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komax



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MEGATRENDS LEAD THE WAY FORWARD

Dear Reader,

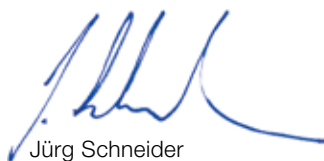
It wasn't so long ago that the idea of digitalization being applied across the board was met with disbelief. Now, just a short time later, we're astonished by just how quickly new technologies revolutionize our production processes and data-driven procedures network our specialist departments.

Megatrends within our industry, such as the automation of manual work, networked factories, electromobility and autonomous driving, show us which path to follow when we consider our future. The first few steps are already complete.

At this year's Productronica, our visitors experienced the incredible value-added potential that can be exploited by machines, robots, assistance systems and cloud applications. Your positive feedback has confirmed that we're on the right track.

We developed the ideas for these solutions based on many personal conversations with you. We would therefore like to invite you to continue this in-depth exchange. Let's join forces to shape a successful and sustainable future.

I hope you enjoy reading the latest edition of Komax News and that you find plenty of inspiring ideas.



Jürg Schneider
Vice President Global Market Services





A modern vertical factory is currently being built at the headquarters in Switzerland, which will be occupied in 2020.

KOMAX GROUP

INVESTMENT IN THE JOINT FUTURE WITH OUR CUSTOMERS

In our increasingly digital world, personal contact to you, our customers, remains vital to us. Geographical proximity is a fundamental pillar of our company strategy, as it allows us to react to your needs in a flexible manner. Another pillar is the continuous development of our skills and solutions along the value chain. It is the engine behind our global investments. We have completed several construction projects, established new companies, as well as acquired other businesses in Europe, Asia, Africa and in the USA. Find out what added value you can enjoy thanks to our most recent activities.

Regionally relevant trends and needs, cultural differences and language hurdles – we aim to improve our approach to all these aspects. Knowledge acquired through conversations with our customers flows directly into our think tank.

Switzerland: A quick journey from the idea to market viability

Until now, we had been divided into three sites in Switzerland. After 2.5 years of construction, the extension of our head-

quarters in Dierikon will finally be complete in 2020. Early 2020 will see a relocation and thus a reduction to two Swiss sites over the course of the year. Teams that rely on physical proximity for efficient and inspiring collaboration with one another, such as production, research and development and logistics, are now coming closer together. Our cutting-edge vertical factory will create significant potential for synergy between all departments, and not just because of the high-tech equipment used in production and warehousing.

Germany: Actively shaping the future

Komax has expanded two of its sites in Germany simultaneously.

At the end of May, Komax's subsidiary Kabatec celebrated the inauguration of its new building together with 1,000 guests. Founded in 2008 in Burghaun, Hesse, the specialist for semi-automated and fully automated taping and binding technology quickly developed into a global player. The new, state-of-the-art head office joins together the teams formerly divided into two sites, offering them everything they need to develop future technologies more quickly and efficiently.



The new production and development facility will enable Kabatec to grow further.

Our German subsidiary, Komax SLE in Grafenau, is also growing. At the end of this year, it will complete another extension, which will double its size again since the last expansion in 2016. In addition to quality assurance tools and micrograph laboratories, our team focuses on customer-specific systems for the fields of data connectivity and high-frequency technology. It offers tailored manufacturing processes for special cables for sensors and infotainment systems. Highly automated driving, not to mention autonomous driving, are unthinkable without these future-oriented technologies.



Komax SLE is the competence center for data connectivity and high-frequency technology.

Belgium: Intelligent solutions for highly automated driving

With the recent acquisition of Exmore, Komax has extended its product line to include machines for automated processing of cables in a wide range of cross-sections. The Belgian team stands out owing to its sound expertise in the development of intelligent applications for the manufacture of sensor cables. Our customers – global players in highly dynamic technology markets – manufacture their cables in a demonstrably more profitable manner thanks to tailored applications.

Morocco: Efficient implementation in a growing market

Our 20 employees in Tangier, Morocco, have been strengthening our position in the field of testing since November 2018. Within the economically emerging North Africa, our newly established company Komax TSK Maroc manages our business with testing systems, from engineering and production through to sales.

Thailand: Even closer to our customers with a fifth company in Asia

The establishment of Komax Distribution (Thailand) Co. in the summer of 2019 is the logical consequence to our motto "global local". With our range of solutions and services, this fifth Asian facility – after China, India, Japan and Singapore – helps our Thai customers to fully benefit from the value added potential.



Grand Opening (f.l.t.r.: Punthip Limjaroensuk and Daniel Schmid)

Singapore: Established on the market for 25 years

Komax Singapore can look back on 25 years of successful development. Many guests joined them in this massive celebration in late August. Their biggest gift for the company anniversary: the inauguration of their new site. Visitors were given the opportunity to experience the latest technology up close in the showroom.



Komax Singapore has solutions to enable its customers to continue to gain competitive advantages. (f.l.t.r.: Larry Wee and Daniel Schmid)

USA: Market position strengthened, expertise strategically enhanced

Komax has had its own company in the US for nearly 40 years. The acquisition of Artos Engineering during the first half of 2019 strengthened our local presence as well as our expertise in the development of customer-specific applications for our machines. This makes us even more flexible and effective in the USA.



Artos has a lot of experience in the development of innovative applications.



GAMMA 450 WITH C1360 CRIMP MODULE

GAMMA 450 AND C1360: THE TOP NEW DUO IN TERMS OF PRICE AND PERFORMANCE

Excellence in wire processing is not just limited to having efficient processes with A1 crimp quality. Parameters like easy-to-operate, multilingual Komax HMI operating software, flexible batch sizes, quick changeovers or short downtimes and low maintenance costs also play a key role. In addition to all these benefits, the Gamma 450 fully automatic wire processing machine, in combination with the C1360 crimp module, also offers great potential for meeting international requirements.

"You get what you pay for" – even markets like South America and Asia now understand this consumer saying. And these countries are therefore gradually raising their quality to European standards. Customers here also expect to gain added value from their acquisition, especially in B2B business.

Equipped with customized quality monitoring

Depending on the application and the requirements of the target markets, the Gamma 450 ensures that quality is made up to 100% transparent throughout the entire production process. CFA or CFA+ monitor

the crimping process, ACD monitors the incision diameter and the Q1240 provides visual process monitoring as standard. A common parts strategy promotes the modularization and standardization of the machine fleet. Customers benefit as a result because – as the machines are handled in the same way – activities like commissioning, maintenance and service are much easier.

