

# IB IL 24 PWR IN/R-PAC

## Inline power/boost terminal



Data sheet  
6483\_en\_05

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## 1 Description

The terminal is designed for use within an Inline station. If the maximum load of the bus coupler for the communications power ( $U_L$ ) or the supply voltage for the analog terminals ( $U_{ANA}$ ) is reached, this terminal can be used to provide these voltages again.

To do this, apply a 24 V DC voltage ( $U_{24V}$ ) to the terminal. The communications power ( $U_L$ ) and the supply voltage for the analog terminals ( $U_{ANA}$ ) are generated from this voltage. In addition, the terminal enables the feed-in of the 24 V DC main voltage ( $U_M$ ) and the 24 V DC segment voltage ( $U_S$ ).

### Features

- Supply of all 24 V voltages required for the low-level signal of an Inline station
- From hardware version 01, approved for use in potentially explosive areas of zone 2



**WARNING: Explosion hazard when used in potentially explosive areas**

When using the terminal in potentially explosive areas, observe the corresponding notes.



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 from the product at [phoenixcontact.net/products](https://www.phoenixcontact.net/products).

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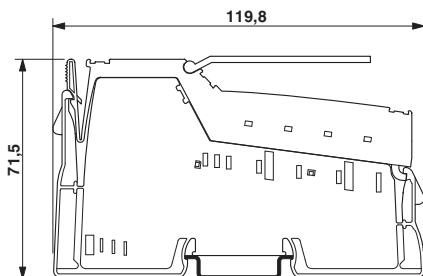
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### 3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline power terminal or boost terminal, complete with accessories (connector and labeling field), 24 V DC, without fuse	IB IL 24 PWR IN/R-PAC	2861674	1
Accessories	Type	Order No.	Pcs./Pkt.
Connector set, for power terminal block, copper, colored identification. (Connector/Adapter)	IB IL PWR IN/R-PLSET	2860620	1
Labeling field, width: 12.2 mm (Marking)	IB IL FIELD 2	2727501	10
Labeling field, width: 48.8 mm (Marking)	IB IL FIELD 8	2727515	10
Insert strip, Sheet, white, unlabeled, can be labeled with: Office printing systems: Laser printer, Mounting type: Insert, Lettering field: 62 x 10 mm (Marking)	ESL 62X10	0809492	1
Insert strip, Sheet, white, unlabeled, can be labeled with: Office printing systems: Laser printer, Mounting type: Insert, Lettering field: 62 x 46 mm (Marking)	ESL 62X46	0809502	5
Documentation	Type	Order No.	Pcs./Pkt.
User manual, English, Automation terminals of the Inline product range	IL SYS INST UM E	-	-

### 4 Technical data

#### Dimensions (nominal sizes in mm)





Width	48.8 mm
Height	119.8 mm
Depth	71.5 mm

General data	
Color	green
Weight	192 g (with connectors)
Mounting type	DIN rail
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

Connection data	
Designation	Inline connector
Connection method	Spring-cage connection
Conductor cross section solid / stranded	0.08 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> / 0.08 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross section [AWG]	28 ... 16
Stripping length	8 mm

Connection data for UL approvals	
Designation	Inline connector
Connection method	Spring-cage connection
Conductor cross section solid / stranded	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> / 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross section [AWG]	24 ... 16
Stripping length	8 mm

Interface Inline local bus	
Connection method	Inline data jumper
Transmission speed	500 kbps / 2 Mbps (Can be used in Inline stations with these transmission speeds)

Power consumption	
	<p><b>NOTE: Electronics may be damaged when overloaded</b></p> <p>Provide external fuses for each 24 V area.</p> <p>The power supply unit must be able to supply four times the nominal current of the external fuse, to ensure that it blows in the event of an error.</p>
	<p>When supply voltages <math>U_M/U_S</math> are supplied separately from the supply voltage <math>U_{24V}</math>, they are electrically isolated from one another. This is only ensured if two separate power supply units are used.</p>

