Inline terminal: 4 digital outputs
ILT 24 DO 4-ME
IB IL 24 DO 4-ME

Device description

SysMik® GmbH Dresden

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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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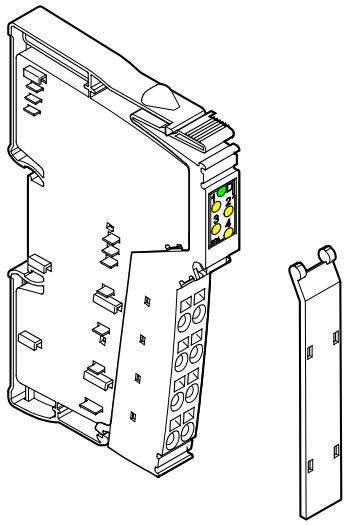
Contents

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.



7036A001

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

Features

- Connections for four digital actuators
- Connection of actuators in 2 and 3-wire technology
- Nominal current of each output: 0.5 A
- Total current of the terminal: 2 A
- Short-circuit and overload protected -outputs
- Diagnostic and status indicators

Functional identification: red

Fig. 1: Inline terminal ILT 24 DO 4-ME

2 Order information

Description	Type	Part number
Terminal with four digital outputs; including connector and labeling field	ILT 24 DO 4-ME	1225-100495-01-6
Alternatively usable terminal	IB IL 24 DO 4-ME	2863931

3 Technical data

General data	
Housing dimansions (width x height x depth)	12.2 mm x 119.8 mm x 71.5 mm
Weight	44 g (without connectors)
Operating mode	Process data mode with 4 bits (1 nibble)
Transmission speed	500 kbaud
Type of actuator connection	2 and 3-wire technology
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)	75 % on average, 85 % occasionally
 **Note:** In the range from -25 °C to +55 °C (-13 °F to +131 °F) appropriate measures against increased humidity (> 85%) must be taken.	
Permissible humidity (storage / transport)	75 % on average, 85 % occasionally
 **Note:** For a short period, slight condensation may appear on the outside of the housing if, for example, the terminal is brought into a closed room from a vehicle.	
Permissible air pressure (operation)	80 kPa to 106 kPa (up to 2000 m [6562 ft.] above sea level)
Permissible air pressure (storage/transport)	70 kPa to 106 kPa (up to 3000 m [9843 ft.] above sea level)
Degree of protection	IP20 according to IEC 60529
Class of protection	Class 3 according to VDE 0106, IEC 60536

Interface	
Local bus	Through data routing

Power consumption	
Communications power	7.5 V DC
Current consumption from the local bus	44 mA maximum
Power consumption from the local bus	0.33 W maximum
Segment supply voltage U_S	24 V DC (nominal value)
Nominal current consumption at U_S	2 A (4 x 0.5 A), maximum

Supply of the module electronics and I/O through bus terminal / power terminal	
Connection method	Through potetial routing

Digital outputs	
Number	4
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	2 A
Protection	Short circuit, overload
Note: All four channels are thermally coupled, i.e., an error in one channel can affect the other channels.	
Nominal load	
Ohmic	48 Ω / 12 W
Lamp	12 W
Inductive	12 VA (1.2 H, 50 Ω)
Signal delay upon power up of	
- Ohmic nominal load	100 µs, typical
- Lamp nominal load	100 ms, typical (with switching frequencies up to 8 Hz; above this frequency the lamp load responds like an ohmic load)
- Inductive nominal load	100 ms, typical (1.2 H, 50 Ω)
Signal delay upon power down of	
- Ohmic nominal load	1 ms, typical
- Lamp nominal load	1 ms, typical
- Inductive nominal load	50 ms, typical (1.2 H, 50 Ω)
Schaltfrequenz bei einer	
- Ohmic nominal load	300 Hz, maximum
Note: The switching frequency is limited by the selected data rate, the number oft bus devices, the bus structure, the software and the control or computer system used.	
- Lamp nominal load	300 Hz, maximum
Note: The switching frequency is limited by the selected data rate, the number oft bus devices, the bus structure, the software and the control or computer system used.	
- Inductive nominal load	0.5 Hz (1.2 H, 50 Ω) , maximum

