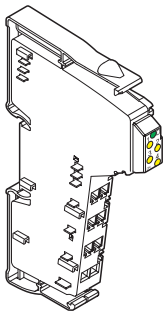
IB IL 24 DI 4-ME

Inline Terminal With Four Digital Inputs



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Data Sheet 703500 04/2004

This data sheet is only valid in association with the IB IL SYS PRO UM E user manual or the Inline system manual for your bus system.

Function

The terminal is designed for use within an Inline station. It is used to acquire digital input signals.

Features

- Connections for four digital sensors
- Connection of sensors in 2 and 3-wire technology
- Maximum permissible load current per sensor: 250 mA
- Maximum permissible load current from the terminal: 1.0 A
- Diagnostic and status indicators

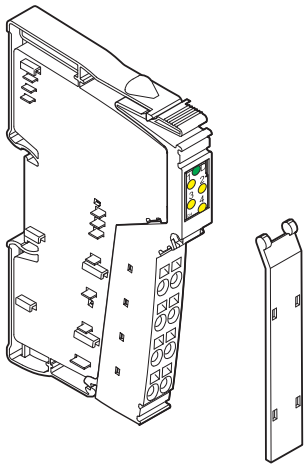

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Figure 1 IB IL 24 DI 4-ME terminal

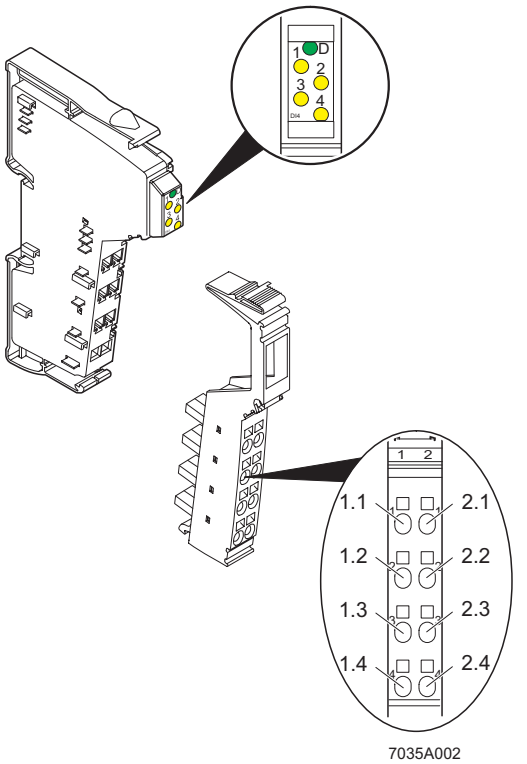


Figure 2 IB IL 24 DI 4-ME

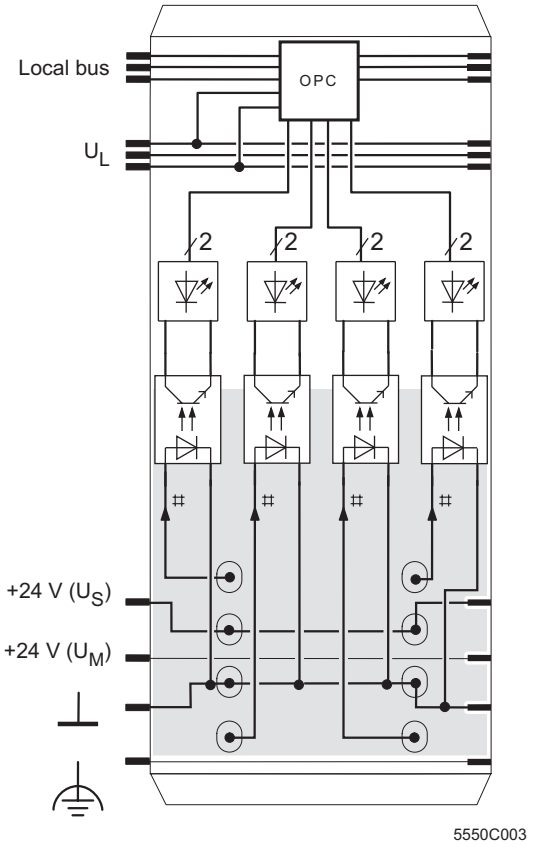
Local Diagnostic and Status Indicators

Des.	Color	Meaning
D	Green	Diagnostics
1, 2, 3, 4	Yellow	Status indicators of the inputs

Terminal Assignment

Terminal Point	Assignment
1.1	Signal input 1 (IN 1)
2.1	Signal input 2 (IN 2)
1.2, 2.2	Segment voltage U_S for 2 and 3-wire termination
1.3, 2.3	Ground contact (GND) for 3-wire termination
1.4	Signal input 3 (IN 3)
2.4	Signal input 4 (IN 4)

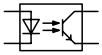
Internal Circuit Diagram



Key:

Protocol chip (bus logic including voltage conditioning)

LED (status indicator)



Optocoupler

Digital input

Electrically isolated area

Other symbols used are explained in the IB IL SYS PRO UM E user manual or in the Inline system manual for your bus system.

