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Inline, Function module, Position detection, Incremental encoder; Incremental encoder input: 1, symmetrical encoders according to EIA-422 and asymmetrical encoders; Digital inputs: 3, 24 V DC; Digital outputs: 1 (0.5 A); transmission speed in the local bus: 500 kbps; degree of protection: IP20; Scope of supply: including Inline connectors and marking fields; The product is being prepared for compliance with the Cyber Resilience Act (CRA).

## Product description

The terminal is designed for use within an Inline station. The terminal is used for detecting positions, lengths, or angular positions with incremental encoders. Both symmetrical (RS-422) and asymmetrical (5 V DC to 24 V DC) encoders with rectangular signals can be connected to the terminal block. Rotary transducers or length measurement systems can be read in with or without a Z pulse. To increase operational safety, all encoder inputs are monitored for broken cables. Using a special operating mode, the terminal supports distance-coded incremental encoders, with which the reference run can be reduced to very short distances. In addition to the input for the encoder signals, the terminal also has three digital 24 V DC inputs, one input for the home position switch, and two inputs for limit position switches. Thus 2 or 3-conductor sensors can be connected. Input E3 can also be used as an "open collector" output. The terminal block records the position values using a counter, which counts up or down depending on the phase relation of the A and B signals.

## Your advantages

- Supports incremental encoders with symmetrical signals in accordance with EIA standard RS-422 (line driver)
- Supports incremental encoder with asymmetrical signals (push-pull)
- Supplies encoder with 5 V or 24 V voltage
- Three digital inputs for connecting two limit switches or a home position switch
- Maximum input frequency: 300 kHz
- 25-bit actual position value
- Precise evaluation via 1x, 2x, or 4x sampling
- Direction of rotation indicator via LED

# IB IL INC-IN-PAC - Function module

2861755

<https://www.phoenixcontact.com/us/products/2861755>



## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2861755       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | DR01          |
| Product key                          | DRI161        |
| GTIN                                 | 4017918899912 |
| Weight per piece (including packing) | 169.3 g       |
| Weight per piece (excluding packing) | 143 g         |
| Customs tariff number                | 85389091      |
| Country of origin                    | DE            |

# IB IL INC-IN-PAC - Function module

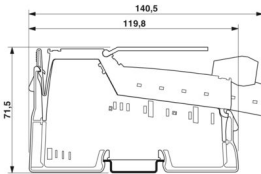
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## Technical data

### Dimensions

|                     |                                                                                    |
|---------------------|------------------------------------------------------------------------------------|
| Dimensional drawing |  |
| Width               | 24.4 mm                                                                            |
| Height              | 140.5 mm                                                                           |
| Depth               | 71.5 mm                                                                            |

### Notes

|                         |                                                                                                                                                                                                                               |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note on application     | Only for industrial use                                                                                                                                                                                                       |
| Note on application     | As things stand now, we are preparing the product so that, as of December 11, 2027, it will comply with the requirements of the EU Cyber Resilience Act (CRA) based on the information currently available regarding the CRA. |
| Utilization restriction |                                                                                                                                                                                                                               |
| CCCex note              | Use in potentially explosive areas is not permitted in China.                                                                                                                                                                 |

### Mounting

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

### Material specifications

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

### Interfaces

|                      |                    |
|----------------------|--------------------|
| Inline local bus     |                    |
| Number of interfaces | 2                  |
| Connection method    | Inline data jumper |
| Transmission speed   | 500 kbps           |
| Transmission physics | Copper             |

### System properties

|                      |        |
|----------------------|--------|
| Programming data     |        |
| Length code (hex)    | 02     |
| ID code (dec.)       | 127    |
| Length code (dec)    | 02     |
| Process data channel | 32 bit |
| Input address area   | 4 Byte |
| Output address area  | 4 Byte |

|                                   |        |
|-----------------------------------|--------|
| Parameter channel (PCP)           | 0 Byte |
| Register length (bus)             | 4 Byte |
| Fieldbus data telegram (PROFIBUS) |        |
| Required parameter data           | 1 Byte |
| Required configuration data       | 5 Byte |

## Input data

### Digital:

|                                   |                        |
|-----------------------------------|------------------------|
| Input name                        | Digital inputs         |
| Description of the input          | EN 61131-2 type 1      |
| Number of inputs                  | 3                      |
| Connection method                 | Spring-cage connection |
| Connection technology             | 3-conductor            |
| Input voltage range "0" signal    | -3 V DC ... 5 V DC     |
| Input voltage range "1" signal    | 15 V DC ... 30 V DC    |
| Nominal input voltage $U_{IN}$    | 24 V DC                |
| Nominal input current at $U_{IN}$ | typ. 2.7 mA            |
| Cable length                      | max. 30 m              |

