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# AXL F CNT2 INC2 XC 1F - Function module

2701239

https://www.phoenixcontact.com/pc/products/2701239

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Axioline F, Function module, Counter inputs: 2, Incremental encoder input: 2, symmetrical encoders according to EIA-422 and asymmetrical encoders, Digital inputs: 8, 24 V DC, Digital outputs: 2, 24 V DC, Extreme conditions version, transmission speed in the local bus: 100 Mbps, degree of protection: IP20, including bus base module and Axioline F connectors

## Product description

The module is designed for use within an Axioline F station. On the one hand, it is used to acquire fast pulse sequences from sensors, and on the other hand to detect positions using incremental encoders. The module combines two counter inputs for the evaluation of fast counter pulses and two incremental encoder inputs for position detection.

## Your advantages

- 2 channels, selectable for each channel: counter function or position detection using incremental encoder
- Maximum input frequency: 300 kHz (one channel wired) or 100 kHz (both channels wired)
- 32-bit counter (up and down)
- Output control according to two limit values
- Counter: counting (source) is controlled via a control input (gate)
- Counter: single or periodic counting
- Incremental encoder acquisition: Acquisition of digital signals from symmetrical and asymmetrical incremental encoders
- Incremental encoder acquisition: evaluation of linear or rotary axes
- 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 | 2701239 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Product key | DRI263 |
| Catalog page | Page 92 (C-6-2019) |
| GTIN | 4046356730082 |
| Weight per piece (including packing) | 264.2 g |
| Weight per piece (excluding packing) | 233.9 g |
| Customs tariff number | 85389091 |
| Country of origin | DE |

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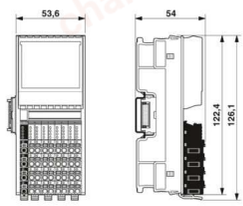
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## Technical data

### Dimensions

| | |
|---|---|
| Dimensional drawing |   |
| Width | 53.6 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

| | |
|---|---|
| Note on application | Only for industrial use |

Utilization restriction

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

### Interfaces

Axioline F local bus

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

### System properties

Module

| | |
|---|---|
| ID code (hex) | none |
| Input address area | 28 Byte |
| Output address area | 28 Byte |
| Required parameter data | 115 Byte |
| Required configuration data | 7 Byte |

### Input data

Digital:

| | |
|---|---|
| Input name | Digital inputs |
| Description of the input | EN 61131-2, type 3 |
| Number of inputs | 8 (CNT: G1, G2, Dir1, Dir2; INC: Ref1, Ref2, L1, L2) |

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| | |
|---|---|
| Connection method | Push-in connection |
| Connection technology | 1-conductor (optional 2, 3-conductor) |
| Input voltage range "0" signal | -3 V DC ... 5 V DC |
| Input voltage range "1" signal | 11 V DC ... 30 V DC |
| Nominal input voltage $U_{IN}$ | 24 V DC |
| Nominal input current at $U_{IN}$ | 2.5 mA (per channel) |

Encoder

| | |
|---|---|
| Number of inputs | 2 (A1, /A1, B1, /B1, Z1, /Z1; A2, /A2, B2, /B2, Z2, /Z2) |
| Input name | Incremental encoder input |
| Encoder signals | symmetrical encoders according to EIA-422 and asymmetrical encoders |
| Cable length | max. 30 m |

Counter:

| | |
|---|---|
| Input name | Counter inputs |
| Description of the input | EN 61131-2, type 3 |
| Connection method | Push-in connection |
| Number of inputs | 2 (S1, S2) |
| Input voltage | 24 V DC |
| Input voltage range "0" signal | -3 V DC ... 5 V DC |
| Input voltage range "1" signal | 11 V DC ... 30 V DC |
| Input frequency | max. 300 kHz (1 channel wired) |
| | max. 100 kHz (more than one channel wired or Z signal monitoring via the firmware) |
| Input current | 2.5 mA (per channel) |
| Resolution | 32 bits |
| Permissible cable length | max. 30 m |

## Output data

Digital:

| | |
|---|---|
| Output name | Digital outputs |
| Connection method | Push-in connection |
| Connection technology | 1-conductor |
| Number of outputs | 2 (Out1, Out2) |
| Protective circuit | Short-circuit protection |
| | Overload protection |
| Output voltage | 24 V DC |
| Maximum output current per channel | 500 mA |
| Nominal output voltage | 24 V DC |
| Nominal load, inductive | max. 12 VA (1.2 H, 48 Ω, with nominal voltage) |
| Nominal load, lamp | max. 12 W (at nominal voltage) |
| Nominal load, ohmic | max. 12 W (48 Ω, with nominal voltage) |

