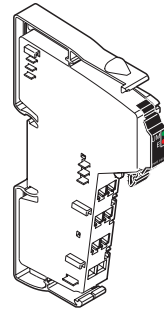


# IB IL 24 PWR IN/2-F

## INTERBUS Inline Power Terminal With Fuse



Data Sheet 6392A

06/2001

6392A001



This data sheet is only valid in association with the "Configuring and Installing the INTERBUS Inline Produce Range" User Manual IB IL SYS PRO UM E.

## Function

The terminal is designed for use within an INTERBUS Inline station.

The terminal supplies 24 V power to the main circuit ( $U_M$ ) and automatically supplies 24 V to the segment circuit ( $U_S$ ).

The terminal has protection against polarity reversal and surge voltage.

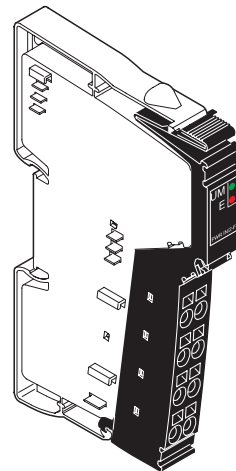
The internal fuse protects the main and segment circuit.

## Features



This terminal does not have an INTERBUS protocol chip and therefore is not an INTERBUS device.

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



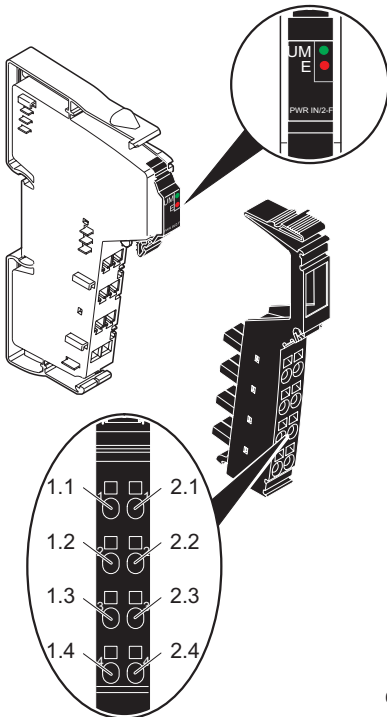
6392A002

Figure 1 IB IL 24 PWR IN/2-F terminal with connector



Please note that the connector is not supplied as standard with the terminal. Please refer to the ordering data on page 12 to order the appropriate connector for your application.

**IB IL 24 PWR IN/2-F**



6392A003

Figure 2 IB IL 24 PWR IN/2-F with appropriate connector

**Local Diagnostic Indicators**

Des.	Color	Meaning
UM	Green	24 V voltage (in main circuit $U_M$ ; prior to fuse)
E	Red	Fuse of the power terminal



A blown fuse is indicated by diagnostic indicator E (the E LED lights up).

**Function Identification**

Black

## Terminal Assignment

Terminal Point	Assignment
1.1, 2.1	Measuring points for the segment circuit $U_S$
1.2, 2.2	Supply points for the main circuit $U_M$ (+24 V) These terminal points are connected with each other and with the voltage jumper of the main supply $U_M$ via the fuse. The voltage jumpers of the main circuit $U_M$ and the segment circuit $U_S$ (both protected) have a combined current carrying capacity of 8 A.
1.3, 2.3	Ground contact (GND) for main circuit and segment circuit The reference potential is directly routed to the voltage jumper and is, at the same time, ground reference for the main and segment voltage.
1.4, 2.4	FE connection The contacts are directly connected with the voltage jumper and the FE spring on the bottom of the housing. The terminal is grounded when it is snapped onto a grounded DIN rail.
	Terminal points 1.2 and 1.3 are connected with a capacitor to FE.

