

IN THE GRIP OF THE PANDEMIC

The coronavirus pandemic has hit the automotive industry hard, leading to a substantial decline in global vehicle production. This left wire manufacturers facing surplus capacity and significantly reduced their need for automation solutions. Solutions for new technologies in connection with trends such as autonomous driving and e-mobility nonetheless remained in demand.

According to IHS Markit analyses, some 74 million cars and light commercial vehicles were manufactured worldwide in 2020. Representing a decrease of 16.7% or 14.9 million vehicles, this is considerably less than in 2019. Compared with 2017, the year with the highest production volume to date, around 22% or 21 million fewer vehicles were manufactured in 2020. The reason for this sharp decline was the coronavirus pandemic, which forced many automotive plants around the world to shut down for weeks in the first half of 2020. As a consequence, only around 30 million vehicles were manufactured in the first six months of the year. In the second half, the production volume increased to approximately 44 million vehicles, reaching the level recorded in 2019, a year in which a total of some 89 million vehicles were manufactured.

All regions witnessed a year-on-year reduction in vehicle production in 2020. The smallest decline was recorded in China. Following a strong slowdown in production in the first few months of the year, China's automotive market recovered faster from the pandemic than was the case in other regions of the world. As a result, despite everything, 23.4 million vehicles were manufactured by the end of the year, representing a decrease of only 1.2 million or 5% against 2019. China thus remains by far the world's biggest automotive producer. In the year under review, over 30% of all cars and light commercial vehicles were manufactured in China. In other regions of Asia as well as in North America (-20%), Europe (-22%), and South America (-31%), production volumes decreased much more substantially than in China. In total, around 55% of all vehicles were produced in Asia, i.e. 3 percentage points more than in 2019.

Substantially higher production volume in 2021

The coronavirus pandemic is not yet over, but IHS Markit is expecting the automotive industry's recovery to continue and global production volumes to grow in 2021. IHS Markit forecasts that around 84 million vehicles will be produced, exceeding the 2020 figure by some 10 million, or almost 14%. For 2022, IHS Markit is projecting an increase to a good 88 million vehicles, which would correspond to the pre-pandemic level of 2019.

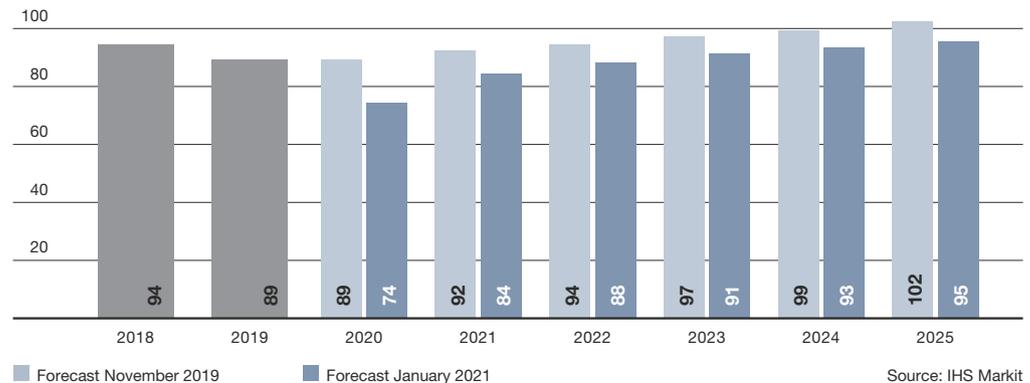
IHS Markit is predicting very strong growth of 24.6%, or 3.2 million vehicles, in North America in 2021. An increase of this magnitude would lift North America’s production level back to its 2019 figure of a good 16 million vehicles. The expected 5.6% rise, i.e. 1.3 million vehicles, should also return China to its 2019 production level in 2021. Growth projections in South America are likewise promising: up 35.1%, or 0.8 million vehicles. Europe’s recovery is progressing at a slower pace. Although Europe, too, is set to see a sizeable increase in production volumes in 2021 – up 15.1%, or 2.5 million vehicles – the European automotive industry will still fall short of the 2019 level by over 2 million vehicles.

Gradual recovery after coronavirus pandemic

The following chart clearly illustrates the effects of the coronavirus pandemic on the expected development of production volumes in the automotive industry. While the pre-crisis level will probably be reached again in various regions as early as 2021, in November 2019 IHS Markit was forecasting even higher production volumes for the coming years. For instance, 92 million vehicles were projected for 2021; now only 84 million are expected. Given that it is difficult to predict how fast the recovery will be following the outlier year 2020, the figures below must be regarded as just a snapshot in time. Forecasts were revised monthly in the course of 2020, with the low point reached in July, when IHS Markit was predicting a production volume of only 78.6 million vehicles in 2021.

