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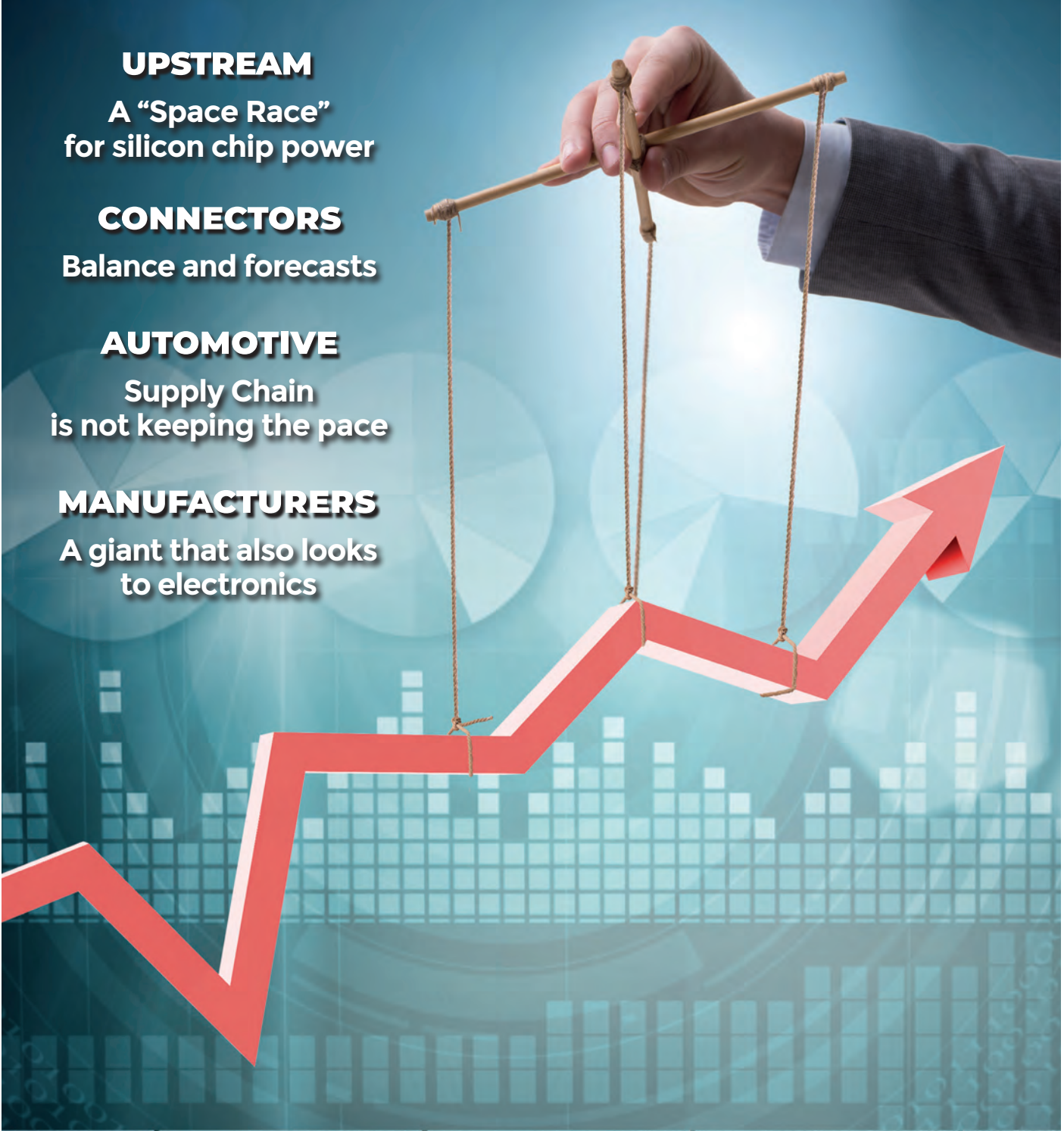
Balance and forecasts

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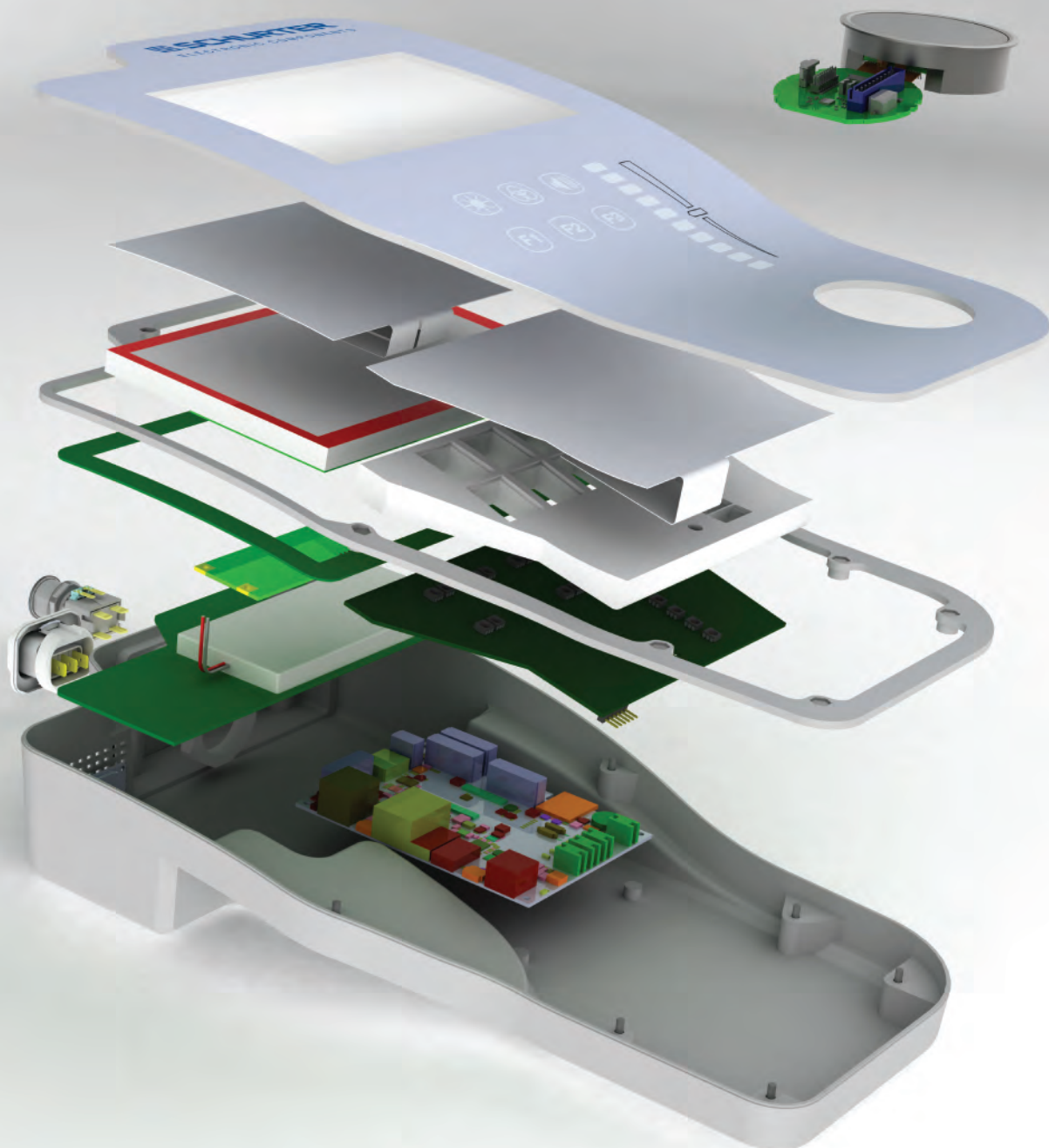
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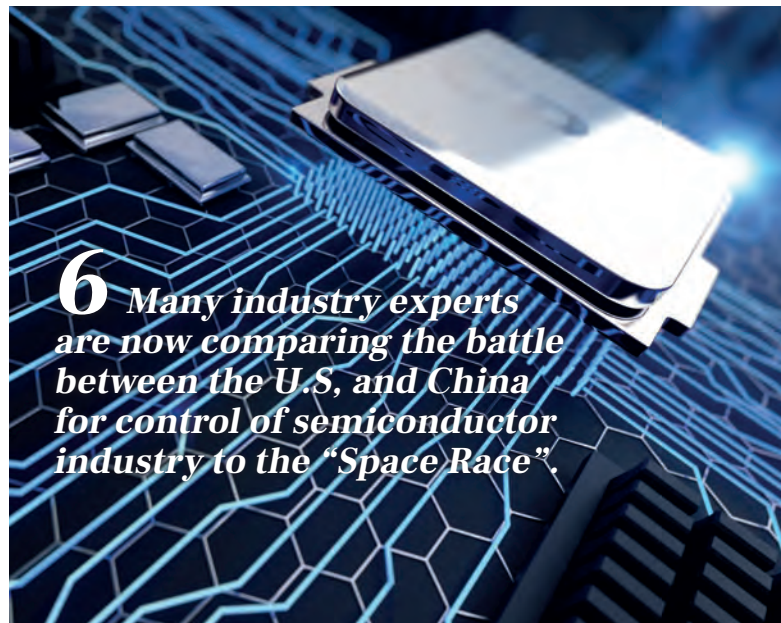
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English Abstract Edition



