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komax



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SERVICES THAT BRING YOU ADDED VALUE

Dear Reader,

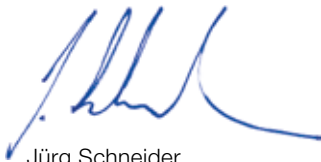
“What counts for you now – today and in the future?” That is the question we ask ourselves and our customers again and again. Maximum agility and constant improvement are demanded in all areas. We create them using the most state-of-the-art technologies available. And we encourage them with standardized services across the entire lifecycle of your equipment. Learn more in our current issue.

You need expertise. You want to improve processes. You want to increase productivity and quality. We can offer you the perfect support with our service offerings. With expertise and experience, from close to our customers to the entire world. One example of the added value offered by our portfolio, which currently includes 17 services, is the Komax Production Analysis. This service allows us to objectively assess the full potential for improvement of your production environment. The resulting maximization processes enable you to increase production by up to 20 %.

Our certified training courses now include the new Komax On.Line Training, which makes the targeted training of employees faster, easier and more efficient so your staff can deliver top performances with Komax equipment. Read about how 24/7 On.Line Training reduces the effort devoted to training and minimizes machine downtimes.

How can we further assist you as the market leader? With the reliability of long-term customer relationships, strong partnerships and future-oriented solutions that help you to become more competitive. Discover the potential of our comprehensive portfolio in this edition of Komax News.

I hope you enjoy reading and get a lot of added value.



Jürg Schneider
Vice President Global Market Services





KOMAX DEUTSCHLAND GMBH

A 25-YEAR SUCCESS STORY

Komax Deutschland GmbH in Nuremberg is celebrating 25 years in business. With a balanced mix of continuity, close customer relations and services perfectly tailored to market demand, the sales company plays a leading role and is a fitting example of our dedication to the motto "global local."

How did it all begin with Komax Deutschland? We posed that question to co-founder and long-time CEO Matthias Klaus. He knows the industry inside and out. In the early years, he did assembly work and operated the machines personally, and he quickly gained an appreciation for Komax expertise. In 1991, he became Head of Sales at AAT Aston Nuremberg, our official representative.

After the fall of the wall, the great migration began

"I have to begin with the fall of the Iron Curtain in 1990. Until that time, it was all but impossible to move production facilities to these low-cost countries because just-in-time supply chains required guaranteed shipping times of typically five days. So it's no surprise that this massive wave of emigration, mainly to the Czech Republic, began immediately after the wall came down."

Was it mainly large companies that benefited from that? "Exactly, it was the smaller and medium-sized companies, which had often been suppliers for the departed large companies, that stayed. Now they had to shift gears. The demand was for extremely high-quality specialties that could be delivered quickly and flexibly, often in small batches, such as products for switch cabinet and machine manufacturing."

The solution was billed as: automation with machines from Komax

What did that mean for Komax? "In order to manufacture economically in the expensive west, those that stayed absolutely had to automate and they needed our machines for that. That's the background story. We established our company on March 1, 1994, in order to serve that market demand. Nine employees moved from AAT Aston to us in order to take over sales and service for the fully automatic machines."

AAT Aston retained its representation for Komax semi-automatic machines. Was this split favorable and amicable? “Absolutely, and definitely beneficial to our largely shared customer base. The collaboration is a close partnership and works outstandingly well. We share information and recommend each other, meet regularly and, when called for, visit our customers together.”

Success thanks to adaptations and additions from the in-house workshop

Today, the 28 employees of Komax Deutschland sell and service the entire range of Komax fully automatic machines, with in-house staff also in the Czech Republic to offer the full range of the primarily German company from a single source. Customers particularly appreciate the exceptional services offered, with 10 service technicians and roughly 3,000 articles of spare and wear parts continuously in stock. Then there are the specific process modules, custom application components and standard machines adapted to special customer requirements that are handled in the in-house workshop.

The popularity of the services developed specifically for the German market is amply demonstrated by a visit to one of the earliest Komax customers, Engeser GmbH, headquartered in the city of Schramberg in the German state of Baden-Württemberg. The company has some 700 employees at locations in Germany, Romania and the Czech Republic. Their specialties in the field of wire production are customer-oriented system

solutions and their entire portfolio of ferrules and technical plastic components is of the highest quality.



“We value our close, long-standing collaboration with Komax Deutschland,” says engineer and CEO of Engeser GmbH, Dirk Kinzel: “Matthias Klaus has been our contact since his time at AAT Aston, so for about 30 years now. I am delighted that I could take over, and even expand, this excellent relationship from company founder Gerhard Engeser. After beginning in the field of wire production with primitive tools, we quickly shifted to automation and were successful with it from day one. Since the 1990s, we have worked exclusively with fully automatic machines from Komax and use their entire range.”

One of the original Komax customers: Engeser GmbH, based in Schramberg, Baden-Württemberg. The company has some 700 employees at locations in Germany, Romania and the Czech Republic.



“Since the 1990s, we have worked exclusively with fully automatic machines from Komax and use their entire range.” Engineer Dirk Kinzel, CEO of Engeser GmbH (right), with Christian Haas, Director Plant 1 and a fully equipped Alpha 356.

What is special about the relationship with Komax Deutschland? “You need strong partners to get to the top, and that was equally true for both us and Komax. We benefit from the innovative strength of the global market leader, as well as the comprehensive and efficient support provided by Komax Deutschland. For its part, Komax benefits from the valuable expertise of our company, which is extremely successful in the German market. We continually test new developments, evaluate them critically and suggest enhancement and optimizations, so we also play a role in the competitiveness of their standard products.”

“We know almost all of the Komax employees and can feel their strong team spirit”

So it's a real give-and-take situation? “Absolutely. We and Komax grew up and became successful together. That only works if both partners – as was the case with us – place great stock in maintaining continuity. I experience this continuity in my everyday dealings with the team at Komax Deutschland, in discussions concerning the ongoing training of our staff in Nuremberg and in their flawless service, which we have to thank for the fact that we have essentially no unplanned downtimes. All of that is very important to us. We know almost all of the employees at Komax and feel their strong team spirit; everyone takes responsibility and passes tasks along to colleagues when they can't do something right away themselves.”

“Engeser is currently in a major development phase. With specialists from Switzerland, we are implementing the Enterprise Manufacturing Execution System for the wire processing industry (MES). We expect significant automation requirements for our plant in the Czech Republic over the coming years. So we are delighted that we can also work with Komax Deutschland there.”

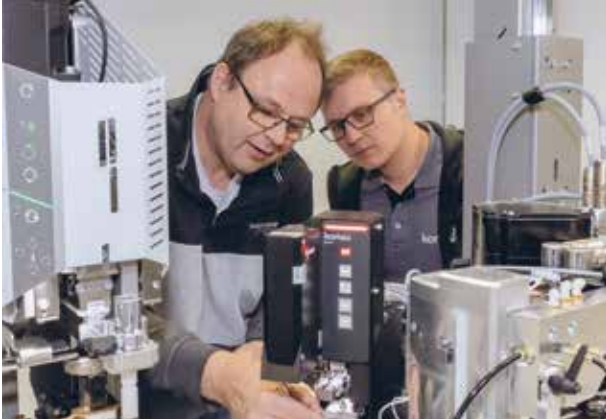


In the Nuremberg showroom, Matthias Klaus (right) talks to Peter Heinlein (Head of Applications) about customer-specific adaptations to an Omega 750.

Kudos to Komax Deutschland, particularly for the services provided by their staff and their exceptional team spirit! What's the secret, we ask Matthias Klaus. “We work hard to accomplish the objective. Loyalty to the company and continuity are important factors. Our team has an average of 15 years of service. There are still seven of us from the founding generation.”



A foursome performs an insertion analysis. From left: Matthias Klaus (CEO), Emil Novy (Sales/Service Czech Republic), Peter Heinlein (Head of Applications), Albert Schuster (Head of Sales).



