AXL F AI4 I XC 1H - Analog module

2702007

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CRA-READY



The figure shows the standard item

Axioline F, Analog input module, Analog inputs: 4, 0 mA ... 20 mA, 4 mA ... 20 mA, -20 mA ... 20 mA, connection technology: 2-, 3-, 4-conductor, transmission speed in the local bus: 100 Mbps, integrated sensor supply, Extreme conditions version, degree of protection: IP20, including bus base module and Axioline F connectors; The product is being prepared for compliance with the Cyber Resilience Act (CRA).

Product description

The module is designed for use within an Axioline F station. It is used to acquire analog current signals.

Your advantages

- 4 analog, bipolar input channels for the connection of current signals
- Connection of sensors in 2-, 3-, and 4-conductor technology
- Current ranges: 0 mA ... 20 mA, 4 mA ... 20 mA, ±20 mA
- Simultaneous scanning of all channels by means of simultaneous sampling
- High crosstalk attenuation between the channels, thanks to separate signal paths
- Particularly robust against electromagnetic interference
- Device rating plate stored
- 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

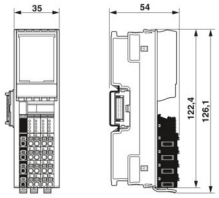


Commercial data

Item number	2702007
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DR02
Product key	DRI241
GTIN	4046356900997
Weight per piece (including packing)	217.8 g
Weight per piece (excluding packing)	145 g
Customs tariff number	85389091
Country of origin	DE

Technical data

Dimensions

Dimensional drawing	
Width	35 mm
Height	126.1 mm
Depth	54 mm
Note on dimensions	The depth applies when a TH 35-7.5 DIN rail is used (in accordance with EN 60715).

Notes

Note on application	Only for industrial use
Note on application	As things stand now, we are preparing the product so that, as of December 11, 2027, it will comply with the requirements of the EU Cyber Resilience Act (CRA) based on the information currently available regarding the CRA.

Utilization restriction

EMC note	EMC: class A product, see manufacturer's declaration in the download area

Mounting

Mounting type	DIN rail mounting
Mounting position	any (no temperature derating)

Material specifications

Color (Housing)	gray (RAL 7042)

Interfaces

Axioline F local bus

Number of interfaces	2
Connection method	Bus base module
Transmission speed	100 Mbps

System properties

Programming data

Input address area	8 Byte
Output address area	0 Byte

Fieldbus data telegram (PROFIBUS)

Required parameter data	7 Byte
Required configuration data	6 Byte

Input data

Analog:

Input name	Analog inputs
Description of the input	Differential inputs, current
Number of inputs	4
Connection method	Push-in connection
Connection technology	2-, 3-, 4-conductor
Note regarding the connection technology	shielded
Process data update	160 µs
A/D conversion time	31.25 µs
A/D converter resolution	16 bit
Limit frequency (3 dB)	30 Hz
	12 kHz
Wire-break behavior	Going to 0 mA; open-circuit detection from 4 mA ... 20 mA
Protective circuit	Transient protection of inputs; Suppressor diode
	Overload protection of the inputs; No; ±5.2 V DC, maximum, I_{max} = 50 mA
Measured value representation	16 bits (15 bits + sign bit)
Data formats	IB IL, S7-compatible
Current input signal	0 mA ... 20 mA
	4 mA ... 20 mA
	-20 mA ... 20 mA
Input resistance current input	104 Ω (typical)
Tolerance, absolute (V)	see tables for tolerance values
Tolerance, relative	typ. 0.1 % (of upper range value for active mean value generation and 30 Hz filter)
	see tables for tolerance values
Input filter	30 Hz, 12 kHz and mean value generation (can be parameterized)

Product properties

Product type	I/O component
Product family	Axioline F
Type	block modular
Mounting position	any (no temperature derating)
Scope of supply	including bus base module and Axioline F connectors
Special properties	The product is being prepared for compliance with the Cyber Resilience Act (CRA)
	integrated sensor supply
	Extreme conditions version

