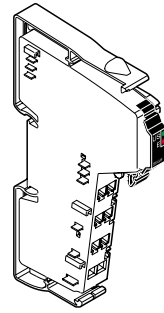


IB IL 24 SEG/F

INTERBUS Inline Segment Terminal With Fuse



Data Sheet 5656B

02/2001

5656A001



This data sheet is intended to be used in conjunction with the “Configuring and Installing the INTERBUS Inline Product Range” User Manual IB IL SYS PRO UM E.

Function

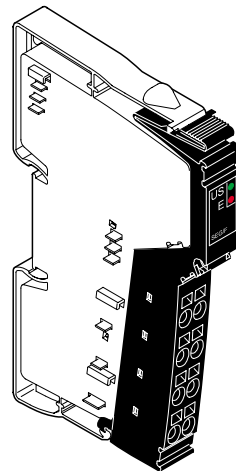
The segment terminal is designed for use within an INTERBUS Inline station. It is used to create a fused partial circuit (segment circuit) within the main circuit. The terminal is not used to supply power and has no components for protection against polarity reversal and surge voltage.

Features



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

- Automatic creation of a segment circuit within the main circuit
- Segment circuit protected by internal fuse
- Diagnostic indicators



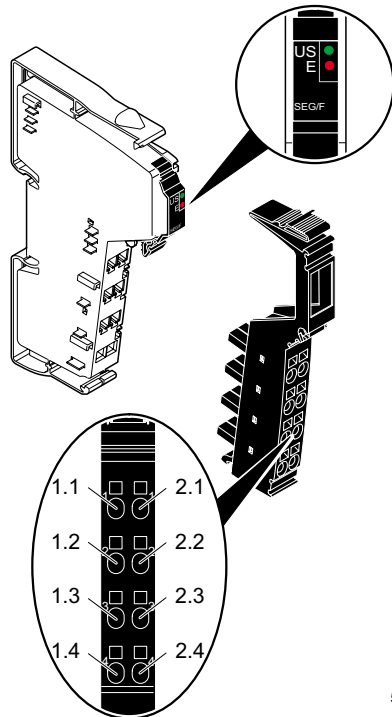
5656A005

Bild 1

IB IL 24 SEG/F terminal
with the connector plugged in



Please note that the connector is not supplied with the terminal. Refer to the ordering data on page 8 to choose the appropriate connector for your application.



5656A002

Bild 2 IB IL 24 SEG/F with the appropriate connector

Function Identification

Black

Local Diagnostic Indicators

Des.	Color	Meaning
US	Green	24 V voltage (in segment circuit US); prior to fuse
E	Red	Fuse in the segment terminal (in segment circuit U _S)



A blown fuse is indicated by diagnostic indicator E (LED E is on).

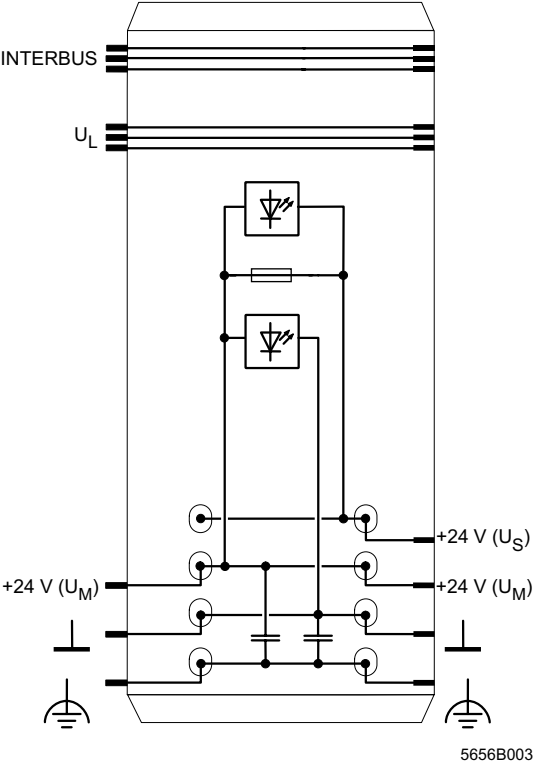
Terminal Assignment







The terminal points are provided for measuring purposes **only!** Power is injected using a bus terminal or a power terminal.

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	FE connection

Internal Circuit Diagram





Key:

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

5656B003

Bild 3 Internal wiring of the terminal points

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 2.795 in.)
Weight	44 g (without connector)
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
 Ranging from -25°C (-13°F) to +55°C (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 [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


24 V I/O Supply

Voltage is supplied through the bus terminal or power terminal.

No connections for supply voltage are required on the segment terminal. The corresponding terminals are available for testing purposes only.

Permissible Total Current in the Voltage Jumpers of the Main and Segment Circuits

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. If there is a higher total current in the voltage jumpers U_M and U_S , the user must ensure a better protection of the current circuit through appropriate fuses. Please note the information for the selection of fuses given on page 7.

