Welcome

Sistema modular Axioline F de Entradas y Salidas

Antonio Gordillo IMA Enero 2021

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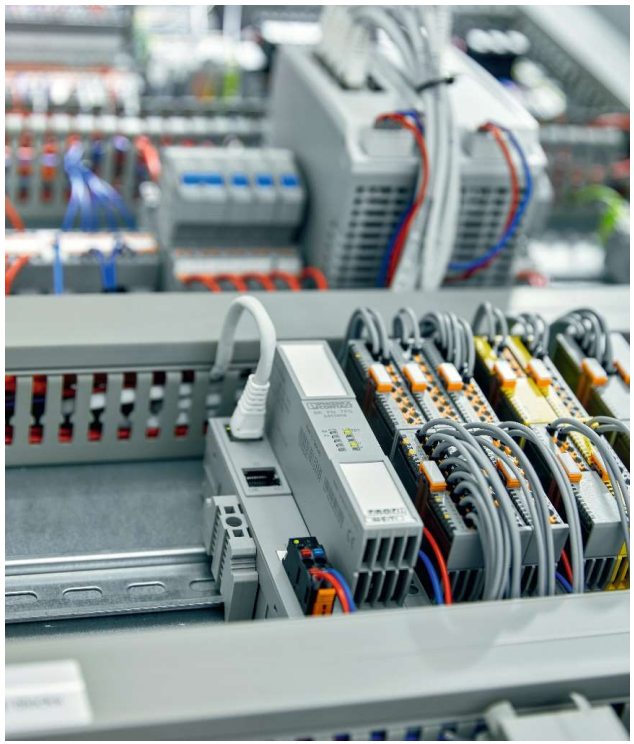
Webinars

Agenda

- Oferta Axioline F
- Actualización IO-Link
- Project+ 3.6
- Arquitecturas



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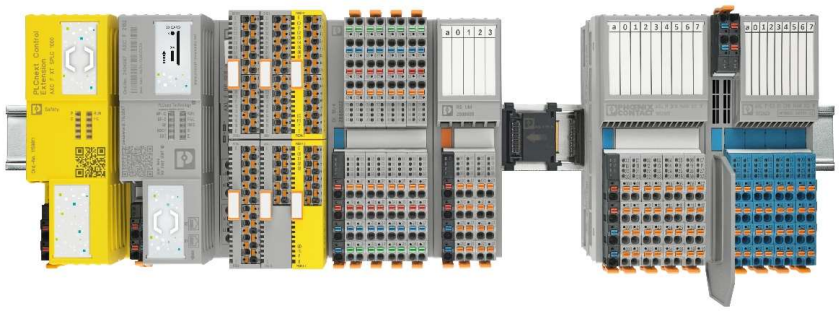
Webinar IMA Enero 2021

Sistema modular Axioline F de Entradas y Salidas



Fecha	**14 Enero 2021**
Hora	9:00
Hora	
Duración	1 hora
Costo	gratuito

Un mayor conocimiento sobre el Sistema modular Axioline F y sus alternativas de módulos de Control, nuevos móodulos de control de seguridad, acopladores de bus y módulos especiales serán presentados.

En el desarrollo de la sesión se orientará con mayor profundidad de las reglas y todos los elementos disponibles de este Sistema modular Axioline F desde sus herramientas para selección, programación, puesta en marcha, diagnóstico así como descubrir las mejores arquitecturas al utilizar módulos Axioline SE, nuevos controladores de expansión para seguridad, Arquitecturas SBT y módulos especiales para áreas peligrosas.

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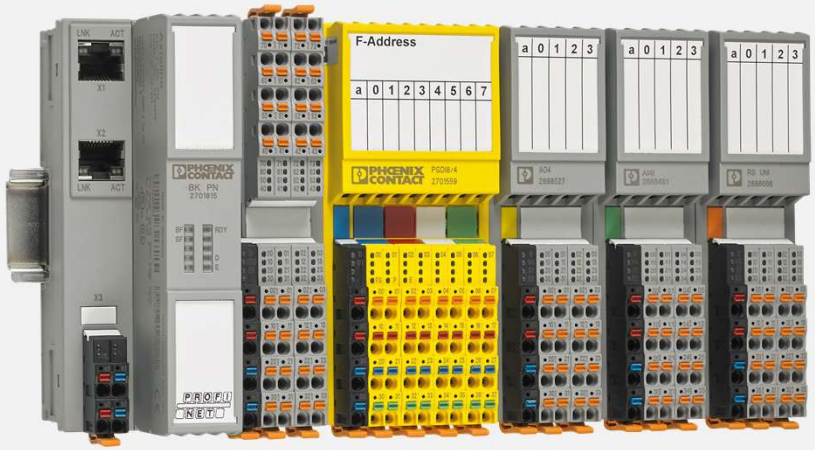

Axioline F
the block-based modular I/O system

TECHNICS

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Axioline F - the block-based modular I/O system

Agenda

- Overview / Basics Axioline F
- Look, colors, LEDs, mechanical specifications
- Power supply, wiring, labelling, shielding
- STARTUP+ - Wiring Check for Axioline F
- Technical data / Approvals
- Axioline F XC (eXtreme Conditions)
- Process data, PDI channel, Response times
- SafetyBridge Technology
- Product Portfolio

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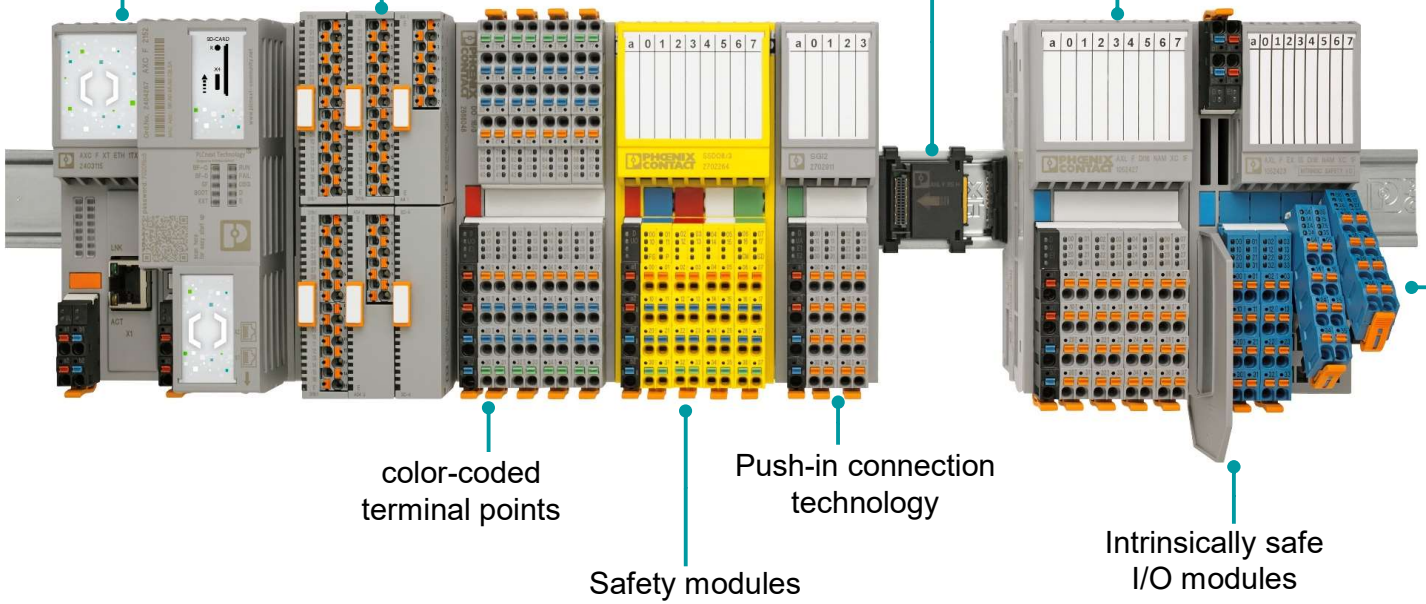
Axioline F - the block-based modular I/O system

Axioline F – the specialist in the control cabinet



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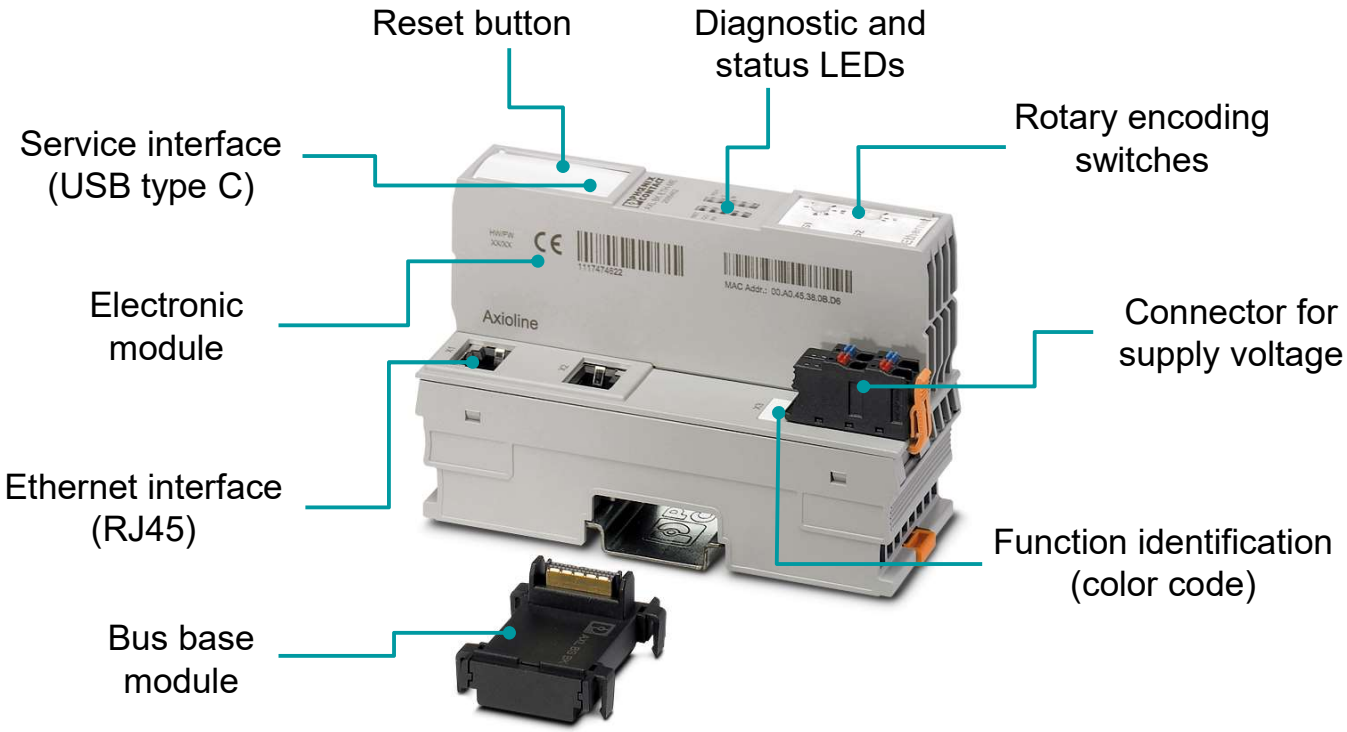
Axioline F - the block-based modular I/O system

Components of an Axioline F bus coupler



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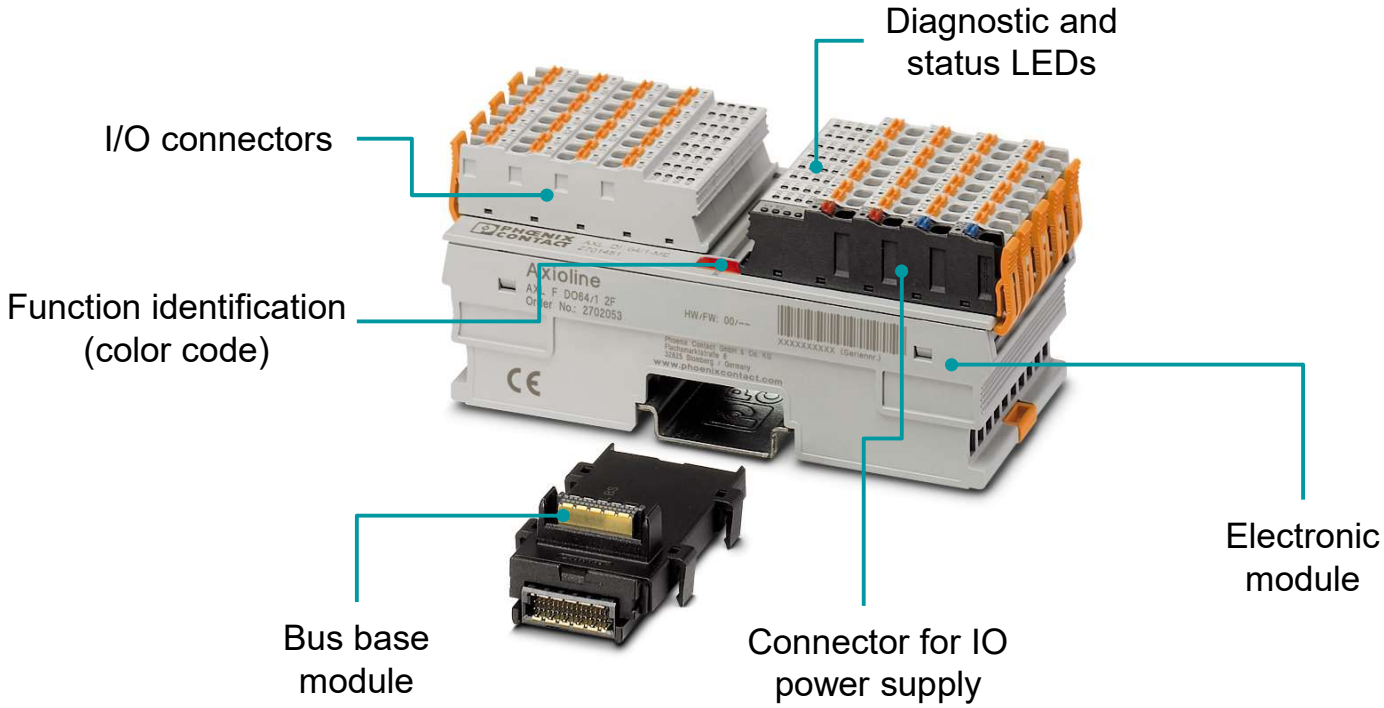
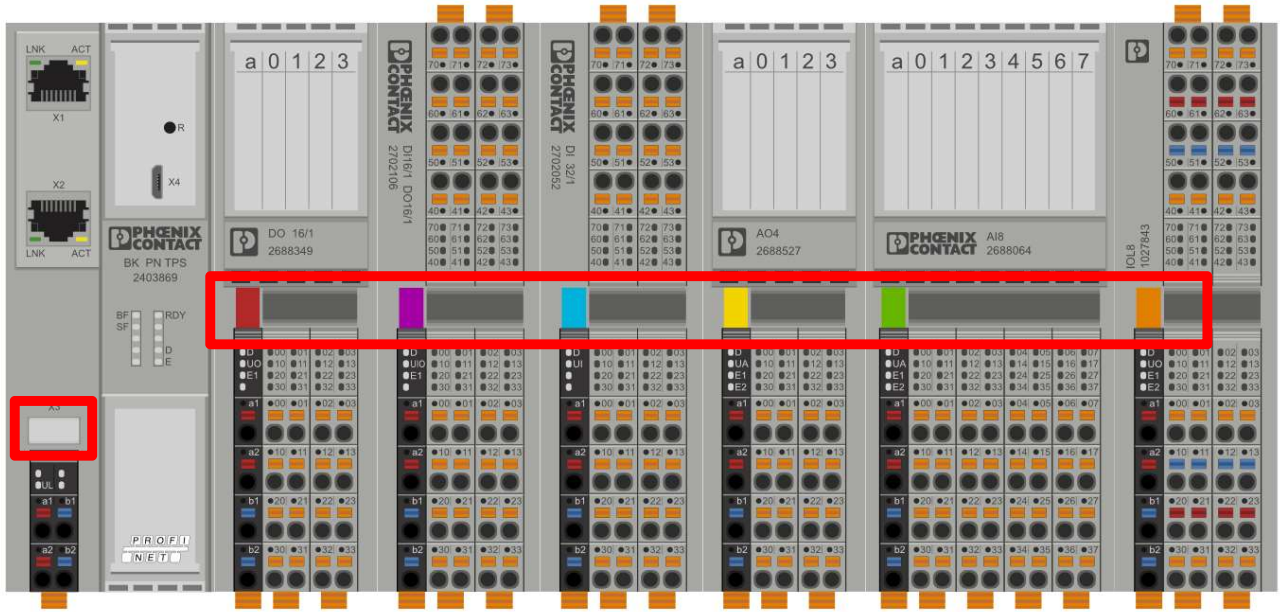
Components of an Axioline F I/O module



Axioline F - the block-based modular I/O system

Function identification via color code

- Bus coupler / PWR
- Digital input
- Digital output
- Digital input / output
- Analog input
- Temperature measurement
- Analog output
- Function / communication



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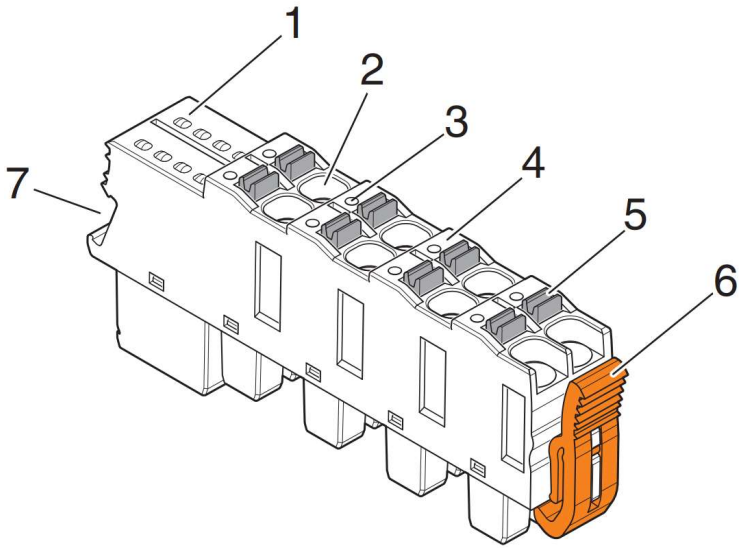
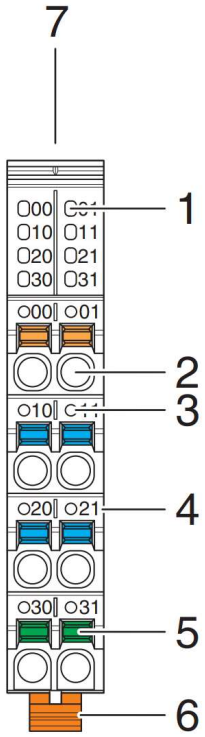
Basic design of an Axioline F connector





1. Local diagnostic and status LEDs
2. Terminal point
3. Touch connection (Measuring point)
4. Terminal point marking
5. Colored spring lever
6. Locking latch
7. Space for connector marking (“ZBF 10/5,8 AXL” or “ZBF 5”)

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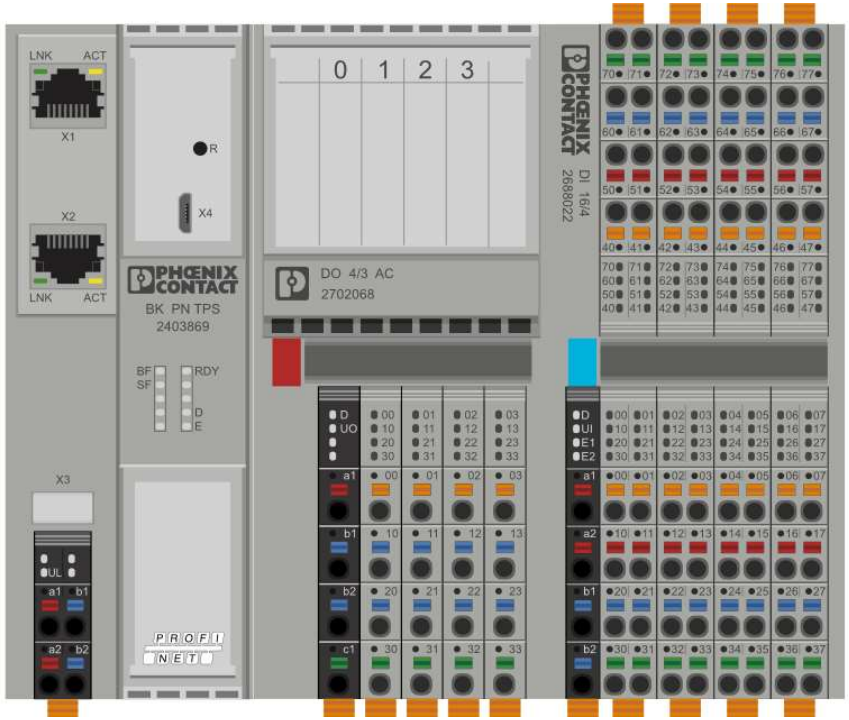
Color coded terminal points (spring lever)

Color	Function of the terminal points	
	Low-level signal	Low voltage
	Signal	Signal
	24 V DC	230 V AC, 220 V DC, relay main contact
	GND	N (neutral conductor)
	FE (functional ground)	PE (protective conductor)



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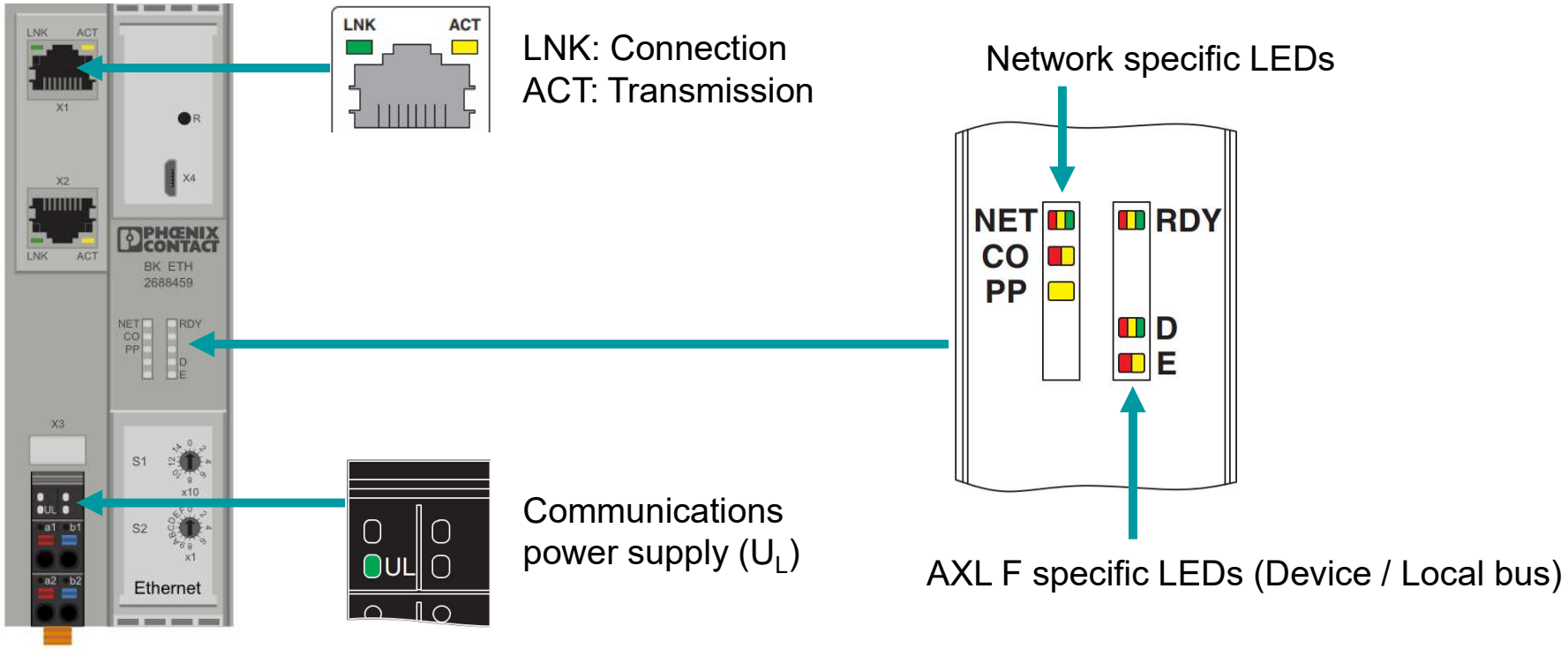
Diagnostic LEDs of bus couplers