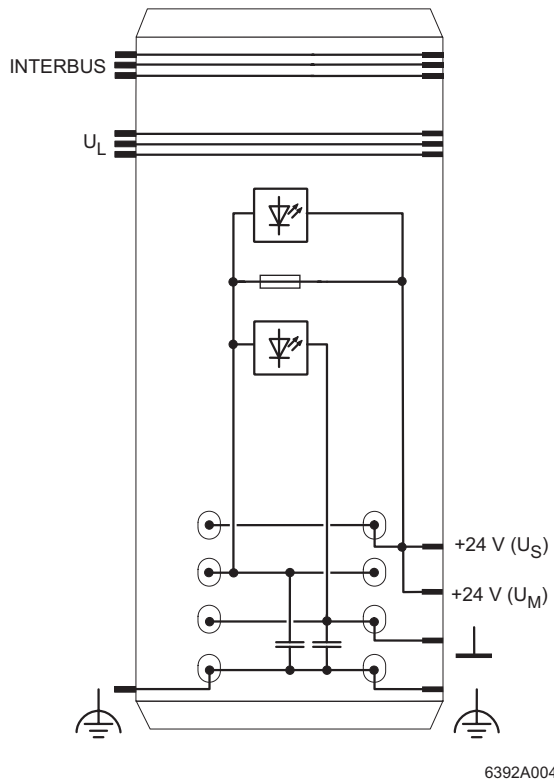


### Observe the current carrying capacity

The maximum total current flowing through the voltage jumpers should not exceed 8 A.

IB IL 24 PWR IN/2-F

# Internal Circuit Diagram



Key:





-  LED
-  Fuse
-  Capacitive connection to functional earth ground (FE)
-  Other symbols are explained in the IB IL SYS PRO UM E User Manual.

Figure 3 Internal wiring of the terminal points

## Connection Example



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



Most I/O terminals receive their supply voltage from the segment circuit. This voltage is automatically supplied to the IB IL 24 PWR IN/2-F terminal.

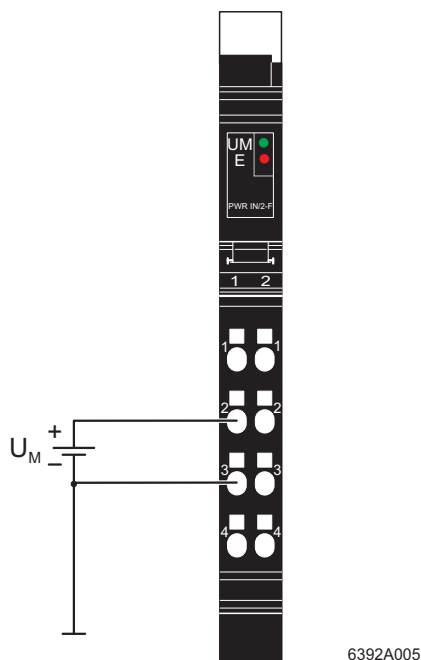




Figure 4 Typical connection of the supply voltage  $U_M$





To ensure maximum current carrying capacity, use a power connector to connect the cables (see page 12). In these connectors, the adjacent terminal points 1.2 and 2.2 and 1.3 and 2.3 are jumpered internally.

## IB IL 24 PWR IN/2-F

## Technical Data

General Data	
Housing dimensions (width x height x depth)	12.2 mm x 120 mm x 71.5 mm (0.480 in. x 4.724 in. x 2.815 in.)
Weight	44 g (without connectors)
Permissible temperature (operation)	-25°C to +55°C (-13°F to +131°F)
Permissible temperature (storage/transport)	-25°C to +85°C (-13°F to +185°F)
Permissible humidity (operation)	75% on average, 85% occasionally
 In the range from -25°C to +55°C (-13°F to +131°F) appropriate measures against increased humidity (> 85%) must be taken.	
Permissible humidity (storage/transport)	75% on average, 85% occasionally
 For a short period, slight condensation may appear on the housing if, for example, the terminal is brought into a closed room from a vehicle.	
Permissible air pressure (operation)	80 kPa to 106 kPa (up to 2000 m [6562 ft.] above sea level)
Permissible air pressure (storage/transport)	70 kPa to 106 kPa (up to 3000 m [9843 ft.] above sea level)
Degree of protection	IP 20 according to IEC 60529
Class of protection	Class 3 according to VDE 0106, IEC 60536

