silicon Labs are the first ultra-low powered devices with built-in dedicated AI/ML accelerators—specialised hardware designed to handle the complex calculations inherent in AI/ML implementations.

"These devices represent a huge step forward in the quest to bring the potential of AI and ML to life in real world applications. Their impressive battery life will help to bring AI/ML applications and wireless high performance to battery-powered edge devices."

Silicon Labs' distribution director for EMEA and Americas, Joel Munday, added: "Distributors like Solid State are key to helping our end-users create solutions for the IoT. We have a long history of successful partnership with Solid State and we are pleased to see our latest SoCs debut in their catalogue."

www.sss/td.com



Cyber safe in defence, motorsport and industrial

Lane Electronics has again been awarded Cyber Essentials Certification. This is a mandatory requirement for companies supplying the UK defence industry and is equally important for commercial and motorsport customers.

Certification ensures a high level of cyber security measures are in place to protect against cyber-attacks. Customers can be assured Lane is working to improve security across its IT systems to secure against cyber-attack. Certification requires compliance to a number of IT-related control parameters including firewalls, user access control, malware protection and patch management.

Cyber Essentials is a Government backed and industry supported scheme that helps businesses protect themselves against the growing threat of cyber-attacks and provides a clear statement of the basic controls organisations should have in place to protect themselves. It is the UK Government's answer to a safer internet space for organisations of all sizes, across all sectors.

www.fclane.com

Just-in-time becomes just-in-case

Make UK and Infor's *Operating without Borders—Building Global Resilient Supply Chains* report shows the stark impact on UK manufacturers from the economic shocks of the last two years and the knock-on effects to supply chains from increased energy, transport and raw material costs, as well as transport availability.

The findings also indicate that the longstanding strategies manufacturers have adopted to off-shore in response to globalisation, operating a 'just in time' process with virtually guaranteed transport links and low-cost production, have been turned upside down with disruption and increased volatility fast becoming normal.

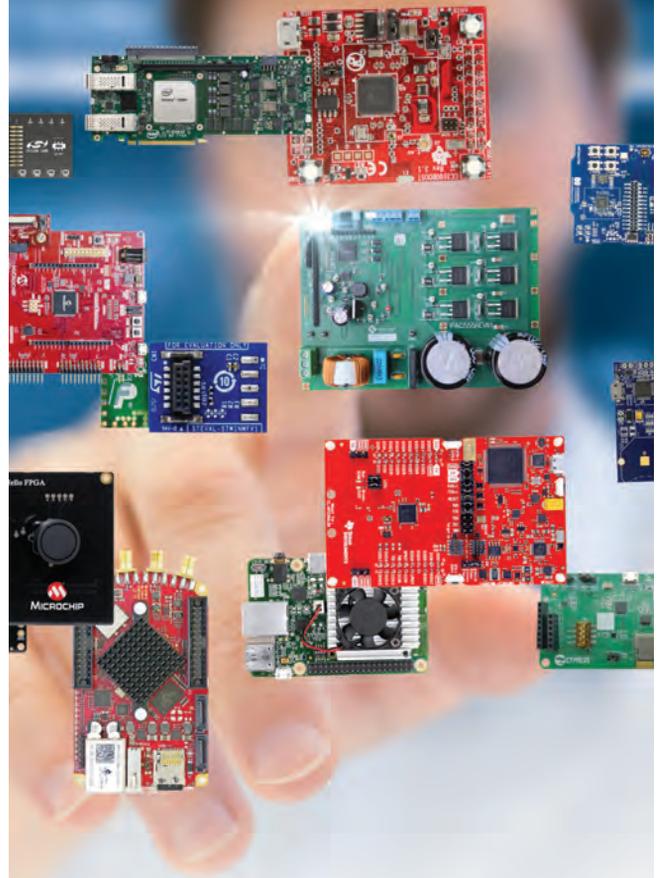
Make UK's director of policy, Verity Davidge, said: "For decades manufacturers have used increased globalisation and supply chains to drive efficiency and create lean manufacturing processes which have helped them grow and remain competitive. However, the economic shocks of the last few years have created a perfect storm which has turned these models upside down and forced companies to re-evaluate their business strategies and seek suppliers much closer to home.

"As a result, we may now be seeing the era of globalisation passing its peak, with disruption and volatility for global trade fast becoming normal. For many companies this will mean leaving 'just in time' behind and embracing 'just in case'."

www.makeuk.org

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**MOUSER
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How to Simplify the Process of Selecting and Buying Electronic Components

By Mark Patrick,
Mouser Electronics

Some aspects of daily work tasks can turn into a laborious process that we try to avoid if possible. If you spend your days struggling to fulfil a new bill of materials (BOM) request from engineering, Mouser has some good news. Mouser developed the Customer Resource Centre to ease the burden on buyers, and improve the productivity of selecting and purchasing electronic components.

The Customer Resource Centre features fourteen tools and resources to assist you in selecting, pricing, ordering, and shipment tracking across the entire Mouser inventory. It also provides the in-depth information required to complete your quality and compliance tasks, providing a one-stop solution to all your procurement needs. Customer Resource Centre account management features

- A convenient way of applying for a Mouser business account (MyMouser).
- Once your business account is set up, you can use the MyMouser Account tool to check order status, set up and edit current projects.
- Review and print invoices so you can keep on top of the paperwork and ensure the buying process runs smoothly.
- Access and download Mouser's quality certifications.

BOM, ordering and product resources

The Customer Resource Centre's BOM capabilities are focused on Mouser's free to use intelligent BOM tool, FORTE. FORTE helps you remove the uncertainties typically associated with buying complex electronic components such as semiconductors and integrated circuits. Time-saving features include the ability to upload a BOM from a spreadsheet or CSV file. Its straightforward user interface makes adding, editing, and deleting BOM items incredibly simple. FORTE permits searching for partial part numbers and part descriptions to validate correct codes and to suggest alternatives.

In addition to FORTE, other resources include the ability to automate order placement using API, EDI, or PunchOut catalogues. You can view the status of orders and track shipments too. If you wish to inquire about an individual or multiple products, you can easily submit a request or delve into the extensive library of articles and datasheets. Not ready to import a BOM yet? then use the price and availability assistant to check for individual parts.

Mouser's Conversion Calculators

If you're not 100% certain you are ordering the correct capacitor and need to check how many picofarads make a microfarad, try using

one of Mouser's online conversion calculators. Available for a range of electronic components, environmental factors, and physical dimensions, they offer a quicker, more accessible alternative to using a scientific calculator.

Visit the Mouser Customer Resource Centre to simplify the task of selecting and buying electronic components: <https://eu.mouser.com/customer-resource-center/>



Mark Patrick
Technical Marketing
Manager EMEA
Marketing



 BOM tool Master your Bill of Materials with greater intelligence.	 Request a quote Easily request a single or multiple item quote.
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www.mouser.com

Robots' starring role in manufacturing

FPE Seals explains why automation is fast becoming a key conversation within British manufacturing industry, with robotics emerging as the solution

Recent years have witnessed a need to move towards more automated manufacturing environments. An ABB Robotics survey found of 250 SME and manufacturing companies, 81.2 per cent were considering incorporating robotics into their processes to combat issues with workforce shortages and supply chain disruptions.

A key question from businesses still on-the-fence about investing in robots is how can robots improve processes. By automating sections of a manufacturing process with robots, manufacturers are offered an opportunity to stay competitive within a constantly evolving industry.

Substituting traditional labour with robots can help improve efficiency. Robots don't require breaks and they're programmed to carry out specific tasks with much smaller margins of error than humans. This results in more cost-effective output which could see greater revenue for less paid labour.

Robots also suit tasks requiring a steadiness that can't always reliably come from humans. Whether it's handling or removing harmful or dangerous materials, welding or separating

materials from one another, robots ease those tasks.

UK manufacturing industry has leant into a 'quality over quantity' mentality and robotics are being incorporated into processes. Between 2020 and 2021, the UK became one of the top 15 for sales of industrial robots globally. The International Federation of Robotics found that 2,205 industrial robots were installed throughout 2020, bringing the country's total to around 23,000.

These robots are often found in the UK's automotive manufacturing industry which accounted for 16 per cent of those installed in 2020. Sectors seeing a benefit in robot applications due to a lack of workers include food and beverage which saw an increase to 304 robots in 2020.

Though these numbers continue to rise, the IFR still ranked the UK outside the top 20 countries regarding robot density within manufacturing. Thus, there is still room for robotics in manufacturing to grow on UK shores.

The government itself outlined how much growth was possible in a Business, Energy and Industrial Strategy (BEIS) report, estimating a potential 40



Substituting traditional labour with robots can help improve efficiency. Robots don't require breaks and they're programmed to carry out specific tasks with much smaller margins of error than humans

per cent annual growth for robotics and autonomous systems in the UK between 2020 and 2030. This could in turn mean an extra £6.4 billion in value for the UK economy by 2035. If the creation and sale of autonomous robots is set to increase, use of them across a number of industries may increase alongside it.

Automating business processes with robotics is not something to fear. The myth that robots steal jobs has been debunked and there are plenty of manufacturing tasks they can help with. Implementing robotics can help keep businesses competitive in a global market, while providing efficiency impossible to achieve with manual labour. A record number of robots have been installed but there is still room for growth.

www.fpeseals.com



Rebound Electronics

Why Rebound?

Rebound Electronics' UK team can offer you real-time insight and trends. Our scale and data centric platform ensure that we are well-placed to secure the best price and availability for the trusted electronic components you need to maintain production and competitiveness.

A flexible approach and quick decision-making ensure that we are an effective partner for your business utilising our 20000 sq. ft UK distribution hub and Enhanced inspection facility.



Our Vision

To buy through Rebound is to take on a new partner, a partner that will do everything in their power to ensure our clients enjoy the growth and success their hard work deserves.

Our Mission

From our humble beginnings, through the global pandemic and beyond, we have always been passionate about our customers, from start-up companies working tirelessly to maintain growth.