Digital output (continued)	
Overload response	Auto-Restart
Response time with ohmic overload (12 Ω)	3 s, approximately
Restart frequency with ohmic overload	250 Hz, approximately
Restart frequency with lamp overload	250 Hz, approximately
Response with inductive overload	Ausgang kann zerstört werden
Response time in the event of a short circuit	850 ms, approximately
Reverse voltage protection against short pulses	Protected against reverse voltages
Resistance to permanently applied reverse voltages	Up to 2 A DC
Resistance to permanently applied surge voltage	No
Validity of output data after connecting the 24 V voltage supply (power up)	5 ms, typical
Response upon power down	The out put follows the supply voltage without delay.
Limitation of the voltage induced on circuit interruption	-15 V ≤ U_{demag} ≤ -46 V (U_{demag} = demagnetization voltage)
Single maximum energy in free running	400 mJ, maximum
Protective circuit type	integrated 45 V Zener diode in the output chip
Overcurrent shutdown	at 0.7 A, minimum
Output current when switched off	300 µA, maximum
Output voltage when switched off	2 V, maximum
Output current with ground connection interrupted	25 mA, amximum
Switching power with ground connection interrupted	100 mW at 1 kΩ load reststance, typical
Inrush current with lamp load	1.5 A for 20 ms, maximum

Output characteristic curve when switched on (typical)	
Output current (A)	**Differential output voltage (V)**
0	0
0.1	0.04
0.2	0.08
0.3	0.12
0.4	0.16
0.5	0.20

Power dissipation	
Formula to calculate the power dissipation oft the electronics	$P_{EL} = 0{,}19\ W + \sum_{n=1}^{4} (0{,}10\ W + I_{Ln}^2 \times 0{,}4\ \Omega)$
Where: P_{EL} Total power dissipation of the module n Index of the number of set outputs n = 1 to 4 I_{Ln} Load current of the output n	
Power dissipation of the housing P_{HOU}	0.6 W, maximum (within the permissible operating temperature)

Limitation oft simultaneity, derating

Ambient temperature (T_A)	Maximum load curren at .. % simultaneity		
	100 %	**75 %**	**50 %**
≤ 35 °C	0,5 A	0,5 A	0,5 A
≤ 45 °C	0,375 A	0,5 A	0,5 A
≤ 55 °C	0,25 A	0,33 A	0,5 A

With 100% simultaneity, a load current of 0.5 A for each channel is permissible up to 35°C (95°F) (ambient temperature range), a load current of 0.375 A between 35°C and 45°C (95°F and 113°F), and a load current of 0.25 A up to 55°C (131°F).

If a maximum of two channels are operated in the permissible ambient temperature range (50% simultaneity), a load current of 0.5 A can be tapped.

If all four channels are used, the permissible working point must be defined according to the above formula. An example can be found in the "Configuring and Installing the -INTERBUS -Inline Product Range" user manual IB IL SYS PRO UM E.

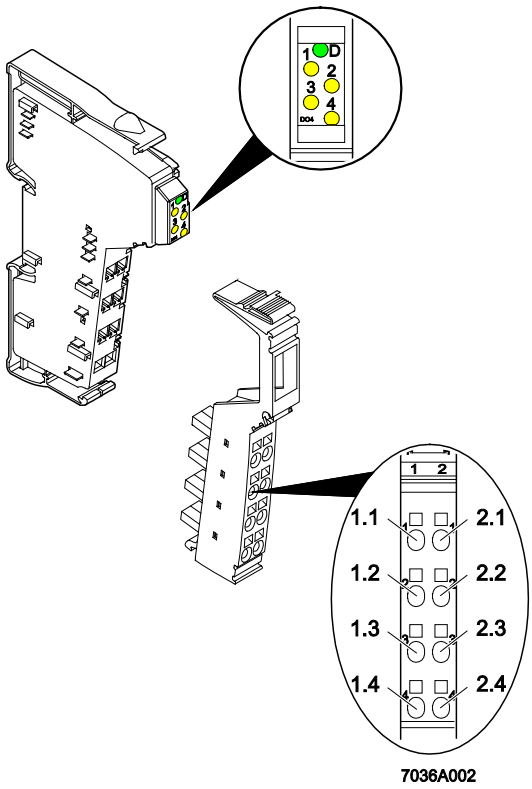
Safety equipment	
Overload/short circuit in the segment circuit	Electronic; with 4-channel driver
Surge voltage	Protective circuits of the power terminal Protection up to 33 V DC
Polarity reversal of supply voltage	Protective circuits of the power terminal It is necessary to protect the voltage supply. The power supply unit should be able to supply 4 times (-400 %) the nominal current of the fuse.
Reverse voltage	Protected against reverse voltages up to 2 A DC

Electrical isolation
Note: To provide electrical isolation between the logic level and the I/O area it is necessary to supply the station bus terminal and the digital input terminal via the bus terminal or a power terminal from separate power supply units. Interconnection of the power supply units in the 24 V area is not permitted. (See also user manual.)
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 Terminal/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 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.

