

ELECTRONICS

MAY/JUNE 2020

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*The European magazine for purchasing professionals*



MAY/JUNE 2020

## **WHAT'S MISSING FROM THE SUPPLY CHAIN PUZZLE?**

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**ROBOTICS:  
DIFFERENT ATTITUDES,  
SAME STRUGGLES**  
page 10

---

**SPECIAL SKILLS OF  
AEROSPACE PROCUREMENT**  
page 11

---

**API SOLUTIONS  
TRANSFORMING INDUSTRY**  
page 26



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## On the cover – May/June 2020

What's missing from the supply chain puzzle?

## Editor's Word



### The day my supply chain stood still

A few weeks ago, my wife heard a radio appeal by a local nurse asking if owners of 3D printing cells could help manufacture face visors for medical staff.

My machine was on tick-over, so I joined a WhatsApp team and started making. To start, I took a base design published by Prusa and redesigned it to get the print time under 60 minutes.

Then I tackled the three row BoM: a reel of PLA; 250-micron acetate sheet; and 25m of button elastic. The PLA and acetate were delivered next day. The acetate was cut/punched and attached to the printed headbands. Semi-finished visors were stacking up, awaiting their elastic rear headband.

Regarding the elastic, the button version (which has formed slots) is slightly unusual. My local haberdashery had closed so the only option was mail order. Most were offering very long lead times, in some cases months, while others were selling very short lengths, at very high prices.

Eventually I found some UK stock on two to four-day delivery. On day four I still hadn't received a dispatch notification. The reply to my question was interesting. It hadn't been dispatched because the carrier hadn't picked it up. I offered to pay extra for next day but was told the carrier network was suffering and the delivery date was unknown. Ultimately, we swapped the button elastic for elastic bands.

It's not called a 'supply chain' for fun. It's there to remind us that every chain is as strong as its weakest link.

*Jon Barrett*

## Contents

# 04

### News

*Demand for water-based fluxes increases*



# 14

### Purchasing

*Procurement: 2020 reboot*



# 18

### Q&A

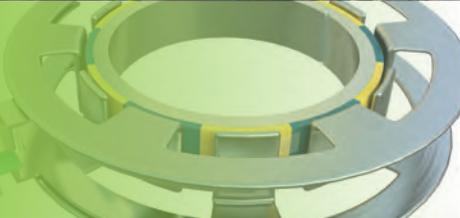
*Buying into power cord capacity*



# 23

### What's new

*Talk about torque sensing*



# IBC

### Buyers' Guide

*All the facts and figures to help you buy*



## Contact



### EDITORIAL

**Managing Editor:** Jon Barrett  
jonb@electronics-sourcing.eu  
**Contributing Editor:** Amy Barker  
amyb@electronics-sourcing.com  
**Editorial & Production:** Thomas Smart  
thomas.smart@electronics-sourcing.com

### ADVERTISING

**Director of New Business:** Charlotte Morgan  
charlotte.morgan@electronics-sourcing.co.uk  
**Advertisement Manager:** Emma Poole  
emma.poole@electronics-sourcing.com  
**Marketing Manager:** Amy Leary  
amy.leary@electronics-sourcing.com

### CIRCULATION

**Circulation Manager:** Vicky Leary  
vicky.leary@electronics-sourcing.com  
**Circulation Account Manager:** Liz Poole  
liz.poole@electronics-sourcing.com

### DESIGN

**Graphic Designer:** Josh Hilton  
josh.hilton@electronics-sourcing.co.uk

### PUBLISHER

**Mark Leary**  
mark.leary@electronics-sourcing.com  
**Office Manager:** Denise Pattenden  
denise.pattenden@electronics-sourcing.com

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## Demand for water-based fluxes increases



Due to the coronavirus, the supply of alcohol-based fluxes to the electronics industry remains critical. Rising demand and alcohol shortages have led to steady price rises and a lack of fluxes. Thus, Emil Otto states the number of electronics service providers switching to its Green Line water-based fluxes is increasing.

Emil Otto's marketing and sales manager, Markus Geßner, said: "Since there is virtually no artificial alcohol on the market anymore, production volumes are becoming smaller and smaller as demand increases. We expect this development to continue in the coming weeks."

Green Line series contain fluxes for wave and selective soldering, with soldering results correspond to those achieved with alcohol-based fluxes. A change to water-based fluxes is therefore possible without further effort.

Geßner added: "We are registering an increased willingness to change and are well prepared for this. The demand for Green Line products is increasing. With water-based fluxes we have no bottlenecks whatsoever and can also produce subsequently at any time."

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

## Battery-based storage larges up

Total has launched a battery-based energy storage project in Mardyck, at the Flandres Center, in Dunkirk's port district. With a storage capacity of 25MWh and output of 25MW, the lithium-ion system will be the largest in France. It will be used to provide fast reserve services to support the stability of the French power grid. It is part of government policy to support the development of electrical capacity.

Scheduled for commissioning in late 2020 the system represents an investment of around €15M and will be based on Saft's Intensium Max 20 high energy solution comprising 11 integrated 2.3MWh containers, designed and manufactured at Saft's production site in Bordeaux.

Total's chairman and CEO, Patrick Pouyanné, said: "This project is part of Total's strategy to develop the stationary energy storage solutions that are critical to the expansion of renewable energy, which is intermittent by nature. It will contribute toward the goal of increasing the share of renewables in France's energy mix, while helping to stabilise the domestic power grid."

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

## Gearing up for RFID demand

To meet the increasing demand for RFID hardware components, Gera-Ident states it has significantly renewed and expanded its production.

Managing director, Ramin Hassan, said: "Demand for the construction of customer-specific ID points and their basic components such as RFID readers and antennas has increased significantly. Gera-Ident is currently reinforcing the development of identification products and systems for customers, as well as cooperating with universities and R&D institutions."

To meet increasing requirements, design competence has been enhanced with new software, and the electronics area has been expanded to include new manufacturing and testing capacity. Internal prototype production has also been expanded, while the assembly area has been upgraded and equipped with more space and technology.

New employees have joined the team and new regional partners have been acquired for mould construction, sheet metal processing, painting and electronic components.

[www.gera-ident.com](http://www.gera-ident.com)



## Buying into flexible connections

Mouser is stocking TE Connectivity's Lumawise Endurance S connector system. Comprising products designed for sensors and control, the keyed system provides a standardised ecosystem offering flexibility in applications such as: street and area lighting; roadway lighting; commercial outdoor lighting; and city management systems.

The connector system features multiple key combinations, with a standardised interface between the receptacle and sealing cap or module base. The system includes several base and dome combinations, with an integrated single gasket that can accommodate and seal both module and luminaire using the same connection interface for 40 mm and 80 mm central management systems. Lumawise Endurance S is field upgradeable.

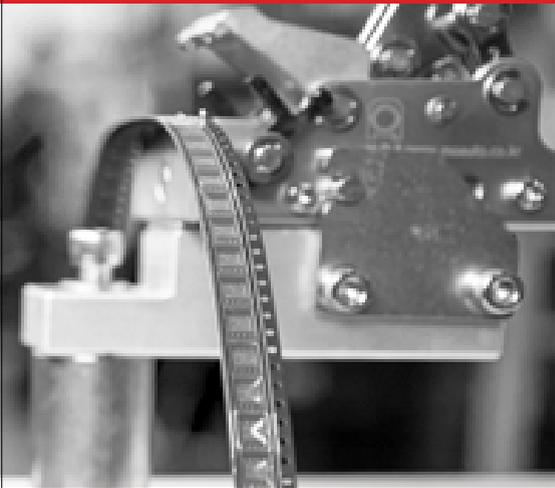
Zhaga Book 18 certified, the system features a 5A, 250V contact rating with a 10kV dielectric withstand voltage rating to the mounting surface. The IP66 and IK09-rated receptacle assembly, base and dome combinations provide a sealed electrical interface and robust, impact-resistant packaging solution.

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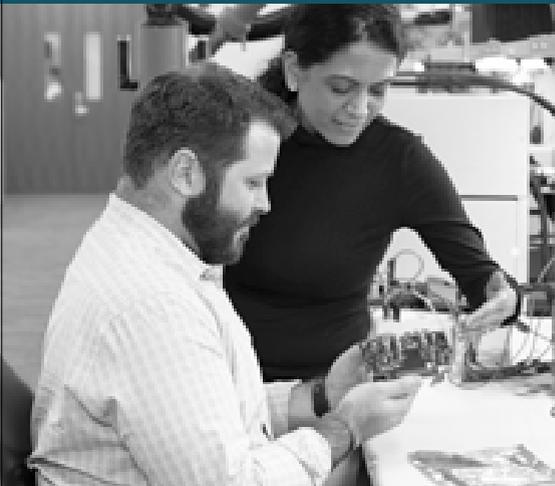


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## Defined product analysis responsibilities

FBDi has presented new guidelines for the Product Analyses and 8D-Report. The trigger for developing the guide is that in almost 80 per cent of complaints about electronic components, with requested product analyses or 8D-Reports, no fault can be found by the manufacturer. To increase quality and throughput speed, and enable realistic assessments, the FBDi Competence Team Quality developed the qualified action guide, which is now available for download in German and English.

