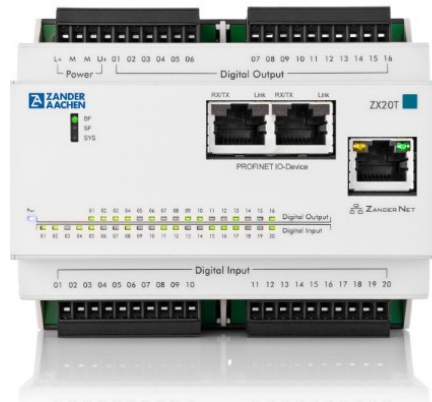
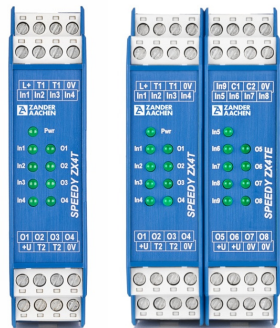


Zander Aachen - Automation

The World of Automation



AUTOMATION



H. Zander GmbH & Co. KG
Am Gut Wolf 15
52070 Aachen



Contents

1. The Challenges of Automation
2. High-speed Automation
3. The SPEEDY Product Group
4. The MVisio Product Group
5. The ZX20- and ZX09 Product Group

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1. The Challenges of Automation

The Challenges

- Growing complexity and accelerating processes
- Integrating the Industry 4.0
 - Networking machines, sensors and people
 - Digitalization and Automation of Processes
 - Technical Assistance
 - Decentralized decision making

➔ The need for fast, secure, reliable, reproducible, flexible and intelligent processes and process management

1. The Challenges of Automation

The Challenges

- Growing complexity and accelerating processes
- Integrating the Industry 4.0
 - Networking machines, sensors and people
 - Digitalization and Automation of Processes
 - Technical Assistance
 - Decentralized decision making

➔ The need for fast, secure, reliable, reproducible, flexible and intelligent processes and process management

The Solution

- Zander Aachen provides a solution
 - PLCs for fast, secure, reliable, reproducible and flexible Automation and Technical Assistance for all processes

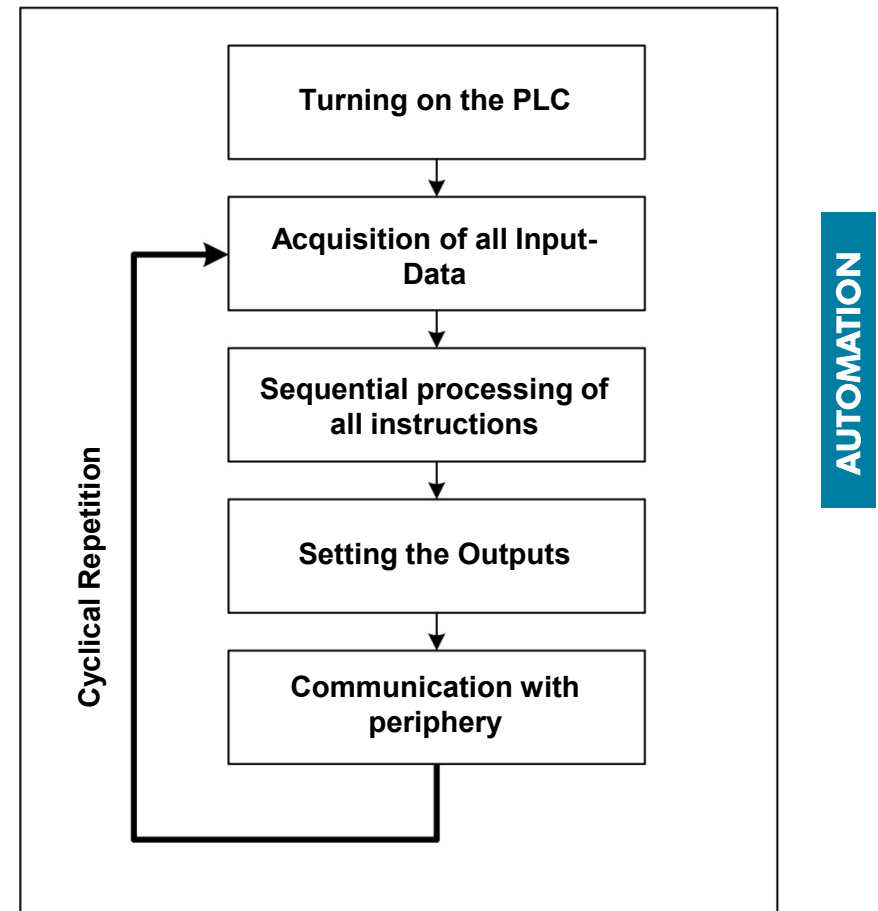
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2. High-speed Automation

The common PLC

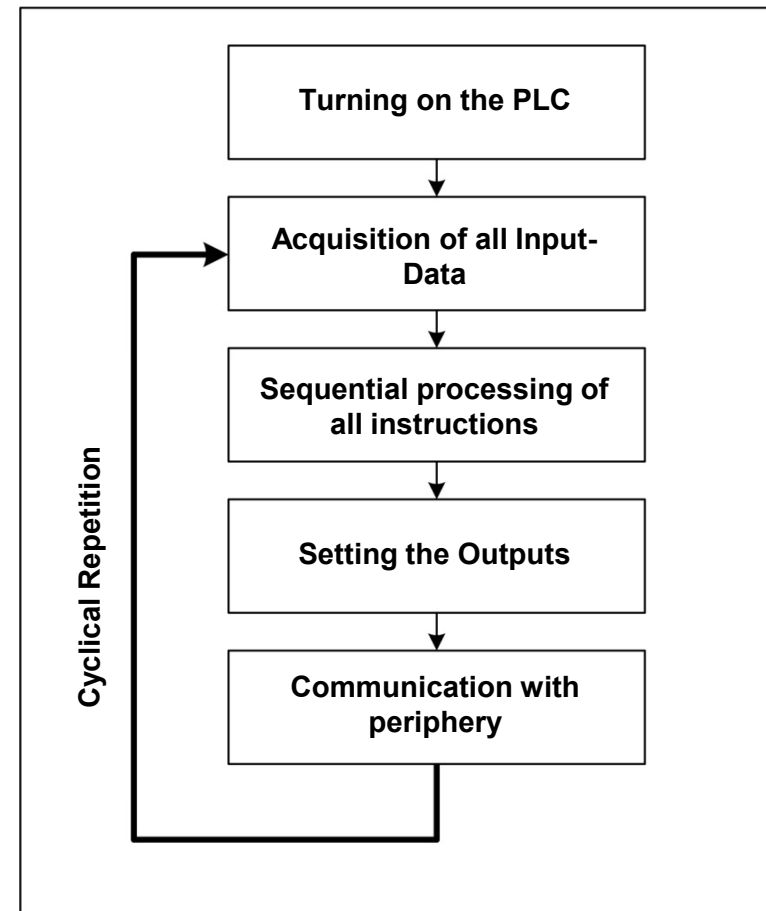
- Powered by a Microcontroller
- Programming in Software
- Sequential processing
 - Time dependent on amount and type of instructions



2. High-speed Automation

The common PLC

- Powered by a Microcontroller
- Programming in Software
- Sequential processing
 - Time dependent on amount and type of instructions
- Consequences
 - Jitter
 - Higher Reaction times
 - No reproducible switching points
 - No guarantee for the acquisition of fast signals



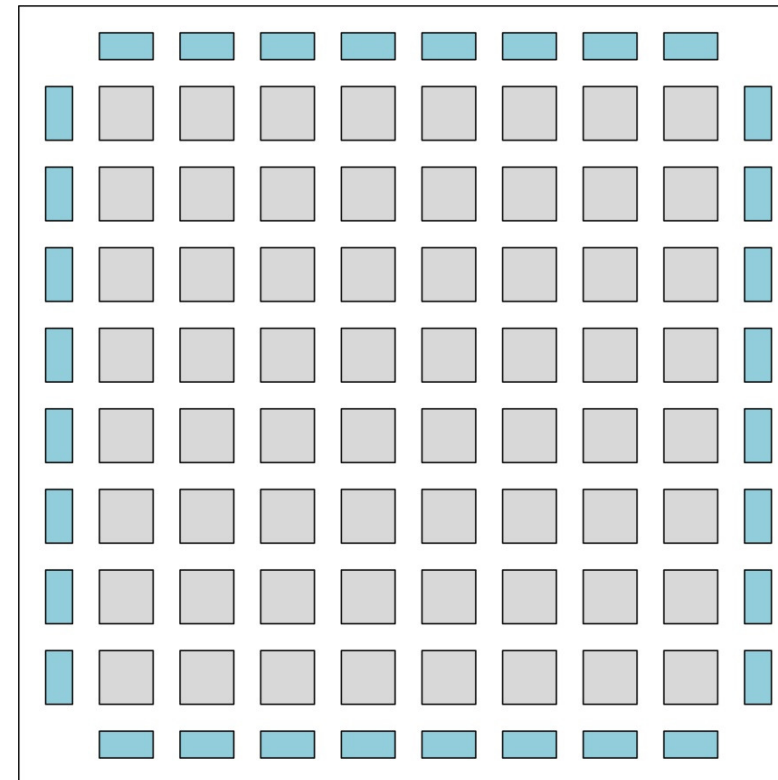
AUTOMATION



2. High-speed Automation

The heart of the ZX Product Group:
The FPGA

- Field Programmable Gate Array
 - Programming in Hardware
 - > 200.000 logic gates