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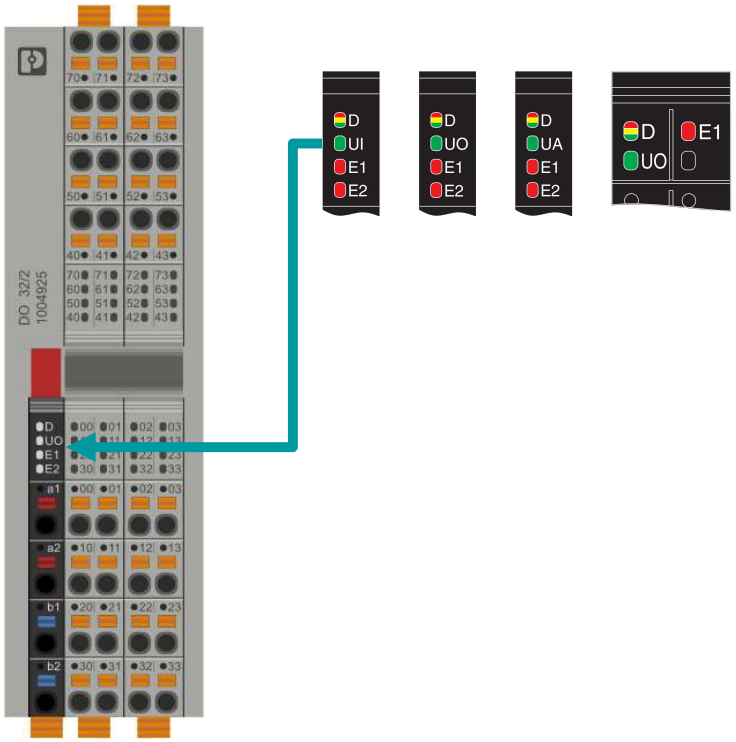
Diagnostic LEDs of I/O modules | PWR connectors



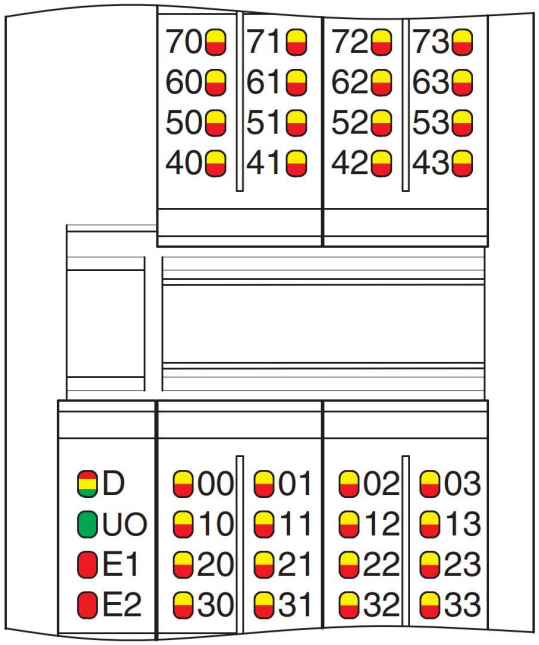
Diagnostics of local bus communication

I/O supply (U_I, U_O, U_{IO}, U_A)

I/O error (entire device)

Channel error

Diagnostic LEDs of I/O modules | I/O connectors



- LEDs are numbered according to terminal points
- Yellow → Status of the input or output
- Red → Diagnostics of the output

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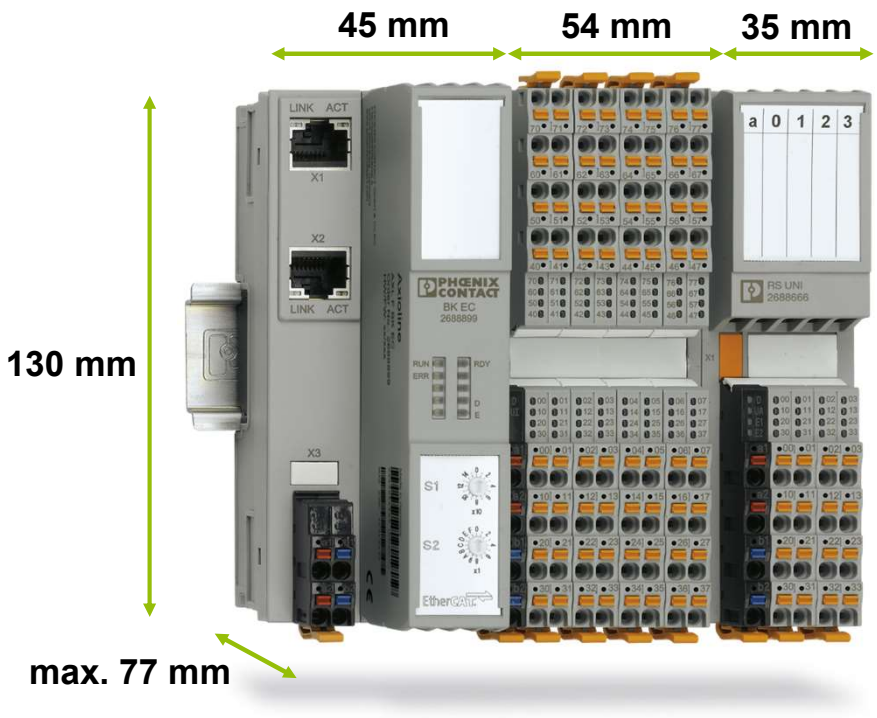
Module dimensions



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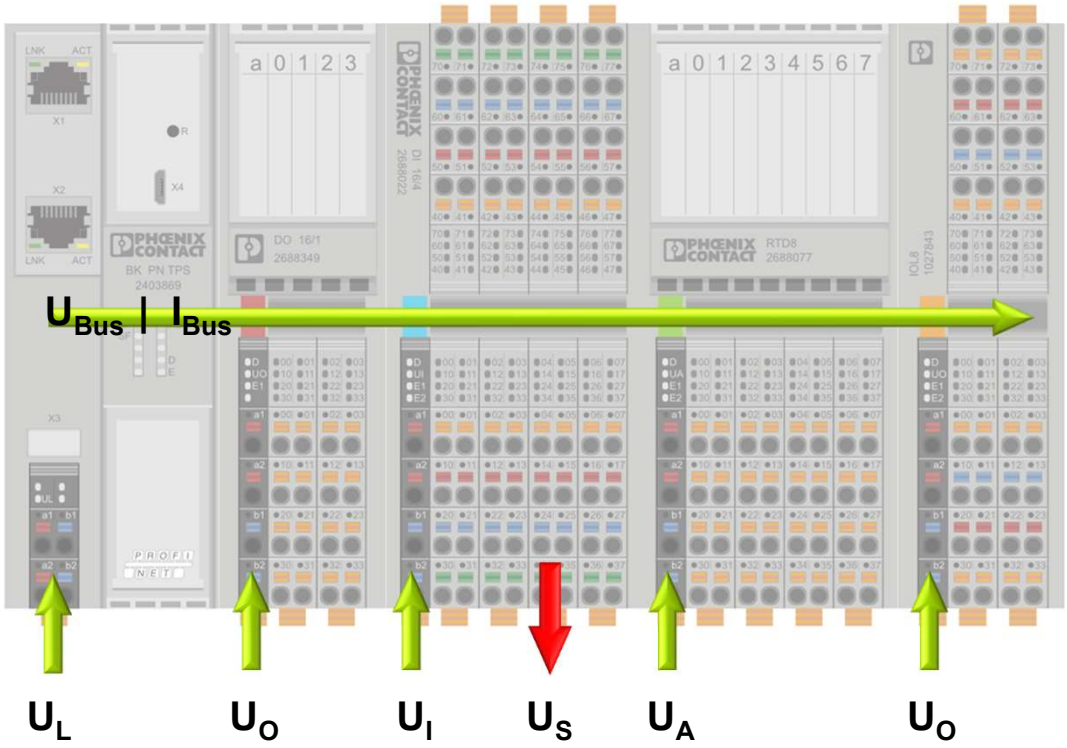
Axioline F system supply



- U_L (U_{Logic}) Communications power supply
- I_{Bus} (I_{Bus}) Local bus
- U_{Bus} (U_{Bus}) Local bus (gen. from U_L)
- U_I (U_{Input}) Digital input modules
- U_S (U_{Sensor}) Sensor supply (gen. from U_I)
- U_O (U_{Output}) Digital output modules
- U_{IO} ($U_{Input/Output}$) Digital input/output modules
- U_A (U_{Analog}) Analog modules

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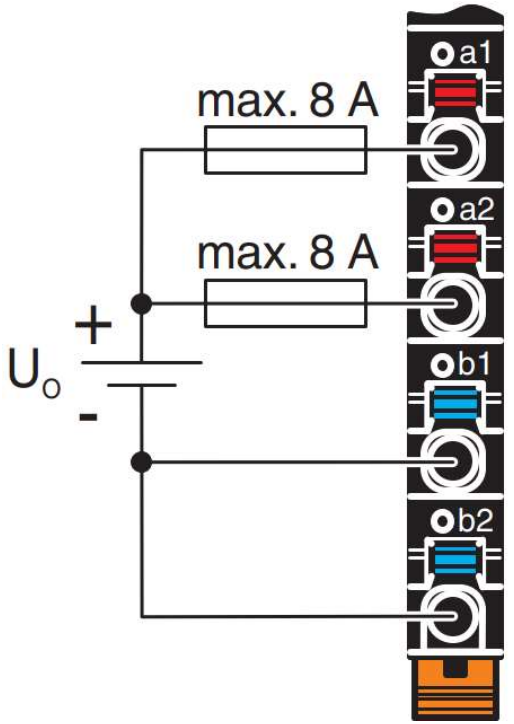
Parallel power supply for more than 8 A

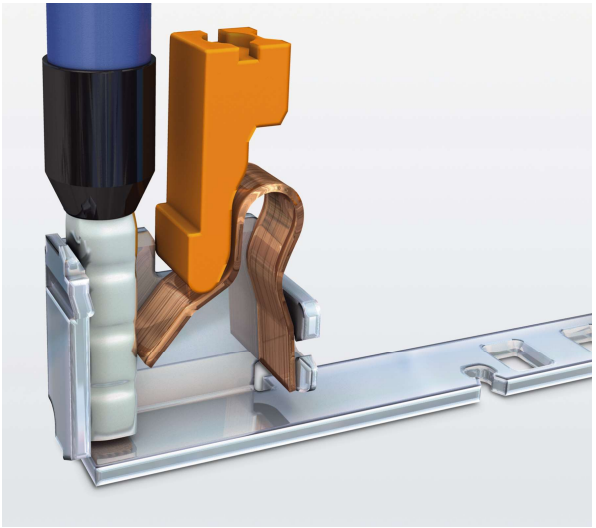
- Maximum current consumption of a terminal point → 8 A
- Example:
  - AXL F DO32/1 2H → 32 channels * 0,5 A = 16 A
  - Power supply (U_O) via one single terminal point limited up to 8 A
  - → Parallel power supply for U_O up to 16 A



Axioline F - the block-based modular I/O system

Conductor cross sections | Push-in Technology

Conductor	Push-in technology	using the spring lever
solid 	min. 0,50 mm² max. 1,50 mm²	min. 0,20 mm² max. 1,50 mm²
stranded 	-	min. 0,20 mm² max. 1,50 mm²
ferrule without collar 	min. 0,25 mm² max. 1,50 mm²	min. 0,25 mm² max. 1,50 mm²
ferrule with collar 	min. 0,25 mm² max. 1,50 mm²	min. 0,25 mm² max. 1,50 mm²



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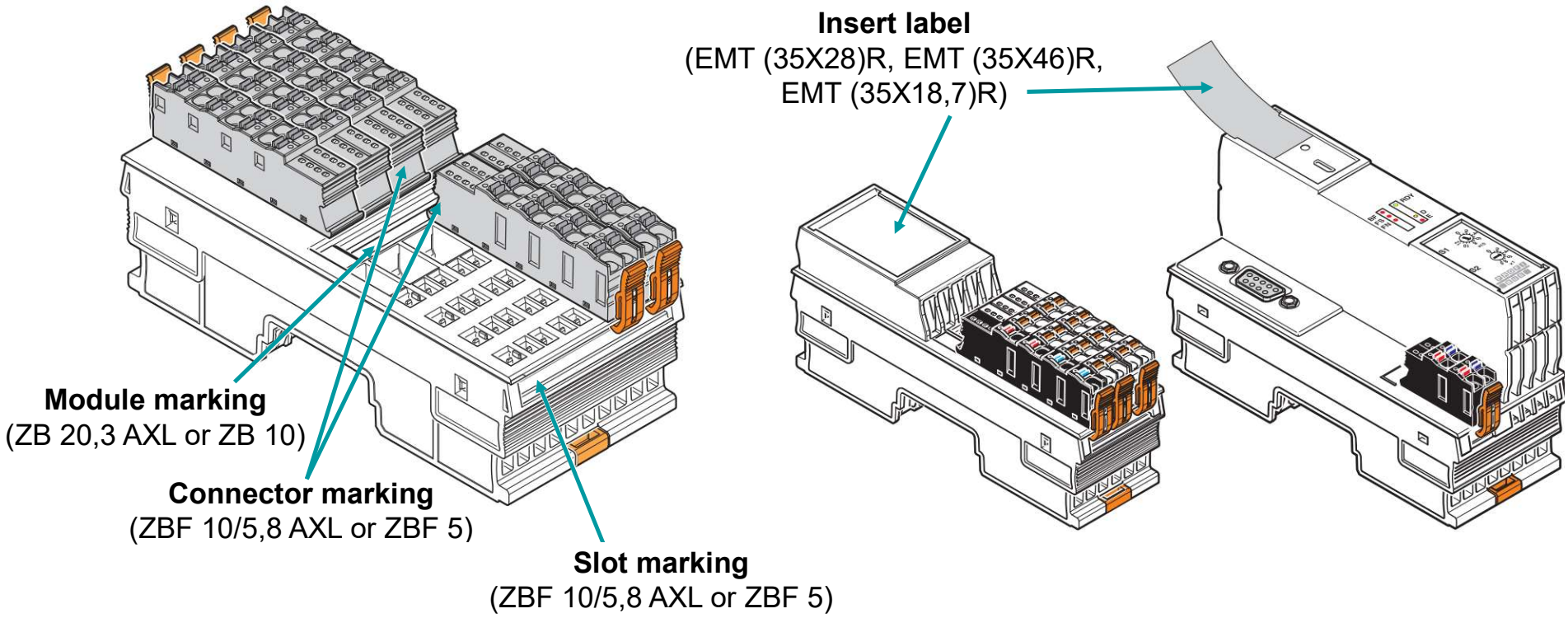
Individual marking with zack marker strips and labels



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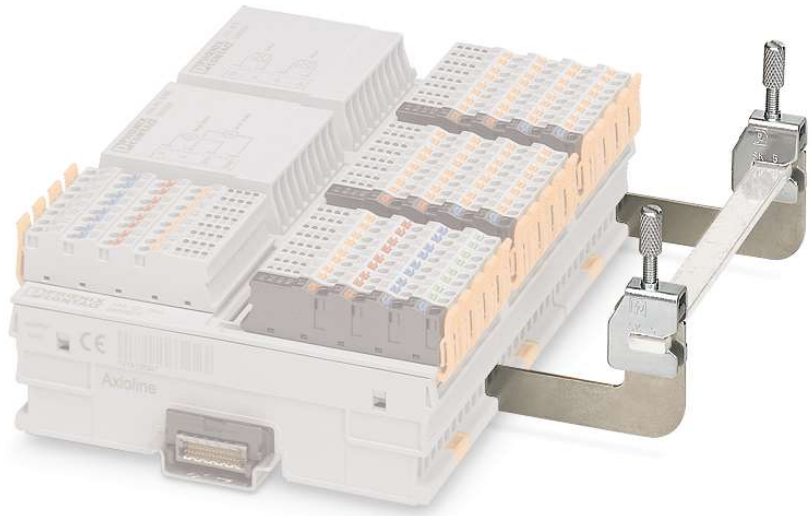
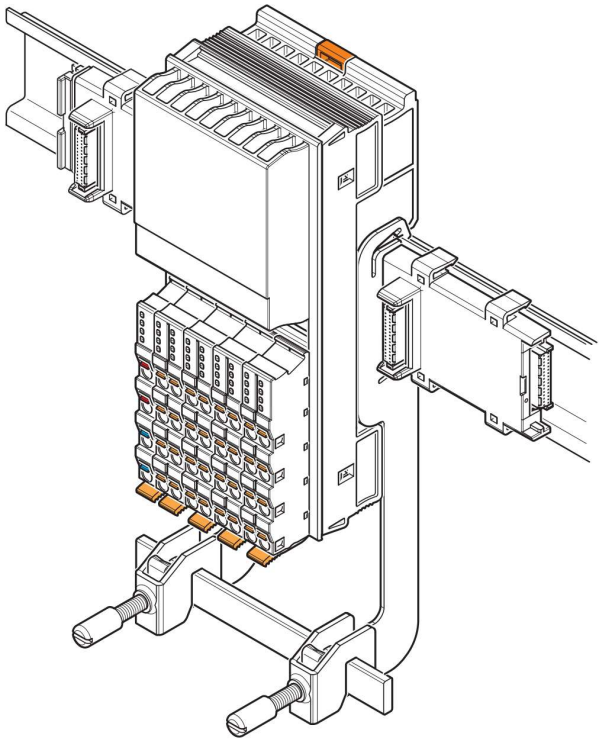
Shielding of signal cables

- System integrated shielding set
  - AXL SHIELD SET - 2700518





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STARTUP+ – Wiring Check for Axioline F

- Connection to the bus coupler via RJ45 or USB interface
- Reading the connected bus; all modules will be displayed
- Reading and writing module process data (IO-Check)
- Parameterization of the modules
- I/O module and the bus coupler diagnostics
- Free to download

AVAILABLE AS FREE DOWNLOAD !

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Axioline F - the block-based modular I/O system

Technical Data – Environment & mechanical tests

Ambient temperature (operation)	-25°C ... +60°C
Ambient temperature (storage/transport)	-40°C ... +85°C
Permissible humidity	5% ... 95% (non-condensing)
Permissible air pressure	70 kPa ... 106 kPa (up to 3000 m above sea level) (> 3000 m with restraints, see user manual)
Degree of protection	IP20
Vibration resistance (IEC 60068-2-6)	5g
Shock testing (IEC 60068-2-27)	30g
Bump endurance test (IEC 60068-2-27)	10g
Noise emission test (EN 61000-6-3)	Class B (residential area)

Axioline F - the block-based modular I/O system

Approvals

Local approvals

CE

c UL US LISTED

EAC

Marine approvals

RINA SERVICES
classification, certification, inspection & testing

BUREAU VERITAS

Lloyd's Register
TYPE APPROVAL

CERTIFIED BY DNV·GL
MARITIME MANUFACTURER

ABS

Ex approvals*

Ex

IECEx

c UL US LISTED
Class 1 Div. 2

* XC modules only

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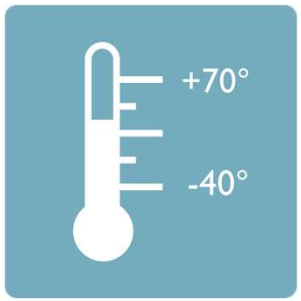
Axioline F - the block-based modular I/O system

Axioline F XC (eXtreme Conditions)

- Axioline F XC modules for rough environment
  - Can be used under extreme ambient conditions
  - Extended temperature range of -40°C ... +70°C (see “Tested successfully: use under extreme ambient conditions” in the data sheet)
  - Partially coated PCBs
  - Ex approvals for many XC modules (July 2020)
    - ATEX (Zone 2)
    - IEC Ex (Zone 2)
    - UL haz. loc. Class 1 Div 2



Class 1 Div. 2

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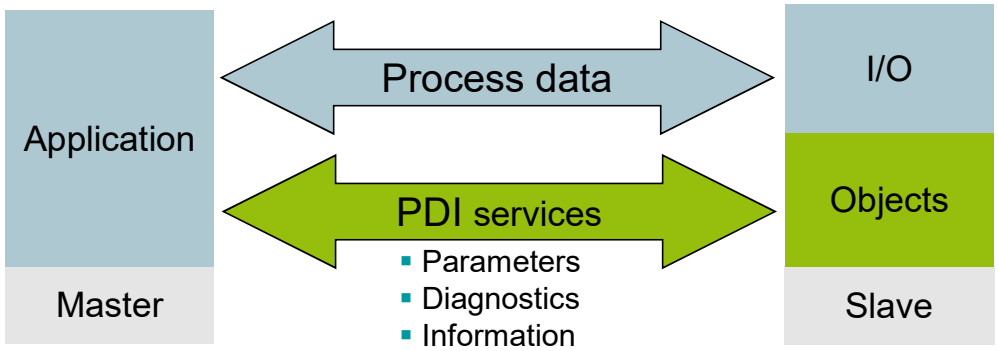
Process data and PDI channel

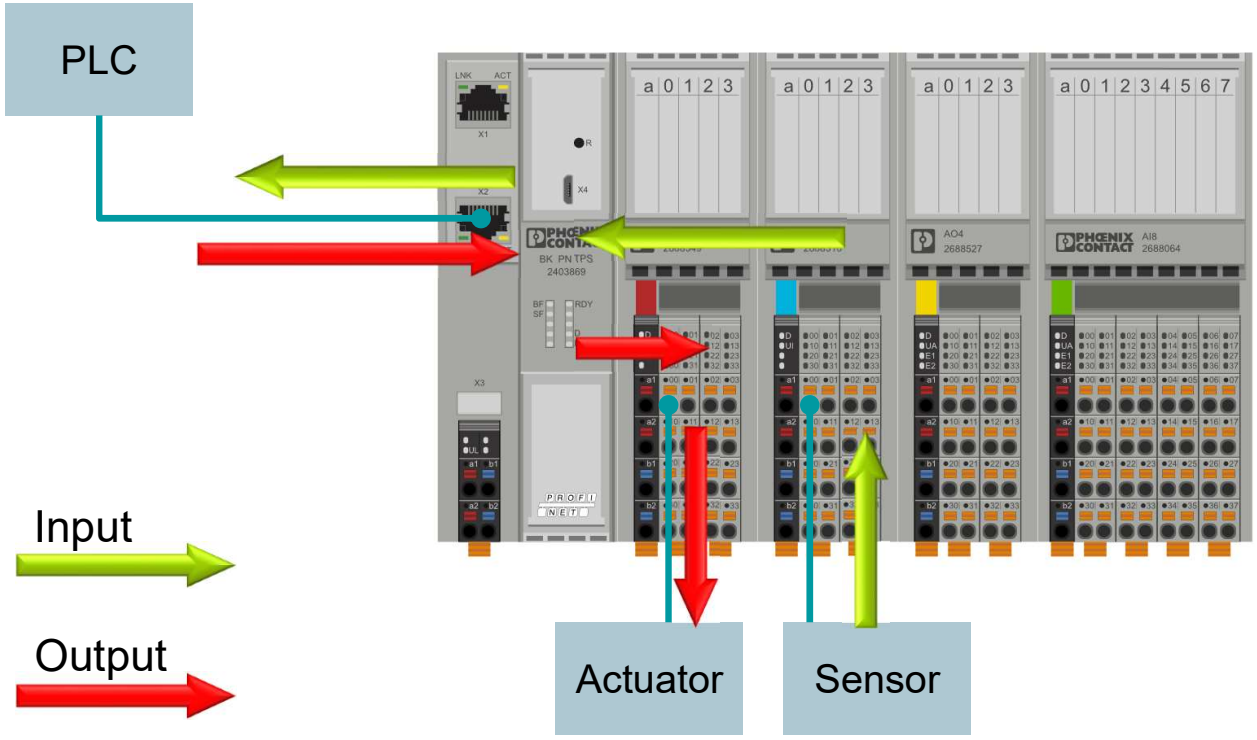
- Process data
  - Every AXL F device has at least one byte process data
  - Motorola format (Big Endian)
- PDI = **P**arameters, **D**iagnostics, and **I**nformation
  - Demand-oriented, acyclic transmission of parameter and diagnostic data



Diagnostic state (0018_{hex}: DiagState)

Index [hex]	Object name	Meaning
0018	DiagState	Diagnostic state
.01	Consec. no.	Consecutive error number since the last power up or error memory reset
.02	Priority	Priority of the message. 1: highest priority
.03	Channel	Channel on which the error occurred (FF_{hex}: entire device)
.04	Code	Error code
….	…	…
.0B	Text	Device-specific explanation of the malfunction that occurred; Default: “Status OK”

Response times for an Axioline F system



- Response time =
  time from reading in the input,
  processing in the controller
  to setting the output
- When determining the response time of the overall system, Axioline F represents the smallest proportion by far and therefore can normally be ignored.

