



Information and Opinions about the Electronics Market

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it's time
to change mindset

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of the American empire

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Precision fishing:
Net benefits

The price of the rebound

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YEAR II | ISSUE 10

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RJ 45 MAGJACK

SINGLE PORT SMD

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SINGLE PORT THT

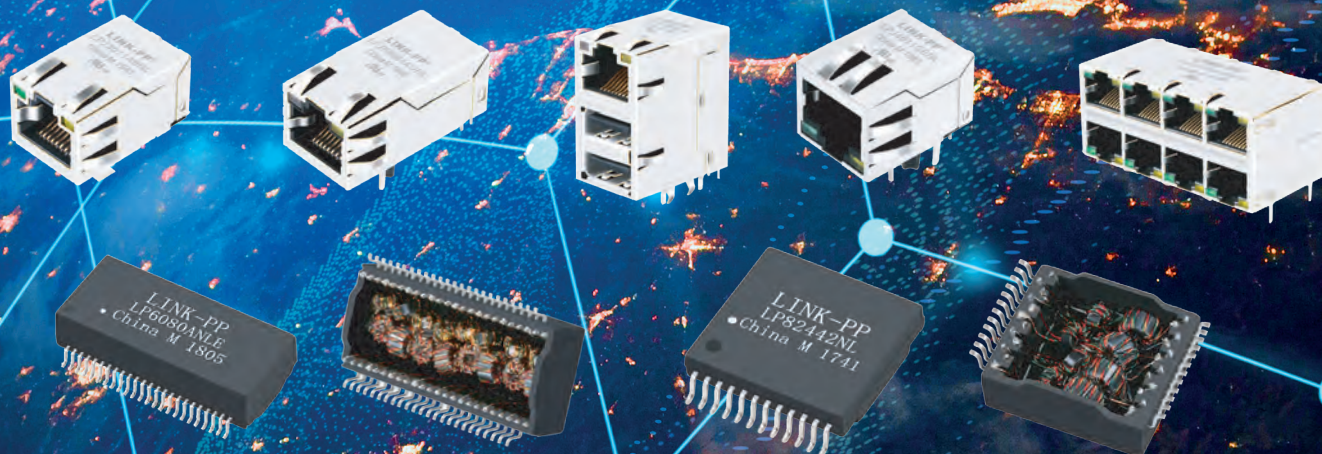
SINGLE PORT WITH USB

MULTIPLE PORT
SINGLE/DOUBLE LINE

LAN TRANSFORMER

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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.



10 *With the recorded defeat in Afghanistan, the United States, the largest superpower of the world, they have lost their influence and credibility. Joe Biden is the third US president in a row to prove that his country no longer intends to be a global policeman.*



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Attracting Tomorrow



by Fritz Walter

“10”

Ten! The number 10 represents football legends including Platini, Pele, Messi, Maradona and Ronaldo was also wearing it for the first time as a Inter player! Ten like the 10 Commandments Christians need to follow, sacred/profane distinction, this is basically an argument for a free decision. And to continue, ten is the perfect number according to Pythagoras who also believed that everything could be reduced to. Ten is still a symbol of optimism and positive thinking.

Finally, the first ten issues of our magazine Elettro-nicaAV are now in our archive since FW Communication became Publisher, establishing a reputation for itself in the field of specialized publishing. It took a deep cleaning on different areas (owner of the business, graphics, mailing and especially on contents) but it sounds like the effort was worth it. This is even more true when the result is contextualized in the most difficult period ever in terms of absence of social relations (no exhibitions and shows, no live events and very often no meetings in attendance). We are positive and are maintaining the optimistic attitude that distinguishes us to carry on our work despite the Coronavirus and its variants, including the little-known but very annoying type from Cremona (this is a remark just for *connoisseurs!*).

In the last twenty months everything has changed, the way we work and also our markets have been transformed. Electronics suddenly found itself in the newspapers' front pages due to a lack of components we have just never ever anything like it in all of history. It took it (i.e., this shortage of components) to tell people about our business. Also,

global politics reshaped. The social/political landscape in particular has been further transformed by the United States presidential transition with the over seventy-year-old Joe Biden's victory and let's not forget the especially cultural tsunami that Afghanistan is experiencing. All of this made us realize how small the world is.

In the meantime while we, the citizens of Italy, are dealing with Covid-19 vaccines (preparing for dose 3) and the proof of vaccination (Green Pass) have also to witness quarrels in Parliament over the citizens' income scheme (Italian: Reddito di Cittadinanza) and the reform of Italy's criminal justice system (did you read the book on Mr Palamara who was lawyer in the past? It still makes me shiver...). We look forward to seeing who will be next Italy's President? Will Mr Mattarella continue to serve Italy for two consecutive 7-year terms or will Mr Mario Draghi receive a majority of the vote? It is im-

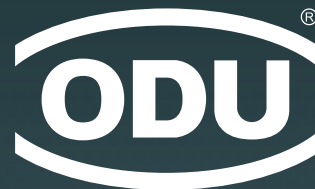
portant to recognize that as soon as a new President is assigned, he needs to fully engage in many different responsibilities and especially to focus on the topic of Justice for that thing Italy's President is at the same time Head of the High Council of Judiciary which instituted it along the Ministry of Justice.... all the while we, the citizens of Italy, wait to see when we can again take part in the election process.

There is no temptation to strive for excellence, political attitude and behaviour are at the stake when it comes to protecting self-interest in public policy issues. We had already endured and the result is always the same. Now, one might ask: "Why do you do it?"... Amen to that, mainly! (*"Marchese del Grillo", 1981, Italian comedy movie*)



IS A 1979 MOVIE
DIRECTED BY
OSCAR-WINNER
BLAKE EDWARDS
AS MASTER OF ROMANTIC
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DUDLEY MOORE,
JULIE ANDREWS
AND A CHARMING
BO DEREK

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by Alan Friedman

Vaccinating the supply chain is the best way to end the disruption

The economic consequences of the pandemic are continuing to manifest themselves across the global automotive, consumer products and many other sectors. The global chip shortage, caused by disruptions in the supply chain due to Covid, continues and the crisis has already halted or slowed car production at Toyota, Stellantis, Volkswagen and other groups. But other supply chain disruptions are also affecting a vast array of intermediate components, plastics and steel.

What is worse is that most top car executives do not see any light at the end of the tunnel. Although the shortage began after last year's lockdowns, it has continued to plague the chip market as a result of the spread of the virus. For example, several plants in Southeast Asia, in areas affected by Covid, have been unable to produce. Now it looks like the problem could persist even beyond 2022, which means a huge loss of revenue and price rises for consumers as the crisis threatens to cut auto output by 7 million cars this year, according to IHS Markit.

Gunnar Herrmann, the chairman of the management board of Ford Europe, this month told CNBC: *"It's not only semiconductors."* He added that lithium, plastics and steel are also in short supply. *"You find shortages or constraints all over the place,"* the Ford Europe chairman lamented. The chip shortage is thought to have been exacerbated by the move to electric vehicles. For example, a Ford Focus typically uses roughly 300 chips, whereas one of Ford's new electric vehicles can have up to 3,000 chips. Herrmann, together with other executives - such as Volkswagen's CEO Herbert Diess - fear that the

chip shortage could continue until 2024. For now, it is difficult to predict how long the crisis will go on, the car executives say. Demand for new cars is not the problem; it is building them. Meanwhile President Joe Biden has said repeatedly that he believes a strategic national program is needed to help nurture more chip production in the United States. In June, a White House report on supply chain vulnerabilities identified semiconductors as one of the four key priority areas where the U.S. must develop more domestic manufacturing capacity. But Biden does not have a magic wand to make this happen.

