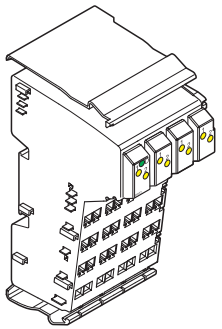
IB IL 24 DI 8/T2
IB IL 24 DI 8/T2-PAC

Inline Terminal With Eight Digital Inputs



6511B001

Data Sheet 651102 02/2003

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.

The item versions IB IL 24 DI 8/T2 and IB IL 24 DI 8/T2-PAC only differ with regard to the standard supplied with the module (see "Ordering Data" on page 9). Function and technical data are identical.

In the following, for greater clarity, we will only use the item designation IB IL 24 DI 8/T2.

Function

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

Features

- Connections for eight digital sensors according to Type 2 limit values as specified in EN 61131-2:1994
- Connection of sensors in 2, 3, and 4-wire technology
- Maximum permissible load current per sensor: 250 mA
- Maximum permissible load current from the terminal: 2.0 A
- Diagnostic and status indicators

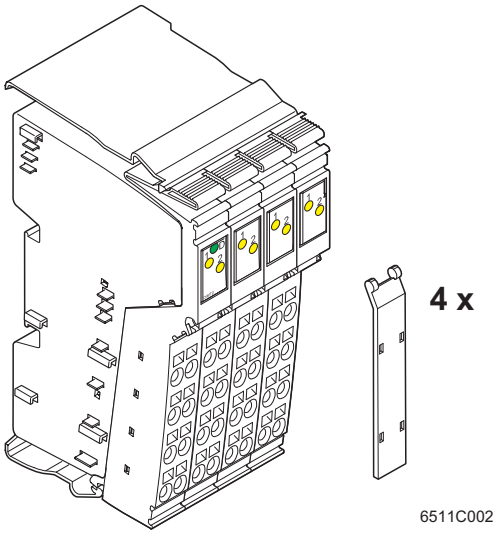


Figure 1 IB IL 24 DI 8/T2-PAC terminal

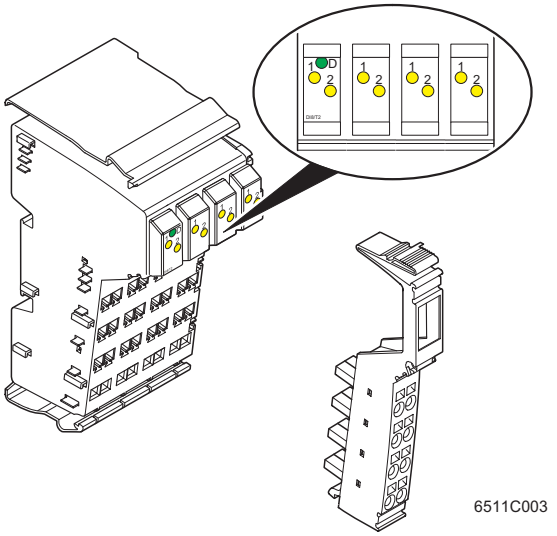


Figure 2 IB IL 24 DI 8/T2 terminal with an appropriate connector

Local Diagnostic and Status Indicators

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

Terminal Assignment for Each Connector

Terminal Point	Assignment
1.1	Signal input (IN1)
2.1	Signal input (IN2)
1.2, 2.2	Segment voltage U_S for 2, 3, and 4-wire termination
1.3, 2.3	Ground contact (GND) for 3 and 4-wire termination
1.4, 2.4	FE connection for 4-wire termination

Function Identification

Light blue

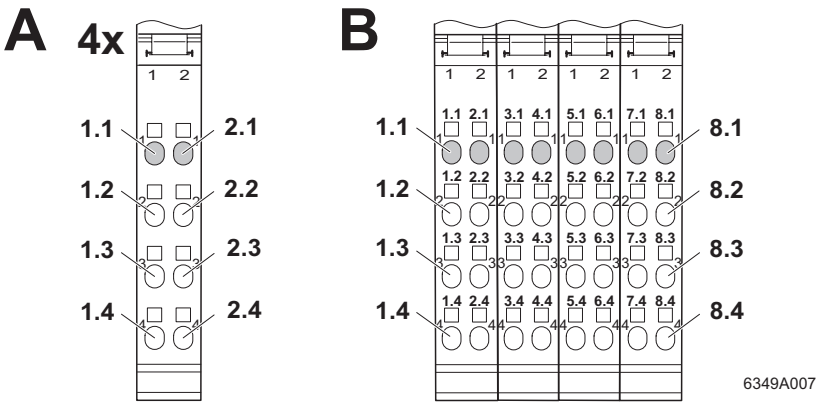


Figure 3 Terminal point numbering when using individual connectors (A) and when using a connector set (B)

