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## On the cover – February 2022

Obsolescence: distribution to the rescue

# Editor's Word



### Shows: back with a vengeance

There was a point over the last two years where I was genuinely worried about the future of face-to-face exhibitions. Legal restrictions essentially banned shows and the tech sector moved in with virtual alternatives. This created a potential tipping point. To my joy it tipped back in favour of live events.

I never frame different media as better or worse than any other. They are just more or less aligned with a message, audience and expected outcome. For example, magazines offer a curated, laser-like focus to specific subjects, delivered to a reader's desk. Conversely, websites provide a deep and wide pool of information that visitors can wade through. Face-to-face shows offer something different again.

Step onto any stand and the product manager acts as a very efficient 'search engine', listening to your questions and literally handing you a potential solution to pore over. However, having attended many shows a year, for over 35-years, I have decided that the premium benefit of a show is tapping into the experience and knowledge of the person you are talking to in an environment actually designed to foster problem solving, collaboration and partnerships.

So, it is with great fanfare that this issue of *Electronics Sourcing* is previewing two shows: *Southern Manufacturing and Electronics 2022* (page 20) and the inaugural *Electronic Component Show* (page 34), a new event designed and managed by the *Electronics Sourcing* team.

I hope to see you on the *Electronics Sourcing* stand at both events and trust you will be ready and raring to mine the minds of the experts you meet.

*Jon Barrett*

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## Supporting interconnect design and purchasing

Lane Electronics has been appointed as a franchised distributor for Lemo connection solutions which are found in applications including motorsport, defence, medical, industrial control, test/measurement, audio-visual and telecommunications.

Lane Electronics' sales director, Nick Wheeler, said: "Lemo connectors strengthen our product portfolio allowing us to offer their products to our customer base, especially in the UK motorsport and defence markets. We will be adding our usual benefits of high levels of customer service, technical support and a dedicated stock profile to make this great product range even easier to access and use."

Lane Electronics will initially focus on M and F series circular connectors. M series connectors suit harsh environments and feature a ratchet screw



system with multiple alignment keys enabling quick and secure coupling. F series products offer compact self-latching multipole connectors, with multiple alignment keys and are suitable for harsh environment.

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



## I/O sensor in stock

Mouser is stocking the Sentrius BT610 I/O sensor from Laird Connectivity. The Bluetooth 5 sensor platform turns wired sensors into IP67-rated, battery-operated wireless nodes that provide robust and secure messaging in applications such as cold chain, HVAC monitoring, single/three-phase induction motor AC current sensing or tank level monitoring.

The sensor is powered by Laird Connectivity's BL654 Bluetooth module, delivering full Bluetooth 5 capabilities, including LE Coded PHY. The BT610 supports virtually any industry-standard external sensor through a range of interface options, such as general-purpose analog inputs, digital input/output to I<sup>2</sup>C, SPI and UART or in combination with a sensor cable assembly.

Configuration lets users read and report sensor data into the cloud and configure alarm events through the associated Android or iOS mobile app. The BT610 is certified for FCC, ISED, EU, RCM, MIC and is Bluetooth SIG listed.

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

## Expanding PCB protection range

Farnell has expanded its PCB protection range with products from Dow, Ambersil, Robnor Resinlab, MG Chemicals, Electrolube CHT and Farnell's private label brand Multicomp Pro. The in-stock range includes flexible silicone, rugged epoxy resin and conformal coating.

One example is MG Chemicals' 832HD potting compound. Solvent free and featuring a low mixed viscosity, the compound is designed to penetrate small gaps and cavities while providing electrical insulation. It protects components from static discharge, vibration, abrasion, thermal shock, environmental humidity, salt water, fungus, and other harsh chemicals.

Offering a wide service temperature of -40 to 150°C, it is said to be simple to mix while offering high compressive/tensile strength with excellent adhesion properties.

Another example is Electrolube's UR5041RP250G polyurethane resin. This two-part, high performance resin system is engineered to provide resistance to sea water and low water absorption, making it ideal for marine environments. It offers good physical protection with strong tear and oxidation resistance, as well as low temperature performance down to -60°C.

[www.element14.com](http://www.element14.com)



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# Semiconductor industry M&As are here to stay

David Stein is vice president of global supplier management for Digi-Key Electronics. Digi-Key is both the leader and continuous innovator in the high service distribution of electronic components and automation products worldwide, providing more than 10.7 million components from over 2,200 quality name-brand manufacturers.

**M**ergers and acquisitions have been prevalent in the semiconductor industry for the past two decades and have substantially increased in the last seven years or so, creating significant consolidation in the industry. These mergers and consolidations are major, multi-billion dollar deals that are streamlining the future of the semiconductor industry, and it's no wonder why: in 2021, semiconductor sales were expected to reach \$527.2 billion USD globally, according to Statista.

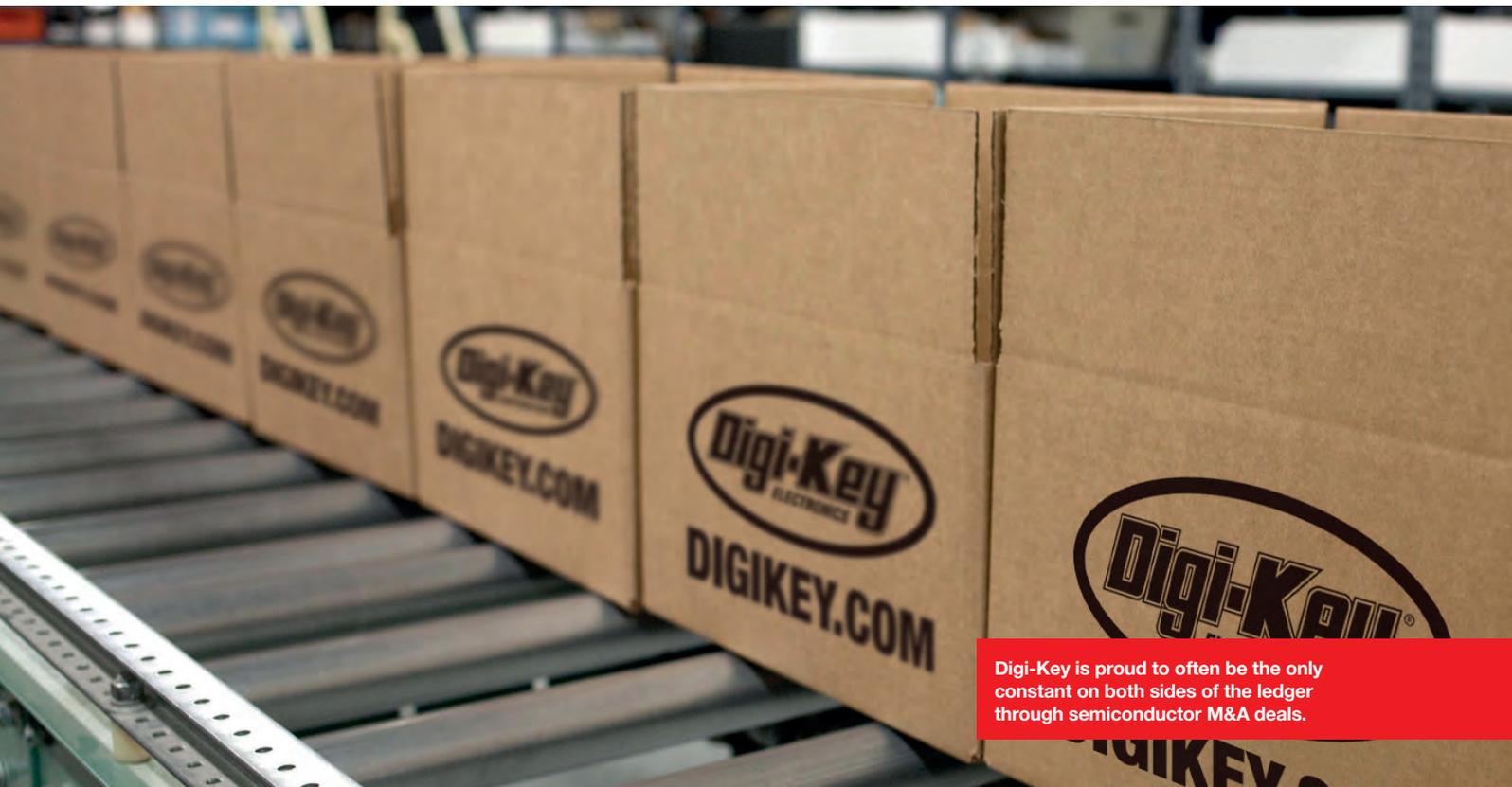
We expect these types of deals to continue for many reasons – technology continues to evolve, interest rates are low, and market caps and buyers' stock prices are high, which allow for easier stock deals and borrowing money. There are also a variety of new markets on the rise, including 5G, artificial intelligence, machine learning, automotive, electric vehicles and IoT sensors, creating many new uses for semiconductors. Acquisitions are an efficient way to fill out a supplier's product mix and provide end customers a robust solution offering.

Whenever there has been an acquisition, Digi-Key has nearly always already carried both lines. Of the major acquisitions in recent history, Digi-Key has been the only e-commerce distributor that has carried all the lines when the acquisitions were made. This has resulted in many synergies for the newly merged companies and exhibited further proof of the stability that Digi-Key provides our customers.

We're proud to be the only constant on both sides of the ledger and are honored to continue working with the companies as they complete their mergers and transformations. For Digi-Key, it's a seamless transition, because there's no learning curve on how to market the products, work with the supplier, and manage relationships with their team – we've got the familiarity on all fronts. And because of our team's technical know-how, we understand the product synergies very well. We're able to take the elements and strengths of both companies and market them to the global engineering community, promoting the newly merged company as stronger than ever.

Looking ahead, we predict the industry will see larger suppliers offering deeper product portfolios, since suppliers are purchasing companies with synergistic products in order to offer a broader range of choices to their customer base. Suppliers will be able to leverage their expanded resources to provide designers and engineers with a solution sell rather than a one-off widget.

Digi-Key is proud of our extensive portfolio and the trust we've built with our supplier partners, which have served us and our customers well through this market consolidation.



Digi-Key is proud to often be the only constant on both sides of the ledger through semiconductor M&A deals.

### In Brief

#### Securing pricing for 30 days

Digi-Key has partnered with CalcuQuote to integrate its technology with Digi-Key's Quote API which secures pricing for 30 days versus standard price and availability options. It also offers a smoother ordering process with more efficient quoting and real-time data on demand.  
[digikey.com](http://digikey.com)

#### Sustainable sourcing agreement

Offshore Electronics has committed to sustainable PCB sourcing and manufacturing through its exclusive supplier agreement with NCAB Group which has conformed to ISO 26000 since 2014. By signing a sole-source supply agreement, Offshore Electronics now effectively adheres to the same standards, extending efforts to minimise its own impact on the environment.  
[www.offshore-electronics.co.uk](http://www.offshore-electronics.co.uk)

#### Positive outlook for 2022

Britain's manufacturers are more positive about growth entering 2022, with greater confidence regarding their own companies than the global or UK economies, according to the 2022 Make UK/PwC Senior Executive survey. It also highlights the scale of uncertainty facing business in the turbulent global environment and that their optimism is tempered by escalating inflationary pressures and access to/retaining talent and key skills.  
[www.makeuk.org](http://www.makeuk.org)

#### Faster PCB manufacture and assembly

RS Components has expanded its design and manufacturing solutions by partnering with Eurocircuits, a specialist manufacturer and assembler of prototype and small series PCBs. Under the service, PCB prototypes can be manufactured in three days, and assembled in three days, catering for crucial time-to-market and thus maximising the product's potential.  
[www.eurocircuits.com](http://www.eurocircuits.com)

## High Power Density Chip Resistor

HPDC SERIES

### Chip resistors suit high continuous and momentary loads

TT Electronics has debuted its HPDC series high power density chip resistors. The design is optimised for power management, actuator drive and heating applications which benefit from enhanced heat transfer from element to terminal. High power density components save PCB area and boost reliability by restricting temperature rise.

TT Electronics' director of engineering, Brian Stephenson, said: "Aluminium nitride gives the HPDC series our highest power density to date. With this product, our customers can reduce the size of their power conversion designs, while enhancing the reliability of the assembly through restricting the component hotspot temperatures.

"These features make the HPDC family ideal for applications with high momentary load conditions, such as power supplies, motor drives, power amplifiers and actuator controls."

Ratings are 2.4W (1206) and 3.5W (2512). Short term overload performance is 4.7W (1206) and 7.7W (2512) for five seconds, making HPDC ideal in active capacitor bleed circuits.