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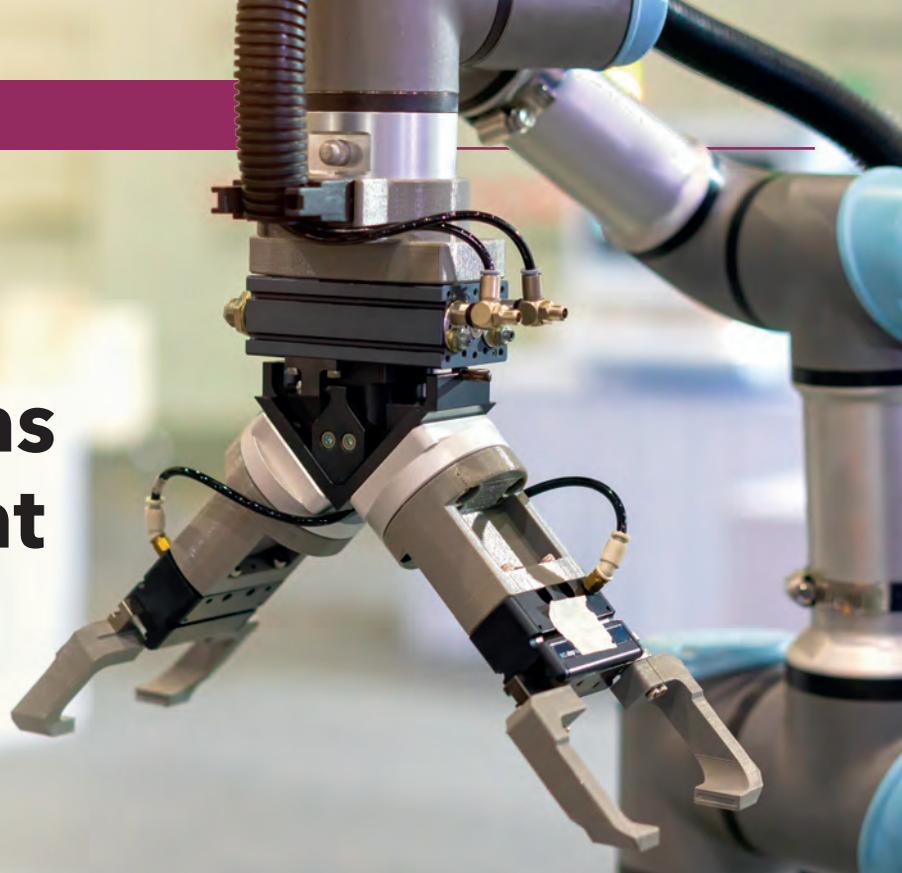
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Considerations for component sourcing in robotic applications



Digi-Key Electronics' partnership marketing manager—strategic programs, Eric Halvorson explores key components buyers will need to consider in robot applications

Incorporating robots and sourcing the necessary components requires planning, preparation and research. Robots are available in many shapes and sizes with each one providing different strengths depending on the application. Plus, there are components and equipment to consider.

End-of-Arm-Tooling

End-of-arm-tooling (EOAT) is a robot's most important part. This is where the work is performed. Selecting the right components here determines the robot's effectiveness in its application. EOAT can mean grippers, welding guns, sprayers, grinders, waterjet cutting and more. Basic EOAT products can be purchased off-the-shelf, while highly customised products can be designed by the manufacturer to customers' specifications.

Vision Inspection Systems

In the past, robots were programmed to move from coordinate-to-coordinate without the ability to move from a programmed path and unable to adapt to products not where the robot expected them to be. Today, robots are equipped with one or more computer connected cameras, letting the robot react to products that vary

in shape/size and located outside the pre-programmed location. Vision systems can detect colour, form, shape, dimensions, temperature and more. They are widely used for sorting and quality inspection with much greater accuracy than human counterparts.

Robot vision systems are versatile and flexible, so choosing the appropriate vision system for an application can be difficult. Exploring a few basic considerations can narrow down the search:

2D v 3D: If the application needs to simply pick up a part and move it to another location with high repeatability, then 2D is most likely the best option. However, if the robot needs to distinguish orientation and even select from an assortment of parts, then 3D is probably the best bet. Another consideration is processing speed. While some cameras can process

images internally, if the robot requires fast part identification and operates quickly to move product from one place to another, an external processor is likely required.

Camera: Different types of cameras are required based on the machine vision's role, which might include inspections such as quantity, foreign matter, defects, dimensions or position.

There are many safety considerations when installing a robot. The following is a sample of products available to protect workers and equipment.

Safety Considerations

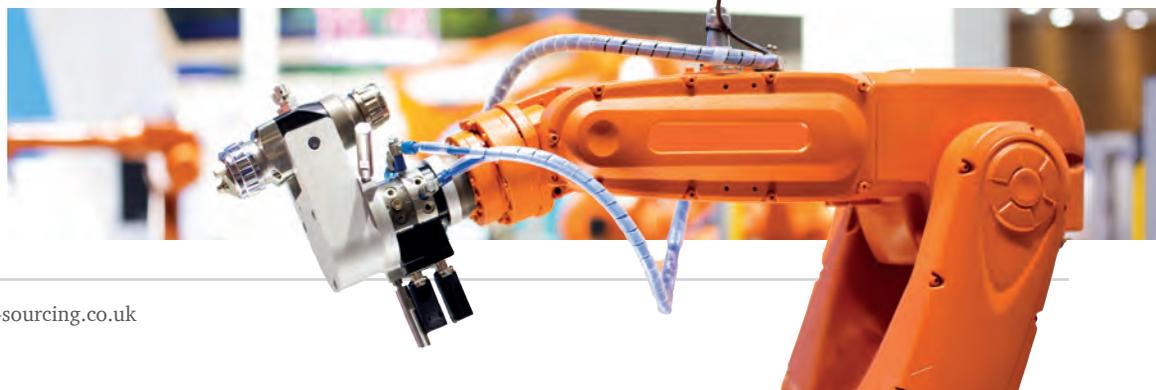
In collaborative environments, workers will be walking into and around the arc of the robot's swing. In these instances, zones are required to determine the robot's speed. These are frequently configured with

a safety scanner, which uses a laser to detect objects within a 360deg span. Light curtains detect if an obstruction, such as a person's arm or leg, has entered a field that may cause injury.

Presence sensing devices, such as mats and operator presence triggers, determine if a person is in an area that may be dangerous and will shut down the robot to prevent injury.

There are many considerations when sourcing robotic components. Digi-Key carries leading automation brands, robot kits and robotic components. The company is looking forward to seeing what products leading automation suppliers bring to market, as well as implementing many of these innovations in its own operations to enable future scalability and success.

digikey.co.uk



Is your DIN rail technology future proof?

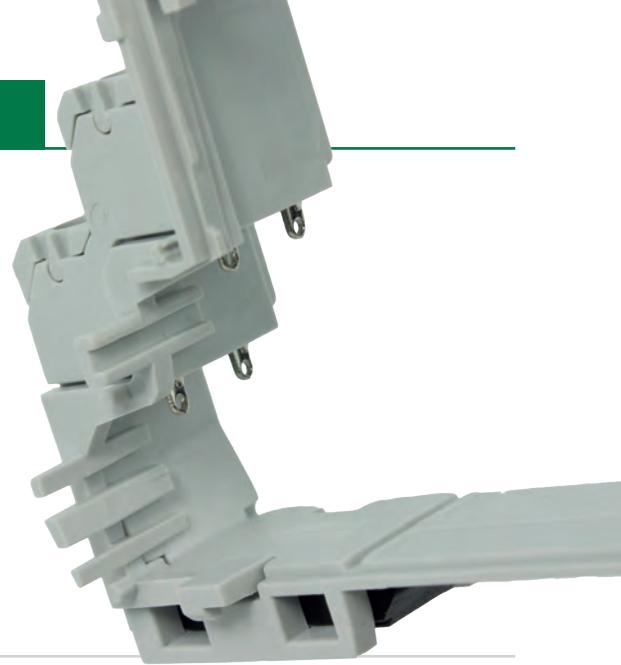
CamdenBoss' technical marketing adviser, Lewis Letchford, explains how new UK manufactured DIN rail enclosures are helping buyers beat supply chain issues

DIN rail enclosures often house crucial equipment in electrical and electronic assemblies, often comprising circuit breakers, switches and power management devices. The rail itself is a basic design, available in industry standard options with 35mm top hat being the most common and 15mm top hat being relatively rare and for small footprint applications. Other types are G and C rails.

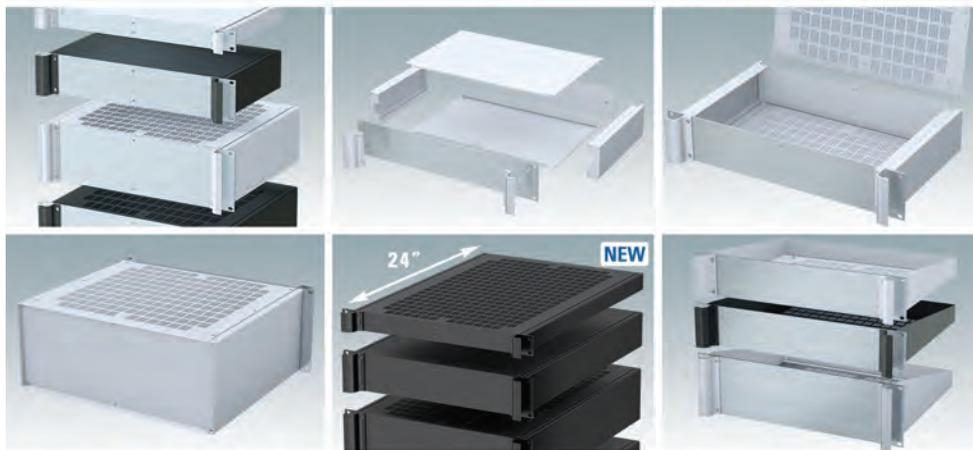
Different enclosure designs saturate the market. With this in mind, it is important manufacturers offer customers products that provide adequate housings that meet industry standards (such as flame retardancy) and features that aid assembly and maintenance.

CamdenBoss has been busy breathing new life into an old-time favourite: the CMEB, extendable DIN rail terminal enclosure. The enclosure is built up of the main housing body, eight pre-fitted saddle washer connectors with adjoining solder tags and two removable side panels. Customers can select from a variety of kits such as open top (with either a solid grey or clear lid) or solid top that provides a slight recess for keypad membranes or displays.

