IB IL 24 DI8/HD-PAC

Inline, digital input terminal, digital inputs: 8, 24 V DC

Data sheet
7984_en_03

1 Description

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

Features

- 8 digital inputs
- Connection of sensors in single-wire technology
- Diagnostic and status indicators

This data sheet is only valid in association with the IL SYS INST UM E user manual.

Make sure you always use the latest documentation.
It can be downloaded from the product at phoenixcontact.net/products.

2 Table of contents

3 Ordering data

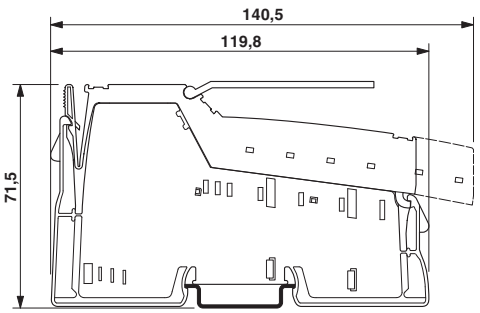
Description	Type	Order No.	Pcs./Pkt.
Inline, Digital input terminal, Digital inputs: 8, 24 V DC, Connection method: 1-wire, Transmission speed in the local bus 500 kbps, Degree of protection IP20, including Inline connector and labeling field	IB IL 24 DI8/HD-PAC	2700173	1

Accessories	Type	Order No.	Pcs./Pkt.
Connector, for digital 1, 2 or 8-channel Inline terminals (Connector/Adapter)	IB IL SCN-8	2726337	10
Labeling field, width: 12.2 mm (Marking)	IB IL FIELD 2	2727501	10
Inline terminal for power distribution (24 V), complete with accessories, (connector and labeling field) 24 V supply voltage is fed out from the segment circuit (US)	IB IL PD 24V-PAC	2862987	1
Inline terminal for power distribution (GND), complete with accessories, (connector and labeling field) connections for GND	IB IL PD GND-PAC	2862990	1
VARIOFACE front adapter for Inline HD modules, for transferring 8 digital signals. (Connector/Adapter)	FLKM 14-PA-INLINE/DIO8	2900889	1

Documentation	Type	Order No.	Pcs./Pkt.
User manual, English, Automation terminals of the Inline product range	IL SYS INST UM E	-	-
Data sheet, English, INTERBUS addressing	DB GB IBS SYS ADDRESS	-	-

4 Technical data

Dimensions (nominal sizes in mm)



Width	12.2 mm
Height	119.8 mm
Depth	71.5 mm

General data	
Color	green
Weight	60 g (with connector)
Operating mode	Process data mode with one byte
Ambient temperature (operation)	-25 °C ... 55 °C
Ambient temperature (storage/transport)	-25 °C ... 85 °C
Permissible humidity (operation)	10 % ... 95 % (according to DIN EN 61131-2)
Permissible humidity (storage/transport)	10 % ... 95 % (according to DIN EN 61131-2)
Air pressure (operation)	70 kPa ... 106 kPa (up to 3000 m above sea level)
Air pressure (storage/transport)	70 kPa ... 106 kPa (up to 3000 m above sea level)
Degree of protection	IP20
Protection class	III, IEC 61140, EN 61140, VDE 0140-1

Connection data	
Designation	Inline connector
Connection method	Spring-cage connection
Conductor cross section solid / stranded	0.08 mm² ... 1.5 mm² / 0.08 mm² ... 1.5 mm²
Conductor cross section [AWG]	28 ... 16
Stripping length	8 mm

Connection data for UL approvals	
Designation	Inline connector
Connection method	Spring-cage connection
Conductor cross section solid / stranded	0.2 mm² ... 1.5 mm² / 0.2 mm² ... 1.5 mm²
Conductor cross section [AWG]	24 ... 16

Interface Inline local bus	
Connection method	Inline data jumper
Transmission speed	500 kbps

Power consumption	
Segment circuit supply U_S	24 V DC (nominal value)
Current consumption from U_S	max. 5.5 mA DC
Communications power U_L	7.5 V DC (via voltage jumper)
Current consumption from U_L	max. 30 mA DC
Power consumption	max. 0.25 W (at U_L)

Digital inputs	
Number of inputs	8
Connection method	Spring-cage connection
Connection method	1-wire
Description of the input	EN 61131-2 types 1 and 3
Nominal input voltage	24 V DC
Nominal input current	typ. 2.4 mA
Input voltage range "0" signal	-3 V DC ... 5 V DC