The U.S chip industry is seeking 50 billion \$ of federal subsidies to help motivate them to build expensive plants in the U.S. And it is possible that the Congress will approve these federal subsidies, matching funds, and tax incentives for manufacturers. But even with 50 billion \$ of aid, the U.S. ranking among international chip producers would remain low. Without the funding the industry estimates that the portion of chips made in the United States would drop to about 6 percent, from its current level of 12 percent. Yet we should remember that well ahead of United States production are South Korea, Taiwan, and Japan. And China is coming on strong.



Alan Friedman,
journalist, writer
and economics expert

For now there is no happy ending in sight; the chip crisis will probably continue to do damage as long as the virus circulates. In the end the real solution may not be subsidies for domestic manufacturing in the United States, but ensuring that everyone can be vaccinated around the world, and not just in Europe and the United States. Vaccinating the supply chain could be the best way to end the disruption.



It's time to change mindset

The global health crisis has shown how the economical processes are structurally interdependent.

Which is the place of Italian economy in this scenario today? According to **Carlo Alberto Carnevale Maffè**, Strategy teacher at Scuola di Direzione Aziendale of **Università Bocconi**, consultant, and expert in economy and technological innovation, it is essential to change perspective to answer to this question.

by Virna Bottarelli

For one year and half we have been wondering on how the pandemic has changed our lives, on how we are improved or worsen, on the efficiency or not of the measures taken by the authorities to fight against the health crisis and its economic consequences.

All the different opinions are not always able to explain these complex and tough times. A condition started before the pandemic which has upset some of our certainties, but also has given some confirmations. One of them is to “*belong to a unique market*” as **Carlo Alberto Carnevale Maffè** says.

Can we learn something from the pandemic impact on our Country?

Who had a longing for a return to “sovereignist” economy has been denied by the evidence of a structural interdependency of economic processes: in economics, the isolationism is today only ideological without evidence in the reality. The boundaries are ideal as well: when goods and people move from a country to another, market dictates the rule to follow and limits of political representation.

Covid-19 pandemic involves all the people, and it is not possible to face it at a local, regional or national level. Global or European health strategies are necessary.

The international politics has understood it by realizing that the national resources cannot face a crisis with such a level of interdependency. It is not only a matter of giving funds to a country or another, but for the first time Europe takes responsibility, through Recovery Fund, to issue debt. Covid-19 pandemic has been the occasion for Europe to realize how global the challenges are and facing them from a national point of view does not guarantee any systemic outcome. We must join our forces. The illusions of economic separatism in these last two years, revealed their nature: mystifications or manipulation for political aims.

Is it realistic thinking about the idea to bring back in Italy those productions which were delocalised during the last years? Or would it be better to bet on the development of a service-oriented economy for our Country?

The pandemic hit more the service sector, from

tourism to transports rather than the industrial field. This last one reacted better and in a shorter time by defining safety protocols and production capability by offering a resilience example.

Italy is a quality and export-oriented manufacturing Country, which is an advantage into an interdependent economy; indeed, our tertiary – banks, transports, professional services – is not competitive and does not export. We have a “natural gift” called tourism, which unfortunately is not well promoted because of a lack of coordination and suitable infrastructures. Isn’t it ridiculous thinking about the fact that the most important booking platforms, on which our accommodation facilities are the protagonists, were invented by Dutch or American companies?

The manufacturing field must be central for our economy, but I do not think our Country could be able to host new productions as they require great investments or a managing and financial capitalism and here in Italy there is not.

The foreign Green Field investment level on our national territory is the lowest across Europe: Italy is ranked 58 on Doing Business Index and capitals coming to Italy, between 25 and 30 billion per year, are dedicated to takeovers. For example, all those big private companies, which are not Italian anymore, like Fiat, Luxottica, and Lottomatica. It is true that investments are made where there are suitable conditions to yield a return, and now in Italy there are not such conditions. When people suggest penalising those who delocalise by focusing on sectors producing low-technology content goods, it is a mistake. We should not bet on already developed technologies: these can be developed all over the world.

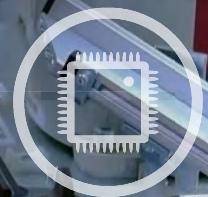
We should bet on those sectors that are increasing by double digits. Capitals do not come because of job costs: investors do not choose Italy to invest because work productivity here has not been growing for years. Please do not expect best long-term investments; I have already explained what’s about those capitalists from abroad. When it comes to think at Italian entrepreneurs, well, they do not invest too much into modern technologies which require billions. They prefer instead to finance small business projects.

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In the scenario you have just described, are there some fields in which the Italian companies can make the difference about innovation?

Unfortunately, in the innovation fields which require great base research, our companies do not make the difference: here great financial resources and a strong relationship between universities and companies are mandatory, but both non-existent in Italy.

Except for some renowned universities like Politecnico in Milan and Politecnico in Turin, we do not have traditional base research and a technology transfer ability. We are too weak in innovation from different points of view and entrepreneurial, financial and institutional perspectives.

However, we are excellent in incremental adaptation strategies meaning the starting point of innovation. We can offer indeed our contribution as Tier 2 providers in the most innovative and great industrial system so to exploit our renowned components production ability. We must learn to work with an European outlook: Italy, together with France and Germany, can build an integrated supply chain of innovation focused on hardware while US has the prerogative to control the evolution of software.

Our Country can grow, but we all do it together

with Europe. No key role for Italy on economic growth - we will be followers and not leaders - but we will keep and save our specialty on quality, style and that feature of "beauty" which comes out when innovation become more consolidated. The aim of innovation on Phase 1 is to develop a ready-to-use solution, to provide aesthetically pleasing only at a later stage and our "Made in Italy" rules.

We come back to the starting point: we should understand that we belong to a great, unique market...

The trend of young professionals to leave Italy confirms that, fortunately, the job and financial markets are European. For this reason, we need to change our mindset: we need to talk about national economy without considering the interdependencies I have already talked about that does not make any sense.

We must see Italy as the Italian region within an European economy. Also, to think about the great capitalisations over the last ten years which is the result of the venture capital investments of the previous decade. That's to say, investments with a long-term and global market vision are successful. This vision needs to be valid also for our Country: Italy need access to the world otherwise Italy will not go anywhere. 

Who is Alberto Carnevale Maffè

Born in 1961, a degree in Political Science from the University of Milan and an MBA in International Economics and Management from SDA Bocconi, Carlo Alberto Carnevale Maffè is Professor of Strategy at the Business Management School of Bocconi University and has taught in international programs at GSB Columbia University, Stern School NYU, Wharton School and Steinbeis University in Berlin. He is the Independent Director of companies in the Technology, Media and Telecommunications sector, some of which are listed on the stock exchange, of the venture capital fund United Ventures and of the start-up studio Foolfarm, dedicated to artificial intelligence.

He was a director of Abi-Lab (Italian Banking Association) and of the Editorial Board of Harvard Business Review Italy. Economic columnist for Mediaset, he collaborates with leading national and international newspapers.