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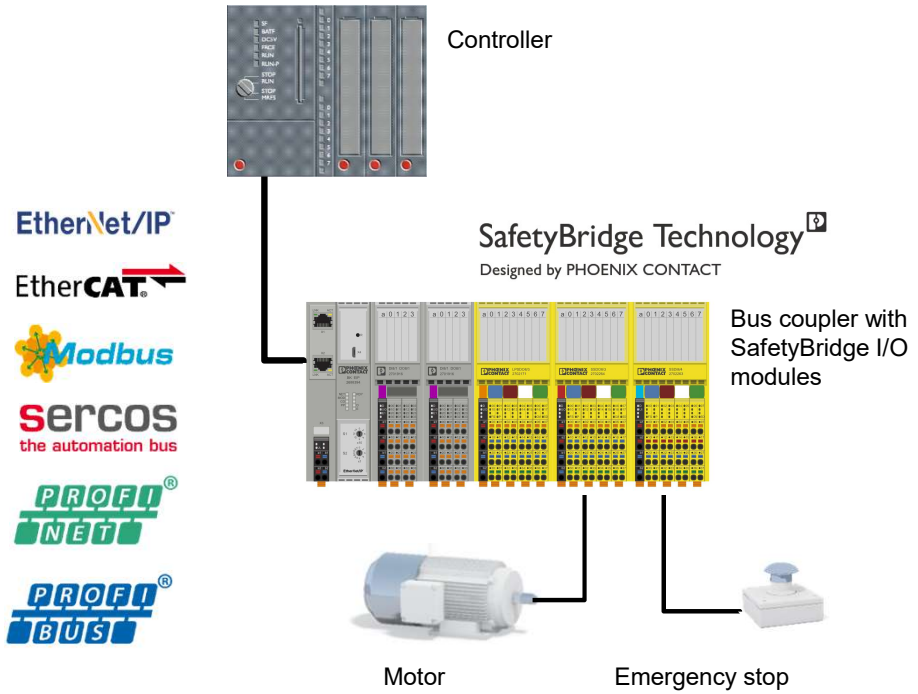
Axioline F - the block-based modular I/O system

SafetyBridge Technology

- Safety I/O modules exchange safety-related signals with each other
- The standard controller and network is only used for transport purposes
- Safety I/O modules process the safety functions themselves
- All safety requirements up to SIL 3 or PL e
  - ➢ Cost-effective solution for functional safety in standard applications



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Axioline F - the block-based modular I/O system

Axiocontrol

PLCnext Control	Extensions (for AXC F 2152 / 3152)	Conventional PLCs
 **AXC F 1152** 1151412 8 tasks, 16 PN devices, ARM® Cortex® A9 single core, 800 MHz	 **AXC F XT ETH 1TX** 2403115 Left-alignable Ethernet interface, Independent MAC-Address, PROFINET support	 **AXC 1050** 2700988 8 tasks, 16 PN devices, Altera® NIOS® II processor, 100 MHz
 **AXC F 2152** 2404267 32 tasks, 64 PN devices, ARM® Cortex® A9 dual core, 2x 800 MHz	 **AXC F XT IB** 2403018 Left-alignable INTERBUS-master, up to 512 INTERBUS devices, 500K / 2MBD (automatic detection)	 UPS **AXC 3050** 2700989 16 tasks, 256 PN devices, Intel® Atom™ E660, 1.3 GHz
 **AXC F 3152** TSN UPS 1234567 32 tasks, 128 PN devices, Intel® Atom™ E3930 dual core, 2x 1.3 GHz	 **AXC F IL ADAPT** 1020304 Right-alignable Inline adapter terminal (INTERBUS master), 500K / 2MBD (automatic detection)	

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Bus coupler

PROFINET PROFIBUS	EtherCAT® Sercos	Modbus/TCP (UDP) EtherNet/IP™	Ethernet (IEC 61850)
 **AXL F BK PN TPS** 2403869	 **AXL F BK EC** 2688899	 **AXL F BK ETH** 2688459	**IEC 61850**  **AXL F BK SAS** 2701457
 **AXL F BK PB** 2688530	 **AXL F BK S3** 2701686	 **AXL F BK EIP** 2688394	

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Digital Input

16 Channels	32 channels	64 channels	8 channels (IEC 61850)
 **AXL F DI16/4 2F** 2688022 24 V DC, 4-wire	 **AXL F DI32/1 2H** 2702052 24 V DC, 1-wire	 **AXL F DI64/1 2F** 2701450 24 V DC, 1-wire	 **AXL F DI8/2 24DC 1F** 2702783 24 V DC, IEC 61850-3
 **AXL F DI16/1 1H** 2688310 24 V DC, 1-wire	 **AXL F DI32/1 1F** 2688035 24 V DC, 1-wire		 **AXL F DI8/2 48/60DC 1F** 2702654 48 / 60 V DC, IEC 61850-3
 **AXL F DI16/1 HS 1H** 2701722 24 V DC, 1-wire, high speed			 **AXL F DI8/2 110/220DC 1F** 2700684 110 / 220 V DC, IEC 61850-3

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Axioline F - the block-based modular I/O system

Digital Output

4 / 8 Channels	16 channels	16 / 32 channels	64 channels
 **AXL F DO8/2 2A 1H** 2688381 24 V DC, 2 A, 2-wire	 **AXL F DO16/3 2F** 2688048 24 V DC, 500 mA, 3-wire, safety circuit	 **AXL F DO16 FLK 1H** 2701813 24 V DC, 500 mA, FLK connection	 **AXL F DO64/1 2F** 2702053 24 V DC, 500 mA, 1-wire
 **AXL F DO4/3 AC 1F** 2702068 Triac, 230 V AC, 2 A, 3-wire	 **AXL F DO16/1 1H** 2688349 24 V DC, 500 mA, 1-wire	 **AXL F DO32/1 2H** 1004925 24 V DC, 500 mA, 1-wire	
 **AXL F DOR4/2 AC/220DC 1F** 2700608 Relay, 8A, 220 V DC / 230 V AC	 **AXL F DO16/2 2H** 1027904 24 V DC, 500 mA, 2-wire, safety circuit	 **AXL F DO32/1 1F** 2688051 24 V DC, 500 mA, 1-wire	

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Axioline F - the block-based modular I/O system

Digital Input / Output

16 Channels	24 channels	32 channels
 **AXL F DI8/1 DO8/1 1H** 2701916 8 DI, 24 V DC, 1-wire 8 DO, 24 V DC, 500 mA, 1-wire	 **AXL F DI16/1 DO8/2-2A 2H** 2702291 16 DI, 24 V DC, 1-wire 8 DO, 24 V DC, 2 A, 2-wire	 **AXL F DI16/1 DO16/1 2H** 2702106 16 DI, 24 V DC, 1-wire 16 DO, 24 V DC, 500 mA, 1-wire
 **AXL F DI8/3 DO8/3 2H** 2702071 8 DI, 24 V DC, 3-wire 8 DO, 24 V DC, 500 mA, 3-wire		

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Analog Input / Analog Output

Analog Input 4 Channels	Analog Input 8 Channels	Analog Output 4 / 8 Channels	Analog Input / Output 4 Channels
 **AXL F AI4 I 1H** 2688491 0 … 20 mA, 4 … 20 mA, -20 … +20 mA, 2-, 3-, 4-wire	 **AXL F AI8 1F** 2688064 0 ... 5 V, -5 ... +5 V, 0 ... 10 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, -20 ... +20 mA, 2-wire	 **AXL F AO4 1H** 2688527 0 ... 5 V, -5 ... +5 V, 0 ... 10 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, 2-wire	 **AXL F AI2 AO2 1H** 2702072 0 ... 5 V, -5 ... +5 V, 0 ... 10 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, -20 ... +20 mA, 2-wire
 **AXL F AI4 U 1H** 2688501 0 ... 5 V, -5 ... 5 V, 0 ... 10 V, -10 ... 10 V, 2-, 3-, 4-wire	 **AXL F AI8 W 1F** 2702525 0 V ... 5 V, -5 ... +5 V, 0 V ... 10 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, -20 ... +20 mA, 2-wire, high long-term stability	 **AXL F AO8 1F** 2688080 0 ... 5 V, -5 ... +5 V, 0 ... 10 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, -20 ... +20 mA, 2-wire	

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Temperature measurement / Strain Gauge Input

RTD (Resistive Temperature Sensors)	UTH (Thermocouple Sensors)	SGI (Strain Gauge Input)
 **AXL F RTD4 1H** 2688556 4 channels; Pt, Ni, KTY, Cu sensors; linear resistance measuring; 2, 3, 4-wire (shielded)	 **AXL F UTH4 1H** 2688598 4 channels; Sensor types: U, T, L, J, E, K, N, S, R, B, C, W, HK; linear voltage measuring; 2-wire (shielded, twisted pair)	 **AXL F SGI2 1H** 2702911 2 channels; high-precision, 4-, 6-wire connection; 2-point adjustment, path-adjustment, PD update time 0,2 … 100 ms
 **AXL F RTD8 1F** 2688077 8 channels, Pt, Ni, KTY, Cu sensors; linear resistance measuring; 2, 3, 4-wire (shielded)	 **AXL F UTH8 1F** 2688417 8 channels; Sensor types: U, T, L, J, E, K, N, S, R, B, C, W, HK; linear voltage measuring; 2-wire (shielded, twisted pair)	

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Axioline F - the block-based modular I/O system

Communication / Master

IO-Link Master, Serial (RS-232, RS-422/485)	Conventional Subbus Masters / Interfaces	Building Automation Subbus Master
 **AXL F IOL8 2H** 1027843 8 IO-Link class A ports, 3-wire, IO-Link-Spec V1.1.2, Parameter data storage	 **AXL F IF CAN 1H** 2702668 1 CAN interface; transparent protocol, max. speed of 1 Mbps **Restricted distribution**	 **AXL F MA DALI2 1H** 2702864 DALI master, two channels, integrated DALI power supply, single master operation, protected up to 250 V AC **only for AXC / RFC**
 **AXL F RS UNI 1H** 2688666 1 interface, RS-485/422 or RS-232; Speed: 110 bps ... 250 kbps; Protocols: Transparent, end-to-end, XON/XOFF, Modbus/RTU	 **AXL F MA IB 1H** 2702148 1 INTERBUS-Master, 9-pos. D-SUB socket, max. 64 byte process data width, 500K / 2MBD (automatic detect.), Automatic startup of INTERBUS **Restricted distribution**	 **AXL F MA MBUS 1H** 1104545 M-Bus master, 2-wire connection, up to 80 devices, transmission speed up to 38.4 kbps, Integrated isolated M-Bus power supply **only for AXC / RFC**

PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F - the block-based modular I/O system

Function / Power Measurement / Power feed

SSI, PWM	Power Measurement, Counter, Incremental Encoder	Logic power supply
 **AXL F SSI1 AO1 1H** 2688433 1 SSI interface for absolute encoder, 62.5 kHz to 2 MHz; 1 analog output	 **AXL F PM EF 1F** 2702671 Power measurement, 4 inputs, 0 … 400 V AC (phase/neutral), 0 … 690 V AC (phase/phase), 0 … 5 A AC	 **AXL F PWR 1H** 2688297 Logic supply U_{Bus}, max. 4 A
 **AXL F PWM2 1H** 1007352 pulse width modulation, 2 independent channels, 24 V DC, 500 mA, 5 V DC, 10 mA, Frequency output (0 ... 65535 Hz)	 **AXL F CNT2 INC2 1F** 2688093 2 Counter inputs, 32 Bit, 2 Incremental encoder inputs, Input frequency up to 300 kHz	

PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F - the block-based modular I/O system

SafetyBridge / PROFIsafe

SafetyBridge logical module	SafetyBridge I/O	PROFIsafe I/O
 **AXL F LPSDO8/3 1F** 2702171 integrated safety logic; 4 safe DOs (two-channel occupancy) or 8 safe DOs (single-channel occupancy)	 **AXL F SSDI8/4 1F** 2702263 4 safe DIs (two-channel occupancy) or 8 safe DIs (single-channel occupancy)	 **AXL F PSDI8/4 1F** 2701559 4 safe DIs (two-channel occupancy) or 8 safe DIs (single-channel occupancy)
	 **AXL F SSDO8/3 1F** 2702264 4 safe DOs (two-channel occupancy) or 8 safe DOs (single-channel occupancy)	 **AXL F PSDO8/3 1F** 2701560 4 safe DOs (two-channel occupancy) or 8 safe DOs (single-channel occupancy)

PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F - the block-based modular I/O system

XC - Axiocontrol and bus coupler

Conventional PLCs	PROFINET PROFIBUS	Modbus/TCP (UDP) EtherNet/IP™
 **AXC 1050 XC** 1089334 8 tasks, 16 PN devices, Altera® NIOS® II processor, 100 MHz	 **AXL F BK PN TPS XC** 1068857	 **AXL F BK ETH XC** 2701949
	 **AXL F BK PB XC** 2702463	 **AXL F BK EIP XC** 1167192

PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F - the block-based modular I/O system

XC - Digital Input / Output

Digital Input	Digital Output	Digital Output Digital Input/Output
 **AXL F DI16/4 XC 2F** 2701224 24 V DC, 4-wire	 **AXL F DO16/3 XC 2F** 2701228 24 V DC, 500 mA, 3-wire, safety circuit	 **AXL F DO8/2 2A XC 1H** 1035427 24 V DC, 2 A, 2-wire
 **AXL F DI32/1 XC 1F** 2701226 24 V DC, 1-wire	 **AXL F DO32/1 XC 1F** 2701230 24 V DC, 500 mA, 1-wire	 **AXL F DI8/1 DO8/1 XC 1H** 2702017 8 DI, 24 V DC, 1-wire 8 DO, 24 V DC, 500 mA, 1-wire

PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F - the block-based modular I/O system

XC Process I/Os - Digital Input / Output

Digital Input	Digital Output
 **AXL F DI16 NAM XC 1F** 1052427 16 digital inputs for NAMUR proximity sensors (IEC/EN 60947-5-6), 2-wire	 **AXL F EX IS DO4 SD 24-48 XC 1F** 1086901 Intrinsically safe, 4 digital outputs, 24 V DC, 48 mA, 3-wire
 **AXL F EX IS DI16 NAM XC 1F** 1052423 Intrinsically safe, 16 digital inputs for NAMUR proximity sensors (IEC/EN 60947-5-6), 2-wire	 **AXL F EX IS DO4 SD 21-60 XC 1F** 1086902 Intrinsically safe, 4 digital outputs, 21 V DC, 60 mA, 3-wire

PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F - the block-based modular I/O system

XC - Analog Input / Output

Analog Input	Analog Input Analog Input/Output	Analog Output
 **AXL F AI4 I XC 1H** 2702007 0 … 20 mA, 4 … 20 mA, -20 … +20 mA, 2-, 3-, 4-wire	 **AXL F AI8 XC 1F** 2701232 0 ... 5 V, -5 ... +5 V, 0 ... 10 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, -20 ... +20 mA, 2-wire	 **AXL F AO4 XC 1H** 2702153 0 ... 5 V, -5 ... +5 V, 0 ... 10 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, 2-wire
 **AXL F AI4 U XC 1H** 2702008 0 ... 5 V, -5 ... 5 V, 0 ... 10 V, -10 ... 10 V, 2-, 3-, 4-wire	 **AXL F AI2 AO2 XC 1H** 1035429 0 ... 5 V, -5 ... +5 V, 0 ... 10 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, -20 ... +20 mA, 2-wire	 **AXL F AO8 XC 1F** 2701237 0 ... 5 V, -5 ... +5 V, 0 ... 10 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, -20 ... +20 mA, 2-wire

PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F - the block-based modular I/O system

XC Process I/Os - Analog Input / Output (HART)

Analog Input	Analog Output
 **AXL F AI8 HART XC 1F** 1052434 8 analog inputs, HART enabled, 4 … 20 mA, 2-wire	 **AXL F AO4 HART XC 1F** 1087080 4 analog outputs, HART enabled, 4 … 20 mA, 2-wire
 **AXL F EX IS AI8 HART XC 1F** 1052432 Intrinsically safe, 8 analog inputs, HART enabled, 4 … 20 mA, 2-wire	 **AXL F EX IS AO4 HART XC 1F** 1087081 Intrinsically safe, 4 analog outputs, HART enabled, 4 … 20 mA, 2-wire

PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F - the block-based modular I/O system

XC - Temperature measurement / Communication / Function

RTD (Resistive Temperature Sensors)	UTH (Thermocouple Sensors) Serial (RS-232, RS-422/485)	Counter, Incremental Encoder Impulse-Input
 **AXL F RTD4 XC 1H** 1035430 4 channels; Pt, Ni, KTY, Cu sensors; linear resistance measuring; 2, 3, 4-wire (shielded)	 **AXL F UTH8 XC 1F** 2702464 8 channels; Sensor types: U, T, L, J, E, K, N, S, R, B, C, W, HK; linear voltage measuring; 2-wire (shielded, twisted pair)	 **AXL F CNT2 INC2 XC 1F** 2701239 2 Counter inputs, 32 Bit, 2 Incremental encoder inputs, Input frequency up to 300 kHz
 **AXL F RTD8 XC 1F** 2701235 8 channels, Pt, Ni, KTY, Cu sensors; linear resistance measuring; 2, 3, 4-wire (shielded)	 **AXL F RS UNI XC 1H** 2702006 1 interface, RS-485/422 or RS-232; Speed: 110 bps ... 250 kbps; Protocols: Transparent, end-to-end, XON/XOFF, Modbus/RTU	 **AXL F IMPULSE2 XC 1H** 2702655 2 channels for magnetostrictive position sensors with start/stop interface, 5 stop events per channel, 4 digital inputs

PHOENIX CONTACT
INSPIRING INNOVATIONS

Designation	Order No.
AXL F IOL8 2H	1027843
AXL SE IOL4	1088132

Axioline F IO-Link

PHOENIX CONTACT
INSPIRING INNOVATIONS

IO / Software

PHOENIX CONTACT
INSPIRING INNOVATIONS

Software

IOL-CONF

The advantage of IO-Link devices is that manufacturers can design them more universally than conventional sensors/actuators. It is only when in use, i.e., during startup, that the IO-Link devices are parameterized for their specific application. To do this, Phoenix Contact provides the IOL-CONF parameterization software. IOL-CONF is a browser-based software tool for the easy parameterization of IO-Link devices.

The IOL-CONF software supports the operation of IO-Link masters from the modular Axioline automation system for the control cabinet (AXL F IOL8 2H and AXL SE IOL4). To use the software, the IO-Link master must be operated on selected bus couplers of the Axioline F system.

Using the Phoenix Contact AXL F IOL8 2H and AXL SE IOL4 IO-Link masters, the software enables the easy and efficient parameterization of IO-Link devices from Phoenix Contact and other manufacturers.

PHOENIX CONTACT
INSPIRING INNOVATIONS

IOL-CONF

Functions

Use of the IOL-CONF software offers the following options:

- ONLINE and OFFLINE parameterization of IO-Link masters from Phoenix Contact and any IO-Link devices over the network.
  - Setting parameters
  - Loading parameters from an IO-Link device
  - Writing parameters to IO-Link devices
  - Storing and loading parameter records to/from a file
  - Writing/copying parameters to multiple IO-Link devices
- Graphical representation of process values
  - Evaluation of measured values
  - Writing process data
  - Exporting displayed measured values

Figure 3-1 "LIMITED" marking in the user interface

IOL-CONF

Supported….

Supported IO-Link masters (used downstream of one of the above bus couplers):

Designation	Order No.	As of hardware	As of firmware
AXL F IOL8 2H	1027843	02 or later	1.01 or later
AXL SE IOL4	1088132	00 or later	1.00 or later

Supported IO-Link devices:

Any, all IO-Link devices of IO-Link specification V1.1.1 or later

Supported bus couplers:

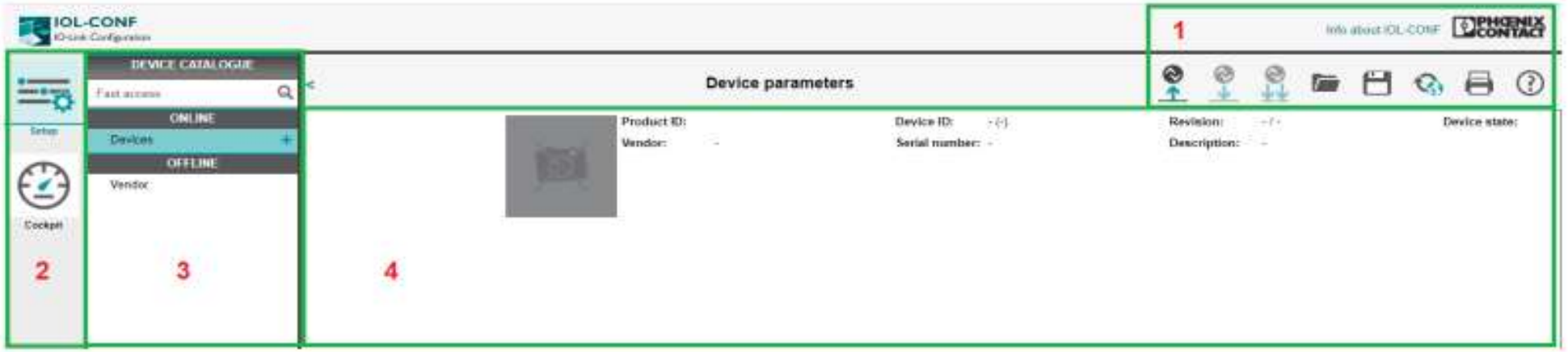
Designation	Order No.	As of hardware	As of firmware
AXL F BK PN TPS	2403869	02 or later	1.31 or later
AXL F BK ETH	2688459	05 or later	1.30 or later
AXL F BK EIP	2688394	05 or later	1.30 or later
AXL F BK EC	2688899	05 or later	1.30 or later
AXL F BK PN TPS XC	1068857	01 or later	1.31 or later
AXL F BK ETH XC	2701949	05 or later	1.30 or later
AXL F BK EIP XC	2403869	05 or later	1.30 or later

PHOENIX CONTACT
INSPIRING INNOVATIONS

IOL-CONF

Software Interface

1. Tool bar/information area
2. View
3. Device catalog
   - ONLINE
   - FILE (not shown in the screenshot below)
   - OFFLINE
4. Device-specific area



Tool bar

Info IOL-Conf	Info about IOL-CONF	Product and contact information, such as the software version, legal information, open-source license terms and conditions
	Read from device	Read IO-Link-specific device parameters from IO-Link masters and devices Scan network for available devices
	Write to device	Write modified IO-Link-specific device parameters to **one** IO-Link master or IO-Link device
	Write to multiple selected devices	Write modified IO-Link-specific device parameters to **multiple** selected IO-Link devices (from OFFLINE mode)
	Load parameters from a file	Load IO-Link-specific device parameters of one IO-Link master and/or one or more IO-Link devices from a project-specific lrp file.