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

ELETTRONICA AV “ENGLISH ABSTRACT EDITION” IS AIMED AT EUROPEAN INTERNATIONAL CORPORATE MANAGERS, MARKETING AND SALES, BUYERS, CONSULTANTS AND ELECTRONICS PROFESSIONALS.



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by Fritz Walter

“No country for old men”

The tenant has changed at Palazzo Chigi, home of the Italian Council of Ministers! Twelve months ago, during Carnival days, Coronavirus entered our lives, first on tiptoe and then with powerful shoulder pushes, and 2021 Lent brought us a new Prime Minister, Mario Draghi (invoked by popular acclaim) who, with his “*whatever it takes*” motto, which has gone down in history, saved the Euro and, consequently, Europe/the Eurozone.

The words of the then president of the European Central Bank were not pronounced in vain: he proved them with actual monetary policy measures but, above all, with Quantitative Easing, multi-year liquidity injections worth over Eur 2.9 trillion through purchase of government bonds issued by “Eurozone residents”. Such numbers can be a source of pride when compared to the 750 million euros of the Recovery Fund (or Recovery Plan) that has cost his seat to Giuseppe Conte (who became the head of government in the typical Italian custom of politics and old associations, according to which presidents proclaim themselves), who was unable to draw up a credible programme for the management of the 209 billion euros allocated to Italy, split into 81.4 billion in subsidies and 127.4 billion in loans.

However, as in the Coen brothers’ movie, in the midst

of a battle between local gangs led by Grillo, Zingaretti, Renzi & Co., soldier and war veteran Mario Draghi will find himself (or rather... has been asked) to quickly manage the aforementioned cascade of money that was kindly made available by his successor Christine Lagarde; such money aims at ensuring a better future to his large family of over 60 million people!

What should worry us, however, is that 70% of subsidies will have to be planned by 2023 through projects to be finalized by 2026. And Italy has not been very far-sighted recently but suffice it to say that it only managed to commit 40% of billions envisaged in the latest European fund planning, therefore without succeeding to take full advantage of contributions received.

Moreover, it should not be forgotten that, vis-à-vis aid earmarked for post-pandemic management, many other existing European funds will gradually be reduced in budget or even not refinanced in the next few years as they are deemed to be embedded in economic plans put in place: digitalization and innovation, environmental transition and social inclusion are and will be the cornerstones of the Next Generation EU programme that, according to many, will be our (last) great opportunity to kindle national yearning for urgent and collective effort. A country for grown-ups!



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by Alan Friedman

Some good news for the health of the global economy

Finally, there is some light at the end of the tunnel. In the United States President Joe Biden has moved swiftly to push through legislation that has unleashed \$1.3 trillion of financial aid for families and businesses, a Big Bazooka-sized stimulus package that will strengthen the economic recovery.

Many economists now see 6% GDP growth as likely in the U.S. this year, and Goldman Sachs recently raised their GDP growth expectations for the U.S. economy to 8% for 2021. A growth of 8% this year would put U.S. GDP at around \$22.6 trillion, marking a full recovery after the economy shrank by 4.1% in 2020. U.S. GDP hasn't grown 8% in a year since 1951. This is why inflation expectations are growing on Wall Street. This is why the U.S. Treasury yield has soared above 1.6% in recent weeks. And this is why the U.S. dollar is likely to strengthen against the euro this Spring.

The eurozone will be lucky to achieve 4 percent growth in 2021, even with the expansionary monetary policy of the European Central Bank and the added firepower of the Next Generation EU funds and grants.

Whereas vaccinations are expected to accelerate in most of Europe only after April, in the United States President Biden has moved very quickly to buy more doses and speed up vaccinations. He has guaranteed that by May 1, 2021 all adult

Americans will have access to the vaccine (Dr Anthony Fauci is now a trusted adviser to Biden).

By July 4th, the U.S. Day of Independence, President Biden has promised that Americans will be able to have barbecues in their gardens again with friends and family. Coming from Trump, such a claim would not be credible. But Biden has already made good on his promise to vaccinate 100m Americans in his first 100 days. He has done it in less than 60 days.

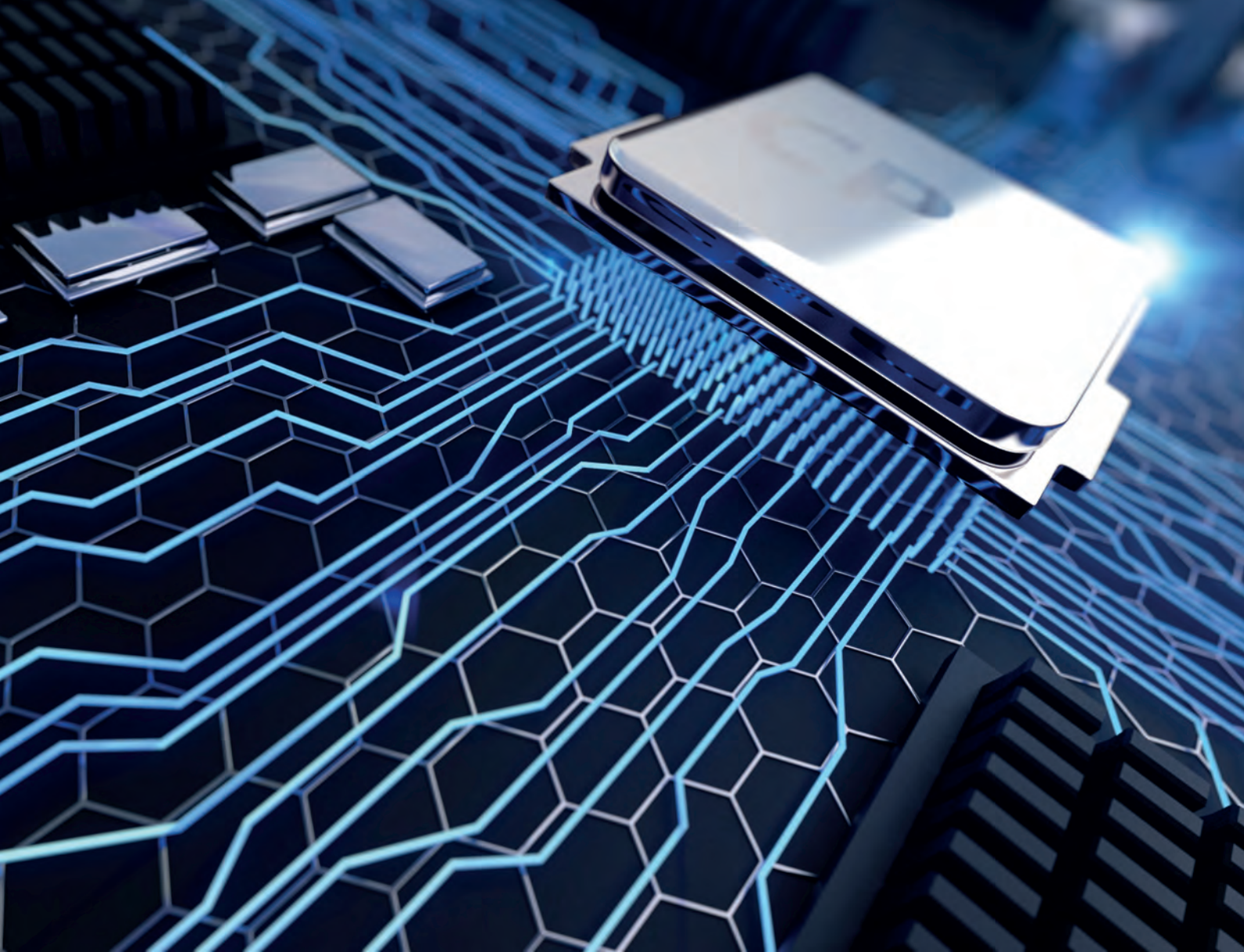
As I have written before, the economic recovery curve in America and Europe this year will be closely linked to the contagion curve and the relative success of vaccinations. If the United States achieves herd immunity by the Summer of 2021 and the eurozone only by autumn 2021, the relative timing of the economic growth curve will reflect the trends of the virus. Europe will lag behind.