24 V I/O Supply (Main Circuit $U_M$ )		
Connection	+24 V Ground (GND)	Terminal points 1.2 and 2.2 Terminal points 1.3 and 2.3
Rated value		24 V DC
Tolerance		-15%/+20%
AC voltage component		5%
Permissible range		19.2 V to 30 V
Permissible current		8 A, maximum
Demands on the voltage supply		<p>The power terminal must be supplied from a new power supply unit to provide electrical isolation. Protect the 24 V power supply with an external fuse.</p> <div style="display: flex; align-items: center;">  <p>The power supply unit must be able to supply 4 times (400%) the nominal current of the external fuse.</p> </div>

Permissible Total Current in the Voltage Jumpers of the Main and Segment Circuit	
Nominal current of the terminal	6.0 A
Maximum permissible value	8.0 A
 The terminal is delivered with a 6.3 A slow-blow fuse. With an increased total current in the voltage jumpers $U_M$ and $U_S$ the user must protect the circuit by using higher rated fuses. Please note the information for the selection of fuses given on page 11.	

**IB IL 24 PWR IN/2-F**

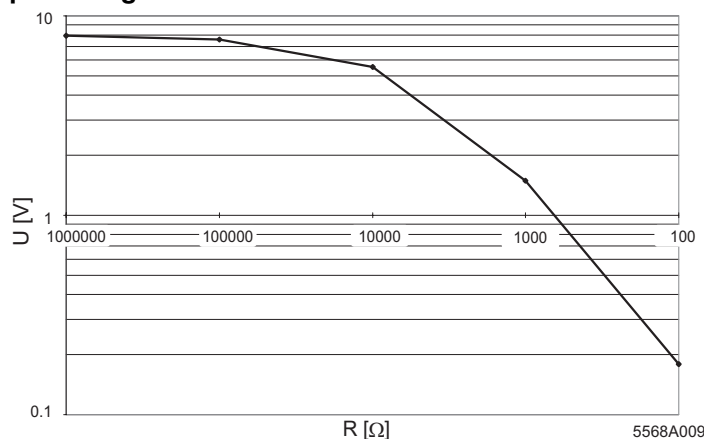
**Characteristic of the Voltage in the Main Circuit When the Fuse Is Blown**



Note that power is not disconnected in the main circuit even after the fuse has blown. Observe the characteristic.

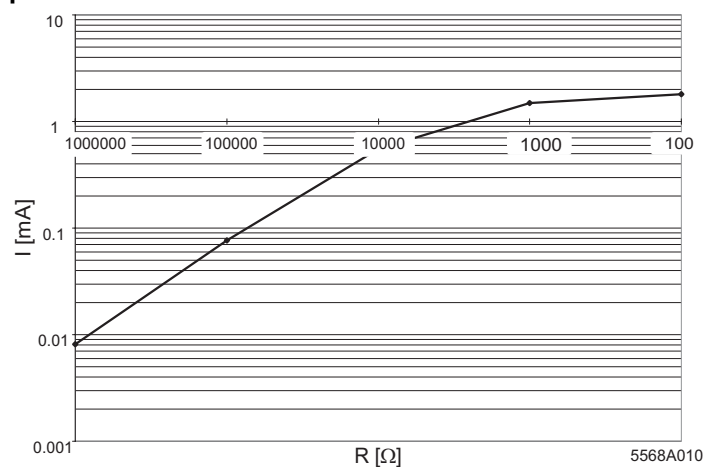
Resistance ( $\Omega$ )	Typical Output Voltage (V)	Typical Current (mA)
1000000	7.930	0.008
100000	7.631	0.076
10000	5.553	0.555
1000	1.492	1.490
100	0.180	1.792

**Output Voltage in Relation to Resistance**



U [V] Output voltage in V  
 R [ $\Omega$ ] Load impedance in  $\Omega$

**Output Current in Relation to Resistance**



I [mA] Output current in mA  
 R [ $\Omega$ ] Load impedance in  $\Omega$

## Power Dissipation

### Formula to Calculate the Power Dissipation of the Electronics

$$P_{\text{tot}} = 0.180 \text{ W} + I_{\text{M}}^2 \times R_{\text{F}}$$

Where

$P_{\text{tot}}$  Total power dissipation of the terminal

$I_{\text{M}}$  Load current in the main circuit

$R_{\text{F}}$  Resistance of the fuse

The resistance of fuse  $R_{\text{F}}$  for a 6.3 AT fuse is approximately 50 m $\Omega$ .

