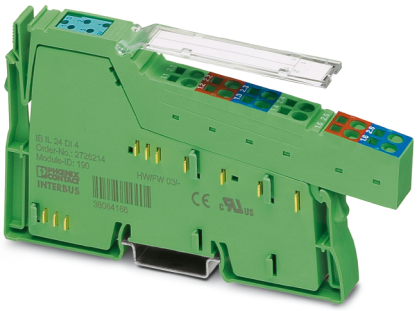
IB IL 24 DI 4(-2MBD)-PAC

**Inline, digital input terminal,
digital inputs: 4, 24 V DC**



Data sheet
5550_en_08

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1 Description

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

Features

- 4 digital inputs
- Connection of sensors in 2- and 3-conductor technology
- Maximum permissible load current per sensor: 250 mA
- Maximum permissible load current from the terminal: 1 A

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.
This is available for downloading at the following addresses:
phoenixcontact.net/product/2861234
phoenixcontact.net/product/2692306

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3 Ordering data

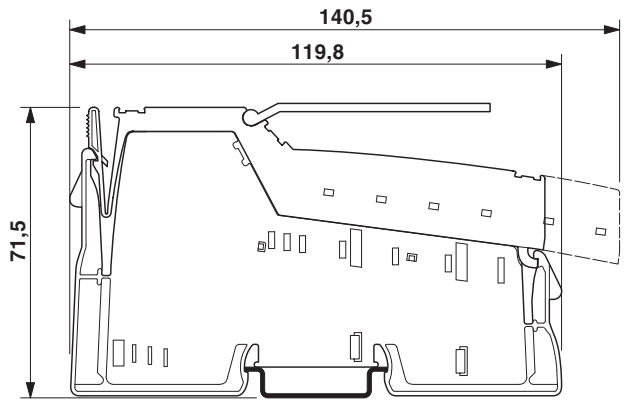
Description	Type	Item no.	Pcs./Pkt.
Inline, Digital input terminal, Digital inputs: 4, 24 V DC, connection technology: 3-conductor, transmission speed in the local bus: 500 kbps, degree of protection: IP20, including Inline connector and labeling field	IB IL 24 DI 4-PAC	2861234	1
Inline, Digital input terminal, Digital inputs: 4, 24 V DC, connection technology: 3-conductor, transmission speed in the local bus: 2 Mbps, degree of protection: IP20, including Inline connector and labeling field	IB IL 24 DI 4-2MBD-PAC	2692306	1

Accessories	Type	Item no.	Pcs./Pkt.
Inline connector, colored (Connector/Adapter)	IB IL SCN-8-CP	2727608	10
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
Insert strip, Sheet, white, unlabeled, can be labeled with: Office printing systems: Laser printer, mounting type: insert, lettering field size: 62 x 10 mm, Number of individual labels: 72 (Marking)	ESL 62X10	0809492	1

Documentation	Type	Item 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	-	-
Application note, English, Inline terminals for use in zone 2 potentially explosive areas	AH EN IL EX ZONE 2	-	-

4 Technical data

Dimensions (nominal sizes in mm)	



Width	12.2 mm
Height	140.5 mm
Depth	71.5 mm
Note on dimensions	Housing dimensions

General data	
Color	green
Weight	66 g (with connector)
Operating mode	Process data operation with 4 bits
Ambient temperature (operation)	-25 °C ... 55 °C
Ambient temperature (storage/transport)	-25 °C ... 85 °C
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	10 % ... 95 % (non-condensing)
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)
Overvoltage category	II (IEC 60664-1, EN 60664-1)
Degree of pollution	2 (IEC 60664-1, EN 60664-1)
Mounting type	DIN rail mounting

Connection data: Inline connector	
Connection method	Spring-cage connection
Conductor cross section, rigid	0.08 mm² ... 1.5 mm²
Conductor cross section, flexible	0.08 mm² ... 1.5 mm²
Conductor cross section [AWG]	28 ... 16
Stripping length	8 mm

