



# KOMAX MES

software & networking

**komax**

# KOMAX MES

Today, wire processing takes place in a context of increasing complexity with demanding requirements in terms of productivity, quality and traceability. New materials, miniaturization and zero-defect production are the biggest challenges – coupled with a simultaneous increase in cost pressure on the products. In order to meet those challenges, production control through an industry-specific MES is absolutely essential. In collaboration with iTAC Software, Komax has developed the tailor-made manufacturing execution system Komax MES for the wire processing industry. It provides interfaces to different ERP systems and controls all processes with end-to-end transparency while increasing productivity and quality. Komax MES makes the wire processing sector ready for the Industry 4.0 era – the prerequisite for surviving and thriving in today's market environment.



## MES for Industry 4.0 in the wire processing sector

- Optimizes the entire value chain
- Ensures global traceability
- Offers high availability and complete scalability
- Developed by two industry leaders

## Across-the-board efficiency

- 100% timely delivery thanks to resource management
- End-to-end supply chain automation
- Increases overall efficiency and product quality
- Lowers inventory costs and capital commitment

## Quality and economy under control

- Increases transparency and prevents poor decisions
- Enables early recognition of bottlenecks
- Improves capacity utilization and increases product quality
- Automates order distribution and minimizes set-up costs

A man in a dark suit and light blue shirt stands centrally, gesturing with his hands. The background is a vibrant blue digital space filled with glowing white lines, circular progress indicators (one showing 0% and another 25%), and various data charts and graphs. The overall aesthetic is high-tech and futuristic.

# **KOMAX MES READIES WIRE PRODUCTION FOR INDUSTRY 4.0**

# OPTIMIZES THE ENTIRE VALUE CHAIN



## Makes wire processing Industry 4.0-capable

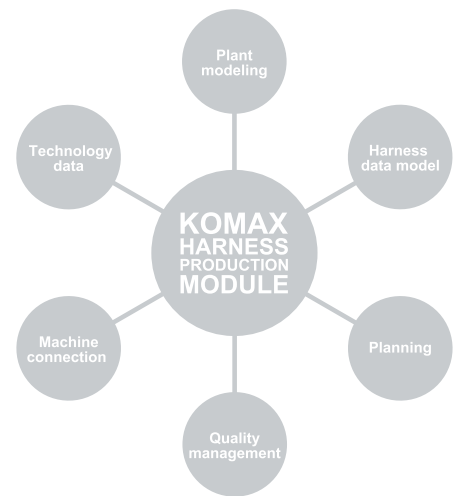
Komax MES is precisely tailored to the needs of wire harness manufacturing: flexibly scalable for all industries and companies of every size. The system has the requisite functional intelligence and can be seamlessly integrated into existing IT systems. This enables economical, individualized production of complex products for batches of any size. Komax MES optimally and economically handles the production of complex products, capital-intensive production processes with limited capacities, the manufacture of products comprised of numerous individual components and fast-growing production processes.

## Optimizes the entire value chain

Komax MES automates the planning, control, monitoring and analysis of all resources and all production processes: machinery, materials, operating equipment and staff are deployed optimally. The integrated production management capacity enables on-schedule production of complex wire harnesses in the desired quality. Across all process steps, from goods receipt to goods issue, Komax MES optimizes the entire value chain in wire harness production. Standardized interface technology combines machine (production) and ERP services (materials management, order processing).

## Increases competitiveness – reduces cost pressure

Optimization of the entire value chain enables maximum productivity and quality while significantly enhancing capabilities. And that has a direct impact on competitiveness. High capacity utilization and short lead times reduce costs, as do zero-defect production, the reduction of unplanned downtimes and small inventories. The total cost of ownership (TCO) can be lowered substantially. And global traceability is guaranteed through comprehensive, end-to-end documentation.



KOMAX MES

## DEVELOPED BY THE LEADERS IN THEIR INDUSTRY

### **Komax MES – from the two industry leaders**

MES is the product from the global leader in the wire processing industry, Komax, in collaboration with iTAC Software. Together with the innovative partner for production control software, Komax developed the high-performance, cloud-capable software Komax MES.