Number of passenger cars and light commercial vehicles produced

in million



Automotive industry in a state of flux

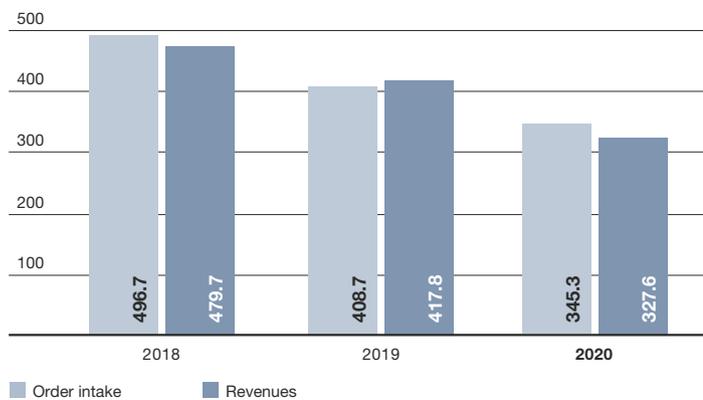
Independently of the coronavirus pandemic, the automotive industry is in a state of flux. Issues such as e-mobility, digitalization, and autonomous driving play a key role, necessitating very sizeable investments from automotive manufacturers. While it is exciting for motorists to follow this trend, many are left unsure as to the consequences. A great many consumers are presently uncertain about which drive technology to opt for when buying a new vehicle and whether the time is ripe to switch to a newer technology. The selection is large, and automotive groups have announced a lot of new models for the years ahead. In addition to fuel- and diesel-powered vehicles, there are alternatives such as electric, hybrid, plug-in hybrid, natural gas, and fuel cell vehicles. In addition to this uncertainty, the coronavirus pandemic left consumers very reluctant to invest, prompting them to delay or put off purchase decisions.

Slump in volume-based business

Markedly lower production volumes in the automotive industry translated into a sizeable decrease in order intake and revenues at Komax in 2020. Approximately one third of Komax's revenues hinge on the number of vehicles produced. In 2020, this figure plunged drastically, after having already decreased significantly in 2019 owing to a sluggish automotive industry. If production volumes drop as sharply as in 2020, the majority of wire manufacturers have sufficient capacity to handle their orders or even have excess capacity. In such a situation, demand for wire processing machines for volume-based business is minimal. This is also due in no small part to individual customers moving machines between plants to manage capacity. The outcome for Komax was a 15.5% reduction in order intake to CHF 345.3 million and a 21.6% slide in revenues to CHF 327.6 million.

Order intake and revenues

in CHF million



If Komax were dependent entirely on the number of vehicles produced per year, the decrease in revenues in 2020 would have been much more severe. Excess capacity does not cause customers to invest less in machines for volume-based business; it causes them not to invest in these machines at all. Thanks to its broad product portfolio and customer proximity, Komax has been able to limit the collapse in revenues. Demand remained solid above all for solutions that are linked to new technologies, such as autonomous driving and e-mobility, and/or which play a role in further increasing the level of automation in wire processing, and it was quick to return when automotive plants reopened and started producing again. Bearing in mind that rising wage costs, a lack of staff availability, the trend towards wire miniaturization, and the need for traceability in the individual process steps for quality assurance purposes are decisive factors, customers will continue to come under pressure to further increase the degree of automation at their plants (see also “Global megatrends” beginning on page 30).

Robust industrial market segment

In 2020, the coronavirus pandemic reduced demand for automation solutions not only in the automotive industry, but also in the other market segments in which Komax operates. The decline witnessed in the industrial market segment was much less pronounced than in the automotive industry. Industrial customers such as control cabinet manufacturers, for instance, remained focused on increasing the level of automation in wire processing in order to raise productivity. While the decline in revenues in the data/telecom market segment was also moderate, the aerospace segment witnessed a massive slump. The coronavirus pandemic dealt the aviation industry a harsh blow, leaving numerous airline companies fighting for survival and wiping out demand for new aircraft. Suppliers such as Komax were hit hard not only by the slump in the automotive industry, but also by the drop in aircraft production.

Decline in revenues in all regions

As a consequence of the coronavirus pandemic, all regions reported a decrease in revenues in 2020. At -32.8%, the decline was most substantial in North/South America. Komax registered its lowest drops in sales in Asia (-9.5%) and Africa (-12.2%). Since both regions witnessed a continual improvement in the market situation in the second half of the year, the year-on-year decline was less substantial at the end of 2020 than at mid-year. In the first half of 2020, Africa recorded a 28.3% decline in sales and Asia a decline of 19.0%. Europe too began to stage a recovery from mid-year on, albeit at a slower pace than the two aforementioned regions. Heavily hit by the coronavirus pandemic, Europe suffered the largest drop in revenue (-32.4%) in the first half of the year. 2020 saw a continuation of the trend in evidence for several years already among wire manufacturers towards relocating part of their production to North Africa to offset a growing shortage of personnel in Eastern Europe. The impact of the coronavirus pandemic was felt last of all in North/South America. Accordingly, the recovery set in later than in the other regions and had, in fact, not yet begun in South America.