If multiple Komax fully automatic wire processing machines are being used, teams can be deployed flexibly and increased stocks of spare and wear parts can be avoided.

Opportunities for growth thanks to increased production capacity

The extremely compact, fully automatic Gamma 450 offers double-sided processing of crimps and seals in the 0.13 mm² to 4 mm² cross section range.

The global requirement for having the best possible ergonomics was central to the machine's design. As a result, it combines compact size with an extremely comfortable operating height. The tried-and-tested cutting and stripping unit, swivel unit and wire deposit assemblies from the Alpha series have also been incorporated, as has the Stationary Terminal Quick Changer (STC). This system facilitates the quick changeover of terminals and crimping tools. The functioning of the wire change is just as smart as the Gamma 450 dispenses with guide parts that are dependent on cross section size.



The stationary quick terminal changer STC (optional) reduces changeover times.

This equipment allows the operator to have complete flexibility in producing different batch sizes and in any order, from one-offs to small batches, right through to mass production.

C1360 – crimp precision with automatic crimp height adjustment

In addition to the excellent crimp quality, the added value for this new module comes from the minimal amount of time required for setup, changeover and sampling. The wire is positioned directly on the module using four direction buttons. The creep speed function with maximum crimp force (22 kN) is then used to define the exact crimp position. The automatic crimp height adjustment allows quick and precise changeover and setup.

Crimp force monitoring using CFA/CFA+ guarantees excellent crimp quality and ensures that the order is produced correctly from the first wire to the last.

Simple operating software frees up capacity for skilled personnel

The multilingual Komax HMI operating software is self-explanatory and therefore quick

to learn. Every Komax machine is operated easily via the large touchscreen. Just one click on the Green Button starts the whole production process.

Gamma 450 is Industry 4.0 ready

This fully automatic wire processing machine supports a range of different interfaces for industrial communication, including the well-known standard WPCS and the future-oriented MIKO interface. This enables the machine to be networked easily with other machines or with production control systems. Beyond just data exchange in real time, the MIKO interface also allows numerous additional functions to be implemented, as well as customer-specific work processes.

The quality control systems send valuable process data back to the execution system. This means that every production order is completely traceable.

The combination of the Gamma 450, C1360 and Komax HMI software enables ergonomic, cost-effective and quality-assured production.



Absolutely precise processing with double blade holder and optional automatic conductor detector (ACD).

INTELLIGENT Q1250 CAMERA SYSTEM ENSURES RELIABLY SAFE CRIMPS

SMART PROCESS MONITORING PROVIDES COMPREHENSIVE AUTOMATION OF VISUAL CRIMP CHECK

The Q1250 automates the visual inspection of the entire crimping process, eliminating to a great extent the previous visual checks by the operator. Fully integrated into a crimp to crimp machine from the Alpha range, the camera system provides images and process data of the highest quality that are then traceable – a must when it concerns wires for autonomous driving.

Full automation for a top-quality processed wire

The automatic monitoring of the crimping process provided by the Q1250 relieves the burden on the operator and frees up their time for other tasks. The system is far superior to the human eye in terms of precision and speed.

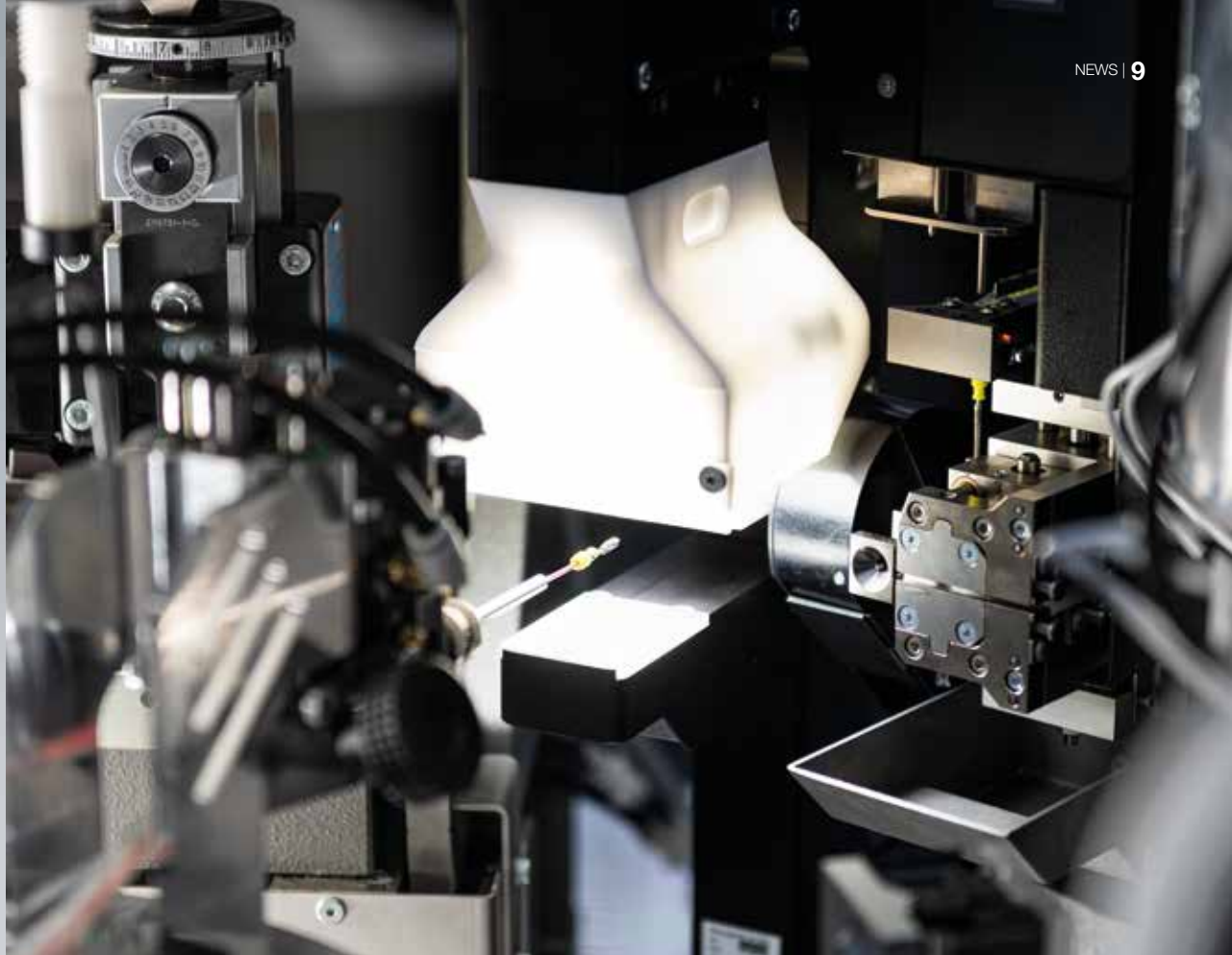
As the swivel arm guides the wire to the crimp module, the camera system checks the quality of the product. Each individual step is checked, from the stripping to the finished crimp, right down to the tiniest detail.