## Product properties

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| | |
|---|---|
| Product type | I/O component |
| Product family | Axioline F |
| Type | block modular |
| Mounting position | any (no temperature derating) |
| Scope of delivery | including bus base module and Axioline F connectors |
| Special properties | 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 | 2.55 W |

Encoder

| | |
|---|---|
| Number | 2 ($U_{E1}$, $U_{E2}$) |
| Nominal output voltage | 5 V DC |
| Voltage range | 5 V DC ... 5.5 V DC |
| Current carrying capacity | max. 250 mA |
| Protective circuit | Short-circuit protection; electronic |
| Number | 2 ($U_{S1}$, $U_{S2}$) |
| Nominal output voltage | 24 V DC |
| Voltage range | 19.2 V DC ... 30 V DC |
| Current carrying capacity | typ. 500 mA |
| Protective circuit | Short-circuit protection; electronic |
| Number | max. 2 (A, /A, B, /B, (Z, /Z)) |
| Designation | Symmetrical incremental encoders |
| Type of connection of signals | Push-in connection |
| Encoder supply voltage | 5 V DC |
| | 24 V DC |
| Signal voltage level | Differential signal (signal – inverted signal) ±0.5 V, minimum; ±6 V, maximum |
| Common mode voltage range signal - ground | -10 V ... 13.2 V |
| Input frequency | max. 300 kHz (1 channel wired) |
| | max. 100 kHz (more than one channel wired or Z signal monitoring via the firmware) |
| Number | max. 2 (A, B, (Z)) |
| Designation | Asymmetrical incremental encoder |
| Type of connection of signals | Push-in connection |
| Signal voltage level | Low ≤ 2.5 V, high ≥ 3.5 V (up to 27 V, maximum) |
| Input frequency | max. 300 kHz (1 channel wired) |
| | max. 100 kHz (more than one channel wired or Z signal monitoring via the firmware) |

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

| | |
|---|---|
| Supply voltage | 5 V DC (via bus base module) |

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| | |
|---|---|
| Current draw | max. 120 mA |
| | typ. 100 mA |

Potentials: Feed-in of supply voltage ($U_l$)

| | |
|---|---|
| Supply voltage | 24 V DC |
| Supply voltage range | 19.2 V DC ... 30 V DC (including all tolerances, including ripple) |
| Current draw | max. 2.5 A (dependent on the encoder or sensor type used and the load on the digital output.) |
| Protective circuit | Surge protection; electronic (35 V, 0.5 s) |
| | Reverse polarity protection; parallel diode; with external 5 A fuse (only for commissioning) |

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 ($U_{Bus}$) / functional ground | 500 V AC, 50 Hz, 1 min |
| Test voltage: 24 V supply (I/O) / 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. |

Conductor connection

| | |
|---|---|
| Connection method | Push-in connection |
| 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 |

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.) |

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| | |
|---|---|
| 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) |

## Standards and regulations

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

## Approvals

### ATEX

| | |
|---|---|
| Identification | II 3 G Ex ec IIC T4 Gc |
| Certificate | UL 20 ATEX 2441X |
| References to standards | EN IEC 60079-0, EN IEC 60079-7 |

### UKEX

| | |
|---|---|
| Identification | II 3 G Ex ec IIC T4 Gc |
| Certificate | PxCIMA22UKEX2701949X |
| References to standards | EN IEC 60079-0, EN IEC 60079-7 |

### IECEx

| | |
|---|---|
| Identification | Ex ec IIC T4 Gc |
| Certificate | IECEx ULD 20.0026X |
| References to standards | IEC 60079-0 Ed. 7, IEC 60079-7 Ed. 5.1 |

### 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, D, T4 |
| | Ex ec IIC T4 Gc X |
| Certificate | E366272 |
| References to standards | UL 60079-0 Ed. 7 / CSA C22.2 NO. 60079-0 Ed. 4 |
| | UL 60079-7 Ed. 5 / CSA C22.2 NO. 60079-7 Ed. 2 |

### CCC / China-Ex

| | |
|---|---|
| Identification | Ex ec IIC T4 Gc |
| Certificate | |
| References to standards | GB/T 3836.1-2021, GB/T 3836.3-2021 |