**Power consumption**

24 V supply ( $U_{24V}$ ) for generating $U_L$ and $U_{ANA}$	24 V DC
Supply voltage range $U_{24V}$	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption	min. 12 mA DC (from $U_{24V}$ , at nominal voltage) max. 1.25 A DC (from $U_{24V}$ , at nominal voltage; consisting of: 0.75 A DC for the communications power and 0.5 A DC for the analog voltage supply)
Main circuit supply $U_M$	24 V DC
Supply voltage range $U_M$	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Power supply at $U_M$	max. 8 A (Sum of $U_M + U_S$ ; 4 A, maximum, when used in potentially explosive areas.)
Segment circuit supply $U_S$	24 V DC
Supply voltage range $U_S$	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Power supply at $U_S$	max. 8 A DC (Sum of $U_M + U_S$ ; 4 A, maximum, when used in potentially explosive areas.)
Communications power $U_L$	7.5 V DC
Power supply at $U_L$	max. 2 A DC
I/O supply voltage $U_{ANA}$	24 V DC
Supply voltage range $U_{ANA}$	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Power supply at $U_{ANA}$	max. 0.5 A DC

**Power dissipation**

Power dissipation	max. 2.55 W (entire device)
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**Configuration and parameter data in a PROFIBUS system**

Required parameter data	0 Byte
Need for configuration data	0 Byte

**Electrical isolation/isolation of the voltage areas**

Test section	Test voltage
7.5 V logics supply, 24 V analog supply/functional earth ground	500 V AC , 50 Hz , 1 min.
7.5 V logics supply, 24 V analog supply, 24 V main supply, 24 V segment supply	500 V AC , 50 Hz , 1 min.
24 V main supply, 24 V segment supply / functional earth ground	500 V AC , 50 Hz , 1 min.

**Error messages to the higher level control or computer system**

None

**Protective circuit**

Surge protection (segment supply, main supply, 24 V supply)

Input protective diodes (can be destroyed by permanent overload)  
Pulse loads up to 1500 W are short circuited by the input protective diode.

Protection against polarity reversal (segment supply/main supply)

Parallel diodes for protection against polarity reversal; in the event of an error the high current flowing through the diodes causes the fuse connected upstream to blow.

Polarity reversal (24 V supply)

Serial diode in the lead path of the power supply unit; in the event of an error only a low current flows. In the event of an error, no fuse trips within the external power supply unit.

**Approvals**

For the latest approvals, please visit [phoenixcontact.net/products](http://phoenixcontact.net/products).

**5 Electrical isolation/isolation of the voltage areas**

<b>Common potentials</b>	
When providing the 24 V supply for generating $U_L$ and $U_{ANA}$ separately from the 24 V main supply/24 V segment supply	Main and segment supply have the same potential. From the power terminal onwards, common ground is led through the potential jumper to the devices as reference ground GND. 24 V supply for generating $U_L$ and $U_{ANA}$ , 24 V analog supply $U_{ANA}$ , and 7.5 V communications power $U_L$ have the same potential. From the bus coupler onwards, common ground is led through the potential jumper to the devices as the reference ground "Logical GND" ( $U_{L-}$ ).
When providing the 24 V supply for generating $U_L$ and $U_{ANA}$ by jumpering the 24 V main supply/24 V segment supply	Main supply, segment supply, 24 V analog supply, and 7.5 V communications power have the same potential. From the power terminal onwards, common ground is led through the potential jumper to the devices as the reference ground "Logical GND" ( $U_{L-}$ ) for the communications power and analog supply and separately as reference ground GND for the supply and segment level.
<b>Separate potentials</b>	
When providing the 24 V supply for generating $U_L$ and $U_{ANA}$ separately from the 24 V main supply/24 V segment supply	The 24 V supply for generating $U_L$ and $U_{ANA}$ is physically and therefore electrically isolated from the main supply and the segment supply.
When providing the 24 V supply for generating $U_L$ and $U_{ANA}$ by jumpering the 24 V main supply/24 V segment supply	None

