# DIGITAL FACTORY now

We make the **sustainable**
Digital Factory happen – **now!**

Cătălin LEPINZEAN – **BD/KA Manager**

PHOENIX CONTACT

PHOENIX CONTACT

Group Center of Competence, Harrisburg/USA

Innovation Center Electronics, Bad Pyrmont/Germany

Group Center of Competence, Nanjing/China

Headquarters Blomberg/Germany

# Phoenix Contact

Phoenix Contact develops and manufactures industrial electrical and electronic technology products that power, protect, connect and automate systems and equipment.

**Global Leader**

**Family Owned**

**90+**

**Founded in 1923**

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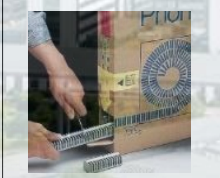
**1923**
Foundation in Essen

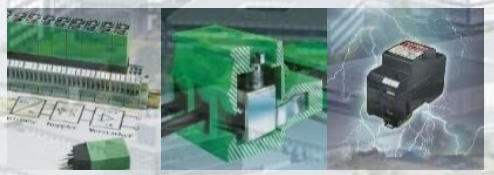
**1928**
The RWE terminal block

**1966**
Company headquarters established in Blomberg

**1967**
Strip terminal blocks



**1977, 1982 and 1983**
Plug-in relay terminal
PCB terminal blocks
Surge protection



**1981**
Onwards: First foreign subsidiaries

**1987**
INTERBUS – serial fieldbus system

**2005**
Safety

**Today**
Located all over the world

PROFICLOUD

PLCnext Technology
Designed by PHOENIX CONTACT

COMPLETE line

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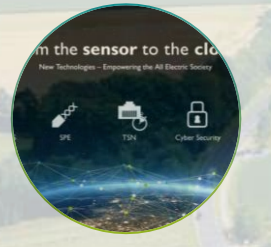
# DIGITAL FACTORY now

## **Empowering** your **business!**

**Technology know-how**




**Innovative products**

**Trend digitalization**

**Multiplicativity**

**Proof-of-concept**

**Scalable solutions**

**Training program**

**Industry know-how**

**Ready-to-use**

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# PLCnext Technology

Designed by PHOENIX CONTACT

PLCnext Control

**Open Control Platform**

Devices in various performance classes including PLCnext Runtime System and accessories

PLCnext Engineer

**Engineering Software**

Engineering tool for commissioning, configuring and programming PLCnext Control

PLCnext Store

**Software Store**

Apps for functional extension of PLCnext Control and PLCnext Engineer

PLCnext Community

**Collaboration & Resources**

We offer our community Information, support and helpful resources, including FAQs, forums, tutorials, and a GitHub presence

Digitalization is changing our world

# DIGITAL FACTORY now

**Energy efficiency**

Reduced energy consumption

**Mass customization**

Economic production with batch size one

**Smart network**

Secured networked systems as a basis

**Services / IoT**

New, data centric business models

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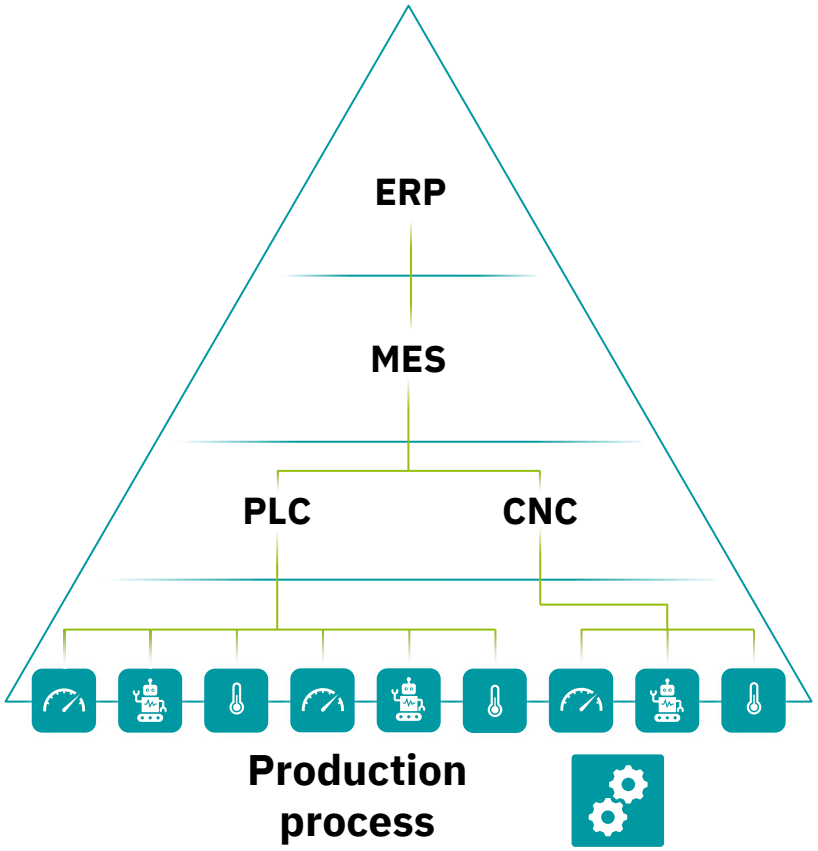
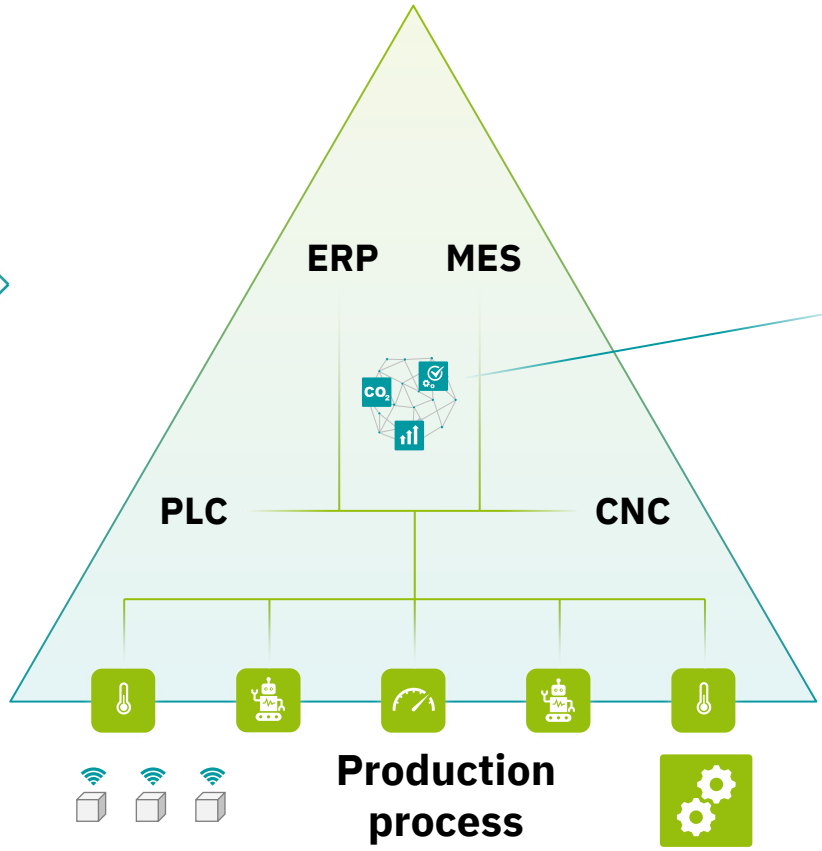
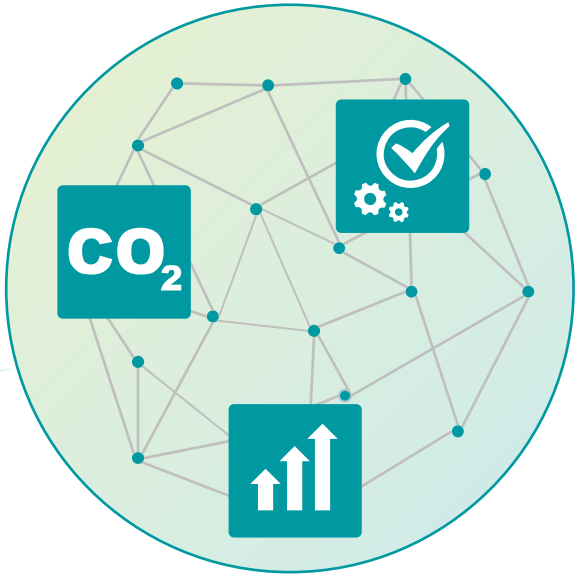
Digitalization is changing our world

