# IB IL 24 EDI 2-DESINA

INTERBUS Inline Terminal With Two Digital Inputs and Two Diagnostic Inputs for Sensors According to the DESINA Specification

6224A001

Data Sheet 6227A   01/2001
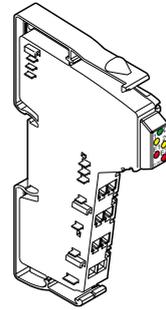
☞ This data sheet is only valid in association with the IB IL SYS PRO UM E "Configuring and Installing the INTERBUS Inline Product Range" User Manual.

Function

The terminal is designed for use within an INTERBUS Inline station.
It is used to detect digital input signals. It is particularly suitable for connecting sensors via the diagnostic inputs according to the DESINA specification.

Features

– Connections for two digital sensors

– Connection for sensors according to the DESINA specification

– Connection of other sensors in 2- and 3-wire technology

– Maximum permissible load current per sensor: 100 mA

– Maximum permissible load current from the terminal: 200 mA

– Diagnostic and status indicators
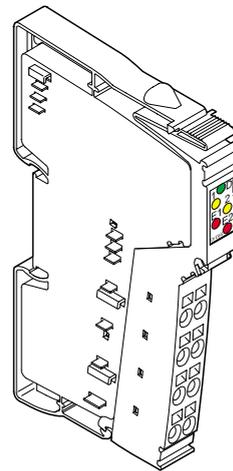
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Figure 1   IB IL 24 EDI 2-DESINA terminal with connector

☞ Please note that the connector is not supplied as standard with the terminal. Please refer to the ordering data on page 10 to order the appropriate connectors for your application.

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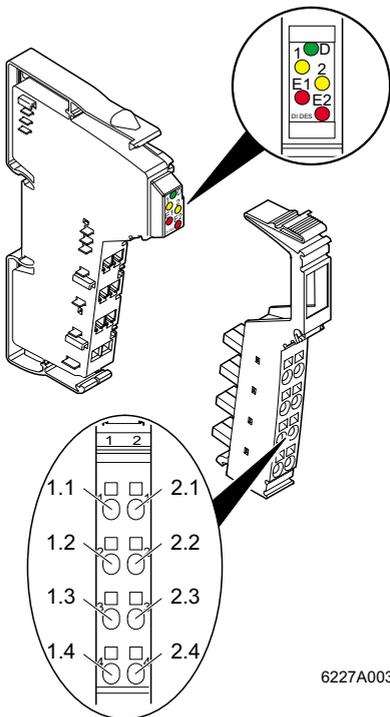
Figure 2   IB IL 24 EDI 2-DESINA
with appropriate connector

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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 at the diagnostic input 1/2 or 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) channel 1 and 2
1.4	Diagnostic input 1
2.1	Digital input 2
2.2	Initiator supply channel 2
2.3	Ground contact (GND) channel 1 and 2
2.4	Diagnostic input 2

Internal Circuit Diagram

Key:

