IB IL 24/48 DOR 2/W-PAC



Inline, Relay terminal,
Relay outputs: 2 (floating contacts),
24 V AC / 48 V DC, 2 A

Data sheet
6850_en_04

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1 Description

The terminal is designed for use within an Inline station.
It has two floating SPDT relay contacts, which are independent of one another.

Features

- 2 relays
- Floating connections for 2 actuators
- Switching current per channel: 2 A, maximum

WARNING: Undefined system state
By default, the position of the relay contacts on the module is not defined. To prevent undesired system states, perform a complete cycle (on/off) before connecting the segment voltage.

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 at: phoenixcontact.net/product/2863119

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3 Ordering data

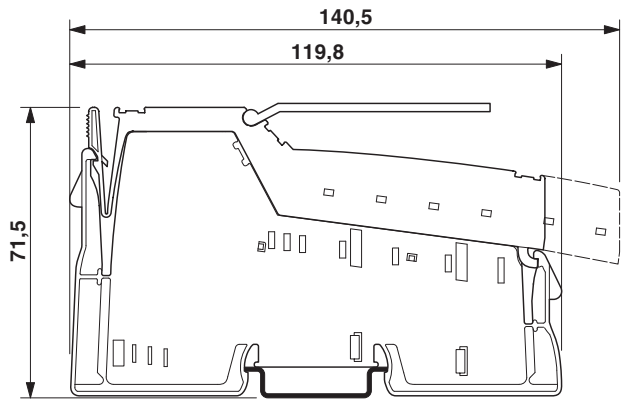
Description	Type	Item no.	Pcs./Pkt.
Inline, Relay terminal, Relay outputs: 2 (floating), Changeover contact, 24 V AC, 48 V DC, for switching ohmic loads, transmission speed in the local bus: 500 kbps, degree of protection: IP20, including Inline connector and labeling field	IB IL 24/48 DOR 2/W-PAC	2863119	1

Accessories	Type	Item 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
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.
Application note, English, The safety-related segment circuit	AH EN IL SAFE	-	-
Data sheet, English, INTERBUS addressing	DB GB IBS SYS ADDRESS	-	-
Application note, English, Fundamentals of relay technology and of solid-state relay technology	AH EN RELAY TECHNOLOGY	-	-

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	63 g (with connector)
Operating mode	Process data mode with 2 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

Interface: Inline local bus	
Number of interfaces	2
Connection method	Inline data jumper
Transmission speed	500 kbps
Communications power (U_L)	
Supply voltage	7.5 V DC (via voltage jumper)
Current consumption	max. 30 mA
Power consumption	max. 0.23 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	max. 4 A
Relay outputs	
Number of outputs	2 (floating)
Connection method	Spring-cage connection
Contact type	Changeover contact
Contact material	$AgSnO_2$, hard gold-plated
Contact resistance	75 mΩ
Nominal output voltage	24 V AC 48 V DC
Output voltage range	5 V AC ... 30 V AC 5 V DC ... 60 V DC
Switching voltage	min. 10 mV (DC) max. 30 V AC (PELV (EN 61131)) max. 60 V DC (PELV (EN 61131))
Switching current	min. 10 µA max. 2 A (30 V DC) max. 1 A (60 V DC)
Limiting continuous current	2 A (at maximum ambient temperature)
Switching capacity	60 W 62 VA (ohmic)
Switching frequency	1 Hz (without load); 1 Hz (with load)
Nominal power consumption	200 mW
Coil resistance	178 Ω ±10 % (at 20 °C)
Typical response time	typ. 20 ms
Bouncing time	4 ms (for on and off)
Typical release time	typ. 20 ms
Service life electrical	10^8 cycles
Mechanical service life	2x 10^5 cycles
Common potentials	all contacts floating

Programming data (INTERBUS, local bus)	
ID code (hex)	BD
ID code (dec.)	189
Length code (hex)	C2
Length code (dec)	194
Process data channel	2 Bit
Input address area	0 Bit
Output address area	2 Bit
Parameter channel (PCP)	0 Bit
Register length (bus)	2 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	3 Byte
Required configuration data	4 Byte

Electrical isolation/isolation of the voltage areas	
Test section	**Test voltage**
Relay contact / Bus logics	1.5 kV, 50 Hz, 1 min.
Contact/contact	1 kV, 50 Hz, 1 min.
Contact/functional ground	1 kV, 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 current approvals, go to:	www.phoenixcontact.net/product/2863119

