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# IB IL EX-IS PWR IN-PAC

Power supply for intrinsically safe Inline terminals used in hazardous locations



Data sheet  
2825\_en\_C

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## 1 Description

The IB IL EX-IS PWR IN-PAC terminal functions as the power supply for the intrinsically safe area. It is mandatory when IB IL EX-IS...IO... terminals are incorporated into the Inline station.

The terminal provides full isolation of the intrinsically safe I/O system. This isolation includes the logic supply ( $U_L$ ), I/O terminal power supply ( $U_{EX}$ ), and local bus communication.

## 2 Features

- Galvanically isolated power supply for communication to intrinsically safe IB IL EX-IS... terminals
- LED indicators for normal, heavy and overload power levels
- Provides the required 50 mm separation between non-intrinsically safe and intrinsically safe I/O wiring
- 1000 mA to logic circuit ( $U_L$ )
- 1000 mA supply for I/O modules ( $U_{EX}$ )
- -25... +60°C operating range



This data sheet is only valid in association with the IB IL SYS PRO UM E user manual or the Inline system manual for your bus system.



Make sure you always use the latest documentation. It can be downloaded at [www.phoenixcontact.net/products](http://www.phoenixcontact.net/products).



This data sheet is valid for all products listed on the following page:

### 3 Ordering data

#### Products

Description	Type	Order No.	Pcs./Pkt.
Terminal, power supply, includes accessories (connectors and labeling fields)	IB IL EX-IS PWR IN-PAC	2869910	1

#### Accessories

Description	Type	Order No.	Pcs./Pkt.
Connector, colored-coded	IB IL SCN-PWR IN-CP	2727637	10

#### Documentation

Description	Type	Order No.	Pcs./Pkt.
User manual: "Configuring and Installing the INTERBUS Inline Product Range"	IB IL SYS PRO UM E	2743048	1
User manual: "Automation Terminals of the Inline Product Range"	IL SYS INST UM E	2698737	1

### 4 Technical data

#### General data

Housing dimensions (width x height x depth)	48.8 mm x 136.8 mm x 71.5 mm
Weight	292 g
Transmission speed	500 kbps
Permissible temperature (operation)	-25°C to +60°C
Permissible temperature (storage/transport)	-25°C to +85°C
Permissible humidity (operation/storage/transport)	10% to 95%, according to DIN EN 61131-2
Permissible air pressure (operation/storage/transport)	70 kPa to 106 kPa (up to 3000 m above sea level)
Degree of protection	IP20 according to IEC 60529
Protection class	Class 3 according to VDE 0106, IEC 60536
Connection data for connector	
Connection method	Spring-cage terminals
Conductor cross section	0.2 mm <sup>2</sup> - 1.5 mm <sup>2</sup> (solid or stranded), 24 - 16 AWG

#### Electrical supply data

Nominal value	24 V DC
Tolerance	-15%/+20%
Ripple	±5%
Permissible range	19.2 V to 30 V
Recommended cable lengths	30 m maximum, do not route cable through outdoor areas
Current load, maximum	1.5 A
Power dissipation, maximum	8 W

#### U<sub>EX</sub> supply to I/O terminals

Connection	Potential jumpers
Nominal value	24 V DC
Current, maximum	1000 mA
Isolation	Galvanic isolation by transformer

#### U<sub>L</sub> supply to logic circuit

Connection	Potential jumpers
Nominal value	5 V DC
Current, maximum	1000 mA
Isolation	Opto-isolation and galvanic isolation by transformer

**Approval/conformance**

CE	94/9/EC EN 60079-0:2006 EN 60079-0:2009 EN 60079-11:2007 IEC 60079-15:2010
ATEX	II 3G Sira 10ATEX2130X; II 3G Ex nA IIC T4 Gc T <sub>a</sub> = -25°C... +60°C
IECEX	SIR 10.0085X; Ex nA IIC T4 Gc
UL/cUL	Class I, Div. 2, Groups A,B,C,D T4
FM	Class I, Div. 2, Groups A,B,C,D T4

