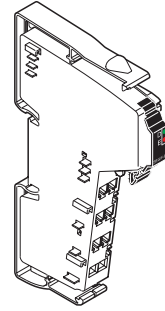


IB IL 24 SEG/F-D IB IL 24 SEG/F-D-PAC

Inline Segment Terminal With Fuse and Diagnostics



Data Sheet 5658C

02/2003

5658A001



The IB IL 24 SEG/F-D and IB IL 24 SEG/F-D-PAC only differ in the scope of supply (see "Ordering Data" on page 10). Their function and technical data are identical.

For greater clarity, the Order Designation IB IL 24 SEG/F-D is used throughout this document.



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

Function

The terminal is designed for use within an Inline station.

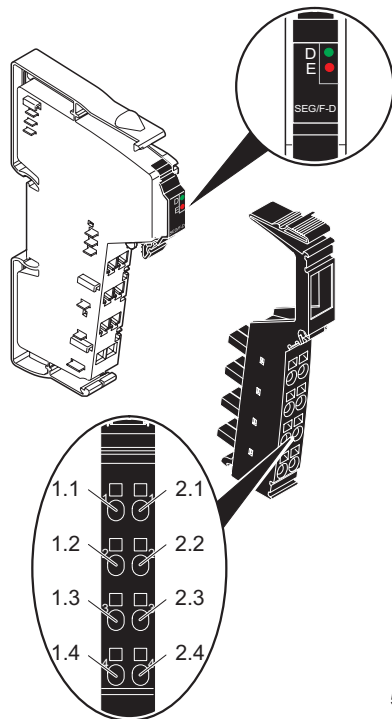
The segment terminal is used to create a protected partial circuit (segment circuit) within the main circuit.

It is not used to supply power and has no elements for protection against polarity reversal and surge voltage.

This terminal has an LED for bus diagnostics and occupies two input data bits, which are used to indicate the presence of the supply voltage and the status of the fuse.

Features

- Automatic creation of a segment circuit within the main circuit
- Segment circuit protected by an internal fuse
- LED diagnostic indicators
- Mapping the status of the internal fuse and the main voltage in the INTERBUS input data



5658A003

Figure 1 IB IL 24 SEG/F-D with appropriate connector

Function Identification

Black

Local LED Diagnostic Indicators

Des.	Color	Meaning
D	Green	Bus diagnostics
		ON INTERBUS is active
	Flashing	
	0.5 Hz	Communications power is present, INTERBUS is not active
	2 Hz	Communications power is present, supply voltage U_M is not present
	4 Hz	Communications power is present, local bus error
OFF	Communications power is not present, INTERBUS is not active	
E	Red	Fuse in segment circuit (U_S)
		OFF Fuse is OK
		ON Fuse has blown



If the supply voltage U_M is not present and the fuse is missing or has blown, an I/O error message is sent to the higher-level control or computer system.



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

Terminal Assignment



The terminal points are **only** provided for measuring purposes.

Terminal Point	Assignment
1.1, 2.1	Segment voltage U_S (after the fuse)
1.2, 2.2	Main voltage U_M
1.3, 2.3	GND of the supply voltages
1.4, 2.4	Functional earth ground (FE)