This regional difference in revenue trends also led to a change in the breakdown of revenues by individual currency from 2019 to 2020. While, for instance, the share in revenue in EUR grew from 45.6% to 50.3% and in CNY from 10.3% to 13.1%, the USD figure slipped from 21.4% to 18.9%. The changes in the key currencies and their respective sensitivities are set out on page 112.

Revenues by region	2020	2019	+/- in %
in TCHF			
Switzerland	4 864	8 479	-42.6
Europe	131 894	169 991	-22.4
Asia/Pacific	72 156	79 767	-9.5
North/South America	69 862	103 907	-32.8
Africa	48 847	55 627	-12.2
Total	327 623	417 771	-21.6

A percentage breakdown of revenues by region can be found on page 95.

Market segments

Komax focuses on four market segments. The core business is the automotive market segment, which accounts for around 80% of revenues. Komax is continuously strengthening its presence in the other three segments – aerospace, data/telecom, and industrial – and exploiting the synergy potential with the core business. All segments benefit from the global service network of the Komax Group and from service offerings such as the Komax Academy (see pages 6 and 7).

Automotive

The automotive segment is by far the most important market segment for Komax. There are a number of reasons for this. In no other industry is the volume of wires to be processed so large. With a current annual production output of 70 to 90 million vehicles, each containing on average some 1 500 wires with 2 500 crimp contacts (see page 33), the demand for automation solutions is enormous. This is because the number of wires per vehicle is continually rising owing to an increase in electrical functions. Although the automotive industry has no peer when it comes to the degree of standardization and automation in the production process, there is still plenty of potential for additional automation steps, as wire harnesses are still manufactured by hand to a large extent.



Data/telecom

The transfer of large volumes of data and the permanent networking of people have become standard practice in the data/telecom market segment. The wiring used for these applications is being increasingly used in vehicles too, as cars become ever more interconnected, with comprehensive information systems that will facilitate autonomous driving in the future. Komax can therefore also use the experience gained from the data/telecom market segment in the automotive segment.



Aerospace

Issues such as safety, lightweight construction, and lower emissions have been at the forefront of developments in aerospace for many years. Komax can draw on the experience gained in these areas when it comes to its core business too, as these themes continue to gain in importance in the automotive industry. Thanks to Toulouse-based Laselec (see page 38), the Komax Group boasts a great deal of aerospace know-how. There is very little automation of wire processing in the aerospace industry. However, as the barriers to entry in this market are very high for suppliers, it has taken several years for Komax to record its first major success. The breakthrough was made in late 2017. Following years of negotiations, towards the end of 2017 Komax succeeded in winning new orders from two leading aerospace companies for several large-scale systems, which since 2019 are being delivered in phases. These systems have taken the automation of wire processing to a level previously unreachable in the aerospace industry.

Industrial

The processing of wires for industrial applications such as control cabinets often involves working with very small batches. To ensure that automation is nevertheless a cost-efficient option for control cabinet manufacturers, Komax has developed specific machines of the Zeta type. These machines manufacture all the various wires that are needed automatically, ensuring that they are in the right sequence and of the right length. This has the effect of reducing manual labor to a minimum. Manual processes such as cutting, stripping, marking, and sleeve insertion are rendered obsolete. Automation of this kind has proven its worth in the area of wire processing in the automotive industry for many years, and is now increasingly finding its way into industrial applications. For the purpose of optimizing the available potential for automating control cabinet construction even more, Komax founded the Smart Cabinet Building Initiative together with technology leaders Weidmüller, Zuken, and Armbruster Engineering in 2020 (see page 21).



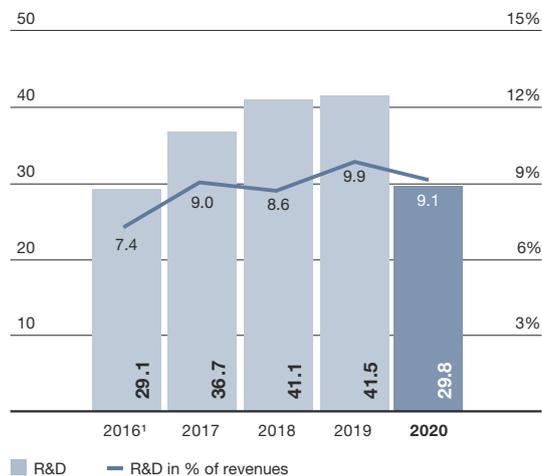
OUTSTANDING INNOVATIVE STRENGTH

Innovation is crucial to long-term success. This is why Komax also invests heavily in research and development when times are challenging. Global trends such as e-mobility, autonomous driving, and digitalization allow Komax to develop additional unique selling propositions and consolidate its technology leadership.

