



The European Institute for the PCB Community

## **EIPC SPEeDNEWS**

*The Weekly On-Line Newsletter from the European Institute of Printed Circuits.  
Issue 32 – November 2021*

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### NEWS FROM THE EIPC

For those unable to attend our recent 12th Technical Snapshot themselves, a read of the review by Pete Starkey is the next best thing. Some would claim that it is actually better, as it saves them from having to concentrate for more than 5 minutes at a time. Happily, Pete's concentration is legendary, as you may see in the link below if you open it.

<http://pcb.icconnect007.com/index.php/article/129550/eipc-technical-snapshot-review-packaging-trends-and-a-ptfe-masterclass/129553/?skin=pcb>

With our best regards to you, and our thanks to the moguls at I-Connect007.  
The EIPC Team



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### ELECTRONIC INDUSTRY NEWS

#### **Car Makers Reap What's Sown During Chip Shortage**

##### **The tech industry is bracing for a potential shortage of passive electronic components**

Taiwanese suppliers are cautiously optimistic about the coming months

In brief: The tech supply chain is still coping with the perfect storm of factors that has led to jammed up ports and severe bottlenecks in the flow of raw materials and components needed to build products with electronics inside. Production slowdowns in China and other Asian countries due to energy restrictions and Covid-related lockdowns are already impacting suppliers of passive electronic components and chips, but some are hopeful about their ability to navigate the coming months without any major disruption.

By now it's no secret the tech supply chain is experiencing the cascading effects of material, component, and shipping container shortages, as well as increased energy prices, Covid-related factory lockdowns, rapid shifts in environmental policies, unrelenting demand for electronics and semiconductors, the rapid digitalisation of companies and public institutions around the world, and a slew of other factors.

The chip shortage has been a lot more prominent in the news over the past year, but other essential components have also been in short supply. Passive electronic components like resistors, capacitors, and inductors were already a bit hard to come by in late 2020, and the situation could get worse towards the end of this year.

Back in December, Walsin Technology reopened its manufacturing plant in Malaysia after several disruptions related to lockdowns in the region. However, just one month later, a fire hit Taiwanese's multilayer ceramic capacitor (MLCC) factory in Dongguan, China, raising concerns around the supply of MLCCs and chip resistors.

By April, those fears had mostly been put to rest. Large passive component suppliers like Yageo, Walsin Technology, Chilisin Electronics, ABC Taiwan Electronics, and Tai-Tech Advanced Electronics were optimistic about their ability to supply passive components for their clients in the second and third quarters, with capacity utilization sitting at around 80 to 90 percent.

Fast forward to August, and renewed lockdowns in Asia were yet again threatening production of passive components. Last month, the effects of the summer restrictions came into focus as Japanese suppliers of aluminium capacitors were forced to operate at a greatly reduced capacity and lead times skyrocketed to more than six months.

Towards the end of September, China implemented an energy crunch that forced several suppliers for tech giants like Apple, Tesla, and Qualcomm to reduce or even halt production. As we enter the fourth quarter, Taiwanese companies are concerned about these disruptions, and the most optimistic among them expect to, at most, maintain the current level of production throughout the rest of the year.

For instance, Yageo believes it will be able to satisfy demand for MLCCs from automakers and other industrial clients, as its factories are located outside of the areas in China that have been subjected to power cuts. At the same time, Walsin's progress on building a new plant in Kaohsiung, Taiwan, is well underway, which is going to aid the supply of MLCCs and chip resistors in the coming months. This is good news for automakers in particular, which have been the hardest hit industry so far.

However, China's aggressive power cuts still have the potential to create problems, as we've seen with the massively reduced output of high-purity silicon from the region. This has sent prices through the roof compared to just a year or even a month ago, and the same happened for rare earth metals and other raw materials like copper, tin, aluminium, and cobalt, which are used for chip packaging, mounting and connecting electronic components on printed circuit boards, and more.