# DIGITAL FACTORY *now*

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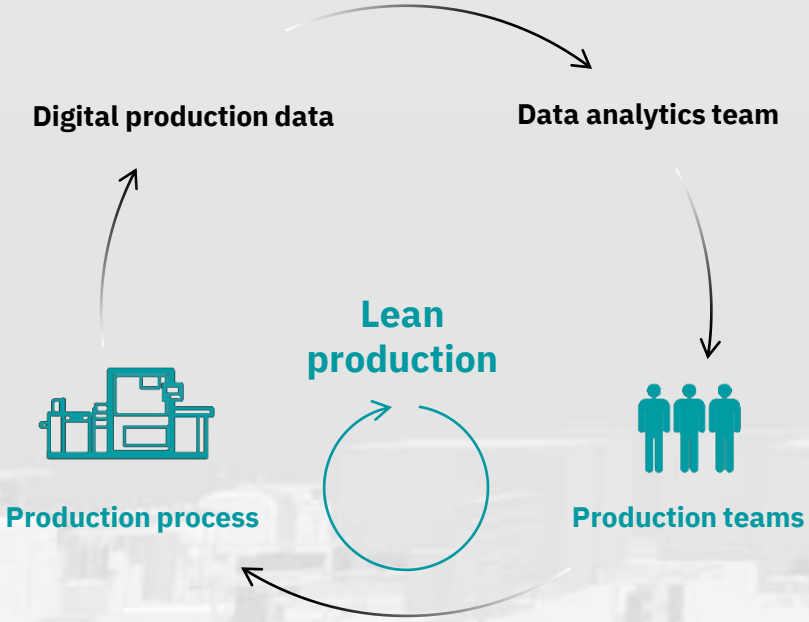
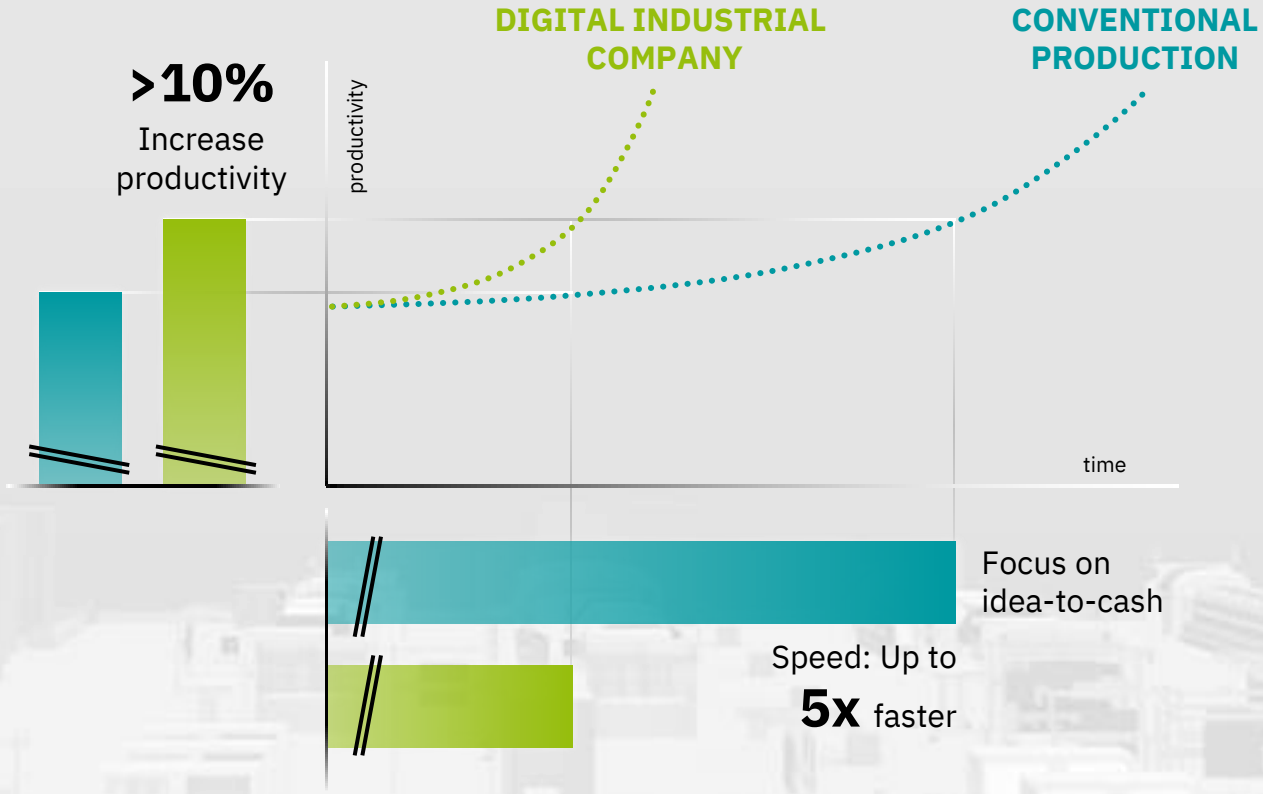
**Proof-of-concept:** Phoenix Contact PLCnext Factory/ Bad Pyrmont/ Germany