Innovation is a key driver of success for Komax. In order to retain market and technology leadership over the long term and stand out with innovative solutions, since 2017 Komax has set itself the goal of spending 8%–9% of Group revenues on research and development (R&D) annually. Prior to that, the target was 7%–8%. The coronavirus pandemic meant that Komax employees in Switzerland, where the company's innovation center is located, were placed on short-time working as of March 2020. As a consequence, R&D expenditure, which largely consists of personnel costs, dropped to CHF 29.8 million (2019: CHF 41.5 million). This amount comprises expenditure on internal development services (CHF 25.1 million) and the development services of third parties (CHF 4.7 million).

R&D expenditure

in CHF million



¹ Since the start of 2017, the consolidated financial statements have been drawn up in accordance with Swiss GAAP FER. The 2016 figures have been revised accordingly.

One of the numerous cost-saving measures implemented by Komax was to reduce the external development spend year-on-year by CHF 2.8 million, or over 35%. As revenues decreased less substantially than investments in research and development, the R&D ratio fell from 9.9% to 9.1%.

Since 2016, Komax has spent CHF 178.2 million on R&D, securing a leading position from which to further drive forward the automation of wire processing and actively shape the transition underway in the automotive industry. For Komax this represents a form of decisive investment in an opportunity to leverage additional unique selling propositions and to secure the company's future. Although Komax had to scale down its innovative efforts in 2020 and delay development projects, various innovations could still be driven forward. Over the next few years as well, Komax will thus be presenting its customers with new solutions designed to give them additional competitive advantages.

More than 440 staff employed in R&D and engineering

As at 31 December 2020, the Komax Group employed a total of 264 staff (2019: 241 employees) in the research and development area. The majority of these staff (166 employees) work in Switzerland, which is why the lion's share of R&D expenditure is incurred there. In addition, Komax has development units in Belgium, China, Germany, France, Japan, Singapore, Hungary, and the US. The Group's innovative strength is further bolstered by 178 engineers (2019: 203 engineers), who make an important contribution through the development of customer-specific applications. The personnel costs of these engineering employees are not contained in research and development expenditure if the staff in question have worked directly on customer projects.

Wire harness production of the future

The technological transformation of the automotive industry not only means substantial investments for automotive companies, it also poses a challenge for suppliers, since they need to develop solutions to meet new customer requirements. Issues such as e-mobility, autonomous driving, and digitalization will shape the automotive industry for years to come. Wheels are already being set in motion that will have long-term technological implications. This is why Komax is striving to play an active part in shaping this development. The acquisition of the company Exmore in 2019 strengthened Komax's position in the autonomous driving sector. Exmore focuses on the development of applications relating to the processing of sensor cables. Sensors are essential for making vehicles smarter. When it comes to current trends, Komax also works together with leading companies in the automotive industry.

One such joint project on which Komax is actively helping shape technological change is underway at the University of Stuttgart's ARENA2036 research campus. ARENA stands for Active Research Environment for the Next Generation of Automobiles, and the year 2036 marks the 150th anniversary of the motor car. ARENA2036 brings science and business together to conduct interdisciplinary research into mobility and automotive production of the future. Collaborating in mixed project groups across company and institute borders facilitates a transfer of expertise. The main focus is on disruptive approaches and springboard innovations. "What does the car of the future look like?" and "How do production processes need to be adapted?" are among the key questions.

An important topic at ARENA2036 is the wire harness, which as one of the most sophisticated, expensive, and complex individual components has assumed increasingly greater significance for the automotive industry – especially in the context of megatrends such as e-mobility and autonomous driving. Komax is therefore strongly committed to the ARENA2036 project "Innovation initiative wire harness" and is heading several subprojects. Under one of these subprojects, guidelines are being drawn up containing rules and recommendations on wire harness design specifications that automotive manufacturers need to meet to achieve efficient and reliable high automation assembly. The number of different components, the complexity of the manufacturing processes, and the actual structure of the wire harness all play a major role. Komax possesses a great deal of experience and know-how in this area and is cooperating under ARENA2036 with leading automotive manufacturers and suppliers such as Aptiv, BMW, Bosch, Daimler, Dräxlmaier, Kromberg & Schubert, Kuka, Nexans, Rosenberger, and Siemens.