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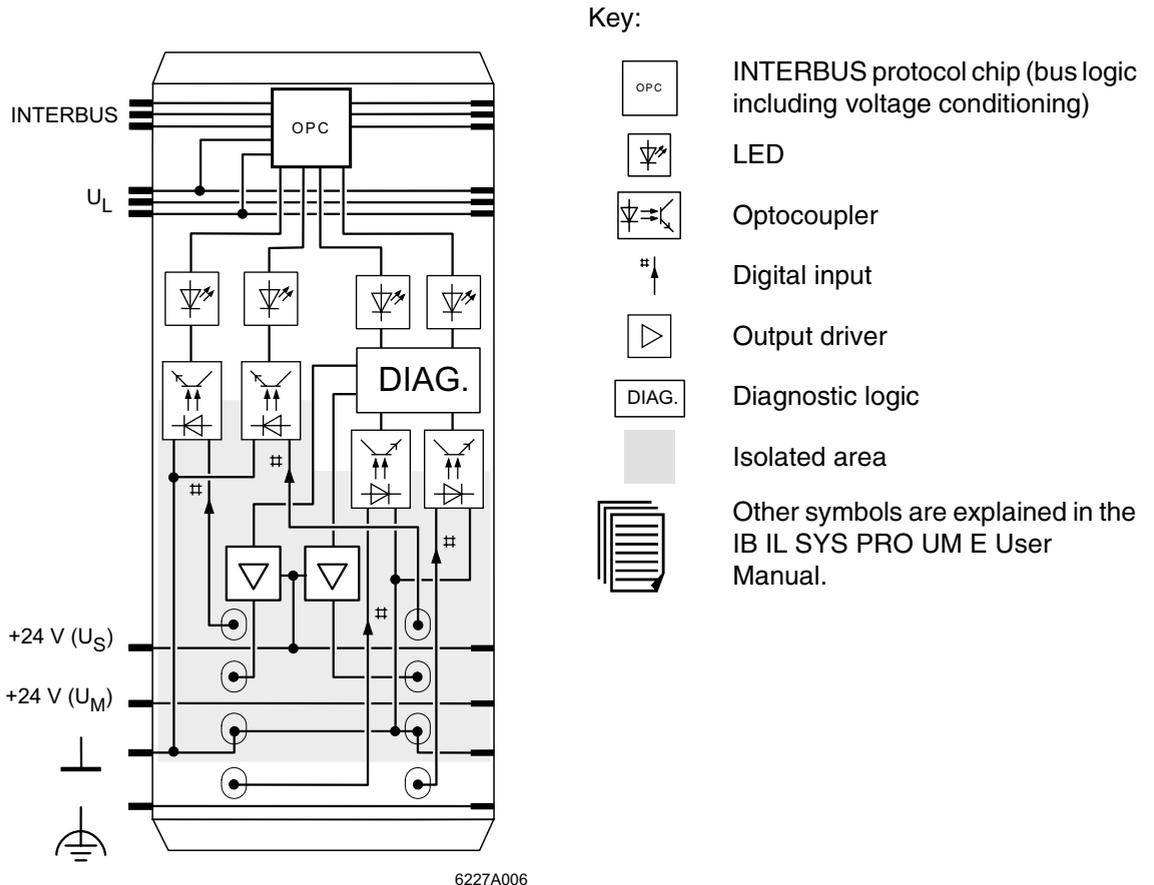
Figure 3   Internal wiring of the terminal points

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Connection Example

⚠ When connecting the sensors observe the assignment of the terminal points to the INTERBUS process data (see page 5).
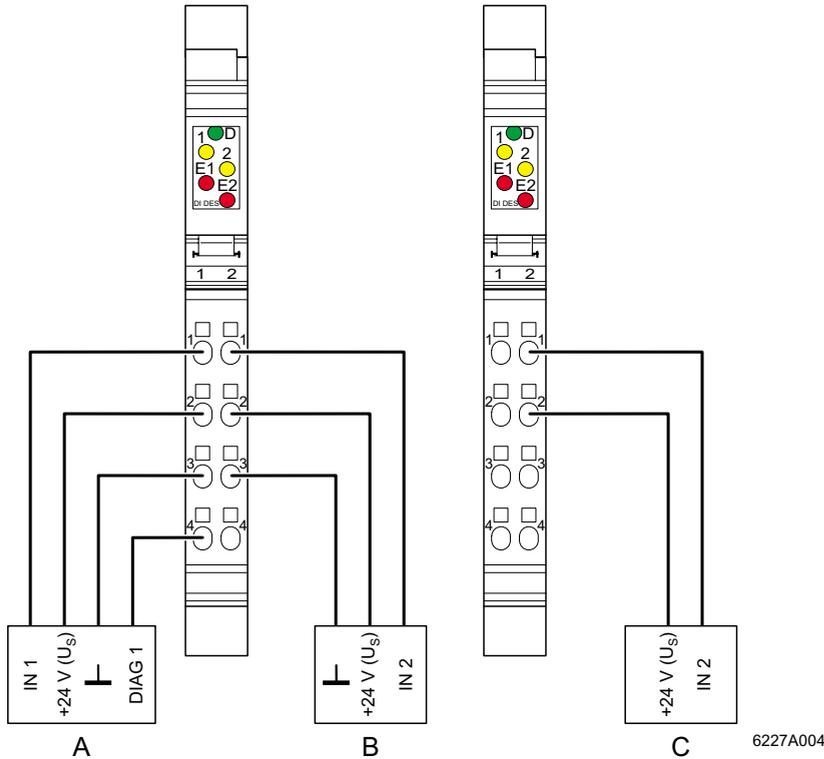
Figure 4   Typical sensor connections

