



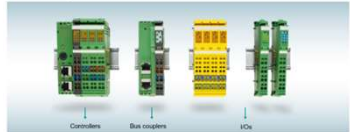
# THE INLINE SYSTEM

# Inline

## Agenda

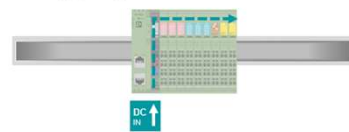
### The Inline system

Inline  
The Inline system



### Power supply concept

Inline  
Power supply concept



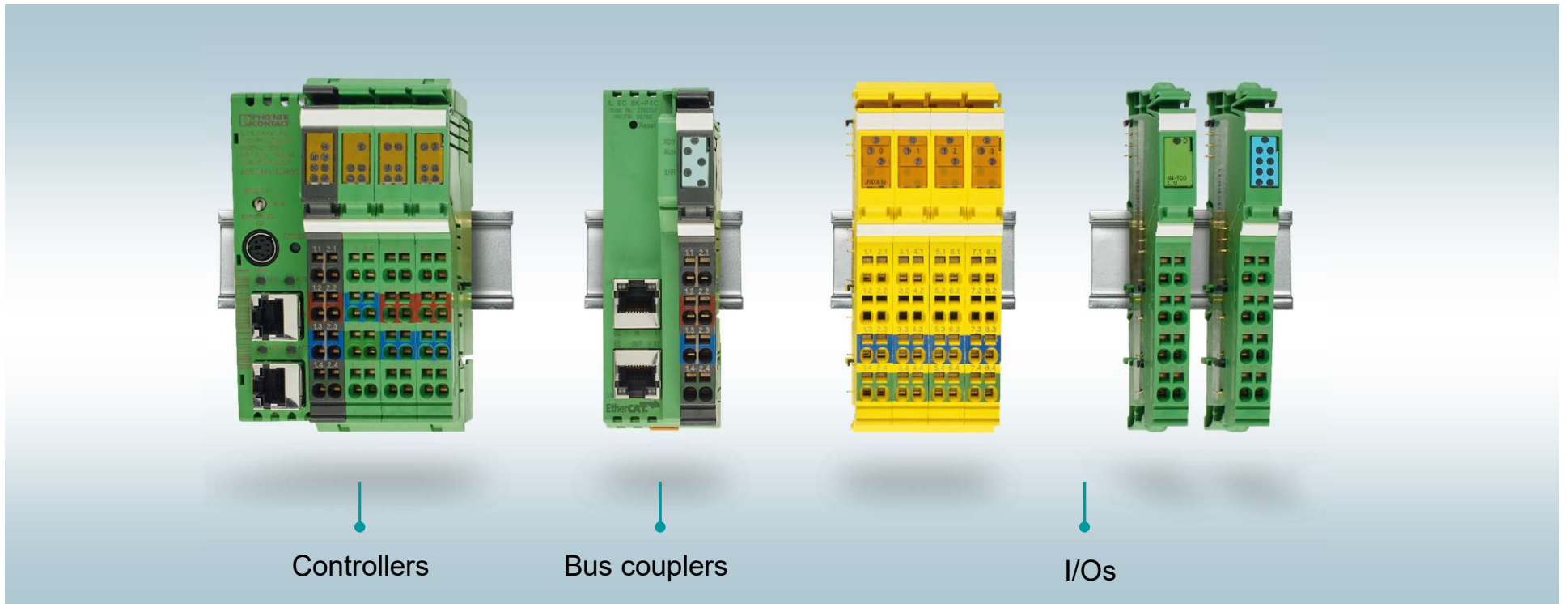
### Applications

Inline  
Scope of applications



Inline

# The Inline system



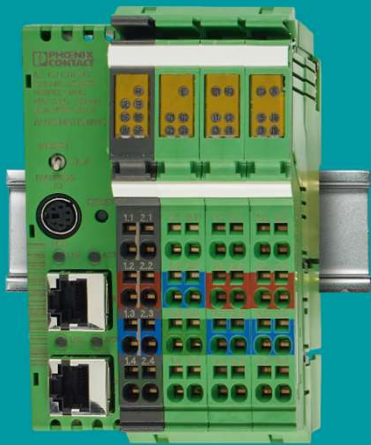
Controllers

Bus couplers

I/Os

The Inline system: basic idea

## The Inline system – easy automation



### CONTROLLERS

Scales performance, I/Os integrated  
programmable with PC Worx

The Inline system: basic idea

## The Inline system – easy automation

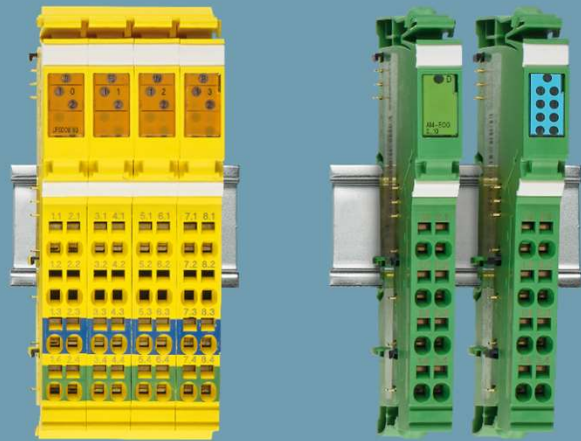


### BUS COUPLERS

Compact,  
PROFINET, EtherCAT<sup>®</sup> and CANopen<sup>®</sup>

The Inline system: basic idea

## The Inline system – easy automation



### I/Os

Compact, easy start-up,  
safe and non-safe I/Os

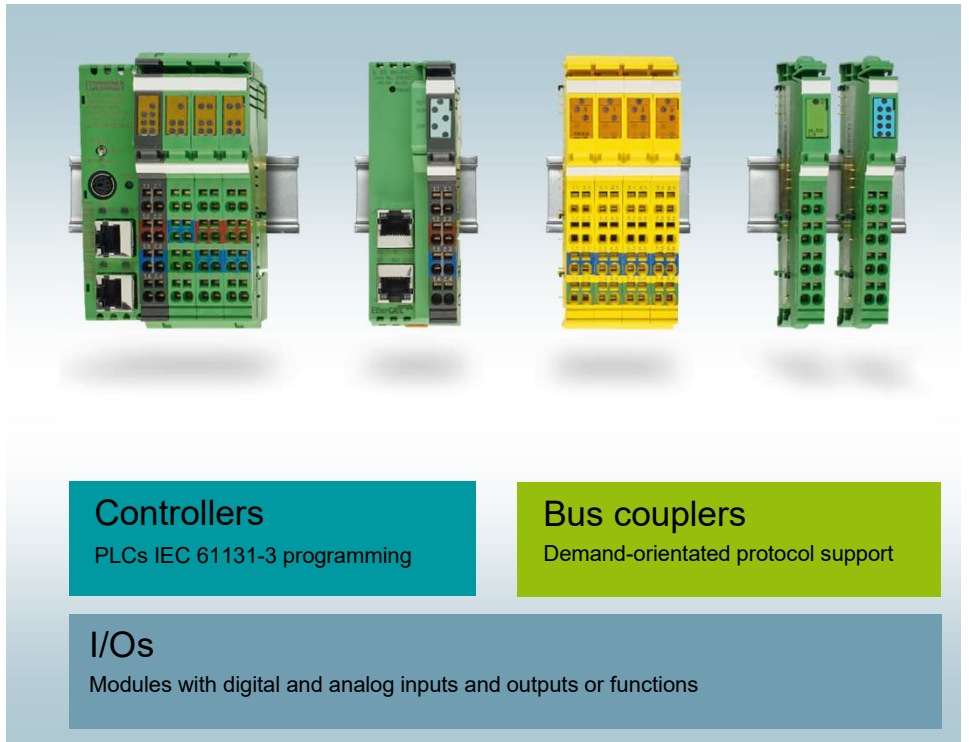
The Inline system: basic idea

## The Inline system

“The Inline system is a subset of the complete product range of Inline Controllers , bus couplers and I/Os. It also consists of controllers, bus couplers and I/Os which fit perfectly together for the use in simple applications.”