# DIGITAL FACTORY now




Visit our own production in Bad Pyrmont

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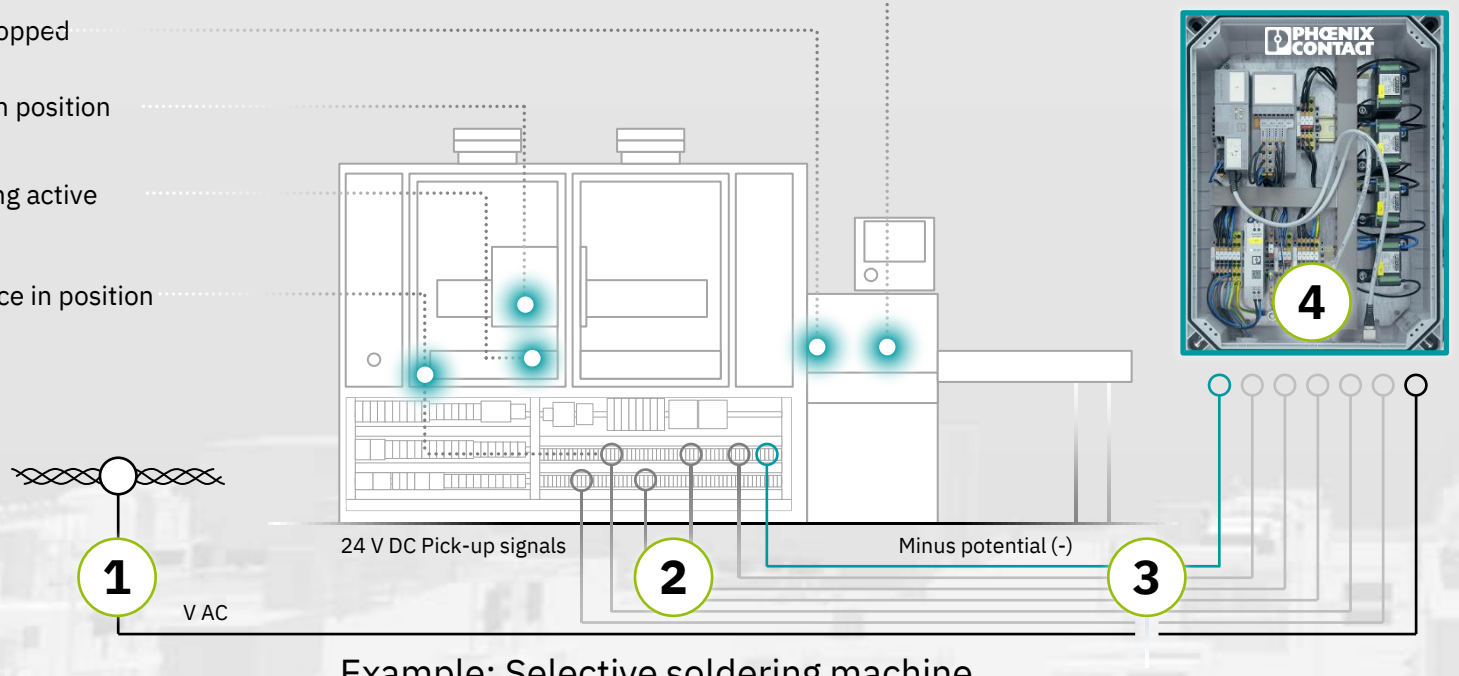
**Proof-of-concept:** Phoenix Contact PLCnext Factory/ Bad Pyrmont/ Germany

# DIGITAL FACTORY now

- Limit position
- Fluxer stopped
- Gripper in position
- Preheating active
- Work piece in position




Example: Selective soldering machine

1 **Minimal retrieving energy consumption**
(just between the power supply line)

2 **3-5% of I/Os are sufficient to fully represent the processes**

3 **Galvanic separation of I/O signals**
(no new CE certification of the plants required)

4 **Ready-to-use and individual** electrical cabinet for each use case

Productivity increase within 1.5 years of >10%!

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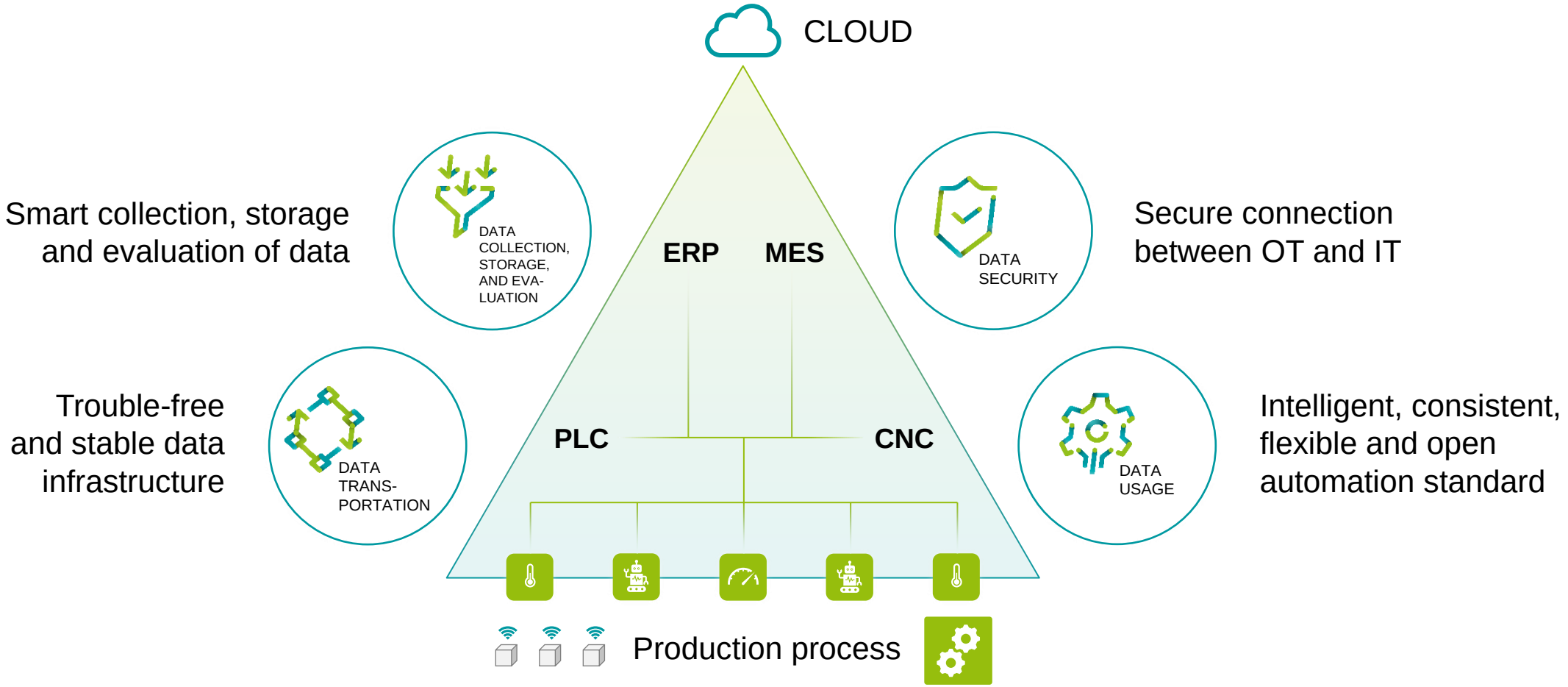
DIGITAL FACTORY *now*

# The holistic offer with Digital Factory now

The holistic offer with Digital Factory now

# DIGITAL FACTORY now



The various solutions of your digitalization success

# DIGITAL FACTORY now

TRANSPORT DATA

SECURE DATA

SMART AUTOMATION **NETWORK**

**CONNECTION** OF SMART DEVICES

SECURITY **EVALUATION**

**SECURELY NETWORKED** PRODUCTION

MANIPULATION **DETECTION**

SECURE **MACHINE INTEGRATION**

DATA **COLLECTION**

**OT** MEETS **IT**

ANOMALY **DETECTION**

**SMART** PRODUCTION

FLEXIBLE PRODUCTION WITH **AGV**

COLLECT DATA

USE DATA

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# COLLECT, STORE, AND EVALUATE DATA

DATA COLLECTION

OT MEETS IT

ANOMALY DETECTION

DIGITAL FACTORY *now*

# DATA **COLLECTION**

## Requirements

- **Gain all types of data**
- **Easy and fast integration**
- **Cost-efficient collection**