### Encoder

|                  |                                                                      |
|------------------|----------------------------------------------------------------------|
| Number of inputs | 1 (Symmetrical or asymmetrical)                                      |
| Input name       | Incremental encoder input                                            |
| Encoder signals  | symmetrical encoders according to EIA-422 and asymmetrical encoders  |
| Cable length     | max. 30 m (shielded cable, to ensure conformance with EMC Directive) |

## Output data

### Digital:

|                       |                                        |
|-----------------------|----------------------------------------|
| Output name           | Digital outputs                        |
| Connection method     | Spring-cage connection                 |
| Connection technology | 2-conductor                            |
| Number of outputs     | 1 (NPN, double assignment of input E3) |

## 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 two words                                                 |
| Special properties | The product is being prepared for compliance with the Cyber Resilience Act (CRA) |

### 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 | 1.4 W |
|-------------------------------------------------|-------|

### Encoder

|                                           |                                                                                         |
|-------------------------------------------|-----------------------------------------------------------------------------------------|
| Number                                    | 1                                                                                       |
| Nominal output voltage                    | 5 V DC                                                                                  |
| Voltage range                             | 4.75 V DC ... 5.25 V DC                                                                 |
| Current carrying capacity                 | max. 250 mA                                                                             |
| Protective circuit                        | Short-circuit protection; Electrical and thermal                                        |
| Number                                    | 1                                                                                       |
| Nominal output voltage                    | 24 V DC                                                                                 |
| Voltage range                             | 19.2 V DC ... 30 V DC                                                                   |
| Current carrying capacity                 | max. 250 mA                                                                             |
| Protective circuit                        | Short-circuit protection; Electronic and thermal                                        |
| Number                                    | max. 1 (A, /A, B, /B, Z, /Z)                                                            |
| Designation                               | Symmetrical incremental encoders                                                        |
| 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 DC ... 13.2 V DC                                                                  |
| Input frequency                           | max. 300 kHz                                                                            |
| Number                                    | max. 1 (A, B, (Z))                                                                      |
| Designation                               | Asymmetrical incremental encoder                                                        |
| Encoder supply voltage                    | 5 V DC                                                                                  |
|                                           | 24 V DC                                                                                 |
| Signal voltage level                      | Low $\leq 2.5$ V, high $\geq 3.5$ V (up to 27 V, maximum)                               |
| Input frequency                           | max. 300 kHz                                                                            |

### Potentials: Communications power ( $U_L$ )

|                |                               |
|----------------|-------------------------------|
| Supply voltage | 7.5 V DC (via voltage jumper) |
| Current draw   | max. 70 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. 1 A                                                           |
|                      | typ. 340 mA                                                        |

### Electrical isolation/isolation of the voltage ranges

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

## Connection data

### Connection technology

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

### Inline connector

|                                   |                        |
|-----------------------------------|------------------------|
| Connection method                 | Spring-cage connection |
| Conductor cross-section, rigid    | 0.08 mm² ... 1.5 mm²   |
| Conductor cross-section, flexible | 0.08 mm² ... 1.5 mm²   |
| Conductor cross-section AWG       | 28 ... 16              |
| Stripping length                  | 8 mm                   |

## Environmental and real-life conditions

### Ambient conditions

|                                          |                                                   |
|------------------------------------------|---------------------------------------------------|
| Ambient temperature (operation)          | -25 °C ... 55 °C                                  |
| 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)  | -25 °C ... 85 °C                                  |
| Permissible humidity (operation)         | 10 % ... 95 % (non-condensing)                    |
| Permissible humidity (storage/transport) | 10 % ... 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              | 25g |