### YOUR ADVANTAGES

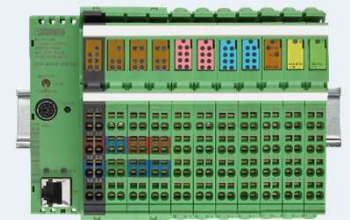
- ✓ Scalable automation system for simple tasks
- ✓ Adapted choice of modules with easy handling
- ✓ Quick start-up due to less parameterization efforts
- ✓ Attractively priced products



The Inline system: basic idea

## A good idea but not a limited portfolio

“ **The Inline system** consists of an optimized portfolio of articles which all have a simple handling and are attractively priced. Hereby this offer of Inline articles can be used well in price sensitive applications with lower automation requirements...



### Controllers



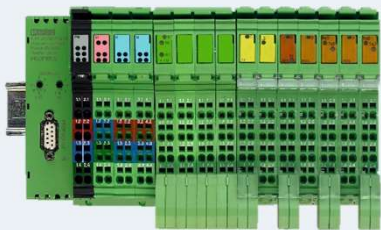
+

### Bus couplers



+

### I/Os



... but if necessary the **complete portfolio** of Inline Controllers (ILC) and the Inline I/O system ist still available and can be used at any time to expand the range of functons and solutions.

”

### Complete portfolio



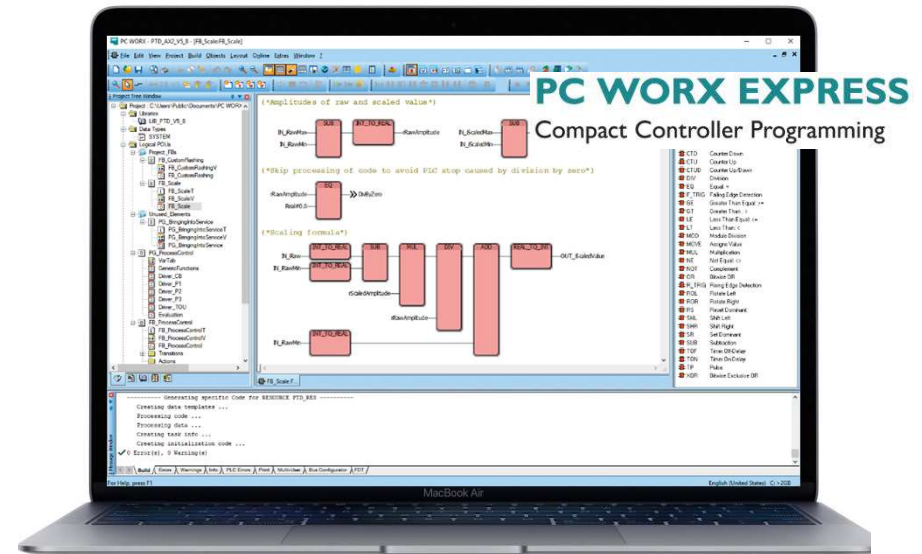
The Inline system: basic idea

## PC Worx Express – PLC programming

“ PC Worx Express is the free introduction to programming of the ILC 1x1 controllers. It combines programming - according to IEC 61131, fieldbus configuration and system diagnostics – in a single software solution. ”

### Your benefits

- Intuitive programming based on all IEC 61131 languages
- Free to download (included in the Automation Suite)



AVAILABLE AS DOWNLOAD !

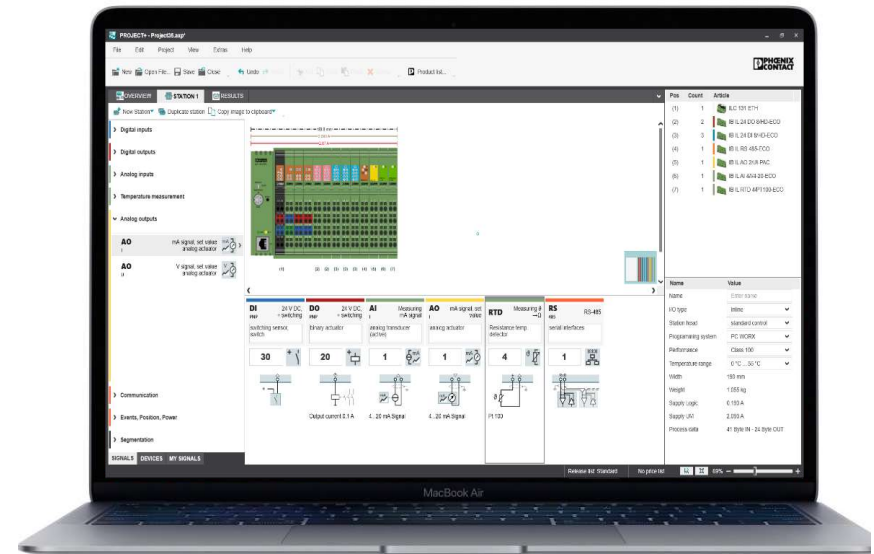
The Inline system: basic idea

## Configuration for I/Os - Project+

“ With no training required, you can create a functional station in accordance with your specifications very quickly with Project+.”

### Your benefits

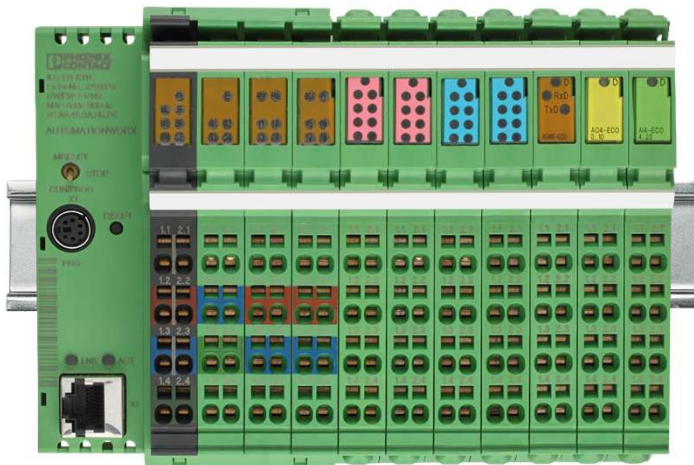
- Configuration software for fast I/O station planning
- Easily create custom I/O stations that are technically correct
- The signal requirements and structure plan at a glance



AVAILABLE AS FREE DOWNLOAD !

