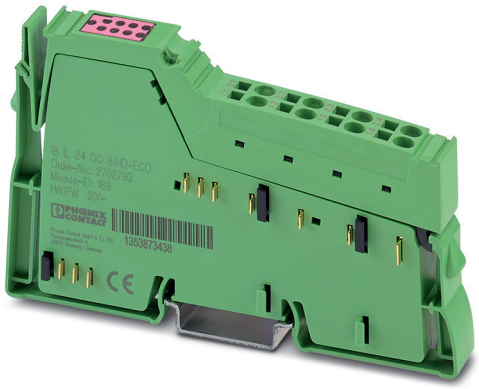
IB IL 24 DO 8/HD-ECO

Inline ECO, digital output terminal, digital outputs: 8, 24 V DC, 500 mA



Data sheet
107135_en_01

1 Description

The terminal is designed for use within an Inline station.
It is used to output digital signals.
Inline ECO terminals are approved for the temperature range from 0°C to +55°C. The electronics base and Inline connector are supplied as standard.

Features

- 8 digital outputs
- Connection of actuators in 1-conductor technology
- Nominal current per output: 500 mA
- Total current of the terminal: 4 A
- Short-circuit-proof and overload-protected outputs

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/2702793

2 Table of contents

3 Ordering data

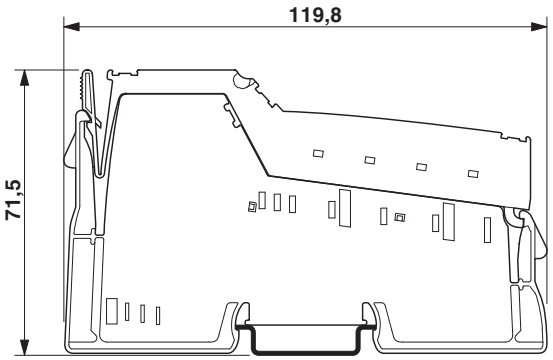
Description	Type	Order No.	Pcs./Pkt.
Inline ECO, Digital output terminal, Digital outputs: 8, 24 V DC, 500 mA, connection method: 1-conductor, transmission speed in the local bus: 500 kbps, degree of protection: IP20, including Inline connector	IB IL 24 DO 8/HD-ECO	2702793	1

Accessories	Type	Order 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
Inline terminal for power distribution (GND), complete with accessories, (connector and labeling field) connections for GND	IB IL PD GND-PAC	2862990	1
VARIOFACE front adapter for Inline HD modules, for transferring 8 digital signals. (Connector/Adapter)	FLKM 14-PA-INLINE/DIO8	2900889	1

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)	0 °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)

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	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. 0.225 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
Power consumption	
Power consumption	max. 0.85 W (Module, complete)
Digital outputs	
Number of outputs	8
Connection method	Spring-cage connection
Connection technology	1-conductor
Nominal output voltage	24 V DC
Maximum output current per channel	500 mA
Maximum output current per device	4 A
Nominal load, ohmic	12 W (48 Ω)
Nominal load, inductive	12 VA (1.2 H, 48 Ω)
Nominal load, lamp	12 W
Signal delay when switching on an ohmic nominal load	typ. 500 µs
Signal delay when switching on an inductive nominal load	typ. 500 µs (1.2 H, 48 Ω)
Signal delay when switching on a lamp nominal load	typ. 100 ms
Signal delay when switching off an ohmic nominal load	typ. 1 ms
Signal delay when switching off an inductive nominal load	typ. 50 ms (1.2 H, 48 Ω)

