



Information and Opinions about the Electronics Market

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welcome America back

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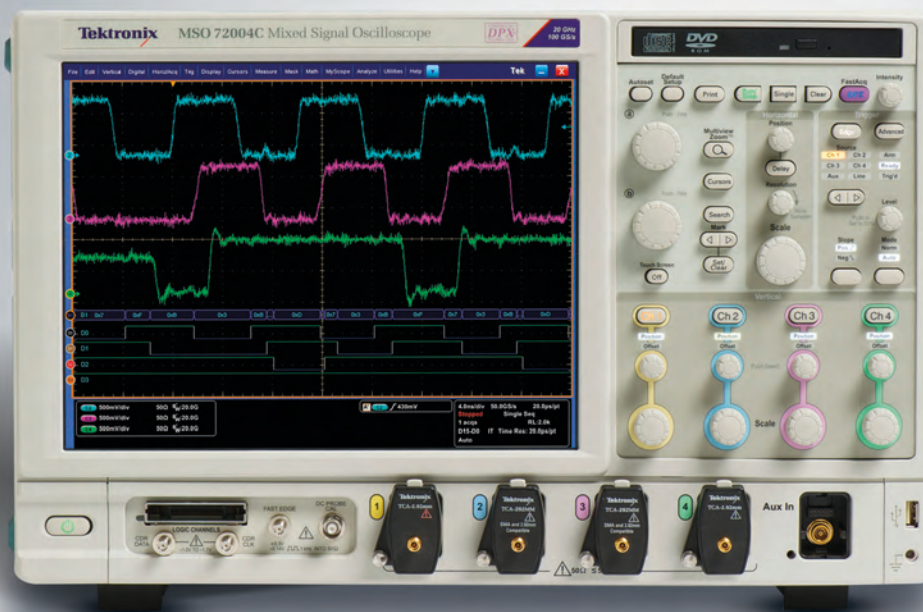
IoT Platform:
build, buy or both?



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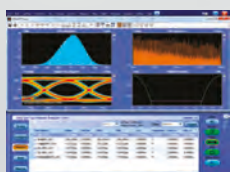
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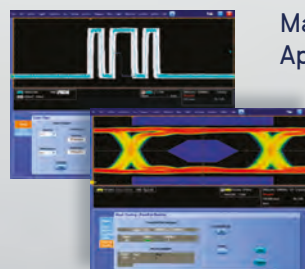
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English Abstract Edition



TO GAIN INTERNATIONAL VISIBILITY, ELETTRONICA AV HAS BEEN ENRICHED WITH A SPECIAL “**ENGLISH ABSTRACT EDITION**”, PUBLISHED AND DISTRIBUTED IN DIGITAL FORMAT. CONTENTS ARE CAREFULLY SELECTED ACCORDINGLY TO THE MAIN TOPIC-AREAS: ELECTRONICS MARKETS, COMPANIES AND INNOVATION.

ELETTRONICA AV “ENGLISH ABSTRACT EDITION”

IS AIMED AT EUROPEAN INTERNATIONAL CORPORATE MANAGERS, MARKETING AND SALES, BUYERS, CONSULTANTS AND ELECTRONICS PROFESSIONALS.



8 *Biden seeks to reaffirm the values of Western democracies and Washington's dedication to the Atlantic alliance. Meanwhile, progress is being made on climate change, on supply shortages and the most serious commercial disputes.*



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by Fritz Walter

“Marrakech Express”

I might say that in a perfect world I would probably have chosen this movie as the starting point for my first ever editorial to introduce the first issue of Elettronica AV. Many positive memories bind me to this film that, in its broader view, can be considered a hymn to friendship: it's about a group of friends embarking on an adventure to live the life of their dreams!

All this happened, more or less. About twelve months ago when we made a sound decision to turn a page in publishing ... or perhaps it would be better to say when we were trying to bring energy back to the publishing business, doing again something exciting! It was in January 2020, in the middle of the pre-pandemic era, when our team made a decision to use our hundred years of communication total experience in the field of electronics in navigating this complexity. Ready, set... go!

The aim of our project was to be much more than before, to offer something new and different to the readers and to the electronics market under the motto “Start doing what you want to do, and everything else will be revealed to you” (by Paulo Coelho). Everything has changed a lot: name for magazine, layout, contents, magazine circulation and distribution, editorial board and staff. Elettronica AV was born and now, in its eighth issue, is a guide to the operators in the sector since it was first published. We get requests each day to join our mailing list as an opportunity to receive the magazine. Germano docet!

But then- I add - if you want, you can do it! Wondering why our Prime Minister Mario Draghi has accepted a mandate from our Italy's President Mattarella last February to try and form a new government? Probably the idea of Mr Draghi replacing Mr Conte as Prime Minister because the emergency required an answer to relaunch the country frustrated with a coalition paralysed by incompetence. In this regard, how much do you know about the arm-wrestling inside the Italy's Five Star movement? But didn't they say that all these quarrels were someone else's fault?

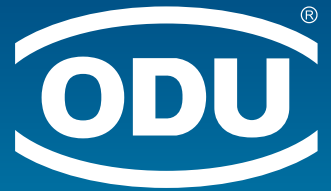
In any event, we (understood as Italian people) have obtained result that according to unconfirmed information (Source: Ansa) Brussels to pass our National Recovery and Resilience Plan (Pnrr) with flying colours. 24,9 billion euros, equal to 13% of the EU fundings will arrive within the end of July 2021 and these resources are like coming up for fresh air. When it comes to the electronics business, the rising booking nearing levels never seen before collapses upon the wave of shortage of raw materials. There is no way, even in a best-case scenario, to overcome it at an earlier date than 2022!



RELEASED IN 1989,
MARRAKECH EXPRESS
IS THE THIRD MOVIE DIRECTED
BY **GABRIELE SALVATORES**
WHICH WAS FOLLOWED
BY MEDITERRANEO, TURNÉ
AND PUERTO ESCONDIDO,
WHERE THE MAIN THEME
IS ESCAPE FROM A REALITY
THAT CAN NOT BE ACCEPTED.

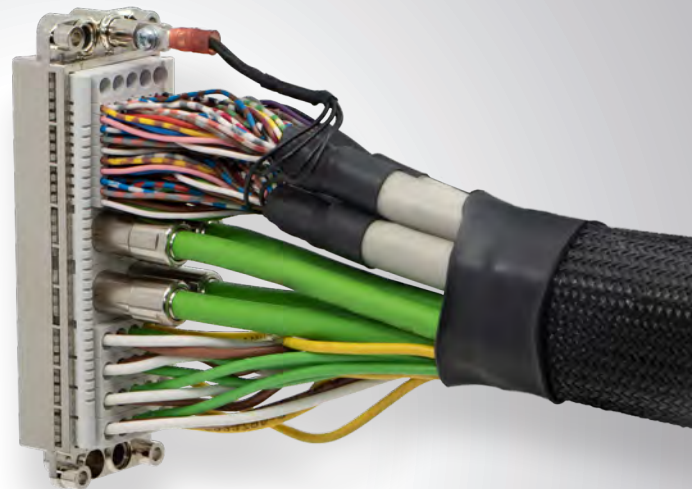
Elettronica AV and Pnrr - National Recovery and Resilience Plan will both be winners and are going to last years rationalizing the dreams into concrete steps that can make it happen - guaranteed. As the Brazilian poet wrote “It is precisely the possibility of realizing a dream that makes life interesting”. (Source: Paulo Coelho)

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by Alan Friedman

Draghi and Biden prioritize green and digital economy

The standing ovation that Mario Draghi received during a recent visit to Spain was a singular and unusual event for an Italian prime minister. Of course Draghi is not your normal Italian prime minister. The new leader of Italy brings to his job a level of prestige, experience and authority that has not been seen among Italian prime ministers for decades, except for the brief intervals of Ciampi (1993-1994) and Prodi (1996-1998 and 2006-2008).

Yet Draghi somehow trumps all his predecessors, and his rising position among European leaders means that as long as he governs Italy will have a seat at the top table of global decision making. This is due not only to his excellent personal relations across Europe but around the world, and especially with the Biden administration. Mario Draghi and Joe Biden are comfortable together, as is Draghi with the Treasury Secretary Janet Yellen, who served as Federal Reserve chairman when Draghi was President of the Bce.