The Inline system: basic idea

## Easy start-up



“ The color coding allows a quick orientation within the Inline station during maintenance purposes. ”

COLOR CODING:

Bus terminal	Digital output	Digital input
Analog output	Analog input	Function terminal

The Inline system: basic idea

## Types of housings & dimensions

TYPES:

SPS



BK



8er



4er



2er



WIDTH:

48,8 mm

40,0 mm

48,8 mm

24,4 mm

12,2 mm

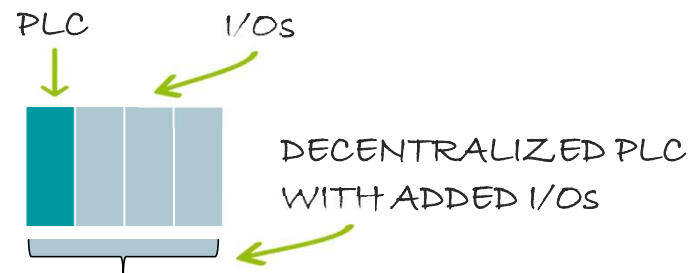


The Inline system: Controllers

## Inline Controllers

“The Inline Controller (ILC) are the PLCs for the Inline System and are best suitable for simple to medium automation tasks. And the best: They can be engineered by the free programming software PC Worx Express!”

PLC in a modular I/O system



The Inline system: Controllers

## Inline controller - powerboost in performance

NEW



### YOUR ADVANTAGES

- ✓ Quick start-up with free engineering tool
- ✓ reliable automation at a reasonable price
- ✓ 2.5 times faster through hardware optimization
- ✓ extensive function block libraries
- ✓ Integrated web server for HTML 5.0 visualization

The Inline system: Controllers

## Portfolio overview - controllers



FOR  
BEGINNERS

ILC 131 ETH



STANDARD  
OPTION

ILC 151 ETH



STANDARD  
OPTION

ILC 171 ETH 2TX



HIGHER  
PERFORMANCE

ILC 191 ETH 2TX

The Inline system: Controllers

## Inline Controller - Portfolio



ART. NO	TYPE	DESCRIPTION
2700973	ILC 131 ETH	1 ETH Port, 192kByte Memory
2700974	ILC 151 ETH	1 ETH Port, 256kByte Memory
2700975	ILC 171 ETH 2TX	2 ETH Ports, 512kByte Memory
2700976	ILC 191 ETH 2TX	2 ETH Ports, 1024kByte Memory
Also available		
2701034	ILC 131 ETH XC	1 ETH Port, 192kByte Memory <span>XC</span>
2701141	ILC 151 ETH XC	1 ETH Port, 256kByte Memory <span>XC</span>
2700977	ILC 151 GSM/GPRS	1 ETH Port, 256kByte Memory
2700074	ILC 191 ME/AN	2 ETH Ports, 1024kByte Memory

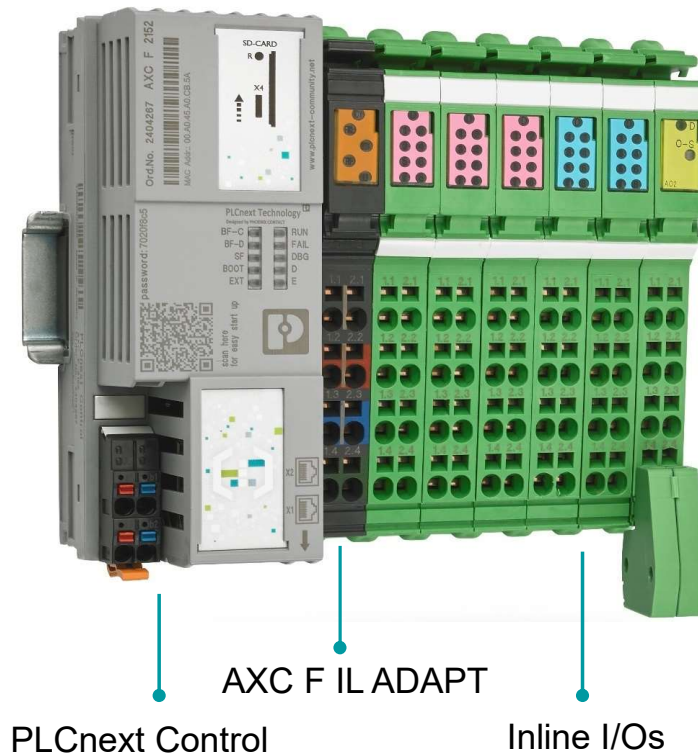
PLCs

The Inline system: Controllers

## (Retro-)fit for the future

“The Inline I/O system and PLCnext Technology fit together!

The Inline adapter terminal (AXC F IL ADAPT 1020304) allows you to easily extend an existing I/O station with a PLCnext Control device, thereby enabling the successive modernization of an existing system.”



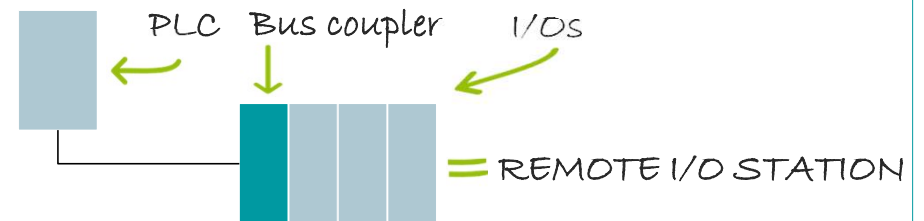


The Inline system: Bus couplers

## Simple connection

“Use bus couplers to integrate all the I/Os of the Inline system into your existing PROFINET, EtherCAT® or CANopen® network or bus system. The bus coupler opens up a local bus for up to 63 further I/Os.”