PHOENIX CONTACT
INSPIRING INNOVATIONS

Tool bar

	Save parameters to a file	Save IO-Link-specific device parameters of one IO-Link master and/or one or more IO-Link devices to a project-specific lrp file in the “Downloads” folder in Windows.
	IODD Manager Search for updates	Import IODD files from the local storage location or from the ONLINE database (IODDfinder) Delete selected IODD files from the device catalog Search for updates to already installed IODD files
	Print displayed parame-ters	Print preview of parameters from the “Device-specific view”
	User manual	Open the item page for the IOL-CONF software in the Phoenix Contact e-shop The latest software versions, information, and documentation can be accessed under Download.

PHOENIX CONTACT
INSPIRING INNOVATIONS

IOL-CONF

View

Parameterization	View for the parameterization of IO-Link masters and/or IO-Link devices
Cockpit	Display mode for all online, available process data including visualization and the option to set outputs

IOL-CONF

Device Catalog

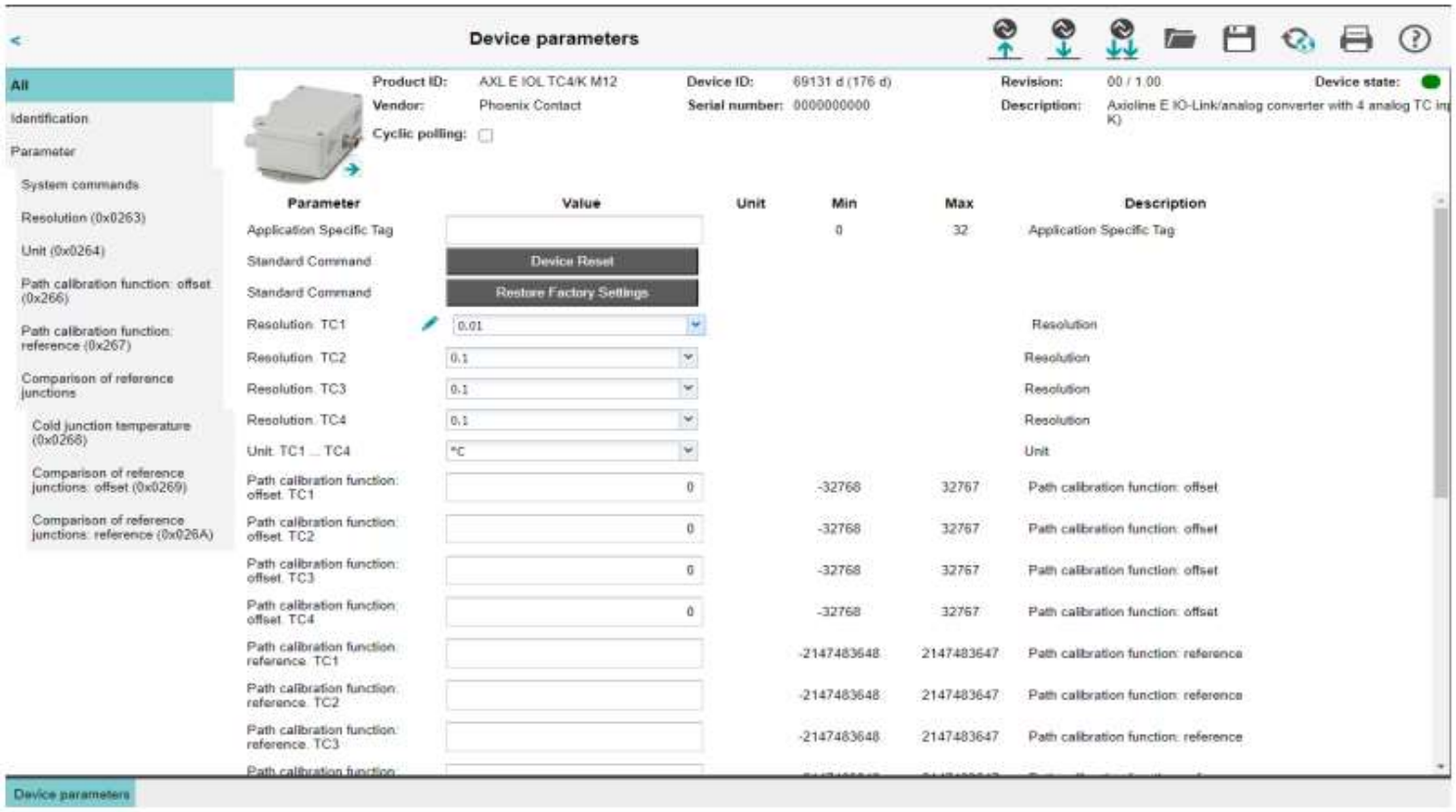
When there is an active TCP/IP connection between IOL-CONF and AXL F stations, the AXL F station along with the connected IO-Link devices can be displayed and parameterized in the ONLINE area (numbering).

In the OFFLINE area of the device catalog, you can virtually create and parameterize IO-Link masters with connected IO-Link devices and save them to files. To do this, the description files (IODDs) of IO-Link masters and IO-Link devices from Phoenix Contact are stored in IOL-CONF (pre-installed).

You can import IODDs later to extend the range of pre-installed devices.

IOL-CONF

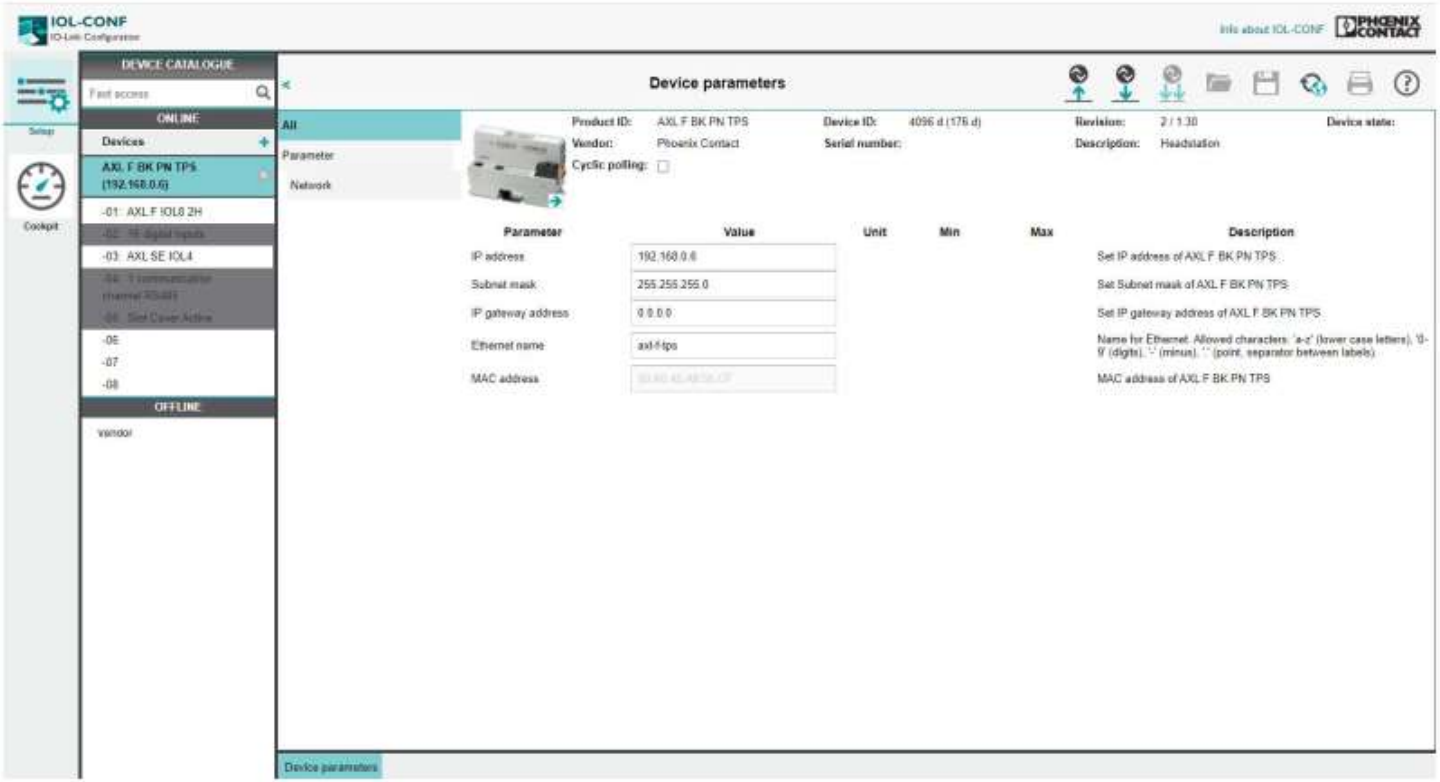
Device Area



PHOENIX CONTACT
INSPIRING INNOVATIONS

IOL-CONF

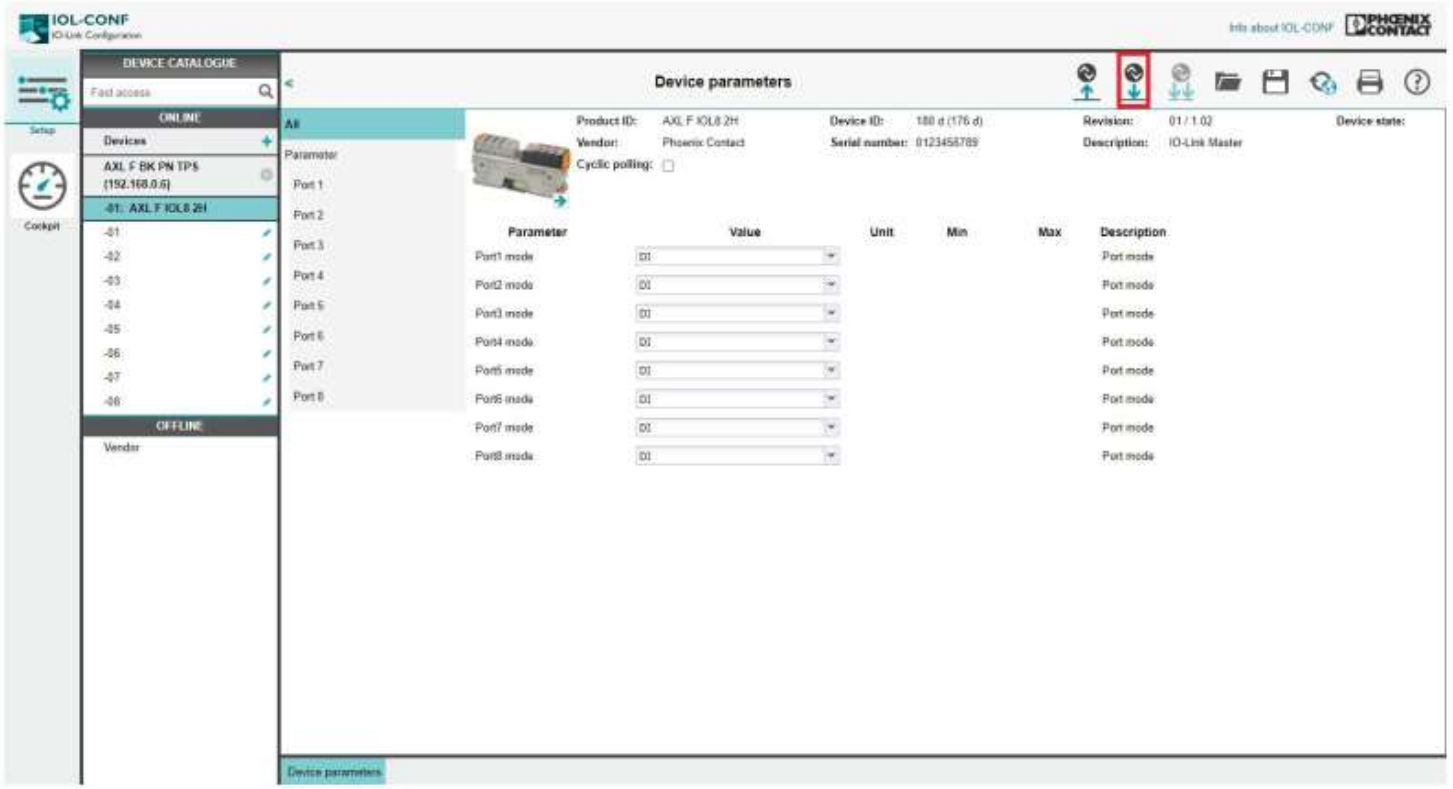
Parametrization ONLINE



PHOENIX CONTACT
INSPIRING INNOVATIONS

IOL-CONF

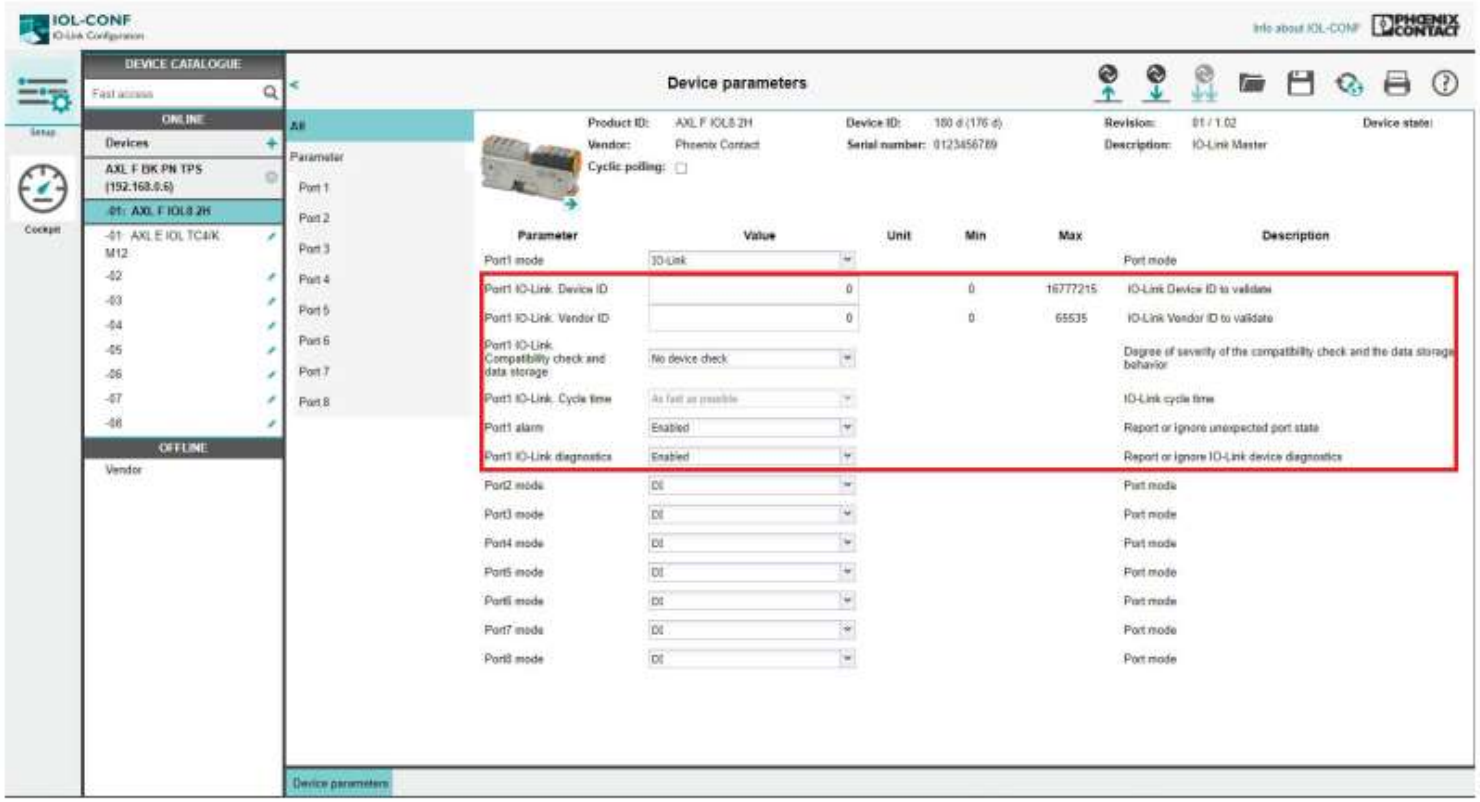
Starting up IO-Link Master



PHOENIX CONTACT
INSPIRING INNOVATIONS

IOL-CONF

Parametrization Port 1



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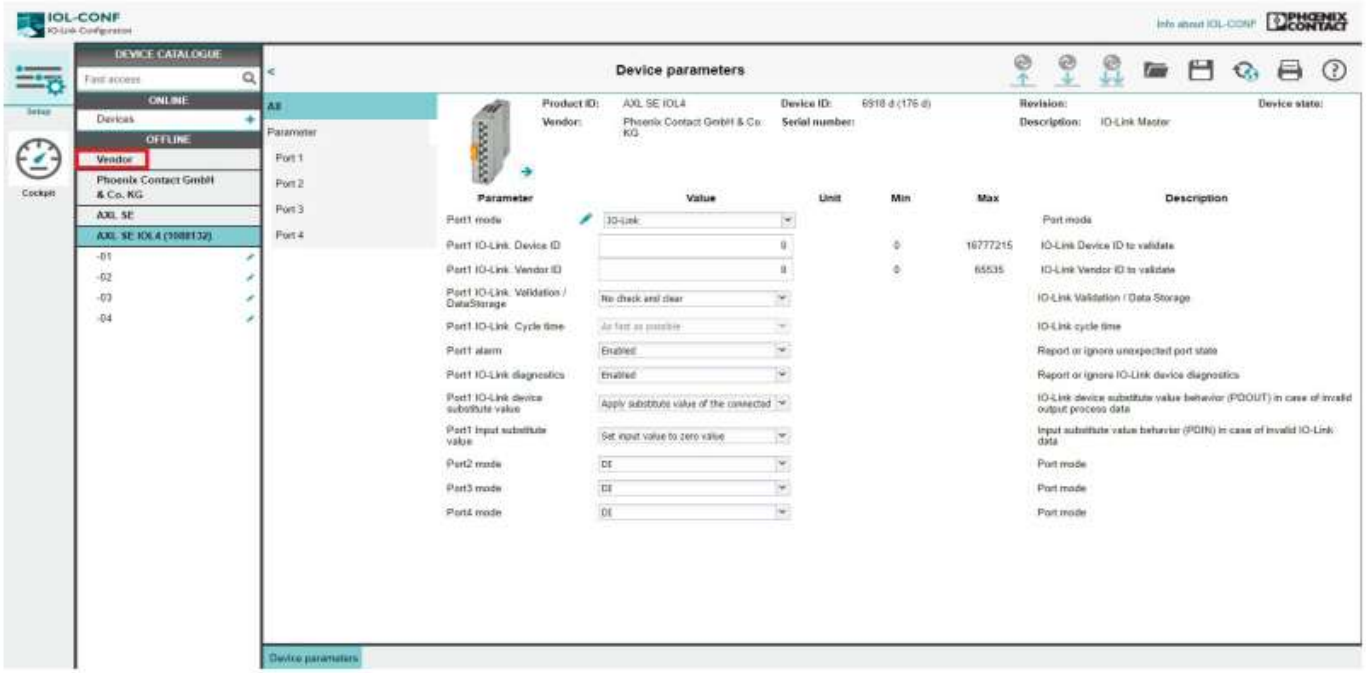
INSPIRING INNOVATIONS

IOL-CONF

Parameter récords (OFFLINE)

You have the option of creating a file in OFFLINE mode. In this file, you can save the parameters of an IO-Link device or the parameters of an IO-Link master together with its devices. If the parameter record of an IO-Link master is written to a file, the parameters of the master and all the parameters of the devices configured for it will be saved. If just one device is selected in the OFFLINE catalog, only its parameters will be saved to a file.

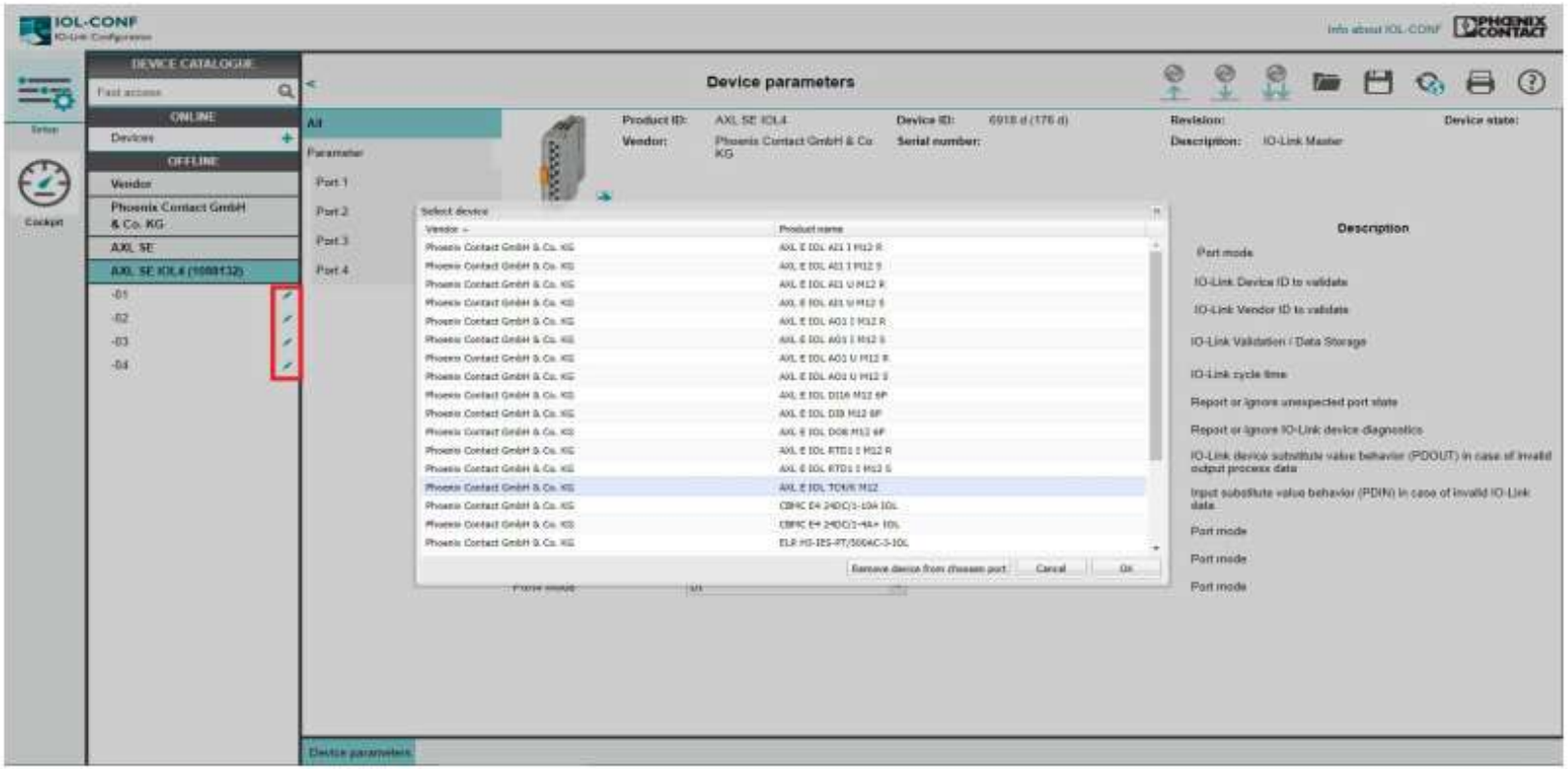
- Under "Vendor" in the OFFLINE area of the device catalog, select your IO-Link master or your IO-Link device.