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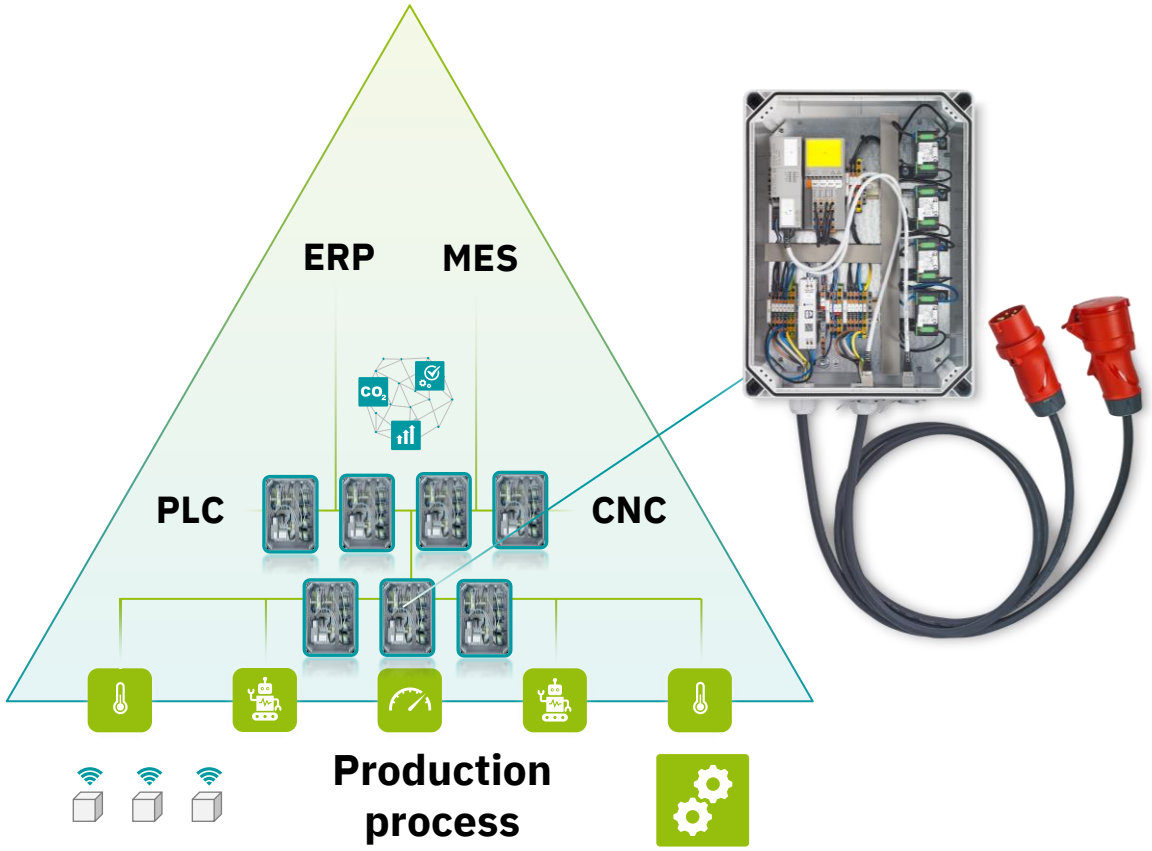
DIGITAL FACTORY *now*

# DATA **COLLECTION**




## Solutions

- **Smart hardware collecting and storing data in OT**
- **Seamless integration of sensors and collecting automation**
- **Scalable, adaptable for brown-and greenfield projects**

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# DATA **COLLECTION**

**Ready-to-use**

**Individual**

## Ready-to-order

- **Tested and validated Data Collection Boxes for various applications**
- **Large portfolio of energy measuring**
- **Individual, customized sensorics**

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# COLLECT **DATA** - OT **MEETS** IT

## Requirements

- **Seamless connection between OT and IT**
- **Data available everywhere and anytime**
- **Data readable, comparable and usable by any device or system**

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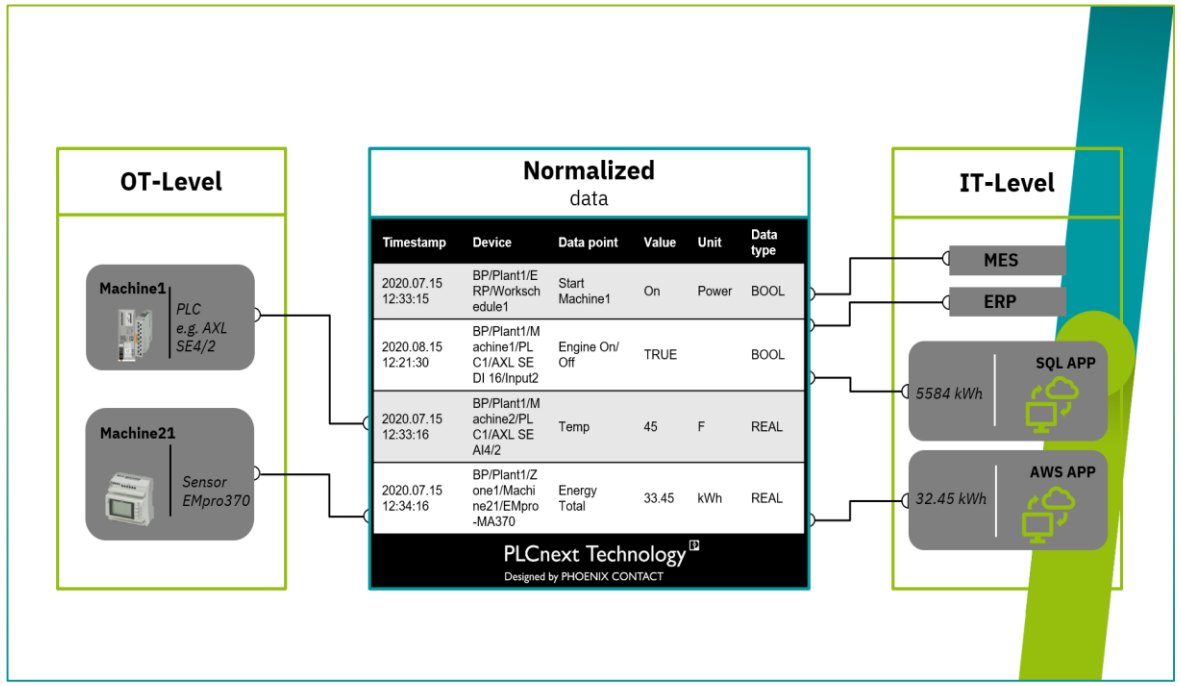
# OT **MEETS** IT




## Solutions

**Easy data exchange between OT and IT layer**

**Open interfaces for limitless connectivity**

**Normalized, real-time and time-stamped data**

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# OT **MEETS** IT

## Ready-to-order

- **PLCnext IIoT framework**
- **Ready-to-use OT and IT connectors**
- **Exchangeable hardware platform**

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# COLLECT **DATA** - ANOMALY **DETECTION**

## Requirements

- **Process optimization**
- **Condition monitoring**
- **Predictive maintenance**

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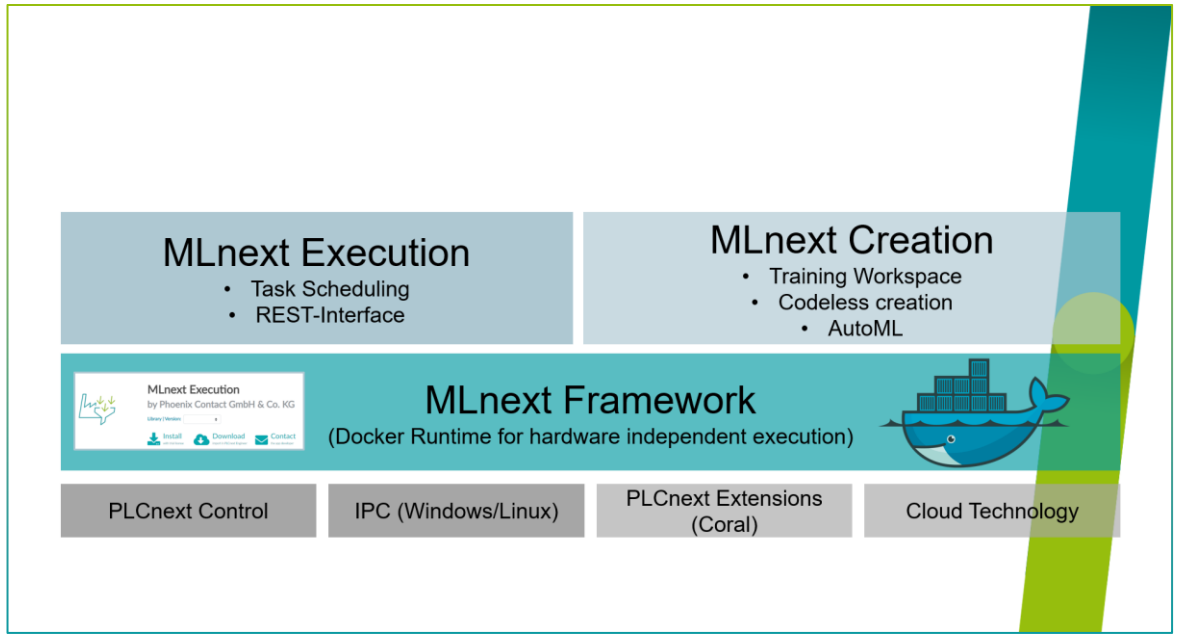
# ANOMALY **DETECTION**




