

AXL F EX IS RTD8 XC 1F - Temperature module



1397158

<https://www.phoenixcontact.com/us/products/1397158>

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Axioline F, Temperature recording module, Analog inputs: 8 (for resistance temperature detectors), connection technology: 2-, 3-, 4-conductor (shielded), transmission speed in the local bus: 100 Mbps, RTD functionality, intrinsically safe, 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 an Axioline F I/O module for use in the Axioline F modular I/O system. The module is a modular I/O device that can be affixed to the Axioline F local bus, to communicate I/O data up to the Axioline F controller or bus coupler, which forms the head of the station. It is used to acquire signals from resistive temperature sensors. The module supports all common platinum and nickel sensors in accordance with DIN EN 60751 and SAMA. Cu10, Cu50, Cu53 sensors as well as various KTY8x sensor types are also supported. As an intrinsic safety I/O module, this device allows direct connection from intrinsically safe field I/Os to the terminals of the module.

Your advantages

- 8 analog input channels for the connection of resistance temperature detectors (RTD)
- 500 Ω , 5 k Ω , and 10 k Ω linear inputs
- Connection of sensors in 2-, 3-, and 4-conductor technology
- Integrated, digital sensor linearization
- Standardized measured value representation directly in $^{\circ}\text{C}$, $^{\circ}\text{F}$ or Ω
- Measured value display in 16-bit format or floating point format
- Programmable filters
- Short-circuit protected inputs
- Temperature stability
- Very high level of noise immunity
- Low noise emission
- Can be used under extreme ambient conditions
- Extended temperature range of -40°C ... $+70^{\circ}\text{C}$
- Partially coated PCBs
- Device rating plate stored

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Commercial data

Item number	1397158
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DR02
Product key	DRI2E8
GTIN	4063151779863
Weight per piece (including packing)	416.4 g
Weight per piece (excluding packing)	278 g
Customs tariff number	85176200
Country of origin	US

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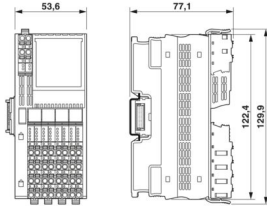


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Technical data

Dimensions

Dimensional drawing	
Width	53.6 mm
Height	129.9 mm
Depth	77.1 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	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)
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Interfaces

Axioline F local bus

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

System properties

Programming data (LocalbusSlave)

Input address area	16 Byte
Output address area	0 Byte

Fieldbus data telegram (PROFIBUS)

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Required parameter data	28 Byte
Required configuration data	6 Byte

Input data

Analog:

Input name	Analog inputs
Description of the input	Inputs for resistive temperature sensors
Number of inputs	8 (for resistance temperature detectors)
Connection method	Push-in connection
Connection technology	2-, 3-, 4-conductor (shielded)
A/D converter resolution	24 bit
Sensor types (RTD) that can be used	Pt, Ni, KTY, Cu sensors
Tolerance, relative	see tables for tolerance values
Tolerance, absolute	typ. ± 0.1 K (Pt 100 with 3-wire connection) see tables for tolerance values
Data formats	Inline, S7-compatible, standard formatting
Measured value representation	16 bits (15 bits + sign bit)
Input filter time	40 ms 60 ms 100 ms 120 ms (adjustable)
Nominal value of the current sources	1 mA (Pt 100, Ni 100, R_{Lin} 500 Ω ; pulse current, the specification is valid during the sampling phase) 210 μ A (Pt 1000, Ni 1000, R_{Lin} 5000 Ω ; pulse current, the specification is valid during the sampling phase) 10 μ A (R_{Lin} 10000 Ω ; pulse current, the specification is valid during the sampling phase)
Differential non-linearity	typ. 1 ppm ± 0.0001 % (in all ranges)
Integral non-linearity	typ. 30 ppm ± 0.003 % (Pt 100) typ. 20 ppm ± 0.02 % (R_{Lin} 500 Ω) typ. 200 ppm ± 0.02 % (R_{Lin} 5000 Ω) typ. 800 ppm ± 0.08 % (R_{Lin} 10000 Ω)
Linear resistance measuring range	0 Ω ... 500 Ω 0 k Ω ... 5 k Ω 0 k Ω ... 10 k Ω
Process data update	1 ms
Protective circuit	Short-circuit protection

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

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Special properties	The product is being prepared for compliance with the Cyber Resilience Act (CRA)
	RTD functionality
	intrinsically safe
	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	1.07 W
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Potentials: Axioline F local bus supply (U_{BUS})