ARENA2036



Industry 4.0: interconnectedness thanks to a uniform language

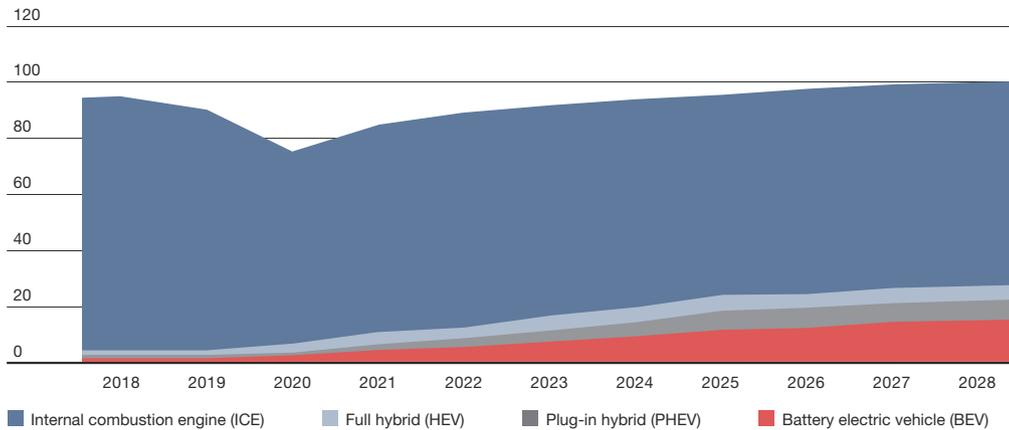
Komax also works with leading companies in the area of digitalization. It is a member of the Open Industry 4.0 Alliance, founded in 2019 by companies in the mechanical engineering, factory automation, and IT industries. The Alliance’s goal is to ensure that up to 80% of machines in a smart factory can communicate with each other. This means that all the networked units in a factory’s value chain – from the production systems and the intralogistics to the IoT cloud – must speak a uniform language. To this end, the Alliance does not itself develop standards, but draws up a so-called framework which is based on existing norms, standards, and protocols (e.g. OPC UA, IO-Link, RAMI 4.0), thanks to which the units are interoperable. Komax brings to the network its core technical competencies from the mechanical engineering sector. This Alliance gives Komax an opportunity to actively play a part in shaping Industry 4.0 and so ensure the optimum interconnectedness of newly developed Komax solutions. The Alliance has grown continually since its founding and now numbers some 70 members, including companies such as Beckhoff, Endress+Hauser, Fujitsu, Kuka, Samson, SAP, and TeamViewer.

Accelerated switch to e-mobility

Another area where Komax demonstrates its innovative strength is e-mobility. Of the 74 million vehicles produced in 2020 “only” around two million were electric vehicles, i.e. pure battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). This is still one million more than in 2019 – despite a significant decline in the number of vehicles produced overall. IHS Markit is projecting that around six million electric vehicles will be produced in 2021. The coronavirus pandemic has accelerated the shift to alternative drives, since in Europe in particular, several countries increased buyers’ premiums for electric vehicles during the crisis. This was not yet foreseeable at the end of 2019, when it was predicted that only four million electric vehicles would be produced in 2021.

Number of produced cars and light commercial vehicles by drive technology

in million



Source: IHS Markit und Komax

In 2020, various automotive groups communicated or reinforced their ambitious multibillion plans in the e-mobility sector and announced numerous new electric vehicles for the years ahead. This is in line with national plans to reduce greenhouse gas emissions, a prerequisite for achieving the targets of initiatives such as the Paris Agreement on climate change and the European Green Deal launched by the European Commission. For instance, Denmark, the UK, Israel, the Netherlands, and Sweden declared their intentions to ban the sale of new fuel- and diesel-powered vehicles with effect from 2030. The state of California, the largest auto market in the US, is planning a ban effective 2035. Pressing ahead fastest, however, is Norway, which plans to adopt a ban on sales of new cars with combustion engines in 2025. 54% of all new cars sold in Norway in 2020 were electric vehicles.

The Paris Agreement, the European Green Deal, and various other initiatives are helping to reduce greenhouse gas emissions and to promote alternative drive concepts for vehicles.



Innovative solutions for the processing of high-voltage cables

Komax's e-mobility center of competence in Hungary is clearly feeling a substantial increase in demand for automation solutions for the processing of high-voltage cables in the fast-growing market for electric and hybrid vehicles. In a few years' time, up to 30% of new cars worldwide will be electrically powered. Aggregates such as air conditioning, power-assisted steering, brake boosters, and heating are also being integrated into the high-voltage electrical system. Up until now, most manufacturers have been producing complex high-voltage cables largely by hand. Manual serial production of the required unit quantities is barely feasible any more – and certainly not to the degree of precision demanded and within the specified time frame. In order to be able to ensure efficient and economic processing, it is becoming increasingly crucial to automate processes.