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

### Buying into efficient relay operation

Rutronik is stocking Omron's G6Q series single pole miniature power relays which are designed to offer flat dimensions, high switching current and robustness/stability in small spaces. Replacing G8P, they are smaller with the same footprint. Specifications include up to 10,000 switching operations at 36A, 250VAC or 100,000 at 30A, 250VAC.

Applications include AC safety shutdown in EV chargers, ground/air heat pumps, lifts and ventilation/temperature controllers.

By reducing the coil voltage after the nominal voltage has been applied for 100ms of relay operation, current consumption is reduced to twelve per cent compared to nominal consumption, thus to 35 per cent of the nominal coil voltage.

Other features include 10kV impulse withstand voltage (between coil and contacts); operating ambient temperature of 85°C; and compliance with cULus, EN and CQC.

[www.rutronik24.com](http://www.rutronik24.com)



### Cost effective LED indicator range

Anglia Components has announced a new UK and Ireland distributor agreement with Ekinglux, an ISO approved manufacturer of discrete indicator LEDs described as cost effective, quality products.

Anglia's technical director, David Pearson, said: "Ekinglux has an excellent reputation for quality and value, and have been manufacturing LED components for over 15 years. They are fully certified to ISO9001."

Anglia will be offering the full range of surface mount and through hole indicator LEDs through Anglia Live, available for same day shipment within the UK and Ireland. SMD options include 0402, 0603, 0805, 1205 and 1206 case sizes in white and all other popular colours. The SMD LEDs are offered with rectangular or round lenses; in right angle or standard format; with clear or diffuse lenses. Through hole LEDs are available in standard 3mm and 5mm diameters and are stocked in the full colour range.

Ekinglux' sales manager, Penny Pan, added: "Ekinglux is excited about our new partnership and believe that Anglia will be successful in introducing our high quality, cost effective and robust LED products to its customers, helping them to deliver projects on budget."

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





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# Programmable oscillators save the day

*In this article, Dove's management team explains how programmable oscillators can save the day when dealing with material shortages and extended lead times*

Crystal and oscillator specialist, Dove Electronic Components, offers an extensive range of frequency control products and services. The company's in-house programming center features four mass production machines with full laser marking and tape and reel capability.

Most programmable orders start as a customer request for a fixed frequency oscillator. Requests range from a prototype to support of an existing design. Programmable oscillators have saved the day when dealing with material shortages and extended lead times. Customers faced with line down situations or delivery dates inside current lead times have found programmable oscillators a perfect fit.

For example, customers looking for a specific oscillator have often exhausted all other stock avenues. Faced with having to wait months, a quick-turn, programmable oscillator offers a potential solution. Assuming the specifications fall within the available footprint, stability, temp range, jitter spec, etc, Dove's team will offer a programmable oscillator from one of several manufacturers Dove is authorized to perform in-house programming for.

We'll send the buyer a formal quote and soft copy of the datasheet to share with their component engineer. Once the customer approves the specification, we can send samples to test (if requested), usually within one to two-days, so

the customer can confirm the programmable solution works before committing to a production order. However, the datasheet is often all they need before placing an order.

Production starts with allocating the blank (unprogrammed) oscillators to the customer's order. This is electronically transmitted to the in-house Programming Center and automatically scheduled against the customer's dock date(s).

Many customers are incorporating programmable options into their products, designs and supply due to their reliability and availability. Dove has revived orders that were facing a >30-week lead time and is ready to help more customers explore this solution.

Dove operates a cohesive process between the sales team and programming department. Strong communication between

departments lets the programming manager provide immediate explanations to the salesperson handling a standard or special order.

As inquiries for programmable oscillators come in, the sales team coordinates availability and scheduling with the programming department: first ensuring the specifications can be met, then confirming a firm ship date. Once an order is in place and on the department schedule, Dove's programming manager prepares the materials and device kit.

The job is setup on a programmable oscillator automation handler, accounting for package size, laser marking and packing requirements. Setup includes hardware removal and installation, hardware alignment, software setup and packaging preparation.



Dove's manager it/web/programming,  
Jason Silva



**Crystal and oscillator specialist, Dove Electronic Components, offers an extensive range of frequency control products and services**



## Crystals and oscillators

Using a combination of supplier provided software and proprietary equipment, specifications are entered and the devices are ready for programming. All program results are saved for reference, with precise and accurate device output frequencies logged.

Devices are laser marked per supplier standards, with some customers requesting custom marking which Dove provides at no additional cost. The laser marking system is constantly monitored for accuracy and etching consistency.

A strict traceability program is followed, tracking lot numbers

and date codes through supplier programming process, ensuring programmable oscillator shipments are traceable to the manufacturing date and facility.

The order is then prepared for shipping. Before parts are shipped the order is processed through a series of quality check points with trained warehouse personnel cross checking customer requirements, date codes and lots against prepared paperwork/labels to ensure the order is shipped complete and precise.

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



Dove's director of sales and business development, **Mark Mardjani**



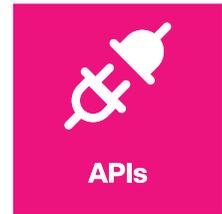
Dove's operations & finance manager, **Crishana Runge**



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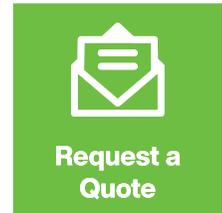
Inventory Management



APIs



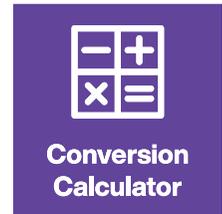
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Conversion Calculator

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



# Why hi-rel markets face increasing obsolescence

*In this article, Flip Electronics' President Bill Bradford explains the forces driving component obsolescence and how to defend against it*

Semiconductor demand is driven by high volume commercial applications such as mobile phones, IoT, and consumer electronics. End equipment in these markets is constantly upgraded to compete with similar products from other manufacturers which, in turn, fuels demand for higher performance semiconductors. Moore's Law accommodates this demand, chasing ever-smaller circuits that deliver on speed and power. Thus, most new chip capacity coming online supports new technologies.

Legacy semiconductor components are built on more mature (>28nm lithography) processes. Recently this meant relatively low production costs because the wafers are generally considerably less expensive

and they are built on fully depreciated manufacturing lines. However, in the wake of the current semiconductor shortage, legacy component supply cannot meet demand and manufacturers are not investing enough in these mature technologies to improve availability. Doing so would disrupt their cost models, as they would no longer be building on depreciated equipment. That's if they can still buy replacement fab equipment for mature nodes.

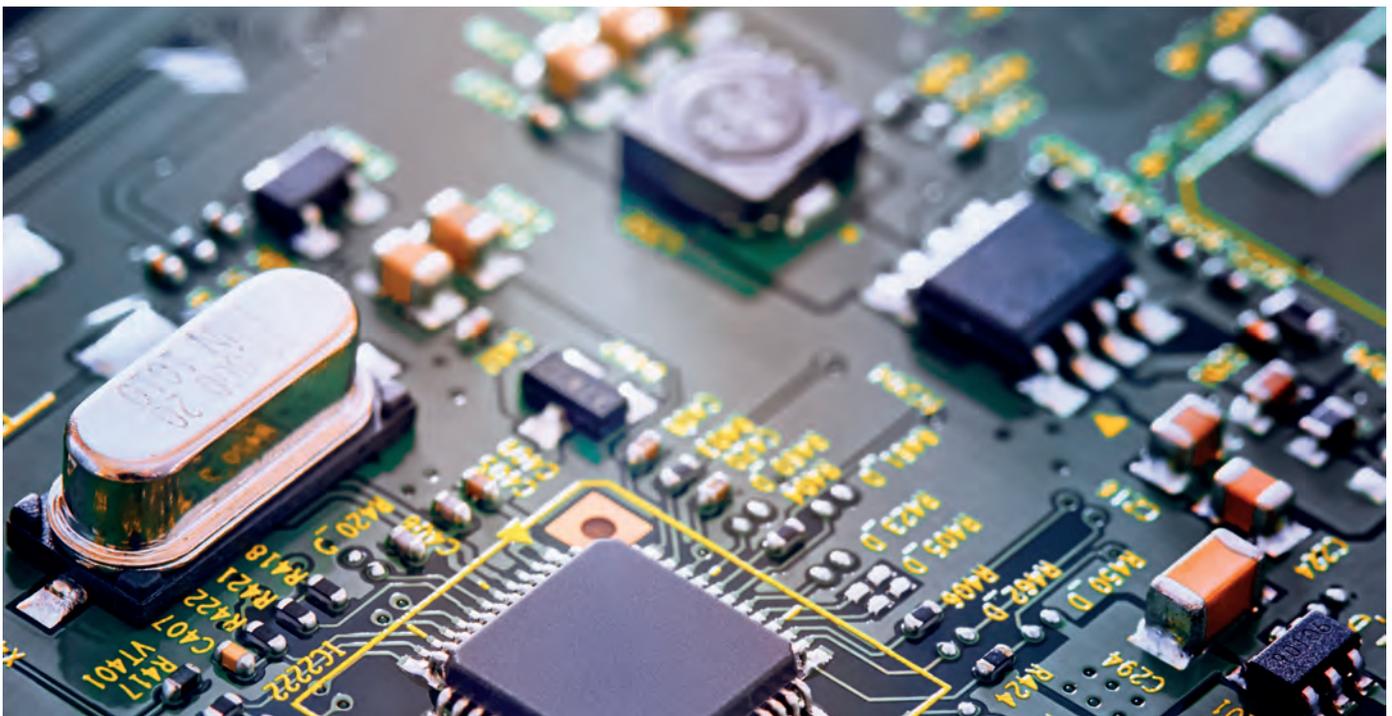
Most applications use some legacy components for simple functions and interfaces, but a much larger percentage of a high-reliability BoM is made up of mature devices. Whether aerospace, defense, telecom, networking infrastructure, or industrial controls,

equipment is complex, new designs are costly/time-consuming to produce, and testing/qualification can add significantly to the expense and time. These factors make it prohibitive for high-reliability systems to go through the cadence of regular upgrades to ensure components remain state-of-the-art. In fact, many defense systems are expected to support a lifecycle of multiple decades.

Over time, manufacturers discontinue many legacy components because they have been replaced by a newer, more advanced, higher performance version, or because the equipment required to build the legacy components is no longer viable.



Flip Electronics' President Bill Bradford



## Obsolescence



**Semiconductor demand is driven by high volume commercial applications such as mobile phones, IoT, and consumer electronics**

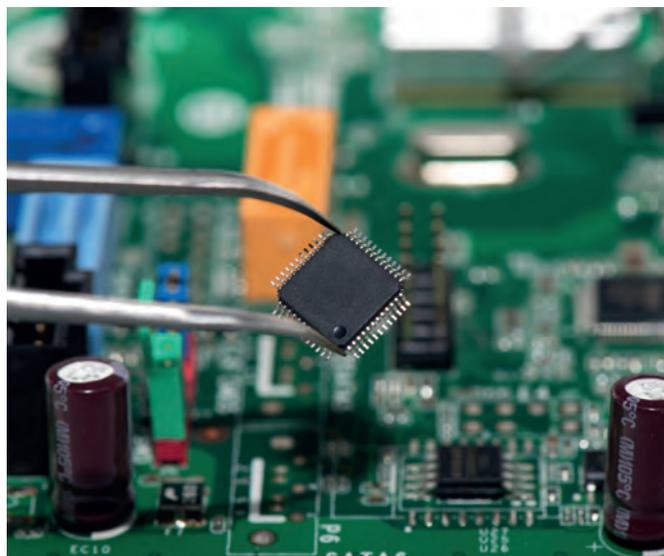
Semiconductor manufacturer consolidation has also reduced the number of legacy component sources, and the rate of product discontinuance notices (PDNs) is increasing. This trend, plus the long design/qualification time for high-reliability systems, means many components are obsolete before a system reaches production, and often most components are obsolete during the planned equipment lifecycle.

This obsolescence, referred to as diminishing manufacturing sources and material shortages (DMSMS), requires a sophisticated forecasting rigor to manage. Precursors to product discontinuance, such as manufacturer announcements, channel inventory trends, supplier consolidation, etc., should be observed. Data modeling can also be used to predict component obsolescence over a longer-term horizon.

Manufacturers of high-reliability equipment can leverage specialty distribution partners to secure availability of obsolete components. Such distributors study the market, perform analytical models, and invest in discontinued inventory when the product is still available to support the lengthy production runs of the manufacturer. In some cases, they can arrange to have additional inventory built to support post last-time-buy requirements.