Some suppliers will be able to take a hit on their profit margins, but most will feel compelled to hoard components and raise prices, which in turn could lead to higher retail prices for all electronics as soon as next year. Coupled with an acute shortage of skilled workers, this could have ripple effects on several industries. The cherry on top is a shipping crisis that will make this year's holiday shopping season a nightmare for people who don't plan ahead or are unwilling to consider locally-produced goods.

By [Adrian Potoroaca](#), [TechSpot](#)

## **Component shortages finally catch up to Apple as delivery times slip further out**

In a nutshell: Apple up to this point has largely seemed immune to the global chip and component shortages that have plagued other hardware makers, but it would seem that the company's time ahead of the situation may have come to an end. A quick check of Apple's website reveals that virtually all of the company's recently announced products have lengthy wait times.

An order placed today for an iPhone 13 Pro, for example, won't ship for another 4-5 weeks. The standard iPhone 13 – if ordered today – isn't scheduled for delivery until early November. The new iPad mini has an estimated order window of November 19 – November 29. A new 14-inch MacBook Pro with Apple's M1 Pro chip, which officially launches on October 26, won't arrive until November 12 – November 19. Even Apple's polishing cloth has a 10-12 week delay.

It's not just newer devices that are seeing shipping delays, either. A higher-end configuration of the MacBook Air ordered today won't arrive until November 5 – November 9.

Apple currently finds itself in a rather unusual situation in the final quarter of 2021. The predicament isn't the worst problem to have, but it's not exactly ideal, either, and could very well undermine what might have otherwise been a record-setting holiday quarter. Based on shipping estimates today, it appears as though orders should still arrive in time for the holiday gift-giving season. That said, I probably wouldn't procrastinate too much, as shipping windows could easily slip to January and beyond in the coming weeks.

*By Shawn Knight, Tech Spot*



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### NEWS FROM ITALY

## SEICA AT PRODUCTRONICA

November, 16-19-, Munich, Germany – **Stand A1-445**

As the world leader in Flying Probe Test technology, Seica is where customers look for leading-edge solutions. At productronica they will be able to see that, once again, the future of FLYING PROBE TEST has arrived at Seica's booth A1-445 in the form of the new PILOT VX platform.



Seica has designed the Pilot VX to raise the bar of flying probe test performance, with cutting-edge solutions that address the fundamental concerns of electronic board manufacturers looking to optimize their investment. In particular:

**Time is a cost** so a reduction of 50% in test time thanks to new state-of-the-art mechanical performance and motion control saves you a lot of money. The Pilot VX has 12 multi-function test heads providing the capability to contact up to 44 points simultaneously, and technologically advanced measurement hardware, new microwave-based measurement techniques

and optimized VIVA software management enable the parallelization of different types of tests, saving more time, and smart analysis capabilities together with algorithms based on the principles of artificial intelligence can automatically optimize the test flow in run-time, while maintaining test coverage targets.

**Flexibility is key** because it allows you to make the most of your investment by meeting more of your needs. Instead of investing in two systems to meet production targets, one could be enough, or you could configure the line to optimize throughput by integrating multiple systems, each performing a different part of the test process in parallel to the others. A vast selection of test performances means that the test process can be tailored to the specific requirements of the product being tested, whether it be a relatively simple bare printed circuit board, a complex pcb with passive and active embedded components, fully

loaded double-side boards with components that also need to be programmed, LEDs to be tested electrically and optically, flex circuits, very small and very large boards with very small and very large components.... in short, the *Pilot VX is a flexible, configurable test system with an unrivaled set of technologically advanced tools, able to provide the test solutions required by the huge diversity which characterize today's electronics.*

**Traceability is a requirement:** it gives you complete visibility of the test process, allowing you to certify the quality of the product and to improve yields by utilizing the analysis of the defects found to diagnose problems in the upstream manufacturing process. Going beyond the ability to store the test data, the Pilot VX has the capability to collect and store the data regarding the mechanical pressure applied by the test probes on every point on the board under test, making it available for visual, graphical and statistical analysis.