Internal Circuit Diagram

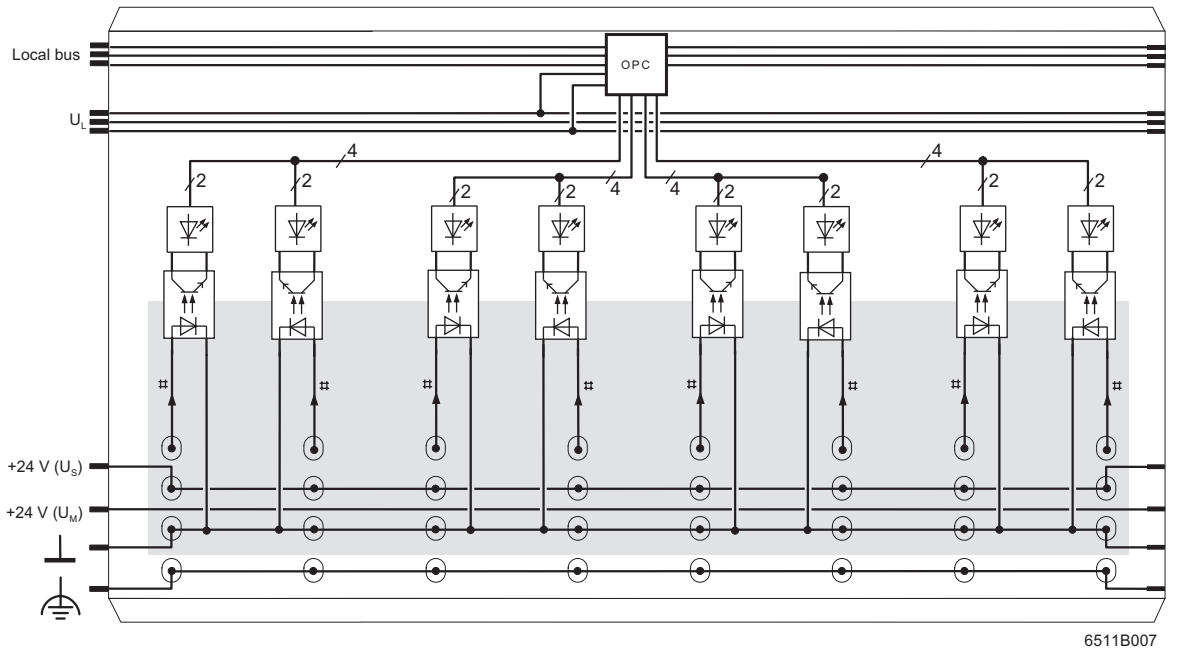


Figure 4 Internal wiring of the terminal points

Key:

OPC — Protocol chip (bus logic including voltage conditioning)

LED

Optocoupler

Digital input

Electrically isolated area

Other symbols are explained in the IB IL SYS PRO UM E User Manual or in the Inline System Manual for your bus system.

Connection Example

When connecting the sensors, observe the assignment of the terminal points to the process data (see page 5).

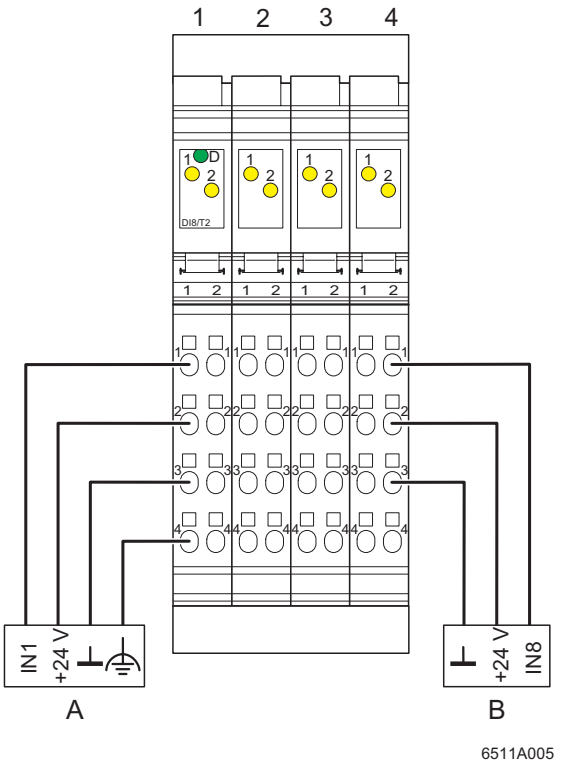


Figure 5 Typical sensor connections

A 4-wire termination

B 3-wire termination

The numbers shown above the module indicate the connector slots.

Programming Data/ Configuration Data

INTERBUS

ID code	BE_{hex} (190_{dec})
Length code	81_{hex}
Process data channel	8 bits
Input address area	1 byte
Output address area	0 bytes
Parameter channel (PCP)	0 bytes
Register length (bus)	1 byte

Other Bus Systems

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

Process Data

Please refer to the data sheet DB GB IBS SYS ADDRESS, Part No. 90 00 99 0, for the assignment of the shown (byte.bit) view to your **INTERBUS** control or computer system.

