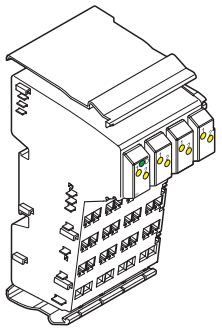
IB IL 24 DI 8
IB IL 24 DI 8-PAC
IB IL 24 DI 8-PAC/SN

Inline Terminal With Eight Digital Inputs



5552A001

Data Sheet 555205 03/2004

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.

The IB IL 24 DI 8, IB IL 24 DI 8-PAC and IB IL 24 DI 8-PAC/SN terminals only differ in the scope of supply (see "Ordering Data" on page 10). Their function and technical data are identical.

For greater clarity, the order designation IB IL 24 DI 8 is used throughout this document.

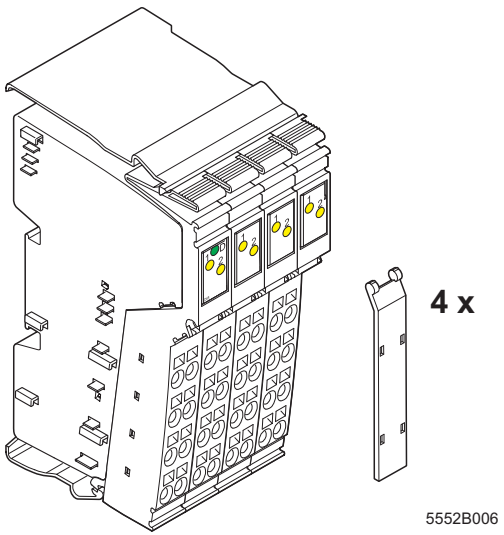
Please note that the numbering of the terminal points differs with regard to the different connector versions (see Figure 3 on page 2).

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
- 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



5552B006

Figure 1 IB IL 24 DI 8-PAC terminal

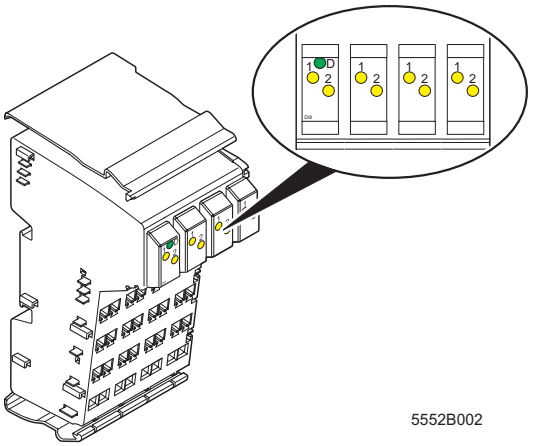


Figure 2 Local diagnostic and status indicators

Function Identification

Light blue

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
x.1	Signal input (IN)
x.2	Segment voltage U_S for 2, 3, and 4-wire termination
x.3	Ground contact (GND) for 3 and 4-wire termination
x.4	FE connection for 4-wire termination

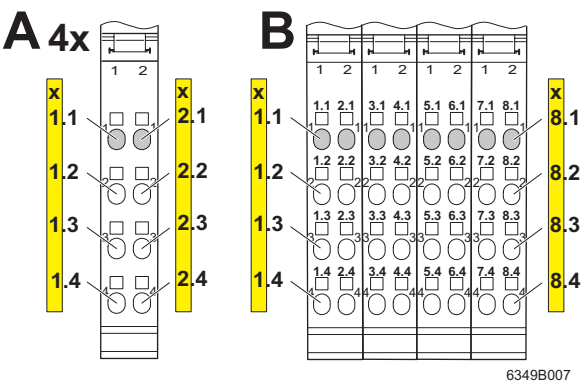


Figure 3 Terminal point numbering: individual connectors (**A**) and connector sets (**B**)

A Using the IB IL 24 DI 8-PAC/SN with the provided connectors
Using individual connectors (IB IL SCN-8 or IB IL SCN-8-ICP)