**High precision is a must** to meet the mechanical challenges of probing the extremely miniaturized circuits in multiple types of electronic products and to measure very small electrical values. With a positioning precision of +/- 10µm, the Pilot VX is able to probe 20µm pads, measure values such as 0,05pF capacitance or 100 µohm resistance and, with a minimum spot of 200 µm, the integrated laser inspection tool can perform presence/absence checks of even 01005 SMDs.

**Automation is a reality:** it is pervasive in today's factories and in most production lines, creating the need to manage not one system, but rather a series of machines and handling modules, including robots, in a fluid, optimized manner. The Seica Asset Manager (SAM) software suite is a configurable platform that can simply perform basic functions such as the connection of a test system to the factory MES, but it also has the potential to supervise all of the assets in a robotic line according to the MQTT Broker IIOT standard, which can then be monitored on a remote PC, tablet or mobile device via the customizable Seica Dashboard App.

**Fast, Powerful, Smart:** See the **new Pilot VX** platform premiering in Seica's booth A1-445 at Productronica 2021.

#### **About Seica S.p.A.**

Founded in 1986, Seica S.p.A. is an innovative, high technology company that develops and manufactures leading-edge solutions for the test and selective soldering of electronic boards and modules. Moreover, Seica provides battery test solutions, automotive electronic board test solutions, infotainment test, as well as electric vehicle inverter and battery charging station test systems. Seica has fully embraced the concept of Industry 4.0, developing solutions to monitor and collect information from machines and industrial plants to enable the optimization of manufacturing processes, maintenance and energy management. Company headquarters are located in Italy, with direct offices in USA, Germany, China, Mexico and France. [www.seica.com](http://www.seica.com)



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### NEWS FROM THE UK

#### **Ventec Completes Asset Purchase Agreement with Holders Technology in Germany & UK**

Ventec International Group Co., Ltd. has finalized an asset purchase agreement with Holders Technology in Europe on October 21, 2021. The transaction completes Ventec's acquisition of a range of PCB assets owned by Holders Technology's German & UK operating subsidiaries. As part of Ventec's continued ambitious strategic investment plans to further expand its strong market positioning and technology leadership, the investment boosts Ventec's value creation in Europe and strengthens its leading position in the PCB design and manufacturing marketplace.

Under the terms of the asset purchase agreement, Ventec will integrate some of Holders Technology's specialist materials into its current portfolio of PCB base material solutions. The complementary product lines, which will provide immediate benefits to Ventec customers, include entry and backing materials for drilling and routing applications, lamination accessories (release films) and copper foil for lamination applications. From 1<sup>st</sup> October 2021, Ventec officially took ownership of the fully tooled and equipped manufacturing site for back-up and entry material located close to Ventec's Central European Hub in Kirchheimbolanden, Germany, with specialist employees transferring to Ventec as part of the agreement.

"The acquisition forms an integral part of our global growth strategy," said Mark Goodwin, COO Europe & Americas of Ventec. "5G, the Internet of Things, vehicle electrification and advanced LED applications are just some of the driving forces of the increasing demand for reliable, high-quality PCB base materials. With the acquisition of some of Holders Technology's specialist material solutions and expertise, we are now even better positioned to implement our long-term growth strategy and to offer a one-stop-shop for our diverse range of customers from industries such as automotive, industrial, medical and mil/aero. This will be of great benefit to customers who rely on Ventec as a trustworthy provider of highly reliable PCB base materials for their demanding applications."

Further information about Ventec's solutions and the company's wide variety of products is available at [www.ventec laminates.com](http://www.ventec laminates.com) and/or by downloading the Ventec APP.



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### PRODUCTRONICA NEWS

For immediate release

## Ventec to unveil 'Aerolam' base material solutions for Aerospace & Defence Electronics at Productronica 2021



At productronica 2021 Ventec International Group Co., Ltd. (6672 TT) will be launching '**aerolam**' – a base material solutions set specifically tailored for the diverse and unique requirements of aerospace & defence applications. The Ventec team will be on hand in **Hall B3 at Stand No. 222** for the launch and to showcase its unique laminate & prepreg

capability across a very wide range of applications and budgets.