This way, FBDi is promoting clean communication between all parties and underlines its role as a distribution platform for comprehensive exchange in the supply chain. The practical guide defines the prerequisites for a meaningful implementation of product analyses and 8D-reports at manufacturers across distribution.

The clear definition of necessary steps in the event of complaints is intended to ensure an optimal process through a uniform, clearly understandable procedure for all parties. The measures contained also support an improved workflow and defined responsibilities in product analyses. Misunderstandings and false expectations can be avoided, because the more qualified the application for product analysis is, the higher the chance of a meaningful and comprehensive error analysis up to an 8D report.

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



## Ramping up medical Li-ion battery production

BMZ Group is converting production to accelerate its focus on Li-ion batteries for medical applications. Customers producing ventilators have asked the company for its solidarity and support. In some cases, inquiry volume has risen by 50 per cent.

Founder and CEO, Sven Bauer, said: "For us, health protection is paramount. That is why we didn't hesitate for a moment when we received a distressed call from manufacturers of urgently needed ventilators. We are in the fortunate situation of having access to an extensive inventory, allowing us to increase the number of batteries we produce for use in medical technology. BMZ immediately assembled a team to ramp up production. We're not leaving anyone behind."

The Group was divided early on into different product areas to weather volatile markets. Today, the company has 3,000 employees worldwide, and delivers products ranging from batteries for power tools (cordless screwdrivers etc) to storage units for interim storage of CO<sup>2</sup>-free energy production (photovoltaic systems, wind turbines etc) to batteries weighing tons for industrial e-mobility (forklifts, excavators etc).

[www.bmz-group.com](http://www.bmz-group.com)

## Knowing which way is up

Mouser Electronics is now stocking Analog Devices' ADIS16507 precision inertial measurement unit (IMU) designed to provide a simplified, cost-effective method for integrating accurate, multi-axis inertial sensing into industrial systems, IoT applications, unmanned aerial vehicles, smart agriculture and autonomous vehicles.

The part delivers six degree-of-freedom sensing using a MEMS-based triple-axis gyroscope and triple-axis accelerometer, allowing devices to accurately characterise motion in a broad set of conditions. The 15 by 15 by 5 mm IMU is tested and factory calibrated for bias, alignment, sensitivity and linear acceleration to ensure each sensor can provide accurate measurements via dynamic compensation formulas.

The device is available in models with dynamic ranges of  $\pm 125$ ,  $\pm 500$  or  $\pm 2000$  degrees per second. Tight orthogonal alignment simplifies inertial frame alignment in navigation systems, and a serial peripheral interface and register structure provide a simple interface for data collection and configuration control.

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



## Local assembly speeds custom rugged connector delivery

European customers have faster, more cost-effective access to Souriau's 851 series rugged connectors thanks to TTI's decision to start assembly at its Munich facility. TTI already distributes Souriau parts so its decision to strengthen its value-added services will cut lead times for the customisable parts to one-week max.

Souriau's 851 series bayonet connectors are designed for rugged applications such as: road-building equipment; machine tools and robotics; military telecommunications systems; water-measurement equipment; aircraft; and the oil and gas industry.

The connector system offers a wide degree of customisation, which means customers can specify them to closely match their application's needs. For example, the connector can be specified with between two and 61 contacts, so that both power and signal transmission can be handled in a single connector to reduce system complexity and minimize component and installation costs.

The 851 series connectors are available in three main families: environmental, hermetic and PC tail versions.

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



# Keeping cool as EV market heats up

*New report examines current methods and future trends for the thermal management of electric vehicles*

As the electric vehicle market grows there is increased need for effective thermal management. Keeping heat under control leads to improved charging, performance, range, longevity and safety. A new report from IDTechEx covers aspects of thermal management for electric vehicles including the batteries, motors and power electronics.

High profile battery related fires from well-known automotive manufacturers does little to instil confidence in potential consumers. With this in mind several new regulations have been proposed relating to safety aspects unique to electric vehicles. The

likely outcome of this being that manufacturers will be required to halt thermal runaway at the individual cell level and warn the vehicles occupants, giving them at least five minutes to exit the vehicle once a thermal event occurs.

Several factors must be considered when designing an electric vehicle for safety, from materials used in the battery pack construction to thermal runaway prevention and early detection. Several companies are designing methods of stopping thermal runaway between cells including flame retardant encapsulants, interweaved products and phase change materials.

Effectively dissipating heat from the battery module or pack to a heat sink is also important and usually carried out using a thermal interface material. This is another area where manufacturers have adopted several strategies including gap pads, fillers and conductive adhesives.

Every manufacturer has its own methodology to thermally manage their batteries with no clear consensus on the most effective design. Companies like Tesla are set on their patented water-glycol coolant lines which snake their way between the cylindrical cells in the pack, whereas Nissan and Toyota are committed to air cooling.



There are multiple battery cooling methodologies



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## Thermal

Active battery cooling with fluids keeps a vehicle cool in conditions where it is stationary but the batteries are in high demand (eg during fast charging). It also allows batteries to be raised to optimal temperature in cold ambient conditions. These are significant advantages but come at the expense of weight, complexity and cost.

Despite these caveats, IDTechEx has observed a market shift towards liquid or refrigerant cooling and foresee this trend continuing into the future, especially following the rise of charging with 350kW sources, with the amount of liquid or refrigerant cooled batteries exceeding 500GWh by 2030.

In addition to widely adopted technologies, other emerging alternatives include immersion cooling and phase change materials. These technologies are gaining modest traction, especially for more specialised markets like construction. The report appraises all these cooling methods in addition to the players utilising them.

The electric motor is the unifying component of an electric vehicle and more demand is being put on them regarding performance during extended use. Most manufacturers use motors containing permanent magnets. These magnets can be denatured and rendered useless above a critical temperature and also need effective thermal management.

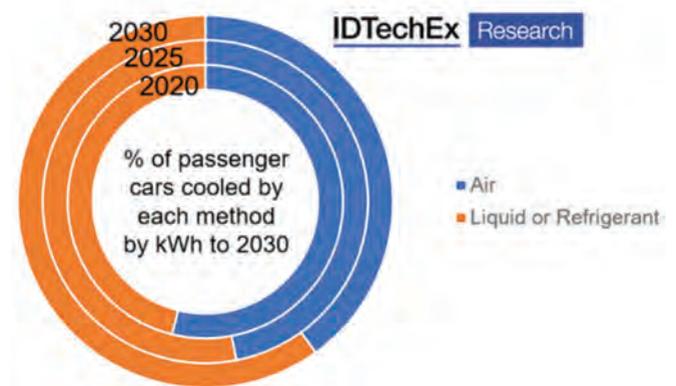
Even motors without permanent magnets still require cooling

to improve performance and reduce overheating neighbouring components. Methodologies adopted typically consist of air, oil or water-glycol cooling. Several manufacturers use the same coolant circuit for their batteries and motors. This reduces the number of components and fluids, while simultaneously allowing excess motor heat to warm the batteries or passengers in cold conditions.

In addition to batteries and motors, power electronics also have to deal with significant heat. The way wire bonds and soldering is carried out, plus the material used, impacts the performance and longevity of the power electronics. Several OEMs are shifting towards advanced substrates and even eliminating the thermal interface material altogether.

IDTechEx's report, *Thermal Management for Electric Vehicles 2020-2030*, covers the above topics through extensive research including primary interviews with companies in the field. The report covers the strategies used by major OEMs, emerging technologies and market forecasts.

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



Air v liquid cooling



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# European robotics: different attitudes, same struggles

To gain insights into European robotics, Reichelt Elektronik commissioned a OnePoll study. Here we explore the findings

In almost all European countries surveyed, most respondents state their enterprise does not currently employ robotic solutions. Italy and Germany are the leaders, with 55 and 48.8 per cent relying on robots. They are followed by the Netherlands and France where 45.5 and 41.6 per cent of firms have invested. The UK at 34.8 per cent and Austria and Switzerland, each 31 per cent have the lowest prevalence.

Regarding a robot's purpose almost all countries agree that robots: take over repetitive, uniform tasks; facilitate physical work; and replace humans in dangerous assignments. Other application include education and test, significant in the UK.