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) on the terminal flashes at 2 Hz (medium) under these conditions.	
Operating voltage out of range	no

4 Local diagnostic and status indicators and terminal point assignment



Des.	Color	Meaning
D	green	Diagnostics
1, 2, 3, 4	yellow	Status indicators of the outputs

Terminal points	Assignment
1.1	Signal output (OUT 1)
2.1	Signal ouput (OUT 2)
1.2, 2.2	Ground contact (GND) for 2 and 3-wire termination
1.3, 2.3	FE connection for 3-wire termination
1.4	Signal output (OUT 3)
2.4	Signal output (OUT 4)

Functionial identification: red

Fig. 2: Local status and diagnostic indicators / terminal point assignment

5 Internal circuit

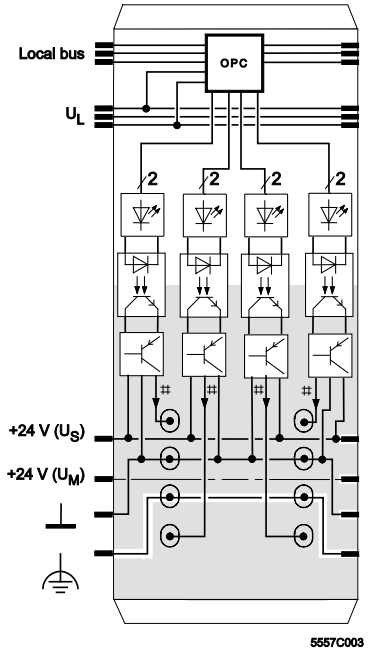
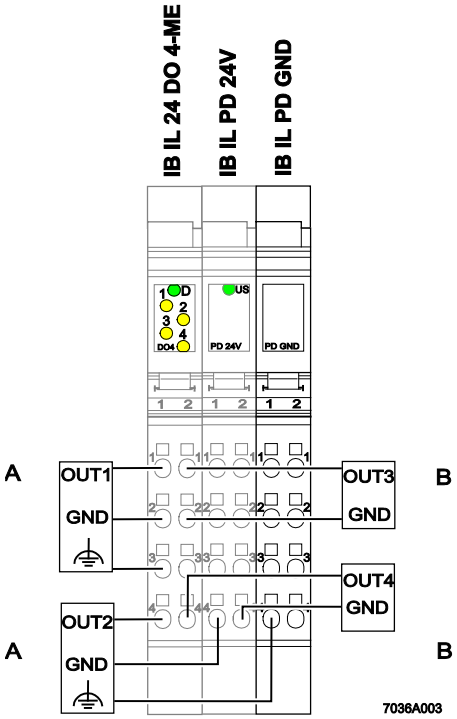


Fig. 3: Internal wiring of terminal points

OPC	Protocol chip (bus logic including voltage conditioning)		Transistor
	LED (status indicator)		Digital output
	Optocoupler		Electrically isolated area

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

6 Connection notes and examples



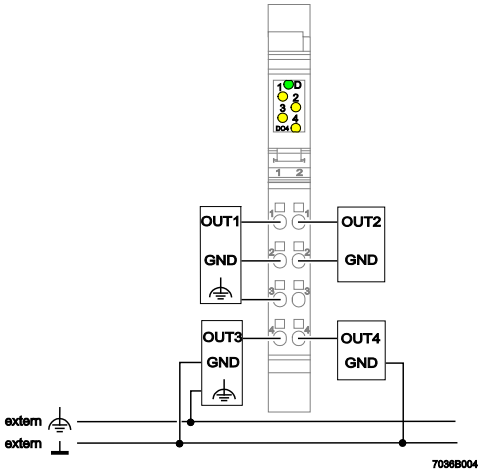
A 3-wire termination

B 2-wire termination

Note: When connecting the actuators observe the assignment of the terminal points to the process data (see terminal assignment)

Fig. 4: Typical connection of actuators

The actuators can also be connected via external bus bars. Ensure that the actuators and U_S are supplied from the same voltage supply.



Note: Ensure that the Inline system ground is reference for at least the ground when using external bus bars.

Fig. 5: Typical connection of actuators when using external bus bars