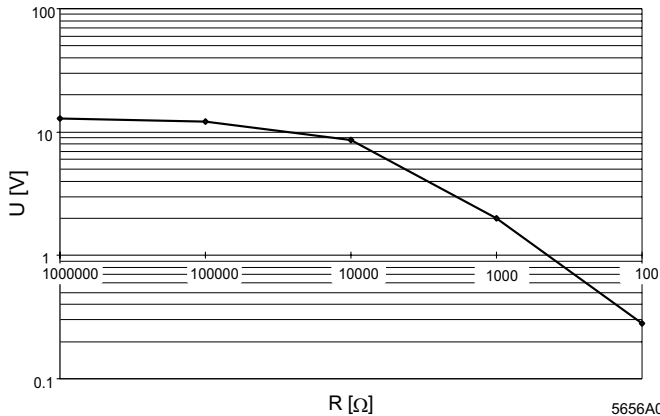
Characteristic of the Voltage in the Segment Circuit When the Fuse Is Blown



Note that power is not disconnected even after the fuse has blown! Observe the characteristic curves below!

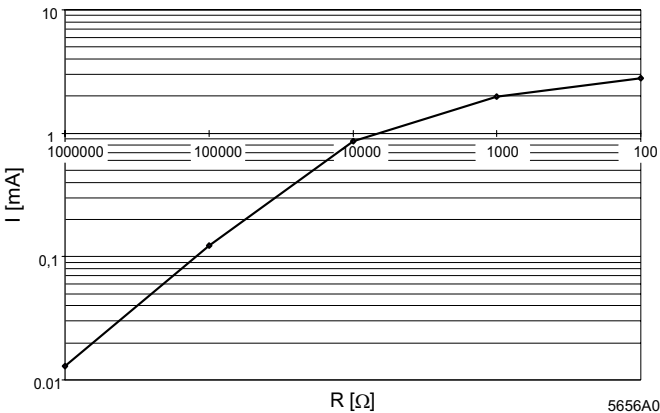
Load Resistance (Ω)	Typical Output Voltage (V)	Typical Current (mA)
1000000	12.80	0.013
100000	12.21	0.122
10000	8.60	0.86
1000	1.99	1.99
100	0.28	2.8

Typical output voltage in relation to resistance within the segment circuit



U [V] Output voltage in V
 R [Ω] Resistance in Ω

Typical output current in relation to resistance within the segment circuit



I [mA] Output current in mA
 R [Ω] Resistance in Ω

Power Dissipation

Formula to calculate the power dissipation of the electronics

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

With

- P_{tot} Total power dissipation of the terminal
- I_S 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 approx. 50 mΩ.

Power dissipation of the housing depending on the ambient temperature

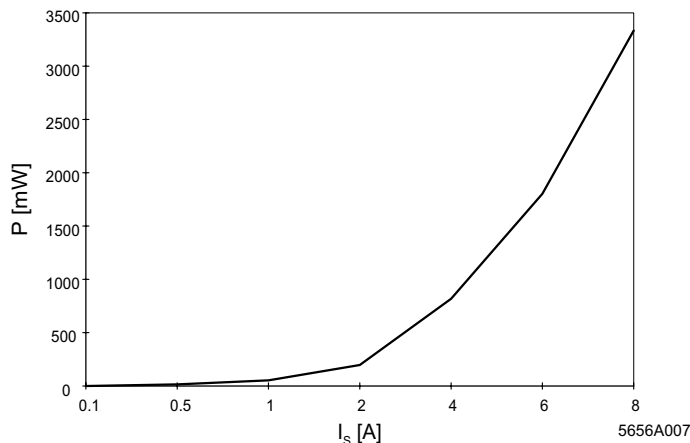
$$P_{\text{HOU}} = 2.4 \text{ W} \quad -25 \text{ °C} < T_U \leq -5 \text{ °C}$$

$$P_{\text{HOU}} = 2.4 \text{ W} - \frac{T_U - (-5 \text{ °C})}{37.5 \text{ K/W}} \quad -5 \text{ °C} < T_U \leq +55 \text{ °C}$$

With

- P_{HOU} Permissible power dissipation of the housing, maximum
- T_U Ambient temperature

Typical power dissipation of the electronics in relation to the load current in the segment circuit



P [mW] Power dissipation in mW

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

This test was carried out with a 10 AT fuse.



Derating of the Load Current in the Segment Circuit	
Ambient temperature T_U in °C	Load current in the segment circuit I_S in A
55°C (131°F)	4.0 A
45°C (113°F)	6.3 A


Permissible load current in the segment circuit in relation to the ambient temperature

The graph plots the permissible load current I_S in Amperes (A) on the y-axis against the ambient temperature T_U in degrees Celsius (°C) on the x-axis. The y-axis ranges from 0 to 8 with increments of 1. The x-axis ranges from -25 to 55 with increments of 5. The data points are as follows:


T_U [°C]	I_S [A]
-25	8.0
-20	8.0
-15	8.0
-10	8.0
-5	8.0
0	8.0
5	8.0
10	8.0
15	8.0
20	8.0
25	8.0
30	8.0
35	8.0
40	7.0
45	6.3
50	5.0
55	4.0

I_S [A] Load current in the segment circuit in A
 T_U [°C] Ambient temperature in °C

Safety Devices	
Overload/short circuit in segment circuit	Fuse 5 x 20 (6.3 A slow-blow)
 You may also use fuses with other values. The maximum fuse value is 8 A.	
 Note for the selection of fuses: Only use slow-blow fuses for currents higher 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	
	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 power supply units in the 24 V range is not allowed. Please pay attention to GND-PE links at the power supply units! (Refer also to 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 system potentials 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	

Ordering Data

Meaning	Order Designation	Order No.
Segment terminal with fuse	IB IL 24 SEG/F	27 27 74 7
 A connector is needed for the power supply of the terminal		
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