



Welcome

Sistema de Control Axioline

Webinars

Agenda

- Axioline E
 - Axioline F
 - Axioline SE
 - Ejemplos de Integración en Sistemas de Control
 - IO-Link
-



Axioline E



The I/O system for field installation— fast, robust and easy

From the cabinet into the field

- Decentralized I/O system for automation tasks on machine and system engineering under harsh environmental conditions
- Stand-alone concept for highly decentralized application with low numbers of I/Os
- Analog functions provided through IO-Link/Analog converters



System properties



- Direct connection to your network
- Degree of protection IP65/67
- Metal and plastic housing
- Available for all networks shown below:
- PROFINET
- Ethernet/IP
- EtherCAT
- Modbus TCP
- sercos
- Profibus DP

Axioline E is fast



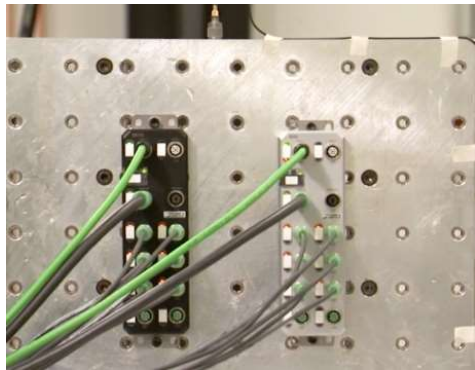
- Fast cabling due to consistent M12-SPEEDCON-connection method at every port
- Toolfree assembly grants fast device exchange (Metal version)



Axioline E is robust



- Especially robust housings
- Highly vibration- and shock-resistant mechanics
- Highest resistance against electromagnetic disturbances
- High temperature range



Sistema de Control Axioline

Axioline E



Video Axioline E Robust

Axioline E is easy



- Reduced cabling thanks to current transmission of M12 Power
- Easiest diagnosis and setting of parameters by means of integrated webserver at the device
- Easy diagnosis onto the device



Axioline E – fast, robust, easy

Fast

Reduced installation time thanks to fast cabling



Easy

M12 Power – up to 2 x 12A in only one single cable simplifies the installation



up to 2x 12A

Easy

Simplified cabling thanks to color-coded functions



Robust

Highly vibration- and shock-resistant housing for the most varied of applications



Fast

Individual and fast marking thanks to MARKING system-Printing systems

Easy

Rotary encoding switch for easy start-up – with an optimum of protection

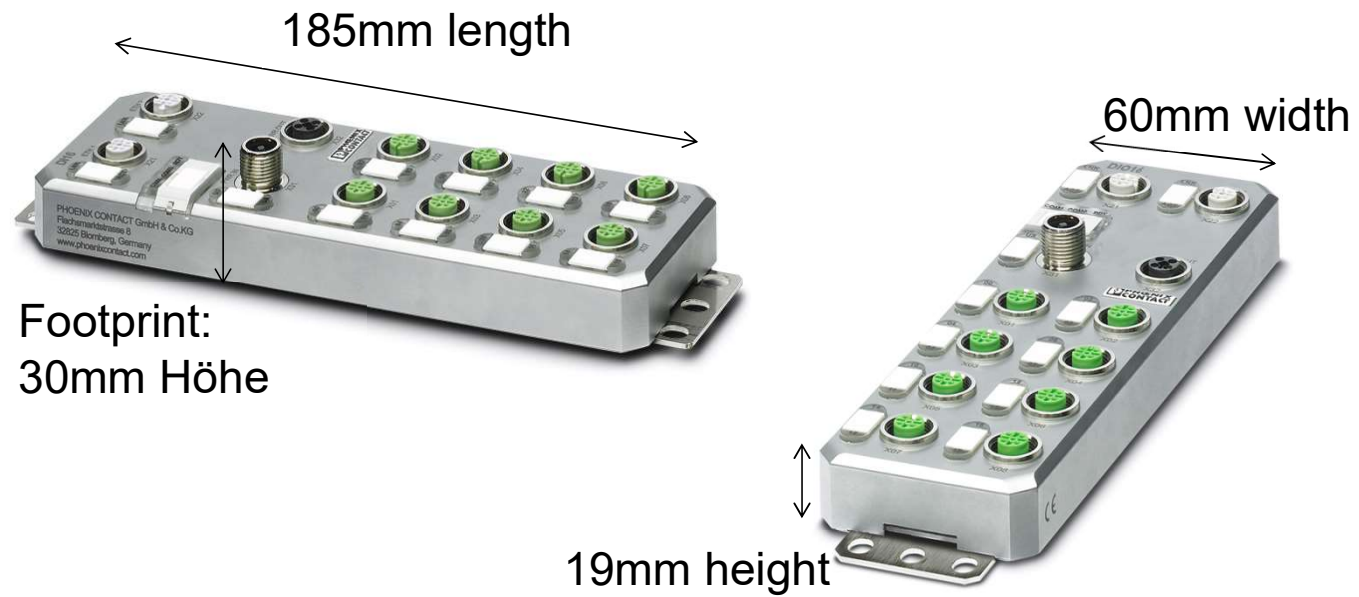
Easy

More flexibility thanks to IO-Link communication

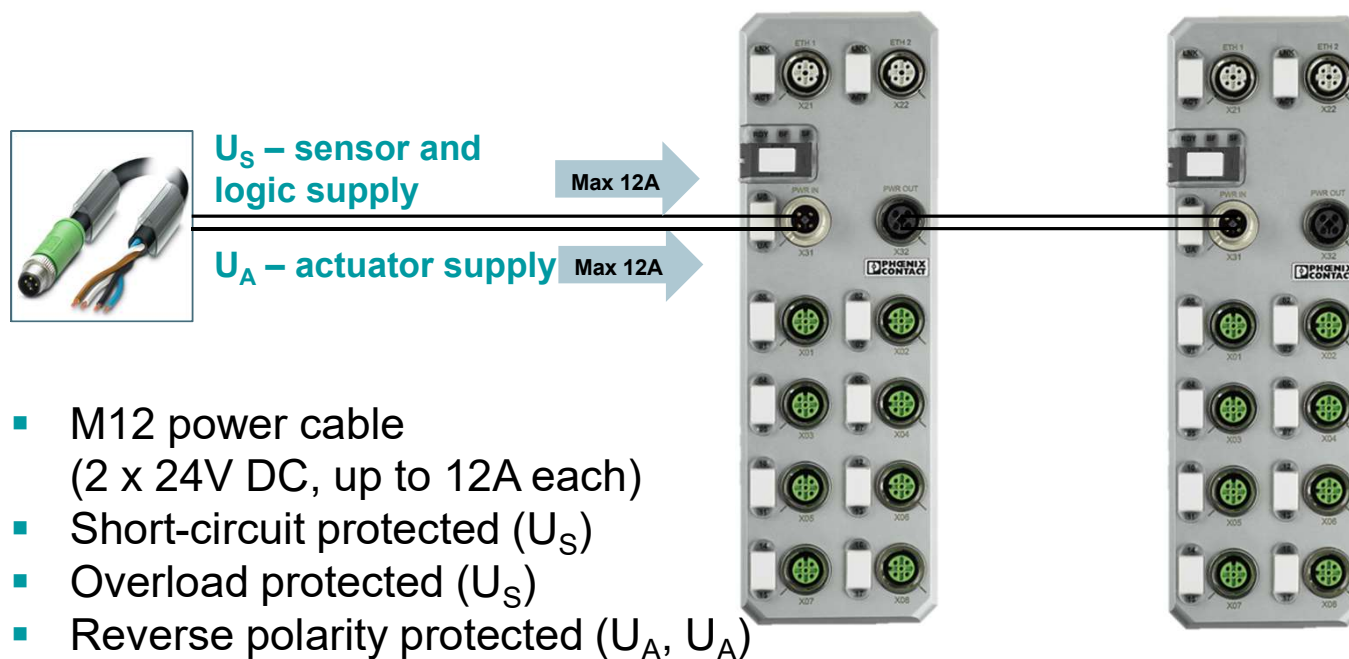


IO-Link

Dimensions



Power supply concept



Portfolio Axioline E

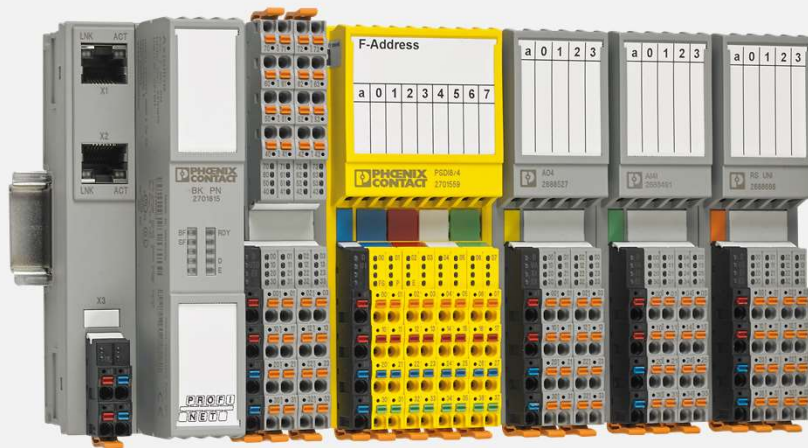
Function		DI16	DIO16 <i>configurable</i>	DI8 DO8	DI8 DO4-2A	IOL8 DI4
Network		Plastic 2701510	Plastic 2701511	Plastic 2701509	Plastic 2701512	Plastic 2701513
		Metal 2701516	Metal 2701517	Metal 2701515	Metal 2701518	Metal 2701519
		Plastic 2701493	Plastic 2701494	Plastic 2701492	Plastic 2701495	Plastic 2701496
		Metal 2701488	Metal 2701489	Metal 2701487	Metal 2701490	Metal 2701491
		Plastic 2701521	Plastic 2701522	Plastic 2701520	Plastic 2701523	Plastic 2701524
		Metal 2701526	Metal 2701528	Metal 2701525	Metal 2701529	Metal 2701531
		Plastic 2701533	Plastic 2701534	Plastic 2701532	Plastic 2701535	Plastic 2701536
		Metal 2701538	Metal 2701539	Metal 2701537	Metal 2701540	Metal 2701541
		Plastic 2701544	Plastic 2701545	Plastic 2701542	Plastic 2701546	Plastic 2701547
		Metal 2701549	Metal 2701550	Metal 2701548	Metal 2701551	Metal 2701552
		Plastic 2701498	Plastic 2701499	Plastic 2701497	Plastic 2701502	Plastic 2701503
		Metal 2701505	Metal 2701506	Metal 2701504	Metal 2701507	Metal 2701508