The evolution of aerospace and defence (A&D) electronics is accelerating at a staggering pace, driving the demand for reliable high-performance materials that maintain mechanical and electrical integrity in harsh mission-critical operating conditions. Paying attention to the properties of materials at the substrate level is the first step towards achieving the most stringent performance targets of today's A&D manufacturers.

Whatever the substrates must handle – high-speed digital signals, high RF frequencies, intense heat dissipation, extreme environmental stresses – the '**aerolam**' portfolio guides designers and manufacturers of high-performance A&D electronics to high-quality products

that are ready to meet those demands and are supported by all the necessary documentation including test schedules and certificates of conformity.

The '*aerolam*' portfolio caters for the complete spectrum of A&D application scenarios, from equipment intended to operate in a relatively benign environment such as inside a command-and-control centre, to high-performance fielded systems that must withstand the toughest conditions including extreme temperatures, high vibration and g-forces, salt spray, and humidity that challenge reliability to the utmost.

**aerolam product-highlights include:**

- **tec-speed 20.0 and tec-speed 30.0** - prepregs and laminates that are engineered to preserve signal energy and aid the fight against noise. Leveraging the latest knowledge in low-loss materials, Ventec's most advanced formulas meet IPC 4103 specifications and provide the foundation for multi-GHz applications up to V/W-band and millimeter-wave frequencies.
- **VT-901** - Where mechanical strength and high-temperature stability are critical, VT-901, a UL-94 V-0 rated polyimide substrate has high flex strength, high glass temperature (T<sub>g</sub>), low Z-axis CTE, and long T260 and T288 times – to maintain dimensional stability and integrity even under harsh loads.
- **VT-90H** –A non-brominated, cost effective high-reliability polyimide that delivers the high-temperature capabilities, high fracture toughness, low Z-axis CTE, and UL-94 flammability HB rating that ensures compliance with defense and aerospace standards worldwide.

Ventec's Quality Management Systems are of course accredited with AS9100 quality standard, and conversant with applicable IPC, space agency and MIL-STD specifications, reflecting Ventec's commitment to meet the strictest industry requirements for aerospace-related products.

For more information about Ventec's solutions and the company's wide variety of products, please visit [www.venteclaminates.com](http://www.venteclaminates.com).



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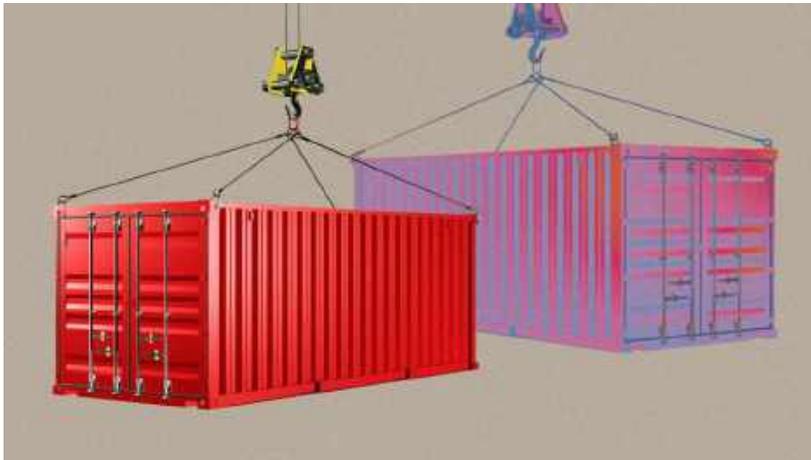
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## SUPPLY CHAIN NEWS

### Just-in-time shipping is dead – long live supply chains stress tested with AI

*Will Douglas Heaven – MIT*



MS TECH | GETTY

With the [supply-chain disruptions](#) of the past two years showing no signs of easing anytime soon, businesses are turning to a new generation of AI-powered simulations called digital twins to help them get goods and services to customers on time. These tools not only predict disruptions down the line, but suggest what to do about it. Desperate companies struggling with the collapse of [just-in-time shipping](#) are using them to find a crucial balance between efficiency and resilience.