**5 Local diagnostic and status indicators and terminal point assignment**

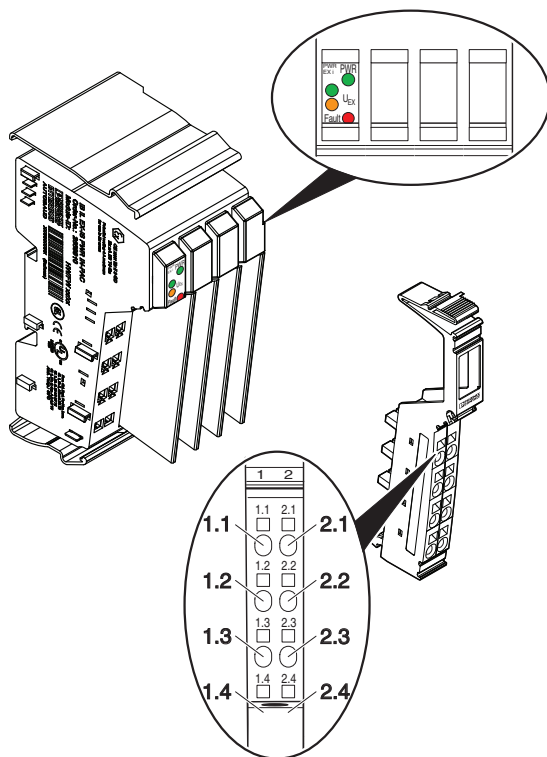


Figure 1 IB IL EX-IS PWR IN-PAC terminal LEDs and connector

**5.1 Function identification**

Color	Meaning
Black	Power supply (input)

**5.2 Local diagnostic and status indicators**

Des.	Color	Meaning
<b>PWR</b>	Green	Power present <sup>1</sup>
<b>U<sub>EX</sub></b>	Green	U <sub>EX</sub> power supply normal with no faults
	Yellow	U <sub>EX</sub> power supply use is high, no faults
<b>FAULT</b>	Red (on)	Module fault exists (U <sub>EX</sub> or U <sub>L</sub> overload) or power supply low

<sup>1</sup> If power supply voltage is below 19.2 V DC or above 32 V DC, the PWR LED will be on and all other LEDs will be off.

**5.3 Terminal point assignment**

Terminal points	Signal	Assignment
1.1	-	
1.2	<b>U<sub>V</sub> (24 V)</b>	Voltage supply for IB IL EX-IS...IO... modules
1.3	<b>GND</b>	Ground of the 24 V supply
1.4	<b>FE</b>	Functional earth/ground
2.1	-	
2.2	-	
2.3	-	
2.4	-	

## 6 Internal circuit diagram

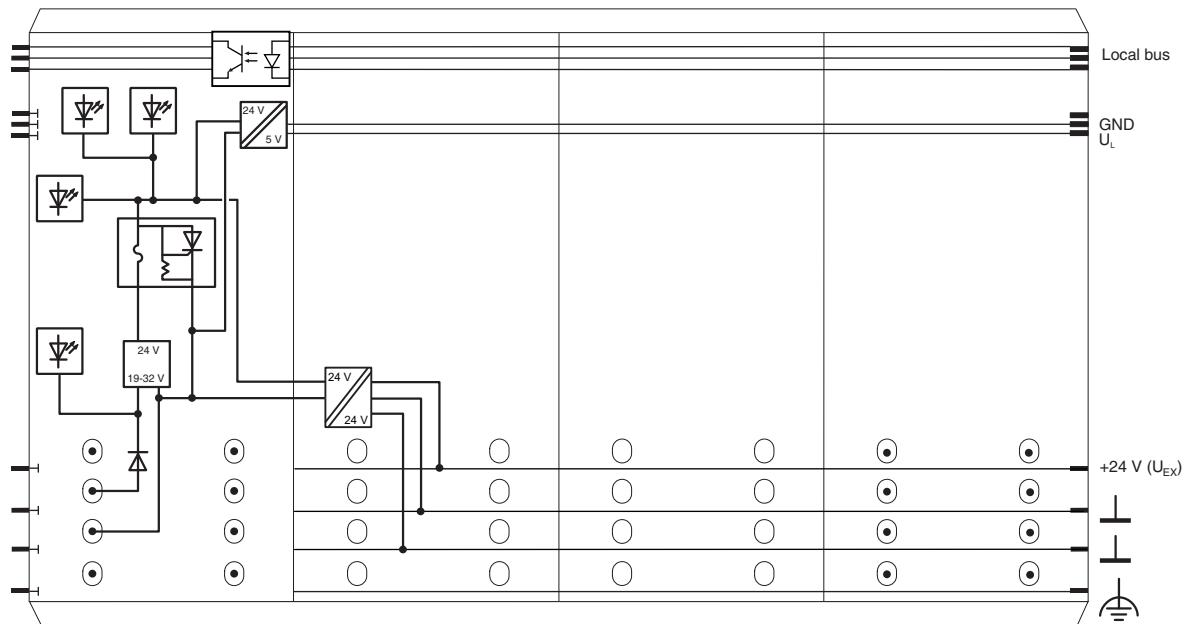
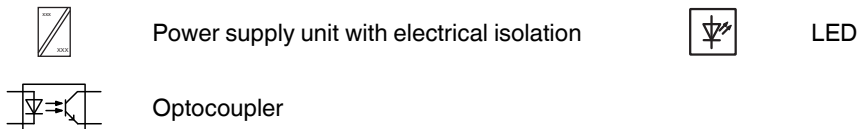