With semiconductor shortages expected to persist through 2022, high-reliability equipment producers should leverage their distribution partners to assist in predicting and managing the added stress of component obsolescence.

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



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# Component sourcing the green way

*Rochester Electronics' technical sales manager, Ken Greenwood, explains how authorised after-market distributors are helping manufacturers extend equipment service life*

The prime goal of environmental legislators is waste prevention. Laws covering waste reduction, such as the Waste from Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU) and the UK's Right-to-Repair Law introduced in 2021, aim to prevent WEEE creation and encourage equipment re-use and repair.

Long-standing partnership between Rochester Electronics and most leading semiconductor companies provides a demonstration of waste prevention in practice, while also offering a risk-free safety net in times of allocation.

The semiconductor supply chain works 'imperfectly'. Production output and demand can never be perfectly matched. Cyclical waves of over/under-supply have been a consistent market feature since the day semiconductors appeared in mass-market goods.

In the past, surplus components were scrapped rather than re-entering the market in an uncontrolled manner. Raw materials were recovered but the sunk costs were lost. Also, the recovery process is highly energy intensive.

Today, many semiconductor manufacturers have eliminated the scrapping of surplus components by engaging an authorised after-market distributor. Sources such as Rochester Electronics, receive surplus stock and keep it in an authorised AS6496 'bubble'. As partners of the semiconductor manufacturers, they act as a trusted instant

source of product when demand starts to outstrip supply. Thus, cyclical market peaks and troughs are smoothed and customers keep production lines rolling.

The second aspect of legislation—the extension of equipment in-service lives—demands increased component longevity.

These market trends are headed in opposite directions. Thirty years of mergers and acquisitions mean fewer suppliers. Fab start-up costs for new geometries mean investment is the preserve of the few. Component lifecycles are reducing.

Component discontinuations present customers and service providers with a stark choice: commit to a last-time-buy (LTB) to cover all future needs; and/or re-design/re-qualify the end-product. An LTB purchase will be based on best forecasts at the time. But what-if circumstances change or in-service life increases?

Semiconductor manufacturers also struggle to match supply with LTB demand. Surpluses inevitably arise, risking scrap and waste.

An authorised after-market distributor and licensed manufacturer can provide a risk-free safety net to help protect against these uncertainties and reduce waste. Deep long-standing relationships with semiconductor manufacturers mean Rochester Electronics receives billions of surplus EOL semiconductors each year. This authorised ready-to-ship stock provides a buffer against market uncertainties and allows customers to:

avoid production stops; extend service-lives; avoid re-designs/re-qualifications; and resurrect older designs to meet critical market demand.

In many cases, surplus wafer/die, test equipment and tooling are also transferred allowing ongoing authorised production, sometimes 20 to 30-years after the original component EOL.

Rochester Electronics supports installed equipment in applications such as energy distribution, transport, industrial controls and aerospace, allowing original designs to continue unchanged. Past focus was on applications where robustness and longevity are the prized attributes. WEEE and Right-to-Repair legislation highlight a need for these attributes in components across a broader spectrum of applications and markets. This will require deeper co-operation between customers, semiconductor manufacturers and after-market distributors.

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



Rochester Electronics' technical sales manager, Ken Greenwood



**Component discontinuations present customers and service providers with a stark choice**





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# Trends influencing the PCB sector

*In this article, NCAB Group's VP sales, Michael Larsson, explores industry trends driving the development of printed circuit boards*

Societal changes are driving electronics innovations, including printed circuit boards. Michael Larsson said: "Although the pandemic has brought many challenges in the last year and a half, the ongoing global trend toward urbanisation has brought greater prosperity for many. There is a rise in middle-income earners, particularly in major Asian nations. More people are living more comfortably and longer and also want better standards and service.

At the same time, efforts are being directed to sustainability to meet the

climate challenge and protect the environment. We need to save more energy and implement the shift to fossil-free energy sources. Another aspect of sustainability is working to secure a healthy future for this and future generations.

## Energy industry in transition

Electronics is an important enabler in the development of technologies for smart homes, solar/wind energy, smart grids, electric vehicles and their associated infrastructures. For example, smart homes are seeing rapid development of control and operating systems that

optimise well-being, net operating income and energy use. Looking at the climate, we are seeing extensive developments towards more electric transport. This will require new fleets of vehicles and upgraded infrastructures incorporating more electronics.

The energy industry is also undergoing change. Solar and wind have moved from symbolic initiatives into competitive energy sources. This is creating demand for electronics to transfer power surplus locally to the grid for storage or onward to where it is needed. In the manufacturing industry, new control and regulating technology is being developed as a result of advances in sensor technology.

Miniaturisation is another trend driving electronics development. The desire to accommodate more electronics into smaller spaces creates opportunities for new applications. At the same time, it creates challenges regarding thermal management.

Looking specifically at PCBs, Michael noted that miniaturisation is encouraging increasing numbers of NCAB customers to make technological leaps such as using more layers and



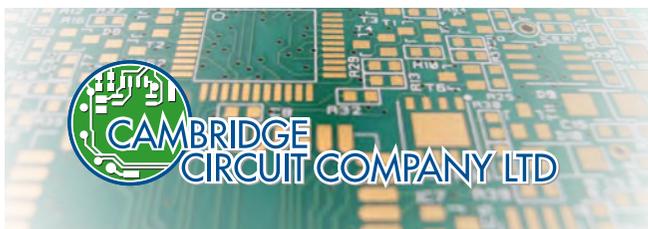
NCAB Group's VP sales, Michael Larsson



**An important part of NCAB's strategy is to work closely with product owners, who are seeking more control over PCB sourcing**



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deploying advanced solutions such as HDI, flex and flex-rigid boards: "Being bold enough to make such a move can result in the customer getting a smarter solution. With today's products, for example, an HDI solution can often help avoid the unnecessary hassle that a traditional design would cause."

#### Consolidation in progress

Commercially, the pandemic has challenged everyone in the PCB industry, but smaller players were hit hardest. This drives consolidation among product owners, contract manufacturers and their suppliers. In the future, size will become increasingly important if companies want to be seen as meaningful business partners.

Michael explained: "If you look at the demand for printed circuit boards from a geographic angle, Asia, where the vast majority of boards are manufactured, is the region that is both the largest and fastest growing. After that, Europe is the largest market for PCBs. About twice as much volume is imported there compared to the third largest market, North America. So for us at NCAB, this means that we are generally in the right markets. However, we are working to gain even better coverage in markets where we are not so well represented, given that an important part of our business concept is being close to the customers."

#### Reliable PCBs

Today, there are more applications where failure is not an option. Reliability is increasingly crucial. An important part of NCAB's strategy is to work closely with product owners, who are seeking more control over PCB sourcing.

Michael added: "This increased focus on control is often linked to key constructions where their own brand may be at risk. Apart from the quality aspects, this trend is also driven by the product owners' own sustainability ambitions and the legal requirements in this area. Having control over sustainability aspects throughout one's supply chain has quickly become increasingly important for both product owners and EMS companies."

#### Growth through knowledge

Going forward, NCAB will continue to focus on growth, both organically and through acquisitions. Capacity is constantly being expanded and NCAB continuously conducts sourcing and factory management work to meet customers' needs regarding, for example, technology and country of manufacture.

Michael concluded: "In addition to control, knowledge is an important part of our offer. Based on the customers' needs, NCAB has over the years built up a knowledge bank that enables us to help customers with good and smart solutions, optimised for production."

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

**Going forward,  
NCAB will  
continue to focus  
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## Sealed connectors are PCB mounted



Heilind Electronics is now stocking Amphenol Sine Systems' ecomate Aquarius PCB mounted jam nut receptacles. They provide an IP67/69K waterproof rating (when mated) for industrial applications. The thermoplastic design meets growing demand for lightweight, lower cost, sealed connector systems. The MIL-DTL-26482 based design provides a quick, reliable, one-third turn bayonet coupling, ideal for indoor/outdoor applications.

Available in optional in-line, square-flanged and end cap configurations, the connectors feature pin and socket contacts that are available on reels and in strip form to accommodate high volume, low cost automatic machine terminations.

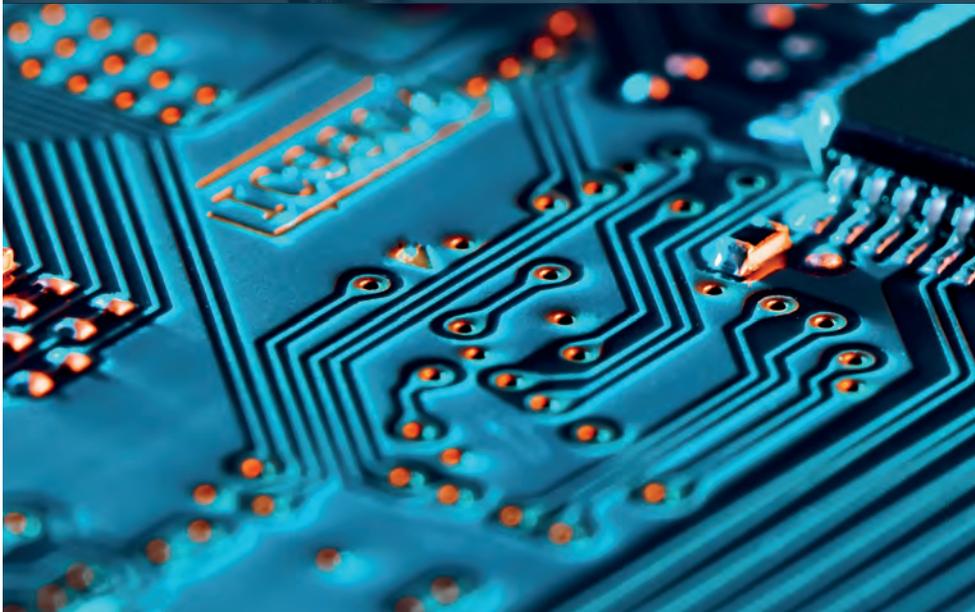
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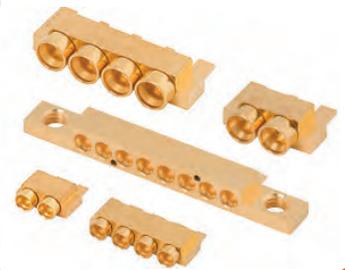
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# Authorised distributors expect strong growth

*Despite chaotic market conditions in 2021, ECSN members remain very positive about their organisation's and its customers' prospects into 2022*

ECSN's latest Leadership Group Forecast predicts the UK and Ireland electronic components market will continue to grow strongly in the first half of 2022, returning between 11 to 15 per cent growth, showing around 13 per cent growth mid-year. In the second half, the association predicts that billings (sales revenues) will slow modestly to give a full year outcome ranging from eight to 12 per cent and showing a mid-point of 10 per cent growth over the previous year.

Market analyst, Aubrey Dunford, said: "The market upswing we expected to commence in 2020 was delayed by the global economic slowdown. A further effect of the pandemic is that normally out-of-phase regional cycles were brought into sync, further contributing to a global supply issue."

In its 2021 Forecast, the association predicted rising global demand and extended lead-times on some products but like the coronavirus itself, the trend spread exponentially to affect virtually all component categories within weeks. From the start of 2021 members saw 'book-to-bill' ratios rise to levels rarely, if ever seen, with unprecedented 'bookings' driven by extending lead-times and price increases.

Dunford continued: "Any disruption to supplies that had been expected as a result of Brexit were dwarfed by the global supply issues. Despite the high level of bookings (new orders entered), billings were both constrained by the supply issues and boosted by

price increases throughout the year. About 15 per cent was added to the DTAM (distributor total available market) as our members also expect a strong finish to the year."

Authorised distributor order books (backlog) remain at historically high levels as market expansion, driven by technologies such as 5G, is now well underway.

Dunford explained: "Electronics are finding their way into more and more applications, so our members are confident that the underlying strong demand from their customers will continue. We therefore predict that bookings will remain strong throughout the first half of 2022, although we do expect to see the book-to-bill ratio decline as the supply conditions improve. In the second half of the year growth in the market will continue although the rate of growth will decline compared to 2H21"

Customer order backlog levels leapt to unprecedented heights in 2021, a trend that looks likely to continue into 2022, driven not by customer forecast or actual demand but their need to have sufficient order cover and in-house inventory to match the very extended manufacturer lead-times.

Association chairman, Adam Fletcher, believes this will change as manufacturer lead-times decline but members' opinions vary about when and by how much: "The consensus opinion held by ECSN members is that by mid-2022 lead-times will be declining rapidly to around an average of 12 to 16-weeks for

most components but there will still be some outliers on much longer lead-times. I suspect proprietary semiconductors and interconnect products will normalise first, while commodity products (other than memory chips) will not be on track until 2H22.

