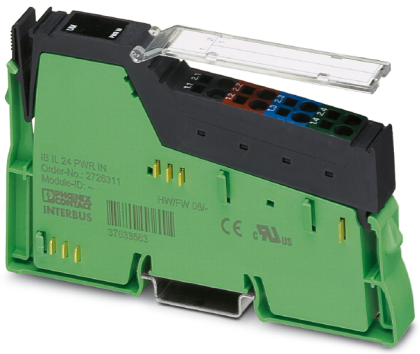
# IB IL 24 PWR IN/2-F-D-PAC

## Inline power terminal, 24 V DC, with fuse (main and segment voltage) and diagnostics



Data sheet
6394_en_04

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## 1 Description

The terminal is designed for use within an Inline station.
It provides a 24 V supply voltage to the main circuit ($U_M$) and automatically supplies power for the 24 V segment circuit ($U_S$).
The terminal has protection against polarity reversal and surge voltage.
The internal fuse protects the main and segment circuits.
This terminal has an LED for bus diagnostics. It occupies two input data bits, which indicate the availability of the supply voltage and the status of the fuse.

### Features

- Supply of the 24 V main voltage $U_M$
- Provision of the 24 V segment voltage $U_S$
- Main and segment circuits protected by an internal fuse

This data sheet is only valid in association with the IL SYS INST UM E user manual.

Make sure you always use the latest documentation.
It can be downloaded at: phoenixcontact.net/product/2862152

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## 3 Ordering data

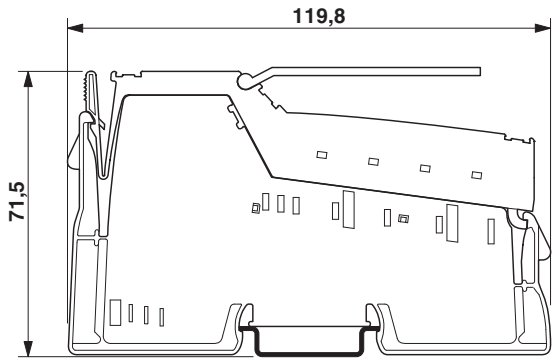
| Description | Type | Item no. | Pcs./Pkt. |
|---|---|---|---|
| Inline power terminal block, complete with accessories (connector and labeling field), 24 V DC, with fuse (Main and segment voltage) and diagnostics | IB IL 24 PWR IN/2-F-D-PAC | 2862152 | 1 |

| Accessories | Type | Item no. | Pcs./Pkt. |
|---|---|---|---|
| Connector, colored, for Inline power and segment terminal blocks (Connector/Adapter) | IB IL SCN-PWR IN-CP | 2727637 | 10 |
| Connector, for Inline power and segment terminal blocks (Connector/Adapter) | IB IL SCN-PWR IN | 2727462 | 10 |
| Labeling field, width: 12.2 mm (Marking) | IB IL FIELD 2 | 2727501 | 10 |
| Insert strip, Sheet, white, unlabeled, can be labeled with: Office printing systems: Laser printer, mounting type: insert, lettering field size: 62 x 10 mm, Number of individual labels: 72 (Marking) | ESL 62X10 | 0809492 | 1 |
| Replacement fuse (Fuse) | SI 5X20 6,3 A T DIN 41662 | 2726104 | 10 |

| Documentation | Type | Item no. | Pcs./Pkt. |
|---|---|---|---|
| User manual, English, Automation terminals of the Inline product range | IL SYS INST UM E | - | - |
| Data sheet, English, INTERBUS addressing | DB GB IBS SYS ADDRESS | - | - |
| Application note, English, Inline terminals for use in zone 2 potentially explosive areas | AH EN IL EX ZONE 2 | - | - |