B Using the IB IL 24 DI 8-PAC with the original connector set
Using the IB IL DI/DO 8-PLSET or IB IL DI/DO 8-PLSET/CP connector sets

Internal Circuit Diagram

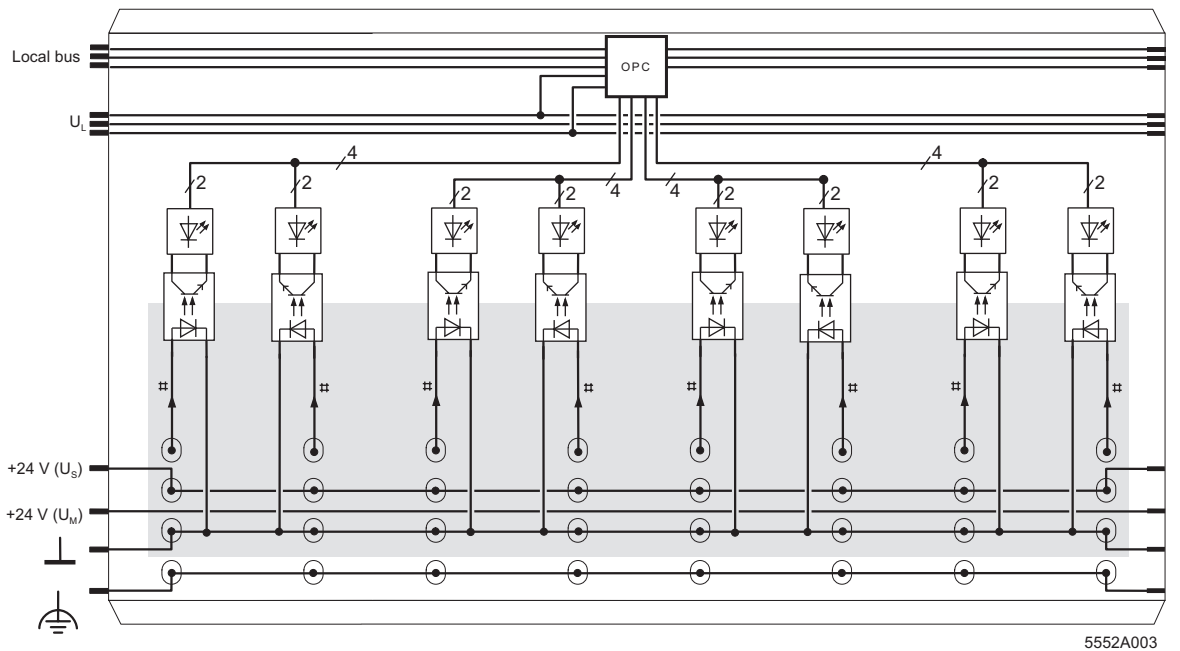


Figure 4 Internal wiring of the terminal points

Key:

OPC — Protocol chip (bus logic including voltage conditioning)

LED

Optocoupler

Digital input

Electrically isolated area

Other symbols used are explained in the IB IL SYS PRO UM E user manual or the 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).