### Bus coupler for a remote I/O solution



The Inline system: Bus couplers

## Portfolio overview



### EASY ACCESS TO YOUR AUTOMATION

- Bus couplers for all relevant communication protocols
- Links the I/O system into your network
- Opens up a local bus for up to 63 further devices

PROFI  
NET



IL PN BK-PAC

EtherCAT



IL EC BK-PAC

CANopen



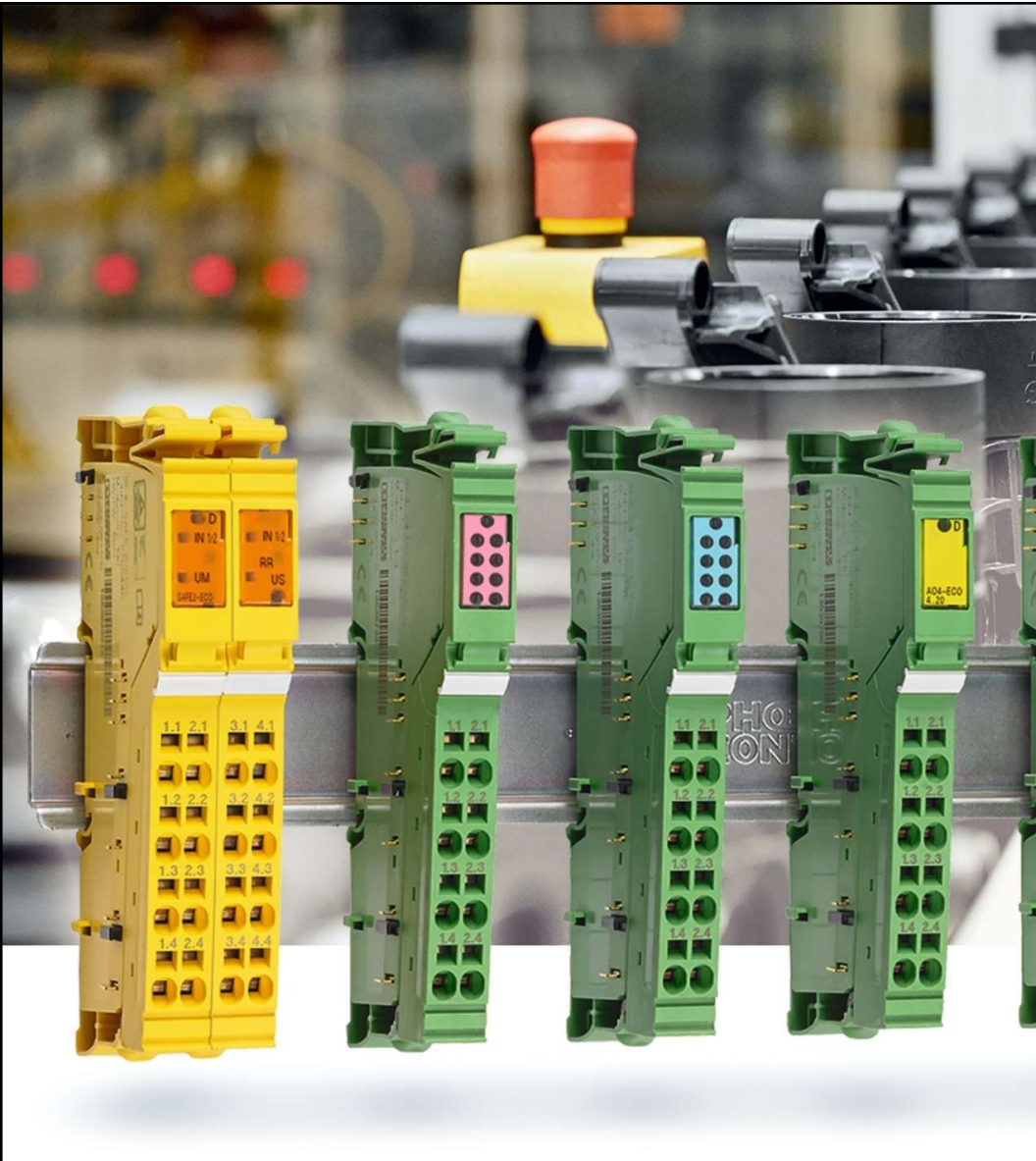
IL CO BK-PAC

The Inline system: I/Os

## Bus couplers - Portfolio



ART. NO	TYPE	FEATURES
2403696	IL PN BK-PAC	Conformance with PROFINET spec. V2.3 PROFIsafe function supported by firmware
2702507	IL EC BK-PAC	Mapped as a modular EtherCAT® device (MDP) SafetyBridge V3 supported
2702230	IL CO BK-PAC	Integrated termination resistor Device profile CiA 401 V3.0

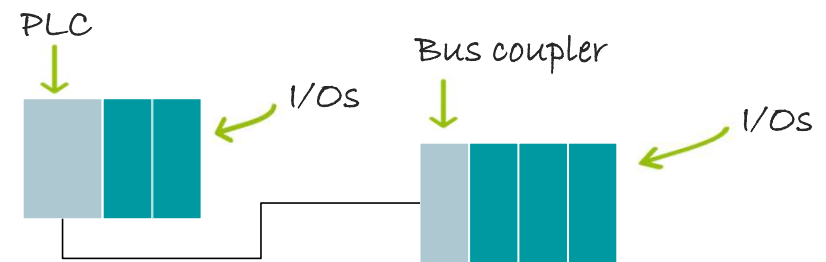


The Inline system: I/Os

## Inline I/Os

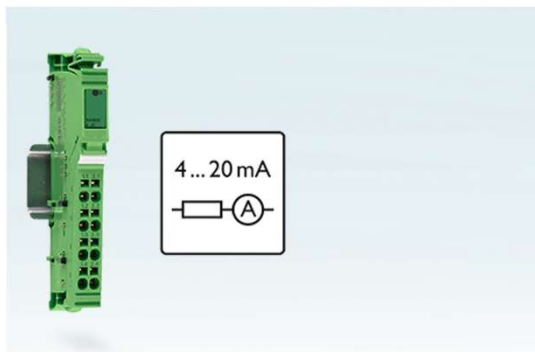
“Inline I/Os can be combined with a PLC or with a bus coupler. According to the motto ‘one terminal one function’, the I/Os can be easily put in operation.”

### I/Os combined with a PLC or a bus coupler



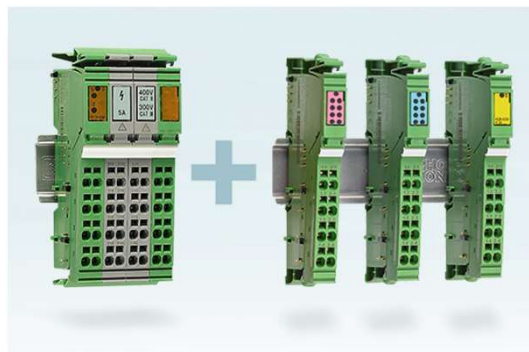
The Inline system: I/Os

## Automation without parameterization



### One terminal, one functionality

- Easy handling
- No parameterization required
- Easy exchange



### Compatible with all terminals

- Can be combined with standard Inline terminals
- High flexibility
- Easy expansion of existing Inline stations



### Safety solution

- Easy handling
- No parameterization required
- No safe controller required
- No (safety) software required

The Inline system: I/Os

## Simple I/Os - Portfolio



ART. NO	TYPE	DESCRIPTION
2702792	IB IL 24 DI 8/HD-ECO	8 digital inputs, 1-wire
2897156	IB IL 24 DI 16-ME	16 digital inputs, 1-wire
2862835	IB IL 24 DI 32/HD-PAC	32 digital inputs, 1-wire
2702825	IB IL 24 DO 4/EF-ECO	4 digital outputs, 1-wire
2702793	IB IL 24 DO 8/HD-ECO	8 digital outputs, 1-wire
2897253	IB IL 24 DO 16-ME	16 digital outputs, 1-wire
2862822	IB IL 24 DO 32/HD-PAC	32 digital outputs, 1-wire