Sistema de Control Axioline

Axioline E



Axioline Getting Started



Axioline F the block-based modular I/O system

TECHNICS

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
-



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

Axioline F – the specialist in the control cabinet

PLCnext Control
or bus coupler

combined with Axioline
Smart Elements

robust mechanical
design

Tool-free
installation

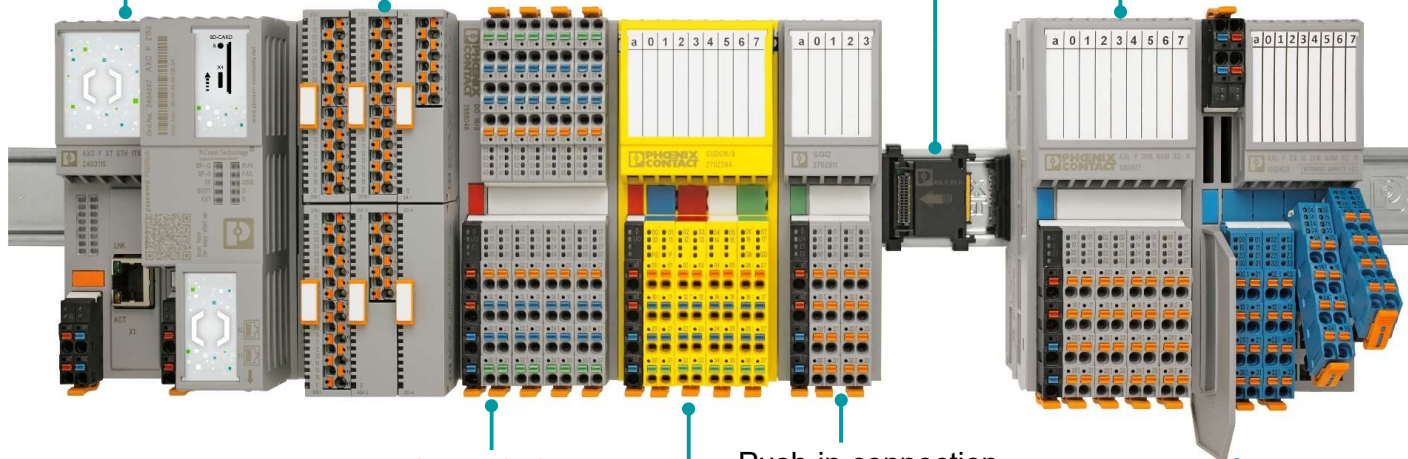
Plug-in I/O
connection

color-coded
terminal points

Push-in connection
technology

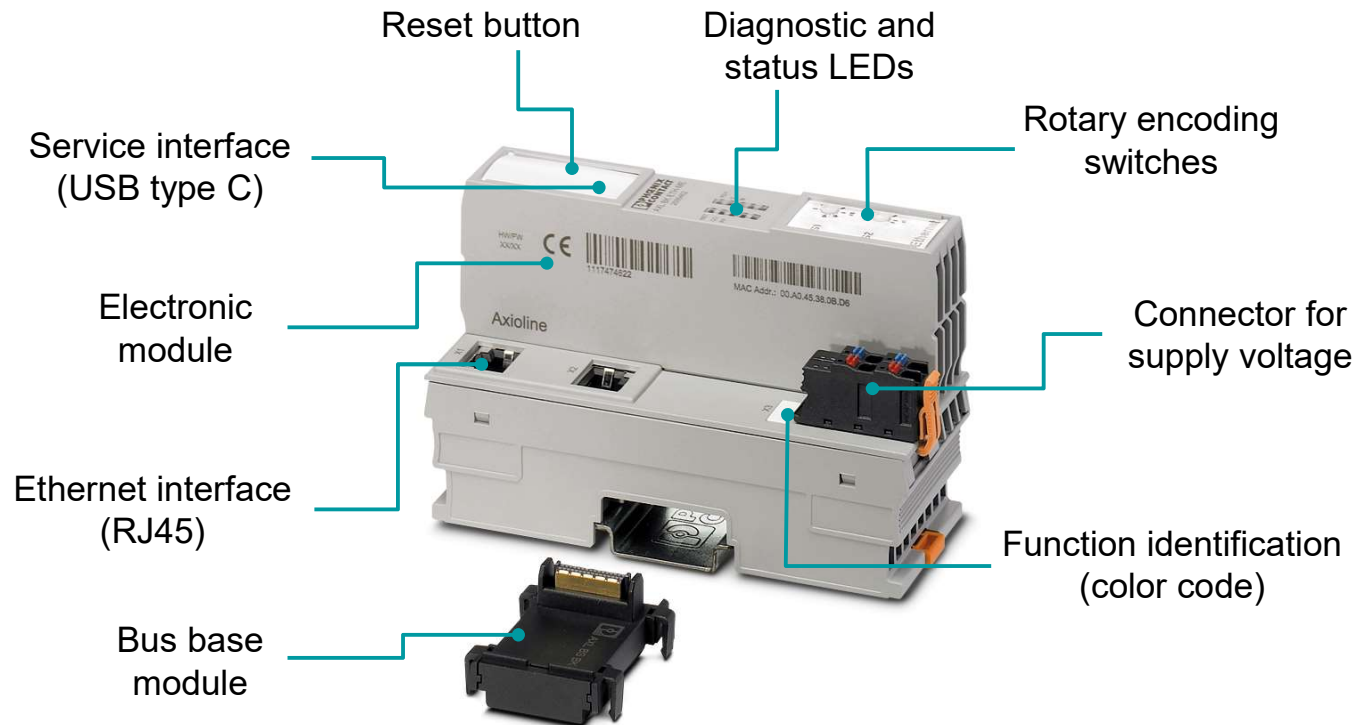
Safety modules

Intrinsically safe
I/O modules



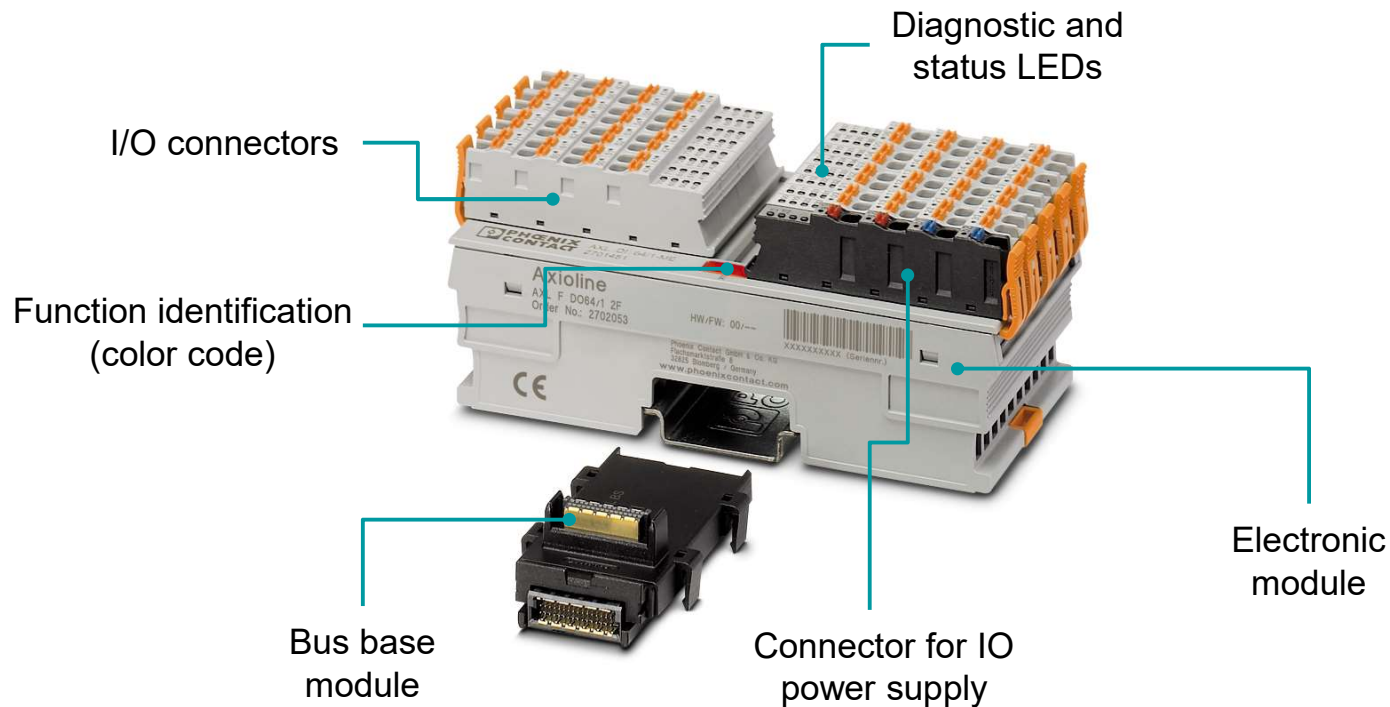
Axioline F - the block-based modular I/O system

Components of an Axioline F bus coupler



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

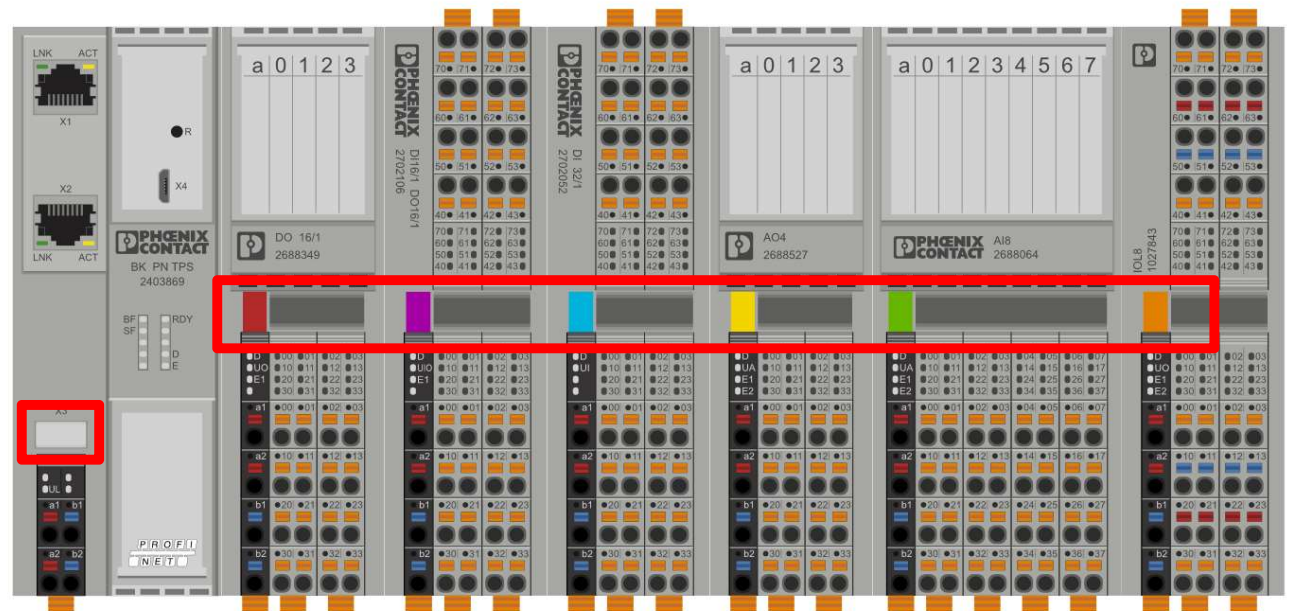
Components of an Axioline F I/O module



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

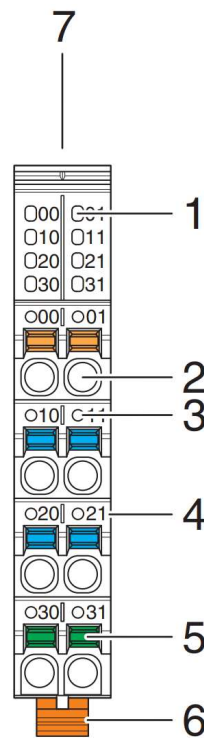
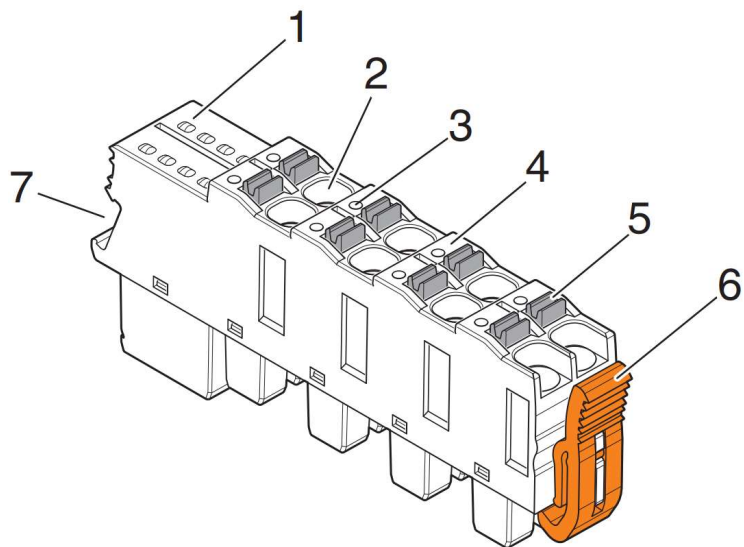
Function identification via color code

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



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

Basic design of an Axioline F connector

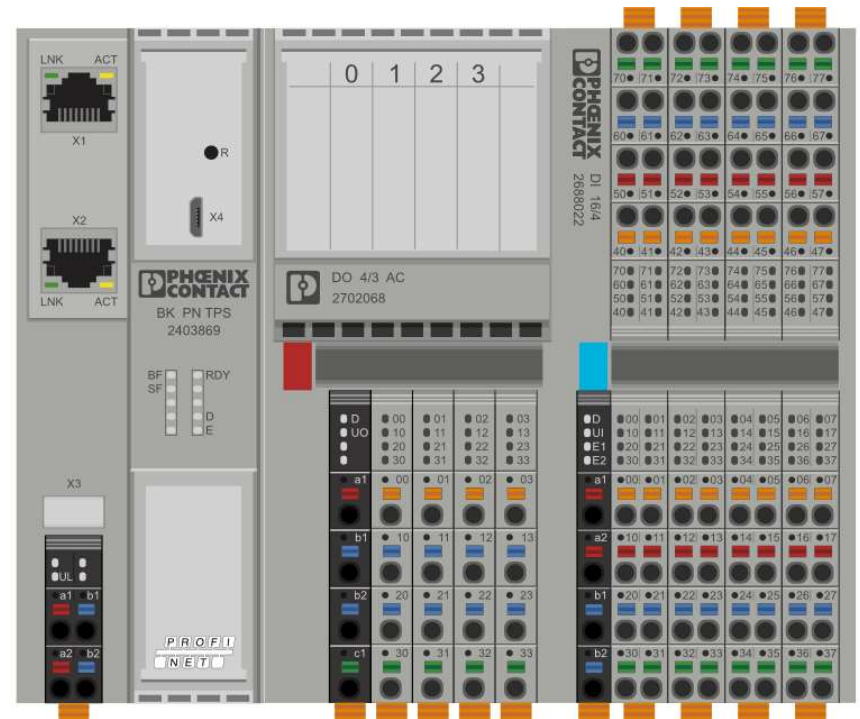


1. Local diagnostic and status LEDs
2. Terminal point
3. Touch connection (Measuring point)
4. Terminal point marking
5. Colored spring lever
6. Locking latch
7. Space for connector marking ("ZBF 10/5,8 AXL" or "ZBF 5")

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

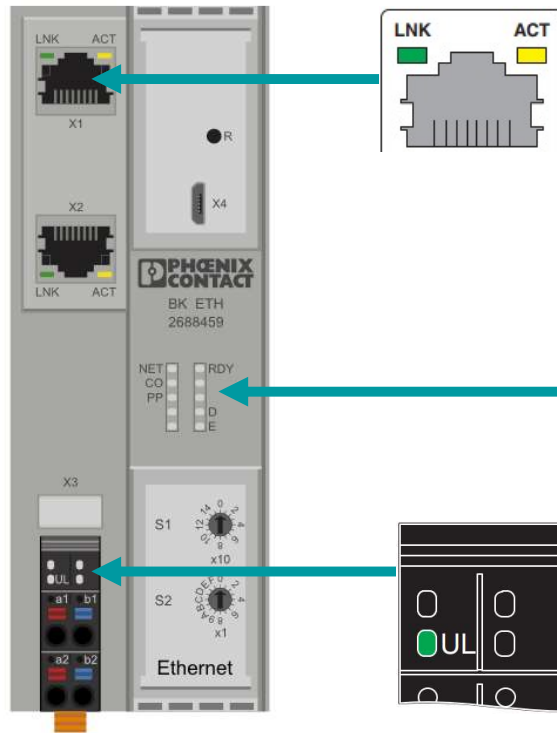
Color coded terminal points (spring lever)

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)



