IB IL 24 DI8/HD-PAC
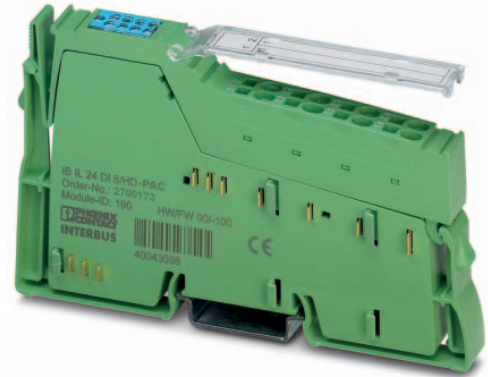
**Inline, digital input terminal,
digital inputs: 8, 24 V DC**

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.

PHŒNIX CONTACT

INSPIRING INNOVATIONS

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)
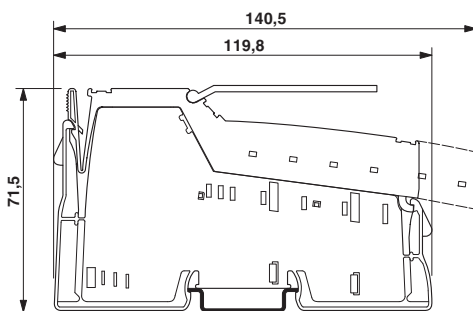
Width	12.2 mm
Height	119.8 mm
Depth	71.5 mm

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 mm^2 ... 1.5 mm^2 / 0.08 mm^2 ... 1.5 mm^2
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 mm^2 ... 1.5 mm^2 / 0.2 mm^2 ... 1.5 mm^2
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

> **i** 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.

> **i** 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

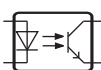| Input characteristic curve	
Input voltage U [V]	**Typical input current I [mA]**
-30 < U ≤ 0.7	0
3	0.12
6	1.32
9	2.32
12	2.36
15	2.36
18	2.36
21	2.36
24	2.40
27	2.40
30	2.40

6 Internal circuit diagram
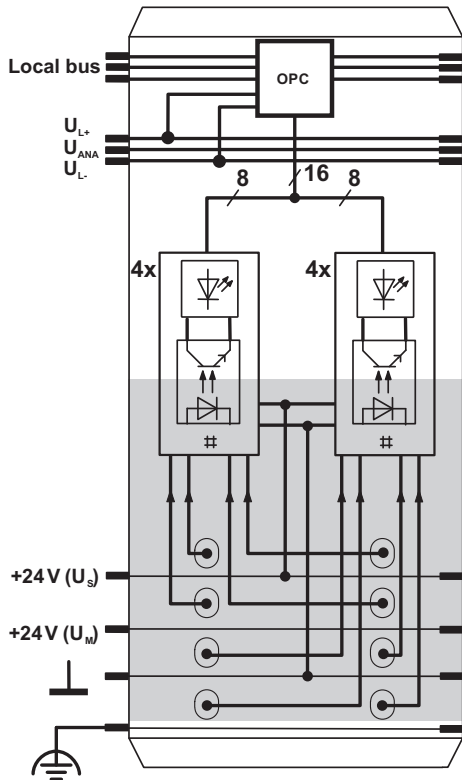
Figure 1   Internal wiring of the terminal points

Key:

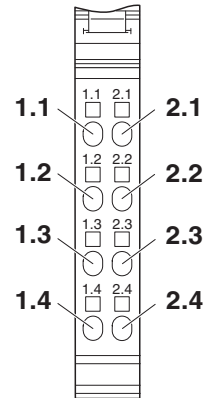|	
OPC	Protocol chip (Bus logic including voltage conditioning)
	LED (status indicator)
	Optocoupler
#	Digital input
	Electrically isolated area
i	Explanation for other used symbols has been provided in the IL SYS INST UM E user manual.