One of the main issues that the CMEB challenges is the separation of the internal space, allowing the enclosure to deal with different levels of supply voltage, in application. Various PCB positions available to an extended enclosure provide a way of separating mains or low/high voltage sides. Input wires can be fed through one side of the enclosure, with output wires fed out of the bottom. A single housing uses a planer PCB, →



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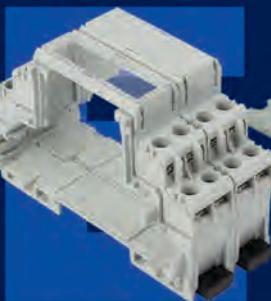
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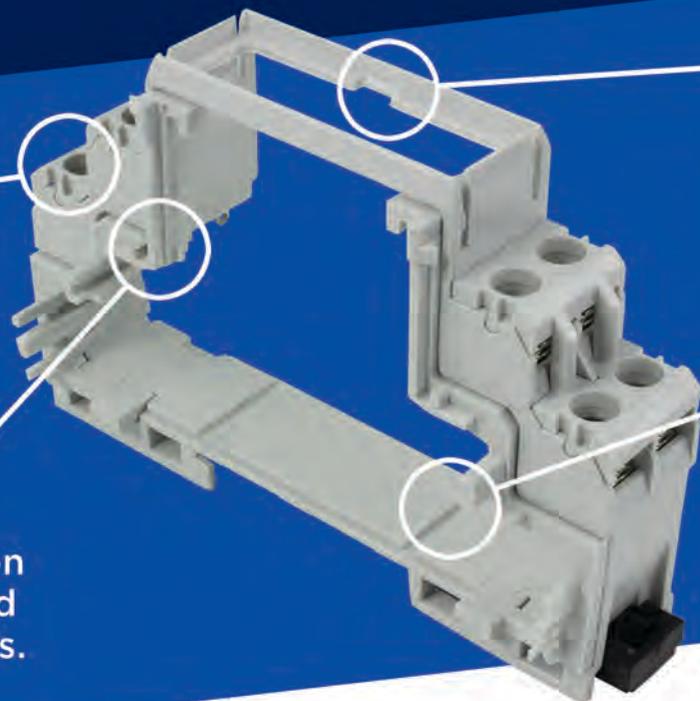
CONNECT. MODULAR. EXTEND. BUILD.

CONNECT.

Eight pre-fitted saddle washer terminals with adjoining solder tags.

EXTEND.

Use the extension arm to easily add multiple modules.



MODULAR.

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following the side profile of the internal face. An extended housing gains horizontal PCBs due to slots on the extension arms.

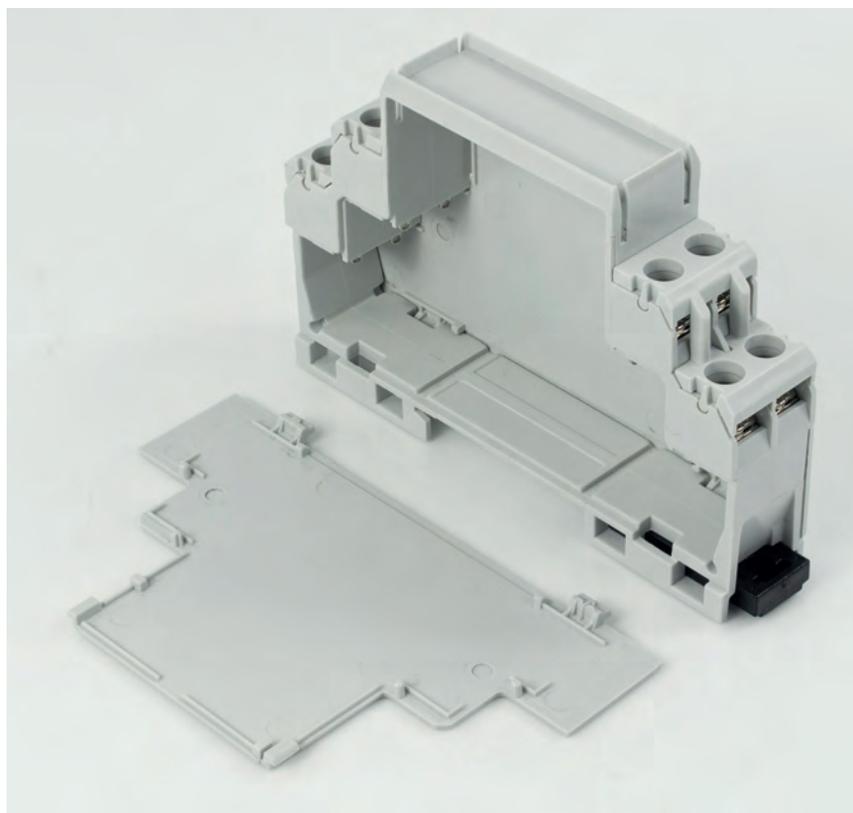
Historically, CMEBs operated using only one attachable side panel. The downside was difficulty accessing the internal space. This was improved by two detachable side panels (opening the enclosure fully) allowing for greater ease of assembly when placing and connecting up the PCB. The end panels are attached using a simple snap-fit, requiring no screws. This speeds up assembly time and eases maintenance.

DIN rail enclosures often connect many wires due to the nature of their applications. DIN rail electronics can be found in homes, offices and factories operating as power supply

equipment, switches, safety devices, relays and more, making them an integral part of industry and commerce. With this in mind, CamdenBoss looked to improve the CMEB's wiring capability, upsizing compatible wire size to a M3 screw with 7mm saddle washer. This improvement to the pre-fit connectors provides an electrical rating of 8A/250V.

Proudly manufactured in the UK, the CMEB joins CamdenBoss' list of UK made products, tackling the current global supply chain issues that many electronics manufacturers are facing. This lets CamdenBoss offer competitive pricing and lead times to trusted distributors, and for bulk orders, direct from its warehouse to the customers.

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Setting the standard for box build projects

Alpha 3 Manufacturing explores what essential services are required from a contract electronics manufacturing partner for a box assembly project

Box or cabinet assembly projects can be complex but a proficient contract electronics manufacturer should be able to provide the services to support their customers' teams from concept through to manufacturing and shipping.

As every project is different, any potential CEM partner should conduct an in-depth consultation with the customer following initial contact. Customers need to feel satisfied the CEM understands their business, challenges and the project's objectives. Only then will they be able to propose a tailored solution and quote.

Quality assurance: Confirming the CEM's accreditation certificates should always be high on the agenda. These quality accreditations are critical to ensuring products will be safe, high quality, consistent and traceable, thus mitigating future issues. Some standards are generally expected as a minimum regardless of the project (ISO9000 for example) which focuses on quality, repeatability and consistency in supply. For a control panel project, UL508A is the standard providing guidelines on issues including component selection, short circuit current rating (SCCR) and wiring methods.

In addition, sectors with more stringent requirements, such as healthcare or aviation, will hold their own directives which must be complied with.

It is wise for customers to research and check for any quality requirements relevant to their industry and application if not already aware.

Technical expertise: It's a good idea to ask the CEM what design support they offer. Even if a drawing exists, it will need to be assessed for manufacturability where changes may be needed for component availability, production feasibility or cost purposes. If a drawing isn't available, a dedicated engineer can work with the customer's team to develop a 3D CAD model. The CEM should also be proactive in making suggestions for improvement. For example, Alpha 3 Manufacturing's experienced engineers recently streamlined a pre-existing design, resulting in less wiring throughout the cabinet assemblies and therefore a significant cost saving.

Continuous improvement: A good CEM should be committed to a culture of continuous improvement, utilising the latest technology when it comes to design, production and final inspection.

Testing services: Typically, CEMs should include some level of testing, however, it is worth enquiring as to how comprehensive the testing is and whether it meets the product's requirements. At Alpha 3 Manufacturing, all assemblies are 100 per cent inspected and electrically tested as standard, with engineers often developing tests for specific requirements.

Multiple assembly processes: A range of assembly methods should be in place or available,

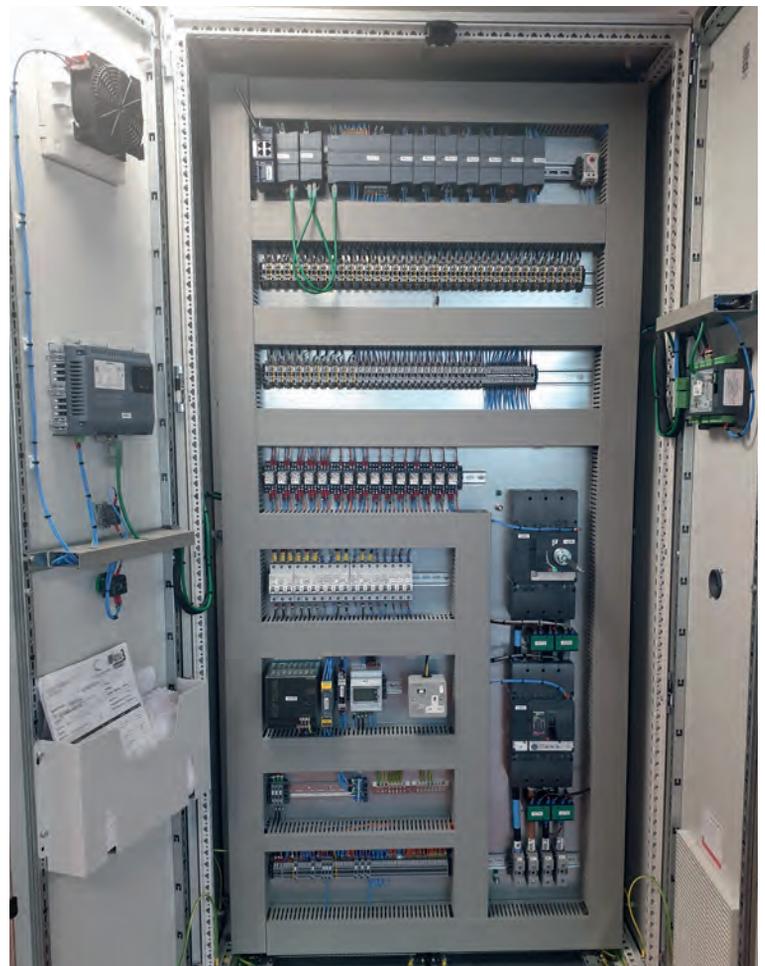
such as bench line and a cell focused on assembly. This offers flexibility for future increases in supply or complexity.

