

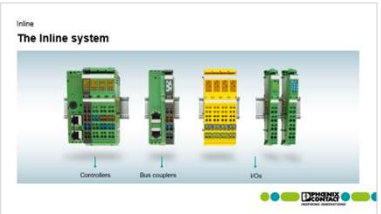
THE INLINE SYSTEM

PHOENIX CONTACT
INSPIRING INNOVATIONS

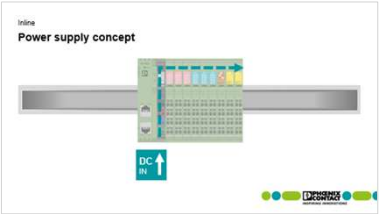
Inline

Agenda

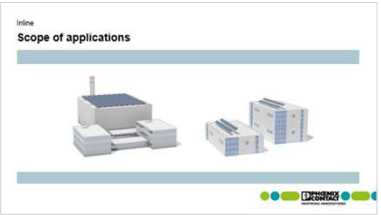
The Inline system



Power supply concept



Applications

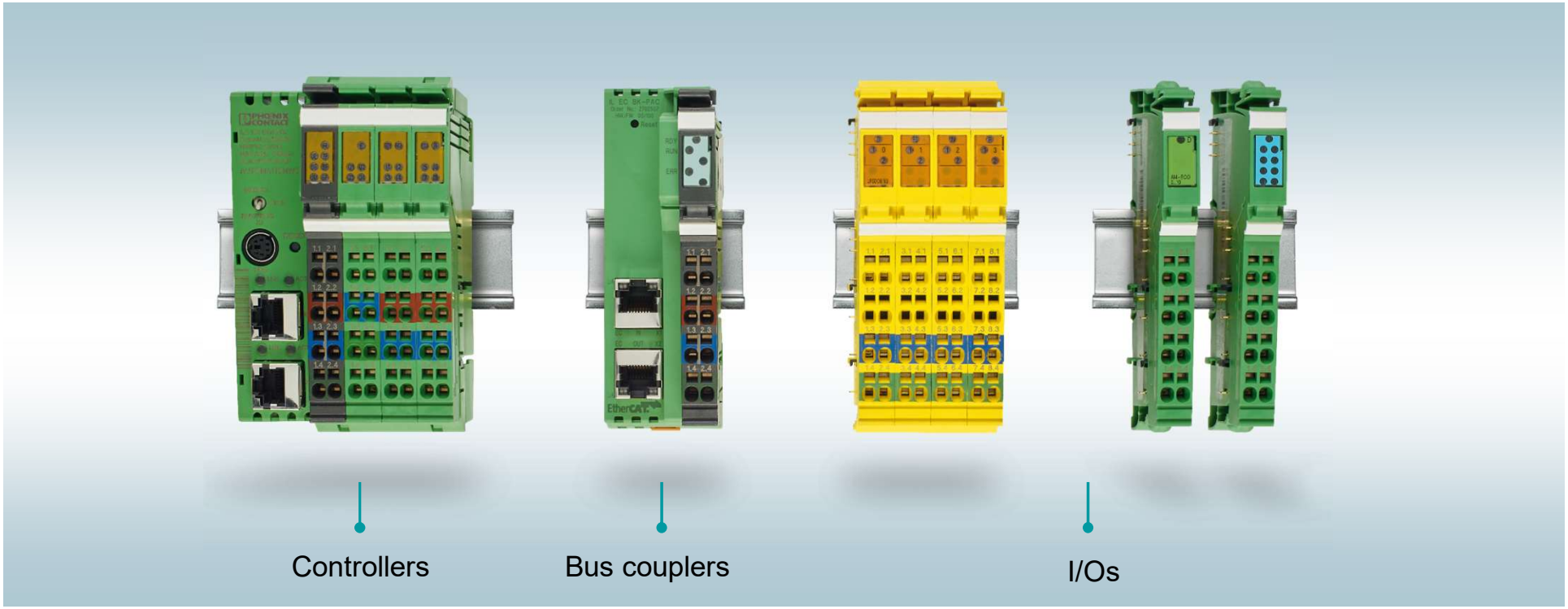




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Inline

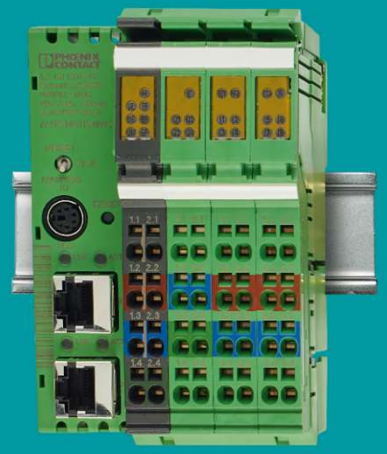
The Inline system



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The Inline system: basic idea