Connection data for UL approvals: Inline connector	
Connection method	Spring-cage connection
Conductor cross section, rigid	0.2 mm² ... 1.5 mm²
Conductor cross section, flexible	0.2 mm² ... 1.5 mm²
Conductor cross section [AWG]	24 ... 16
Stripping length	8 mm
Interface: Inline local bus	
Number of interfaces	2
Connection method	Inline data jumper
Transmission speed Inline local bus	
IB IL 24 DI 4-PAC	500 kbps
IB IL 24 DI 4-2MBD-PAC	2 Mbps
Communications power (U_L) (500 kbps)	
Supply voltage	7.5 V DC (via voltage jumper)
Current consumption	max. 40 mA
Power consumption	max. 0.3 W
Communications power (U_L) (2 Mbps)	
Supply voltage	7.5 V DC (via voltage jumper)
Current consumption	max. 51 mA
Power consumption	max. 0.4 W
Segment circuit supply (U_S)	
Supply voltage	24 V DC (via voltage jumper)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption	0 A (without sensors) max. 1 A
Digital inputs	
Number of inputs	4
Connection method	Spring-cage connection
Connection technology	3-conductor
Description of the input	EN 61131-2 type 1
Nominal input voltage	24 V DC
Nominal input current	min. 3 mA (at nominal voltage)
Sensor current per channel	max. 250 mA
Input voltage range "0" signal	-3 V DC ... 5 V DC
Input voltage range "1" signal	15 V DC ... 30 V DC
Permissible conductor length to the sensor	30 m
Short-circuit and overload protection	yes

Programming data (INTERBUS, local bus)	
ID code (hex)	BE
ID code (dec.)	190
Length code (hex)	41
Length code (dec)	65
Process data channel	4 Bit
Input address area	4 Bit
Output address area	0 Bit
Parameter channel (PCP)	0 Bit
Register length (bus)	4 Bit



For the programming data/configuration data for other bus systems, 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
Required configuration data	4 Byte

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.
24 V supply (I/O) / functional ground	500 V AC, 50 Hz, 1 min.
7.5 V supply (bus logic)/functional ground	500 V AC, 50 Hz, 500 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 current approvals, go to:	www.phoenixcontact.net/product/2861234 www.phoenixcontact.net/product/2692306



IB IL 24 DI 4-PAC:

Items manufactured **until the start of 2023** comply with directive 2014/34/EU (ATEX). You may use these items in potentially explosive areas of category 3.

Items manufactured **afterwards** do **not** meet the requirements of directive 2014/34/EU. Use in potentially explosive areas of category 3 is **not permitted**.

If you use an item with ATEX-relevant printing in a potentially explosive area, please observe the associated documentation.

Please also observe the specifications in the AH DE IL EX ZONE 2 (German) or AH EN IL EX ZONE 2 (English) application note.

If the item used by you does not feature ATEX-relevant identification, use in potentially explosive areas is not permitted.

Manufacturer's declarations	
For the current manufacturer’s declarations, go to:	www.phoenixcontact.net/product/2861234 www.phoenixcontact.net/product/2692306

5 Additional tables

5.1 Input characteristic curve

500 kbps

Current depending on the input voltage and the ambient temperature T_A			
Supply voltage [V]	**Input current [mA]**	**Input current for t ≥ 20 s [mA]**	
		T_A = 25°C	**T_A = 55°C**
18	3.0	2.9	2.5
24	3.9	3.8	3.5
30	4.5	4.2	3.0
The current is reduced depending on the ambient temperature and the number of inputs that are switched on (internal module temperature).			

5.2 Power dissipation

Formula for calculating the power dissipation of the electronics

$$P_{EL} = 0{,}24\ W + \sum_{i=1}^{n} (U_{INi} \times 0{,}003\ A)$$

Where:

P_{EL}	Total power dissipation in the terminal
i	Continuous index
n	Number of set inputs (n = 1 ... 4)
U_{INi}	Input voltage of input i

Power dissipation of the housing

Maximum 0.6 W (within the permissible operating temperature)