Figure 2 Internal wiring of the terminal points

Key:





## 7 Safety regulations and installation notes

### 7.1 Safety regulations for installation in the potentially explosive area

This Inline terminal conforms to standard EN 50021 and can be installed in a Zone 2 potentially explosive area. These Inline terminals are category 3 items of equipment.

This Inline terminal for the indicated hardware version or later is suitable for use in Class I, Zone 2, Groups A, B, C, D.



For a list of terminals that are approved for the potentially explosive areas of Zone 2, please refer to the AH EN IL EX ZONE 2 application note. Verify use by checking the label on the Inline terminal and the packaging.

#### Installation in Zone 2



**WARNING: Explosion hazard**

The device is classed as category 3 electrical equipment and is suitable for installation in zone 2.

Observe the specified conditions for use in potentially explosive areas.



**WARNING: Explosion hazard**

Install the device in suitable housing with a minimum of IP54 degree of protection. Observe the requirements of IEC 60079-14/EN 60079-14, e.g., steel housing with a wall thickness of 3 mm.



**WARNING: Explosion hazard**

Disconnect the block power supply before:

- Snapping it on or disconnecting it
- Connecting or disconnecting cables



**WARNING: Explosion hazard**

Only use category 3G modules (ATEX 94/9/EC).

### 7.2 Installation and operation

Follow the installation instructions.



**NOTE:**

Installation, operation, and maintenance may only be carried out by qualified personnel.

When installing and operating the device, the applicable safety directives (including national safety directives), accident prevention regulations, as well as general technical regulations, must be observed.



**NOTE:**

The circuits inside the device must not be accessed.

Do not repair the device yourself, but replace it with an equivalent device. Repairs may only be carried out by the manufacturer.



**NOTE:**

The device is designed to meet IP20 protection when:

- It is installed outside potentially explosive areas.
- The environment is clean and dry.

Install the device in a suitable housing with a suitable degree of protection in accordance with IEC 60529 in order to protect it from mechanical and electrical damage.

For the safety data, please refer to the operating instructions and certificates and other approvals, if necessary.

## 8 Installation

### 8.1 Overview

Inline intrinsically safe IO terminals can be installed in a standard Inline station and is supported by all major industrial networks. Basic and intrinsically safe wiring practices need to be followed by the following concept.

