

Information and Opinions about the Electronics Market

ELETRONICA

Markets | Companies | Innovation

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UPSTREAM

America
turns the page

MARKETS

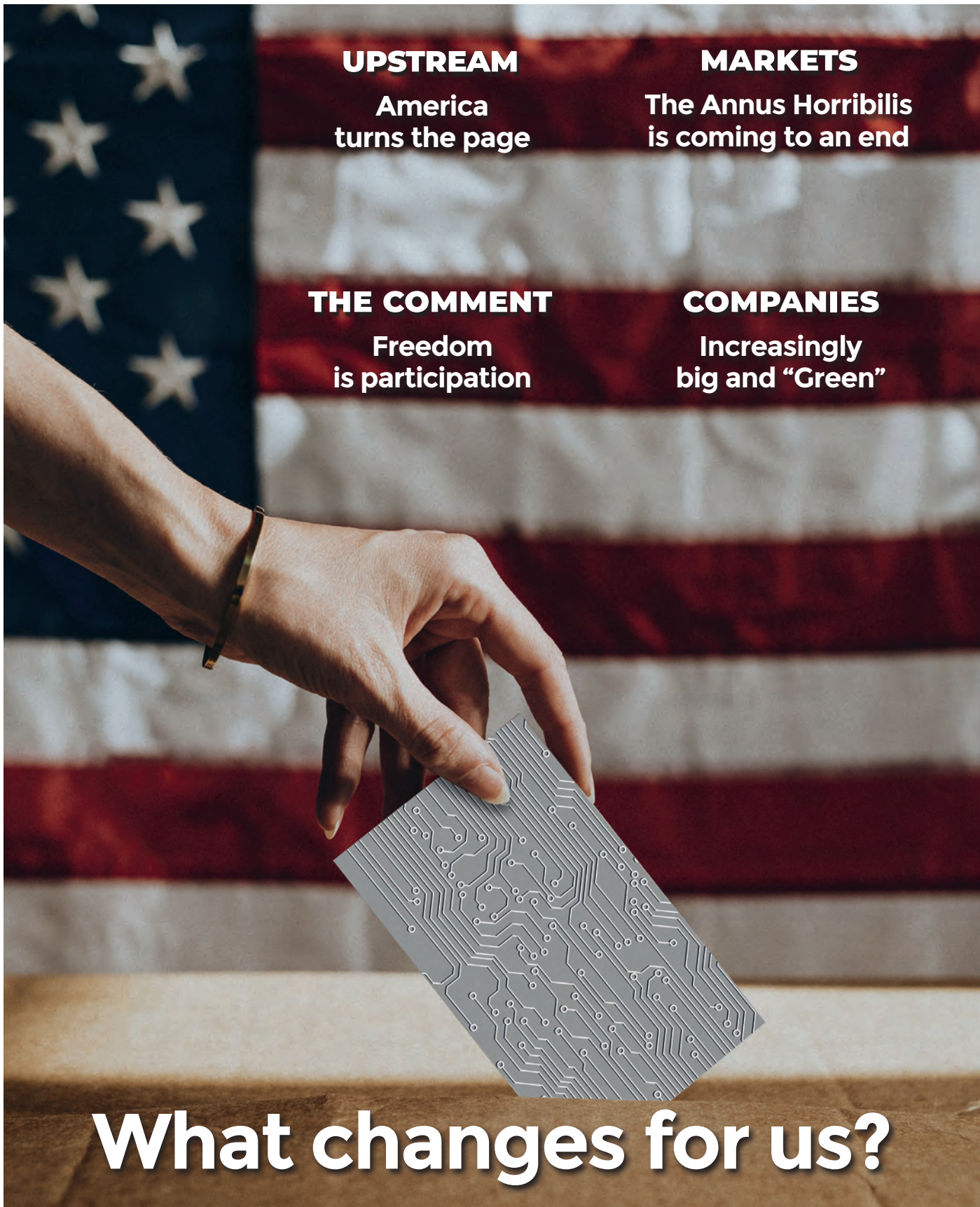
The Annus Horribilis
is coming to an end

THE COMMENT

Freedom
is participation

COMPANIES

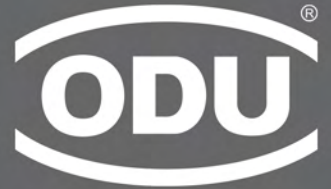
Increasingly
big and "Green"



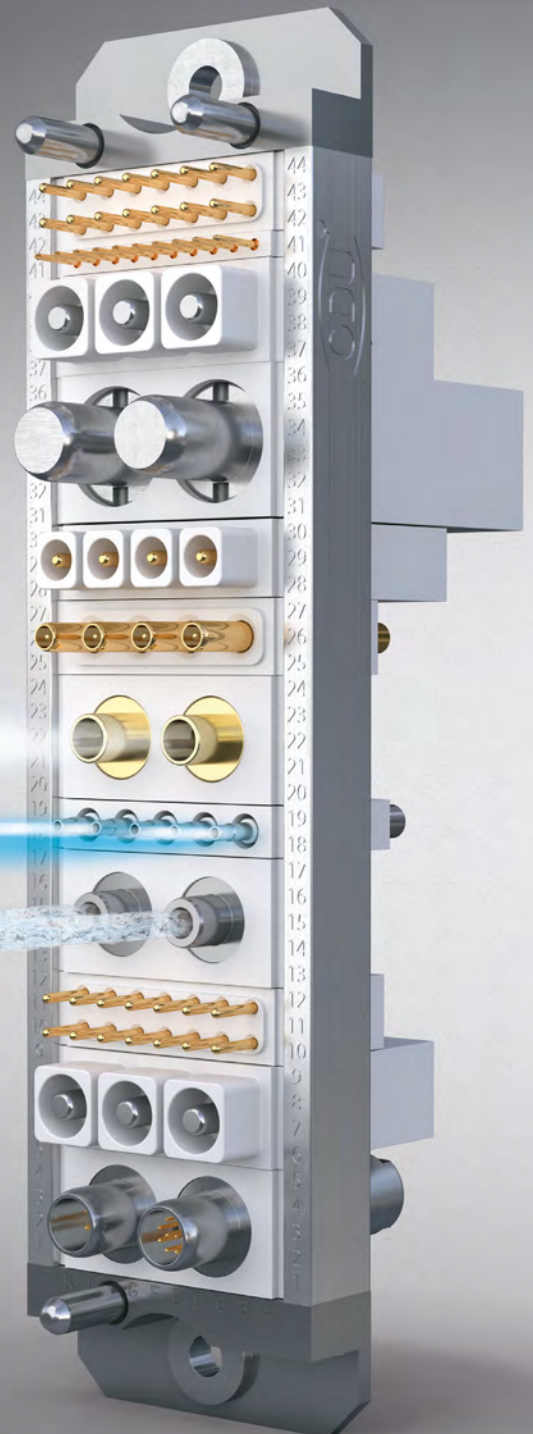
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English Abstract Edition



8 *What does Joe Biden's victory mean for the United States of America and the world in terms of economic and political prospects? It can be seen as an extraordinarily positive development, not just for America but for the entire free world.*

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.

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by Fritz Walter

“The Crying Game”

We have reasons for crying! But not everyone considers this to be a game. Maybe it is for some, but most people will never smile when remembering 2020; of course, it has to do with work, but nobody in their right mind, in January of this terrible year would have expected the avalanche of mud (let me stress it, mud) started from Wuhan that, little by little, day by day, has swept the whole world. However, common sense leads one to hope that the smiling “lucky few”, often frustrated lovers of a power that they have never conquered on the field but rather inherited, will also remember 2020 as the beginning of the end. Worse: the end of the end. It is indeed unquestionably true that the wind blowing behind them in recent months and years did not bode well.

In all this, how can one not rethink the story attributed to Aesop of the frog and the scorpion, one of the most intense moments in the film that gives the title to this editorial? The scorpion wants to cross the river but cannot swim. So it goes to the frog, which can swim, and asks it for a ride. The frog says: *“If I carry you on my shoulders, you will surely sting me”*. And the scorpion replies: *“What would I sting you for? I am on your shoulders: we would both drown”*. The frog thinks about this explanation for a while and then accepts: it puts the scorpion on its shoulders and throws itself into water. Halfway through, however, it suddenly feels a burning sensation on its side and realises that the scorpion has actually stung it. And while both of them are sinking amidst waves, the frog starts shouting: *“Why have you stung me, my scorpion friend? We are now both drowning”*. And the scorpion replies:

“I cannot help it: it is in my nature”. And now, dear reader, choose the ending you prefer.

Ending A - Right on the shoulders of a frog called Italian people, a scorpion that was never elected by free vote has autonomously decided to nail an important group of small and medium-size enterprises to a cross bearing the inscription “Covid”. It promised money that never arrived. It put millions of Italians in debt. It led thousands of businesses to bankruptcy. It did this by clinging tooth and nail to an armchair that, in the last ten months, has guaranteed a salary that has never been touched in the slightest. An armchair so comfortable and full of privileges that anyone, regardless of their political preference, can’t relinquish it ‘by nature’.

Ending B - Now, right on the shoulders of a frog which we call it Viberre out of affection a scorpion, that in its entire life has never done anything but destroy good things created by others in over 30 years of business, decides to make and then to unmake agreements and contracts following an own-initiative without respecting investments, particularly time spent and commitments that both our frog and its tadpoles have shown in the creation of an unique magazine in Italy, like Elettronica AV is, offering the market a number of real services like nobody has ever provided before. All this has been done by the scorpion which has not even been humble enough to admit that it has made yet another wrong business decision.