### Power Dissipation of the Housing Depending on the Ambient Temperature

$$P_{\text{HOU}} = 2.4 \text{ W} \quad -25 \text{ }^\circ\text{C} < T_{\text{UA}} \leq -5 \text{ }^\circ\text{C}$$

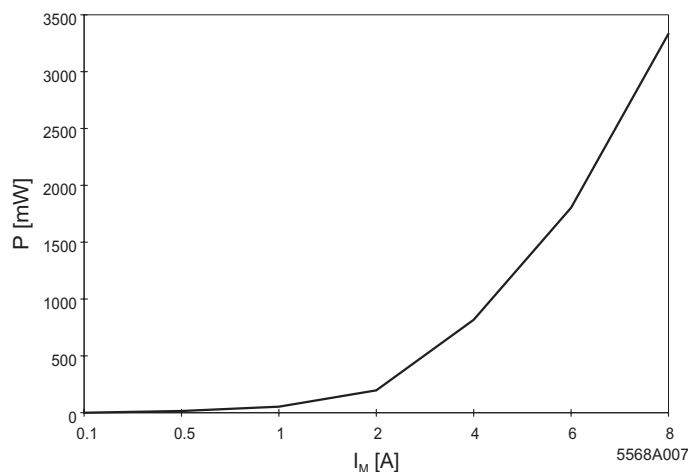
$$P_{\text{HOU}} = 2.4 \text{ W} - \frac{T_{\text{U}} - (-5 \text{ }^\circ\text{C})}{37.5 \text{ K/W}} \quad -5 \text{ }^\circ\text{C} < T_{\text{UA}} \leq +55 \text{ }^\circ\text{C}$$