Yet more important than personal relations is the way the Biden administration's policies mirror many of the European Union's current priorities, including the need for expansionary fiscal policies to support recovery, the need to reduce trade tensions and resolve old conflicts like the Airbus matter, and many other areas such as the fight against Covid,

the fight against climate change, and even a shared geopolitical awareness of the challenges posed by Vladimir Putin. While Biden and Europe may differ on China in tone, there is harmony in many other areas.

The recent G-7 and EU-USA summits showed how Joe Biden is seeking to return America to an internationalist and multilateral approach to diplomacy. And Mario Draghi has shown himself to be a fervent Atlantist.



Alan Friedman
is journalist, writer
and economics expert

Even more importantly for Italy, the Biden administration is also prioritizing a massive spending programme for ecological transition, the green economy, and also for digitalization of the economy. These are the same priorities for Italy and the United States, and across much of Europe during the phase of NextGeneration EU spending. And the model of the Biden administration successfully providing infrastructure spending, even

if less than the president would like to see, is the mirror of what Italy is about to try and do, under Draghi.

All of this may not mean much, but then again the winds of the Atlantic can bring change and renewal to Europe. In other words, the currently expansionary economic policies of the U.S. and Europe, at a time when the global economy is already bouncing back strongly, can only be good news on both sides of the Atlantic.

A crisis which hasn't infected us

Mouser has dealt with the challenges of the pandemic by making use of their hallmark feature: a combination of global organisation and local technical support which has rendered them the supplier of choice among engineers and buyers looking for innovative components. We talk to **Graham Maggs**, Vice President of Marketing Emea.

by Virna Bottarelli

E-commerce supplier of semiconductors and electrical components with peculiar characteristics, Mouser represents, on a global scale, more than 1,100 brands, pairing their global reach with a local presence which allows to promptly meet the needs of various markets with different client base while focusing on professionals who need to purchase electronic components in order to design and develop innovative products. Graham Maggs, Vice President of Marketing Emea, has contributed first-hand to the company's foundation in Europe. He speaks about the business' trends over the past year, as well as the consequences of various international events.



How did 2020 end for Mouser in Europe?

2020 began quite well for us but the effects of Covid-19 quickly started to take their toll. Luckily, we didn't experience any sort of crash: our employees continued to work, and the drop in last year's second and third quarters was relatively well-contained. We

experienced a slight increase in Q4 2020 which allowed us to complete the year with a growth level of 4% in Europe. On a global scale, however, we grew at a rate of 9%: recovery has begun in developing in Asia in the latter part of 2020 (+22%). The most dynamic sectors were medical (+14%), for obvious reasons, industrial IoT and 5G. But we also recorded a good general trend in other fields of applications, from telecommunications to military. Numbers we achieved speak for themselves: in 2020 we delivered more than 6.3 billion products across the world.

So, your sales haven't been affected. What about your clients?

Alongside a growth in sales, it's also important for us to expand our client base: we'll never experience growth caused by selling large volumes of products to a handful of big clients. Our focus is on supplying small batches to help those who come to us for buying components to use in their projects. Every year in Europe we have from 200,000 to 300,000 buyers and engineers from various fields – from larger corporations such as Apple and BMW to research centres and smaller businesses – who purchase the products we offer. In Europe, new customers have grown by 16% over the past year thanks to our marketing efforts. We've been making good use of our strengths: an ample inventory, a good customer service and a user-friendly website. We don't have the pressure of needing to sell in large quantities, which means our prices don't have to be the lowest on the market. However, we do also need to be competitive and as I've previously mentioned, we have



all the characteristics for being so. We want to be seen as 'the place' for engineers and buyers to find innovative technological solutions for their projects.

What has allowed you to manage and maintain your competitive position in the market during such a complicated time?

Unlike many companies, we expanded our workforce in 2020. In particular, we add more headcounts to both our warehouse staff, so that we could process larger quantities of products and, most importantly, our global customer support. This was key to us, as strengthening a close relationship with clients and being able to speak with them in their languages make all the difference. By that, I mean that, for us, a real person responds to client calls, not a pre-recorded voice. We are an e-commerce platform, but our strength lies in having that personal exchange with our clients: our job does not finish once an order has been placed. We also offer regular updates and make sure we are transparent about delivery times. This is greatly appreciated, especially during a phase which is often time-sensitive and client often need to ask questions. To improve our customer service, we've developed new tools and resources online: I'm referring to our "Technical Resource Centre" which we've designed for engineers, with a library and multimedia information sources on products and applications. We also offer a "Customer Resource Centre" aimed primarily at our buyers, with calculation tools and ad hoc documentation to cover their needs. There have also been a number of other important events: the expansion of our UK office; the transfer of our Sweden office to Malmö, a decision which was made to offer better client coverage to the entire Scandinavian region; a new Customer Service Centre in our headquarters in Texas, dedicated entirely to the service and support of our clients. When it comes to the availability of our products,

the fact that we have managed to maintain an extremely high level of inventory has also helped a lot; our investment in the automation of our warehouses has also been beneficial.

Currently, what are the main difficulties faced by electronic distributors?

The year began with logistical challenges, with a shortage in the availability of sea transport, due to high demand following a simultaneous drop in flights, and a boom in requests for shipping companies to carry out air transportation using their own planes. I also want to highlight that the delivery companies we work with – UPS, DHL, FedEx, to name just a few – did a great job at limiting delays. The leading role for issues within the market, however, was played by a lack of components: a problem still affecting all production sectors but it is a serious issue for automotive in particular and especially in Europe. We have to remember that, towards the end of 2019, the demand for vehicles – from both private buyers and businesses – dropped with many cars left unsold. Because of this, car manufactures reviewed the quantity of cars put into production; for several months they paused manufacturing and as a consequence they stopped supplies of materials. When demand increased again, they hoped that supply chains would be able to recover immediately but this didn't happen – at least not for electronic modules, which require determined time frames to be developed and produced and not for sheet metal or plastic. This situation, alongside the restrictions put in place to stem the spread of the virus, gave rise to a shortage in components which is still in progress. However, they are thinking about having new production units, factories and plants back in Europe, which is a good thing, but it would take years to implement production lines of this type. So, in the near future, this wouldn't be a solution to the problem. **E**



Europe and the G-7 welcome America back

Biden seeks to reaffirm the values of Western democracies and Washington's commitment to the Atlantic alliance. Progress was made on climate change, supply chain shortages and key trade disputes.

by Alan Friedman

Perhaps the words that best summed up Europe's reaction to the recent visit of President Joe Biden came from European Commission President Ursula von der Leyen, when she greeted the American leader in Brussels: "What a pleasure to have you here. What an honor to have you here. The fact that you are coming so early in your mandate, I think, underlines your personal attachment to Europe, and we really appreciate that. And indeed, the last four years have not been easy. The world has dramatically changed. Europe has changed. But we wanted to reassure you: We are friends and allies and we are very much looking forward to working together."

The last four years have not been easy! The sophisticated and polyglot von der Leyen showed her mastery of European understatement as she brushed away the debris of the Trumpian era and put on a broad smile to the renewed commitment of Washington to the trans-Atlantic alliance. For his part, **Joe Biden** was both magnanimous and humble. But he also warned against what he called "phony populism" that was spreading in both America and Europe. "A great shift in technology. A great shift in development in the world. It's causing great anxiety in our countries" Biden said. "It generates some folks, who are somewhat more like charlatans, trying to take advantage of those concerns. We see that in Europe and the United States, we see that around the world -

this phony populism. It seems to me the best answer to deal with these changes is to have a circumstance where our economies grow and they grow together". "Europe is our natural partner, and the reason is we're committed to the same democratic norms, and they are increasingly under attack" Biden added.

Many criticisms of China and Russia

The US president attempted to unite his European and G-7 allies from Canada and Japan with a strongly worded G-7 statement critical of China. But it was clear that Germany and Italy, both having substantial trade interests, are less willing to overtly attack Beijing with explicit American-style rhetoric. Apart from the China differences, though, there was plenty of harmony: on the use of fiscal stimulus to help the global economy to recover, on climate change and anti-Covid health measures, and on a shared position of defending Western democratic values from the aggressive provocations of Vladimir Putin. Nato leaders declared that "Russia's aggressive actions constitute a threat to Euro-Atlantic security" in their communique following the summit. And Biden made crystal clear his concerns about Putin's attacks on democracy during his summit with the Russian leader in Geneva.