In fractions of seconds, the camera system detects faults in the cutting and stripping such as pulled strands, incorrect stripping lengths, insulation burrs or wire splay. Optionally, the system can also inspect whether the seal is intact as well as its position and orientation.

On the way back, the system monitors the crimp. Here, the camera uses color recognition to capture conductor brush length, protruding and crimped-on strands. Defective articles are cut up, separated and discarded.

The Q1250 is self-explanatory and designed to be user friendly.





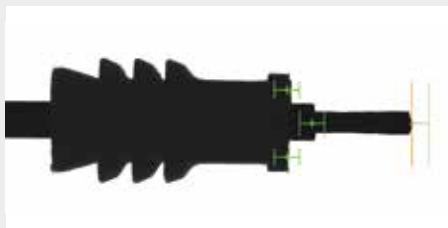
Controllable quality through the use of networking

Every production order has its own individually pre-defined quality features. The machine control picks up this data to execute during the production process. The monitoring system is then set up quickly and ready to go. The machine operator thus has very little influence on the quality level of the crimp monitoring.

Another special feature of the testing system is that the hardware adjusts itself automatically to the production environment. Brightness and image sharpness are adjusted to suit the available lighting conditions.

Dome light and backlight provide optimal illumination of the items and prevent reflections that would hamper the image analysis. This guarantees that it always produces consistent image quality, resulting in high-quality measurement data – a requirement for reliable analysis of good and bad parts as well as for long-term validity in terms of verifying the crimp quality of each individual product.

While the production order is running, the data is transferred continuously to the Komax HMI and clearly displayed there.



Monitoring of the strip and seal position



Q1250 with dome light

THE VERSATILE ALL-ROUNDER WITH A DUAL HEAD

THE KAPPA 330 AUTOMATIC CUT & STRIP MACHINE – HIGH PERFORMANCE FOR A WIDE VARIETY OF WIRES

The aim is always to achieve highly productive conductor processing with as few rejects as possible. That is exactly what the Kappa 330 automatic cutting and stripping machine provides. It is designed specifically to process a range of wire types efficiently. The Dual Head version handles multiple process steps in a single operation. The unique sensor technology on the Kappa 330 is extremely versatile and ensures optimal processes, such as minimizing cut wastage. Overall, this machine is not only particularly efficient, it can also be changed over and set up for new materials very quickly. This also helps to make it highly cost effective.

The Kappa 330 offers an attractive mix of technologies, enabling it to process a wide range of conductors in a variety of different ways to suit their particular properties.

In a safe and reliable process, the Kappa 330 cuts and strips wires or processes the core. The machine's upper limit is a cross section of 35 mm² and an outer diameter of 16 mm. Ribbon cables can be up to 40 mm wide.

Thanks to the sophisticated design of the Dual Head version of the automatic cut & strip machine, it is able to handle multiple process steps at once. Special blades have been designed to carry out a range of different procedures and they can be fitted in no time at all. One blade type therefore produces a particularly large cutting surface on the wire insulation, while another type carefully strips the wire's core. Based on the application needed, Single Head Kappa 330 machines from serial number 2000 onwards can be changed over to the Dual Head version.



Multifunctional sensor technology for top results

The multitasking sensor technology on the Kappa 330 is truly versatile. It identifies the start and the end of the wire. This enables the first cut in the process to be made as close as possible to the start of the wire, minimizing any material wastage.

Once the sensor detects the end of the material, the Kappa 330 stops automatically and informs the operator, who can then replenish it or prepare for the next job. This prevents any unnecessary downtime.

At the same time, the sensors help with the machine's setup. Their ability to automatically determine the wire's diameter enables them to provide valuable support in setting up the Kappa 330 for new materials and they speed up the process significantly.

Touch and produce

The Kappa 330 is distinguished by its ease of use. On the stand-alone version – including when combined with other upstream and downstream devices – the machine is controlled via an integrated touch display. The icons and images in the Komax Top-Touch operating software make the program intuitive to use and it is ready to go after just a few taps.

The Kappa 330 doesn't just process single production orders and part lists, it is also able to schedule orders in the required order so that they can then be processed sequentially.

The higher level Komax TopWin desktop software is used if the machine is combined with a printing system or linked to a company network via a Wire Processing Communication Standard (WPCS) interface. The latter could be used to transfer production orders to the Kappa 330 directly from the ERP or MES system, for example. In the opposite direction, process data can be transferred and saved. In this configuration, production can also be controlled from TopWin.

The machine can be set up for new materials with just a few clicks on a PC. Drop-down lists linking the individual process steps with the corresponding tools make the procedure much easier.



Quick and careful separation of cores using the patented Komax roller system.



Can be integrated perfectly into a production line consisting of a prefeeder, inkjet or laser printer and deposit system. By using TopWin, the system can be linked to a company network or manufacturing execution system via a WPCS interface.



MOBILE AUTOMATIC VENDING MACHINE AS KOMAX CONSIGNMENT STOCK

KOMAX SMART STOCK FOR 24/7 ACCESS TO SPARE AND WEAR PARTS

With Komax Smart Stock, we are presenting an absolute market innovation: an automatic vending machine as a mobile consignment stock. Individually configured and stocked with the specific spare and wear parts needed for your Komax machines, the intelligent storage system is then positioned in close proximity to your wire assembly. Machine downtimes due to missing parts therefore become a thing of the past since the intelligent system can issue materials as soon as they are required. Access is limited to authorized employees and whatever they take out is logged in real time. Only then does Komax issue the invoice for the material. This modern digital concept relies on automated processes that are therefore reliable and lean – with no additional expense for your company.



