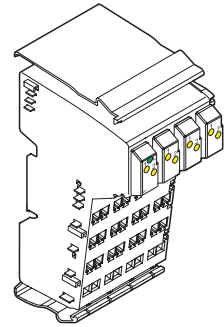# IB IL 24 DI 8

INTERBUS Inline Terminal With Eight Digital Inputs

55521001

Data Sheet 5552A   05/1999

👉 This data sheet is intended to be used in conjunction with the "INTERBUS Inline System Manual" IB IL SYS PRO UM E.

Function

This terminal is used to accept 24 V digital input signals from sourcing devices.

Features

– Connections for eight digital sensors
– 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
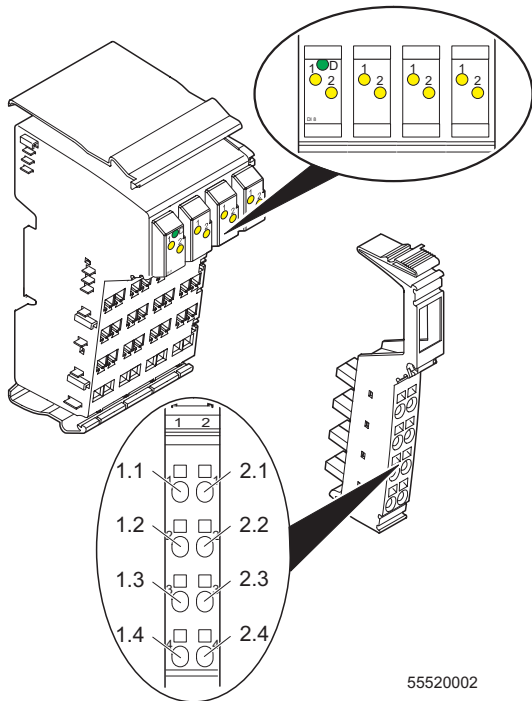– Diagnostic and status indicators
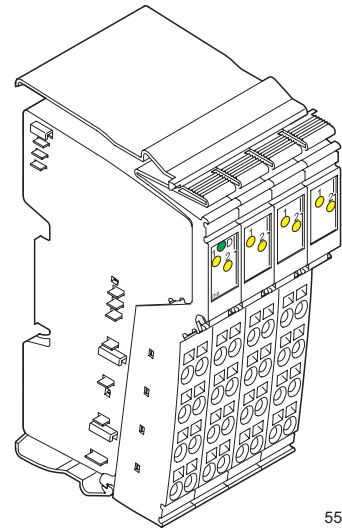
5552A006

Figure 1   IB IL 24 DI 8 module with the connectors plugged in

👉 Please note that the connectors are not supplied with the module. Refer to the "Ordering Data" Table at the end of this data sheet to choose the appropriate connector(s) for your application.

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Figure 2   IB IL 24 DI 8 module with an appropriate connector

Local Diagnostic and Status Indicators

Des.	Color	Meaning
D	Green	Bus diagnostics
Each connector		
1, 2	Yellow	Status indication of the inputs

Terminal Assignment for Each Connector

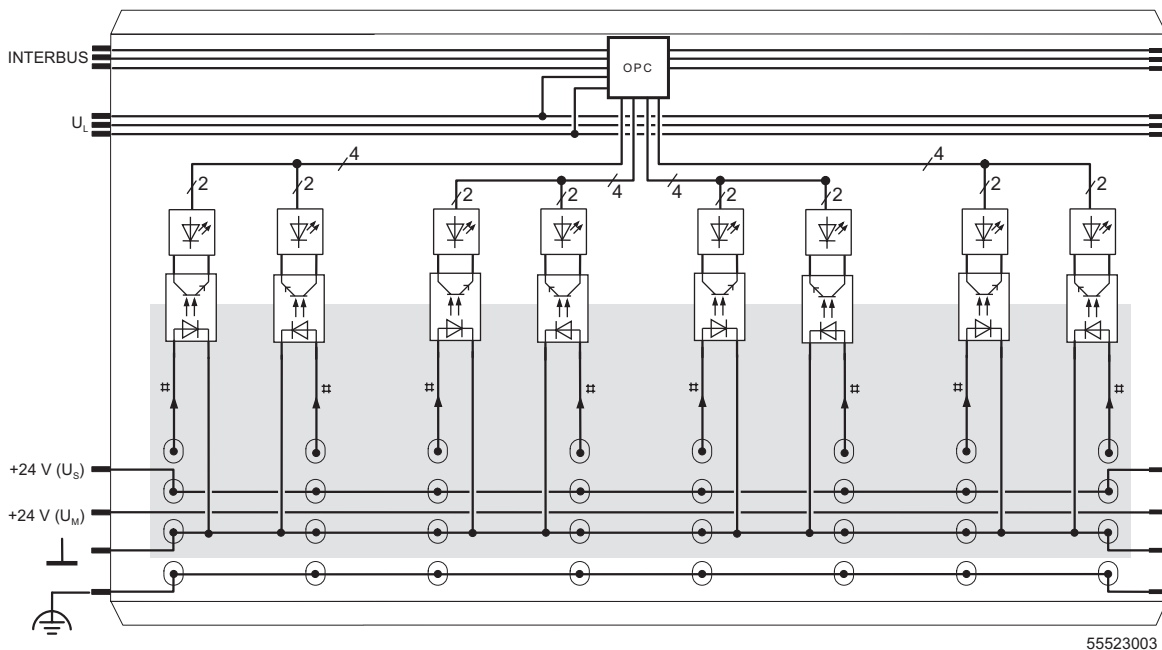| Terminal Point	Assignment
1.1, 2.1	Signal input (IN)
1.2, 2.2	Segment voltage U_S for 2-, 3-, and 4-wire termination
1.3, 2.3	Ground contact (GND) for 3- and 4-wire-termination
1.4, 2.4	FE connection for 4-wire-termination

# Internal Circuit Diagram

55523003

Figure 3   Internal wiring of the terminal points

Key:

	INTERBUS protocol chip (bus logic including voltage conditioning)
	LED
	Optocoupler
	Digital input
	Isolated area

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

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Connection Example

⚠ When connecting the sensors, observe the assignment of the terminal points to the INTERBUS reference (see page 5).

