



# AUTO- MATION

IN CONTROL CABINET  
CONSTRUCTION



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It is very time-consuming to design and build control cabinets manually and is dependent on specialists. To slash the throughput time and make production processes more flexible and ideal, Komax offers a range of optimum automation solutions. These are designed to improve the process, increase efficiency, and reduce the throughput time for switch cabinet production. As a result, they generate major time and cost savings while simultaneously boosting quality and economic efficiency. These perfectly coordinated solutions cover all your needs from entry-level automation right through to fully automated wire assembly – whether you are producing a single control cabinet or manufacturing small or large series.

## Save with automation

- Reduce your production costs
- Production times reduced by up to 50% and more
- The savings start from a batch size of one

## Flexibly increase efficiency

- Wide processing area for wire ends
- Optimized logistics
- Greater workforce flexibility, due to intuitive guidance in work processes and through optimal use of the available expertise.

## Achieve top quality

- Most efficient use of resources
- Low effort to achieve high production data quality
- Consistently high quality throughout





IMPROVING ECONOMIC EFFICIENCY  
**WITH AUTOMATION**

# SHORTER PRODUCTION TIMES – MAXIMUM EFFICIENCY

## Cut time and costs

Trained specialists need around 157 seconds to manually assemble a wire, with an average of 500 wires per switch cabinet. To read a connection from the schematic with 300 pages, an average of 67 seconds is required. Mounting of a wire requires on average 42 seconds. Depending on the degree of automation, this processing time can be significantly reduced. With full automation, the production time, compared to manual wire assembly, can be reduced by up to 64%.

## Consistent data flow

Data preparation is efficient using the Komax software DLW (Digital Lean Wiring)

or via ECAD from exported Wire lists. Automation that relies on consistent data flow optimizes quality and reduces input errors. Within this framework, ready-to-install wires can be produced fully automatically: by cutting them to the correct length, assembling them and with inkjet or tubes.. What's more, you can even produce the cables sequentially in the correct order of installation and tie them.

## Greater flexibility

You can process the wire ends in a whole host of ways: by attaching ferrules, crimp contacts, or MIL crimps, or compacting them through ultrasonic welding.

The solutions feature fully integrated inkjet labeling or tube marking systems to ensure that everything is always labeled in accordance with the diagram. This simplified approach means that control cabinet wiring can be carried out by less specialized personnel.

## Perfectly coordinated automation

By offering solutions to match any requirements, the market leader Komax is opening up the huge potential for automation in control cabinet construction. Its semi- and fully automatic state-of-the-art machines ensure maximum efficiency on any scale: from individual units through to small and large series.

## Manual Wiring



Average values:  
 – 500 wires per cabinet  
 – 300 pages schematic

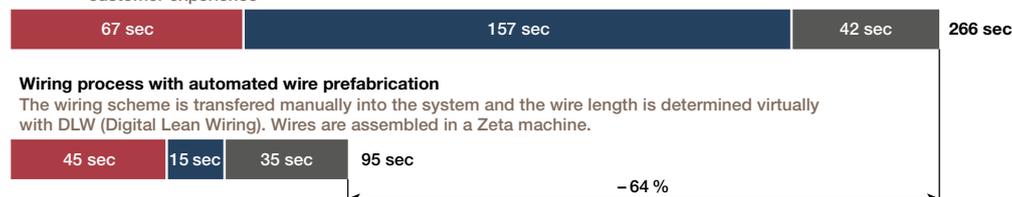
## Digital Lean Wiring



## Comparison of processes

### Manual wiring process – read schema – produce wire – laying cables

Source: Study of University Stuttgart customer experience



### Wiring process with automated wire prefabrication

The wiring scheme is transferred manually into the system and the wire length is determined virtually with DLW (Digital Lean Wiring). Wires are assembled in a Zeta machine.

- Data preparation
- Cable processing
- Wire laying

# IDEAL FOR ANY LEVEL OF AUTOMATION



## Cut and strip – Low level of automation

Semi-automated production sorted according to cross-section

### Processing options

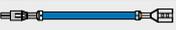
Labels	
Wire production in sequences	

## Crimp to Crimp – Moderate level of automation

Fully automated production sorted according to cross-section



### Processing options

Labels	  
Wire production in sequences	
Process wire ends (ferrule, crimp, weld, etc.)	   