DIGITAL I/Os



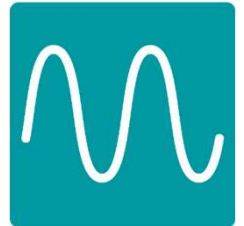
The Inline system: I/Os

## Simple I/Os - Portfolio



ART. NO	TYPE	DESCRIPTION
2863944	IB IL AI 2/SF-ME	2 analog inputs, U,I
2702496	IB IL AI 4/U/0-10-ECO	4 analog inputs, U
2702495	IB IL AI 4/I/4-20-ECO	4 analog inputs, I
2863957	IB IL AO 2/U/BP-ME	2 analog outputs, U
2702498	IB IL AO 4/U/0-10-ECO	4 analog outputs, U
2702497	IB IL AO 4/I/4-20-ECO	4 analog outputs, I

## ANALOG I/Os



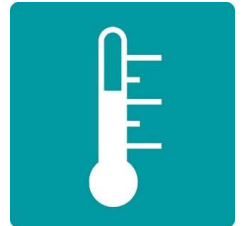
The Inline system: I/Os

## Simple I/Os - Portfolio



ART. NO	TYPE	DESCRIPTION
2702499	IB IL RTD 4/PT100-ECO	4 RTD inputs, PT100
2702501	IB IL RTD 4/PT1000-ECO	4 RTD inputs, PT1000
1185434	IB IL RTD 4/NTC-ECO	4 RTD inputs, NTC
2702502	IB IL UTH 4/J-ECO	4 UTH inputs, type J
2702503	IB IL UTH 4/K-ECO	4 UTH inputs, type K
2702504	IB IL UTH 4/L-ECO	4 UTH inputs, type L

## TEMP I/Os



The Inline system: I/Os

## Simple I/Os - Portfolio



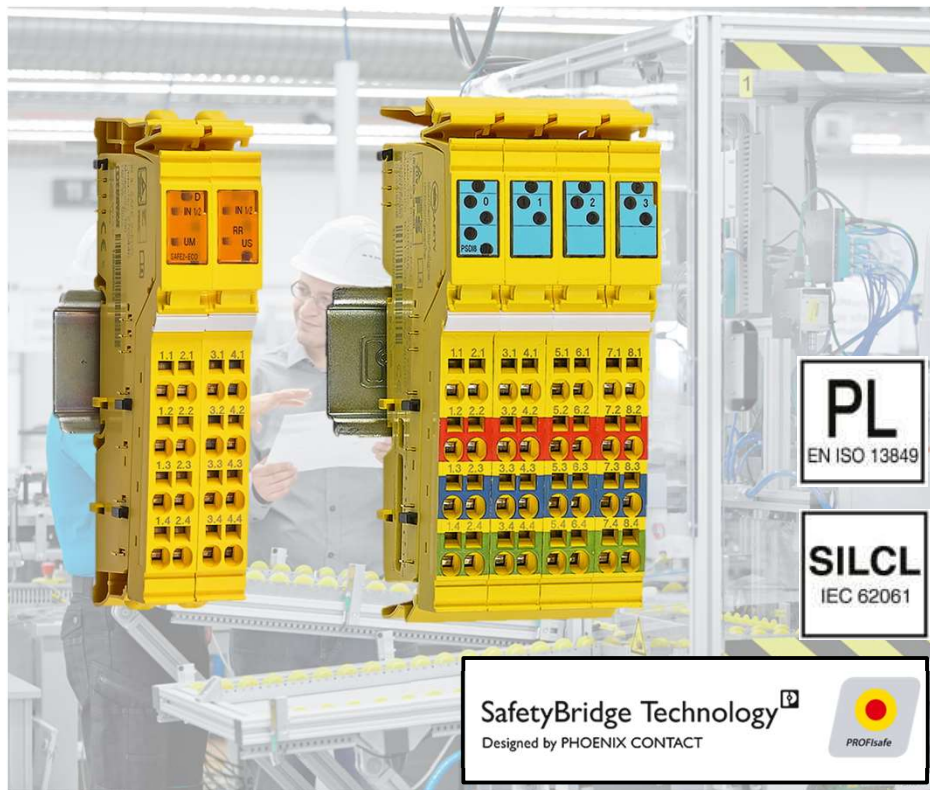
ART. NO	TYPE	DESCRIPTION
2702795	IB IL RS 232-ECO	Serial interface RS-232
2702141	IB IL RS 485-ECO	Serial interface RS-485

SERIAL COM



The Inline system: I/Os

## I/Os for safety applications

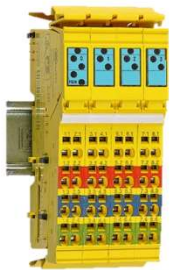


### SAFE YET EASY

“ The safety-relevant I/Os also underscore the flexibility and simplicity of the Inline system. Depending on the bus couplers and safety controllers, the I/Os can be used with PROFIsafe in PROFINET and PROFIBUS systems or with SafetyBridge Technology in many other networks. ”

The Inline system: I/Os

## I/Os for safety applications



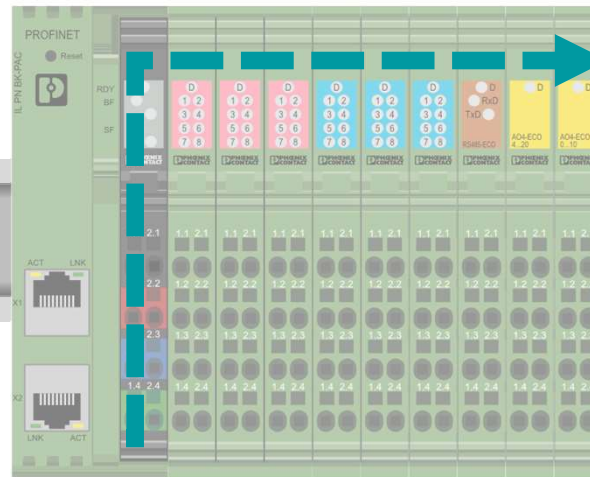
ART. NO	TYPE	DESCRIPTION
2702446	IB IL SAFE 2-ECO	4 digital inputs (for 2 sensor circuits (1- or 2-channel, non-equivalent/equivalent)), Enabling current path: 1 (internal, two-channel enabling current path)
2985688	IB IL 24 PSDI 8-PAC	4 safe digital inputs for two-channel assignment or 8 safe digital inputs for single-channel assignment, for SafetyBridge and PROFIsafe
2700994	IB IL 24 PSDI 16-PAC	8 safe digital inputs for two-channel assignment or 16 safe digital inputs for single-channel assignment, for SafetyBridge V3 and PROFIsafe
2985631	IB IL 24 PSDO 8-PAC	4 safe digital outputs for two-channel assignment or 8 safe digital outputs for single-channel assignment, for SafetyBridge and PROFIsafe
2916493	IB IL 24 PSDO 4/4-PAC	4 safe digital outputs which include one positive and one negative switching output each depending on the parameterization, for SafetyBridge and PROFIsafe
2916024	IB IL 24 LPSDO 8-PAC	4 safe digital outputs with two-channel occupancy or 8 safe digital outputs with single-channel occupancy, with integrated safety logic, for SafetyBridge