Good news on the trade front

Biden's visit to Europe brought some good news on the trade front: The U.S. and Europe finally settled their long-standing disagreement over government subsidies for their respective aircraft manufacturers. The 17-year-long dispute over government support

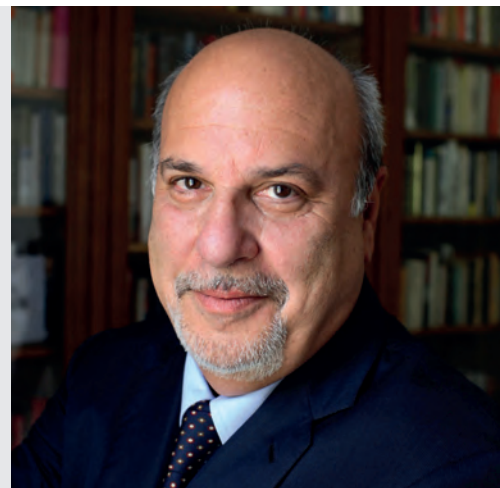
for Boeing and Airbus came to a head when former president Donald Trump issued \$7.5 billion in tariffs on European products. The EU responded with their own tariffs on the United States. Both sides have now agreed to suspend tariffs for five years. The G-7 leaders also discussed the critical needs of global supply chains and the disruptions caused by Covid. They discussed in particular the issue of semiconductor shortages, along with how to guarantee the supply of rare earths, key pharmaceuticals, advanced health technology and other strategic manufacturing sectors. Biden proposed new forms of collaboration between US and European companies.

Building resilient supply chains

In fact the G-7 summit came just days after the June 8th release by the Biden Administration of its 100-day supply chain report. The report was entitled **"Building resilient supply chains, revitalising manufacturing and fostering broad-based growth"**. The paper was not just a blueprint to revive the US economy. It was really about getting American and European capitalism fit and strong enough to compete with state-sponsored Chinese capitalism in the semiconductor sector. The report recommends that the United States work closely with its European allies and partners and in every product sector. Meanwhile, SEMI, the semi conductor industry association serving the global electronics design and manufacturing supply chain, was very pleased to see that the U.S Senate has now voted to approve some \$52 billion in funding for new incentives to promote U.S. semiconductor manufacturing and research. The funding is part of the United States Innovation and Competition Act. 

Who is Alan Friedman

Alan Friedman is a journalist, writer, television host and economist. Correspondent for the *International Herald Tribune*, global economy columnist for the *Wall Street Journal*, he worked for the *Financial Times* in London from 1979 to 1993: in this period he was awarded with the *British Press Award* four times. He also had a professional experience as Presidential Management Intern in the administration of President Jimmy Carter. The scoop regarding the Iraqgate scandal in 1991 was one of his most famous.





Connectors look to new records

Connectors recorded two excellent results for the sector in **April 2021**: orders increased by **71.5%** and sales by **43%**. And for the entire second quarter, new orders and billing **records are expected**.

by Ron Bishop

Connector demand is soaring: april orders were up +71.5% and we believe that is the largest year over year increase ever recorded in the connector industry. April sales were up +43.4% which is also probably an industry record. Obviously, much of this increase in connector demand is directly related to pent up

demand created by the COVID-19 pandemic and the shutdown of business activity. Based on early results, the second quarter of 2021 is probably going to result in new record being set for bookings and billings. The second quarter of 2020 resulted in orders down -19.4% and sales down -17.2% which creates very easy comparisons for 2Q21. Already, April

MARKETS CONNECTORS

	BOOKING		BILLING	
MONTH	2020	2021	2020	2021
April	-21.8%	71.5%	-19.9%	43.4%
May	-24.8%		-20%	
June	-1.16%		-11.6%	
TOTAL	-19.4%		-17.2%	

The trend of booking and billing in the second quarter of 2021
(annual change, source Bishop & Associates)

orders are up significantly. As noted, because of the significant decline in May of 2020, we are optimistic that May and June results will also be outstanding. We also expect the third and fourth quarters of 2021 to result in good demand.

However, the second half of 2020 was the beginning of the turnaround in connector demand we are now experiencing. Thereafter, year-over-year comparisons become more difficult.

Forecasts for 2021

Historically, 2008 to 2020, the first four months account for 31.97% of the full year sales.

The industry had connector sales of \$19,061 million in 1Q21 and \$5,908 million in April. Year-to-date, sales are \$24,969 million. Assuming histo-

rical averages hold up, the industry would ship \$78,104 million in connectors in 2021. This would be an increase of +24.5% over 2020 sales of \$62,727 million.

Historically, it is possible that the industry could achieve a +24.5% growth rate. We believe it is more likely we will achieve growth in the +15.0% range. This is primarily because we have more difficult comparisons in the second half of 2021 and there are many uncertainties going forward. It is important to remember that current industry sales are up +28.1% through April.

One could easily argue that our current forecast is too conservative and may be on the low side of possibilities for industry sales in 2021. We will continue to watch where the monthly numbers go and keep you advised. 

Who is Ron Bishop

Ronald E. Bishop is a world's leading connection expert. In 1985 he founded **Bishop & Associates**, a market research firm that specializes in the world electronic connector industry. The firm publishes "**The Bishop Report**", a monthly research newsletter and several weekly publications by connectorsupplier.com. A staff of 20 researchers produces reports centered on geographic regions, end-use equipment markets, connector products and interconnect technologies. The US headquarters is located in St. Charles, Ill., Chicago. The firm also has offices in Brussels, Sidney and Hong Kong.





Year starts “flat” for European distribution

The first quarter of 2021 closes, according to **DMASS** data, with a drop of 1.6% compared to the previous year.

The impact of Covid disappears,
but **availability problems** limit growth.

by Cleopatra Gatti

The European semiconductor distribution market started with a “flat tyre” into 2021, despite a significant increase in bookings since last quarter. According to DMASS, sales in the European Semiconductor Distribution Market fell by 1.6% to 2.17 Billion Euro. Sequential growth of 15.6% (against Q4/2020) indicates strong turnaround.

Georg Steinberger, chairman of DMASS: “While 2020 certainly was influenced by the Covid-19 pandemic and Brexit anxieties, these factors seem to have disappeared completely from the

current market development. Now, it is all about components shortage and strategic dependencies on Asian production. Booking levels are crazy and availability has become a revenue-limiting factor for distribution and their customers. The sequential growth indicates the direction the rest of the year might take”.

Germany and France decreasing, UK and Italy are growing

At a country or region level, the market situation varies significantly and does not show any clear

direction. While Eastern Europe, UK, Italy, Switzerland, Nordic and Benelux showed positive development, Germany, France, Iberia, Israel and Russia declined in the low to high single-digits. Germany ended with a decrease of 8.7% and 594 Million Euro. France declined by 5.9% to 135 Million Euro, while the UK increased by 8.7% to 143 Million Euro. Italy went up by 3% to 212 Million Euro. Eastern Europe continued to grow in a stable way by 3.2% to 398 Million Euro and the Nordic region by 4.9% to 164 Million Euro.

Georg Steinberger: *"Q1 is not really a great trend indicator, considering the major sequential swing and the giant semiconductor shortage, accompanied by significant price increases. As it stands, the current constraints may last well into the later part of 2021, if not beyond".*

Disparity also at a product group level

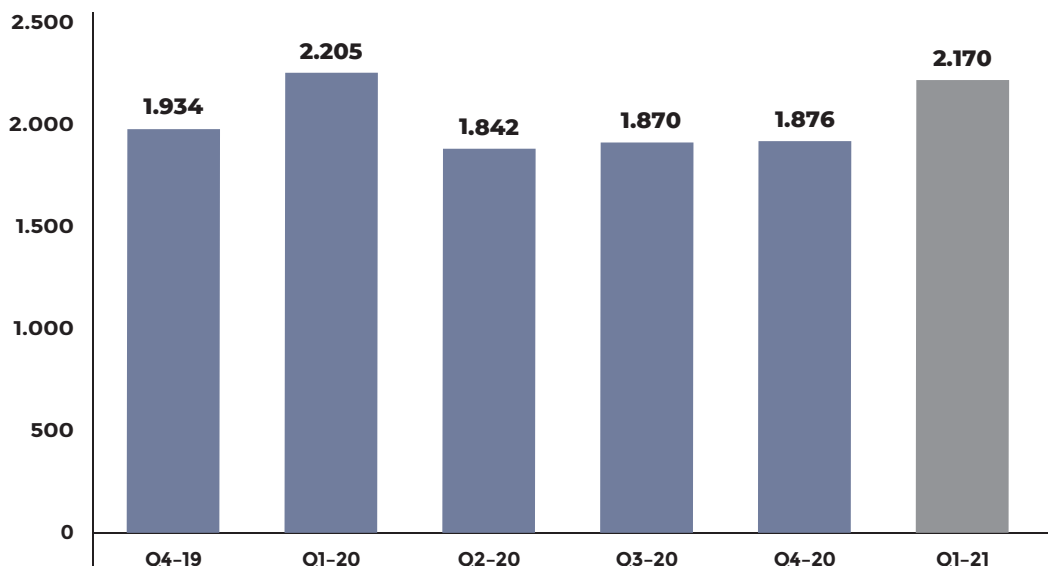
Evaluation at a product group level is similarly difficult, and can be summarised in one word: disparity. While for example Discretes, Power and Sensors grew nicely, Opto, Analog and MOS Micro declined slightly and Programmable Logic, Other Logic and Standard Logic tanked. Ranked by size, Analog components declined by -3.8% to 627 Million Euro and MOS Micro by -0.7% to 430 Million Euro. Power grew by 6.8% to 266 Million Euro, Opto stayed flat with -0.3%