Also, when asked which advantages did or could persuade enterprises to invest in robotics, all countries answer similarly. The

main benefit is increasing productivity through automation. Other positive aspects included: reduction of mistakes; supporting workers in physically demanding and dangerous tasks; and decreasing costs.

The study shows most European companies prefer to purchase robots from manufacturers as they place a huge emphasis on support services such as comprehensive technical advice. Other optional benefits include software platforms, hardware leasing, implementation/integration and maintenance.

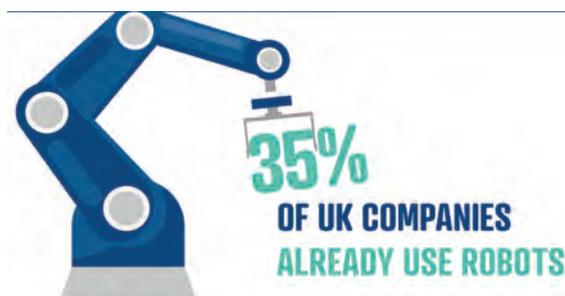
Asked about purchasing intentions over the following 12-months (before coronavirus), attitude was divided. Most enterprises in Germany, France, Italy and the Netherlands were planning to invest within a year. Austrian, Swiss and British organisations, for the most part, did not intend to.

While acquisition costs were the number one concern in Germany (41.8 per cent), the country showed the highest share of enterprises willing to spend more than €100,000 on robotic projects. Austria and Switzerland were the most hesitant to invest, but almost a third of organisations that decided to do so had a budget over €100,000. In Italy and France, the majority (30 and 29.6 per cent) claimed to have dedicated financial means of €50,000 to €100,000 for robots.

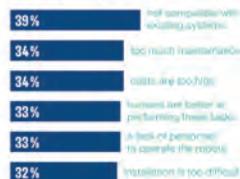
British interviewees stated the biggest challenge is the possible incompatibility of new robots with existing systems. The survey also shows a lack of trust in the capabilities of robots across all markets. In fact, a significant share thinks that tasks can be better executed by humans.

Collaborative robots have become increasingly

interesting for enterprises to start their automation journey. Being smaller and more flexible, small and medium-sized firms have decided to invest in cobots. In Germany, Switzerland, UK, France and Italy, the largest part of the decision makers reply that their enterprise already uses collaborative robots or plans to do so in the following 12-months. Austrian (57.81 per cent) and Dutch (48.18 per cent) firms show interest but haven't made the final decision for an investment yet. Attitude towards cobots is torn in Switzerland. Over half (56 per cent) of interviewees claim that collaborative robots are already being employed or will be implemented within 12-months, 41 per cent have clearly decided against the technology.



What are the main factors holding back the introduction of robots in business?



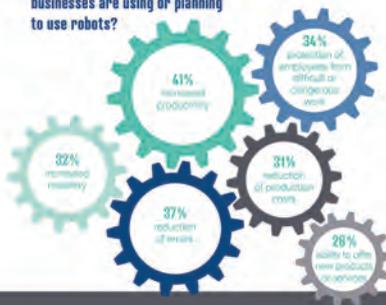
**Most enterprises in Germany, France, Italy and the Netherlands were planning to invest within a year**

Robot use in comparison to other countries



**38%** of companies plan to purchase more robots in 2020  
55% are interested in purchasing robots

What are the main reasons businesses are using or planning to use robots?



Representative survey of OnePoll on behalf of Reichelt Elektronik, November 2019

# Special skills of aerospace procurement

*Debbie Rowland explains that purchasing components for mission-critical or harsh applications needs a tougher approach than buying parts for commercial designs*

The sourcing of components for aerospace applications places demands on procurement professionals which require a careful balancing act. Limitations which are part of sourcing components for critical applications have several factors: components can sometimes only be sourced from an approved supplier list; parts must comply with operational and regulatory standards; and equipment typically has an extended lifetime.

The lifetime of aerospace systems can be up to 20-years. This means component obsolescence is a factor which must be considered from the design and prototyping stages and beyond. It is certainly a factor

in maintenance, repair and overhaul (MRO) programmes which deliver support throughout the equipment's lifetime. Whilst any approved distributor should be able to supply the parts, aerospace OEMs and CEMs should also ensure distributors have active obsolescence strategies which can check a component's long-term viability. This strategy limits component obsolescence and needs to be supported by specialist knowledge and experience.

#### **Distribution supplier or partner**

Buyers can take one of two approaches to purchasing components for tough or critical applications. Parts can simply be purchased from a distributor on the

approved list; or the buyer can decide to use the distributor as an in-depth procurement partner. The partnership approach means the distributor should have the skills, processes and commitment to work as an integral part of the procurement process.

For a new design, the real question for the buyer is not just price and availability but also the component's longer-term availability. Whilst the full component lifespan cannot be guaranteed, the distributor should have the experience of supplying components for long-life and critical applications as well as a close relationship with the manufacturer. The relationship between component manufacturer

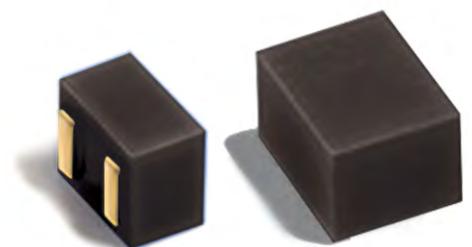


**Charcroft** director,  
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and distributor will provide an understanding of the component's proposed lifetime and any risk of an imminent end-of-life (EOL).

For components which become obsolete during the equipment's lifetime there are several potential solutions from a partner distributor. A last-time-buy (LTB) could provide inventory and the distributor may hold the inventory for the OEM or CEM. An alternative is for the distributor to identify and supply a replacement component to ensure ongoing viability throughout the programme's lifetime. Later in the lifecycle, obsolescence can affect the continued need

for the spares to support maintenance, repair and overhaul.

**Understanding component compliance**

Industry standards which the parts must meet are an essential element in the purchasing decision. For some aerospace systems, the most stringent approvals are not mandatory and passive components which are approved to automotive-grade AEC-Q200 can be used to deliver reliability at a reduced cost. The use of automotive devices requires specialist knowledge to identify where these devices offer a suitable alternative. Aerospace parts

are often specified for high temperature, high reliability and high tolerances but may also need to be released to CECC or a MIL-SPEC.

Strict industry standards, such as JOSCAR and AS9100, give OEMs the confidence the distributor is operating to the highest standards. These accreditations indicate the distribution process is backed by in-house expertise and robust quality control systems.

**From design to through-life**

Distributors should certainly understand the full range of approvals, but through-life support demands specialist

“ “ “  
**Industry standards which the parts must meet are an essential element in the purchasing decision**

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technical expertise and the commitment to assess the bill-of-materials (BOM). Stringent quality systems and checks should be used before shipment to ensure the parts are correct, undamaged and have the appropriate documentation. In aerospace applications, buying components from a franchised distributor ensures the parts are genuine and fully traceable. This overcomes the huge risk of sourcing from non-approved suppliers which can add to potentially receiving counterfeit devices.

Through-life support for a programme emphasises the longevity and experience of distributors which can also be important. Support during design and prototyping is crucial for ensuring a component has the best fit and performance characteristics. Specialist support on pricing can also be pivotal during design. A specialist franchised distributor should be able to liaise with the manufacturer on the longer-term validity of pricing, quantity price breaks and additional support such as component testing.

Partnering with a distributor which offers specialist support for the aerospace market will help purchasing professionals manage demanding procurement processes. From ensuring the long-term viability to providing through-life support, the distributor's knowledge and skill can be crucial to the continued success of aerospace procurement.

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# Procurement: 2020 reboot



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 the post Covid-19 electronics manufacturing world a heavy burden will fall on procurement to help pick up the pieces and restore order

Procurement • By John Denslinger

**W**hile medical teams, financial institutions and governments continue working tirelessly on issues, the forecast ahead for procurement is almost as daunting. Faced with the aftermath of shelter-in-place and similar decrees, the great American industrial reboot is about to begin.

Containing the spread among citizens took precedence over business as usual. Yet for many of us, that decision ripped apart global supply lines, the life blood of our industry. Left in the wake were closed businesses big and small; employees asked to work remotely or temporarily laid off; and while e-commerce flourished, daily person-to-person commerce vaporized. Supply chains once considered reliable, almost invincible, unraveled. Surreal is an understatement! Now the burden falls on procurement to pick up the pieces and restore order.