We therefore analyzed the spare and wear parts business from the past few years. Our service department evaluated the options for being able to guarantee a quick response, particularly in an emergency situation. Their conclusion was that no other alternative could beat having spare parts storage on site. But we no longer wanted to expect our customers to bear this extra cost, so we took the initiative.

Material issuing system with high added value

The key fact first: Smart Stock is a consignment stock. This means that Komax remains the owner of the system and the stored materials.

Increased capital commitment for stored material or additional cost and effort for inventory management and procurement are therefore not an issue. You don't even incur any acquisition or installation costs.

You just reap the benefits. The bigger the range of parts and the higher the throughput, the greater the added value. That is, added value from having spare and wear parts just a short distance away on the shop floor and therefore available at all times. This

reduces the downtime on your machine to the precise time it takes to replace the part.

Carsten Kortwig, Chief Sales Officer at CabTec GmbH, is impressed:

"Komax, as owner of the Smart Stock, takes over the inventory/material management. There are no additional storage and administrative costs for us. We value the individual access rights, which can be defined for each individual staff member. With this function we can precisely track the consumption and increase transparency." Kortwig clarified further: "We only provide the space, electricity and the internet connection. The invoice will only be generated when we take out material."

In addition to governing the storage equipment itself, a contract also sets out the minimum and maximum stock levels for the inventory management, as well as the access rights. It also determines which of your employees are involved in which processes, at what interval reports are generated from the transaction logs and when removed materials are invoiced. The stocktaking criteria can also be found here. Transparency is important to us.

Sometimes, things just happen. The stepper motor in the wire processing machine stops unexpectedly or the spare blades were ordered too late. Smart Stock is there for precisely these situations. And even more: you can also schedule maintenance specifically for cost-effective phases of production, such as when a machine already needs to be changed over for the next production job.

Our aim is to have completely satisfied customers. That's why we regularly ask you how we could increase your satisfaction even more. Most recently, the issue of Komax spare and wear parts was highlighted. You want to reduce your storage and the associated capital commitment, which requires easier procurement with reliably short delivery times.



The spare and wear parts are well protected in clear drawers or lockers.

Access rights control the individually configured stock

The new service is a closed stock, with access and actions controlled via access rights. Similar to an ERP system, user details are stored in a rights matrix along with the actions they are permitted to carry out. This means the compartments that they are permitted to open in order to remove, restore or replenish materials.

The purchasing history indicates which parts are relevant for your business. We work with you to establish the range of parts needed for your automatic vending machine, customized to your individual requirements, including the associated maximum stock level and the minimum stock or re-order level.

We then configure your vending machine with various differently sized boxes and drawers to suit the size of the parts and the quantities to be stored. If your requirements change over time, the selection of parts and the cabinet layout can be adjusted or extended at any point.

Automatic processes safeguard stock levels

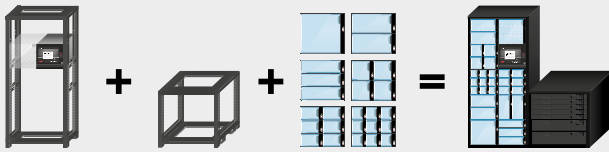
Just as in a "normal" warehouse, each part is assigned a fixed storage location. Products are recorded in the Komax Direct system, together with their inventory level criteria.

One of the Smart Stock's core features is automatically triggered replenishment. This ensures that a sufficient quantity of the spare and wear parts needed for your production are always held in stock. Smart Stock is therefore connected directly to Komax Direct via LAN. In practice, this means that the Komax representative will replenish it automatically when stock of a component reaches its minimum or re-order level. This also saves you time and delivery costs.

Your company therefore has no additional administrative burden as a result of the Smart Stock. Instead, the purchasing and finance departments can be integrated into the automatic process and, on that basis, be able to release and process the subsequent invoice quickly and easily.

Checking the inventory list provides an opportunity to see whether other compartments are about to reach their re-order level. It could make sense to replenish this stock straight away.





Smart Stock is scalable – the basic unit can be flexibly extended and precisely adapted to your needs.

User-friendly operating concept

Once commissioned, the vending machine's filled compartments light up green. **"The usability of the Smart Stock is very simple" confirms Carsten Kortwig, and continues: "In case we need a part, the colleague logs into the system. The usability of the structured software is very intuitive, you are done with only a view clicks."**

Smart Stock offers two ways to access materials:

1. The employee knows the compartment in which the required part is located. In this case, they just open the compartment and take it. They then record and confirm that the part has been removed.
2. If the employee doesn't know which compartment the required part is in, they can use the menu to select the part they want. Once the quantity is recorded, the relevant compartment lights up.

Only then is the position assigned for invoicing. Returning parts that aren't required into a separate box and filling up the compartments is just as easy.

The connection to Komax Direct ensures that every action is logged and the stock level adjusted.

100% transparent flow of goods

Komax Direct manages every stock movement in real time and synchronizes the data centrally. You can view a continuously updated snapshot of the system and the history at any point from anywhere in the world and download them in Excel format. This is particularly beneficial if your production, finance department and

controlling are spread across different locations. This way, every employee can get an accurate update as and when they need it.

The Komax representative will carry out a regular stocktake to reconcile the actual and target stocks. If values are adjusted in the system, a correction process is triggered that automatically issues the corresponding credit note or retrospective invoice.

At the agreed interval, Komax will send the updated overview of consumed materials to you and your Komax representative. These reports show the consumption during the latest period, the cumulative consumption and the individual parts. This provides a valuable basis for determining down-times, consumption and costs for your wire processing.

Smart Stock – another step towards the Smart Factory

Smart Stock enables Komax to make a further contribution on your journey towards networked production. The concept behind this intelligent consignment stock puts the processes concerned on track digitally and integrates and automates them across the company.

This new method of spare and wear parts management is characterized by high levels of efficiency and transparency and will certainly lead to condition-based maintenance in the future. Not least for the benefit of your customers.

Bit by bit, the former value chain will become a value network in which a company's own specialist departments work closely with business partners and suppliers.

KOMAX SERVICES

Komax Product Information

Everything there is to know about your Komax equipment – available quickly, easily and around the clock on your computer, tablet or smartphone.

Komax On.Line und On.Site Training

Extensive training opportunities to ensure that you have fully trained employees who can operate Komax products efficiently.