While the United States enjoys a strong economic recovery, and Europe claws back what it lost at a slower pace, China is meanwhile targeting 6 percent of GDP growth in 2021, and some economists think the growth rate may be higher, as much as 7 or 8 percent. This convergence of strong 6-8

percent GDP growth in China and the United States will be good for the global economy, and smart European companies could end up as beneficiaries, with an increase in their exports to both Asia and North America.



Alan Friedman, journalist, writer and economics expert



A “Space Race” for silicon chip power?

Many industry experts are now comparing the battle between the **U.S.** and **China** for control of the semiconductor industry to the “**space race**”.

The Semiconductor shortage is a **Case Study** of how Covid has affected global supply chains and geopolitics.

by Alan Friedman

The semiconductor manufacturing industry is not usually the subject of frontpage headlines, but lately the global shortage and the battle for control of manufacturing power has been at the center of a growing rivalry between the United States and China, with Europe caught in the middle

President **Joe Biden** has taken action to help build more production capability in the United States while Asian giants such as **Samsung** are being encouraged to shift some of their production from South Korea to places such as Arizona. And the Biden approach toward China has been muscular, even if expressed in more diplomatic tones than his predecessor.

An interesting Case Study

What is the story? The current global semiconductor shortage is a case study of how Covid has affected supply chains, production and employment trends. The production of integrated circuits, using the semiconductor material silicon, has become increasingly vital in recent years, but the impact of the Covid lockdowns in 2020 has created a global shortage of silicon chips. This has disrupted the global supply chains and production capabilities of many industries, especially the automotive industry.

The world's biggest car makers, including **Ford**, **General Motors** and **Volkswagen**, have been unable to produce cars because of the shortage. They slashed their orders for silicon chips during the lockdown last year, which are normally delivered as part of a just-in-time supply chain, and they did not anticipate how quickly demand for cars would rebound in late 2020. Chip manufacturers, meanwhile, shifted their production to more profitable chips for laptops, consumer electronics and data centers, where demand has soared during the pandemic.

As a result the silicon chip manufacturers have shifted their production, and this trend is destined to continue in the era of 5G and Artificial Intelligence and the Internet of Things. In the car industry, the first three months of 2021 will likely see global production drop by more than a million car sales. These days about \$800 worth of integrated circuits go into each and every new electric vehicle. The car industry spends a total of \$40 billion a year on silicon chips. But Apple alone is now a bigger customer of silicon chips than the entire automobile industry put together. This is because of the boom that smart phone and consumer

electronics makers are enjoying thanks to consumers stuck at home.

Demand for semiconductors has actually increased as a result of Covid, even if it dropped for automobiles last year. Demand has soared for laptops, desktops, monitors, routers, gaming devices, gaming controllers, gaming headphones, normal headphones, and virtually anything associated with smartworking or the new digital revolution that Covid has unleashed.

The Geopolitics of Semiconductors

Today some 75% of global semiconductor production comes from China, Japan, South Korea and Taiwan. Of these four countries in Asia, Taiwan is the single biggest manufacturer of semiconductors in the world, with its foundry chip giant **TSMC** (*Taiwan Semiconductor Manufacturing Company*) accounting for a reported 51 per cent market share.

And while Taiwan is currently independent from China, there are concerns in Washington about how much Chinese money is being invested in Taiwan and how a worsening of US-Chinese relations could affect TSMC's future supply of chips to American companies, including important Pentagon contractors who build U.S. fighter jets. This is why many industry experts are now comparing the race for control of the global semiconductor manufacturing industry to the space race.

The United States today accounts for only 12% of global chip manufacturing. America's comparative chip advantage is in engineering, not manufacturing. China has meanwhile set a goal of dominating semiconductor manufacturing by 2025, a target it probably won't achieve.

Biden's Response

Joe Biden's response to the semiconductor shortage and to the industry's pleas for assistance in America has been rapid and forceful. Where once Trump used the constant threat of new punitive tariffs against China, and announced them via tweet, Biden prefers a more traditional diplomacy and a starkly different



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form of national industrial policy, which is a policy of tax incentives and subsidies to help nurture a larger production capability in the US over time.

Biden has also allowed U.S. navy ships to sail through the Strait of Taiwan as a reminder to Beijing that America is back in the global game of geopolitics. Biden does not want to threaten China; he merely wants to make it clear that Taiwan must remain free of interference and that America intends to strengthen its own semiconductor industry with tax incentives and federal money.

At the same time President Biden is pushing for \$37 billion of aid for the U.S. semiconductor industry. In February he signed an Executive Order that calls for a supply chain review of semiconductors and advanced chip packaging technologies as well as IT technologies.

"I'm directing senior officials in my administration to work with industrial leaders to identify solutions to the semiconductor shortfall," Biden said as he signed the Executive Order. *"Congress has authorized a bill but they need \$37 billion to make sure that we have this capacity. I'll push for that as well. Recently we have seen a shortage of computer chips, semiconductors, which has caused delays of production of automobiles and resulted in reduced hours for American workers... We need to*

make sure these supply chains are secure and reliable," Biden declared.

What About Europe?

So as Washington and Beijing do battle for control of the global semiconductor supply chain, what about Europe?

Europe is caught in the middle of the U.S.-China showdown, and not really a big enough player to matter very much. Europe accounts for around ten percent of the global semiconductor industry, and the European Union's car makers were caught off guard by the shortage just like their competitors in Detroit.

In broader terms there is no doubt that the Biden administration is seeking to unite like-minded democracies with its Asia strategy, especially in standing up to China. Unfortunately for Washington, some of its biggest allies in Europe and Asia have trade and business relations with China that they may consider to be more important.

Meanwhile, there are multiple lessons to be learned from the semiconductor story, and an evolving geopolitical aspect. It is all part of the bigger story of the upcoming battle for global techno-supremacy between the world's two 21st century superpowers, the US and China, one a techno-democracy and the other a techno-autocracy. **E**

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.





Balance and forecasts

The worldwide demand for connectors in 2020 decreased by only 2.2%; the worst performances are those of the **automotive** sector and the **Japanese** market. The signs of the beginning of the year are positive and in 2021 the sector should grow, led by **China**, by at least 7%.

by Ron Bishop

The Covid-19 pandemic became a reality in March of 2020 when the U.S. and many other countries closed for business.

Air travel between countries stopped and everyone was sent home to “stop the spread”.