INSPIRING INNOVATIONS

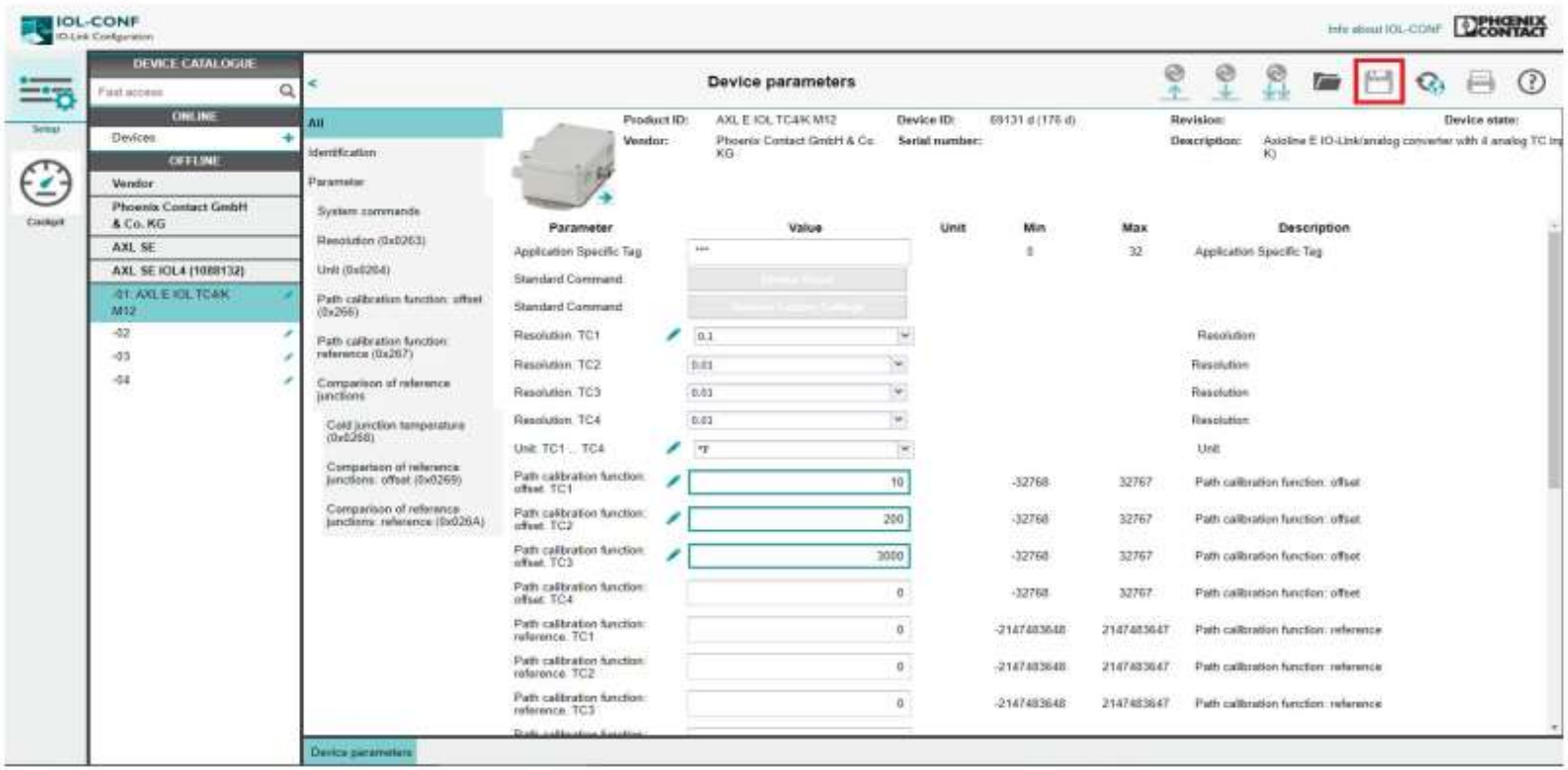
IOL-CONF

Device Catalog Parameter



IOL-CONF

Parametrization IO-Link Device

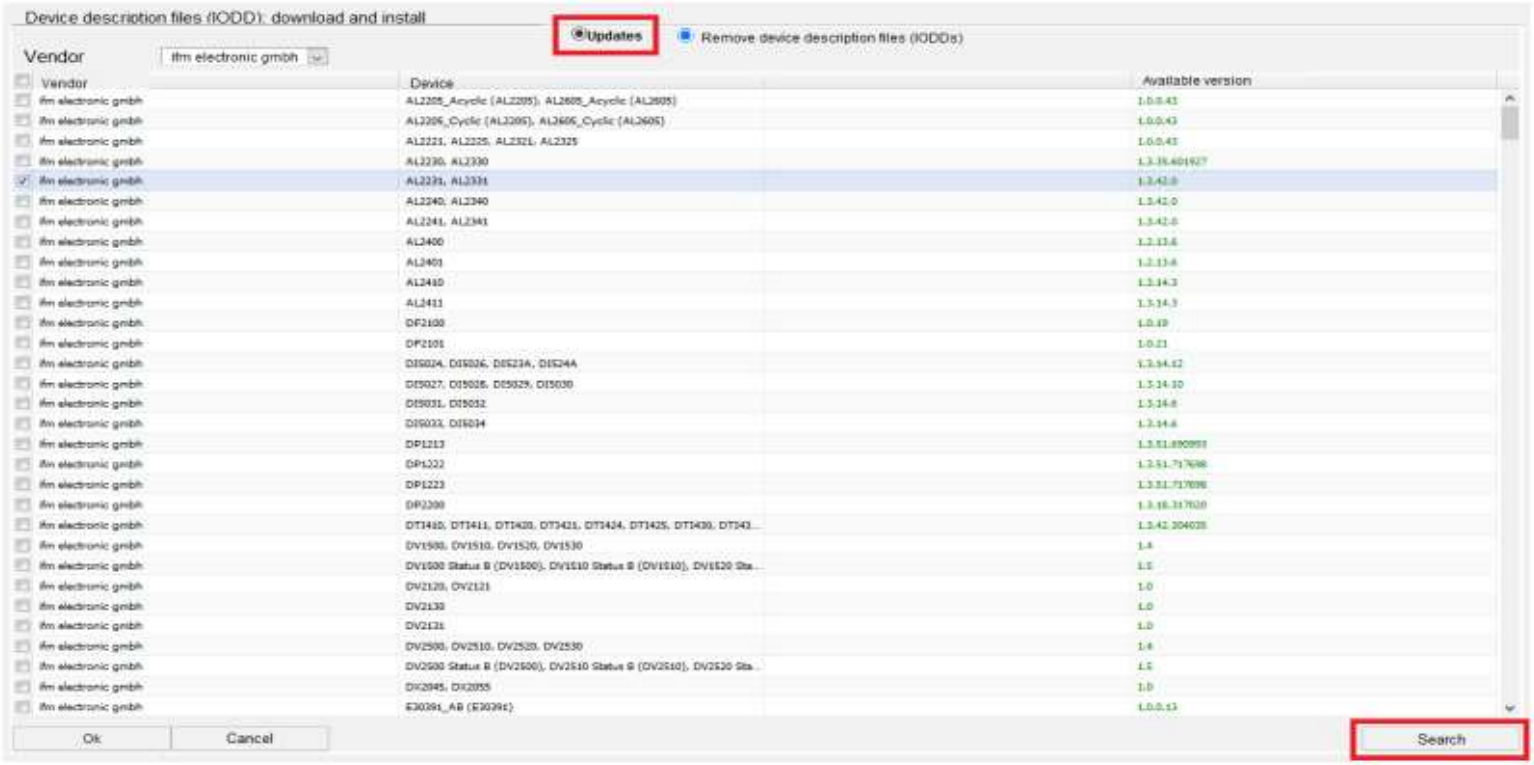


PHOENIX CONTACT
INSPIRING INNOVATIONS

IOL-CONF

Device Catalog IODD

ONLINE via the IODDfinder portal



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INSPIRING INNOVATIONS

IOL-CONF

Device Catalog IODD

Manually from the local file system of your PC

You can search for the file on your computer and install it in IOL-CONF from there.

- To do this, click on the “Search” button in the bottom right corner.
- Click “OK” to load the IODD in the IOL-CONF software.

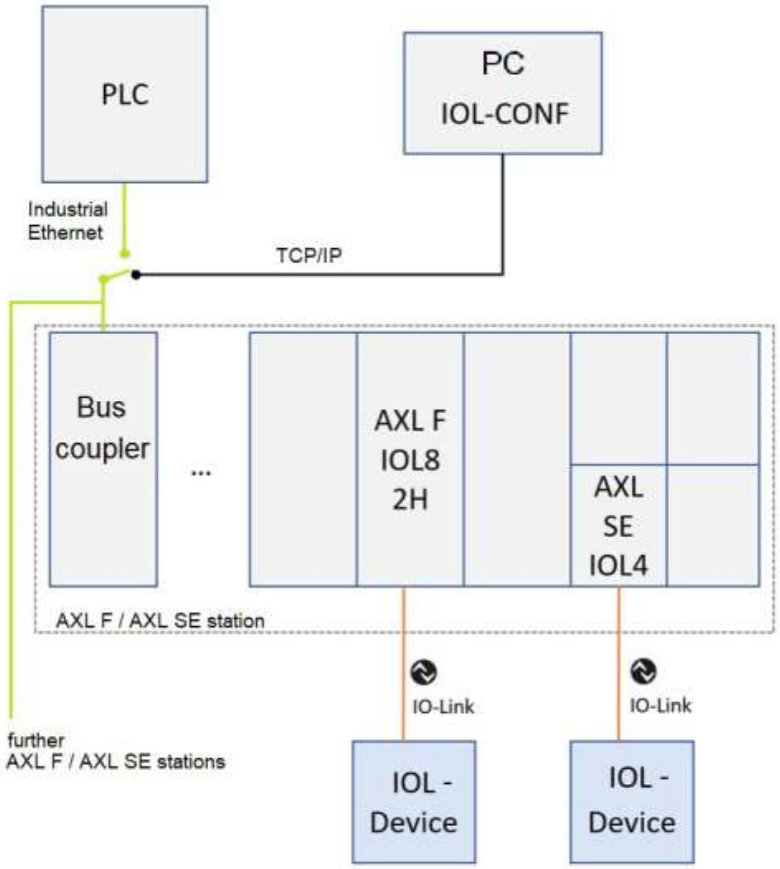
	IODD Manager Search for updates	Import IODD files from the local storage location or from the ONLINE database (IODDfinder) Delete selected IODD files from the device catalog Search for updates to already installed IODD files

PHOENIX CONTACT
INSPIRING INNOVATIONS

IOL-CONF

IO-Link Topology example

Designation	Order No.
AXL F IOL8 2H	1027843
AXL SE IOL4	1088132



PHOENIX CONTACT
INSPIRING INNOVATIONS

Project+ 3.6

PROJECT+3

I/O Project Planning

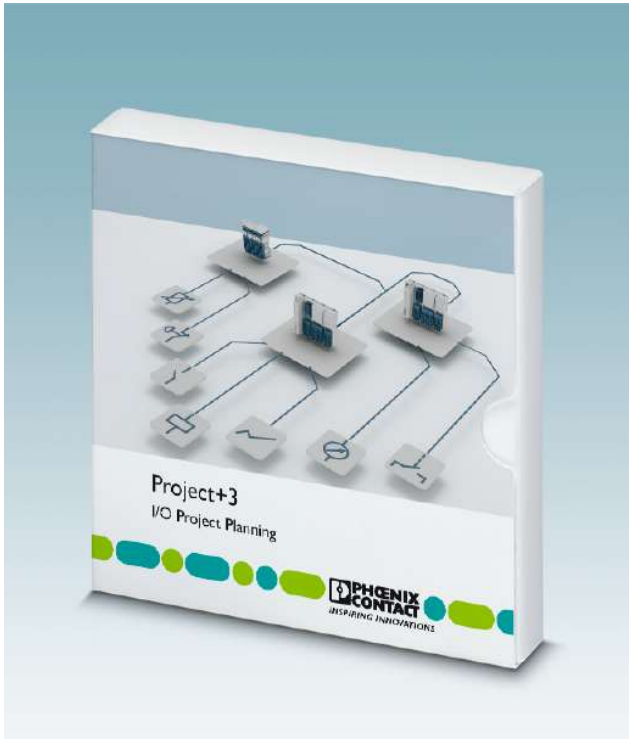
PHOENIX CONTACT

INSPIRING INNOVATIONS

Axioline F System

Project+ 3.6

- Axioline F I/O modules for connecting process signals; standard area and potentially explosive atmospheres
- Planning of signals switched via relay contacts Inline and Axioline F relay modules
- New Smart Elements Modules DI/DO-NPN Axioline F I/O module for CAN
- Integrated call of Project+ from PROJECT complete

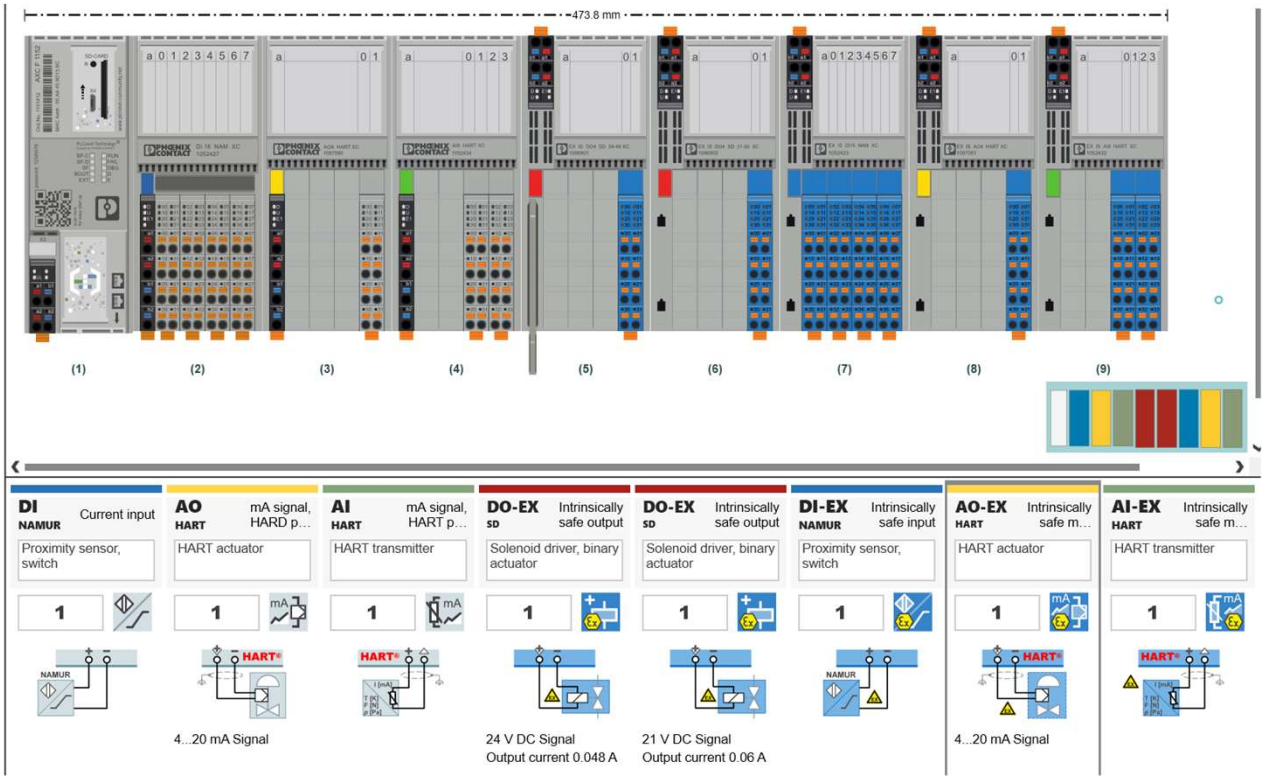


PHOENIX CONTACT
INSPIRING INNOVATIONS

Overview - new Axioline F modules for connecting process signals

Axioline F modules for connecting process signals

I/O group	Item no.	Designation
Axioline F		
		Digital input modules
	1052427	AXL F DI16 NAM XC 1F
	1052423	AXL F EX IS DI16 NAM XC 1F
		Digital output modules
	1086901	AXL F EX IS DO4 SD 24-48 XC 1F
	1086902	AXL F EX IS DO4 SD 21-60 XC 1F
		Analog input modules
	1052434	AXL F AI8 HARD XC 1F
	1052432	AXL F EX IS AI8 HARD XC 1F
		Analog output modules
	1087080	AXL F AO4 HARD XC 1F
	1087081	AXL F EX IS AO4 HARD XC 1F
		Infrastructure modules
	1100201	AXL F/P IO EX PP



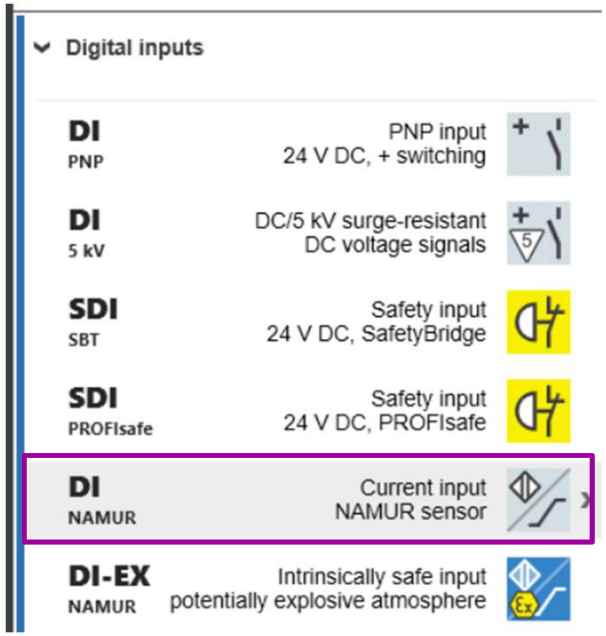
PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F I/O modules for connecting process signals

NAMUR signals in the standard range (XC)

InterfaceType: **IDigitalInFeature**

SignalType: **DI NAMUR**

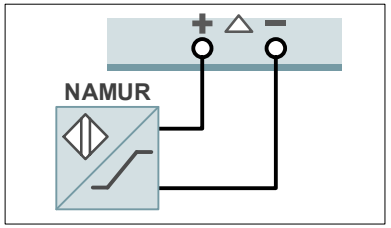


Identifier: Current input

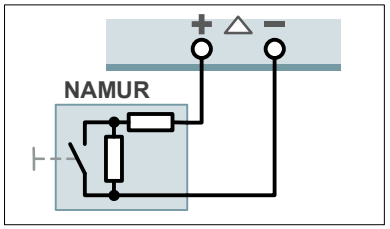
Description: NAMUR sensor

Connection scenario:

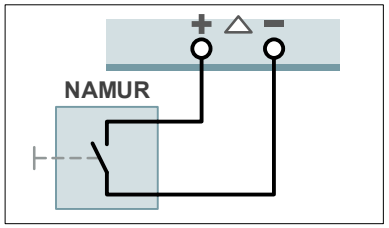
Proximity switch



Contact with resistor circuit



Unconnected contact



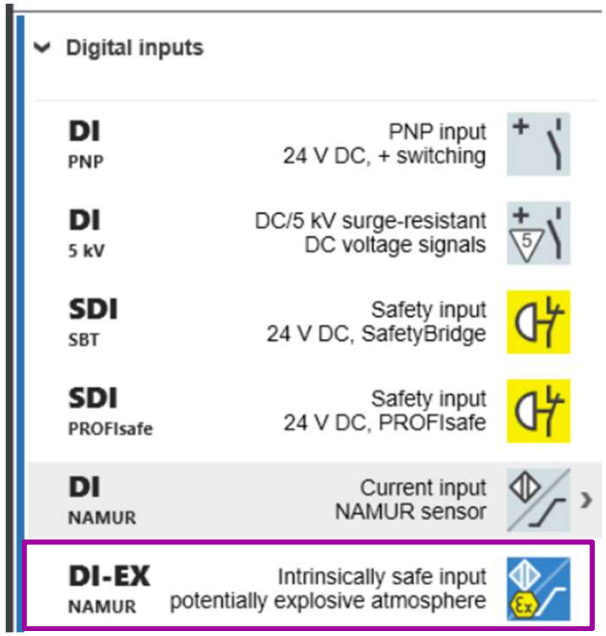
PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F I/O modules for connecting process signals

NAMUR signals in potentially explosive atmospheres (XC)

InterfaceType: **IDigitalInFeature**

SignalType: **DI-EX NAMUR**

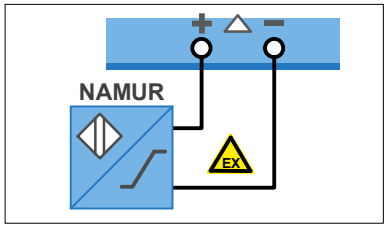


Identifier: Intrinsically safe input

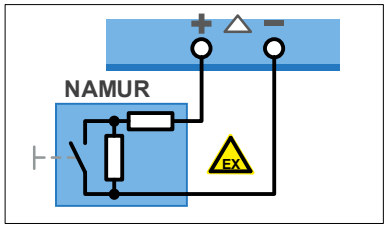
Description: potentially explosive atmosphere

Connection scenario:

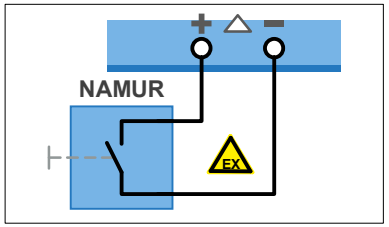
Proximity switch



Contact with resistor circuit



Unconnected contact



PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F I/O modules for connecting process signals

Digital output signals in potentially explosive atmospheres

InterfaceType: **IDigitalOutFeature**

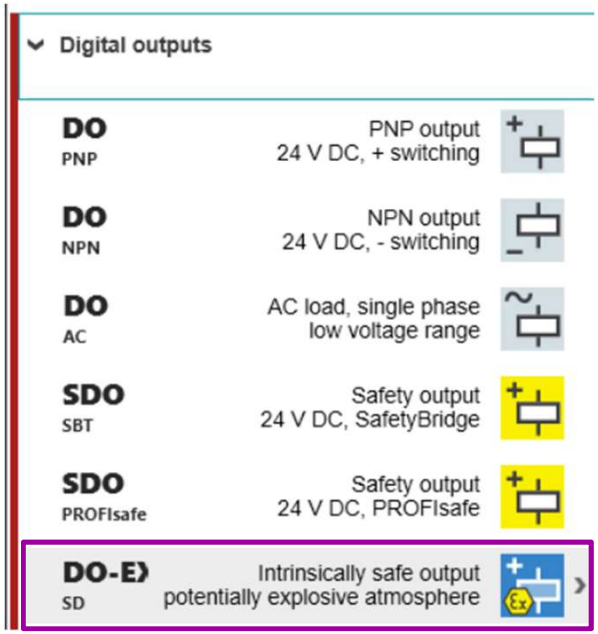
SignalType: **DO-EX SD**

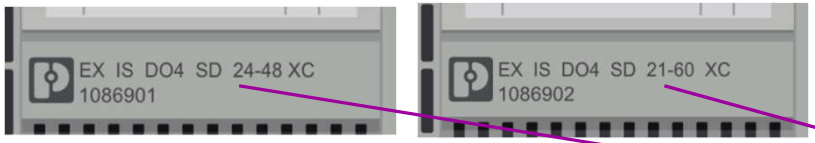
Identifier: Intrinsically safe output

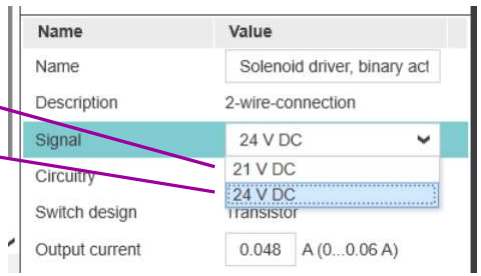
Description: potentially explosive atmosphere