Insulation characteristics

Overvoltage category	II (IEC 60664-1, EN 60664-1)
Pollution degree	2 (IEC 60664-1, EN 60664-1)

Electrical properties

Maximum power dissipation for nominal condition	2 W

Potentials: Axioline F local bus supply (U_{Bus})

Supply voltage	5 V DC (via bus base module)
Current draw	max. 150 mA
	typ. 120 mA

Potentials: Supply for analog modules (U_A)

Supply voltage	24 V DC (I/O supply and sensor supply)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current draw	max. 245 mA (I_{iS} = 4 x 50 mA (full load))
	max. 45 mA (I_{iS} = 0 mA)
	typ. 118 mA (I_{iS} = 4 x 20 mA (nominal load))
	max. 125 mA (I_{iS} = 4 x 20 mA (nominal load))
	typ. 238 mA (I_{iS} = 4 x 50 mA (full load))
Current consumption	typ. 38 mA (I_{iS} = 0 mA)
Protective circuit	Surge protection; electronic (35 V, 0.5 s)
	Reverse polarity protection; up to HW 02: polarity protection diodefrom HW 03: parallel diode; with external 5 A fuse (for startup only)
	Transient protection; Suppressor diode

Supply:

Designation	Sensor supply U_{iS}
Supply voltage	24 V DC (from U_A)
Current consumption	max. 50 mA (per channel)

Electrical isolation/isolation of the voltage ranges

Test voltage: 5 V supply of the local bus (U_{Bus}) / 24 V supply (I/Os)	500 V AC, 50 Hz, 1 min
Test voltage: 5 V supply of the local bus (U_{Bus}) / analog inputs	500 V AC, 50 Hz, 1 min
Test voltage: 5 V supply of the local bus (U_{Bus}) / functional ground	500 V AC, 50 Hz, 1 min
Test voltage: 24 V supply (I/O) / analog inputs	500 V AC, 50 Hz, 1 min
Test voltage: 24 V supply (I/O) / functional ground	500 V AC, 50 Hz, 1 min
Test voltage: Analog inputs / functional ground	500 V AC, 50 Hz, 1 min

Connection data

Connection technology

Connection name	Axioline F connector

Note on the connection method	Please observe the information provided on conductor cross-sections in the “Axioline F: system and installation” user manual.

Axioline F connector

Connection method	Push-in connection
Note on the connection method	Please observe the information provided on conductor cross-sections in the “Axioline F: system and installation” user manual.
Conductor cross-section, rigid	0.2 mm² ... 1.5 mm²
Conductor cross-section, flexible	0.2 mm² ... 1.5 mm²
Conductor cross-section AWG	24 ... 16
Stripping length	8 mm

Environmental and real-life conditions

Ambient conditions

Ambient temperature (operation)	-25 °C ... 60 °C (Standard, applications with UL approval, use in zone 2 potentially explosive area)
	-40 °C ... 70 °C (Extended, see section “Tested successfully: use under extreme ambient conditions” in the data sheet.)
Degree of protection	IP20
Air pressure (operation)	70 kPa ... 106 kPa (up to 3000 m above sea level)
Air pressure (storage/transport)	70 kPa ... 106 kPa (up to 3000 m above sea level)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	5 % ... 95 % (non-condensing)

Mechanical test

Vibration resistance in accordance with EN 60068-2-6/IEC 60068-2-6	5g
Shock in accordance with EN 60068-2-27/IEC 60068-2-27	30g
Continuous shock in accordance with EN 60068-2-27/IEC 60068-2-27	10g

Test (noxious gas)