to 205 Million Euro and Memories grew by 1.2% to 191 Million Euro. Discretes grew by 14.6% to 130 Million Euro and overtook Programmable Logic, which decreased by 20.5% to 124 Million Euro. Other Logic recorded a decrease of 13.7% at 105 Million Euro and finally Sensors increased by 15.7% to 64 Million Euro.

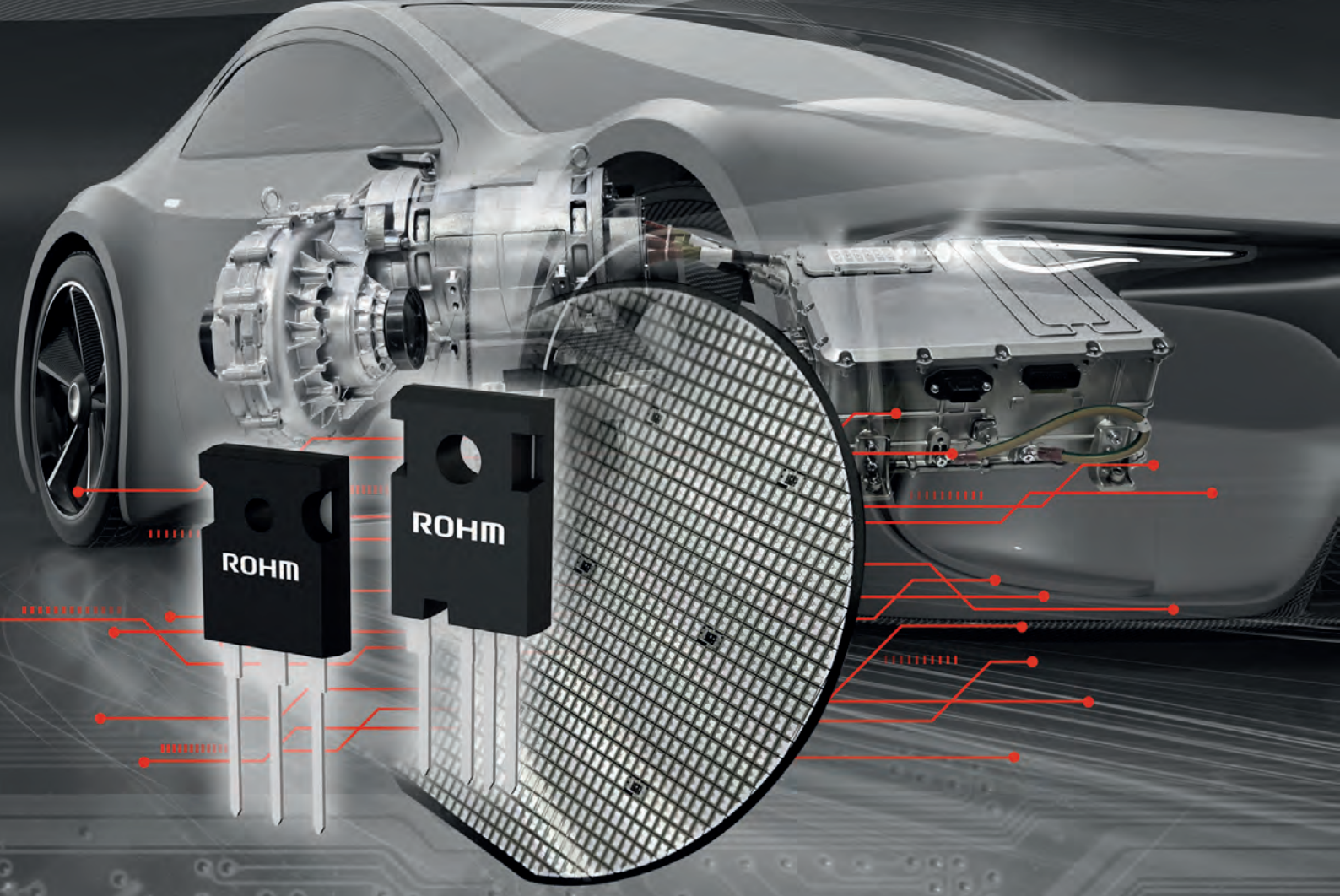
Georg Steinberger: *"Funnily enough, some standard products like Discrete and Power did much better in Q1 than Logic in general or Analog, quite the opposite of last year. However, with a market in turmoil (or boost mode, depending from which perspective you view it) the situation will change during the course of the year. And, as the sequential growth shows, the limiting factor in the coming months may be availability rather than demand."*

A new awareness

"What 2021 will bring is more of what we have seen for a few months, which is over-the-top bookings, price increases, shortage and a reconciliation of procurement strategies to longer-term ordering. The furore with which politics are now trying to tackle the dependency of Europe on Asia when it comes to semiconductor production shows the strategic significance of this technology for many sectors of the European industry. It can be expected that the shift in awareness will not have any short-term impact on supply." 



The quarterly trend of semiconductor sales by distribution in Europe
(turnover in millions of Euro, source Dmass)



Sustainable technology for a changing world

Among the objectives proposed by **ROHM Semiconductor** is the contribution to an ever-changing world through the development of technology able to reduce environmental impact and create a greener society.

We discuss this with Italy Country Manager **Alessandro Zanarella**.

by Laura Reggiani

Founded in 1958 in Kyoto, Japan, ROHM has become one of the globe's biggest suppliers in the electronics industry, constantly expanding the range of products they offer.

Today, the company develops and produces a vast range of solutions, including power management integrated circuits, diodes, MOSFETs and SiC power modules, transistors, and power diodes, as well as LEDs, resistors and a number of other electronic components. Managing the development strategy

and the implementation of products intended for the Italian automotive - industrial market is Alessandro Zanarella, Country Manager for both Italy and Israel since 2019. In his almost thirty years of experience in the international strategy and business development Zanarella has previously worked as Sales Director, Country Director and Field Sales Engineer for multinational distributors such as Ebv Elektronik, Future and Arrow. In this interview he explains to us the company's strategies, currently focused upon the development of analog and power solu-

tions, which are *“able to resolve social issues and contribute to client energy-saving needs”*.

Which stages of development have been fundamental for the company since its conception in 1958? Who is ROHM Semiconductor today, and what is its business model?

ROHM has come a long way since its establishment in 1958. It began as a producer of resistors; in 1967, it expanded its production to include transistors and diodes and in 1969 it added power management integrated circuits and other semiconductor products to its range. I think one of the most fundamental development was in 1971 when, going against Japanese business culture at the time, the company entered the US market, setting up a sales office and a design centre for the power management integrated circuits right in Silicon Valley. We're talking about a fifty-year presence outside of Japan, which we're actually celebrating this year. Other Japanese companies quickly started to use this as a business model, until it became common practice. Among a number of other milestones, I should also mention 2010: the year in which mass production began for first components – diodes and MOSFETs – in silicon carbide technology. Once again, we became pioneers at a technological level. Today, ROHM plays a fundamental role as a global electronics supplier, with a turnover of roughly 3.3 billion dollars a year. We have over 22,000 employees around the world, with cutting-edge production plants in Japan, Korea, Malaysia, Thailand, the Philippines, China and also in Europe. We base our business model on a precise, managerial vision which allows us to concentrate on the development of analog and power devices and recommend solutions in energy efficiency and in product size reduction.

What are ROHM's strengths which differentiate it from other competitors on the market?