## Mounting

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

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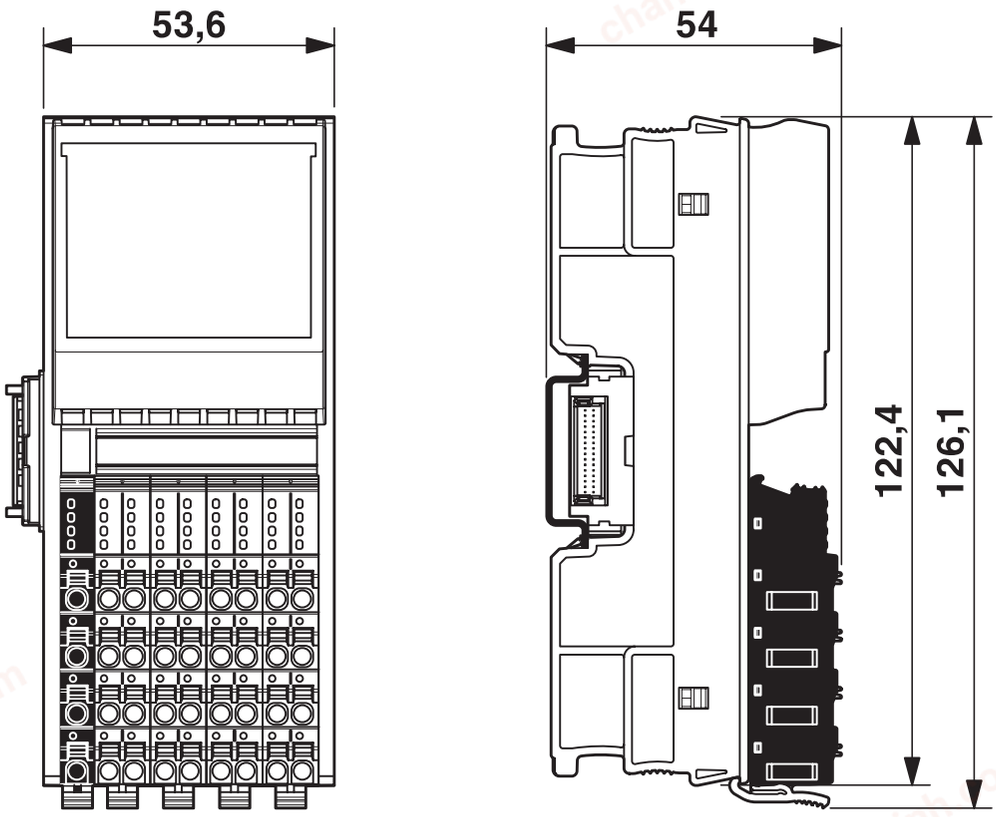
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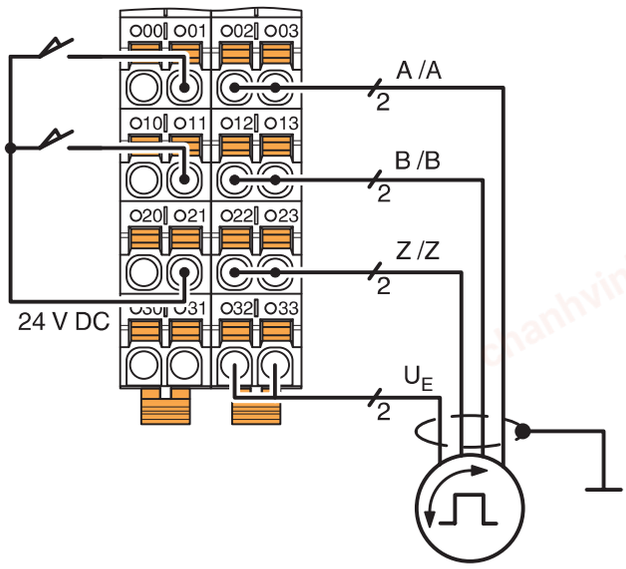
## Drawings