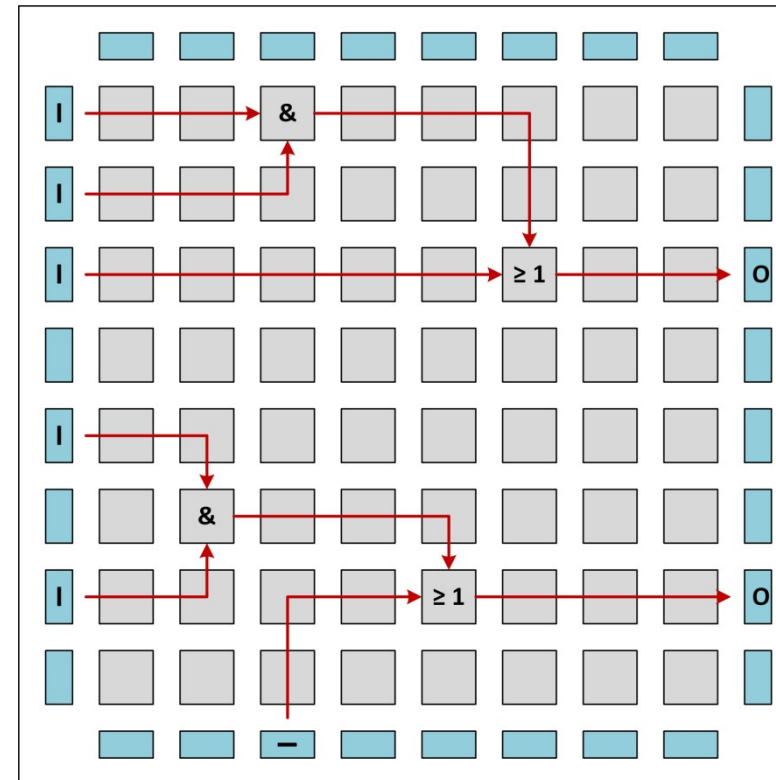


AUTOMATION

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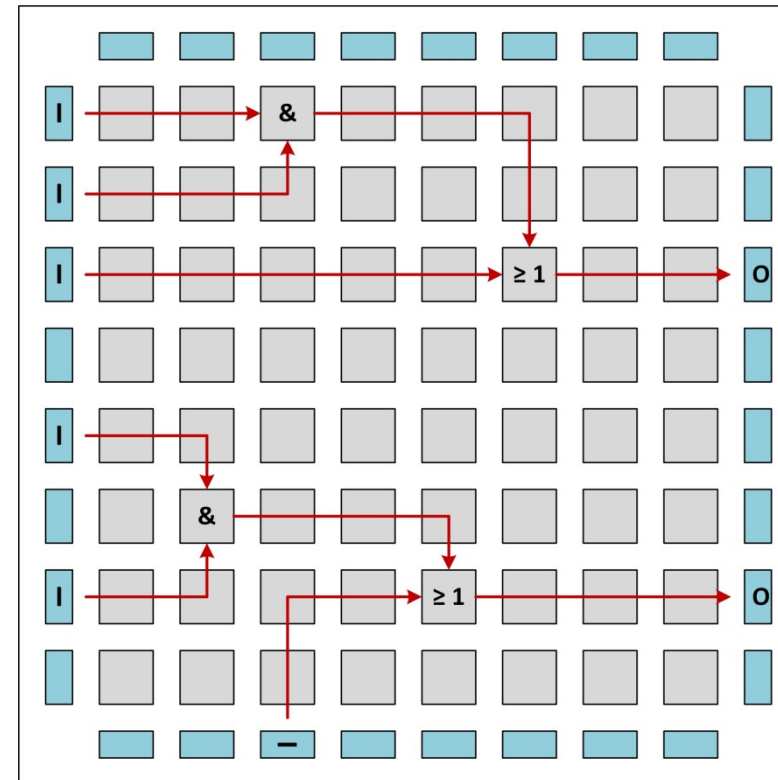


AUTOMATION

2. High-speed Automation

The heart of the ZX Product Group: The FPGA

- Field Programmable Gate Array
 - Programming in Hardware
 - > 200.000 logic gates
- Advantages
 - Cycle and jitter free
 - No sequential processing
 - 100% reproducible switching points for different machine speeds
 - Real parallel processing
- Completely reprogrammable
- For the ZX8T and ZX4T / ZX4TE a CPLD is used



2. High-speed Automation

The ZX Product Group: High-speed PLCs for every possible demand

- Solution for the accelerating production processes
 - Packaging machines
 - Filling systems
 - Labeling machines
 - ...



AUTOMATION



2. High-speed Automation

The ZX Product Group: High-speed PLCs for every possible demand

- Solution for the accelerating production processes
 - Packaging machines
 - Filling systems
 - Labeling machines
 - ...
- Realized with a new type of PLC
- Easy programmable in Structured Text (ST)
 - EX_PRESS 4 for ZX8T, ZX4T and ZX4TE
 - EX_PRESS 5 for ZX20T, ZX20TP, ZX20TC, ZX09 and ZX09A
 - No new language required
- Fast Subsystem for cooperation with slower PLCs

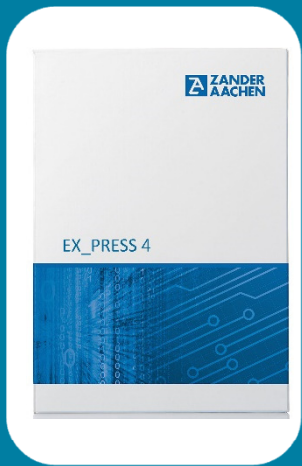


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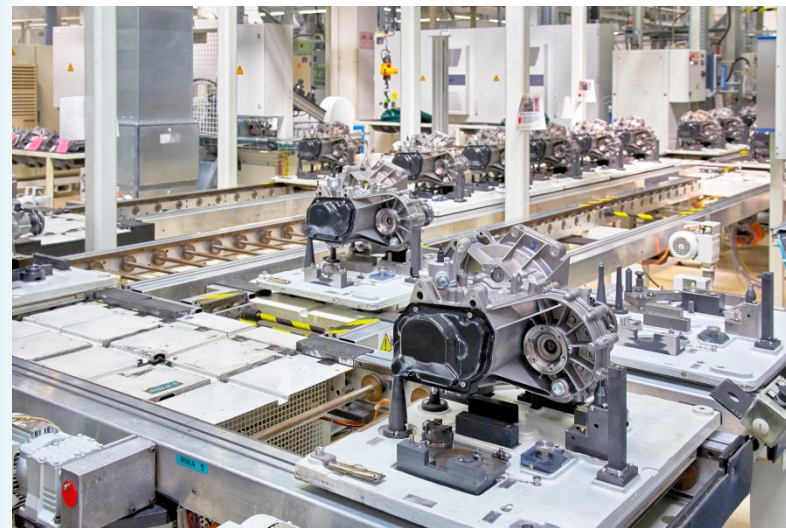
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3. The SPEEDY Product Group



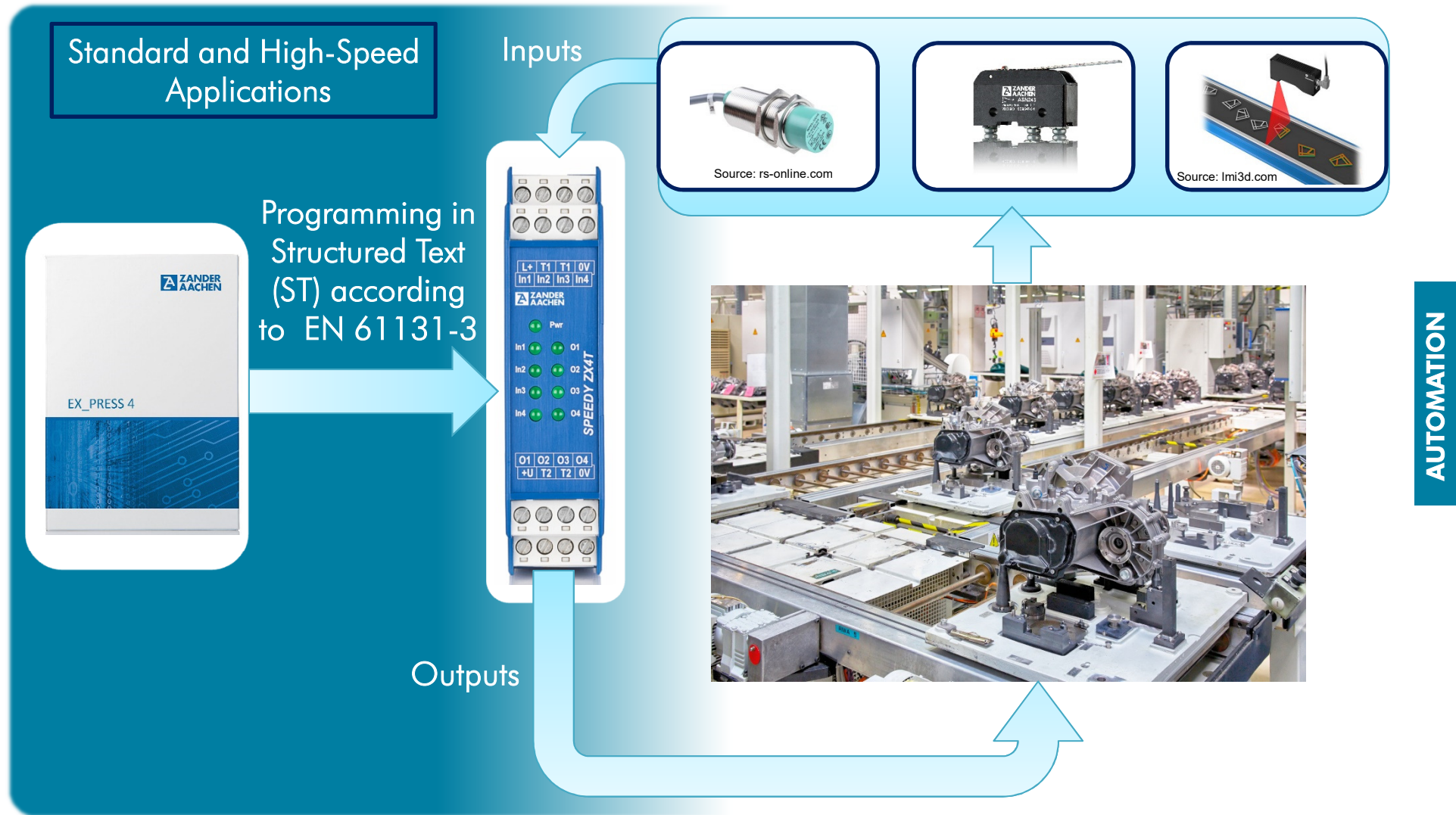
Programming in Structured Text (ST) according to EN 61131-3



AUTOMATION



3. The SPEEDY Product Group



3. The SPEEDY Product Group

Size doesn't matter - The compact and fast SPEEDY ZX4T and SPEEDY ZX4TE

- Function
 - Micro PLC for small systems
 - Fixed timers, configurable through remote potentiometer
 - Easily programmable with EX_PRESS 4
- Variations
 - ZX4T: 4 digital In- and Outputs
 - ZX4TE: 9 digital In- and 8 Outputs / 2 fast Counter



AUTOMATION



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 - Easily programmable with EX_PRESS 4
- Variations
 - ZX4T: 4 digital In- and Outputs
 - ZX4TE: 9 digital In- and 8 Outputs / 2 fast Counter
- The Advantages
 - Cost efficient micro high-speed solution with no cycle time
 - Reaction time < 100 μ s / 20 μ s
 - Very compact (22.5 mm; 45 mm)