Some manufacturers will specialise in certain sectors, but most longstanding CEMs will be experienced in designing and producing box or cabinet assemblies for a range of industries and applications. Alpha 3 Manufacturing has worked across numerous sectors, providing a quality service with flexibility and tailored solutions to meet customers' criteria.

www.alpha3manufacturing.com



If a drawing isn't available, a dedicated engineer can work with the customer's team to develop a 3D CAD model

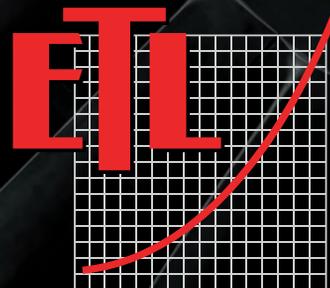


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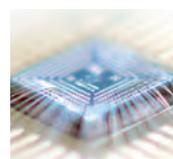
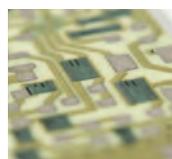
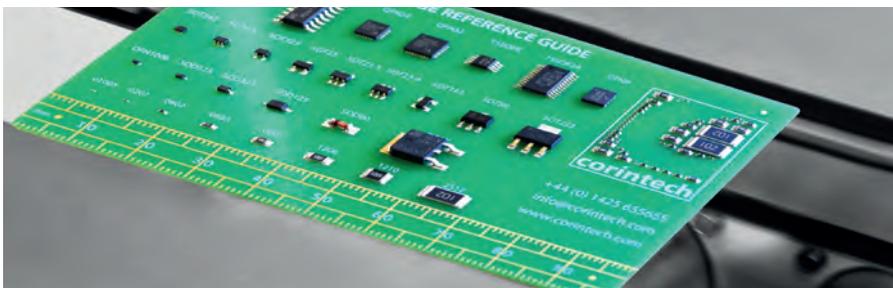
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Know-how gets products to market on time

Dynamic EMS' production manager, Gordon McAlpine, explains how know-how can help resolve manufacturing issues without forcing products through a redesign process

The most nerve-racking time for any company introducing a new product is when the first populated boards arrive from the EMS. The OEM has done everything correctly, tested at every stage and worked with the EMS to ensure the design is as manufacturable as possible.

However, there is still a chance of a failure leading to a redesign which is painful and expensive. Costs include more development time and the expense of missing the market. Early sales make up a disproportionate amount of a product's potential profit, especially if the product is seasonal or event driven. This hit is compounded if a competitor manages to get to market first and win sales. A delay of between nine to 12-months in introducing an electronic product has been estimated to cost up to 50 per cent of the product's anticipated revenues.

Working with a knowledgeable EMS can often provide a solution that minimises delays or even keeps the product launch on schedule, giving the OEM time to take more permanent steps to

rectify the design if required. That possibility depends on the type of fault and the degree of the EMS provider's expertise, as any changes require in-depth knowledge of the product's function and manufacturing processes to find possible remedies.

Repairing and reworking faulty designs originally took the shape of breaking copper tracks and adding wires. However, as boards became more complex, more thorough knowledge and expertise in a range of disciplines is required to put things right.

As an example, Dynamic EMS recently helped a customer quickly resolve a problem, allowing the customer to get to market without a redesign. The issue involved an SMD HDMI connector that used through-hole pins to aid placement and improve robustness. Both these techniques require different fabrication methods, which can lead to a build-up of tolerances.

The drill and artwork alignment tolerances compounded on some boards and when the connectors

were placed on the PCB, they twisted slightly causing a short. Dynamic EMS engineers adjusted the placement machine to accommodate the offset but the faults persisted, although the alignment appeared excellent. After more investigation, the company found some boards had nodules on one side of the hole that pushed the connector, again causing rotation. The situation was resolved after component placement was offset in the other direction.

Dynamic EMS has worked hard to bring knowledgeable personnel into the company, while encouraging staff to take advantage of training opportunities. This know-how lets the company work with customers to find solutions to manufacturing issues and offer help on a variety of other topics, such as advice on how to design and manufacture more environmentally friendly and sustainable solutions or helping with procurement and suggesting alternative products and suppliers in times of component shortages.

www.dynamic-ems.com



Dynamic EMS' production manager, **Gordon McAlpine**

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Who should be responsible for procurement?

Corintech encourages OEMs to carefully weigh the pros and cons when deciding whether to free-issue components or entrust the procurement process to their CEM

When outsourcing manufacturing, original equipment manufacturers (OEMs) must decide who will be responsible for supplying components. A contract electronics manufacturer (CEM) with an in-house procurement team can manage the process, sourcing components from their own suppliers and distributors. However, an OEM may opt to take on responsibility for purchasing and delivering components, known as free-issuing.

Many OEMs outsource manufacturing to simplify production processes, allowing reallocation of time and resources elsewhere within their business. By free issuing components, an OEM could be adding unnecessary complications they initially intended to simplify. When

free issuing components, the OEM is responsible for ensuring the CEM receives sufficient quantities on time and that the components are genuine and high-quality. CEMs with procurement experience can merge supply chain management seamlessly with their assembly line requirements, eliminating manufacturing disruptions and freeing the OEM of unnecessary logistics.

Costs also play a role. Free issuing materials could potentially save OEMs money. For example, purchasing directly from the supplier negates any mark-up so the OEM only pays the CEM to manufacture the product. OEMs may also have existing relationships with suppliers, helping them negotiate lower prices and obtain components which may be experiencing

supply issues. However, by maintaining strong, long-lasting relationships with global suppliers and purchasing in high volumes, a well-established CEM can likely source components at a lower cost than an OEM. Furthermore, the hidden logistical costs and challenges arising when free-issuing components may outweigh potential savings. The OEM is also responsible for the costs of storing and delivering components to the CEM, on-time and in-full. Delays or insufficient quantities can impact production and further increase OEM costs.

OEMs with existing longstanding relationships with trusted suppliers will have confidence in component quality and prefer to continue using these components to

maintain consistency. Conversely, OEMs may lack the experience and resources to quality control components in-house. This is where handing procurement responsibilities to a CEM can help. Experienced CEMs, especially those AS9100 or ISO9001 accredited, will have strict processes and criteria in place that govern their procurement, nullifying counterfeit risks.

Free issuing components offers advantages, especially for experienced OEMs. However, letting their CEM take full control of the procurement process can avoid complications, reduce overall costs and ensure assemblies are delivered on-time, in-full.

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Sustainable smart packaging



John Denslinger is a former executive VP Murata, president SyChip Wireless, and president/CEO ECIA, the industry's trade association. His career spans 40 years in electronics

John Denslinger reminds purchasing professionals that company-wide ESG mandates are directing an ever-brighter spotlight on sustainable packaging requirements

Sustainability • By John Denslinger

When it comes to sourcing materials, packaging might be last on the list of priorities. Often an after-thought, packaging is getting more attention lately driven by company-wide ESG mandates. Attention procurement: the era of sustainable packaging is here and it offers a number of challenging decisions.

More than ten years ago, the Sustainable Packaging Coalition (a www.GreenBlue.org industry working group) defined the criteria for sustainable packaging as follows:

- Is beneficial, safe, and healthy for individuals/communities throughout its life cycle
- Meets market needs for performance and cost
- Is sourced, manufactured, transported, and recycled using renewable energy
- Optimizes the use of renewables or recycled materials
- Is manufactured using clean production technologies minimizing waste and emissions
- Is made from material additives (inks, adhesives, resins) healthy throughout its life cycle
- Is physically designed to optimize materials and energy consumption
- Is effectively recovered and utilized again in closed loop systems

It would seem that list still applies today so choosing to be sustainable won't be easy or quick.

It should come as no surprise, e-commerce escalated consumer awareness and the push for sustainable packaging. For industry, e-commerce also highlighted product safety, counterfeiting, and last-mile delivery issues. As a result, the demand for better, cheaper and more environmentally friendly packaging is now an expectation shared by plastic and paper producers, packaging fabricators, the buying community and customers on the receiving end of packaged products.

Packaging material is part of the circular economy subject to 4Rs: reduce, recycle, re-use and re-think. In the words of

EPA: "The circular economy reduces material use, redesigns materials to be less resource intensive and recaptures 'waste' as a resource to manufacture new materials and products." As good as that sounds, recycling may produce some adverse consequences. One EPA study found unhealthy chemicals in recycled materials ranging from flame retardants, solvents, biocides, inks and dyes. Comprehensive sustainability must remedy these secondary contaminants as well.

Sustainability implies sourcing more eco-friendly materials. Plastic, especially fossil-based, is non grata nowadays. Microplastics, once considered eco-friendly, have entered our food chain and recently been found in human blood. Because of that, compostable and biodegradable replacements are gaining favor with consumers. Substitutes such as bamboo paper, stone paper, and plant-based cellulose alternatives like cotton, corn and hay eliminate the need to harvest millions of trees. In the past, packaging often combined dissimilar materials, but no longer. Mono-material design is now the baseline. Mixed, laminated and composite packaging is difficult to recycle and often ends up in landfills as waste.

Did you ever think of lowly packaging as a high-tech product? Sustainable packaging is going digital incorporating connectivity. Packaging is pervasive. It's a common commodity found everywhere and thus provides a tremendous opportunity for data mining. Digital integration features NFC sensors and RFID tags. NFC offers the interactive experience delivering product information, as well as a safe and secure authentication process. RFID, on the other hand, is better suited for asset management and tracking.

Implementing green strategies for sustainable packaging will take time. As with any newly sourced material, there is the lengthy discovery phase, concept development, design for manufacturing, prototyping, test and evaluation. Optimization may require several iterations given the rapid advancements in Smart technology. Proper environmental stewardship benefits everyone. Thank you, procurement, for your commitment to sustainability.

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Exploring contract manufacturing 'what ifs'

Pektron explains how the process of sourcing contract design and manufacturing services is influenced by the nature of a project

OEMs deciding to outsource their electronics manufacturing do so for many reasons and those reasons will directly influence the CEM they select.

Scenario 1: What if the OEM is looking for a straightforward build-to-print? Let's say they have a design and simply want it manufactured. In this case they will be looking at SMT manufacturing facilities and volumes. Does the CEM have the capability and capacity to deliver what is needed?

