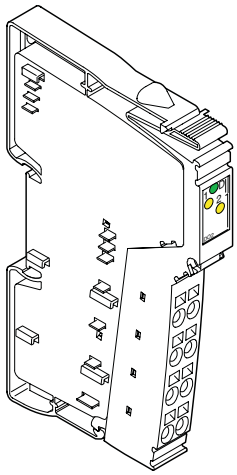
IB IL 24 DO 2 (-PAC)

Inline Terminal
With Two Digital Outputs



6187A007

AUTOMATIONWORX

Data Sheet
6187_en_01

Description

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

Features

- Connections for two digital actuators
- Connection of actuators in 2, 3, and 4-wire technology
- Nominal current per output: 500 mA
- Total current of the terminal: 1 A
- Short-circuit and overload protected outputs
- Diagnostic and status indicators

This data sheet is only valid in association with the IB IL SYS PRO UM E user manual or the Inline system manual for your bus system.

Make sure you always use the latest documentation.
It can be downloaded at www.download.phoenixcontact.com.

A conversion table is available on the Internet at
www.download.phoenixcontact.com/general/7000_en_00.pdf.

This data sheet is valid for all products listed on the following page:

Ordering Data

Products

Description	Type	Order No.	Pcs./Pck.
Inline terminal with two digital outputs	IB IL 24 DO 2	2740106	1
Inline terminal with two digital outputs; including connector and labeling field	IB IL 24 DO 2-PAC	2861470	1

Accessories

Description	Type	Order No.	Pcs./Pck.
Connector for digital single-channel, two-channel or 8-channel Inline terminals	IB IL SCN-8	2726337	10
Connector, with color print, for digital single-channel, two-channel or 8-channel Inline terminals	IB IL SCN-8-CP	2727608	10

Documentation

Description	Type	Order No.	Pcs./Pck.
"Configuring and Installing the INTERBUS Inline Product Range" user manual	IB IL SYS PRO UM E	2743048	1
"Automation Terminals of the Inline Product Range" user manual	IL SYS INST UM E	2698737	1

Technical Data

General Data	
Housing dimensions (width x height x depth)	12.2 mm x 120 mm x 71.5 mm
Weight	41 g (without connector); 56 g (with connector)
Operating mode	Process data mode with 2 bits
Connection method for actuators	2, 3, and 4-wire technology
Permissible temperature (operation)	-25°C to +55°C
Permissible temperature (storage/transport)	-25°C to +85°C
Permissible humidity (operation/storage/transport)	10% to 95% according to DIN EN 61131-2
Permissible air pressure (operation/storage/transport)	70 kPa to 106 kPa (up to 3000 m above sea level)
Degree of protection	IP20 according to IEC 60529
Protection class	Class 3 according to VDE 0106, IEC 60536
Connection data for Inline connector	
Connection method	Spring-cage terminals
Conductor cross section	0.2 mm^2 to 1.5 mm^2 (solid or stranded), 24 - 16 AWG

Interface	
Local bus	Through data routing

Power Consumption	
Communications power	7.5 V DC
Current consumption at U_L	33 mA, maximum
Power consumption at U_L	0.25 W, maximum
Segment supply voltage U_S	24 V DC (nominal value)
Nominal current consumption at U_S	1 A (2 x 0.5 A), maximum

Supply of the Module Electronics and I/O Through Bus Coupler/Power Terminal	
Connection method	Through potential routing

Digital Outputs	
Number	2
Nominal output voltage U_{OUT}	24 V DC
Differential voltage for I_{nom}	≤ 1 V
Nominal current I_{nom} per channel	0.5 A
Tolerance of the nominal current	+10%
Total current	1 A
Protection	Short circuit; overload
Nominal load	
Ohmic	48 Ω/12 W
Lamp	12 W
Inductive	12 VA (1.2 H, 50 Ω)
Signal delay upon power up of:	
Nominal ohmic load	200 µs, approximately
Nominal lamp load	200 ms, typical (with switching frequencies up to 8 Hz; above this frequency the lamp load responds like an ohmic load)
Nominal inductive load	250 ms (1.2 H, 50 Ω), approximately
Signal delay upon power down of:	
Nominal ohmic load	200 µs, approximately
Nominal lamp load	200 µs, approximately
Nominal inductive load	250 ms (1.2 H, 50 Ω), approximately
Switching frequency with:	
Nominal ohmic load	300 Hz, maximum

This switching frequency is limited by the selected data rate, the number of bus devices, the bus structure, the software and the control or computer system used.