Mentoring at Komax Deutschland: Service Director Raimund Schmidt shares his knowledge and experience with junior service technician Felix Hofmann.



Junior service technicians: Lukas Wagner, Felix Hofmann, Moritz Kugler

And yet it is also important to keep bringing new people into the team so that the coming generation will be just as capable and successful. "It starts with the employee selection process. We're not looking for the fully trained individual with lofty career ambitions. The important thing is that they have a solid basic education and fit well with our existing team – someone who values camaraderie and a first-class working environment."

"Each new employee gets a mentor"

Then Komax Deutschland trains its employees itself? "To a great extent, yes. Each new employee has a mentor who, over the years, imparts all of his or her knowledge and experience to the newcomer and also, of course, introduces them to the customers with great care. It works. Many also – entirely voluntarily – do activities together outside of work. We continually have teams taking part in triathlon and marathons, for example."

What's on the agenda for the next quarter century? "For starters, we're preparing the in-house show in June, where we want to celebrate our anniversary together with our customers and most important partner companies. This includes plans for three workshops. We also have the goal of staying number one. And we are using highly digitalized communication to that end. For 20 years, our sales and service staff have been maintaining a customer database that

is continuously updated to reflect the latest information. This year, we started having customers sign our reports digitally. We're very optimistic about the future, not least because our internationally active group gives us the freedom we need to serve the market optimally."

Komax has four companies with over 300 employees in Germany:

Komax Deutschland GmbH

Nuremberg,
sales company for fully automatic machines

Komax SLE GmbH

Grafenau,
customer-specific solutions

KABATEC GmbH & Co. KG

Burghaun,
taping and assembly technology

TSK

Porta Westfalica,
testing systems



Artos Engineering in Brookfield, Wisconsin, USA

KOMAX GROUP

KOMAX STRENGTHENS ITS PROXIMITY TO CUSTOMERS IN NORTH AMERICA AND NORTH AFRICA WITH ARTOS ENGINEERING AND KOMAX TSK MAROC

The Komax Group has set itself the goal of getting closer to its customers in order to offer outstanding sales, engineering and support services with the shortest possible reaction and delivery times. With the acquisition of Artos Engineering and the founding of Komax TSK Maroc, Komax is strengthening its proximity to customers in North America and North Africa and further extending its global presence.

With the acquisition of Artos Engineering in March 2019, customers of the Komax Group will now receive additional competitive advantages. Artos Engineering, founded in 1911 and headquartered in Brookfield, Wisconsin (USA), has 50 employees. The longstanding company stands out due to its proximity to customers, its product portfolio and its extensive experience in the development of innovative applications for wire processing equipment. In the course of its long history, Artos Engineering has delivered more than 100,000 wire processing machines to its customers.

Competitive advantages for customers

John Olson, CEO of Artos Engineering, is very happy to now be part of the Komax Group and lists the advantages for customers: "Our enormous expertise in the development of customer-specific applications, combined with Komax's broad product portfolio, offers our customers an unrivaled

range of solutions for all areas of automated wire processing." Matijas Meyer, CEO of the Komax Group, adds: "Our customers benefit from the strengths of both companies. Thanks to new, innovative solutions that we are launching this year and in coming years, our customers will receive even more advantages compared to our competitors."

Greater proximity to customers in North America

Komax had already strengthened its proximity to customers in North America at the end of 2018 through an asset deal with TE Connectivity's Application Tooling division. TE Connectivity sold the sales business relating to Komax products in the US, Canada and Mexico to Komax.

Strengthening the testing business in North Africa

To increase proximity to customers in the booming North African market and to achieve

an even stronger position in the testing business, Komax founded Komax TSK Maroc in November 2018. It is headquartered in the port city of Tangier (Morocco), on the Strait of Gibraltar. When founding the company, Komax also acquired assets and all employees of TX Mechatronics, which manufactures testing systems in Morocco. Komax TSK Maroc was thereby able to commence operations with 20 employees.



Komax TSK Maroc in Tanger, Morocco

MICROPULL 10

ENSURE QUALITY – VERSATILE AND EFFICIENT

The MicroPull 10 table device can be perfectly tailored to each customer's needs. Whether single measurements with or without standard specifications for quick checking of a pull-off force value or verification of a measurement series, the operator will always be able to select the right mode for the job. Operating the device is easy and intuitive with our completely redeveloped user interface.

Intelligent verification

Pre-configured measurement modes enable the user to customize the device for individual client standards. The MicroPull 10 supports the user in defining and evaluating the measuring task. In the process, errors typically made through definition, execution and evaluation are reduced to a minimum. Access rights can be limited on a user-dependent basis.

Effective verification of standards

Easy integration of verification standards allows to accomplish any necessary tests with one push of the button. The MicroPull 10 performs the evaluation and displays the results to the user in one view. It is possible to access all measurement results and to perform the necessary verifications at any point.

The tool for detailed testing

Thanks to its various additional features, the MicroPull 10 is well suited for detailed process quality testing. Using the integrated statistics mode, measurements can be easily performed on site. In addition to the usual determination of pull-off force, retaining forces can also be specified with dwell times.



MIRA 440/440 SF

MAXIMUM PRECISION FOR MULTI-LAYERED CABLES

The Mira 440 and Mira 440 SF are the first choice for the stripping of coaxial, triaxial and multi-layered cables. They also offer a broad processing range of 0.02 – 13 mm² / AWG 36–6 for single wires, while their rotary flat blades and centering guarantee a precise, smooth cut. Thanks to sequence functions and a wire library, they enable high productivity and reproducible quality.

The new programmable Mira 440 is the ideal wire stripper for wire harnesses with a large proportion of coaxial, triaxial and other multi-layer cables up to 9 mm outer diameter and 40 mm strip length. It guarantees the high level of precision required for coaxial connectors along with a smooth cut thanks to rotary flat blades and accurate centering. It can also be used for single-conductor wires and multi-core cables at 0.02 – 13 mm² / AWG 36–6. The Mira 440 SF model is tailored specifically to semi-flex cables. Both of these latest generation Komax machines boast a comprehensive range of functions, intuitive operation and smart design.

Ultimate precision thanks to rotary cutting and centering

The narrow tolerance ranges for coaxial connectors require exceptionally accurate strip lengths. Komax developed the Mira 440 and Mira 440 SF to meet these high requirements. They remove the concentric layers using a precise rotary cut without releasing the grippers. At the same time, the blade's smooth cutting surface is directed towards the dielectric and the wire is centered precisely using centering devices. Strip length and incision diameter can be adjusted with a high level of accuracy in 0.01 mm increments. The Mira 440 SF features an optimized cutting geometry for processing semi-flex cables.



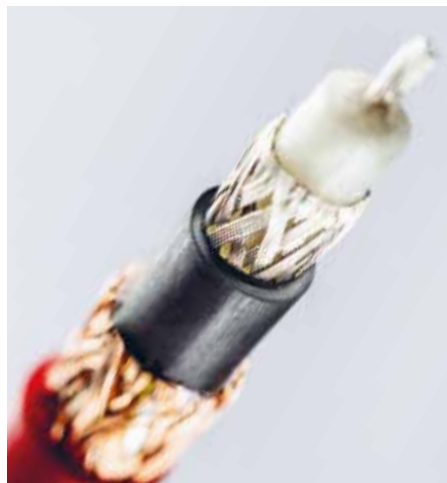
Rotary incision, centering
and flat blades for the
smoothest cut.



Fast and functional at a reproducible quality standard

Working with the Mira 440 machines saves a lot of time. Wire harnesses with a combination of single-conductor wires, multi-core, multi-coaxial and hybrid cables can be processed sequentially one after another. Versatile functions such as trimming, offset pull-off, multi-step stripping and twisting the strands increase quality and productivity.

All the processing steps for each article are saved in the wire library and can be repeated whenever necessary at reproducible quality. At the same time, smart touchscreen operation provides intelligent search and filter functions, while articles can also be scanned in error-free using a barcode scanner. A trigger sensor starts the process automatically when the wire is inserted.