The Inline system – easy automation



CONTROLLERS

Scales performance, I/Os integrated
programable with PC Worx

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INSPIRING INNOVATIONS

The Inline system: basic idea

The Inline system – easy automation

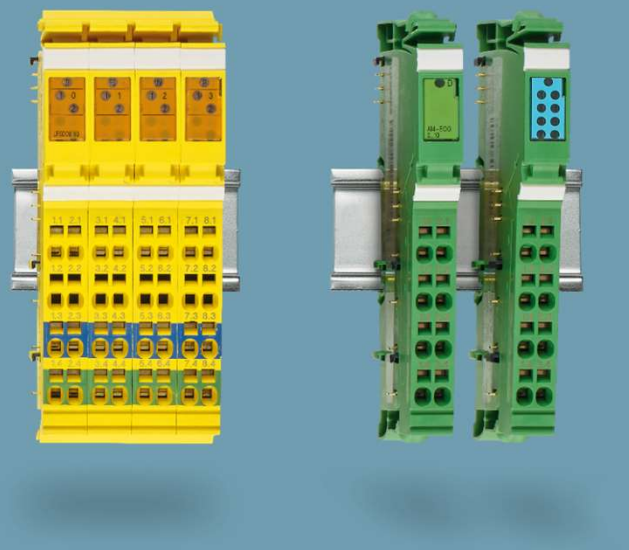


BUS COUPLERS

Compact,
PROFINET, EtherCAT® and CANopen®

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INSPIRING INNOVATIONS

The Inline system – easy automation



I/Os

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

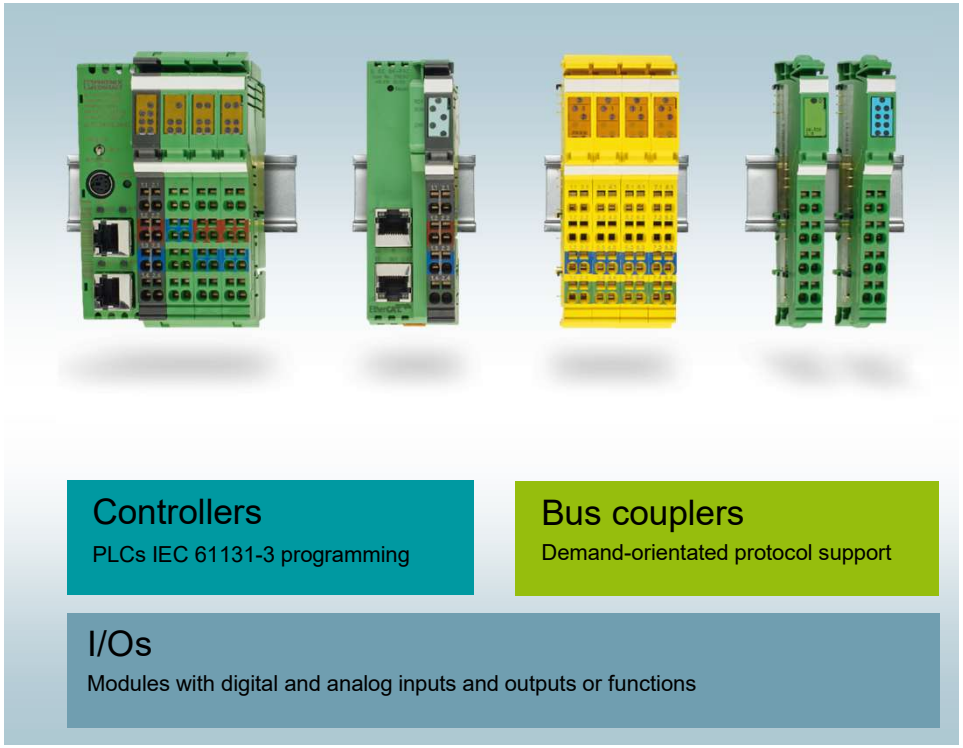
The Inline system: basic idea

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 choise of modules with easy handling
- ✓ Quick start-up due to less parameterization efforts
- ✓ Attractively priced products

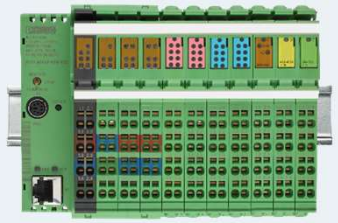


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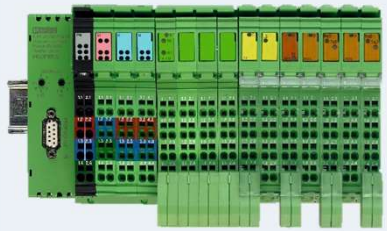
The Inline system: basic idea

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 avaliable and can be used at any time to expand the range of functons and solutions. ”

Complete portfolio



PHOENIX CONTACT
INSPIRING INNOVATIONS

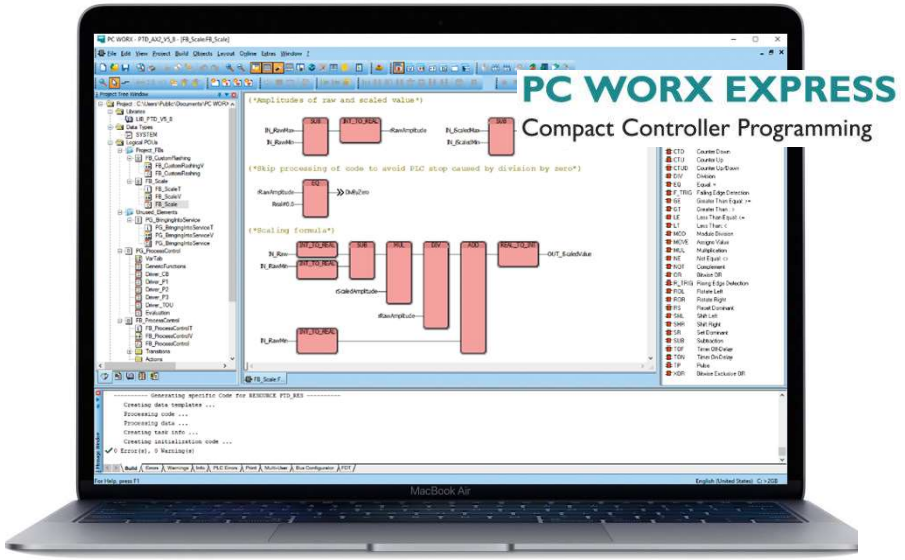
The Inline system: basic idea

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)



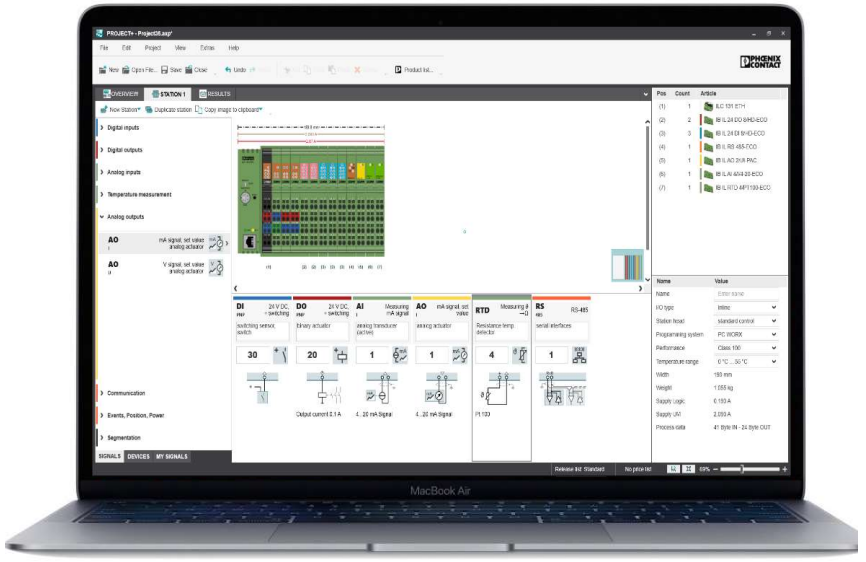
AVAILABLE AS DOWNLOAD !

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INSPIRING INNOVATIONS

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

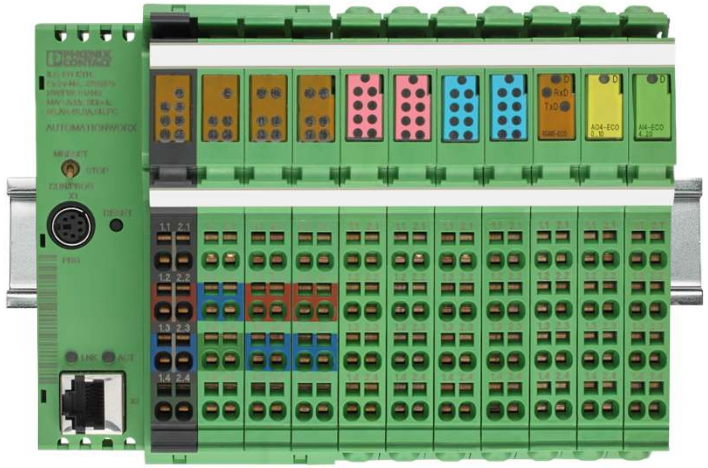
- Configuration software for fast I/O station planning
- Easily create custom I/O stations that are technically correct
- The signal requirements and structure plan at a glance

AVAILABLE AS FREE DOWNLOAD !