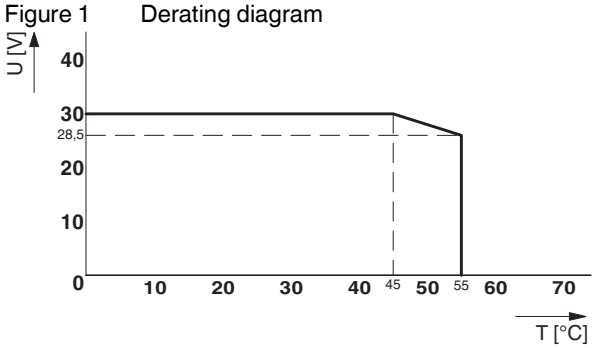
5.3 Limitation of simultaneity, derating

500 kbps

No limitation of simultaneity, no derating

2 Mbps

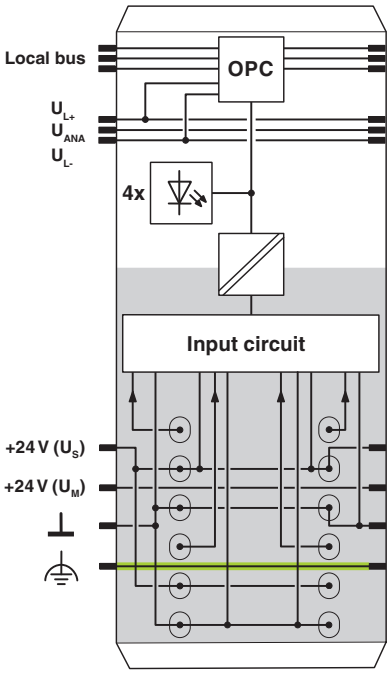
Figure 1 Derating diagram



An example for calculating the working point can be found in the user manual IL SYS INST UM E.

6 Internal circuit diagram

Figure 2 Internal wiring of the terminal points



Key:

OPC — Protocol chip
(Bus logic including voltage conditioning)

Electrical isolation for data or power supply

LED (status indicator)

Input circuit — Input circuit

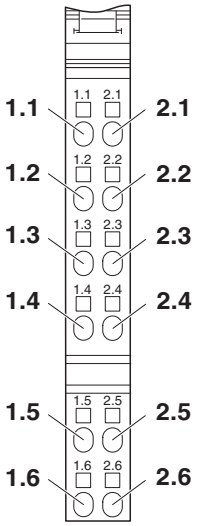
Digital input

Electrically isolated areas

Other symbols used are explained in the IL SYS INST UM E user manual.

7 Terminal point assignment

Figure 3 Terminal point assignment



Terminal point	Assignment
1.1 / 2.1	Signal input (IN01 / IN02)
1.2 / 2.2	Segment voltage U_S for 2- and 3-conductor connection
1.3 / 2.3	Ground contact (GND) for 3-conductor connection
1.4 / 2.4	Signal input (IN03 / IN04)
1.5 / 2.5	Segment voltage U_S for 2- and 3-conductor connection
1.6 / 2.6	Ground contact (GND) for 3-conductor connection

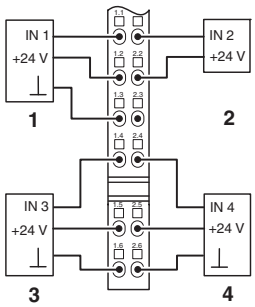
8 Connection notes and examples

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.

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

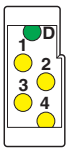
Figure 4 Typical connection of sensors



1, 3, 4 3-conductor connection
2 2-conductor connection

9 Local diagnostic and status indicators

Figure 5 Local diagnostic and status indicators



Designation	Color	Meaning
D	Green	Diagnostics (bus and logic voltage)
1 ... 4	Yellow	Status of the inputs

For detailed information on diagnostics, please refer to the IL SYS INST UM E user manual.

Function identification

Light blue

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

10 Process data

Assignment of the terminal points to IN process data

(Byte.Bit) view	Byte.Bit	0.3	0.2	0.1	0.0
Assignment	Signal	IN04	IN03	IN02	IN01
	Terminal point (signal)	2.4	1.4	2.1	1.1
	Terminal point (24 V)	2.5	1.5	2.2	1.2
	Terminal point (GND)	2.6	1.6	2.3	1.3
Status indicator	LED	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.