## Solutions

- **Highest flexibility by open source code**
- **Self learning algorithm**
- **Visualization of results and recommended action**

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# ANOMALY **DETECTION**

**Framework**

**Excecution**

**Creation**

## Ready-to-order

**MLnext Framework and Execution:** hardware independent runtime for AI

**MLnext Creation:** Codeless creation of neural networks

**MLnext Service:** Support and consulting

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# COLLECT DATA, STORE AND EVALUATE

## Segment

PICTURE: Digitized "Selective Soldering System

Energy measurement - minimally invasive within the PLCnext Factory as proof-of-concept

## Example: How to start?

Success in 3 steps...

### STEP 1

DATA ***COLLECTION***

Holistic, ready-to-use Hardware (control cabinet) portfolio

### STEP 2

OT ***MEETS*** IT

Normalizing software bridge between OT and IT

### STEP 3

ANOMALY ***DETECTION***

Platform and hardware-independent anomaly detection software

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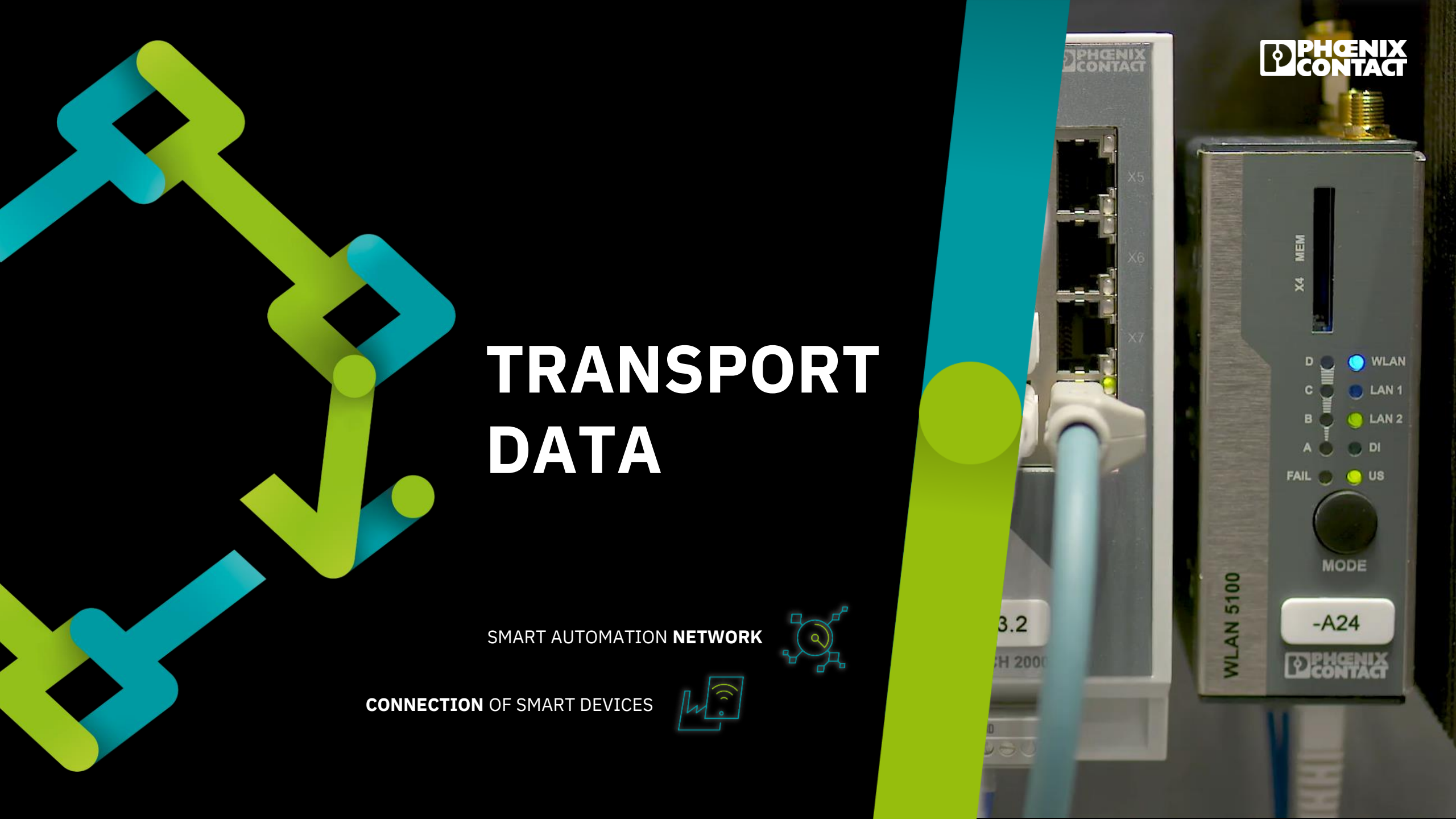
# TRANSPORT DATA

SMART AUTOMATION **NETWORK**

**CONNECTION** OF SMART DEVICES



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# SMART AUTOMATION **NETWORK**

## Requirements

- **Structured, managed, reliable network**
- **Gigabit ready for future viability**
- **Various diagnostic possibilities for network optimization**

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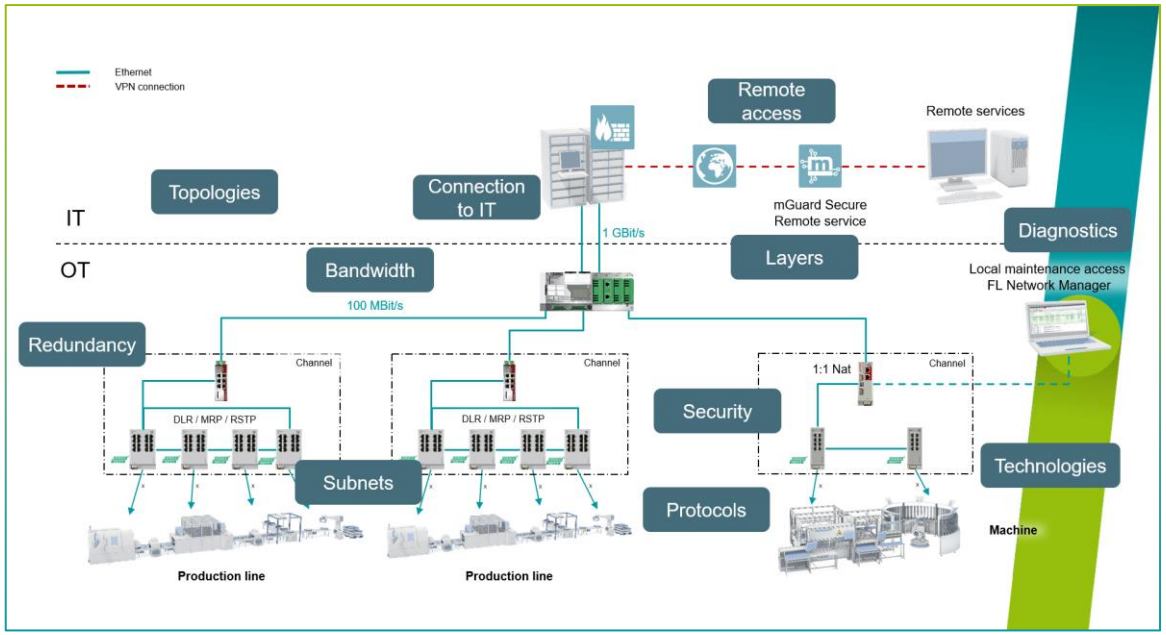
# SMART AUTOMATION **NETWORK**