The slow decline of the American empire

With the recorded defeat in **Afghanistan**, the United States, the largest superpower of the world, they have lost their influence and credibility.

Joe Biden is the third US president in a row to prove that his country no longer intends to be a global policeman, while **Xi Jinping** and **Putin** are pleased to observe.

by Alan Friedman

There is plenty of disagreement about the issue of whether the United States is now irretrievably divided as a nation and in irreversible decline, its empire coming to a close after generations of decline, or whether the American people can somehow wake up, reverse course, halt their decline and find some sense of national unity and purpose again.

In Europe, however, there is plenty of agreement that President **Joe Biden** did not help trans-Atlantic relations by ignoring his NATO allies in his poor management of the exit from Afghanistan. Currently, in foreign policy, Biden is a disappointment. The lasting image of the crowds swarming into Kabul airport, the poor souls who clung to a C 130 trans-

sport jet and fell to their deaths, the general image of defeat and blood, will probably be seen by future historians as one of a series of important American foreign policy failures, following the 1975 defeat in Vietnam, the 1980 Iran hostage crisis and the isolationist America First retrenchment from American leadership that was accelerated by Trump.

The century of China

Even before the *débâcle* in Kabul most informed members of the political, business or media elites already knew that the 21st century was destined to become the century of China. Whether they like it or not, they understand that China is becoming the

economic superpower of the 21st century, and the only question open is whether China will overtake the United States in GDP size by 2028 or 2030 or a few years later. The process is pretty much inexorable. The decline of the American empire has now been accelerated by America's defeat in Afghanistan and by the humiliation of seeing a government of Taliban terrorists take office in Kabul just as America was commemorating the 20th anniversary of an attack by Al Qaeda that was helped by the Taliban hosts of Osama bin Laden in Afghanistan. President **Xi Jinping** appears delighted to see Washington floundering, and has used the Kabul *débâcle* as propaganda material. **Vladimir Putin**, who has been manipulating Trump while preaching the death of liberal democracy, is also delighted at Washington's embarrassment. He will certainly be encouraged to engage in more geopolitical mischief as a result.

The implications for the West

The real issue related to the collapse in Afghanistan for Europeans is not about a lack of consultation or even about US competence.

It is that Biden is actually the third US president in a row, after Obama and Trump, who has demonstrated that his country will no longer police the world or even care about long-running conflicts in faraway places or about exporting democracy. Biden is the third American president to either ignore or betray America's long-established foreign policy traditions and values. Most Americans don't care about Afghanistan or the Middle East or Europe really; their ignorance and xenophobia have of course been fueled by the Trumpian era. Biden

made a cynical political calculation that he could afford a messy exit from Afghanistan because after a week or two the issue would go off the front pages and people would forget. Unfortunately for Biden, 13 U.S. soldiers were blown into pieces by a Jihadi terrorist at Kabul airport. The national mood in America is morose and discouraged, the country is bitterly divided, and Biden needs to turn around his political fortunes quickly if he is to avoid losing control of the US Senate and maybe even the House of Representatives in mid term elections in November 2022. If that were to happen, a Trumpian majority would block any attempts by Biden to restore authority to American foreign policy. But even if Biden keeps control of the legislature until 2024 he has already outlined what appears to be a "*Biden Doctrine*" which is at odds with his idealistic rhetoric about defending democracy and human rights. It is a brutal American realpolitik in which American allies are abandoned and American values are given lip service but are not really defended.

At an international level, **Mario Draghi** is right to try and achieve some form of international consensus about Afghanistan through his presidency of the G-20. But it will not be easy. In the United States, Biden is meanwhile getting bogged down by a huge new wave of Covid infections and by a Trumpian Republican Party which vigorously supported the surrender signed by Trump with the Taliban in 2020 in Doha but which now finds it easy to criticize Biden for messing up the withdrawal.

The geopolitical consequences of America's defeat in Afghanistan are a loss of influence and a loss of credibility for the world's biggest superpower. Future historians may see the Kabul fiasco as a milestone in America's abdication of empire. 

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.





Positive sign for connector (and chip) sales

From the data updated to June 2021, **sales of connectors** increased by **33%** compared to the previous year, those of semiconductors by **28.9%**.

Considering the international scenario, the two sectors are expected to have increasingly similar trends.

by Ron Bishop

The Semiconductor Industry Association (SIA) reported June sales of \$44.5 billion, up +28.9% from the prior year, and up +2.1% sequentially. Regionally for June, the SIA reported that the Americas grew +23.4% YOY, China increased +27.5%, Japan increased +20.7%, Asia Pacific/

Other increased by +34.1%, and Europe increased +42.3%. 2Q21 sales were up +29.2% over prior year.

Connector industry sales in June were up +33.0% from the prior year and decreased 3.8% sequentially. Regionally for June, YOY sales increased +26.6% in Japan, +39.9% in Asia Paci-

MARKETS CONNECTORS

	SEMICONDUCTORS	CONNECTORS
North America	15.4%	27.2%
Europe	17.5%	41.3%
Japan	12.5%	-20%
China	22.8%	32.0%
Asia Pacific/Other	23.6%	31.4%
Total World	20.1%	32.7%

Year-to-date performance, by geographic region for both components

(source: Sia e Bishop & Associates)

fic, +45.6% in Europe, +23.6% in North America, +28.0% in China, and +41.4% in the Rest of the World. 2Q21 sales were up +42.5% over prior year.

Sales performance is converging

Connector industry sales performance has been higher than semis for the last eight months. Sales performance for semis did not decline in early 2020, as connectors did.

The converging sales performance, however, makes more sense for the two components which are largely used in tandem.

Although connector sales performance surpassed semi sales performance for the last eight consecutive months, the YTD sales performance of both components is converging.

The surge in Covid-19 cases in recent months has picked up in some countries such as India and Brazil, however, an increase in industrial production around the world has resulted in spiking demand for semiconductors and other materials, with many shortages showing up since the beginning of the year. New Covid outbreaks in Asia Pacific could further exacerbate the semi shortages. **Gartner** predicts that semiconductor shortages will continue through 1Q22.

Progress in the economies

Many countries have made progress in reviving their economies. We do not anticipate that there will be significant setbacks, beyond those discussed here, in connector industry performance in the second half of 2021. **E**

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.



Hunting for raw materials

Vaccine strategy works and we are prepared to go the extra mile to put this negative experience with Covid-19 behind us. **Shortage** of raw materials is among the negative unforeseen consequences and is increasingly becoming a central concern to many sectors with particular regard to **Automotive** and **Tech industries** that are struggling for chip stocks while prices are higher and some worry about inflation.



by Daniela Garbillo

Copper, iron, steel, maize, coffee, wheat, soya, timber, plastic and cardboard for packaging and especially semiconductors, the list of various, critical raw materials is long and consequences of such disturbances are being felt in different industries from construction to steel, from automotive to electronics and also from telecommunications to high tech. Some examples? The price of copper has risen by 47%, wheat by 12%, soya by 15%, wood by 20%, nickel and zinc by 51% and aluminium by 26%. Oil for about USD 70 for first time since 2020.

