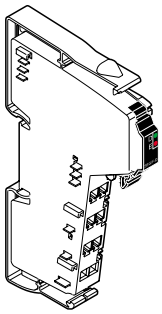
IB IL 24 SEG/F-D

INTERBUS Inline
Segment Terminal With Fuse and Diagnostics



5658A001

Data sheet 5658B 01/2001

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.

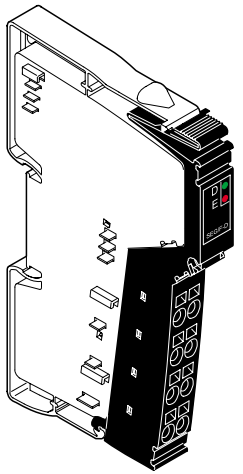
Function

The terminal is designed for use within an INTERBUS 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 the 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 state of the fuse.

Features

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



5658A002

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

Please note that the connector is not supplied with the terminal. Please refer to Ordering Data on page 9 to order the appropriate connectors for your application.

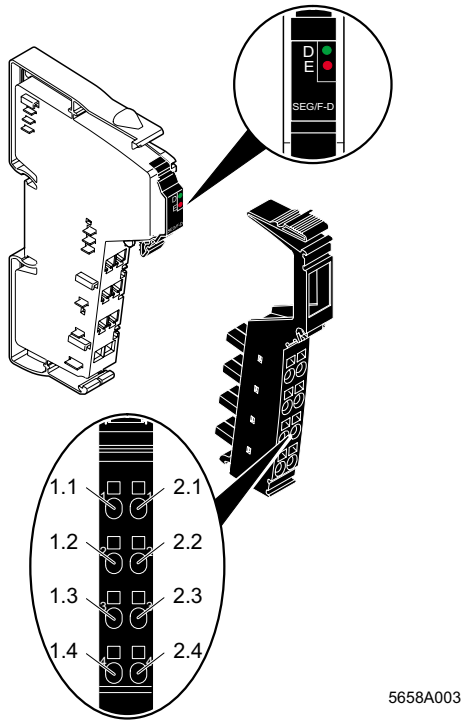


Figure 2 IB IL 24 SEG/F-D with appropriate connector

Function Identification

Black

Local Diagnostic Indicators

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

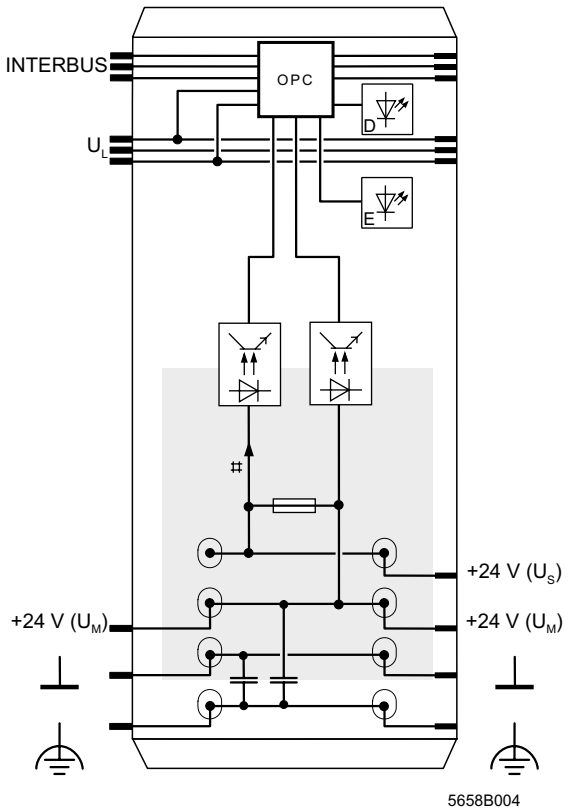
A blown fuse is indicated on both diagnostic indicators. The red LED E lights up and the green LED D flashes at 2 Hz.

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 power U_M
1.3, 2.3	GND of the supply voltages
1.4, 2.4	Functional earth ground (FE)

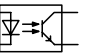
Internal Circuit Diagram



Key:

INTERBUS protocol chip (bus logic including voltage conditioning)

LED with details of the display designation "D" or "E" (see page 2)



Optocoupler

Fuse

Capacitive connection to functional earth ground (FE)

Isolated area

Other symbols are explained in the IB IL SYS PRO UM E User Manual.