## Solutions

**Reliable portfolio based on long-time technical know-how**

**Consulting how to setup managed networks**

**Software for fast startup, diagnostic and networking scanning**

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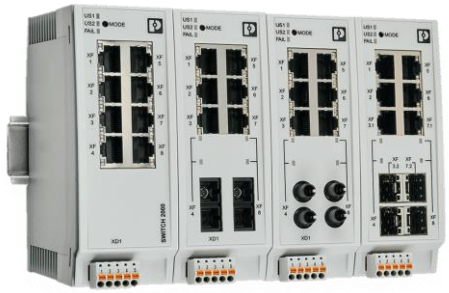
# SMART AUTOMATION **NETWORK**

**Managed switches**



**Network installation**

## Ready-to-order

**Managed switches, cabling, connectors for copper and fiber based networks**

**Holistic industrial ethernet services**

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# **CONNECTION** OF SMART DEVICES

## Requirements

- **Reliable wireless connectivity**
- **Fast wireless communication**
- **Restricted and secured access**

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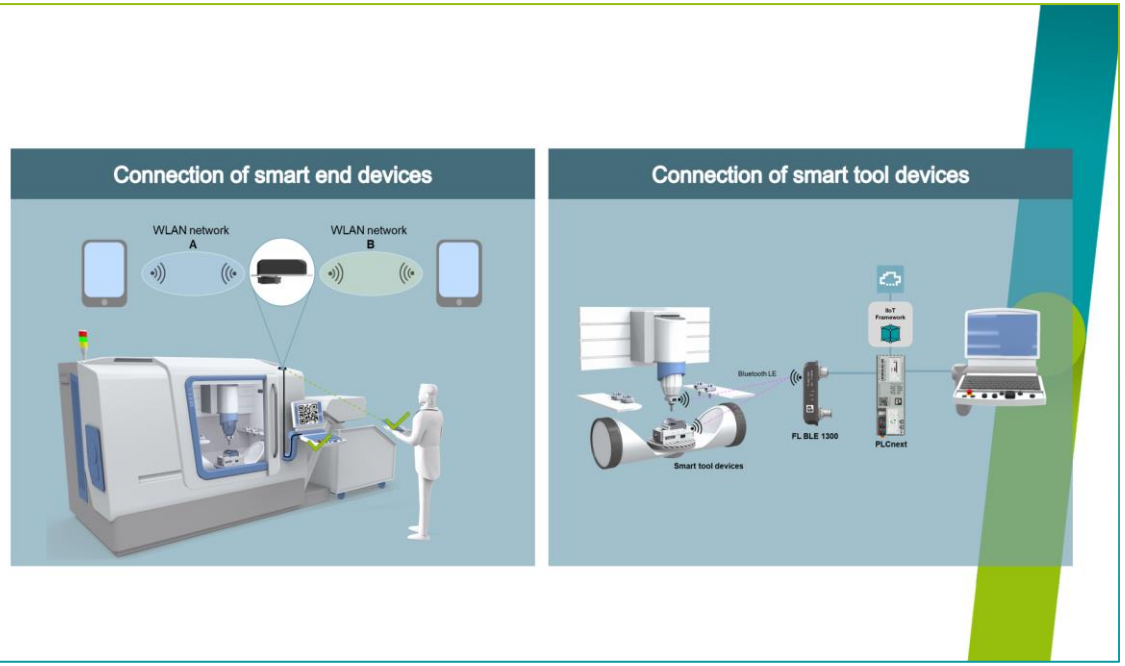
# **CONNECTION** OF SMART DEVICES




## Solutions

- **Customer consulting for individual network solutions**
- **Easy connection and secure access of smart devices**
- **Temporary access points (AP) for smart devices**

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# **CONNECTION** OF SMART DEVICES

**Wireless ethernet**

**PLCnext library/ store**

## Ready-to-order

- **Large product portfolio for Trusted Wireless, Bluetooth, WLAN and NearFi**
- **Holistic industrial wireless services**
- **Pre-engineered PLCnext function blocks, libraries and apps** (REST API*)

***RE**presentational **S**tate **T**ransfer **A**pplication **P**rogramming **I**nterface

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# USE DATA

SMART PRODUCTION

FLEXIBLE PRODUCTION WITH AGV

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# **SMART** PRODUCTION

## Requirements

- **More automation with as little effort as possible optimization**
- **More parameterization and configuration, less programming**
- **Faster startup and reduced downtime**

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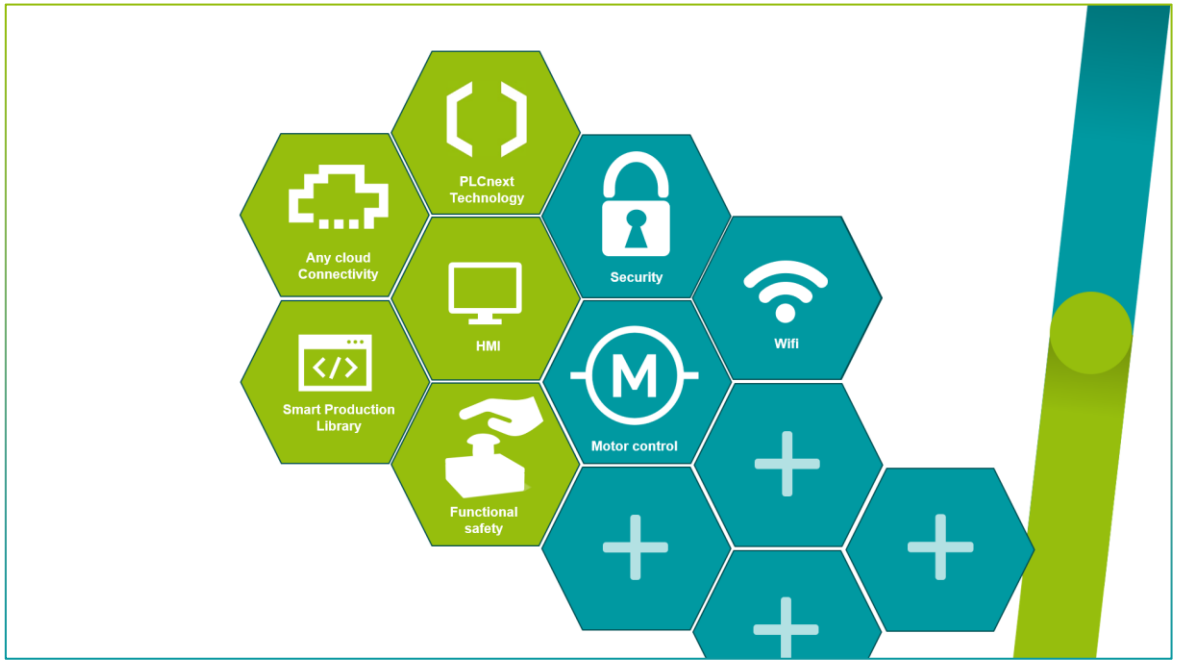
# **SMART** PRODUCTION