The unintended consequences of lockdowns

What is causing the shortage in raw materials? Impact of lockdowns in 2020, in particular. The first time in history that such severe measures were taken with strong containment of individual movements. Many people were confined to their home

and had intended to use the lockdowns to buy items like goods and services while restaurant, transportation and clothing spending were suddenly out of favour. The production of semiconductors was not sufficient to meet the surge in demand from high-tech and household industries. In addition, global commitments to achieve sustainable development with some governments imposing shut-down a number of coal-fired power plants - particularly in China, the country currently consumes about the half of the world's copper, steel and aluminium. This resulted in an unprecedented supply-chain crisis. Copper shortage, with a deficit of 4,5 million tons against a surplus in "normal" activity of 200 thousand tons, had big consequences on the development of electric motor vehicle industry. EVs need about 80 kgs of copper as well as electronic equipment is essential, meaning it accounts for 40%.

The International Energy Agency analysis is highlighting that mineral demand for electric vehicles and batteries is forecast to increase by at least 30 times



by 2040, thus far motor vehicle industry appears to be mostly affected by the semiconductor shortage. **Volkswagen, Ford, General Motors and Toyota** had to cut production. It could result in 1,28 million fewer cars being made in the U.S. this year. There is no solution on the horizon, automotive supply chain believes to take semiconductor shortage for granted until 2022 and for some, like CEOs at **Intel** and **STMicroelectronics**, it might end up by 2023.

Microchip – the hidden and precious treasures

We have already said that semiconductors are nowadays used in many, many consumer electronic devices: cell phones, personal computers, tablets and laptops, home appliances, products for defence applications and precisely road vehicles. We have also already mentioned that remote working and distance learning during lockdowns have undoubtedly impacted production of today's most advanced hardware components for personal computers (graphic cards, CPUs) and most powerful remote communication technologies. Overall demand from most forward-thinking countries and busi-

nesses arose here for significantly larger amounts of stock than normal. Prices up about 10/15 times compared to normal market conditions. Semiconductors manufacturing – Chinese and Korean are supposed to be the most advanced makers – require time to implement capacity and, at present, lead times reach 26 weeks (this out of sync in automotive industry). This is a supply chain disruption hurting the demand from car makers and the urgent request from consumer electronics.

Fear of inflation

Coronavirus pandemic has put our health system under immense pressure. Over 4 million and 400 thousand people have died so far, showing how ill-equipped we were to handle the crisis and causing unusual market disruption. Covid-19 has affected production lead times and all prices and not forgetting the repercussion for workers. In this regard, there is now increasing concern about inflation due to global economy overloading: we need strategies, we need investments and we need economies of scale but we must be patient and we have to wait to see results. 

Beyond the boundaries of the instrumentation

An important goal reached by the technology pioneer and also industry leader in **Test & Measurement**. **Maria Heriz**, Vice President at **Tektronix** talks about success to be “Number One” and what she sees in the future of the electronics industry.

by Laura Reggiani

Credited with being the seed that made the Silicon forest grow, Tektronix was established in 1946 by C. Howard Vollum e Melvin J. Murdock with the creation of world's first-time triggered oscilloscope. With major and well-known technological contributions that include the invention of the colour television and also the space exploration, **Tektronix** is listed among the most influential Test & Measurement company of all time. **Maria Heriz**, Vice President, Commercial Operations at Tektronix, talks about milestones and success for the company in the last seventy-five year and what technological advances and new strategies in T&M we will see in the future.

Tektronix's contribution to technological innovation in all sectors, from healthcare to aerospace, has been constant since the foundation of the company. Which have been the most revolutionary innovations you contributed to?

Tektronix is an industry-leading test and measurement company. Delivering innovative, precise and easy-to-operate solutions for measurement and monitoring, Tektronix technology unlocks insights and drives discovery for engineers across the globe. Tektronix has supported many of humanity's greatest advances of the past 75 years in sectors from space exploration to healthcare, communications to mobility. When we were founded by two veterans returned home after World War II, radio communications was a leading technology. Our test and measurement equipment – our oscilloscopes – helped take the next step and build the television industry. Since then, our equipment has been a part

of NASA's first space shuttle work, major military advances, smart phones and now smart cars. You see the pattern? Wherever there has been innovation, wherever engineers have broken boundaries, there's a good chance Tektronix equipment made that work possible. So, we'll continue to enable technical innovators to do more, fueling success and partnering with startups around the world who can help us best connect with tomorrow's engineers. For example, end of 2020 we launched TekDrive – a cloud platform that enables engineers to take data in real-time from their oscilloscope and collaborate and manipulate it anywhere in the world. This is GoogleDrive but for engineers, and it will change how global engineering team's work. Whenever you view a website, make a phone call or turn on a TV, you touch Tektronix. We enable technical innovators to do more, and fuel success in essential technology industries. Tektronix empowers engineers to create and realize technological advances with ever greater ease, speed and accuracy.

President Tami Newcombe called Tektronix a company “with the mentality of a 75-year-old start-up”. How has the company succeeded in keeping the desire to innovate alive over time?

We continue to listen to our employee and customer needs. As part of Fortive, Tektronix has the shared purpose of ‘Kaizen’, or continuous improvement. Our global operations team is always working to optimize supply chain resilience, agility, and cost. Moreover, we also encourage Out-of-the-box thinking, which starts with out-of-the office thinking. At Tek and our parent company, Fortive, we are obsessed

with our customers. Their challenges are our own. Also we are constantly curious, so we constantly ask our customers questions to bring their voice to our work. You can't be curious without being innovative, and you can't really learn if you only talk to yourself. How we recruit, who we recruit, the startups we engage with; that's all going to be fueled by that same sense of curiosity, that same hunger for what's next. Lastly, part of our Fortive Business System that underpins our work is the concept of #OneTeam. This constant focus on uniting our people helps us create a culture of engagement and connection. Everyone feels part of the solutions we are creating. We are OneTeam with our customers to deliver innovative solutions that solve their problems. We don't just listen and go to work. We stay closely engaged with our customers as we develop and deliver our solutions. Our employees feel this start up culture through our accelerated growth model, as well. This business system gives our employees a chance to pitch new ideas to our leadership team, receive limited funding to research and test those ideas in the market, and then more funding to pursue ideas that seem to have market traction. Good ideas grow, and those that flounder are eliminated in months so teams can accelerate the growth of a different idea. By giving our own employees this ability to flex their entrepreneurial muscles, we as an organization can test new ideas fast, leveraging higher-risk creative thinking alongside the stability of a Fortune 500 company.

What are now the most promising industries for your business and how are you approaching them?

Overall the EMEA Market is buoyant with strong demand to satisfy rising output and order demand. We are seeing positive investment growth in key areas like Power / Green energy / Battery technologies as well as continuing demand to support the Aerospace and Defence industries in cyber security, border control and material research. As datacenters and wired communication technologies continue to evolve we are seeing strong customer demands grow to support emerging next generation technologies in High Speed Serial (USB HDMI PCIe as examples), Memory (DDR) and Optical (Coherent and PAM4). Education and Research continue to be a growth area in EMEA with investments continuing to be made in fundamental teaching labs – and how to support students remotely during the continuing restrictions as well as advanced research funding

continuing in areas like Quantum Computing, Medical sciences, Photonics and High Energy Physics. Tektronix continues to hold a unique position in the market, building on its unique 75-year heritage and expertise, to provide market-leading Test & Measurement technology and innovation. Recent technology enhancements in Tektronix's best-in-class portfolio, including our 3, 4, 5, 6, and 8 Series, new probing for Wideband Gap technologies and Software solutions enabling working remotely, all continue to enhance Tektronix's market-leading position in bench, real-time and high-performance oscilloscopes.