"My real concern is longer-term availability of legacy, larger case size MLCC and TFCR components used widely in the US and Europe. Lack of focus on increasing manufacturing capacity for these parts has the potential to be the next significant industry supply problem."



Association chairman, Adam Fletcher



Market analyst, Aubrey Dunford



Book-to-bill ratio 2017 to 2021



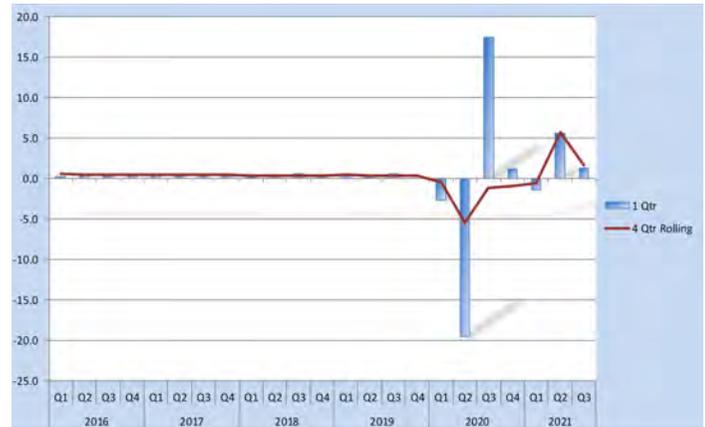
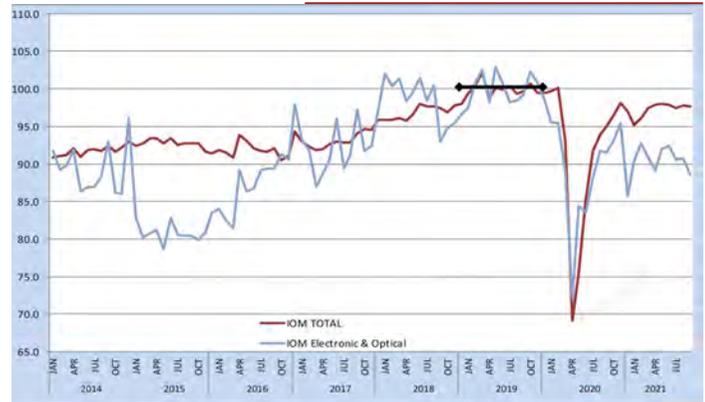
Book-to-bill ratio 2019 to 2021 with trend

Mid-term trajectory for the electronic components markets continues up and to the right. Despite the difficult market conditions in 2021, Fletcher remains confident that stronger underlying growth will return to global electronic components markets because so many competing applications are driving it. He sees 5G handsets and infrastructure, cloud/high performance computing and automotive as the main push with industrial automation and medical running a close second. Fletcher fears avionics and military will likely remain constrained.

Managing director Solid State Supplies and Pacer Electronics, John Macmichael, concluded: "It seems clear that despite the projected market growth 2022 is going to continue to be a challenging year with further price increases and shortages.

It is therefore, going to be equally important in 2022 for customers to work with their distribution partners to get order cover and buffer stocks in place. It goes without saying now that the longer the view a customer can give, the better able the distributor is to provide support. As an added benefit, but equally important now, a longer view of the customer's forecast or order book allows the distributor to better manage their CO<sup>2</sup> emissions potentially using ocean freight instead of airfreight, with a consequent 20 times reduction in CO<sup>2</sup>."

UK manufacturing output 2014 to Q3 2021



UK GDP 2016 to Q3 2021



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# Recharged and ready

*Southern Manufacturing & Electronics returns to Farnborough from 8 to 10 February 2022, with over half the show's 20,000m<sup>2</sup> floorspace dedicated to electronics*

In the component arena, names include Transfer Multisort Elektronik, one of Europe's largest distributors carrying over 500,000 product lines covering semiconductors, IoT, optoelectronics, passive, electromechanical and more. UK-based firms include Würth Electronics, G English Electronics, RF Solutions, RJS Electronics and Easby Electronics, itself one of the UK's leading suppliers of components including custom batteries, power supplies, semiconductors, displays, electromechanical, passives, optoelectronics, IoT devices and EV charging equipment.

OEM manufacturers include Yamaichi Electronics, Relec, Coax Connectors, Binder, Cosel Europe, Midas Displays, TDK-Lambda UK and more.

Subcontract expertise will be on show, including design, assembly, PCB production and inspection. Design and software development consultancy Ignys will be offering advice on designing-around the global chip shortage. Esprit Electronics will highlight its range of services, including PCB assembly, NPI, DFT/DFM, test and inspection, conformal coating and box build. PCB specialists returning for 2022 include European Circuits and Shenzhen X-Mulong.

The free seminar programme returns for 2022 in a socially-distanced format. With UK business now operating in a post-covid, post-Brexit world, keeping abreast of the latest legislation and management strategies is important. Among topics discussed, Paul Grabham looks at post Brexit and

covid impacts on HMRC R&D Tax Credits. Applied Lean Consulting's Tim Scurlock offers delegates ideas on how to drive continuous improvement in their business. Graham Cooper provides tips on energy usage reduction in manufacturing. Nick Aitken and Dr Alex Martin give advice on how to handle a product safety incident. Sessions run over all three days.

Farnborough International Exhibition Centre offers extensive infection control measures to reduce risk. Free onsite car parking for 3,500 vehicles, plus a dedicated free bus service between Farnborough's train stations aid travel arrangements. Other benefits include free WiFi and on-site catering.

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



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## Simplify safe signal transmission in sensor-actuator applications

M8 signal cable connectors from Binder are designed for efficient, reliable installations in sensor and actuator applications. Featuring snap-in quick locking and three to six pins, they are used in industrial applications requiring reliable signal transmission and subject to space constraints.

Further straight overmoulded M8 snap-in connectors are being added to the 718 series, offering five and six-pin versions. They are available with PUR or PVC cables up to 2 or 5m standard length. Custom lengths are available. The locking mechanism doesn't require rotating elements, making them easy to handle.

Specifications include IP65 when mated and gold-plated contacts—brass for male and bronze for female—offering over 50 mating cycles. Rated voltage is 30 to 60V, while rated current is 1.5 to 3A depending on wire gauge and pin count.

Binder product manager, Guido Werner, said: "With the M8 circular connectors and the quick locking mechanism, we are strengthening our position as a solution provider in automation technology. We will be happy to offer further variants or even customer-specific solutions with the snap-in latch on request."

[www.binder-connector.com](http://www.binder-connector.com)



## SMA connector range suits harsh environments

Coax Connectors has added more harsh environment connectors to its off-the-shelf range. The latest, an SMA reverse polarity, straight three-hole flange mount PCB jack, is IP68 un-mated and has a black non-reflective finish.

While some customers require a different finish for aesthetic reasons or to differentiate between connectors, specific characteristics are sometimes sought. For environments where reflection is undesirable, black plating can deliver a less reflective connector finish than gold or nickel in military, avionics, nautical and broadcast applications.

IP68 sealing provides protection against liquids and/or dirt which can damage the connector which impacts the associated equipment and RF signal performance.

[www.coax-connectors.com](http://www.coax-connectors.com)



## Blowers suit medical and industrial applications

Micronel will showcase high pressure and suction miniature DC blowers at *Southern Manufacturing 2022*. Visitors can see updated ranges of compact, energy-saving, miniature DC fans and blowers aimed at a wide variety of medical, industrial and process control, pressure or suction/vacuum applications.

High pressure medical blowers and turbine products suit Covid-19-related applications, such as breathing therapy, ventilators, respirators, personal protection, ICU hospital beds, air purification, disinfection, air sampling, laboratory, diagnostic and test equipment. All air movement with significant pressure or suction to force air through tubes or chambers or overcome system/filter resistance.

The company's industrial blowers can be considered energy and space saving alternatives to bulky side-channel blowers and compressed air sources. Micronel states its 24V DC brushless motors use a fraction of the power of larger side channel blowers, which typically use over 2kW, and have much lower running costs when compared to costly compressed air systems.

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



## Investing in harness manufacturing

Cable loom and harness manufacturer, Convert, is showcasing its capabilities at *Southern Manufacturing and Electronics*. The Kent-based company specialises in automotive, public transport and scientific/medical sectors, manufacturing cable harnesses for car head and rear lights, passenger gates at railway stations and a range of scientific equipment.

Managing director, Dave Lord, said: "We are very excited to be able to attend the *Southern Manufacturing* show once again. It's the only show we attend and have done so for the last 12-years. We've been working on some really interesting projects, so we are looking forward to connecting with customers and getting back to face-to-face networking to see what else exciting is going on in the manufacturing world."

With its trained staff and continual investment in state-of-the-art equipment—including a Komax Gamma 255 automatic crimping machine and an Artos CR11 crimping machine—Convert states its cable looms and harnesses are manufactured to the highest quality, delivered on time and at competitive prices.

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



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### Safety-first adhesives

Henkel's new Loctite 402 is an instant adhesive which develops handling strength twice as fast on most substrates by comparison with other assembly solutions (three to ten seconds). This single component product is claimed to remain three times stronger on most metals at temperatures up to 150°C and offer sustained hot strength performance on selected metals at 135°C. This benefits products whose power supply and connectivity generate heat.

This adhesive is also said to set a new health and safety milestone for instant adhesives. Specifically, it features a novel stabiliser package that removes the need for ingredients that recently came under greater regulatory scrutiny.

Tasks such as bonding, locking and sealing threads, retaining assemblies and liquid gasketing benefit from Henkel's continuous product development process. Notable improvements include higher service temperatures, ability to cure through light surface contamination and improved curing on inactive metals without a primer.

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



### Choice of locking mechanism

ODU UK is supporting its distributor Selwyn Electronics with new products including the latest additions to the AMC (advanced military connector) range. The AMC Series T now offers three locking variants of plug to fit the same receptacle: push-pull, break-away and screw locking (a built-in serrated trapezoidal thread ensures additional safety).

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

In a second innovation, a new seven-pole insert for the ODU-AMC high-density Series features a size O shell but with a larger 0.7mm contact for higher robustness. The seven-pole configuration offers a future-proof alternative to other six-pole NETT-Warrior connectors, together with a significant performance increase.

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



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# Covid presents challenge and opportunity for medical electronics

*Anglia Components' marketing director, John Bowman, explains how the pandemic has transformed medical instrument design and the components specified*

The market for medical and healthcare products is accelerating. High demand for ventilators and other patient-connected systems remains. The drive to streamline treatments to optimise the valuable time of healthcare professionals is increasing the requirement for all kinds of instruments. Telemedicine and eHealth markets are also expanding rapidly, as medical professionals move to remotely diagnose, monitor and treat patients outside a dedicated healthcare environment. This is reducing the burden on health services while also limiting potential exposure to the virus.

Customers' ability to fulfil this demand is constrained by the same supply chain challenges impacting the whole industry. In the pandemic's early stages, we established a Covid task force dedicated to expediting inventory for ventilators and similar essential systems. Anglia is still prioritising these medical designs in partnership with its suppliers. As a privately owned company Anglia can take a strong inventory position. Despite this, we recommend all customers extend the lead-times on their ERP systems and forecast at least twelve months.

In parallel with the demand surge, the pandemic has transformed medical instrument design and the components specified. Most obviously is the issue of social distance. Previously, clinicians stood close to patients when setting up instruments and taking readings. Instruments now need to be operated at a distance from the patient wherever possible. Touch screens—until now the preferred user interface technology—are now seen as a potential infection vector. Instruments need to be redesigned with a touchless two-way communication such as a cell phone, tablet or other device allocated to



Anglia Components' marketing director, John Bowman

Telemedicine in active use



the carer. Finally, a new level of robustness is required. The expected operational demands on medical equipment (run hours, longevity) have increased significantly and need to be addressed.

The pandemic has also changed the volumes of instruments manufactured. Medical equipment normally made in quantities of hundreds per week are now manufactured in thousands per week. This means specialist medical manufacturers need to consider adopting some of the disciplines established in the consumer electronics space. Their situation is made

more complex by the current exceptionally challenging supply chain situation. The best advice is to be realistic about what you need and when. Anglia has invested in its customers and business by vastly increasing its own forward ordering when stock was still relatively plentiful. Even so, the stock and forward orders will only go so far. Simply providing your best forecast, as far forward as possible, (without over-ordering) allows us to make the most of the supplies we can secure.

Medical electronics will play a growing part in addressing the pressure healthcare professionals are

under, both directly from the pandemic and by the need to continue treatment of other conditions despite the depleted resources. Demand for medical technology to improve, speed and simplify treatment is strong. Our customers can capture this demand and benefit from these developments if they think about the supply chain early enough in the project's lifecycle.

