# Inline terminal: 8 digital inputs ILT 24 DO8/HD / IB IL 24 DO8/HD-PAC

## Device description

SysMik® GmbH Dresden

This manual is intended to provide support for installation and usage of the device. The information is believed to be accurate and reliable. However, SysMik GmbH Dresden assumes no responsibility for possible mistakes and deviations in the technical specifications. SysMik GmbH Dresden reserves the right to make modifications in the interest of technical progress to improve our modules and software or to correct mistakes.

We are grateful to you for criticism and suggestions. Further information (device description, available software) can be found on our homepage www.sysmik.de. Please ask for latest information.

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# Contents

# Contents

# 1    Description

> **Note:** This device description is only valid in association with the IL SYS INST UM user manual.
>
> Make sure you always use the latest documentation – it can be downloaded at www.sysmik.de.

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

**Features**

- Connections for eight digital actuators

- Connection of actuators in 1-wire technology

- Nominal current per output: 0.5 A

- Total current of the terminal: 4 A

- Short-circuit and overload protected outputs

- Diagnostic and status indicators

# 2    Order information

| Description | Type | Part number | Pcs./Pkt. |
|---|---|---|---|
| Inline digital output terminal, complete with accessories (connector and labelling field), 8 outputs, 24 V DC, 500 mA, single-wire connection method | ILT 24 DO8/HD | 1225-100540-01-3 | 1 |
| ILT terminals may be replaced by device type ‚IB IL' terminals alternatively: | IB IL 24 DO8/HD-PAC | 2700172 | 1 |

# 3 Technical data

| General data | |
|---|---|
| Housing dimansions (width x height x depth) | 12,2 mm x 119,8 mm x 71,5 mm |
| Weight | 60 g (without connectors) |
| Operating mode | Process data mode with one byte |
| Ambient temperature (operation) | -25 °C to +55 °C (-13 °F to +13 °F) |
| Ambient temperature (storage / transport) | -25 °C to +85 °C (-13 °F to +185 °F) |
| Permissible humidity (operation/storage/transport) | 10 % … 95 % (according to DIN EN 61131-2) |
| Permissible air pressure (operation/ storage/transport) | 70 kPa to 106 kPa (up to 3000 m [9843 ft.] above sea level) |
| Degree of protection | IP20 |
| Class of protection | III, IEC 61140, EN 61140, VDE 0140-1 |

| Power consumption | |
|---|---|
| Segment supply voltage $U_S$ | 24 V DC (nominal value) |
| Current consumption from $U_S$ | max. 4 A DC |
| Communications power $U_L$ | 7,5 V DC |
| Current consumption from $U_L$ | max. 45 mA |
| Power consumption | max. 0,34 W (at $U_L$) |
| Power loss | max. 0,62 W |

| Connection data | |
|---|---|
| Name | Inline connectors |
| Connection method | Spring-cage connection |
| Conductor cross section solid / stranded | 0,08 mm² ... 1,5 mm² |
| Conductor cross section [AWG] | 28 ... 16 |

| Interface | |
|---|---|
| Local bus | Inline data jumper |
| Local bus transmission speed | 500 kBit/s |

| Digital outputs | |
|---|---|
| Number | 8 |
| Connection method | Spring-cage connection |
| Connectioin technology | 1-wire |
| Ausgangsspannung | 24 V ($U_S$ – 1 V) |
| Maximum output current per channel | 500 mA |
| Maximum output current per device | 4 A |

| Digital outputs (continued) | |
|---|---|
| Nominal load, ohmic | 12 W (48 Ω) |
| Nominal load, inductive | 12 VA (1,2 H; 50 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. 100 ms (1,2 H; 50 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; 50 Ω) |
| 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 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 |
| 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 | $-15\ V \leq U_{Demag} \leq -45{,}8\ V$ ($U_{Demag}$ = demagnetization voltage) |
| Output voltage when switched off | max. 1 V |
| Output current when switched off | max. 300 μA |
| Behavior with overload | Auto restart |
| Restart frequency with ohmic overload | 400 Hz |
| Restart frequency with lamp overload | 400 Hz |
| Behavior with inductive overload | Output can be destroyed |
| 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 |

| 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 | |
|---|---|
| ⚠️ **Note:** 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). | |
| 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 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. |

| Approvals |
|---|
| Fort he latest approvals please visit www.sysmik.de. |

| Output characteristic curve when switched on (typical) | |
|---|---|
| **Output current (A)** | **Differential output voltage (V)** |
| 0 | 0 |
| 0,1 | 0,02 |
| 0,2 | 0,03 |
| 0,3 | 0,04 |
| 0,4 | 0,06 |
| 0,5 | 0,07 |