One and only conclusion for the two endings: yes okay then, scorpion... get off our back, we can swim alone because this is not a game!



WITH SEVERAL OSCAR NOMINATIONS IN 1993, THE FILM WRITTEN AND DIRECTED BY NEIL JORDAN IS A PIONEERING FILM, WHERE POLITICAL, SENTIMENTAL, SEXUAL BELIEFS VANISH AND MERGE INTO ONE ANOTHER.

MODULI I/O DI ACQUISIZIONE E CONTROLLO DATI PER SMART CITIES E IIoT



by Alan Friedman

The influence of Biden's victory will be felt across Europe

It is morning in America. Joe Biden is the new President-elect, having achieved a clear majority of votes in the Electoral College and having won more than 76m votes in the popular vote, against around 71m votes for Donald Trump. The size of Trump's vote count is impressive, and it means that nearly half of America is comfortable with this man, the most authoritarian and the least competent president in the history of the United States. Yet in democracies the majority wins, and this remains true in my country. At the end of the day it should not matter if Trump and his extreme rightwing enablers in the Republican party continue to repeat a series of falsehoods and conspiracy theories and attempt to challenge the outcome of the election through a series of frivolous and unsubstantiated lawsuits. It does not matter if Trump refuses to concede his loss and congratulate the winner. What matters is that the people have spoken; a majority of Americans have decided in favor of Biden.

While the impact of Biden's victory will have far-reaching consequences across America, it will also have a trickle-down effect across the entire free world, starting with Europe. I discuss the economic, political and foreign policy implications of the Biden victory in a separate article elsewhere in the pages of this edition of ELETTRONICA. But here I just want to remind everyone of how Biden's victory may be felt across the European Union, including Italy. After four years of Trump's insults, general hostility and aggressive denigration of Angela Merkel and the European Union, and after four years in which the U.S. president and his top aides such as Steve Bannon have cozied up to Putin, Erdogan, Orban and Bolsonaro, everything is about to change. The winds of traditional liberal democracy will soon be blowing across the Atlantic again, which explains the hugely enthusiastic reaction to Biden's victory that we have seen from Merkel and from President Macron of France and many other leaders of the European establishment. These Europeans are clearly relieved, but in my opinion it is not just because they finally will have an American interlocutor who wants to support Nato and honor the Atlanticist tradition and disavow support for dictators. It is also because they know the impact that an American president can have as an example to the rest of the free world. In Europe the real losers are the

rightwing nationalists and demagogues who felt emboldened by the Trump presidency to push their anti-euro or anti-immigrant or negationist and anti-science stance on Covid-19. There can be no doubt that Boris Johnson is among the biggest losers; his handling of Covid has been similar to Trump's, his reckless embrace of Brexit has had the explicit support of Trump, and although he was quick to congratulate Biden on his victory it is clear that Biden is not very fond of Johnson. Among the other Trump's supporters whose fortunes may be affected indirectly by the return of America to its traditional role as a leading liberal democracy are Hungary's Orban, France's Le Pen, Wilders in the Netherlands, Salvini and Meloni in Italy, and members of extremist nationalist parties in places like Germany, Spain and Poland.

In terms of the influence on economic policies, Italy should benefit by having a new U.S. president who no longer threatens duties against auto makers or the food sector or winemakers. Likewise Biden's embrace of public investments in infrastructure should become an example for many in Italy who want to do the same with European Recovery Funds. And perhaps the fact that Biden will listen to Dr Anthony Fauci and to real scientists about how to battle the pandemic can be an example for the anti-mask populists and negationists across Europe as well.

Whether the Biden presidency will have a real impact on the way Italians think about their political choices is not yet clear, but often the transatlantic winds take time to have their effect, and can influence psychology more than substance in the initial phase. It is

perfectly plausible that Meloni and Salvini will win the next election, in 2022 or 2023. But it is also plausible that a progressive Biden who is committed to healthy relations with the European Union will condition some people's way of perceiving the world. To be clear, I am not suggesting that the arrival of Biden means Italian or German or French voters will suddenly change their political preferences. But it would be wrong to think that there will not be a series of subtle influences, which in time will once again show the world why liberal democracy is the best way forward if we wish to achieve a more equitable society and a more competently managed economy.



Alan Friedman
journalist, writer
and economics expert

Freedom is participation



The only possible alternative to the current scenario, on the edge between direct **democracy** and **technocracy**, lies in **restoring political action** involving and effectively engaging people in decision-making

by Rossano Salini

The current upsurge in the spread of Coronavirus, which can definitely not be compared to the devastating wave that last Spring swept Italy and in particular Northern Italy, is leading to a new climate of anxiety, uncertainty and fear for the consequences of new forthcoming closures and personal restrictions. We are still in the midst of the economic depression caused by the complete lockdown of a few months ago and we are already facing new and disturbing scenarios that may give a real blow to the national economic framework.

Incompetent political leaders

In this climate of uncertainty and confusion there is a strong need for a political class that can make clear and impacting decisions, bravely and timely. Such a need, at least for the moment, remains pending. It is

a general condition going beyond any opinion about something or other, about one or the other political group. The more serious and complex our general situation gets, the more evident the inadequacy of our political class appears, which is merely interested in maintaining approval and does not have a clear understanding of the present, a vision of the future and a consequent decision-making ability.

Beyond what is required at the present time, it is now urgent to wonder how to rebuild a political and institutional body able to face wisely emergency situations. A referendum has just been held on the cut in the number of representatives in the Country's Parliament which has once again confirmed how intolerant Italians are of politics also fed by years of anti-caste rhetoric without any structure and any proposals of alternatives. The prospect of such a cut does not help us at all in understanding how we could get out of the current situation. We are then

looking at the current political landscape with great discouragement. The prevalence of instinctiveness and easy sympathy often lead us to the extreme consequence of distrusting democratic processes implemented today. Although we do not admit it openly, with such barbarous condition sometimes we even run the risk of hoping in a single leader or in an élite group to come and get us through. And again that's why the search for alternative sources is crucial and necessary.

The death of politics

Be aware of how you choose alternatives. Today we often hear about a talk that is characterised by the opposition of People and Élite group. In political terms, this turns into an alternative between direct Democracy on one side and Technocracy on the other. Both scenarios, however, imply the death of legitimate and genuine politics. Direct democracy, theorised in particular by "Casaleggio Associati" but actually implemented by all those who consider political action to be a direct relationship between leaders and voters (especially nowadays because of social media), reports a lack of the participation: everything comes down in giving or not approval to proposals made by the leader on duty who cares mostly about meeting prevalent expectations. Direct democracy leads to easy consensus, which - as we are experiencing - turns out to be straw fires: big flames, though lasting very little time. On the other hand, technocracy also limits democratic participation: political decisions are intended as pure applications of the Laws, of the Regulations and no deviation is permitted. Protection against fluctuating consensus turns in this case into a completely self-referential approach that does not reflect the different aspects of our reality and is not able at all to support and meet the most profound needs of people. This very brief analysis clears up that direct democracy and technocracy (people and élite group) are not 'matching against' but they must be seen as two sides of the same coin: political decision taken regardless of real involvement, citizens' involvement in the decision-making process by means of a proper application of the dynamic representation.

Presence and participation

The real alternative to the current outline therefore lies in restoring an active political action

with people's participation. This used to happen in the ordinary life of popular mass parties: discussions in the circles, many people were willing to get involved personally, important decisions were examined not only by the parties' top management but also by their small circles, be these the speakers or their small sections. It is not a matter of being nostalgic and restoring a model of the past: it must be said with total clarity that there is no other way to make authentic politics than getting through a direct involvement, participation, presence of people. Distance politics - a little like remote learning we have experienced during lockdown - is something other than human attitude. It can not have consistent results, it is not effective. Human beings are made to be there, to be present, to see other individuals, to meet, to talk, to look people in the face live while they are talking to, to share in flesh and blood ideas and values to which they are committed. If today in politics this no longer passes through parties, then other forms will have to be invented but let us not make the mistake that there is no other way of doing politics, just as in general there is other way among human beings of doing things while living them in person.

Rebuilding politics

And we are now back to our starting point: extremely difficult scenarios, social and economic emergencies such as the current ones require position taking, real political decisions in the full and global sense of the term which are based on the knowledge of reality and on people's participation in the decision-making processes becoming finally accountability. Theoretical and abstract reasoning on what today would be better to do or to hold up does not work. The current context misses in which all of this is done and takes shape. The issue of rebuilding the political structure is therefore much more complex and urgent than a simple and - let us say it - somewhat trivial and approximate cut in the number of those at the Country's Parliament.

We are dealing with the need for substantial reconstruction, the only way to achieve the ability to find solutions that can give hope to the next generation having to manage many, many years of social, economic and employment crisis. The way out for them? Only through considered and far-sighted decisions.