Manufacturer's declarations	
For the current manufacturer’s declarations, go to:	www.phoenixcontact.net/product/2863119

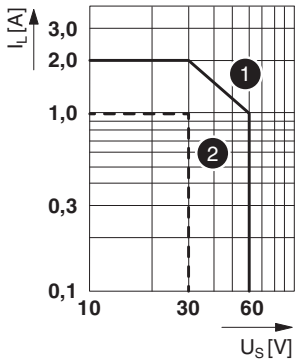
5 Additional tables

5.1 Maximum switching current for ohmic load depending on the switching voltage

Switching voltage (V DC)	Switching current (A)
10	2.0
20	2.0
30	2.0
60	1.0

Load current I_L as a function of the switching voltage U_S

Figure 1 Load current I_L as a function of the switching voltage U_S

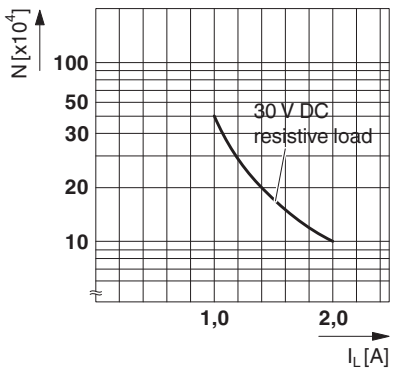


1 DC, ohmic load

2 AC, ohmic load

Number of operations N as a function of the load current I_L

Figure 2 Number of operations N as a function of the load current I_L



5.2 Power dissipation

Formula for calculating the power dissipation of the electronics

$$P_{EL} = 0{,}23\ W + m \times 0{,}14W + \sum_{i=1}^{n} (I_{Li}^2 \times 0{,}075)$$

Where:

P_{EL}	Total power dissipation in the terminal
i	Continuous index
n	Number of set outputs (n = 1 ... 2)
m	Number of relays with controlled coil
I_{Li}	Load current of output i

Power dissipation of the housing

$P_{HOU} = 1.2\ W$ $\quad -25\ °C \le T_U < +25\ °C$

$P_{HOU} = 1.2\ W - [(T_A - 25°C) \times 0.02\ W/°C]$ $\quad +25°C < T_A \le +55°C$

Where:

P_{HOU}	Power dissipation of the housing
T_A	Ambient temperature

5.3 Limitation of simultaneity, derating

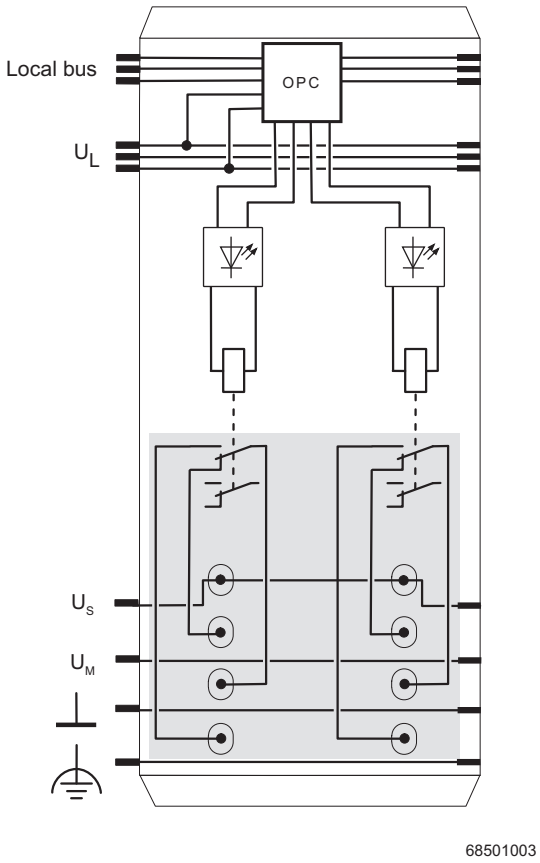
Derating when using the N/O contact			
Ambient temperature T_{amb}	**Power dissipation of the housing**	**Maximum load current**	
		100 % simultaneity	**50 % simultaneity**
≤ 40°C	0.9 W	2.0 A	2.0 A
≤ 55 °C	0.6 W	1.0 A	2.0 A

