

# IB IL AI 4/EF-XC-PAC - Analog module



2701215

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The figure shows the standard item

Inline, Analog input terminal, Analog inputs: 4, 0 V ... 5 V, -5 V ... 5 V, 0 V ... 10 V, -10 V ... 10 V, 0 mA ... 20 mA, 4 mA ... 20 mA, -20 mA ... 20 mA, connection technology: 2-, 3-, 4-conductor, transmission speed in the local bus: 500 kbps, Extreme conditions version, degree of protection: IP20, including Inline connectors and marking fields

## Product description

The terminal is designed for use within an Inline station. It is used to acquire analog voltage and current signals. Thanks to special engineering measures and tests, the terminal can be used under extreme ambient conditions.

## Your advantages

- 4 differential signal inputs
- Connection of sensors in 2-, 3-, and 4-conductor technology
- Current ranges: 0 mA ... 20 mA, 4 mA ... 20 mA,  $\pm 20$  mA
- Voltage ranges: 0 V ... 10 V,  $\pm 10$  V, 0 V ... 5 V,  $\pm 5$  V
- The channels are parameterized independently of one another via the bus system
- Parameterization via process data or PCP
- Measured values can be represented in four different formats
- Resolution depends on the representation format and the measuring range
- Process data update of all channels in max. 1 ms
- Sensor supply with channel-specific integrated short-circuit and overload protection
- Bus-synchronous provision of input values with very low jitter ( $< 10 \mu\text{s}$ )
- Can be used under extreme ambient conditions
- Extended temperature range of  $-40 \text{ }^\circ\text{C}$  ...  $+70 \text{ }^\circ\text{C}$  (see "Tested successfully: use under extreme ambient conditions" in the data sheet)
- Coated PCBs

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2701215       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | DR01          |
| Product key                          | DRI141        |
| GTIN                                 | 4046356727839 |
| Weight per piece (including packing) | 264.7 g       |
| Weight per piece (excluding packing) | 210 g         |

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|                       |          |
|-----------------------|----------|
| Customs tariff number | 85389091 |
| Country of origin     | DE       |

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## Technical data

### Dimensions

|                     |  |
|---------------------|--|
| Dimensional drawing |  |
| Width               | 48.8 mm  |
| Height              | 135 mm   |
| Depth               | 71.5 mm  |
| Note on dimensions  | Housing dimensions   |

### Notes

#### Note on application

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

### Material specifications

|                 |                  |
|-----------------|------------------|
| Color (Housing) | green (RAL 6021) |
|-----------------|------------------|

### Interfaces

#### Inline local bus

|                      |                    |
|----------------------|--------------------|
| Number of interfaces | 2                  |
| Connection method    | Inline data jumper |
| Transmission speed   | 500 kbps           |

### System properties

#### Programming data (LocalbusSlave)

|                         |         |
|-------------------------|---------|
| Length code (hex)       | 05      |
| ID code (dec.)          | 223     |
| Length code (dec)       | 05      |
| Process data channel    | 80 bit  |
| Input address area      | 10 Byte |
| Output address area     | 10 Byte |
| Parameter channel (PCP) | 2 Byte  |
| Register length (bus)   | 96 bit  |

#### Fieldbus data telegram

|                             |         |
|-----------------------------|---------|
| Required parameter data     | 28 Byte |
| Required configuration data | 4 Byte  |

### Input data

## Analog:

|  |   |
|--|---|
| Input name                               | Analog inputs   |
| Description of the input                 | Differential input, including sensor supply (24 V DC)   |
| Number of inputs                         | 4   |
| A/D conversion time                      | max. 10 $\mu$ s   |
| Connection method                        | Inline shield connector   |
| Connection technology                    | 2-, 3-, 4-conductor   |
| Note regarding the connection technology | shielded  |
| Current input signal                     | 0 mA ... 20 mA<br>4 mA ... 20 mA<br>-20 mA ... 20 mA  |
| Input resistance current input           | typ. 110 $\Omega$   |
| Voltage input signal                     | 0 V ... 5 V<br>-5 V ... 5 V<br>0 V ... 10 V<br>-10 V ... 10 V                                     |
| Input resistance of voltage input        | typ. 300 k $\Omega$   |
| A/D converter resolution                 | 16 bit  |
| Data formats                             | IB IL, IB ST, standardized representation, S7 compatible  |
| Limit frequency (3 dB)                   | 500 Hz  |
| Measured value resolution                | 16 bits (15 bits + sign bit)  |
| Protective circuit                       | Transient protection; Yes, via arresters<br>Overload protection of the current inputs; electronic |

