

Eckelmann

#Steel and Rolling Mills

Smart Modernisation of Automation



Modernisation at eye level with your process

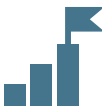
The Eckelmann Group is a medium-sized, internationally active company that provides complete solutions for the automation and digitalisation of production processes in the metal industry. We are automation experts. As consultant and automation partner, we support you in maintaining your reliable production process. As an initiator and implementation partner, we identify and develop new technologies and applications for you.



Your benefits



Competitive advantage due to quality improvement and innovation



Increase productivity



Reduce energy consumption



Optimise production costs



Increase plant availability and reliability



Minimise maintenance costs



Networked production for more transparency and efficiency (KPI, Big Data, Industry 4.0)



Innovative operating concepts of the next generation



Future-proof due to compatibility and long-term availability of current technologies



Independent from proprietary hardware and software solutions



Smart implementation of human and machine safety for a higher productivity

Where standard is not enough

Our scope

We do not provide just standard solutions but comprehensively designed automation systems that solve your highly specific tasks optimally integrated in the existing technical environment.

The more complex your requirements are, the more you will appreciate our know-how. You can rely on customised modernisation solutions that are open and flexible.

At Eckelmann, a large expert team of engineers and technicians will ensure that your modernisation project is a complete success – from comprehensive and detailed planning to professional and on-time implementation.



Drive Technology



Basic automation including SCADA systems



Technological Control Systems (TCS) with high demands on processing power and scalability



Parts of the superordinated process control technology (Level 2)



Innovative automation for the Smart Factory



Industrial Big Data Analytics with AI and Machine Learning for deeper analysis and optimisation of the production process

All competences from a single source:

Consulting– Engineering – Implementation – Life Cycle Management

Our Competences

- Electrical automation as a turnkey solution
- Switchgear with in-house manufacturing, UL certified
- Engineering, PLC Programming & Visualisation
- Open for all platforms: Siemens, ABB, Schneider Electric, Allen Bradley and many more
- Experience with all common HMI tools: WinCC / WinCC Flexible, InTouch, GE Fanuc iFIX, GE CIMPLICITY, GTI PROCON-WIN, FactoryLink, Rockwell FactoryTalk View, ...
- Manufacturer-independent consulting for the selection of the appropriate technological control platform
- Individual hardware and software solutions for highly dynamic control systems
- Process data recording with ibaPDA and AI-supported optimisation of processes



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Automation pioneers think ahead in metal processing

"Eckelmann has always seen itself as an initiator and companion in the development of new technologies and applications. Everything started in the metal sector in 1987 as a **development partner** of the SMS group, the year I myself joined Eckelmann as a young electrical engineer. It was the initial point of E°ProBAS, a fast and real-time capable control system especially for the metal processing industry. I would like to tell you about this unique success story. The motivation then, as now, were increasing requirements for product quality and productivity. The innovative automation system for rolling mills brought the decisive breakthrough here. As a manufacturer and technology independent **system integrator** we have over 30 years of experience in the automation in the metal processing industry. We are dedicated to finding the best solution for our customers.

For our solutions, we use industrial components from leading global suppliers such as Siemens, ABB, GE and others, and are a sought-after **Siemens Solution Partner**. With E°ProBAS, we also have our own high-performance automation system, which was created for the requirements of the metal industry and which is developed further all the time. As an experienced **solution partner**, we are thinking ahead with digital automation. We develop new types of solutions and services with and for our customers in the innovation fields of Industry 4.0 and Smart Factory. Thus, with our **customised modernisation solutions in the metal processing industry**, we also enable dynamic innovation processes and innovative value added models. Increasingly, this also makes us a service and operator partner for 24/7 monitoring and competent diagnosis of processes, machinery and plants."



Peter Frankenbach
Spokesman of
the Board of Directors

**We are convinced:
The digital transformation of
processes can only be achieved
from automation.**

Continuity and innovation for more than 40 years

1977

Founding
of Dr.-Ing.
Eckelmann
GmbH

1988

First Eckelmann
real-time automation
solution for a
skin pass mill in
Metz / F based on the
hardware platform
Multibus

1994

Automation of
first **CSP plant**
for **NUCOR /**
Arkansas / USA

1992

BAS-II System,
now with
Standard
Libraries

1997

Further development of
the BAS-II system for the
E°ProBAS system, now with
graphical programming

VAI (Voest Alpine
Industrieanlagen, later
Siemens Metals, later
Primetals) **becomes an**
E°ProBAS customer and
implements the E°ProBAS
system under the name
Vantage in many **hot and**
cold rolling mills

1998

Automation of
the first **casting**
machine with
the E°ProBAS system
for **Zhujiang Steel /**
China