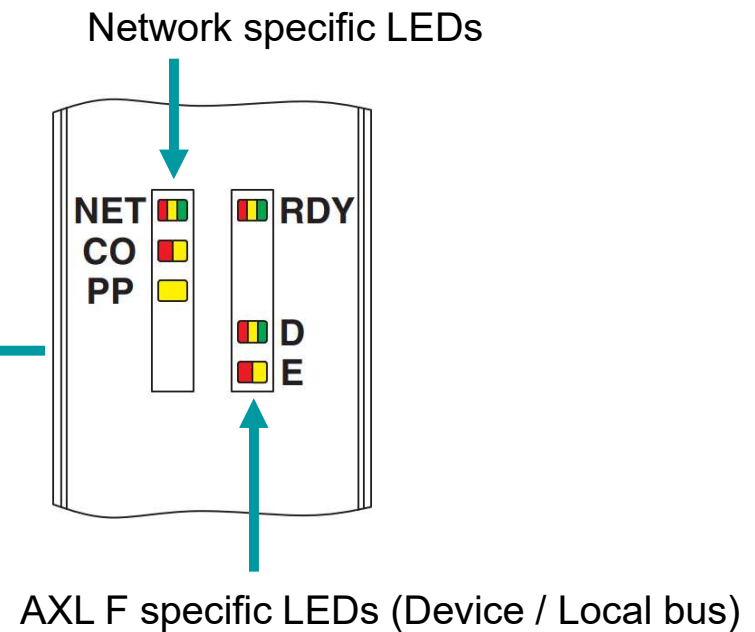
Axioline F - the block-based modular I/O system

Diagnostic LEDs of bus couplers



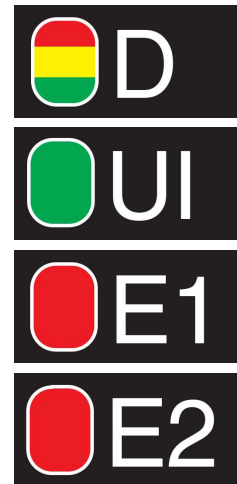
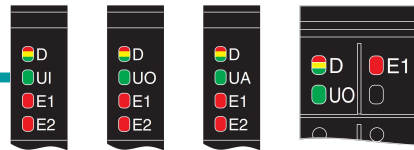
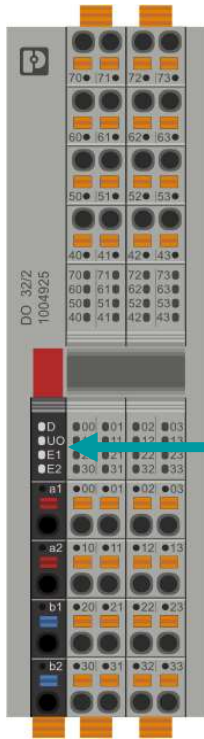
LNK: Connection
ACT: Transmission

Communications
power supply (U_L)



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

Diagnostic LEDs of I/O modules | PWR connectors



Diagnostics of local bus communication

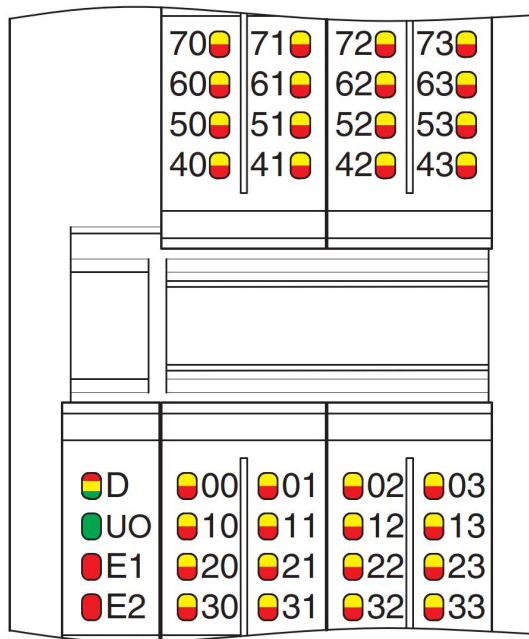
I/O supply (U_I , U_O , U_{IO} , U_A)

I/O error (entire device)

Channel error

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

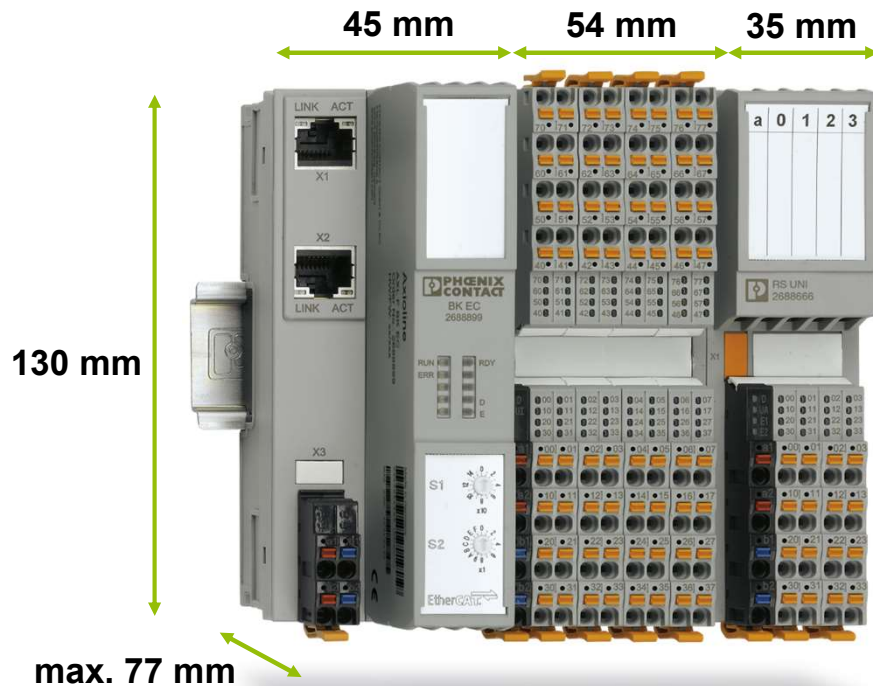
Diagnostic LEDs of I/O modules | I/O connectors



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

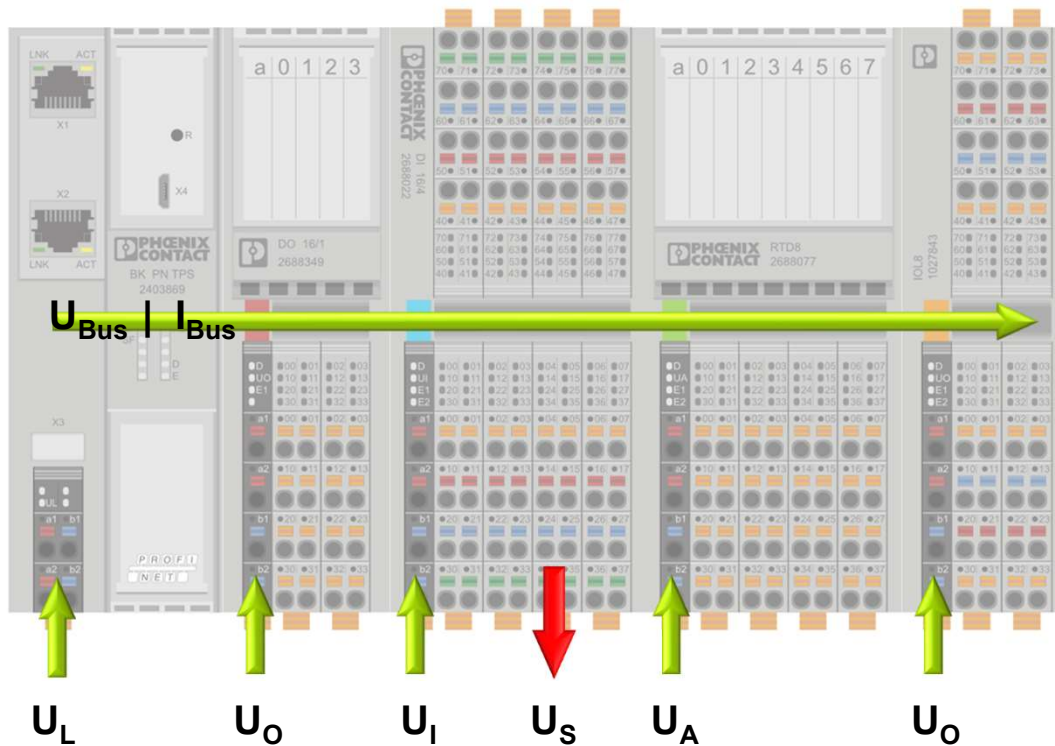
Axioline F - the block-based modular I/O system

Module dimensions



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

Axioline F system supply

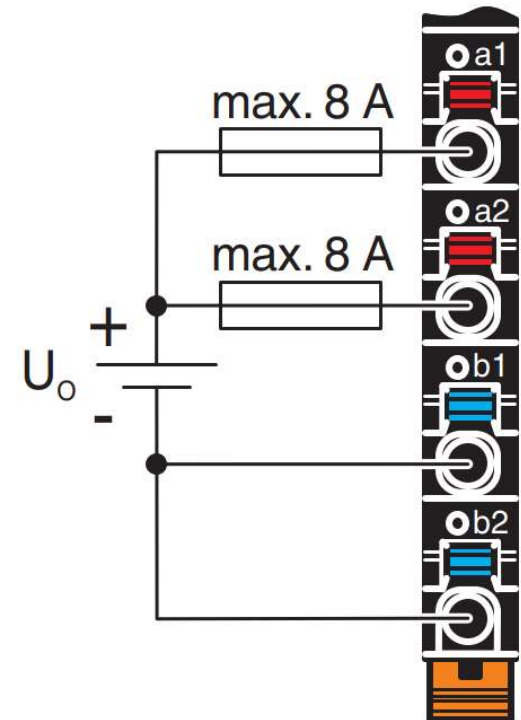


- U_L (U_{Logic}) Communications power supply
- I_{Bus} (I_{Bus}) Local bus
- U_{Bus} (U_{Bus}) Local bus (gen. from U_L)
- U_I (U_{Input}) Digital input modules
- U_S (U_{Sensor}) Sensor supply (gen. from U_I)
- U_O (U_{Output}) Digital output modules
- U_{IO} ($U_{Input/Output}$) Digital input/output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

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

Parallel power supply for more than 8 A

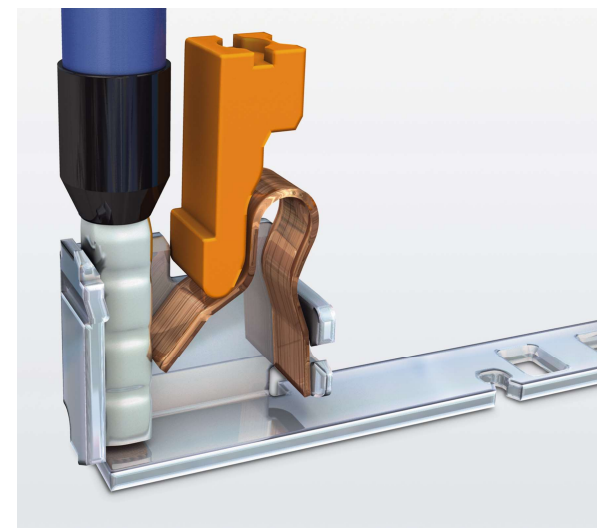
- Maximum current consumption of a terminal point → 8 A
- Example:
 - AXL F DO32/1 2H → 32 channels * 0,5 A = 16 A
 - Power supply (U_O) via one single terminal point limited up to 8 A
 - → Parallel power supply for U_O up to 16 A



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

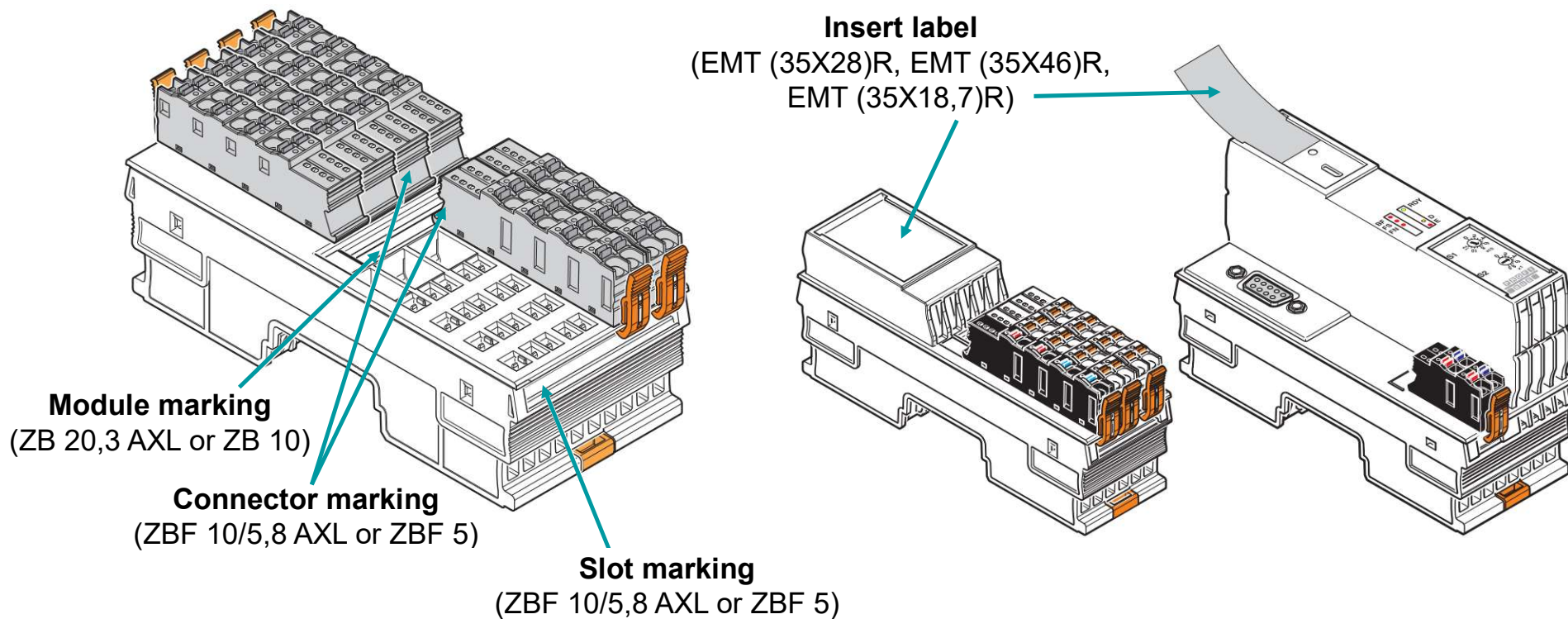
Conductor cross sections | Push-in Technology