[www.anglia-live.com](http://www.anglia-live.com)

**The drive to streamline treatments to optimise the valuable time of healthcare professionals is increasing the requirement for all kinds of instruments**

Medical applications are being prioritised for supply



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# Think medical, think EMC

SCHURTER is working with medical device manufacturers to ensure their applications comply with the strictest EMC standards

For patients with an implanted device, such as a pacemaker, communication between the device and control unit takes place wirelessly via a radio signal. This signal has a specific frequency, so no radiation may be emitted from electronics in applications used in that frequency range. Thus, EMC plays a crucial role in application development.

For a touch controller multi-layer PCBs are used. The outer layers act as shields so signals in the inner layer cannot cause emission. Filter components are placed at cable and sensor connections so interference from the chip is stopped. The power supply uses linear regulators, instead of switched, because they also produce interference.

Many medical applications use an LCD controlled by internal electronics. To limit emission, a shielding film can be placed in front of the screen. This uses a mesh foil with electrically conductive grid.

While many mesh films darken the image, SCHURTER uses a film with high transparency so the image is not affected.

A prototype EMC properties are tested in a specially designed radiation-free room. The product is placed in the room, connected to cabling and switched on. Signals around the frequency in question are registered by an antenna and transmitted via coaxial cable to a spectrum analyser outside the room. An algorithm determines an average value which must lie between two set values.

Attention to EMC requirements is part of the initial product design so the choice of materials and their constructions are adjusted accordingly. Thus, it is possible to develop a quality product, that aligns with the production process, without too much additional cost, with the right EMC properties.

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



Many medical applications use an LCD controlled by internal electronics. To limit emission, a shielding film can be placed in front of the screen



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## PCB sockets available in longer lengths

Harwin has expanded its portfolio of board sockets with additional sizes for its Sycamore Contact range. These 6A current rated surface-mount PCB sockets are ideal in applications such as electric vehicle battery management systems, solid state lighting panels, gas detection systems, fire alarms and smart metering equipment.

Two additions complement the existing 3.87mm length sockets, which accept 0.8 to 1.3mm or 1.5 to 1.9mm mating pins. The new versions have a body length of 5.87mm for use with longer mating pins or in deeper PCBs. Though both versions are bottom entry, they can be inverted to serve as top entry sockets.

Unlike other surface mount sockets, products in the range have three points of contact, thereby maintaining electric connection even when subject to vibration. Sockets also feature gold plating to maximise conductivity and reduce mechanical wear, ensuring long-term operation with a 500-mating cycle durability. A working temperature range of -50 to 125°C is supported due to the use of beryllium copper.

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



## Sealed harness solutions in stock

Powell Electronics is now stocking ModICE modular connector enclosures with SHS harness connectors from Cinch Connectivity Solutions. Available from stock for immediate delivery, the range provides sealed packaging solutions for rugged electronic control modules.

The Cinch 1.5mm SHS system is used as the base interconnect technology for ModICE connector enclosures. These sealed rugged I/O connectors are designed to function in extreme environmental conditions commonly found in commercial and off-road vehicles and industrial equipment.

Cinch ModICE connector enclosures are available in three sizes and with four header configurations: 18, 30, 48 and 60 I/O. Resistant to most industrial fluids, the products are sealed to IP67 and IP69K and remain sealed even when the harness connectors are not mated. Further details include a current capacity of 10A at 85°C, a contact resistance of less than 10mOhm, an insulation resistance of over 1,000MOhm, and an operating temperature range of -40 to 125°C. ME headers with integrated RF ports, headers with integrated ferrite filtering, as well as blank headers are also available.

[www.powell-electronics.eu](http://www.powell-electronics.eu)



## New bussing options support data comms

Schurter has introduced a new version of its NR010 series NEMA 5-15R receptacles featuring insulation displacement contacts (IDC) terminals for bussing insulated wires perpendicular to the pin-axis. The new version completes the range with both vertical and horizontal bussed wire options. All three terminals, L, N and E can be bussed, or variations thereof, leaving the line terminal independent. This allows for the application of maximum load to each outlet according to UL rating 15A, 125V, or for extending functionality to each outlet.

The NR10 series addresses demand for increased packaging density in data communication and storage equipment, as well as increased ambient temperatures. It boasts a wide operating temperature range of -25 to 150°C.

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



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### Small connectors deliver automotive quality

Hirose Electric has developed a 1mm pitch wire-to-board connector that can be used safely for automotive applications due to its heat resistance and robust design.

The new GT50 series meets increased demand for wire-to-board connectors caused by the shift to electronic vehicles. These applications require smaller, lighter connectors due to limited mounting space. Heat resistance and the ability to withstand vibration are also essential.

GT50 connectors offer a small size, featuring a 1mm pitch and 5.97mm height. Lances on both the contacts and housing support high retention force during cable pulling. In addition, GT50 boasts sufficient locking strength and PCB peel strength for robust connections.

Heat resistant material and crimp contact design ensure heat resistance of 125°C. A stabilizer also ensures high vibration resistance.

[www.hirose.com/eu](http://www.hirose.com/eu)



LET IT BE  
LEAD-FREE

### Lead-free high current portfolio expanded

Würth Elektronik ICS has added a new bushing variant with a 6mm diameter to its LF PowerBasket surface-mount series of lead-free Powerelements products.

The LF PowerBasket SMD power supply terminals are multi-pluggable and are ideal for use in wire-to-board and board-to-board connections. Compared to conventional systems, the contact blade design is said to reduce insertion and extraction forces. A position tolerance of up to 0.6mm ensures several contacts can be plugged in at the same time. This offers a considerable advantage for three-phase connections.

Powerelements products feature a high current carrying capacity of up to 160A at 20°C. Operating temperature range can be up to 150°C and even up to 170°C for short periods.

LF PowerBasket SMD high current contacts are also manufactured without any lead additive using a punching and bending process. This ensures they are unaffected by impending changes to exemption 6c of the RoHS Directive.

[www.we-online.com/ics](http://www.we-online.com/ics)



### SPE solutions facilitate IIoT

Yamaichi Electronics offers a new series of connectors for industrial single pair Ethernet (SPE) according to IEC 63171. The new Y-SPE series includes both IP20 and M12 sockets with IP67 protection for PCB mounting in accordance with IEC standards 63171-2 and -6.

Designed to offer efficient data transmission from the sensor to the cloud, these single pair Ethernet products meet the increasing communication requirements of machines and devices in the production environment. They are particularly suitable for systems with cable distances over 100m.

Due to its large range and uniform communication level, single pair Ethernet is key in the transition to IIoT and Industry 4.0. Transmission takes place via only two contacts, making it possible to build smaller connectors than the previous RJ45. Only one pair of cables is needed, which also saves space, raw materials, weight, and money.

To ensure the supply of power, SPE offers Power over Data Line (PoDL) with a limit of approximately 60W. Alternatively, for components that require more energy, Yamaichi can provide hybrid connectors and customer-specific designs.

[www.yamaichi.de](http://www.yamaichi.de)



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# Using D38999 connectors in challenging environments

*D38999 connectors have remained popular for decades. PEI-Genesis' European product manager, Emily Rowe, explains why*

Connectors must endure extreme conditions, especially in aerospace and military applications. Often subjected to rapid temperature changes or constant vibrations, impacts and signal interference, they must be robust enough to continue operating reliably and safely to ensure users have 100 per cent trust in the product.

Take the D38999 connector for example. This military-specification connector was originally designed in the 1970s and is now on its third-generation. The main reason the D38999

connector soared to popularity is that it offers a higher contact density than predecessors—128 contacts compared to only 19 for 5015 connectors.

It comprises a few basic components: hard outer shell; neoprene rubber insert with holes to house pins or contacts; and sometimes a backshell for additional shielding and durability. One benefit of D38999 connectors is the customisation options such as different shell types, materials, finish and insert arrangements. This appeals to customers, particularly

in industries often requiring bespoke solutions, such as military and aerospace.

Military applications are seeing growing need for shielding and durability, with electrical connectors expected to be in service for decades. With life spans between 500 and 1,500 mating cycles, D38999 connectors can last for up to 30-years depending on application.

Many aerospace and military customers require custom components and D38999 connectors facilitate this since backshells and contacts



PEI-Genesis' European product manager, **Emily Rowe**

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## Connectors

are easily customisable. For example, backshells can be aluminium, stainless steel or composite. Newer composite options are popular because they are lightweight and offer high performance in harsh environments. They are also REACH compliant and QPL qualified for military use.

Customisation options are also driving popularity in other industries such as industrial, marine and automotive. For every new application, new additions or changes can be made to enhance the robustness and reliability for that industry. Simply choose a reliable connector supplier to meet the application's demands and, where necessary, provide guidance on the best solution.

PEI-Genesis provides an extensive range of D38999 connectors from Amphenol, ITT Cannon, TE Deutsch, Souriau Eaton and Conesys. It stocks large volumes of component parts and can build millions of connector types while offering lead times of just 48-hours from order placement.

The company can offer standard solutions or work with customers to create something bespoke for their specific application using its in-house design team. PEI-Genesis also supplies D38999 accessories such as protective caps, backshells, contacts, nut plates for receptacles and tooling.

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# Day in the life of a value-added connector order

*ECCO Connectors offers readers a behind-the-scenes tour of a circular connector's birth including demand, order, build, shipping and delivery in just a few days*

Circular connectors are a unique commodity, often required last minute with delivery ASAP. The following story focusses on a 5015 series mil spec style connector.

The process starts with the end customer AGS, an aircraft test and measure OEM which supports aircraft maintenance operations and often lacks visibility regarding their customer's demand for tools and equipment. Given recent and continuing increases in freight and commercial air travel, AGS needs to replenish its products in the field at much faster rates. It looks online to find material available at authorized distributors and identifies two sources for the exact SKU it needs.

After choosing its desired source, the company places an order for the required quantity of an MS3102E22-19P. The order is transmitted to the distributor via email and confirmed. With a quick turn requested, the distributor's system breaks out the top-level assembly into its various sub-components where a pick ticket and production order are generated. The required material is then picked and delivered to the operator's workstation where it is cleaned and inspected. If all components pass first level inspection the operator follows the work instructions.

The assembly process begins with applying adhesive to the contacts,

outer shells and insulators/inserts, which are allowed to air dry. Several sub-tasks follow, including insulator insertion into the outer shell (pneumatic press) and insertion of contacts into the insulator (arbor press). These insert/shell subassemblies are then oven cured for a specific duration, at a calibrated temperature.

Once cured, the parts are moved to QC for inspection and pressure tested to ensure/confirm resilience to fluid penetration. After passing inspection and testing requirements, they are moved to marking to add the finished part number, date code, manufacturer and mint mark to each part produced.



Part marking



**Because of their high reliability, circular connectors are used in aerospace, transportation, medical and harsh industrial applications**

Shipping packaging area



The parts are oven cured again to ensure marking permanence.

These subassemblies are then combined with the remaining components to produce the 'top level assembly'. The finished connectors are sent to secondary QC where a separate operator inspects the finished parts regarding assembly and marking. Once completed and stamped with final QC inspection, the parts head to packaging, along with the certificate of compliance and associated shipping documents.

Finally, the connectors are boxed and shipped to AGS Next Day Air given the customer's immediate need. An invoice is generated on shipment and its corresponding tracking number is automatically sent via

email to the buyer. This entire process, from start to finish, has taken less than two-days.

Because of their high reliability, circular connectors are used in aerospace, transportation, medical and harsh industrial applications. They come in different sizes and pin configurations that make it difficult to stock all possible variations: thus, the need and benefit for partnering with qualified, authorized, value added connector specialists who can stock the various components, take an order and quickly assemble them into a specific finished good.

ECCO's warehouse acts like a big puzzle box with thousands of puzzle pieces to be put together at a moment's notice to solve

customers' quick delivery material demands. In this case AGS got what it needed fast, assembled by a high-quality staff.