Dimensional drawing




Dimensional drawing

Connection diagram




Quadrature encoder with 5 V supply

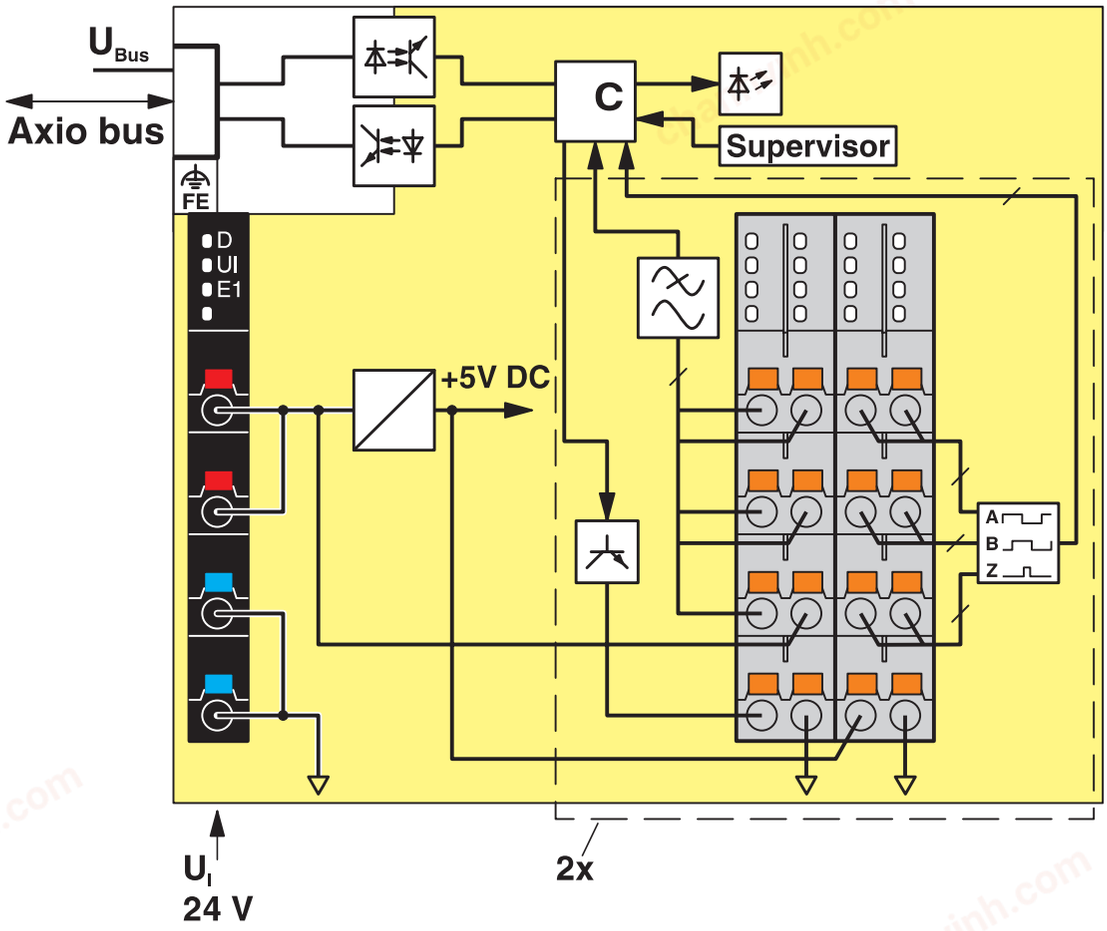
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Block diagram




Internal wiring of the terminal points

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## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/pc/products/2701239

**DNV GL**
Approval ID: TAA00000DF

**LR**
Approval ID: LR2480202TA

**NK**
Approval ID: 14A006

**BV**
Approval ID: 36433/B4 BV

**PRS**
Approval ID: TE/1020/880590/21

**BSH**
Approval ID: 840

**RINA**
Approval ID: ELE008423XG

**ABS**
Approval ID: 23-2449604-PDA

**UAE-RoHS**
Approval ID: 23-02-63243

**cULus Listed**
Approval ID: E238705

**IECEx**
Approval ID: IECEx ULD 20.0026X

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**ATEX**
Approval ID: UL 20 ATEX 2441X

**cULus Listed**
Approval ID: E366272

**CCC**
Approval ID: 2021122309114456_CN

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## Classifications

### ECLASS

| | |
|---|---|
| ECLASS-11.0 | 27242605 |
| ECLASS-12.0 | 27242605 |
| ECLASS-13.0 | 27242605 |

### ETIM

| | |
|---|---|
| ETIM 9.0 | EC001601 |

### 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-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 | acec7780-1e0c-4b01-a1a4-dd015abc4f1e |

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