## 6 Internal circuit diagram

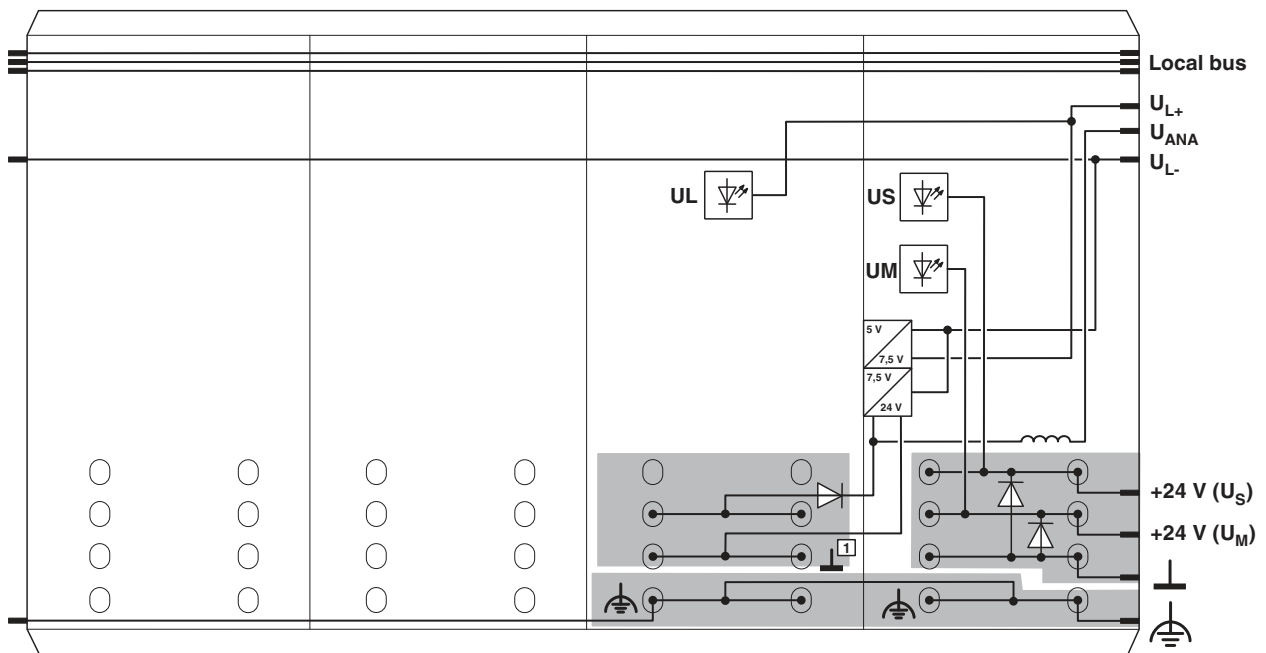








Figure 1 Internal wiring of the terminal points

Key:

-  LED
-  Electrically isolated area
-  Power supply unit
-  Diode
-  Reference potential GND (24 V supply)

 Explanation for other used symbols has been provided in the IL SYS INST UM E user manual.

## 7 Terminal point assignment

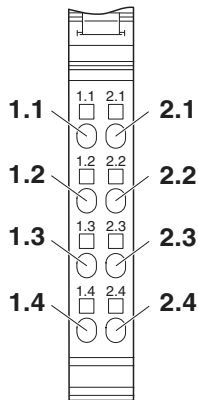


Figure 2 Terminal point assignment

Terminal point	Designation	Assignment	
<b>Connector 1</b>	<b>Not used</b>		
<b>Connector 2</b>	<b>Not used</b>		
<b>Connector 3</b>	<b>Voltage supply for generating the communications power and analog voltage</b>		
1.1 / 2.1	Not used		
1.2 / 2.2	24 V DC	For generating $U_L$ and $U_{ANA}$	
1.3 / 2.3	GND	Ground	Ground of the 24 V supply
1.4 / 2.4	FE	Functional earth ground	Functional earth ground of the power terminal and, therefore, of the Inline station. The contacts are directly connected to the potential jumper and the FE spring on the bottom of the housing.
<b>Connector 4</b>	<b>Voltage supply for the main circuit and segment circuit</b>		
1.1 / 2.1	24 V DC	$U_S$	24 V supply for segment circuit
1.2 / 2.2	24 V DC	$U_M$	24 V supply for main circuit
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 earth ground	Functional earth ground of the power terminal and, therefore, of the Inline station. The contacts are directly connected to the potential jumper and the FE spring on the bottom of the housing.