Internal Circuit Diagram

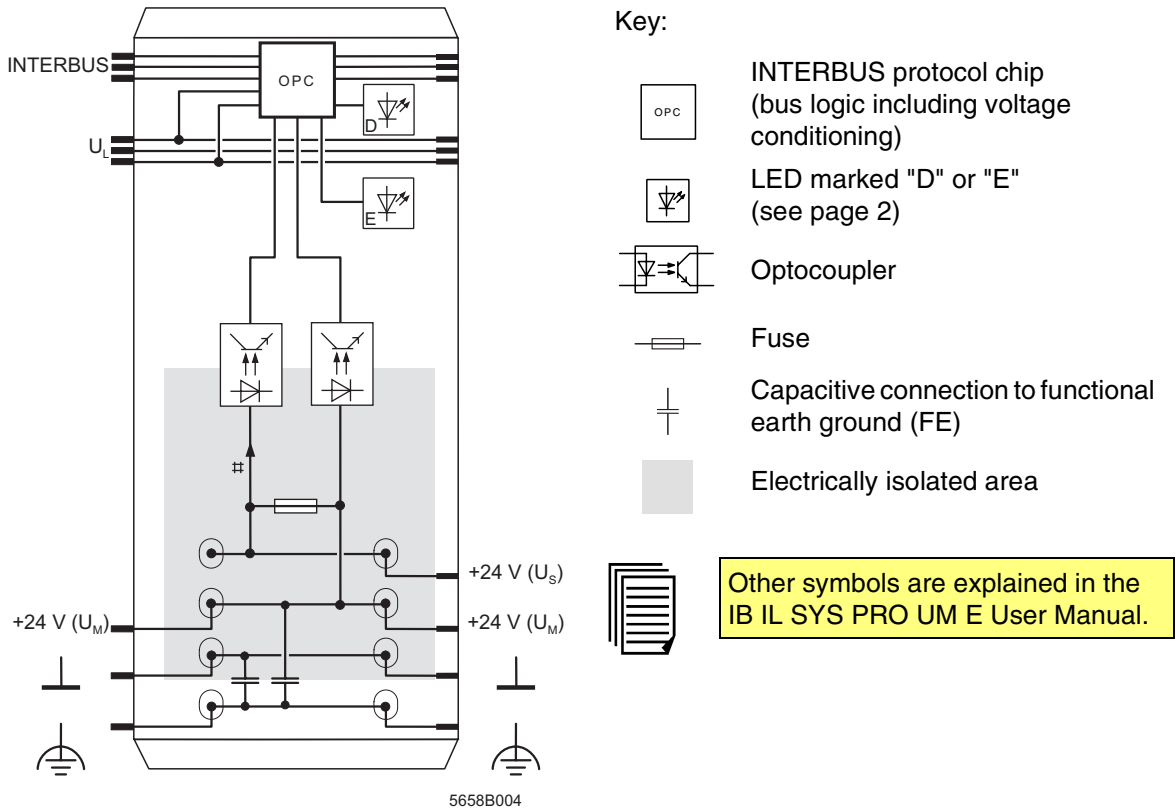


Figure 2 Internal wiring of the terminal points

Programming Data

ID code	BE _{hex} (190 _{dec})
Length code	C2 _{hex}
Process data channel	2 bits
Input address area	2 bits
Output address area	0 bits
Parameter channel (PCP)	0 bits
Register length (bus)	2 bits

INTERBUS Process Data

Assignment of IN Process Data





The IN process data only maps 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 control or computer system, please refer to the DB GB IBS SYS ADDRESS data sheet, Order No. 90 00 99 0.

Technical Data

General Data	
Order designation (order number)	IB IL 24 SEG/F-D (28 36 68 3) IB IL 24 SEG/F-D-PAC (28 61 90 4)
Housing dimensions (width x height x depth)	12.2 mm x 120 mm x 71.5 mm (0.480 x 4.724 x 2.815 in.)
Weight	44 g (without connectors)
Operating mode	Process data mode with 2 bits
Transmission speed	500 kbps
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 outside of the housing if, for example, the terminal is brought into a closed room from a vehicle.
Air pressure (operation)	80 kPa to 106 kPa (up to 2000 m [6562 ft.] above sea level)
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
Interface	
INTERBUS interface	Through data routing
Power Consumption	
Communications power U_L	7.5 V DC
Current consumption at U_L	25 mA (maximum)
Power consumption at U_L	0.19 W (maximum)
Main voltage U_M	24 V DC (nominal value)
Nominal current consumption at U_M	4.0 A (nominal value)

**Supply of the Module Electronics and I/O Through Bus Terminal/Power Terminal
(U_L , U_M)**

Connection method	Through potential routing
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24 V I/O Supply (U_M , U_S)

The main voltage U_M is supplied by the bus terminal or by a power terminal. The segment voltage U_S is provided automatically at this segment terminal and protected by the internal fuse.

