IB IL 24 DO 2-2A-XC-PAC

Inline digital output terminal, version for extreme conditions, 2 outputs, 24 V DC, 2 A

Data sheet
106145_en_00

1 Description

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

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

Features

- Connections for two digital actuators
- Connection of actuators in 2, 3, and 4-wire technology
- Nominal current of each output: 2 A
- Total current of the terminal: 4 A
- Short-circuit and overload protected outputs
- 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 phoenixcontact.net/products.

2 Table of contents

3 Ordering data

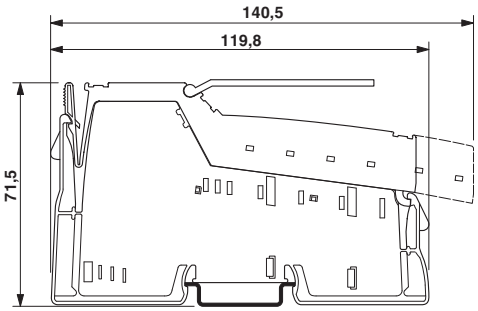
Description	Type	Order No.	Pcs. / Pkt.
Inline digital output terminal, version for extreme conditions, complete with accessories (connector plug and marking field), 2 outputs, 24 V DC, 2 A, 4-conductor connection technology	IB IL 24 DO 2-2A-XC-PAC	2702133	1

Accessories	Type	Order No.	Pcs. / Pkt.
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, Plotter: Laser printer, Mounting type: Insert, Lettering field: 62 x 10 mm (Marking)	ESL 62X10	0809492	1
Insert strip, Sheet, white, unlabeled, can be labeled with: Office printing systems, Plotter: Laser printer, Mounting type: Insert, Lettering field: 62 x 46 mm (Marking)	ESL 62X46	0809502	5
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

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	61 g (with connector)
Operating mode	Process data mode with 2 bits
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.)

General data	
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)
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
Stripping length	8 mm

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. 4 A
Communications power U_L	7.5 V DC (via voltage jumper)
Current consumption from U_L	max. 35 mA
Power consumption	max. 0.27 W (at U_L)

Digital outputs	
Number of outputs	2
Connection method	Spring-cage connection
Connection method	2, 3, 4-wire
Nominal output voltage	24 V DC
Voltage difference with nominal current	≤ 1 V
Maximum output current per channel	2 A
Maximum output current per device	4 A
Nominal load, ohmic	48 W (12 Ω)
Nominal load, inductive	48 VA (1.2 H, 12 Ω)
Nominal load, lamp	48 W
Signal delay when switching on an ohmic nominal load	approx. 200 µs
Signal delay when switching on an inductive nominal load	approx. 250 ms (1.2 H, 12 Ω)
Signal delay when switching on a lamp nominal load	typ. 200 ms (for switching frequencies up to 8 Hz; above this frequency, the lamp load behaves like an ohmic load)
Signal delay when switching off an ohmic nominal load	approx. 200 µs
Signal delay when switching off an inductive nominal load	approx. 250 ms (1.2 H, 12 Ω)

Digital outputs	
Signal delay when switching off a lamp nominal load	approx. 200 µs
Maximum operating frequency with ohmic nominal load	max. 300 Hz (this switching frequency is limited by the data rate selected, the number of bus devices, the structure of the bus, the software used and the control or computer system used)
Maximum operating frequency with inductive nominal load	max. 0.5 Hz (1.2 H, 12 Ω)
Maximum operating frequency with lamp nominal load	max. 300 Hz (this switching frequency is limited by the data rate selected, the number of bus devices, the structure of the bus, the software used and the control or computer system used)
Behavior at voltage switch-off	The output follows the power supply without delay
Limitation of the voltage induced on circuit interruption	approx. -0.7 V
Behavior with overload	Auto restart
Behavior with inductive overload	Output can be destroyed
Reverse voltage resistance to short pulses	Reverse voltage proof
Resistance to permanent reverse voltage	to 2 A DC
Overload protection, short-circuit protection of outputs	Yes
Type of external protective circuit	Freewheeling diode per channel

Programming Data	
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 of other bus systems, please refer to the corresponding electronic device data sheet (e.g., GSD, EDS).

Fieldbus data telegram	
Fieldbus system	PROFIBUS DP
Required parameter data	3 Byte
Need for configuration data	4 Byte

Error messages to the higher level control or computer system	
Short-circuit / overload of the digital outputs	Error message in the diagnostic code (bus) and display (2 Hz) via the LED (D) on the module

Electrical isolation/isolation of the voltage areas

Test section	Test voltage
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 phoenixcontact.net/products.

