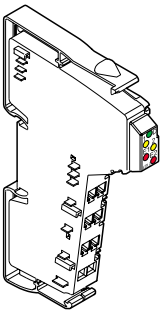
IB IL 24 EDI 2

INTERBUS Inline Terminal With Two Digital Inputs



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Data Sheet 6277A 02/2001

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 terminal is designed for use within an INTERBUS Inline station.
It is used to detect digital input signals. The terminal has two initiator supplies protected against overload and short-circuit which are powered from the segment circuit. In case of overload or short-circuit the initiator supply is switched off. In addition, an error message is generated and sent to the INTERBUS master. A red LED indicates the error on the terminal.

Features

- Connections for two digital sensors
- Connection of sensors in 2-, 3-, and 4-wire technology
- Maximum permissible load current per sensor: 100 mA
- Maximum permissible load current from the terminal: 200 mA
- Diagnostic and status indicators

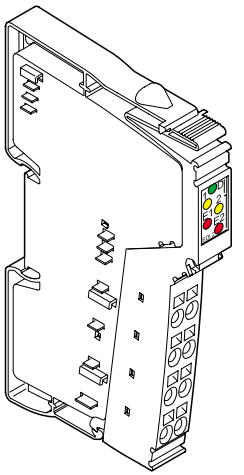

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Figure 1 The IB IL 24 EDI 2 terminal with connector plugged in

Please note that the connector is not supplied as standard with the terminal. Please refer to the ordering data on page 9 to order the appropriate connectors for your application.

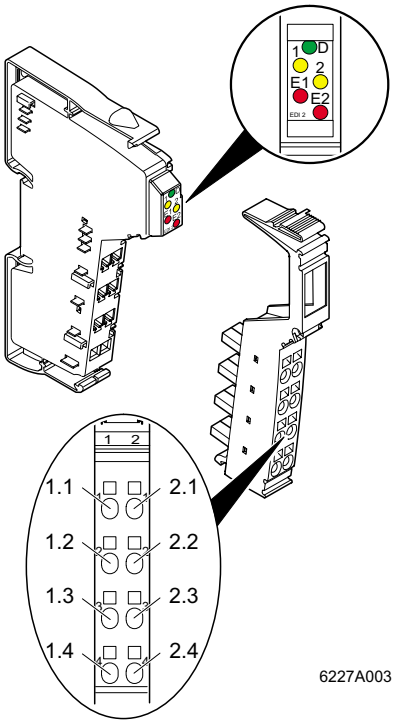


Figure 2 IB IL 24 EDI 2
with the appropriate connector

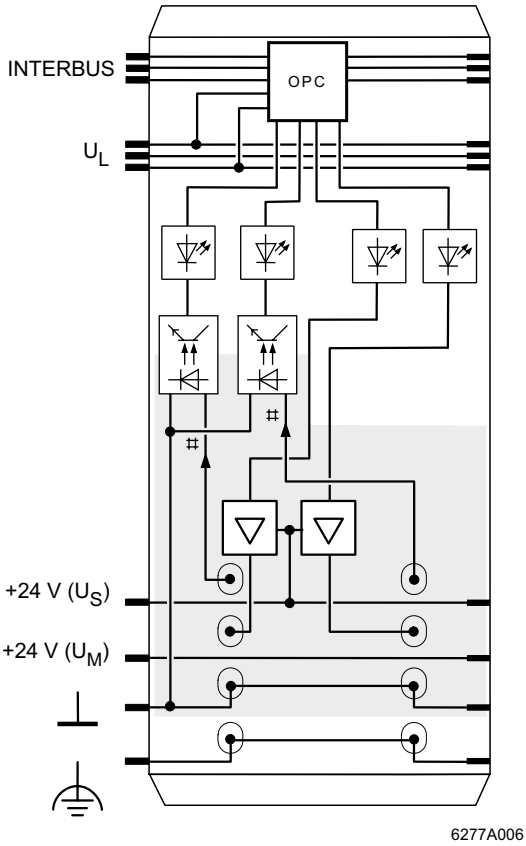
Local Diagnostic and Status Indicators

Des.	Color	Meaning
D	Green	Bus diagnostics
1, 2	Yellow	Status indicators of the inputs
E1, E2	Red	Error message (overload/short-circuit of the initiator supply 1/2)

Terminal Assignment

Terminal Point	Assignment
1.1	Digital input 1
1.2	Initiator supply channel 1
1.3	Ground contact (GND) for channel 1 and 2
1.4	Functional earth ground (FE)
2.1	Digital input 2
2.2	Initiator supply channel 2
2.3	Ground contact (GND) for channel 1 and 2
2.4	Functional earth ground (FE)

Internal Circuit Diagram



Key:

INTERBUS protocol chip (bus logic including voltage conditioning)

LED

Optocoupler

Digital input

Output driver

Electrically isolated area

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

Figure 3 Internal wiring of the terminal points

Connection Example

When connecting the sensors observe the assignment of the terminal points to the INTERBUS process data (see page 4).