Test standard	ISA-71.04-2013 G3 Harsh Group A
	IEC 60068-2-60:2015 Method 4
Temperature	25 °C ±1 K
Humidity (relative)	75 % ±3 %
Test duration	21 Days
Volume concentration H_2S (Hydrogen sulfide)	50 ppb
Volume concentration NO_2 (Nitrogen dioxide)	1250 ppb
Volume concentration Cl_2 (Chlorine)	10 ppb
Volume concentration SO_2 (Sulfur dioxide)	300 ppb

Standards and regulations

Protection class	III (IEC 61140, EN 61140, VDE 0140-1)

Approvals

ATEX

Identification	Ⓔx II 3 G Ex ec IIC T4 Gc
Certificate	UL 20 ATEX 2441X

IECEx

Identification	Ex ec IIC T4 Gc
Certificate	IECEx ULD 20.0026X

UL, USA/Canada

Identification	cULus
Certificate	E238705

UL Ex, USA / Canada

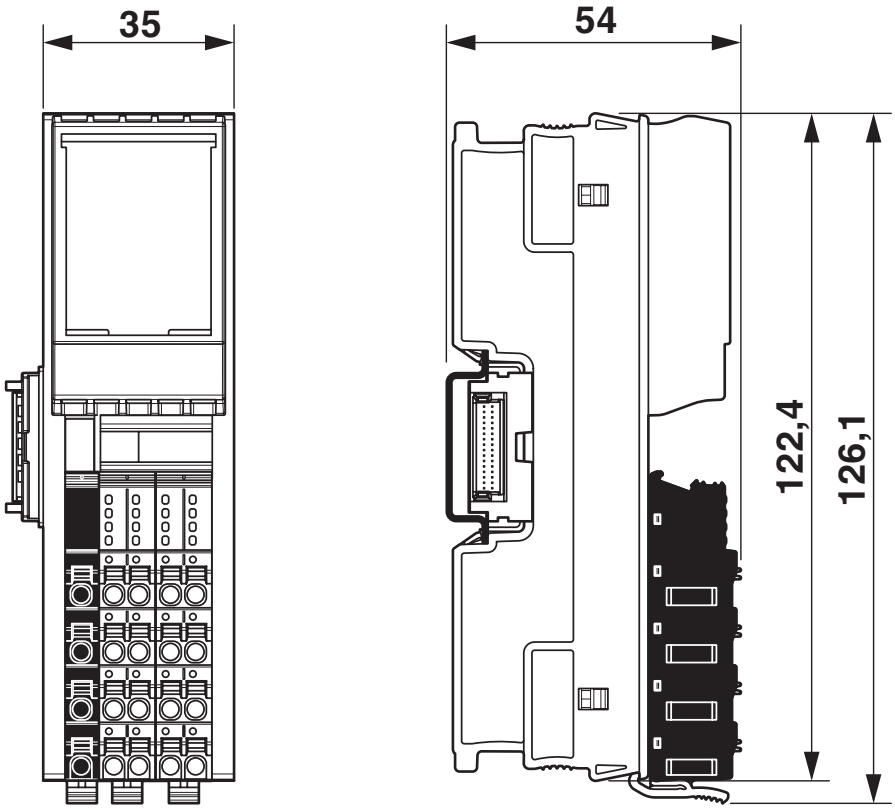
Identification	Class I, Zone 2, AEx ec IIC T4
	Class I, Division 2, Groups A, B, C, and D, T4
	Ex ec IIC T4 Gc X
Certificate	E366272