Nominal lamp load	300 Hz, maximum

This switching frequency is limited by the selected data rate, the number of bus devices, the bus structure, the software and the control or computer system used.

Nominal inductive load	0.5 Hz (1.2 H, 50 Ω), maximum
Overload response	Auto restart
Response time with ohmic overload (2 Ω)	3 s, maximum
Restart frequency with ohmic overload (2 Ω)	133 Hz, approximately
Restart frequency with lamp overload	133 Hz, approximately
Response with inductive overload	Output may be damaged
Reverse voltage protection against short pulses	Protected against reverse voltages
Resistance to permanently applied surge voltages	No
Validity of output data after connecting the 24 V supply voltage (power up)	5 ms, typical
Response upon power down	The output follows the supply voltage without delay
Limitation of the voltage induced on circuit interruption	-24 V, approximately
Single maximum energy in free running	50 mJ
Protective circuit type	Integrated Zener diode in output chip
Overcurrent shutdown	0.7 A, minimum
Output current when switched off	60 µA, maximum
Output voltage when switched off	2 V, maximum
Output current with ground connection interrupt	210 µA, maximum
Switching power with ground connection interrupt	0.4 mW at 10 kΩ load resistance, typical
Inrush current	1.5 A for 20 ms maximum, typical

Output Characteristic Curve When Switched On (Typical)

Output Current (A)	Differential Output Voltage (V)
0	0
0.2	0.045
0.3	0.066
0.5	0.110
0.7	0.150

Power Dissipation

Formula to Calculate the Power Dissipation of the Electronics

$$P_{TOT} = 0.18\ W + \sum_{i=1}^{n} (200\ mW + I_{Li}^2 \times 0.135\ \Omega)$$

Where:

P_{TOT}	Total power dissipation in the terminal
i	Index
n	Number of set outputs (n = 1 to 2)
I_{Li}	Load current of output i

Power Dissipation of the Housing P_{HOU}

0.7 W (within the permissible operating temperature)

Limitation of Simultaneity, Derating

No limitation of simultaneity, no derating

Safety Equipment

Overload/short circuit in the segment circuit	Electronic
Surge voltage	Protective elements of the power terminal
Polarity reversal	Protective elements of the power terminal

Electrical Isolation/Isolation of the Voltage Areas

To provide electrical isolation between the logic level and the I/O area it is necessary to supply the station bus coupler and the digital output terminal described here via the bus coupler or a power terminal from separate power supply units. Interconnection of the power supply units in the 24 V area is not permitted.

Common Potentials

The 24 V main voltage, 24 V segment voltage, and GND have the same potential. FE is a separate potential area.

Separate Potentials in the System Consisting of Bus Coupler/Power Terminal and I/O Terminal

- Test Distance	- Test Voltage
5 V supply incoming remote bus/7.5 V supply (bus logic)	500 V AC, 50 Hz, 1 min.
5 V supply outgoing remote bus/7.5 V supply (bus logic)	500 V AC, 50 Hz, 1 min.
7.5 V supply (bus logic)/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.

Error Messages to the Higher-Level Control or Computer System

Short circuit/overload of an output	Yes

An error message is generated when an output is short circuited and switched on. In addition, the diagnostic LED (D) flashes on the terminal at 2 Hz (medium) under these conditions.

Falling below or exceeding the operating voltage	No

Approvals

For the latest approvals, please visit www.download.phoenixcontact.com.

Local Diagnostic and Status Indicators and Terminal Point Assignment

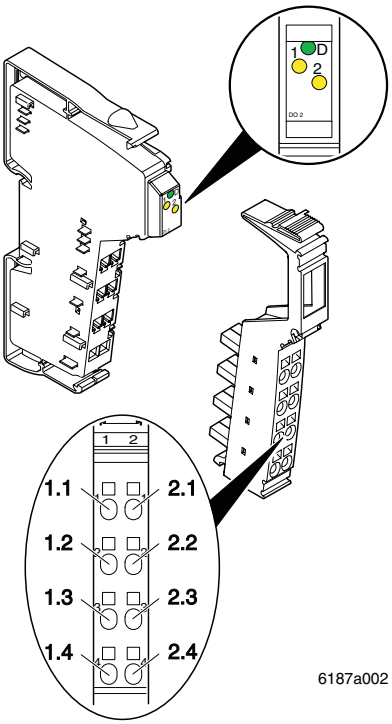


Figure 1 Terminal with appropriate connector

Local Diagnostic and Status Indicators

Des.	Color	Meaning
D	Green	Diagnostics
1, 2	Yellow	Status indicators of the outputs