A word of warning though. Even the most apparently simple build-to-print projects can present issues around design or manufacture, so keep an open mind. Is the CEM expected to be proactive and highlight issues, offering opportunities to improve design and manufacture leading to reduced costs/timescales and improved quality/reliability? If so, this should be factored in.

Scenario 2: What if the OEM has a technical challenge, physical limitation or perhaps no design at all?

Some OEMs will outsource the entire design, letting the CEM write the initial specification. Others will have a specification which the CEM will work with. Either way, the OEM's engineers and designers will

be working closely with the CEM to discuss what needs to be achieved, agreeing roles/responsibilities and working closely as the design and development progresses. The OEM might also want to explore the CEM's experience in technical innovation, market sector expertise, production engineering capability, accreditations, enclosures, testing and validation facilities.

Scenario 3: What if the OEM needs to reduce costs and timescales? Outsourcing design and development can reduce costs and timings. Likewise, the OEM should explore the CEM's experience in managing their supply chain and working with suppliers to source components at competitive prices and within timescales.

Often, CEMs can reduce time-to-market via component lifecycle and availability analysis, which may lead to increased yields, reliability and cost efficiencies. Question how the CEM is coping in the current environment? How successful is it sourcing parts, finding alternatives and using the grey market?

Depending on the scenario weigh up the relative importance of a CEM's key attributes including:

- Quality standards and industry accreditations
- Facilities: SMT lines, assembly capabilities
- Technical support
- Design and development

- Testing and validation facilities
- Quantities/volume capabilities
- Flexibility and responsiveness
- Supply chain: Traceability and obsolescence management
- Account management, personal relationships and named contacts
- Areas of experience and expertise

While an online search will provide some information, it's more than a tick box exercise. It will always require a phone call or visit involving the OEM's design or engineering colleagues speaking with the CEM's counterparts.

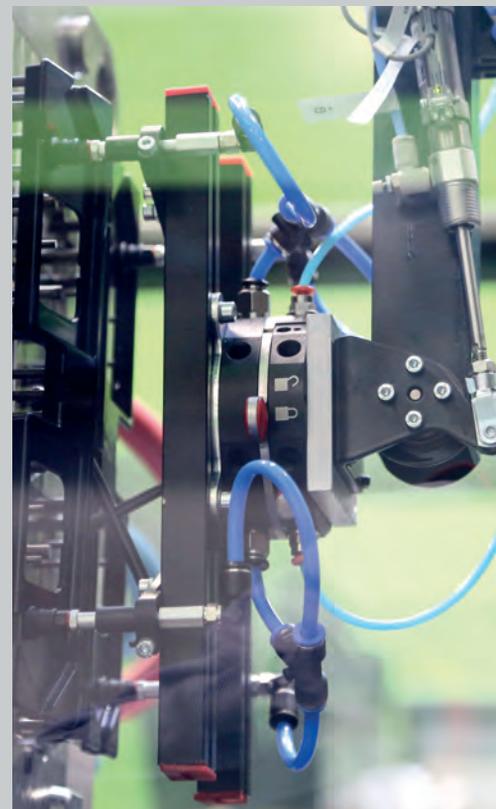
Working with a CEM is a long-term commitment, based on respect, trust and clear communication. People buy from people and strong relationships build success so meeting the people and understanding the business is important.

In addition, a CEM may be able to add value in atypical areas such as: investment (CEMs keep pace with the latest equipment); testing and validation (onsite facilities reduce timescales and costs); and injection moulding (developing the enclosure alongside the electronics can deliver time and cost benefits).

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Even the most apparently simple build-to-print projects can present issues around design or manufacture, so keep an open mind



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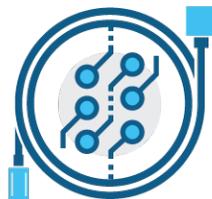


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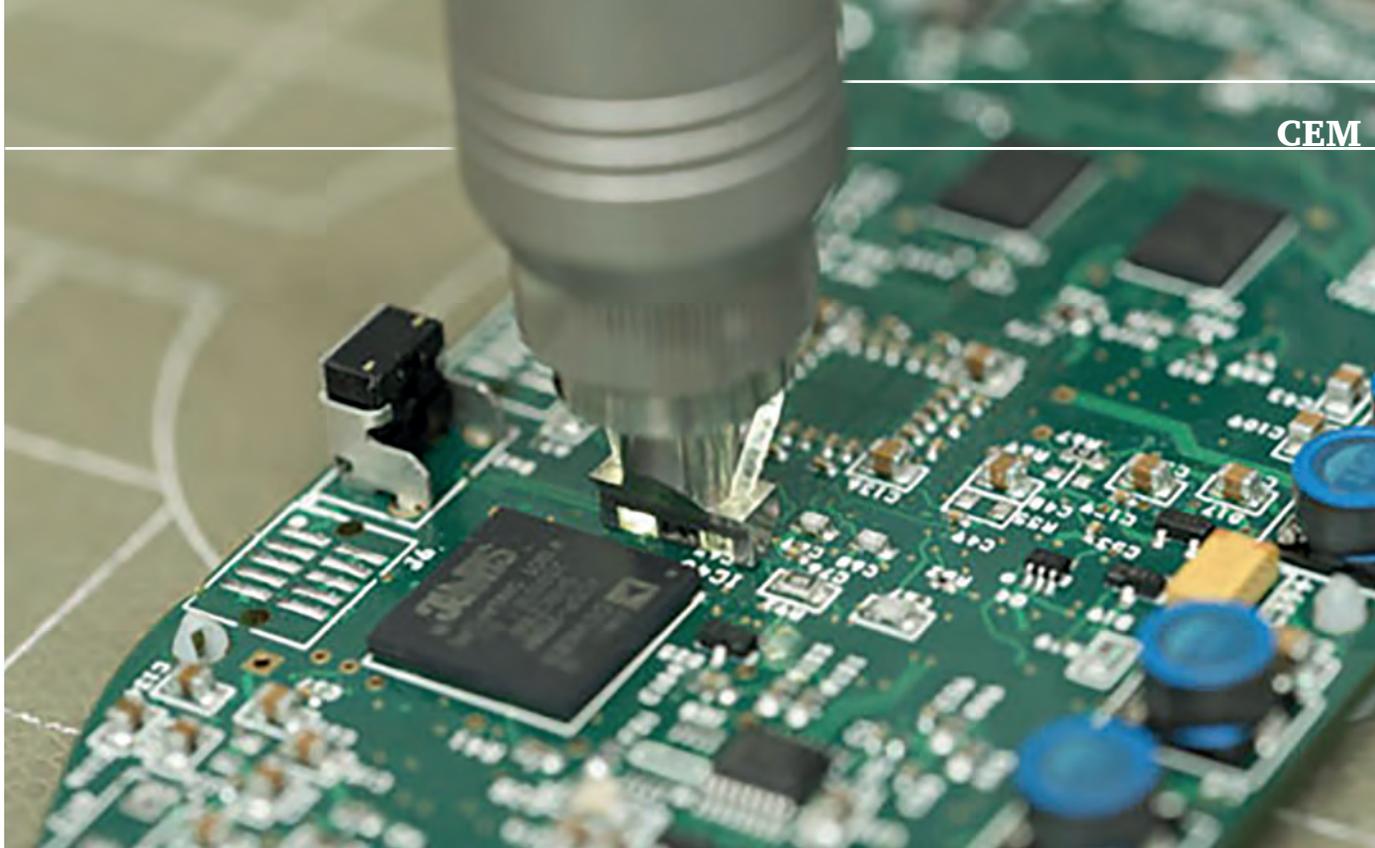
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In this article, Contract Production's senior marketing executive, Clarke Roberts, identifies eleven reshoring benefits, from cost savings to reduced environmental impact

Subcontract electronics is one of the most competitive industries, with hundreds of organisations across the world vying for business. When choosing a subcontract electronics partner, opting for an offshore manufacturer may seem attractive. Overseas firms often offer lower prices and larger production capacity. However, what appears too good to refuse is usually too good to be true.

The most important things to consider when choosing an electronics manufacturer are reliability and how invested they are in the work. Having spent time and money on a project, OEMs want whoever they work with to be as equally excited and enthusiastic. With this in mind, working with an electronics manufacturer halfway around the world doesn't immediately appear a recipe for success, often fostering an impersonal relationship via a computer screen. Also, working across multiple time zones and, in some cases languages, can affect working closely together, which is crucial to the development of a successful contractor-client relationship. Covid-19 has also disrupted international supply chains, impacting delivery reliability from overseas partners.

More and more British businesses are reshoring their electronics manufacturing



operations. Why, because it makes good sense and for a host of reasons. The following are 11 reasons why reshoring electronics manufacturing can supercharge production lines.

1) Closer communication: As mentioned, working with overseas partners can be a challenge. Language barriers and time zone difference can make developing an effective relationship tricky. By reshoring and choosing a UK-based partner, these challenges can be overcome.

2) See the work for yourself: Although travelling the world sounds rather appealing, having quick access to a manufacturing partner is a vital part of the relationship. Witnessing the work they're doing and seeing a project come to life provides confidence it's proceeding as planned.

3) Higher quality: This is a key selling point of reshored manufacturing. British manufacturing is renowned the world over and China often imports electronics solutions for particular applications.

4) Better cashflow: Offshore partners regularly insist on partial or full payment with order. With potential lead times of several months from order to fulfilment, cashflow

becomes important. Also, most overseas organisations complete transactions in US Dollars, likely leading to pricing fluctuations between order and fulfilment. Reshoring lets OEM's take advantage of operating in one local currency, providing peace of mind and full cashflow control.

5) Facility inspections: Offshore providers may offer expected quality levels but facility inspections are more difficult when they're thousands of miles away. It's essential for OEMs to protect their reputation by ensuring they are involved in an ethical production chain. Strict UK employment laws cover everything from workers' rights to anti-slavery. Overseas companies may not be subject to the same level of regulation.

6) One-stop solution: Electronics manufacturing often comprises more than just PCB assembly. Developing prototypes, testing board layouts and making changes to final designs all form part of the process. Reshoring allows more flexibility to choose a one-stop partner offering all these services, reducing costs and saving time.