Komax Production Analysis

During an independent evaluation of your production environment, we objectively assess problems and optimization potential, identify possible improvements and work with you to develop a catalog of helpful measures.

Komax Production + Ramp-up Support

We harmonize your new and existing equipment on site for optimal process stability, productivity and quality and thoroughly instruct your employees.

Komax Service Contract

Service and maintenance contracts tailored to your requirements, with a clearly defined scope at a fixed price.



MILESTONE AUTOMATED MANUFACTURE OF HIGH-VOLTAGE CABLES FOR E-MOBILITY

LAMBDA 440 THE NEXT GENERATION OF HV CABLE PROCESSING MACHINES

The automotive industry is facing extensive technological change. Spoiled by the highly automated value creation found in traditional vehicle construction, electromobility now requires all-new production processes, including for large and heavy cables as high voltage will play a key role in vehicles from now on. The issue of human safety will therefore take on a whole new dimension in vehicle construction, along with the corresponding quality management. Komax is now introducing the next level in high-voltage (HV) cable automation: the Lambda 440.

Electric vehicles represent the future of mobility. HV cables will therefore become an increasing priority as car manufacturers will soon require huge volumes of single and multi-pole cables in a range of cross sections and specifications. In light of stringent quality and process requirements as well as the current skills shortage, there is a strong argument to support the comprehensive automation of HV cable processing in order to ensure reliable delivery within the customary tight schedules.

Site for HV technology massively expanded

Development of the Lambda 440 required space and specific expertise. The Komax Thonauer team in Hungary was able to provide this at its new plant, which is more than 4,000 m² in size.

The new state-of-the-art building provides the specialists in high-voltage technology and Lambda machines with the ideal conditions to bring their innovations to market quickly. The doors are now wide

open for customers and interested parties to engage in an intensive exchange of knowledge.

MPS – modular platform system for end-to-end production

Up to now, machines designed specifically for HV cable production, such as the Lambda 240 SP, 240 ST or 240 SC, only supported single process steps. However, these machines cannot run independently; they need an operator.

As a result, anyone wanting to reduce the cycle time needs to have a large team of people processing HV cables in parallel on multiple machines.

Like a system of building blocks, the Lambda 440 comprises different process modules from the Lambda 2 series. The machine assembles each cable in a continuous process, from preparation through to the housing assembly. Its functions are tailored precisely to the respective connector systems.

Logistical masterstroke also reduces the cycle time

The prescribed process is set up in the production line in multiple stages. This means that the Lambda 440 does not necessarily have to process the cables consecutively. Instead, a sophisticated program coordinates the individual stages in parallel. To do this, shuttles distribute multiple cables to the individual stations, where they are then processed at the same time.

HV cables are heavy and not especially flexible. To enable the shuttles and tools to perform their job at maximum speed without the weight causing unnecessary strain, each cable is supported on a conveyor belt that follows the shuttle runs. This allows the customer to process a cable in less than 20 seconds.

High quality standards met by automation

Each processing step on the Lambda 440 is checked and logged. Both visual and physical monitoring methods are integrated into the production process as and where useful or necessary. Challenging process steps are carried out in a special environment. For example, the braided shield is checked and removed in a hermetically isolated area, which guarantees that all the shield strands are extracted and disposed of cleanly.

Precise design of the Lambda 440 production line

The wide variety of plug systems offered means that the Lambda 440 needs to reproduce just as many different production processes.

The Komax Thonauer team works with customers to determine the exact specifications required, puts together the combination of system modules accordingly and customizes the functions. Whatever the degree of individuality, the Lambda 440 still guarantees its users high added value and an attractive ROI.



Entrance to the new Komax Thonauer Kft. building in Budakeszi (Hungary)



EMPLOYER BRANDING

A WORLD FULL OF OPPORTUNITIES

The Komax brand has been established on the market for decades. Customers, partners and investors know that Komax stands for innovative strength, pioneering spirit and high quality. Now, Komax's employer branding is also defined.

Komax wants to further implement its growth strategy. To do this, we rely on being able to keep recruiting outstanding employees in the future. Only with the best employees can we ensure that we are able to continue offering our customers innovative solutions for process optimization and increasing their productivity in the future. It is just as important that our employees know what they can expect from Komax as an employer and are proud to work for Komax. In order to meet these requirements, we have made it our goal to clearly position Komax as an employer and to increase its level of recognition among potential employees.

Komax's positioning as an employer

"To enable us to achieve these goals, we have developed our employer branding," says Sandra Keller, Vice President Global Human Resources. The employer branding defines the employer strengths and the employee benefits, in line with the Komax brand essence and the core values of the Komax Group. From this, Komax's positioning as an employer can be determined. As a result, the following positioning message has been distilled:

"With us, you are in the middle of a world full of opportunities. As a driving force in the market, we offer you the chance to shape

the industry sector and become the catalyst for your own success. Take on the challenge and shape the future together with us."

In connection with this positioning message, Komax's three central strengths as an employer are highlighted: scope to create change, responsibility and togetherness.

"The strengths are put into context, together with corresponding keywords, and describe the employee benefits," Sandra Keller explains further. These keywords form the basis for communication: room to maneuver, fresh ideas, curiosity, courage, initiative, responsibility, trust or inspiring togetherness.



The key visuals of the communication campaign convey the world of opportunities (Meet your opportunities), such as room to maneuver (Shape things), courage, curiosity and fresh ideas (Be curious) or inspiring togetherness (Inspiring).

SCOPE TO CREATE CHANGE

Room for ideas

We give our employees the room to maneuver to pursue their tasks and develop as individuals. Everyone counts. We facilitate developments.

TOGETHERNESS

Inspiration through community

We maintain a valued working atmosphere with international character and a sense of togetherness. Everyone is part of the whole. We maintain an inspiring togetherness.

CURIOSITY
ROOM TO MANEUVER
INSPIRING TOGETHERNESS
COURAGE
RESPONSIBILITY
INITIATIVE
FRESH IDEAS
TRUST

RESPONSIBILITY

Commitment builds trust

Room to maneuver requires commitment and a shared responsibility. We challenge our employees. Everyone takes responsibility. We take and delegate responsibility, which forms commitment between us.



"Komax is an attractive international employer. This is becoming even more visible thanks to our employer branding. We attach great importance to this as it will enable us to continue recruiting qualified employees."