Where

$P_{\text{HOU}}$  Maximum permissible power dissipation of the housing

$T_{\text{A}}$  Ambient temperature

### Typical Power Dissipation of the Electronics Depending on the Load Current of the Main Circuit

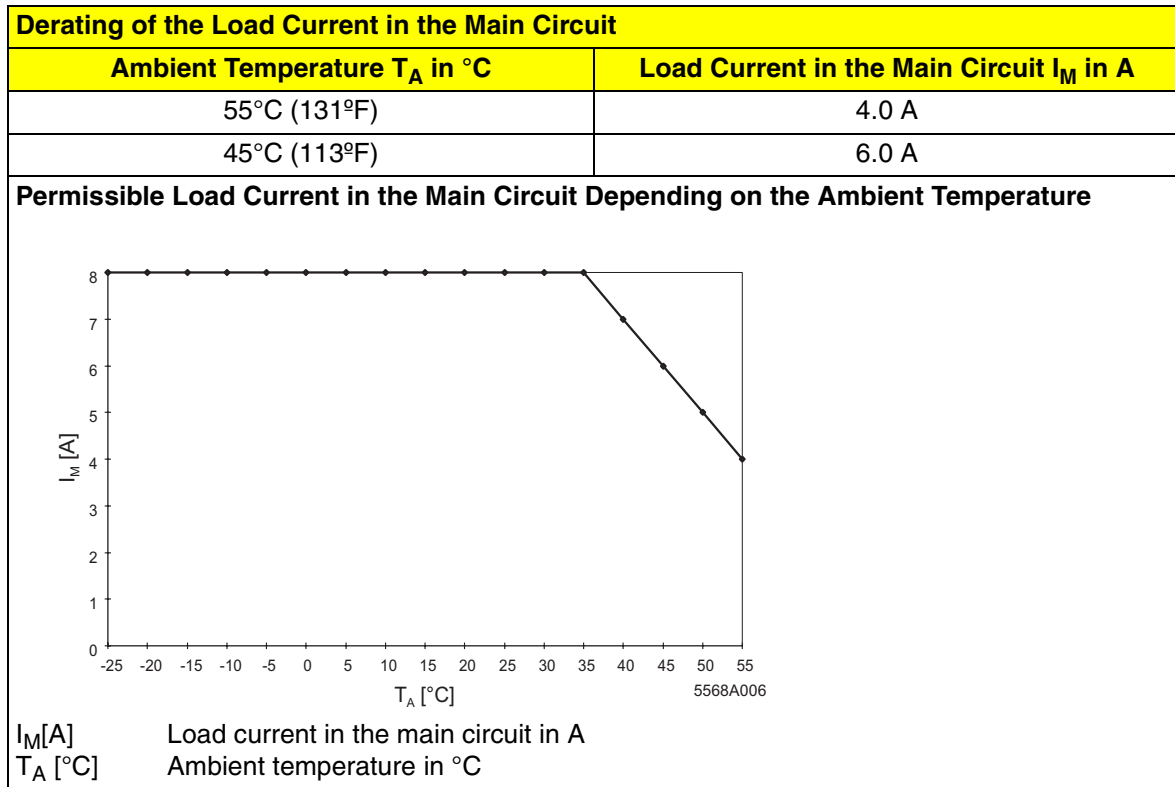





$P$  [mW] Power dissipation in mW


$I_{\text{M}}$  [A] Load current in the main circuit in A

**This test was carried out with a 10 AT fuse.**

**IB IL 24 PWR IN/2-F**




Safety Devices	
Overload/short circuit in the main circuit and in the segment circuit	Fuse 5 x 20 with 6.3 A, slow-blow
 You may also use fuses with other values. The maximum fuse value is 8 A.	
 <b>Note for the selection of fuses:</b> Only use slow-blow fuses for currents higher than 2 A.	
Surge voltage	Yes; suppressor diode for voltage limitation between terminal points 1.1 and 1.3 and terminal points 1.2 and 1.3
Polarity reversal	Yes; diode connected in parallel as protection against polarity reversal   The power supply unit must be able to supply 4 times (400%) the nominal current of the internal fuse.

Electrical Isolation	
 To provide electrical isolation between the logic level and the I/O area, these areas must be supplied from the bus terminal, or from the bus terminal and a power terminal with separate power supplies. Interconnection of the 24 V power supplies is not permitted. Please pay attention to GND/PE connections on the power supply units (see also user manual).	
Common Potentials	
24 V main power, 24 V segment voltage, and GND have the same potential. FE is a separate potential area.	
Separate Potentials in the System Consisting of Bus Terminal/Power Terminal and I/O Terminal	
- Test Distance	- Test Voltage
5 V supply incoming remote bus/7.5 V supply (bus logic)	500 V AC, 50 Hz, 1 min
5 V supply outgoing remote bus/7.5 V supply (bus logic)	500 V AC, 50 Hz, 1 min
7.5 V supply (bus logic)/24 V supply (I/O)	500 V AC, 50 Hz, 1 min
24 V supply (I/O)/functional earth ground	500 V AC, 50 Hz, 1 min


Error Messages to the Higher-Level Control or Computer System
None


## IB IL 24 PWR IN/2-F


## Ordering Data

Description	Order Designation	Order No.
Power terminal with fuse	IB IL 24 PWR IN/2-F	28 60 01 5
 You need one connector for the power supply of the terminal.		
Connector for power supply (black, with color print) pack of: 10	IB IL SCN-PWR IN-CP	27 27 63 7
Connector for power supply (black, w/o color print) pack of: 10	IB IL SCN-PWR IN	27 27 46 2
Fuse	SI 5x20 6,300 A T	50 30 51 2
"Configuring and Installing the INTERBUS Inline Product Range" User Manual	IB IL SYS PRO UM E	27 43 04 8

Phoenix Contact GmbH & Co.KG  
 Flachsmarktstr. 8  
 32825 Blomberg  
 Germany

 + 49 - 52 35 - 30 0

 + 49 - 52 35 - 34 12 00

 [www.phoenixcontact.com](http://www.phoenixcontact.com)



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