Digital inputs	
Input voltage range "1" signal	11 V DC ... 30 V DC
Delay at signal change from 0 to 1	typ. 1 ms
Delay at signal change from 1 to 0	typ. 1 ms
Permissible conductor length to the sensor	30 m

Programming data (INTERBUS, local bus)	
ID code (hex)	BE
ID code (dec.)	190
Length code (hex)	81
Length code (dec.)	129
Process data channel	8 Bit
Input address area	1 Byte
Output address area	0 Byte
Parameter channel (PCP)	0 Byte
Register length (bus)	8 Bit

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

Configuration and parameter data in a PROFIBUS system	
Required parameter data	1 Byte
Need for configuration data	4 Byte

Error messages to the higher level control or computer system

None

Electrical isolation/isolation of the voltage areas	
Test section	**Test voltage**
7.5 V supply (bus logics)/24 V supply (I/O)	500 V AC, 50 Hz, 1 min.
7.5 V supply (bus logics) / functional earth ground	500 V AC, 50 Hz, 1 min.
24 V supply (I/O) / functional earth ground	500 V AC, 50 Hz, 1 min.

To achieve electrical isolation between the logic level and the I/O area, supply these areas from separate power supply units. Interconnection of the power supply units in the 24 V area is not permitted (see IL SYS INST UM E user manual).

Approvals

For the latest approvals, please visit phoenixcontact.net/products.

5 Additional tables

Input characteristic curve	
Input voltage U [V]	**Typical input current I [mA]**
-30 < U ≤ 0.7	0
3	0.12
6	1.32
9	2.32
12	2.36
15	2.36
18	2.36
21	2.36
24	2.40
27	2.40
30	2.40

6 Internal circuit diagram

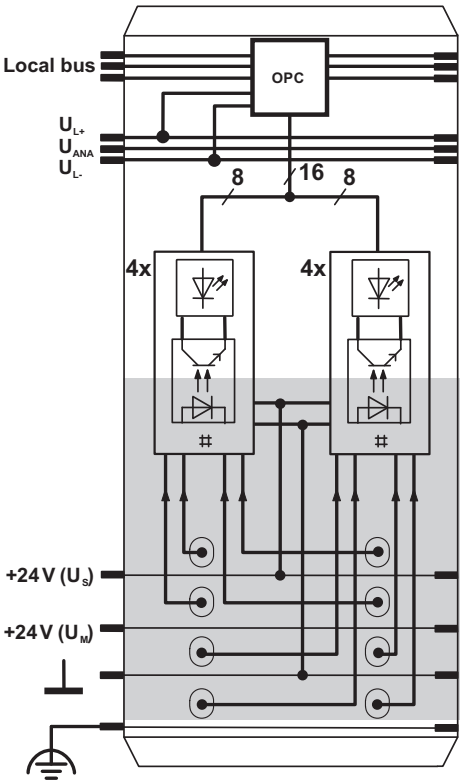


Figure 1 Internal wiring of the terminal points

Key:

OPC — Protocol chip (Bus logic including voltage conditioning)

LED (status indicator)

Optocoupler

Digital input

Electrically isolated area

Explanation for other used symbols has been provided in the IL SYS INST UM E user manual.

7 Terminal point assignment

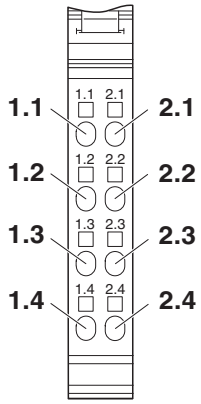


Figure 2 Terminal point assignment

Terminal point	Assignment
1.1 / 2.1	Signal input (IN01 / IN02)
1.2 / 2.2	Signal input (IN03 / IN04)
1.3 / 2.3	Signal input (IN05 / IN06)
1.4 / 2.4	Signal input (IN07 / IN08)

8 Connection notes and examples

When connecting the sensors observe the assignment of the terminal points to the process data.

NOTE: Malfunction

The supply voltage U_S is used internally as the auxiliary supply.
If it is not present, the terminal will not operate properly.
Make sure that the supply voltage U_S is available.

NOTE: Malfunction

The sensors and U_S must be supplied from the same voltage supply.

The simplest way to meet this requirement is to use the IB IL PD 24V-PAC terminal. Wire the 24 V sensor connections to this terminal. In this way, they are supplied from the potential jumper U_S of the Inline station.