2000

New E°ProBAS
hardware platform
VMEbus

1999

Automation of the first
profile rolling mill
with the E°ProBAS
system for
Chaparral Steel / USA
(today: **Gerdau**)

2003

New E°ProBAS
hardware
platform **IPC**

2008

First automation
of a **tube rolling**
mill with stretch
reducing process
for the German
plant manufacturer
KOCKS

2004

First use of the IPC
based E°ProBAS
solution for the
Section Mill
ArcelorMittal
Luxemburg

First automation
of a **bar mill** for
Trinecke Zelezarny
in **Trinec / Czech**
Republic

2001

Change of name to a
public limited company

Automation Partner
Siemens

2nd building extension
in Wiesbaden, approx.
200 employees

2014

Establishment of
a **subsidiary in**
Shanghai / China
with focus on
“metals”

Automation of a
Finishing Line for
Structural Steel
for **Baotou Iron**
and **Steel**
Group / China

2015

Complete automation
of a **Structural Steel**
Mill, modernisation
Basic automation and
TCS system for
Hyundai / Korea

2013

3rd building extension in
Wiesbaden for new development
and technology centre

Automation of the first
Wire Mill / Steel Bar Rolling
Mill with the E°ProBAS system
for **Wuhan Iron and Steel Co. /**
China

Modernisation (Multibus ->
VMEbus) of the first equipped in
1994 **CSP plant** of
NUCOR / Arkansas / USA

2017

New E°ProBAS platform Box-PC E°TEC-B
Technological Edge Controller

Complete automation Level 1 and Level 2
for a **Tube Finishing Line** with multiple
Siemens S7 SPSe, **OMK Steel / Russia**

2019

First use of the Box-PC
E°ProBAS platform for
Jianglin Steel / China

Modernisation of caster
to Siemens S7-1500 PLC for
NUCOR / USA

E°ProBAS IoT Edge for
process optimisations with
AI and Machine Learning

2020

Modernisation of
Section Rolling
Mill Peiner Träger
(40th project in the
area of profile rolling)

iba Certified Partner

2018

New E°ProBAS
platform
CompactPCI Serial

First use of the
E°ProBAS CompactPCI
Serial platform for
Baotou Iron and
Steel Group / China

Our solution modules for your modernisation

Specification, planning and engineering

Successful modernisation starts long before detailed engineering – with a comprehensive preliminary assessment of the previous systems. We analyse the **actual condition** of your installation on site.

What do you want to achieve with the modernisation? Considering the actual and future functionalities we elaborate the requirements for the new hard- and software together with you. The specific **modernisation objectives** are precisely defined on this basis, such as the replacement of discontinued components or installation of additional safety functions. But is this also really feasible with these technologies and in the desired time? Therefore, detailed time scheduling of the project is mandatory. This is the only way that production downtimes or impacts on the production can be effectively avoided. According to the requirements of your production, we plan the **modernisation in substeps** and **make use of scheduled plant downtimes for all upgrade preparations**. We minimise residual risks using appropriate **fallback strategies**.

Summarized: You can be confident that our professional **time and risk management** will prepare us perfectly for your modernisation and that we will carefully evaluate and weigh up all the advantages and disadvantages of the technologies and procedures used before we put the project into action. The result of the technical discussions is a **functional specification** in which we summarise the **basic and detailed engineering** for you. This creates complete transparency and clarity for both sides.

Simulation and digital twin

We use simulation to intensively test the new software for your plant. Another advantage of simulation is that we can train your personnel on the new systems in the simulator even before start-up. In this way, we can professionally accompany the introduction of new operating concepts. Using a digital twin of your production plant, we can also safely test possible optimisation concepts in advance and independently of your physical twin. We thus bring our solutions to digital maturity in order to ensure a safe and low-risk migration to the new systems.



Experience has shown that virtual commissioning carried out in advance, ensures significantly shorter downtimes when modernising highly complex systems.



In-house platform for highly dynamic technical controller without limits

E°ProBAS is our own automation system, with already proven reliability in many applications, for flexible and modular automation – with over **1000 systems in the steel industry worldwide**. Selected reference projects can be found in the timeline in this brochure.

- Multi-platform system
- Fast controller circuits under hard real-time conditions
- Easy upgrades without changing the application software
- Consistent system of hardware, operating system, system layer and application software
- Wide range of interface options



Software modernisation and changes at the right time with the appropriate strategy we can refer to

Benefit from software innovations and individual extensions. As a long-standing partner to our customers, we can draw on a wealth of experience and highly developed solution modules. This enables us to constantly refine the application software and optimise processes.

Beyond the optimisations of the application software, the modernised development environment provides additional functionalities such as an extended status display and detailed error diagnostics from the system.