Coaxial processing up to nine wire layers.



Processing a wide range of wire types such as semiflex and shielded multi-conductor cables, wires with braided fibers and coaxial cables.



ALPHA 560

POWERFUL AND FLEXIBLE – DESIGNED FOR LARGE CONDUCTOR CROSS SECTIONS

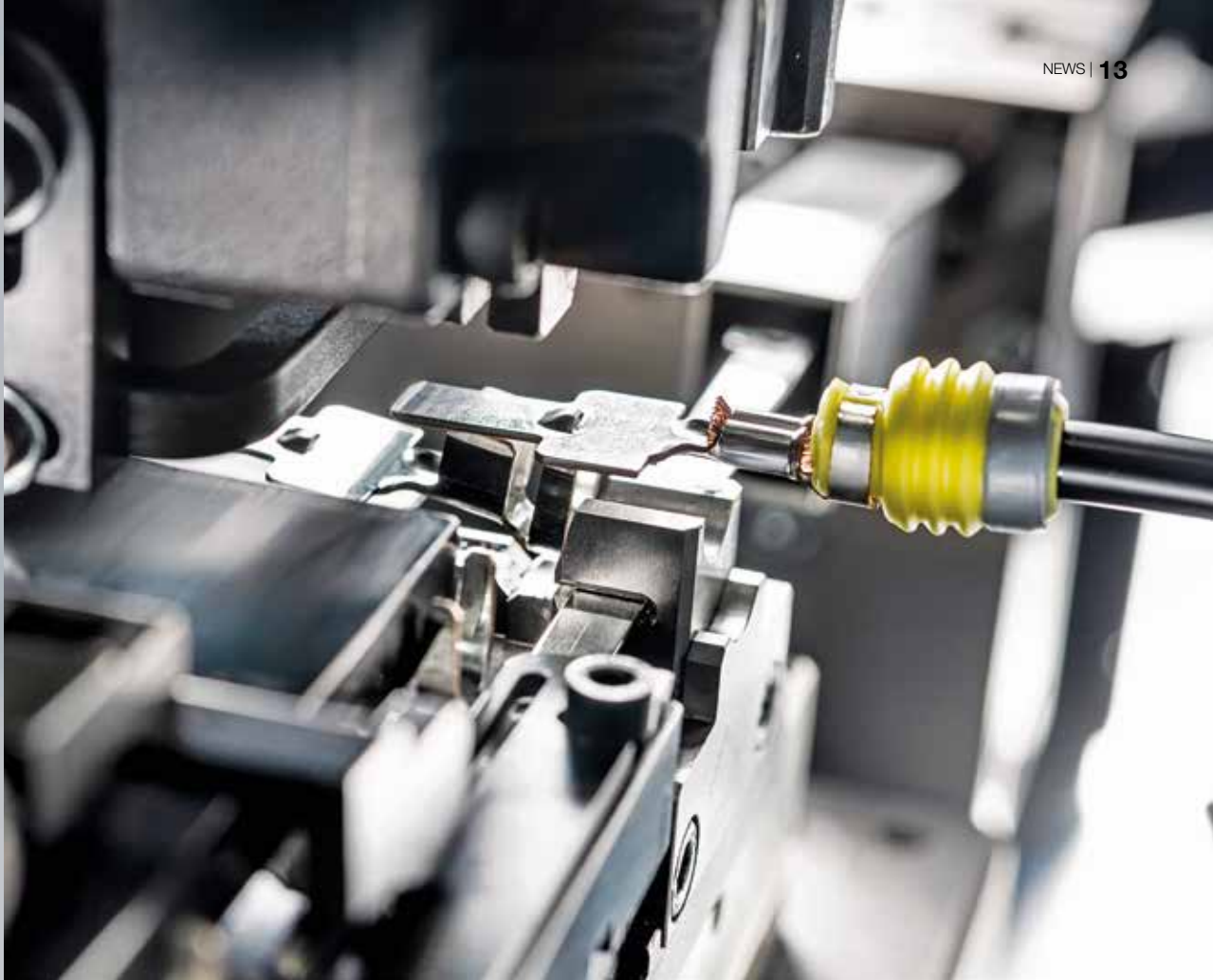
The new wire processing machine processes demanding terminals and large seals fully automatically – even in rough environments. It offers a broad processing range, with cross sections of 2.5 – 16 mm². Thanks to a flexible process module setup for minimal setup times and downtime, the Alpha 560 guarantees high productivity.

The Alpha 560 from Komax is a powerful, fully automatic wire processing machine for one- or two-sided loading with large terminals and seals. Two crimp modules and two seal modules each cover the uniquely broad spectrum. They handle conductor cross sections of up to 16 mm² (AWG 6), such as those used for grounding, battery and solar wires. Fittingly, they can also process correspondingly large terminals and seals. Operation with the large 22" HMI touchscreen is simple and quickly learned in a short training course. With the so-called Green Button, the user is intuitively guided by the innovative HMI controller. The flexible process module setup ensures short changeover times. The entire stripping process down to the finished

crimp is assured by a fully integrated, end-to-end quality monitoring system.

Performance across a uniquely broad processing range

The Alpha 560 processes conductor cross sections of 2.5 – 16 mm² (AWG 14 – 6), complex terminals up to 55 mm in length and large seals up to Ø 18 × 21 mm. With a crimp force of 50 kN or higher, the new C1380 crimp module guarantees problem-free processing of even the most demanding terminals. Cable positioning directly on the module saves time during setup, changeover and sampling and creates the conditions for maximum productivity. The new S1441 G seal module masters up to 380 different seal variants quickly and



With a crimp force of 50 kN, demanding crimp terminals of up to 55 mm in length can be processed with ease.

reliably. Automatic seal detection and stored parameters significantly reduce set-up time. The modules reliably guarantee high performance even in harsh environments. Quality components from the proven Alpha 5xx platform complete the robust design.

The perfect setup for high efficiency and productivity

Optimized work processes and operating functions promote efficiency and increase productivity. The flexible process module setup simplifies procedures and ensures very short changeover, start-up and reset

times. Wire positioning directly on the module saves time. The touchscreen assists the user with a clearly structured user interface. With the Komax Green Button, the innovative HMI controller simply and flawlessly guides the user through the processing procedure.

Reproducible quality, comprehensive service, inexpensive maintenance

The Alpha 560 features a forward-looking quality concept: fully integrated quality monitoring functions oversee the entire manufacturing process through to the fin-

ished product. The monitoring functions for crimp force (CFA+/CFA), seal position and strip quality ensure maximum quality with minimal rejects. With the integrated quality monitoring functions, faulty products are automatically rejected. Using statistics, image storage and network capability, product quality can be traced from end to end. With comprehensive services, Komax ensures and strengthens the productivity of the Alpha 560. The modular Komax commo part concept lowers costs for the procurement of spare and wear parts.



With the double-blade holder, two different blade edge radii or special blades can be selected at the press of a button.



Quick and reliable setup directly on the crimp module.



A wide range of process options for a large selection of terminals.


SIGMA 688 ST

OEM QUALITY WITH ONE MACHINE AND THREE FULLY AUTOMATED PROCESSES



Sigma 688 ST enables, for the first time, fully automatic processing with twisting and simultaneous taping of both open wire ends. The automated overall process improves performance, productivity and profitability. The integrated taping function simplifies logistics and ensures high quality for downstream operations. Thanks to dimensionally accurate reproducibility, it complies with the strictest OEM quality specifications.





Optional "short lengths" processing set for twisted wires from 150 mm (with activated spot taping modules from 300 mm).

Manual work takes time, costs money and is prone to error. A situation that has, ultimately, only one solution: full automation of all processes. As the first fully automatic twisting machine, the Sigma 688 ST now facilitates the entire process, from processing and twisting to spot taping open wire ends. Thanks to spot-taped UTP wires (Unshielded Twisted Pairs), it fulfills OEM quality requirements when wires need to be fixed on a fully automatic twisting machine in a single process. This move to automation enhances both process security and stability. It allows manufacturers to enhance their performance, productivity and profitability while creating reproducible quality at OEM levels.