What are the critical issues that the electronics market, on a global level, is facing today?

One of the most critical issues the electronics market faces today is a product of our own success. Seemingly everything is electronic, which has driven a surge in demand for electronics components, including



Maria Heriz, Vice President, Commercial Operations, EMEA at Tektronix



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semiconductor chips. Car manufacturers investing in tech-heavy electric vehicles, the boom in sales of TVs and home computers and launch of new games consoles and 5G-enabled mobile phones have all driven demand for semiconductor chips, bottlenecking the global market. Tektronix operates a world-class supply chain that has the time-tested ability to navigate the semiconductor cycles that produce longer lead times on components and materials. For example, we are moving some ASIC wafer and package test in-house to counter measure industry constraints. Another advantage for us is our decades long partnership with global distributors that maintain 4-6 months of product inventory. This month (September) we are also releasing an upgrade to some of our testing solutions that will help semiconductor chip manufacturers run parallel tests, ultimately speeding their fabrication process and time to market.

What can you tell us about the European market?

We are starting to see Macro Trends; within the industry today. These consist of power applications, where the proliferation of connected devices and electrification are driving the need for power efficiency; wired applications, where there is exponential data growth which is driving the need for new wired, high speed, communications standards; and thirdly, wireless applications. We are seeing the increasing bandwidth and low latency driving the need for new wireless test solutions and aim to address and grow in the industrial, telecommunications, education, automotive and semiconductor industry, as well as in the aerospace & defense sector. There have been numerous studies into the advancements within these segments and we expect market growth to change significantly here, and our internal focus will shift to support that, depending on the current demands. Our main strategy is to listen to customers' needs and other trends and forecasts within the market to ensure our solutions meet the demands in these key areas. For example, a study by the industry trade association predicts that there will be 1.3 billion 5G subscriptions within the next 2 years and so we aim to ensure our telecommunications solutions will advance to support this growing demand. In addition, we have recently strengthened our position within the automotive sector, as the market is forecast to grow within the next 3 years, and, according to the Statista,

McK Global Institute, it is estimated that there will be a 10% rise in the demand of electric vehicles. As the shift towards environmentally-friendly solutions continues to be prevalent, we aim to ensure our portfolio of products and expertise develop to support our customers accordingly. Furthermore, we have established a new innovation process and created new tools to support growth internally.

What are now the most fertile areas of research & development in your opinion?

At Tektronix we enable the realization of new-to-the-world technology. Looking forward to the needs of the next decade, technologists are focused on enabling new solutions in complex, high-growth industries including healthcare, transportation, communications, and aerospace and defense. At the core our work is research in the area of communications to ensure future connected devices realize new uses. This research spans wireless RF and optical communications that will power 6G networks of the 2030s and quantum communications to ensure the security of those networks. Within the semiconductor industry, thought leaders are busy developing technological innovations that leverage silicon photonics and advanced packaging to ensure the cost, size, and performance scalability enjoyed by Moore's law in everything from I/O interfaces to high speed computing and dynamic sensors. Quantum Information Science brings together industry, government, and academia and is one of the most promising areas of research, hence the rapidly growing investment it continues to receive from government and industry each year. 



Smart technologies for a better future

Create power and sensing solutions and think to prepare a better future for the next generations is one of the goals of the new **onsemi's** strategy announced by its President **Hassane El-Khoury**.

by Laura Reggiani

At the head of onsemi as President and CEO since December 2020, Hassane El-Khoury, American but of Lebanese origin, obtained a Bachelor of Scien-

ce in electrical engineering and a Master in engineering management. Before coming to ON Semiconductor, he was President, CEO, and member of BoD of Cypress until its sale to Infineon in April 2020, by covering distinct roles from product development to application engineering and business development.

After the first 6 months of "exploration", the last August, **Hassane El-Khoury** announced the new company name and the renewed company brand which turns into "onsemi". This is a further evolution of the company to become the leader supplier of smart solutions for power and sensing applications.

With a constant attention to end markets of automotive and industry, onsemi has improved its strategy to guide the innovation, which makes it possible and helps the creation of a sustainable ecosystem to support the fast-developing megatrends like vehicles electrification, advanced safety, alternative powers and smart industries. We have talked about this with Hassane El-Khoury.

Who is "onsemi" as of today and what is its business model?

Through the takeovers and the solid inner development, onsemi has become leader in different markets and technologies that feed its growth like automotive, industry and cloud power. With more than 80.000 different products and a global supply chain, onsemi serves ten of thousands of clients. In August 2021 to better embody its transformation and the future focus, ON Semiconductor was renamed as onsemi. In this way, the company



Hassane El-Khoury, President and CEO at onsemi

gets in position to guide the shattering innovations and to help the creation of a better future. By focusing on automotive and industry end markets, the company is accelerating its growth in the sustainable market, which includes vehicles electrification, power infrastructures, industrial automation, 5G and cloud power. With a highly diversified and innovative portfolio, it is creating smart charging and sensing technologies able to solve even the most complex challenges.

In the last two years, the company made different acquisitions among which the most important is the one of Fairchild in 2016. What do the takeovers mean? Can we expect more?

We have recently announced the agreement with **GT Advanced Technologies**, a producer of silicon carbide. This acquisition is meant to accelerate our mission of pushing the innovation to create smart powers and sensing technologies and build a sustainable future.

It also enhances our commitment to make important investments for innovative and high-growth technologies, to gain an interesting position in the field of SiC so to meet the fast-demanding request for SiC-based solutions for a sustainable ecosystem (electrical vehicles and recharging solutions as well as power infrastructures). On our Analyst Day at the beginning of August in New York City, we have created a solid strategy to grow more than semiconductor market and to wide our turnover. Our strategy is based on further investments in power and smart sensing solutions. We operate into a consolidating market and we want to be initiative-taking in “Merger & Acquisition” activities. We will use an organised and strategy-oriented approach.

You have been at the head of onsemi for less than one year. What would you change about your company to make it better?

I took my time to understand what onsemi could offer, its points of strength and weakness. I started what I call the “stress test” by working together with the executive management team with the aim of improving onsemi’s success. The change of direction has been communicated to all the inside and outside resources at the recent Analyst Day. It is a company’s evolution path and not a change, of course. What has already changed is our focus on products and solutions that enhance

our clients and their markets. We add value by solving specific problems: this value means a turnover increase and a value creation for stakeholders. Shortly, this means to move our product mix and focus on automotive and industrial markets and on the sustainable ecosystem I was referring to. Our strengths lie within smart power and sensing technologies, and we are able to offer innovative solutions in these fields that make all the difference.

Automotive is your target market. What are the trends in this sector and on which applications are you focusing?

The two great trends in Automotive are electrical vehicles and advanced safety. To us this means smart power and sensing solutions which are increasing thirty times their presence inside the vehicles and increasing tenfold our turnover. Advanced safety means sensors and all those smart sensing technologies onsemi can offer allowing cars to see one hundred times more than the human eye detection ability in all the conditions of luminosity or deep darkness. The sense and detection on the road cannot fail, above all when we refer to self-driving vehicles. Our technology has been assessed and analysed for 4.000 malfunction modes and guarantees corrective actions even during malfunctions. Our technology saves nine lives every hour. EVs and electrification are pushing the necessity of smart energy and innovative technologies like SiC.