If you are thinking further into the future, you are also excellently positioned for upcoming tasks and challenges with the modern E°ProBAS automation environment.

Due to the wide range of interfaces, it is particularly easy to use digital process data in modern machine learning and AI applications.

Customized IO systems close to your process

In order to avoid long cable runs, it would be optimal to install the remote I/O cabinets close to the process. But is this even feasible under the harsh conditions in the steelworks?

From numerous automation projects, we know the hardware requirements under extreme environmental conditions such as heat, cold, humidity, vibration and dirt. With this experience, we advise you comprehensively and find the best solution for your individual application – whether the solution is located within the switch cabinet or in the field. In this way, you will benefit across the board from the advantages of finely scalable remote IO systems.

The use of scalable remote IO systems not only provides you with the best investment protection, but also high operational reliability due to increased interference resistance.

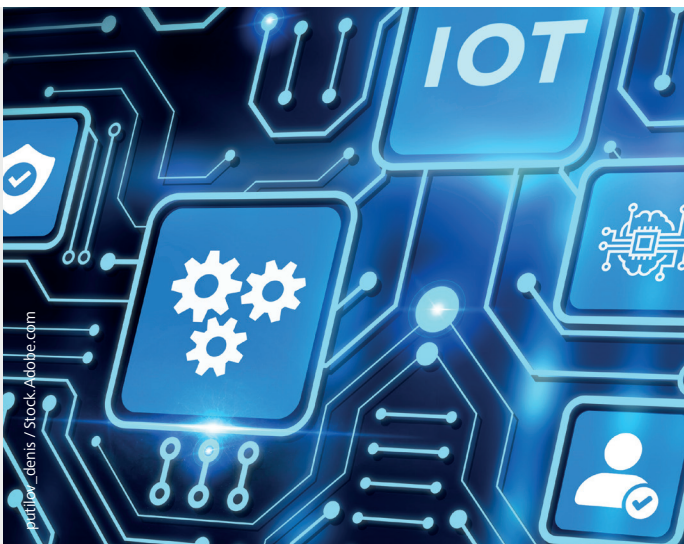
Remote IO solutions – as individual as your requirements. We consider your performance requirements, environmental conditions and available space for the development of the best solution.

Process Data Recording

We are a **Certified System Integrator of iba AG** and are very familiar with all products related to the ibaPDA process data recording system.

Upgrading or optimising existing ibaPDA systems is therefore a natural part of every modernisation project for us.

Furthermore, we use the ibaPDA system for a before-and-after comparison of the plant performance. We can thus precisely check and transparently verify the success of your modernisation.





Industrial Big Data Analytics meets real process know-how

Investment in the future

Modernising means investing in the future. The new E°ProBAS platforms offer a variety of interfaces that allow future technological and data processing applications to be connected.

One of these applications is our E°ProBAS 4.0 IoT Edge system.

Our E°ProBAS 4.0 IoT Edge concept provides advanced data services for:

- Condition Monitoring
- Intelligent support of the maintenance personnel during system diagnosis
- AI-supported system optimisation
- Real-time dashboards with individual KPI visualisations
- Connection to an internal or external cloud
- WEB service for displaying the system characteristics and system status on mobile devices

The E°ProBAS 4.0 IoT Edge system component is an addition to the established E°ProBAS TCS systems.

