

# AXL F CNT2 INC2 XC 1F - Function module



2701239

<https://www.phoenixcontact.com/us/products/2701239>

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The figure shows the standard item

Axioline F, Function module, Counter input, Incremental encoder; 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; transmission speed in the local bus: 100 Mbps; degree of protection: IP20; Extreme conditions version; Scope of supply: 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
Sales key	DR02
Product key	DRI263
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

# AXL F CNT2 INC2 XC 1F - Function module

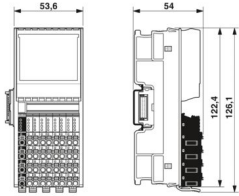


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## Technical data

### 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

### 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	28 Byte
Output address area	28 Byte
Fieldbus data telegram	
Required parameter data	115 Byte
Required configuration data	7 Byte

### Input data

Digital:	
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2701239

<https://www.phoenixcontact.com/us/products/2701239>

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)
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 $\Omega$ , with nominal voltage)
Nominal load, lamp	max. 12 W (at nominal voltage)

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2701239

<https://www.phoenixcontact.com/us/products/2701239>

Nominal load, ohmic	max. 12 W (48 Ω, with nominal voltage)
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## 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	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
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## 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) $\pm 0.5$ V, minimum; $\pm 6$ 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 $\leq 2.5$ V, high $\geq 3.5$ 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)

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2701239

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

Supply voltage	5 V DC (via bus base module)
Current draw	max. 120 mA
	typ. 100 mA

## Potentials: Feed-in of supply voltage ( $U_I$ )

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.)
Current consumption	typ. 50.5 mA (Own current consumption; without wiring of the terminal points)
Protective circuit	Surge protection; electronic (35 V, 0.5 s)
	Reverse polarity protection; parallel diode; with external 5 A fuse (only for commissioning)
Protection	max. 8 A (polarity reversal protection up to 5 A)

## 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.

### 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 <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross-section, flexible	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
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)

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2701239

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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 <sub>2</sub> S (Hydrogen sulfide)	50 ppb
Volume concentration NO <sub>2</sub> (Nitrogen dioxide)	1250 ppb
Volume concentration Cl <sub>2</sub> (Chlorine)	10 ppb
Volume concentration SO <sub>2</sub> (Sulfur dioxide)	300 ppb

## Standards and regulations

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

### ATEX

Identification	⊕ 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, D, T4
	Ex ec IIC T4 Gc X
Certificate	E366272

### CCC / China-Ex

Identification	Ex ec IIC T4 Gc
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Certificate	
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## Mounting

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

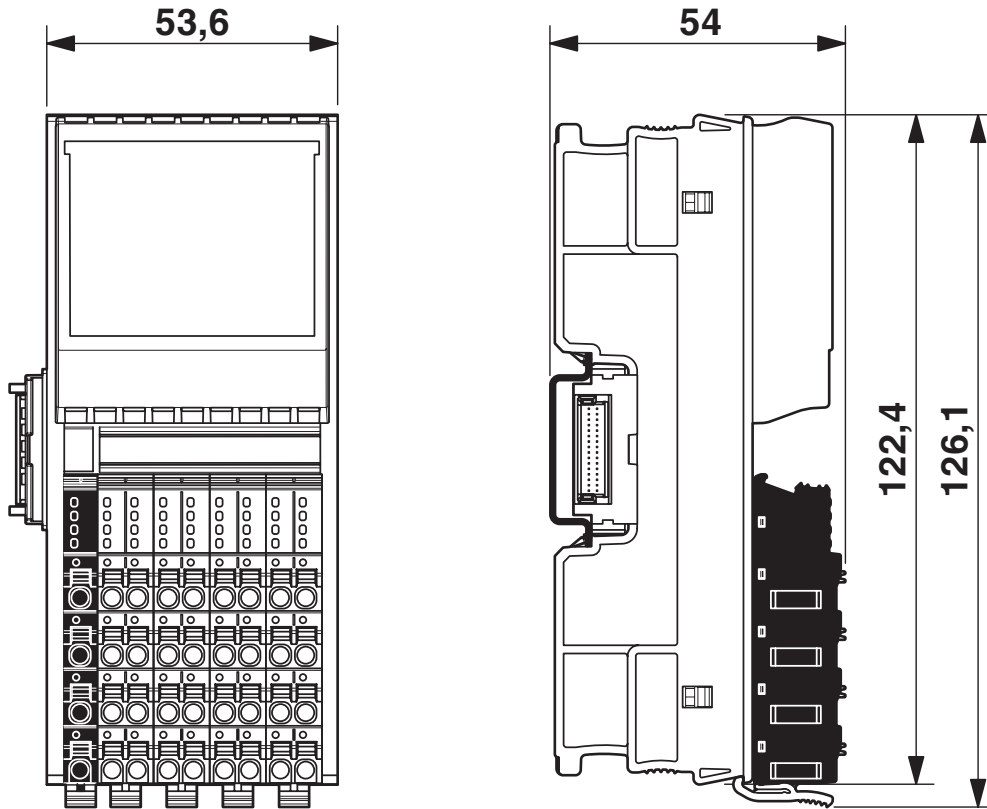
# AXL F CNT2 INC2 XC 1F - Function module