The intersection between Automotive and Industrial is essential to be taken into consideration. The more electrical vehicles are produced, the more it is necessary to provide with fast charging stations and to work on renewable powers to support the sustainable ecosystem. This will impact on the growth of our other target market: Industrial. Without a balance between these two markets, the ecosystem will be extremely limited. This means that Automotive and Industrial growth must go hand in hand. At this point the role of SiC technology becomes essential, it helps build a battery charger of level 3 which can recharge a car in 20-30 minutes, only. We are planning to invest more into R&D that let us to improve and increase our offer for SiC products: from the substrate thanks to GTAT’s takeover to the wider SiC supply chain with foundry and packaging capabilities.



Specific expertise

A deep market knowledge together with strong technical abilities, long-term relationships with clients, selected suppliers and sector leader allowed **Consystem** to be recognized by the market in terms of professionalism, quality, and competitiveness, as explained by the Sales Manager **Mario Lesinigo**.

by Laura Reggiani

The history of Consystem is all-around evolution, innovation and quality of the products offered to the market. Its history is characterized by on-going research of technological excellences available on the market to offer to the clients together with a top-quality technical support granted by a constantly updated staff. A successful history for 45 years so far as explained by **Mario Lesinigo**, Managing Director of Sales at **Consystem**: *"Our business organisation has been working on the market for more than 45 years. There are a great on-going operativity, a company improvement and a constant focus on technological innovation required by the market. We want to look to the future in this way, to keep on being a reference point in the development and change process of the market in the electronic components business thanks to a wide range of cutting-edge technological innovations able to generate and guarantee a high value."*

What is Consystem as of today and what is its business model? How are your activities organized from a sales point of view?

Consystem has always kept a strong identity well resumed by our Tag Line "Your Local Partner Specialist." This identity also mirrors our business model: to know well the market and to have strong technical skills so to be able to establish and maintain long-term relationships with both clients and

suppliers as well. The goal is to show our capability, expertise and responsibility by listening to, anticipate and manage clients and suppliers' expectations. This helped us to be recognized in terms of professionalism, quality and competitiveness. Our sales organization explains this model and goal with the presence of dedicated product specialists who are characterized by a strong technical background and by a willingness to be practically involved and to be able to work in departments which are focused to specific fields of application. Departments supported by product specialists, by a direct in-house logistic, by a strong back office for pre-after sales assistance and by a marketing activity. Every department is responsible for the whole sale cycle, and this allows Consystem to have a great verticality on specific sectors. Our vision represents well the heart and the soul of all the sales system able to meet our clients' expectations in the "value proposition" phase up to post-sales assistance. We support the clients in the solution choice by offering specific products for every kind of need and also for a real personalization of the solution offered.

Which are your strengths and diversities comparing to the other market players? Who are your customers and what kind of service they can expect from Consystem?

Consystem's philosophy has always been to offer components, products, and cutting-edge electronical technological solutions

together with a highly specific support service. We make a bundle including products and solutions as the result of a dialogue with designers to suggest the most suitable solutions. Another point of strength regards the company size: Consystem is a quite well-organized company able to offer a complex and advanced sales organisation and, at the same time, a small-sized enterprise to ensure speed, agility, flexibility, reactivity and accessibility to the Top Management, which are very much appreciated features in the dynamism of the market. As for our clients, their types are different, from medium-sized to international companies and they operate in several fields: automotive, broadcasting & RF, safety, aeronautical and space, medical, vending and home appliances. We strongly believe that our clients expect a wide and complex sales and technical collaboration with high-quality services. For this reason, the company commits also with a quality management system in compliance with and for Uni En Iso 9001:2015 certification.

How important is the local presence? What are the referring sectors? Where do you see growth opportunities?

The local presence is essential to talk with the clients and support them in the most suitable components choice. Thanks to an international and digital market, new interaction ways and brand-new opportunities are born, and they helped us to cover not only the Italian or European market but also the global one (USA, Canada, and East Asia) by following the delocalisation of our clients. Therefore, our concept of "Local Partner" is upgrading, too. Today more than ever it is possible to remotely support partners and clients. We strongly believe that the most correct and updated approach is to create, develop and save the partnerships through an integrated mode which can efficiently join the relationship and the dialogue in presence with the digital exchange and interaction. Regarding the applications we are focused on, they mirror our specific audience and their set of needs and also our expertise: automotive (onboard applications for the independent management of the vehicle,

Mario Lesinigo,
Sales Manager
at Consystem



engine section and applications for the automotive comfort); Power Supply for the EV charging stations; medical (for the high precision instruments); safety (monitoring and detection in the industrial, transportation, home appliance and healthcare fields) and the satellite market. The market offers new opportunities linked to Green Automotive, Power Supply (photovoltaic, broadcasting). Due to the pandemic, we are experiencing a boom in the demand for touchless technologies in several fields like healthcare, transports, and home appliances. The "space race" is creating a demanding request of high-quality components.

What are the development plans and which kind of instruments will you use?

Regarding the future development plans (always very uncertain), one thing is certain: we do not want to change our soul and core of business model. Remembering the Italian football team that gained a lot of successes this year in Europe, "do not change a winning team." We are working to find new suitable and coherent modes and channels able to increase the company visibility and the sales efficiency by connecting the specialists and the clients. For this reason, we would like to strengthen our presence in other countries to create more international collaborations and a strong technical relationship with our suppliers that have recently opened offices in Europe and in Italy. 



Precision Fishing: Net benefits

The integration and growth of advanced analytics in **seafood harvesting** is on track to solve many of the supply chain **waste challenges**.

by Gordon Feller*

Sea fishing is becoming less sustainable as the taste for seafood increases in pace with the world's population. It is clear that trawler fleets will have to employ smart technologies to bring about precision fishing so that depleted species can be left undisturbed while thriving shoals are harvested.

Overfishing, climate change, pollution, habitat destruction, and the use of fish for other purposes besides human consumption all threaten the global seafood supply. The quest to harvest enough fish and the need to satisfy soaring consumer demand will continue to exert incredible pressures on marine systems. It now takes five times the effort to catch the same amount of fish as it did in 1950. The reason for this is quite simple: so many species that we depended on are now in scarce supply. The introduction of new and advanced precision-fishing tools and technologies is beginning to help companies optimize and reduce the waste in their operations. According to several recent reports, if large-scale fishing companies around the world would adopt these new technologies more

enthusiastically, they could decrease their annual operating costs by around \$11 billion (€9 billion). Precision-fishing technologies will not only help improve commercial fishing, it will also improve the ability for managers to adaptively govern various fisheries around the world more sustainably. It is projected that precision-fishing technologies could increase industry profits by as much as \$53 billion (€44 billion) by 2050 while also doubling the level of total fish biomass in the ocean.

Diminishing Returns

The quest for fish is a billion-dollar business. But as demand grows, so do the costs as supplies of wild fish are becoming increasingly scarce. More fish are harvested by trawling than any other method of fishing. The problem with trawl fishing is waste. It is inherently a "blind" activity and on average one in every four fish caught is typically the wrong species, known as bycatch. According to some estimates, global bycatch may amount to 10 percent of the world's haul, totaling 16 billion

pounds (7.3 billion kilograms) of waste per year. Several companies are developing precision harvesting and traceability products to reduce waste, improve data availability, and improve sustainability in the seafood industry. Their tools directly address overfishing and dwindling fish stocks with clean technologies and advanced analytics.

