

# Special function module - AXL F CNT2 INC2 XC 1F - 2701239

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Axioline F XC, Function module, Counter input for 24 V signals: 2, Incremental encoder inputs: 2, Symmetrical 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

The figure shows the standard item

## 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



## Key Commercial Data

Packing unit	1 pc
GTIN	 4 046356 730082
GTIN	4046356730082

## Technical data

### Note

# Special function module - AXL F CNT2 INC2 XC 1F - 2701239

## Technical data

### Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
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### Dimensions

Caption	Dimensional drawing
Width	53.6 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 (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.)
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 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 solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	1.5 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>
Conductor cross section flexible max.	1.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	16
Stripping length	8 mm

### General

Mounting type	DIN rail
Color	traffic grey A RAL 7042
Net weight	233.9 g
Note on weight specifications	with connectors and bus base module
Degree of pollution	2 (IEC 60664-1, EN 60664-1)
Mounting position	any (no temperature derating)

### Interfaces

# Special function module - AXL F CNT2 INC2 XC 1F - 2701239

## Technical data

### Interfaces

Designation	Axiline F local bus
Number of interfaces	2
Connection method	Bus base module
Transmission speed	100 Mbps

### Axiline potentials

Designation	Axiline F local bus supply ( $U_{Bus}$ )
Supply voltage	5 V DC (via bus base module)
Current consumption	typ. 100 mA
	max. 120 mA
Power consumption	typ. 0.5 W
	max. 0.6 W
Designation	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 consumption	max. 2.5 A (dependent on the encoder or sensor type used and the load on the digital output.)
Power consumption	max. 60 W (of which 1.6 W internal losses)
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)

### Counter inputs

Input name	Counter input for 24 V signals
Number of inputs	2 (S1, S2)
Description of the input	EN 61131-2, type 3
Connection method	Push-in connection
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 to the sensor	< 30 m

### Encoder inputs

Input name	Incremental encoder inputs
Number of inputs	2 (A1, /A1, B1, /B1, Z1, /Z1; A2, /A2, B2, /B2, Z2, /Z2)
Connection method	Push-in connection
Encoder signals	Symmetrical and asymmetrical encoders

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## Technical data

### Encoder inputs

Cable length	< 30 m
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### Encoder data

Number of 5 V encoder supplies	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
Type of protection	Short-circuit protection
Number of 24 V encoder supplies	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
Type of protection	Short-circuit protection
Designation	Symmetrical incremental encoders
Encoder types that can be connected	max. 2 (A, /A, B, /B, (Z, /Z))
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)
Designation	Asymmetrical incremental encoder
Encoder types that can be connected	max. 2 (A, B, (Z))
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)

### Digital inputs

Input name	Digital inputs
Description of the input	EN 61131-2, type 3
Connection method	Push-in connection
Connection technology	1-conductor (optional 2, 3-conductor)
Number of inputs	8 (CNT: G1, G2, Dir1, Dir2; INC: Ref1, Ref2, L1, L2)
Nominal input voltage $U_{IN}$	24 V DC
Nominal input current at $U_{IN}$	2.5 mA (per channel)
Input voltage range "0" signal	-3 V DC ... 5 V DC
Input voltage range "1" signal	11 V DC ... 30 V DC

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## Technical data

### Digital outputs

Output name	Digital outputs
Number of outputs	2 (Out1, Out2)
Connection method	Push-in connection
Connection technology	1-conductor
Protective circuit	Short-circuit protection
	Overload protection
Output voltage	24 V DC
Nominal output voltage	24 V DC
Output current per channel	500 mA
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)

### Electrical isolation

Test section	5 V supply of the local bus ( $U_{BUS}$ ) / 24 V supply (I/Os) 500 V AC 50 Hz 1 min.
	5 V supply of the local bus ( $U_{BUS}$ ) / functional ground 500 V AC 50 Hz 1 min.
	24 V supply (I/O) / functional ground 500 V AC 50 Hz 1 min.

### Standards and Regulations

Immunity to ESD	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
Immunity to EF	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
Immunity to burst	Noise immunity test in accordance with EN 61000-6-2 Fast transients (burst) EN 61000-4-4/IEC 61000-4-4 Criterion B, 2 kV
Immunity to surge	Noise immunity test in accordance with EN 61000-6-2 Transient overvoltage (surge) EN 61000-4-5/IEC 61000-4-5 Criterion B, DC supply lines: $\pm 0.5$ kV/ $\pm 0.5$ kV (symmetrical/asymmetrical)
Immunity to conducted interference	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
Interference emission	Noise emission test according to EN 61000-6-3 Class B
Mechanical tests	Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6 5g
	Shock in acc. with EN 60068-2-27/IEC 60068-2-27 30g
	Continuous shock according to EN 60068-2-27/IEC 60068-2-27 10g
ATEX	# II 3 G Ex ec IIC T4 Gc
IECEX	Ex ec IIC T4 Gc
UL, USA / Canada	cULus
	Class I, Zone 2, AEx ec IIC T4, Ex ec IIC T4 Gc X
	Class I, Div. 2, Groups A, B, C, D T4
Protection class	III (IEC 61140, EN 61140, VDE 0140-1)
Overvoltage category	II (IEC 60664-1, EN 60664-1)