5 Additional tables

5.1 Output characteristic curve

Output characteristic curve when switched on (typical)	
Output current (A)	**Differential output voltage (V)**
0	0
0.2	0.02
0.4	0.04
0.6	0.06
0.8	0.08
1.0	0.10
1.2	0.12
1.4	0.14
1.6	0,16
1.8	0.18
2.0	0,20
2.2	0.22

5.2 Power dissipation

Formula for calculating the power dissipation of the electronics

$$P_{EL} = 0{,}18\ W + \sum_{i=1}^{n} (0{,}20\ W + I_{Li}^2 \times 0{,}10\ \Omega)$$

Where:

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

Power dissipation of the housing

$P_{HOU} = 2.4\ W$ $\quad -25°C < T_A \leq -5°C$

$P_{HOU} = 2.4\ W - \{[T_A - (-5\ °C)]/37.5\ K/W\}$ $\quad -5°C < T_A \leq +55°C$

Where:

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

5.3 Limitation of simultaneity, derating

Ambient temperature T_{amb}	Maximum load current	
	100 % simultaneity	50 % simultaneity
≤ 55 °C	1 A	2 A
≤ 40°C	2 A	2 A

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)

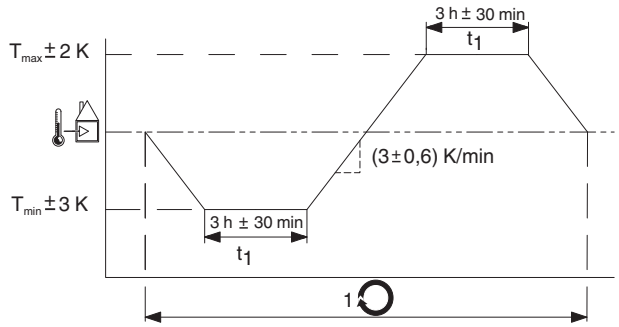


Figure 1 Temperature change cycle

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

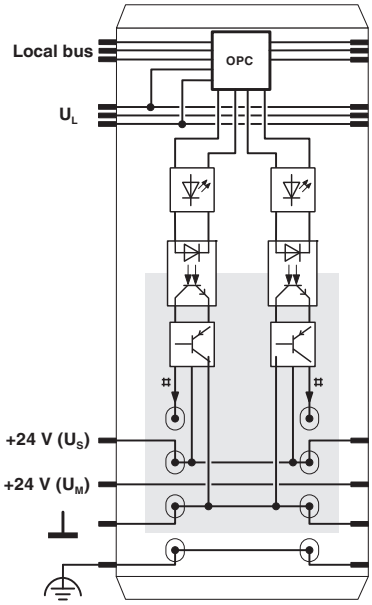


Figure 2 Internal wiring of the terminal points

Key:

Protocol chip
(Bus logic including voltage conditioning)

LED (status indicator)

Optocoupler

Transistor

Digital output

Electrically isolated area

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

8 Local status and diagnostic indicators

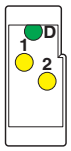


Figure 3 Local status and diagnostic indicators

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

Function identification

Pink

9 Terminal point assignment

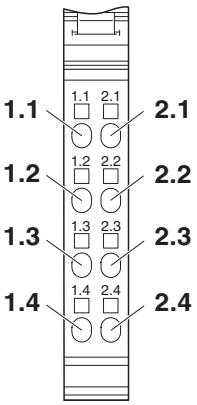


Figure 4 Terminal point assignment

Terminal point	Assignment
1.1 / 2.1	Signal output (OUT 1 / OUT 2)
1.2, 2.2	Segment voltage U_S for 4-wire connection
	Measuring points for segment voltage U_S (24 V DC)
1.3, 2.3	Ground connection (GND) for 2, 3 and 4-wire connection
1.4, 2.4	FE connection for 3 and 4-wire connection

10 Connection notes and examples

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

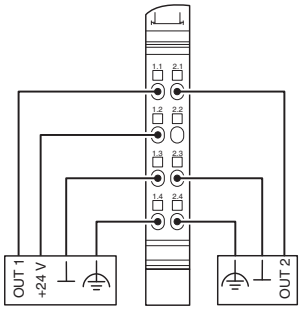


Figure 5 Typical connection of actuators

The connection of actuators in 4 and 3-wire technology is illustrated.

11 Process data

Assignment of the terminal points to the output process data

(Byte.Bit) view	Byte.Bit	0.1	0.0
Assignment	Terminal point (signal)	2.1	1.1
	Terminal point (24 V)	2.2	1.2
	Terminal point (GND)	2.3	1.3
	Terminal point (FE)	2.4	1.4
Status indicator	LED	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.

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

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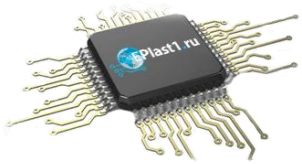
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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