I think that one of our strongest points – and therefore something which differentiates us from our competitors – is the fact that we have immediately applied a vertically integrated production system which is able to cover the entire production process, from silicon wafer diffusion to assembly. Another strong point, possibly linked to the previous one, is our attention to quality. From our establishment, where the motto “Quality First” was coined, ROHM has consistently adhered to a quality level which is superior to the industry standard. From then on, we

have always sought to improve the reliability of our products, mechanising and automating all processes. The implementation of these strategies has allowed us also to reduce the impact on delivery, and to always respect the time frame agreed with our clients. It has allowed us to become recognised within the market as a serious, reliable supplier.

You focus mainly upon the automotive and industrial markets. Which applications do you analyse carefully within these fields?

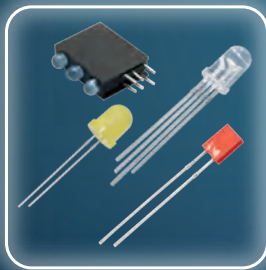
The key applications within the automotive market for ROHM are linked to the electrification of vehicles and the ADAS sector. In the past few years, electric cars – and hybrids – have quickly entered into our daily lives. Within these applications, we appear



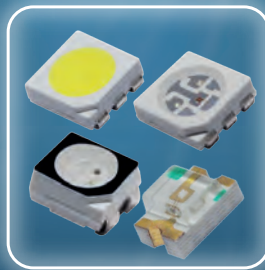
Alessandro Zanarella, Italy Country Manager at ROHM

Luckylight

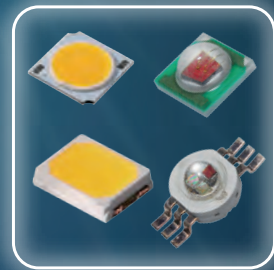
Light up your Future



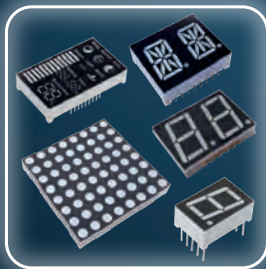
THT LED



SMD LED



LIGHTING LED



LED DISPLAY



IR LED



SPECIAL LED



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in well-known business rankings as our solutions can be used both for on-board applications – i.e., for implementation within the vehicle, such as the management of batteries and inverters for electric traction – and for off-board applications – i.e. public and private recharging stations. Also, within the automotive industry, we have established a name for ourselves when it comes to infotainment solutions, as well as those linked to assisted and autonomous driving. Within the industrial market, however, we are greatly involved in applications linked to inverters, to solutions for solar panels, to large industrial engines and to the powering of data centres.

What role does Europe play in ROHM's strategies? What does it represent in terms of turnover and investment?

This year we're celebrating fifty years in the European market. ROHM has operated in Europe since 1971, with its headquarters near Düsseldorf from which it works throughout the EMEA region. Europe is essential to our strategy and will continue to be so in future. Our objective, in fact, is to keep expanding into markets outside of Japan in general, with a particular focus on Europe, concentrating on analog and power devices whose importance will be continuing to grow. As a testament to our interest in the European market and in our European clients, we've opened our Power Lab: a laboratory specialising in power electronics situated in Willich, near Düsseldorf. Our Power Lab provides locally essential technical support at a practical level to our European clients; here, they also have the opportunity to try out, test and first-hand evaluate the characteristics and functions of our components, as well as the practicality of their applications.

Technology in power electronics is quickly evolving. What are ROHM's latest developments? Which technology is most prominent?

As I have already mentioned, we were the first manufacturers in the world to develop silicon carbide products, a technology we've been working on for several years. We are already mass-producing products of different technologies, from trench process to planar process. The fifth generation is already in the development phase, with the aim of beginning mass production by 2025. This technology, unlike silicon which has already encountered various limitations, allows the possibility for further optimisation – particularly in terms of Rds(on) reduction,

the miniaturization of devices, and the increase in efficiency. ROHM has planned for an investment of more than 3 billion euros in R&S and in production over the next five years, with a large proportion of this money to be invested in SiC technology: this will be our spearhead for the future. Technology linked to sustainability will be, in our opinion, among the most promising. With this in mind, we intend to supply products that help reduce CO₂ emissions and that minimise ecological impact. We are dedicated to aiding in the protection of the environment with our technological solutions.

You have years of experience in distribution. What has already changed and what will change in the electronics market?

I've been working in distribution for roughly thirty years, starting out as a young salesman and working my way up into managerial roles which have greatly enriched me, both professionally and personally. But I've never forgotten where I started, and this still helps me today in understanding both clients' needs and what's required when selling to them. If, twenty years ago, the role of a salesman consisted of providing clients with useful information and then selling them the requested product, then nowadays a consulting business model is needed. The market has become more complex; the client needs more attention and more specific technical expertise. They need quick solutions to their applications and truly innovative products. What I observe in the day to day things, is an explosion in new applications, alongside a growing need for eco-friendly technologies. Newly-applicable areas, such as electric mobility, autonomous driving and renewable energy are increasing the use of electronics – and this is nothing but positive, especially when we consider how useful it can be for our society and for a more sustainable future.





Powell, the connector specialist

Powell has chosen to support the European market with a new office, technically-advanced staff and new franchising and have also called upon a connector industry veteran to develop the Italian and Eastern European markets. **Nicola Della Malva** talks to us about their business model, their strategies and any future developments for **Powell Europe**.

by Laura Reggiani

One of the world's largest distributor of electronic components and value-added services, **Powell Europe** supplies connectors and other products to clients who require highly-reliable solutions in various fields of application such as defence, aerospace sector and industrial.

In the USA, **Powell Electronics** operates from a space of 30,000 square metres, certified Iso9001 and AS9100, and is the qualified and listed distributor in the QPL for more than 50 connector types specified by the military sector. The company had already reinforced its European presence last year with the establishment of a new office in Dublin, Ireland, hiring more technical staff to carry out design activities and to sign new franchising contracts. With an excellent reputation already in the United States, where they offer from their New Jersey office high-value connectors and cable assembly services, Powell Electronics was, until last year, exclusively concentrated on the agriculture sector from a small headquarters in the Netherlands.

Gary Evans, a connector professional who had

worked in several managerial positions in Harwin, Deutsch and ITT, was taken on in mid-2019 to re-define Powell's European business plan. Consequently, since 2020, several important European franchising agreements have been signed with companies such as Glenair, Harwin, Amphenol Aerospace, Quell, AB Connectors, Lemo, Conesys and many more. Evans has also built up a strong team of experts to support clients across Europe. **Nicola Della Malva** was appointed Country Manager for Italy and South-Eastern Europe. A notable figure in the market, Della Malva, who has previously worked at PEI Genesis – a company he founded in Italy 11 years ago – as well as in ITT and Yamaichi. Here, he explains Powell Europe's business model and their strategies for development within the European market.

As of today who is Powell Electronics and what is your business model?

Powell began operating as a distributor of connectors and other solutions for high-reliability applications in 1946 within defence, aerospace and in-

dustrial sectors: this is still our business model today. The company, run for years by founder Harold H. Powell, has expanded from its hub in the North-East of the United States, opening a number of offices across America. Over the years, it has grown both organically and through acquisitions - such as, for example, the purchase of East Coast Microwave, a component manufacturer of RF and microwaves. Powell's acquisition strategy is very clear and includes the supply of infrastructure and financial support to the acquired company which continues to operate as stand-alone business in the market. Today, the type of business model is very clear: in-depth specialisation in interconnection and electromechanics, a sign of strength while competitors should not find it. At Powell, we are entirely concentrated on the core business of selling connectors and on offering a first-level support, both commercial and technical. Most of our experts have gained experience in senior positions in sales or in technical dept at some of our key franchises.



Nicola Della Malva, Country Manager for Italy and SE Europe at Powell Europe

What are Powell's strengths against the market? Why should a client choose you as a supplier?

Despite our doubled dimensions and extreme business growth, Powell has been able to maintain an intimacy with its clients which many competitors do not have. At Powell, all positions, from executive manager to customer service, require daily interaction with clients. This is because we believe that a direct relationship, as well as the consultancy provided by our specialists, is a key factor in our differentiation from competitors and in our success - especially in a market as difficult as the one we operate in. Additionally, we don't limit ourselves to sell connectors manufactured by our suppliers; we are able also to develop connectors of all shapes and sizes ourselves, within our offices.