First fully automatic overall process

For UTP wires used in applications with high data transfer speeds (CAN FD, FlexRay or 100 MBit/s Ethernet), OEMs require open wire ends to be spot taped for quality reasons. This prevents ends from opening up unintentionally during downstream logistical steps or manual loading. For the first time, the Sigma 688 ST now permits fully auto-

matic processing including double-sided spot taping at the first intersection point. It guarantees reproducible quality with high performance. Tried and tested, innovative monitoring systems ensure OEM-compliant quality and precision.

Greater flexibility and profitability – simplified logistics

The Sigma 688 ST allows economical parallel processing of two single wires (bulk goods) in one go. Automatically spot-taped UTP wires no longer need to be moved on to a manual spot taping station. This cuts out one step of the process and reduces the need for floor space and resources, scaling down the cost of logistics overall.

The spot taping modules can be activated or deactivated on both sides or on one side, depending on the article. The WPCS interface can be used to save time by communicating stored taping parameters between the machine and ME system. Processing sets are available for "short open ends" and "open ends standard". Three others are also available as an option: for long and unequal

length open ends, for short lengths and for small cross sections. A variety of different options are ideal for marking, optimized loading thanks to the terminal pre-orientation module X2880 and quality assurance. A wide selection of suitable accessories do their bit to significantly boost overall efficiency.

The latest technologies, efficient operation and maintenance

When starting, the wire pull-out carriage with integrated delta length analyzer (DLA) guarantees gentle feed-in of two wires as well as high length accuracy and symmetry. The wires are processed flawlessly via the dynamic twisting head featuring an AC servo drive. In the process, the integrated twist force analyzer (TFA) checks forces, regulates corrective motion and guarantees precise twisting. A wireless ICS power transmission system and autonomous air-pressure storage system allow the omission of the drag chain at the wire-puller carriage. A pivoting operator console ensures optimal ergonomics and takes up minimal space. Operation is made easy by sophisticated handling,



Taped unshielded twisted pairs (UTP) that fulfill OEM quality requirements.

assisted by: touchscreen with graphical user interface, two-hand operation directly at the crimp modules, easy-access stations as well as quick tape changes and bar code verification. What's more, the simplified hardware architecture and oil-free compressed air supply keep maintenance to a minimum.

The outstanding functionality and innovative force of the Sigma 688 ST is typified in the unmistakable machine layout and design developed by market leaders Komax.



Time-saving, simultaneous, double-sided spot taping of wire ends.

DRAINWIRE FROM KABATEC

SHIELDED CABLES ON DEMAND – JUST IN TIME

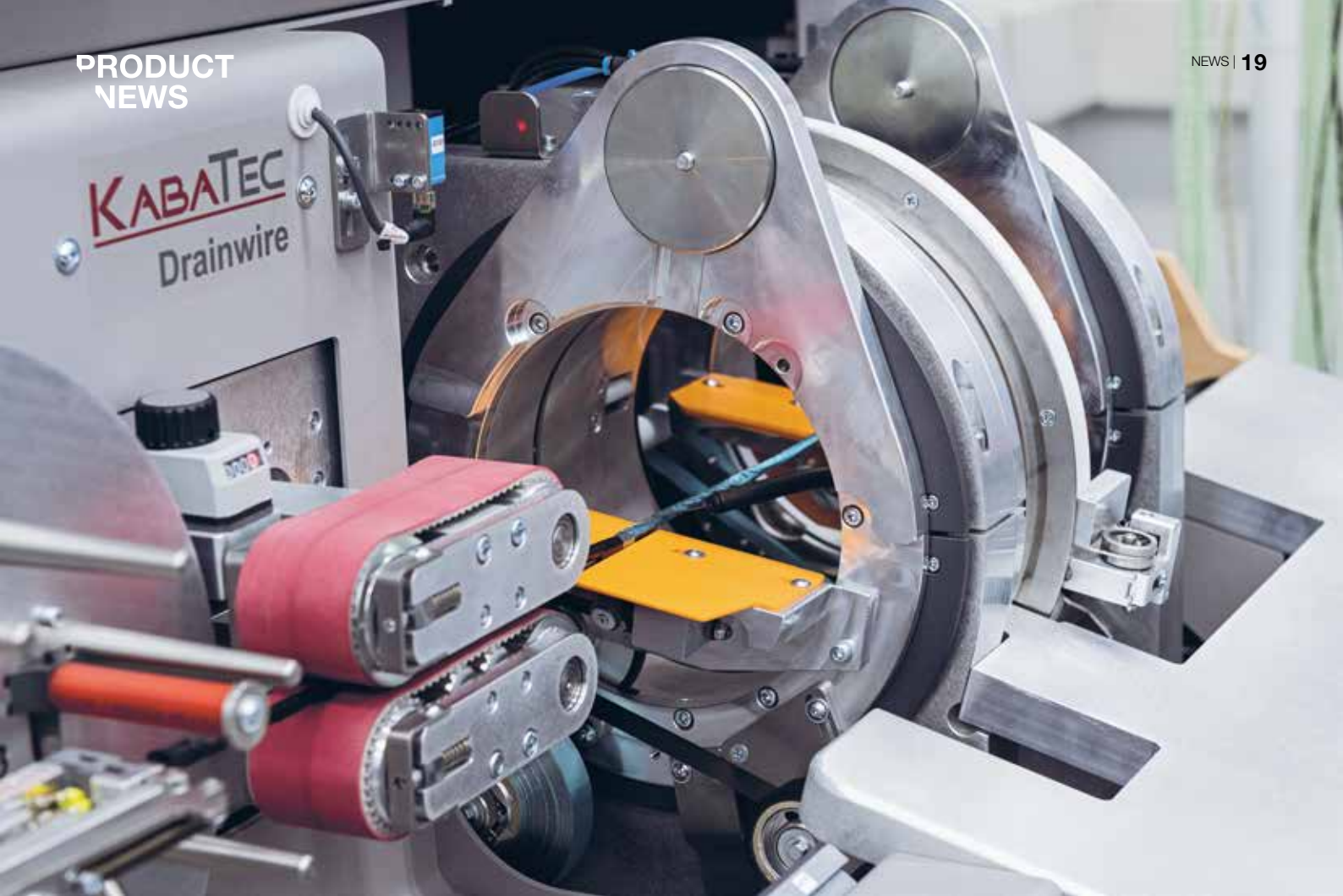
Reduced storage costs, increased capacity – a significant side effect of the new Drainwire from Kabatec. This high-quality machine enables you to produce shielded cables on demand. It processes aluminum shield tape, drain wires and cover tape in a single operation. Three separate winding heads create internal or external shielding as required. The just-in-time production saves storage costs and the planning capability ensures optimum capacity of upstream Komax machines such as an Sigma 688 ST.

Rising demands for speed and quality

Speed demands for the networks in cars are increasing rapidly. High-speed data transport in the latest infotainment systems and autonomous vehicle functions requires a growing number of increasingly specific

shielded cables. Kabatec has developed the innovative, flexible Drainwire machine in close cooperation with a long-standing customer to enable suppliers to provide agile, just-in-time production of the highest quality.





Variable arrangement for aluminum, PVC tape and drain wires

Thanks to the combined length measurement and belt feed system, the Kabatec Drainwire is very compact. It processes both twisted and straight wires, whereby the structure of aluminum tape, adhesive tape and drain wire is available in two variants. The shielding can either work against interference signals from the outside or the other way around – the environment is protected against electromagnetic interference signals. Three separate winding heads enable the required variability. The first winding head applies the aluminum foil. A winding head with a changeable coil inserts the drain wire as a spiral or parallel. A third winding head with double tape intake winds the aluminum and/or the PVC tape.

Free programmability and high process stability

All process-relevant parameters can be programmed – including the overlap of aluminum tape and PVC tape, inclining the drain wire, winding lengths and rotation speed of

the winding head. Up to 200 programs can be saved and quickly selected via the bar code scanner.