Conductor		Push-in technology	using the spring lever
solid		min. 0,50 mm ² max. 1,50 mm ²	min. 0,20 mm ² max. 1,50 mm ²
stranded		-	min. 0,20 mm ² max. 1,50 mm ²
ferrule without collar		min. 0,25 mm ² max. 1,50 mm ²	min. 0,25 mm ² max. 1,50 mm ²
ferrule with collar		min. 0,25 mm ² max. 1,50 mm ²	min. 0,25 mm ² max. 1,50 mm ²



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

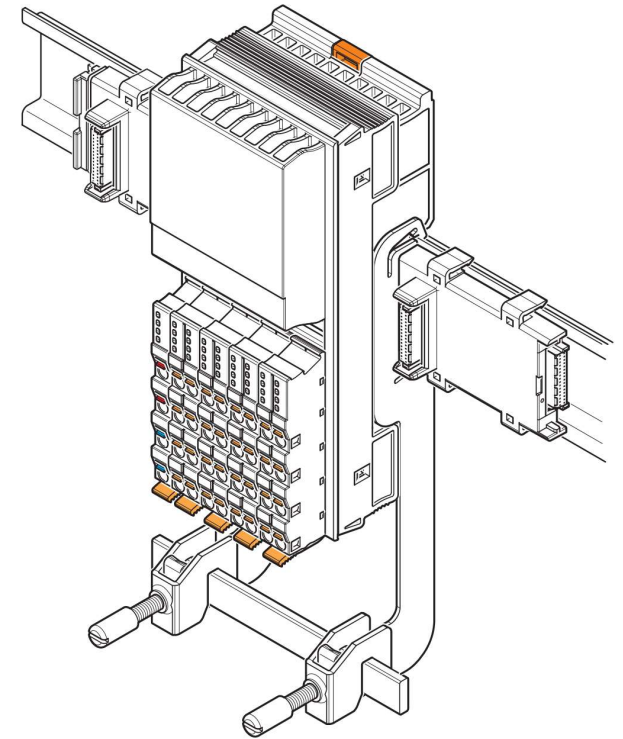
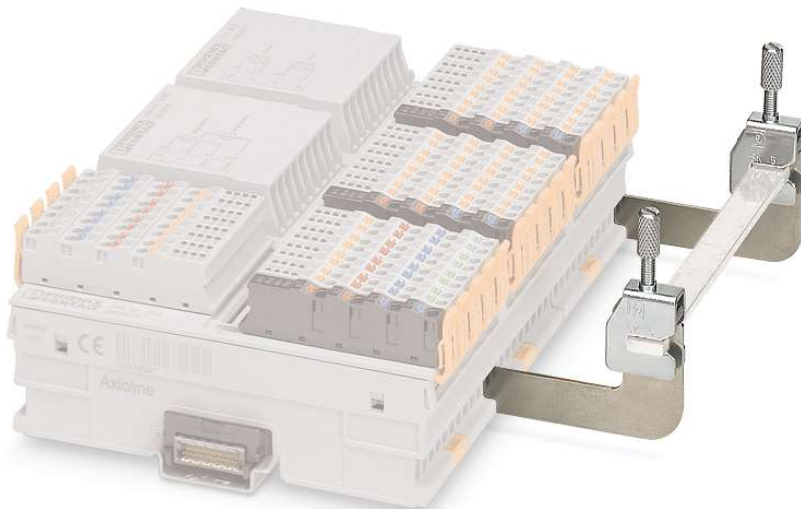
Individual marking with zack marker strips and labels



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

Shielding of signal cables

- System integrated shielding set
 - AXL SHIELD SET - 2700518



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

STARTUP+ – Wiring Check for Axioline F

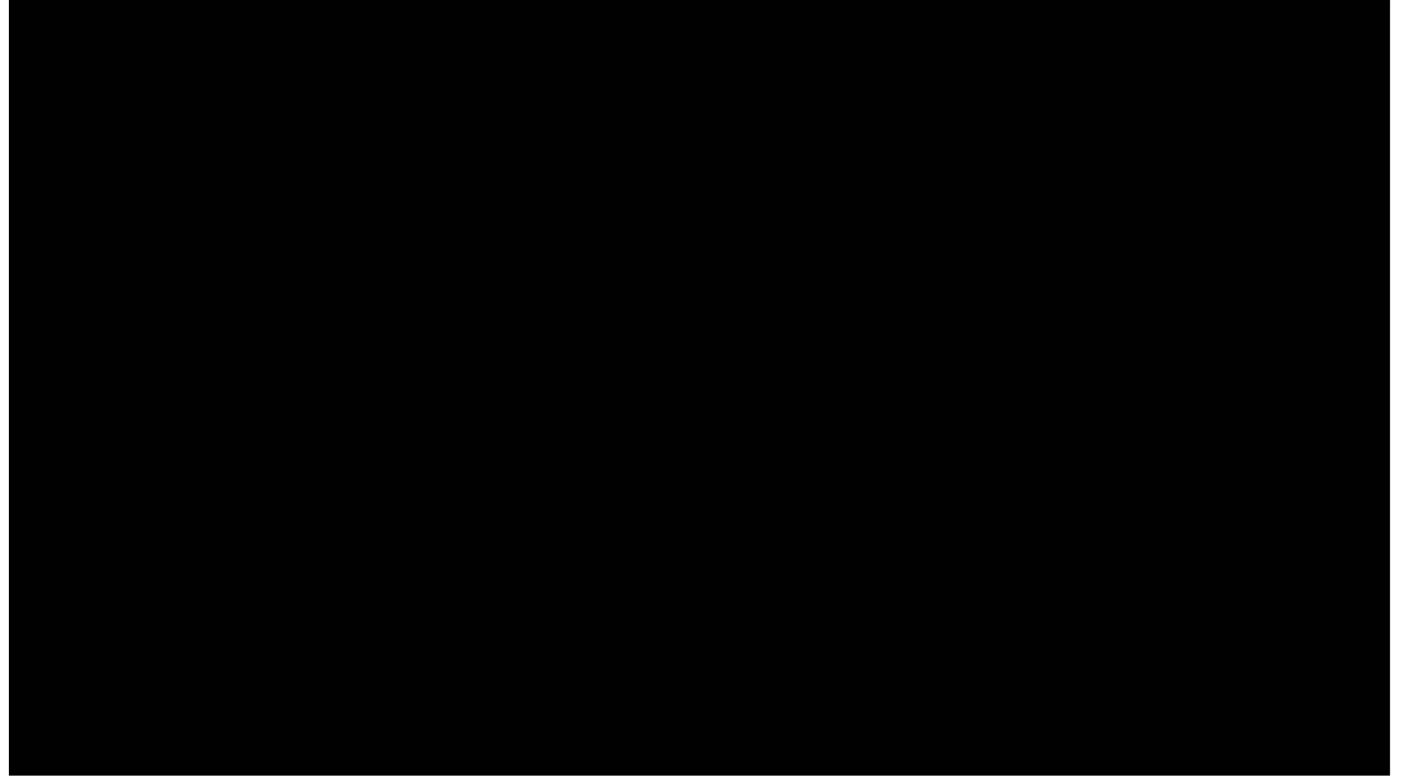
- Connection to the bus coupler via RJ45 or USB interface
- Reading the connected bus; all modules will be displayed
- Reading and writing module process data (IO-Check)
- Parameterization of the modules
- I/O module and the bus coupler diagnostics
- Free to download



AVAILABLE AS FREE DOWNLOAD !

Axioline F

Startup +



Video How to configure Axioline F Buskopler EIP with Startup +

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



Marine approvals



Ex approvals*



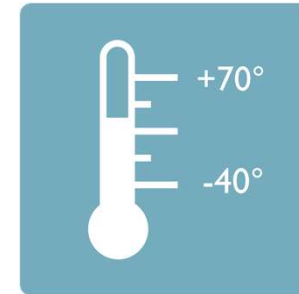
Class 1 Div. 2

* XC modules only

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



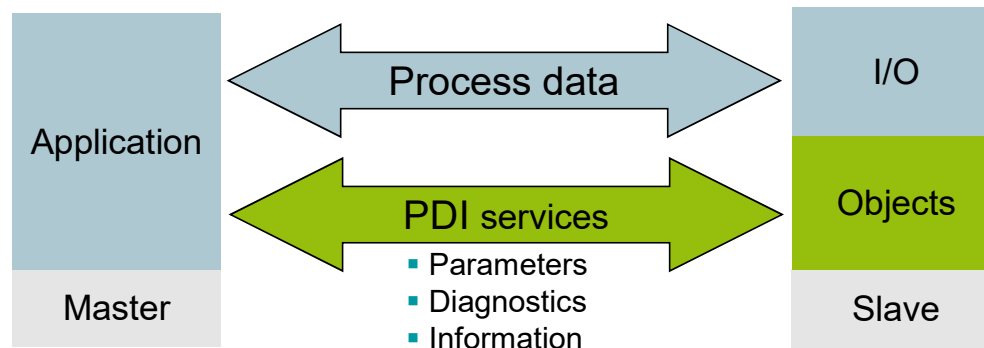
Class 1 Div. 2



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

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



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

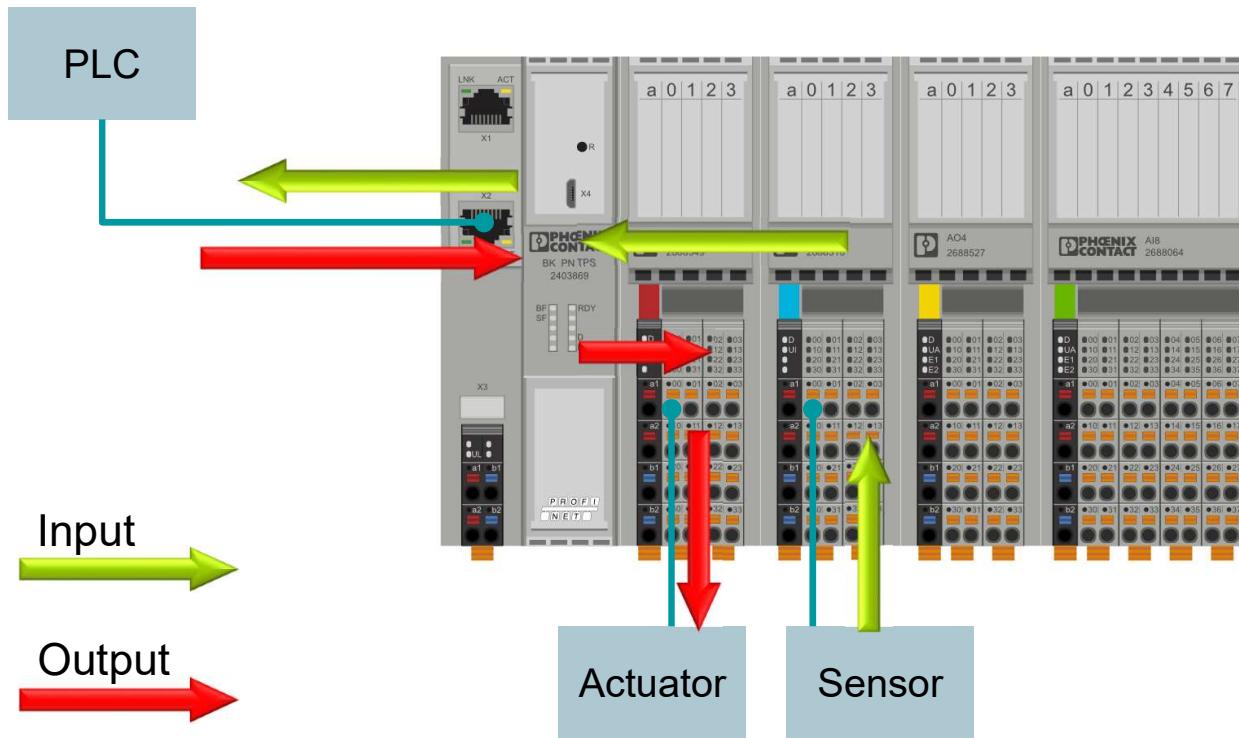
Diagnostic state (0018_{hex}: DiagState)

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"



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

Response times for an Axioline F system

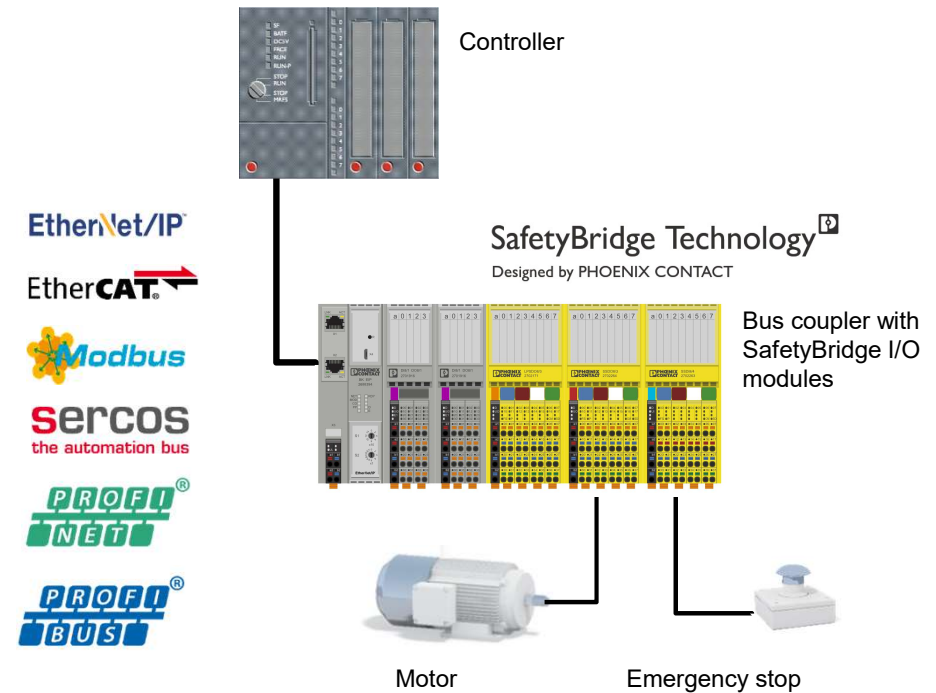


- Response time = time from reading in the input, processing in the controller to setting the output
- When determining the response time of the overall system, Axioline F represents the smallest proportion by far and therefore can normally be ignored.