Historically the worst year in the connector industry was 2009, with sales down -21.8% (housing crisis and financial meltdown). Forecasting the full year 2020, logic would dictate that 2020 would likely result in a new record decline in connector demand. At that point in time, a sales decline of -25%, or more, seemed a reasonable assumption. That did not happen! The first quarter was down -3.1% and the second quarter declined -17.2%. The third quarter saw stabilized demand, up +1.3% and the fourth grew a healthy +10.2%.

Regions and sectors

World connector demand declined a paltry -2.2%. If it wasn't for the turmoil caused by the pandemic, the small decline in demand would be classified as just a normal business cycle adjustment.

The two largest geographic regions, China and the U.S., achieved better results than the rest of the world. China was first in and first out of Covid-19 and achieved connector sales of +3.6%. The U.S. performed reasonably well, declining only -2.8% in connector sales, driven

strongly by a decrease in the automotive and transportation sectors. The world economy in 2020 was devastating to the service industry which fortunately had minimal impact on the electronics industries. This included restaurants, beauty salons, barber shops, bowling alleys, movie theaters, airlines, hotels, vacation rentals, and vacation destinations, which all saw sales plummet.

Conversely businesses tied to electronics, such as computer/computer peripherals and telecom/datacom performed much better as the world's workforce shifted to remote offices.

The automotive industry was down -7.0%, which is the largest downturn in at least a decade for this sector. Transportation was down -3.0% with much of this decline attributed to commercial aviation.

How's business now

Business is good. January 2021 bookings were up a staggering +18.0% over last January. Billings increased +16.2%. Sales have increased in the past five consecutive months. The book-to-bill ratio was 1.11 which signals a strong first quarter for 2021. **TE Connectivity** and **Amphenol** both projected double-digit growth in 1Q21 (TE +10.5% and Amphenol +15.5%). The World Bank forecasts world 2021 GDP growth of 4.0%. The IMF predicts world GDP growth of 5.5%.

QUARTER	2019	2020	2020 vs 2019	2021	2021 vs 2020
1°	15,890	15,397	-3.1%	17,037	+10.7%
2°	16,097	13,333	-17.2%	16,492	+23.7%
3°	16,475	16,689	+1.3%	16,952	+1.6%
4°	15,707	17,308	+10.2%	16,640	-3.9%
TOTAL	64,169	62,726	-2.2%	67,122	+7.0%

Trend and quarterly forecasts of the world connector market

(Million dollars, source Bishop & Associates)

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REGION	2019	2020	2020 vs 2019	2021	2021 vs 2020
North America	13,887	13,491	-2.8%	14,330	+6.2%
Europe	13,544	12,837	-5.2%	13,520	+5.3%
Japan	4,891	4,430	-9.4%	4,654	+5.1%
China	19,477	20,184	+3.6%	22,213	+10.1%
Asia Pacific	9,435	9,045	-4.1%	9,535	+5.4%
Rest of the world	2,933	2,737	-6.7%	2,867	+4.7%
TOTAL	64,169	62,726	-2.2%	67,122	+7.0%

Sales and quarterly forecasts of the world connector market by geographic area

(Million dollars, source Bishop & Associates)

Connector industry forecast

There are positive signs that 2021 will be a growth year for the connector industry.

- Interest rates are low and the Federal Reserve signaled that there will be no rate increase in 2021.
- Inflation is low, but there are signs of increasing material prices.
- January connector sales were up +16.2% coupled with a very high book-to-bill ratio of 1.11.
- The two largest connector companies forecast double-digit sales growth in one Q 21.

- World GDP growth predicted to be in the four to five percent range. Much of this growth will come from a rebound in the now devastated service industry. GDP growth in electronics will be lower.

We believe the first half of 2021 will be very strong, near double digits. This is mainly because of easy comparisons to the first half of 2020, which was greatly impacted by the pandemic. The second half of 2021 may result in small declines in demand. For now we would classify our forecast as conservative and believe there is good potential for growth above +7.0%. **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.





Supply chain is not keeping the pace

The pandemic crisis has highlighted the need to adjust **procurement models** used by car manufacturers, Tier 1 suppliers, semiconductor suppliers and their foundries. Only **supply chain cooperation** can help limit damages.

by Laura Reggiani

The crisis due to semiconductor shortage has affected the automotive industry at a time when the sector was beginning to experience moderate recovery in manufacturing levels after the slowdown caused by the pandemic.

The increase in chip demand from the automotive industry started at a time when the supply chain was already struggling with significant semiconductor demand from the consumer sector, for 5G phones and infrastructures, new gaming platforms and IT equipments. There are no easy solutions; increasing semiconductor capacity takes a long time, but, more importantly, it needs a lot of money which is why leading analysts forecast that such shortage may last until the

third quarter of 2021, when the reallocation of foundry capacity and, perhaps, partial cooling of consumer electronics demand should lead to more certainty throughout the supply chain.

Even though major semiconductor suppliers such as Tsmc and Umc have already announced massive investment plans to increase their manufacturing capacity, such efforts will not bear fruit in the short run and will force automotive OEMs to review their semiconductor procurement strategies. The crisis has indeed shown that the traditional short-term supply cycle implemented by automotive companies may no longer be consistent with production cycles and paces imposed on chipmakers by the consumer market.

IHS Markit, which has analysed chip trends since April 2020, expects the entire supply chain to introduce changes in inventory management to be better prepared in the future: *“The reason for this complex situation stems from increasing OEMs demand and limited semiconductor supply and it will not be solved until both forces are aligned. If the cause were a natural disaster, the supply chain would respond with appropriate recovery plans, but in this case we are talking of balancing supply and demand and delivery times that exceed 26 weeks for microcontrollers. This is why we cannot expect any changes until the second half of the year”*, said **Phil Amsrud**. IHS Markit has also estimated that almost 1 million fewer light vehicles will be manufactured in the first quarter of 2021 due to supply chain disruptions. **Audi**, for example, has recently laid off 10,000 workers and has announced delays on some models; **Volkswagen** has had to cut manufacturing at its Wolfsburg and Emden plants “due to lack of microchips”; **Ford** has suspended manufacturing of Focus for a month; **Honda**, **Renault**, **Toyota** and **Mazda** have also recently made similar announcements.

Reliance upon Tsmc

Most interruptions in vehicle manufacturing are due to MCUs shortage. Today microcontrollers are indeed ubiquitous in vehicles and are required in all electronic control units in cars. They are used in all areas of vehicles, ranging from braking systems to window control; an average vehicle contains over 20 MCUs (a Chevy Equinox has 27 while an Audi Q7 up to 38 of them). Multiple suppliers are used for each MCU which are appointed based on “direct purchasing scheme”, whereby the OEM tells the relevant Tier 1 supplier and also Tier 2 and Tier 3 ones they must use. Each vehicle therefore relies upon multiple MCU suppliers; for instance, 2018 Honda Accord uses up to eight different suppliers. It is also worth noting that microcontrollers, being proprietary architectures, do not easily allow for a “second source” from another supplier. Microcontrollers shortage will therefore significantly affect the work of Tier1s such as **Bosch**, Continental and **Denso**, each of which manufactures at least 30 different ECUs for different automotive needs and which have



Mcu's sourcing for the Audi Q7 reveals a large dependence on various suppliers

(source: IHS Markit)

already confirmed the shortage of such devices. It should also be noted that the seven main suppliers of MCUs account for about 98% of demand and only a few of them, first and foremost **STMicroelectronics**, have a high level of vertical integration; instead, all the others strongly rely on foundries, in particular on the Taiwanese **TSMC**. Such reliance on Tsmc has built up over time, as several chipmakers have implemented a “fab-light” strategy over the years. Tsmc, which currently manufactures around 70% of all chips sold to the automotive sector, announced some capacity constraints in 2020, partly due to the fact that the automotive sector accounts for only 3% of Tsmc total revenue.