Drainwire meets increasing quality demands with high process stability. Machine production without operator influence guarantees the required consistent wire quality. Wire coils no longer need to be formed by hand or using a separate machine as the wire harness is automatically transferred from the linear gripper system to the coiler. The final process step thus results in a fully coiled end product. When it comes to ease of use, the Kabatec Drainwire leaves nothing to be desired: the operator controls the machine functions via touchscreen – ergonomically at a height that can be electrically adjusted to suit them.

Continued development of tried-and-tested machine concepts

With Drainwire, the Komax subsidiary Kabatec is launching an innovative machine that anticipates future developments in the automotive sector. Kabatec has achieved

this consistent development based on tried-and-tested taping machines such as the KTR 10 and the KTR 100. In contrast to these, it processes wire harnesses with drain wires and incline options to internally or externally shielded cables. The advantages of this just-in-time production are clearly evident in practice: a lower number of cable drums in storage and the ability to create custom wire harnesses at any time, in perfect quality.



EASYTOUCH, A NEW EASYWIRING ADDITIONAL FEATURES

THIS SOLUTION REDUCES THE COMPLEXITY AND DURATION OF HARNESS MANUFACTURING

Planes, trains, cars and ships contain thousands of wires that connect their various electrical systems through an electrical wire harness. The manufacturing of this wire harness is a monumental and complex task. Technicians have to deal with a plethora of assembly instructions to help them locate the appropriate wires before cutting them to size and connecting them to the proper components. In the electrical harness manufacturing process, technicians typically use wooden nail boards and large paper drawings at present. In many cases, mistakes are made due to wrong information, a misunderstanding of instructions, improper training and the normal human error that accompanies any manual process.

Some of the more typical errors that are made during the construction of the harness can be traced back to simple mistakes such as a lack of preparation, the use of inadequate equipment, mismatching of hardware due to an accumulation of wrong data, improper harness layout or even the

incorrect use of a technique or tool. Additionally, the more manual a process, the greater the chance of human error. A double quality check is required to root out potential errors. Unfortunately, this adds to the time and productivity lost along the way.



Electrical harness manufacturers have been searching for solutions to reduce production time and related errors. Laselec, located in Toulouse, France, has developed an alternative to the traditional harness building method: EasyWiring interactive harness boards. This innovative solution modernizes electrical harness manufacturing by using software that guides the operator through the entire harness assembly process. The benefits of this system are readily realized and include increased productivity, reduction in training time and, most importantly, traceability. On the screen, EasyWiring displays step-by-step instructions, routing paths, type of tools or even interactive pictures of targets to insert the terminal. EasyWiring even reduces the risk of an error and decreases the time spent on prototyping.

Laselec EasyTouch

EasyTouch is a new additional feature for the EasyWiring interactive harness assembly board manufactured by Laselec. It reduces the complexity of routing operations and harness manufacturing control.

Touch mode

With EasyTouch, a simple touch of the wire end is all that is necessary to display the routing path and the pinning information on the interactive assembly board. The human factor of the misidentification of a single wire can be reduced to zero with this feature.

Continuity test mode

After finishing all routing and insertion operations, the operator can perform a continuity test by connecting the harness to the EasyTouch test unit. This checks the correct

connection of each terminal on the complete harness and allows the operator to detect and correct any errors directly on the assembly board. A test report can be generated as a final result, thus ensuring rigorous control.

Key benefits

This solution reduces the complexity and duration of harness manufacturing: the operator is guided throughout the workflow and no paper documentation is needed.

With the Touch Mode, the operator no longer needs to use a barcode reader or the keyboard to display routing and pinning information on the EasyWiring board.

The continuity test mode reduces routing and pinning errors. Corrections can be performed directly after the in-line test.



AUTOMATIC SOLUTIONS FROM LASELEC

RAPIDSHARE SYSTEM

Laselec's automatic solutions began with the RapidShare automated wire processing line in the year 2014. Laselec has now developed a new version of the automated wire processing line to satisfy new customer requirements while further optimizing harness manufacturing.

With the new RapidShare Wire by Wire, labels with the necessary information can be applied at both wire ends.

The new fully automatic and highly autonomous RapidShare bundles the wires into coils, tapes the coils, applies a label for identification and loads the kitted coils onto a stack in a bin. Even the bin dividers are handled automatically by the system. With identification by QR codes, the system ensures traceability and accuracy while the bins are removed or loaded.

Together with the ULYS Modena laser marking machine, the RapidShare system will prepare your material at the highest level: a cut-to-length, laser-marked and labeled wire coil, pre-kitted in bins ready to deliver to your harness assembly – fully automatic and autonomous with 24/7 production. Successful installations such as at Safran in Villemur-sur-Tarn show the power of the combination of the ULYS Modena and RapidShare system production.

"RapidShare enables us to offer solutions that meet the requirements of aerospace customers. Below is an example of a satisfied customer, Safran Electrical & Power, one of our major aerospace customers.



Florian Bila,
Laselec, Automation Project Manager

"This automation is fully in line with Safran Electrical & Power's Factory of the Future approach. It reduces operator interaction on difficult or low-value-added tasks. This in turn allows for a greater allocation of time to the high-value-added tasks. Reliability and standardization are also improved by increasing consistency, which translates into trust from our customers. And last but not least, it is allowing us to remain competitive."



Alain Ferrero,
EWIS Eurasia Director of Operations



Safran Electrical & Power in Villemur-sur-Tarn, France, has taken a new step towards their "Factory of the Future" with the acquisition of a Laselec RapidShare system. Following a validation period, this automated marking and cutting production line has been adopted by various teams.

"With the previous machine, we changed spools for each new type/gauge. The new machine is pre-loaded. Just select the production files you want to run and the system will feed the proper cables, thus reducing spool handling. In addition, cables are sorted by electrical reference. Physically, you feel better and you save time!"

Mark and Cut Operator

"This automation has allowed a threefold increase in productivity compared to conventional methods. Almost all ergonomic risks have been eliminated! It is also an opportunity to increase the skills of the production and maintenance teams in the use and upkeep of this type of technology."



Jérémie Chauvot,
head of large production tools,
Villemur-sur-Tarn

© Alexandre Ollier

© Alexandre Ollier

KOMAX ON.LINE TRAINING

TRAIN EMPLOYEES QUICKLY AND EASILY

Komax On.Line Training, launched at the beginning of 2019, meets both the existing and new needs of Komax customers. It serves as preparation for the proven Komax On.Site Training and also supplements it. The key subjects in the wide range available are the fundamentals of wire processing, wire processing machines, software and quality tools. We spoke to Wolfgang Denk, Product Group Manager Services at Komax, about the idea, the concept and benefits.

What brought about this development and what were the objectives?

"Competently trained employees reduce unplanned downtime caused by operator error or incorrect maintenance. By introducing Komax On.Line Training, we are supplementing the long-established Komax On.Site Training. It is generally intended for familiarizing new personnel quickly and easily, improving and expanding existing expertise as well as for reducing company training costs and expenditure. With On.Line Training, your employees can gain certification and be prepared for On.Site Training in the Komax Academy."

In line with the participants' learning speed and existing knowledge

How are the individual training sessions structured?

"All have a common, clear structure with an introduction and also the overview of the machine, safety, operation, maintenance, troubleshooting and testing. On the first page, the trainees learn what the training module is specifically about, the objectives to be achieved and how much time it will take. Generally speaking, that is approximately 30 to 45 minutes."

Why is Komax On.Line Training particularly good as preparation for On.Site Training in the Komax Academy?

"The training is interactive and adapts to the learning speed of the participants. With a click of the mouse, they can view more detailed content and go back to the lesson to repeat the steps. In the exercises, they get continuous feedback about their input. If

they already have prior knowledge of something, they can skip content. This is the ideal way to bring trainees with different skills up to the same level."

Less training required, more transparency

How does the customer benefit as an employer?