In 2018, Komax already boasted a portfolio of solutions covering the entire value chain from processing high-voltage cables to testing harnesses. Plug manufacturing called for multiple machines from the Lambda 2 series. These are semi-automatic, with every machine needing an operator. Optimum productivity therefore requires a team of several people to process the high-voltage cables in parallel on multiple machines.



The modular concept allows Komax to provide its customers with different levels of automation, such as the Lambda 440 (left) and the Lambda 240 SP (right).

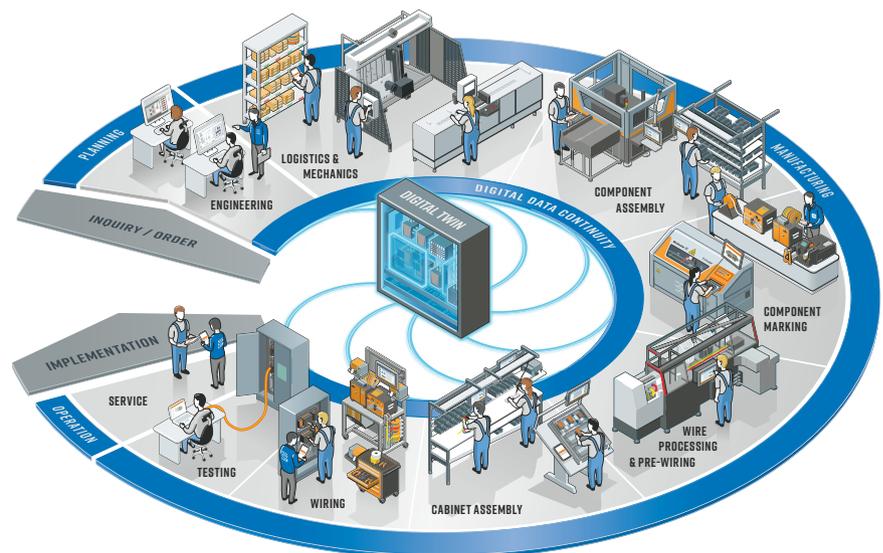
Komax took the next innovative step forward in 2019 and presented the Lambda 440, the first machine for the automated production of high-voltage cables. The Lambda 440 is a modular platform made up of processing modules from the Lambda 2 series. The various modules can be used as required. Options range up to full automation, where the system manufactures the cable from the preparation stage to housing assembly. Under this process, stations connected in parallel can process different cables simultaneously. When a cable has gone through the first steps and is being prepared for crimping, the first tool is already removing the jacket and foil of the next cable. This saves time and increases productivity. Quality solutions integrated into the system are a guarantee that the stringent quality requirements placed on high-voltage cables are met.

Komax does more than just offer solutions for processing individual high-voltage cables. Its portfolio also contains the Omega 750 MEB, a machine capable of automatically producing complete wire harnesses for electric vehicles. This is a further development of the Omega 750 fully automatic block loader machine. The Omega 750 MEB is used, for example, to manufacture the wire harness for the auxiliary unit for Volkswagen's new modular electric drive matrix (MEB) in an automated process. This wire harness connects the battery with various systems such as air conditioning, battery heat management, or the direct current converter. In addition, the Omega 740 ensures the automated production of heat pump wire harnesses for Tesla's electric vehicles.

Smart Cabinet Building Initiative – combination of technology and expertise

There is a lot of automation potential available not just in the automotive industry, but for instance in control cabinet construction as well. To be able to lock into this potential to maximum effect, Komax and three leading technology companies – Armbruster Engineering, Weidmüller, and Zuken – launched the Smart Cabinet Building Initiative in 2020. The objective behind smart cabinet building is to combine technology and expertise to provide holistic solutions across all process steps for present and future challenges facing the control cabinet construction sector. The four partners cover everything – from the selection of components through the prefabrication of wire harnesses, operating equipment, and housings to assisted final assembly and pre-commissioning testing.

The areas of expertise of the four partners complement each other ideally. They cover all the process steps in control cabinet construction.



Weidmüller boasts considerable expertise in the automatic assembly and labeling of terminal strips as well as in manual activities. Zuken has unparalleled experience in the field of digital development data as needed for fully automatic wire assembly on Komax machines. And with its many years of know-how in assisted assembly, Armbruster Engineering rounds out the Initiative team.