E

America turns the page

What does **Joe Biden's** victory mean for the US and the world in terms of economic and political prospects?

by Alan Friedman

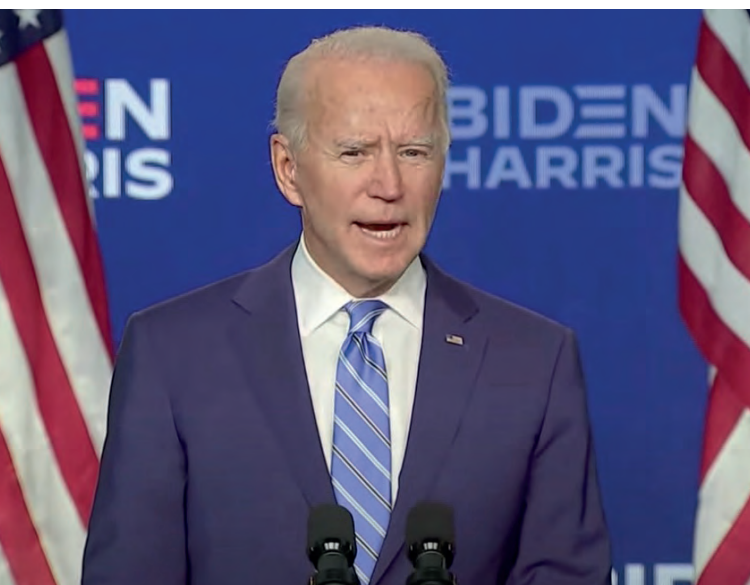
America is about to turn the page. Our long national nightmare is almost over. Starting after his oath on January 20, 2021, President-elect Joe Biden will be the driver of a wide-ranging series of changes that are designed to bring the United States back into the family of civilized nations and to heal the deep wounds that divide America in two.

In political terms, the biggest news is that with Biden we will have once again a U.S. president who does not attack and insult somebody every single day via tweet or on Fox News and who does not preach hate and fear, who does not attack blacks and Hispanics and other ethnic minorities while praising white supremacists. We will have a president who is pledged to re-unite our divided nation and to seek a period of healing. We will also have a president who believes in our democratic institutions and does not try to delegitimize them. Trump has displayed his authoritarian tendencies on many occasions. He is not a normal U.S. president, but rather an aberration. Trump

is the first American president who obviously does not believe in the rules of law, and that is why he will ultimately end up on the dustbin of history.

The economic policy

In terms of the battle against Covid-19, the big news is that we will have a US president who is not a denier. Biden has already named a serious and top-level Covid task force. In economic terms, the battle against Covid-19 is a starting point, because the trajectory of the US economy is closely aligned to the path of the virus. But we can be more specific about the kind of economic policies we expect from the new US president. First, Biden will try to push through a massive new emergency package of support for American workers and families and companies that are suffering from the effects of the virus. The Republican Senate controlled by Senator Mitch McConnell, the Republican leader of the Senate, chose to block a 2 trillion dollars package of aid, while both Biden and U.S. House of Representatives leader Nancy Pelosi want to rush this assistance to the Americans who need it most. Biden will also want to help those millions of Americans who are still unemployed as a result of the devastating effects of Covid on the economy. He wants to approve a \$700 billion program of public investments, largely in infrastructure, aimed at creating at least five million new jobs. He also promises a new minimum wage of 15 dollars/hour at least, which would be the double of the current level. This measure would help many poor white Americans, the so-called "working poors" but especially Afro Americans and other ethnic minorities. The move would also represent a Keynesian move, as it would increase consumer spending by increasing disposable income for America's underclass. It is true that Biden wants to increase corporate taxes and personal income taxes for the two percent of Ameri-



Joe Biden is the US president-elect

cans who earn more than \$400,000 a year. But Wall Street does not seem to be afraid of this; indeed the growing consensus among many investors is that political stability is critical for America's economic success, even with higher taxes. Finally, Biden will probably eschew the aggressive and hostile trade wars that Trump has launched against China and the European Union. This does not mean Biden will be "soft" on China but rather that he will be more sophisticated and more diplomatic than his predecessor in protecting U.S. interests.

The majority in the Senate

Of course Biden's ability to implement all these policies will depend in great part on whether the U.S. Senate will be controlled by the Republicans or Democrats. If the Democrats in January win the two Senate seats in Georgia they will have control of 50 seats of the 100-seat Senate. But this would mean they will have full control because the Vice President, in this case Kamala Harris, possesses the final vote which can break tied votes in the Senate. If instead the Republicans remain in control of 51 seats they are unlikely to cooperate with Biden despite his best efforts to reach across the political aisle and seek bipartisan legislation. Joe Biden has been a centrist all his life. He is not a man of the Left. He has often tried to achieve cooperation between Democrats and Republicans.

The foreign policy

So what does Biden's election mean for U.S. foreign policy? The good news for Europe is that Biden has already said he wants to reaffirm Washington's

commitment to the Nato alliance, and he wants to respect (rather than disparage) the Atlanticist tradition. Perhaps as soon as his first day in office Biden can be expected to announce plans for the United States to return to the Paris agreements on climate change which Trump abandoned. Biden believes in climate science, and he also understands the job-creating potential of the green economy. Biden will also bring the U.S. back into the World Health Organization and he will recommit America to a multilateral rules based system for international trade. Biden will also probably try to bring America back into the important nuclear agreement with Iran, if Tehran allows this to happen.

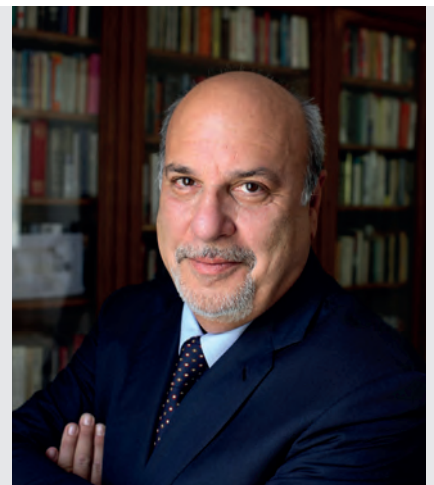
A positive news

Unfortunately, between now and January 20th Trump will not go away quietly, and he is proving to be quite recalcitrant about his departure. Being an uncouth boor, Trump may even refuse to show up, as is tradition, for the inauguration ceremony on January 20th. The point is that Trump is not going to easily accept his defeat and gracefully cooperate as Biden prepares to take power on January 20, 2021. It is important to remember that until 11.59 am of the morning of January 20th Trump will remain in possession of the *pieni poteri* of the U.S. presidency. And that means anything can happen over the next two months.

Nonetheless, it is morning in America. A new dawn awaits us. Our democracy is secure again, and while the road ahead will be tough, and our nation will remain divided for years to come, the victory of Biden is an extraordinarily positive development, not just for America, but for the entire free world. **B**

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, which involved the CIA and the Italian BNL, was one of his most famous. The book "Questa non è l'Italia", published by Newton Compton, is his ninth best-seller.





This Annus Horribilis is coming to an end

After the first quarter falling by **4.5%**, the second quarter going down by **19.4%** and the third quarter falling further by **12.8%**, it is certain that 2020 will end with a negative sign. **Assodel** figures presented last October confirm it.

by Laura Reggiani

The meeting organised last October by Assodel in dual mode (face-to-face gathering at Cosmo Palace Hotel in Cini-sello Balsamo, near Milan, and virtual meeting on an online platform) was an opportunity to take stock of the electronics market and to look into future trends also in the light of major changes triggered by the crisis caused by the pandemic.

The economic crisis linked to the health emergency is affecting all markets globally and 2020 will undoubtedly be remembered as an “annus horri-

bilis” for many reasons. Yet, despite difficulties, the electronics sector appears among the few industries affected by slight decline and, above all, having precisely those assets to quickly overcome the crisis.

Acceleration of innovation and digital transformation processes in all application sectors, pervasiveness of electronics, the need to use increasingly smart (Internet of Things, Big Data and Artificial Intelligence, first and foremost) but also more efficient systems (due to power electronics, for example) will help the sector recover faster.

MARKETS

DISTRIBUTION

PRODUCTS	Q319	Q419	Q120	Q220	Q320	Q/Q-1	Q/QY-1
Total SC	192.1	185.1	227.6	180.1	159.3	-11.5%	-17.1%
Total IP&E	82.6	80.5	109.0	83.9	82.9	-1.2%	+0.4%
Total Systems	22.5	21.4	23.9	19.9	16.8	-15.5%	-25.3%
TOTAL DISTRIB.	297.2	286.9	360.5	283.8	259.0	-8.7%	-12.8%
Total Ytd	1.022.9	1.309.8	360.5	644.3	903.4		
Ytd	-4.7%	-5.0%	-3.5%	-11.2	-11.7		

Italian Distribution's turnover quarterly trend, by product family
(millions euro, source Assodel)

Proactive policies for innovation

Maurizio Maitti, President of **Assodel**, who resigned, thanked the Board of Directors and made the opening statement followed by the speech held by **Berlino Tazza**, President of **Sistema Impresa**, the Italian Independent Federation of Businesses and Professionals with which Assodel has been associated since 2012, focusing on proactive policies for innovation. Innovation and digital transformation will indeed become the crucial tools to achieve the goals of energy efficiency, environmental sustainability and digitisation established by the "Green Deal" and by the "National Recovery and Resilience Plan" as part of industry, buildings and mobility. Technologies will underpin the future energy where a shift in the paradigm is required to a digital and sustainable model of society. In this sense, an opportunity to redesign the national economy is the Recovery Fund which is being discussed about. The European Union will indeed allocate 209 billion to Italy by setting clear constraints for money earmarking, i.e. digitisation, Green transition and industry 4.0.

"70% of the Recovery Fund needs to be committed by 2021-22", said Berlino Tazza during the meeting, "and in any case expenses have to be made by 2026 through clear policies and a reliable and timely planning. This programme of incentives and European funds will rekindle our supply chains and restore the growth potential of EU economies by creating new job opportunities and new professionals".