The post-virus world will have its challenges as many industries, manufacturers and suppliers vie for needed resources. The resumption of business will not be smooth, and neither will the job of procurement. There will be countless problems to solve. Perhaps the first glaring one is component shortages, late deliveries and lack of alternatives. Unlike capacity issues that stymied supply in 2018, this time a number of new factors are at play. For example, not every supplier will restart at the same time. That consequence could delay flow of essential raw materials to some. It would be wise to assess each supplier's start up plan paying particular attention to country of origin. Be alert to newly designated virus hot spots, as well as, that locale's tendencies on constraints. The situation could change overnight, so nonstop monitoring is suggested.

The virus also exposed one other vulnerability not usually a concern: employees, people, labor. With so many individuals sidelined by shelter-in-place directives, the workforce will likely trickle back unevenly. For those companies who resorted to massive layoffs, the road back may be spasmodic. On the other hand, employers retaining core competencies throughout the downturn should experience moderate to seamless restarts. In either case, be cognizant that employees will also need time to recover. Many will need to overcome the personal trauma inflicted by the crisis. Furthermore, each must now adjust to new conditions, work rules and employment policies in a post Covid-19 environment. HR fatigue may take an early toll on productivity.

There are some helpful resources available. As mentioned last month, ECIA continues surveying manufacturers and distributors on Covid-19 impact. The third update compiled by Dale Ford, chief analyst, is now available. Also, Robin Gray, ECIA COO & general counsel, posted ECIA's efforts to make sure the electronic industry (manufacturers, distributors and corresponding supply chain) is designated essential and thus exempt from current and future shelter-in-place orders. This might be extremely important should there be a Covid recurrence.

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# Prices for optoelectronic components will fall

Overall weaker demand and high inventory levels for some optoelectronic components such as LEDs mean buyers can expect short lead times and soft prices



James Carbone

Prices for optoelectronic components, including LEDs, image and light sensors, will decline this year due in part to the coronavirus pandemic, which has resulted in weakened demand.

The average price for an optoelectronic component will fall about 2 per cent to 16.7 cents on average as demand slows. Weaker demand also means that the overall optoelectronics market will drop 6 per cent in 2020 to \$41.7 billion from \$44 billion in 2019, according to researcher IC Insights. Unit shipments will decline 3.2 per cent from 258.4 billion in 2019 to 250.1 billion in 2020, the researcher said.

However, prices for some optoelectronic components from some manufacturers increased following the spread of COVID-19. For instance, Lumileds increased prices 4 per cent for LEDs. The company said the pandemic resulted in higher costs for transportation and some raw materials. Signify, formerly

Phillips Lighting, increased prices 3 per cent for LEDs and lamp products.

The good news for optoelectronics manufacturers is that the slide in revenue and demand may be relatively short lived. In 2021, sales should increase 10 per cent to \$45.8 billion as unit shipments rise 12 per cent to 281.1 billion, according to IC insights. While demand will rise, buyers can expect lead times to be mostly stable and prices will decline 1 to 2 per cent depending on the type of optoelectronic component.

The forecast assumes that containment of the COVID-19 will take hold around the middle of the year, the researcher said. "The market decline in 2020 could be greater if containment of the virus doesn't happen until later in the summer," said Rob Lineback, senior market analyst for IC insights. He said there could be stronger growth for optoelectronics if there is faster recovery from coronavirus.

## The Chinese connection

China is a big market for optoelectronics accounting for about one third of all sales. The rest of Asia-Pacific accounts for about 27 per cent sales. However, even if demand begins to increase in China and other Asian countries "we do not anticipate a 'snapback recovery' in the second half of 2020 as we saw in the recovery from the financial crisis-driven industry downturn in 2009," said Lineback.

The optoelectronics recovery is expected to be more gradual with fairly strong sales and unit shipment increases in 2021. However, sales will not be "over the top as they were in 2010 when optoelectronics sales surged 30 per cent and unit volume jumped 29 per cent after 2009 declines of 5 percent in revenue but 15 per cent growth in units, he said. The increase in unit occurred in the downturn year mostly because high-brightness LEDs were emerging in display-backlighting applications, he said.

While all optoelectronic components will suffer sales declines, some parts will be more impacted than others. CCD image sensors will have the biggest decline as revenue falls 7 per cent. However, CMOS sensor revenue will drop only 3 per cent and unit shipments will be flat compared to last year, according to IC Insights.

LED lamp device sales are forecast to drop 7 per cent in 2020 to \$13.2 billion and unit shipments will fall 3 per cent to 203.4 billion, the researcher said.

While the overall optoelectronics market had been growing prior to the coronavirus outbreak, most of the growth was due to a few product segments. "We had three product segments that all record revenue and double-digit growth in 2019," said Lineback. Those products include CMOS image sensors, laser transmitters, and light sensors. "But there was single-digit per cent declines in other optoelectronic product segments," said Lineback.

## By the Numbers

Source: IC Insights



5%

The compound annual growth rate for optoelectronic components from 2019 through 2020



\$44 billion

The size of the global optoelectronic components market in 2019



16.7 cents

The average price for an optoelectronic component in 2020



30%

The size of the revenue increase for CMOS image sensors 2019



\$56 billion

The size of the worldwide optoelectronic component market in 2024





In 2019, CMOS image sensors revenue increased 30 per cent, light sensor sales rose 32 per cent and laser transmitters revenue grew 14 per cent. However, LED sales declined 4 per cent, optocoupler revenue fell 6 per cent. CCD image sensor sales dropped 11 per cent and infrared device revenue declined 4 per cent, said Lineback.

**LED supply glut**

LEDs were hit by a 10 percent drop in unit purchases mostly because of the oversupply in the market, said Lineback. "There's a bit of a glut of LEDs in the market rate because of China's overinvestment. They made high-brightness LEDs a priority because they wanted to be self-sufficient. That's what drove the market in 2019," said Lineback.

Oversupply will likely continue through the year due in part to the pandemic which slowed production in China, which means high inventory levels of LEDs will continue for a while. Most LED production in China is outside of Wuhan, Hubei province, which was the center of the outbreak. However, LED manufacturers in other parts of China could not

resume full production because workers, many of whom had traveled to other regions of China or other countries for Chinese New Year, could not get back to factories because of travel restrictions. In addition, workers returning were quarantined for a period of time before they could go back to the production line, so some factories were only at 50 to 60 per cent capacity in March, according to research firm TrendForce.

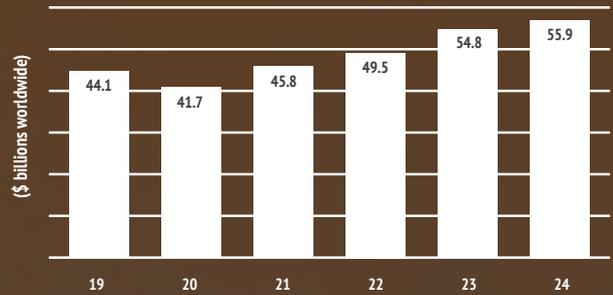
While there is a lot of uncertainty in the optoelectronics market, the long-term outlook is positive and there will continue to be growth in demand and revenue for optoelectronic components.

The compound annual growth rate (CAGR) for the optoelectronics revenue will be about 5 per cent from 2019 through 2024. The market will grow from \$44.7 billion in 2019 to nearly \$56 billion in 2024, according to IC Insights. Unit shipment CAGR will be about 7 per cent.

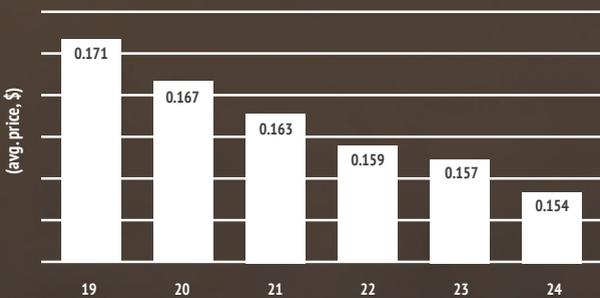
One reason for the growth will be rising demand for image sensors. "The applications that

The worldwide optoelectronics market will decline in 2020, sales growth will return in 2021 and continue through 2024  
Source: IC Insights

**Optoelectronics market will bounce back**



**Tags for optoelectronic parts, will fall**



Buyers can expect slow but steady price declines for optoelectronic parts through 2024  
Source: IC Insights

are really driving CMOS image sensors are strong" and there are new applications emerging, said Lineback. Such applications include machine vision, security, video surveillance products which all use cameras that are equipped with image sensors.

In addition, more cameras are being used in smart phones. Smart phones used to have two cameras, but now more are being shipped with three or more cameras, so more image sensors are needed, he said.

**Strong demand from automotive**

Automotive is also using more optoelectronics. Automotive optoelectronics sales are forecast to rise 10 per cent per year from 2019 through 2024, reaching \$8.5 billion, said Lineback.