"Firstly, Komax On.Line Training reduces the need for internal training thanks to its clearly structured, practice-oriented, specific training with flexible access and 24/7 availability. Secondly, it provides transparency about what skills the participants have, which additional training steps could be of interest in their development and which subjects need to be repeated. The final test with a personalized certificate ensures all of this. This test has multiple choice questions and gives the percentage of correct answers."

How did Komax customize the training for customers?

"We have been developing and using internal web-based training for many years and use this to teach about products, safety or work processes, for example. In this way, we guarantee consistent knowledge across the workforce. Why should we not also use this valuable expertise to benefit our customers? We knew there was interest, but would it be accepted? A customer survey of trade fair visitors and field trial customers produced extremely positive results. All the trial participants were enthusiastic about the training and gave us valuable tips for optimizing it and making improvements. We really hit the mark with this idea."



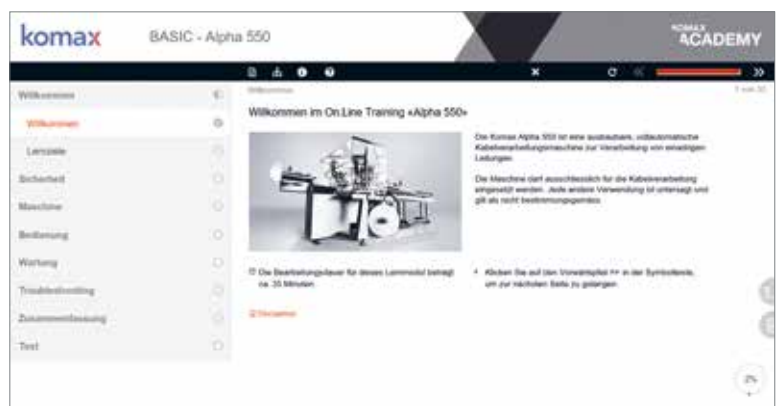
The trainees can access Komax On.Line Training via a web browser on a PC or tablet at any time.

Ongoing expansion of the training

Is the current range of training final?

"No, we are always expanding it. Our goal is to offer specific training for each product, each software program and all process and quality modules."

For detailed information about the On.Line Training, please visit academy.komaxgroup.com or contact your local sales representative.



At the start of the course, training participants receive a summary of the objectives and the time required to give them a good overview.

Komax On.Line Training

Target group: New and experienced operators, maintenance staff, shift supervisors and quality control staff

Subject areas: Fundamentals of wire processing, cutting and stripping units, crimp to crimp machines, machines for producing wire harnesses, process modules, software and networking, labeling, quality tools, bundling and taping machines, test systems

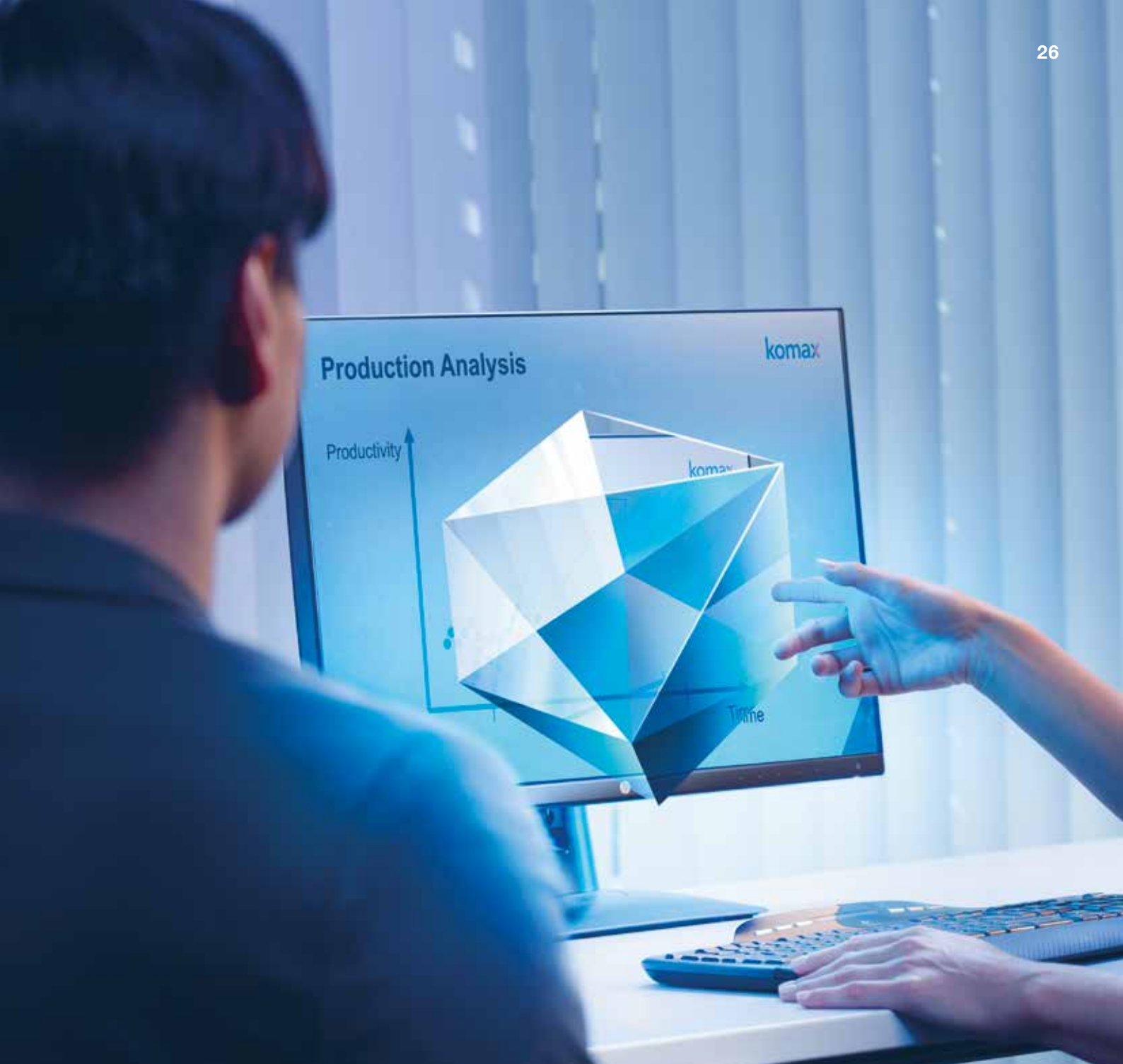
Languages: German, English, Spanish, Chinese – other languages on request



How the interactivity works: clicking on a red square displays further clarification.



Get a demo version of
Komax On.Line Training.



KOMAX PRODUCTION ANALYSIS

MAXIMIZE PRODUCTIVITY – BUT HOW?

Greater output could be achieved on some Komax equipment. This typically involves boosts in operations, logistics, process organization, maintenance, etc. The maximization process starts with Komax Production Analysis, a service that forms part of the comprehensive Komax Services portfolio. Using this service, we ensure clarity and a reliable basis for improvement measures.



Anyone using Komax equipment for their production is opting for reliability, quality and speed – in short: high productivity and profitability. Nevertheless, we often find that our customers could get more out of their equipment with an optimized operational concept. With Komax Production Analysis, Komax provides a service that gets maximum productivity out of existing equipment.

We demonstrate how this works in an interview with Pius Anderhub, Product Support Manager Services. Mr. Anderhub carries out

production analyses at our customers' locations around the world.

Analyses that collect data at the customer's location

How does it actually come about that equipment falls short of its optimal productivity?

"It's very simple: because it's not run frequently and/or fast enough. It's then my job to use analysis to search intensively and meticulously for data regarding the causes of this."

How does this kind of analysis work?

"Analysis takes place at the customer's location in their usual production environment and typically takes three days. We pay attention to every tiny detail during this time. We examine the condition of the equipment, test the parameter settings, measure and observe how fast and how often the machine runs. Every time a downtime or interruption occurs, we record all the causes."

