

## I/O module - AXL F UTH4 1H - 2688598

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Axioline F temperature module, 4 inputs for connection of thermocouple sensors (including bus base module and connectors)

### Product description

The module is designed for use within an Axioline station.

It is used to acquire signals from standard thermocouples in industrial applications.

The module supports various types of thermocouple conforming to DIN EN 60584-1 and DIN 46710 as well as linear voltages from -100 mV to +100 mV.

It also offers a voltage input from -5 V to +5 V. Heating currents can be monitored here, for example, using a measuring transducer.

Both Pt 100 inputs (CJ1 and CJ2) can each be used as a sensor input or as an external cold junction.

### Product Features

- ✓ 4 analog input channels to connect thermocouples or linear voltages from -100 mV to +100 mV
- ✓ 1 analog input channel for the connection of voltages from -5 V to +5 V
- ✓ Connection of sensors in 2-wire technology
- ✓ Internal detection and compensation of cold junction temperature (configurable)
- ✓ External connection of Pt 100 cold junction sensors possible
- ✓ High level of accuracy (typically  $\pm 0.01$  % sensor type K)
- ✓ High level of accuracy, even in various mounting positions, thanks to built-in space compensation of the internal cold junction
- ✓ High temperature stability (typically 5 ppm/K)
- ✓ High temperature stability (typically 8 ppm/K)
- ✓ High resistance to electromagnetic interference (Class A)
- ✓ "Channel Scout" function
- ✓ Device rating plate stored
- ✓ Diagnostic and status indicators
- ✓ Installation monitoring with indication via diagnostic LED for each channel



### Key commercial data

Packing unit	1 pc
Weight per Piece (excluding packing)	200.0 GRM
Custom tariff number	85389091
Country of origin	Germany

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## Technical data

### Dimensions

Width	35 mm
Height	126.1 mm
Depth	54 mm
Note on dimensions	The depth is valid when a TH 35-7.5 DIN rail is used (according to EN 60715).

### Ambient conditions

Ambient temperature (operation)	-25 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	5 % ... 95 % (non-condensing)
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)
Degree of protection	IP20

### Connection data

Designation	Axioline F connector
Connection method	Push-in technology
Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	1.5 mm <sup>2</sup>
Conductor cross section stranded min.	0.2 mm <sup>2</sup>
Conductor cross section stranded max.	1.5 mm <sup>2</sup>
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max	16
Stripping length	8 mm

### General

Weight	144 g
Note on weight specifications	with connectors and bus base module
Mounting type	DIN rail
Protection class	III, IEC 61140, EN 61140, VDE 0140-1
Test section	5 V communications power (logic), 24 V supply (I/O) 500 V AC 50 Hz 1 min
	5 V supply (logic)/functional earth ground 500 V AC 50 Hz 1 min
	24 V supply (I/O) / functional earth ground 500 V AC 50 Hz 1 min
Conformance with EMC directives	Noise immunity test in accordance with EN 61000-6-2 Electrostatic discharge (ESD) EN 61000-4-2/IEC 61000-4-2 Criterion B; 6 kV contact discharge, 8 kV air discharge
	Noise immunity test in accordance with EN 61000-6-2 Electromagnetic fields EN 61000-4-3/IEC 61000-4-3 Criterion A; Field intensity: 10 V/m

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### General

	Noise immunity test in accordance with EN 61000-6-2 Fast transients (burst) EN 61000-4-4/IEC 61000-4-4 Criterion A for shielded cables; 2 kV
	Noise immunity test in accordance with EN 61000-6-2 Transient surge voltage (surge) EN 61000-4-5/IEC 61000-4-5 Criterion B; supply lines DC: $\pm 0.5$ kV/ $\pm 0.5$ kV (symmetrical/asymmetrical); $\pm 1$ kV to shielded I/O cables
	Noise immunity test in accordance with EN 61000-6-2 Conducted interference EN 61000-4-6/IEC 61000-4-6 Criterion A; Test voltage 10 V
	Noise emission test according to EN 61000-6-3 Radio interference properties EN 55022 Class B
	Conducted noise emission test according to EN 55016-2-1 and EN 55016-1-2; 9 kHz ... 30 MHz Class A
Mechanical tests	Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6 5 g
	Shock in acc. with EN 60068-2-27/IEC 60068-2-27 30 g, 11 ms period, half-sine shock pulse
	Continuous shock according to EN 60068-2-27/IEC 60068-2-27 10 g

### Interfaces

Designation	Axioline F local bus
Connection method	Bus base module
Transmission speed	100 MBit/s