Eyes in the Net

One such company is **SmartCatch** from California's Silicon Valley. It has developed DigiCatch, a turnkey system that allows trawler skippers to harvest their targeted species with greater precision. At its heart is a real-time, high definition smart camera system that gives the fishermen "*eyes in their net*". The camera is in a 1.2-meter metal tube which also contains powerful lighting and sensors for temperature, salinity, and water depth. The images and data can be viewed from the ship's wheelhouse, allowing fishermen to move on when they see stocks are low or when fish are the wrong size or species. Watching the Catch SmartCatch has a real-time camera that can sort out unwanted species of fish and help protect the environment at the same time. This operational transparency supports fishing optimization while avoiding unwanted species and reducing negative ecological footprints. The real-time camera works on any coax sonar cable system and retrofits any type of trawl net. Thanks to IoT, trawler skippers can search for and harvest their targeted species.

SmartCatch's DigiServices features and IoT devices are designed to facilitate the real-time collection, organization, analysis, and storage of seafood data. The connected products and digital services leverage big data, artificial intelligence (AI), digital video, deep analytics, and cloud computing. The company is currently developing AI integration across the systems to relieve captains from always having to view the screen, recognize and count fish, and pull the data needed to help drive efficiencies and profits.

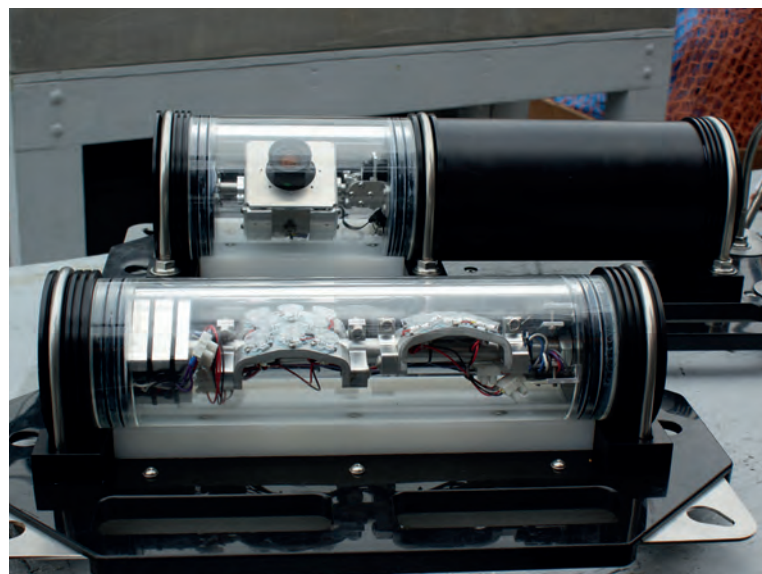
SmartCatch's future plans for hardware devices and software aims to facilitate the capturing and "brokering" of critical data for fishermen, catch processors, buyers, and certification agencies. This includes blockchain authentication of fishing data and provenance – ultimately, the value the company's product roadmap promises will extend across the entire value chain.

Best Connections

Cloud technology is a chief enabler for these capabilities. Computing technology has continued to become a lot cheaper and we use cloud computing for massively available storage, massively available compute power, so you can now do things with predictive analytics and science to change the way a business works, instead of relying on traditional manual processes. Technologies like SmartCatch's IoT system are using cloud benefits to convert physical data into actionable insights, as well as improving biosecurity by connecting the data from the first mile – harvest and processing – to the last mile, which means the actual consumer. The more that tools like this are put out there, the more likely businesses are to achieve more favorable outcomes faster and with greater profitability.

The key to these IoT systems is that they are not just focused on generic species or type information, they also place an emphasis on what is specific to each fish. Among these areas of focus would be: where and when the fish was harvested; its attributes; quality testing information in a consumer-friendly view; benchmarking against industry standards; how and where the fish was processed; how it was handled; sustainability information; and similar relevant information. **E**

* Smart Industry Manager at Avnet Silica



Images and data can be viewed directly without the need to leave the ship's wheelhouse



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Energy comes from the wave

Thanks to **Vicor** technology, **C-Power** autonomous offshore power systems promise to unlock new marine applications through efficient energy delivery.

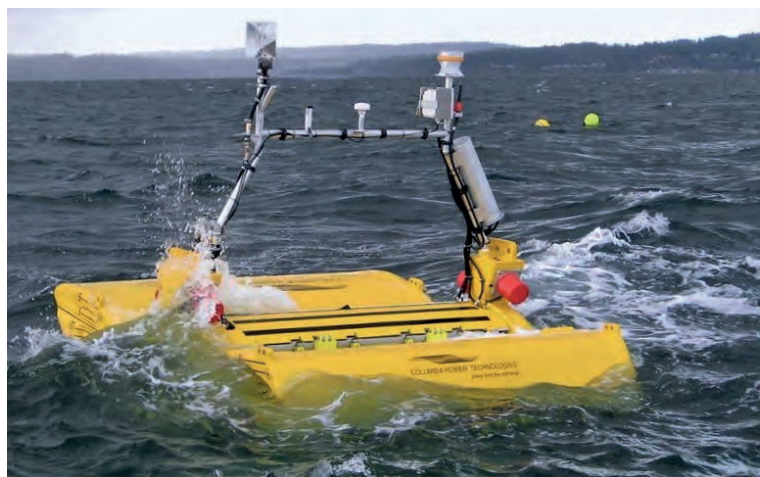
by Cleopatra Gatti

The ability to harness ocean wave energy is a rapidly evolving field that marine engineers are refining to provide reliable, cost-effective maritime energy generation and storage while enabling new forms of offshore data and communication services. **C-Power**, a global leader in wave energy systems, is helping to expand the marine economy by providing reliable, cost-effective energy generation and storage, data and communication services for offshore assets. **C-Power Autonomous Offshore Power Systems** capture mechanical wave energy and convert it into usable power for a wide range of oceanic applications such as offshore oil and gas exploration and production, offshore carbon sequestration, oceanographic research, aquaculture and homeland defense.

Harvesting ocean energy on the kilowatt scale

While other companies pursue large, megawatt systems, C-Power focuses on remote, kilowatt-scale power for offshore data communications networks, initially through a Darpa project called Wave Energy Buoy Systems. Through the WEBS project, C-Power discovered a nascent opportunity in the form of localized power generation for underwater vehicles, sub-sea operating equipment and open-ocean sensors used to collect environmental data. With the development of AOPS, C-Power opened the door to un-imagined new applications by supplying an autonomous, environmentally friendly, ocean-borne power source capable of doubling as a communications conduit.