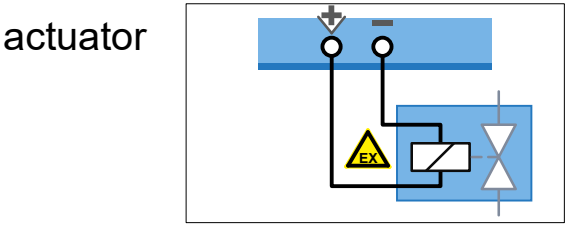
Connection scenario:

Solenoid valve, binary actuator









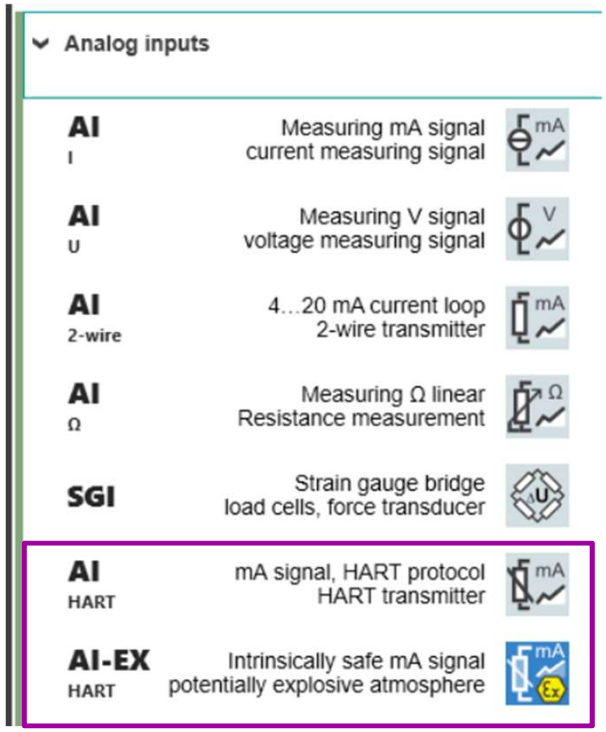
PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F I/O modules for connecting process signals

Analog input signals with HART communication

InterfaceType: **IAnalogInFeature**

SignalType: **AI HART**
AI-EX HART

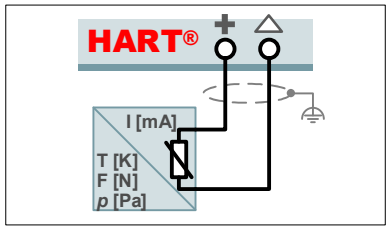


Identifier: mA signal, HART protocol

Description: HART transmitter

Connection scenario:

HART transmitter
Current loop, point-to-point connection

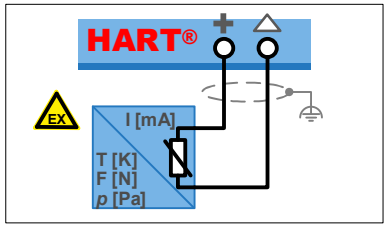


Identifier: Intrinsically safe mA signal

Description: potentially explosive atmosphere

Connection scenario:

HART transmitter
Intrinsically safe current loop



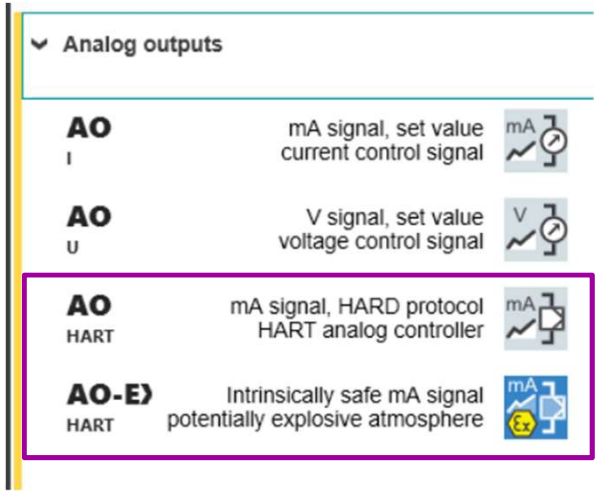
PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F I/O modules for connecting process signals

Analog output signals with HART communication

InterfaceType: **IAnalogOutFeature**

SignalType: **AO HART**
AO-EX HART

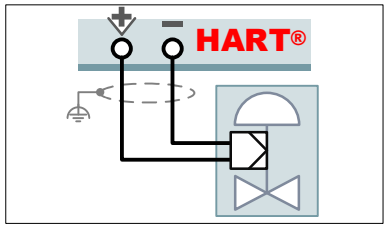


Identifier: mA signal, HART protocol

Description: HART analog controller

Connection scenario:

HART actuator
Current loop, point-to-point connection

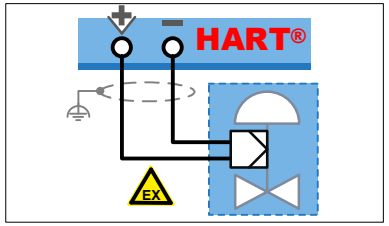


Identifier: Intrinsically safe mA signal

Description: Hazardous area

Connection scenario:

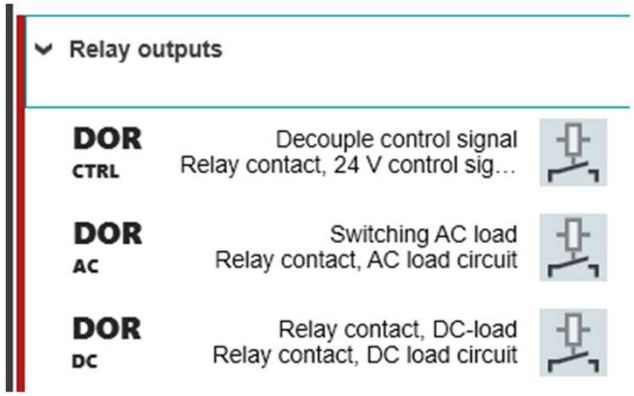
HART actuator
Intrinsically safe current loop



PHOENIX CONTACT
INSPIRING INNOVATIONS

Planning I/O modules with relay outputs via signals

Signal types for planning signals switched via relay contacts



DOR-CTRL - Galvanic isolation of control signals in the extra-low voltage range; switching of low powers to control electronic inputs, e.g. a PLC
Switching voltages - 24 V DC
- V AC

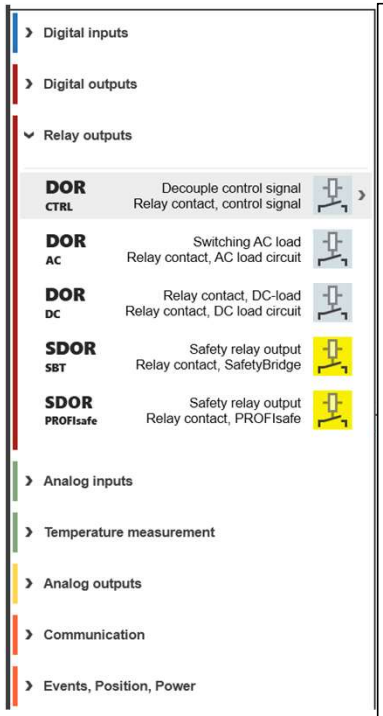
DOR-AC - Design of signals for switching AC loads in the low voltage range
Switching voltages - 120 V AC
- 0 V AC

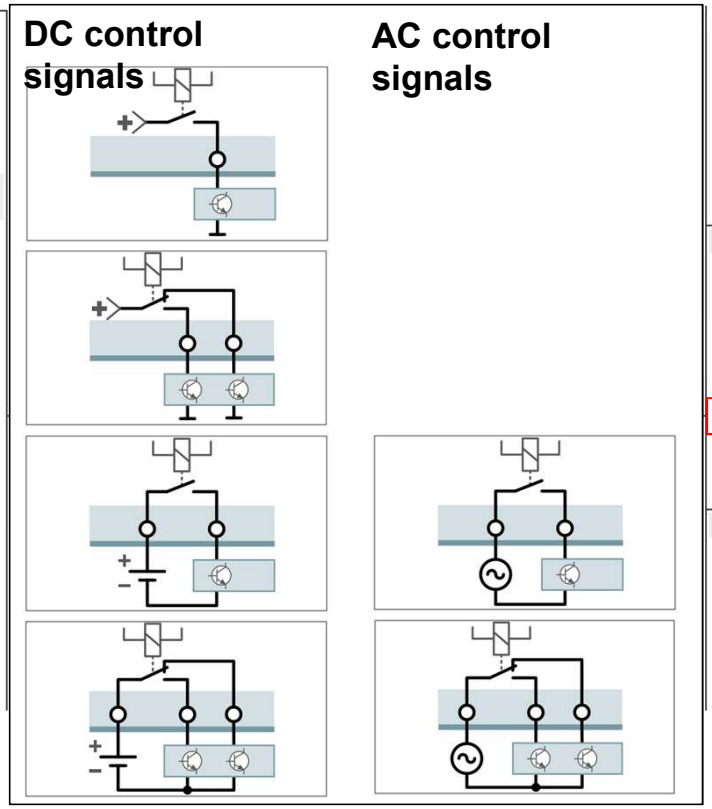
DOR-DC - Design of signals for switching of DC loads in the low and extra-low voltage range
Switching voltages - 24 V DC
- V DC
- 0 V DC
- 0 V DC

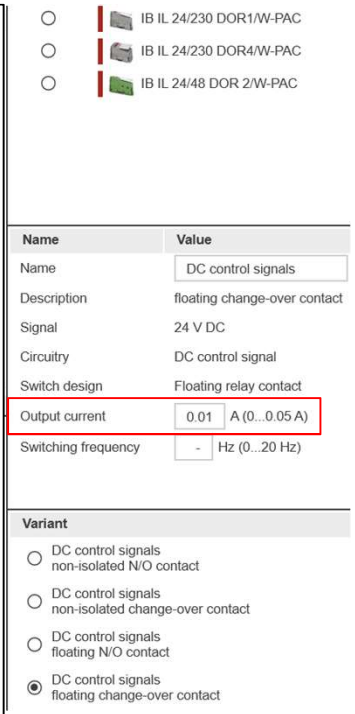
PHOENIX CONTACT
INSPIRING INNOVATIONS

Planning I/O modules with relay outputs via signals

DOR-CTRL – floating separation of control signals





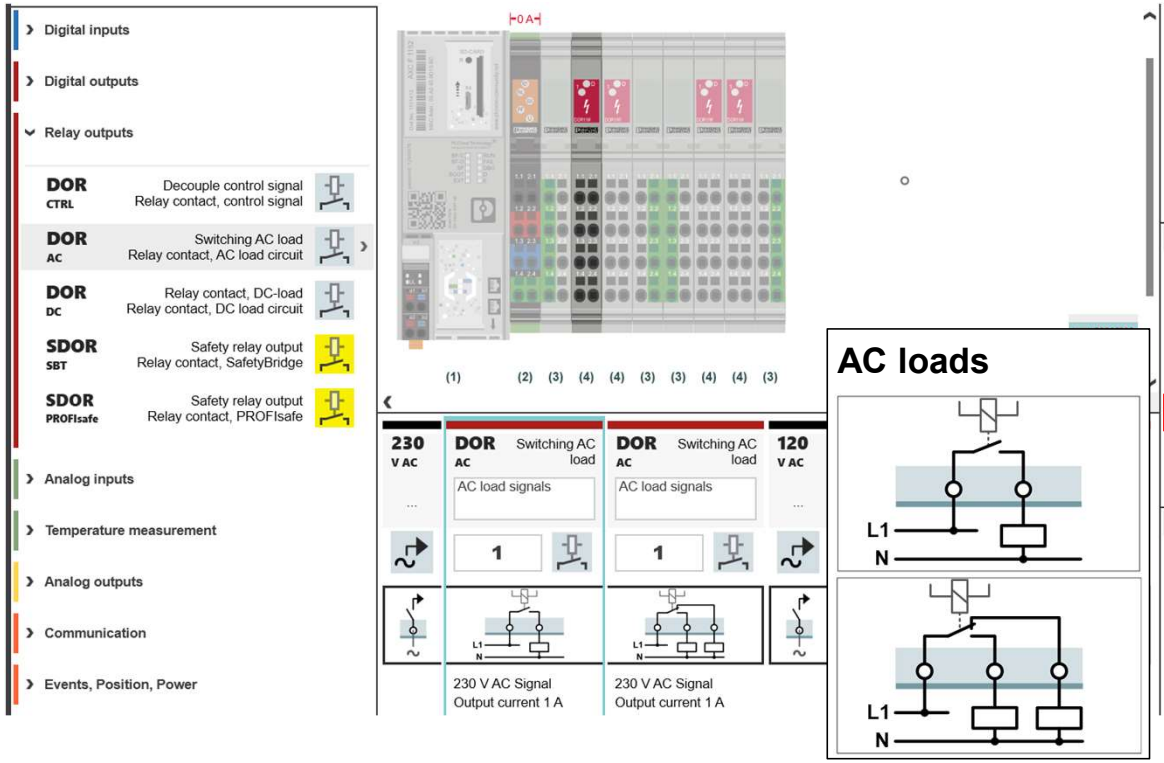


Control signals in the extra-low voltage range (24 V DC / 24 V AC) for controlling electronic inputs
– Relay contacts with gold plating, these have only a very limited switching capacity

PHOENIX CONTACT
INSPIRING INNOVATIONS

Planning I/O modules with relay outputs via signals

DOR-AC – Project engineering of signals for switching AC loads in the low-voltage range



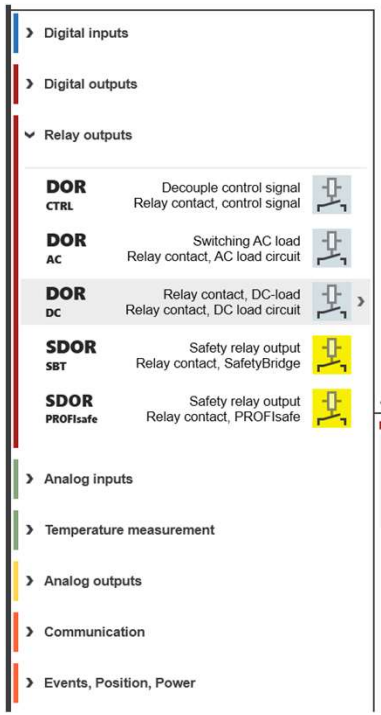
for AC loads, the relay contact can switch the maximum switching current over the entire voltage range

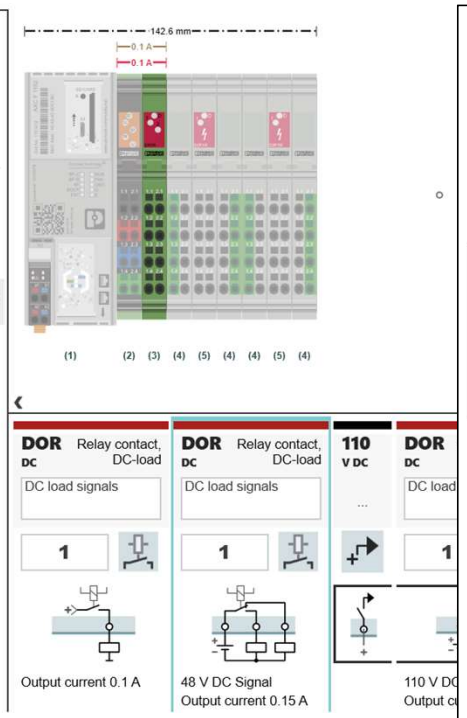
since the arc is extinguished at the zero crossing of the switching current

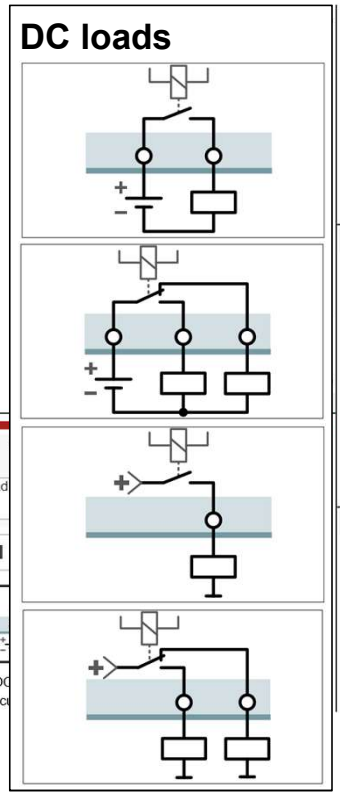
PHOENIX CONTACT
INSPIRING INNOVATIONS

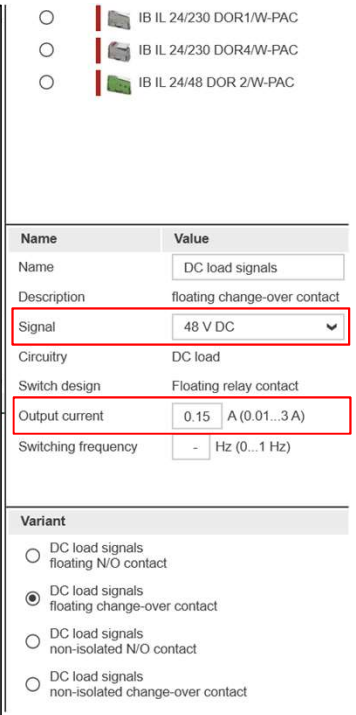
Planning I/O modules with relay outputs via signals

DOR-DC – Project engineering of signals for switching DC loads in the low and extra-low voltage range









Selection of the switching voltage:

- 24 V DC
- 48 V DC
- 110 V DC
- 220 V DC

for DC voltages, the maximum switching current is strongly dependent on the level of the switching voltage

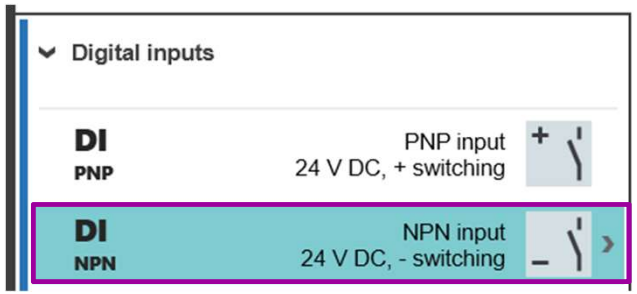
PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline Smart Elements modules for connection of sensors/actuators in NPN circuit

Smart Elements DI & DO module for NPN circuits

InterfaceType: **IDigitalInFeature**

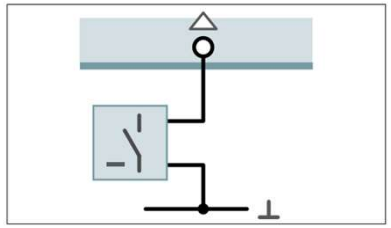
SignalType: **DI NPN**



Identifier: NPN input

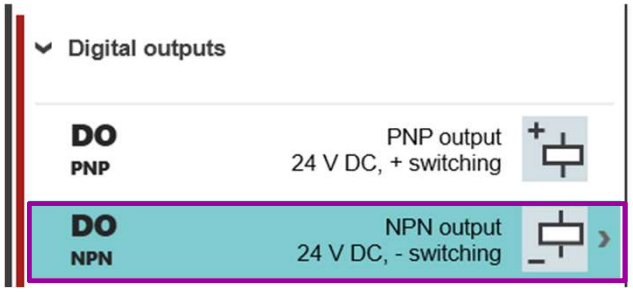
Description: 24 V DC, - switching

Connection scenario: 1-wire connection



InterfaceType: **IDigitalOutFeature**

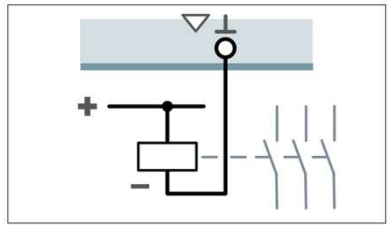
SignalType: **DO NPN**



Identifier: NPN output

Description: 24 V DC, - switching

Connection scenario: 1-wire connection



PHOENIX CONTACT
INSPIRING INNOVATIONS

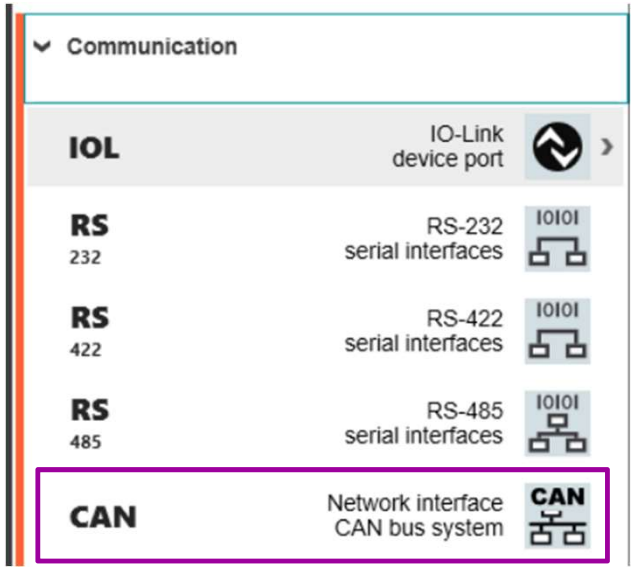
Axioline F communication modules

Axioline F I/O module for connection to a CAN bus system

InterfaceType: **ICANInterfaceFeature**

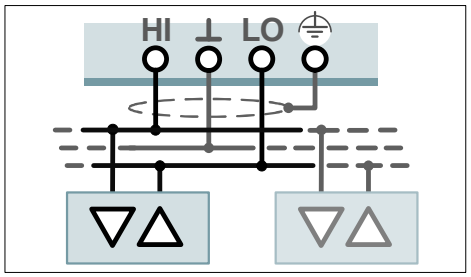
SignalType: **CAN**

Identifier: Network interface
Description: CAN bus system



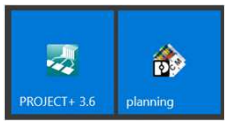
Connection scenario:

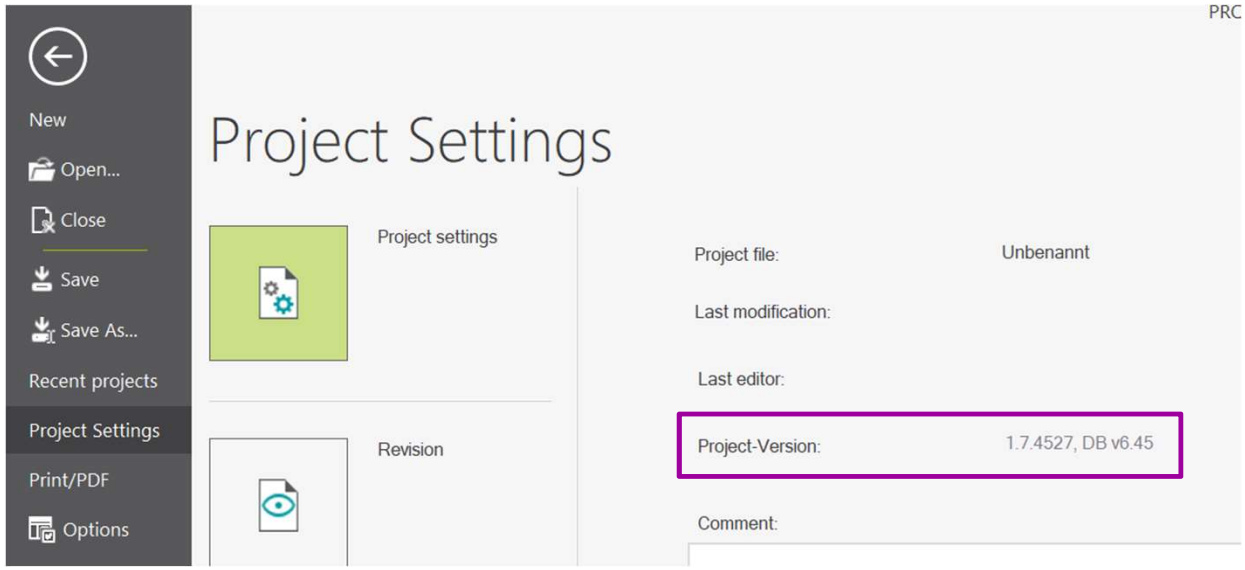
Connection to a CAN bus system



PHOENIX CONTACT
INSPIRING INNOVATIONS

Integrated call of Project+ from PROJECT complete





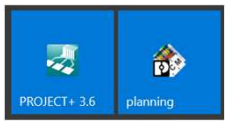
Creation and editing of I/O stations via integrated call of Project+ from PROJECT complete Planning