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The Inline system: basic idea

Easy start-up



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

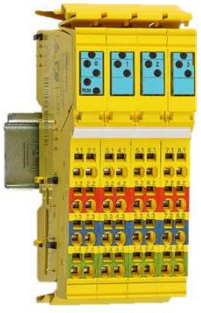
COLOR CODING:

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

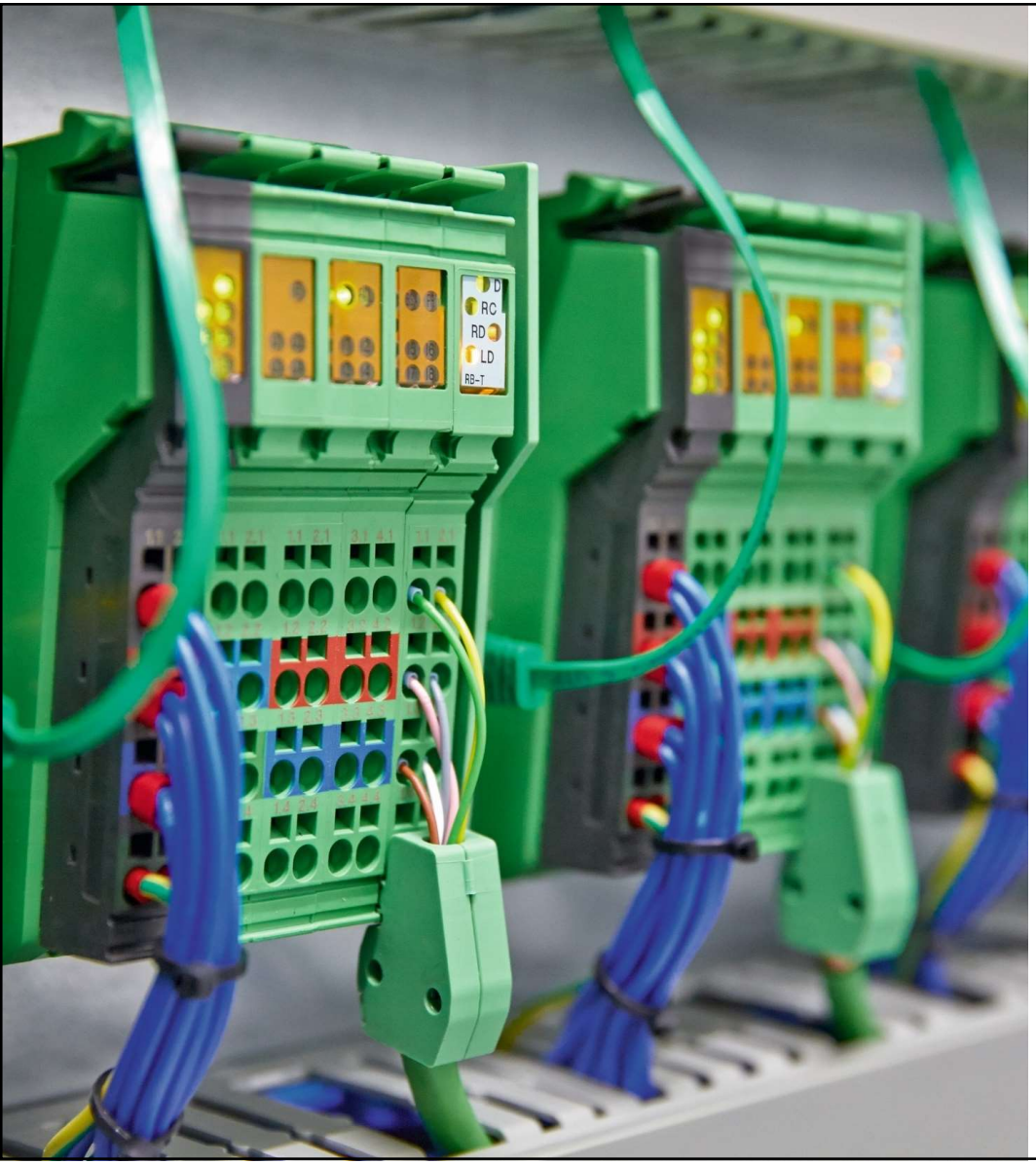
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The Inline system: basic idea

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

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INSPIRING INNOVATIONS

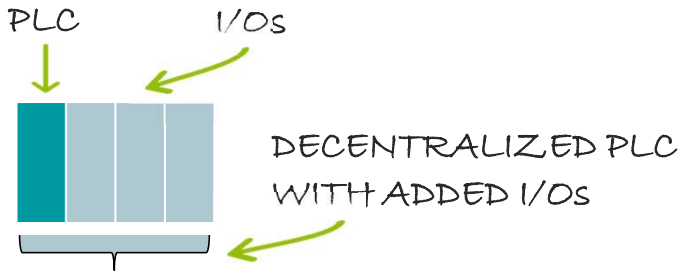


The Inline system: Controllers

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



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INSPIRING INNOVATIONS

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

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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

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The Inline system: Controllers

Inline Controller - Portfolio

PLCs



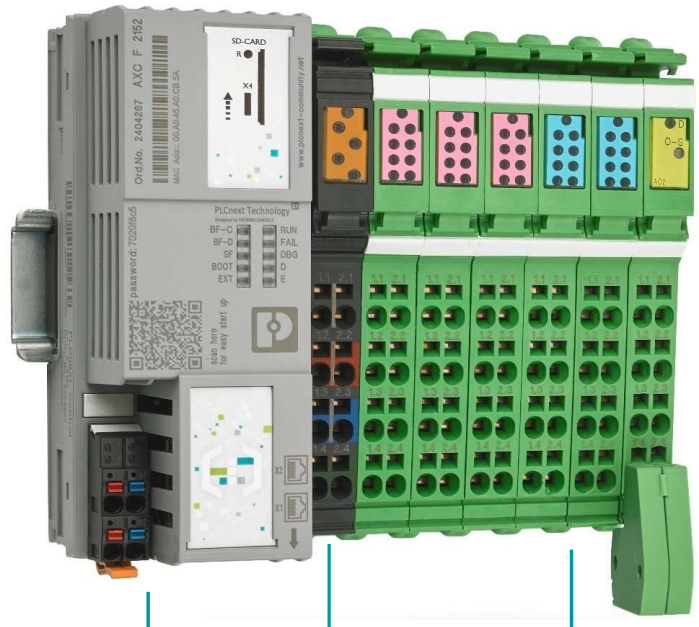
ART. NO	TYPE	DESCRIPTION	
2700973	ILC 131 ETH	1 ETH Port, 192kByte Memory	
2700974	ILC 151 ETH	1 ETH Port, 256kByte Memory	
2700975	ILC 171 ETH 2TX	2 ETH Ports, 512kByte Memory	
2700976	ILC 191 ETH 2TX	2 ETH Ports, 1024kByte Memory	
Also available			
2701034	ILC 131 ETH XC	1 ETH Port, 192kByte Memory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

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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.”