# 4 Technical data

| Dimensions (nominal sizes in mm) | |
|---|---|




| | |
|---|---|
| Width | 12.2 mm |
| Height | 119.8 mm |
| Depth | 71.5 mm |

| General data | |
|---|---|
| Color | green |
| Weight | 59 g (with connector) |
| Operating mode | Process data mode with 2 bits |
| Ambient temperature (operation) | -25 °C ... 55 °C |
| Ambient temperature (storage/transport) | -25 °C ... 85 °C |
| Permissible humidity (operation) | 10 % ... 95 % (non-condensing) |
| Permissible humidity (storage/transport) | 10 % ... 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 |
| Protection class | III (IEC 61140, EN 61140, VDE 0140-1) |
| Mounting type | DIN rail mounting |

| Connection data: 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 |

| Connection data for UL approvals: Inline connector | |
|---|---|
| Connection method | Spring-cage 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 |

| Interface: Inline local bus | |
|---|---|
| Connection method | Inline data jumper |
| Transmission speed | 500 kbps |

| Communications power ($U_L$) | |
|---|---|
| Supply voltage | 7.5 V DC (via voltage jumper) |
| Current consumption | max. 25 mA |
| Power consumption | max. 0.19 W |

| Main circuit supply ($U_M$) | |
|---|---|
| Supply voltage | 24 V DC (via Inline connector) |
| Supply voltage range | 19.2 V ... 30 V (including all tolerances, including ripple) |
| Power supply unit | max. 6.3 A (sum of $U_M$ + $U_S$) |
| Current consumption | typ. 4 A (nominal value) |

| Segment circuit supply ($U_S$) | |
|---|---|
| Supply voltage | 24 V DC |
| Supply voltage range | 19.2 V DC ... 30 V DC (including all tolerances, including ripple) |
| Power supply unit | max. 6.3 A (sum of $U_M$ + $U_S$) |
| Current consumption | typ. 4 A (nominal value) |

**Protection**

Maximum permissible value 6.3 A. The terminal is supplied with a 6.3 A slow-blow fuse. Fuses with other values can also be used. The maximum fuse value is 6.3 A.

**NOTE: Electronics may be damaged when overloaded**

Provide external fuses for the 24 V area.

If you use a fuse, the power supply unit must be capable of supplying four times the nominal current of the fuse. This ensures that the fuse trips reliably in the event of a fault.

| Programming Data | |
|---|---|
| ID code (hex) | BE |
| ID code (dec.) | 190 |
| Length code (hex) | C2 |
| Length code (dec) | 194 |
| Process data channel | 2 Bit |
| Input address area | 2 Bit |
| Output address area | 0 Bit |

| Programming Data | |
|---|---|
| Parameter channel (PCP) | 0 Bit |
| Register length (bus) | 2 Bit |

For the programming data/configuration data for other bus systems, refer to the corresponding electronic device data sheet (e.g., GSD, EDS).

| Configuration and parameter data in a PROFIBUS system | |
|---|---|
| Required parameter data | 1 Byte |
| Required configuration data | 4 Byte |

| Electrical isolation/isolation of the voltage areas | |
|---|---|
| **Test section** | **Test voltage** |
| 7.5 V supply (bus logics)/24 V supply (I/O) | 500 V AC , 50 Hz , 1 min. |
| 24 V supply (I/O) / functional ground | 500 V AC , 50 Hz , 1 min. |
| 7.5 V supply (bus logic)/functional ground | 500 V AC , 50 Hz , 1 min. |

If an electrically isolated area is to be established, the power terminal must be supplied from a new power supply unit. Protect the 24 V area with an external fuse.

If you use a fuse, the power supply unit must be capable of supplying four times the nominal current of the fuse. This ensures that the fuse trips reliably in the event of a fault.

To achieve electrical isolation between the logic level and the I/O area, supply these areas from separate power supply units. Interconnection of the power supply units in the 24 V area is not permitted (see IL SYS INST UM E user manual).

| Error messages to the higher level control or computer system | |
|---|---|
| Fuse blown or missing | I/O error message sent to the bus coupler |
| Supply voltage $U_M$ is not present | I/O error message sent to the bus coupler |

| Protective circuit | |
|---|---|
| Surge protection | Suppressor diode |
| Reverse polarity protection | Parallel polarity protection diode |
| Overload protection, short-circuit protection in the main and segment circuits | Fuse 5x20 with 6.3 A slow-blow<br>Fuses with other values can also be used. The maximum fuse value is 6.3 A.<br>For fuses with a value greater than 2 A, only slow-blow fuses may be used. |

## Approvals

For the current approvals, go to: www.phoenixcontact.net/product/2862152

Items manufactured **until the start of 2023** comply with directive 2014/34/EU (ATEX). You may use these items in potentially explosive areas of category 3.