The distribution market

Market trends were presented by **Franco Musiari**. **According to Assodel's latest market report, after a 4.5% decline in the first quarter, decrease was 19.4% in the second quarter and an additional 12.8% drop in the third quarter.** When it comes to specific figures, the turnover of semiconductors was 159 million euros in the third quarter, down 11.5% compared to the previous quarter and down 17.1% compared to the same quarter of the previous year; sensors (-8.6%) and micros (-10.3%) were the least worse, optos (-19.1%) and memory products (-17.5%) were the worst. IP&E performed better leading to a turnover of 82.9 million euros in the third quarter, down only 1.2% compared to the previous quarter and basically stable compared to the same quarter in 2019 (+0.4%). On the other hand, systems performance was very poor, with a turnover of 60.6 million euros in the third quarter, down 15.5% compared to the previous quarter and 25.3% compared to the same quarter of the previous year. Wireless devices are the only ones having positive YtD% and displays kept the place with a 14.3% downturn. Looking at the first 9 months of the year, systems were the worst performers with a 14.4% drop, followed by semiconductors losing 13.3% and IP&E losing only 7.4%. To understand the performance of the year, it is useful to analyse book-to-bill, which was 0.79 in the second quarter but luckily it rose above the unit in the third quarter (1.09) bringing the B/b of the first 9 months of the year to 1.01. Current year will most likely close with a negative sign. In spite of all this, forecasts for the next two years open up huge opportunities for the electronics industry. 



Connector: Top 10 Manufacturers

In 1980 they covered 38% of world demand.

Today they share 60% of the market.

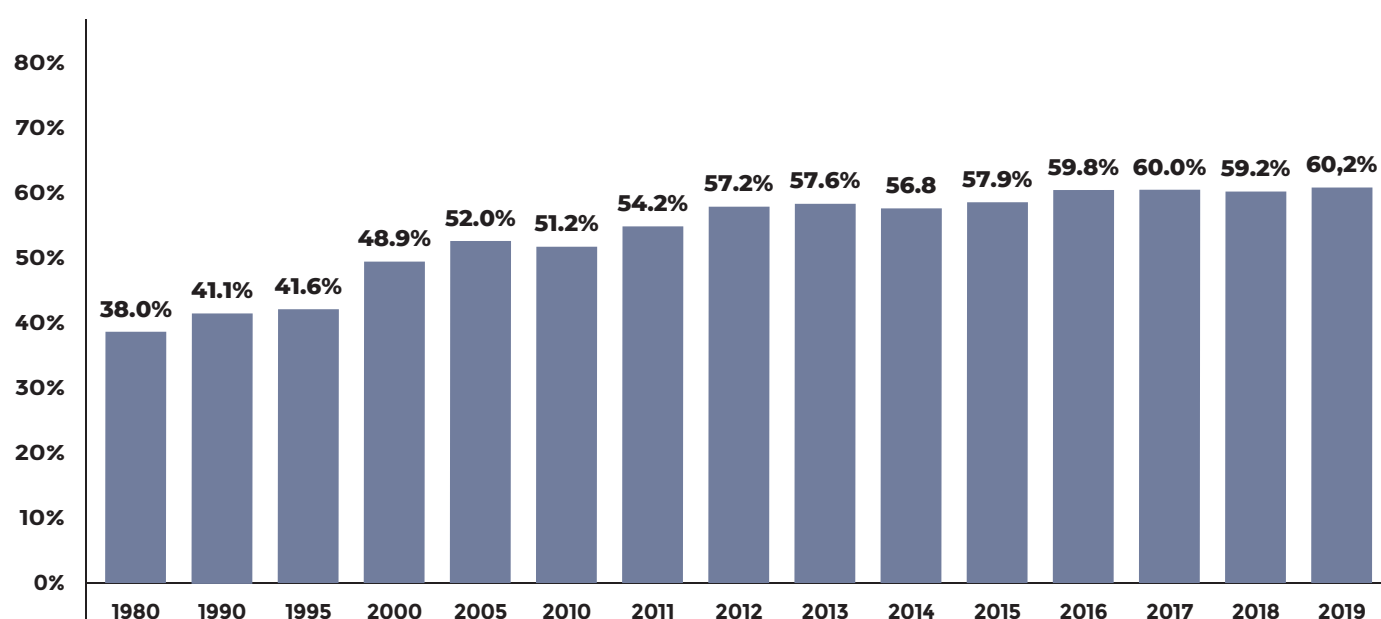
They are the **top ten connector** manufacturers in the world,
a Top Ten that sees the stars and stripes on the podium.

by Ron Bishop

The top 10 connector manufacturers, as a group, achieved \$38.7 billion in annual sales in 2019 or 60.2% of world connector demand. This is up from 2018's market share of 59.5%. The table reveals some interesting trends.

The top four connector manufacturers are all US based companies (TE Connectivity #1, Amphenol #2, Molex #3 and Aptiv #4); there are three Japanese companies in the top 10 (Yazaki #7, JAE #8 and J.S.T. #9); there is one top 10 company from Europe (Rosenberger, #10); there is one top 10 company from

MARKETS CONNECTORS



Top 10 Market Share percentage of world market (source Bishop & Associates)

the Asia Pacific region (Foxconn (FIT), Taiwan #6); there is one top 10 company from China (Luxshare); the top 10, as a group, reported a sales decrease of -2.7% in 2019. This compares favorably to an industrywide sales decrease of -3.8%. The better performance of the top 10 was the result of acquisitions that occurred in 2019, as well as previous years and the close to double digit growth of Luxshare Precision, China's largest connector manufacturer. Note that the three largest companies, TE Connectivity,

Molex, and Amphenol, are very active acquirers. Rosenberger made the top 10 for the first time in 2017, previously ranking in the top 15.

The top 10 accounted for 38% of the world connector demand in 1980 and 60.2% in 2019. Much of this growth can be attributed to acquisitions made by the top 10. In the last decade, significant M&A activity has occurred, e.g., TE acquired Deutsch (\$670 million - 2011), Aptiv (Delphi) acquired the MVL division of FCI (\$950 million - 2012), Molex acquired

2019 RANK	COMPANY	2018 SALES	2019 SALES	PERCENTAGE CHANGE
1	TE Connectivity	10,304	9,916	-3.8%
2	Amphenol	7,567	7,339	-3.0%
3	Molex	5,093	5,301	+4.1%
4	Aptiv (Fka Delphi)	3,511	3,373	-3.9%
5	Foxconn (Fit)	3,195	3,092	-3.2%
6	Luxshare Precision	2,716	2,974	+9.5%
7	Yazaki	2,692	2,471	-8.2%
8	Jae	1,947	1,628	-16.4%
9	Jst	1,475	1,350	-8.5%
10	Rosenberger	1,214	1,213	-0.1%
TOTALE		39,715	38,659	-2.7%

Top 10 Connectors Manufacturers ranked by world sales (in million dollars, source Bishop & Associates)



DARTON

molex®

INSIEME OGNI COSA È POSSIBILE

AUTOMOTIVE

DOMOTICS

INVERTER

LIGHTING

MEDICAL

METERING

NAT

RAILWAYS

TELECOMUNICATION

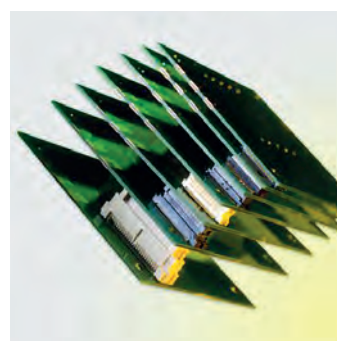
VENDING



Gamma completa di connettori filo-scheda adattabili ad applicazioni che richiedono soluzioni ad alta potenza, segnale o miniaturizzati.



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MARKETS CONNECTORS

YEAR	TOP TEN SALES	WORLD SALES	TOP TEN MARKET SHARE
1980	3,417	8,989	38.0%
1990	7,063	17,166	41.1%
2000	17,462	35,692	48.9%
2010	24,542	47,938	51.2%
2015	30,121	52,049	57.9%
2019	38,659	64,169	60.2%

Top 10 share of the market through 2019 (in million dollars, source Bishop & Associates)

Oplink (\$200 million – 2014), Amphenol acquired FCI (\$600 million – 2016) and Conec (2019), and Aptiv acquired Winchester (\$650 million – 2018). In addition to those mentioned, manufacturers listed in the top 10 made over 50 acquisitions during the past five-years.

Since 1980, there has been a dramatic change in the companies that comprise the top 10. Some companies have moved up in rank, others have moved out of the top 10 and still others have gone out of business or have been acquired by larger companies. Some highlights include:

- TE Connectivity has remained the largest connector company since 1980. The name changed from AMP to Tyco International to Tyco Electronics and currently to TE Connectivity.
- Molex and Amphenol have remained in the top 10 throughout the 39-year time frame. Molex moved from the tenth largest in 1980 to the third largest in 2019. Amphenol, the second largest in 1980 fell to fifth in 2000 but moved up to the third

largest in 2010 and the second largest in 2019.

- Companies that were in the top 10 in 1980 but have not retained a top 10 ranking are ITT Cannon, DuPont (Berg) 3M, Winchester, Augat, Cinch, and Burndy. DuPont (Berg) was acquired by Framatone (FCI) in 1998 and later by Amphenol in 2016. Augat was acquired by Thomas Betts in 1996 and Thomas & Betts' OEM division was acquired by Tyco Electronics in 2000. Cinch was acquired by Bel in 2010. Burndy was acquired by Framatone (FCI). Both ITT and 3M were still ranked in 2019 but have slipped to positions outside the top 10.
- There were no Asian companies in the top 10 in 1980. In 2019, there were five Asian companies represented in the top 10.
- Luxshare achieved a top 10 rank in 2015, making it the first and only Chinese company achieving top 10 status. They maintained this ranking in 2019. Rosenberger, who first achieved top 10 status in 2017, is the first European company to achieve top 10 ranking since 2011. 