Supply voltage	5 V DC (via bus base module)
Current draw	max. 60 mA
	typ. 40 mA

Potentials: Supply for analog modules (U_A)

Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC
Current draw	max. 40 mA
Protective circuit	Surge protection; electronic (35 V, 0.5 s)
	Reverse polarity protection; Polarity protection diode
	Transient protection; Suppressor diode

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, 60 Hz, 1 min
Test voltage: 5 V supply of the local bus (U_{BUS}) / functional ground	500 V AC, 60 Hz, 1 min
Test voltage: 5 V supply of the local bus (U_{BUS}) / analog inputs	1500 V AC, 60 Hz, 1 min
Test voltage: 24 V supply (I/O) / functional ground	500 V AC, 60 Hz, 1 min
Test voltage: 24 V supply (I/O) / analog inputs	1500 V AC, 60 Hz, 1 min
Test voltage: Analog inputs / functional ground	500 V AC, 60 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 mm ² ... 1.5 mm ²

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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) -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

Standards and regulations

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

ATEX

Identification	II 3(1) G Ex ec [ia Ga] IIC T4 Gc II (1) D [Ex ia Da] IIIC
Certificate	DEMKO 20 ATEX 2370X

IECEX

Identification	Ex ec [ia Ga] IIC T4 Gc [Ex ia Da] IIIC
Certificate	IECEX UL 20.0044X

UL, USA/Canada

Identification	cULus
Certificate	E238705

UL Ex, USA / Canada

Identification	Class I, Division 2, Groups A, B, C, D, T4 Intrinsically safe connections to: Class I, Groups A, B, C, D; Class II, Groups E, F, G; Class III; [Ex ia] Haz loc Class I, Zone 2, AEx ec [ia Ga] IIC T4 Gc [AEx ia Da] IIIC
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Certificate	Ex ec [ia Ga] IIC T4 Gc
	[Ex ia Da] IIIC
	E196811

CCC / China-Ex

Identification	Ex ec [ia Ga] IIC T4 Gc
	[Ex ia Da] IIIC

Ex data

Safety data

Max. output voltage U_o	10.6 V
Max. output current I_o	16.8 mA
Max. output power P_o	45 mW
Safety-related maximum voltage U_m	250 V
A, B / IIC: Max. external inductivity L_o / Max. external capacitance C_o	100 mH / 2.3 μ F
C/IIB, IIIC: Max. external inductivity L_o / Max. external capacitance C_o	100 mH / 16.2 μ F
D/IIA, E, F, G, Class III: Max. external inductivity L_o / Max. external capacitance C_o	100 mH / 72 μ F