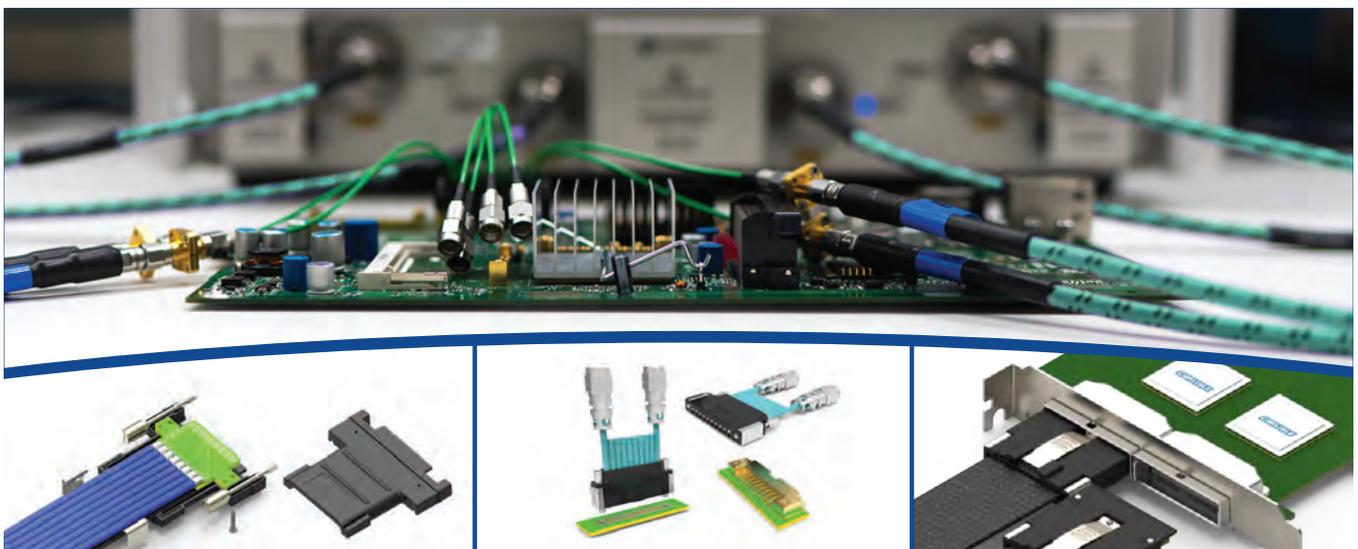
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**The assembly process begins with applying adhesive to the contacts, outer shells and insulators/inserts**



Connector assembly



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# Design, buy, manufacture

Welcome to the first of three Electronic Component Show previews building up to the one day event at the Kassam Stadium, Oxford on Thursday 19 May 2022

Following the postponement of ECS 2020 due to the pandemic, the ECS 2022 exhibition and seminar programme are back, offering visitors attending the one-day event the opportunity to meet with 70 exhibitors.

The range of exhibitors provides an ideal opportunity for manufacturers to explore new or alternative suppliers for their design and supply chain requirements. ECS offers visitors access to quality exhibitors on their UK doorstep, with excellent accessibility to Oxford.

At time of writing, current exhibitors include; European Circuits, INCAP, G-English, Solid State Supplies, Phoenix Contact, ODU, FC Lane, Datasound Laboratories, Luso, EDAC, Cliff Electronics, Würth, Force Technologies, Pacer Components, Fischer Connectors, Cupio, Fermionx, Switchtec, Nexus, NCAB, Rebound, Retronix, Lincoln Bins, Midas Displays, Foremost, Mouser, Nicomatic, Powell, Omron, Charcroft, APC, Yamaichi Connectors, Esprit Electronics, Photronix, TT Electronics, Future Facilities, Rochester Electronics, Camden Boss, CML, Farnell,

DVR, Nicab, Harwin, Anders, M-TEK, Rohde & Schwarz, GCT, Micronel, Review Display Systems, Micross, Lemo, Schurter, Phoenix Dynamics, Binder Connectors, RYS Electronics, Astute, Dold Industries, Hamamatsu, Alpha 3 Manufacturing, Aerco.

The supporting seminar series will provide educational insights catering for design engineers, manufacturing engineers and purchasing professionals.

[www.electronic-component-show.co.uk](http://www.electronic-component-show.co.uk)



**WHEN** – Thursday 19 May 2022

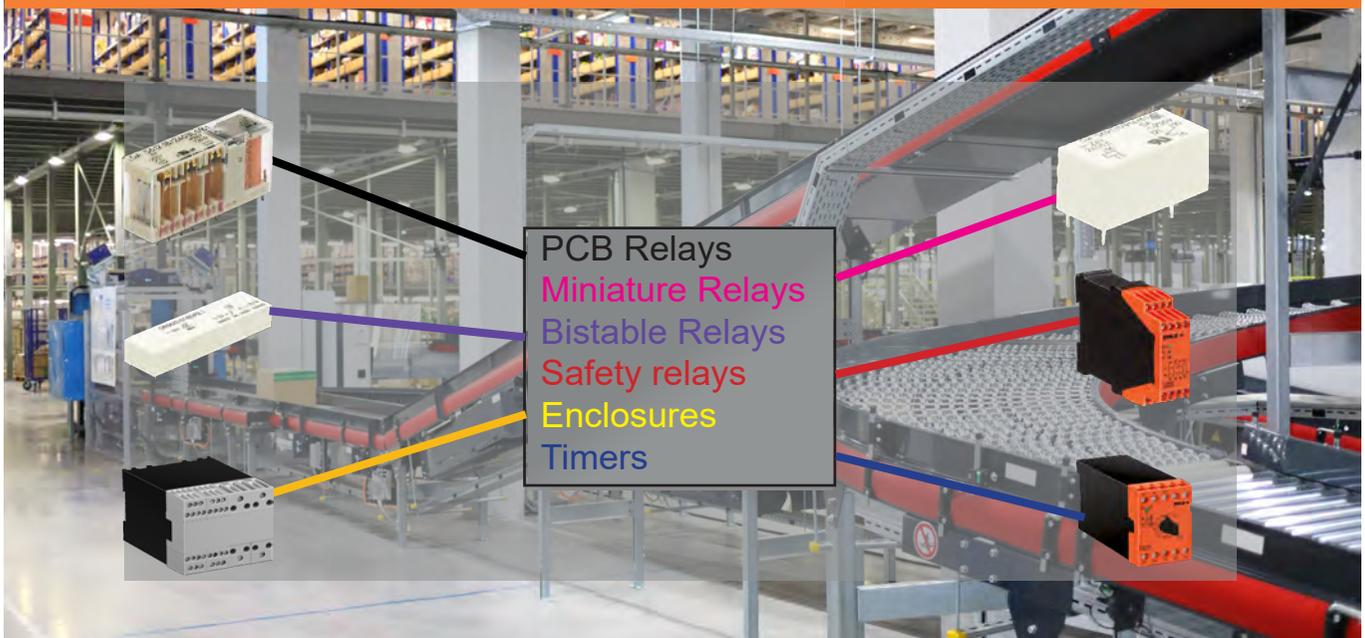
**WHERE** – Kassam Stadium, Grenoble Road, Oxford, OX4 4XP

**WHY** – 2,000 free car parking spaces; free entrance; free educational seminars; free soft drink, tea and coffee refreshments; 70 exhibitors supporting design, purchasing and manufacturing requirements

**WHAT TO DO** – ECS 2022 registration is now open at [electronic-component-show.co.uk/register/](http://electronic-component-show.co.uk/register/)

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# Relays, terminal blocks, enclosures and more

Switchtec's attendance at ECS will include Hongfa relays, Euroclamp terminal blocks and the CEM series of modular DIN rail mounted enclosures

Designed to meet demand for simple, customisable off-the-shelf enclosures, the CEM series has been developed for OEMs/ equipment manufacturers and features internal supports/guides for easy PCB installation. PCBs are held firmly, even when heavier components, such as relays or transformers, are used.

The CEM range is available in 17, 22 and 35mm and is designed to maximise internal capacity allowing use and mounting of a higher number of components. Using the 22 and 35mm versions it is possible to mount two

PCBs and by selecting one of two versions, PCBs can be mounted vertically or horizontally for the best application solution.

This customisable enclosure range can be manufactured in different colours and to customers' specifications. Holes can be drilled for component access; terminals can be blanked if not needed; and housing bodies can be printed with customer designs.

The CEM range is manufactured as standard from grey self-extinguishing polyamide 6.6 UL94V0 material.

Switchtec is a UK franchisee for electromechanical, electrical and electronic components. Using its 40-years' experience, the company focusses on addressing customers' business needs with knowledgeable technical support, supply chain management and cost avoidance.

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



Hongfa relays



CEM range



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# Investing in UK manufacturing

Visit DVR's stand to discover how the company is investing in its people, facility, machinery and services, all for the benefit of its customers

Over the past three years, DVR has invested over £3 million in new equipment and services, enabling the company to work with blue-chip organisations. DVR's website illustrates how far the company has progressed. The modern 40,000ft<sup>2</sup> bespoke facility is only the start. The equipment list is high calibre, with DVR boasting some exclusive machinery not available elsewhere in the UK.

Investments don't stop there. Without investing in people DVR would be unable to progress. Thus, the company has employed a dedicated in-house trainer which ensures both the equipment

and employees are at the forefront of the business. This future-proofs DVR and helps towards sustainability in electronics assembly long term.

DVR now offers a low-cost, fast turnaround PCB assembly manufacturing service for all new electronic designs required at the pre-production benchtop stage. This is not designed to replace production assemblies, but to complement design engineers and their need to rapidly test new and innovative electronic concepts. This service offers engineers the opportunity to have their concept produced professionally and quickly.

Service developments don't stop at electronics assembly. DVR has dedicated in-house design engineers who develop projects for customers across a range of applications. DVR is proud to partner with London Underground on projects that monitor train movements on the underground. Other London Underground projects include development of LED lights as a direct replacement for traditional filament bulbs. DVR now has a dedicated LU design team.

[www.dvr-ltd.co.uk](http://www.dvr-ltd.co.uk)



**DVR now offers a low-cost, fast turnaround PCB assembly manufacturing service for all new electronic designs required at the pre-production benchtop stage**

# ECS

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# Cyber secure memory

Discover how Nexus challenge the way engineers think about data access, data storage and security by introducing them to products that address the pain points that most widely available products do not

Nexus Industrial Memory is showcasing some of the industry's most secure embedded memory solutions including Flexxon's X-PHY solid state drives, recently selected by Lenovo for its all-in-one AI cybersecurity laptops. The SSDs are proving popular in embedded systems as security is implemented in the drive's firmware, which monitors for threats in real-time and locks down the moment a threat is detected. Nexus will be running demonstrations simulating cyber-attacks on the X-PHY.

Also on show will be a wide range of Flexxon's memory ICs, cards and modules.

Flexxon's solutions include ICs (such as SLC NAND flash and eMMC ICs), SSDs (including SATA II and III, PATA, PCIe NVMe) and standard form factor removable memory drives and cards.

The industry's most secure removable memory drive technology will also be shown. Atek's Datakey CryptoAuthentication memory tokens are ideal for the transfer of passwords, security keys, certificates, sensitive data or system configuration files. The tokens employ Microchip CryptoAuthentication high-security hardware ICs, which feature: a

unique, non-changeable 72-bit serial number (set by Microchip); a 512bit one-time programmable zone; a random number generator; and a SHA-256 hash algorithm for data encryption.

Nexus is an added value distributor which supports engineers in applications where a memory solution needs to be designed into a new product or to upgrade/evolve products when legacy memory solutions start failing or become susceptible to cyberattacks.

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



Flexxon's X-PHY solid state drives (SSD)



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# Dedicated to performance interconnect

*Push-pull connector manufacturer, Lemo UK, will be using its ECS stand to showcase its portfolio of precision engineered connection solutions*

Lemo's products are manufactured at its state-of-the-art facilities in Switzerland. The company will be using its ECS attendance to display a selection of its UK manufactured cable assemblies produced at its 42,000ft<sup>2</sup> purpose built facility in Worthing, West Sussex.

Connectors are also assembled on site which helps with current lead time issues inherent in the global supply chain. A show first will be the new high power M series designed to meet the

demands of increased power consumption across many sectors.

Visitors can also explore examples of IEC60601 compliant plastic connectors aimed principally at the medical market. These include increased creepage and clearance features to enhance user safety.

Fibre optic connectors will also be on display, including the SMPTE standard broadcast connector which has stood the test of time in demanding environments.

Lemo's M series offering includes Cat 6A and hybrid variants and is ideal for defence and aerospace applications where density and mass are important.

Staff will be on hand to answer visitors' questions and offer technical, sourcing and logistics advice covering a diverse range of applications.

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# Explore contract manufacturing services, face-to-face

Southampton based contract electronics manufacturer Esprit Electronics invites visitors to its stand to explore their production requirements over a free coffee and cake

Managing director Laurie Sigournay and sales director Russell Otter will be on hand to discuss the company's customer service focus and how its bespoke, flexible solutions can help OEMs with their contract electronics manufacturing requirements. Even in these unprecedented times Esprit continues to invest in capital equipment to provide the best possible service.