Sandra Keller,
Vice President Global Human Resources

Communication campaign that sets Komax apart

Key visuals convey the message of Komax as an attractive employer with a distinct visual identity. The slogan “Meet your Opportunities” illustrates that employees are offered a world full of opportunities. A world with lots of room to maneuver (Shape Things), a world for fresh ideas, courage and curiosity (Be Curious) or for inspiring togetherness (Inspiring). Based on these key visuals, the campaign also includes films which can be viewed on our website (komaxgroup.com/careers) and elsewhere. This allows Komax to set itself apart from competitors on the employer market in terms of both content and visuals.

Employees as brand ambassadors

“We want our employer branding to be actively experienced,” says Sandra Keller. “That’s why we involved our employees in a photo shoot during the launch of the new employer branding campaign.” The event was filmed – take a look on our website to see how our employees are living the new brand identity.

We are convinced that the new brand identity also shows Komax’s clear profile as an employer. And our employees should be proud to work for Komax and happy to communicate this to others. Because our employees are the best brand ambassadors.



Employer branding@Komax – how employees in Switzerland are living the new brand identity. Photo shoot at the launch of the employer branding.



FIRST HIGH-VOLTAGE PROJECT FOR AUTOMATED WIRE HARNESS MANUFACTURING

INNOVATION LEAP – AUTOMATED ASSEMBLY OF HIGH-VOLTAGE WIRES

This joint project with LEONI is certainly one of the most challenging in Komax's history. Within just a few months, LEONI was to supply Volkswagen with wire harnesses for the high-voltage (HV) wiring system in its new battery-powered ID.3 compact car. And this despite the fact that neither the components for the auxiliary units to be processed nor their final specifications were available. The bold challenge: adapting the Omega 750 cable assembly line, including ongoing changes, to the brand new requirements for HV wire harnesses. Working closely together, LEONI and Komax gradually arrived at an optimum solution. LEONI has been manufacturing MEB wire harnesses for the ID.3 with the new Omega 750 since December 2018.

"This was a daring move for all of us", says Remo Baumgartner, project manager at Komax Solutions, describing the project with the automotive supplier LEONI. "The processing of high-voltage wire harnesses in the context of electromobility involves new requirements and thus many unknowns. Reason enough to take an iterative approach to the project with LEONI. The result was a custom solution tailored to meet the customer's specific needs."

A tight development timeline

The timeline was determined by VW's strategy for electromobility. In recent years, the Wolfsburg-based company has been driving this topic forward like never before. No sooner had VW presented its modular car platform for electric cars (MEB) at the end of 2017 than the carmaker announced the start of production of the ID.3 for the third quarter of 2019. And on top of that, interested parties would soon be able to pre-order the electric car.



Omega 750 MEB assembles HV harnesses in an automated process

This dictated the date by which manufacturers and their suppliers had to design their tried-and-tested, highly automated concepts specifically for manufacturing and ensuring the quality of HV wire harnesses.

Achieving the desired level of automation step by step

The aim of the project was to produce the wire harness for the auxiliary unit in the ID.3 in a process that was automated to the greatest extent possible. This wire harness connects the battery to different systems such as air conditioning units, battery heat management systems or DC-DC converters. LEONI has already programmed 80 different wire harness variants for the MEB platform on its Omega.

VW is a pioneer when it comes to the use of unshielded wires in the auxiliary unit. The advantage they offer compared to shielded wires is their lower weight and smaller bending radius, which allows them to be easily installed in the confined installation space of the electric vehicles. When designing the assembly process, special attention was therefore paid to ensuring the cable insulation remained intact.

The Omega 750 transfer machine offered the best technical and technological prerequisites for the joint project. The hardware and software for existing applications were modified to allow implementation of the new functions. After all, the LEONI and

Komax project teams had only 24 weeks before the machine had to be ready for the start of production. They therefore organized the development, construction and testing work to run in parallel wherever possible. Komax's interdisciplinary engineering team alone racked up almost 1,000 hours.

The project's success was due, first and foremost, to the close collaboration between the two companies. The project partners' various departments exchanged information regularly, both via video conferences and in person at different locations.

Omega 750 MEB assembles HV wire harnesses in an automated process

The wire harness for the MEB auxiliary unit contains two wire cross sections as well as two different housing classes, each with multiple coding and corresponding covers for cable fixing. As a power distributor, the wire harness requires a 3-way or 5-way distributor housing on the second end of its wires.

At 4 mm² and 6 mm², the wire cross sections lie well outside the Omega machine specification. Processing tests carried out in advance ensured that the machine could also process this wire material reliably.

A spark tester integrated in the Omega platform guarantees the quality of the wire material. It also prevents rejects due to damaged material.

The ring sensors installed in front of the wire draw-in are also new. With this and other sensors, they detect any change in material, including wires, terminals and crimping tools. If their barcodes are scanned and stored, all the wire harness components can be traced back via their batch number. This transparency in production is becoming increasingly relevant in the context of autonomous driving.

A special module developed specifically for the MEB platform processes three different covers for cable fixing, which reduce contact in the housing caused by vibrations. The module clips the appropriate fixings onto the wires once the usual steps such as cutting, stripping and crimping have been completed. The gripper inserts them into the housings in a controlled manner in accordance with the set force and route parameters.

Because the project team had to design the first version of the machine without the final distributor housing, they initially developed a dummy holder for it. This ensured that the distributors were part of the automatic assembly process from the very start. In the future, the insertion gripper will load the distributor housings directly, which increases the machine's added value and reduces the number of manual process steps. An additional auxiliary function provided by the MEB pallet application closes the secondary locking mechanism of the fully loaded housings.



Remo Baumgartner, Project Manager at Komax Solutions

The application was also optimized during the course of the project to enable the machine operator to release the housing's locking mechanism using a foot pedal, thus leaving both hands free to remove the wire harness.

Further potential in the value-added process

The first machine was delivered to Bistrita, Romania. Further process improvements for the next machine were defined during commissioning. They have been incorporated in the series-production machine ordered by LEONI in 2019.

Today, the Omega 750 MEB offers an end-to-end assembly process. The well-coordinated project team plans to gradually integrate what are today downstream tasks that are mainly performed manually into the automated production process as far as is possible. This includes not only ultrasonic welding and the assembly of the distributor housings but also quality checks, taping the wires and attaching clips to fix the wire harness in the installation space.