- as of version 1.7.4527 with Project+ 3.6.182

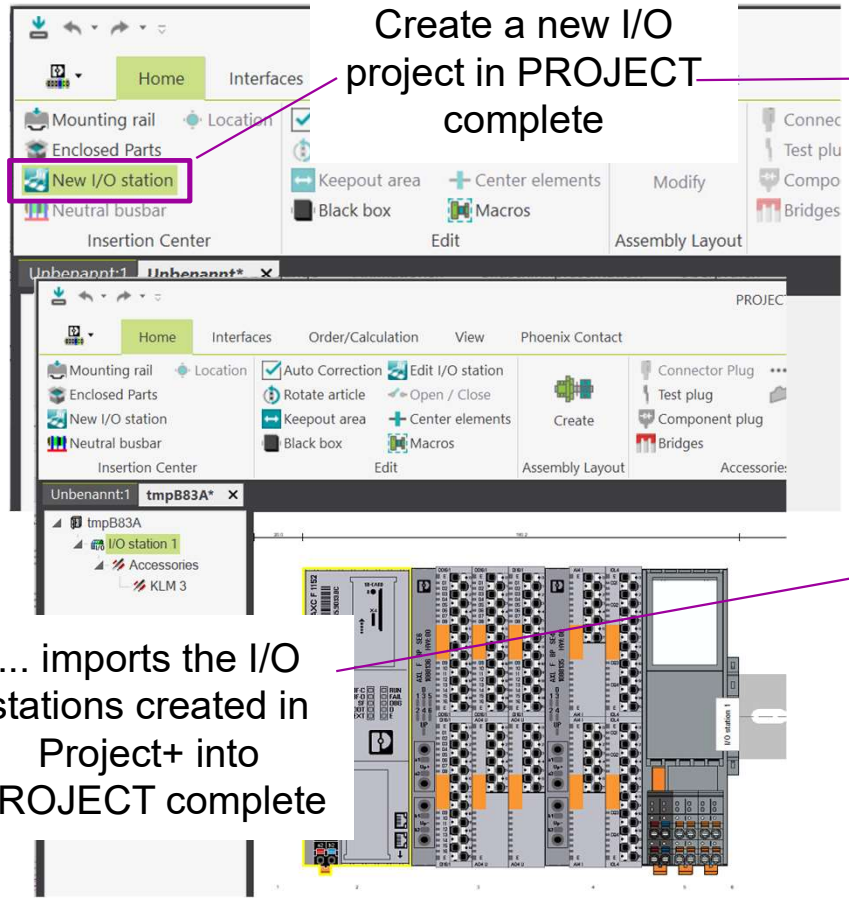
PHOENIX CONTACT
INSPIRING INNOVATIONS

Coupling of PROJECT complete and Project+ for the creation and editing of I/O stations

Integrated call of Project+ from PROJECT complete

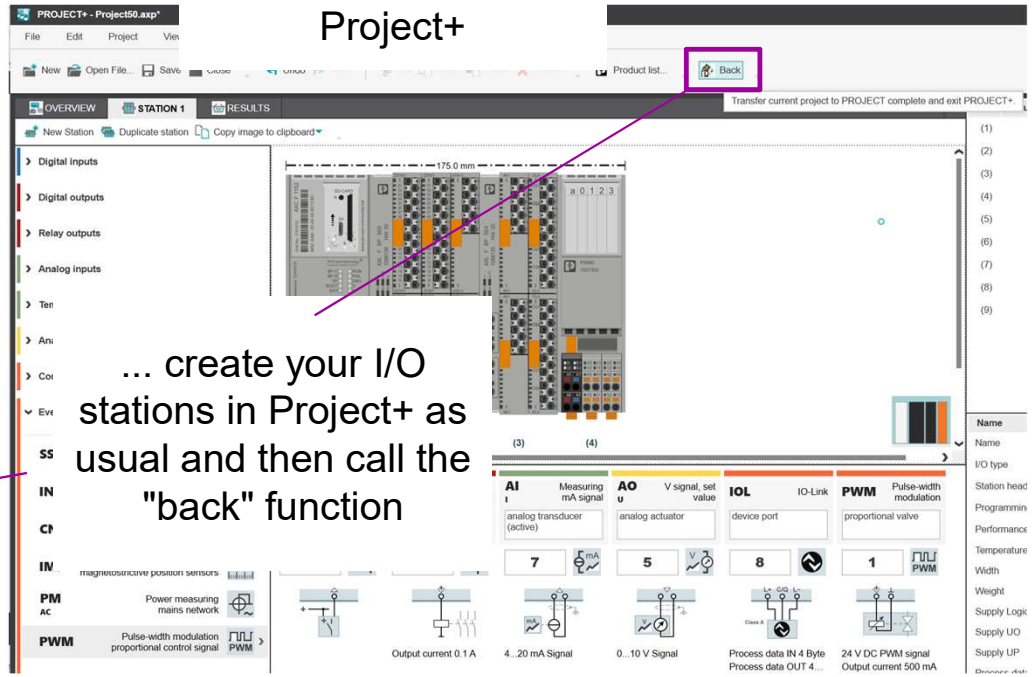


Create a new I/O project in PROJECT complete



... imports the I/O stations created in Project+ into PROJECT complete

... automatically executes a call to Project+

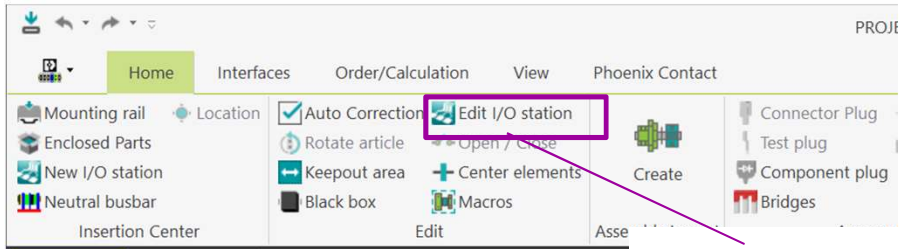


... create your I/O stations in Project+ as usual and then call the "back" function

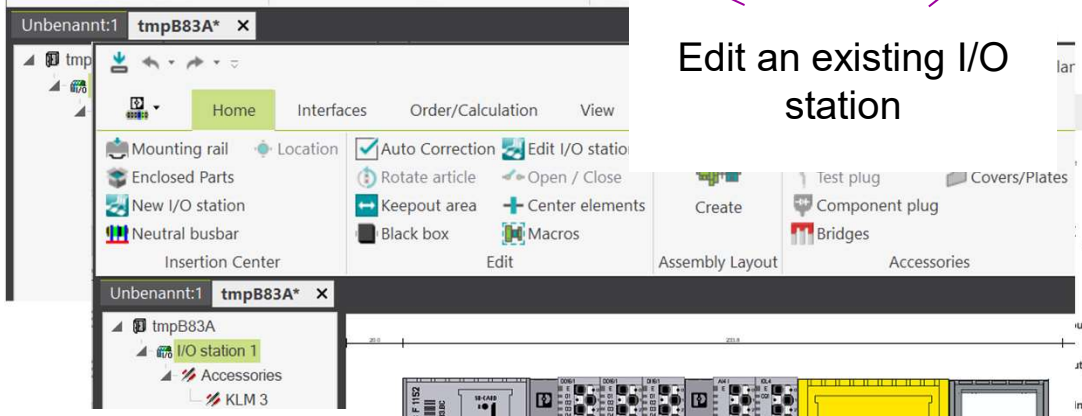
PHOENIX CONTACT
INSPIRING INNOVATIONS

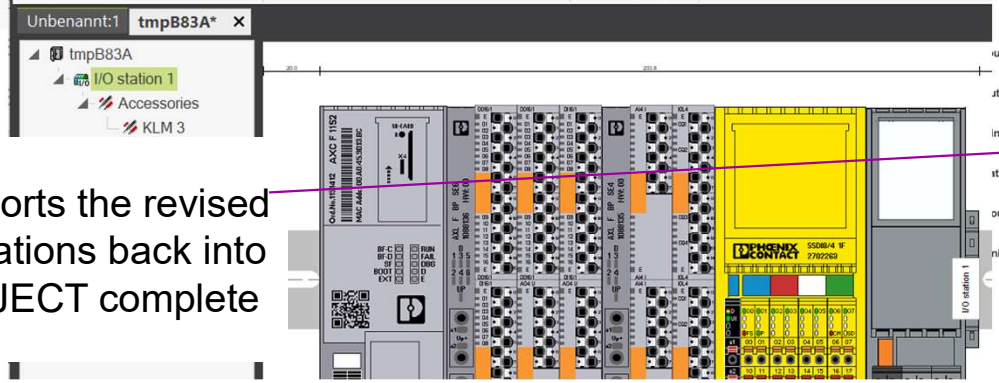
Coupling of PROJECT complete and Project+ for the creation and editing of I/O stations

Integrated call of Project+ from PROJECT complete



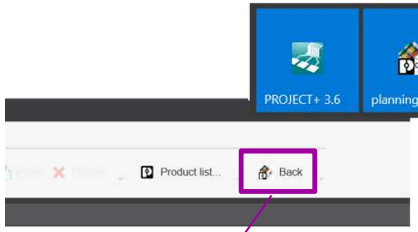
Edit an existing I/O station

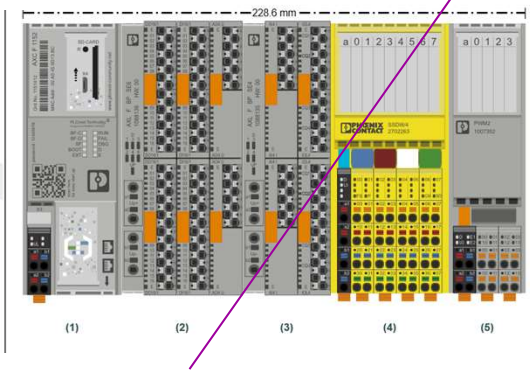




... imports the revised I/O stations back into PROJECT complete

... takes over the I/O project back into Project+



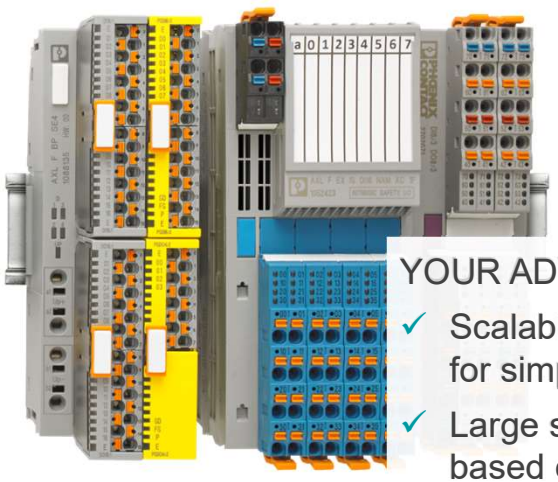


... edit the I/O stations in Project+ and apply the changes with "back"

PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline F

Arquitecturas



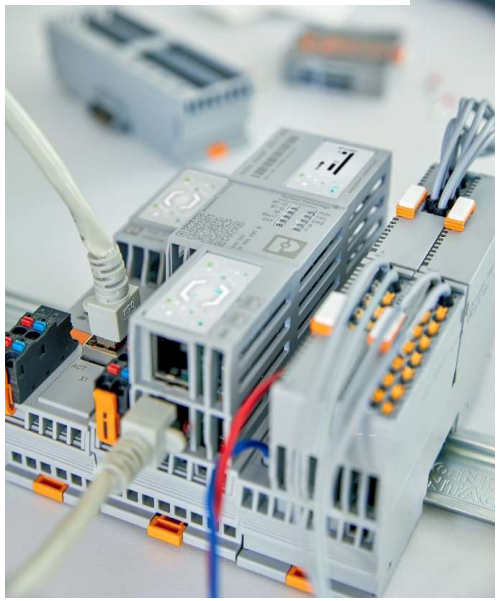
YOUR ADVANTAGES

- ✓ Scalable automation system for simple to complex tasks
- ✓ Large selection of modules based on the modular principle
- ✓ Systemic configuration to different networks using various front modules

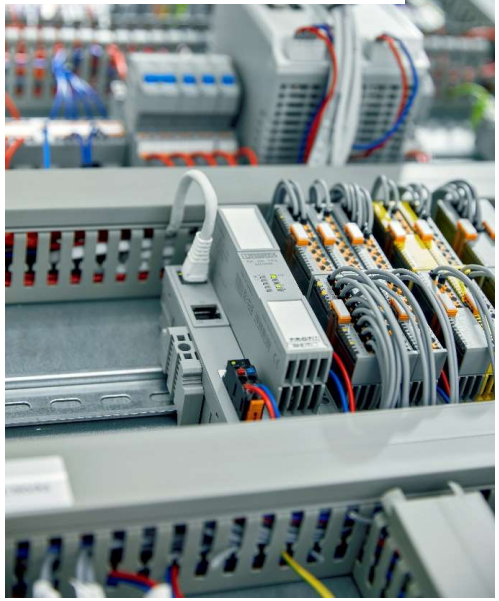
PHOENIX CONTACT
INSPIRING INNOVATIONS

Details of each „discipline“

CONTROLS



BUS COUPLERS



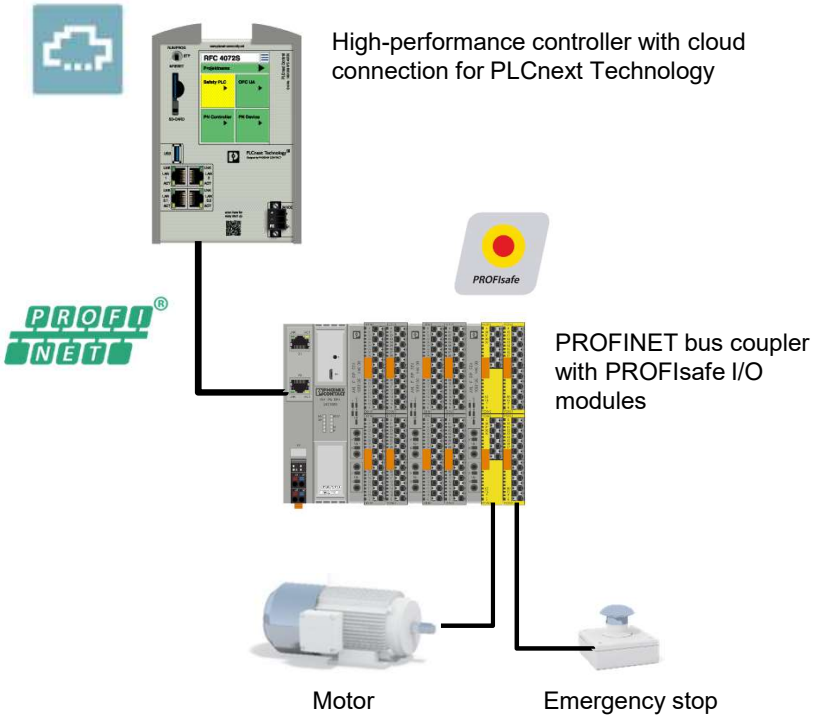
I/Os

PHOENIX CONTACT
INSPIRING INNOVATIONS

Bus coupler

Safety in the system

“Implement PROFIsafe solutions systemically in PROFINET networks. This can be easily done through the lower-level connection of PROFINET bus couplers with PROFIsafe I/O modules to a Phoenix Contact PROFIsafe controller.”

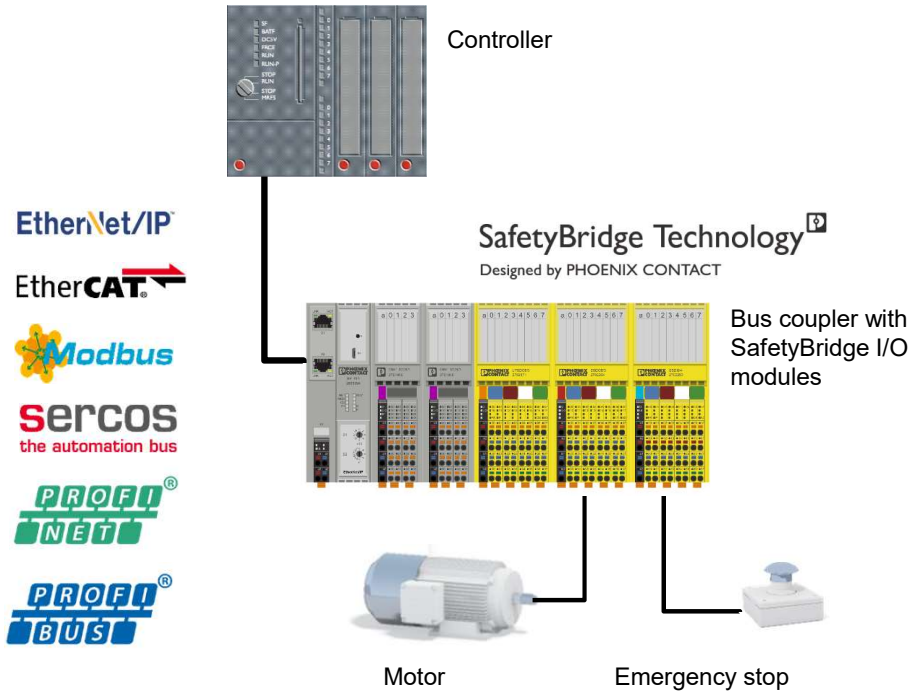


PHOENIX CONTACT
INSPIRING INNOVATIONS

Bus coupler

SafetyBridge Technology

“Use bus couplers to integrate I/Os into all common ethernet networks and bus systems. SafetyBridge Technology enables the network- and controller-independent implementation of safety applications – even without a safety controller.”

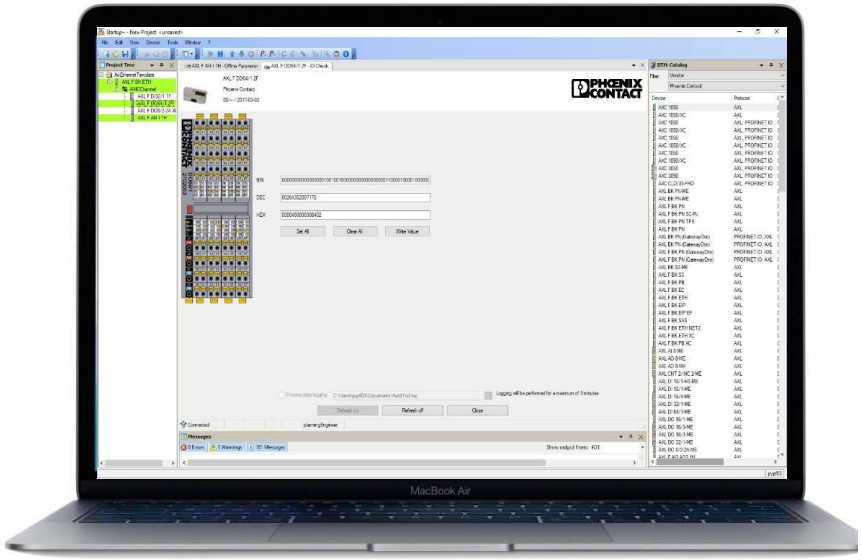


PHOENIX CONTACT
INSPIRING INNOVATIONS

Bus coupler

Easy offline parameterization - Startup+

“The Startup+ software is specifically designed for the Axioline F I/O system. Each bus coupler provides an interface for the data exchange with the software.”



Your benefits

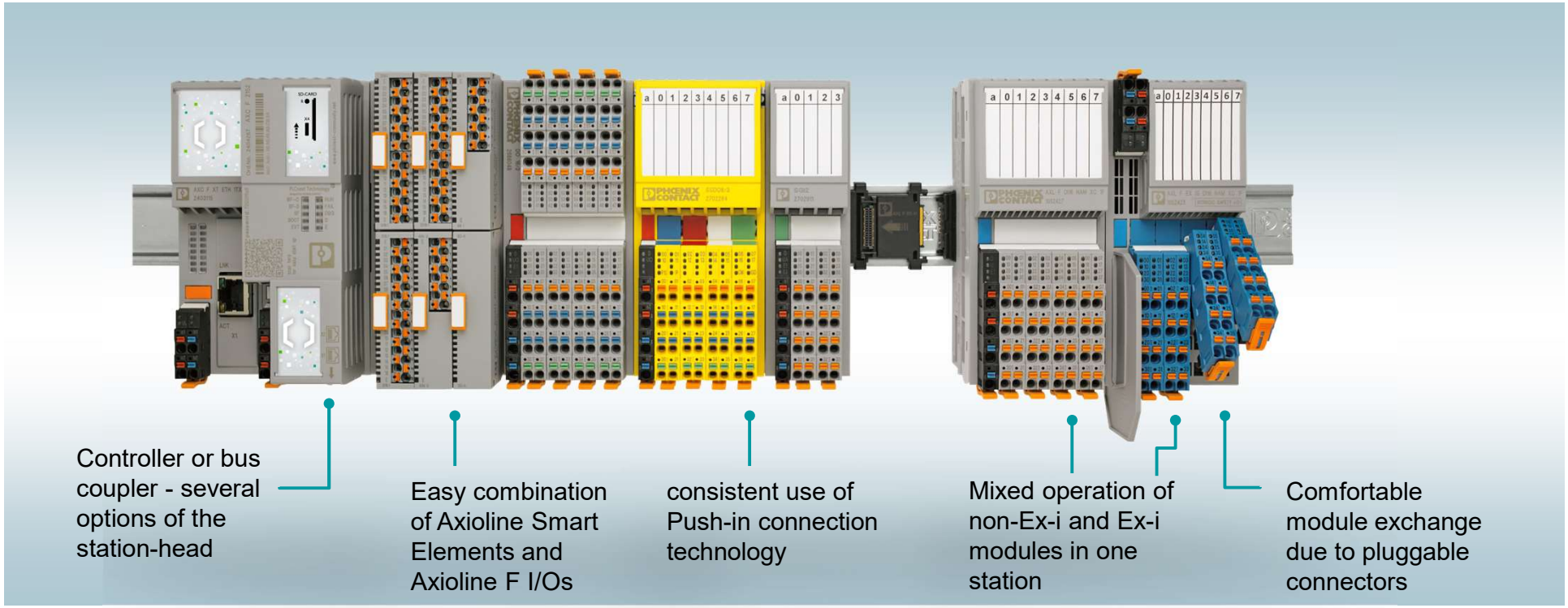
- Easily check the wiring of the Axioline F I/O station
- Parameterization of the I/O modules used
- Comprehensive diagnostics during operation

AVAILABLE AS FREE DOWNLOAD !