## Standards and regulations

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

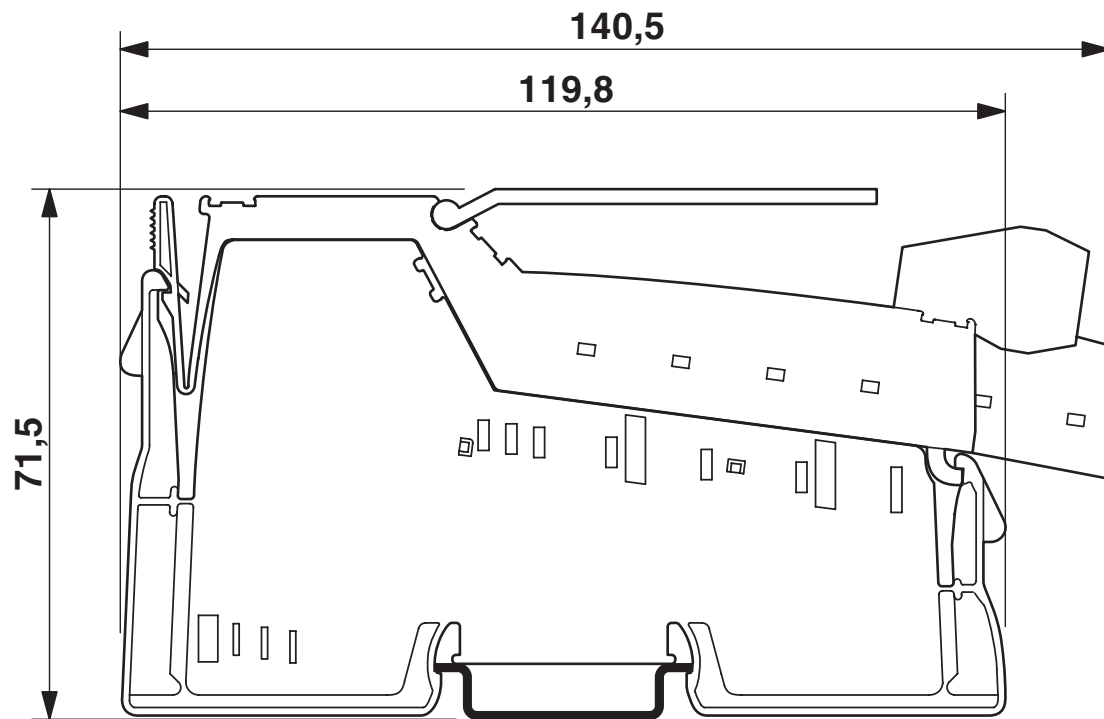
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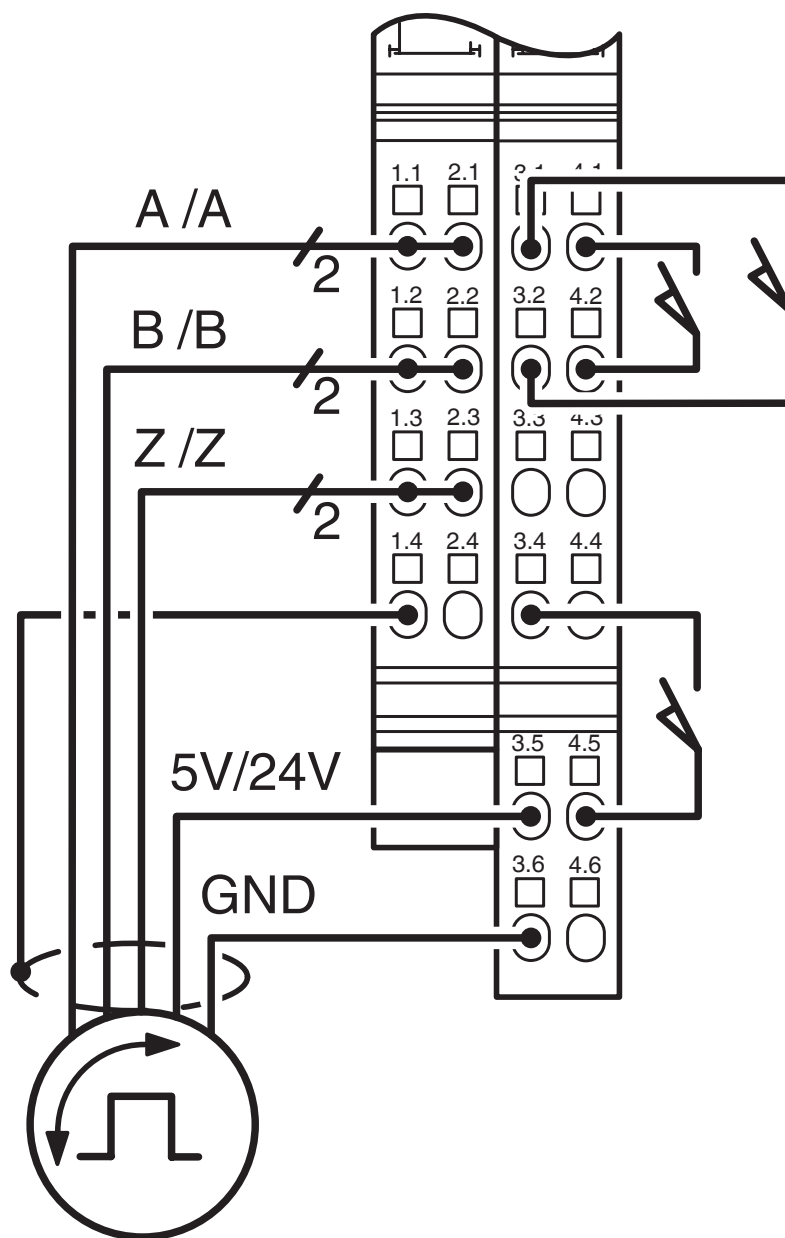
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## Drawings