Ahead of visiting Esprit at the show, customers can visit the company's new

website ([espritelectronics.com](http://espritelectronics.com)) where they can find information on contract manufacturing services and solutions including PCB assembly, NPI, DfT/DfM, test/inspection, conformal coating and box build.

Esprit provides electronics manufacturing services to UK and European markets including marine, medical, environmental, mobility, industrial, instrumentation, oil/gas, security and communications.

Laurie Sigournay said: "We're thrilled to be exhibiting at the *Electronic Component Show*. It's fantastic that after a prolonged period of cancelled live events we now have the opportunity to listen to some great speakers, catch-up with our customers, and meet some new people again. We honestly can't wait."

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



**Esprit provides electronics manufacturing services to UK and European markets including marine, medical and environmental**

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# Reconnect with interconnect

Connector specialist EDAC is proud to support ECS' inaugural event and welcomes the opportunity to meet face-to-face with purchasing professionals and design engineers

EDAC, incorporating MH Connectors, is a globally recognised name in the design and manufacture of interconnect components. The company's products are used in a range of quality oriented applications including medical, industrial and communications networks. EDAC's wide product range includes D-Sub, USB and waterproof solutions, plus the magnetic jacks series: EDAC Jax.

EDAC Jax are available in single or dual stack multiport options, with spring fingers for better EMI and combining connectivity, signal conditioning and

interference suppression—all in one handy part. The range offers an easy integrated solution, letting engineers maximise available PCB space, boost efficiency and reduce noise.

EDAC's sales and product team will be on the stand to bring together specialist product knowledge and build relationships with key business partners. EDAC products can be customised, developed and delivered worldwide.

Visitors to EDAC's stand can also explore MH Connectors' product offering. Acquired by the EDAC Group in 2011,

MH Connectors is a popular brand across mainland Europe offering practical and versatile solutions for interconnect professionals.

EDAC will be using LinkedIn and Twitter @EdacEurope to broadcast its pre-show news.

[edac.net](http://edac.net)



**EDAC's sales and product team will be on the stand to bring together specialist product knowledge and build relationships with key business partners**

*Is your electronic contract manufacturing partner meeting your expectations?*

*If the answer is no, what is missing in the relationship, quality, delivery, service or cost. These are some of the key components often missing when choosing the right electronic contract partner.*

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# Committed to UK manufacturing

*Fermionx will be using its ECS stand to demonstrate its commitment to keeping the UK electronics manufacturing industry moving*

Like many British CEMs, Fermionx adapted quickly to the restrictions and challenges of the past two years, changing our internal processes to better manage the strain of the global restrictions imposed on the supply chain. We focused on our core values to ensure our partners were well supported.

From maintaining customers current build requirements, to supporting customers who are developing and evolving their products, FermionX has been working hard to identify the best ways of working together without compromising quality.

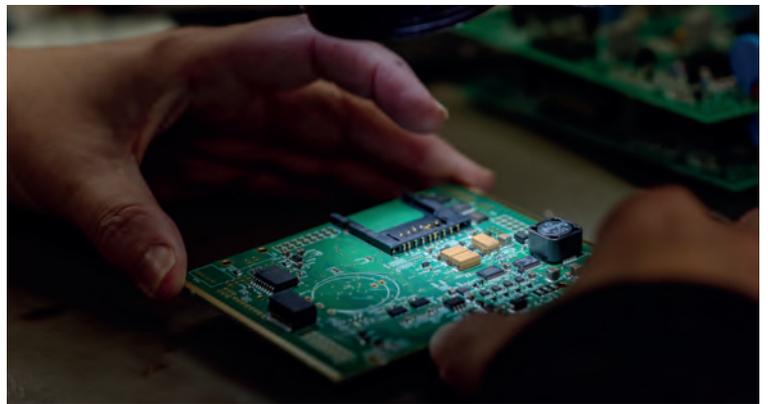
We never stop learning and never stop looking for ways to continue to deliver the service, partnership and support our customers value. Fermionx supports customers of all sizes, in many industries, across the UK. We work with partners on projects and products that rely on services including design for manufacture, manufacturing capability, component delivery and full product build.

The Fermionx team are looking forward to meeting existing and new partners at ECS. Whether visitors have projects at first build stage, have an established

product or are just keen to share how they have managed the last 24-months in manufacturing, we would love to talk to you.

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

**Fermionx has been working hard with its customers to identify the best ways of working together**





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# Time to digitalise work, workforce and workplace



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 argues that in today's new working world, companies may find agile cultures, built on policies that are intentionally fluid, work best*

Digitisation • By John Denslinger

Every day, pundits and so-called experts offer simplistic views of the post-Covid workplace. Most describe it in terse, declarative statements: employees return to office; employees remain remote; or a mix of the two referred to as hybrid. They cite surveys, studies, interviews as rationale for their conclusion. But as the latest Omicron variant demonstrates, the post-Covid world is not behind us at all. Rather, it suggests work related decisions must consider Covid and its' future permutations as long-term workforce and workplace disruptors. That being the case, successful companies may find agile cultures built on policies that are intentionally fluid work best.

Unfortunately, confusion and challenges still abound everywhere. Political directives, medical guidance, regulatory edicts, media hype rarely sync on the baselines for a safe and secure America. Are vaccine and mask mandates reasonable and enforceable? Are lockdowns and gathering restrictions proven deterrents to community spread? How does one safeguard personal health and still respect individual rights? How many shots constitutes vaccination? According to CDC stats, 77 per cent of the US population age five and over received at least one vaccination. Is that sufficient coverage for containment? Challenged from all sides, courts are now weighing-in with mixed rulings. No wonder companies thinking ahead are embracing digital strategies for the workforce and workplace.

Transitioning one's view of how work is accomplished traditionally to one that is seamlessly digital may be a hallmark decision to post-Covid survival. A digital strategy is where it starts but involving both employer and employee remains fundamental to digital optimisation. If concerns from either side are neglected the entire approach may fail. A Deloitte Insights Tech Trends 2021 article published earlier this year, suggested companies should ask themselves three basic questions:

- Work—what can be automated?
- Workforce—who can do the work?
- Workplace—where is work done?

Fortunately, work can be transformed today applying several existing technologies like AI, cloud, edge computing, robotics and a host of collaborative tools. Similarly, tomorrow's workforce can be energised by variety and continual investment in talent development. External resources (freelance, contract labour, Gig workers) will expand the workforce ushering in the era of advanced digital teamwork. And, then there is the workplace. The digital workplace becomes virtual, no longer limited by time and distance.

Borrowing a well-known phrase 'the genie is out of the bottle' the pandemic permanently altered the nature of work. Employees want jobs that accommodate individual preferences for flexibility and mobility. Employers still want development, productivity and measurability. Digitalisation bridges both. Digitalisation allows work to be accomplished by a satisfied workforce from any desirable workplace productively.

In the end, it's data, data, data. Collecting, analysing and disseminating data ensures organisational productivity, employee inclusivity, professional development and recognition, streamlined communications, efficient work processes and continued innovation. The beauty of digitalisation is the absence of traditional boundaries to work, workforce and workplace.

# Buyers' Guide

Manufacturer	Distributor	Telephone	Website	Franchised Distributor	No. of Lines for Principal	Stock Value for Principal	Minimum Order Value	% Lead Free for Principal Range	No. of Technical Support Staff	Total No. of Staff	Buffer Stock Facility
<b>CABLE ASSEMBLY &amp; HARNESSING</b>											
Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,000	N/A	0 €	N/A	50	2,500+	Y
FTDI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	50	N/A	0 €	N/A	50	2,500+	Y
Harwin	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,550	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
<b>CIRCUIT PROTECTION</b>											
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,800	N/A	0 €	N/A	50	2,500+	Y
EPCOS/TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,950	N/A	0 €	N/A	50	2,500+	Y
Littelfuse	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	11,450	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,150	N/A	0 €	N/A	50	2,500+	Y
<b>ENCLOSURES</b>											
Bud Industries	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,600	N/A	0 €	N/A	50	2,500+	Y
Hammond	Switch Electronics	01482 862255	switchelectronics.co.uk	Y	500	N/A	£0	70%	2	6	Y
Hammond	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,350	N/A	0 €	N/A	50	2,500+	Y
Metcase Enclosures	OKW Enclosures	01489 583858	www.metcase.co.uk	N	288	£40,000	£0	N/A	5	22	Y
New Age Enclosures	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
OKW Enclosures Ltd	OKW Enclosures	01489 583858	www.okw.co.uk	N	1,955	£40,000	£0	N/A	5	22	Y
Rolec Enclosures	OKW Enclosures	01489 583858	www.rolec-enclosures.co.uk	Y	935	£40,000	£0	N/A	5	22	Y
Teko Enclosures	OKW Enclosures	01489 583858	www.teko.co.uk	Y	1,860	£40,000	£0	N/A	5	22	Y
<b>FREQUENCY MANAGEMENT</b>											
ABRACON	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,750	N/A	0 €	N/A	50	2,500+	Y
AEL Crystals Ltd	AEL Crystals Ltd	01293 789200	www.aelcrystals.co.uk	N	N/A	£200,000	£50	100%	3	15	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
ECS	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,050	N/A	0 €	N/A	50	2,500+	Y
Epson	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	900	N/A	0 €	N/A	50	2,500+	Y