The list of things that have been hard to get hold of at one time or another in the last few months is as varied as it is long: new cars, new phones, contact lenses, cleaning products, fresh produce, garden furniture, books, [the color blue](#). “It’s not like when everyone ran out of toilet paper in March 2020,” says Chris Nicholson, founder of Pathmind, a company that applies AI to logistics problems. “This time the missing items feel personalized.”



### [Our weird behavior during the pandemic is messing with AI models](#)

Machine-learning models trained on normal behavior are showing cracks —forcing humans to step in to set them straight.

[Covid-19](#) has shined a spotlight on many of the world’s networks, from [the internet](#) to international air travel. But the supply chains that crisscross the world—the ships and trucks and trains that link factories to ports and warehouses, bringing almost everything we buy many thousands of miles from where it’s produced to where it’s consumed—are facing more scrutiny than they ever have.

“It’s fair to say that whatever you’re selling, you’ve got a problem right now,” says Jason Boyce, founder and CEO of Avenue7Media, a consulting firm that advises top Amazon sellers. Boyce says he has clients who would be turning over tens of millions of dollars a year if they could stay in stock. “We’re having talks with clients every day where they’re just crying,” he says. “For months, they haven’t been fully in stock for one 30-day period in a row.”

Digital twins seek to solve breakages in the supply chain by anticipating them before they happen and then using AI to figure out a workaround. The name captures the key idea of simulating a complex system in a computer, creating a kind of twin that mirrors real-world objects—from ports to products—and the processes they are a part of. Simulations have been a part of decision-making in industry for some years, helping people explore different product designs or streamline the layout of a warehouse. But the availability of large amounts of real-time data and computing power means that more complex processes can be simulated for the first time, including the chaos of global supply chains that often rely on numerous vendors and transportation networks.

This kind of technology has given Amazon, which already has the advantage of controlling its own trucks and warehouses, an extra edge for years. Now others are embracing it as well. Google is developing supply-chain digital twins that the car maker Renault announced it had started using in September. International shipping giants like FedEx and DHL are building their own simulation software. And AI firms like Pathmind are creating bespoke tools for anyone who can pay for them. Yet not everyone will benefit. In fact, the powerful new technology could widen a growing digital divide in the global economy.

### **Weather the storm**

It's easy to blame the pandemic for the current supply-chain problems. Factory closures and [labor shortages](#) knocked out production and delivery hubs at the same time that a leap in online shopping and comfort buying sent demand for home deliveries rocketing.

But in truth, the pandemic only made a bad situation worse. "There are global forces driving this, all combined into a perfect storm," says D'Maris Coffman, an economist at University College London who studies the effect of the pandemic on supply chains.

Quelling this storm will require sinking trillions of dollars into global infrastructure, expanding ports and delivery fleets, and investing in better management, better working conditions, and better trade deals. "Technology is not going to solve these problems. It's not going to allow ships to carry more containers," says David Simchi-Levi, who leads the data science lab at the Massachusetts Institute of Technology and has helped build digital twins for several large companies. But AI can help companies weather the worst of it. "Digital twins allow us to identify issues before they happen," he says.

According to Hans Thalbauer, the managing director of the supply chains and logistics team at Google, the biggest problem businesses face is an inability to forecast events up the chain. "It doesn't matter which company you talk to," he says. "Everyone in the supply-chain world will tell you they don't have the visibility they need to make decisions"

It's supply-chain visibility that lets Amazon, for example, predict when an item will show up on your doorstep. For every item that Amazon delivers itself—and that includes the millions of items it delivers on behalf of third-party sellers like Boyce and his clients—it gives an accurate estimate of when it will arrive. It might not seem like much, says Boyce, but if Amazon got these predictions wrong, it would start losing customers—especially around the holiday season, when people are buying last-minute gifts and trusting Amazon to deliver them. "It takes massive computing power just to show that simple little delivery day," he says. "But people freak the hell out when they don't get their stuff on time."