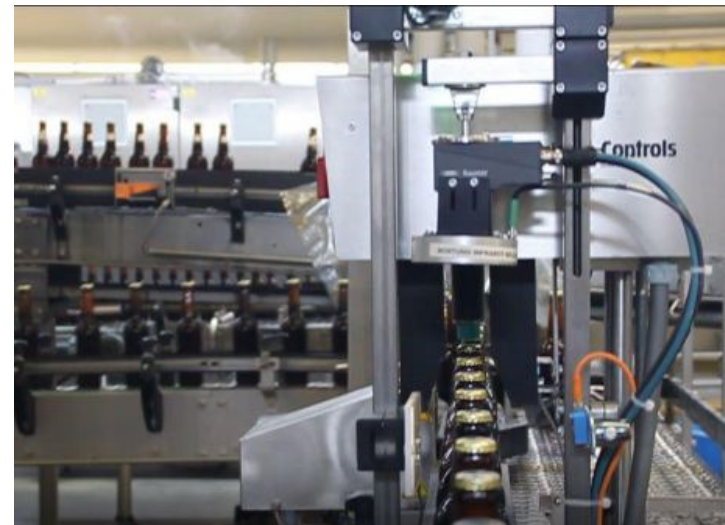
AUTOMATION



3. The SPEEDY Product Group

A ZX4T Application

- The Task
 - Fast sorting of good and bad parts in the food industry
 - Detection, tracking and sorting of incorrectly placed bottle caps
- The Realization
 - Good / Bad detection with a camera
 - Comparison with default image
 - Tracking and sorting of incorrectly placed bottle caps with ZX4T

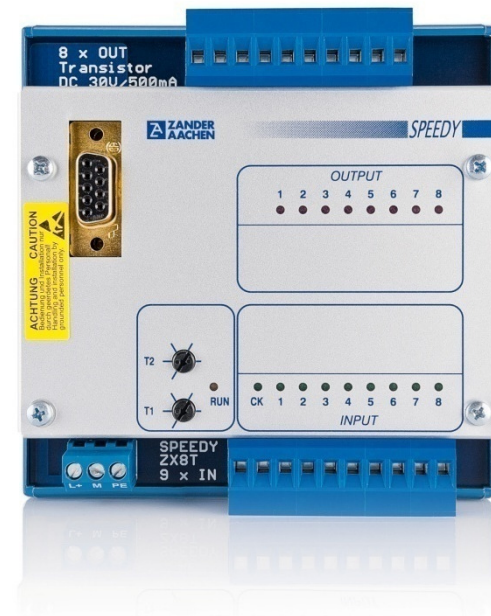


AUTOMATION

3. The SPEEDY Product Group

The all-rounder - The versatile, compact and fast SPEEDY ZX8T

- Function
 - Micro PLC for small to medium-sized systems
 - Configurable timer through potentiometer
 - 8 digital In- and Outputs
 - Easily programmable with EX_PRESS 4
- Expansions
 - Expansions connectable through the internal bus



AUTOMATION



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 - Configurable timer through potentiometer
 - 8 digital In- and Outputs
 - Easily programmable with EX_PRESS 4
- Expansions
 - Expansions connectable through the internal bus
- The Advantages
 - Cost efficient high-speed solution with no cycle time
 - Reaction time < 100 μ s
 - Extendable through internal bus



AUTOMATION

3. The SPEEDY Product Group

Further ZX4T and ZX8T Applications

- Air Lock Control
 - Reliable Air lock control for operating rooms in hospitals
 - Efficient and fail-safe method to control and keep air pressure in operating rooms
- Neon Sign Control
 - Reliable sequence control of neon signs for the optimal advertising effect
- Barrier Control in parking garages
 - Reliable and efficient barrier control in parking garages



Source: oiger.de



AUTOMATION



3. The SPEEDY Product Group

Programming made easy - EX_PRESS 4

- Function
 - Programming of SPEEDY PLCs
 - Programming in Structured Text (ST) according to EN 61131-3
- Advantages
 - Easy to use and comfortable development system
 - Simple code development and compilation



AUTOMATION

3. The SPEEDY Product Group

The screenshot shows a software window titled "EX_PRESS - C:\Zander\EX_PRESS4e\Examples\EX_PRESS\SPEEDY ZX4T\Conveyor.s16". The main window contains the following text:

Conveyor control for SPEEDY

ATTENTION: Please choose the item "SPEEDY" in the menu "SPS-Type".

This program realizes a control of a conveyor line which consists of eight sequential belts. The drives are automatically controlled depending on the loading condition. Light barriers prevent a collision of the loads at the connection points.

PROGRAM CONVEYOR

VAR_INPUT

- LS1 AT CK; (* Light barrier supply station *)
- LS2 AT E1; (* Light barrier segment 1/2 *)
- LS3 AT E2; (* Light barrier segment 2/3 *)
- LS4 AT E3; (* Light barrier segment 3/4 *)
- LS5 AT E4; (* Light barrier segment 4/5 *)
- LS6 AT E5; (* Light barrier segment 5/6 *)
- LS7 AT E6; (* Light barrier segment 6/7 *)
- LS8 AT E7; (* Light barrier segment 7/8 *)
- LS9 AT E8; (* Light barrier pick up station *)

POR AT POR; (* Power on reset *)

END_VAR;

VAR_OUTPUT

- Belt1 AT A1; (* Drive for conveyor segment 1 *)
- Belt2 AT A2; (* Drive for conveyor segment 2 *)
- Belt3 AT A3; (* Drive for conveyor segment 3 *)
- Belt4 AT A4; (* Drive for conveyor segment 4 *)
- Belt5 AT A5; (* Drive for conveyor segment 5 *)
- Belt6 AT A6; (* Drive for conveyor segment 6 *)
- Belt7 AT A7; (* Drive for conveyor segment 7 *)
- Belt8 AT A8; (* Drive for conveyor segment 8 *)

END_VAR;

IF (LS1 = 1 AND LS2 = 0 OR
Belt1 = 1 AND LS2 = 0 AND POR = 0) THEN (* Switch on belt 1, if material lies at the supply *)
Belt1 := 1; (* station and at the same time the end of belt 1 *)
END_IF; (* (= start of belt 2) is empty. The belt will *)
(* remain switched on until the end of belt 1 is *)
(* reached (self holding). The inquiry of the *)
(* signal POR takes care that the output is not *)
(* set into self holding while the supply power is *)
(* built up and undefined voltage levels at the *)

The log window shows the following output:

```
..  
Minimierung von Belt1  
Minimierung von Belt2  
Minimierung von Belt3  
Minimierung von Belt4  
Minimierung von Belt5  
Minimierung von Belt6  
Minimierung von Belt7  
Minimierung von Belt8  
Compilevorgang beendet. Warnungen: 0, Fehler: 0.  
Fitterdurchgang erfolgreich beendet
```

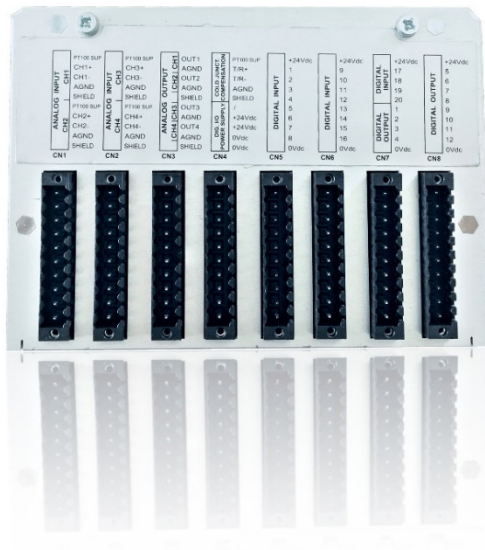
AUTOMATION



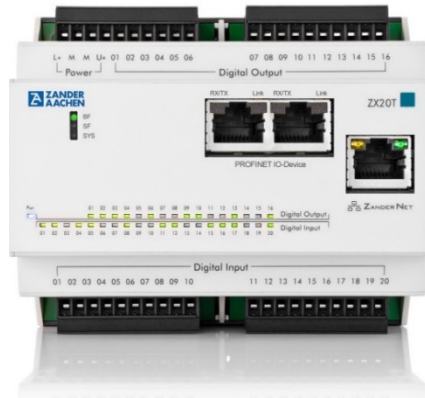
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4. The MVisio Product Group



- Automate



- Visualize



- Parameterize
- Control

AUTOMATION



4. The MVisio Product Group

Automation at the palm of your hands - The MVisio 7 HMI

- Function
 - HMI PLC for small to medium-sized systems
 - 7 inch 16:9 Display (800 x 480 px)
 - 64 K colors
 - Resistive Touchscreen
- Programmability and Visualization
 - CODESYS



AUTOMATION



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 - HMI PLC for small to medium-sized systems
 - 7 inch 16:9 Display (800 x 480 px)
 - 64 K colors
 - Resistive Touchscreen
- Programmability and Visualization
 - CODESYS
- The Advantages
 - Cost efficient HMI-Solution
 - Connectable with the PCL ZX20TP
 - Allows an easy and convenient way to control and watch your processes



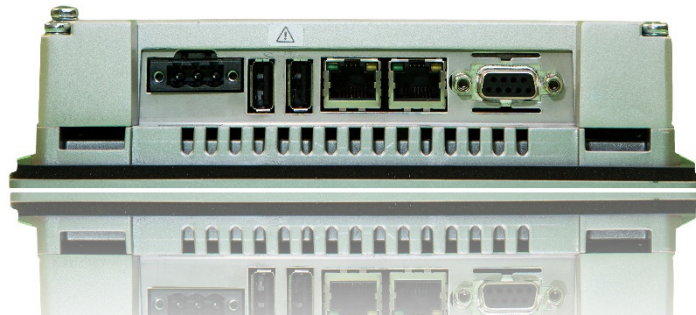
AUTOMATION



4. The MVisio Product Group

Automation at the palm of your hands - The Mvisio_7 HMI

- Communication
 - 2x RJ45 Ethernet ports, 10/100 Mbit with an integrated switch
 - Ethernet
 - PROFINET
 - 1x serial Interface RS 232 / RS 485 / RS 422
 - 2x I/O module ports
 - 2x USB 2.0 ports
 - 1x SD-Card slot