## Product properties

|                      |  |
|----------------------|--|
| Product type         | I/O component  |
| Product family       | Inline   |
| Type                 | modular  |
| Scope of supply      | including Inline connectors and marking fields   |
| Operating mode       | Process data mode with 5 words/1 word PCP  |
| Special properties   | Extreme conditions version   |
| Diagnostics messages | Failure of the internal I/O supply I/O error message sent to the bus coupler<br>Failure of or insufficient communications power $U_L$ I/O error message sent to the bus coupler<br>I/O error Error message in the process data<br>User error Error message in the process data |

## Insulation characteristics

|                      |                              |
|----------------------|------------------------------|
| Overvoltage category | II (IEC 60664-1, EN 60664-1) |
| Pollution degree     | 2 (IEC 60664-1, EN 60664-1)  |

## Electrical properties

Potentials: Communications power ( $U_L$ )

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|                |                               |
|----------------|-------------------------------|
| Supply voltage | 7.5 V DC (via voltage jumper) |
| Current draw   | max. 100 mA                   |
|                | typ. 85 mA                    |

## Potentials: Supply of analog modules ( $U_{ANA}$ )

|                      |  |
|----------------------|--|
| Supply voltage       | 24 V DC (via voltage jumper)                                       |
| Supply voltage range | 19.2 V DC ... 30 V DC (including all tolerances, including ripple) |
| Current draw         | max. 20 mA   |
|                      | typ. 13 mA   |

## Potentials: Main circuit supply ( $U_M$ )

|                      |  |
|----------------------|--|
| Supply voltage       | 24 V DC (via voltage jumper)                                       |
| Supply voltage range | 19.2 V DC ... 30 V DC (including all tolerances, including ripple) |
| Current draw         | max. 200 mA  |
|                      | min. 0 mA (No-load)  |

## Supply:

|                     |                                   |
|---------------------|-----------------------------------|
| Designation         | Sensor supply $U_{IS}$            |
| Supply voltage      | 24 V DC (via feed-in from $U_M$ ) |
| Current consumption | max. 50 mA (per channel)          |

## Electrical isolation/isolation of the voltage ranges

|   |                        |
|---|------------------------|
| Test voltage: 7.5 V supply (bus logic), 24 V supply $U_{ANA}$ / I/O               | 500 V AC, 50 Hz, 1 min |
| Test voltage: 7.5 V supply (bus logic), 24 V supply $U_{ANA}$ / functional ground | 500 V AC, 50 Hz, 1 min |
| Test voltage: I/O/functional ground   | 500 V AC, 50 Hz, 1 min |

## Connection data

### Connection technology

|                 |                  |
|-----------------|------------------|
| Connection name | Inline connector |
|-----------------|------------------|

### Inline connector

|                                   |  |
|-----------------------------------|--|
| Connection method                 | Spring-cage connection                       |
| Conductor cross-section, rigid    | 0.08 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross-section, flexible | 0.08 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross-section AWG       | 28 ... 16                                    |
| Stripping length                  | 8 mm   |

## Environmental and real-life conditions

### Ambient conditions

|                                  |   |
|----------------------------------|---|
| Ambient temperature (operation)  | -25 °C ... 55 °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)   |

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|  |                                |
|--|--------------------------------|
| Ambient temperature (storage/transport)  | -40 °C ... 85 °C               |
| Permissible humidity (operation)         | 10 % ... 95 % (non-condensing) |
| Permissible humidity (storage/transport) | 10 % ... 95 % (non-condensing) |

## Standards and regulations

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

## Mounting

|               |                   |
|---------------|-------------------|
| Mounting type | DIN rail mounting |
|---------------|-------------------|