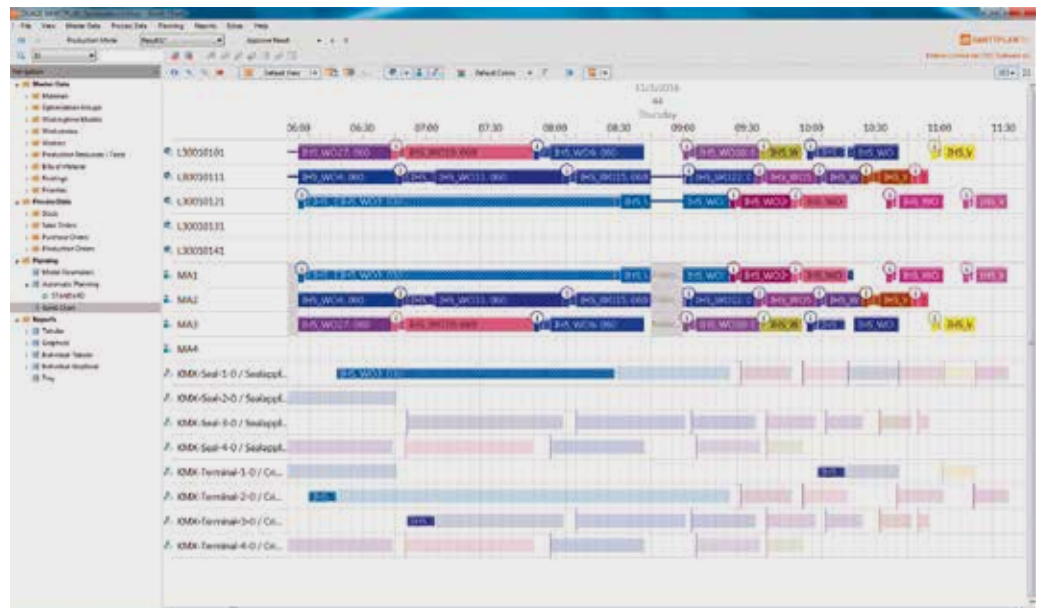
iTAC supplies 70 global OEMs and supply-chain players in a variety of industries worldwide. iTAC has equipped and networked over 200 factories and 35 000 machines. Komax brings comprehensive wire

processing industry expertise to the manufacturing execution system. As the market leader, Komax offers future-ready solutions, business intelligence and tools for precise contact connections to all industries and sectors worldwide. And it does so with the expertise amassed in over 40 years “at the cutting edge” of wire harness production.

By uniting the capabilities of the two leading companies, Komax MES precisely fulfills the requirements of the wire processing industry – with unique characteristics and specific functionalities.



Komax MES controls the detailed scheduling of production orders and distributes them to the work stations, personnel and machinery fully automatically.



# FULL-TIME ACCESS TO ALL RELEVANT INDICATORS

## Automates production planning

The production planning APS (Advanced Planning and Scheduling) functions integrated in Komax MES automatically handle the planning of resources. The basis for this is generally the production orders generated by the ERP system. APS assigns them to available work stations – taking into account the relevant resources, capacities, scheduling and cost factors. It considers all indicators such as capacity, personnel, material, machines, manual work stations, assembly boards, testing and logistics. It also involves visualization of the results at the control station.

## Saves set-up costs and planning time

Process flow planning with APS guarantees compliance with the specified process steps, standardizes procedures and enables firm assurances with regard to delivery dates. Planning costs can be reduced significantly. The optimized job sequencing saves set-up costs, minimizes lead times and yields significant cost savings.