7) Reduced delivery times: Even in today's hyper-

connected world, there's no escaping the enormous role geography plays in business. Reshoring means orders may be fulfilled quicker, reducing the time it takes to get a project from factory floor into customers' hands.

8) Reduced delivery costs: as above, the closer an OEM and its manufacturing partner are, the cheaper it will be to have things delivered.

9) Reduced carbon footprint: Shortening the distance goods have to travel also reduces the environmental impact, which should be a focus for every business. Also, it may be possible to reduce the amount of packaging or consider reusable packaging with a more local supplier.

10) Reduced supply chain risk: Local supply chains are often far simpler to work with and offer greater flexibility when external factors such as Covid, customs and international couriers cause disruption.

11) Lower minimum order requirements: Using local suppliers often means smaller orders are more practical, which lessens the level of commitment needed from the business.

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The most important things to consider when choosing an electronics manufacturer are reliability and how invested they are in the work

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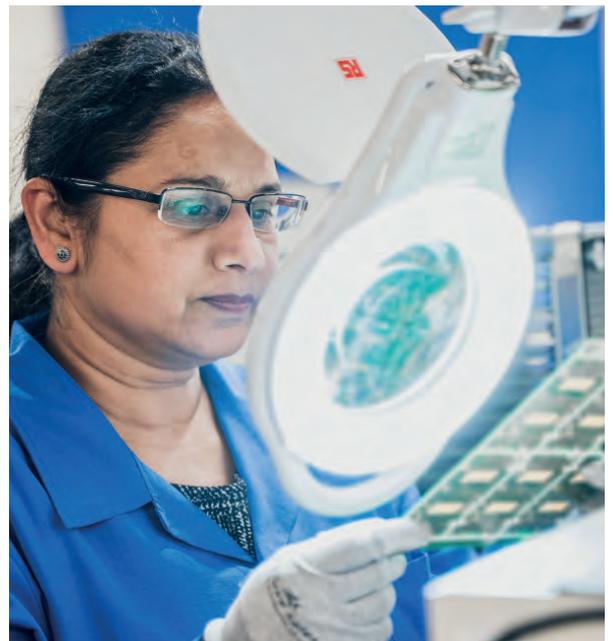
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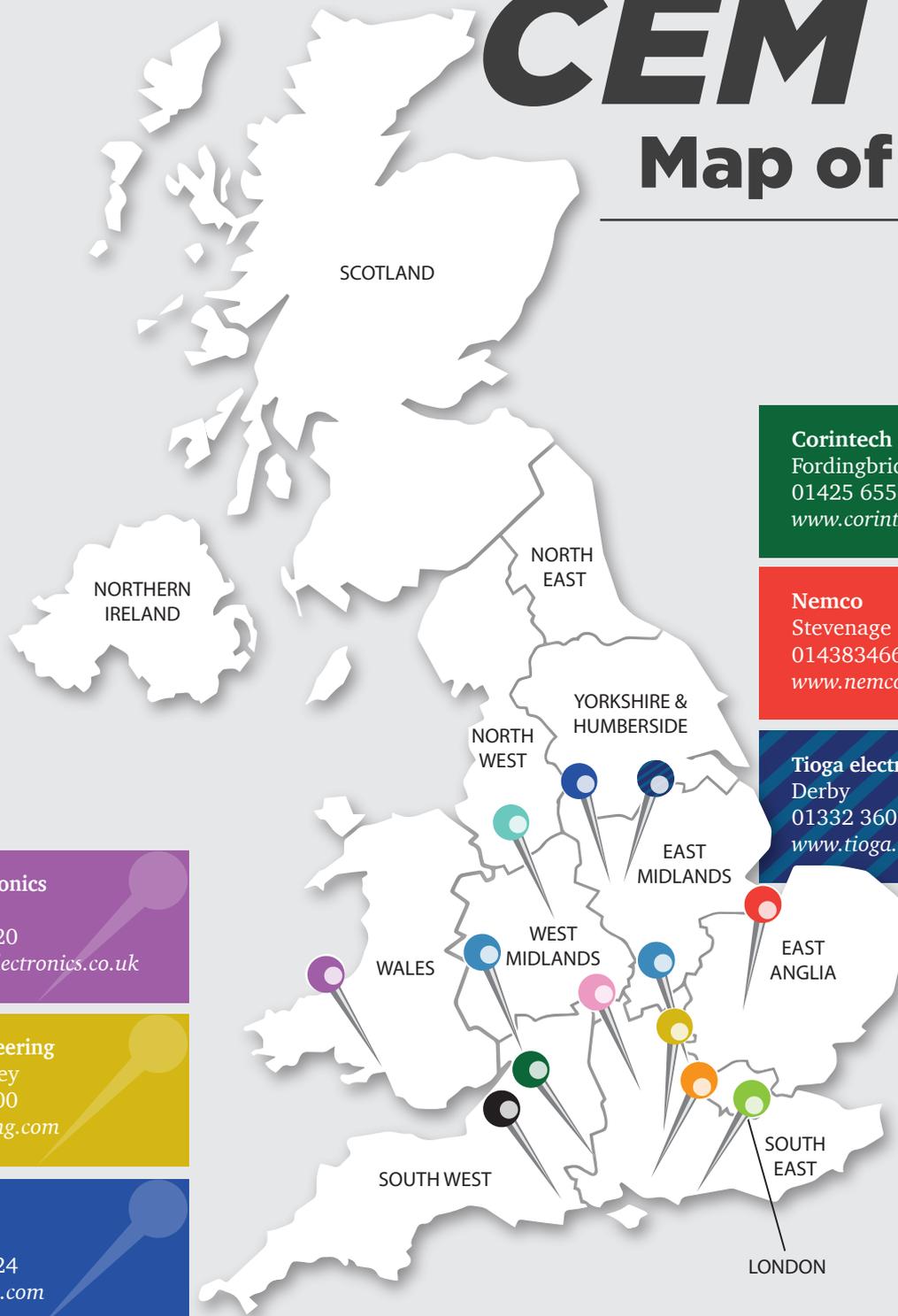
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Approved for medical use

Traco Power has announced its new TPP 300 series of 300W high-density AC/DC power supplies available in open frame or fan-enclosed packages for medical and industrial applications where long-term reliability is critical and space is limited.

Specifications include: efficiencies of 91 to 93 per cent; 360W peak load power up to 5s; 300W continuous power (forced air cooling); up to 180W continuous power (convection cooling); -40 to 85°C operating temperature range; reinforced I/O isolation 3,000VAC; and leakage current <100µA rated for BF applications.

Regarding approvals, the supplies boast: IEC/EN/ES 60601-1 (Class I & Class II) for 2xMOPP; IEC/EN/UL 62368-1 (Class I & Class II); and EMC to CE 60601-1-2 4th edition and EN55032 class B.

MTBF is >1 million hours (MIL-HDBK-217F, ground benign) and the products are supported by the company's five-year warranty.

tracopower.com

Reliability in demanding applications

Cosel has launched a new series of high isolation 6W DC/DC converters for medical, industrial and ICT applications. The MH6 series has a reinforced isolation of 3kVAC and 4.2kVDC. For medical applications, the series complies with the 2xMOOP (250VAC) (means of operator protection) isolation requirement, as specified in the IEC60601-1 3rd edition standard.

To reduce inventory, the series is available in three wide-input range voltages: 4.5 to 18V (covering 12V battery applications); 9 to 36V (combining 12V and 24V battery systems); and 18 to 76V (addressing 24V and 48V systems). The series is available in five single outputs 3.3, 5, 9, 12 and 15V and two dual outputs +/-12V and +/-15V.

Some medical equipment can be subject to vibrations so MH6 series pins are moulded in an epoxy holder, strengthening the connections between the application PCB and module, improving reliability in demanding applications.

www.coseurope.eu



Medical desktop power half the size

XP Power has released a new range of ultra-compact medical desktop power supplies as space-saving fan-less solutions in home healthcare and hospital applications. Power densities are up to 11W/in³. The company states that compared to existing solutions they reduce space requirements by 50 per cent, thus doubling the power density. By using a compact external power supply, the size and weight of end equipment is reduced, offering more convenient, portable solutions.

The AQM series offers 200, 250 and 300W power levels to address a variety of medical applications. All units operate from universal mains input (85 to 264VAC). The AQM250 offers single outputs of 12, 19, 24 and 48V, with the AQM200 and AQM300 additionally offering a 15V output.

AQM power supplies are certified to international safety and EMI approvals, including EN/IEC60601-1, EN61000 and EN55032. The units comply with 4th Edition Medical EMC requirements and offer 2 x MOPP protection.

xppower.com



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Night vision for aerospace applications

Data Modul is expanding its display portfolio with new 11.6in HD and 10.4in XGA night vision displays suited to aerospace applications.

Data Modul's head of product management USA, Kirk Frederick, said: "With the new 11.6in full HD night vision display, we offer for the first time a display in our portfolio that is perfectly suited for night vision. This display is unique in the market due to its FHD resolution and high contrast values and thus clearly stands out from other NVIS models.

"In accordance with the MIL-STD-3009 standard, the display meets all requirements for the emission properties of lighting and display devices in aircraft, which are necessary for operation at night. Thanks to dual mode backlighting and a luminance of 1500cd/m², the display can be used not only in dark but also in extremely bright environments."

Specifications include -40 to 85°C operating temperature range, 1,300:1 contrast ratio and 70k hours backlight lifetime.

www.data-modul.com



Intelligent functions, soundbars and more

Display Technology has added the Plus Line and Eco Line 4K, 3840 by 2160px screens to its portfolio. The Plus Line combines UHD displays and a modular monitor series which is adaptable and suits 24/7 operation. Sizes are 55 and 65in.

Standard open frame monitors come in a powder-coated, black steel housing. The P4K version features an industrial 4K TFT controller, while the IQi5 version is a complete panel PC with the new Intel Core i5-1145G7E processor. Options include: open frame, true flat glass and PCAP touchscreen.

The Eco Line offers preconfigured intelligent monitor solutions with an Android operating system for wireless or remote management. Content can also be displayed via smartphone. Sizes are 43 to 86in in a slim, lightweight design.

www.displaytechnology.co.uk



Engineered for industry

Review Display Systems has announced a range of industrial 10.1in TFT display modules for industrial applications. Features include SVGA, WSVGA and WXGA resolution, plus 4:3 and widescreen 16:9 aspect ratios.