Figure 3 Internal wiring of the terminal points

Connection Example

When connecting the sensors observe the assignment of the terminal points to the process data (see page 6).

When using the IB IL PD terminals, the 24 V sensor supply voltage is provided by the potential jumpers U_S of the Inline station.

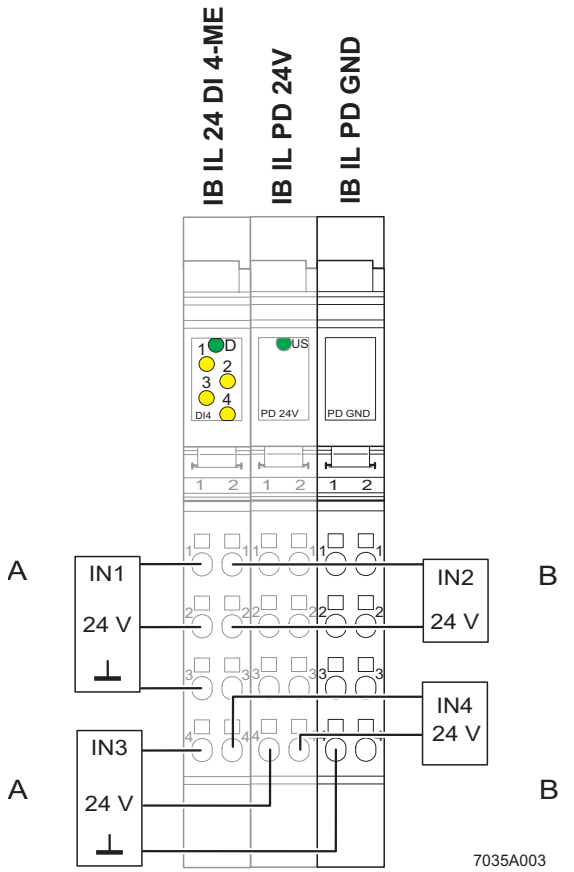


Figure 4 Typical sensor connections

A 3-wire termination

B 2-wire termination

The sensors can also be connected via external bus bars. Ensure that the sensors and U_S are supplied from the same voltage supply.

Ensure that the Inline system ground is reference for at least the ground when using external bus bars.

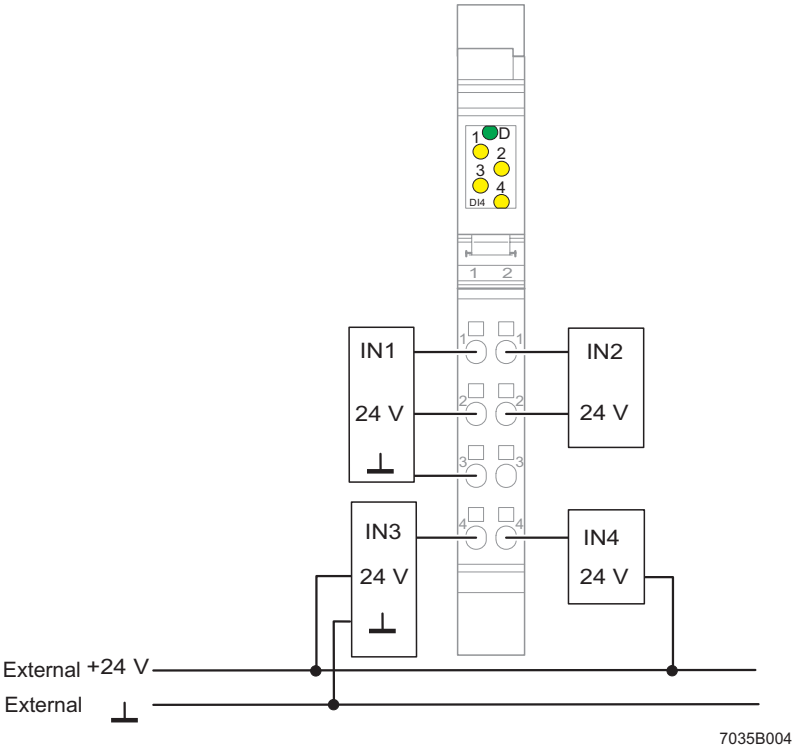


Figure 5 Typical connection of sensors when using external bus bars

Programming Data/ Configuration Data

INTERBUS

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

Other Bus Systems

For the programming data/ configuration data of other bus systems, please refer to the corresponding electronic device data sheet (GSD, EDS).