"We are seeing a lot of high-brightness headlights and more image sensors being used more in automotive systems," he said. For instance, automatic braking, which prevents a vehicle from crashing, uses image sensors and more vehicles are being equipped with the safety feature.

In 2014, automotive accounted for only about 7 per cent of optoelectronics sales. In 2018, that percentage was 12 per cent. By 2024, automotive will represent about 14 per cent of our control electronic component sales, according to IC Insights.

Communications, which includes optical transmission networks and smart phones, is the single biggest customer segment for optoelectronics components representing 44 per cent total revenue. Industrial is the second biggest segment at 24 per cent. Industrial include robotics and a lot of commercial systems which use optocouplers and infrared devices and light sensors, said Lineback.

Consumer electronics accounts for about 14 per cent of sales, but it's percentage is shrinking as other segments have used more optoelectronic components.





# Buying into power cord capacity

*In this article, Interpower emphasizes the importance of product quality and service level when sourcing and purchasing power costs for domestic and international markets*

**Q** What significant changes has the power cord market experienced over the last 20-years?

In North America, high volume power cord customers have, for the most part, either moved manufacturing to China or switched from North American to Chinese suppliers. There are few low mix, high volume electrical equipment manufacturers left in North America and even fewer that source their components in North America. Today, electrical equipment manufacturers operating in North America are low volume, high mix operations that make high quality, high performance equipment. Applications include medical devices, scientific instrumentation and test/measurement instrumentation. Order sizes are smaller but more frequent than 20-years ago.

**Q** How has Interpower adapted to these changes?

Interpower has integrated vertically and now makes cords that meet all of the world's cord standards, while also making its own cable. Interpower operates a customer-focused manufacturing model that achieves same-day shipments of standard items, one-week manufacturing lead times of cords that must be made to order, and no minimum order. This allows customers to purchase exactly what they need, while maintaining minimum inventory levels.

**Q** Regarding pricing, how have cheaper foreign power cords impacted sales and how have you responded?

Interpower experienced declining sales over the past ten years while gaining market share. We have competed successfully with

foreign vendors that offer lower prices by improving service and responsiveness while maintaining a very high quality level. High quality and outstanding service is important to manufacturers of quality equipment and Interpower has staked out a strong position in that market sector.

**Q** What are the differences between the power cords made in China compared to Interpower cords?

There are some quality Chinese cord manufacturers, but the differentiating feature of most Chinese cords is their low price. To achieve low prices, manufacturers cut corners on quality and only accept large orders manufactured with significant delivery times. Interpower's cord manufacturing process starts with the cable itself. We have optimized our manufacturing system to produce the cable we need



**Bob Wersen**, President at Interpower Corporation

to meet customer power cord requirements and do so quickly. All our cords and cord sets have approvals in all the countries they are used in. Also, Interpower cords are tested for continuity and short circuits and then hi-potted at 2,500VAC. Resistance of ground is measured at 25A. Finally, all cords are visually inspected to eliminate any with sink marks or other visual imperfections.

**Q** Coronavirus is causing major disruption to international supply channels. Does made in the USA mean 100 per cent availability to readers globally?

All components used in manufacturing Interpower cords, with the exception of one plug-bridge, are manufactured outside of China. Most remaining parts including copper wire and insulation material are made in the USA. We ship small quantities from stock on the day we receive the order and anything that we have to manufacture is ready for shipment in one week.

**Q** What percentage of Interpower's power cords are for international applications compared to North American use?

Interpower's power cord sales are approximately 50/50 international v North American.

**Q** How do you see the power cord market over the next 12-months in the US and international markets?

Interpower sees the market in the next twelve months as stable to slightly weaker than it was in 2019.

**Q** What advice would you give to *Electronics Sourcing* readers looking to source power cords?

Determine how critical price, quality and service levels are in your operation. Service levels would include fast and certain delivery times, no minimum order, quick and accurate information on requirements of test agencies in various international markets. If your objectives are quality and high service levels, contact Interpower.

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

**Interpower has integrated vertically and now makes cords that meet all of the world's cord standards, while also making its own cable**



# Power supply production in China starts to get back to normal

*Supply of AC-DC converters and DC-DC modules should not be a problem for buyers as production of power supplies has resumed*

Buyers can expect normal lead times, ample availability and falling prices for most power supplies for the rest of the year, despite the impact that Coronavirus has had on the overall electronics supply chain including power supply manufacturers.

As of early April, power supply production in China resumed and was ramping up. About 60-70 per cent of all power supplies are made in China, according to Mohan Mankikar, president of Micro-Tech Consultants, a power supply research firm based in Santa Rosa, Calif. Most power supply manufacturing in China is in Shanghai and Shenzhen, which is “pretty far away from Wuhan,” where the outbreak of Covid-19 originated, said Mankikar.

“Christoph Wolf, president RECOM Power, Inc., said RECOM operates one factory in Xiamen, China and two in Taiwan. “The Taiwan factories were minimally impacted. Our Chinese factory is almost running at full capacity, as the government lifted restrictions over there” he said in the first week of April. Wolf added RECOM’s bookings and billing were strong and lead times have not been affected. “However component availability for our factories may become an issue moving forward, because of restrictions in

other Asian countries where these components are made,” said Wolf. This could impact lead times in the future across the industry.”

Power supply manufacturing in China “may be OK, but it is not fantastic,” said Mankikar. The bigger issue is the impact that coronavirus is having on demand. Many companies have shut down, furloughing or laying off workers. With no income, sales of televisions, mobile phones, computers, etc have declined. That obviously means less demand for power supplies.

“You can make all the power supplies that you want, but if there’s nobody there to buy them it doesn’t matter,” said Mankikar. He said the overall impact of coronavirus on the power supply market will depend on the duration of the pandemic. “China seems to have recovered relatively quickly” but countries in other regions were still being ravaged by COVID-19 in early April and it was unknown when other regions would recover.

**Recovery will happen**  
Despite the pandemic, the long-term outlook for the global power supply industry is positive, according to Mankikar. The switching power supply market grew from about \$30.1 billion in 2018 to \$31.6 billion in 2019, he said. Growth could

have been stronger, but inventory levels were high in the electronics supply chain.

“In 2018 a lot of our distributors invested in inventory,” said Wolf. “Some of them built up too much inventory, which led to fewer orders in 2019. But the point of sale level was slightly above 2018,” said Wolf.

The inventory has been worked off and bookings improved at the end of the year and prior to the COVID-19 outbreak, RECOM was expecting business to be better in 2020. “The outlook for this year was pretty good on growth side but that was pre-coronavirus.”

However, RECOM has a broad customer base which should help the company weather the storm. “Our customer base is diverse and power supplies are needed in every single application,” said Wolf. It has a strong presence in medical and industrial IoT.

“Our bread-and-butter businesses is DC-DC converters. That continues to be very strong, but the biggest growth that we see is on the AC-DC modules,” said Wolf.

RECOM and other power supply manufacturers may see some sales growth in 2020 despite of the pandemic. Micro-Tech



**Christoph Wolf**, president, Americas for power supply manufacturer **RECOM**



**Our bread-and-butter businesses is DC-DC converters. That continues to be very strong, but the biggest growth that we see is on the AC-DC modules**

Consultants is forecasting 1.1 per cent growth as sales rise from \$31.6 billion in 2019 to about \$3.2 billion in 2020. However, sales growth may end up being flat or down depending on the impact of coronavirus, said Mankikar. Longer term, Mankikar says annual sales growth for power supplies would be about 2.7 per cent from 2019 through 2024, he said.

Mankikar points out that power supplies, which include AC-DC and DC-DC converters, is a mature market. "It is one of the oldest electronics industries. It started in 1945 at the end of World War II and is now 75 years old," he said. It is mature and mature industries tend to have lower annual sales growth rates. The power supplies business is steady, but double-digit growth is highly probable. Low to mid-single digit growth is more likely.

While sales growth in power supplies is steady, sales from certain customer segments are higher than others and sometimes reach double-digit thresholds. For instance, some manufacturers that sell power supplies for LED lighting applications have grown 15 per cent in some years.

Consumer electronics, which includes mobile phones, desktop computers, laptops, accounts for about 30 per cent of power supply revenue and is the largest customer segment for power supplies, according to Micro-Tech Consultants. Power supply sales to the consumer segments tends to be in the low-single digits.

Transportation, which includes cars, trucks and trains, is the second biggest segment, representing about 20 per cent of power supply revenue, said Mankikar. Computing and office equipment, which includes servers, buys about 13 per cent of all power supplies as measured by revenue, he said.

In 2019, transportation was a key driver for power supply sales. Much of power supply demand in transportation is for "battery chargers used for electric vehicles in different locations," said Mankikar. Some chargers are used in cars and trucks, while others are used in public places such as charging stations. Some are used at residences and in office parking lots, and demand for them continues to grow, he said.