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

i	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.
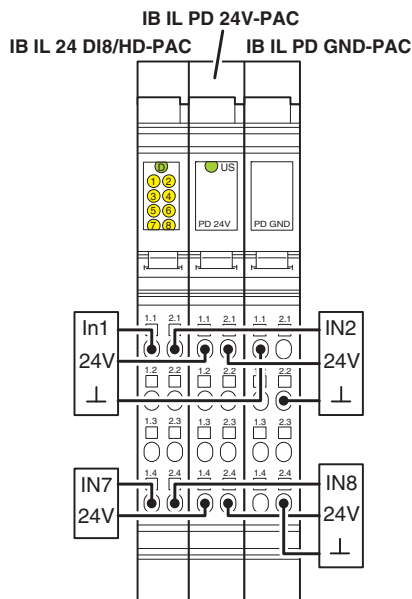

Figure 3   Typical connection of sensors when terminals for potential distribution are used

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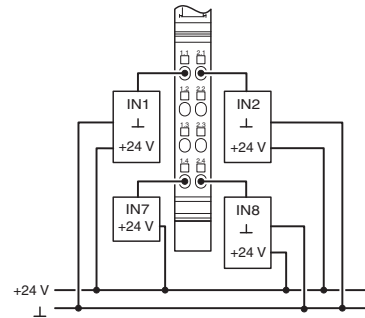

Figure 4   Example of a connection of sensors when using external busbars

9 Application examples

IB IL 24 DI 8/HD-PAC
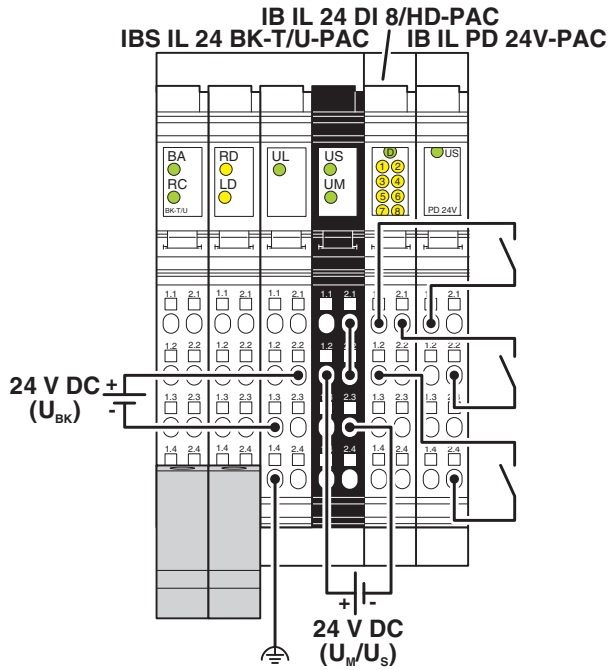**IBS IL 24 BK-T/U-PAC** | **IB IL PD 24V-PAC**

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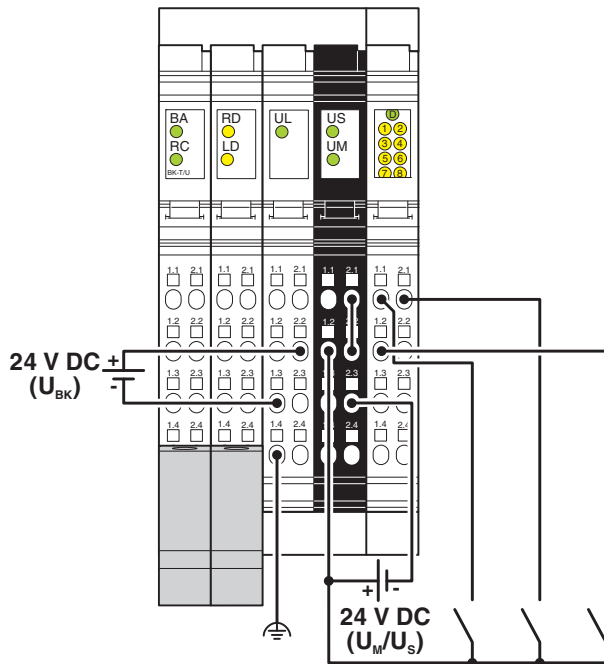

Figure 6   Connection of sensors when using external busbars
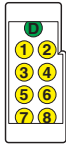
10 Local diagnostic and status indicators

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

> **i** 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.