Our experience in project design allows us to work alongside our clients laying out the entire proposal, 12% of our sales comes from a "demand creation" approach with clients.

Powell works within a market which requires high-reliability connectors. Which sectors are you currently focused on? Are there any new markets you're considering expanding into?

Powell has always been focused on demanding markets and on applications which require a highly reliable connection and this is confirmed by the fact that 60% of our business is based on defence and aerospace. Over the years, we've also added agricultural machinery and earth moving to this list: two areas which we are also specialised. We therefore have all the potential to obtain valuable results in Europe's military and aerospace markets, as

well as within agricultural machinery, rails, oil and gas and in industrial fields of application. But we also pay incredibly close attention to any evolution linked to the Internet of Things. The enormous increase in renewable energy and the electric vehicle certainly represent for Powell important opportunities for growth. We are keeping a particularly close eye on these areas too.

What are Powell's plans for development in Europe? Which tools and strategies will you put into place to reach your expected objectives?

We want to become a global partner offering local solutions. With this in mind, Powell Europe will carry out all its logistic management from Ireland and, through its regional teams, manage client relationships and local assistance efforts. We want to develop the Powell Europe brand using infrastructure from our US headquarters, whilst also offering a local "flavour" in the markets we operate in. We want to further develop the most popular and well-known brands in Europe and offer a consulting service through our experienced staff. We are entering organically into the markets which interest us through local recruitment, but one of the strategies we will put into place to achieve our mid- and long-term growth goals is the acquisition of those companies that can facilitate us to enter into particular countries or applications.





Greater production capacity for Infineon

The German chip maker will be able to cope with a lack in global supply and satisfy the needs of its **European customers** thanks to a new production plant for power semiconductor which will soon become operational in **Villach, Austria**.

by Laura Reggiani

As recently announced by Reinhard Ploss, CEO of Infineon, the new plant built in Villach, Austria, will begin production by the end of the Summer and will be able to produce enough power semiconductor each year to equip transmissions of 25 million electric vehicles.

The crisis surrounding the supply of semiconductors has forced car manufacturers such as Volkswagen, Ford and General Motors to halt

production at some car factories after the chip market was overwhelmed by an unusual demand from consumer electronics with larger margin profit. Analysts agree that the supply of products dedicated to the automotive world will still remain limited. The Covid-19 pandemic has caused an unconventional recession, after initial demand disruption chip producers are now experiencing a sudden recovery driven by the restart of the consumer sector.

Infineon, which handled the turbulence of the past year relatively well by building up a surprising stock to support their clients, was faced with various challenges caused by issues linked to the somewhat limited quota of production carried out in Asia, like many active companies in the chip sector.

These issues stemmed from foundries such as Tsmc and Global Foundries, as well as the suspension in production in the factory in Austin, Texas, caused by violent winter storms which hit that area. They have, however, now returned to their normal levels of production. With the launch of the new plant in Villach, Infineon adds a twin plant similar to that in Dresden, Germany, in order to work more flexibly. *"This will allow us to check production in the two sites as if it were one sole factory"*, explains **Reinhard Ploss** to the shareholders present at the annual general assembly. Infineon has also confirmed their plans to make a turnover of 10.8 billion euros with a profit of 17.5% in the fiscal year ending 30th September. The company has also announced that they will complete their integration process linked to the recent 10-billion-dollar acquisition of US company **Cypress** by next autumn.

A plant which creates both chips and jobs

The plant is completely automated and required an investment equal to 1.6 billion euros. It will be dedicated to the production of chips on 300-millimetre wafers. The building, whose construction has only recently been completed, has an area of roughly 60,000 square metres and will create 400 advanced jobs. The production system adopted will be a clone of that in Dresden, which has proven to be stable and very efficient and uses "Adabas & Natural" technology by **AG Software** as a fundamental component of the central manufacturing execution system (IFX Core MES System).

In fact, Infineon uses Adabas' NoSQL technology for its efficient storage and quick access to its data matrix, which provides measurements for all product areas for the automation of chip production. *"Chip production is extremely complicated and requires perfect collaboration, uncompromised quality, and professionalism across all our processes. Our new Villach plant*

will apply the digitalisation models used in Dresden and will collaborate with their continued development. Thanks to "Adabas & Natural", we now have a stable platform which satisfies all requirements in our production and ensures that we can fully take advantage of the synergy in both plants on a long-term basis".

The power semiconductor devices which will be produced in Villach on 300-millimetre wafers allow energy to be saved and are used in a vast range of applications, from smartphones to household appliances and from cars to medical devices. Of the 400 highly-qualified available jobs on the new chip factory, roughly 40% have already been assigned, whilst the remaining positions will be filled over the coming year.

A significant presence in Italy

Infineon has an important presence in Italy also, led by **Alessandro Matera**, which is managed from a head office in Milan – employing roughly 30 people – a research centre in Pavia with over 50 researchers and another research centre in Padua, with roughly 210 employees.

The latter has been in a phase of constant growth since 2001: the year in which the first group of researchers decided upon the Venetian city as their ideal headquarter, thanks to its access to qualified human capital developed at the local university with which Infineon immediately established a close relationship. Today, the research centre in Padua is focused mainly on automotive applications with the development of autonomous driving solutions and new-generation headlights; however, it also carries out research on artificial intelligence and deep learning.

As explained by Senior Director Sales **Roberto Legnani**, a significant expansion and reinforcement process is also underway in Italy, which will soon lead to new investments in people dedicated to technical support and sales. Infineon's objective, as confirmed by **Giuseppe Finazzi**, Distribution Sales Manager, is to become a crucial partner to Italian clients – also for contribution via indirect channels – who play a fundamental role, now more than ever, in demand creation and the development of new technological solutions. 

IoT Platform: build, buy or both?

Only because you have the potential to build something yourself it doesn't mean that doing so is always **the best choice**.

by Mauro Pasqualini*

With the accessibility, affordability and overall democratization of technology, it is tempting today to try and do everything by ourselves. But the keyword in the growing category of DIY or “do it yourself” is the word “it.” “It” is not “everything.” That is particularly true when a company or an organization is thinking about the Internet of Things (IoT). Faced with increasing competitive pressures and the mad rush to digitize, monetize and continually transform every business aspect, we are often tempted to try and go “it” alone — that is DIY IoT. It is tempting to think we could do it all. One knows his business or organization, its assets and liabilities, strengths and weaknesses. And, as we noted, technology is becoming more and more affordable. But just because one can build something doesn't mean he should. That is particularly true for the most critical and complex part of an IoT system: the platform on which the IoT system runs. IoT platforms aren't a “thing” in the ordinary sense of the word. They are more like animate beings. Once IoT platforms are developed, they require constant care, feeding and nurturing. They need to be scalable, flexible and adaptable all at the same time. They need to continually develop, grow and adapt to an ever-changing technology and business environment.

Some of the common pitfalls

Some of the common pitfalls we've seen in attempts to “DIY” an IoT platform include:

- **Underestimating the cost** | An IoT platform can be a budget-buster. Most people underestimate the cost of constant maintenance, upgrades, security, stability, reliability and a host of other factors that come with ownership of an IoT platform.

- **Underestimating the time** | Closely linked to the above are staffing and time. IoT platforms involve dozens of different systems and technologies. In trying to build, secure and maintain these platforms, one instantly become a general contractor with the responsibility of managing and juggling multiple vendors and contracts.

- **Underestimating expertise** | Building and maintaining an IoT platform goes well beyond the ability to code software. It requires not just knowing and having immediate access to the latest software and hardware technologies, but also the implementation of best practices in the areas of operationalization, logistics, maintenance, system reliability and data security.