The latest AOPS platform, known as the **SeaRAY**, is key to the near-term focus of C-Power to produce power systems that generate 10W to 1MW from ocean waves. To achieve its goals at the lower end



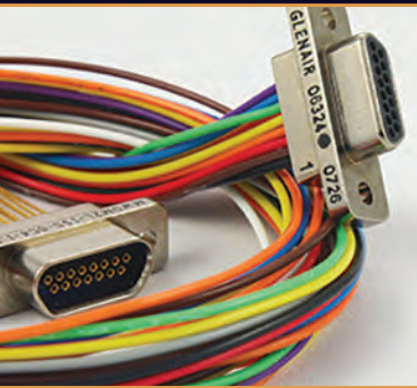
of the power spectrum, C-Power created a SeaRAY AOPS design with a high power-to-weight ratio using power conversion technology from **Vicor**. The small design footprint enhances mobility and commercial viability, making SeaRAY easier to deliver and set up, saving tens of thousands of dollars in daily operating costs. The SeaRAY design makes remote, autonomous data communications possible by sending information from the ocean to the cloud. Using cellular networks and satellite communications to pass data in real-time between the cloud and the SeaRAY AOPS allows more and richer data to be collected and delivered more often.

The SeaRAY design also makes autonomous, remote data communications possible by transmitting what happens in the ocean to the cloud in real time. Previously, marine data-gathering systems have been limited in the breadth and frequency of data collection. Using cellular networks and satellite communications to pass data in real-time between the cloud and the SeaRAY allows more and richer data to be collected and delivered more often.



Hi-rel interconnection from Powell Electronics in Europe

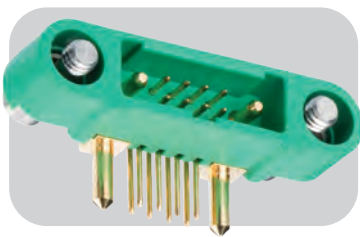
Connectors, cables, value added assembly



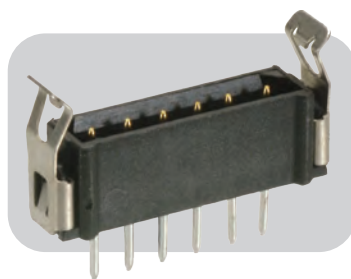
Glenair | Harwin | Amphenol Aerospace | Positronic
AB Connectors | Quell | Lemo | Conesys | and others

HARWIN

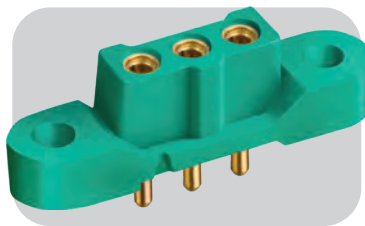
Examples of Harwin's high reliability connector
portfolio in stock at Powell Electronics



Gecko
1.25mm



Datamate
2.00mm



M300
3.00mm



Kona
8.50mm

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ROHM IN EUROPE: WE SHAPE INNOVATIONS FOR THE FUTURE

ANNIVERSARY

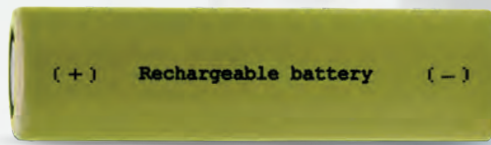
ROHM celebrates its 50th Anniversary in Europe

SINCE 1971, ROHM SEMICONDUCTOR GMBH HAS ESTABLISHED EIGHT LOCATIONS THROUGHOUT EUROPE TO SUPPORT ITS CUSTOMERS WITH TAILORED SEMICONDUCTOR SOLUTIONS – LOCALLY. The company highlights the milestones of its European activities with a special “50th Anniversary” website.

ROHM Semiconductor Europe, founded in 1971, with Headquarters in Willich near Düsseldorf, Germany, is represented by eight offices in six countries today: Germany, France, UK, Spain, Finland and Italy. Additionally, ROHM’s production facility SiCrystal, located in Nuremberg, Germany, supplies the global markets with silicon carbide wafers. The company’s European business activities – in line with the ROHM group’s Medium-Term Management Plan ‘Moving Forward to 2025’ – aim to accelerate social contribution. “We focus on power and analog solutions and contribute to our customers’ needs for energy saving and downsizing of their products,” states **Wolfram Harnack**, President at ROHM Semiconductor Europe.

ROHM’s European business both serves the needs of automotive and industrial application areas. “For example, car manufacturers strongly demand our silicon carbide devices for their production of electric cars. In addition, we also see exciting projects in the industrial field and expect a major growth in Europe – particularly in the area of infrastructure for e-mobility and alternative energies,” Harnack continues. ROHM’s customer focus in Europe is reflected by the Power Lab, a modern laboratory for power electronics located at the company’s EU Headquarters in Willich. It provides important local technical support at application level to ROHM’s European customers. “With our Application and Technical Solution Center and Power Lab activities and expertise we enhance our local customer support to make their products even better – with state-of-the-art equipment and specialized measurements,” explains **Aly Mashaly**, Director of ROHM’s European Application and Technical Solution Center.

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MAX78000 AI microcontroller and **Xailient's Detectum** neural network detects and localizes faces in video and images at just 12ms per inference.

MAXIM INTEGRATED AND XAILIENT INC., A COMPANY FOCUSED ON ARTIFICIAL INTELLIGENCE FOR THE EDGE, ANNOUNCED THAT MAXIM INTEGRATED'S **MAX78000** ULTRA-LOW POWER NEURAL-NETWORK MICROCONTROLLER DETECTS AND LOCALIZES FACES IN VIDEO AND IMAGES USING XAILIENT'S PROPRIETARY **DETECTUM** NEURAL NETWORK. Xailient's neural network draws 250x lower power (at just 280 microJoules) than conventional embedded solutions, and at 12 milliseconds (ms) per inference, the network performs in real time and is faster than the most efficient face-detection solution available for the edge.

Battery-powered AI systems that require face detection, such as home cameras, industrial grade smart security cameras and retail solutions, require a low-power solution to provide the longest possible operation between charges. In addition to supporting standalone applications, Maxim Integrated's microcontroller paired with Xailient's neural network improves overall power efficiency and battery life of hybrid edge/cloud applications that employ a low-power 'listening' mode which then awakens more complex systems when a face is detected. Xailient's Detectum neural network includes focus, zoom and visual wake-word technologies to detect and localize faces in video and images at 76x faster rates than conventional software solutions, at similar or better accuracy. In addition, the flexible network can be extended to applications other than facial recognition, such as livestock inventory and monitoring, parking spot occupancy, inventory levels and more.

Solution advantages

- **Longest Battery Life/Highest Energy Efficiency:** Xailient's neural network optimizes the

computational efficiency and flexible low power sleep modes offered by Maxim Integrated's ultra-low power MAX78000 microcontroller. Together, the products extend the operating time of coin cell battery-powered, hybrid edge/cloud applications for many years.

- **Fastest Inference Speed for Improved Accuracy:** Speed is a significant factor for AI because with faster inferencing, you can react in real time or quickly average multiple inferences to improve accuracy. Detecting faces in an image in just 12ms provides that flexibility between response time and accuracy.

They say:

"The MAX78000 is capable of both classification and localization. In addition to seeing faces in the image or video you can also determine where those faces are in the image's field of view. Advanced applications include person, vehicle and object counting, presence or obstruction detection, path mapping and footfall heatmaps."

Robert Muchsel, Maxim Integrated Fellow and architect of the MAX78000 microcontroller.



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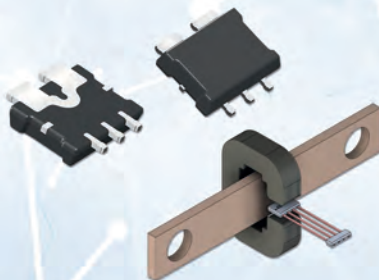
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