## DIGITAL I/Os



Inline

# Power supply concept



The Inline power supply concept

## Power supply concept

$U_{BK}$   $U_M$   $U_S$  INPUT SUPPLIES

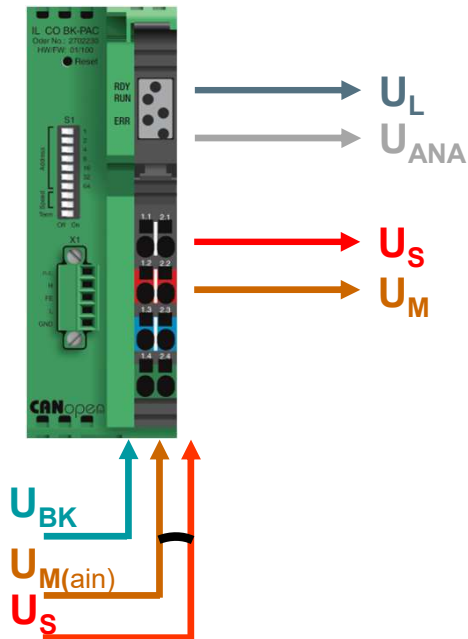
- $U_{BK}$  supplies the bus coupler
- $U_M$  is the main supply to build the segment voltage ( $U_S$ )
- $U_S$  supplies the peripheral voltage of the I/O terminals
- $U_M$  and  $U_S$  can be bridged at the BK



The Inline power supply concept

## Power supply concept

### $U_L$ $U_{ANA}$ $U_S$ $U_M$ LOCAL BUS SUPPLIES



- From  $U_{BK}$  two additional voltages are generated, which are passed through the whole I/O station:
- $U_L$  supplies the local bus electronic
- $U_{ANA}$  is a separated voltage to supply analog terminals, without disturbance
- $U_S$  &  $U_M$  are forwarded through the local bus

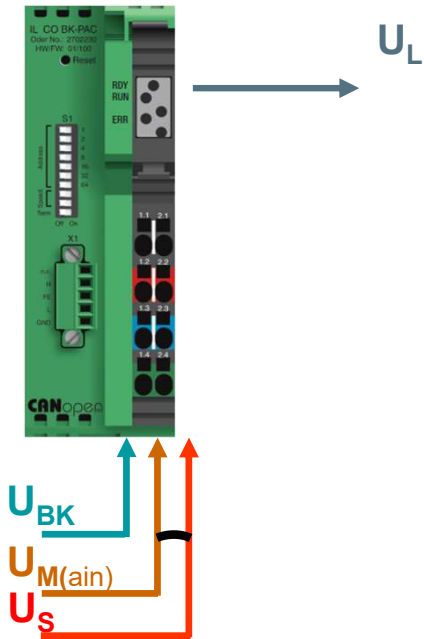
The Inline power supply concept

## Power supply concept

### $U_L$ THE LOCAL BUS SUPPLY

#### Characteristics of $U_L$

- Supplies a  $\mu$ Controller of a terminals
- Generated out of  $U_{BK}$
- Voltage = 7.5 V DC
- Max. current capacity is 0.7 A or 2 A



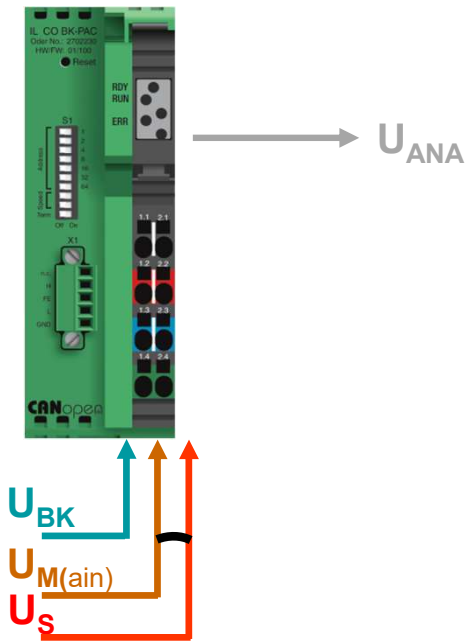
The Inline power supply concept

## Power supply concept

**U<sub>ANA</sub>** THE ANALOG CIRCUIT SUPPLY

### Characteristics of U<sub>ANA</sub>

- Supplies the analog terminals
- Generated out of UBK
- Voltage = 24 V DC
- Max. current capacity is 0,5 A



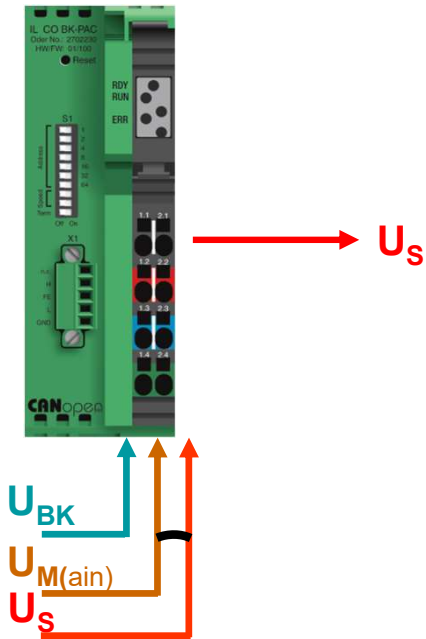
The Inline power supply concept

## Power supply concept

### $U_s$ THE SEGMENT CIRCUIT SUPPLY

#### Characteristics of $U_s$

- Supplies the peripheral circuits
- Can supply the complete station
- Voltage = 24 V DC
- Max. current capacity is 8 A