In order for the individual process steps to be interconnected, a full digital description of the control cabinet and its components is crucial. The so-called digital twin was created for this purpose. It is used to control the various process steps and allows key optimization potential to be fully leveraged. The systematic collaboration that characterizes the Smart Cabinet Building Initiative means the digital twin can be deployed to maximum effect. This in turn will enable Komax and its partners to increase automation and efficiency levels in the control cabinet construction sector going forward.

SMART FACTORY by KOMAX

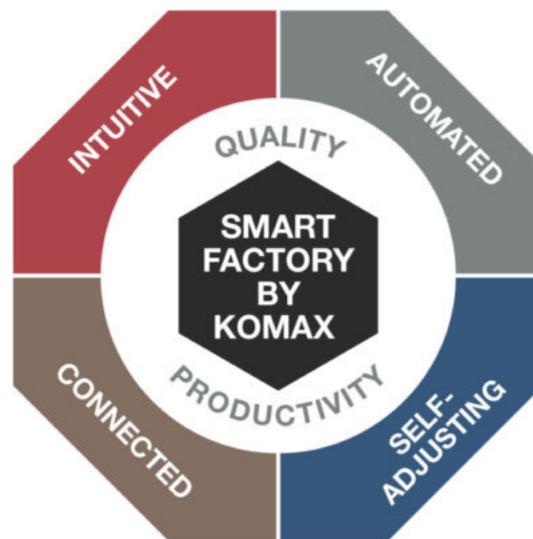
For decades, Komax has been renowned for its innovative products and leading market position. But what does Komax want to achieve and accomplish with its work? And what contribution is it making to society? Komax's purpose can be summarized in just a few words:

As a driver of innovation and market leader in automated wire processing, we develop and produce intelligent, reliable, and optimally cost-effective wiring solutions for smart mobility and smart city applications. We work closely with our customers to make life simpler, more convenient, and safer.

Komax understands smart mobility to mean today's increasingly diverse range of mobility options, which are used in very different ways. Many of these means of transport – from e-bikes to electric cars and trains – are increasingly powered by electricity. Where electricity is used, there are wires, and where there are wires, there are fields of application for Komax. What's more, the optimal usage of these mobility options is supported by smart city solutions, be they traffic management systems or intelligent power usage, distribution, or storage systems. These solutions also need wires, for transmitting either power or data.

The challenge: sustained high quality at low costs

The megatrends of smart mobility and smart city are increasingly becoming part of everyday life. And a large number of products are becoming increasingly more intelligent and power-hungry. Komax's customers are involved in these trends and supply key components, so they have to overcome huge challenges: despite the increasing complexity, they have to deliver sustained high quality while keeping costs as low as possible. To make this possible, Komax provides its customers with SMART FACTORY by KOMAX, which encompasses products and solutions that substantially reduce quality costs and significantly increase wire processing productivity. In specific terms, this means demonstrably fewer faults and greater efficiency, even in complex production tasks. In this way, Komax – together with its customers – is providing consumers with intelligent products that are not only continuously improving, but also operate reliably and are affordable.



SMART FACTORY by KOMAX is characterized by four attributes: it is intuitive to use, it automates production as well as material and dataflows, it is connected within a network, and it self-regulates its production processes.

What benefits does SMART FACTORY by KOMAX have to offer?

If operating Komax machinery is intuitive, human error can be largely eliminated because the system specifies the settings and the correct operating procedure. This minimizes not only the operator's influence and scope for decision-making, but also the need for customer training. The products are also automated to such an extent that they can instigate and complete increasing numbers of tasks themselves. Once they are started up, significantly fewer human-led intermediate steps are needed. This applies not only to material flows but also to data exchanges.

Smart factory solutions are integrated into a network, with all the stages of production being linked to each other. Connectivity standards and the use of cloud technology enable full transparency and make it possible to achieve fact-based increases in productivity and quality. Komax is working towards enabling its systems to adjust themselves, thereby autonomously controlling the production process. This could be the case for simple process and monitoring tasks, but may also extend as far as optimizing entire production processes. And this could even conceivably take place across different plants. Customers would be able to reduce bottlenecks, downtimes, scrap, and rejects. At the same time, smart factory solutions can systematically track and register any number of production stages so they can be traced back if problems occur with deliveries.

Smart factory solutions

Komax has been developing intelligent products for years, well before the existence of terms such as Industry 4.0, Smart Factory, and Industry 2025. SMART FACTORY by KOMAX is therefore the continuation of a long tradition. It is helping Komax to continue fulfilling its role as a pioneer and technology leader, thereby enabling its customers to benefit from an additional competitive edge. Over the past few years, Komax has already launched numerous smart factory solutions onto the market, among the latest of which is the Q1250 quality tool – the digital eye. With its intelligent image analysis, the Q1250 module monitors crimp quality completely automatically, thereby eliminating the need for laborious visual checks by the machine operator. Other important new elements of the smart factory include the Lambda 416 H-MTD (see next page), the Komax Connect range of products, and the Sigma 688 ST. The Sigma 688 ST features the maximum degree of automation for manufacturing twisted-pair wires.