There are no connections for a supply voltage on the segment terminal. The terminal points are **only** provided for measuring purposes.

Permissible Total Current in the Potential Jumpers of the Main and Segment Circuit/Nominal Current of the Terminal

Permissible total current in the potential jumpers	6.3 A
Nominal current of the terminal	4.0 A
Tolerance	+10%



The terminal is supplied with a 6.3 A slow-blow fuse.

Power Dissipation

Formula to Calculate the Power Dissipation of the Electronics

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

Where

P_{EL} Total power dissipation in the terminal

I_L Load current in the segment circuit

R_F Resistance of the fuse

The resistance of fuse R_F for a 6.3 AT fuse is approximately 12 mΩ.

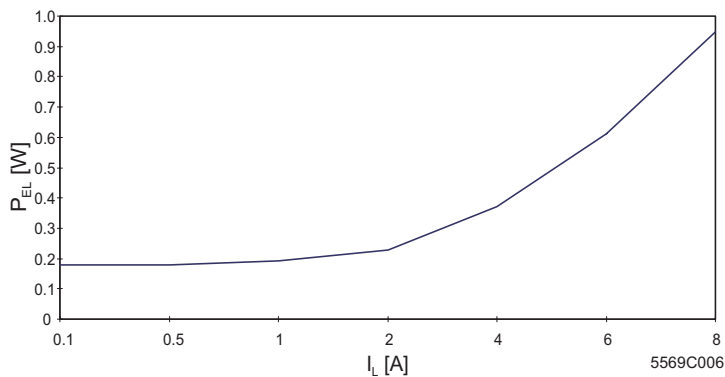
The power dissipation of the electronics for a theoretical maximum current of 6.3 A (nominal current = 4.0 A) is calculated as follows:

$$\begin{aligned} P_{EL} &= 0.18 \text{ W} + 39.69 \text{ A}^2 \times 0.012 \text{ } \Omega \\ &= 0.66 \text{ W} \end{aligned}$$

Power Dissipation of the Housing (P_{HOU})

$P_{HOU} = 0.7 \text{ W}$ in the entire ambient temperature range

Typical Power Dissipation of the Electronics in Relation to the Load Current in the Segment Circuit





P [W] Power dissipation in W


I_L [A] Load current in the segment circuit in A

This test was carried out with a 6.3 AT fuse.

Derating of the Load Current in the Segment Circuit


No derating

Safety Devices	
Overload/short circuit in segment circuit	Fuse 5 x 20 with 6.3 A, slow-blow
	Fuses with other values can also be used. The maximum fuse value should not exceed 6.3 A.
	Note for the selection of fuses: Only use slow-blow fuses for currents greater than 2 A.
Surge voltage	Protective elements in the power terminal or the bus terminal
Protection against polarity reversal	Protective elements in the power terminal or the bus terminal

Electrical Isolation/Isolation of the Voltage Areas	
	To provide electrical isolation between the logic level and the I/O area, it is necessary to supply these areas via the bus terminal or via the bus terminal and a power terminal from separate power supply units. 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	
The 24 V main voltage, 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
I/O error message if fuse blown or missing
I/O error message if supply voltage U_M is not present

Ordering Data

Description	Order Designation	Order No.
Segment terminal with fuse and diagnostics; including connectors and labeling field	IB IL 24 SEG/F-D-PAC	28 61 90 4
Segment terminal with fuse and diagnostics	IB IL 24 SEG/F-D	28 36 68 3
 <p>One of the listed connectors is needed for the complete fitting of the IB IL 24 SEG/F-D terminal.</p>		
Connector (black, w/o color print), pack of 10	IB IL SCN-PWR IN	27 27 46 2
Connector (black, with color print), pack of 10	IB IL SCN-PWR IN-CP	27 27 63 7
Fuse	SI 5 x20 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



Documentation is available at www.phoenixcontact.com. It can be downloaded free of charge.

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