Functional earth ground is only used to discharge interference.



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

Ensure that the maximum permissible current of 8 A flowing through potential jumpers  $U_M$  and  $U_S$  (total current) is not exceeded.



**NOTE: Malfunction**

Connect the power terminal to the functional earth ground (FE) via one of the FE connections of connector 3 or connector 4. To do so, connect the corresponding contact to a grounding terminal block.



### 24 V segment supply/24 V main supply

The segment supply and main supply must have the same reference potential. Therefore, an electrically isolated voltage area on the I/O side cannot be created.

The main supply and the segment supply are protected against polarity reversal and transient overvoltage.



**NOTE: Module can become damaged**  
 The main supply and segment supply do not have short-circuit protection.  
 The user must provide short-circuit protection. Measure the rating of the fuse connected upstream such that the maximum permissible load current is not exceeded.

### 24 V segment supply

You can provide the segment voltage at this terminal or one of the supply terminals.

There are several ways of providing the segment voltage at the terminal (connector 4):

1. The segment voltage can be supplied separately at terminal points 1.1 (or 2.1) and 1.3 (or 2.3) (GND) of the power connector.
2. Connections 1.1 (or 2.1) and 1.2 (or 2.2) can be jumpered to tap the supply for the segment circuit from the main circuit.
3. A switch can be inserted between terminal points 1.1 (or 2.1) and 1.2 (or 2.2) to create a switched segment circuit (e.g., an emergency stop circuit).

### 24 V supply for generating $U_L$ and $U_{ANA}$

The 24 V supply has protection against polarity reversal and transient overvoltage. These protective elements are only used to protect the power supply unit.



**NOTE: Module can become damaged**  
 The 24 V supply does not have short-circuit protection.  
 The user must provide short-circuit protection. Measure the rating of the fuse connected upstream such that the maximum permissible load current is not exceeded.

## 8 Connection example

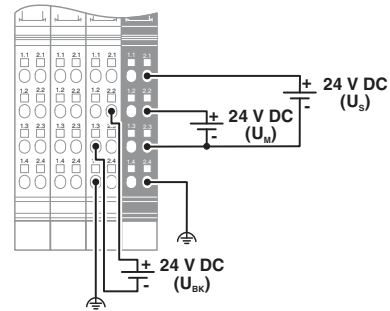


Figure 3 Typical connection of the supply voltage

## 9 Local diagnostic indicators

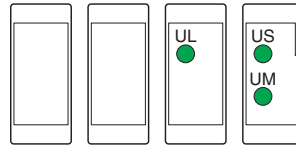


Figure 4 Local diagnostic indicators

LED	Color	Meaning
UL	Green	7.5 V communications power
US	Green	24 V supply for segment circuit
UM	Green	24 V supply for main circuit

### Function identification

Black

## 10 Notes on using the terminal block in potentially explosive areas

**WARNING: Explosion hazard**

Please make sure that the following notes and instructions are observed.

### Approval according to ATEX Directive 2014/34/EU

Ⓜ II 3 G Ex nA IIC T4 Gc X

### Installation notes

The category 3 device is designed for installation in zone 2 potentially explosive areas.

The device meets the requirements of EN 60079–0:2012 + A11:2013 and EN 60079–15:2010.

- Observe the specified conditions for use in potentially explosive areas.
- At the time of installation, use an approved housing (minimum protection IP54), which meets the requirements of EN 60079-15. Within this context, observe the requirements of IEC 60079-14/EN 60079-14.
- The following work is only permitted in potentially explosive areas when the power is disconnected:
  - Snapping the device onto the DIN rail
  - Removing the device from the DIN rail
  - Connection and disconnection of cables
- Connect the DIN rail to the protective earth ground.
- Only devices that are designed for operation in Ex Zone 2 and the conditions at the installation location may be connected to the circuits in Zone 2.
- The maximum permissible current for each tension spring contact is **2 A**.
- When using the device in potentially explosive areas, observe the specifications in the application note AH DE IL EX ZONE 2 (German) / AH EN IL EX ZONE 2 (English).