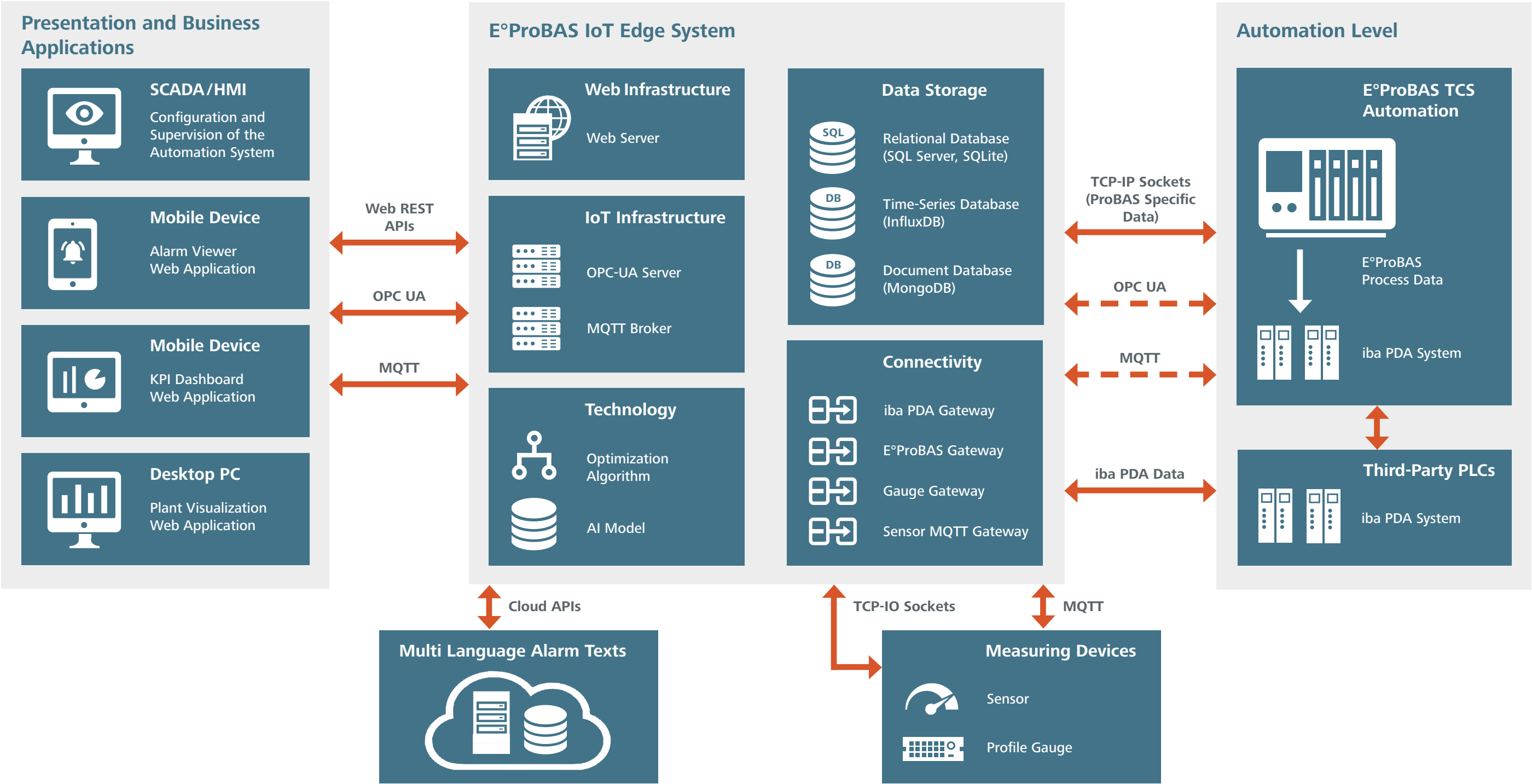
While the E°ProBAS TCS system processes the automation tasks in real time, the E°ProBAS 4.0 IoT Edge system is responsible, among other things, for the superordinated acquisition and processing of the plant-wide process data.

The process data collected in this way are used by the E°ProBAS 4.0 IoT Edge system as a basis for optimising the cascaded processes and as an aid for the early identification and compensation of possible disturbing factors in the automation process.

Reference applications

- | | | |
|---|----------------------|----------------------|
| ■ Cold rolling mills | ■ Wire rod mills | ■ Edger |
| ■ Hot rolling mills | ■ Tube rolling mills | ■ Induction furnaces |
| ■ CSP and billet casters (casting machines) | ■ Finishing lines | ■ Cooling sections |
| ■ Straightening machines | ■ Shears | ■ Heavy plate mills |
| ■ Coilers | ■ Hydraulic stations | ■ Pickling lines |
| ■ Section mills | ■ Descalers | ■ Bar mills |

E°ProBAS IoT 4.0 Edge System Architecture



The E°ProBas IoT Edge system includes various categories of basic modules:

- Web Server
- Databases (relational database, time series database, document database)
- IoT infrastructure
- Enhanced connectivity
- Technological algorithms for the optimisation of the production processes

Eckelmann – Partner for Automation and Digitalisation

The Eckelmann Group is a major **medium-sized system partner for automation and digitalisation** and is now represented at seven locations in Europe and China. As a strategic partner in the **digital transformation** we make the opportunities of digitalisation in production environments usable and secure sustainable competitive advantages for our customers by creating appropriate solutions. We are curious and passionate about technology. We combine pragmatic, goal-oriented thinking with the utmost care and reliability.

Automation

Productivity and competitiveness are determined by the efficiency of production processes. The best possible automation of production processes with the appropriate technologies. We make sure of that.

Digitalisation

Only those who combine IT technology and automation technology can fulfil the value proposition of Industry 4.0. We can do that.

From a single source

Plan – Build – Operate. We accompany the complete life cycle of a solution. From planning to engineering and implementation to after-sales support. We are always there for you.

In Partnership

We know: Success is also a matter of attitude. Unreserved commitment to the best solution is part of our corporate culture. We act fairly, honestly and reliably. Promised.

500 + employees

7 sites

€ 73 million sales

Contact us.



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