## Steers operations and secures zero-defect production

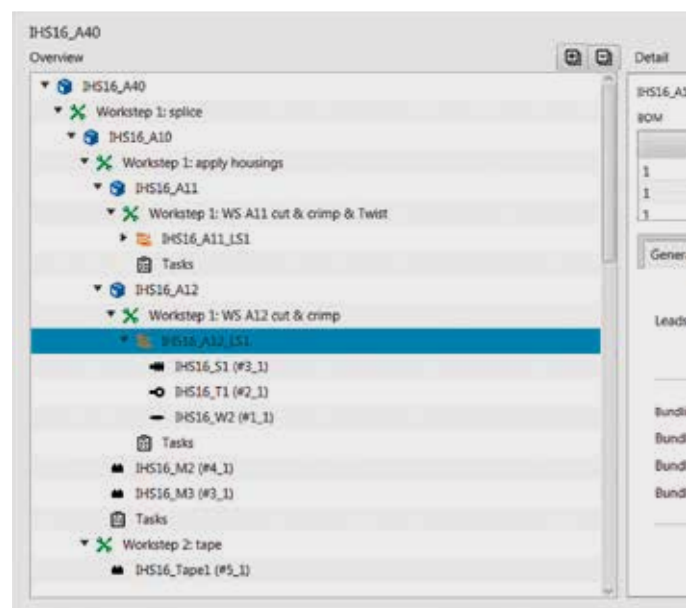
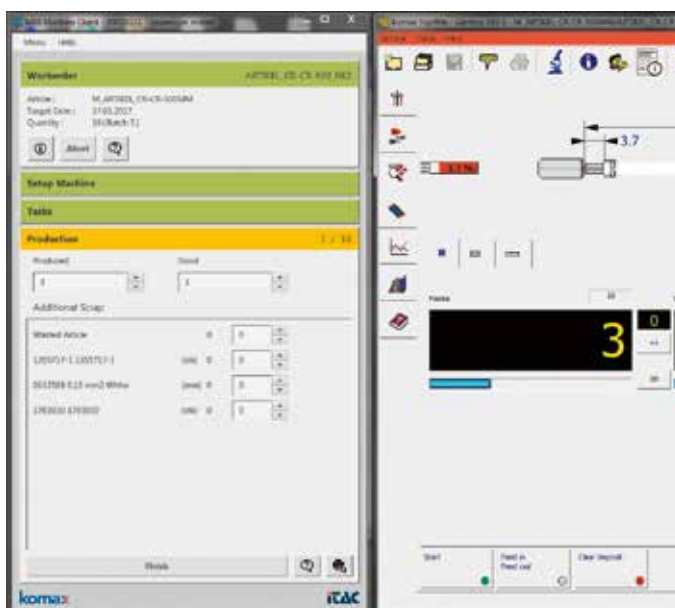
Through the machine client, the operator receives all instructions for the process flow in a step-by-step procedure. The operator sees which job is up next, which materials and tools will be needed and when quality inspections are due to take place. Only after successful verification of the machine setup with a barcode scanner and check of the quality data does Komax MES give approval for production.

## Increases effectiveness through machine data collection

To achieve maximum productivity and the best overall equipment effectiveness (OEE), operating and machine data is systematically collected. This data forms the basis for OEE analysis and can be evaluated by Komax MES in real time. Thanks to this, processes and machine capacity are continuously optimized. Comparative options include: planned set-up times and processing times vs. actual times; specified piece numbers with produced piece numbers (including scrap); analysis of unplanned downtime and other indicators. Using the performance indicators, the machinery as a whole can be optimized and used even more productively.

The technical data is adopted by the machine client and production data processed bidirectionally.

The complete cable harness is shown in detail, including materials, lead sets, articles, parts lists, work plans and work stages.



# OPTIMIZES THE USE OF MACHINERY

## Optimizes the use of machinery and staff

The system decides on the optimal assignment of jobs to the machinery based on the machine capabilities. At the same time, it conducts the scheduling of employees based on their availability and their capabilities in terms of machine setup and operation. If two machines are equally well suited to the task, the system selects the one with lower set-up requirements. Idle times are avoided and new scheduling can be conducted easily if operational malfunctions occur. The integrated machine administration records the most important machine data such as installed modules, the cross-section range to be processed and general machine capabilities. Individual material restrictions can be set for each module (e.g. crimp module or seal module). This makes it possible to precisely define the range of use for the machine.

## Ensures global traceability

Komax MES ensures traceability through end-to-end, secured documentation – from the used material to the packaged product as well as the routes from the supplier to the customer. All production data remains traceable at any time across the entire value chain. This creates transparency: it specifies which master data, with which production order, when, by whom, on which machines, with which quality and measurement data, with which supplier batches and assemblies the product was manufactured. All processes are under control at any time through access to all relevant indicators.

Real-time information across all production sites are accessible on any end device, anywhere in the world, 24/7.