## Solutions

**Intelligent, consistent, flexible open PLC automation standard**

**Solutions and products for controlling, process and functional safety**

**Smart collaboration of Humans and Machines**

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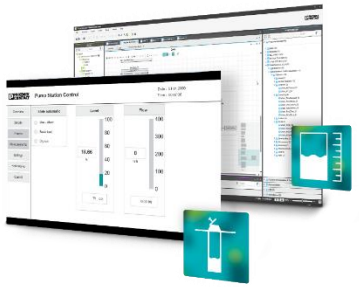
# **SMART** PRODUCTION

**Modular operator stations**

**Smart production cabinets**

**Smart production PLCnext library**



## Ready-to-order

- **Tested, validated and customizable Smart Production Cabinet for various applications**
- **Tested, validated and customzable Modular Operator Stations**
- **PLCnext Smart Production library**

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# SECURE DATA

SECURITY EVALUATION

SECURELY NETWORKED PRODUCTION

MANIPULATION DETECTION

SECURE MACHINE INTEGRATION

ev. 00

**PHOENIX CONTACT GmbH**
Flachsmarktstr. 8
32825 Blomberg
GERMANY

Industrial IT Security

: **ICS Security Service Provi**

V SÜD Product Service GmbH certifies that the
s maintaining a management system which me
sults are documented in a report. See http://ww

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# SECURITY **EVALUATION**

## Requirements

- **Fulfillment of international Cybersecurity Acts**
- **Accurate and individual security concept**
- **Protection against external and internal attacks**

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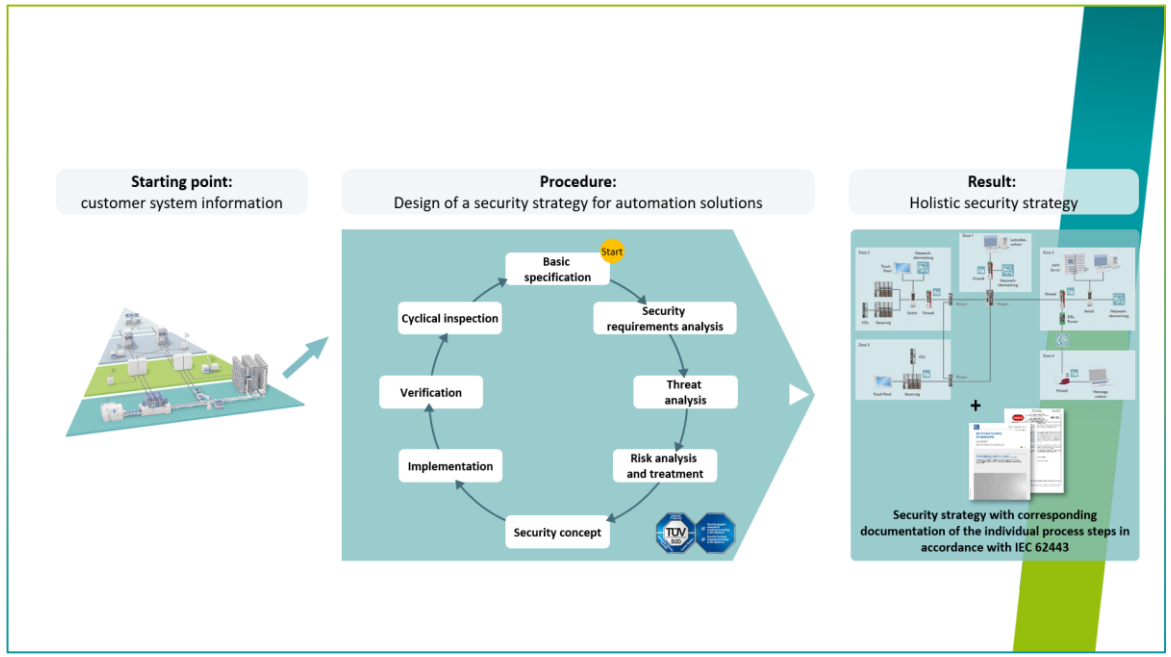
# SECURITY **EVALUATION**




## Solutions

- **Consulting service for holistic 360° security concept (based on IEC 62443)**
- **Security threat and risk analysis**
- **Longterm, international security expertise of Phoenix Contact**

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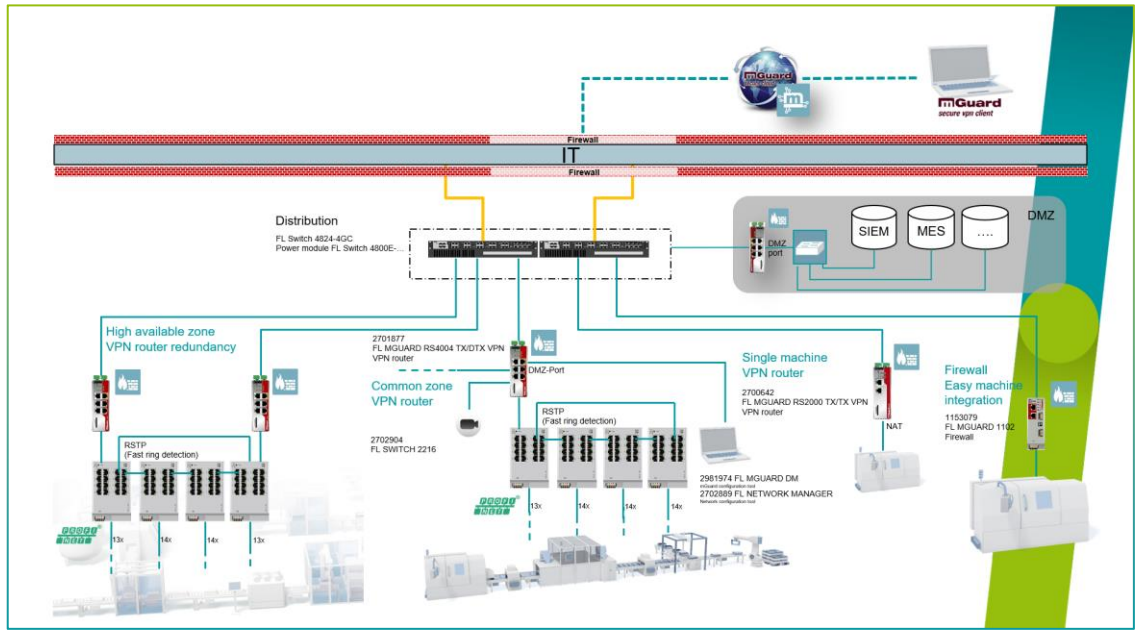
# SECURELY NETWORKED PRODUCTION




## Solutions

- **Separation into risk zones in line with industrial security standards**
- **Reduction of complexity by NAT and masquerading**
- **International remote secure cloud service**