CCC / China-Ex

Identification	Ex ec IIC T4 Gc
Certificate	

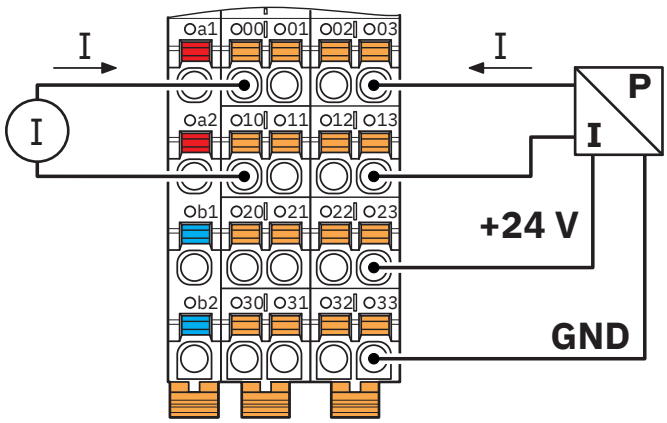
Drawings

Dimensional drawing



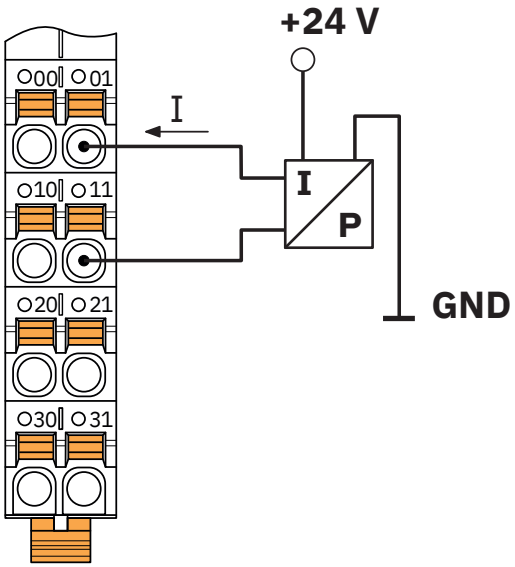
Dimensional drawing

Connection diagram



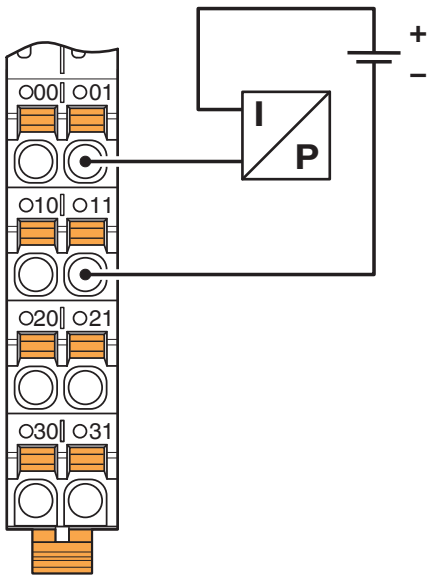
Connection for current measurment

Connection diagram



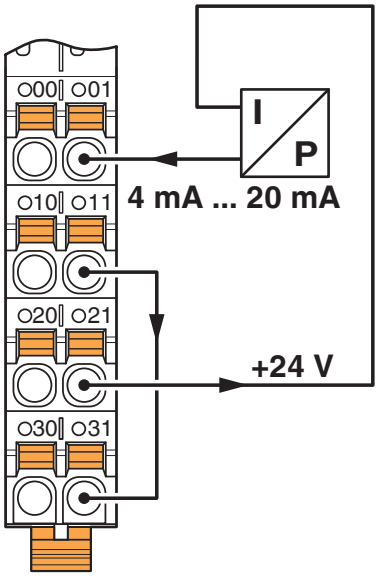
Active pressure sensor at a differential current input