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INSPIRING INNOVATIONS

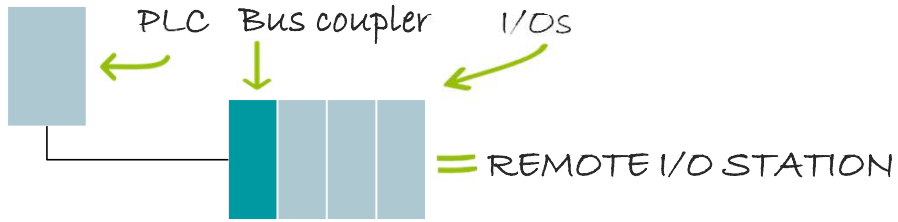


The Inline system: Bus couplers

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 soulution



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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

PROFINET	EtherCAT	CANopen
		
IL PN BK-PAC	IL EC BK-PAC	IL CO BK-PAC

PHOENIX CONTACT
INSPIRING INNOVATIONS

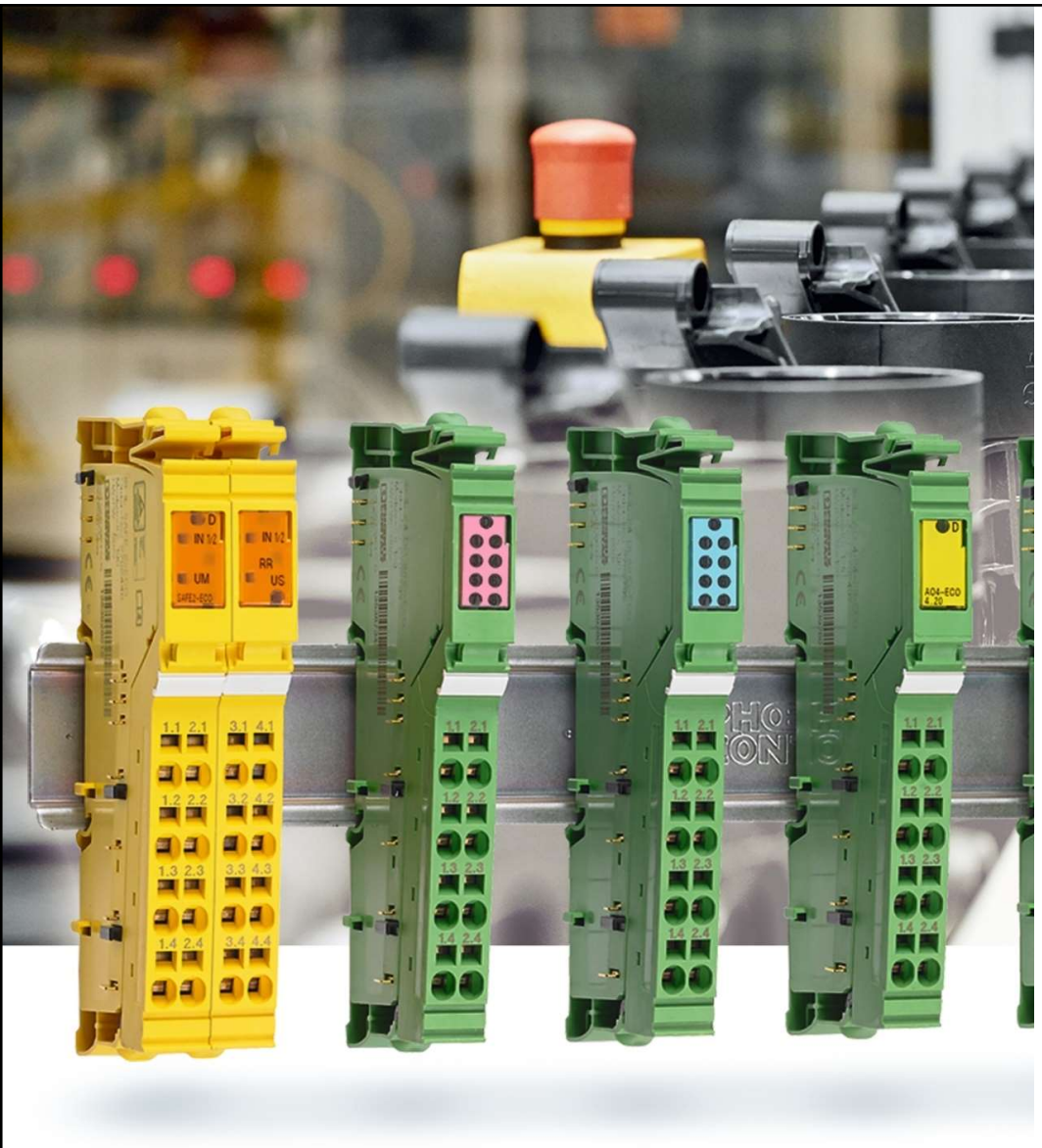
The Inline system: I/Os

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

PHOENIX CONTACT
INSPIRING INNOVATIONS

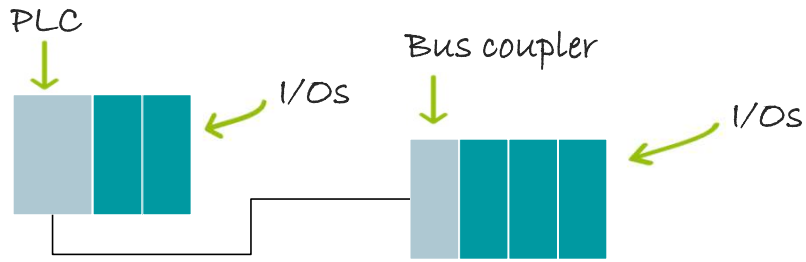


The Inline system: I/Os

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.”