According to Deliverr, a US company that manages delivery logistics for multiple e-commerce firms including Amazon, Walmart, eBay, and Shopify, an estimated delivery time of two days versus seven to 10 days increases sales by 40%; an estimated delivery time of one day increases sales by 70%.

It's no surprise that others want a crystal ball of their own. Just-in-time supply chains are nearly dead. The disruptions of the past two years sank many businesses that chased hyper-efficiency to an extreme. Warehouse space is expensive, and paying to store inventory you might not need for a week can seem extravagant in times of plenty. But when next week's stock doesn't show up, you have nothing to sell.

“Before the pandemic, most companies were focusing on cutting costs,” says Simchi-Levi. Now they’re willing to pay for resiliency, but focusing on resiliency alone is also a mistake: you need to find the right balance between the two. This is the real power of simulations. “We’re seeing a growing number of companies starting to stress-test their supply chains using digital twins,” he says.

### What if?

By exploring different possible scenarios, companies can identify the balance between efficiency and resiliency that works best for them. Add deep reinforcement learning, which lets an AI learn through trial and error what actions to take in different situations, and digital twins become machines for exploring what-if questions. What if there’s a drought in Taiwan and the water shortage shuts down microchip manufacturing? A digital twin could predict the risk of this happening, trace the impact it would have on your supply chain, and—using reinforcement learning—suggest what actions to take to minimize the harm.

If you’re a car maker in the US Midwest, a digital twin might suggest you buy extra components from a distributor on the West Coast that still has surplus. But thread multiple scenarios together and things soon become vastly complex. For example, according to Simchi-Levi, Ford maintains more than 50 plants around the world, which use 35 billion parts to produce 6 million cars and trucks each year. There are around 1,400 suppliers spread across 4,400 manufacturing sites that it interacts with directly, and a stack of suppliers and suppliers’ suppliers up to 10 layers deep between Ford and the raw materials that go into its vehicles. Any one of those links could break, and a good stress test would need to probe each of them.

Digital twins draw on as much data as possible to run their simulations and train their AIs. There’s logistical information about the company and its suppliers, accounting for inputs such as inventory and shipping data. Then there’s data on consumer behavior, based on market analysis and financial projections. And data about the wider world, such as geopolitical and socioeconomic trends. Simchi-Levi has even drawn data from social media to predict people’s behavior, especially during the pandemic.

Google’s digital twin can be plugged into Google Earth and takes into account global weather patterns. If you’re a vegetable farmer in California, you can run simulations to see which of your fields are at risk from La Niña, says Thalbauer. When Google sets up a digital



twin for a client such as Renault, they can choose which of the many available data sources to include.

Big online stores are based around vast automated warehouses. Smaller and cheaper versions of this tech will be key if smaller stores are to survive through a series of lockdowns.

Pathmind takes a less heavyweight approach. Its digital twin simply wraps around a company's existing supply-chain management tools, tapping into the data they already produce. It then augments this data by running what-if simulations and adding the resulting synthetic data to the pot on which it trains its AI. The approach is similar to how AlphaZero mastered Go and chess by playing millions of virtual games against itself. Instead of learning what piece to move on a board, digital twins can learn what stock to order and when, or where to open a new warehouse.

With the right synthetic data, a digital twin can learn to respond to previously unseen events, even global pandemics. "This is where we get into the whole secret of 'Why is AI smart?'" says Nicholson. "It lives more than we do, in these many different worlds, some of which have never existed before."

In theory, anyone can benefit from this technology. In practice, there will be winners and losers. "Digital-twin technology presents a powerful opportunity for companies of any size," says Rick Lazio, a lawyer and former US congressman who is now senior vice president at Alliantgroup, a US-based tax consultancy. But he notes that it's larger companies, which are already the best protected from losses, that are starting to use this tech fastest.

Lazio thinks that many smaller firms will need some help, perhaps through government investment, to stop them from falling behind. "Companies that adopt technology early see benefits greater than the sum of its parts," he says.

And it's not just smaller businesses. "A lot of the world's ports run on paper; if you're lucky, they're using PDFs and emails," says Nicholson. "These are major operators, not a candle maker in New Hampshire. But without digitization, we don't get AI."