Most businesses generate a great amount of valuable data, but that data must be funneled back into the organization to take advantage of operation and business innovations. IoT solutions can be extremely complex and it's easy to feel overwhelmed when seeing its real-life use cases and the hype around it. But IoT opens up new areas of innovation, business models and revenue. Rather than how to collect data from the company's devices, prototype, manufacturing units and field services, the challenge is how the IoT platform contributes business context across data sources and data types. Looking for a better way, we have applied our technology ecosystem to build an advanced IoT platform that gives every client a competitive edge. **Avnet's IoTConnect Platform** enables to quickly connect, collect and generate valuable insights from data across the enterprise. Companies can also create new revenue streams and service models by quickly deploying solutions that scale across production environments. Avnet's IoTConnect Platform is time tested. Having been in the technology business for 99 years, and



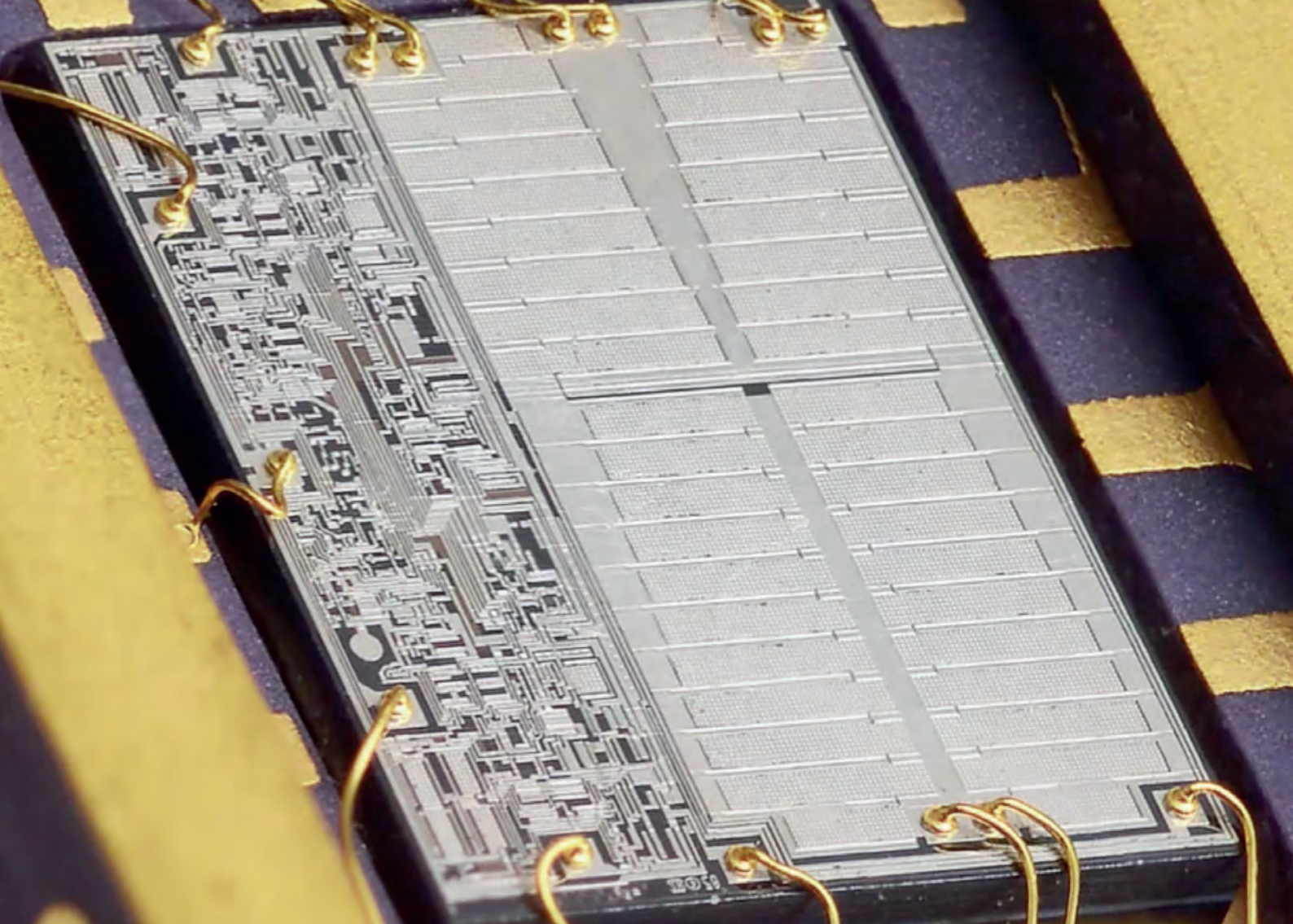
the IoT platform business for six years, we can combine best-in-class expertise in hardware, software and operations. Using the latest and most advanced technologies from Microsoft and others, we provide clients with an IoT platform that is and will always be agile, reliable and secure.

Speed time to market and manage the entire process.

Avnet Silica's IoTConnect Platform addresses all common industry needs and the challenges businesses have been facing, providing a standardized way to harness IoT so the business can quickly build smart apps and solutions on the platform, follow best practices, have a data-driven decision-making process, and extend capabilities. Through IoTConnect, companies can boost efficient, better manage

assets and adopt innovation faster. So before saying, *"We can do that!"* we encourage to reflect on what an enterprise might be getting itself into. And in the meanwhile, check out the IoTConnect® Platform along with all the offerings in Avnet Silica's IoTConnect Solutions Suite that are enabled through our IoT partner program. See how our ecosystem partnership model is helping to accelerate and scale IoT solutions for our customers — so you don't have to go it alone. We do all this so companies can focus on things that your customers value most. They can dedicate their resources to new applications and services — elements of IoT that are best suited — without having to worry about the underlying IoT infrastructure. **E**

* **Mauro Pasqualini** is Director Business Development Emea at Avnet Silica



ST wins the Nobel Prize for electronics

STMicroelectronics honored with prestigious IEEE Milestone for historical
“Multiple Silicon Technologies on a Chip” achievement.

by Laura Reggiani

STMicroelectronics announced that the Institute of Electrical and Electronics Engineering (IEEE) presented the Company with an IEEE Milestone for its groundbreaking work in the super-integrated silicon-gate semiconductor process technology combining the high-precision analog transistors from a Bipolar process, with the high-performance digital switching transistors from a CMOS process, and with the high-power DMOS (BCD) transistors onto a single chip for complex, power-demanding applications.

Over the years, the BCD process technology has enabled revolutionary developments in such end applications as hard disk drives, printers, and the full range of automotive applications, among many others. During a live-virtual ceremony held at ST's plant in Agrate Brianza, **Giambattista Gruosso**, IEEE Italy Section Humanitarian Activities Committee Coordinator and past Secretary, and **Jean-Marc Chery**, President and CEO of STMicroelectronics, unveiled the IEEE Milestone plaque. The plaque will be mounted in two ST locations around Milan, Italy, where the development work on the Multiple Silicon-Gate Multipower BCD work was performed: at

the main entrances to two ST sites: Agrate (located in Agrate Brianza, Italy) and Castelletto (Cornaredo, Milan, Italy).

A pioneering work

In the early 1980s, ST engineers began work to reliably address a broad range of electronic applications by pioneering the ability to integrate heterogeneous transistors and diodes on a single die. Focused on customer needs across multiple market segments, the engineers' objective was to deliver electric power in the range of hundreds of Watts under the control of digital logic that could scale with Moore law. The target devices would also support precise analog functions and minimize power consumption to eliminate heat-sinks. Those efforts launched a new integrated Silicon-Gate technology. The Bipolar, CMOS, DMOS (BCD) technology allowed the integration, onto a single chip, of diodes, bipolar linear, complex CMOS logic, and multiple DMOS power functions with complex interconnections. The first chip, the L6202 full-bridge motor driver, operated at 60V, delivering 1.5A, switching power at 300kHz and meeting all its design goals. The new reliable process technology enabled chip designers to flexibly combine power, analog, and

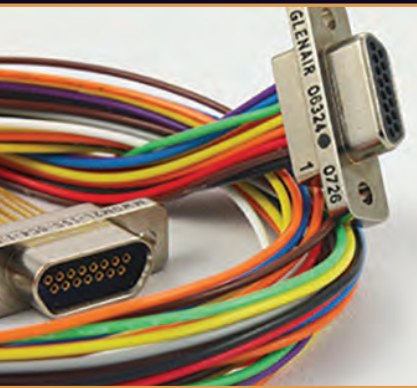
digital signal processing on a single die. Since launching the BCD process, ST has sold 40 billion devices using ST Silicon-Gate Multipower BCD and is soon to begin production of the 10th generation of the technology. The technology used in front- and back-end manufacturing sites in Europe and Asia is ubiquitous in the market and can be found across a range of automotive subsystems, in smartphones, home appliances, audio amplifiers, hard disks, power supplies, printers, pico-projectors, lighting, medical equipment, motors, modems, displays, and more. *"Blending together the high-precision capabilities of Bipolar transistors with the digital control of CMOS, and the high-power benefits of DMOS in the early 80s was an exceptional achievement. It could only have been done by an incredibly talented technical team operating within an organization that had the vision and foresight to recognize the value of smart power, which was then a completely unique concept,"* said **Jean-Marc Chery**, President and CEO, STMicroelectronics. *"Now, we are 35 years, 9 technical generations, 50 million wafers, and 40 billion chips sold later – almost 3 billion delivered last year. We proudly welcome this IEEE Milestone plaque, which recognizes ST's BCD invention among the select group of technologies that have advanced mankind".* 