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Manufacturer	Distributor	Telephone	Website	Franchised Distributor	No. of Lines for Principal	Stock Value for Principal	Minimum Order Value	% Lead Free for Principal Range	No. of Technical Support Staff	Total No. of Staff	Buffer Stock Facility
Golledge Electronics Ltd	Golledge Electronics Ltd	01460 256 100	www.golledge.com	N	N/A	£800,000	£0	100%	12	24	Y
IQD Frequency Products	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,500	N/A	0 €	N/A	50	2,500+	Y
Jauch Quartz	Digi-Key Electronics	0800 587 0991	www.digikey.co.uk	Y	500	£250,000	0	100%	15	130	Y
Kyocera	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	950	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
TXC Corporation	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
<b>HEATSINKS</b>											
Aavid	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
<b>ICs &amp; SEMICONDUCTORS</b>											
Alliance Memory	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18,700	N/A	0 €	N/A	50	2,500+	Y
Broadcom Limited	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Central Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,250	N/A	0 €	N/A	50	2,500+	Y
Cirrus Logic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Cree, Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Diodes Incorporated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	8,200	N/A	0 €	N/A	50	2,500+	Y
FTDI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	100	N/A	0 €	N/A	50	2,500+	Y
Infineon	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	8,300	N/A	0 €	N/A	50	2,500+	Y
Intel	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,750	N/A	0 €	N/A	50	2,500+	Y
Maxim Integrated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	14,050	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	24,200	N/A	0 €	N/A	50	2,500+	Y
Micron Technology	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
Monolithic Power Systems (MPS)	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	850	N/A	0 €	N/A	50	2,500+	Y
Nexperia	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,600	N/A	0 €	N/A	50	2,500+	Y
Nordic Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	60	N/A	0 €	N/A	50	2,500+	Y
NXP	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
ON Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18,700	N/A	0 €	N/A	50	2,500+	Y
Power Integrations	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	750	N/A	0 €	N/A	50	2,500+	Y
Qorvo	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	700	N/A	0 €	N/A	50	2,500+	Y
Renesas Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,550	N/A	0 €	N/A	50	2,500+	Y
ROHM Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,900	N/A	0 €	N/A	50	2,500+	Y
Semtech	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	350	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
Skyworks	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
STMicroelectronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10,050	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	39,050	N/A	0 €	N/A	50	2,500+	Y
Toshiba	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,050	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10,850	N/A	0 €	N/A	50	2,500+	Y
Xilinx	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,900	N/A	0 €	N/A	50	2,500+	Y
<b>INTERCONNECTION</b>											
3M	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,750	N/A	0 €	N/A	50	2,500+	Y
Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	33,200	N/A	0 €	N/A	50	2,500+	Y
Cinch Connectivity Solutions	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,250	N/A	0 €	N/A	50	2,500+	Y
FCI / Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,850	N/A	0 €	N/A	50	2,500+	Y
HARTING	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,800	N/A	0 €	N/A	50	2,500+	Y
Harwin	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,950	N/A	0 €	N/A	50	2,500+	Y
Hellermann Tyton	Lane Electronics	01403 790661	www.fclane.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	Y
Hirose Electric	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,850	N/A	0 €	N/A	50	2,500+	Y
Huber+Suhner	Lane Electronics	01403 790661	www.fclane.com	Y	766	£116,000	£0	100%	6	38	Y
Intelliconnect (Europe) Ltd		01245 347145	www.intelliconnect.co.uk	N/A	N/A	N/A	N/A	100%	5	30	
ITW McMurdo	Lane Electronics	01403 790661	www.fclane.com	Y	866	£219,000	£0	100%	6	38	Y
JAE Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	23,600	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	17,150	N/A	0 €	N/A	50	2,500+	Y
Polamco	Lane Electronics	01403 790661	www.fclane.com	Y	218	£146,000	£0	100%	6	38	Y
Positronic	Lane Electronics	01403 790661	www.fclane.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	Y
Radiall	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y
Samtec	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	16,300	N/A	0 €	N/A	50	2,500+	Y
Souriau	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,300	N/A	0 €	N/A	50	2,500+	Y
Souriau	Lane Electronics	01403 790661	www.fclane.com	Y	1,929	£806,000	£0	100%	6	38	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	41,850	N/A	0 €	N/A	50	2,500+	Y
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
<b>MEDICAL CERTIFIED</b>											
Review Display Systems		01959 563 345	www.review-displays.co.uk				£100				
<b>OBSOLESCENCE / HARD TO FIND</b>											
	Cyclops Electronics	01904 415 415	www.cyclops-electronics.com	N/A	177,232	£12m	£100	75%	3	78	Y
Rochester Electronics	Rochester Electronics	+44.1480.408400	www.rocelec.com	Y	299	N/A	\$250	N/A	10	400+	Y
<b>OPTO ELECTRONICS</b>											
Broadcom Limited	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,300	N/A	0 €	N/A	50	2,500+	Y
Cree, Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,800	N/A	0 €	N/A	50	2,500+	Y
Intel	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	20	N/A	0 €	N/A	50	2,500+	Y
Osram Opto Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,300	N/A	0 €	N/A	50	2,500+	Y
Toshiba	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	450	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y
<b>PASSIVES</b>											
AVX	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	17850	N/A	0 €	N/A	50	2,500+	Y
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	15,100	N/A	0 €	N/A	50	2,500+	Y
Coilcraft	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,750	N/A	0 €	N/A	50	2,500+	Y
EPCOS / TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,450	N/A	0 €	N/A	50	2,500+	Y
KEMET	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	23,650	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18700	N/A	0 €	N/A	50	2,500+	Y
Ohmite	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,550	N/A	0 €	N/A	50	2,500+	Y
Panasonic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25,450	N/A	0 €	N/A	50	2,500+	Y
Taiyo Yuden	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,100	N/A	0 €	N/A	50	2,500+	Y
TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	13,050	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	11,500	N/A	0 €	N/A	50	2,500+	Y
TT Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,050	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	43850	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,750	N/A	0 €	N/A	50	2,500+	Y
Yageo	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	21,450	N/A	0 €	N/A	50	2,500+	Y
<b>PASSIVES ALTERNATIVES</b>											
BEC Distribution Ltd		01844 275824	www.bec.co.uk		5,000	N/A	£0	100%	3	5	Y
<b>POWER &amp; BATTERIES</b>											
FRIWO Gerätebau GmbH	Haredata Electronics	01423 796240	www.haredata.co.uk	Y	250 - 500	€1M	£250	100%	7	14	Y
Jauch Quartz		01276 605900	www.jauch.com			£500,000	0	95	15	130	Y
Mean Well	Ecopac (UK) Power Ltd	01844 204420	www.ecopacpower.co.uk	Y	6,000	£2M	£0	100%	8	30	Y
Bel Power Solutions	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
CUI Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
MEAN WELL	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,400	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1500	N/A	0 €	N/A	50	2,500+	Y
RECOM	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,150	N/A	0 €	N/A	50	2,500+	Y
TDK-Lambda	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,900	N/A	0 €	N/A	50	2,500+	Y
TRACO Power	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,000	N/A	0 €	N/A	50	2,500+	Y
Vicor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,300	N/A	0 €	N/A	50	2,500+	Y
XP Power	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
<b>SENSORS</b>											
ams	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	300	N/A	0 €	N/A	50	2,500+	Y
Bosch	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25	N/A	0 €	N/A	50	2,500+	Y
Honeywell	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
Maxim Integrated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	350	N/A	0 €	N/A	50	2,500+	Y
NXP	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	300	N/A	0 €	N/A	50	2,500+	Y
Sensirion	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	80	N/A	0 €	N/A	50	2,500+	Y
STMicroelectronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	75	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	650	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	850	N/A	0 €	N/A	50	2,500+	Y
<b>SWITCHES &amp; KEYBOARDS</b>											
Apem	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,850	N/A	0 €	N/A	50	2,500+	Y
C&K Switches	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,550	N/A	0 €	N/A	50	2,500+	Y
E-Switch	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y

## Buyers' Guide

Manufacturer	Distributor	Telephone	Website	Franchised Distributor	No. of Lines for Principal	Stock Value for Principal	Minimum Order Value	% Lead Free for Principal Range	No. of Technical Support Staff	Total No. of Staff	Buffer Stock Facility
EA0	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,800	N/A	0 €	N/A	50	2,500+	Y
Honeywell	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
NKK Switches	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,000	N/A	0 €	N/A	50	2,500+	Y
Omron	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
Panasonic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,350	N/A	0 €	N/A	50	2,500+	Y
<b>TERMINAL BLOCKS</b>											
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
<b>THERMAL MANAGEMENT</b>											
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
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
<b>TRANSFORMERS &amp; INDUCTORS</b>											
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
<b>WIRELESS SOLUTIONS</b>											
DIGI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Espressif	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	30	N/A	0 €	N/A	50	2,500+	Y
Laird Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	100	N/A	0 €	N/A	50	2,500+	Y
Lantronix	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	30	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	20	N/A	0 €	N/A	50	2,500+	Y
u-blox	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10	N/A	0 €	N/A	50	2,500+	Y

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## Contract Manufacturers Buyers' Guide

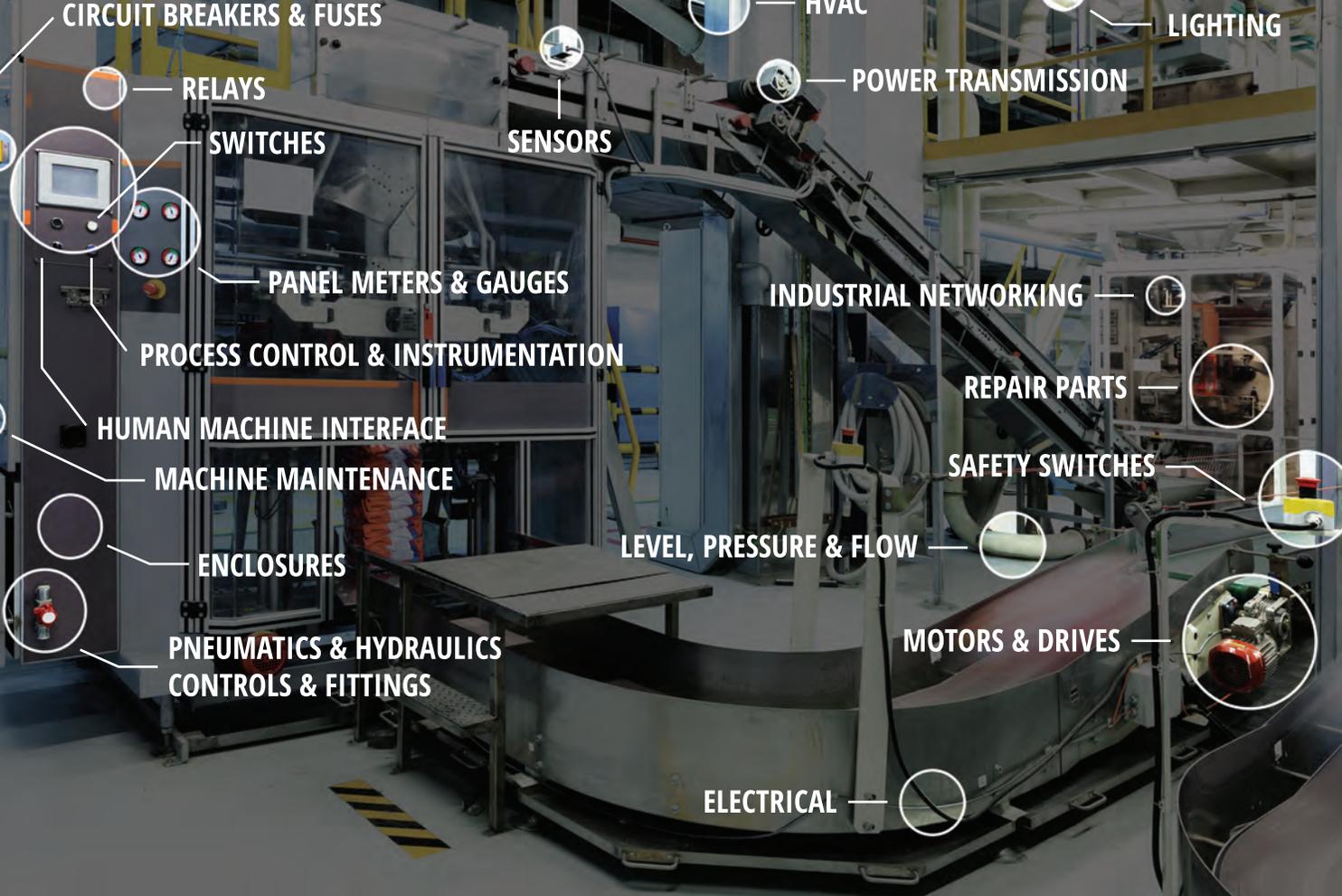
Manufacturer	Telephone	Website	Turnover	Location	Employees	Number of Surface Mount Lines	Approvals	BGA Capacity	Lead Free Manufacturer	Prototyping	Design Capability	Full Turnkey	Cables and Harnessing
Challenger Solutions Ltd	01245 325252	www.challengersolutions.com	£10m	Essex/SE	70	9	AS9100 Rev D, ISO9001:2015, ISO 140001:2015, UL, CCC, IPC-610-G Class 3, TUV	Y	Y	Y	Y	Y	Y
CML Innovative Technologies (uk) Ltd	01284 714700	www.cml-it.com	£12M	UK/EU/China	65		ISO9001, TS16949, UL ISO9001 2015, IATF 16949 2016	N	Y	Y	Y	Y	Y
Corintech Ltd	+44 (0)1425 655655	www.corintech.com	£12.5m	UK & Far East	72	10	AS9100, ISO9001, IPC-A-610 Class 3, J-STD-001	Y	Y	Y	Y	Y	Y
Custom Interconnect Ltd	01264 321321	www.cil-uk.co.uk	£18.6m	Andover (Hampshire)	130	6	AS9100 ISO13485 ISO9001 IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y
Electronic Technicians Ltd	01202 897722	www.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 J-STD-001, IPC 7711/7721	Y	Y	Y	N	Y	N
Hallmark Electronics Ltd	01782 362255	www.hallmarkelectronics.com	£2.4m	Staffordshire	26	2	ISO9000/UL, IPC610/D	Y	Y	Y	Y	Y	Y
Icon Electronics Limited	01423 449080	www.iconelectronics.co.uk	£6.5m	Hampshire & Yorkshire	70	5	AS9100, ISO9001, BS EN ISO/IEC 80079-34:2018 ATEX, IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y
Incap Electronics UK Limited	01782 753200	www.incapcorp.com	€113m+	UK, Slovakia, Estonia & India	2,000	20	ISO9100, ISO14001, ISO13485, AS9100D, ISO45001 & IATF16949	Y	Y	Y	Y	Y	Y
Industrial Electronic Wiring Ltd.	+44(0)1793 694033	www.ievw.co.uk	£5.5m	Swindon, UK	60	N/A	ISO9001:2015, IPC610, IPC620	N	Y	Y	N	Y	Y
Jaltek	01582578170	jaltek.com	£10m	UK	90	3	AS9100, ISO9001, ISO13485, IPC-A-610 Class 3, Certified IPC Trainer (IPC-A-610, J-STD-001 & J-STD-001 Space Addendum)	Y	Y	Y	Y	Y	Y
KEY-TECH ELECTRONIC SYSTEMS	01592 597711	www.key-tech.co.uk	£5m	UK	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	£151m	UK/EU/China	1,100	18	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, 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, JOSCAR	SML	Y	4-58	Y	Y	Y	Y	Y	Y	Y
GSPK Circuits Ltd	+44 (0)1423 798 740	www.gspkcircuits.ltd.uk	M/R	UK, Europe, Asia	IS 9001:2015, IATF 16949:2016, EN (AS) 9100, Joscar	SML	Y	4-34	Y	Y	Y	Y	Y	Y	Y
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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