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



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)	 AXC 3050 2700989 16 tasks, 256 PN devices, Intel® Atom™ E660, 1.3 GHz UPS
 AXC F 3152 1234567 32 tasks, 128 PN devices, Intel® Atom™ E3930 dual core, 2x 1.3 GHz TSN UPS	 AXC F IL ADAPT 1020304 Right-alignable Inline adapter terminal (INTERBUS master), 500K / 2MBD (automatic detection)	

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

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	  AXL F BK SAS 2701457
  AXL F BK PB 2688530	  AXL F BK S3 2701686	  AXL F BK EIP 2688394	

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

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

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	

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		

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

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	

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

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)	

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

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 AAC	 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	

Axioline F

Configure Axioline F Profinet



The image shows a Phoenix Contact Axioline F Profinet I/O station. It is a grey, rack-mountable unit with a central terminal block and two side panels. The top panel has a label 'a 0 1 2 3' and a 'PROFINET' label. The bottom panel has a label '1 2 3 4'. The unit is shown from a front-three-quarter view.

Axioline F - Profinet

Set up
Linking a Profinet I/O station
into the TIA Portal V13

PHOENIX CONTACT

Video Axioline F PROFINET TIA Portal

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)

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	 PROFINET AXL F BK PN TPS XC 1068857	 Modbus AXL F BK ETH XC 2701949
	 PROFIBUS AXL F BK PB XC 2702463	 EtherNet/IP AXL F BK EIP XC 1167192

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

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

XC Process I/Os - Digital Input / Output

Digital Input



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 DI16 NAM XC 1F
1052423

Intrinsically safe, 16 digital inputs for NAMUR proximity sensors (IEC/EN 60947-5-6), 2-wire

Digital Output



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 DO4 SD 21-60 XC 1F
1086902

Intrinsically safe, 4 digital outputs, 21 V DC, 60 mA, 3-wire

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

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

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

Analog Input



AXL F AI8 HART XC 1F
1052434

8 analog inputs, 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

Analog Output



AXL F AO4 HART XC 1F
1087080

4 analog outputs, 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

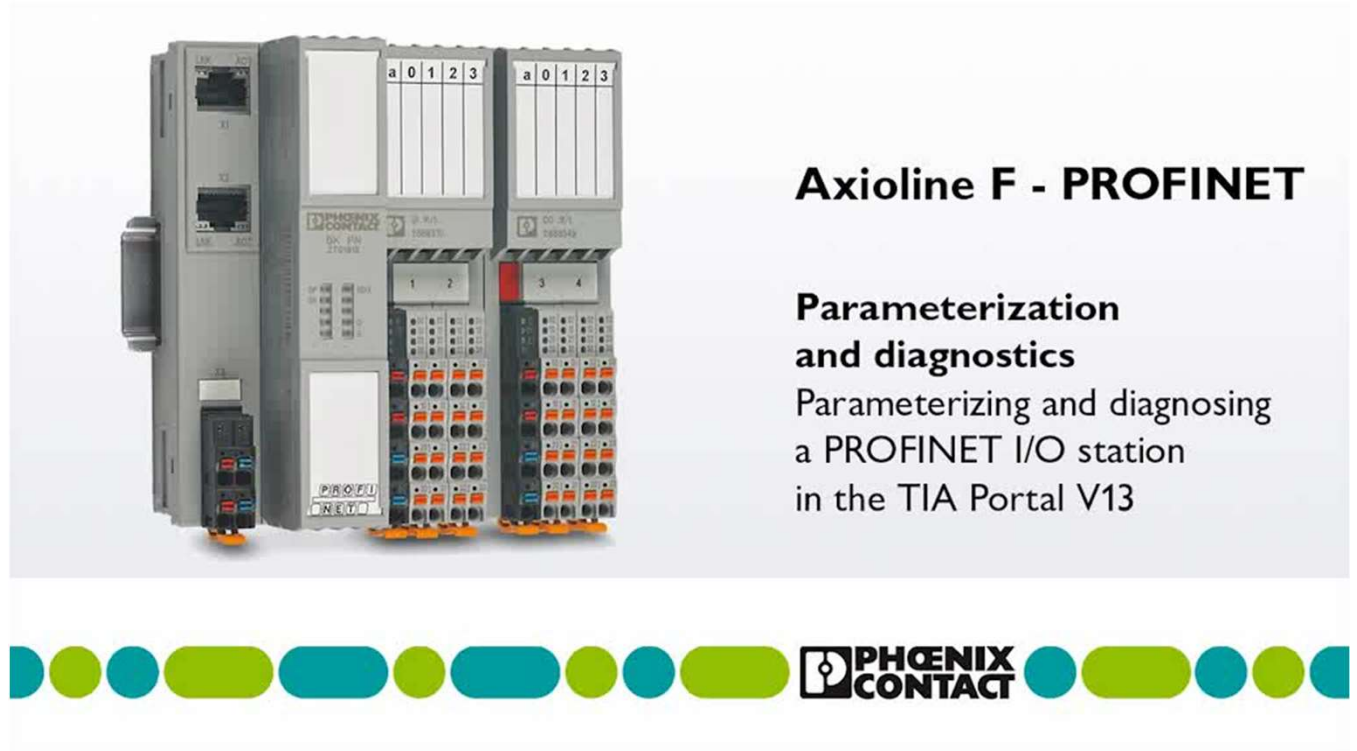
Axioline F - the block-based modular I/O system

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

Sistema de control Axioline

Axioline F Parametrization Diagnostic



Axioline F - PROFINET

Parameterization and diagnostics

Parameterizing and diagnosing
a PROFINET I/O station
in the TIA Portal V13

Video Axioline F Parametrization and Diagnostic

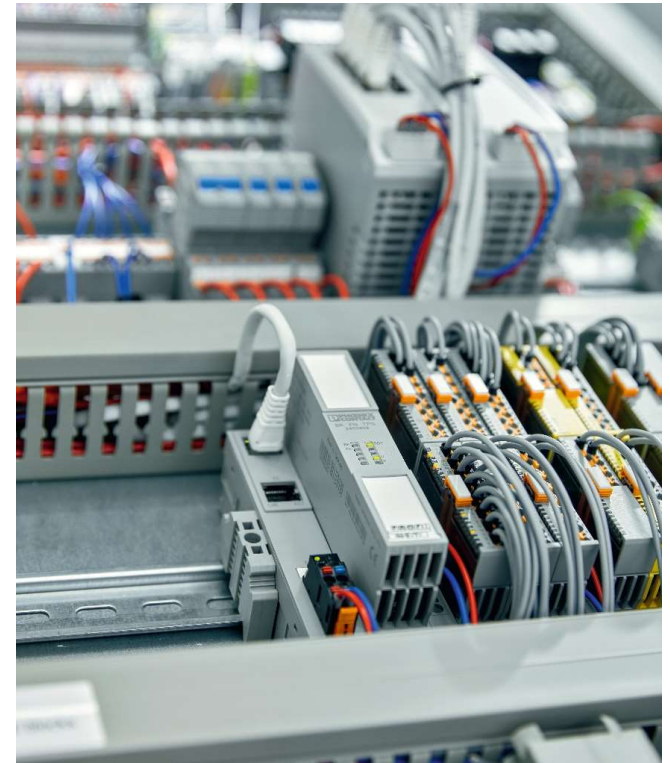
Sistema de Control Axioline

Axioline SE Smart Elements

- Un Webinar sobre Axioline SE Smart Elements se realizará próximamente.



Miniaturization in control cabinet building



IO-Link portfolio

The Phoenix Contact IO-Link portfolio



IO-Link portfolio

Fast growing communication standard of industrial automation

Market trend

End of 2018 there have been about 11,40 million IO-Link devices in use.



Source: www.io-link.com

Success factors

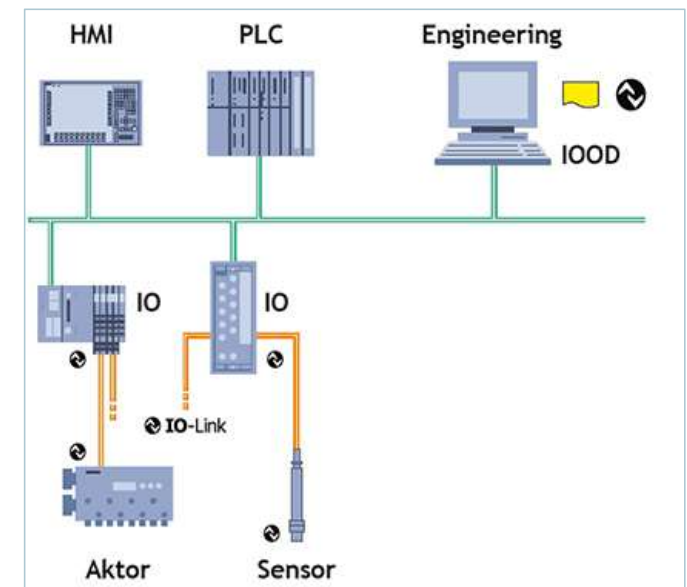
- ✓ **Open** standard IEC 61131-9
- ✓ **Simple**, significantly reduced number of interfaces on the sensors/actuators
- ✓ **Consistent** communication between sensors/actuators and the PLC
- ✓ **Cost-effective** because of non-shielded cabling

IO-Link portfolio

Components of an IO-Link system

An IO-Link system basically consists of the following components:

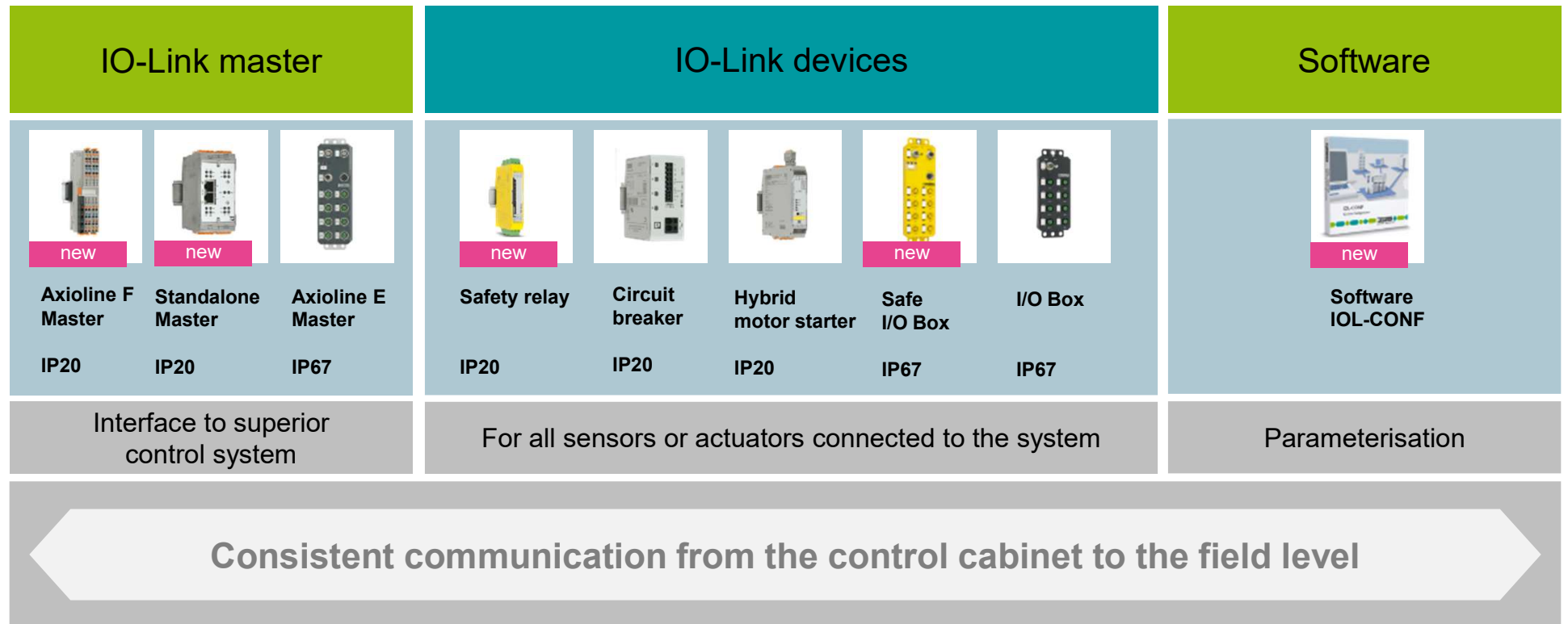
- IO-Link master ✓
- IO-Link device (e.g. sensors, RFID reader, valves, motor starter, I/O modules) ✓
- Unshielded 3- or 5-wire standard cables ✓
- Engineering tool for project planning and parameterization of IO-Link ✓