Causes of suboptimal productivity

What are the principal causes?

"Productivity losses can occur, for example, during the operating process, specifically in operation scheduling, in the settings, placement, transportation from raw material storage to the machine and to finished material storage as well as during assembly work carried out by the operator."

How do you gain the expertise and experience to assess these processes objectively and offer the right solutions?

"As part of advising customers all around the world, we have of course experienced all these processes and how long they usually take. We are something akin to intermediaries between our customers and are able to compare many different production sites. These different insights prove very useful and reinforce the high quality of our consultancy work."

Primary measures for the optimization process

Are there examples of how processes can be optimized?

"Yes, there are plenty. Logistics is important. For example, you can shorten distances to storage facilities or set up intermediate storage as and when required. There's also potential in the batch sizes, especially when an operator stops a machine to spot tape processed cables. Doing this for every 20 cables wastes more time than if they spot-taped 100 cables."

So, saving just a few minutes is worth looking into?

"Very often, yes. Multiply these delays over a whole day and this very quickly becomes several hours. It has an immediate impact on output. Sometimes customers also don't achieve optimal productivity due to employees slowing down equipment over time through errors in operation, instead of setting it up and operating it correctly."

Improvements in maintenance policy, quality tools and calibration

Other factors are production downtimes due to repair or maintenance works. Where these are extensive or unplanned, this can impact the entire production. What can customers do to minimize these downtimes?

"Quite a lot; they can, for example, plan maintenance better or replace wear parts preventively."

Too many rejects also curb production. What can customers optimize here?

"In these instances, the question is often whether this is remedied by new calibration or whether an improvement package is better, such as with the latest quality tools."

Creating clarity in conversation with customers

What happens once the Komax Production Analysis is complete?

"Using all our observations and findings, we then put together a report and discuss this together with the customer. Often they are not at all aware that a significant increase in production is even possible."

Do you need experience to have this discussion with customers?

"Yes, and we have this experience. Customers readily accept an assessment when someone external assumes responsibility for making the judgment, especially when it concerns the skills of operating personnel. We also communicate a sense of certainty to everyone that they will subsequently be more successful as a result of our assistance."

Catalog of measures with other customized Komax Services

Following the discussion, customers are aware of issues detected impartially as well as optimization potential and possible

improvements and receive an extensive catalog of measures. Core elements of this catalog are Komax services targeted specifically at maximizing production (see box).

All those years of experience allow you to assess just how much customers can gain in productivity through the measures suggested. Are the projections reliable?

"Our customers are very satisfied with our assessments and with the implementation of measures. This is another area where we benefit from the experience gathered over 40 years and from our market leadership."

Up to 20 % productivity possible

What happens once a customer gives the go-ahead?

"This is when the local branch or representative starts implementing the measures. They work directly with the customer in their own language and are able to respond very quickly because they operate within the same time zone. Once all measures are implemented, we conduct a second analysis that we can use to demonstrate the results achieved to the customer."



How great an increase in production can customers typically expect?

"It varies. With some projects, we were at more than 20 %. Even a 1 % to 2 % increase per machine already makes a big difference if you can multiply the findings across several machines."

Retailers and service technicians are in the know

How can customers use the services offered by Komax?

"Local retailers or service technicians are the place to go. They are rigorously trained and informed of every new development. If they do come across an issue that's harder to solve, they are in close contact with Komax specialists at our headquarters in Switzerland. In this way, we make sure our services are of the same high quality around the world."

KOMAX SERVICES

A range of services to maximize your productivity

The Komax Production Analysis described in this piece is the first step towards finding out how productively a machine operates. As set out in a catalog of measures, these other Komax Services are also performed:

Komax Spare + Wear Parts

Guaranteed regional or local availability of around 80 % of all spare parts, with express delivery on all other parts

Komax Emergency Plan

Clear scenarios and assignment of responsibilities in machine downtimes

Komax Service Contract

Service and maintenance contracts tailored to your needs

Komax Upgrade

Hardware and software upgrades

Komax Calibration

Verification and documentation that a product conforms to specifications and maintains tolerances

Komax On.Line and On.Site Training

Extensive training opportunities to ensure that employees are fully trained and work efficiently with Komax products

Komax Services – the best equipment deserves the best service

Komax currently provides a total of 17 services tailored to requirements across a piece of equipment's entire lifecycle. These services guarantee operation that is failure-free wherever possible, while allowing our customers to get the most out of their existing equipment and systematically align their potential with market requirements both now and in the future. They can use this to strengthen their position on the market while also yielding greater profits and higher quality in the mid to long term. We offer all services worldwide, whether in relation to machines, test systems or custom-made products.

komaxgroup.com/komax-services





WIRE YOUR SWITCHGEAR AND CONTROL SYSTEMS UP TO 80 % MORE QUICKLY

DIGITAL, AUTOMATED PRODUCTION PROCESSES INCREASE PRODUCTIVITY EXPONENTIALLY

Company growth does not necessarily require more staff or more space on the shop floor. Modern technologies provide control cabinet builders with great potential for streamlining their processes. Departments that work closely with each other in the digital sense significantly increase delivery performance – and create capacity for additional projects. The combination of efficient production and greatly reduced opportunity costs of lost orders quickly amortizes the required investment in software and machinery. Not least because the consistently first-class quality products will also turn customers into loyal customers.

One technician, one control cabinet, one week. Would that be your estimate? Then your employees are probably working with an average 300-page wiring diagram, plus a parts list, in order to build a control system. They manually prepare the housing themselves, they process, label and assemble the parts, then they wire them.

Modern technologies offer your industry great potential for optimizing your development and production departments. So, it is not a matter of whether internal processes should be digitalized and automated, it is a question of how and in what order.

The Institute for Control Engineering of Machine Tools and Manufacturing Units (ISW) of the University of Stuttgart addressed this exact subject recently. [Source: "Control cabinet construction 4.0 – a study into the potential for automation and digitalization in the manufacture of control cabinets and switchgears in classic mechanical and systems engineering," April 2017]

Engineering2Manufacturing – using ECAD documentation profitably

In its conclusion, the study highlights the virtual twin of the switchgear in the ECAD system as the key feature for all downstream processes. For your development team, this would mean using the full functionality of the ECAD system, including the checking routines that detect any anomalies in the wiring diagram, as only error-free data can generate reliable lists and overviews, culminating in a graphic visualization of the construction of the control cabinet. Available electronically, it makes the diverse range of tasks on your shop floor much easier.

W. Althaus AG, for example, a Swiss full-service specialist for industrial automation, is fully automated. Also, all production data is generated in formats that allow the housings

to be prepared automatically – or to process and label the mechanical parts and wires automatically. This produces no rejects and is much faster and more precise than would be possible by hand. This is confirmed by Marco Schneider, Managing Director of W. Althaus AG: "By using automation and networked work processes, we have significantly increased our company's efficiency. Wire processing machines and software solutions by Komax provide optimal support in our engineering and production process."

65 % quicker due to parallel processes in production planning

Another key to success (in terms of reducing opportunity costs) is to take tasks previously carried out in sequence by one expert and share them out amongst specially trained employees. This ensures that all the material required for the project reaches the required control cabinet and is ready to install over twice as quickly.

This succeeds because all the required data is available in relevant documentation as production starts. It enables the team to prepare the housings, the components for the control cabinet and the wires at dedicated stations quickly and accurately.

LEVELS OF AUTOMATION IN WIRE PROCESSING



MEDIUM LEVEL OF AUTOMATION

Cut and strip with the Kappa range by Komax

For smaller control cabinet construction companies, the first step in achieving automation is the automated labeling, cutting and stripping of wires according to their connection list.



HIGH LEVEL OF AUTOMATION

Crimp to crimp with the Gamma & Alpha series by Komax

Higher quantities require a higher level of automation. Alpha and Gamma machines also take over the final processing of the inner conductors with terminals.