All this has seriously impacted on delivery times: for a single MCU that usually takes 12 or at most 16 weeks from manufacturing to delivery, you now have to wait up to 38 weeks. The pandemic has indeed only highlighted the fragility of an ecosystem in which many, many other dynamics are at play. Fortunately, the market is experiencing limited cases of double or triple orders from OEMs, meaning that the supply chain can be relatively confident in demand data. However, this does not change the thorny issue, which is that automotive demand is exceeding MCUs supply.





Italian electronics looks to recovery

The Italian **industry of technology** represented by **Anie** had one of the worst performances of the last twenty years, losing 9,6% in 2020. A similar scenario has been outlined in the **distribution of electronic components** that, according to **Assodel** data, closed with a 10.1% drop. However, the upturn seems to be close.

by Laura Reggiani

The 2020 will be remembered in Italian electronics history as the worst ever. According to data released by Istat (*Italian Institute of Statistics*), the Italian industry of technology represented by Federazione Anie closed 2020 with a 9.6% cumulative decrease in industrial activity.

This is the second worst result in the last twenty years after 2009 plunge. The strong drop has affected both macro areas but was more

pronounced in Electronics (-13.3%) than in Electrotechnics (-8.9%). Gradual recovery that took place in the last quarter of 2020 did not indeed offset losses in industrial activity in the first part of the year.

The 10.9% drop in Q1 of 2020 and the subsequent -26.4% plunge in Q2 are the most evident consequence of spring lockdown, which halted business with the sole exception of essential activities.

Recovery has already started

However, when comparing December 2020 alone with December 2019, one can see a positive trend in industrial manufacturing (+5.3%). Considering the conjuncture, when comparing December 2020 and November 2020, the Electrotechnics and Electronics industries experienced a 0.9% drop in industrial manufacturing.

As far as expectations for the following months are concerned, recovery experienced in December should also be confirmed in January 2021, based on an order portfolio that improved the rate of decline of the previous months in the last quarter of 2020.

However, the dynamics of Anie sectors are still significantly linked to an extremely uncertain economic context that strongly depends on the evolution of the pandemic.

The vantage point of distribution

Assodel data on distribution of electronic components on the Italian market is also aligned. The latest report presented by the association, related to the fourth quarter of the year, shows a turnover of 275 million euros, driving the whole of 2020 towards a consolidated turnover of 1 billion 178 million euros.

This value shows, on a year-on-year basis, a decrease of -10.1% compared to the previous year. The general picture is shown in the table, which summarizes results for the three macro

product families. The overall market decline was adversely affected by semiconductors (-11.4%) and, even more so, by systems (-15%); passive components were less penalized, having a limited drop of -6%.

Promising booking

Deep-diving into the last quarter of the year, at the end of 2020, the ratio of orders to turnover (book-to-bill) was extraordinary: 1.42 on the total, distributed across the three product families.

Such surge in orders is consistent with the above-unity value (1.12) of the previous quarter and shows signs of a turnaround that may lead to a positive 2021.

Market analyst **Livio Azzoni** has commented such values and pointed out that the increasing order intake may partly stem from customer concerns of possible imbalances between demand and future material availability.

In general, some distributors are urging customers to think ahead to 2022.

Already in the last few months, despite challenges, the electronics industry has proven to be one of the few sectors experiencing limited decline compared to the macroeconomic situation and having all assets to be able to emerge more quickly from the crisis.

The figures for the last part of the year confirm that despite all difficulties and critical issues, the electronics distribution sector is achieving 2016 levels and showing a new drive towards potential future growth. 

PRODUCT	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20	Q/Q-1	Q/QY-1	YtD%
Total SC	192.1	185.1	227.6	180.1	159.3	176.8	+11.0	-4.5	-11.4
Total IP&E	82.6	80.5	109.0	83.9	82.9	80.3	-3.2	-0.2	-5.9
Total Systems	22.5	21.4	23.9	19.9	16.8	17.7	+5.1	-17.6	-15.1
TOTALE DISTRIB.	297.2	286.9	360.5	283.8	259.0	274.8	+6.1	-4.2	-10.1
Ytd	1,022.9	1,309.8	360.5	644.3	903.4	1,178.1			
Ytd%	-4.7%	-5.0%	-3.5%	-11.2%	-11.7%	-10.1%			

The quarterly trend of the turnover of distribution in Italy by product type

(Million euro, source Assodel)



A giant that also looks to electronics

Operating on the market for 110 years and always focusing on energy management, **Eaton** talks about its development strategies for the European market looking at the power management business, in a chat with **Marco Rizzo**, European Sales Director.

by Laura Reggiani

In the field of electronic components, Eaton may be known as a brand only to insiders, but in the universe of energy and industry it certainly needs no introduction. A US corporation founded in 1911 in New Jersey and managed since 2016 by Chairman and CEO **Craig Arnold**, the company has a turnover of around \$20 billion, Eaton employs approximately 100,000 people worldwide and supports thousands of global customers through its presence in over 175 countries. Headquartered in Dublin, Ireland, having its Emea headquar-

ters in Morges, Switzerland, it has a strong presence in the European market where it operates 187 sites and employs over 25,000 people over 47 countries.

Eaton deals in the “power management” business, helping customers use energy more efficiently, safely, reliably and sustainably through two divisions: the first is dedicated to the electrical sector which provides products, systems and services related to power management and the second is committed to the industrial sector which includes the applications for aerospace,

hydraulics, automotive and eMobility. All of this generated revenues of \$21.4 billion in 2019 then declined to \$17.9 billion in 2020 but Eaton Group now see a high recovery.

The role of electronics and the European market

A small part of this business also comes from the electronic components division. The recently established electronic components division (created through several acquisitions, including 2012 acquisition of Cooper Bussmann) employs around 3,000 people and manufactures power and signal inductors, fuses, supercapacitors, connectors and terminal blocks in its own plants based in the Far East (China and the Philippines) to be then sold to customers in a wide range of sectors including industrial, consumer, automotive and ICTs.

Leading Eaton's electronics division in Europe is **Marco Rizzo** who, with his over 20 years of experience in distribution at Future Electronics and over 10 years in sales at ITT and Philips, has been in charge since 2017 as European Sales Director to manage and coordinate sales in Europe: *"I am responsible for leading and implementing the regional sales plan, managing the local sales team and liaising with the division's distribution partners. I set targets for our electronics business in the EMEA region with a view to increasing sales and our market share"*.

Assisted for a few months by **Simona Vigetti** as Regional Sales Manager for Southern Europe, Marco Rizzo coordinates a network of fifteen people including salespeople and Field Application Engineers and is now working on business development in Europe.

The parent company is indeed pushing for further development of the electronics division in the European market. *"We aim at repositioning, pushing and making the brand better known in the electronics world as well, implementing a strategy that will be based on new marketing and communication activities. Our goal in Europe is to double turnover in the next 5 years. We aim at achieving organic growth including through greater penetration of the German market where we are weaker, which is strange, and through the introduction of new*

extremely innovative products related to Power Management. However, there may also be possible acquisitions on the horizon, through which we will further expand our market presence". Eaton's electronics division offers a wide range of electronic components including electronic circuit protection devices such as TVS diodes, fuses and ESDs, inductors and supercapacitors. In the area of circuit protection, the Bussmann range includes fuses, accessories, ESD surge suppressors and PTC resettable devices. The range of magnetic power components, on the other hand, includes inductors and transformers offered in a wide variety of sizes with high current capacity and power density even for applications in critical environments and the offering also includes terminal blocks and connectors on board. Supercapacitors are particularly noteworthy, as they are unique devices with very high capacitance, manufactured using cutting-edge technologies and tailored to specific applications.