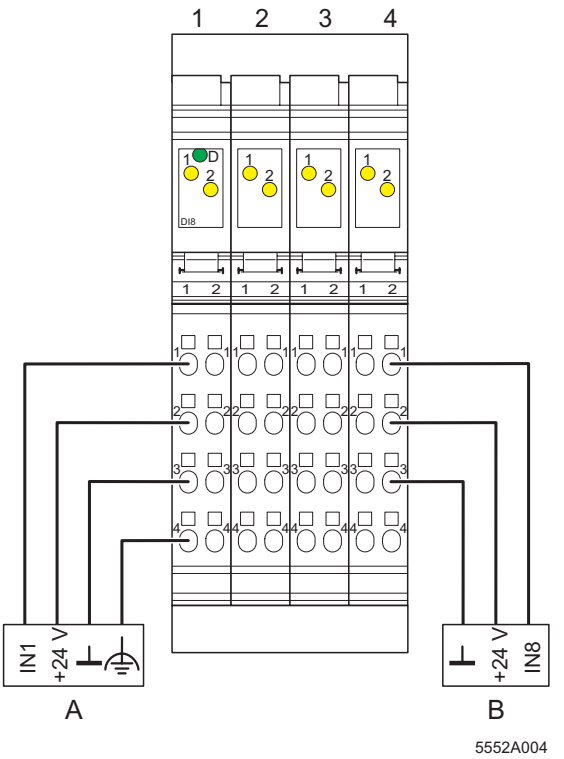


Figure 5 Typical sensor connections

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

Process Data

Please refer to the data sheet DB GB IBS SYS ADDRESS, Order 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 to the IB IL 24 DI 8-PAC terminal with the original connector set and when using the IB IL DI/DO 8-PLSET and IB IL DI/DO 8-PLSET/CP connector sets (see also Figure 3 on page 2, detail B).

(Byte.bit) view	Byte	Byte 0							
	Bit	7	6	5	4	3	2	1	0
Assignment	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 indicator	Slot	4		3		2		1	
	LED	2	1	2	1	2	1	2	1

The following table applies to the IB IL 24 DI 8-PAC/SN terminal when using the original connector set and the IB IL SCN-8 or IB IL SCN-8-CP connectors (see also Figure 3 on page 2, detail A).

(Byte.bit) view	Byte	Byte 0							
	Bit	7	6	5	4	3	2	1	0
Assignment	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 indicator	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 (27 26 22 7) IB IL 24 DI 8-PAC (28 61 24 7) IB IL 24 DI 8-PAC/SN (28 62 93 2)
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	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 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 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}	5 mA
Current flow	Linear in the range 1 V < U_{IN} < 30 V
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)

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

Power Dissipation

Formula to Calculate the Power Dissipation of the Electronics

$$P_{EL} = 0.375\ W + \sum_{n=1}^{8} \left[U_{INn} \times \frac{U_{INn} - 1.8\ V}{4400\ \Omega} \right]$$

Where

P_{EL}	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 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/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 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 eight digital inputs including connectors (with consecutive numbering) and labeling fields	IB IL 24 DI 8-PAC	28 61 24 7
Terminal with eight digital inputs including connectors (with individual numbering) and labeling fields	IB IL 24 DI 8-PAC/SN	28 62 93 2
Terminal with eight digital inputs	IB IL 24 DI 8	27 26 22 7
Four of the listed connectors or one connector set are needed for the complete fitting of the IB IL 24 DI 8 terminal.		
Connector with eight spring-cage connections (green, w/o color print); pack of 10	IB IL SCN-8	27 26 33 7
Connector with eight spring-cage connections (green, with color print); pack of 10	IB IL SCN-8-CP	27 27 60 8
Connector set with 32 spring-cage connections (green, w/o color print)	IB IL DI/DO 8-PLSET	28 60 95 0
Connector set with 32 spring-cage connections (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
Make sure you always use the latest documentation. It can be downloaded at www.phoenixcontact.com.		