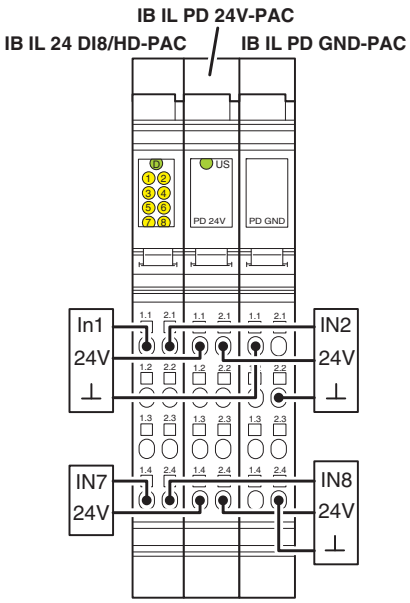


Figure 3 Typical connection of sensors when terminals for potential distribution are used

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

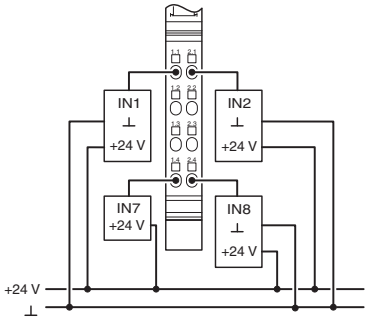


Figure 4 Example of a connection of sensors when using external busbars

9 Application examples

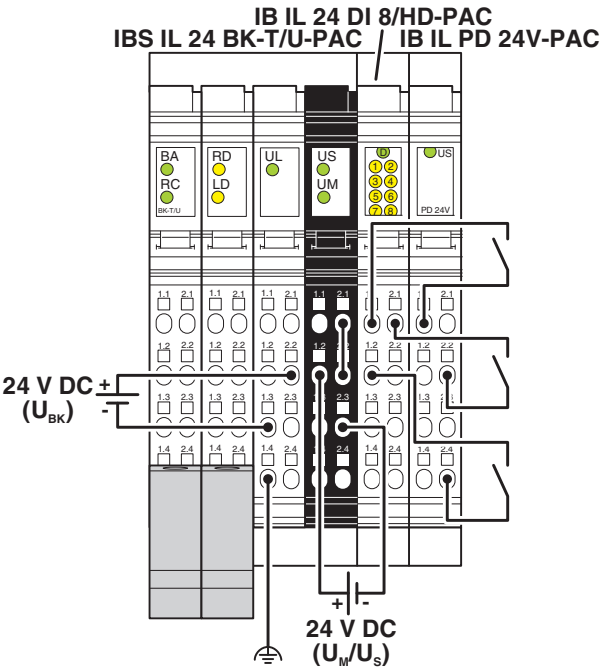


Figure 5 Connection of sensors when using the IB IL PD 24V-PAC terminal

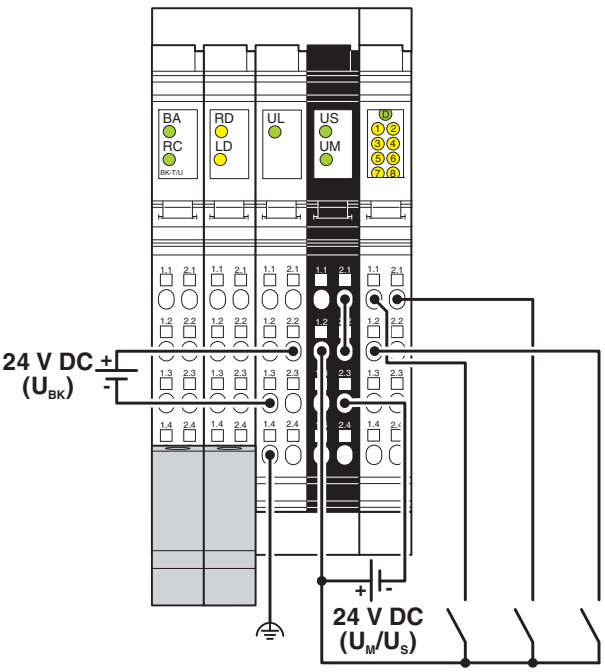


Figure 6 Connection of sensors when using external busbars

10 Local diagnostic and status indicators

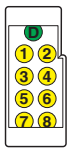


Figure 7 Local diagnostic and status indicators

Designation	Color	Meaning
D	Green	Diagnostics (bus and logic voltage)
1 ... 8	Yellow	Status of the inputs

Function identification

Light blue

2 Mbps: White stripe in the vicinity of the D LED

11 Process data

Assignment of the terminal points to IN process data

(Byte.Bit) view	Byte	Byte 0							
	Bit	7	6	5	4	3	2	1	0
Assignment	Signal	IN08	IN07	IN06	IN05	IN04	IN03	IN02	IN01
	Terminal point (signal)	2.4	1.4	2.3	1.3	2.2	1.2	2.1	1.1
Status indicator	LED	8	7	6	5	4	3	2	1

For the assignment of the illustrated (byte.bit) view to your INTERBUS control or computer system, please refer to the DB GB IBS SYS ADDRESS data sheet.