"One of Eaton's strengths is undoubtedly its ability to innovate and bring new products to the market. Our product range is very competitive and, if you exclude fuses, we are able to



Marco Rizzo, European Sales Director at Eaton

“IL MIGLIOR RICONOSCIMENTO PER LA FATICA FATTA
NON È CIÒ CHE SI RICAVA, MA CIÒ CHE
SI DIVENTA GRAZIE AD ESSA”



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offer very special design products. I am thinking, for example, of supercaps, which require not only fulfilment but also actual technical advice”, explains Marco Rizzo. “We are also penetrating the world of power electronics through the introduction of new components that were not typically part of our portfolio, including TVS and DC/DC converters”. As far as application sectors are concerned, at European level Eaton’s electronic components are widely present in the automotive, industrial and energy sectors as a whole.

“Automotive and transportation are our target sectors. The market recognises us as a leader in applications such as LED lighting, but also in powertrain, infotainment and Adas. We are also very active in the industrial market, in applications ranging from automation to metering and in energy management”.

Sales and distribution

The sales organization for the European market is very lean and even though the company has decided to hire staff in order to support future developments, distribution is playing a crucial role. *“In Europe we work with less than a dozen direct customers, the reason why distribution is pivotal to Eaton. Distribution accounts for more than 85% of our European turnover and 100% of our Italian turnover”. The company operates through all the main broadline distributors such as Arrow, Avnet, Future and TTI and through all catalogue distributors such as Mouser, Digi-Key, Farnell and RS Components and also through some more “regional and local” partners such as Omega Fusibili, Rutronik and Melchioni.*

“Such a well-structured distribution network is essential to support our business model and also it plays the important role of being a generator-collector of opportunities”, explains Simona Vigetti. ‘Value Service’ distribution plays an important role in the ‘seeding’ stage to introduce our products to different customer groups, including students, small workshops, hobbyists or start-ups. Broadline distribution helps us with fulfilment specifically for large international customers who operate globally. Local distributors, on the other hand, are certainly more attentive to demand creation, they

are more present throughout the territory and are closer to the needs of small and medium-sized customers that are typical of the Italian market. As Rizzo explains: “Distribution is very important to us but I also believe that we can be an interesting partner for distribution as a result. In the area of passive components there are still good opportunities for margins and with us distributors can be confident of achieving constant growth in the market while being fully confident of the business it generates”.

Concerning the future, the outlook of Eaton’s electronic business is more than positive: “In the first few months of the year we have experienced good results in bookings, mainly due to design-in activities from distribution. Constant introduction of new products focused on power management, a sector that is expected to grow steadily, it can only help us achieve our set goals”, concludes Rizzo



Simona Vigetti, Regional Sales Manager South Europe at Eaton



The actual link between manufacturer and customer

Supplier of choice for **connection, electromechanical and passive devices**, **Darton** competes on the Italian market with national presence, a staff of over 30 people and a range of solutions offered by leading manufacturers.

by Laura Reggiani

A turnover of 20 million Euros, 32 people working to support over 1,500 customers, a specialised product range with 15 top-level suppliers, two offices in the country, a warehouse available to customers, a website structured for e-commerce, the recent entry into the universe of social media: here are some of the insights to understand Darton's market positioning. Founded in 1982 by **Gaetano Bruschi**, the company was acquired in 2006 by **Francesco Mongiardo, Riccardo Balconi** and **Mauro Crespi** who are still at the helm of it. They embody a history of sweat and success, the result of work and passion, of the desire to overcome their own limits aimed at paying the utmost attention and consideration to their collaborators, customers and suppliers: *"We are convinced that fairness and transparency, combined with expertise and specialisation, are the best way to build and maintain a profitable, long-term relationship with all partners, whether they are collaborators, customers or suppliers"*, explains Mongiardo, whom we asked to explain the reasons for Darton's success and future goals.

Darton is approaching its first forty years in business. How has the company changed under your leadership in the last few years?

Darton was founded in 1982 as a distributor of connectors and mechanics for the Lombardy region, and since then the company has come a long way. In 2006 we acquired the company and turned it into a structured and consolidated organization, a supplier of choice throughout Italy not only for connectors but also for electromechanical and passive components. An important milestone dating back to 2008 is the acquisition of the company **Raimondi**, historic distributor of Murata, later integrated into Darton in 2018, leading to a single national distribution organization. In the last 15 years, Darton has changed a lot, as shown by its turnover, which has increased from 3 to 20 million Euros, as well as by its team, which has grown from 6 to 32 people, and by its line card, which now includes 15 suppliers compared to its initial 6. Therefore the size of the company has changed, as a logical consequence of its different vision and long-term goals.

What are the advantages of being a national and specialised distributor? How can you stand out?

Our vision is that, today and in the future more than ever, a distributor must increasingly specialise. The secret of Darton's success lies not only in being a local distributor, operating throughout the country, but above all in its ability to offer added value to both customers and suppliers. We indeed work side by side with our customers in the development of their projects, we can offer them complete solutions, we can support them in their search for the right product and in the management of their logistics. Therefore, ours is not simple product offering but rather actual consultancy, as comprehensive help provided by specialists in project development through a co-engineering approach. On the other hand, we ensure suppliers total focus on their lines and products, the professionalism and expertise of our team, security design development and demand-creation. All these are activities that broadlines are no longer able to perform. We stand out for our specialisation, meaning that we work on the product and not just on its part number. We can do this by fostering the expertise of our sales staff and their technical training on the product. We stand out for our presence in the country, our knowledge of the market and our customers, our ability to network with our customers with whom we share the same culture and mindset and whose problems and needs we understand, as we are both national organizations. We are prominent in our flexibility and in our speed of reaction, ensured by a short decision-making chain, and for our ability and willingness to tackle issues together with customers.

Molex and Murata are the flagships of your offering. How important is the partnership with historic suppliers?

Facilitating teamwork is key, skills integral to collaboration between of our team and our suppliers with whom we have been having stable, mutually trusting partnerships for around 40 years. Maintaining relationships with suppliers has proven to be a winning strategy to overcome challenges of recent times and to increase our visibility and recognition on the market. We have been increasing our shares for the last few years thanks to the support given to us by historic suppliers such as Molex and Murata which account for around 60% of our business, just as Darton is constantly at the top of the podium of their distributors in Italy. We believe that the contri-

bution of all our partners, who have always relied on us to increase their presence in the Italian market, is equally important. However, we are always looking for new opportunities that can open up possibilities to expand the value we are delivering our customers.

The universe of semiconductors is experiencing shortage. Is the same occurring in IP&E products?

Undoubtedly, the IP&E frames are also experiencing the same issues as semiconductors are; we have moved from a year with full warehouses to a year in which we are all looking for raw material. There is shortage and this has gone on for several months in the passive components industry and for some time now also in the connection sector. Recovery of the Chinese and US markets has indeed led to what will be the real "leitmotif" of 2021: the rise in the cost of raw materials which, combined with soaring transport and freight costs, is leading to significant rise in component prices.

What are your development plans for the next three years? What tools and strategies will you put in place to achieve your goals?

Over the last few years, namely in the last three years, we have consolidated achieving a notable growth, sometimes over 20%, until we reached our ambitious target of €20 million in 2019. Our turnover development has meant for us a workforce growing; indeed, we have been steadily adding people to our team, three of them also in 2020 and four more in 2021. Today we can confidently and consciously present ourselves on the market with a solid and adequate organization to get to our end goal in three years' time : a 25 million euros turnover by 2023. This result will be carried out organically, through the work of our people on proposals made by our suppliers and the needs of our customers. The strategy, on which we are already working on, envisages upward dimensional growth with our current brands through the strengthening of our sales network also supported by digital and social channels. The change will be driven, as I said, by expansion of our organization, so that all our lines can grow steadily and effectively. A paradigm shift through which we will make better use of the potential of our suppliers and their technological know-how with the ultimate aim of meeting the needs and requirements of our customers in an excellent way, a crucial asset and a fundamental value for a distributor like Darton. E



IoT has never been easier

The new **Connected-Edge Platform by NXP Semiconductors** is making it easier and faster to deliver IoT connectivity.

by Ron Martino*

Like every semiconductor company, we spend a lot of time talking to design engineers about what they're working on and the features they're adding to their systems.

These days, we're hearing a lot about wireless connectivity and with it, some of the challenges that come with developing these types of advanced solutions.