Phoenix Contact GmbH & Co. KG
Flachsmarktstr. 8
32825 Blomberg
Germany

+ 49 - (0) 52 35 - 3-00

+ 49 - (0) 52 35 - 3-4 12 00

www.phoenixcontact.com

Worldwide Locations:
www.phoenixcontact.com/salesnetwork

SCATTERGOOD & JOHNSON LTD
ELECTRICAL ENGINEERING & FLUID CONTROL DISTRIBUTORS
Est.1899

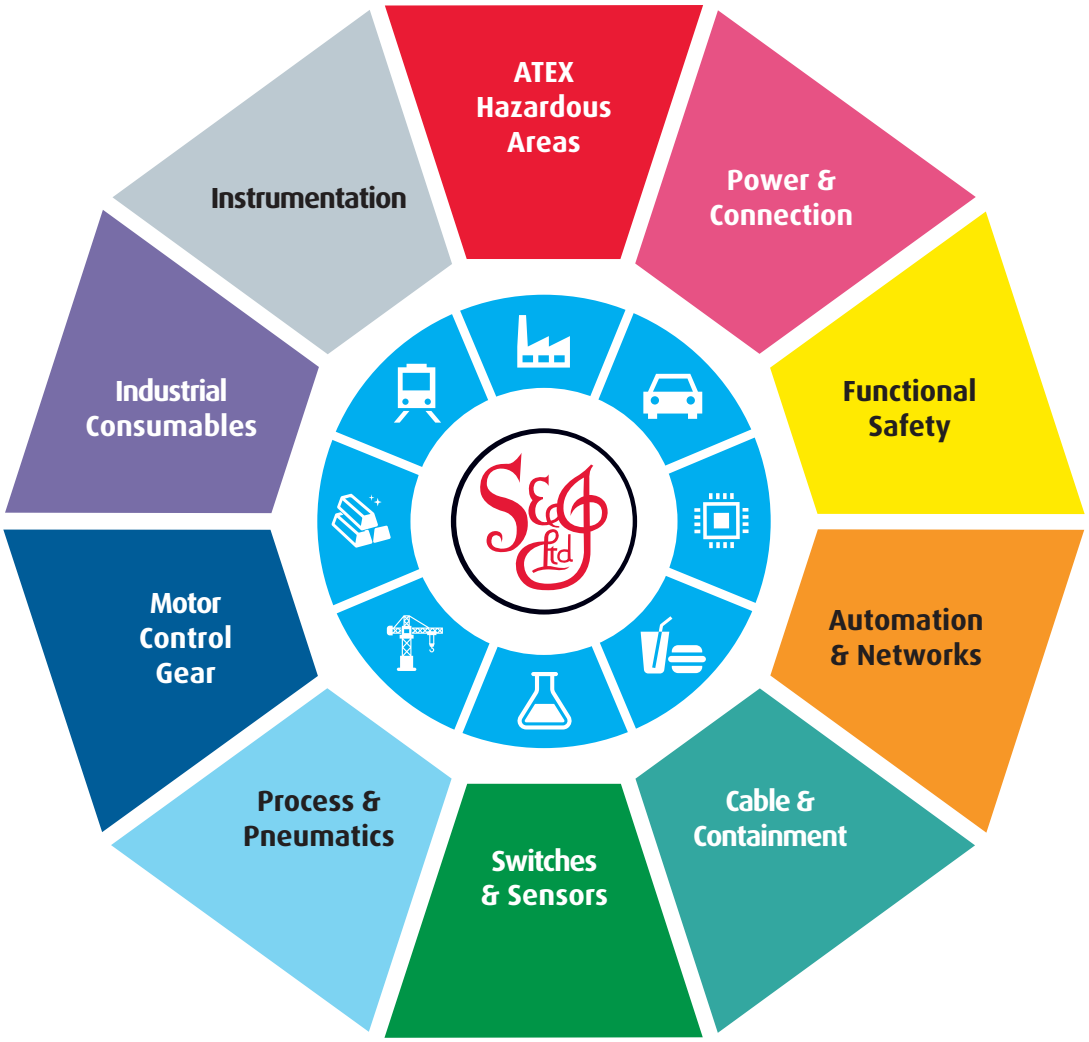
At Scattergood & Johnson Ltd, we pride ourselves on being a technical distributor to specialist industries.

Working with a range of quality product suppliers across a number of specialist markets, we are not your average 'box shifter' - we are your technical and supply chain partner.

We fully support every product we sell - for free! Our internal team and external sales engineers can answer any product or application question, no matter the complexity.

Backing up this technical ability is a range of 50,000+ products available from stock for nationwide next day delivery (same day if required!), or you can collect what you need from any of our trade counters around the UK.

Select your specialist interest below to learn more about how we can help.



Online, In Branch and On the Road - Scattergood & Johnson Ltd, there when you need us.

www.scatts.co.uk