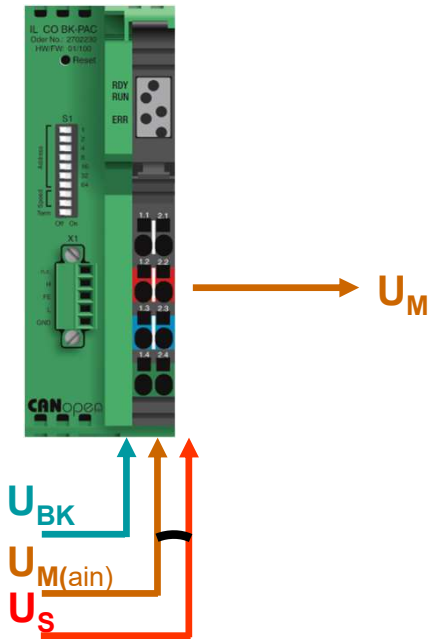
The Inline power supply concept

## Power supply concept

$U_M$  THE MAIN PERIPHERAL SUPPLY

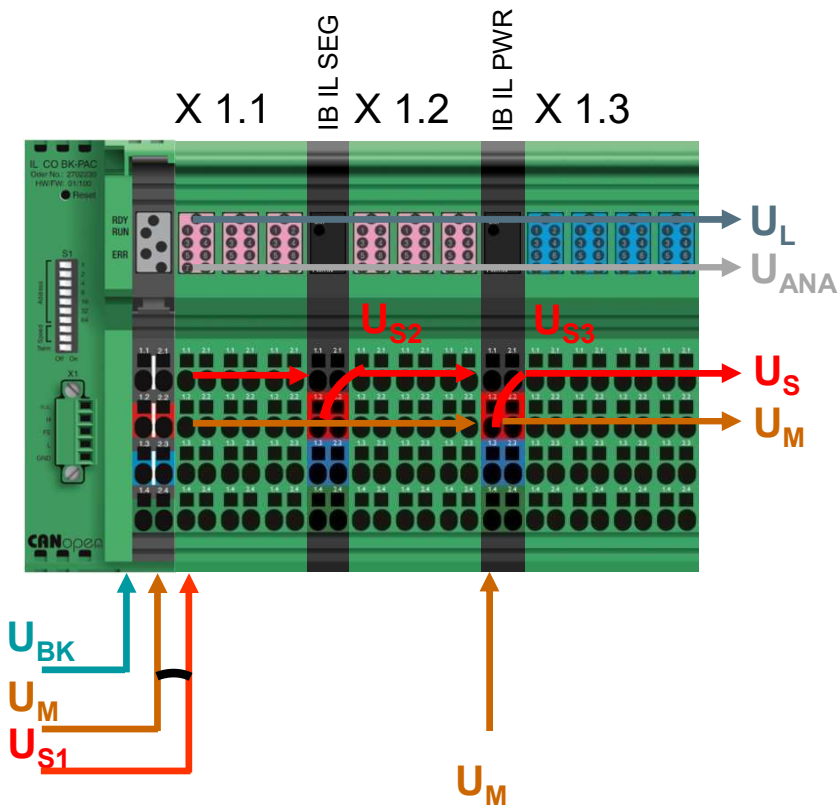
### Characteristics of $U_M$

- Base for  $U_S$
- Transferred through the complete station
- Voltage = 24 V DC
- Max. current capacity is 8 A



The Inline power supply concept

## Power supply concept – Segmentation

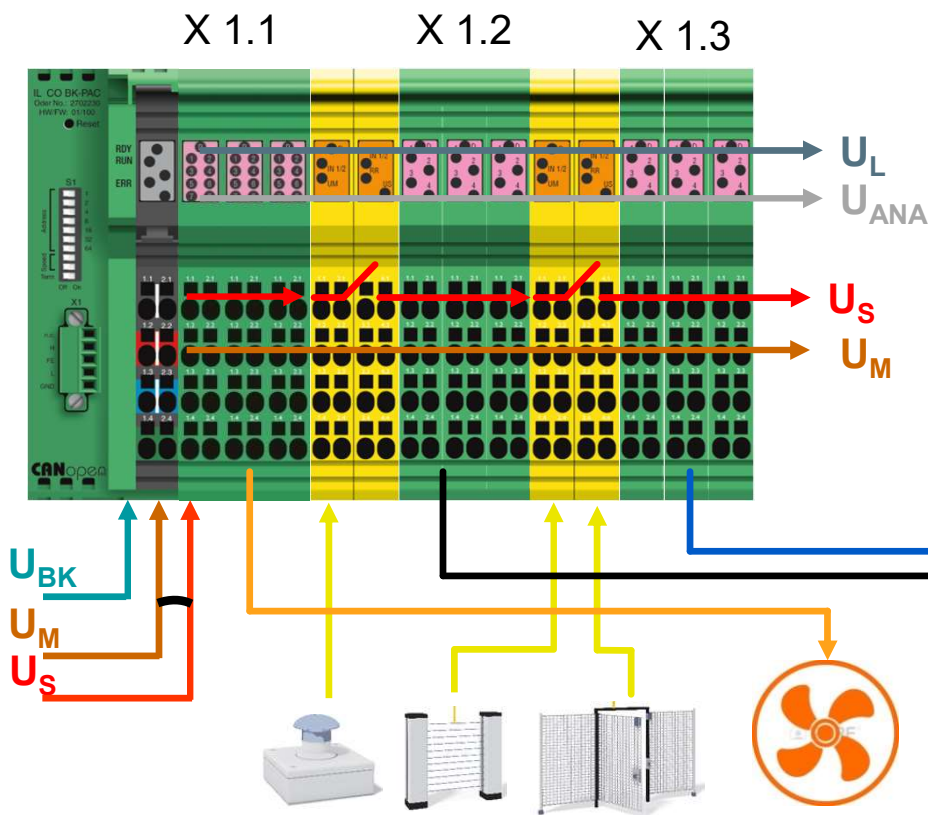


- 3 terminal groups
- Power terminal IB IL PWR refeeds U<sub>M</sub> and U<sub>S</sub> when the supply is not sufficient anymore
- Segment terminal IB IL SEG... creates new segment circuits with different U<sub>S</sub>
- Enables to switch-off grouped output terminals



MOST OF THE COMPETITORS CAN'T DO THAT!

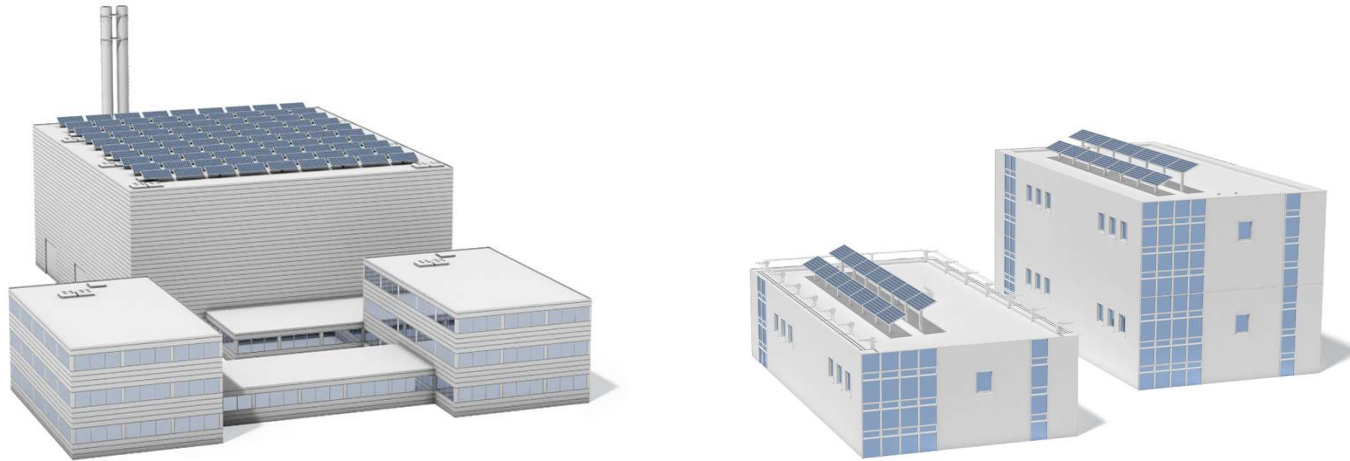
# Inline Power supply concept – Safety



- 3 terminal groups X 1.1...1.3
- 2 safety segments
  - Emergency button
  - Light barrier
  - Security gate
- DO 4/EF-ECO has to be installed to the right of the safety terminal