It doesn't seem to matter what industry they're designing for – industrial, automotive, healthcare, energy, infrastructure – our customers asking for flexible and scalable tools and solutions to develop the next generation of IoT devices.

Of the various WLAN and WPAN options out there, Wi-Fi and Bluetooth are in particularly high

demand. Designers typically use a dedicated Wi-Fi/Bluetooth module to add connectivity to their systems, but off-the-shelf modules aren't always as easy to work with as one might hope. Integration with the system's microprocessor or microcontroller can be tricky, even for experienced designers and programmers, which means design teams can find themselves struggling with extra iterations of debug to make the system behave the way they want it to.

What's more, wireless systems need to meet regional regulatory requirements, and typically need to be certified as ready for use before they ship.

Getting the right certifications for each region can add extra steps to the development cycle,

and can add to the pressure of having to meet tight time-to-market deadlines.

We decided it was time for a change. For too long now, the need to integrate Wi-Fi and Bluetooth has added stress to the development cycle. Using separate modules for wireless connectivity has forced designers to work with multiple components from different suppliers, and has added extra time and effort to what are already demanding timelines for delivery.

The quick, easy way to deliver wireless at scale

In our recent announcement, we unveiled a new platform that is making it easier than ever to deliver wireless functionality. Our Wi-Fi/Bluetooth combo and i.MX RT MCU crossover processors are now fully supported within **MCUXpresso**, which dramatically simplifies product development. With this new level of integration, we've expanded the connectivity capabilities of our EdgeVerse™ edge computing and security platform. The result is new and secure, fully scalable edge-connected platforms that combine our Wi-Fi/Bluetooth combo and i.MX RT MCU crossover processors.

Modules made to order

It begins with hardware. We've partnered with leading module providers to create solutions that accelerate development, decrease time-to-market, and create processor choices.

It's all about flexibility – you choose the best combination of processor, wireless device, and module for your design, so you start with a tailored solution that saves time and effort. Working with our module partners, we deliver a fully certified, platform-integrated solution ready to go. We even offer software examples that have been tested for use with our i.MX RT development boards, for added time-savings.

Comprehensive enablement tools

The benefits continue when it comes time to finalize your application. We've brought together all the software elements you need into our popular, easy-to-use MCUXpresso operating en-

vironment. You can mix and match elements for edge-connected solutions, optimizing every aspect of your design using just one familiar Software Development Kit (SDK). For example, the upper layers of the stack, including TCP/IP stack and application layers, will run on an i.MX RT device. The upper layers are integrated into the host operating system, for an added level of flexibility in how to use resources and control the combined applications. The final application can share CPU cycles with the Wi-Fi stack, while leveraging extensive memory resources to ensure the right levels of performance.

The MCUXpresso's integrated driver support simplifies the design and accelerates application development. You can use display controllers and graphics accelerators integrated into the i.MX RT crossover processor, or advanced features in the i.MX 8 series, along with pre-integrated drivers for Wi-Fi and Bluetooth that have been verified and tested to deliver the capabilities your design is likely to need.

For Wi-Fi, we've ported popular LWIP stack, an open-source solution in widespread use, to FreeRTOS. We add to that a number of fully verified and tested capabilities.

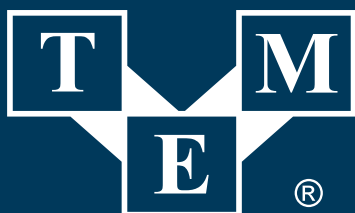
We make sure It works

We've invested our time and effort in this platform, so you don't have to. Our dedicated design teams have brought expertise from various disciplines to optimize our solutions and anticipate what customers will need, regardless of the design team's experience working with wireless. Our in-house experts and trusted ecosystem partners have paid attention to all the details, so you can focus on delivery.

We've looked at every aspect of design, from the initial selection of features to final delivery of certified products, and we've anticipated future needs for wireless applications. We've optimized the hardware, updated the integrated software, and written the test modules for final compliance testing.

The result is a standardized approach that makes it easier than ever to deliver the wireless features that everyone wants. 

* **Ron Martino** is Vice President Edge Processing at NXP Semiconductors.



Electronic Components

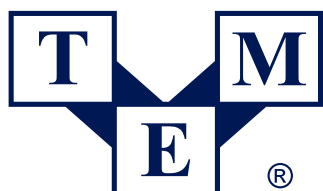
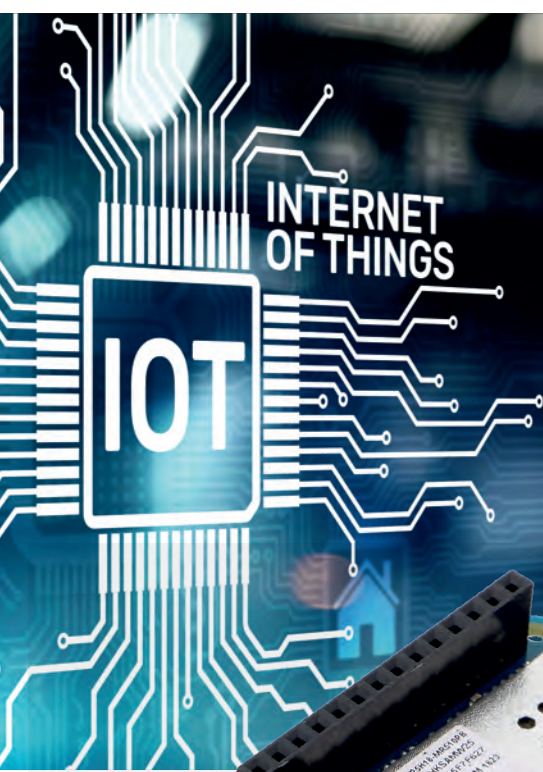
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The car seat that saves lives with Bluetooth

Silicon Labs Bluetooth modules are used in the life-saving alarm of the car seat made by **Filo**. They ensure **secure wireless communication** to alert the parent when the child is left in the car.

by Greta Gironi

In 2019, Italy became the first country in the European Union to make it mandatory for parents to utilize technology to prevent children from being left behind in the backseat of a car.

Filo, an IoT start-up in Rome, Italy, had been helping users keep tabs on their belongings since launching its original product, the **Filo Tag**, in 2014. With the passage of the anti-abandonment law, the company saw an opportunity to bring its Bluetooth tracking solution to bear on this very serious challenge. On the strength of the Tag's success, the company set out on development of the **Tata Pad**. It uses a capacitive sensor embedded into a cushioned pad that fits any car seat. When a child sits down, the Tata Pad is activated. The sensor detects their presence and sends that information to the parents' phone via an iOS or Android app. When (if) the parent is away from the car for more than three minutes, the first of three alarms are triggered. This tiered system that uses both text messages and calls is one of the primary advantages **Filo's** solution has over its competitors. This first alarm sends a notification to the phone, which lasts for 30 seconds. This alarm works even if the phone is on silent. If it isn't deactivated by the user, the second alarm is triggered – an actual phone call is placed to the phone from the Tata cloud service and includes voice instructions on how to deactivate it. Finally, if these two alerts are not enough, text messages and calls are placed to your pre-selected emergency contacts, who can then request a text message with your last known location. These emergency calls are made independently of the parent's phone si-

gnal, which means all three levels of alerts work even if the parent's phone is out of battery or not receiving a signal.

Bluetooth Low Energy Modules

When it came to choosing a technology, **Filo** had some key requirements in mind. For the networking protocol, Bluetooth was selected because of its cost-efficiency compared to other networking technologies and its wide adoption in consumer applications. When selecting wireless technology, **Silicon Labs'** Bluetooth solution emerged as the favorite due to its competitive price and sophisticated security features.

The result of this effort is the only baby car seat alarm with three levels of alerts, making it extremely popular with consumers and guiding **Tata's** way to further innovations including another alert device, the **Tata Band**, which can be used with any seatbelt in the world and attaches to the car seat's shoulder strap. The **Tata Band** also leverages **Silicon Labs** Bluetooth modules and extends **Filo's** impact beyond car seats, which have different standards depending on the country, to safety belts that are more universal. 