# 4 Local diagnostic and status indicators and terminal point assignment
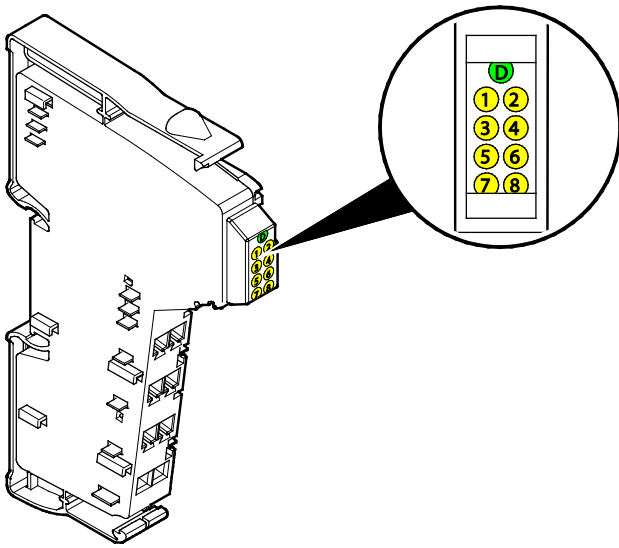


**Functional identification**: pink

Fig. 1: Local status and diagnostic indicators

| Des. | Color | Meaning |
|---|---|---|
| **D** | green | Diagnostics |
| **1, to 8** | yellow | Status of the outputs |
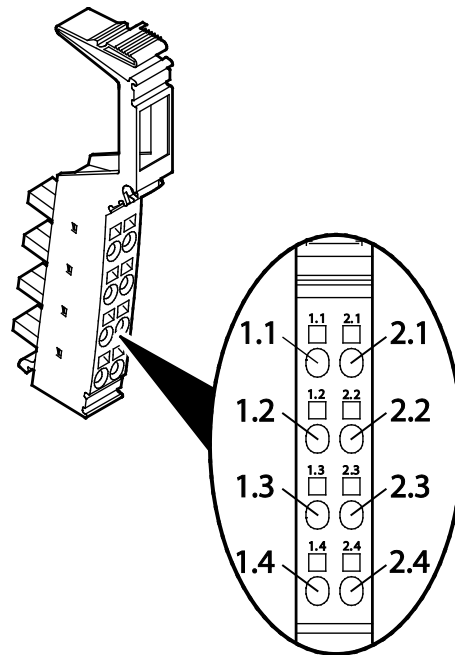
Fig. 2: Terminal assignment

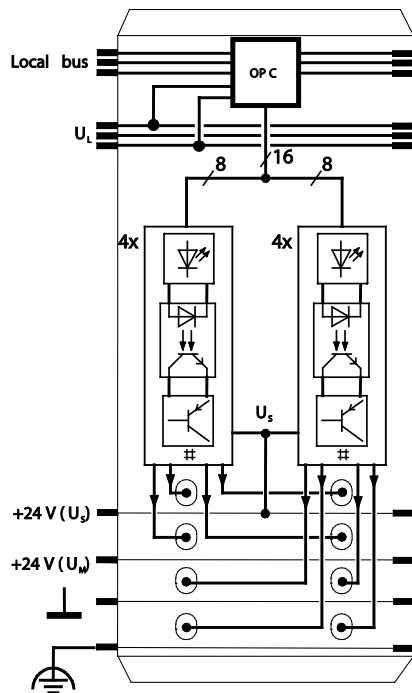| Terminal point | Assignment |
|---|---|
| **1.1 / 2.1** | Signal output (OUT 1 / OUT 2) |
| **1.2, 2.2** | Signal output (OUT 3 / OUT 4) |
| **1.3, 2.3** | Signal output (OUT 5 / OUT 6) |
| **1.4, 2.4** | Signal output (OUT 7 / OUT 8) |

# 5 Internal circuit



Fig. 3: Interne Beschaltung der Klemmpunkte

| | | | |
|---|---|---|---|
| **OPC** | Protocol chip (bus logic including voltage conditioning) | ⊞ Transistor | Transistor |
| LED (status indicator) | LED (status indicator) | # Digital output | Digital output |
| Optocoupler | Optocoupler | | |

⚠ **Note:** Explanation for other used symbols is provided in the IL SYS INST UM E manual.

# 6    Connection notes and examples

⚠ **Note:**

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

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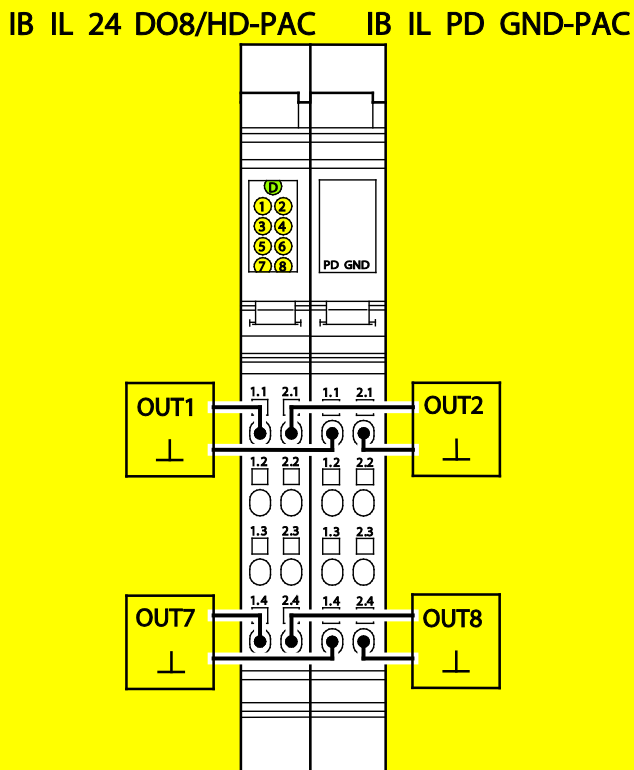
The actuators can also be connected via external busbars. Ensure that GND of the actuators and GND for $U_S$ have the same potential.