The mobile devices and chargers market is estimated to be the largest segment of AC-DC and DC-DC merchant power supplies, accounting for 29 per cent of total revenues of AC-DC and DC-DC market, according to researcher OMDIA. However, the market is high-volume, low-margin nature and its share is expected to drop to 23 per cent of the total power supply market in 2023 because of stagnant growth and falling prices, the researcher said. Mobile device and chargers market will have a five-year compound annual growth rate of -2.1 per cent from 2019-2023, according to OMDIA.

### The 5G bump

A key driver for power supply sales growth is 5G infrastructure, but it may be a short-term driver. "With telecom you get a big boost as the infrastructure is built, but then growth flattens" once the networks are completed and all the equipment is place, said Mankikar.

The industrial segment continues to be an important segment for power supply manufacturers. "It is pretty stable. It grew about 2.5 per cent last year because it is a mature segment," said Mankikar. However, it may be negatively impacted this year because of the decline in the oil and gas industry as energy prices fall.

While industrial and telecommunications are traditional segments for power supplies, "new

applications for power supplies are always occurring and there's so much diversity in applications," said Mankikar. "There are smart speakers, artificial intelligence, machine learning applications and home and business security applications that continue to "pop up all the time and all of them require power supplies, he noted.

One application that has had strong growth in recent years is LED lighting systems. Many power supply manufacturers build LED drivers for such lighting systems. An LED driver is a self-contained power supply which regulates the power required for an LED or array of LEDs. Because LEDs are low energy lighting devices with long lifespans, they require specialised power supplies.

Wolfe said RECOM supplies LED drivers for some applications. "LED drivers are dominated by Asian suppliers. However, there are a lot of companies that make intelligent lighting controls and do a lot more than just controlling the lights. They are doing other IoT functions. That's where we're seeing the growth in the Americas," he said.

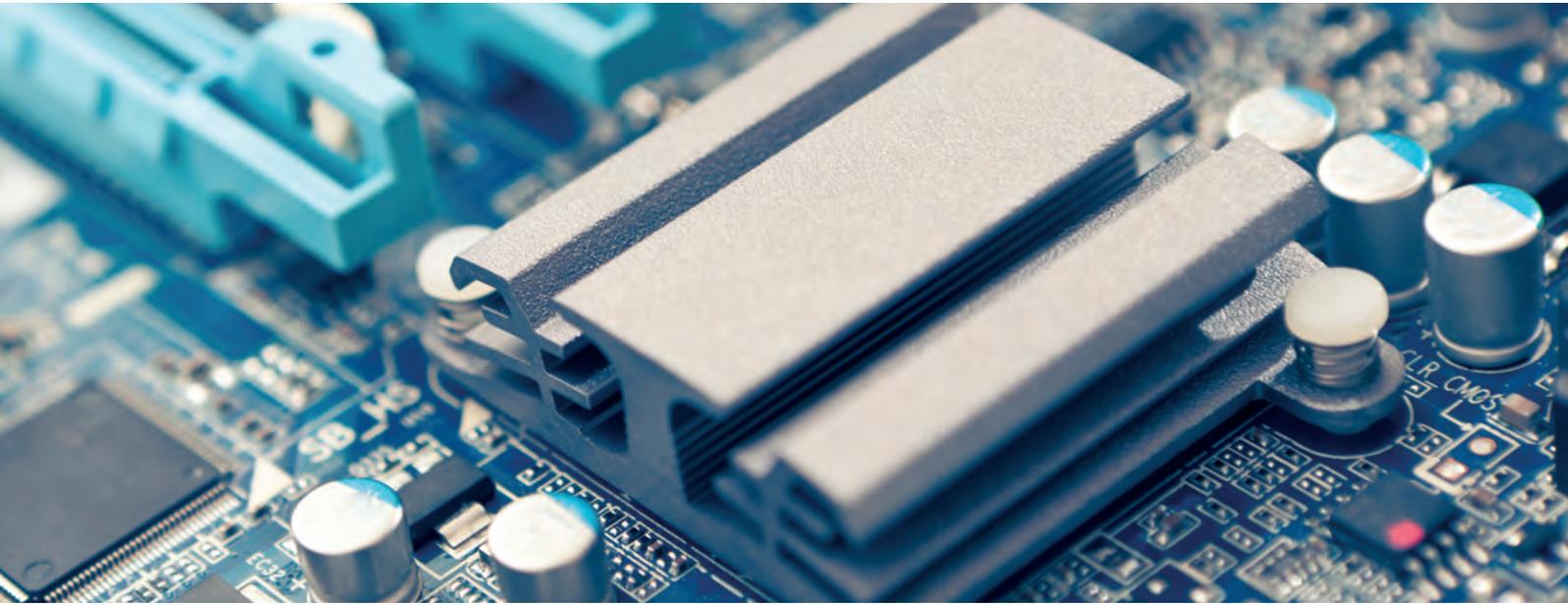
Manufacturers building power supply products for lighting systems manufacturers posted strong growth in 2017 and 2018, but business flattened in 2019.

The LED power supply segment was "going gangbusters in 2018 with a 15 per cent growth rate," but sales in the segment went down significantly in 2019, said Mankikar. "I don't know if it's a one-year deal or if it's a trend. There's a company called Mean Well which grew to a \$1 billion company in 2018. Last year its sales remained flat. It was a big surprise," he said.

A Chinese company called MOSO Power makes LED drivers. The company had sales of \$250 million in 2017,



**I see the power supply market getting more and more consolidated, but it is gradual**



\$190 million in 2018 and \$181 last year. It is unclear why MOSO's LED drivers sales have declined, said Mankikar.

However, it is likely that in the long-term, LED lighting systems will continue to be an important segment for power supply manufacturers. LED lighting is projected to be the fastest-growing application sector in revenue terms from 2018 to 2023, according to researcher OMDIA. The market for merchant power supplies in LED lighting application was about \$5.6 billion in 2018, accounting for 25 per cent of the total market. It is projected to increase to \$7.6 billion in 2023. LEDs will account for 31 per cent of the total power supply market in 2023, the researcher said.

#### Supply will meet demand

While there are many traditional and new applications for power supplies, the good news for electronics purchasers is there likely will be ample supply to meet demand for the foreseeable future. With adequate supply, buyers can expect short lead times and modest price declines through the rest of the year and probably longer.

There are many large, established power supply manufacturers such as Delta, Artesyn and TDK-Lambda, among others, as well as thousands of smaller power supply manufacturers. Some specialise in power supplies for certain types of product.

In addition, it's likely that new power supply manufacturers will go into business. "Power supply design is not that difficult and it does not need a lot of capital equipment," said Mankikar. "It's not that difficult to get started. You may not become a big company, but you can get into the business," he said.

However, while some new power supply companies will form, there could be some mergers and acquisitions over the next several years. While there has not been much consolidation with power supply manufacturers compared to other segments of the electronics industry, there are indications that may change.

"I see the power supply market getting more and more consolidated, but it is gradual" said Dinesh Kithany, senior principal analyst, wireless power supplies for researcher OMDIA. He noted that in 2017 the top 10

companies had about 42 per cent of all power supply sales. In 2019 that grew to 45 per cent and that percentage will likely continue to increase. One reason that the big are getting bigger is the top 10 companies are acquiring some smaller power supply manufacturers.

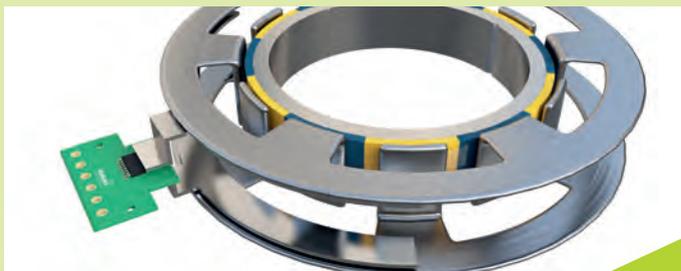
"There is a change in the power supply landscape occurring," said Kithany. The big players are buying smaller companies and I'm expecting more and more mergers and acquisitions to happen in the power supply market," he said.

"Larger companies may be active with acquisitions because they want to expand within the market, within the same sector, or expand into new applications," he said.

A power supply manufacturer that doesn't supply much to the medical equipment or solid-state lighting industries may acquire a smaller company that does. Some small niche power supply manufacturers that are growing fast because of their narrow focus may be the targets of larger power supply manufacturers.



**It's likely that new power supply manufacturers will go into business**



### Talk about torque sensing

Melexis' MLX91377 ASIL-ready Hall sensor IC suits safety-critical automotive systems such as electric power-assisted steering.