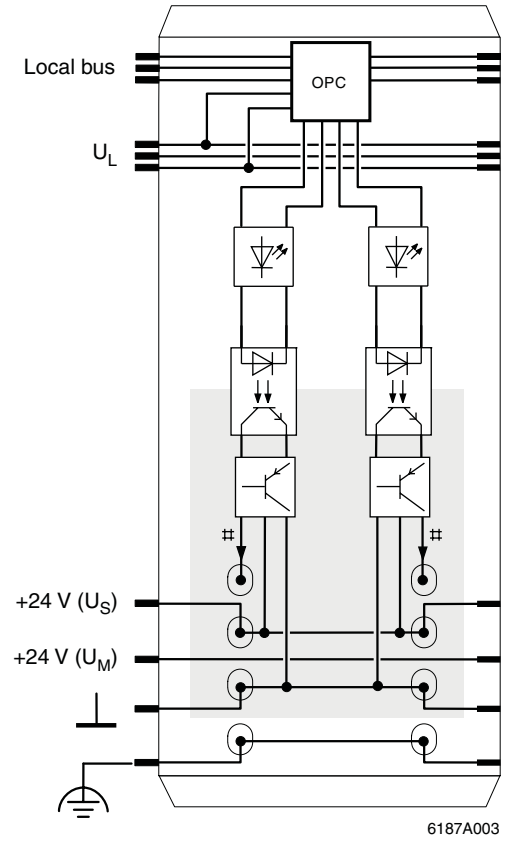
Function Identification

Pink

Terminal Point Assignment

Terminal Points	Assignment
1.1, 2.1	Signal output (OUT)
1.2, 2.2	Segment voltage U_S for 4-wire termination Measuring point for the supply voltage
1.3, 2.3	Ground contact (GND) for 2, 3, and 4-wire termination
1.4, 2.4	FE connection for 3 and 4-wire termination

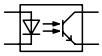
Internal Circuit Diagram



Key:

Protocol chip (bus logic including voltage conditioning)

LED



Optocoupler

Transistor

Digital output

Electrically isolated area

Other symbols used are explained in the IB IL SYS PRO UM E user manual or the Inline system manual for your bus system.

Figure 2 Internal wiring of the terminal points

Connection Example

When connecting the actuators observe the assignment of the terminal points to the process data (see page 7).

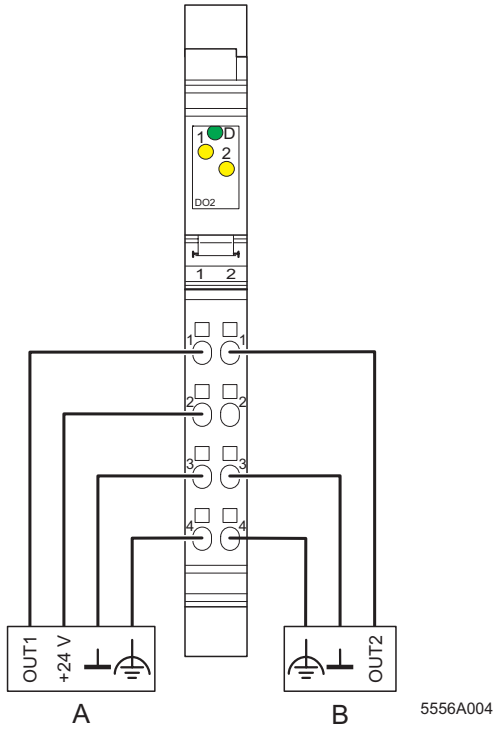


Figure 3 Typical actuator connection

A 4-wire termination
B 3-wire termination

Programming Data

Local Bus (INTERBUS)

ID code	BD_{hex} (189_{dec})
Length code	$C2_{hex}$
Process data channel	2 bits
Input address area	0 bits
Output address area	2 bits
Parameter channel (PCP)	0 bits
Register length (bus)	2 bits

Process Data

IN process data is not available.

Assignment of Terminal Points to OUT Process Data

"Bit" view	Bit	1	0
Module	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

The two bits can be at any position within a byte due to automatic addressing.

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