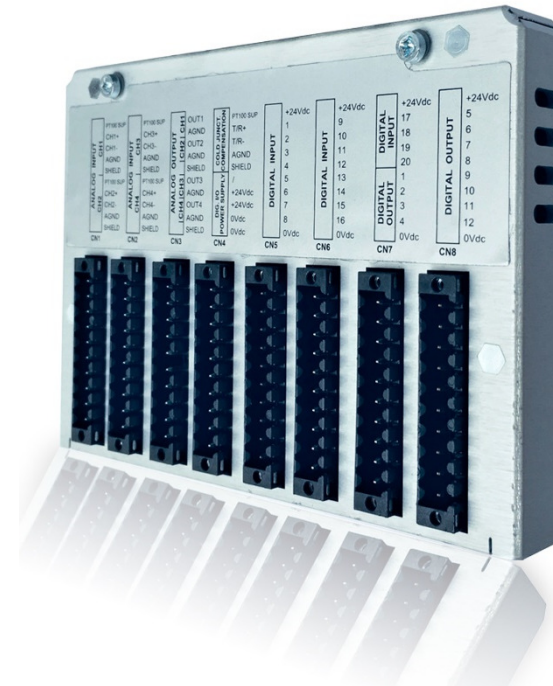
AUTOMATION



4. The MVisio Product Group

The excellent addition - The multifunctional Plug-In MVisio I/O-Module

- Function
 - Multifunctional Plug-In I/O Module for the MVisio_7
- Inputs and Outputs
 - 20 digital Inputs
 - 12 digital Outputs
 - Encoder, Frequency and Counter Inputs
 - Up to 8 analog Inputs
 - 4 analog Outputs
 - Pt100 and Thermocouple Inputs



AUTOMATION

4. The MVisio Product Group

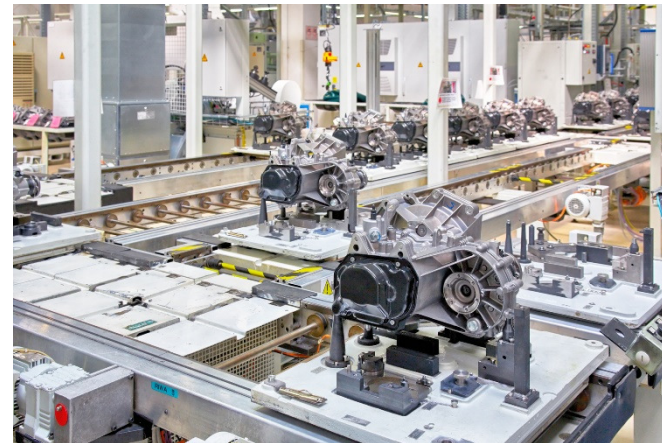
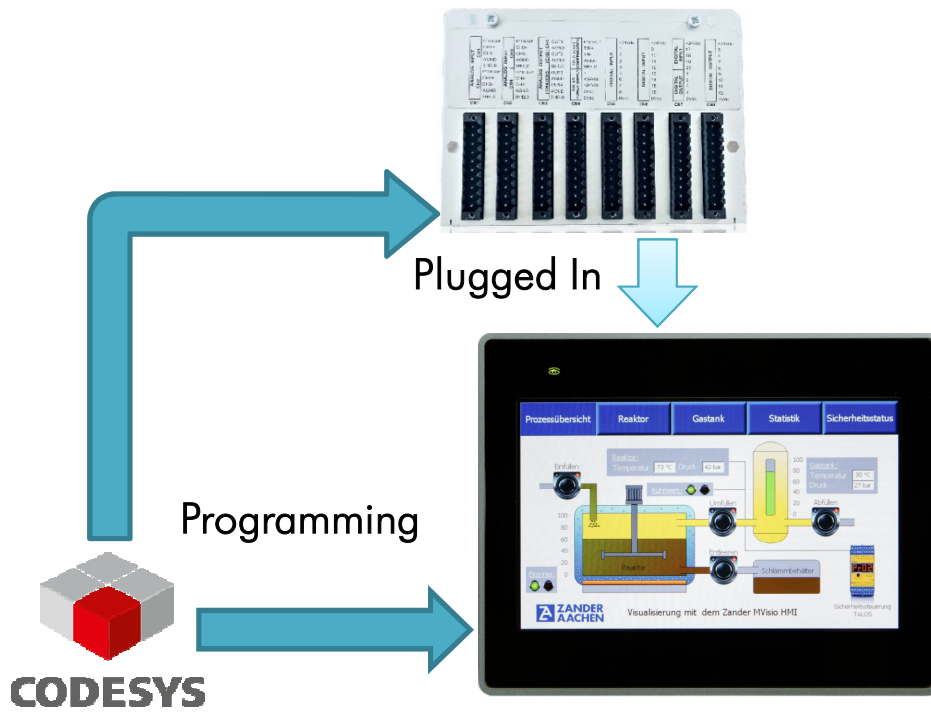
The excellent addition - The multifunctional Plug-In MVisio I/O-Module

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 - Multifunctional Plug-In I/O Module for the Mviso_7
- Inputs and Outputs
 - 20 digital Inputs
 - 12 digital Outputs
 - Encoder, Frequency and Counter Inputs
 - Up to 8 analog Inputs
 - 4 analog Outputs
 - Pt100 and Thermocouple Inputs
- The Advantages
 - Easy installation via Plug-In
 - Transforms the Mviso_7 into an multifunctional independent HMI PLC