With an ambient operating temperature up to 160°C and combining high linearity with excellent thermal stability, including low offset and sensitivity drift, the MLX91377 supports accurate, dependable torque sensing.

Developed as a Safety Element Out of Context (SEoOC), the technology complies with ISO 26262 and is qualified to AEC Q-100 Grade 0. Supporting functional safety level ASIL-C in digital (SENT or SPC) mode and ASIL-B in analog mode, the component offers a high level of functional safety, per die, and can detect internal failures and enter a safe state to prevent unintended vehicle behaviour. The available dual die TSSOP-16 package offers two redundant dies to enable support for safety critical applications like steering and braking.

Applications include steering torque sensors, acceleration, brake, or clutch pedal sensors, absolute linear position sensors, float-level sensors, non-contacting potentiometers, small-angle position sensors and small stroke position sensors.

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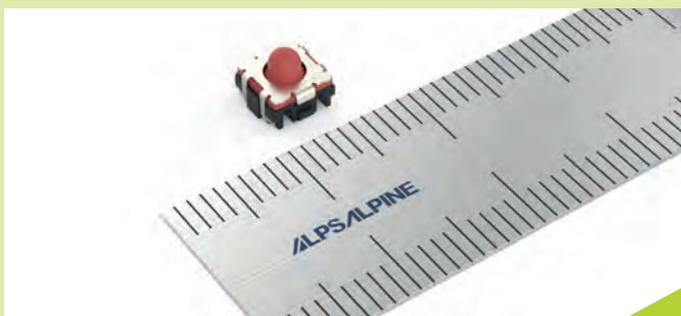
### Lagging connectors for live swap

The One27 with a 1.27mm pitch is now also available with lagging contacts. This makes it possible to simply change modules in industrial applications during live operation. Electronics are reliably protected during this process, as a defined sequence of signal, ground, and electrical contacts is adhered to during insertion and disconnection. This ensures that the ground connection is established first to conduct ground potential differences and electrostatic charges before the data line is connected.

Modules that contain the One27 can be disassembled and replaced without having to switch off the device. The double-row SMT connector with an angled male connector can be assembled individually and its lagging contacts can be placed in any position.

The connector range offers a variety of types and plug versions. The board-to-board distance can range between 8.00 and 13.88mm. The male and female connectors can be inserted anywhere within a 1.5mm range, thanks to secure mating. The connection is established by a double-sided female contact that envelops the contact pin of the male connector.

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### Switch discourages accidental operation

Alps has added a new 5N and 1.04mm travel model to its SKSU series compact, middle-stroke Tact Switch line up suitable for automotive use. Mass production begins in April 2020.

As an automobile safety consideration, input switches inside vehicles are increasingly integrated into the steering wheel area for drivers to operate without taking their eyes off the road.

Responding to such needs, the SKSU's characteristics are designed to enhance clarity, helping to prevent accidental operation, while impressing with a premium operating feel. The switch incorporates a pre-stroke design, helping to prevent rattling while integrated into the end product.

Because the SKSU Series has mounting compatibility with the existing SKTQ Series, customers using an existing product can choose the best operating feel for their vehicle brand without having to modify the board design.

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# Distributors' e-commerce tools provide critical information and insight to buyers

*Some e-commerce tools can help buyers manage component obsolescence and reduce supply chain risk*



James Carbone

Most electronics distributors offer purchasers a range of online e-commerce tools to help them find parts to make the purchasing process easier and more efficient. However, there is no one-size-fits-all solution because the kind of tools that buyers need varies depending on the volume and mix of parts that are required.

Some purchasers need a robust suite of e-commerce tools that can handle and track multiple bills of materials and provide real-time information about lead times, prices, and product change and end of life notices. However, other buyers just need a tool that allows them to cut and paste a bill of materials into an online shopping cart.

For example, Integra, a distributor based in Anaheim, Calif., has limited e-commerce tools for buyers. "We have what we call a quick BOM which allows customers to come to our website and upload their bill of materials," said Mark Baker, director of business development for Integra, which sells passives, discrete semiconductors, connectors, switches and other components.

"A member of our inside sales team then goes through the BOM and fills out a spreadsheet for the customer and sends it back within 24 hours with information about the lead times of the parts, cross references and the availability of

the parts that we have in stock and what we don't." Such a tool is what many of Integra's customers want.

However, many other purchasing professionals and engineers need a wider range of more complex purchasing tools that can handle a number of BOMs, cross reference the manufacturer's part numbers to a customer's part numbers, identify a part number when the exact number is not known by a customer and provide quick access to product attributes.

"Some organisations will integrate Mouser's application programming interface (API) so they can build Mouser's price and availability into their own corporate tools," said Hayne Shumate, senior vice president, Internet business for Mouser Electronics. He said the tools are available in 20 languages and list quantity-based pricing in many currencies.

Mouser's BOM tool has an order history application that keeps track of all past orders whether they came in through Mouser's website, phone, email, or EDI. Parts previously purchased can be added to a cart to reorder directly from history, said Shumate.

#### Identifying supply-chain issues

Mouser's tool can also help customers identify and manage



**Hayne Shumate**, senior vice president, Internet business for **Mouser Electronics**

**"We look at customer's relevant history with a product including purchases, quotes, carts and other signals and notify customers of critical product change notifications and end of life status changes"**

component obsolescence and other supply chain issues in its BOM tool and in its project manager, shopping cart, search results and product pages, he said.

"We do get daily signals from many suppliers regarding life-cycle and risk of products," said Shumate. "Some of this is automated, but the best information from some suppliers comes through the regular meetings and calls we have with them and understanding their plans for product direction," he said.

By working with suppliers, Mouser can reflect their product evolution decisions through the "badges on our site that indicate product life-cycle status and through links that direct customers to replacements for obsolete products," said Shumate.

However, the tools will not have decision-making information if a buyer is "trying to determine if he will be able to source 100,000 of a part every month for the next 36 months," he said. Mouser's primary focus is keeping inventory on the shelf for design engineers.





### Managing obsolescence

Mouser has tools that can help with managing obsolescence. Not only will the tool indicate products that are obsolete or end of life, "but we also show a status of not recommended for new designs," said Shumate. "This gives the designer an indication that the product may be available for some time, but there are better options for designs that will be going forward," he said.

If a supplier provides information on replacement products for an EOL part, that information is reflected in the tools. If no specific information is supplied, the "Find Similar" tool on the website in Mousers BOM tool allows the customer to find other products that most closely match based on our deep database of product attributes, said Shumate.

Mouser's tools push information to customers if the status of product has changed. "We look at customer's relevant history with a product including purchases, quotes, carts and other signals and notify customers of critical product change notifications and end of life status changes," he said.

Nishant Nishant, vice president and global head Digital for Avnet, said Avnet is seeing increased demand for "self-service tools

across the spectrum of customers. Tools for purchasers and supply chain managers are getting more utilisation," he said.

Avnet's key purchasing tool is MyAvnet. With MyAvnet, buyers can do parametric searches, receive product change and end of life notices, upload bills of materials, and check past bills of materials, stock levels and prices.

Avnet also offers a forecasting tool which keeps buyers apprised about the availability of scheduled parts using color-coded notifications, said Nishant. If an ordered part is coded green, the buyer knows there are no issues with the parts. An amber color means there are some issues, but it does not necessarily mean the "issue cannot be resolved. It just means we need to talk about that," said Nishant. The parts could still be delivered on time.

"If a part turns up amber, it could mean that the lead time of the component stretched," said Nishant. "It could be the quantities that the customer is asking for are not available immediately based on our lead time. The amber code gives buyers "some early warning signal so we can be proactive about the scheduled order versus coming to the 11th hour and needing to be reactive," said Nishant.

**"Avnet is seeing increased demand for self-service tools across the spectrum of customers. Tools for purchasers and supply chain managers are getting more utilisation"**



**Nishant Nishant**, vice president and global head Digital for Avnet

When a scheduled order is coded red, it means the "risk is high and we need to take some mitigation action," said Nishant. "It could be that production of the part shut down for some reason. It could mean we have to pull some parts in early or have to find alternative solutions," he said.

Avnet has a conversation with the customer about how critical the issue with a part is and what the alternatives are. In some cases, the solution may require a redesign of hardware, said Nishant.

Avnet's forecasting tool "gives the supply-chain manager a holistic view of everything that they have in their schedules at one glance," he said.

The forecasting tool is beneficial to customers of all sizes. "It is for any active customer that has transactions with us in a planned, scheduled manner. "The tool is extremely effective and the feedback that we got from our customers has been phenomenal," said Nishant.