In-plane switching underpins optical performance, viewing angles and colour reproduction. Brightness ranges from 300 to 1,000cd/m², supported by long life LED backlights. An extended operating temperature range of -30 to 85°C is available.

RDS' display business manager, Justin Coleman, said: "The product range

enables engineers to enhance, upgrade and add new features to their products without the need to redesign their mechanical fixtures and fittings, or change the electronics driving the display."

Data interfaces include 24-bit RGB, 6-bit and 8-bit LVDS and MIPI which support up to a 16.7 million colour palette. Interconnect options include ZIF and FFC.

Resistive and multi-touch projected capacitive touch screen options are available.

www.review-displays.com



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Constant performance and uniform spectrum

Beck Elektronik has added RGBW dynamic tuneable COB modules to its Luminus portfolio. The CTM-9-RGBW-12-TW01 and CTM-14-RGBW-24-TW01 modules feature two different sized light emitting surfaces of 9.5 and 14.5mm. They comprise 1616 LEDs in blue and warm white, plus phosphor-converted red and green on a metal PCB, driven with four channels. Constant performance and uniform spectrum over wide temperature and current ranges is achieved by using the same blue InGaN chip for all LEDs. The modules suit indoor and outdoor applications.

Also, the Luminus MP-1616 is available as a single component. Besides the white coloured LED the variants in blue and phosphor-converted green and red are new to the product family. The 135deg beam angle and 1.6 by 1.6mm size allows use in diverse applications.

www.beck-elektronik.de



Easy read indoor and out

GTK UK has launched a new 5.0in transfective IPS TFT display. Under dim or dark ambient situations, backlight is transmitted through the transfective layer, lighting the display. In bright ambient conditions the TFT acts as a reflective display, enhancing image and improving contrast.

GTK's business manager for displays, Clive Dickinson, said: "In daylight hours the display operates in reflective mode using natural light and this minimises power usage. At night, the display switches to transmissive mode, using the backlight to illuminate the display. A practical example of this would be an outdoor parking meter display being easily readable in daylight and at night an IR sensor triggering the backlight when a user approaches the meter.

"The advantage of this technology is that the reduced power usage can extend the life of the product by between three to five-years, which is significant for OEMs and this needs to be considered when calculating the full lifetime cost of the finished product. Other applications for this technology include handheld meters, kiosk displays, EV chargers, marine electronics and outdoor digital displays."

www.gtk.co.uk

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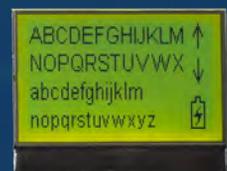
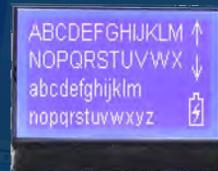
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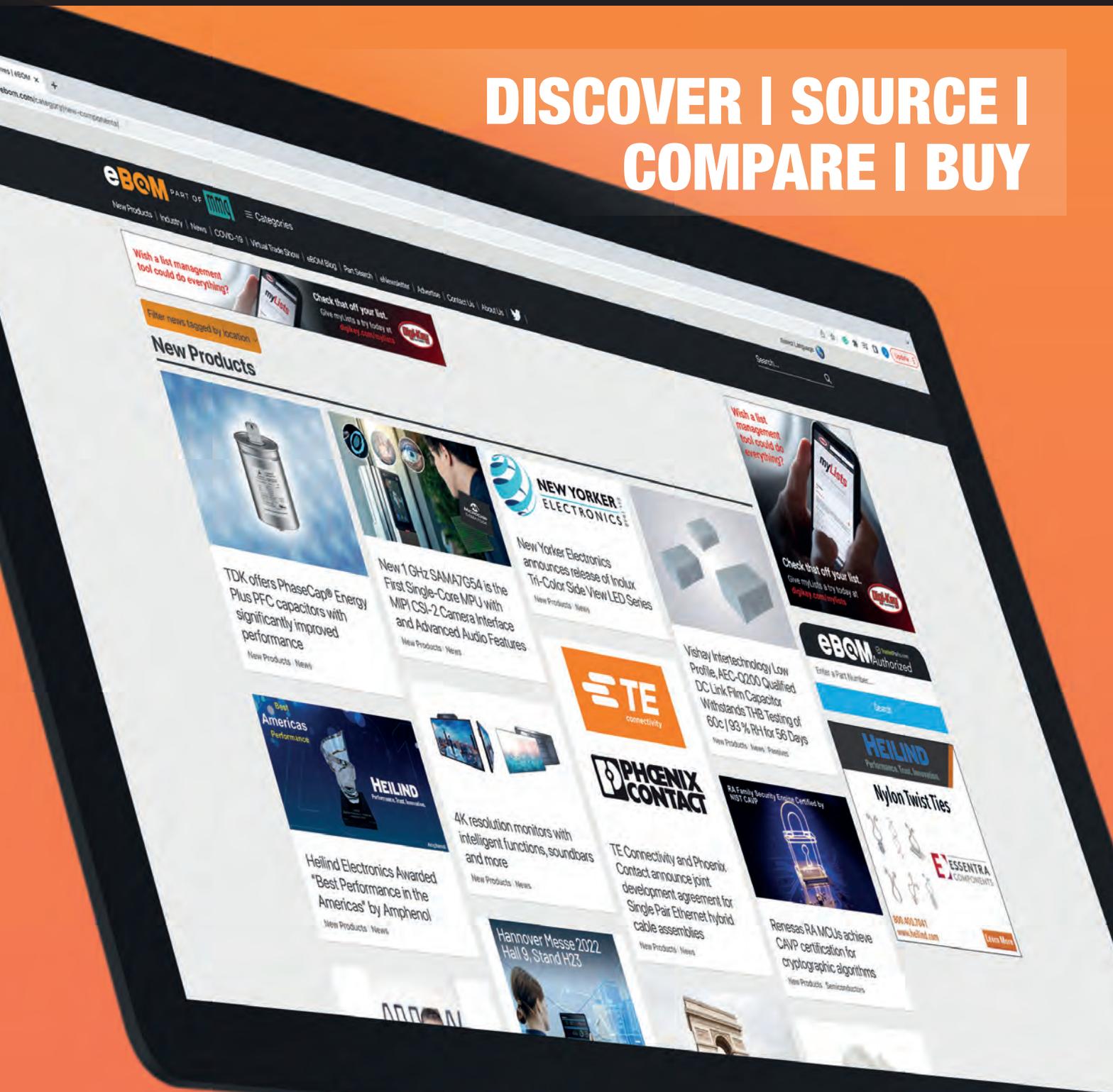


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Market Update from Digi-Key Electronics

by Dave Doherty, president, Digi-Key Electronics

2022 is well on its way to being another strong year for the electronic distribution industry, despite tight supply from component manufacturers and continued supply chain disruptions. We wrapped up 2021 growing faster than Digi-Key has ever grown in its history, with a 65% revenue growth rate. Through the first half of 2022, bookings were up more than 25% over last year, as was quote activity, shipments going out the door and customers searching the website. Digi-Key was just as busy, if not busier, than last year.

Observations and predictions

Customer demand remains extremely strong across all industries and verticals, and Digi-Key expects that to continue throughout this year and into 2023 as customers catch up, and perhaps build safety stock. Lead times from suppliers are gradually improving and inventory levels are beginning to stabilize, but acquiring certain components continues to be a challenge, with many semiconductor lead times stagnating at 40+ weeks. However, Digi-Key has received more product to date in 2022 than it has ever received during a similar time period in the history of the company, so we continue to make meaningful progress on increasing inventory.

Addressing challenges

There is growing uncertainty and concern regarding the general economy and how it may be affected by higher interest rates and other factors. The good news is that Digi-Key has maintained a long-term perspective and prioritized its core strategies to support high service levels throughout industry cycles. In some cases, Digi-Key has placed orders out to late 2023 to ensure inventory will

be available to meet customer requirements. We also connect with supplier partners to receive automated, real-time shipping updates, which allows Digi-Key to provide the latest information to customers. Digi-Key is fortunate to have suppliers who understand the importance of getting products to its customers, and the company is committed to expediting products from suppliers as quickly as possible and to providing suppliers with accurate forecasts. Digi-Key is also dedicated to keeping both on-site and remote employees safe and healthy.

To further enable customers to improve efficiency, Digi-Key recently combined several digital tools into one seamless experience with myLists. The consolidated list management system allows users to determine stock availability and lead times, perform attrition calculations to plan for lost or damaged components during manufacturing, create quotes to secure pricing for 30 days and share lists with others in their organization.

Coming soon: PDCe grand opening

This year, Digi-Key is opening the doors to its brand-new, 204,400 square meter Product Distribution Centre expansion (PDCe), which will dramatically increase the amount of space the company has to store existing product and add new ones. Increased automation within the PDCe will decrease turnaround time and boost same-day order fulfillment to customers, while also improving quality, increasing capacity and enhancing efficiency.

We look forward to welcoming suppliers and customers to visit and celebrate together the continued growth of our entire industry.





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ECS review

A cacophony of problem solving conversations



"Generally, I met two types of people at ECS. Firstly, procurement teams struggling to find components. I felt for them as it was obviously causing stress just by having a shortage of what could be simple parts. Secondly, design engineers were getting ideas to solve their current design problems. These people have been stuck at home for two-years searching for solutions on the internet. Yet hours of screen time seem to have not replaced hands-on samples and face-to-face discussions."

Powell Electronics' European applications manager, Robert Webber

"The big discussion on the EDAC and MH Connectors' stand was where IoT could take us and where connectors fit into the picture. IoT is the industry's hottest buzzword, so we took time with visitors to discuss what this could mean for the future of electronics. IoT relies on sensors and data speed to deliver machine-to-machine communication, all of which need reliable connectors. edacJAX or MH RJ45s will be crucial for data transfer, and where environmental factors need to be considered."

EDAC Europe's marketing manager Rebecca Redden



"From European Circuits' point of view, visitors we spoke to were specifically looking for PCB manufacture and assembly, several of which were looking to return to sourcing in the UK rather than the Far East. Questions visitors asked were mainly about our capabilities and delivery times."