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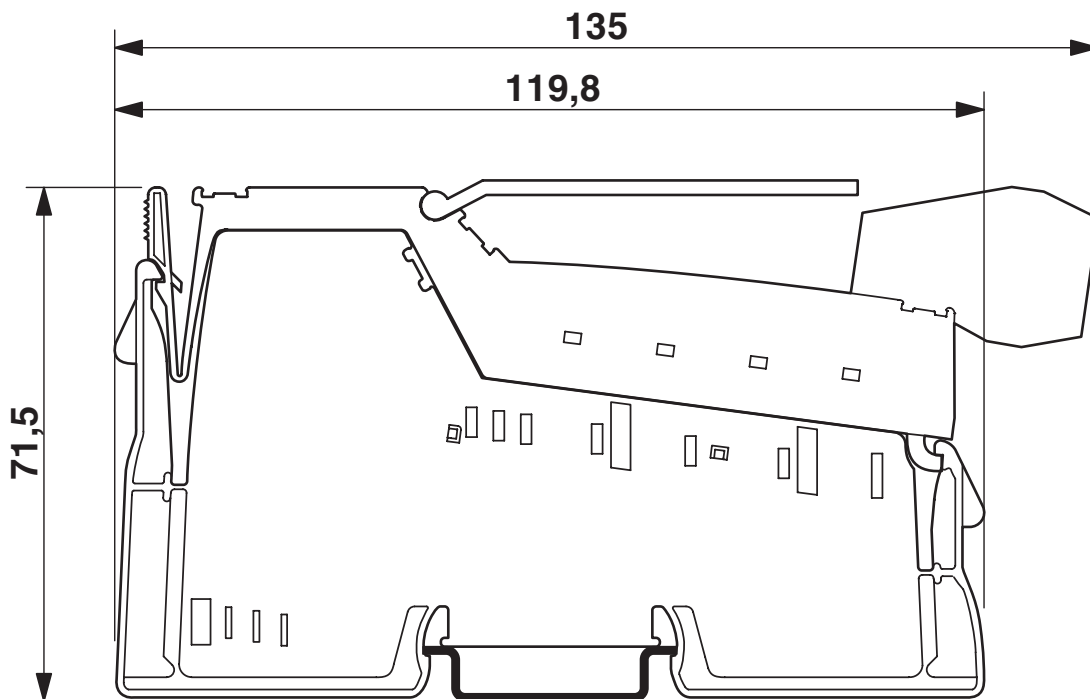


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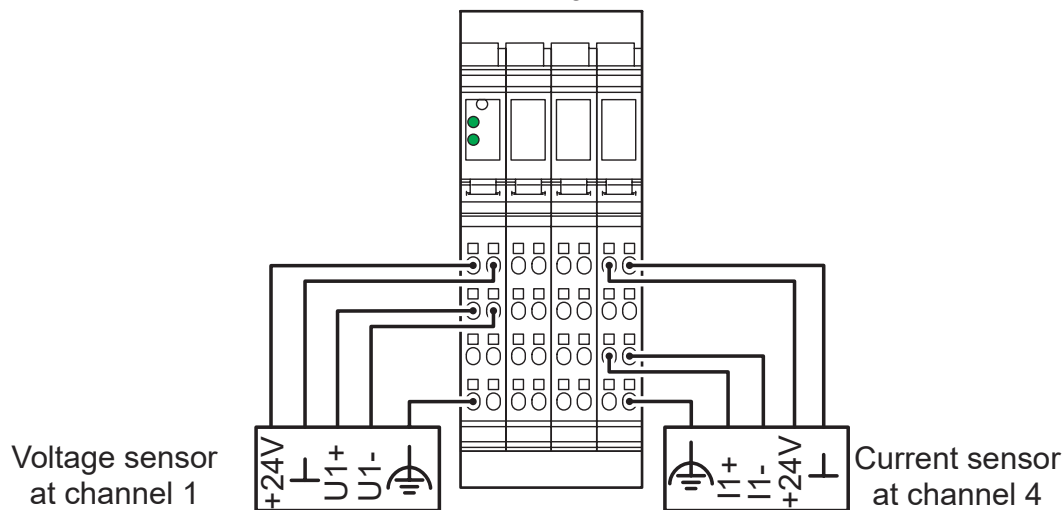
## Drawings

Dimensional drawing



Connection diagram

| Slot    | 1 | 2 | 3 | 4 |
|---------|---|---|---|---|
| Channel | 1 | 2 | 3 | 4 |



Connection example

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2701215>



**cULus Recognized**  
Approval ID: E140324

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27242601 |
| ECLASS-15.0 | 27242601 |

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC001596 |
|----------|----------|

### 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-E                                   |
|  | No hazardous substances above the limits |

### EU REACH SVHC

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| REACH candidate substance (CAS No.) | Lead(CAS: 7439-92-1)                 |
| SCIP                                | f81e82b4-b52b-485f-8db7-89b7179487d2 |

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