Source: www.io-link.com

IO-Link portfolio

The Phoenix Contact IO-Link portfolio



IO-Link portfolio

Standalone IO-Link master

IO-Link master for the cabinet

- 8 IO-Link Ports
- 4 additional digital inputs
- Configuration by web server
- IO-Link V1.1 compatible

Order information:

IOL MA8 PN DI8 (1072838) for PROFINET

IOL MA8 EIP DI8 (1072839) for Ethernet/IP™

Available SPS 18



IO-Link portfolio

Axioline F IO-Link master

IO-Link master for Axioline F I/O system

- 8 IO-Link ports type A
- IO-Link V1.1 compatible
- 200 mA at C/Q, 2A at L+/L- (total 8A)

Order information:

AXL F IOL8 2H (1027843)

Total functionality until Hannover Fair 2019 only with AXL F ETH BK

Available SPS 18



IO-Link portfolio

Axioline E IO-Link master

IO-Link master for Axioline E I/O system

- 4 IO-Link ports type A, 4 IO-Link Ports type B
- IO-Link V1.1 compatible
- M12 power connector

Order information:

AXL E xx IOL8 DI4 M12 6M (metal housing)

AXL E xx IOL8 DI4 M12 6P (plastic housing)

Available



Software IOL-CONF

- Configuration of each IO-Link Device
- Easy integration of IODD
- Visualization of device process data

[illegible]

IOL-CONF (1083065) download

IO-Link portfolio

Axioline E IO-Link I/O Boxes

I/O Boxes for digital inputs and outputs in the field

- IO-Link V1.1 compatible
- 8 or 16 digital input channels
- 8 digital output channels

Order information:

AXL E IOL DI8 M12 6P (2702658)
AXL E IOL DI16 M12 6P (2702660)
AXL E IOL DO8 M12 6P (2702659)

Available



IO-Link portfolio

Axioline E IO-Link Converter

Converter for analog Signals to IO-Link

- Input / output for analog signals (voltage / ampere)
- Input / output for temperature signals (RTD)
- 4 TC-Input channels (Type K)

Order information:

AXL E IOL TC4 K M12 (2702983)

AXL E IOL Ax....

AXL E IOL RTD...

Available HM 2019



IO-Link portfolio

Non-contact safety switch with diagnostics

Available SPS 2018

Non-contact safety switch PSRswitch with safety relay PSRmini

- Up to 32 switches in line
- Additional input for safety switch
- Combination with safety relay PSRmini PSR-MC42 for intelligent diagnostics via IO-Link

Order information:

PSR-MC42-2NO-1DO-24DC-SC (2702901, 2702902)

PSR-CT-F-SEN-1-8 (2702976) Fixcode sensor

PSR-CT-C-SEN-1-8 (2702972) Unicode sensor

PSR-CT-M-SEN-1-8 (2702975) Multicode sensor

PSR-CT-C-ACT (2702973) actuator



IO-Link portfolio

Axioline E Safety IO-Link I/O Box

Available HM 2019

IO-Link I/O Box with safety digital inputs and outputs

- Suitable for PROFI-safe or SafetyBridge Technology
- 8 digital inputs
- 4 digital outputs

Order information:

AXL E IOL SDI8 SDO4 2A M12 6P (2702833)



IO-Link portfolio

Hybrid Motor Starter with IO-Link

Available

Hybrid Motor Starter CONTACTRON pro with IO-Link interface

- Motor protection
- Current measuring
- Extended diagnostic

Order information:

ELR H5-IES-PT/500AC-3-IOL (2908669)
ELR H5-IES-PT/500AC-9-IOL (2908670)
ELR H3-IES-PT/500AC-3-IOL (2908671)
ELR H3-IES-PT/500AC-9-IOL (2908672)



IO-Link portfolio

Electronic Circuit Breaker

Circuit Breaker multichannel compact with IO-Link

- Current limitation from 1...10A or 1...4A
- Extended diagnostics
- Adjustable by button or IO-Link

Orderinformation:

CBMC E4 24DC/1-10A IOL (2910411)

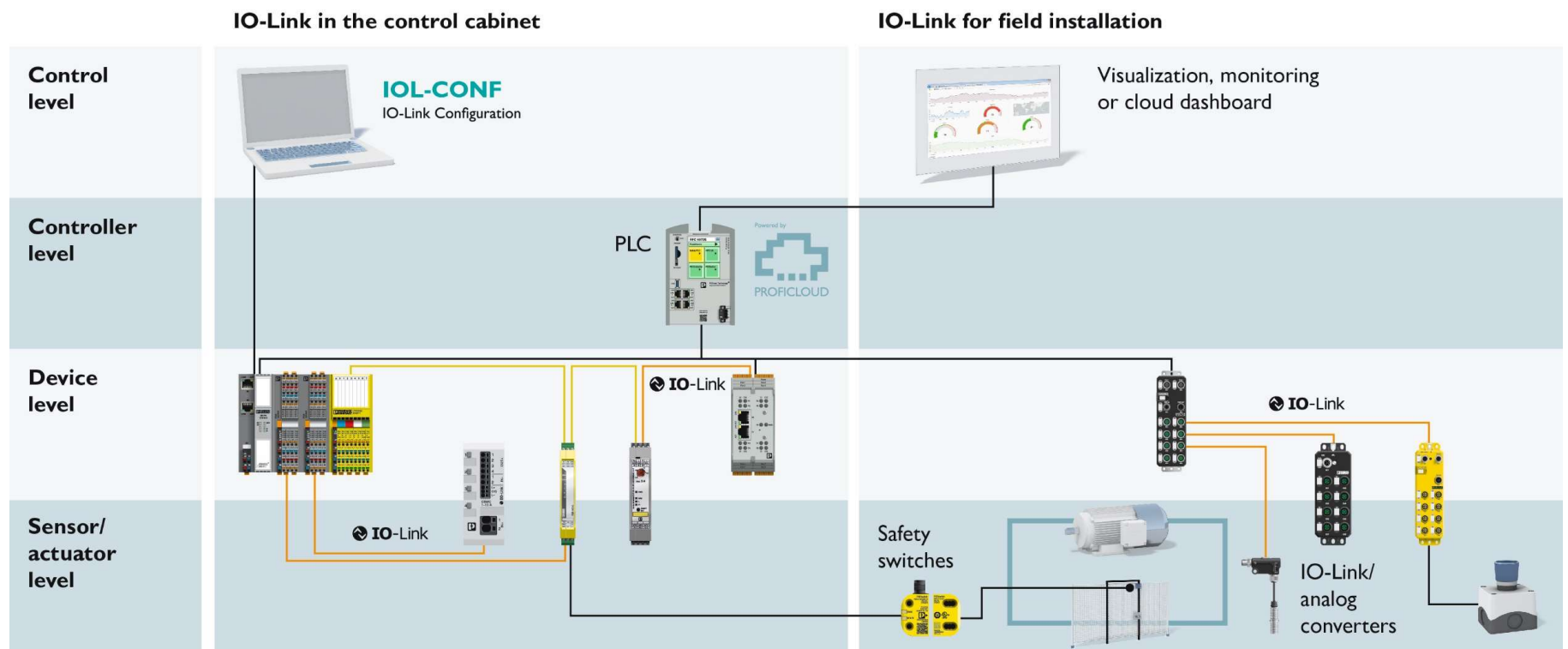
CBMC E4 24DC/1-47A+ IOL (2910410)

Available



IO-Link portfolio

IO-Link products from Phoenix Contact



IO-Link in the Axioline E system



 **IO-Link**

IO-Link

What is IO-Link?

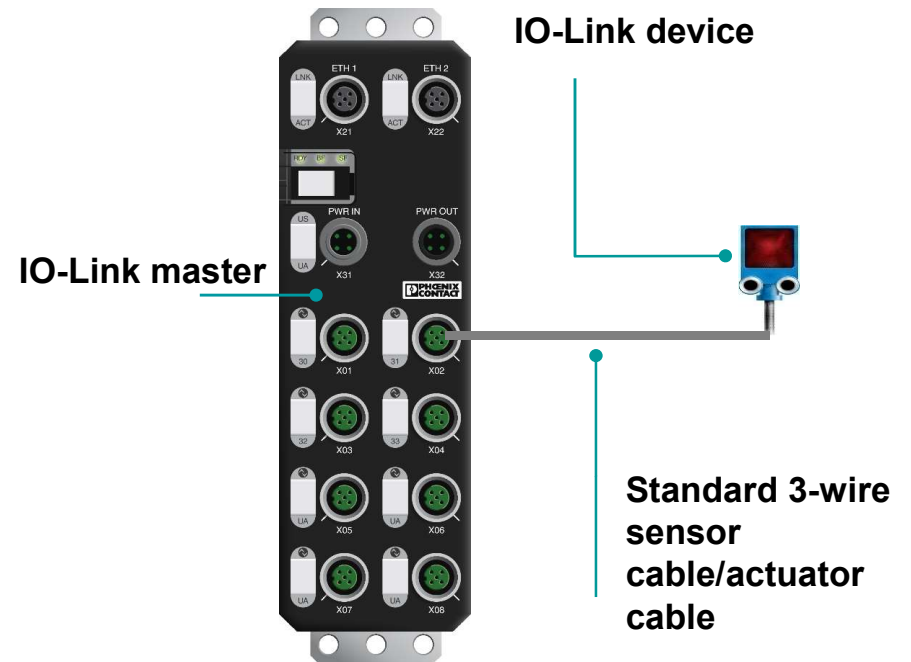
- Standardized IO-technology (IEC 61131-9) focussing the communication between field devices and PLC
- Direct point-to-point communication based on 3-wire sensor/actuator connection
- Current specification: IO-Link spec V1.1



IO-Link

System components

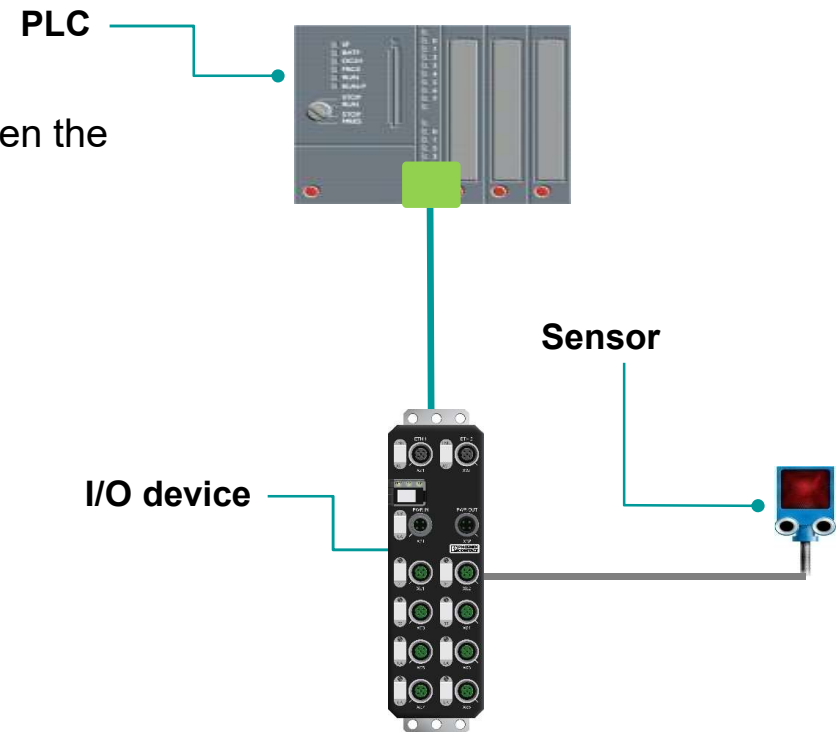
- An IO-Link system consists of:
 - IO-Link master
 - IO-Link devices
 - Standard 3-wire sensor cable/actuator cable



IO-Link

Data transfer conventional

- Data transfer via data packages (Ethernet)
- Transfer of process data, parameters and diagnostics between the PLC and the I/O device

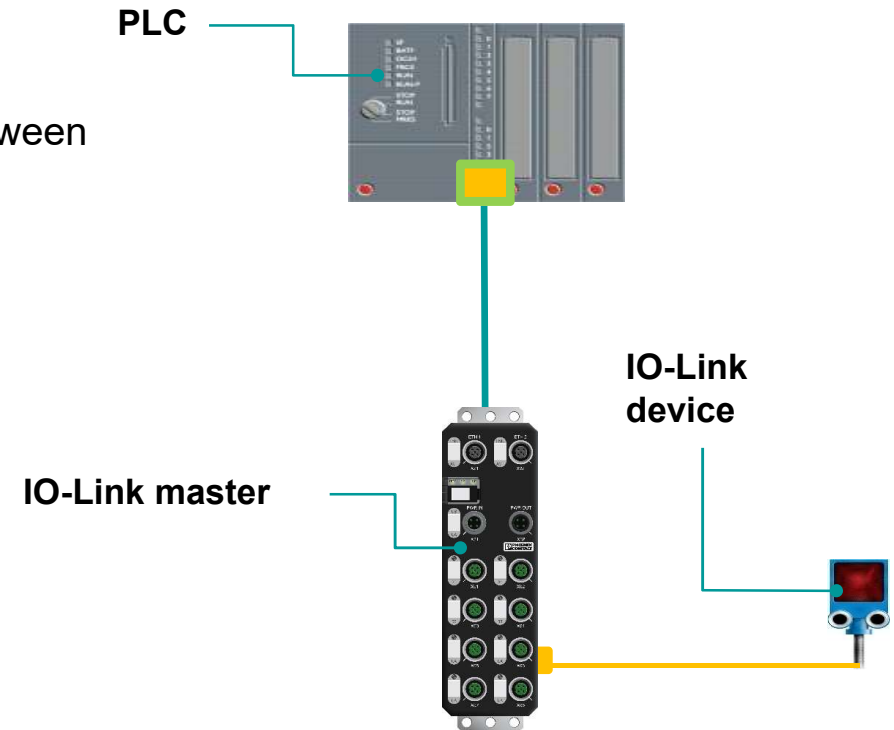


■ Data packages (example Ethernet)