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, Chicago, Illinois. The firm also has offices in Brussels, Sidney and Hong Kong.





Increasingly big and “Green”

Analog Devices has strengthened its leadership in the analog industry and has become a giant committed to “connecting the physical world to the digital world” but also to minimizing environmental footprint and resources used. We talked about it with **Mike Britchfield**, VP Sales Emea.

by Laura Reggiani

When Analog Devices acquired its historic rival Linear Technology for around \$15 billion in 2016, the merge created a giant in the analog ICs with a turnover increasing from \$8 to \$14 billion and a market share of 9% leading ADI to the top of the analog chipmakers.

Last July, by acquiring **Maxim Integrated** through a share transaction valued at over \$20 billion, the giant of Massachusetts made another major move in the analog chip universe in particular, and in the semiconductor one in general which led **Analog Devices** to further consolidation. The transaction, unanimously approved by the Board of Directors of both companies, has indeed fur-

ther strengthened ADI as a leader in the analog industry and has allowed the company to expand its product range and to penetrate more end markets.

We met **Mike Britchfield**, VP Sales Emea at **Analog Devices** since 2014, to understand the rationale behind the acquisition, how the company is moving strategically at this particular time and the role that the electronics industry will have to play after the pandemic.

2020 will be remembered as the year of the pandemic but for ADI it is also the year of Maxim acquisition. What reasons led you to this decision?

This important agreement aims at strengthening our leadership in the analog semicon-

ductor industry, we expect to grow our turnover by additional \$8.2 billion. At present, Maxim's strength in the automotive and data centre fields and our strength in industrial, communications and healthcare markets have highly complementary bases making the combination a strategic expansion into main growth trends. Concerning power management, Maxim's application-focused products and ADI catalogue with broad market solutions offer now a fully tailored program. Additionally, the combination of the best available technologies with our industry expertise and design capabilities will enable us to offer more complete solutions in order to serve over 125,000 customers and to gain a greater share in a market valued at over \$60 billion and not to mention that both companies have shared passion for innovation-driven growth. This deal is also bringing together similar corporate cultures focused on talent, innovation and engineering excellence with over 10,000 engineers and around \$1.5 billion invested in R&D on an annual basis.

Commenting on the acquisition, CEO Vincent Roche said "It is the next step in ADI's vision to connect the physical and digital worlds". What are the goals of this good deal?

Analog Devices and Maxim share a passion for solving customers' most complex issues and by combining our in-depth knowledge of technology and talent, we will be able to develop more complete and cutting-edge solutions. Maxim is a well-established company operating in signal processing and energy management with a portfolio of proven technologies and a unique history in design innovation development. Together, we are well positioned to build the next generation of semiconductors and, at the same time, to design a better, safer and more sustainable future for all.

It is impossible not to talk about Coronavirus. How has the pandemic impacted on your business? What did you do to deal with it?

Due to the very nature of Covid-19, Analog Devices' solutions have proven to be in-

valuable in the fight against the pandemic, to both slow the spread of the disease and support customers. Our expertise in converting real-world phenomena into usable information and data flows has enabled us to adapt our product portfolio and address this situation on an on-going basis. Bearing this in mind, the company wanted to show its proactive approach and dedication to innovation. As early as March, we formed a task force to prioritise key medical device manufacturers by increasing production to deal with perceived and actual equipment shortages.

Our background in the healthcare industry and the on-going goal of digitisation enabled us to move quickly, playing a successful role in projects or initiatives requiring consistent action. Medical devices such as ventilators, respirators, diagnostic test systems, CT scanners, digital X-ray machines and patient monitoring are all decisive to fighting Covid-19 and due to our knowledge in manufacturing components for such medical technologies, we could be proactive in the fight against the

Mike
Britchfield,
Vice
President
Sales and
Marketing
Emea,
Analog
Devices



pandemic from day one. In addition, we have been involved in several fundraising initiatives through Analog Devices Foundation to support research and development of test solutions and, what is more important, of a vaccine. Since the beginning of the pandemic crisis, ADI has followed three guiding principles: to Protect, to Respect and to Serve. These principles have been the foundation of our response to the emergency, we have taken a higher degree of responsibility to our workforce (including workers at the forefront of our plants), but also to our partners and customers. We immediately realised that our business optimisation needed to be tailored to the needs of the organisation's stakeholders and we reviewed our operations: we had to be confident that business optimisation strategies matched those needed to fight or minimise the impact of Covid-19. Ultimately, ADI has focused on solving challenges, namely in healthcare and manufacturing.

How have your end markets performed? Could you tell us if you have had areas where you have suffered and others where you have been successful enough? Any considerations in the end?

Obviously, there was an immediate surge in demand in the healthcare sector. We needed to enable our clients to operate effectively within the restrictions that the pandemic were imposing and remain confident at the same time to meet such demand. Also, connectivity is another core business. It seems that the demand for work-from-home is increasing and is requiring a more steady and efficient communications infrastructure: wireless networks and connectivity in general are two areas that will be significantly impacted by smart work, both now and in the near future.

The increase in smart work has shown that there is a clear need for a faster communication structure. The demand for reliable and efficient communication tools will go hand in hand together with wireless infrastructure development speed in several areas and connectivity will be crucial on how the industry will be adapting to the post-Covid

world. If we look at the automotive field and at other consumer sectors, we can say that the economic downturn caused by a decreased consumer demand is reflecting the fact that customers are becoming more budget-conscious and latest models, albeit equipped with cutting-edge technology, are no longer a priority for them.

Sustainability is a very sensitive area for the company. What have you done in this sense?

ADI is committed to protecting the environment and to ensuring the health and safety of employees, customers and individuals. We have taken this commitment for many years and very seriously. As a company rooted in technology and innovation, our products are often used to implement sustainable systems and solutions developed by other companies. We set a good example in all our activities, which is why we designed them to minimise our environmental footprint and to preserve resources. "Green design" and efficiency-oriented attitude have helped us maintain energy consumption stable year after year, even though we are constantly growing.

Furthermore, when it comes to manufacturing, we are rapidly increasing the use of renewable energy, indeed last year 52% of power consumption came from sustainable sources. 2020 has been equally important in our commitment to designing a sustainable future. This year we have taken an important step forward in promoting sustainable growth for all our stakeholders. We have indeed been the first semiconductor manufacturer to issue "Green Bond", aiming at using proceeds to finance or refinance projects that can offer benefits in terms of environmental sustainability. Renewable energy, energy efficiency, green buildings and transport, sustainable water and wastewater management, pollution prevention and control, eco-efficient products, technologies and manufacturing processes as well as circular economy are all issues in ADI's environmental protection and regeneration projects, also in line with the sustainable development goals. 



Competence, expertise and innovation

These are the strengths of **Omega**, a group operating for over 70 years in distribution of electrical and electronic equipment. **Roberto Ciboldi**, chairman and general manager, talked about his company and national and international challenges ahead.

by Laura Reggiani

A company in constant growth, **Omega Fusibili** has been on the market for over seventy years and has become a group employing more than 130 people, with a turnover of about 56 million euros and appearing at the top of rankings of Italian companies in the sector. It is based in Italy, France and Spain, supported by a widespread sales

network consisting of 15 expert sales technicians, 10 customer service operators, over 40 regional agents and 30 local distributors. Today headed by **Roberto Ciboldi**, chairman and general manager who joined the company in 1988 representing the third generation of entrepreneurs. We met him to discover **Omega**, its strengths and the strategies at the basis of its constant success.

Omega has been on the market for over 70 years. What are the main steps that led you from being a manufacturer to becoming a distributor and from being a distributor to becoming a group?

Omega's history can be summarised as "a continuous path on the road to success" and can be correctly divided into three eras managed by three different entrepreneurs: its origins, when it was founded by **Alessandro Molinari**, my father's uncle, and the first manufacturing and commercial organisation; the transition from manufacturer to distributor, led by my father **Mario Ciboldi**, when corporate policies were renewed introducing a new appeal based on lo-

gistics and also improving the commercial offering; the transition from distributor to group, managed by me, a pivotal step involving a new strategic vision and significant investments.

You have made several acquisitions in the last few years. What other projects have you been involved in?

2019 was a very important year. We acquired the company Ocmei specializing in electrical safety, later completely integrated in Italweber which helped to achieve an interesting increase in our turnover, and the company Ermec, based in Barcelona, operating for more than 25 years in the Spanish and Portuguese distribution markets with the aim of pursuing our international vision. In the same year we further expanded our warehouse, doubling our logistics capacity. A long-term investment of almost three and a half million euros in storehouse and machinery, with 7,000 automatically moved pallet spaces which makes Omega the company having the best logistics organization in the industry, so that we can look to the future with serenity and plan expansions. We have made further investments in assembly. We have built state-of-the-art automations to sell assembled components and therefore offer a service allowing the customers to save on labour costs. Through this project we can counter competition of fuses importers from China and secure customer loyalty.

When it comes to end markets, who are your customers? What are the main applications and the most significant trends?