Another key function in MyAvnet is providing notifications if parts that have been bought over the last 13 months are going end-of-life. "When an EOL notice has been issued by a component manufacturer, the buyer is notified," said Nishant.

He noted that customers often have different part numbers than the component manufacturer has for its part. Avnet's tool automatically matches the manufacturers' with the customers' so a buyer does not have to cross reference when an EOL notice is issued. Besides EOL notices, product change notices are also sent to buyers.



# How API Solutions will transform the electronics industry

*Digi-Key Electronics' API Champion EMEA/APAC, Stephane Ratelet, encourages manufacturers to investigate how APIs can smooth their purchasing processes*

If you haven't heard of an application programming interface (API), you soon will. I expect API solutions to be the most disruptive electronics market innovation in the next five to 10-years. Whether you realise it or not, you're already using APIs. Simply put, an API is a machine-to-machine connection. Every time you visit a modern web page, you are interacting with a remote server's API.

An API is not the first digital connection designed to make the purchasing process more efficient, but the customisation available with APIs make them a popular choice for procurement executives. Digi-Key found 70 per cent of companies it surveyed are exploring machine-to-machine connections. That's because with an API, a business can streamline existing processes and introduce automation, producing an immediate return on investment (ROI) across the entire enterprise.

API solutions allow purchasers to quickly get a price without having to compare every website. With Digi-Key's API solution, pricing is updated in real-time and prices can be honoured for 30-days by generating a digital quote. With these reduced hard costs of product prices, plus soft costs of time spent on invoices, quotes and returns and the cost of stock, it's clear: companies who utilise API solutions can expect significant cost savings.

In Europe, where taxes are high and companies need

to stay competitive if they want to remain in the region, the savings that result from utilising API solutions are especially attractive. Digi-Key already has 200 to 400 active API customers in Europe.

With the advent of digital technology, prioritising which tasks should be digitalised and which require people is becoming an important route to cost savings. Employees become more efficient, spending time on what they are most valuable for.

API solutions also improve accuracy. With the accuracy of a fully digital solution, the entire supply chain benefits. Again, with Europe's highly competitive environment, utilising solutions that improve accuracy and thus result in greater customer satisfaction should be a priority.

API connectivity can be implemented in three different ways, depending on a company's size and needs. Customers can implement API via their own internal resources; by subcontracting to an external developer team; and by using one of the third-party software solutions from Digi-Key's list of qualified partners.

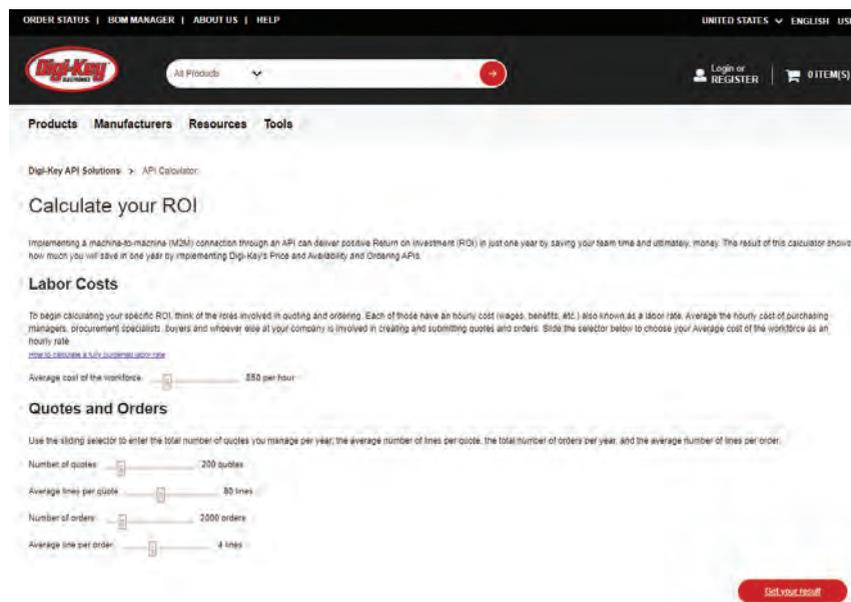
Digi-Key's API solutions are free to use and interested customers can download a free eBook and try out the free ROI calculator, which shows how much they can save in one year by implementing Digi-Key's price, availability and ordering APIs. Customers who have utilised the calculator have seen an

average of fifty thousand to one hundred thousand dollars in cost savings by implementing API solutions.

In our increasingly digital world, data and speed of information are king. As a result, finding ways to harness digital solutions like APIs for cost savings is critical. I encourage you to learn how API solutions could benefit your business and improve your operational efficiency: you simply can't afford not to.

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

Digi-Key's API champion, Stephane Ratelet



Customers using the ROI calculator have seen fifty thousand to one hundred thousand dollars in savings

## Buyers' Guide

Manufacturer	Distributor	Telephone	Website	Location	Franchised Distributor	No. of Lines for Principle	Stock Value for Principle	Minimum Order Value	% Lead Free for Principle Range	No. of Technical Support Staff	Total No. of Staff	Buffer Stock Facility
<b>ENCLOSURES</b>												
Metcase Enclosures	OKW Enclosures	+44 (0) 1489 583858	www.metcase.com	EU	N/A	288	£40K	0 €	100%	5	22	Y
<b>INTERCONNECTION</b>												
Amphenol	PEI Genesis	+44 8716060	www.peigenesis.com	EU	Y	N/A	£1.3m	10 €	N/A	N/A	85	Y
Hirose Electric Europe B.V.		0031-(0)2 655 7460	www.hirose.com/eu	EU	Y	50,000	N/A	0 €	N/A	N/A	4,190	Y
ITT Cannon	PEI Genesis	+44 8716060	www.peigenesis.com	EU	Y	N/A	£1.3m	10 €	N/A	N/A	85	Y
ODU		+49 8631 6156-0	www.odu.de	EU, USA, ASIA			N/A	0 €	N/A	50	1,650	
<b>OBSOLESCENCE / HARD TO FIND</b>												
	Chip 1 Exchange	949-589-5400	www.chip1.com		Y	850,000	N/A	\$0	85%	20	150	
<b>PASSIVES</b>												
Kemet	RS Components	08457 201201	www.rs-components.com	EU	Y	N/A	£161m	0 €	N/A	50+	2,500	Y
Würth Elektronik	Würth Elektronik	+49 (0) 7942 945 0	www.we-online.com	EU	Y	N/A	N/A	0 €	100%	250	4,000	Y
<b>POWER &amp; BATTERIES</b>												
Sanyo Electronic Industries Co., Ltd.	Sanyo Electronic Industries Co., Ltd.	+81 36699 8080	www.eta.co.jp	JP	N	1,000	€3000k	20 €	90%	10	100	Y
<b>SWITCHES &amp; KEYBOARDS</b>												
CHERRY	RS Components	08457 201201	www.rs-components.com	EU	Y	600	N/A	0 €	N/A	50+	3,500+	Y
Rubbertech 2000	Rubbertech 2000	+44 1594 826019	www.rubbertech2000.co.uk	EU	N/A	N/A	£40k	100 €	N/A	N/A	25	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	Flexi / Flexi-Rigid	Obsolescence Solutions	Modifications	Prototyping
Elvia PCB Group	+33 233 763 200	www.gepcb.com	M/B	France, Tunisia, China	AS9100, PRI-NADCAP, ISO-TS16949, ESA, UL, ISO9001, ISO14001	S/M/L	Y	1-30	Y	F, F/R	Y	Y	Y
Graphic Plc	00441363 774874	www.graphic.plc.uk	M	UK/China	AS9100, NADCAP, ISO 9001, AIS014001, OHSAS 18001, MIL 31032, MIL 55110, MIL 50884	S/M/L	N	4-10	Y	Y	N	Y	Y

## Contract Manufacturers Buyers' Guide

Manufacturer	Telephone	Website	Turnover	Location	Approvals	Employees	Number of Surface Mount Lines	BGA Capacity	Lead Free Manufacturer	Prototyping	Design Capability	Full Turnkey	Cables and Harnessing
AWS Electronics Group	+44 (0)1782 753200	www.awselectronicsgroup.com	£40m	UK & Slovakia	AS9100, ISO9001, 13485, 14001, TS16949, IPC-A-610 Class 3, NADCAP	430	11	Y	Y	Y	Y	Y	Y

## Advert Index

Advert	Page	Advert	Page
Astute Electronics	13	Euroquartz	12
Burklin GmbH & Co.	8	Interpower	BC
Coilcraft	11	Lemo	9
Digi-Key Electronics	FC, IFC & 14	TCL	23
EA Elektro-Automatik	7	TI	5
eBOM.com	15, 16, 17, 24 & 25		

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