Figure 3 Internal wiring of the terminal points

Programming Data

ID code	BE_{hex} (190_{dec})
Length code	$C2_{hex}$
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 power.

Bit View	Bit	1	0
Assignment	Main power U_M is present, fuse OK	1	1
	Main power U_M is present, fuse blown or not present	1	0
	Main power U_M is not present, fuse blown or not present	0	0

TOUT process data is not used.

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 connector)
Operating mode	Process data operation with 2 bits
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.	
Air pressure (operation)	80 kPa to 106 kPa (up to 2000 m [6561.680 ft.] above sea level)
Air pressure (storage/transport)	70 kPa to 106 kPa (up to 3000 m [9842.520 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 of U_L	25 mA, maximum
Power consumption of U_L	0.19 W, maximum
Main power U_M	24 V DC (nominal value)
Nominal current consumption at U_M	4.0 A (nominal value)

Supply of the Module Electronics and of the I/O Through Bus Terminal/Power Terminal (U_L, U_M)	
Connection method	Through potential routing

24 V I/O Device Supply (U_M, U_S)
The main power 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. No connections for a supply voltage exist on the segment terminal. The terminal points are **only** provided for measuring purposes.

Permissible Total Current in the Voltage Jumpers of the Main and Segment Circuit/Nominal Current of the Terminal	
Permissible total current in the voltage jumpers	6.3 A
Nominal current of the terminal	4.0 A
Tolerance	+10%
The terminal is delivered with a 6.3 A fuse.	

Power Dissipation

Formula to Calculate the Power Dissipation of the Electronics

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

Where

P_{tot}	Total power dissipation of 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:

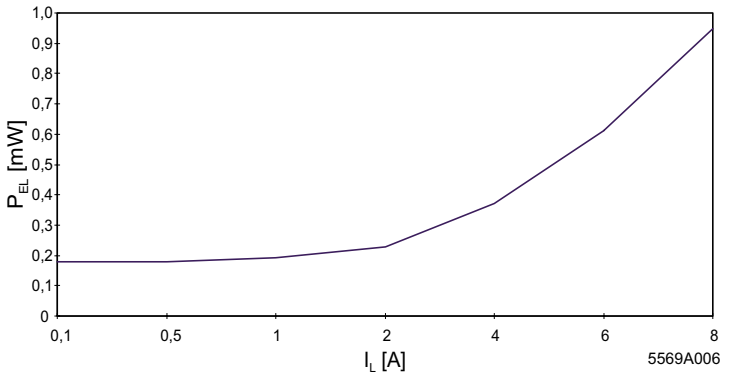
$P_{tot} = 0.18\ W + 39.69\ A^2 \times 0.012\ \Omega$
$= 0.66\ W$

Power Dissipation of the Housing (P_{HOU})

P_{HOU} = 0.7 W in the total permissible ambient temperature range

Power Dissipation (Continued)

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



P [mW] Power dissipation in mW

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

You may also use fuses with other values. The maximum fuse value should not exceed 6.3 A.

Note for the selection of fuses:

Only use slow-blow fuses for currents higher than 2 A.

Surge voltage	Protective components of the power terminal or the bus terminal
Protection against polarity reversal	Protective components of the power terminal or the bus terminal

Electrical Isolation
To provide electrical isolation between the logic level and the I/O area, it is necessary to supply these areas 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 allowed. Please pay attention to GND-PE links at 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 (functional earth ground) is a separate potential area.
Separate Potentials in the System Comprising 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 for defective or missing fuse

Ordering Data

Description	Order Designation	Order No.
Segment terminal with fuse and diagnostics	IB IL 24 SEG/F-D	28 36 68 3
 You need a connector for the terminal.		
Connector for power supply (black, w/o color print) Pack of 10	IB IL SCN-PWR IN	27 27 46 2
Connector for power supply (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

Phoenix Contact GmbH & Co
Flachsmarktstr. 8
32825 Blomberg
Germany

 + 49 - 52 35 - 3 00

 + 49 - 52 35 - 34 12 00

 www.phoenixcontact.com