PHOENIX CONTACT
INSPIRING INNOVATIONS

I/Os

Modularity in the system



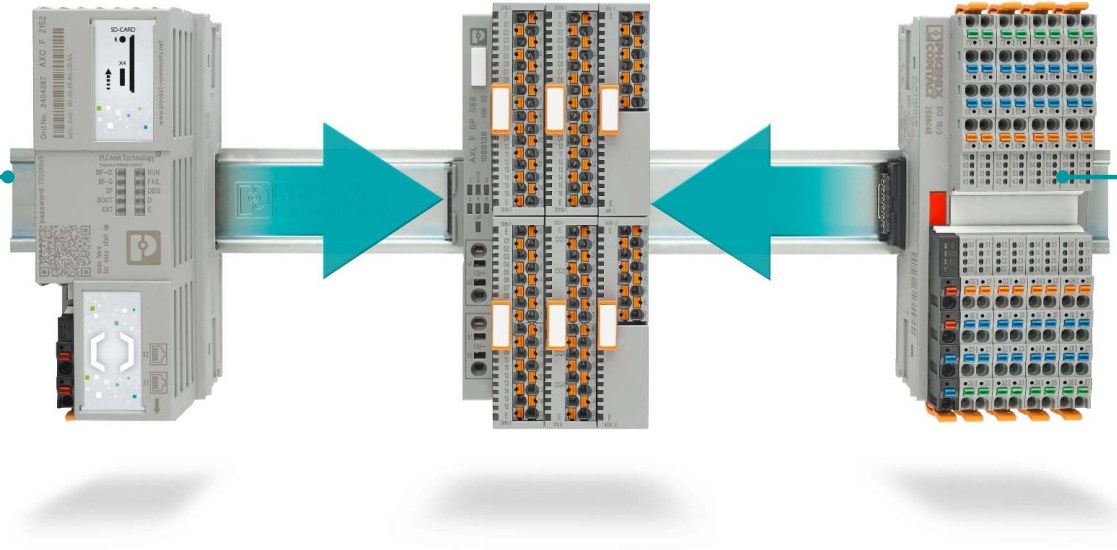
PHOENIX CONTACT
INSPIRING INNOVATIONS

Axioline Smart Elements

Full compatibility

All Axiocontrols

All bus couplers



All Axioline F I/Os

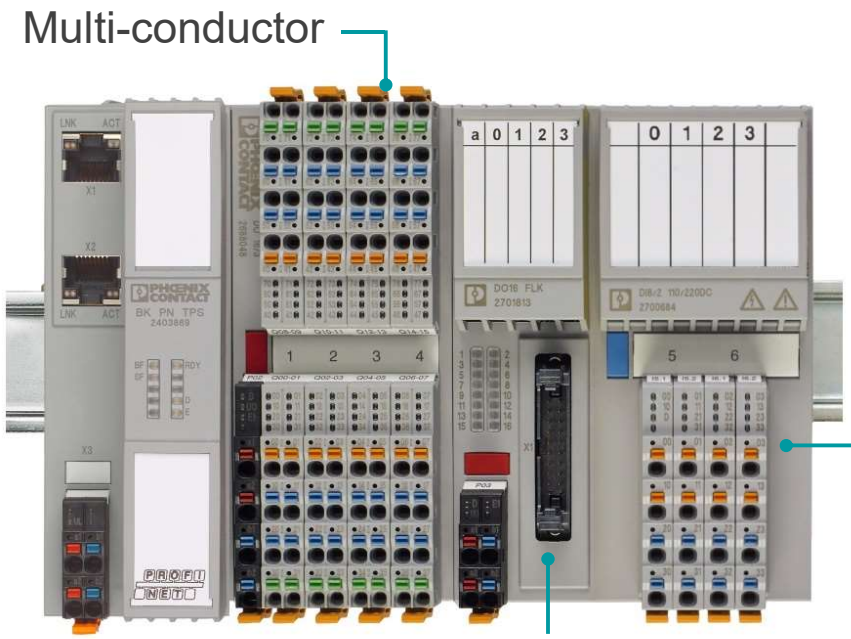
Choose out of a portfolio of more than 80 I/Os, bus couplers and controls

PHOENIX CONTACT
INSPIRING INNOVATIONS

AXIOLINE F: Standard I/O modules

PHOENIX CONTACT
INSPIRING INNOVATIONS

Various connection methods



VERSATILE CONNECTABLE

Axioline F impresses with its versatile connection methods. Just as you need it.

PHOENIX CONTACT
INSPIRING INNOVATIONS

I/Os

Functions for every application

IEC 61850

SafetyBridge Technology
Designed by PHOENIX CONTACT

IO-Link

LAGRE RANGE OF I/Os

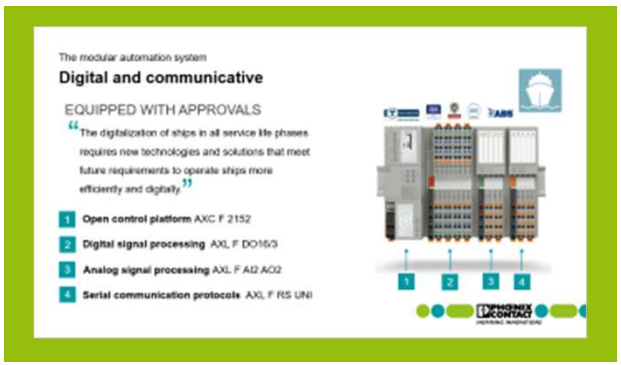
“Axioline F is a modular I/O system designed to meet every requirement and it offers a large range of I/O modules with digital and analog inputs and outputs, functions or for special applications. Implement safety applications with PROFIsafe or SafetyBridge Technology.”

DIGITAL | ANALOG | FUNCTION | SAFETY

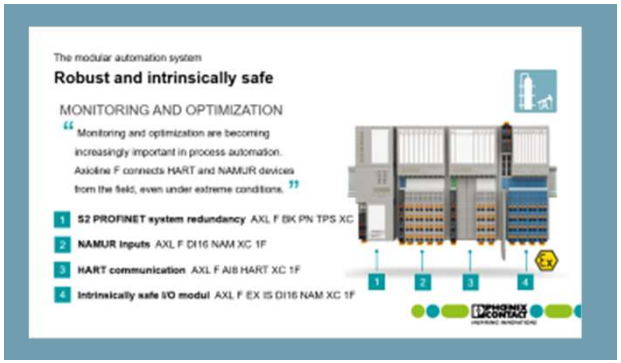
PHOENIX CONTACT
INSPIRING INNOVATIONS

The modular automation system

The right automation solution for every requirement



Click on the tiles to see four possible solution for different use cases which can be created using our Modular automation system.



PHOENIX CONTACT
INSPIRING INNOVATIONS

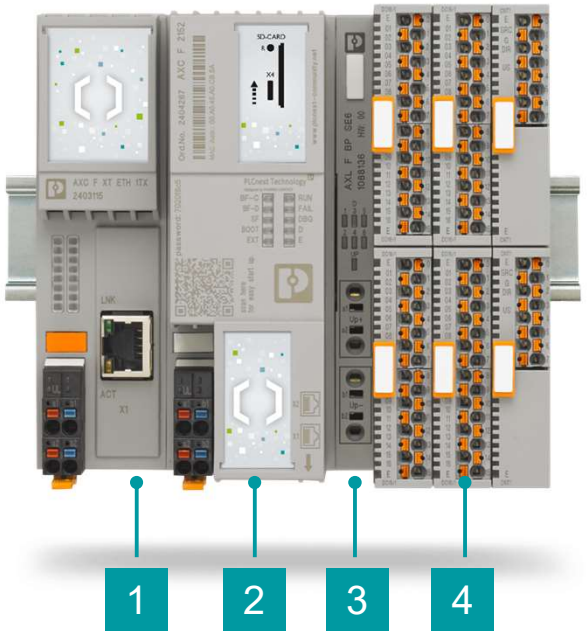
The modular automation system

Some solutions

OPEN AND FUTUREPROOF

“Create a compact I/O solution with Axioline Smart Elements and a PLCnext Control. Use parallel programming such as IEC 61131-3 or high-level-languages and easy access to cloud services.”

1. **Functional expansion of the PLC** AXC F XT ETH 1TX
2. **Open control platform** AXC F 2152
3. **Backplane for Axioline Smart Elements** AXC F BP SE6
4. **Digital signal processing** AXL SE DI16/1



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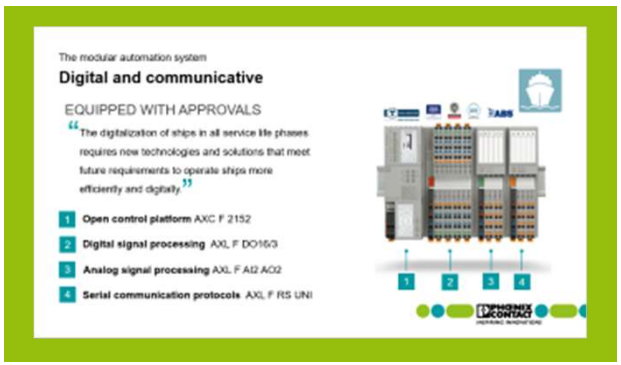
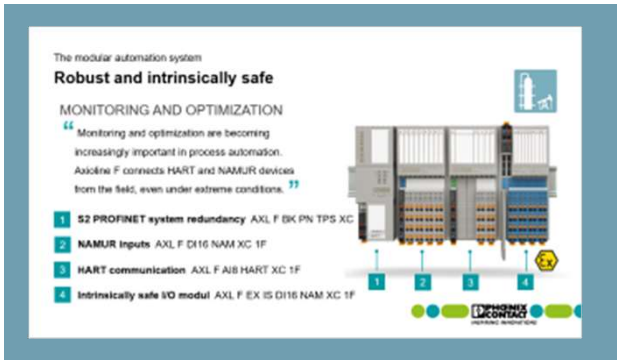
The modular automation system

The right automation solution for every requirement



Click on the tiles to see four possible solution for different use cases which can be created using our Modular automation system.



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The modular automation system

Some solutions

NUMEROUS POSSIBILITIES

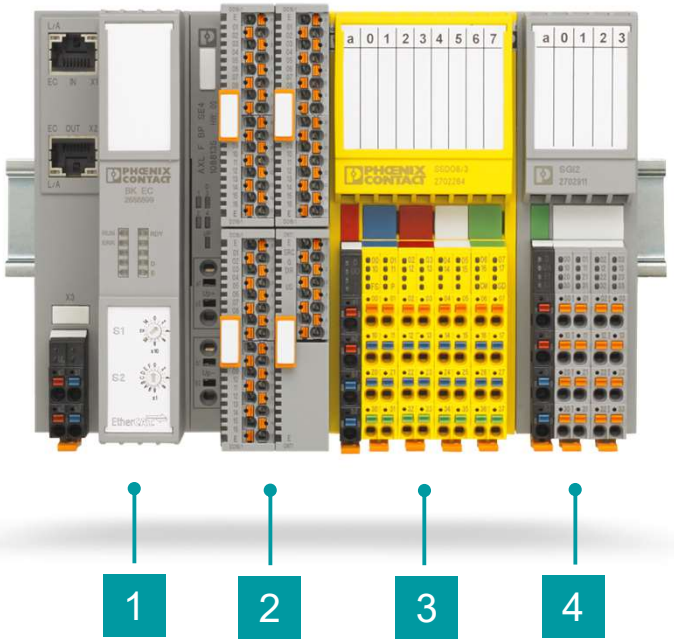
“Many machine variants require a high degree of flexibility with respect to the station structure and a wide range of function modules. Axioline F offers many products to provide an optimal solution for this type of application.”

1 **EtherCAT communication** AXL F BK EC

2 **Digital signal processing** AXL SE DO16

3 **SafetyBridge Technology** AXL F SSDO8/3

4 **Connection of strain gauge** AXL F SGI2



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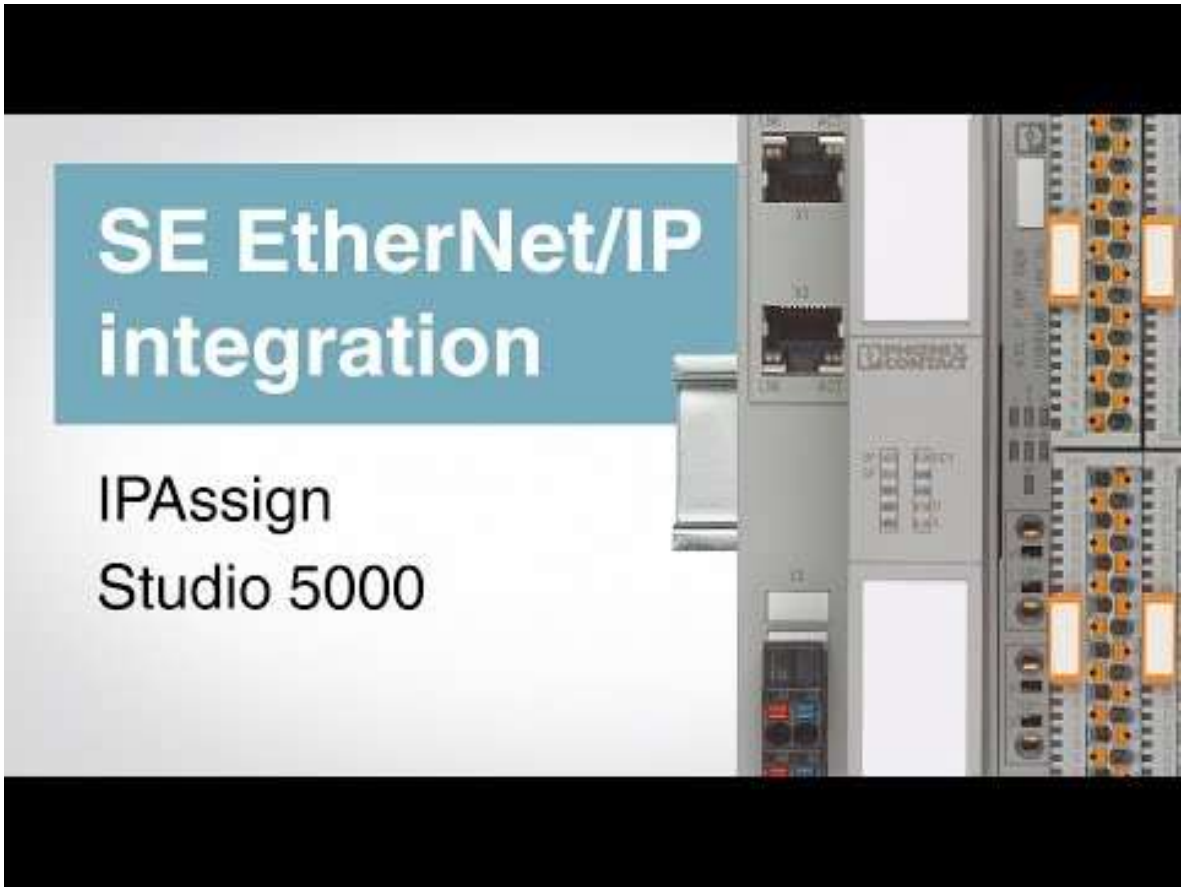
Sistema Axioline

Axioline SE en

EtherNet/IP

Studio 5000 (software)



Axioline Smart Element configuration with EtherNet/IP integration

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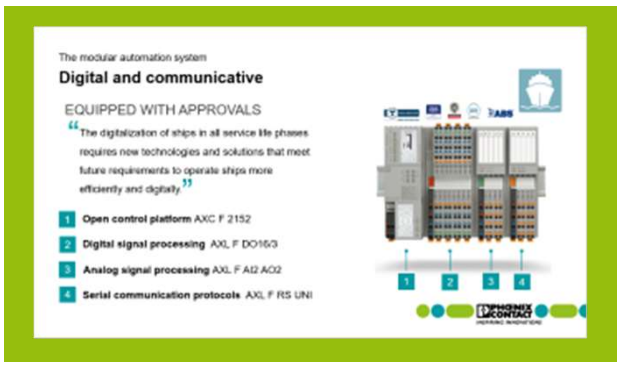
The right automation solution for every requirement



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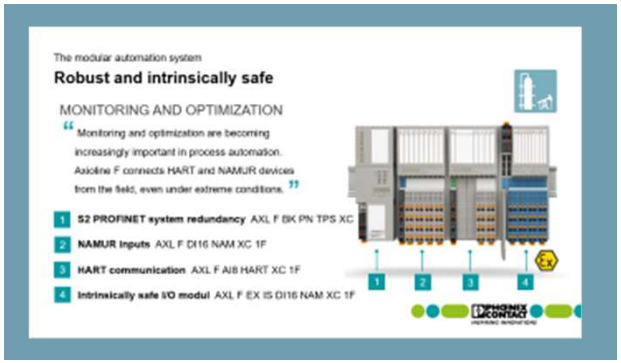

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The modular automation system

Digital and communicative

EQUIPPED WITH APPROVALS

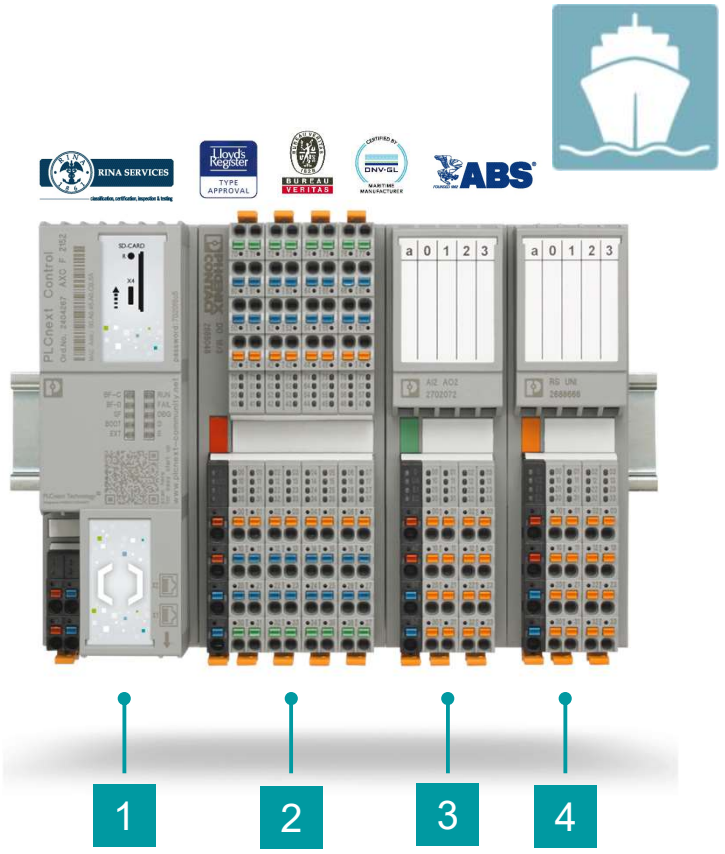
“The digitalization of ships in all service life phases requires new technologies and solutions that meet future requirements to operate ships more efficiently and digitally.”

1 **Open control platform** AXC F 2152

2 **Digital signal processing** AXL F DO16/3

3 **Analog signal processing** AXL F AI2 AO2

4 **Serial communication protocols** AXL F RS UNI



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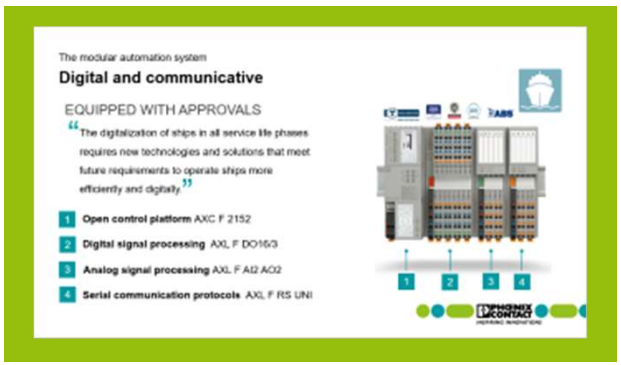
The right automation solution for every requirement



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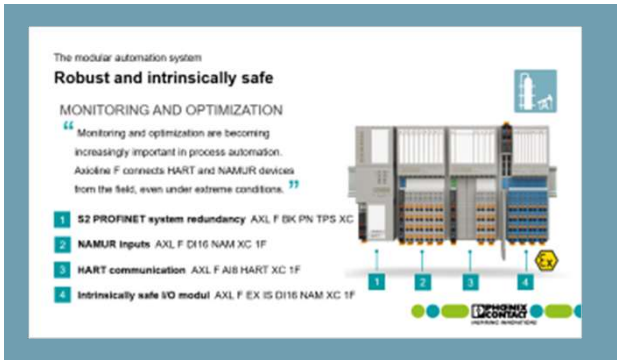

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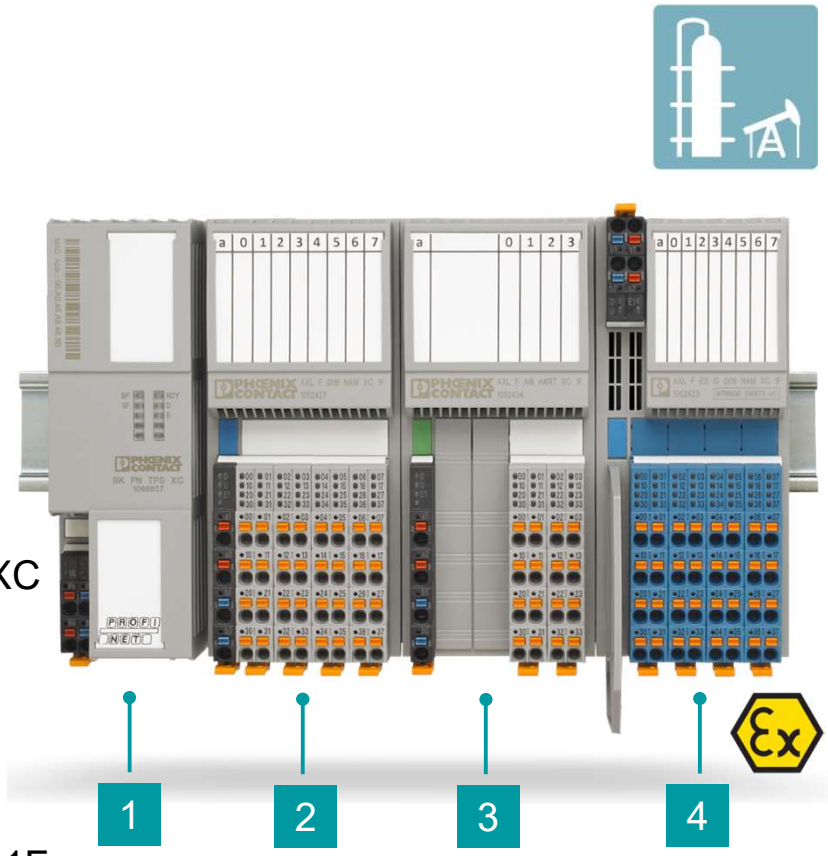
Robust and intrinsically safe

MONITORING AND OPTIMIZATION

“Monitoring and optimization are becoming increasingly important in process automation. Axioline F connects HART and NAMUR devices from the field, even under extreme conditions.”



1 **S2 PROFINET system redundancy** AXL F BK PN TPS XC

2 **NAMUR inputs** AXL F DI16 NAM XC 1F

3 **HART communication** AXL F AI8 HART XC 1F

4 **Intrinsically safe I/O modul** AXL F EX IS DI16 NAM XC 1F

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Axioline F

Profinet

Inside TIA Portal

How to set up an Axioline F Profinet I/O station in the TIA Portal

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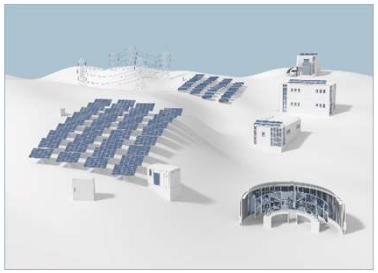
Scope of applications

IP20 I/O Systems


SIMPLE APPLICATIONS COMPLEX





IO-Link IO-Link HART COMMUNICATION PROTOCOL HART COMMUNICATION PROTOCOL

MODULAR AUTOMATION SYSTEM

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