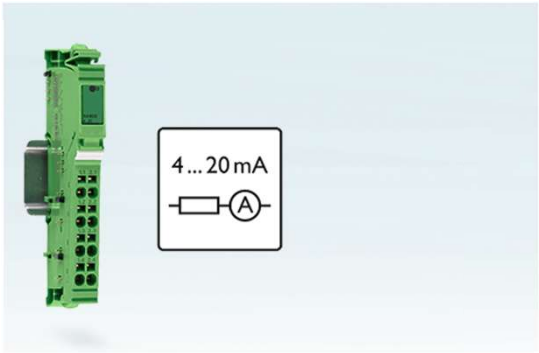
I/Os combined with a PLC or a bus coupler



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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

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INSPIRING INNOVATIONS

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



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INSPIRING INNOVATIONS

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



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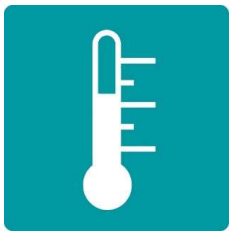
The Inline system: I/Os

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



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The Inline system: I/Os

Simple I/Os - Portfolio



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

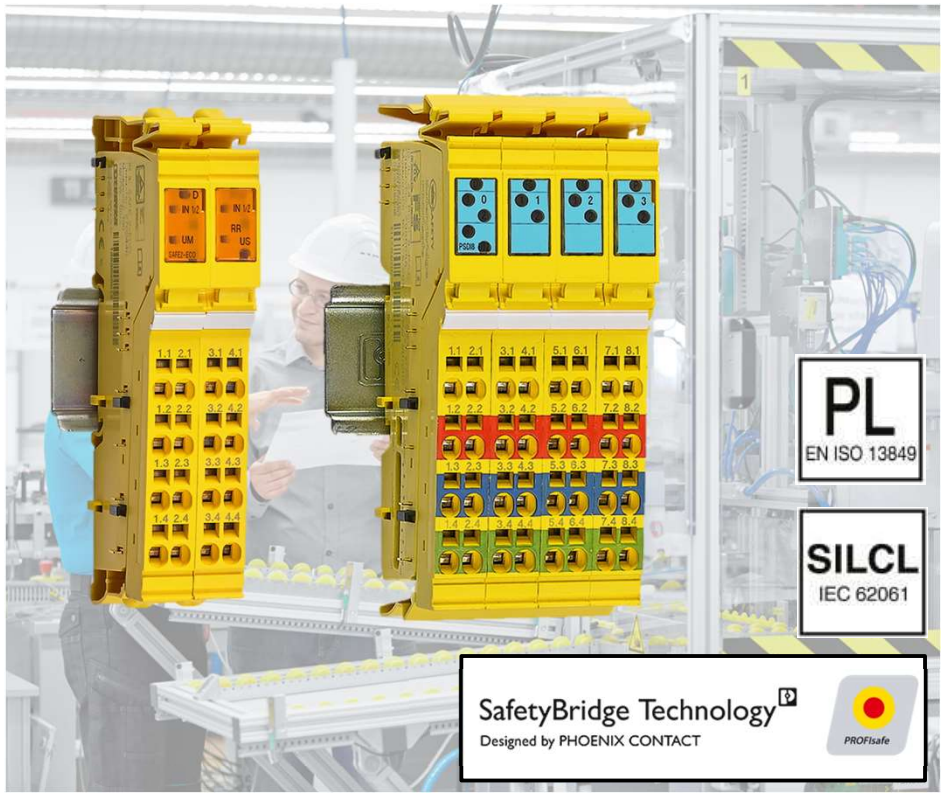
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The Inline system: I/Os

I/Os for safety applications



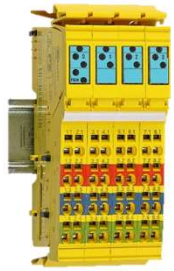
SAFE YET EASY

“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.”