Our customers are OEMs, distributors and subcontractors operating in different fields, especially in the industrial and automation sectors but also in automotive, lighting, household appliances, medical and many other different applications. The variety of applications perhaps makes our work more complex: we indeed need to develop many different skills and knowledges and our business management has to be flexible enough to keep up with the changing times. As a result, Omega is an extremely solid company and it is able to stand in other markets and compensate for difficulties arising in certain sectors. In this very moment, e-mobility and Industry 4.0, along with the electro-medical devices sector, appear to be among the most booming markets.



Roberto Ciboldi, Chairman and General Manager at Omega Group

You operate on the international arena. What are your main regions? Are there any other areas of interest besides those you already operate in?

We mainly operate in Southern Europe, as we are located in Italy, but also in France, Spain and Portugal. Therefore, we are not 'yet' a European company but our strategy is to become more international. Italy is located in the Mediterranean basin and we intend to cover subcontractors in North Africa, especially Morocco and Tunisia which we think we can reach through our French organization and also by adding sales agents in the area. We want to cover Eastern Europe by implementing the same strategy, in particular Poland, Hungary and Romania.

It is not possible not to talk about Coronavirus. What actions have you taken? How has Covid-19 impacted on your business?

In the first months of the epidemic, we took a number of Covid-related initiatives involving employees and customers to whom we donated over 10,000 face masks. We immediately took action by making ourselves available to make shipments earlier than agreed dates and move payments and we accepted all requests for deferred payments and orders. Covid has strongly impacted on Omega's business, but due to our solidity, we are confident with result to success and our staff will not make redundant. The second wave of Covid has obviously worsened the thing and led us to review our forecasts and assume a 15% drop by the end of the year.

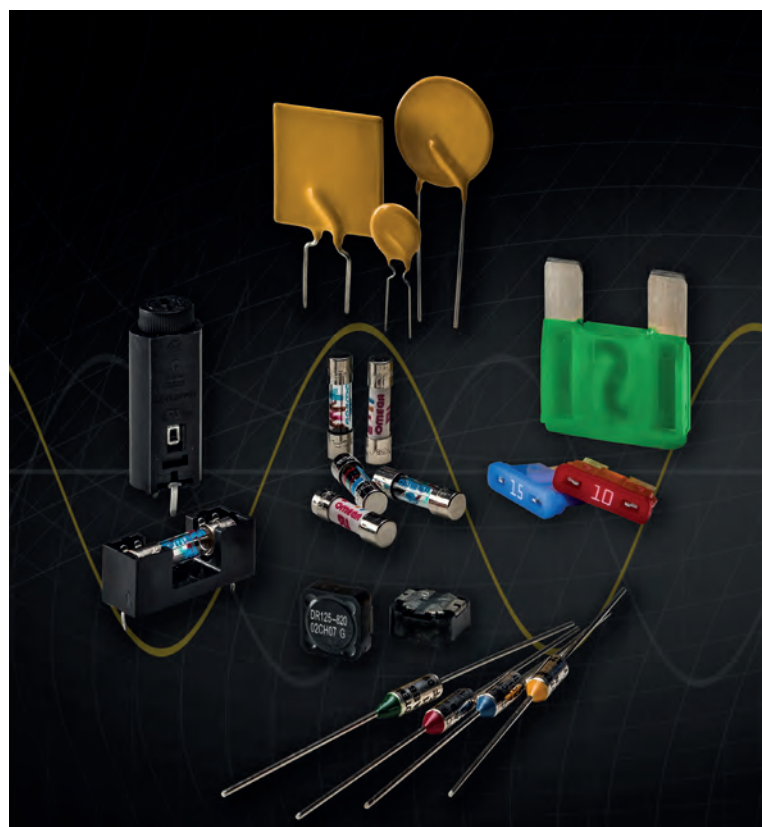
Your father Mario Ciboldi has made Omega very successful. What have you inherited and decide to maintain in your management of the company?

I am proud I grew up in a solid and sound company and this is my driving force when it comes to planning new expansions. I have undoubtedly inherited the entrepreneurial philosophy and mindset from my father, which I totally practice and can be summed up as follows: "The best recognition of efforts made is not what you get but what you become through them". I have also inherited from my father the important bond with the staff which I consider to be the core value of my company. I believe that the way we deal with, talk and consider employees is one of

the pivotal values of the company.

In conclusion, how will your company be over the next five years? What will future challenges be for Omega?

Over the next five years we will keep following the journey we have started by consolidating our position on both the domestic and international markets. Making acquisitions is no longer a challenge for Omega and me; we have our own model for acquiring new companies, we have the expertise, we can calculate risks and forecast results. Our actual future challenge lies in digital transformation and I am committed to turn Omega, a company that is currently operating in the traditional way, into a company that also operates in the digital field. How will components be sold in ten years? Will buyers still be interested in meeting up with my agents or will they prefer to have everything available online? I believe that these are the big questions and this is why I want to find the right way to implement a new model without aiming at becoming a competitor of big companies that sell online but taking the very first steps in this direction next year. E



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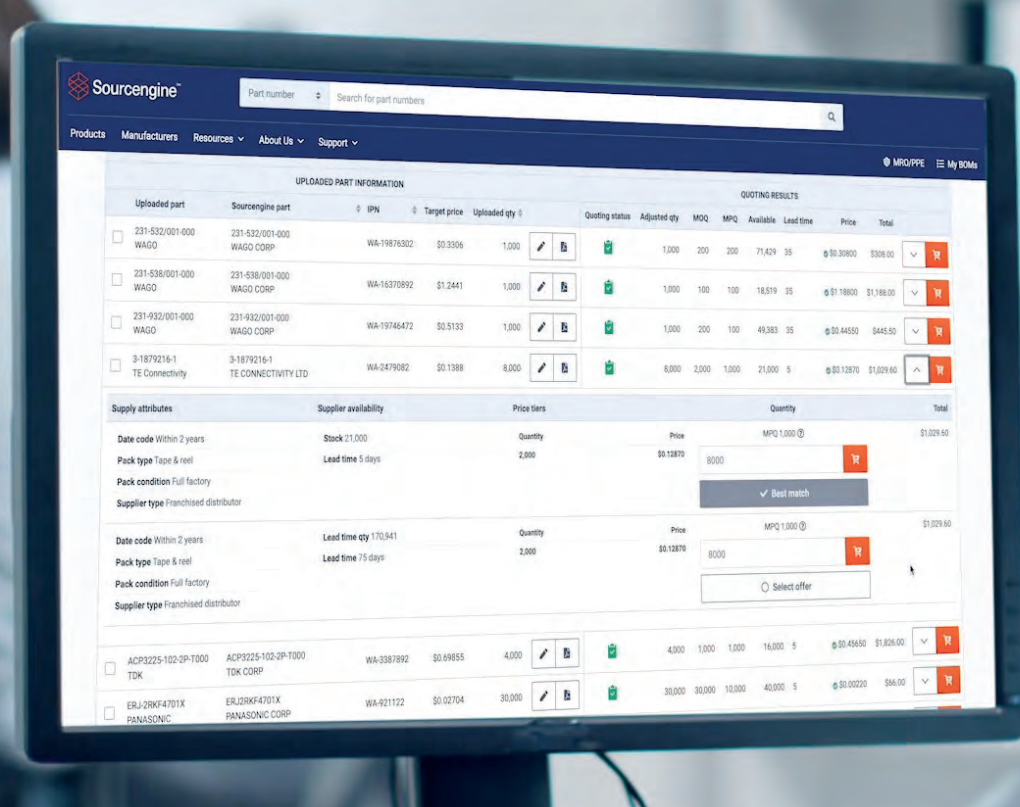


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Where you can buy with one click

On the B2B e-commerce platform **Sourcengine**, a new tool for the **Bill of Material** management developed by **Sourceability** allows to purchase electronic components with just one click.

by Greta Gironi

Sourceability has launched a BOM management tool with 'one-click' transaction capabilities. Designed for procurement specialists and purchasing departments, the BOM tool delivers on both fast quotes and 'one-click' purchasing in a simple, easy-to-use tool. It is available on **Sourcengine**, the B2B e-commerce marketplace for the electronic components industry where users can buy from over 2,600 traceable vendors.

For the supply chain professionals

Supply chain professionals can upload 2,000 line items in a bill of materials and receive offers on over 550 million manufacturer part numbers within a matter of seconds. More importantly, this tool allows buyers to transact upon these quotes with one click - cutting out the usual purchasing process of writing numerous RFQs, reviewing pricing, contacting individual suppliers and then finalizing shipments. Procurement specialists can export BOM tool results and share it with their global team and organization, thus speeding up the procurement process and keeping production lines moving. "Purchasing managers need to be able to move fast in order to redu-

ce time to market, and source smart to smooth the procurement process and control the bottom line," said **Jens Gamperl**, **Sourceability** CEO. "The digitalization of the supply chain enables this kind of streamlined and intuitive approach. With our new BOM tool, we are putting as much control into the hands of purchasers as possible by providing access to a truly global supply chain in real-time."

The BOM tool also delivers important product information to supply chain professionals such as description, life cycle and compliance specifications (import and export). Users can schedule deliveries up to 12 months and every uploaded BOM is saved for future review. Saved BOMs can easily be rerun in the tool to obtain the latest offers with a single click of a button. Each BOM purchase is also backed by a 3-year warranty. Gamperl continued: "With a sophisticated UI and fine-tuned export functions, users can precisely map results against their BOM and requirements. Our aim is to meet our customers' needs - even if their request doesn't fit within a minimum order quantity or availability. We will continue to engage with the needs of our customers and work hard to deliver a valuable tool that is a true asset to purchasers."



