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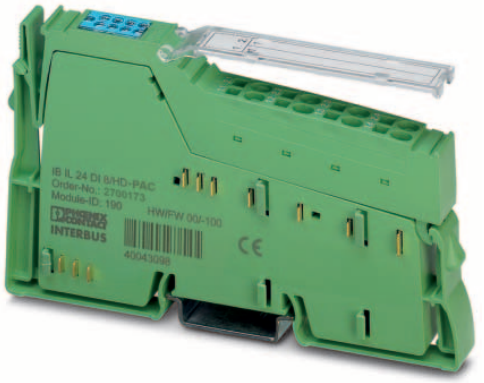
IB IL 24 DI8/HD-XC-PAC



**Inline digital input terminal,
version for extreme conditions,
8 inputs, 24 V DC**

Data sheet
8461_en_00

1 Description

The terminal block has been developed for use in an Inline station. It is used to acquire digital signals.

Thanks to special engineering measures and tests, the terminal can be used under extreme ambient conditions.

Features

- Connections for eight digital sensors
- Connection of sensors in 1-wire technology
- Diagnostic and status indicators
- Can be used under extreme ambient conditions
- Painted PCBs
- Extended temperature range T2 (-40°C … +55°C)

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 www.phoenixcontact.net/catalog.

2 Table of contents

3 Ordering data

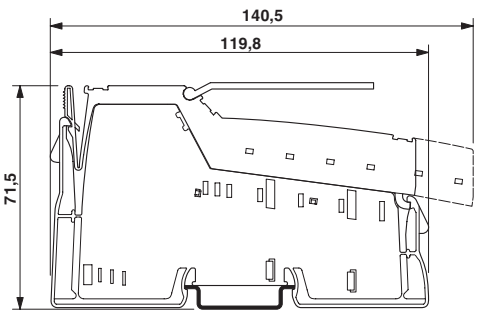
Description	Type	Order No.	Pcs. / Pkt.
Inline digital input terminal, version for extreme conditions, complete with accessories (connector plug and labeling field), 8 inputs, 24 V DC, 1-wire connection technology	IB IL 24 DI8/HD-XC-PAC	2701212	1

Accessories	Type	Order No.	Pcs. / Pkt.
Connector, for digital 1, 2 or 8-channel Inline terminals (Plug/Adapter)	IB IL SCN-8	2726337	10
Labeling field, width: 12.2 mm (Marking)	IB IL FIELD 2	2727501	10

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
Note on dimensions	Housing dimensions

General data

Color	green
Weight	60 g (With connector)
Operating mode	Process data mode with one byte
Ambient temperature (operation)	-40 °C ... 55 °C (See also the "Tested successfully: Use under extreme ambient conditions" section of the data sheet.)
Ambient temperature (operation)	-40 °C ... 60 °C (At U_S < 24.5 V; see also the "Tested successfully: Use under extreme ambient conditions" section of the data sheet.)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Temperature class	T2 (-40°C ... 55°C, EN 50155)
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)

General data	
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	
Name	Inline connectors
Connection method	Spring-cage connection
Conductor cross section solid / stranded	0.08 mm² ... 1.5 mm²
Conductor cross section [AWG]	28 ... 16

Interface Inline local bus	
Connection method	Inline data jumper
Transmission speed	500 kBit/s

Power consumption	
Segment supply voltage 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
Current consumption from U_L	max. 30 mA DC
Power loss	max. 0.72 W

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

Programming Data	
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).

PROFIBUS telegram data	
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	
5 V supply, incoming remote bus/7.5 V supply (bus logics)	500 V AC , 50 Hz , 1 min
5 V supply, outgoing remote bus/7.5 V supply (bus logics)	500 V AC , 50 Hz , 1 min
7.5 V supply (bus logics)/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

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 also user manual).

Approvals
For the latest approvals, please visit www.phoenixcontact.net/catalog.

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 Tested successfully: Use under extreme ambient conditions

The terminal has been tested successfully over 250 temperature change cycles in accordance with IEC 61131-2 in the range from -40°C to +70°C.