AUTOMATION

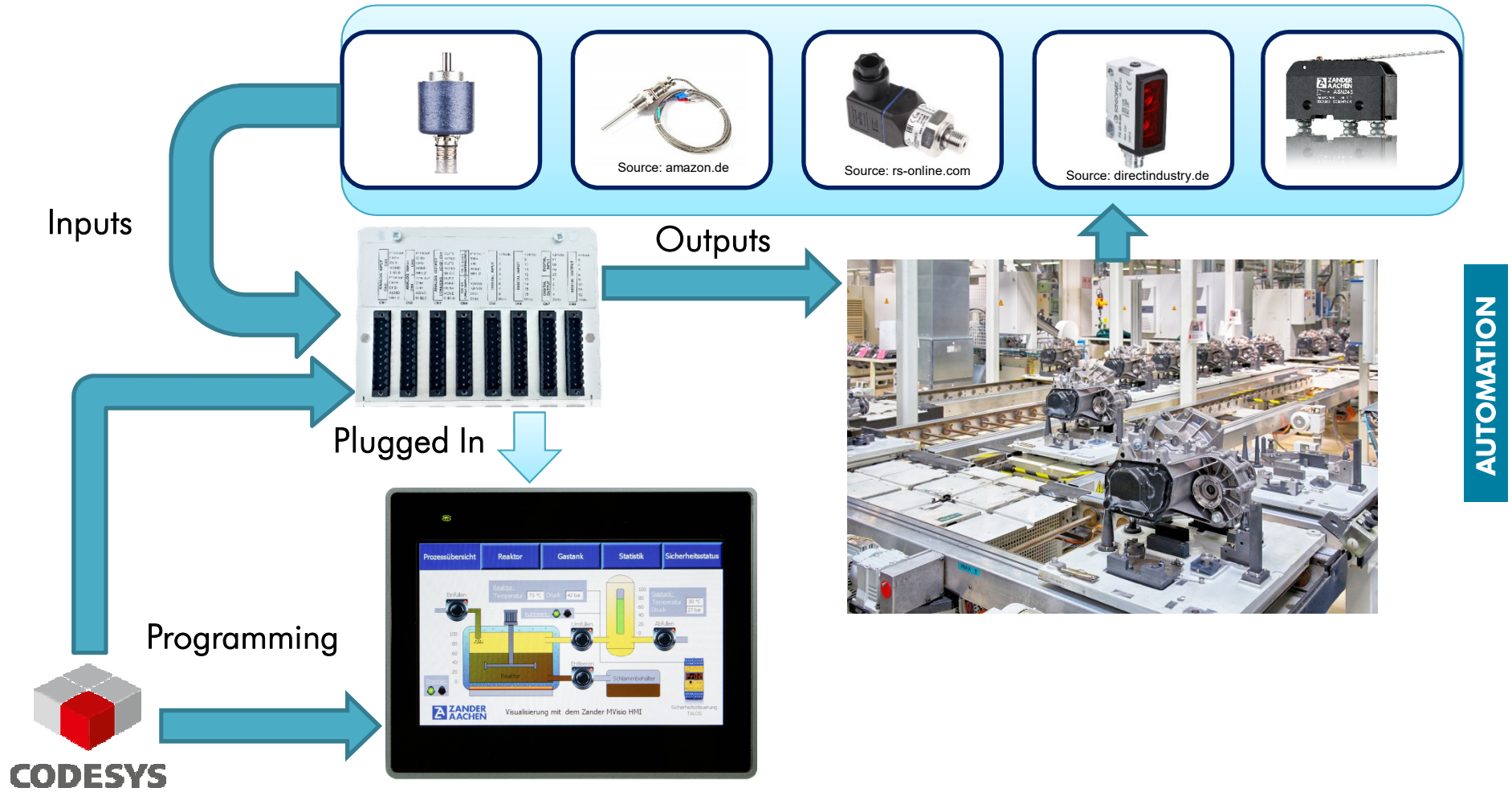
4. The MVisio Product Group



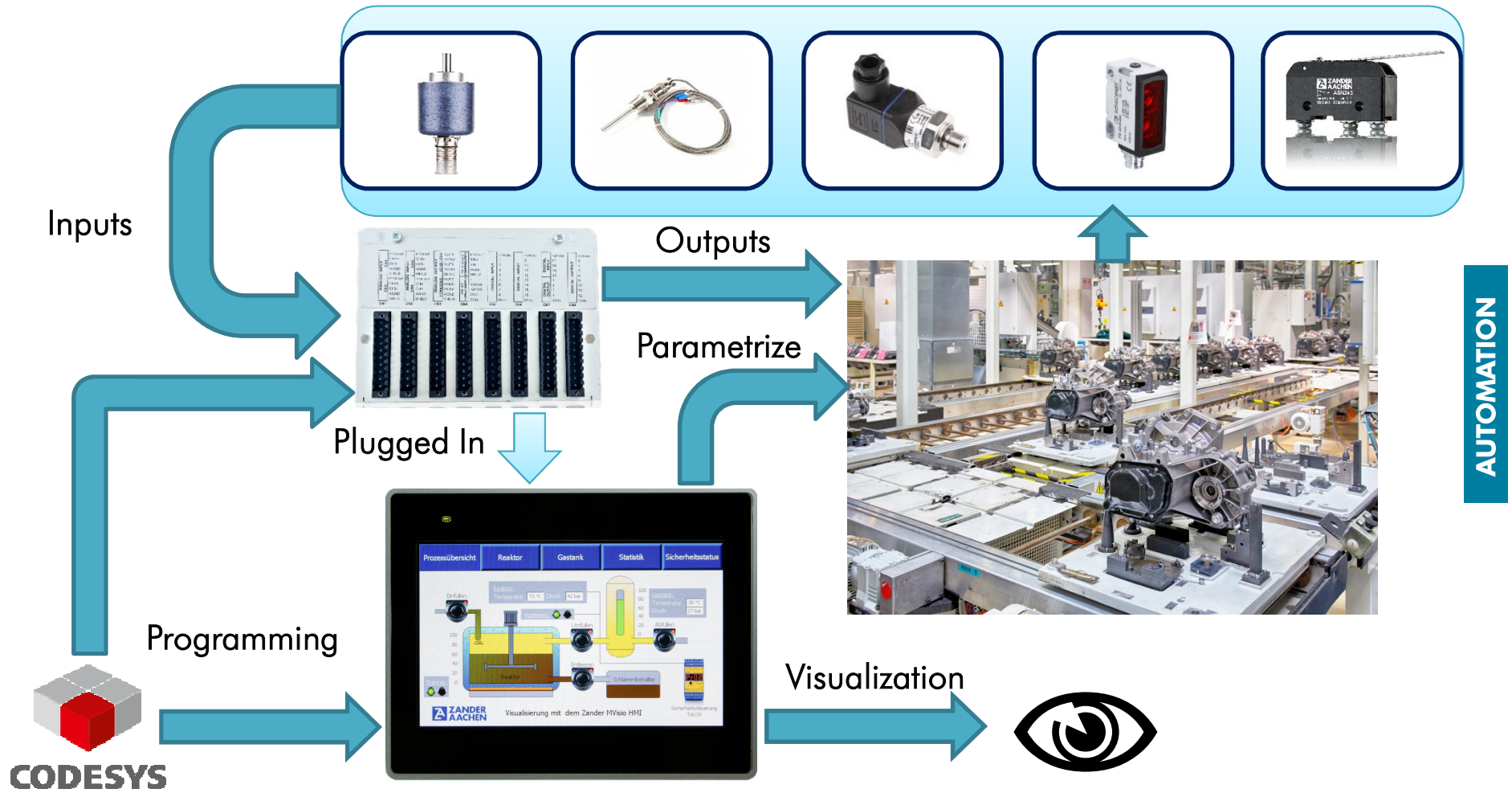
AUTOMATION



4. The MVisio Product Group



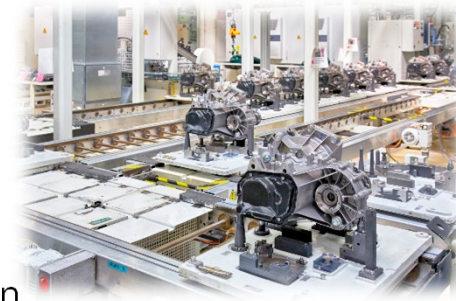
4. The MVisio Product Group



4. The MVisio Product Group

MVisio_7 Applications

- Manufacturing processes
 - Continuous status monitoring through visualization
 - Control and adjustment of all sub-processes while in operation
 - Application in automated individual up to serial production
- Filling processes
 - Process complexity reduction for the user through visualization and control possibility
- Count and sorting processes
 - ZX20TP: Fast evaluation of the sensors and control of the actuators for high throughput and better selectivity
 - MVisio_7: Control and Visualization of the process for higher flexibility and complexity reduction



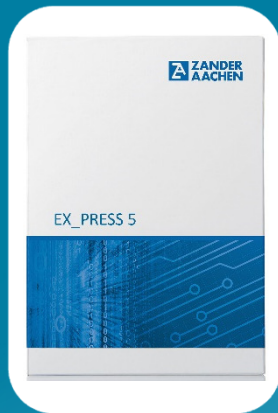
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5. The ZX20- and ZX09 Product Group



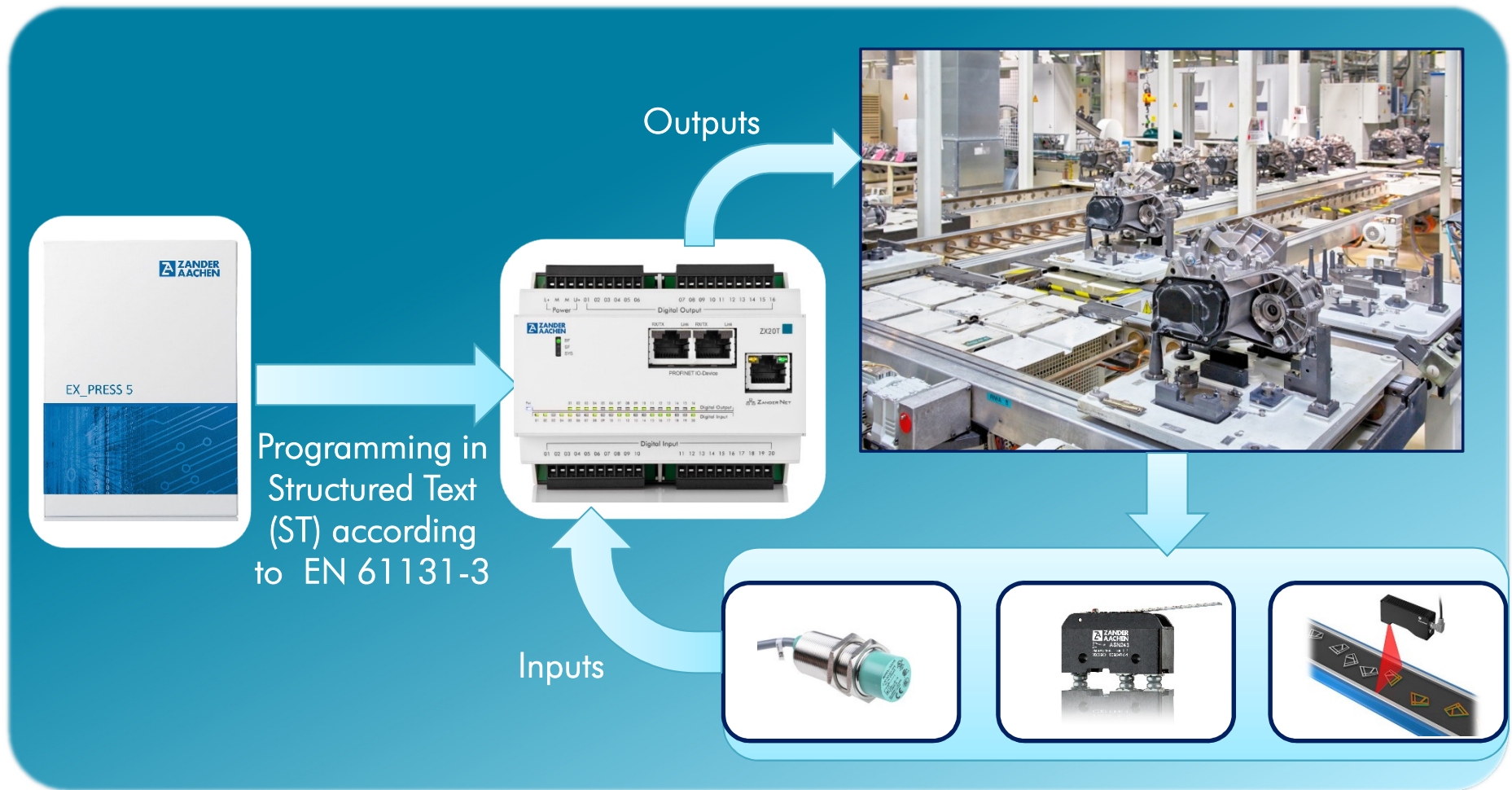
Programming in Structured Text (ST) according to EN 61131-3