### Axioline potentials

Communications power $U_{Bus}$	5 V DC (via bus base module)
Current consumption from $U_{Bus}$	typ. 23 mA
	max. 40 mA
Supply of analog modules $U_A$	24 V DC
Current consumption from $U_A$	typ. 112 mA
	max. 160 mA

### Analog inputs

Number of inputs	4 +1 (4 inputs for thermocouples or linear voltage, plus 1 input -5 V to +5 V)
Input name	Analog inputs
Description of the input	Inputs for thermocouples or linear voltage
Connection method	Spring-cage connection with direct connector-in method
	2-wire (shielded, twisted pair)
Sensor types (RTD) that can be used	Pt 100 (2 external cold junctions, can also be used as a sensor input)
Sensor types that can be used (TC)	U, T, L, J, E, K, N, S, R, B, C, W, HK
Measuring principle	Sigma/Delta process
Measured value representation	16 bits (15 bits + sign bit)
Resolution A/D	24 bit

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### Analog inputs

Protective circuit	Short-circuit protection, overload protection of the inputs
Precision	typ. 0.01 % (Thermocouple type K, NiCr-Ni; see tables under tolerance values)
Input filter time	40 ms

## Classifications

### eCl@ss

eCl@ss 4.0	27240405
eCl@ss 4.1	27240405
eCl@ss 5.0	27242201
eCl@ss 5.1	27242601
eCl@ss 6.0	27242601
eCl@ss 7.0	27242601
eCl@ss 8.0	27242601

### ETIM

ETIM 3.0	EC001599
ETIM 4.0	EC001596
ETIM 5.0	EC001596

### UNSPSC

UNSPSC 6.01	43172015
UNSPSC 7.0901	43201404
UNSPSC 11	39121311
UNSPSC 12.01	39121311
UNSPSC 13.2	39121311

## Approvals

### Approvals

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Approvals

UL Listed / cUL Listed / cULus Listed

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Ex Approvals

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## Approvals

Approvals submitted

### Approval details

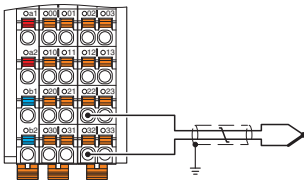
UL Listed

cUL Listed

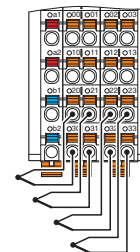
cULus Listed

## Drawings

Connection diagram



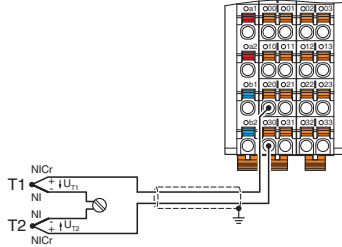
Connection diagram



Connection example: absolute temperature measurement

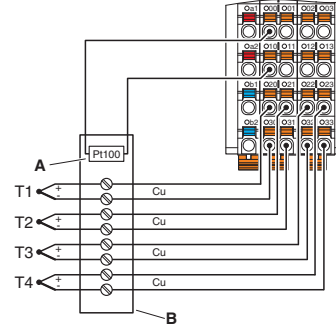
# I/O module - AXL F UTH4 1H - 2688598

Connection diagram



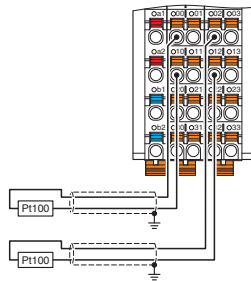
Differential temperature measurement

Connection diagram



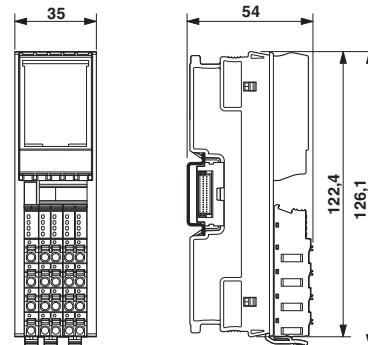
Thermocouple detection with external cold junction compensation at channel 1

Connection diagram

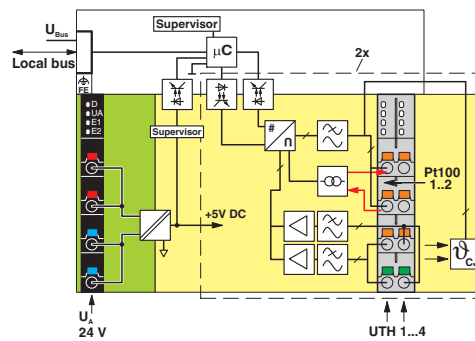


Pt 100 detection

Dimensioned drawing



Block diagram



Internal wiring of the terminal points