Prepared for the next products generation

As the world responds to **new challenges**, the next generation of end electronic products will need to meet high expectations and deliver even higher levels of **security**.

by Mike Ballard*

It takes more than using the latest embedded devices for customers to develop ground-breaking products which deliver real change. Selecting a new device is only the start, and engineers working in Original Equipment Manufacturers of all sizes must be able to realize the potential that can be unlocked by each new part. To do this, OEMs need to understand how to integrate the functions and capabilities provided by the latest devices into their application. They will also need a deep knowledge of their market and the trends that are happening within it to succeed. Daily life is becoming a smarter and more connected experience for developers as well as for end users. And, as the levels of sophistication and connectivity continue to grow, the need to deliver smarter advanced security for connected applications is also growing.

Driven by market intelligence

Microchip identifies and understands the needs and trends across multiple markets, now and into the future. To help customers, the technology values of each new solution must be conveyed accurately, clearly and quickly. The insights gained from monitoring different trends can benefit clients of all sizes, from major multi-nationals to the start-ups which drive grass-root innovation. Technology is moving fast and the path to developing new products and applications should be made as smooth as possible. Microchip's wide partnerships with clients of every size across every market sector gives us insight into the unique needs of various applications. This insight enables our business units to create new devices that meet our client's needs for current and yet-to-be-realized end products.

Technology is a moving target

As technology continues to evolve, security must evolve at the same speed or faster and engineers must deliver secure connection to MCUs as well as to cloud servers. The growth of cloud connectivity leaves OEM products more open to the risk of attack. For developers, this means that the products they create must keep their IP secure and maintain high levels of security for the users. The challenge is to bring emerging technologies to OEM customers in a way that puts safety at the forefront of technology. To deliver the products of the future, the speed of development must be combined with an understanding of how technology is moving across different markets. When the first smartphones came out, consumer expectations changed dramatically. The first touchscreen excited the market, but that technology is now integrated into products at the lower end of the market. Cutting-edge technologies which are developed for high-end applications will soon be scaled to reach lower-cost devices. The reality is that today's high technology will become mainstream in three or four years. Product developers must envision where they should be heading and understand what they should be avoiding.

Game changing technologies

Today, the technologies which are providing the biggest disruption to the user experience are facial recognition, voice commands, machine learning, artificial intelligence and the Internet of Things. Scaling these technologies from high-end to individual applications in the mass market can deliver a more customized user experience and si-

multaneously drive higher expectations. What will these future applications do? Your front door may be able to recognize you and unlock itself automatically. A large trend in the U.S. is the video doorbell that already allows you to talk to someone who is standing at the door when you are in another location. The combination of facial recognition and machine learning could also mean that your coffee maker will recognize you and then make the type of coffee that you prefer. New drivers for technology are also coming from unexpected sources. The Covid-19 lockdown changed the world in just a few weeks and new market trends are appearing.

So how will the electronics industry respond to these changes? As working from home becomes the new norm, the risk of leaving home resulted in fewer cars on the road and a significant reduction in carbon emissions. Companies may embrace this concept more in the future and products may be needed to enable people to work together even when we are separated. The University paradigm may also changing as classes are moving online; and, there is a rise in the use of home-based products for health monitoring and even virtual healthcare appointments. Will the long-term result of these changes be that business moves to a more communication-based model? Will using a ride-sharing app on your phone replace owning a car? And will the new products be able to learn on their own and write their own code?

Creating the future

Engineers have great ideas for applications that respond to new opportunities. However, they often do not have the internal design resources and expertise to develop them. Working closely with a major global partner, like Microchip, can make a real difference in delivering the performance expected of next-generation products to the right markets at the right time. To enable companies to create products which break new ground, they must have access to the resources which support advanced development as well as to proven software and a solid security platform. The wide partnerships that Microchip has in virtually every sector of the market gives us market insight that we share with our customers directly or through third-party partners. It is important for engineers to be able to have the building blocks for new devices and to implement the security which protects their users as well as their products and reputation. This means that all the secure elements of

a new product or application must be connected to deliver the most robust levels of security.

The support which helps customers capitalize on using the latest technologies and devices enables applications to be delivered across different markets. The size of these customers ranges from major companies with significant resources and revenue, to smaller start-ups where the focus is on innovation and individualism. This could include a university student who may be using an easy-to-use maker board to develop their revolutionary new application. A new device may do a million things. Microchip's role is to connect the dots between shaping the capabilities of each new device and helping customers to keep pace with technology when they are creating that new device.

* Mike Ballard is Global Home Automation and Security Leader for Microchip Technology.





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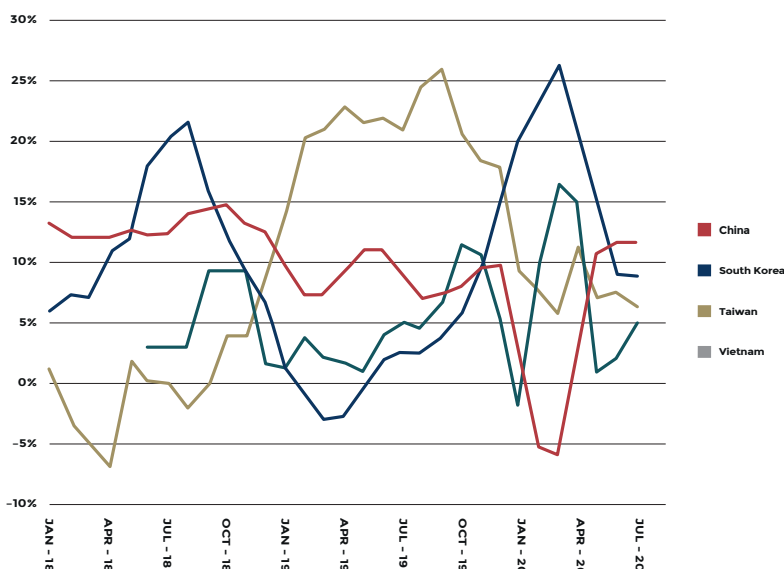
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Electronics production is healthy, but only in Asia

China is back on track, while in mature economies like the **US** and **Europe**, the growth of electronic production is very weak. **Semiconductor Intelligence** data confirms this.

GLOBAL ELECTRONICS PRODUCTION IS HEALTHY, DESPITE THE COVID-19 PANDEMIC. China is the largest electronics manufacturing country and the original source of the Covid-19 outbreak. In 2018, China electronics production growth averaged 13% versus the prior year. In 2019, the average growth dropped to 9% as some manufacturing shifted to other countries due to the trade dispute between the U.S. and China. In early 2020, China shut down many manufacturing plants in an effort to control the spread of Covid-19. As a result, change went negative in February and March, bottoming out at -5.9% in March. China production has since recovered to growth rates in the 11% to 12% range in May through July. Taiwan was a major beneficiary of production shifts out of China in 2019. Taiwan's electronics production change averaged just about flat in 2018 before averaging 21% in 2019. Average growth has slowed to 8% in 2020, but no significant slowdown due to Covid-19 has been shown. South Korea and Vietnam change has been volatile over

the last two and a half years. Electronic production in the mature economies of the United State and European Union has shown weak to moderate growth in the last few years. U.S. growth in 2018 averaged 4%, slowing to 0.7% in 2019. EU-27 growth averaged 5% in 2018 and -1.7% in 2019. growth in the U.S. and EU has been weak in 2020, but it is difficult to say how much of this is due to the Covid-19 pandemic and how much is a continuation of previous trends. Both the U.S. and EU bounced back to growth of 2% in July. The impact of the Covid-19 pandemic on electronics production is also demonstrated by the combined revenue trends of the two largest contract electronics manufacturers, **HonHai** and **Pegatron**. The combined revenues dropped by more than half from NT\$668 million in December 2019 to NT\$299 million in February 2020. Year-to-year growth was 2% in 2019 over 2018 but declined 14% in January and February. Year-to-year growth recovered to 6% in August and revenues were NT\$526 million, 94% of the average monthly revenues in 2019.



Three-month-average change versus a year ago in electronics production for the major Asian producers
(source Semiconductor Intelligence)



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TDK-Lambda invests in the UK

The investment dedicated to the redevelopment of the **Ilfracombe production plant** is of 11.5 million pounds.