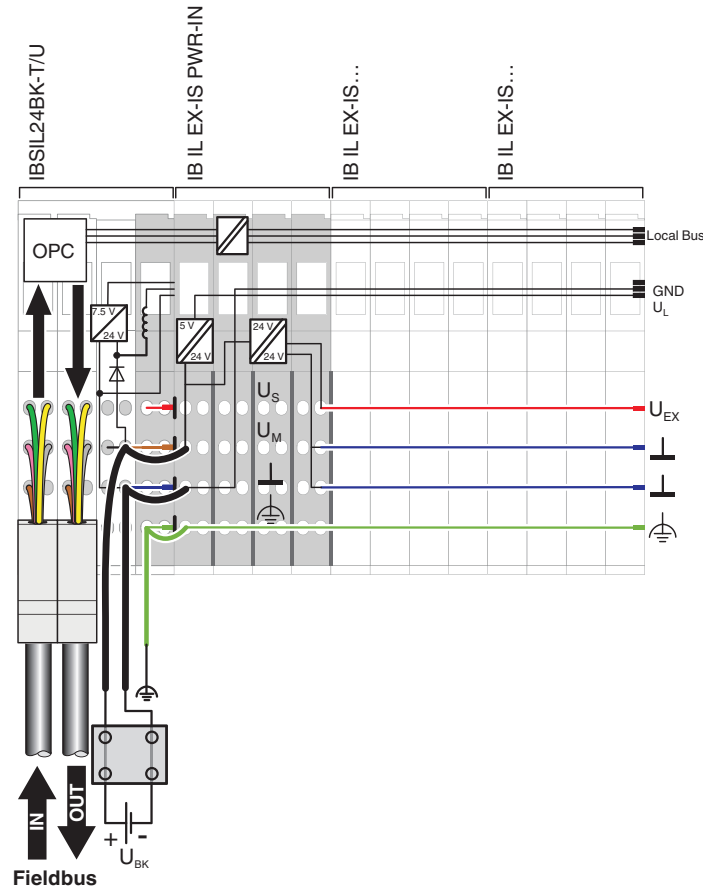


Figure 3 Intrinsically safe Inline terminals power supply

The IB IL EX-IS PWR IN-PAC terminal:

- provides isolation between unsafe power and power into the safe zone.
- limits the available energy to the intrinsically safe I/O modules.
- provides the required separation of 50 mm between safe and non-safe wire connections.

Intrinsically safe wiring must be installed separately from non-intrinsically safe wiring (must not be mixed within a wire channel). Only one IS power supply can be installed in an Inline station. Onboard I/Os on a bus coupler may be used. If additional power is required, a new node must be installed.

### 8.2 Power budget

The IB IL EX-IS PWR IN-PAC provides power to the IB IL EX-IS...IO... terminals in two ways:

- 1000 mA is available for the logic functions ( $U_L$ ).
- 1000 mA is available for the I/O functions ( $U_{EX}$ ).



The IB IL EX-IS PWR IN-PAC contains no logic function and therefore, does not draw power for itself.

The number of terminals that can be powered via the IB IL EX-IS PWR IN-PAC varies according to the type of terminal and the number and type of I/O connections.

Based on the logic functions, the maximum number of terminals that can be connected is 10.

To determine the number of I/O points that can be connected, refer to Table 1.

Table 1  $U_{EX}$  Current Draw

	IB IL EX-IS DIO 4/NAM-PAC	IB IL EX-IS AIO 4/EF-PAC	IB IL EX-IS TEMP 4 RTD/TC-PAC
Terminal overhead	20 mA	45 mA	45 mA
Output channel	45 mA	25 mA	–
Input channel	10 mA	25 mA	10 mA

To calculate the power requirements of a system, list the number and type of each connected point. From this list, determine the number and type of terminals required.

Multiply the number of each I/O point by the appropriate current draw listed in Table 1.

Add the terminal overhead current for each terminal used. The sum of the I/O point current draw and the terminal overhead current draw determines the current draw from the IB IL EX-IS PWR IN-PAC. The maximum current draw is 1000 mA.

**Example:**

For the following point count:

	Number of points	Current per point	Total
Digital Inputs	10	10 mA	100 mA
Digital Outputs	1	45 mA	45 mA
Temp/RTD inputs	6	10 mA	60 mA
Analog Inputs/Outputs	8	25 mA	200 mA
		<b>Subtotal</b>	405 mA

To connect this number of points, the following number of terminals are required (four channels per terminal). Add the total current draw for each terminal to determine the total terminal overhead.

	Digital points	Number of terminals	Current per terminal	Total
Digital I/O	11	3	20 mA	60 mA
Temperature	6	2	45 mA	90 mA
Analog I/O	8	2	45 mA	90 mA
<b>Number of terminals</b>		<b>7</b>	<b>Subtotal</b>	240 mA

Add the subtotals together and the total current draw from  $U_{EX}$  is 645 mA. This is less than 1000 mA and does not exceed the maximum  $U_{EX}$  current draw. The total number of

terminals is 7 (less than 10). Based on these totals, this is a viable configuration.

**8.3 Connections**

The IB IL EX-IS PWR IN-PAC terminal must be installed along within an existing IB IL system. The IB IL EX-IS PWR IN-PAC separates the existing IB IL system from the intrinsically safe area by providing isolation to the local bus as well as the I/O terminals ( $U_{EX}$ ).

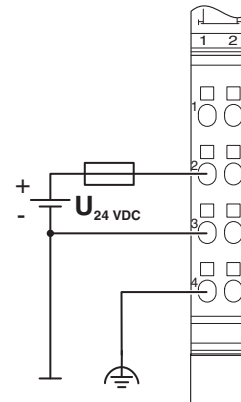


Figure 4 Connections