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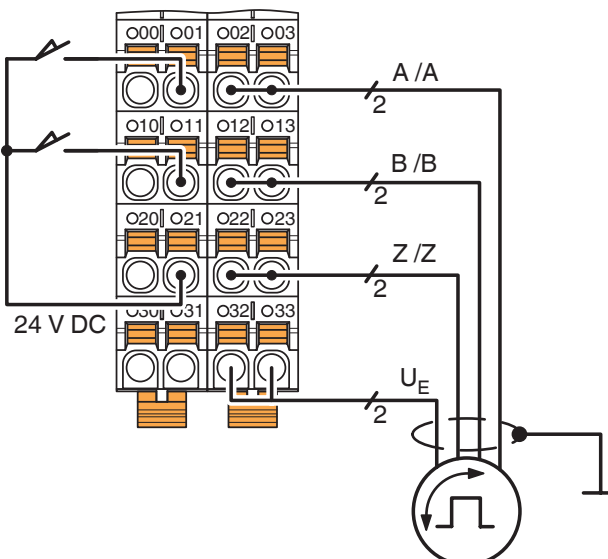
## Drawings

Dimensional drawing



Dimensional drawing

Connection diagram



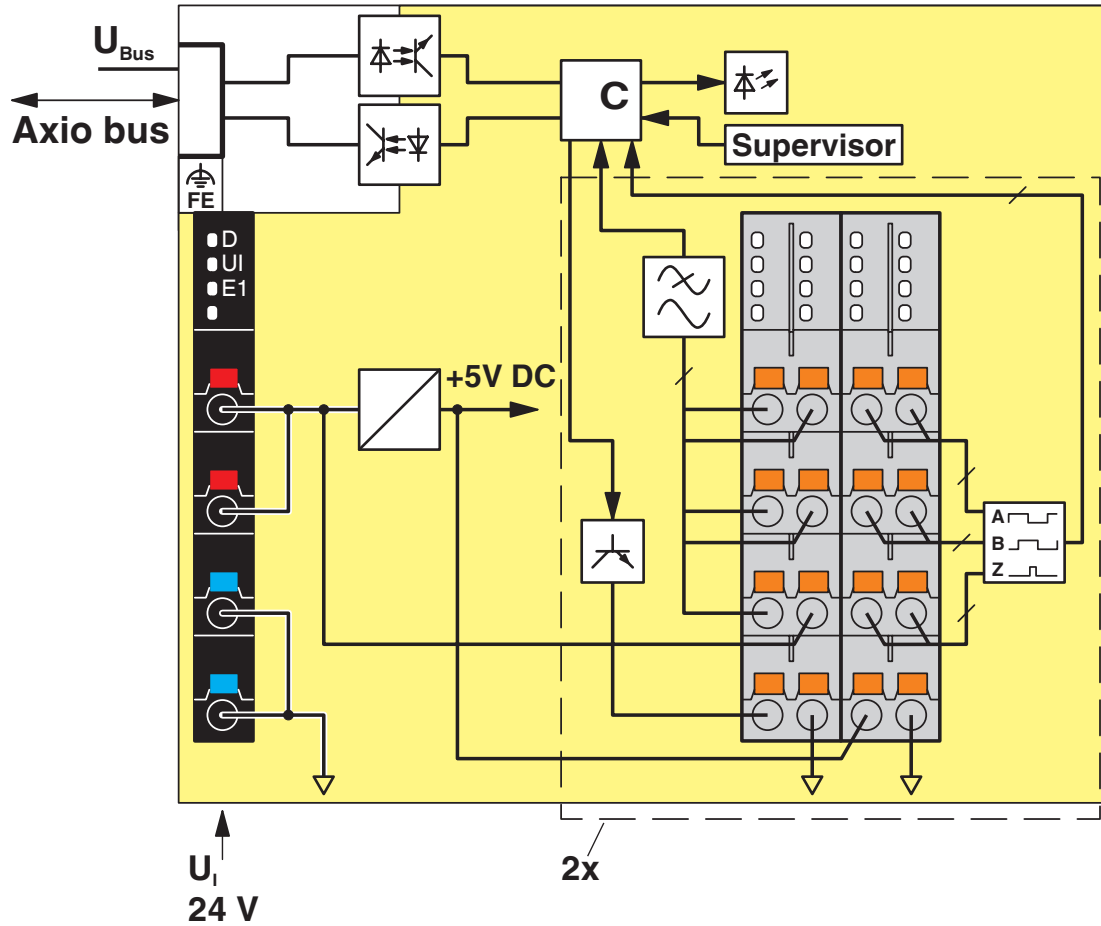
Quadrature encoder with 5 V supply

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Block diagram



Internal wiring of the terminal points

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## Approvals

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**DNV GL**

Approval ID: TAA00000DF



**LR**

Approval ID: LR2480202TA-02



**PRS**

Approval ID: TE/1020/880590/21

**BSH**

Approval ID: 840



**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\_CN

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## Classifications

### ECLASS

ECLASS-13.0	27242605
ECLASS-15.0	27242605

### ETIM

ETIM 10.0	EC001601
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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-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)
	6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol(CAS: 119-47-1)
SCIP	acec7780-1e0c-4b01-a1a4-dd015abc4f1e

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