5.4 Air clearances and creepage distances

Air clearances and creepage distances (in accordance with EN 50178, VDE 0109, VDE 0110)			
Isolating distance	**Clearance**	**Creepage distance**	**Test voltage**
Relay contact/bus logic	≥ 1.5 mm	≥ 1.5 mm	1.5 kV, 50 Hz, 1 min.
Contact/contact	≥ 1.5 mm	≥ 1.5 mm	1.0 kV, 50 Hz, 1 min.
Contact/PE	≥ 3.1 mm*	≥ 3.1 mm*	1.5 kV, 50 Hz, 1 min.
Relay/relay	None		

6 Internal circuit diagram

Figure 3 Internal wiring of the terminal points



Key:

OPC — Protocol chip
(Bus logic including voltage conditioning)

LED

Relay

Electrically isolated area
I/O area including relay contact isolated from the logic area including the relay coil

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

7 Special features of the terminal

For more detailed information on the basics of relay technology, please refer to the RELAY TECHNOLOGY application note.

7.1 Switching a voltage equal to the segment voltage

The potential U_S is available at terminal points 1.1 and 1.2.

If you insert a jumper between 1.1 and 1.3 or 2.1 and 2.3, you connect the segment voltage potential to the main contact of the relevant relay and can therefore switch the connected load in a **non-isolated** manner.

If you do not insert a jumper, you can switch the load in a **floating** manner.

7.2 Switching a voltage unequal to the segment voltage

Different DC voltages

Distance terminals are not required.

Only **floating** switching of the load is permitted. Do not, therefore, attach any jumpers to the connector.

If the switch contact potentials and the segment circuit potential are two different DC circuits, Phoenix Contact recommends establishing a ground connection between the two power supply units.

Switching an AC voltage within a DC segment circuit

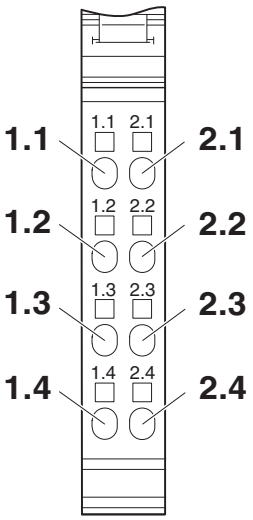
Distance terminals are not required.

Only **floating** switching of the load is permitted. Do not, therefore, attach any jumpers to the connector.

Use Inline terminals IB IL 24/230 DOR1W-PAC or IB IL 24/230 DOR4/W-PAC for switching voltages outside of the PELV.

8 Terminal point assignment

Figure 4 Terminal point assignment



Terminal point	Assignment	
1.1 / 2.1	Segment voltage U_S	
1.2	Relay N/C contact	Relay 1
1.3	Relay main contact	Relay 1
1.4	Relay N/O contact	Relay 1
2.2	Relay N/C contact	Relay 2
2.3	Relay main contact	Relay 2
2.4	Relay N/O contact	Relay 2

9 Connection notes and examples

NOTE: Damage to the electronics

Use the terminal within the PELV range (EN 61131) up to a maximum of 30 V AC or 60 V DC.

Figure 5 Actuator connection; floating connection

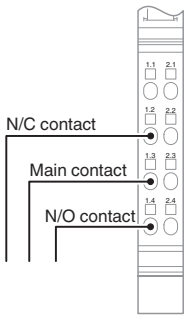


Figure 6 Actuator connection; non-isolated connection

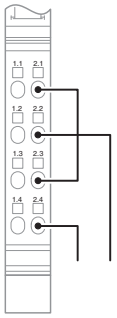
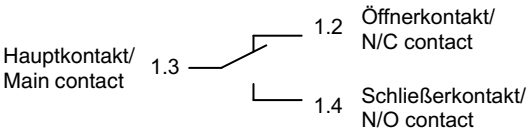
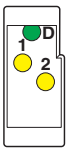


Figure 7 Output relay contacts



10 Local diagnostic and status indicators

Figure 8 Local diagnostic and status indicators



Designation	Color	Meaning
D	Green	Diagnostics (bus and logic voltage)
1 ... 2	Yellow	Status of the outputs (relay has picked up)

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

Function identification

Pink

Housing/connector color

Green housing

Green, unprinted connector

11 Process data

Assignment of the terminal points to the output process data

(Byte.Bit) view	0.1	0.0	N/O contact 2 (contact 2.4)	N/O contact 1 (contact 1.4)
Possible bit combinations	0	0	open	open
	0	1	open	closed
	1	0	closed	open
	1	1	closed	closed
Status indicator	LED		2	1

The LED lights up if the corresponding N/O contact is closed.

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.