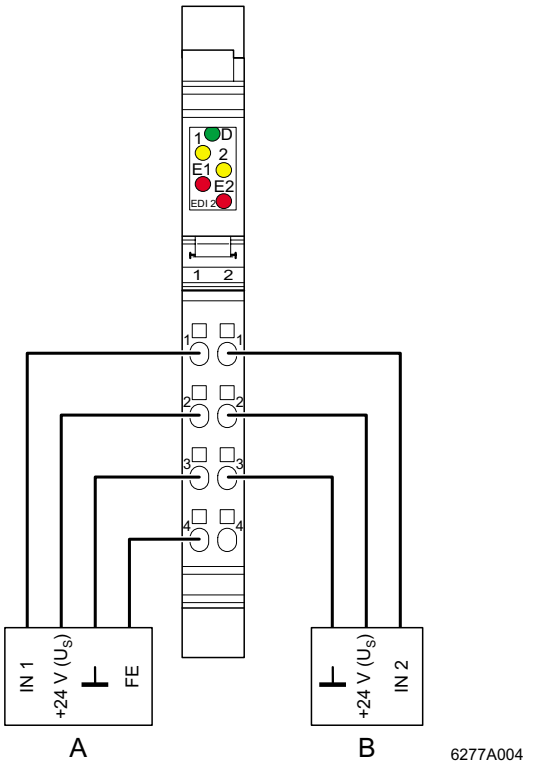


Figure 4 Typical sensor connections

A 4-wire termination

B 3-wire termination

Programming Data

ID code	BE_{hex} (190_{dec})
Length code	$C2_{hex}$ (194_{dec})
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 the Terminal Points for the IN Process Data

(Bit) view	Bit	1	0
Module	Terminal point (signal)	2.1	1.1
	Terminal point (+24 V)	2.2	1.2
	Terminal point (GND)	2.3	1.3
Status indicator	LED	2	1

OUT process data is not available.

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	43 g (without connector)
Operating mode	Process data operation with 2 bits
Connection method of the sensors	2-, 3-, and 4-wire technology
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

Interface	
INTERBUS local bus	Through data routing

Power Consumption	
Communications power	7.5 V
Current consumption from the local bus	31 mA, maximum
Power consumption from the local bus	0.23 W, maximum
Segment supply voltage U_S	24 V DC (nominal value)
Nominal current consumption at U_S	0.25 A, maximum

Supply of the Module Electronics and I/O Through Bus Terminal/Power Terminal	
Connection method	Through potential routing

Digital Inputs	
Number	2
Input design	According to EN 61131-2 Type 1
Definition of switching thresholds	
Maximum low level voltage	U_{Lmax} < 6 V
Minimum high level voltage	U_{Hmin} > 13 V
Common potentials	Segment supply, ground
Nominal input voltage U_{IN}	24 V DC
Permissible range	-30 V < U_{IN} < +30 V DC
Nominal input current for U_{IN}	5 mA
Characteristic curve of the current	Linear in the range 1 V < U_{IN} < 30 V
Delay time	None
Permissible cable length to the sensor	30 m (98.425 ft.)
Use of AC sensors	AC sensors in the voltage range < U_{IN} are limited in application

Input Characteristic Curve	
Input Voltage (V)	**Typical Input Current (mA)**
-30 < U_{IN} < 0.7	0
3	0,5
6	1,1
9	1,7
12	2,4
15	3,1
18	3,7
21	4,4
24	5,1
27	5,8
30	6,5

Initiator Supply	
Minimum sensor voltage	U_S -1 V
Nominal current per channel	100 mA
Overload protection	Electronic per channel
Short-circuit protection	Electronic per channel

Power Dissipation

Formula to Calculate the Power Dissipation of the Electronics

$$P_{EL} = 0.23\ W + \sum_{n=1}^{2} \left[U_{INn} \times \frac{U_{INn} - 1.8\ V}{4400\ \Omega} \right] + I_{INI}^2 \times 0.25\ \Omega$$

Where

P_{EL}	Total power dissipation of the terminal
n	Index of the number of set inputs n = 1 to 2
U_{INn}	Input voltage of the input n
I_{INI}	Sum of the initiator current

Power Dissipation of the Housing P_{HOU}	0.6 W (within the permissible operating temperature)

Concurrent Channel Derating	
Derating	None

Safety Devices	
Overload of initiator supply	Electronic per channel
Short-circuit of the initiator supply	Electronic per channel
Surge voltage	Protective elements of the power terminal
Polarity reversal	Protective elements of the power 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 the bus terminal and the digital input terminal via the bus terminal or a power terminal from separate power supply units. Interconnection of the 24 V power supplies is not permitted (see IB IL SYS PRO UM E 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	
Short-circuit of the initiator supply	Yes
Overload of initiator supply	Yes
If an error is triggered by an overload or short-circuit of the initiator supply, the terminal switches off the initiator supply of the associated channel and a peripheral fault (PF) is reported to the master.	

Ordering Data

Description	Order Designation	Order No.
Terminal with two digital inputs	IB IL 24 EDI 2	27 42 60 9
 You need a connector for the terminal.		
I/O connector with eight terminals, spring-clamp connection (green, w/o color print); pack of 10	IB IL SCN-8	27 26 33 7
I/O connector with eight terminals using the spring-clamp method (green, with color print); pack of 10	IB IL SCN-8-CP	27 27 60 8
"Configuring and Installing the INTERBUS Inline Product Range" User Manual	IB IL SYS PRO UM E	27 43 04 8

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