Digital outputs	
Signal delay when switching off a lamp nominal load	typ. 1 ms
Maximum operating frequency with ohmic nominal load	max. 300 Hz (this switching frequency is limited by 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, 48 Ω)
Maximum operating frequency with lamp nominal load	max. 8 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)
Reaction time with short-circuit	ca. 1 s
Reaction time with ohmic overload	ca. 3 s
Behavior at voltage switch-off	The output follows the power supply without delay
One-time unsolicited energy	300 mJ
Limitation of the voltage induced on circuit interruption	-45.8 V ... -15 V
Output voltage when switched off	max. 1 V
Output current when switched off	max. 300 µA
Behavior with overload	Auto restart
Behavior with inductive overload	Output can be destroyed
Restart frequency with ohmic overload	400 Hz
Restart frequency with lamp overload	400 Hz
Reverse voltage resistance to short pulses	Reverse voltage proof
Resistance to permanent reverse voltage	max. 500 mA
Overcurrent shut-down	min. 0.7 A
Overload protection, short-circuit protection of outputs	Zener diode in output chip

Programming data (INTERBUS, local bus)	
ID code (hex)	BD
ID code (dec.)	189
Length code (hex)	81
Length code (dec)	129
Process data channel	8 Bit
Input address area	0 Byte
Output address area	1 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).

Configuration and parameter data in a PROFIBUS system	
Required parameter data	3 Byte
Required configuration data	4 Byte

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

Protective circuit	
Short-circuit protection, overload protection in the segment circuit	Electronic, for each module

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.
7.5 V supply (bus logic)/functional ground	500 V AC, 50 Hz, 1 min.
24 V supply (I/O) / functional ground	500 V AC, 50 Hz, 1 min.

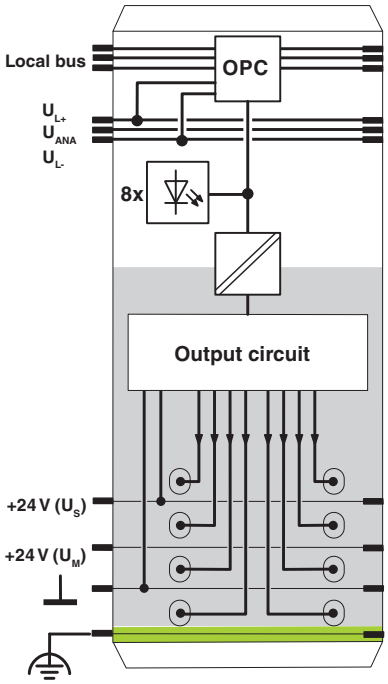
To achieve electrical isolation between the logic level and the I/O area, supply these areas from separate power supply units. Interconnection of the power supply units in the 24 V area is not permitted (see IL SYS INST UM E user manual).

Approvals

For the latest approvals, please visit phoenixcontact.net/products.

5 Internal circuit diagram

Figure 1 Internal wiring of the terminal points



Key:

OPC — Protocol chip
(Bus logic including voltage conditioning)

LED (status indicator)

Electrical isolation

Output circuit — Output configuration

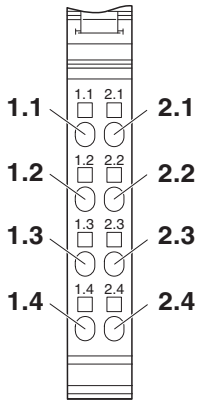
Digital output

Electrically isolated areas

Please refer to the IL SYS INST UM E user manual for an explanation of other symbols used.

6 Terminal point assignment

Figure 2 Terminal point assignment



Terminal point	Assignment
1.1 / 2.1	Signal output (OUT01 / OUT02)
1.2 / 2.2	Signal output (OUT03 / OUT04)
1.3 / 2.3	Signal output (OUT05 / OUT06)
1.4 / 2.4	Signal output (OUT07 / OUT08)

7 Connection notes and examples

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

NOTE: Malfunction

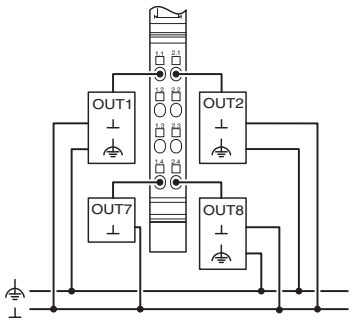
GND of the actuators and GND of the supply voltage U_S, which supply the actuators, must have the same potential.