The relevant concepts also involve Komax subsidiaries such as Kabatec and TSK. This highlights the fact that the Group brings together all the skills needed to develop and implement custom manufacturing concepts together with its customers along the entire value chain.

Profile Omega 750 for the assembly of HV wire harnesses

Classic functions

- Processing of up to 36 different wire types
- Sequential processing of wires with cross sections of 0.13 mm² to 2.5 mm²
- Up to 8 process modules (on the Omega 750)
- Double-ended insertion of the wire ends with crimp force monitoring and pull-out force measurement

HV functions

- Adaptation of the standard machine allows the processing of wires with cross sections of up to 6 mm²
- Spark tester
- Detection of changes involving wires, contacts and crimping tools
- Scanning of component batch numbers
- Attachment of the 3 different cable fixings
- Additional functions: loading, cable fixing
- Closing the secondary locking mechanism of the housing
- Accelerated removal of wire harnesses thanks to the pneumatic opening of housing grippers

“Komax has once again impressed us with its professional project management and top-notch equipment. The team addressed the challenges posed by the new HV wire harness in a competent, solution-oriented and inspiring manner. Despite the time pressures, we were always able to pursue our goal in a pleasant and stable working environment.”



Jürgen Zull,
Teamleiter Operations Business VW, LEONI Kabel GmbH

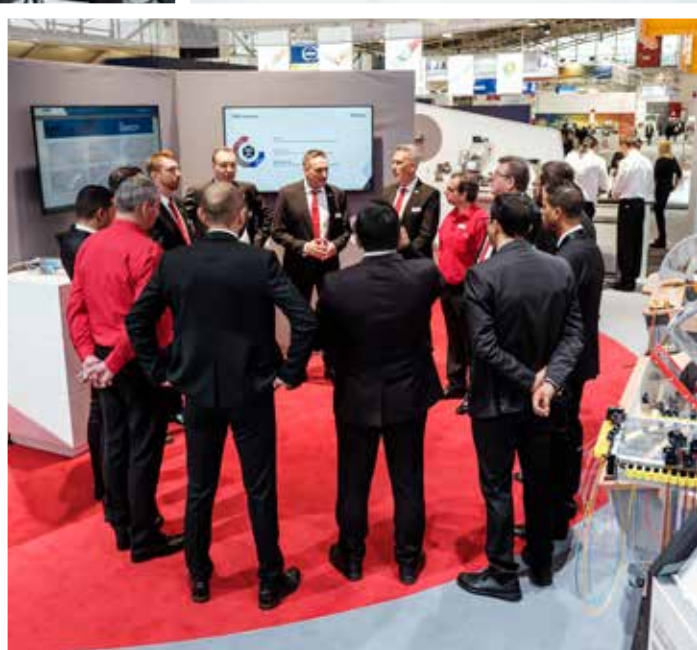
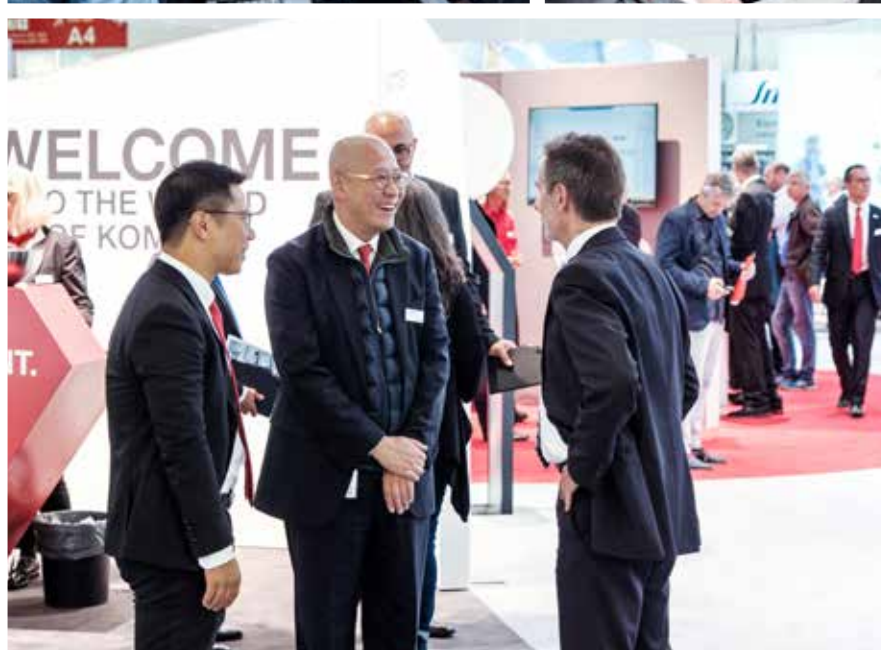
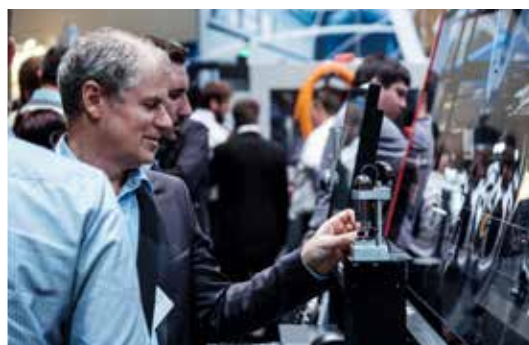
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PRODUCTRONICA 2019 NOVEMBER 12–15 IN MUNICH



Exhibition video



PRODUCTRONICA 2019 IN MUNICH

A WORLD OF EXPERIENCE – WIRE PRODUCTION 4.0

Stand 211 in Hall 5 of this year's Productronica certainly inspired visitors with regard to wire processing. It was particularly inspiring in view of the megatrends within the industry, as the Komax Group presented a machine park 4.0 on roughly 600 m² that astounded visitors. They enjoyed a live experience of how they can efficiently utilize the latest technologies and discovered the enormous potential it could hold for them. They certainly also noted that the Komax Group is able to deliver a tailored solution, even for highly complex requirements.





PRODUCTRONICA 2019

Figures, details, facts

- 44,000 visitors from 96 countries
- More than 1,500 exhibitors from 44 countries
- Main topics: Smart factory, smart maintenance
- **New:** Accelerating Talents – to get students and young professionals excited about electronic manufacturing
- **New:** 48-hour hackathon – organized by the Mechanical Engineering Industry Association (VDMA) and the Fraunhofer Institute for Reliability and Microintegration (IZM) to provide young professionals with mechanical engineering connections



The bright curved LED drew eyes from far and wide. It hung over the exhibition stand and promised an upgrade to the Smart Factory. In fact, one thing at the stand became very clear: digitally aligning your wire processing operations will give you a significant competitive edge.