European Circuits' sales manager, Philip Briscoe



"Micronel had lots of interest regarding supply chain and energy use. Visitors told horror stories of lead times ranging from 50 to 90-weeks. Many requests were for form-fit-function DC fan alternatives with better availability from Micronel UK's stocked ranges. We also had good interest in our low energy rugged blowers as possible low energy alternatives to compressed air and side channel blowers. Micronel blowers are typically under 200W and can pay for themselves in energy savings alone within a few months."
Micronel UK's MD, John Roe



"The Electronic Component Show's central location and exhibitor line-up meant good visitor numbers for Harwin. The team were busy throughout the day talking to established and potential new customers. Discussions involved new designs as much as they did the supply into existing projects. It was very encouraging to see OEMs send both their design engineering and purchasing teams to the show, giving us the opportunity to talk about projects at all stages of their development cycle."
Harwin's business development manager, Andy Brayford

"A recurring question from visitors at ECS was regarding supply chain issues, extended delivery lead-times and price increases. Although all customer's requirements are different, we have certainly noticed an increased willingness from them to accept alternative components or make design modifications to address these problems. As Phoenix Dynamics is an independent company, we have the flexibility to shop around for the best solution and our engineers can assist customers with their cable assembly designs to minimise the impact of these issues."
Phoenix Dynamics' commercial director, Carl Kirk

"As well as asking about the manufacturing services we can offer, there was particular interest amongst attendees in the techniques customers are using to counter the current lack of component supply. We offered advice, based on solutions some of our customers have implemented. We also highlighted how building a partnership, where we are an extension to their business (rather than treating a job as simply another invoice) provides the additional flexibility needed to pull through tough market conditions."
FermionX' commercial director, Will Patrick



"ECS was a fantastic chance to connect with design and procurement people. We distribute industrial memory products and had great conversations, especially around life expectancy of various forms of memory. One customer was concerned about the perceived short number of read/write cycles on a microSD card. We have memory to suit heavy industrial use so we were able to provide a solution. That's the beauty of talking face-to-face, people are able to chat through every issue."
Nexus Industrial Memory's, UK Sales Engineer, Keith Twigg



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
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Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,000	N/A	0 €	N/A	50	2,500+	Y
FTDI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	50	N/A	0 €	N/A	50	2,500+	Y
Harwin	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,550	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
CIRCUIT PROTECTION											
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,800	N/A	0 €	N/A	50	2,500+	Y
EPCOS/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
ENCLOSURES											
Bud Industries	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,600	N/A	0 €	N/A	50	2,500+	Y
Hammond	Switch Electronics	01482 862255	switchelectronics.co.uk	Y	500	N/A	£0	70%	2	6	Y
Hammond	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,350	N/A	0 €	N/A	50	2,500+	Y
Metcase Enclosures	OKW Enclosures	01489 583858	www.metcase.co.uk	N	288	£40,000	£0	N/A	5	22	Y
New Age Enclosures	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
OKW Enclosures Ltd	OKW Enclosures	01489 583858	www.okw.co.uk	N	1,955	£40,000	£0	N/A	5	22	Y
Rolec Enclosures	OKW Enclosures	01489 583858	www.rolec-enclosures.co.uk	Y	935	£40,000	£0	N/A	5	22	Y
Teko Enclosures	OKW Enclosures	01489 583858	www.teko.co.uk	Y	1,860	£40,000	£0	N/A	5	22	Y
FREQUENCY MANAGEMENT											
ABRACON	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,750	N/A	0 €	N/A	50	2,500+	Y
Analogue Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
ECS	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,050	N/A	0 €	N/A	50	2,500+	Y
Epson	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	900	N/A	0 €	N/A	50	2,500+	Y
Golledge Electronics Ltd	Golledge Electronics Ltd	01460 256 100	www.golledge.com	N	N/A	£800,000	£0	100%	12	24	Y

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IQD Frequency Products	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,500	N/A	0 €	N/A	50	2,500+	Y
Jauch Quartz	Digi-Key Electronics	0800 587 0991	www.digikey.co.uk	Y	500	£250,000	0	100%	15	130	Y
Kyocera	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	950	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
TXC Corporation	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
HEATSINKS											
Aavid	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
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Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18,700	N/A	0 €	N/A	50	2,500+	Y
	Avant Electronics LTD	01449 774247	www.avantelectronics.co.uk	N	5000	N/A	£100	N/A	2	10	Y
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Cirrus Logic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
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Infineon	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	8,300	N/A	0 €	N/A	50	2,500+	Y
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Power Integrations	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	750	N/A	0 €	N/A	50	2,500+	Y
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Semtech	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	350	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
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Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	39,050	N/A	0 €	N/A	50	2,500+	Y
Toshiba	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,050	N/A	0 €	N/A	50	2,500+	Y
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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
Wurth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,650	N/A	0 €	N/A	50	2,500+	Y

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
OBSOLESCENCE / HARD TO FIND											
	Cyclops Electronics	01904 415 415	www.cyclops-electronics.com	N/A	177,232	£12m	£100	75%	3	78	Y
Rochester Electronics	Rochester Electronics	+44.1480.408400	www.rocelec.com	Y	299	N/A	\$250	N/A	10	400+	Y
OPTO ELECTRONICS											
Broadcom Limited	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,300	N/A	0 €	N/A	50	2,500+	Y
Cree, Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,800	N/A	0 €	N/A	50	2,500+	Y
Intel	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	20	N/A	0 €	N/A	50	2,500+	Y
Osram Opto Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,300	N/A	0 €	N/A	50	2,500+	Y
Toshiba	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	450	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y
PASSIVES											
AVX	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	17850	N/A	0 €	N/A	50	2,500+	Y
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	15,100	N/A	0 €	N/A	50	2,500+	Y
Coilcraft	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,750	N/A	0 €	N/A	50	2,500+	Y
EPCOS / TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,450	N/A	0 €	N/A	50	2,500+	Y
KEMET	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	23,650	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18,700	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	43,850	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,750	N/A	0 €	N/A	50	2,500+	Y
Yageo	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	21,450	N/A	0 €	N/A	50	2,500+	Y
PASSIVES ALTERNATIVES											
BEC Distribution Ltd		01844 275824	www.bec.co.uk		5,000	N/A	£0	100%	3	5	Y
POWER & BATTERIES											
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	1,500	N/A	0 €	N/A	50	2,500+	Y
RECOM	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,150	N/A	0 €	N/A	50	2,500+	Y
TDK-Lambda	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,900	N/A	0 €	N/A	50	2,500+	Y
TRACO Power	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,000	N/A	0 €	N/A	50	2,500+	Y
Vicor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,300	N/A	0 €	N/A	50	2,500+	Y
XP Power	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
SENSORS											
ams	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	300	N/A	0 €	N/A	50	2,500+	Y
Bosch	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25	N/A	0 €	N/A	50	2,500+	Y
Honeywell	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
Maxim Integrated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	350	N/A	0 €	N/A	50	2,500+	Y
NXP	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	300	N/A	0 €	N/A	50	2,500+	Y
Sensirion	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	80	N/A	0 €	N/A	50	2,500+	Y
STMicroelectronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	75	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	650	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	850	N/A	0 €	N/A	50	2,500+	Y
SWITCHES & KEYBOARDS											
Apem	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,850	N/A	0 €	N/A	50	2,500+	Y
C&K Switches	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,550	N/A	0 €	N/A	50	2,500+	Y
E-Switch	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y
EAO	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,800	N/A	0 €	N/A	50	2,500+	Y
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

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
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	BCA 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	£12.5m	UK & Far East	72	10	AS9100, ISO9001, IPC-A-610 Class 3, J-STD-001	Y	Y	Y	Y	Y	Y
Custom Interconnect Ltd	01264 321321	www.cil-uk.co.uk	£18.6m	Andover (Hampshire)	130	6	AS9100 ISO13485 ISO9001 IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y
Electronic Technicians Ltd	01202 897722	www.etluk.co.uk	£3.7m	SE	50	2	AS9100, ISO9001, ISO14001, IPC610/620 Class 3	Y	Y	Y	Y	Y	Y
Esprit Electronics Ltd	02380 455411	www.espritelectronics.com	£11m	Hampshire	80	4	ISO9001:2008, IPC610 to Class 3	Y	Y	Y	Y	Y	Y
FermionX Ltd	+44(0)1903 524600	www.fermionx.com	£5m	Worthing, W. Sussex	40	4	ISO9001:2015, ISO14001:2015, IPC 610 A Class 2 & 3	Y	Y	Y	Y	Y	Y
G&B Electronic Designs Ltd	01420 474188	www.gandbelectronics.co.uk	£4.6m	Hampshire	60	2	ISO9001, ISO13485, IPC-A-610, IPC-I-STD-001, IPC 7711/7721	Y	Y	Y	N	Y	N
Hallmark Electronics Ltd	01782 562255	www.hallmarkelectronics.com	£2.4m	Staffordshire	26	2	ISO9000/UL, IPC610/D	Y	Y	Y	Y	Y	Y
Icon Electronics Limited	01423 449080	www.iconelectronics.co.uk	£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	Flexi / Flexi-Rigid	Obsolescence Solutions	Modifications	Prototyping
ABL Circuits Ltd	01462 894312	www.ablcircuits.co.uk	M	SE	ISO9000: 2015	SML	Y	4-10	Y	N/A	N/A	Y	Y	Y	Y
Cambridge Circuit Company Ltd	01223 423100	www.cambridge-circuit.co.uk	M	SE	ISO9001:2015, UL, ISO 14001:2015	SML	Y	4-16	Y	N/A	N/A	Y	Y	Y	Y
DK-Daleba Printed Circuit Boards	01992 510000	www.dk-daleba.co.uk	M	UK, Europe, Asia	ISO 9001:2015, UL, TS16949, IOSCAR	SML	Y	4-58	Y	Y	Y	Y	Y	Y	Y
GSPK Circuits Ltd	+44 (0)1423 798 740	www.gspkcircuits.ltd.uk	M/R	UK, Europe, Asia	ISO 9001:2015, IATF 16949:2016, EN (AS) 9100, Joscar	SML	Y	4-34	Y	Y	Y	Y	Y	Y	Y
Tate Circuit Industries Ltd	01543 622 435	www.tatecircuits.com	M/B	UK/China	ISO 9001:2015, UL	SML	Y	4-20	Y	N/A	N/A	Y	Y	Y	Y

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