The following conditions were observed:

– The Inline devices for all connecting cables were connected with a minimum conductor cross section of 0.5 mm²
– The Inline station was assembled on a wall-mounted horizontal DIN rail
– Fans were used to ensure continuous movement of air in the control cabinet
– The Inline station was not exposed to vibration or shock
– The Inline station was operated with a maximum of 24.5 V (ensured by using regulated power supply units)

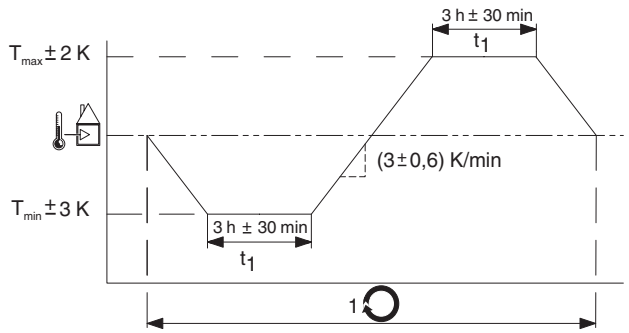


Figure 1 Temperature change cycle

Temperature in the control cabinet/ambient temperature

Cycle

WARNING:

The terminal is not approved for use in potentially explosive areas.

The terminal is not approved for use in safety technology.

7 Internal circuit diagram

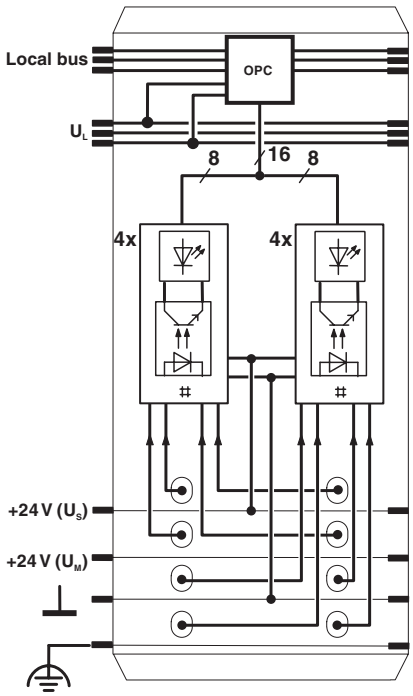


Figure 2 Internal wiring of the terminal points

OPC — Protocol chip (Bus logic including voltage conditioning)

LED (status indicator)

Optocoupler

Digital input

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

8 Local status and diagnostic indicators

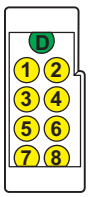


Figure 3 Local status and diagnostic indicators

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

Function identification

Light blue

9 Terminal point assignment

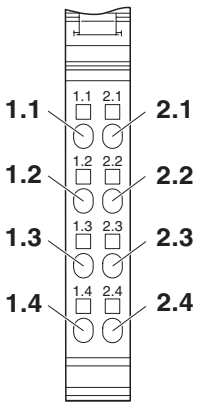


Figure 4 Terminal point assignment

Terminal point	Assignment
1.1 / 2.1	Signal input (IN 1 / IN 2)
1.2 / 2.2	Signal input (IN 3 / IN 4)
1.3 / 2.3	Signal input (IN 5 / IN 6)
1.4 / 2.4	Signal input (IN 7 / IN 8)

10 Connection notes and examples

NOTE: Malfunction

Make sure that the supply voltage U_S is available, as it is used internally as the auxiliary voltage.

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

NOTE: Malfunction

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

If you connect the sensors via external busbars, make sure that the sensors and U_S are supplied by the same power supply.

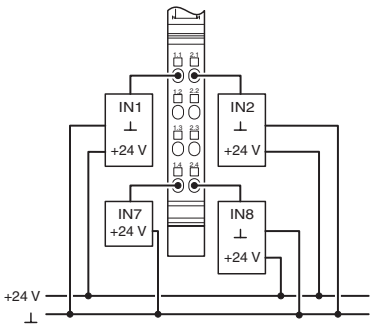


Figure 5 Example of a connection of sensors when using external busbars

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	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.