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

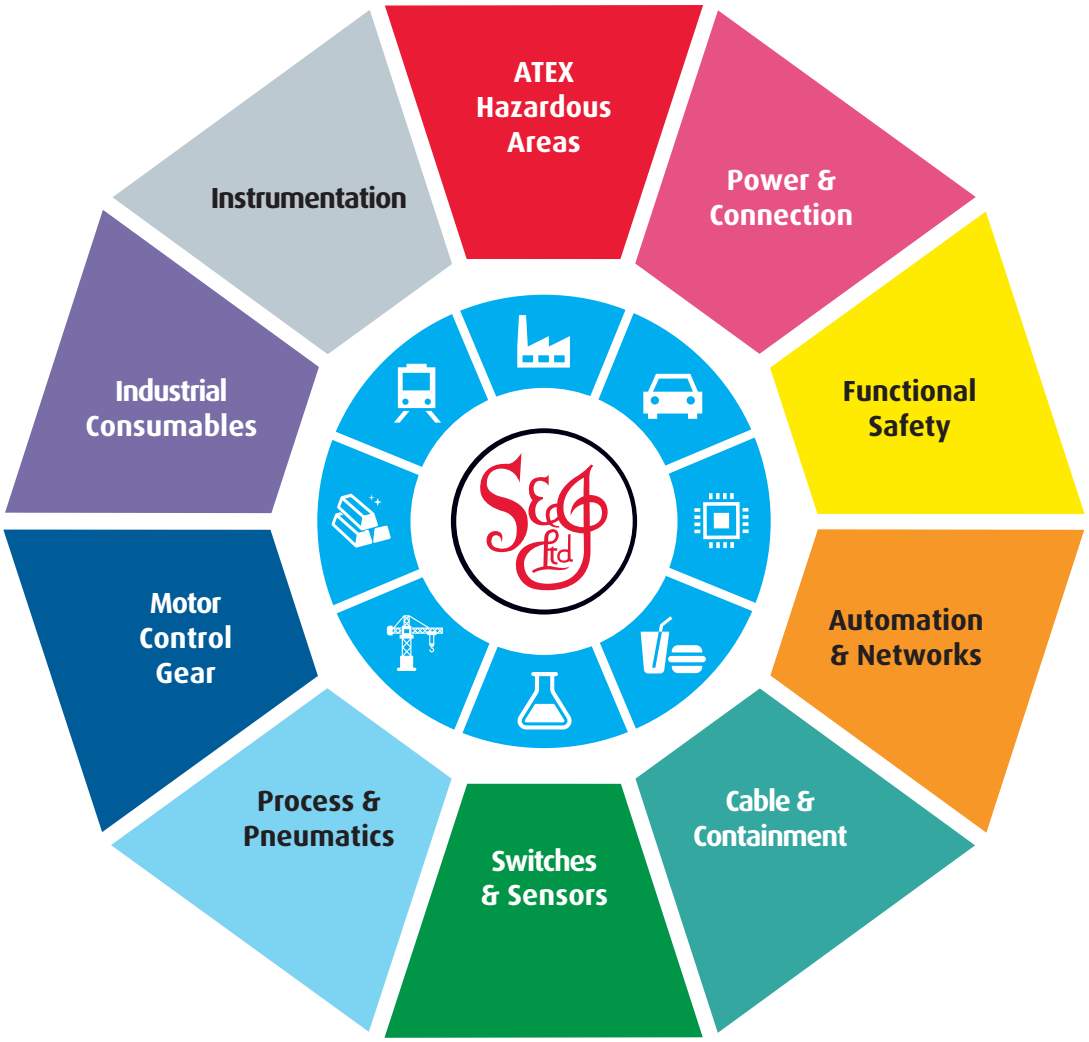
At Scattergood & Johnson Ltd, we pride ourselves on being a technical distributor to specialist industries.

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