With Komax Cloud MES, even SMEs can control their production intelligently

Komax Cloud MES (Manufacturing Execution System) was an absolute novelty. The product is based on Komax's existing MES, but as a classic Software-as-a-Service (SaaS) solution, it requires virtually no capital expenditure and is set up individually.



The highlights include the extended parts list information, which also describes the exact wire configuration. This plays a key role particularly if the exchange of information between engineering, production control and the machine is exclusively electronic.

The Komax Cloud MES thus recognizes how wires and strands should be processed. The system controls the production order accordingly. With 3G and internet access, all planning, production and machine data can also be accessed via mobile devices.

When it comes to machine utilization, the Komax solution also differs from conventional MES systems thanks to its algorithm. Since Komax customers are increasingly operating their machines with individually adapted modules, Komax Cloud MES does not plan at the machine level, but rather at the module level. The system knows which modules are equipped for which machine and determines the optimal, time-optimized sequence for production orders. In the event of faults, users can make a decision based on facts.

Komax MES Cloud stands for optimally utilized wire processing with added value from first machine.

Komax Cloud MES is a fully scalable, user-based rental solution. The monthly subscription fee for software and support depends on the number of machines and functions used. This minimizes both the financial risk and the maintenance work to be carried out by your IT department.

Komax Cloud MES: short & sweet

- High-end software for production planning and control
- Profitable from the first machine – even for SMEs
- A solution precisely tailored to the requirements of the wire assembly
- An SaaS solution with no investment in licenses, hardware or implementation
- Runs without its own IT structure, maintenance or backup
- Fully scalable: facility structure precisely down to module level
- Maximum data security

Assistance systems close the gap between man and machine

In addition to the Digital Lean Wiring (DLW) and EasyWiring assistance systems, Komax also closed another gap between man and machine with TSK Connect.

On the presented test system, the visitors were convinced that the new TSK Connect technology fulfills their desire for increased efficiency, more transparency and quickly available test systems for wire harnesses, and therefore optimized process costs.

They had direct access to all test system data via a mobile app, exactly where they needed it – on the test system. This digital access not only speeds up the installation, but also the maintenance over the entire life cycle.

TSK Connect provides versatile support for customers and setup personnel. Installation of fully equipped TSK test systems can be done significantly faster with new smart software features. The system learns the existing hardware configuration within minutes and transfers it to the software settings.

Through the mobile device, users get the complete, clearly structured documentation, including all commercial and technical information, such as order data, drawings and parts lists. From the highest data level, they have simple, paper-free access to details such as configuration, functions and material data for each component.

TSK Connect: short & sweet

- Automated setup of test systems
- Even without power supply, the data of test adapters is accessible
- Completely digitized test bench documentation
- Reduced search times during setup phases of test adapters and complete systems
- Detailed material data facilitates procurement
- Quick maintenance: process values of the test bench components are available in real time
- Technology-compatible and upgradeable to existing test systems and test adapters





Zero defects strategy in 100 % transparent production

Q1250 surprised visitors with its operator-independent quality assurance. Q1250 took over the optical inspection using a camera. Brightness and sharpness adapt to the lighting conditions of the production environment as necessary for flawless images. The product quality was visualized in the ongoing process. The system adopts the specifications from the machine in order to set its own parameters independently.

Q1250 stands for intelligent, fully automated optical inspection of the entire crimping process.

Electromobility requires a customized standard

Electromobility is gaining real momentum. For assembly companies, this means delivery of individually configured high-voltage wire harnesses in large quantities. The Omega and the Lambda 440 proved to be highly practicable in this regard.

The Omega because it handles both low-voltage and high-voltage wires of varying cross sections and housings, and can align its tools precisely to individual requirements.

Through its shuttle system with sophisticated logistics, the Lambda 440 demonstrated its ability to process several shielded and unshielded HV wires in parallel. The modules of the Lambda series can be individually combined and tailored to meet special requirements through specific applications.



The process monitoring of the Lambda 440 guarantees the operating reliability of the HV cable harnesses for electric vehicles.



The logistics of the Artos CS-327 is specially designed for particularly heavy wires.

Powerful machine for particularly heavy wires

The Artos CS-327 was impressive for cutting and stripping wires with very large diameters up to 300 mm. Belts driven by servo motors transported the heavy material and the stripping unit operated two blades. Artos Engineering exhibited at the Group's joint stand for the first time this year as a new member of the Komax family.

Robotics for wire assembly

The new Komax subsidiary Exmore, demonstrated its comprehensive expertise in new technologies at a stand of its own. With the prototype of its assembly line, the team set a milestone whereby a robotic arm inserted crimped components into a wire housing before it was closed and welded fully automatically.



Inspire, learn and network in a start-up atmosphere: the hackathon

With this 48-hour hackathon, Messe München offered a networking platform for exhibitors, students and start-ups.

Komax provided three data sources for its "From Plan to Reality" case, namely machine data, Komax Cloud MES and SAP Analytics. The aim was to find a solution that would enable fact-based decisions in the event of production faults. After the briefing, the

talented participants did not leave the area unless they sought further conversation at the stand. Food was provided and partakers were able to rest in igloo tents.

The participants presented their concepts via a four-minute pitch. Their fresh ideas and great abstractive abilities were highly impressive. In addition to acquiring excellent contacts, Komax was delighted to receive positive feedback on its outstanding support and positive corporate culture.

Finding a dream job at the "Accelerating Talents" career café

The Career Café was also part of the networking platform for students and start-ups. The talents met our HR specialists in a lively café atmosphere, where they were able to discuss their professional interests and opportunities.

Even if she had wished for more traffic, Sandra Keller, Vice President Global Human Resources of the Komax Group, she and her HR colleagues had many interesting conversations and were even able to take away some exciting CVs from interested parties.



◀◀ **HACKATHON@PRODUCTRONICA** was organized for the first time by Fraunhofer IZM, Messe München and VDMA Productronic. The hackathon is challenge-oriented; i.e. the participants work on a concrete task and real challenges of Industry 4.0.

◀ **Full concentration on the task!** Tobias Rölz, Vice President Global IT & Digital Business, explains the objective.



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