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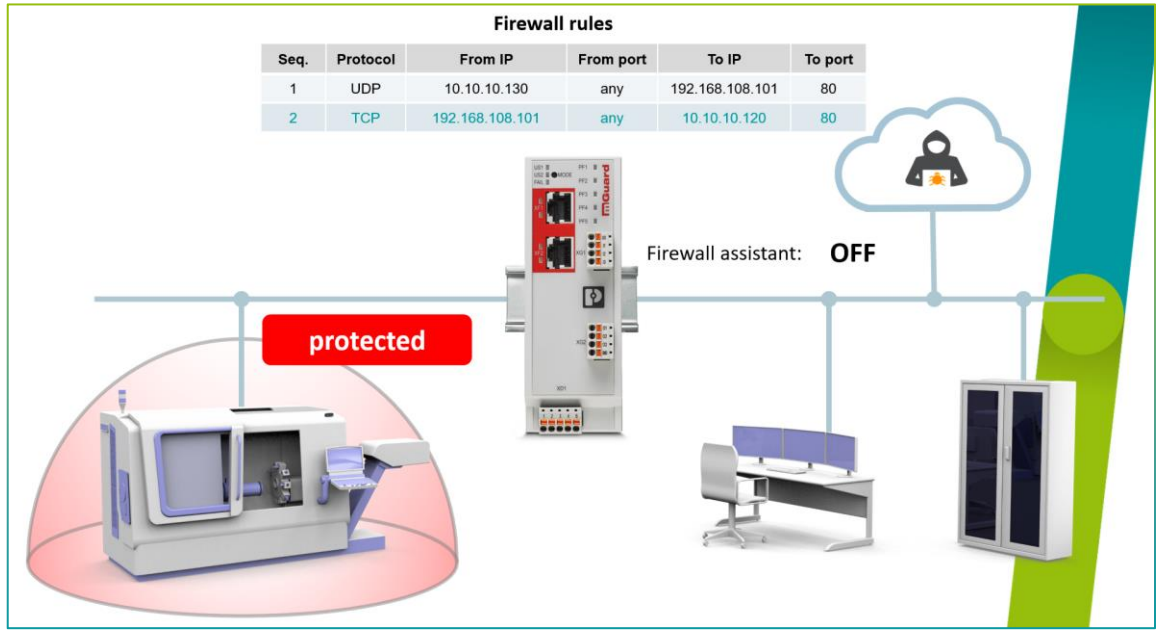
# SECURE **MACHINE INTEGRATION**




## Solutions

- **Plug and protect with 1:1 NAT implementation**
- **Protection against unauthorized access**
- **Intelligent firewall ruling**

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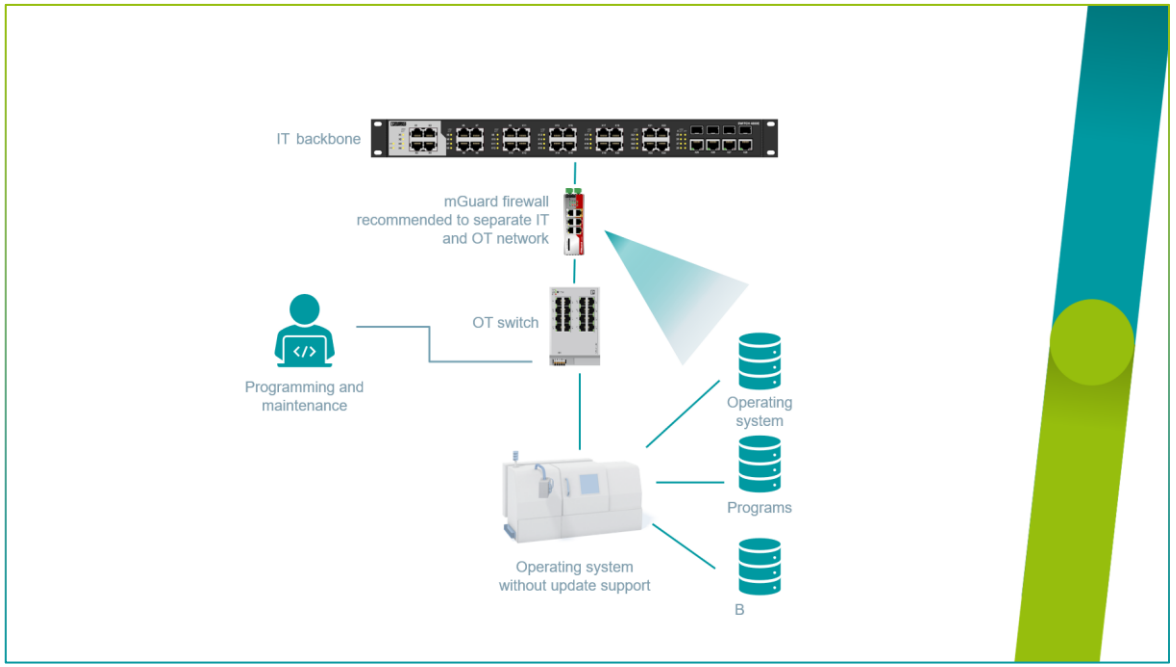
# MANIPULATION **DETECTION**




## Solutions

- **Antivirus scanner for industrial applications**
- **Detecting manipulation on Windows-based systems, even day zero attacks**
- **No installation and internet connectivity required**

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# SECURE **MACHINE INTEGRATION**

## mGuard security router

## Ready-to-order

- **Proven security portfolio with mGuard1100**
- **Proven security portfolio with VPN remote access by mGuard2000 and 4000**

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# SECURITY **EVALUATION**

## TÜV SÜD ICS security service provider

ZERTIFIKAT ◆ CERTIFICATE ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

CERTIFICATE

No. IITS1 029429 0015 Rev. 00

Holder of Certificate: PHOENIX CONTACT GmbH & Co. KG

Flachsmarktstr. 8
32825 Blomberg
GERMANY

Certification Mark:

Type: Industrial IT Security

Scope of Certificate: ICS Security Service Provider

The Certification Body of TÜV SÜD Product Service GmbH certifies that the company mentioned above has established and is maintaining a management system which meets the requirements of the listed standards. The results are documented in a report. See http://www.tuvsud.com/ps-cert for details.

Report No.: 20CR11S021 Rev 2.0

Valid until: 2023-05-06

Date, 2020-05-19 ( Christian Dirmeier )

Page 1 of 2
TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

## Ready-to-order

- **Individual security consulting**
- **Trainings and seminars**

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# For every manufacturing company and their suppliers Digital Factory now projects

# DIGITAL FACTORY now

**Network**

**Energy Meters**

**Monitor Relays**

**UPS**

**Electronic circuit breaker**

**Power Supplies**

**Functional Safety**

**PLCnext/ Edge**

**Terminal Blocks**

**Redundancy**

**Hybrid Motor starters**

**Surge Protection**

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Industries

# DIGITAL FACTORY now

**Logistic, intralogistic**
(AMR/ AGV, COBOTS,...)

**Thermo processes & machinery**
(Glass industry,...)

**Electronic production**
(Industrial, consumer products,...)

**Automotive**
(Leading industry)

**Food & Beverage**
(Packaging, food, ...)

**Any production**
(...)

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Industries

# DIGITAL FACTORY now

DIGITAL FACTORY now

**Customer:**
End user/ Produciton infrastructure/ facility

**Digital Factory now Industry:**
Automotive industry

**Application:**
Production data collection, storage and transport of data to have a better level of $CO_2$

DIGITAL FACTORY now

**Customer:**
Machine and plant builder (OEM/ EPC)

**Digital Factory now Industry:**
Glass industry (Hollow)

**Application:**
Smart control for main gas skid, reg. Machinery Directive/ EN746-2/ ISO13577-2 and NFPA85, 86

DIGITAL FACTORY now

**Customer:**
Car part supplier

**Digital Factory now Industry:**
Automotive

**Application:**
End-of-Line test benches for clutches and gearboxes in addtition to existing measurement for better diagnostic in low-cost test benches

DIGITAL FACTORY now

**Customer:**
End user/ Manufacturer of pantyhose and knee highs

**Digital Factory now Industry:**
Textil industry

**Application:**
Production data collection, storage on knitting machines

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DIGITAL FACTORY *now*

# Digital Factory now 360° production tour

# DIGITAL FACTORY now

**Discover virtual** the **solutions** of the **Digital Factory** in our own production in **Bad Pyrmont**, Germany!

**Explore** the **Digital Factory** now!

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# DIGITAL FACTORY now

Thank **YOU!**

Cătălin LEPINZEAN – **BD/KA Manager**

PHOENIX CONTACT