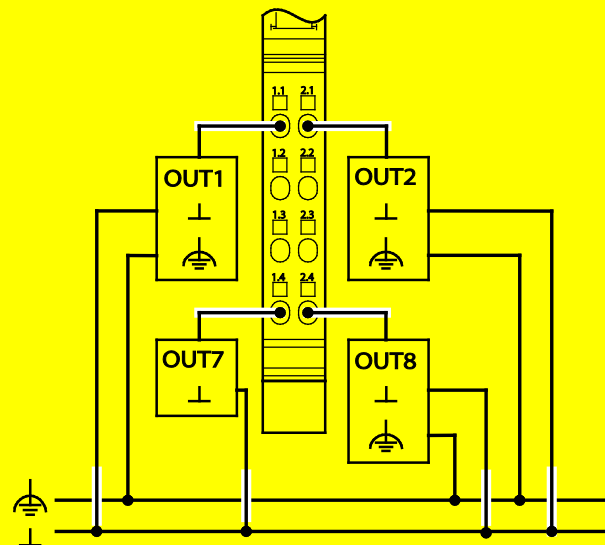Fig. 4:   Typical connection of actuators when using the IB IL PD GND-PAC terminal

Fig. 5:   Typical connection of actuators when using external busbars
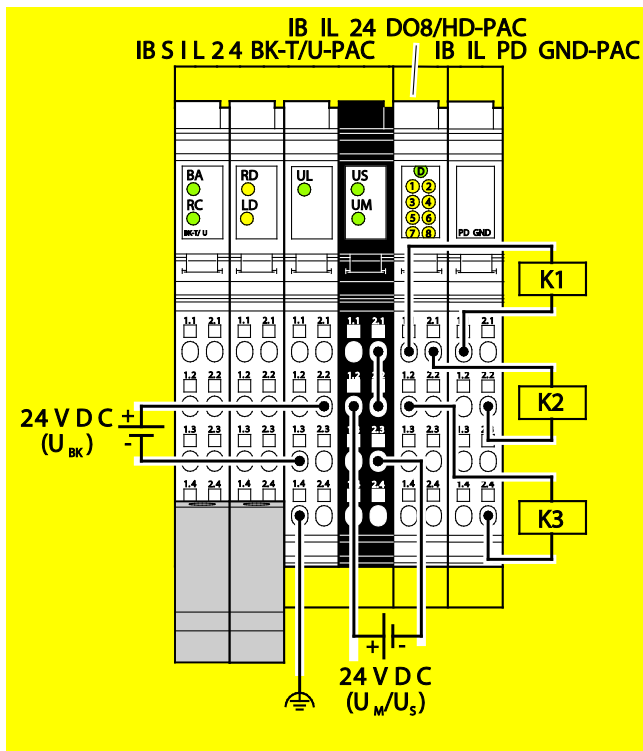
# 7    Application examples



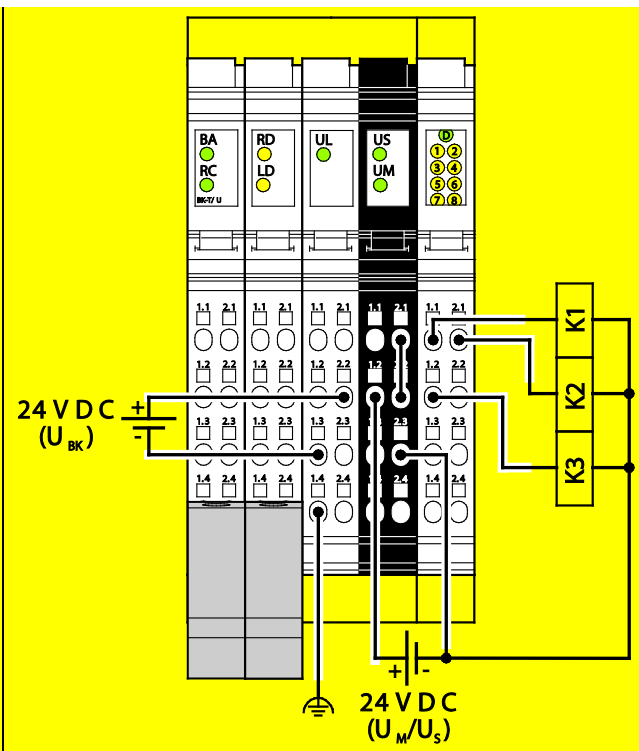Fig. 6:   Connection of contactors when using the IB IL PD GND-PAC terminal



Fig. 7:   Connection of contactors when using external busbars