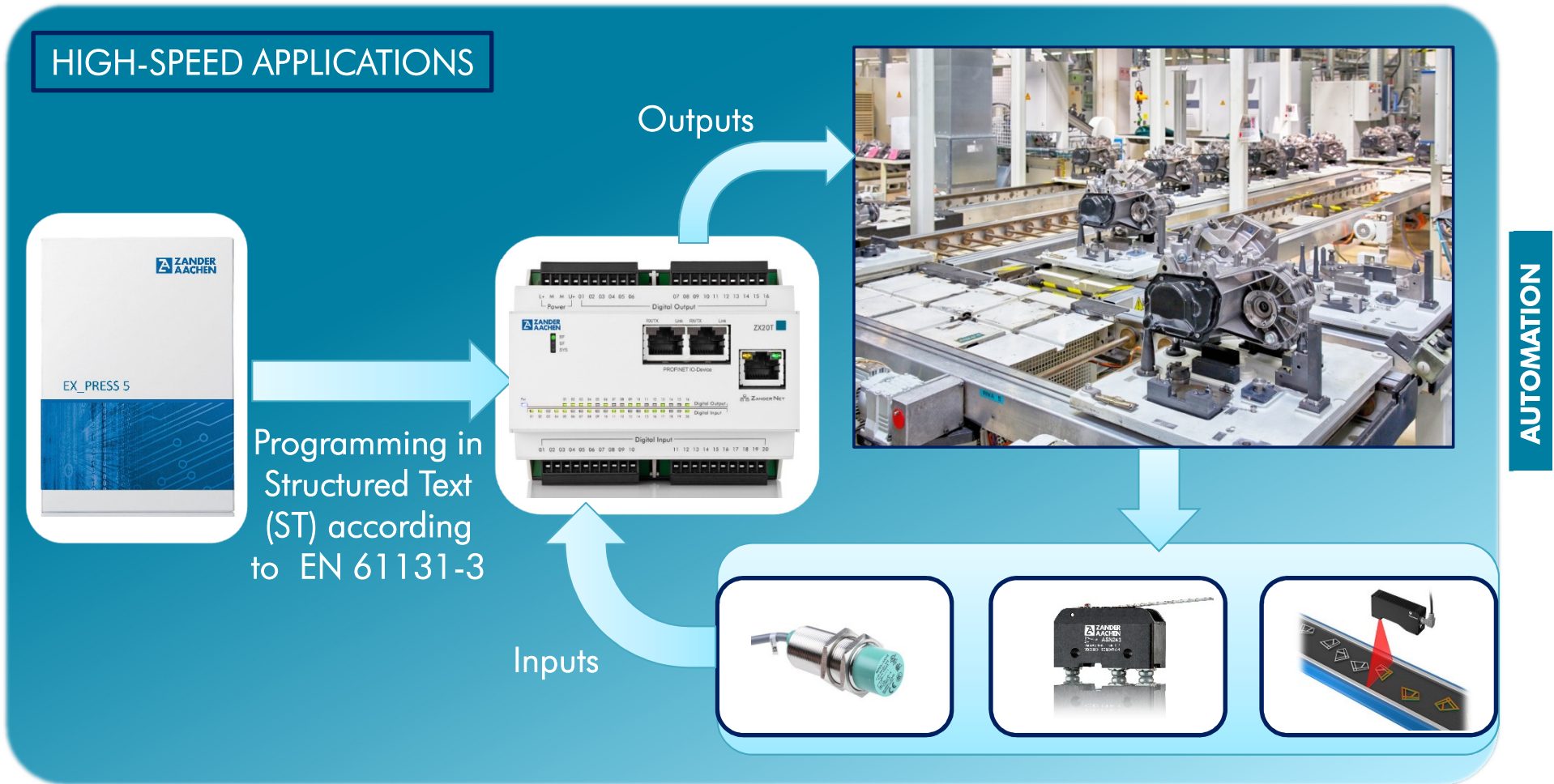
AUTOMATION



5. The ZX20- and ZX09 Product Group



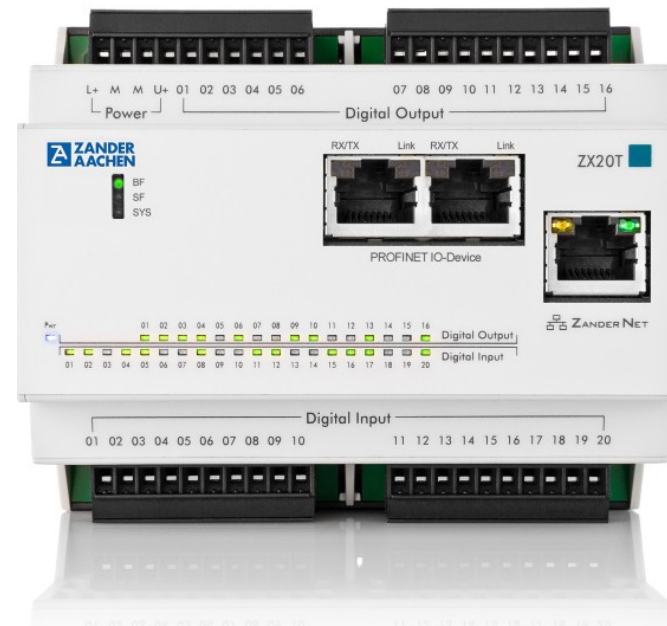
5. The ZX20- and ZX09 Product Group



5. The ZX20- and ZX09 Product Group

When time is of the essence - The high-speed ZX20T, ZX20TP and ZX20TC

- Function
 - Micro PLC for small to medium-sized systems
 - Almost limitless configurable timers
 - Easily programmable with EX_PRESS 5
 - Almost no processing time: 1 μ s
- Variations
 - ZX20T: 20 digital Inputs , 16 digital Outputs
 - ZX20TP: 2x Additional PROFINET port
 - ZX20TC: 1x Additional In/Out EtherCAT port

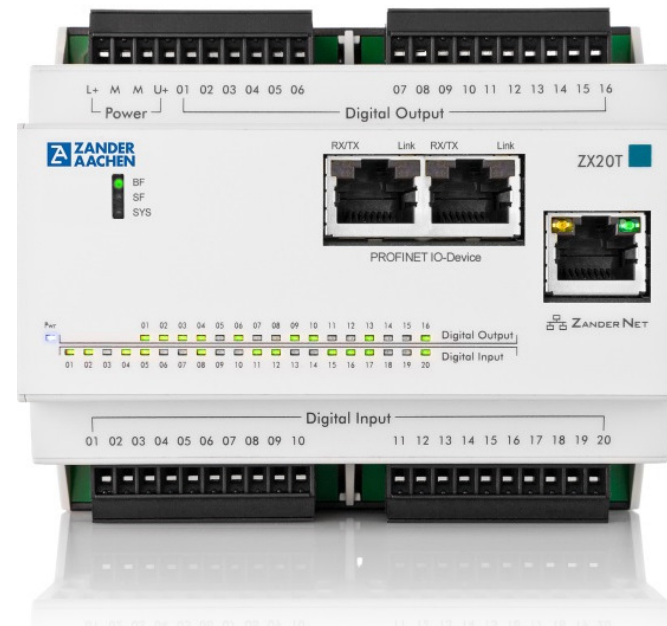


AUTOMATION

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 - ZX20TP: 2x Additional PROFINET port
 - ZX20TC: 1x Additional In/Out EtherCAT port
- The Advantages
 - Cost efficient high-speed solution with no cycle time; Reaction time < 9 μ s
 - Integrable in existing Networks, programmable within the Network



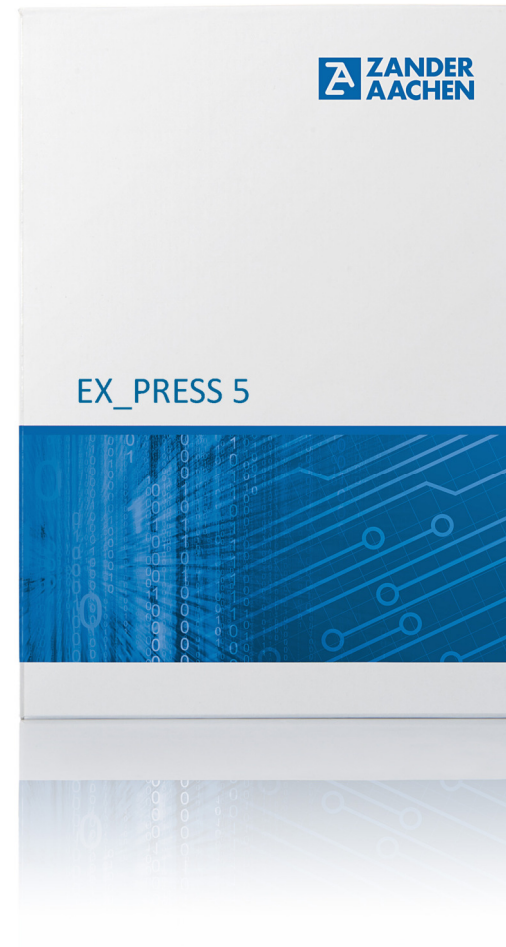
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5. The ZX20- and ZX09 Product Group

Programming made easy - EX_PRESS 5

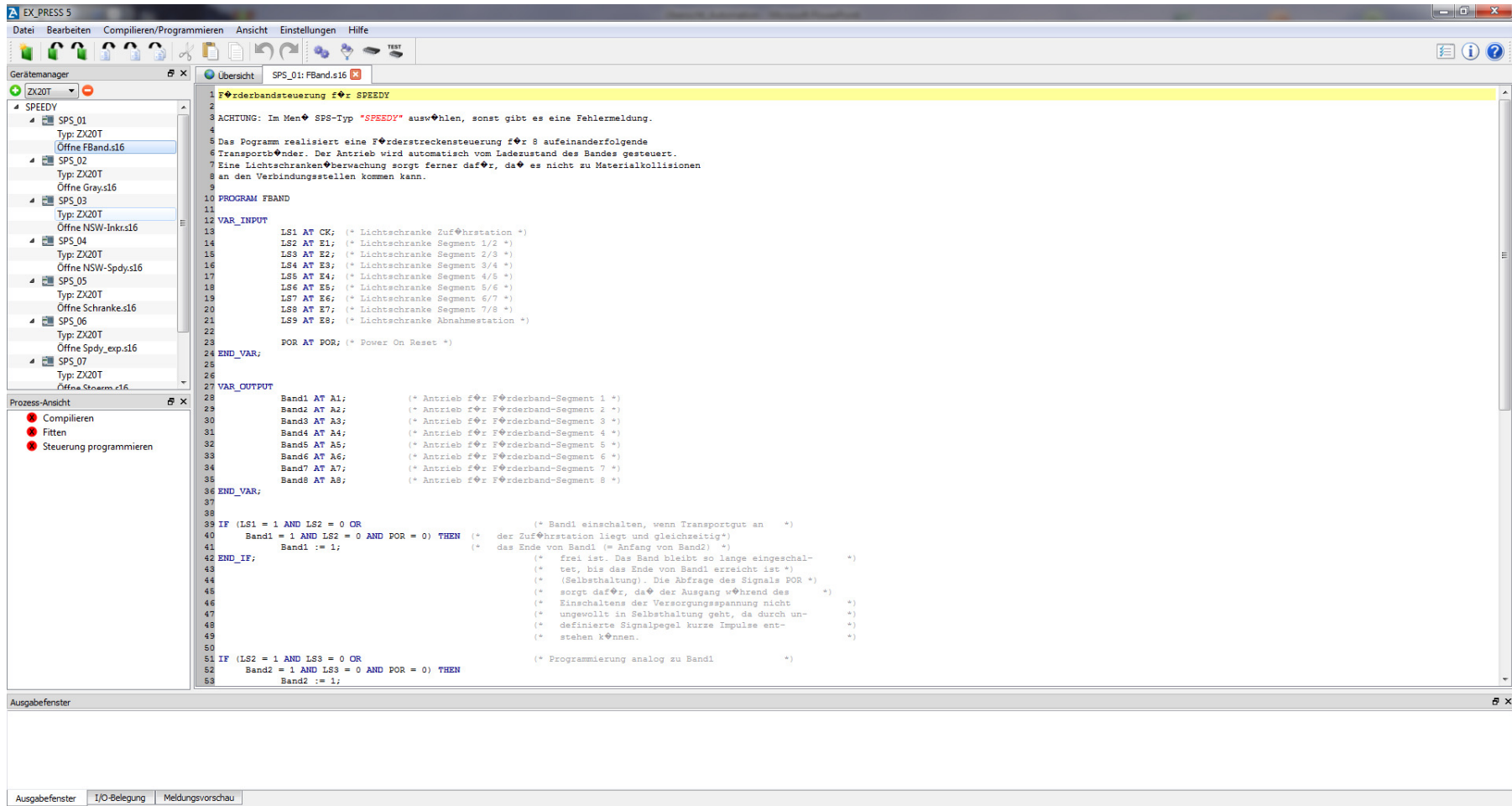
- Function
 - Programming of ZX20 and ZX09 PLCs
 - Programming in Structured Text (ST) according to EN 61131-3
- Advantages
 - Easy to use and comfortable development system
 - Familiar Windows interface