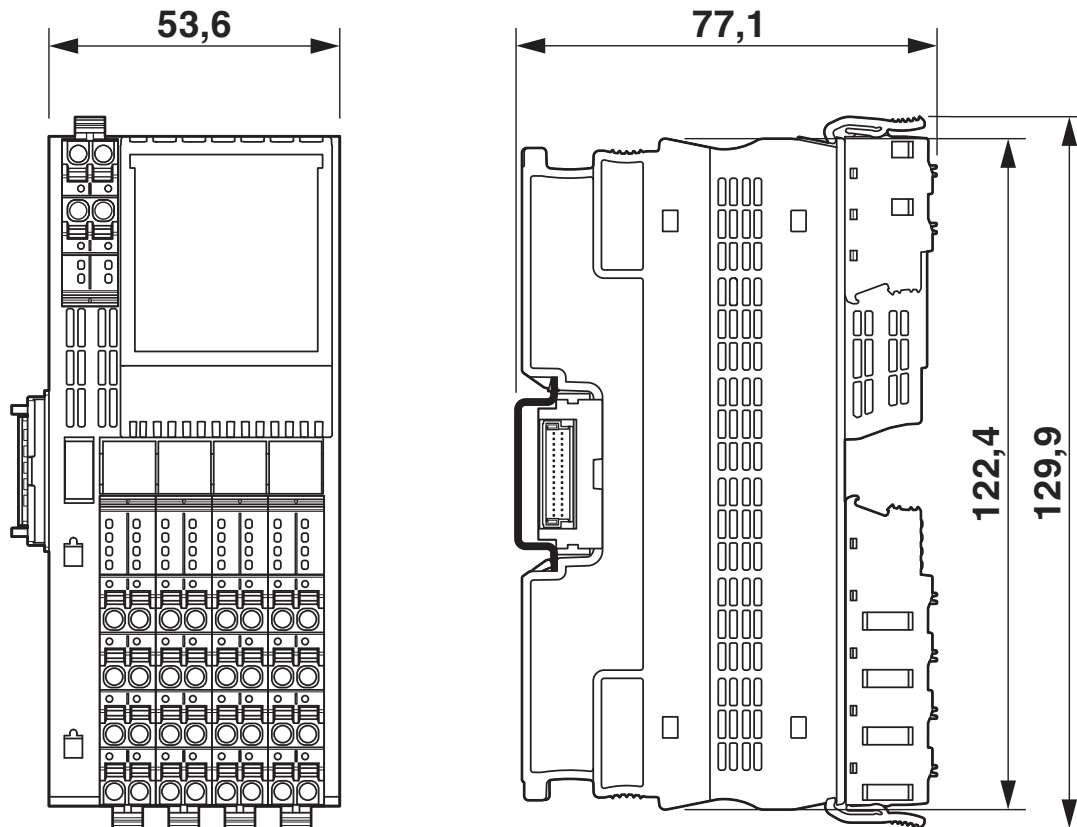
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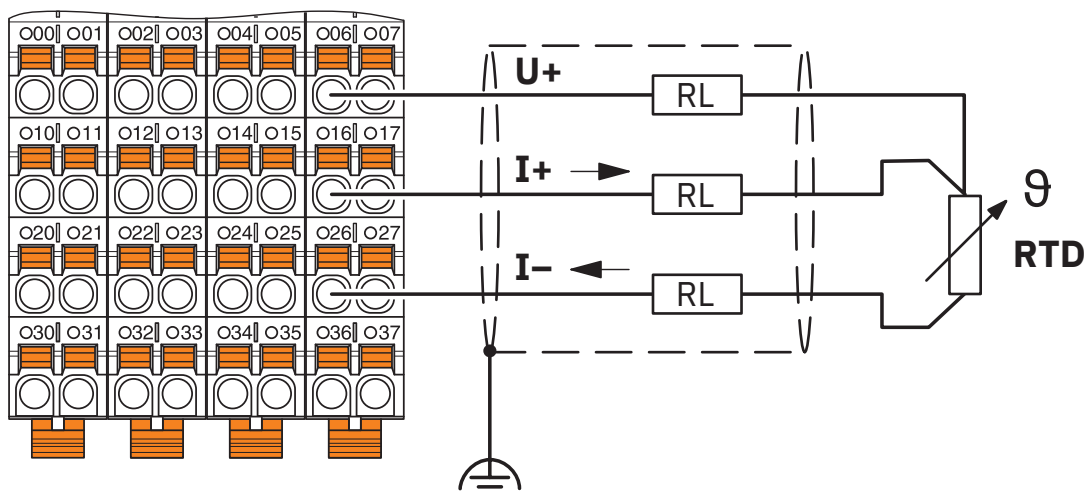
Drawings

Dimensional drawing



Dimensional drawing

Connection diagram



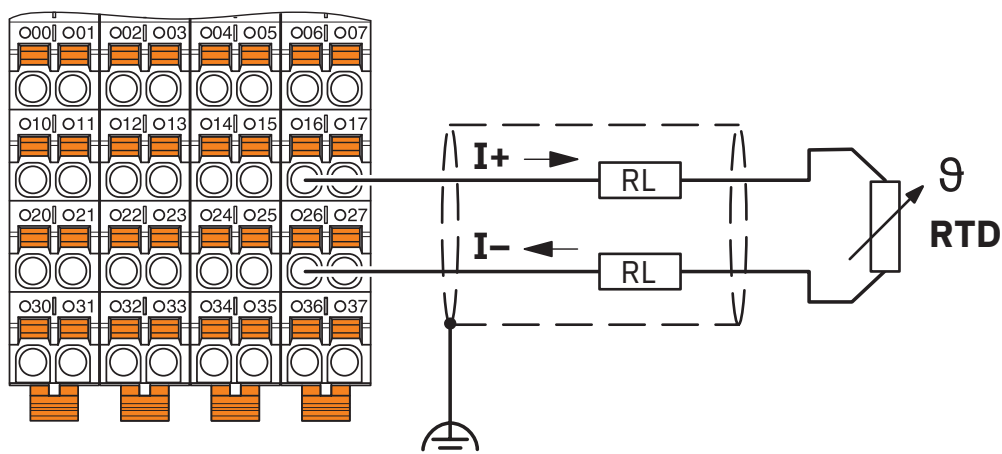
Connection example: 4-conductor connection