Dimensional drawing

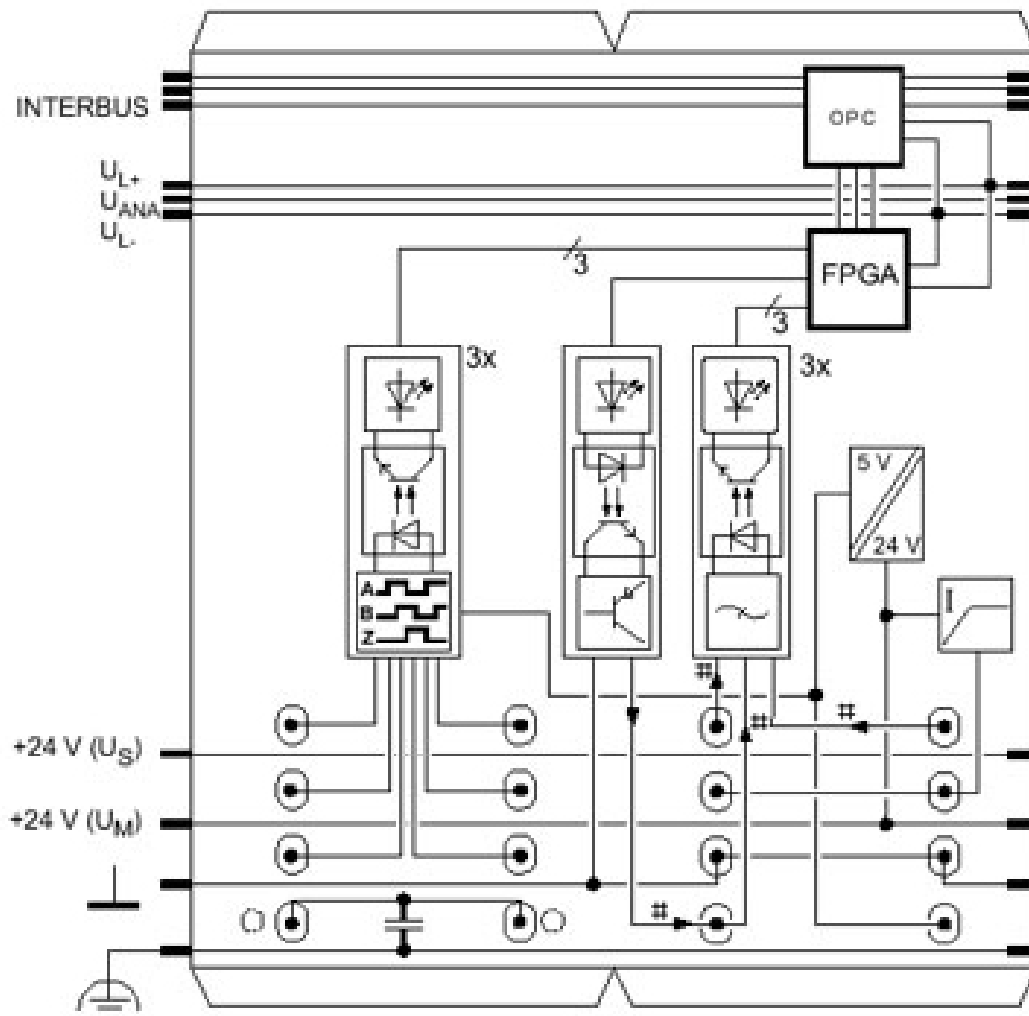


Connection diagram



Quadrature encoder with 24 V supply

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/us/products/2861755>



**cULus Listed**

Approval ID: E140324



**cULus Listed**

Approval ID: E199827

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27242605 |
| ECLASS-15.0 | 27242605 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC001601 |
|-----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 32151600 |
|-------------|----------|

## 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                                | 6b4dac9-3a17-4f9b-8af4-b32882f2f18a |

### EF3.1 Climate Change

|         |                |
|---------|----------------|
| CO2e kg | 12.716 kg CO2e |
|---------|----------------|

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