# HIGHLY EFFECTIVE CONTROL OF ALL PRODUCTION PROCESSES

## **Increases quality – reduces scrap**

Komax MES offers comprehensive capabilities to ensure compliance with quality requirements, enhance product quality and fulfill OEM quality standards. Quality data management ensures that processing takes place with correct crimp data. Production progress and the production quality can be tracked in real time. Standardized procedures prevent production flaws. If errors do occur, they are detected at an early stage and the affected assembly is removed from production and put into a defined escalation process. Various methods are available for quality analysis, such as test planning with a micrograph laboratory, analysis of the operating equipment, products, sources of errors and measured values.

## **Optimizes inventory management – reduces tied-up capital**

To regulate material flows in every phase of production, Komax MES offers “Material and Logistics” as a service. The sophisticated material and logistics planning capability enhances planning security by making it possible to determine the actual material consumption figures in the production process at any given time. The consolidated data is then transferred to the inventory-managing ERP system. This significantly minimizes material inventory deviations in the ERP system while reducing the required administrative effort.

The right material is automatically provisioned in the correct quantity for each work station. Repeat orders are made in good time to ensure that sufficient material is in stock at all times. This makes it possible to reduce inventories while simultaneously increasing the stock turnover rate, which in turn frees previously tied-up capital.

# HIGHLY SCALABLE WITH INCREMENTAL INTRODUCTION



## High scalability – step by step

Komax MES is highly scalable. It grows to meet requirements and remains in step with rising demand. Flexibly adapted to meet individual requirements – from small companies with just a few machines to major factories with hundreds of work stations and machines – MES enables automated planning, control, monitoring and analysis of all resources and production processes.

## Introduction in steps and project phases

A full version of Komax MES is generally introduced in a series of steps. For instance, the rollout may first be limited to the “cutting room only” or the “cutting room and

tool management.” Each introduction step, in turn, comprises three project phases: First: analysis and determination of the solution. Second: implementation. Third: the operational phase. The duration of the project phases depends on the step and the status of the introduction process.

## Start with a pilot project

If operation entails particular crimpers for a specific range of products, the process kicks off with a pilot project. In this way, Komax ensures that the production process and the system can be integrated into the IT infrastructure. The pilot project provides a chance to assess the data migration concept and gain experience for daily operations.

#### **Possible next steps**

One potential next step would be to integrate the entire cutting chamber. Or the focus might be on the complete automation of production planning in order to plan the shifts of the machine operators and increase productivity. After that, all further steps can be done in phases: material management or a tool management system, pre-assembly, the assembly board and quality inspection devices. Once all of the extended functions are available, Komax MES controls and checks the entire wire manufacturing process automatically. With these capabilities in place, delivery times can be predicted with outstanding accuracy, and the performance of the entire production process kept in check at all times.

#### **MES extension and releases**

Komax MES is completely based on the iTAC.MES.Suite. This enables the ME system to be used in fields other than cable harness manufacturing as well. Komax MES users can therefore also benefit from the continuous innovations of the new software releases.

#### **Komax helps companies achieve their objectives**

- Increase OEE (Overall Equipment Effectiveness)
- Reduce scrap
- Fulfill new OEM quality standards
- Become the preferred supplier
- Ensure end-to-end traceability
- Implement any number of new processes

## Komax – leading the field now and in the future

As a pioneer and market leader in the field of automated wire processing, Komax provides its customers with innovative and sustainable solutions for any situation that calls for precise contact connections. Komax manufactures series and customer-specific machinery for various industries, catering for every degree of automation and customization. Its range of quality tools, test systems, and intelligent networking solutions complete the portfolio, and ensure safe and efficient production. Komax is a globally active Swiss company with development and production facilities on several continents. It supports customers locally in more than 60 countries with its extensive distribution and service network, ensuring the availability and value of their investments after equipment commissioning through standardized service processes. Komax includes more than 30 companies worldwide and employs around 1700 members of staff.

**40**  
**YEARS**  
CUTTING  
EDGE

### Market segments

**Komax offers outstanding competence and solutions for various areas of application and draws on them to generate the desired value-added for the entire process and optimize economic efficiency in line with customer requirements. The main markets of Komax are as follows: automotive, aerospace, industrial and telecom & datacom. With this breadth of experience, customers obtain expert knowledge for process optimization and access to the latest technologies.**



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