Assignment of the Terminal Points to the IN Process Data

The following table applies for IB IL 24 DI 8/T2-PAC terminal with the origianal connector set and when using the connector sets IB IL DI/DO 8-PLSET and IB IL DI/DO 8-PLSET/CP (see also Figure 3 auf Seite 2, part B).

(Byte.bit) view	Byte	Byte 0							
	Bit	7	6	5	4	3	2	1	0
Terminal	Slot	4		3		2		1	
	Terminal point (signal)	**8.1**	**7.1**	**6.1**	**5.1**	**4.1**	**3.1**	**2.1**	**1.1**
	Terminal point (24 V)	8.2	7.2	6.2	5.2	4.2	3.2	2.2	1.2
	Terminal point (GND)	8.3	7.3	6.3	5.3	4.3	3.3	2.3	1.3
	Terminal point (FE)	8.4	7.4	6.4	5.4	4.4	3.4	2.4	1.4
Status indication	Slot	4		3		2		1	
	LED	2	1	2	1	2	1	2	1

The following table applies when using the connectors IB IL SCN-8 or IB IL SCN-8-CP (see also Figure 3 auf Seite 2, part A).

(Byte.bit) view	Byte	Byte 0							
	Bit	7	6	5	4	3	2	1	0
Terminal	Slot	4		3		2		1	
	Terminal point (signal)	**2.1**	**1.1**	**2.1**	**1.1**	**2.1**	**1.1**	**2.1**	**1.1**
	Terminal point (24 V)	2.2	1.2	2.2	1.2	2.2	1.2	2.2	1.2
	Terminal point (GND)	2.3	1.3	2.3	1.3	2.3	1.3	2.3	1.3
	Terminal point (FE)	2.4	1.4	2.4	1.4	2.4	1.4	2.4	1.4
Status indication	Slot	4		3		2		1	
	LED	2	1	2	1	2	1	2	1

Technical Data

General Data	
Order designation (Order No.)	IB IL 24 DI 8/T2 (28 60 43 9) IB IL 24 DI 8/T2-PAC (28 62 20 4)
Housing dimensions (width x height x depth)	48.8 mm x 120 mm x 71.5 mm (1.921 x 4.724 x 2.815 in.)
Weight	118 g (without connectors)
Operating mode	Process data mode with 1 byte
Transmission speed	500 kBaud
Type of sensor connection	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 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	IP 20 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 DC
Current consumption from the local bus	50 mA, maximum
Power consumption from the local bus	0.375 W, maximum
Segment supply voltage U_S	24 V DC (nominal value)
Nominal current consumption at U_S	2 A, maximum

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

Digital Inputs	
Number	8
Input design	According to EN 61131-2 Type 2
Definition of switching thresholds	
Maximum low level voltage	U_{Lmax} < 5 V
Minimum high level voltage	U_{Hmin} > 11 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 at U_{IN}	6 mA, minimum
The input current depends on the ambient temperature and the number of connected inputs.	
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)

Power Dissipation	
Formula to Calculate the Power Dissipation of the Electronics	
$P_{tot} = 0.375\ W + \sum_{n=1}^{8} [\ U_{INn} \times 0.006\ A\ ]$	
Where P_{tot} Total power dissipation in the terminal n Index of the number of set inputs n = 1 to 8 U_{INn} Input voltage of the input n	
Power dissipation of the housing P_{HOU}	2.8 W, maximum (within the permissible operating temperature)

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

Safety Equipment	
Overload in segment circuit	No
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 station bus terminal and the digital output terminal described here using the bus terminal or a power terminal from separate power supply units. Interconnection of the 24 V power supplies is not permitted. (See also the 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 eight digital inputs for connecting sensors according to Type 2 limit values as specified in EN 61131-2:1994; including connectors and labeling fields	IB IL 24 DI 8/T2-PAC	28 62 20 4
Terminal with eight digital inputs for connecting sensors according to Type 2 limit values as specified in EN 61131-2:1994	IB IL 24 DI 8/T2	28 60 43 9
Four of the listed connectors or one connector set are/is needed for the complete fitting of the terminal IB IL 24 DI 8/T2.		
Connector with eight terminals using the spring-cage method (green, without color print); pack of 10	IB IL SCN-8	27 26 33 7
Connector with eight terminals using the spring-cage method (green, with color print); pack of 10	IB IL SCN-8-CP	27 27 60 8
Connector set with 32 terminals using the spring-cage method (green, without color print)	IB IL DI/DO 8-PLSET	28 60 95 0
Connector set with 32 terminals using the spring-cage method (green, with color print)	IB IL DI/DO 8-PLSET/CP	28 60 96 3
"Configuring and Installing the INTERBUS Inline Product Range" User Manual	IB IL SYS PRO UM E	27 43 04 8

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