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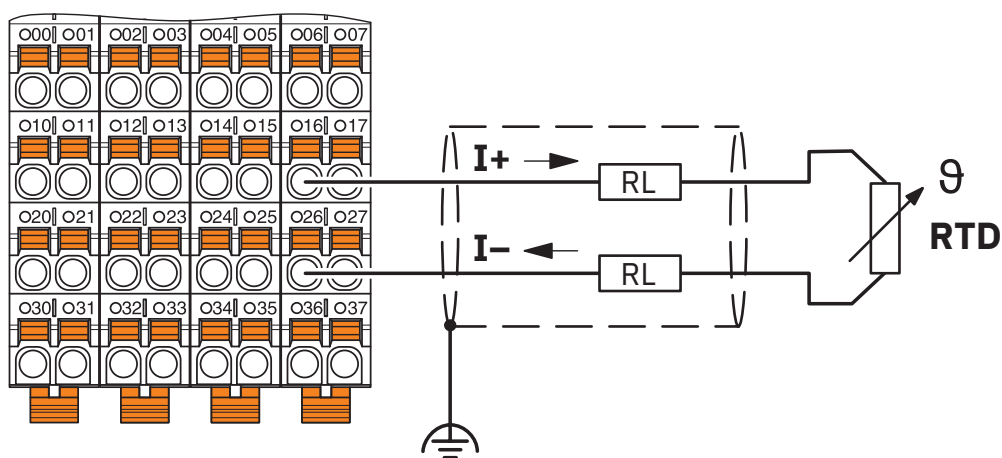
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Connection diagram



Connection example: 3-conductor connection

Connection diagram



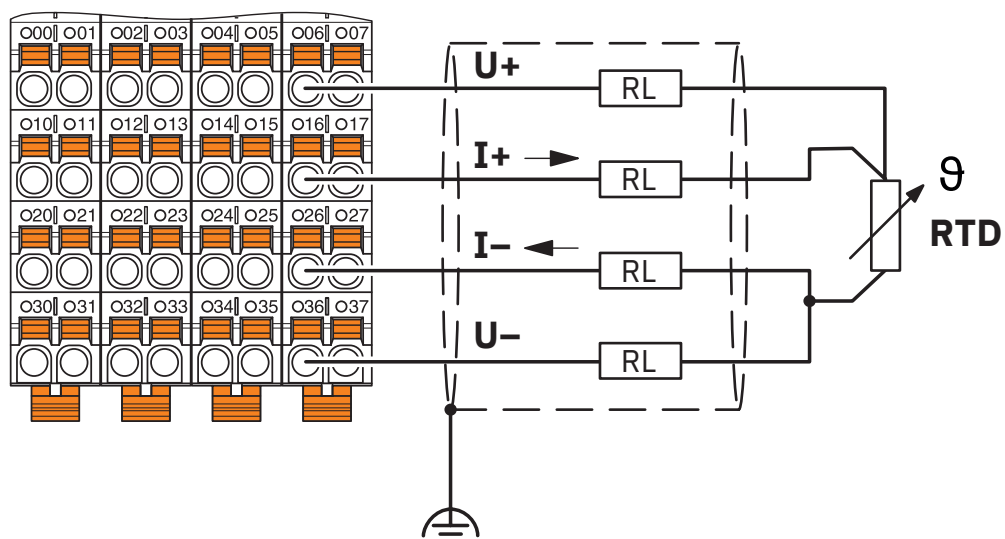
Connection example: 2-conductor connection

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Connection diagram



Connection example: 4-conductor connection for 3-conductor sensor with very long supply lines (> 100 m)

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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1397158>



cULus Listed

Approval ID: E238705



IECEx

Approval ID: IECEx UL 20.0044X



cUL Listed

Approval ID: FILE E196811



UL Listed

Approval ID: FILE E196811



ATEX

Approval ID: DEMKO 20 ATEX 2370X



CCC

Approval ID: 2024122309122109

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Classifications

ECLASS

ECLASS-13.0	27242601
ECLASS-15.0	27242601

ETIM

ETIM 10.0	EC001596
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UNSPSC

UNSPSC 21.0	32151600
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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-25
	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)
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