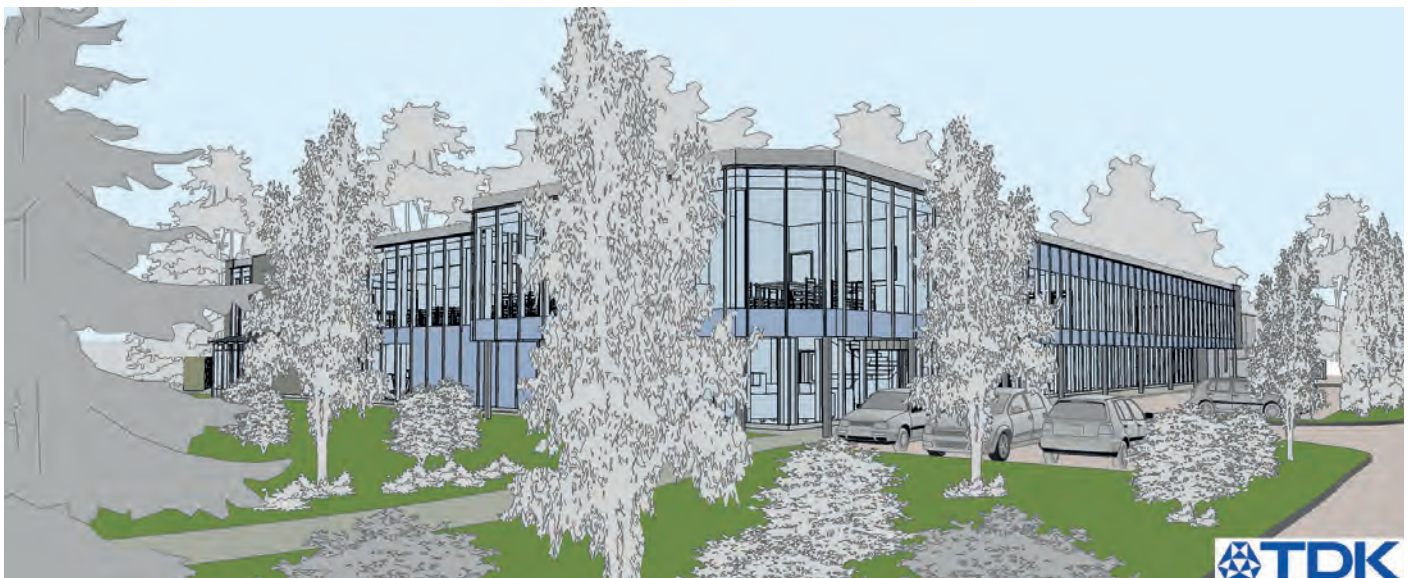
TDK ANNOUNCES AN £11.5M INVESTMENT PACKAGE TO REDEVELOP ITS TDK-LAMBDA MANUFACTURING FACILITY IN ILFRACOMBE, UK. THE INVESTMENT, WHICH WILL BE STAGED OVER THE NEXT THREE AND A HALF YEARS, WILL ENABLE THE COMPANY TO INCREASE PRODUCTION CAPACITY BY 50%.

The original factory was built over 50 years ago with further expansion in the mid-1980s. While the company has invested heavily in new equipment and building upgrades over these years, including the addition of a £1 million EMC Centre in 2019, it is now time to redevelop the site. The redevelopment will increase manufacturing space, expand the R&D facilities, and radically overhaul and automate the end-to-end material flow. According to market research company Omdia, the global power supply market is forecast to reach almost \$26bn in 2024, driven by the rapidly expanding digitalisation of economies, increasing healthcare demands and renewable energy trends. Also, noting customers' heightened awareness of the need for trusted, dependable suppliers due to recent events - such as

the USA/China tariffs and Covid-19 pandemic - the planned expansion will provide further supply chain robustness within the TDK-Lambda manufacturing network, especially for the European market.

The redevelopment programme will be split up into a four-stage process to ensure continuity of production and services. Stage one will be the construction of new offices, including employees' facilities and a health and fitness centre, on the North and West faces. Upon completion, the South facing office will be extended to expand the R&D, product verification & test, and manufacturing engineering facilities. The link area between the two factory buildings will then be infilled, and Smart, Lean storage facilities and AGVs for material handling installed. Finally, the manufacturing areas will be reconfigured with designated Front End and Back End (production areas).

"Since the Covid-19 outbreak, delivery quantities to certain healthcare and bio-diagnostic customers have increased by six to tenfold", says **Geoff Wilby**, Managing Director of TDK-Lambda UK.





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CERTIFICAZIONI



Flexible transmission options for every application

THE MODULAR CONNECTORS OF THE ODU-MAC® AND ODU DOCK PRODUCT LINES ENSURE RELIABLE CONNECTIONS TO MEET INDIVIDUAL REQUIREMENTS. THEY ALLOW A COMBINATION OF DIFFERENT TRANSMISSION TYPES WITHIN A SINGLE CONNECTOR.

Thanks to their modular design, signals, power, high current, high voltage, HF signals (coax), media such as air or fluids, as well as data and fiber optics can all be transmitted as required. A wide range of transmission variants can be easily combined in accordance with the modular principle.

Robust hybrid interfaces

The [ODU-MAC® Silver-Line](#) convinces thanks to high reliability and contact safety as well as vibration resistance. It is also extremely robust and durable. There are seven different docking frames to choose from, making them a universal solution. Each docking frame can be equipped with the various available modules. The ODU DOCK Silver-Line docking connectors are suitable for tool change systems, multi-couplings and docking systems.

Thanks to the time-saving quick-change head solution, an extremely high number of mating cycles – up to 10 million – is possible.

Manual mating

The ODU-MAC® White-Line offers versatile solutions for manual mating. These products are designed for at least 100,000 mating cycles, making them ideal for exceptional requirements. To ensure ergonomic handling and intuitive operation in any situation, models with spindle, lever or snap-in locking are available. [Non-magnetic versions](#) are available on request.

The performance class

The products of the ODU-MAC® Blue-Line are particularly compact and easy to handle. They are based on the [easy-clip principle](#), which allows the modules to be positioned within the connector frame without tools. There are currently 31 modules to choose from.

www.odu-connectors.com



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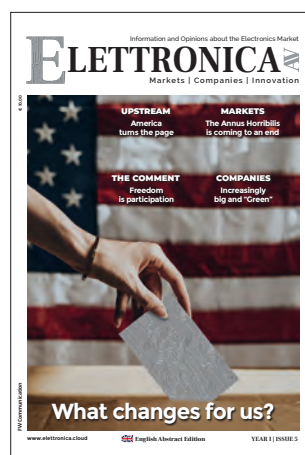
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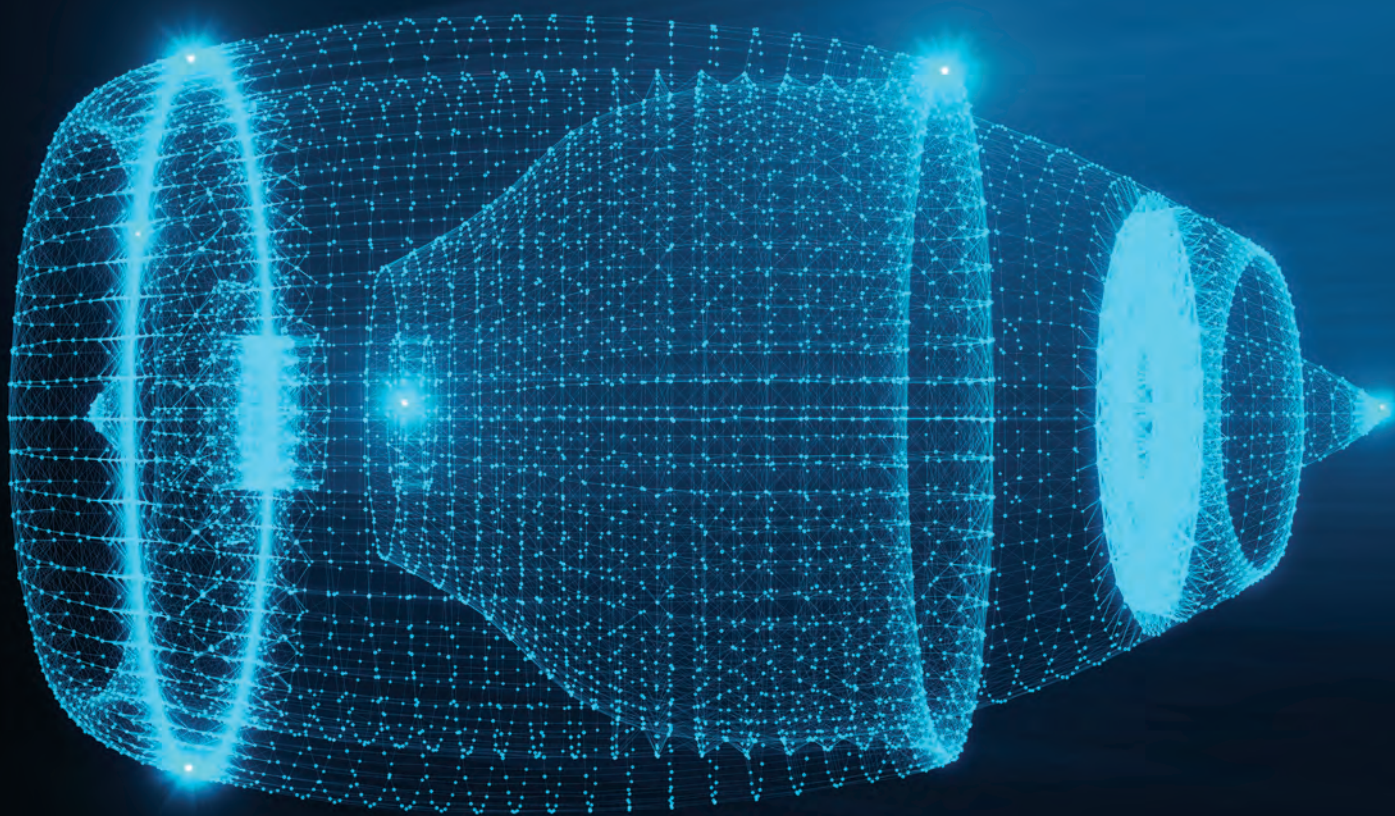
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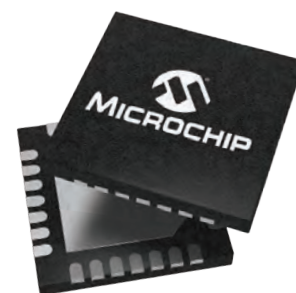
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