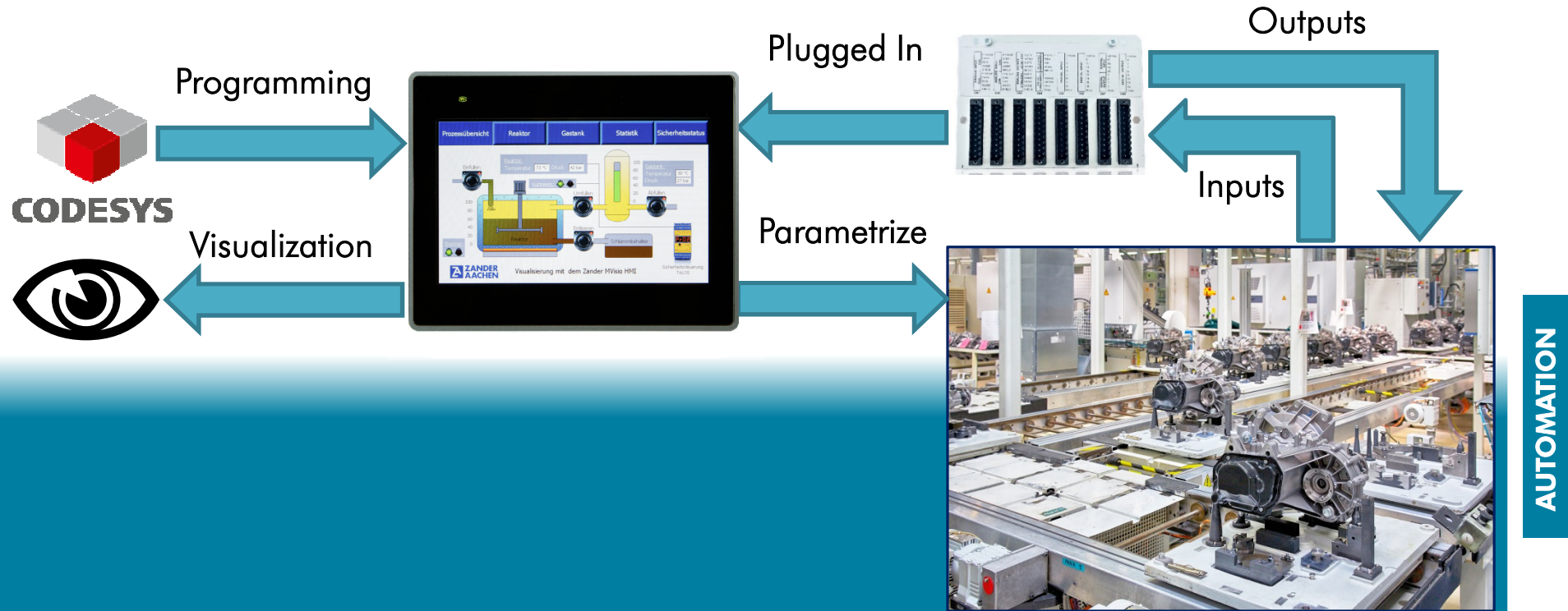
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5. The ZX20- and ZX09 Product Group

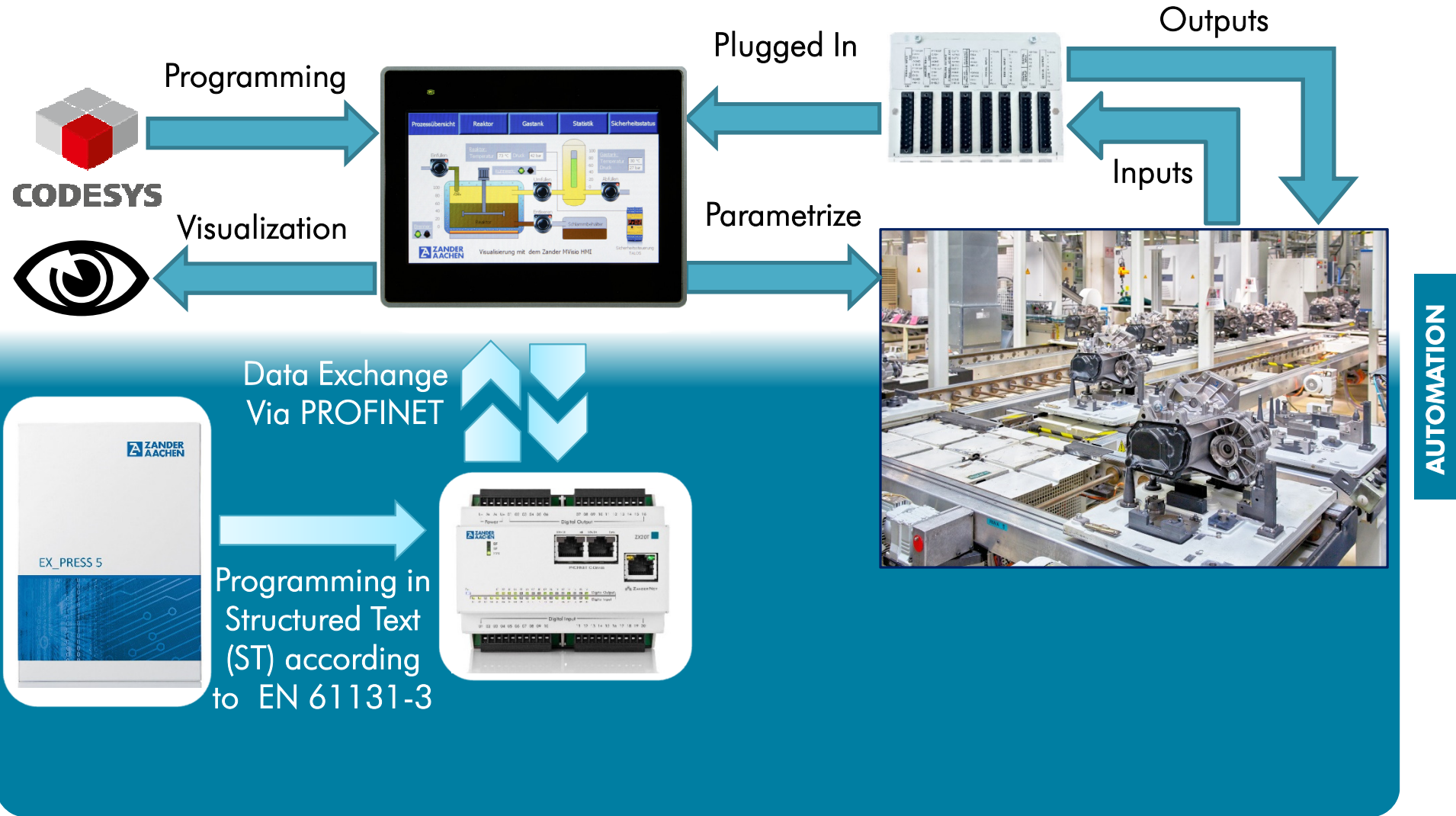
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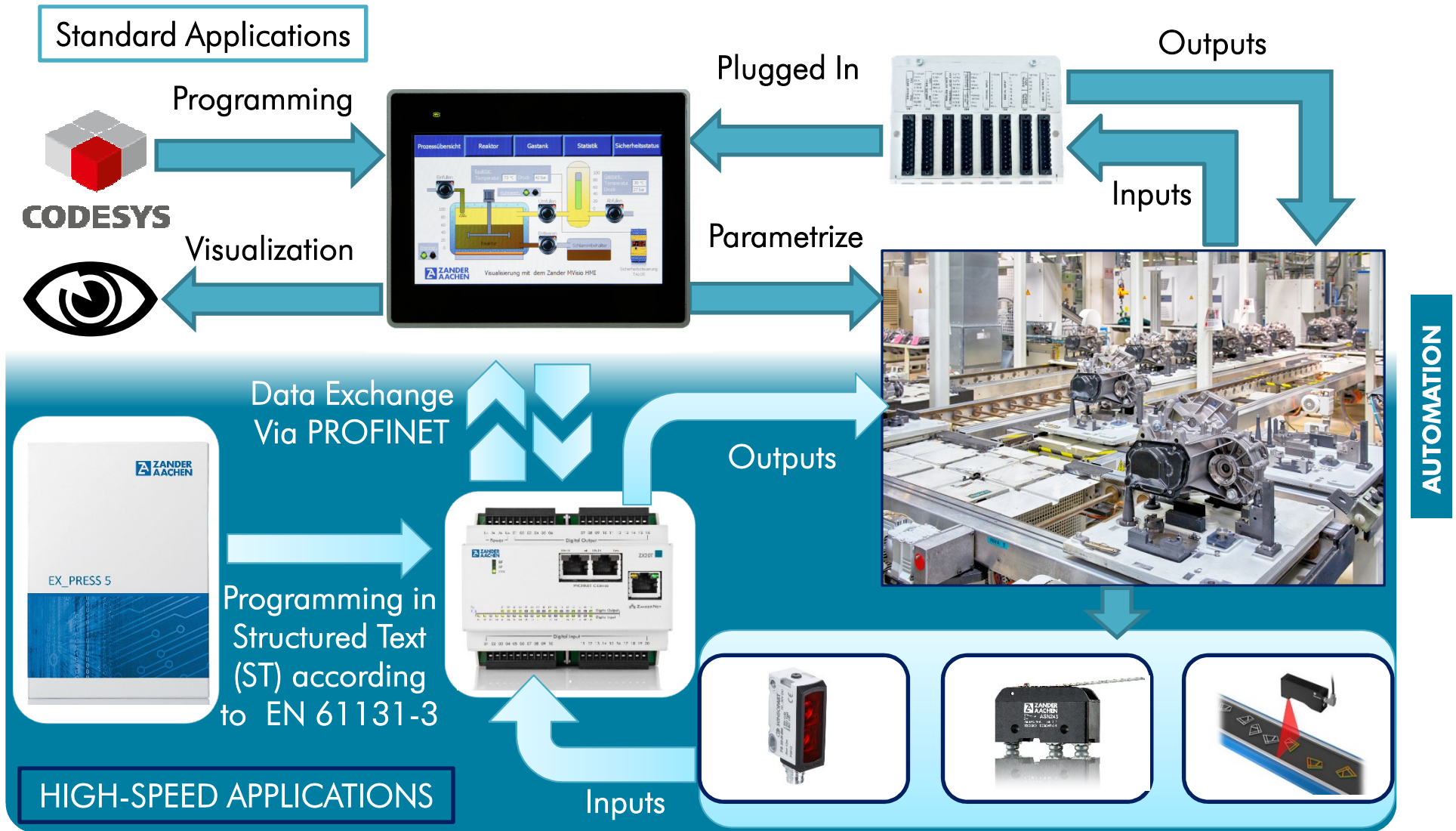
5. The ZX20- and ZX09 Product Group