55523004

Figure 4   Typical sensor connections

A   4-wire termination

B   3-wire termination

The numbers above the module display indicate the slot number.

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Programming Data

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

INTERBUS Process Data Words

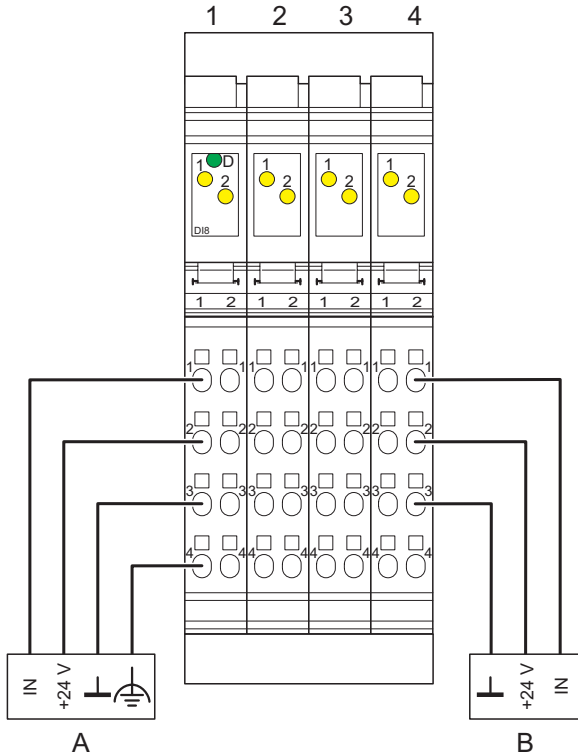**Assignment of the Terminal Points to the Process Data Input Word**

INTERBUS reference	Word	Word 0															
	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
"Byte-bit" view	Byte	Byte 0								Byte 1							
	Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Module	Slot	4		3		2		1									
	Terminal point (signal)	2.1	1.1	2.1	1.1	2.1	1.1	2.1	1.1	Not used							
	Terminal point (+24 V)	2.2	1.2	2.2	1.2	2.2	1.2	2.2	1.2								
	Terminal point (ground)	2.3	1.3	2.3	1.3	2.3	1.3	2.3	1.3								
	Terminal point (FE [functional earth ground])	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								

☞ The process data output word is not used.

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Technical Data

General	
Housing dimensions (width x height x depth)	48.8 mm x 120 mm x 71.5 mm (1.921 in. x 4.724 in. x 2.815 in.)
Weight	118 g (without connectors)
Operating mode	Process data operation with 1 byte
Connection type 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)	5% to 90%, condensation is not permissible
Permissible humidity (storage/transport)	5% to 95%, condensation is not permissible
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	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 of 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 1
Definition of operating points/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 U_{IN}	5 mA
Characteristic curve of the current	Linear in the area 1 V < U_{IN} < 30 V
Delay time	None
Permissible cable length to the sensor	30 m (98.4 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. (The signal levels of the AC sensors must correspond with EN 61131-2 Type 1)

Input Characteristic Curve	
Input voltage (V)	Typical input current (mA)
-30 < U_{IN} < 0.7	0
3	0.4
6	1.0
9	1.7
12	2.3
15	3.0
18	3.7
21	4.4
24	5.0
27	5.7
30	6.4

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Power Dissipation

Formula to calculate the power dissipation of the electronics

$$P_{tot} = 0.375\ W + \sum_{n=0}^{8} [\ U_{INn} \times \frac{U_{INn} - 1.8\ V}{4400\ \Omega}]$$

With

P_{tot}	Total power dissipation of the terminal
n	Index of the number of set inputs n = 0 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)

Concurrent Channel Derating

Derating	No limitation of the simultaneity No derating

Safety Devices

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 bus terminal and the digital input terminal using the bus terminal or a power terminal from separate power supply units. Interconnection of power supply units in the 24 V range is not allowed! (For detailed information refer to the User Manual.)

Common potentials

24 V main power, 24 V segment voltage and GND have the same potential. FE (functional earth ground) 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.

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Error Messages to the Higher-Level Control or Computer System	
None	

Ordering Data

Description	Order Designation	Order No.
Terminal with 8 digital inputs	IB IL 24 DI 8	27 26 22 7
I/O connectors with 8 terminals using the spring-clamp method (green, w/o color print) You need 4 connectors for the DI 8 terminal.	IB IL SCN-8	27 26 33 7
I/O connectors with 8 terminals using the spring-clamp method (green, with color print) You need 4 connectors for the DI 8 terminal.	IB IL SCN-8-CP	27 27 60 8
"INTERBUS Inline System Manual"	IB IL SYS PRO UM E	27 43 04 8

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