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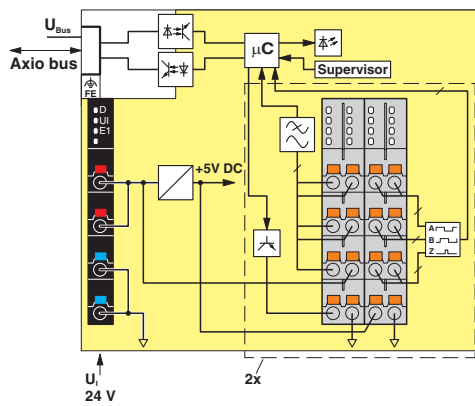
## Technical data

### Environmental Product Compliance

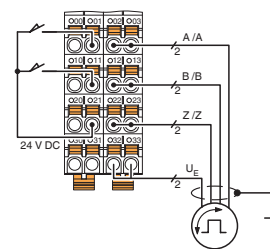
REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

## Drawings

Block diagram



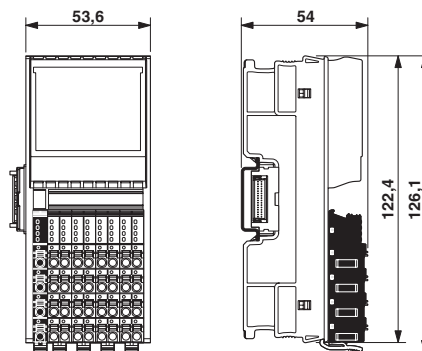
Connection diagram



Quadrature encoder with 5 V supply

### Internal wiring of the terminal points

Dimensional drawing



### Dimensional drawing

## Classifications

eCl@ss

eCl@ss 10.0.1	27242605
eCl@ss 11.0	27242605
eCl@ss 4.0	27240400
eCl@ss 4.1	27240400

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## Classifications

### eCl@ss

eCl@ss 5.0	27242200
eCl@ss 5.1	27242600
eCl@ss 6.0	27242600
eCl@ss 7.0	27242605
eCl@ss 9.0	27242605

### ETIM

ETIM 3.0	EC001599
ETIM 4.0	EC001435
ETIM 6.0	EC001601
ETIM 7.0	EC001601

### UNSPSC

UNSPSC 6.01	43172015
UNSPSC 7.0901	43201404
UNSPSC 11	39121311
UNSPSC 12.01	39121311
UNSPSC 13.2	32151602
UNSPSC 18.0	32151602
UNSPSC 19.0	32151602
UNSPSC 20.0	32151602
UNSPSC 21.0	32151602

## Approvals

### Approvals

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#### Approvals

PRS / BV / LR / KR / NK / ABS / BSH / RINA / DNV GL / UL Listed / cUL Listed / cULus Listed

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#### Ex Approvals

ATEX / cULus Listed / IECEx

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### Approval details

PRS		<a href="http://www.prs.pl/">http://www.prs.pl/</a>	TE/1020/880590/21
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### Approvals

BV		<a href="http://www.veristar.com/portal/veristarinfo/generalinfo/approved/approvedProducts/equipmentAndMaterials">http://www.veristar.com/portal/veristarinfo/generalinfo/approved/approvedProducts/equipmentAndMaterials</a>	36433/B2 BV
LR		<a href="http://www.lr.org/en">http://www.lr.org/en</a>	LR2001902TA
KR		<a href="http://www.krs.co.kr/eng/main/main.aspx">http://www.krs.co.kr/eng/main/main.aspx</a>	HMB17372-AC002
NK		<a href="http://www.classnk.or.jp/hp/en/">http://www.classnk.or.jp/hp/en/</a>	14A006
ABS		<a href="http://www.eagle.org/eagleExternalPortalWEB/">http://www.eagle.org/eagleExternalPortalWEB/</a>	18-HG1767360-PDA
BSH			840
RINA		<a href="http://www.rina.org/en">http://www.rina.org/en</a>	ELE233820XG
DNV GL		<a href="https://approvalfinder.dnvgl.com/">https://approvalfinder.dnvgl.com/</a>	TAA00000DF
UL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 238705
cUL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 238705
cULus Listed			

### Accessories

#### Accessories



## Special function module - AXL F CNT2 INC2 XC 1F - 2701239

### Accessories

#### Device marking

Insert label - EMT (35X46)R - 0801604



Insert label, for the Axioline F series from Phoenix Contact, Roll, white, unlabeled, can be labeled with: THERMOMARK ROLLMASTER 300/600, THERMOMARK X1.2, THERMOMARK ROLL X1, THERMOMARK ROLL 2.0, THERMOMARK ROLL, mounting type: snapped into marker carrier, lettering field size: 35 x 46 mm, Number of individual labels: 500

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#### DIN rail connector

Bus connector - AXL F BS F - 2688129



Axioline F bus base module for housing type F

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#### Shield connection

Shield connection - AXL SHIELD SET - 2700518



Axioline shield connection set (contains 2 shield bus holders and 2 SK 5 shield connection clamps)

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#### Terminal marking

Zack marker strip - ZB 20,3 AXL UNPRINTED - 0829579



Zack marker strip for Axioline F (device labeling), in 2 x 20.3 mm pitch, unprinted, 25-section, for individual labeling with B-STIFT 0.8, X-PEN, or CMS-P1-PLOTTER

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Zack Marker strip, flat - ZBF 10/5,8 AXL UNPRINTED - 0829580



Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: PLOTMARK, CMS-P1-PLOTTER, mounting type: snap into flat marker groove, for terminal block width: 10.15 mm, lettering field size: 4 of 10.15 x 5 mm and 1 of 5.8 x 5 mm, Number of individual labels: 50

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