Items manufactured **afterwards** do **not** meet the requirements of directive 2014/34/EU. Use in potentially explosive areas of category 3 is **not permitted**.

If you use an item with ATEX-relevant printing in a potentially explosive area, please observe the associated documentation.

Please also observe the specifications in the AH DE IL EX ZONE 2 (German) or AH EN IL EX ZONE 2 (English) application note.

**If the item used by you does not feature ATEX-relevant identification, use in potentially explosive areas is not permitted.**

## Manufacturer's declarations

For the current manufacturer’s declarations, go to: www.phoenixcontact.net/product/2862152

# 5 Additional tables

## 5.1 Power dissipation

### Formula for calculating the power dissipation of the electronics

$P_{EL} = 0.180\ W + I_M^2 \times R_F$

Where:

| | |
|---|---|
| $P_{EL}$ | Total power dissipation in the terminal |
| $I_M$ | Load current in the main circuit in A |
| $R_F$ | Resistance of the fuse<br>The resistance of the fuse $R_F$ for a 6.3 AT fuse is approximately 12 mΩ. |

At a theoretical maximum current of 6.3 A, the power dissipation of the electronics is calculated to be:

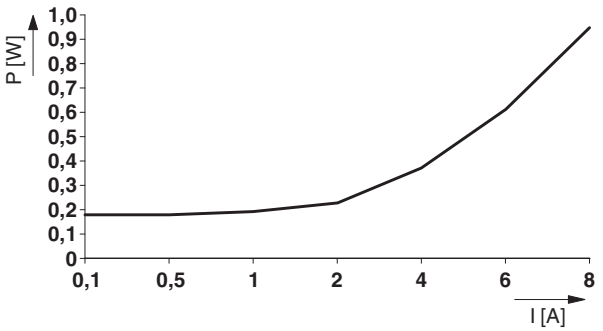
$P_{EL} = 0.18\ W + 39.69\ A^2 \times 0.012\ \Omega = 0.66\ W$

### Power dissipation of the housing

| | | |
|---|---|---|
| $P_{HOU}$ | = | 0.7 W<br>across the entire permitted ambient temperature range |

### Typical power dissipation of the electronics

Figure 1 Typical power dissipation of the electronics in relation to the load current in the main circuit




| | |
|---|---|
| P [W] | Power dissipation in W |
| I [A] | Load current in the main circuit in A |

This test was carried out with a 6.3 AT fuse.

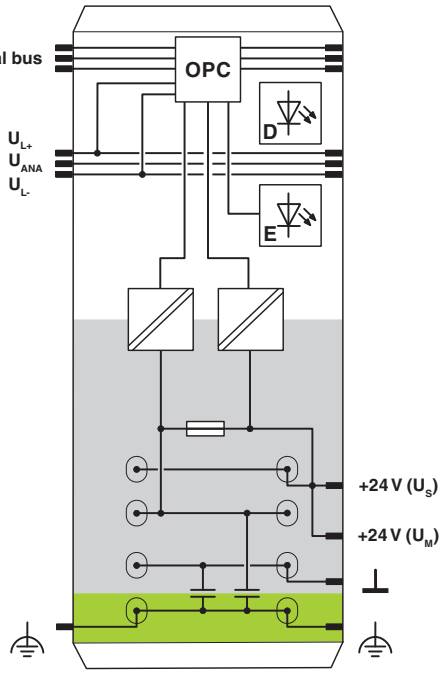
## 5.2 Derating

**Derating of the load current in the segment circuit**

No derating

# 6 Internal circuit diagram

Figure 2 Internal wiring of the terminal points



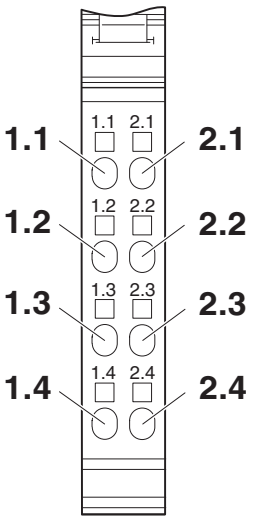

Key:

| | |
|---|---|
| OPC | Protocol chip<br>(Bus logic including voltage conditioning) |
| | LED |
| | Electrical isolation |
| | Fuse |
| | Capacitive connection to the functional ground (FG) |
| | Electrically isolated areas |

Other symbols used are explained in the IL SYS INST UM E user manual.