New products

Thanks to its targeted investment in research and development, Komax succeeds in bringing a variety of new products and product enhancements to market every year. Despite the coronavirus pandemic, 2020 was a further year in which Komax was able to showcase its technology leadership to impressive effect and set new standards, with a number of market launches. We provide a selection of these new products below.

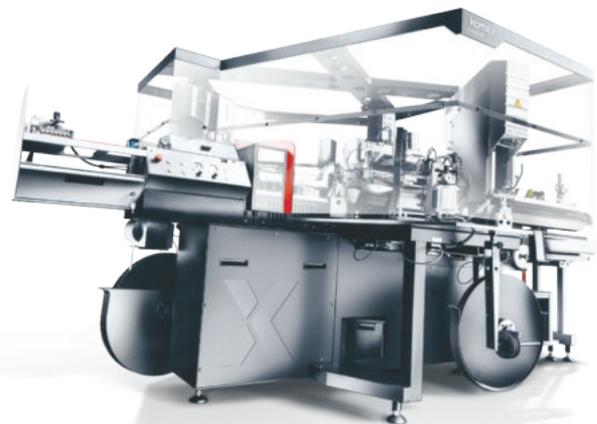


Lambda 416 H-MTD

The Lambda 416 H-MTD marks Komax's successful entry into the future-proof business of wire processing in the automotive Ethernet segment – the automobile Internet, so to speak. The shielded twisted pairs (STPs) used permit high data transfer rates and are a key element of the zonal electrical system in vehicles (see page 31). The Lambda 416 H-MTD enables the efficient, semi-automated series production of STPs and has a modular construction in terms of hardware, machine control, and user interface. Reliable, integrated testing systems deliver the high level of processing quality necessary to ensure that the cables can transfer high data volumes. The trend towards more and more in-vehicle infotainment applications and modern driver assistance systems which are required for highly automated and autonomous driving is prompting a continual increase in the number of data lines to be processed.

Alpha 565

The Alpha 565 offers Komax customers a great deal of flexibility when it comes to increasing the degree of automation. Based on the proven Alpha 550 technology, it can be configured according to customer requirements. In addition to its core functions of two-sided crimp and seal insertion, the Alpha 565 also offers space for up to seven process modules. Ferrule, tinning, twisting, double gripper, and optical quality monitoring modules can, for instance, be integrated. Even complex processes such as dual core wire processing, ultrasonic compaction, or welding can be realized. Realtime data exchange of all quality and production data via Komax HMI also ensures a high degree of quality and productivity. The Alpha 565 processes conductor cross sections of 0.13 to 6 mm² – an extension to cross sections of up to 10 mm² is possible.



M1650 Tube Marking Module

The M1650 Tube Marking Module marks wires fully automatically with a wire tube that is pushed on. In this process, a tube is printed on from a roller using the thermal transfer process, cut to the correct length with V-blades and pushed onto the wire using a gripper system. In contrast to many stand-alone solutions on the market, this module is completely integrated into Komax machines in the Zeta series, which permit fully automated wire harnessing. Labelling with Tube Marking allows the marking to be rotated and moved on the wire. This is particularly advantageous in control cabinet construction when wires have to be shortened and markings aligned to the front.



Mira 340 Q

For wires that are a challenge to process and whose stripping, cutting, and twisting has to satisfy the highest quality standards – as required, for example, by the aviation industry – Komax has developed the Mira 340 Q benchtop machine. The Mira 340 Q features a rotary cutting head that is combined with 4X blades. In order to guarantee a constant, high level of quality, Komax has integrated its ACD (Automatic Conductor Detector) into the Mira 340 Q. This is the first multi-patented ACD application worldwide with rotary incision, and it is protected by multiple patents. ACD detects and indicates even the slightest contact between blade and conductor. The Mira 340 Q additionally offers an automatic adjustment function, namely by modifying the blade incision values on the basis of the measured conductor diameter. This has the effect of increasing work process efficiency and hence productivity.

Komax Direct App

The Komax Direct App brings Komax’s digital services and products closer to its customers and promotes direct dialog with them. Customers can use the app to get direct access to all product and service information (operating and service manuals, overview of spare and wear parts, etc.) and to the global distribution and service network for technical issues. They also have access to the Komax Academy and its activated On.Line training courses (see page 7). In addition, customers can use the app to send feedback on any topic whenever they want. For Komax, the app represents a key element of the digitalization road ahead, with new features and services being continually added.