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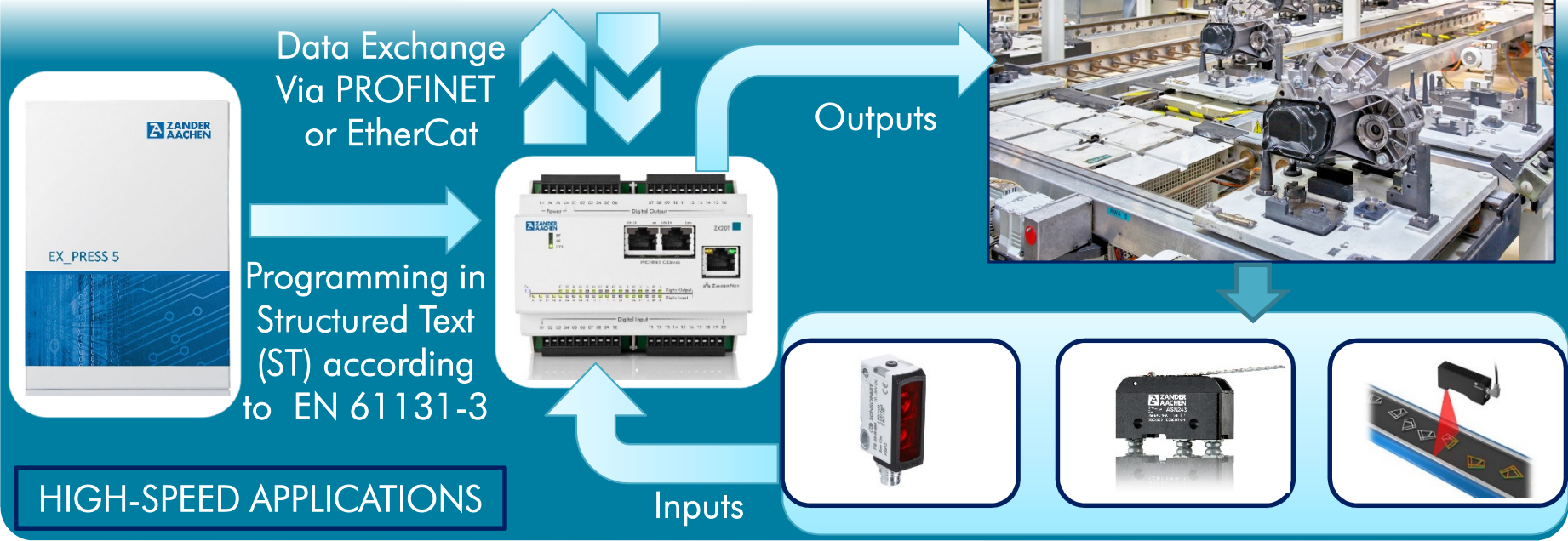
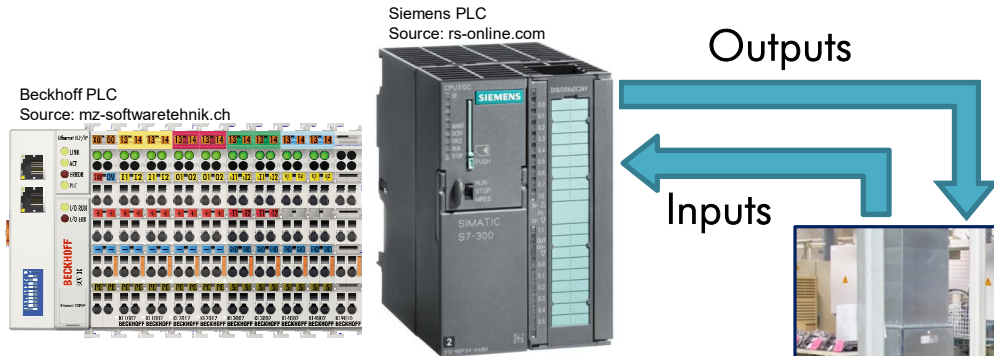


5. The ZX20- and ZX09 Product Group



5. The ZX20- and ZX09 Product Group

Standard Applications



AUTOMATION

HIGH-SPEED APPLICATIONS



5. The ZX20- and ZX09 Product Group

A ZX20 Application

- The Task
 - Fast detection of products in the food industry
 - Detection of missing pouches
- The Realization
 - Detection of passing pouches
 - Comparison with a default number of pouches
 - If a deviation occurs, a signal is send to the filling plant
 - If the overall time changes, the new default can be taught in



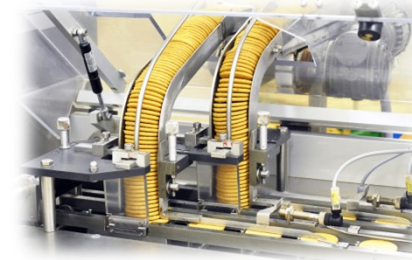
AUTOMATION



5. The ZX20- and ZX09 Product Group

Additional ZX20 Applications

- Labeling and Print processes
 - Minimization of cycle time for reproducible printing points
 - Application in the tobacco, packaging or food industry
- Filling processes
 - Cycle free processing -> minimization of volume loss
- Count and sorting processes
 - Fast evaluation of the sensors and control of the actuators for high throughput and better selectivity
 - Application in the recycling industry or testing systems

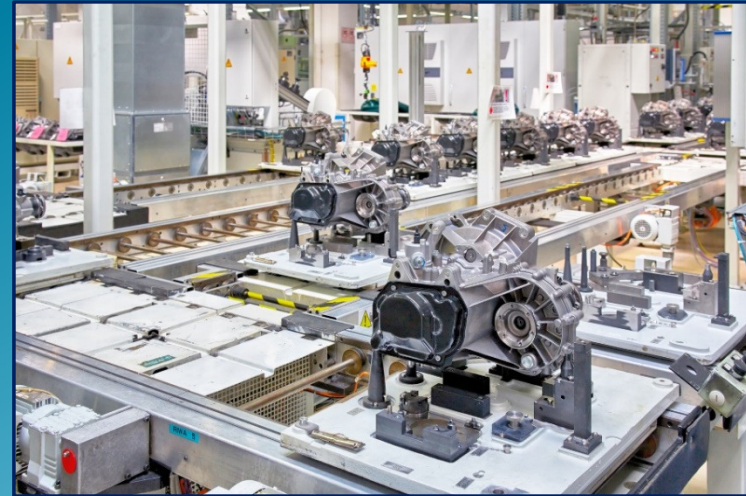


AUTOMATION

5. The ZX20- and ZX09 Product Group



Programming in Structured Text (ST) according to EN 61131-3



AUTOMATION



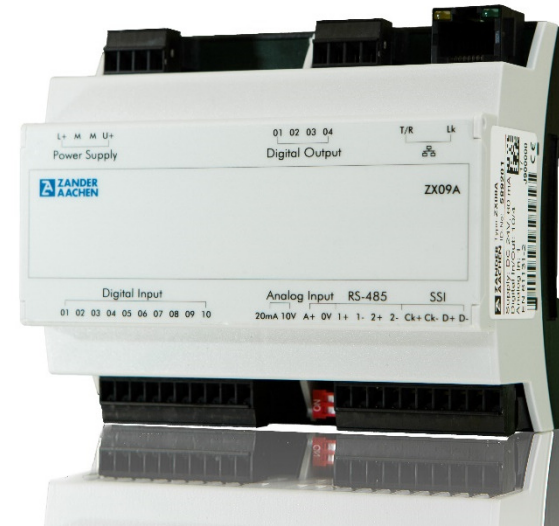
5. The ZX20- and ZX09 Product Group



5. The ZX20- and ZX09 Product Group

Even more diverse - The ZX09 and ZX09A

- Function
 - Micro PLC for small to medium-sized systems
 - Almost limitless configurable timers
 - Easily programmable with EX_PRESS 5
- Variations
 - ZX09: 10 digital Inputs, 4 digital Outputs, 1x RS232 / RS485 Interface, 1x SSI Interface
 - ZX09A: 10 digital Inputs, 4 digital Outputs, 1x RS232 / RS485 Interface, 1x SSI Interface, 1 analog Input



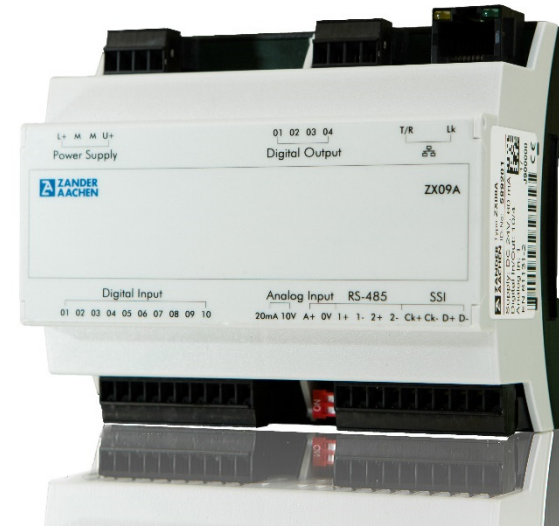
AUTOMATION



5. The ZX20- and ZX09 Product Group

Even more diverse - The ZX09 and ZX09A

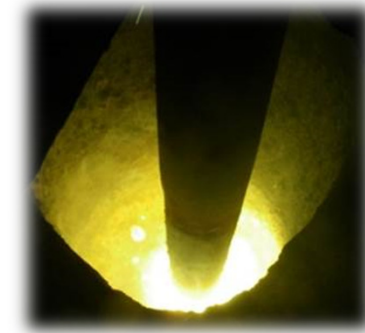
- Function
 - Micro PLC for small to medium-sized systems
 - Almost limitless configurable timers
 - Easily programmable with EX_PRESS 5
- Variations
 - ZX09: 10 digital Inputs, 4 digital Outputs, 1x RS232 / RS485 Interface, 1x SSI Interface
 - ZX09A: 10 digital Inputs, 4 digital Outputs, 1x RS232 / RS485 Interface, 1x SSI Interface, 1 analog Input
- The Advantages
 - Cost efficient high-speed solution with no cycle time
 - Reaction time $< 9 \mu s$
 - Integrable in existing Networks, programmable within the Network



5. The ZX20- and ZX09 Product Group

The benefits of analog data processing with the ZX09A

- Real-Time data acquisition (e.g. electric arc or plasma monitoring)
 - Increased process knowledge and safety
- Controlling of fast rolling, cutting and forging processes
 - Increased quality and throughput of the products
- Fast and safe shutdown at overvoltages and overcurrents
 - Secures the system (infrastructure) in case of failure
- Pressure and temperature control for the accelerating manufacturing processes
 - Increases the throughput and quality, e.g. for spray pressure or adhesive automats



AUTOMATION

Thank You for Your Attention

AUTOMATION