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- Small-footprint packages for sensor interface applications
- Faster time to market with MPLAB® Code Configurator and MPLAB Mindi™ Analog Simulator
- Easy-to-use development tools to get your design to market faster



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Acquire well to better analyze

New entry in **Yokogawa's ScopeCorder** family: the new portable multichannel data acquisition recorder it's called **DL950**, it's faster and offers an improved ability of vision and analysis.

by Giorgia Andrei

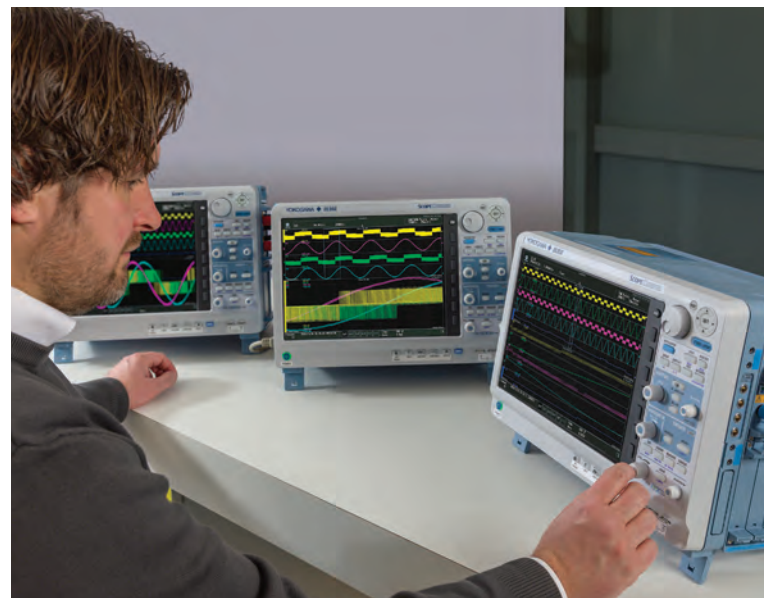
The DL950 is the successor to the DL850 and DL850V ScopeCorder series that were released in 2010, and features a number of enhancements that improve both functionality and operability. In addition, two new input modules are being released for the DL950; these are the 720212, which is capable of reading data at 200 mega-samples per second (MS/s), and the 720256, which can read data from four input channels at 10 MS/s. By the fall of this year, **Yokogawa** will also release an optional flash acquisition function for the storage of high-sampling-rate data in embedded non-volatile memory.

DL950 Features

As the high-end model in the ScopeCorder series, which includes the DL350 portable model and the system-specialized SL1000, the DL950 will help to improve the efficiency of new product development in the automobile, mechatronics, and electronics industries. Yokogawa will offer the DL950 together with other products such as oscilloscopes and power analyzers to provide total solutions that help reduce power consumption and improve power conversion efficiency in customer's products. ScopeCorder series data acquisition systems combine the functions of oscilloscopes and data recorders, and have been widely used since the early 2000s for the development and maintenance of mechatronic equipment. Recently, there has been a growing demand in the electric vehicle and renewable energy markets for motors, inverters, and photovoltaic units that reduce power consumption and enable highly efficient power conversion. For the development of electric vehicles, for example, it is necessary to

simultaneously acquire control signals, communication data, and NVH*1 signals at multiple points over long timeframes. Up to five DL950 units can be connected for synchronized measurement, making it possible to simultaneously measure and display weight, pressure, displacement, vibration, torque, and other parameters for the analysis of correlations among data. The addition of the two new input modules also allow the DL950 to meet high-speed multi-input measurement demands.

The DL950 is equipped with a large touch panel display for the easy and intuitive viewing of detailed waveform images. The DL950 also retains the same mechanical buttons, knobs, and other control panel features used in previous models, giving users a wider range of choices in how to operate the display. Also provided is an application menu with a configuration wizard that enables the easy configuration of often-used applications such as power analysis and strain measurement. In response to customer demands, Yokogawa plans in the future to increase the number of wizard-format settings menus. **E**





Farnell enhances eCommerce website to support growth of online business

New enhancements to Farnell's website enhance the **customer experience**, making it easier than ever for **engineers** and **designers** to find and order the right products for their projects.

FARNELL HAS ROLLED OUT NEW WEBSITE FUNCTIONALITY TO ENHANCE USER EXPERIENCE AS MORE CUSTOMERS MAKE USE OF ONLINE CHANNELS AND SERVICES.

The enhancements provide **Farnell** customers with increased flexibility and ease of use when identifying and buying components for new product design, production and testing. Farnell has a strong online presence in Europe and has seen the proportion of business conducted online grow further since the start of the global Covid-19 pandemic, reflecting the changing needs of engineers and designers working and ordering products from home. The proportion of online orders in some European markets has increased to more than 90 per cent within the last 12 months. Farnell's latest website enhancements enable customers to speed up project design and the product procurement process. The new enhancements to Farnell's website include:

- Free Traceparts 3D Cad Models and 2D Cad Drawings are now available in response to customer requests.
- Access up to 5 years of Order History means that customers can quickly access their order history, making it easier for them to reorder previously used parts from past projects.
- Enhanced Technical Documents provide vital product data and technical information to help customers research and purchase products online.
- Highlighting popular products provide professionals working from home with increased confidence when choosing components and products.
- Product Page Attribute selector makes it simpler to navigate across products within a range.
- Faster Website has been a key focus for Farnell with the aim of making it one of the fastest in the industry.

Power and reliability for complex applications

ON Semiconductor announce new 650V **Silicon Carbide MOSFETs**: superior switching and improved reliability deliver power density improvements in a variety of challenging applications.

ON SEMICONDUCTOR HAS ANNOUNCED A NEW RANGE OF SILICON CARBIDE MOSFET DEVICES FOR DEMANDING APPLICATIONS WHERE POWER DENSITY, EFFICIENCY AND RELIABILITY ARE KEY CONSIDERATIONS. By replacing existing silicon switching technologies with the new SiC devices, designers will achieve significantly better performance in applications such as electric vehicles (EV) on-board chargers, solar inverters, server power supply units, telecoms and uninterruptible power supplies.

ON Semiconductor's new automotive AECQ101 and industrial grade qualified 650 volt SiC MOSFETs are based upon a new wide bandgap material that provides superior switching performance and improved thermals when compared to silicon. This results in improved efficiency at the system level, enhanced power density, reduced electromagnetic interference and reduced system size and weight.

The new generation of SiC MOSFETs employ a novel active cell design combined with advanced thin wafer technology enabling best in class figure of merit R_{sp} ($R_{ds(on)} \times \text{area}$) for 650 V breakdown voltage. The NVBG015N065SC1, NTB015N065SC1, NVH4L015N065SC1 and NTH4L015N065SC1 have the lowest $R_{ds(on)}$ (12 mOhm) in the market in D2PAK7L and To247 packages.

This technology is also optimized around energy loss figure of merits, optimizing performance in automotive and industrial applications. An internal gate resistor (R_g) allows more flexibility to designers eliminating the need to slow down devices artificially with external gate resistors. Higher surge, avalanche capability and short circuit robustness all contribute to enhanced ruggedness that delivers higher reliability and longer device lifetimes.

They say:

"In modern power applications such as on-board chargers for EV and other applications including renewable energy, enterprise computing and telecom, efficiency, reliability and power density are constant challenges for designers. These new SiC MOSFETs significantly improve performance over the equivalent silicon switching technologies, allowing engineers to meet these challenging design goals. The enhanced performance delivers lower losses that enhance efficiency and reduce thermal management needs as well as reducing EMI. The end result of using these new SiC MOSFETs is a smaller, lighter, more efficient and more reliable power solution".

Asif Jakwani, senior vice president of the Advanced Power Division at **ON Semiconductor**.



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