Inline

## Scope of applications



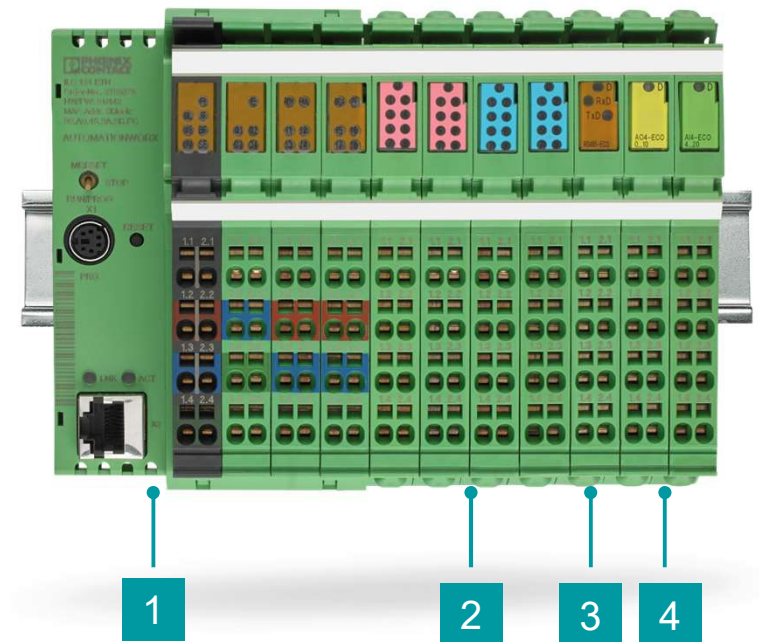
Scope of Applications

## Just one example

### SIMPLE AND COST-OPTIMIZED AUTOMATION

“ Simple application can be optimally solved with the Inline system. The portfolio offers a harmonized range of cost-optimized products with a focus on autonomously controlled I/O stations.”

- |   |                                  |  |
|---|----------------------------------|--|
| 1 | <b>Controller</b>                | ILC 151 ETH                                    |
| 2 | <b>Digital signal processing</b> | IB IL 24 DO8 HD/ECO<br>IB IL 24 DI8 HD/ECO     |
| 3 | <b>Serial communication</b>      | IB IL RS 485-ECO                               |
| 4 | <b>Analog signal processing</b>  | IB IL AO 4/U/0-10-ECO<br>IB IL AI 4/I/4-20-ECO |



Scope of Applications

## Inline for building automation

“ The combination of the ILC 2050 BI and the Inline I/Os guarantees system openness, reliability and comfortable handling - resulting in a simple solution for building automation. ”



Scope of applications

# IP20 I/O systems



SIMPLE

## INLINE

- Easy handling
- Well suited for simple and low-priced applications



COMPLEX



INLINE



IO-Link



IO-Link



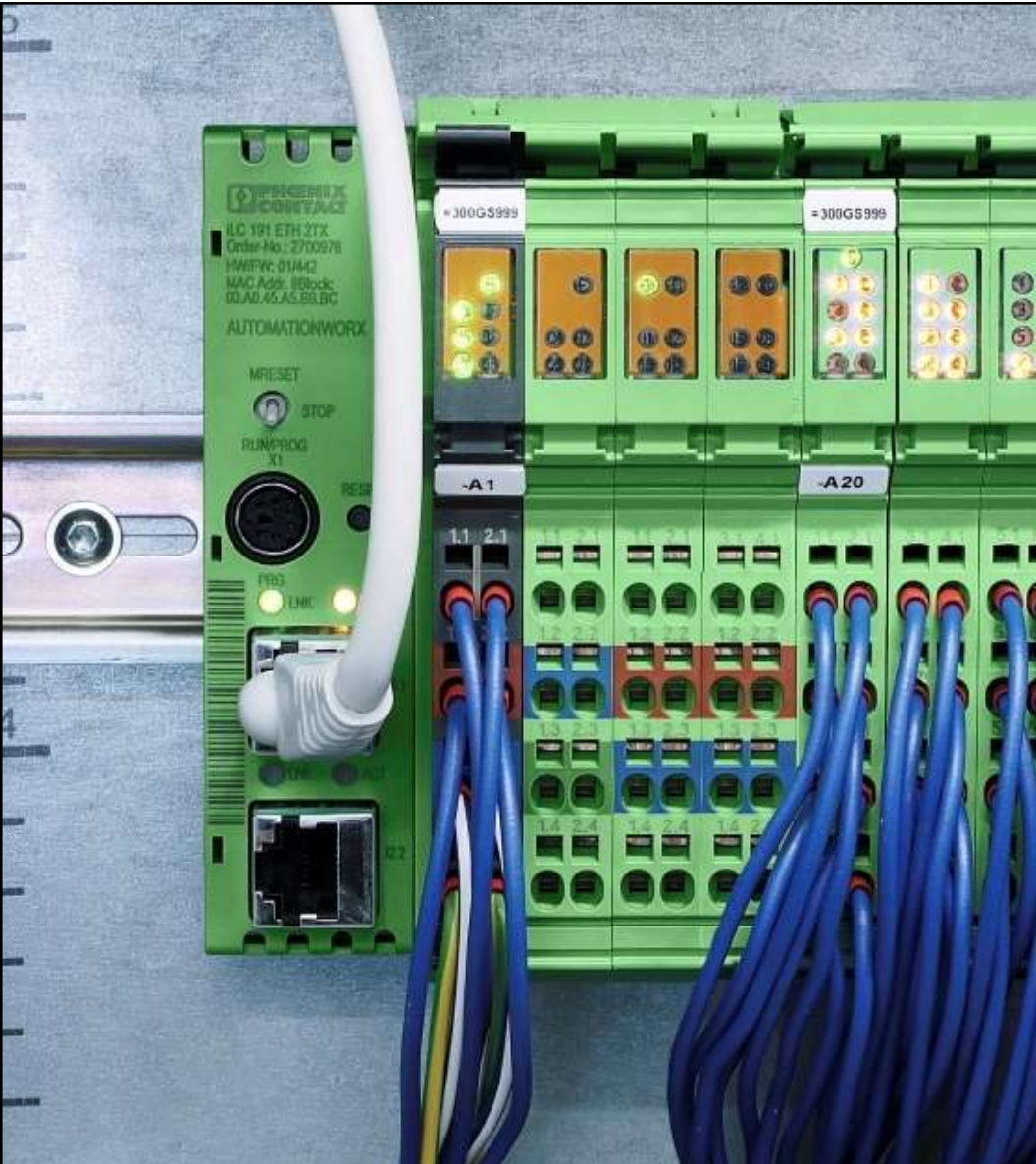
Ex HART COMMUNICATION PROTOCOL



Ex HART COMMUNICATION PROTOCOL

MODULAR AUTOMATION SYSTEM

AXIOLINE P



# Thank you

## THE INLINE SYSTEM