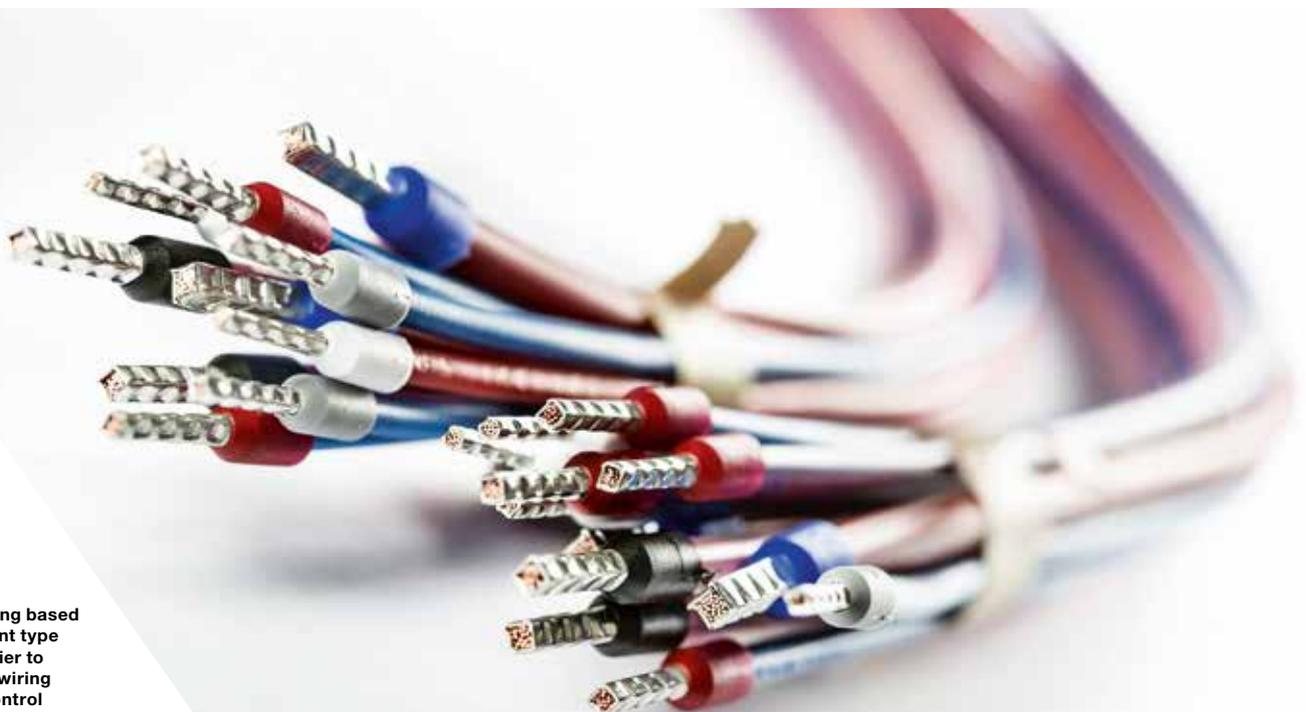


## Harness manufacturing – High level of automation

- Fully automated production sorted according to assemblies (sequential production)
- Tied with tape

### Processing options

Labels	
Wire production in sequences	
Process wire ends (ferrule, crimp, weld, etc.)	
Bundle wire sequence	



▶ Cable bundling based on component type makes it easier to manage the wiring inside the control cabinet.

# EASIER DATA PREPARATION WITH DLW



## The simple alternative

In order for the control cabinet construction process to be automated, the first step is to collect the production data, including the cable length. The DLW (Digital Lean Wiring) software developed by Komax offers the ideal solution for this with its clear focus on simplicity and flexibility. It offers various options for importing and preparing the data. For instance, you can use existing wire lists to define how the connections should be marked. You can also import 2D drawings in a variety of formats with ease. If you want to avoid the high costs involved with maintaining a component database of standard ECAD systems, virtual wiring can be carried out based on a high-resolution photo. This keeps product maintenance to an absolute minimum.

## Photo with Roundshot or 2D drawing for wire length determination

A high-resolution photo of the control cabinet or a trustworthy 2D drawing is a really easy way of dimensioning the lengths of the cables. The photo is captured by the optionally available Roundshot camera. This takes several individual images and combines them to create one dimensionally accurate overall image, which is then imported into DLW.

## Virtual wiring

In the DLW software, the technician uses this image or a 2D drawing to wire the cables virtually on the screen. This is a highly efficient method of determining the cable length per connection. After that, the production data is converted and uploaded to the wire processing machine, which produces the ready-to-install cables.

## DLW Viewer – Guided assembly

The DLW Viewer features a streamlined, touch-operated interface. This guides the operator along the wiring path as they lay the pre-assembled strands virtually on the screen. As a result, this processing step can be carried out by less highly specialized personnel.

## 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 to 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. Komax uses its extensive distribution and service network, which includes local companies and their employees, to support customers across the world on site, thus ensuring the availability and value of their investments after equipment commissioning through standardized service processes.



### 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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