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INSPIRING INNOVATIONS

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

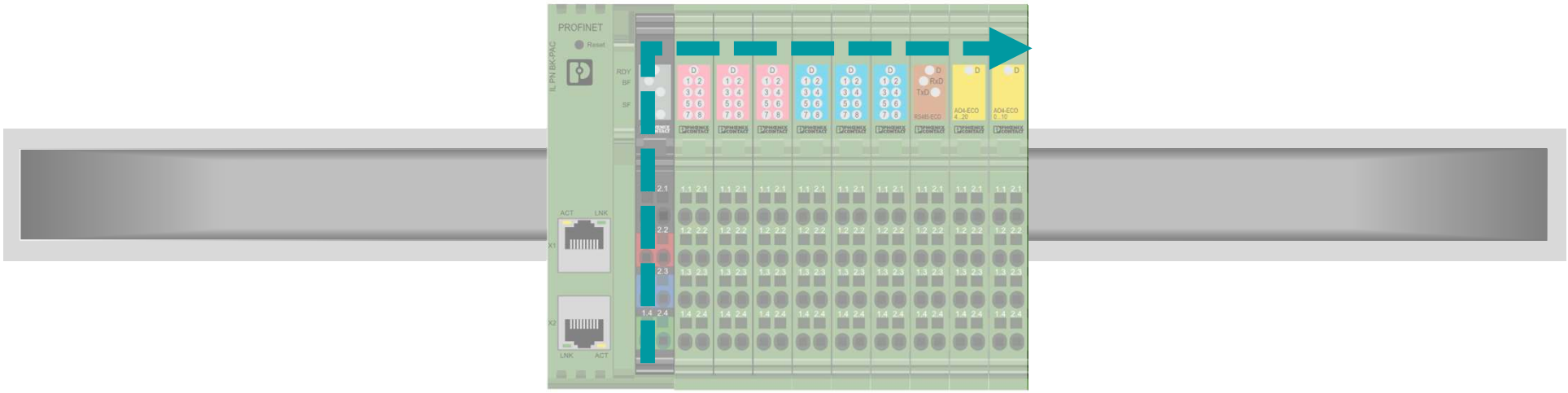
DIGITAL I/Os



PHOENIX CONTACT
INSPIRING INNOVATIONS

Inline

Power supply concept





PHOENIX CONTACT
INSPIRING INNOVATIONS

Power supply concept

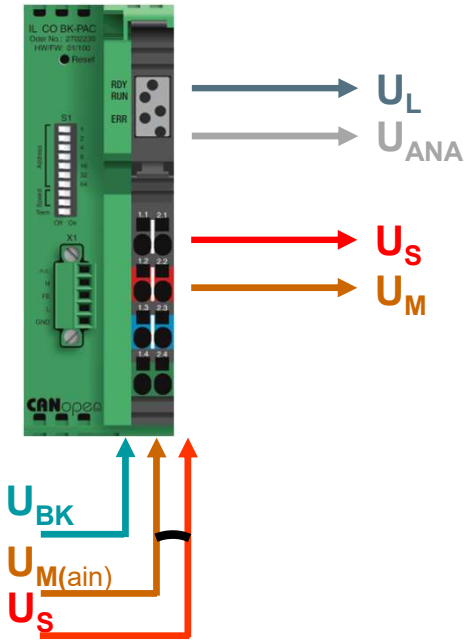


U_{BK} U_M U_S INPUT SUPPLIES

- 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



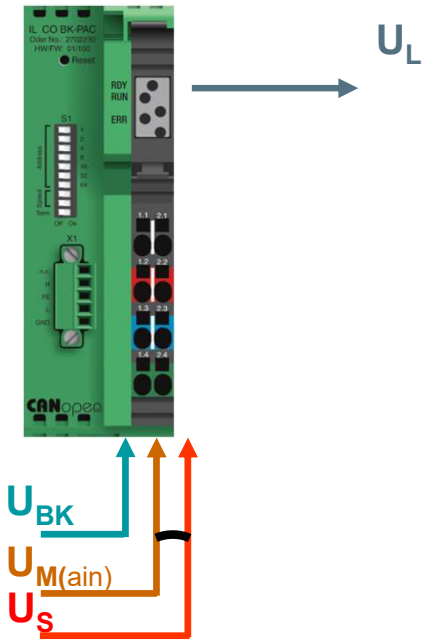
U_L U_{ANA} U_S U_M LOCAL BUS SUPPLIES

- 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

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The Inline power supply concept

Power supply concept



U_L THE LOCAL BUS SUPPLY

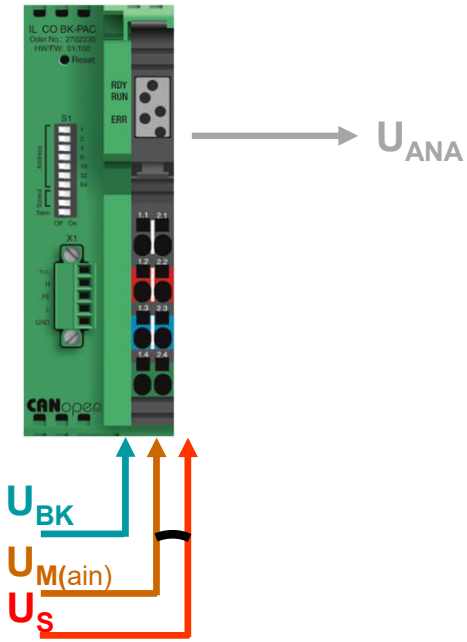
Characteristics of U_L

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

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The Inline power supply concept