Simchi-Levi is more optimistic. Many businesses used to assume that setting up a digital twin would take enormous investment and years to pay for itself, he says, but that's no longer the case: a million dollars and 18 months can give you many of the benefits.

Simchi-Levi has no doubt that the buzz around digital twins will remain even once the worst of the current disruptions are over. If it's not the pandemic, it will be something else, he says. The last couple of years have taught businesses how to prepare better, and how to compete better. "When we go back to normal, it won't be the same as before," he says. "The pandemic proved that the future is here."



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### SEMICONDUCTOR INDUSTRY NEWS

For the definitive news on this industry sector, we commend a read of the

**Future Horizons Global Semiconductor Free Newsletter**

[https://www.futurehorizons.com/assets/future\\_horizons\\_newsletter\\_1634548992.pdf](https://www.futurehorizons.com/assets/future_horizons_newsletter_1634548992.pdf)



## Issue 32- November 2021

### NEWS FROM THE IPC

#### **North American PCB Industry Sales Up 2.3 Percent in September**

*IPC Releases PCB Industry Results for September 2021*

IPC announced today the September 2021 findings from its North American Printed Circuit Board (PCB) Statistical Program. The book-to-bill ratio stands at 1.25.

Total North American PCB shipments in September 2021 were up 2.3 percent compared to the same month last year. Compared to the preceding month, September shipments grew 18.4 percent.

PCB year-to-date bookings in September were up 19.2 percent compared to last year. Bookings in September grew 4.7 percent from the previous month.

“The PCB sector saw strong shipment growth during September, a hopeful sign that production levels are improving after two months of lower-than-expected deliveries,” said Shawn DuBravac, IPC’s chief economist. “Order flow during the month suggests demand remain strong for electronics manufacturing capacity.”

#### **Detailed Data Available**

Companies that participate in IPC’s North American PCB Statistical Program have access to detailed findings on rigid PCB and flexible circuit sales and orders, including separate rigid and flex book-to-bill ratios, growth trends by product types and company size tiers, demand for prototypes, sales growth to military and medical markets, and other timely data.

#### **Interpreting the Data**

The book-to-bill ratios are calculated by dividing the value of orders booked over the past three months by the value of sales billed during the same period from companies in IPC’s survey sample. A ratio of more than 1.00 suggests that current demand is ahead of supply, which is a positive indicator for sales growth over the next three to twelve months. A ratio of less than 1.00 indicates the reverse.

Year-on-year and year-to-date growth rates provide the most meaningful view of industry growth. Month-to-month comparisons should be made with caution as they reflect seasonal effects and short-term volatility.

Because bookings tend to be more volatile than shipments, changes in the book-to-bill ratios from month to month might not be significant unless a trend of more than three consecutive months is apparent. It is also important to consider changes in both bookings and shipments to understand what is driving changes in the book-to-bill ratio.

IPC's monthly PCB industry statistics are based on data provided by a representative sample of both rigid PCB and flexible circuit manufacturers selling in the USA and Canada. IPC publishes the PCB book-to-bill ratio by the end of each month.

## **North American EMS Industry Down 9.9 Percent in September** *IPC Releases EMS Industry Results for September 2021*

[IPC](#) announced today the September 2021 findings from its North American Electronics Manufacturing Services (EMS) Statistical Program. The book-to-bill ratio stands at 1.41.

Total North American EMS shipments in September 2021 were down 9.9 percent compared to the same month last year. Compared to the preceding month, September shipments fell 0.8 percent.

EMS bookings in September rose 14.7 percent year-over-year, but fell 17.3 percent from the previous month.

“September EMS results make clear that component shortages and other supply chain disruptions continue to hinder electronics manufacturers,” said Shawn DuBravac, IPC's chief economist. “Shipments remain constrained, falling from the previous month, despite historically strong order flow.”