From left, Jean-Marc Chery, President & CEO at STMicroelectronics and Maria Cristina Messa, Minister of University and Research in Italy

Hi-rel interconnection from Powell Electronics in Europe

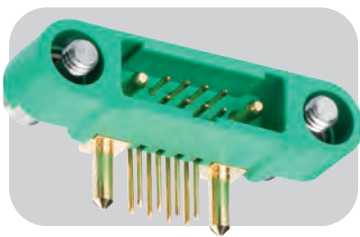
Connectors, cables, value added assembly



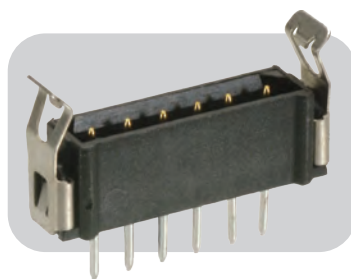
Glenair | Harwin | Amphenol Aerospace | Positronic
AB Connectors | Quell | Lemo | Conesys | and others

HARWIN

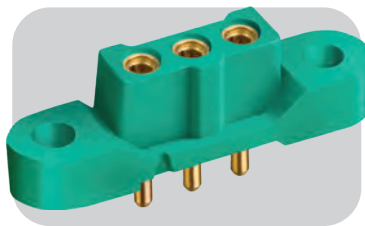
Examples of Harwin's high reliability connector
portfolio in stock at Powell Electronics



Gecko
1.25mm



Datamate
2.00mm



M300
3.00mm



Kona
8.50mm

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Test helps speed data transfers

Tektronix delivers automated USB Type-C compliance and debugging solutions. New test solutions easily integrate into test environments, enabling higher speed data transfers.

by Greta Gironi

To meet consumer demand for ever faster data downloads, from live streaming videos to global videoconferences, Tektronix announces three new testing solutions to help drive the future of data transfers.

The new transmitter automated test solutions are designed to meet the demanding requirements of next-generation technologies for large, rapid data transfers and low-latency video displays. Tektronix USB4, Thunderbolt 4 and DisplayPort 2.0 automated compliance and debugging solutions address the most common challenges design engineers face, including test time, signal integrity and Device Under Test control. The solutions also boast physical layer electrical testing and characterization, which is crucial for designers to comply with the next-generation standards over the USB-C connector.

“These solutions easily integrate into custom test environments and will enable our customers to test and debug USB4 designs that go into any device with a USB4 or TBT4 port - from laptops to tablets and cell phones to televisions”, says Matt Ochs, general manager at Tektronix. “The results will be faster charging times and data transfers, plus a sleek new design that allows connection of up to six devices in parallel”.

The new USB4 standard increases data transfer rates up to eight times faster than the USB 3.0 standard and delivers fast and secure 100W USB-C charging. DisplayPort 2.0 is set to triple data bandwidth performance compared to the DisplayPort 1.4 and includes 16K video resolution, higher refresh rates, and improved user experience with augmented/virtual reality (AR/VR) displays.

What customers are saying

Graphics card maker MSI relies on the Tektronix solution to continue to advance its innovations. *“The Tektronix TekExpress USB4 automation software was the first to offer USB4 DUT automation, which helped us reach our required compliance patterns”* says Anthony Liang, signal integrity department manager at MSI. *“Tektronix and MSI’s collaboration has defined the next generation of USB4 compliance automation software”.*

Electronic design automation company Synopsys also leverages Tektronix technology for its semiconductor chip design work. *“The USB-C IO solutions, in our case for DisplayPort 2.0, are must-haves. When using the TekExpress DisplayPort 2.0 Tool, we were not only able to understand how to meet compliance, but we were also able to debug and understand the limits of our physical layer. Also, the tool is very user friendly”* says Andre Merlo, senior test engineer at Synopsys. E





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Ensuring Functional Safety in Vehicles

ROHM's new website consolidates 1,000 products under the ComfySIL brand to support functional safety in automotive systems.

IN RECENT YEARS, FOLLOWING THE ACCELERATION OF TECHNICAL INNOVATION REPRESENTED BY ADAS (ADVANCED DRIVER ASSISTANCE SYSTEM) IN THE AUTOMOTIVE SECTOR, IT HAS BECOME NECESSARY TO CONSIDER FUNCTIONAL SAFETY TO HELP PREVENT ACCIDENTS.

At the same time, in response to the increasing importance to ensure vehicle safety by supporting safety requirements at the device level for onboard electrical systems, a 2nd edition of ISO 26262, the international standard for functional safety, was released in December 2018 that adds a chapter on semiconductor.

A dedicated ComfySIL site

ROHM Semiconductor quickly responded to these needs, and in March 2018 successfully acquired ISO 26262 development process certification from 3rd party certification body **TÜV Rheinland**. Since then, ROHM gradually expan-

ded its portfolio to include documents required for functional safety design, and currently features a lineup of more than 1,000 compatible part numbers. This new special site consolidates functional safety compliant products under the brand name ComfySIL that will be used on the web and relevant documents to significantly improve product searchability.

The ComfySIL brand targets not only vehicles, but also functional safety for other markets as well, and going forward we will expand our lineup products that support functional safety for the industrial equipment field as well.

As the role of semiconductors in the automotive and industrial equipment markets continues to grow, ROHM will strive to manufacture high quality products and contribute to the creation of a safer, more secure, environmentally friendly automotive society through its products.





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- Best-in-class security and reliability



Future trends for a “smart” operating room

ODU connectors for medical applications are developed taking into account innovations that are transforming surgery and medicine.

MINI DOSING DEVICES, OPERATION ROBOTS AND MEDICAL INTERVENTIONS CONTROLLED VIA SCREENS AND ACROSS NATIONAL BORDERS. The latest high-tech methods and innovations are turning the medical technology sector into a booming industry marked by rapid change. Doctors, patients and care staff all stand to benefit from these developments.

Sensor technology for patient monitoring

An important trend lies in the field of sensor technology. In other words, a growing number of sensors are used to monitor vital signs, lying positions and other patient parameters. The relevant information is automatically sent to the medical staff. For this reason, there's a growing demand for sensor technology interfaces. In the medical field, one of the most widespread sensors is the SPO2, which is attached to the patient's finger to measure the oxygen content in the patient's blood. ODU is committed to ensure the fast and secure transmission of data with the highest level of reliability.

Robots in the operating room

Another major trend marked by complex technology and a fast pace of innovation is automation and the use of robots. This area will continue to gain momentum in the years to come as new interfaces will be required between robot arms and instruments. Thanks to systems installed in the arms, operating instruments, endoscopes, light or gas can be used simultaneously to expand the operating field. This way, surgeons can carry out surgery by themselves without needing additional assistants. Especially in the face of cost pressure, this is a profound advantage. Furthermore, the use of robots in operations can minimize the risk of errors.

Computer-controlled knee surgery

The networked operating room of the future will face robots collaborating with cameras and a navigation

system that records all parameters and changes during an intervention. If the patient changes their position even minimally, for example, the system will register this immediately and can adjust the device control in an instant. Currently there is a trend toward developing operation robots with just one or two arms. Today such robots are already used in areas as knee replacement surgery.

The interface between the robotic arm and the medical technology being used plays a central role in this field. The interface typically takes a modular design in the form of a flange with various contacts so that different devices can be used. This way, it becomes possible to use different media. For this purpose, ODU offers modular connectors of the **ODU-MAC®** series to combine such media as fiber optics, power, signals and others. ODU integrates these trends in their product developments. High-performance interfaces with high data transmission and modular design are further developed. Easy cleaning surfaces, sterilizable and disinfectable connector solutions with cable assembly are part of the portfolio. Comprehensive durability and reliability tests guarantee proven quality.



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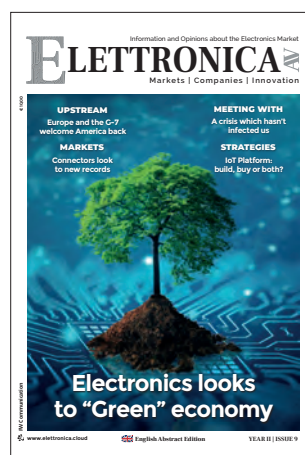
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