IO-Link

Data transfer via IO-Link

- Data transfer via data packages (Ethernet)
- Transferring process data, parameters and diagnosis between controller and IO-Link device through the IO-Link master



■ Data packages (example Ethernet)

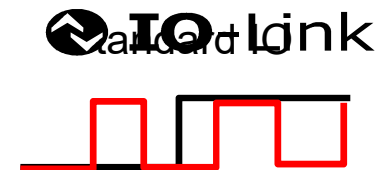
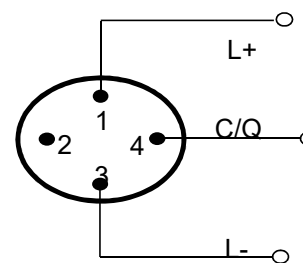
■ IO-Link data package

IO-Link

Functional principle

- 3-wire connection
- Function of any Port is adjustable:
 - Standard IO (SIO)
 - IO-Link
- Transfer of:
 - Cyclic process data
 - Device-parameters (acyclic)
 - Events

PHYSICAL LAYER



Portfolio

IO-Link

Overview of IO-Link componets for Axioline E



IO-Link

IO-Link



IO-Link master



IO-Link master



IO-Link device



IO-Link device

IO-Link

Axioline E – fast, robust, easy

Fast

Reduced installation time thanks to fast cabling



Fast

Tool-free device replacement when using the mounting plate

Easy

Simplified cabling thanks to color-coded functions

Easy

M12 Power – up to 2 x 12 A in only one single cable simplifies the installation

Fast

Individual and fast marking thanks to MARKING system-Printing systems

Robust

Highly vibration- and shock-resistant housing for the most varied of applications

IO-Link

IO-Link-Master für Axioline E

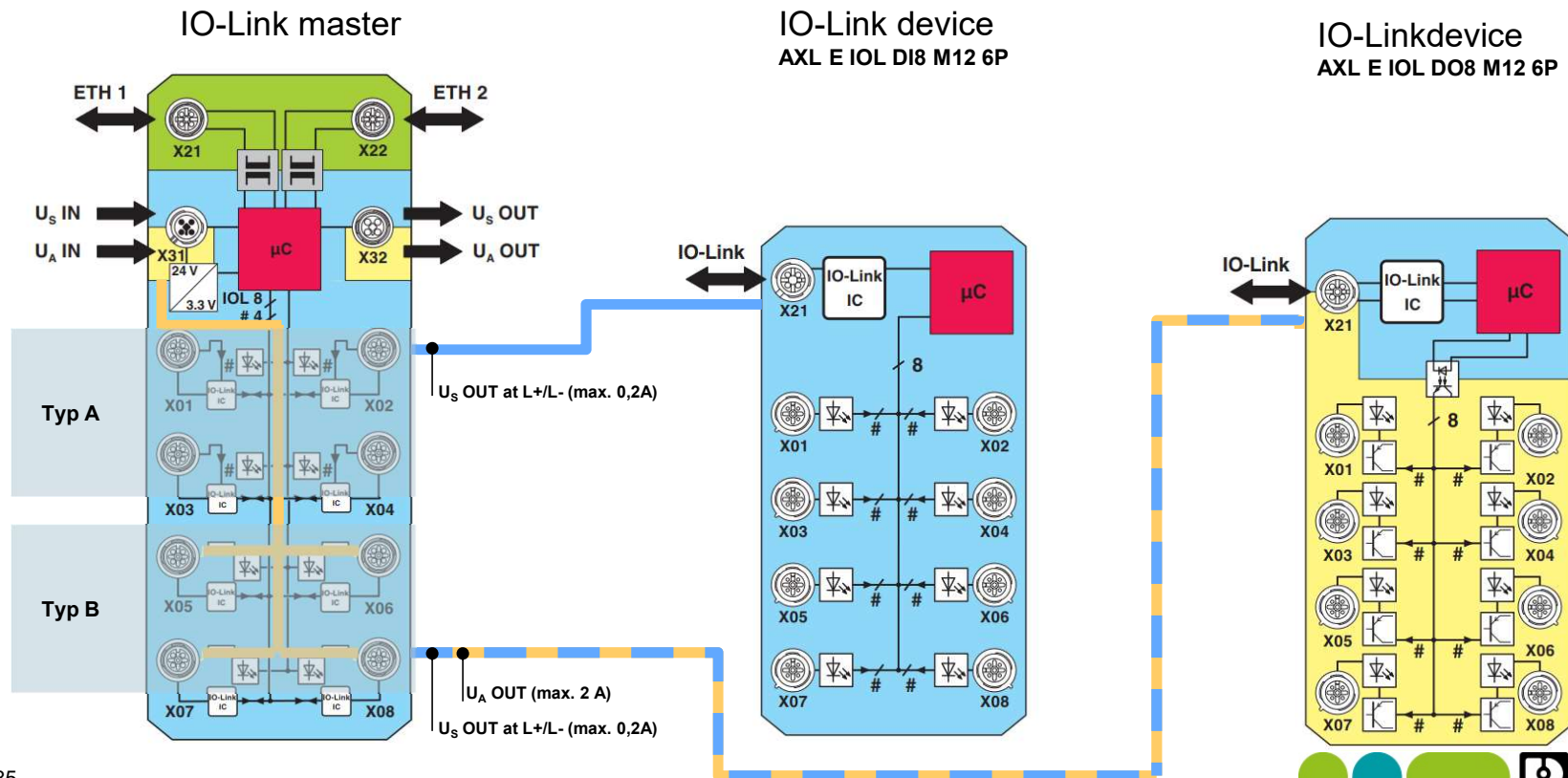
Axioline E xxx IOL8 DI4

- Degree of protection IP65/67
- Metal and plastic housing
- Available for all leading industrial protocols
- IO-Link spec.
 - Acc. IO-Link spec V 1.1
 - 4 Type A ports
 - 4 Type B ports
- 4 Additional DI's onboard



IO-Link

Power supply concept IO-Link



IO-Link

IO-Link devices – digital I/O boxes

- Variants:
 - 8 digital inputs
 - 8 digital outputs, 500 mA
- Technical design:
 - 8 x M12
 - 60 mm width



IO-Link

IO-Link devices – Analog communication

Axioline E IOL1 xxx

- Analog converters using IO-Link as communication protocol
- Straight or rectangular design
- IO-Link spec V 1.1
- 12 Bit resolution
- Available functions:
 - AI-I 4-20mA
 - AI-U 0-10V
 - AO-I 4-20mA
 - AO-U 0-10V
 - RTD (PT100/PT1000)



Application benefits

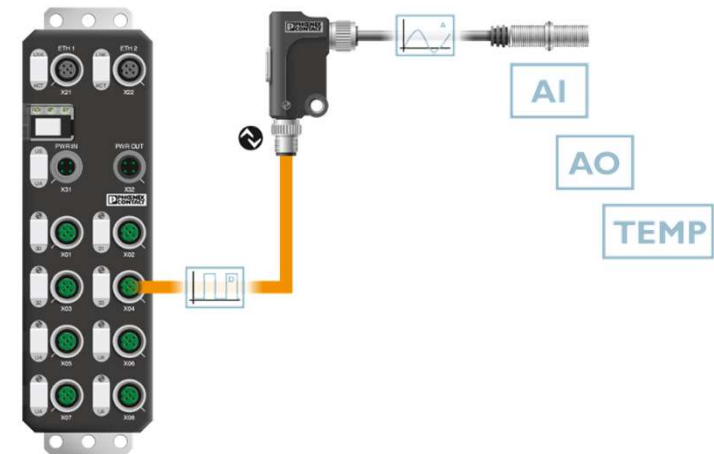
IO-Link

IO-Link-Devices - Analog communication

- Capture and output analog signals via IO-Link and analog converters
- M12-connection method for direct assembly at sensor or actuator

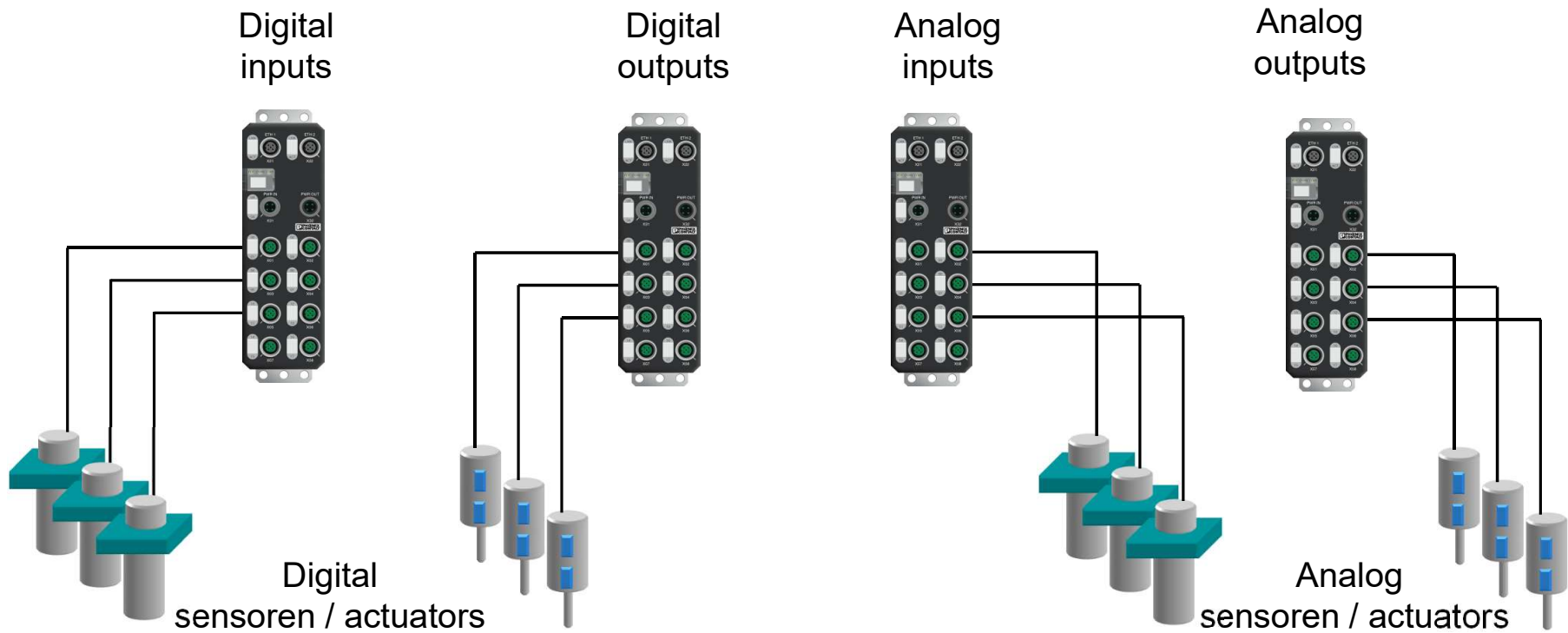
Advantages:

- ✓ No longer need of shielded cables due to digital data transmission
- ✓ Enhanced EMC behaviour
- ✓ Needs-based use of analog function at the device
- ✓ One end device for all signals will reduce storage cost