Process Data

For the assignment of the illustrated (byte.bit) view to your **INTERBUS** control or computer system, please refer to the data sheet
DB GB IBS SYS ADDRESS
Order No. 90 00 99 0.

Assignment of the Terminal Points to the IN Process Data

(Byte.bit) view	Byte.Bit	0.3	0.2	0.1	0.0
Module	Terminal point (signal)	2.4	1.4	2.1	1.1
	Terminal point (+24 V)	2.5	1.5	2.2	1.2
	Terminal point (GND)	2.6	1.6	2.3	1.3
Status indicator	LED	4	3	2	1

Technical Data

General Data	
Order Designation	IB IL 24 DI 4-ME
Order No.	28 63 92 8
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 4 bits (1 nibble)
Transmission speed	500 kbaud
Type of sensor connection	2 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 outside of 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	IP20 according to IEC 60529
Class of protection	Class 3 according to VDE 0106, IEC 60536

Interface	
Local bus	Through data routing

Power Consumption	
Communications power	7.5 V
Current consumption from the local bus	40 mA, maximum
Power consumption from the local bus	0.3 W, maximum

Power Consumption	
Segment supply voltage U_S	24 V DC (nominal value)
Nominal current consumption at U_S	1.0 A, maximum

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

Digital Inputs	
Number	4
Input design	According to EN 61131-2 Type 1
Definition of switching thresholds	
Maximum low level voltage	U_{Lmax} < 5 V
Minimum high level voltage	U_{Hmin} > 15 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, minimum
Delay time	None
Permissible cable length to the sensor	30 m (98.43 ft.) (to ensure conformance with EMC Directive 89/336/EEC)
Use of AC sensors	AC sensors in the voltage range < U_{IN} are limited in application (corresponding to the input design)

Characteristic Curve: Current Depending on the Input Voltage and the Ambient Temperature T_A			
Supply Voltage	Input Current	Input Current According to t >= 20 s	
		With T_A= 25°C (77°F)	With T_A= 55°C (131°F)
18 V	3.0 mA	2.9 mA	2.5 mA
24 V	3.9 mA	3.8 mA	3.5 mA
30 V	4.5 mA	4.2 mA	3.0 mA
The current is reduced depending on the ambient temperature T_A and the number of inputs that are switched on (internal module temperature).			

Power Dissipation	
Formula to Calculate the Power Dissipation of the Electronics	
$P_{EL} = 0.24\ W + \sum_{n=1}^{4} [\ U_{INn} \times 0.003\ A]$ Where P_{EL} Total power dissipation in the terminal n Index of the number of set inputs n = 1 to 4 U_{INn} Input voltage of the input n	
Power dissipation of the housing P_{HOU}	0.6 W, maximum (within the permissible operating temperature)

Limitation of Simultaneity, Derating	
Derating	No limitation of simultaneity, no derating

Safety Equipment	
Overload in segment circuit	No
Surge voltage	Protective circuits of the power terminal
Polarity reversal	Protective circuits of the power terminal

Electrical Isolation
To provide electrical isolation between the logic level and the I/O area it is necessary to supply the station bus terminal and the digital input terminal via the bus terminal or a power terminal from separate power supply units. Interconnection of the power supply units in the 24 V area is not permitted. (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	
None	

Ordering Data

Description	Order Designation	Order No.
Terminal with four digital inputs; including connector and labeling field, pack of 4	IB IL 24 DI 4-ME	28 63 92 8
"Configuring and Installing the INTERBUS Inline Product Range" user manual	IB IL SYS PRO UM E	27 43 04 8
Accessories		
Terminal for potential distribution 24 V; including connector and labeling field	IB IL PD 24V-PAC	28 62 98 7
Terminal for potential distribution GND; including connector and labeling field	IB IL PD GND-PAC	28 62 99 0

Make sure you always use the latest documentation.
It can be downloaded at www.phoenixcontact.com.

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