Power supply concept



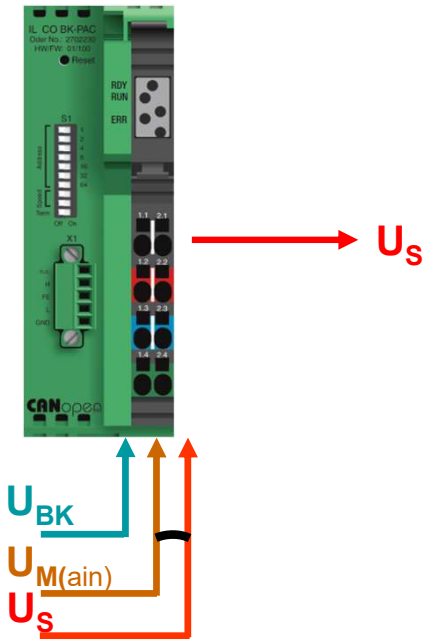
U_{ANA} THE ANALOG CIRCUIT SUPPLY

Characteristics of U_{ANA}

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

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Power supply concept

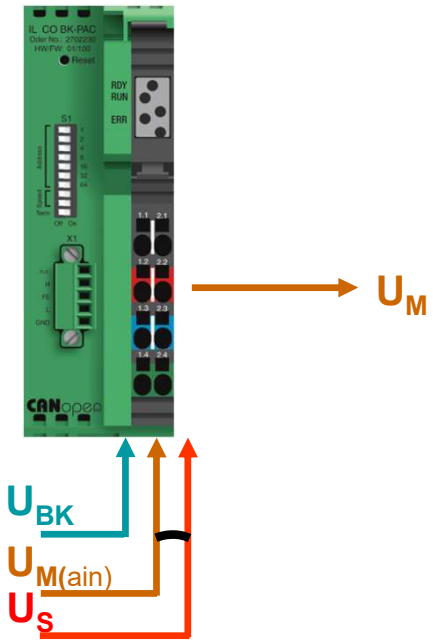


U_S THE SEGMENT CIRCUIT SUPPLY

Characteristics of U_S

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

Power supply concept



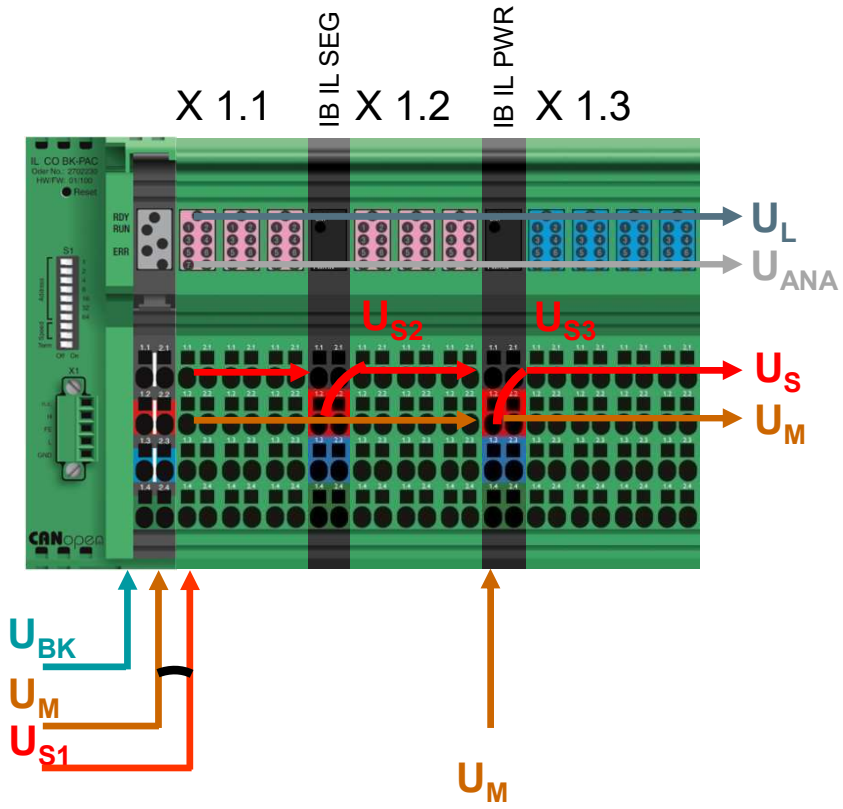
U_M THE MAIN PERIPHERAL SUPPLY

Characteristics of U_M

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

The Inline power supply concept

Power supply concept – Segmentation



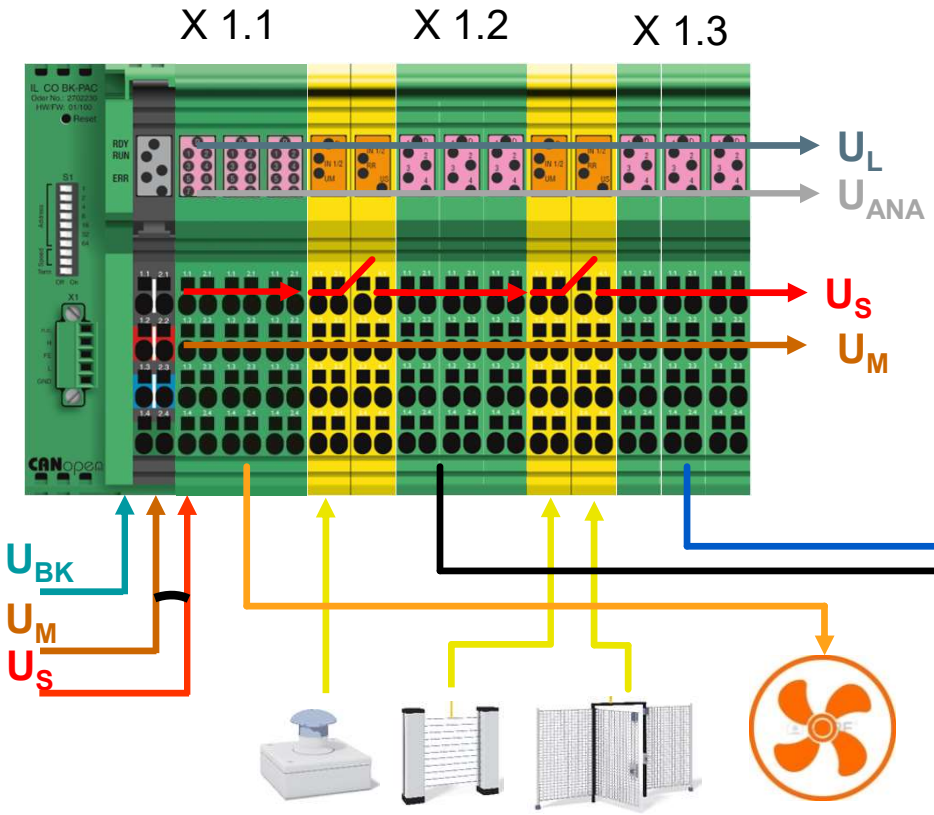
- 3 terminal groups
- Power terminal IB IL PWR refeeds U_M and U_S when the supply is not sufficient anymore
- Segment terminal IB IL SEG… creates new segment circuits with different U_S
- Enables to switch-off grouped output terminals

! MOST OF THE COMPETITORS CAN‘T DO THAT!

PHOENIX CONTACT
INSPIRING INNOVATIONS

Inline

Power supply concept – Safety

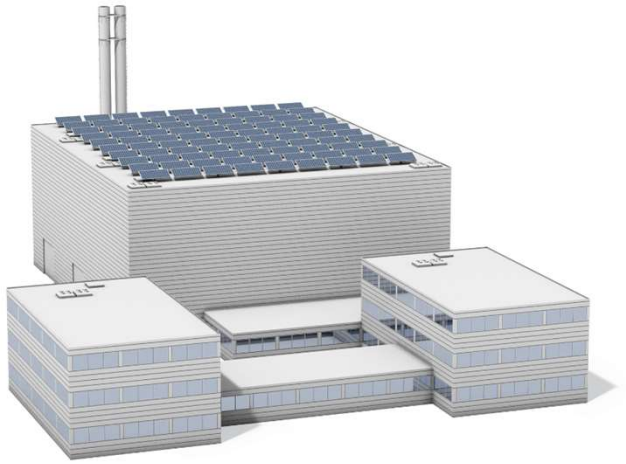


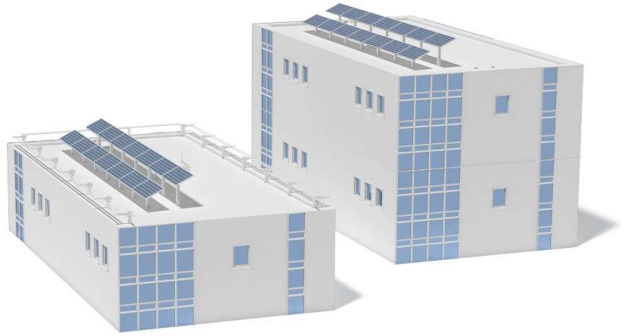
- 3 terminal groups X 1.1…1.3
- 2 safety segments
  - Emergency button
  - Light barrier
  - Security gate
- DO 4/EF-ECO has to be installed to the right of the safety terminal

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INSPIRING INNOVATIONS

Inline

Scope of applications





INSPIRING INNOVATIONS

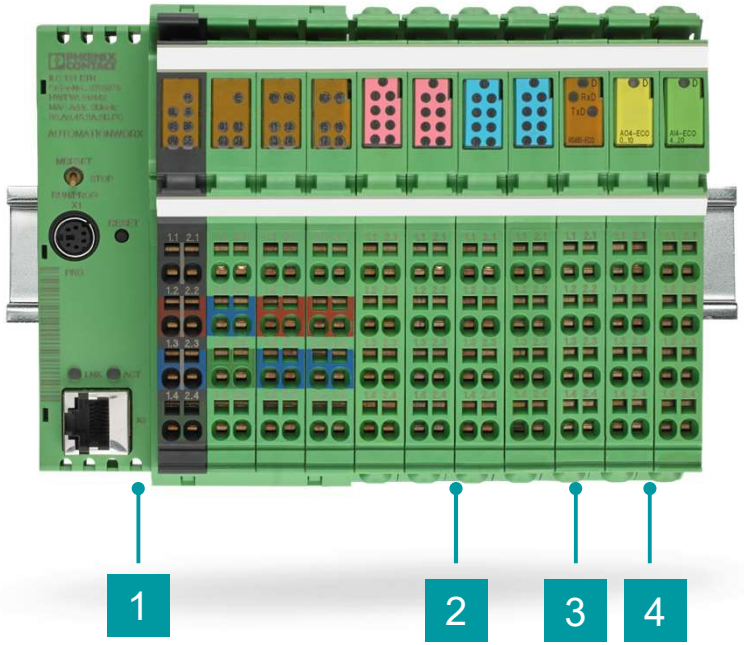
Scope of Applications

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



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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.”