### **Detailed Data Available**

Companies that participate in IPC's North American EMS Statistical Program have access to detailed findings on EMS sales growth by type of production and company size tier, order growth and backlogs by company size tier, vertical market growth, the EMS book-to-bill ratio, 3-month and 12-month sales outlooks, and other timely data.

### **Interpreting the Data**

The book-to-bill ratios are calculated by dividing the value of orders booked over the past three months by the value of sales billed during the same period from companies in IPC's survey sample. A ratio of more than

1.00 suggests that current demand is ahead of supply, which is a positive indicator for sales growth over the next three to twelve months. A ratio of less than 1.00 indicates the reverse.

Year-on-year and year-to-date growth rates provide the most meaningful view of industry growth. Month-to-month comparisons should be made with caution as they reflect seasonal effects and short-term volatility. Because bookings tend to be more volatile than shipments, changes in the book-to-bill ratios from month to month might not be significant unless a trend of more than three consecutive months is apparent. It is also important to consider changes in both bookings and shipments to understand what is driving changes in the book-to-bill ratio.

IPC's monthly EMS industry statistics are based on data provided by a representative sample of assembly equipment manufacturers selling in the USA and Canada. IPC publishes the EMS book-to-bill ratio by the end of each month.

## **IPC APEX EXPO 2022 Attendees Can Achieve Digital Transcendence at Show Networking Events**

[IPC APEX EXPO 2022](#) attendees can meet with electronics industry innovators and connect with peers all in one place at the San Diego Convention Centre, January 22–27, 2022.

From the exhibit floor to the classroom and everywhere in between, including the International, Newcomers Networking, Show Floor and Women in Electronics at IPC APEX EXPO Receptions; Ice Cream Social; Ribbon Cutting Ceremony; Keynote Sessions; New Products Corridor; Trivia Networking Night; and more, attendees can connect and collaborate.

Among the highly anticipated special events is the opening keynote by New York Times Columnist, Emmy-Winning CBS Sunday Morning Contributor and NOVA Host, David Pogue. On Tuesday, January 25, Pogue will present, "Disruptive Tech & How it Will Affect Your Business: What's Coming by 2026," taking attendees on a wild ride through the cutting-edge

science and technology that is powering a next wave of technological innovation.

On Wednesday, January 26, John Mitchell, IPC president and CEO, will assess the state of electronics manufacturing and identify the trends that will define the industry's financial growth and technological progress in 2022 and beyond. Touching on topics that are the focus of board rooms and shop floors: factory modernization, supply chain resiliency, workforce demands, and environmental stewardship, Mitchell will cover ways to navigate your organization to succeed in today's dynamic global marketplace in his dynamic keynote, "State of the Industry: Electronics Manufacturing Embraces Digital."

"Special events at IPC APEX EXPO add tremendous value for attendees," said Alicia Balonek, IPC senior director of trade shows and events. "Networking in person makes a difference; and attendees have an optimal opportunity to network with thousands of their electronics industry colleagues at IPC APEX EXPO 2022," Balonek added. "Improving your company's performance and furthering your own personal success, making new connections and strengthening existing relationships—it's what makes the IPC APEX EXPO experience priceless."

Event essentials as well as access to the exhibit hall are only \$20 to those who register in advance, a savings of \$20 on-site. Attendees who register by December 17 will save 20 percent off registration fees. In addition, attendees who register for the All-Access Package will receive a significant percentage off a la carte options. Schedule and registration details are available at [www.IPCAPEXEXPO.org](http://www.IPCAPEXEXPO.org).



The European Institute for the PCB Community

# EIPC SPEeDNEWS

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## International Diary

### 2021

#### **EIPC @ Productronica 2021**

**Stand B3-529**

Messe München

16-19 November

#### **13<sup>th</sup> EIPC Technical Snapshot Webinar**

Registrations via [www.eipc.org](http://www.eipc.org)

24 November

#### **EIPC @ Evertiq Tampere**

Tampere, Finland

1 December

#### **HKPCA Hongkong**

8-10 December

#### **TPCA Taiwan**

21-23 December

### 2022

#### **EIPC Winter Conference**

10 February

Frankfurt, Germany