A   DESINA

B   3-wire termination

C   2-wire termination

☞ If sensors in 2- or 3-wire technology are connected and terminal points 1.4 and/or 2.4 are not used, a peripheral fault (PF) is continuously reported to the master. It is possible to suppress this error message by connecting terminal points 1.4 and/or 2.4 to +24 V DC.

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Programming Data

ID code	BE_{hex} (190_{dec})
Length code	41_{hex} (65_{dec})
Process data channel	4 bits
Input address area	4 bits
Output address area	0 bits
Parameter channel (PCP)	0 bits
Register length (bus)	4 bits

INTERBUS Process Data

Assignment of the Terminal Points for the IN Process Data

Bit view	Bit	3	2	1	0
Module	Terminal point (signal)	2.4	1.4	2.1	1.1
	Terminal point (+24 V)			2.2	1.2
	Terminal point (GND)			2.3	1.3
Status indicator	LED	I 2	I1	2	1

☞ Out process data is not available.

Error Storage

If an error is diagnosed via the diagnostic input 1 or 2, a peripheral fault (PF) is reported to the master. The corresponding set bit 2 or 3 indicates which input reported the error. The error remains set on the Inline terminal until it is acknowledged by the master.

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. The corresponding set bit 2 or 3 indicates the channel where the error occurred. After the error cause has been removed, the initiator supply for the channel is switched on again. The error remains set on the Inline terminal until it is acknowledged by the master.

Error Message to the Master	INTERBUS Process Data	Error
PF	Bit 2 = 1	– Diagnostic input 1 reports an error – Initiator supply channel 1 switched off due to overload or short circuit
PF	Bit 3 = 1	– Diagnostic input 2 reports an error – Initiator supply channel 2 switched off due to overload or short circuit

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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 4 bits
Connection method of the sensors	According to DESINA specification or 2-wire and 3-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

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

Digital Inputs	
Number	2 digital inputs + 2 diagnostic inputs
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}	3 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	0.3
6	0.7
9	1.0
12	1.4
15	1.8
18	2.2
21	2.6
24	3.0
27	3.4
30	3.8

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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	

$$P_{tot} = 0.19 \text{ W} + \sum_{n=1}^{4} \left[U_{INn} \times \frac{U_{INn} - 1.8 \text{ V}}{7800 \text{ }\Omega} \right] + I_{INI}^2 \times 0.25 \text{ }\Omega$$

Where

P_{tot}	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	No limitation of the channel simultaneity, no derating

Safety Devices	
Overload of initiator supply	Electronic per channel
Short circuit of the initiator supply	Electronic per channel
Surge voltage	Protective circuits of the power terminal
Polarity reversal	Protective circuits 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	
Error message at the diagnostic input	Yes
Short circuit of the initiator supply	Yes
Overload of initiator supply	Yes

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Ordering Data

Description	Order Designation	Order No.
Terminal with two digital inputs and two diagnostic inputs for sensors according to the DESINA specification	IB IL 24 EDI 2-DESINA	27 40 32 6
☞ 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
"Configuring and Installing the INTERBUS Inline Product Range" User Manual	IB IL SYS PRO UM E	27 43 04 8

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