MAXIMUM LEVEL OF AUTOMATION

Harness manufacturing with the Zeta range

The maximum level of automation reduces manual work to a minimum. Wires with various cross sections are processed sequentially, bundled and supplied according to assembly. This is carried out in the correct order to allow easy installation in the control cabinet. This enables swift, error-free wiring without the help of the connection diagram.

Adam Smith already proved the high level of efficiency achieved by this method in his study, "Division of Labor." To do this, Smith broke an overall process down into logical sub-processes that were carried out by specialists.

The following processes in your production can be transferred to automation solutions:

Housings: The digital twin produces all the CAM data in the ECAD system that is required for fully-automated sheet metal processing by CNC machines. They work extremely accurately, quickly and with all the required contours, so that assembly is possible without any reworking.

Mechanical parts: Employees cut the terminal channels, mounting rails and copper rails to length, pre-fabricate terminal strips and assemblies and label them at specially equipped stations. Using ECAD data, even these jobs can be handled measurably more efficiently by machines and robots. Especially when regularly used functional parts are pre-made in small batches and held in stock.

Wires and conductors: Pre-assembled wires have numerous advantages:

- Wire reels, tools, material for terminal parts, etc., do not take up space in the assembly shop if they are managed centrally.
- Wires, pre-cut for orders and fitted with ferrules and cable shoes, and wire harnesses are pre-sorted and available for use. This simplifies and speeds up the wiring.
- The indication of the component and connection points on the wire saves your employee a time-consuming search in the wiring diagram.

Various Komax machines process wires either semi-automatically or fully automatically. They offer the potential for making huge savings in both time and materials.

Data2Wire speeds up wiring by up to 80 %

One thing is certain – by far the most time-consuming task in constructing a control cabinet is the wiring. According to the ISW study, an expert needs around 25 hours, i.e. three working days, to wire a typical control cabinet with approximately 380 connections.



Digital wiring data accelerates this process by up to 80 %. If the ECAD item master data describes the component's dimensions and connections, all the required solid wire and cable information such as length, performance, etc., is available and can be installed by trained operators.

To do this, the operator is provided with the wiring plan digitally via the ECAD viewer – on a tablet directly alongside the control cabinet for which they require the information. On this, they can navigate easily through the documentation and access details in the parts list, terminal diagrams, wiring lists or the 3D view of the control cabinet construction. Just by tapping on it, they can find all the information they require and complete the work considerably more quickly than when using printed documentation.

If the ECAD item data does not provide the relevant information for the wiring, the Komax Digital Lean Wiring software can assist with this.

Digital Lean Wiring (DLW) for digitally guided wiring

In DLW, Komax has developed a tool that provides step by step support for the installation of pre-assembled strands. The viewer guides even semi-skilled workers through the wiring process safely and accurately. Each step is confirmed along the way. Meanwhile, your specialist staff can be deployed where their expertise is required.

DLW offers various options for importing and processing the connection data. If this information is not provided by the ECAD system, the Komax software allows it to be determined in a convenient virtual way. A high-resolution photo of the control cabinet, already fitted with the mechanical components, is also loaded in DLW. The connections can hence be mapped and processed quite easily.

Using DLW, a typical control cabinet can be wired completely within roughly one working day, meaning it is up to 20 hours quicker.

PARALLEL INSTEAD OF LINEAR

Conventional, linear production process



Automated, parallel production process



For example, with an average hourly rate of EUR 30, this means an average cost saving for you of approx. EUR 600 per cabinet. This also applies to a batch size of one.

Digital is cost-effective, starting from a batch size of one

Are all your individual jobs absolutely unique? Probably not. Most projects are variations of previous ones, matching by anything up to 80 %.

This is precisely where a digitalized engineering process with electronically accessible documentation can add huge value. Once the wiring diagram for a similar system has been adapted using just a few simple steps and validated by the system, the design engineer can start to generate the complete purchasing and production documents.

Here, just as with larger projects, digitalized processes provide flexibility and enable you to implement customer requirements right up until shortly before dispatch. And you can do this without affecting the delivery date as every engineering modification is also made available to production quickly in digital

form. Every control cabinet therefore also leaves your site with “as-built documentation.”

Conclusion

Current expectations from customers regarding the construction of switchgear and control systems, such as short lead-times, pressure on costs, skills shortages, frequent change requests during the project phase, small batch sizes and high quality requirements, no longer need to be such a challenge.

Under the same conditions, modern technologies and lean processes can increase your added value. With lead-times reduced by up to 65 %, you can fulfill considerably more orders with the same team and within the same space. At W. Althaus, this is already the case. Marco Schneider emphasizes, “Thanks to the targeted optimization and networking of our work processes, we have completely automated our production. With wire assembly, sheet metal processing, terminal block production and fully-automated wiring, we can offer a complete range of services.”



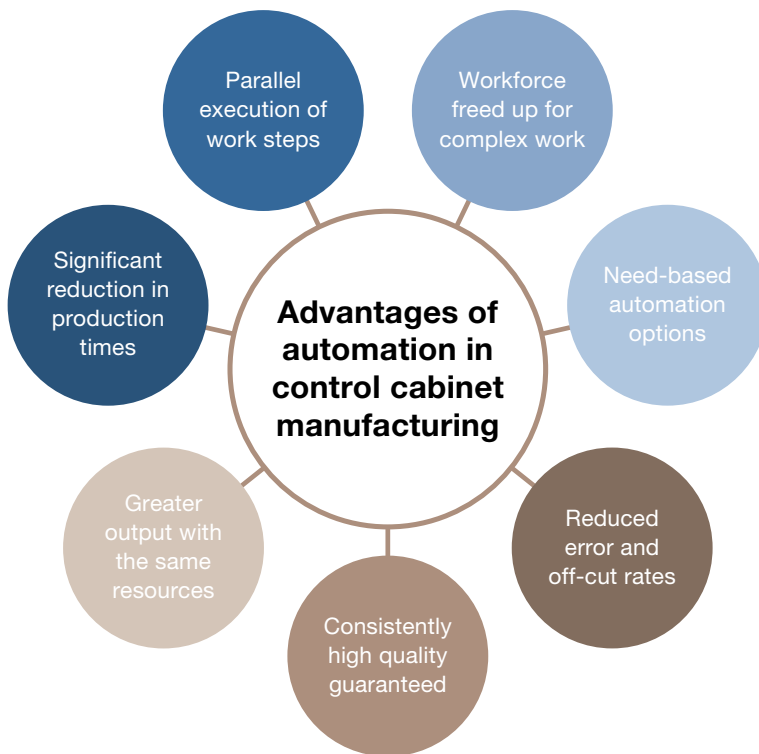
Dr. Tilman Hoss,
Director Market Segment Manager
& Business Development

“Through the close contact we have with our customers, we understand the growing expectations of our target markets such as energy, machinery, rail technology or system and building automation.

For Komax, this is reason enough to see automated control cabinet construction as a strategic issue and to reorganize accordingly. Together with our partners, our Customer Center Industries offers comprehensive, customized solutions,” explains Dr. Tilman Hoss, Director of Market Segment Management & Business Development.



BENEFITS AT A GLANCE



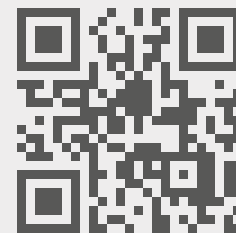
Best practice: Automation at W. Althaus AG

W. Althaus AG in Aarwangen has been the Swiss full-service specialist for industrial automation for over 50 years. Its core competence ranges from the development and production of simple electrical control components to complex automation solutions. The Swiss family-run company was founded in 1968 and employs over 100 staff.

“WE DIGITIZE OUR PROCESSES FROM PLANNING TO DELIVERY.”



Marco Schneider, General Manager, W. Althaus AG



Please have a look at the customer statement on YouTube as well as the information on "Automation in control cabinet construction".

40
YEARS
CUTTING
EDGE



Komax AG
Industriestrasse 6
6036 Dierikon
Switzerland
+41 41 455 04 55

komax
komaxgroup.com