# 7 Terminal point assignment

Figure 3 Terminal point assignment




| Terminal point | Assignment | | |
|---|---|---|---|
| 1.1 / 2.1 | 24 V DC | $U_S$ | Measuring points for segment voltage $U_S$ (24 V DC) |
| 1.2 / 2.2 | 24 V DC | $U_M$ | 24 V supply for main circuit<br>These terminal points are connected with each other and with the potential jumper of the main supply $U_M$ via the fuse. The potential jumpers of the main circuit $U_M$ and the segment circuit $U_S$ (both fused) have a combined current carrying capacity of 6.3 A. |
| 1.3 / 2.3 | GND | Reference potential of the I/O supply | The reference potential is routed directly to the potential jumper and simultaneously functions as reference ground for the main and segment supplies. |
| 1.4 / 2.4 | FE | Functional ground | Functional ground of the power terminal and, therefore, of the Inline station.<br>The contacts are connected directly to the potential jumper and the functional ground spring on the bottom of the housing. |
| | | | Terminal points 1.2, and 1.3 are connected with a capacitor to FE. |

**NOTE: Electronics may be damaged when overloaded**

Ensure that the maximum permissible current of 6.3 A is not exceeded by the potential jumpers $U_M$ and $U_S$ (total current).

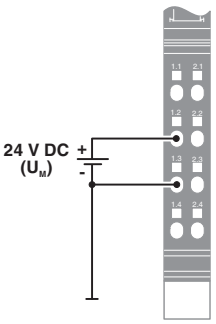
## 8 Connection example

**NOTE: Electronics may be damaged when overloaded**

Use the intended power connector for supplying the voltage.
The full current carrying capacity is ensured by internal bridging of the terminal points (see connection assignment).

The main circuit and the segment circuit are protected by an internal fuse.

Figure 4 Typical connection of the supply voltage

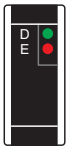



Most I/O terminals draw their supply voltage from the segment circuit.

This voltage is automatically provided at the terminal.

## 9 Local diagnostic indicators

Figure 5 Local diagnostic indicators




| LED | Color | Meaning |
|---|---|---|
| D | Green | Diagnostics (bus and logic voltage) |
| | On: | Data transmission active within the station |
| | Flashing: | |
| | 0.5 Hz: (slow) | Communications power present, Data transmission not active within the station |
| | 2 Hz: (medium) | Communications power present, supply voltage $U_M$ not present |
| | 4 Hz: (fast) | Communications power present, local bus error |
| | Off: | Communications power not present, data transmission not active within the station |
| E | Red | Fuse |
| | Off: | Fuse is OK |
| | On: | Fuse blown |

If there is no supply voltage $U_M$ and if the fuse has blown or is missing, the module sends a periphery error message to the superordinate control or computer system.

A blown or missing fuse is indicated via both diagnostic indicators. The red LED E lights up and the green LED D flashes at 2 Hz.

**Function identification**

Black

## 10 Process data

The terminal occupies two input process data bits. These only indicate the status of the fuse and the main voltage.

| (Byte.Bit) view | | 0.1 | 0.0 |
|---|---|---|---|
| Assignment | Main voltage $U_M$ is present, fuse is OK | 1 | 1 |
| | Main voltage $U_M$ is present, fuse has blown or is missing | 1 | 0 |
| | Main voltage $U_M$ is not present, fuse has blown or is missing | 0 | 0 |

For the assignment of the illustrated (byte.bit) view to your INTERBUS control or computer system, please refer to the DB GB IBS SYS ADDRESS data sheet.