The simplest way to meet this requirement is to use the IB IL PD GND-PAC terminal. Wire the GND connections for the actuators to these terminals. In this way, they are connected with the potential jumper GND of the Inline station.

See “Application examples”.

The actuators can also be connected via external busbars. Ensure that GND of the actuators and GND for U_S have the same potential.

Figure 3 Typical connection of actuators when using external busbars



8 Application examples

Figure 4 Connection of contactors when using the IB IL PD GND-PAC terminal

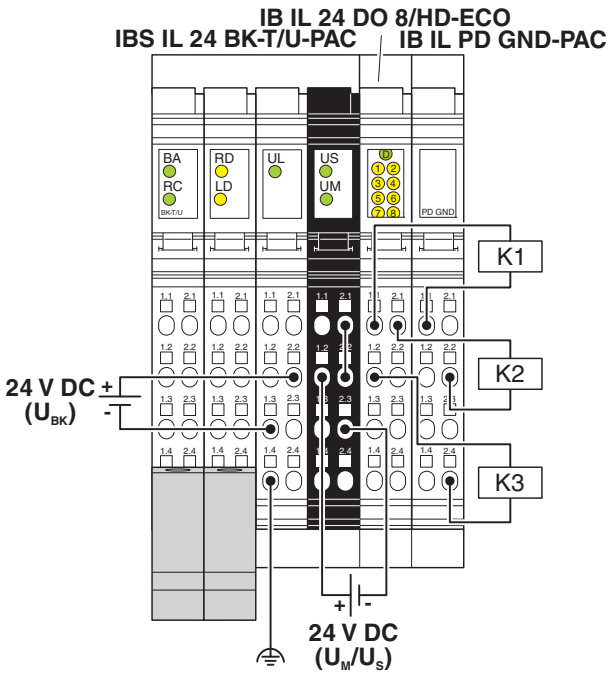
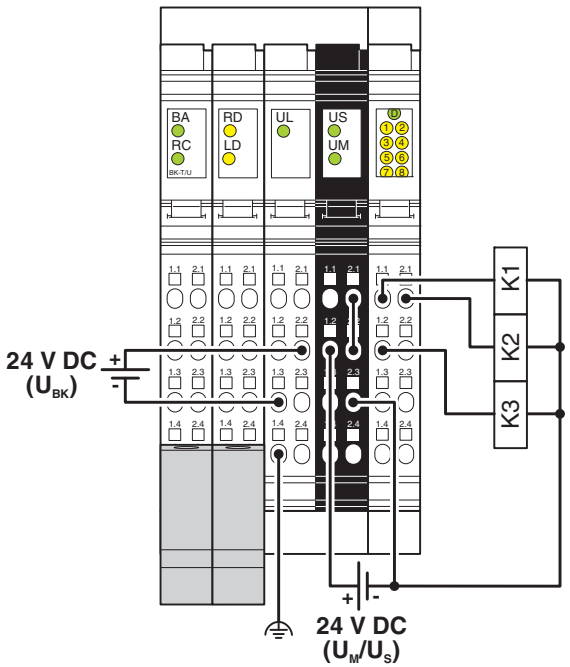
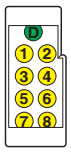


Figure 5 Connection of contactors when using external busbars



9 Local diagnostic and status indicators

Figure 6 Local diagnostic and status indicators



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

Function identification

Pink

10 Process data

Assignment of the terminal points to the output process data

(Byte.Bit) view	Byte	Byte 0							
	Bit	7	6	5	4	3	2	1	0
Assignment	Signal	OUT08	OUT07	OUT06	OUT05	OUT04	OUT03	OUT02	OUT01
	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.