Modular controller



I/O terminals

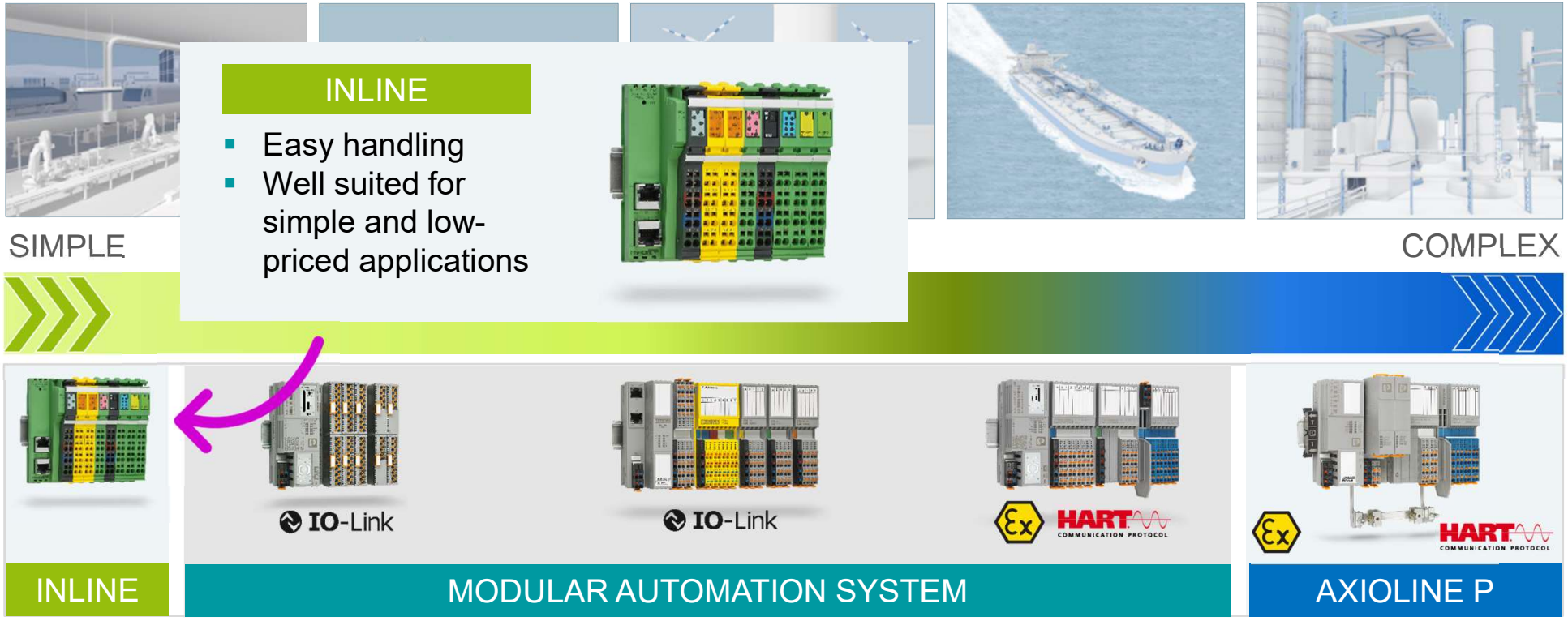


Contact the Building Technologies Sales Team about the Emalytics Building Management Solution

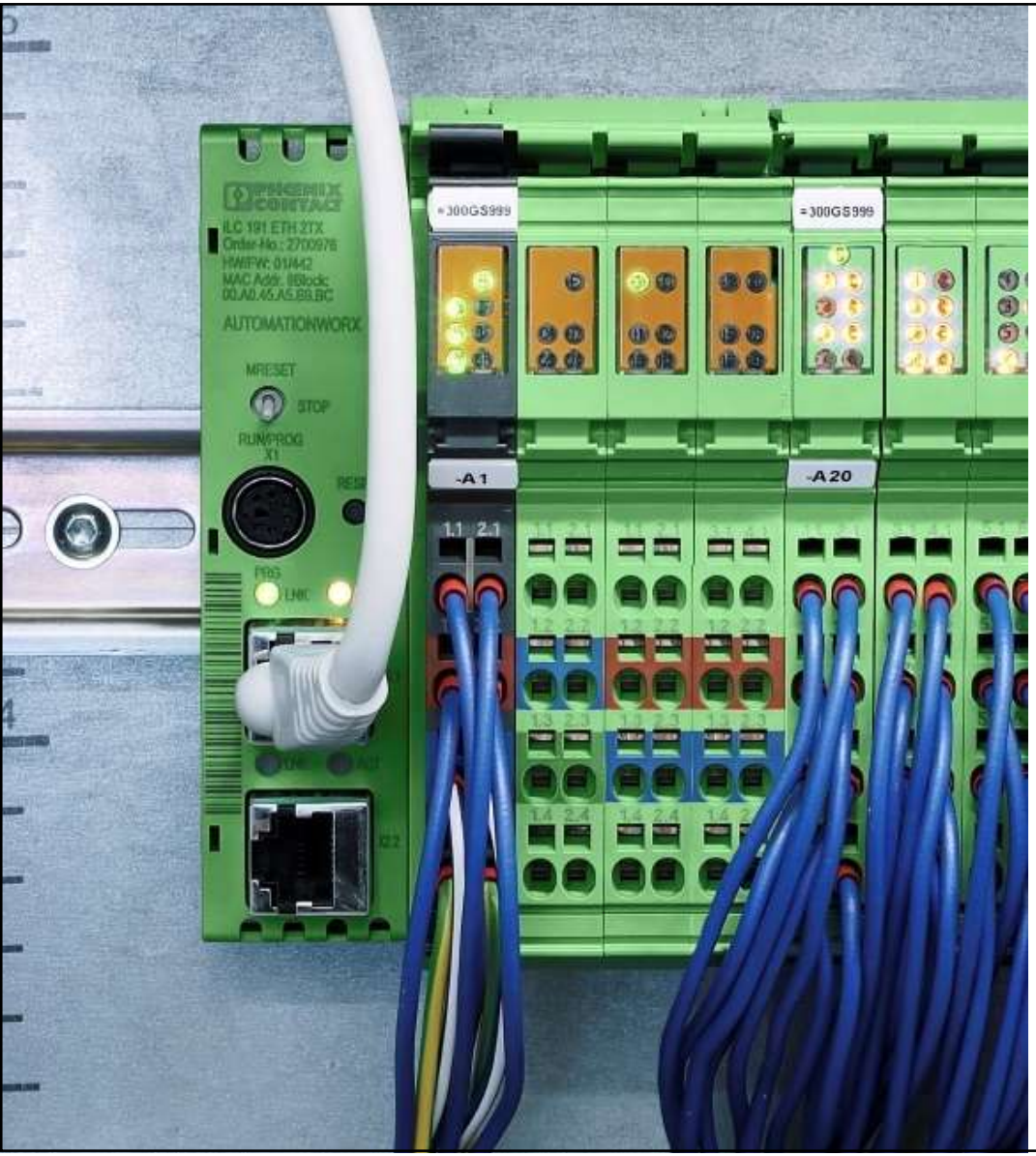
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Scope of applications

IP20 I/O systems



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Thank you

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