Connection diagram



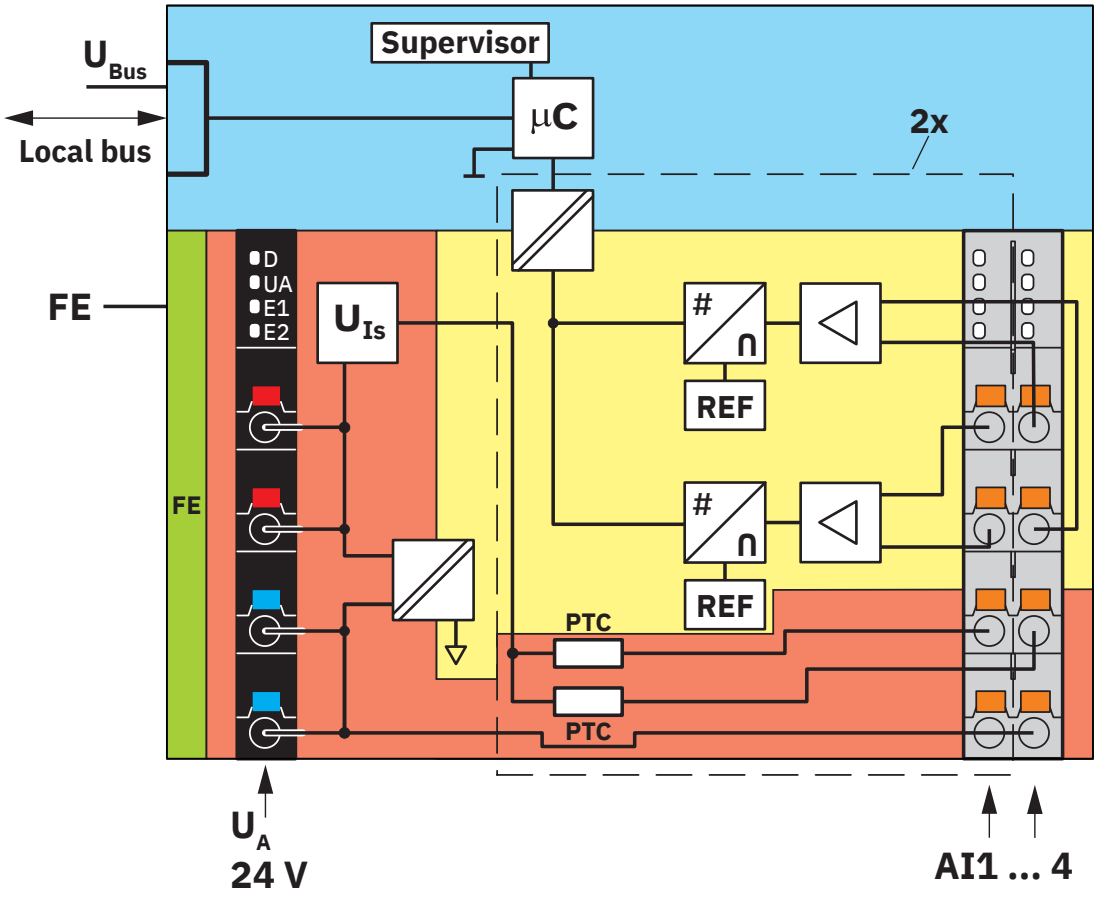
Differential current input with passive 2-conductor transmitter (current loop)

Connection diagram



Differential current input with passive 2-conductor transmitter (current loop)

Block diagram



Internal wiring of the terminal points

Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2702007

DNV GL
Approval ID: TAA00000DF

LR
Approval ID: LR2480202TA-02

BSH
Approval ID: 840c

RINA
Approval ID: ELE008423XG001

ABS
Approval ID: 23-2449604-PDA

cULus Listed
Approval ID: E238705

IECEx
Approval ID: IECEx ULD 20.0026X

ATEX
Approval ID: UL 20 ATEX 2441X

cULus Listed
Approval ID: E366272

CCC
Approval ID: 2021122309114456

Classifications

ECLASS

ECLASS-13.0	27242601
ECLASS-15.0	27242601

ETIM

ETIM 10.0	EC001596

UNSPSC

UNSPSC 21.0	32151600

Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	9bcf0b4f-5acf-49f3-9081-6c46b7266855

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https://www.phoenixcontact.com

Phoenix Contact USA
586 Fulling Mill Road
Middletown, PA 17057, United States
(+717) 944-1300
info@phoenixcon.com