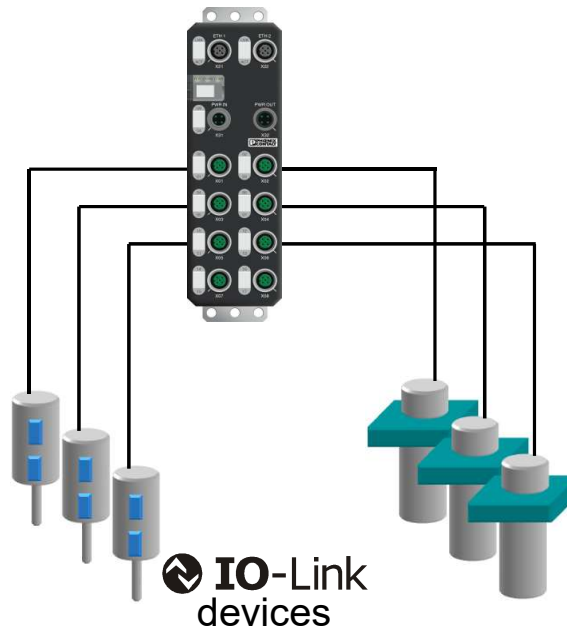
IO-Link

Standardisation of the decentralized periphery



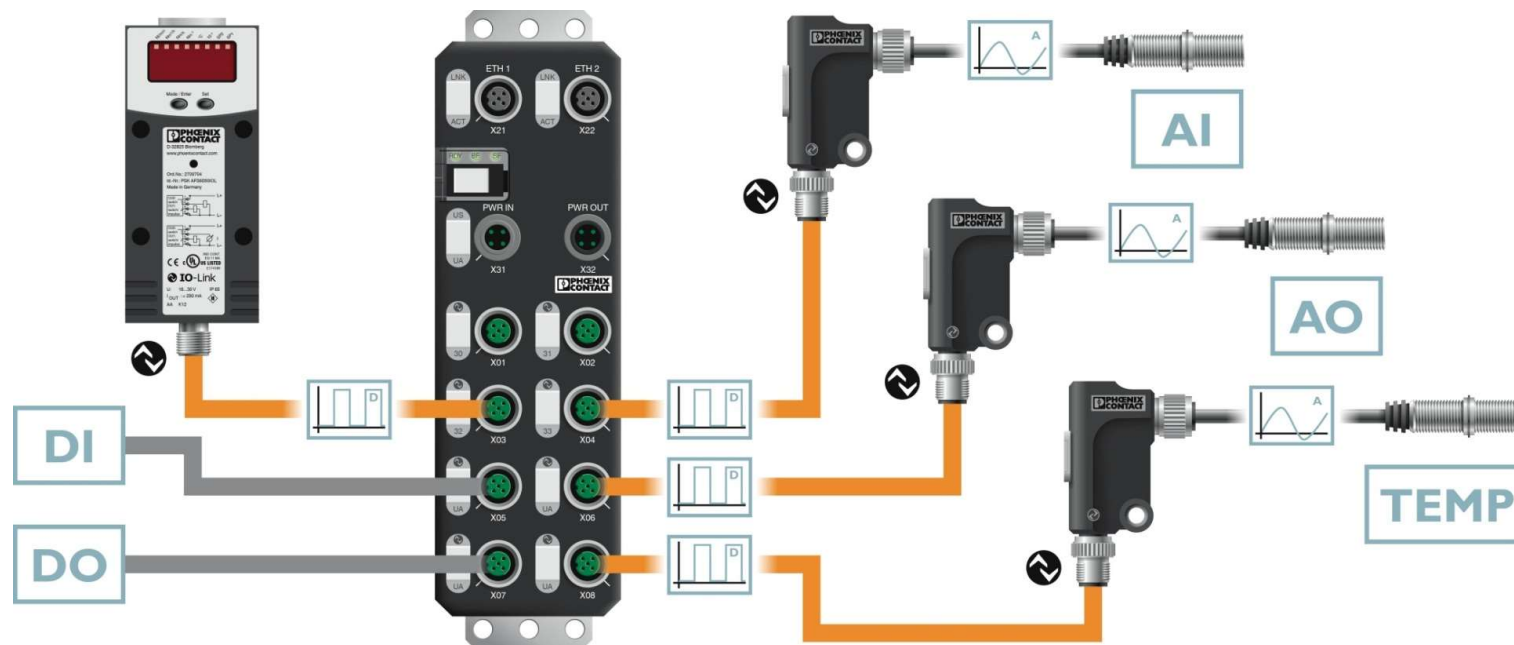
IO-Link

Standardisation of the decentralized periphery



IO-Link

One device– numerous possibilities



IO-Link als Basistechnologie

IO-Link

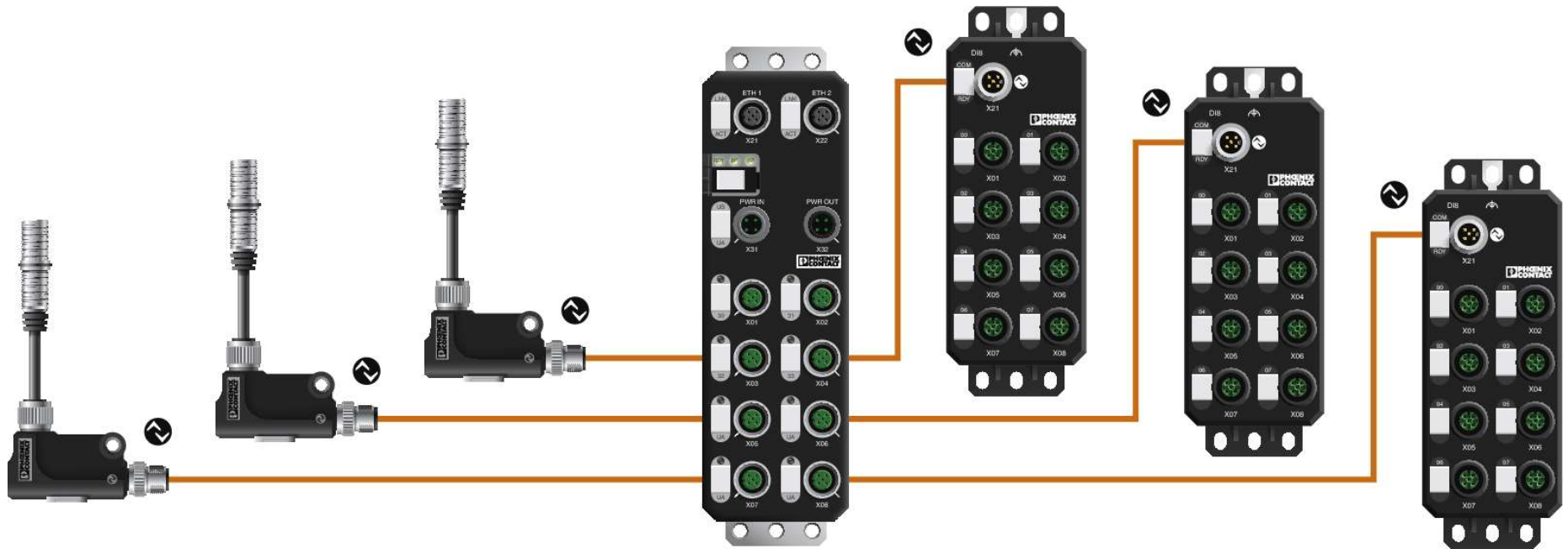
Configuration possibilities

Configurations*	DI	DO	IO-Link
IOL8 DI4	4	0	8
DI12	12	0	0
DI4 DO8	4	8	0
IOL4 DI8	8	0	4
IOL4 DI4 DO4	4	4	4
IOL2 DI4 DO6	4	6	2
IOL2 DI8 DO2	8	2	2
IOL6 DI4 DO2	4	2	6

* This overview does not display every configuration

IO-Link

Modularity in the field

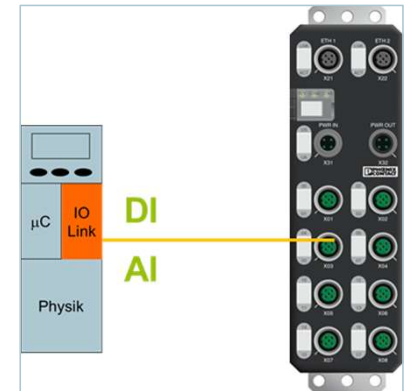


IO-Link devices extend the functional scope of an Axioline E device

IO-Link

Reducing the installation effort

- Data transfer of different signals in only one unshielded 3-wire cable
- Reduced cabling and dimensions of the field device for more diagnosis and functionality

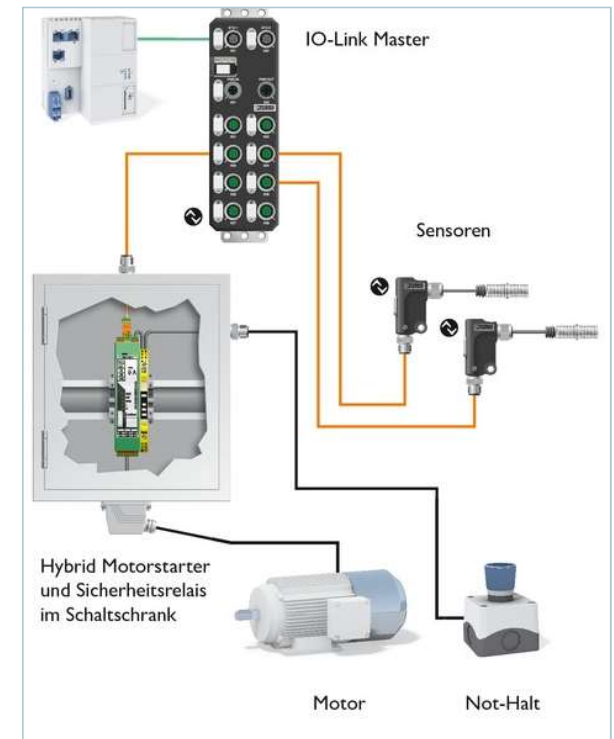


Further IO-Link devices

Hybrid motor starter CONTACTRON with IO-Link

Switch and reverse motors quickly and reliably with the CONTACTRON hybrid motor starters. The new linkable variants enable continuous communication between the field and controller levels so that process data can be transferred easily.

- IO-Link interface for direct connection and transmission of process data
- Flexible use in central control cabinet and in the decentralized control box
- Increased system availability, thanks to service intervals based on process data
- Low-wear switching using hybrid technology
- Compact design saves space in the application

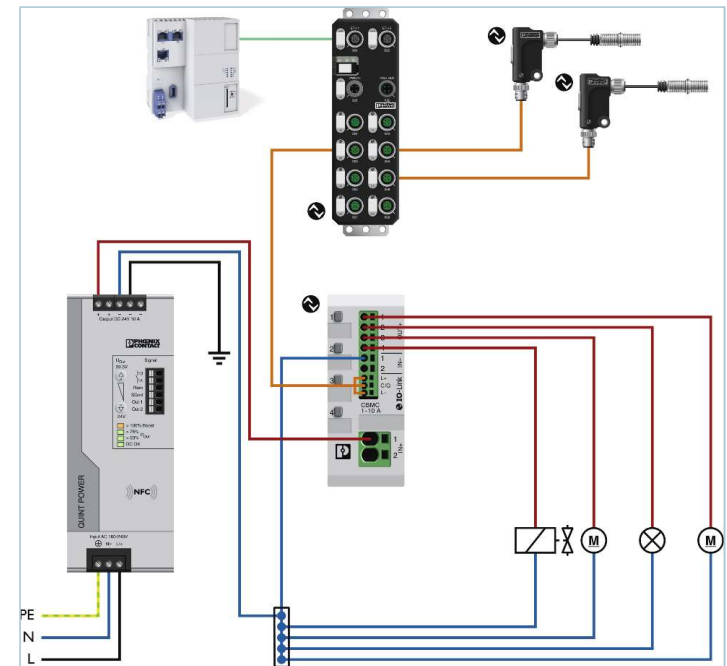


Further IO-Link devices

Multi-channel electronic circuit breakers with IO-Link

The new electronic CBMC device circuit breakers combine compact design and the ability to be adjusted individually. This circuit breaker can easily and flexibly adjust currents, save space, and reliably protect all applications with just one device.

- Four independent channels
- Nominal current adjustable in 1 A increments
- Floating remote indication contact
- Individual marking options
- Electronic protection of overload and short-circuit currents
- Rated voltage: 24 V DC
- Push-in connection

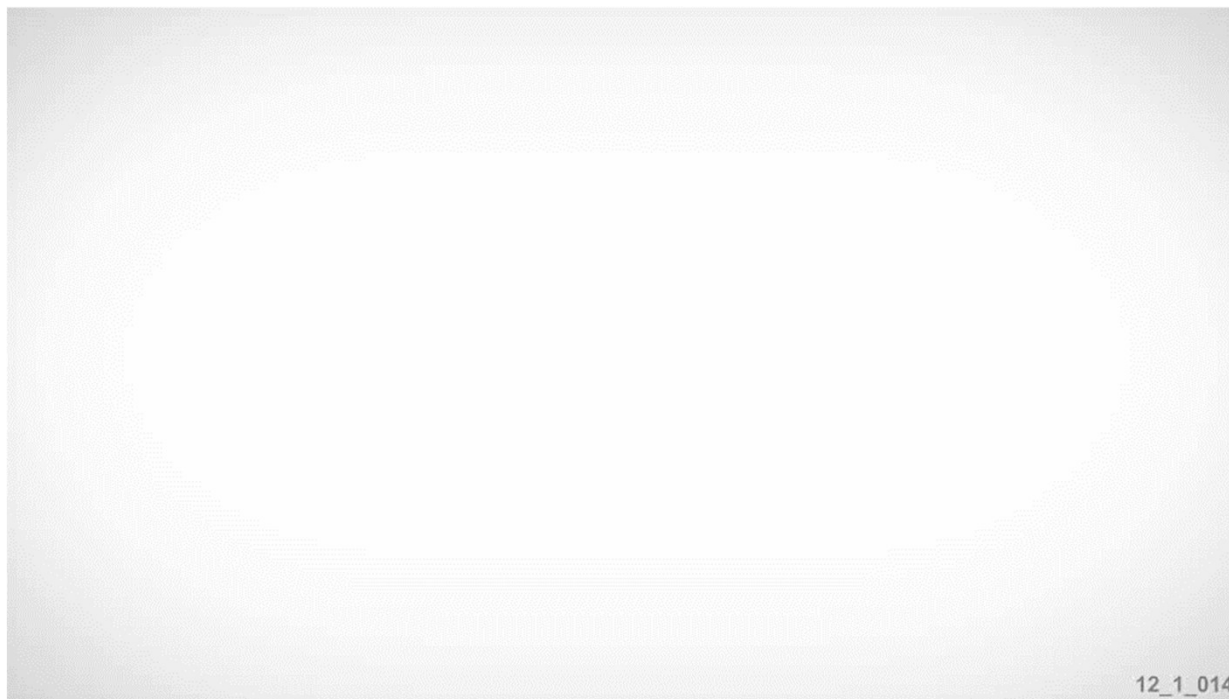


Sistemas de Control

Axioline E

Link

Axioline E Connecting
With IO-Link



Link

Axioline E
DIO 16

Videos Axioline E Application

Webinar IMA 2020

Mayor información



Phoenix Contact, S.A. de C.V.
Lago Alberto 319 Piso 9,
Locales 902 y 903-A,
Col. Granada Del. Miguel Hidalgo,
Ciudad de México. 11520
Tel.: +52 55 1101 1380 Ext. 393
Cel.: +52 55 3233 6518
agordillo@phoenixcontact.com.mx
www.phoenixcontact.com.mx

Ing. Antonio Gordillo
Infrastructure and Systems Automation
Product Marketing Manager

www.phoenixcontact.com.mx

ventas@phoenixcontact.com.mx

55 1101 1380

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