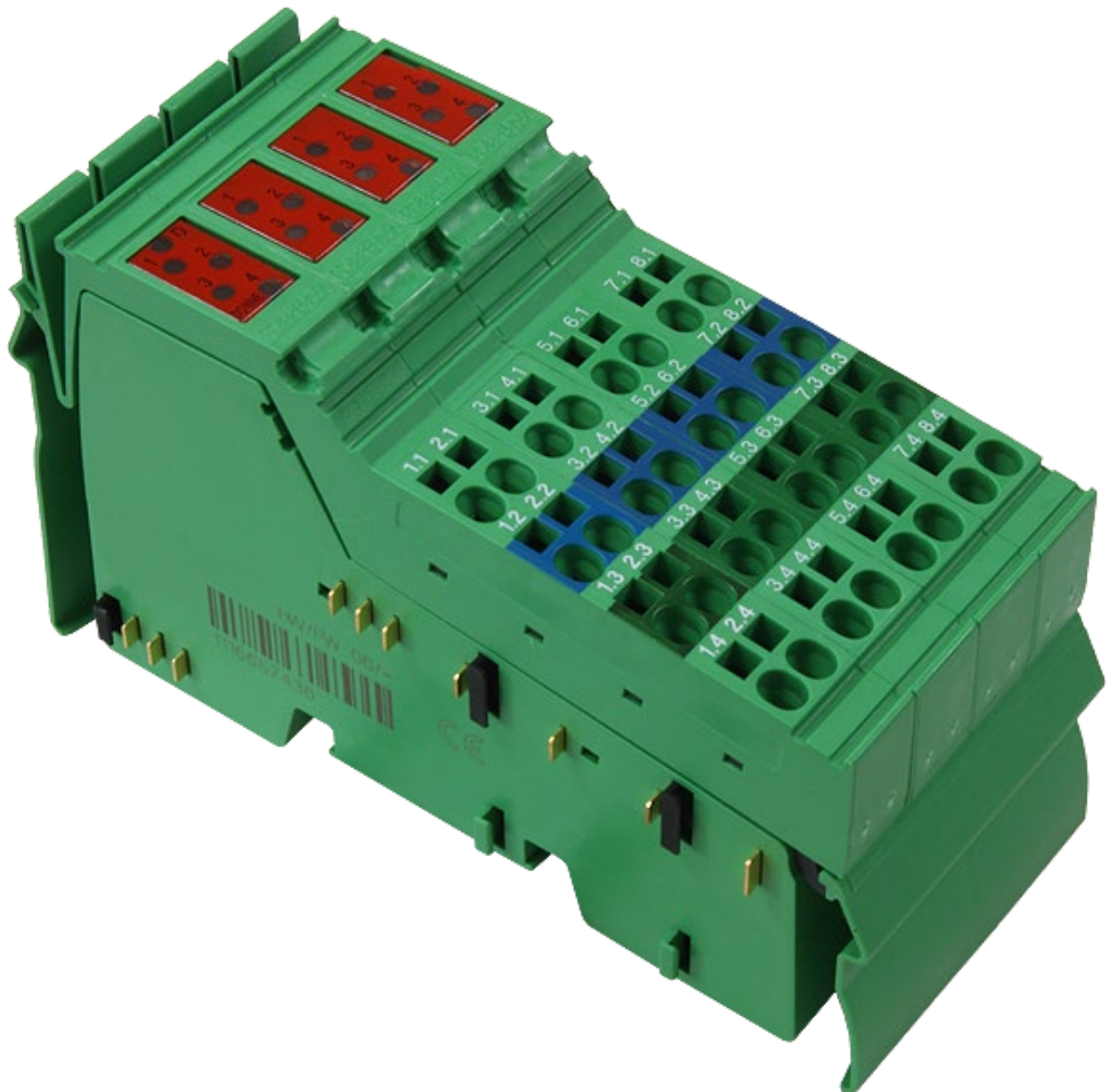

Inline terminal: 16 digital outputs

ILT 24 DO 16-ME

IB IL 24 DO 16-ME

Device description



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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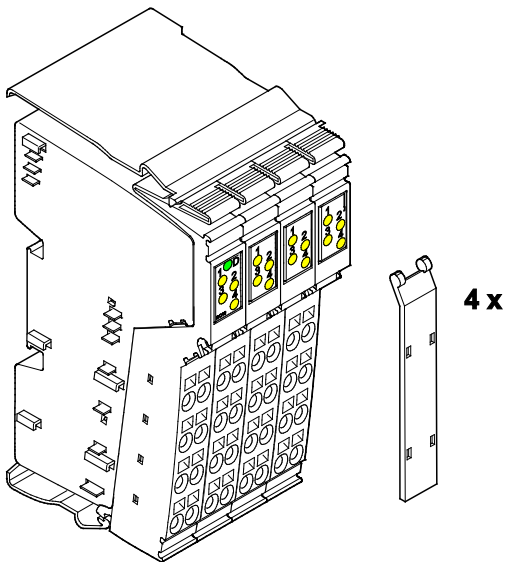
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1 Description



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 -acquire digital output signals.

Features

- § Connections for 16 digital actuators
- § Connection of actuators in 2 and 3--wire technology
- § Nominal current per output: 0.5 mA
- § Total current of the terminal:- 8.0 A
- § Short-circuit and overload protected -outputs
- § Diagnostic and status indicators

Bild 1: Inline-Klemme ILT 24 DO 16-ME

2 Order information

Description	Type	Part number	Pcs./Pkt.
Terminal with four digital outputs; including connector and labeling field	ILT 24 DO 16-ME	1225-100516-01-8	1
Device type ILT terminals can be replaced by device type IB IL alternatively:	IB IL 24 DO 16-ME	2897253	1

3 Technical data

General Data	
Housing dimensions (width x height x depth)	48.8 mm x 120 mm x 71.5 mm
Weight	130 g (without connectors)
Operating mode	Process data mode with 1 word
Transmission speed	500 kBaud
Connection method for sensors	2 and 3-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

Interface	
Local bus	Via data routing
Current consumption from the local bus	90 mA maximum

Power Consumption	
Power consumption from the local bus	0.675 W maximum
Segment supply voltage U_S	24 V DC (nominal value)
Nominal current consumption at U_S	8 A (16 x 0.5 A) maximum

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

Digital Outputs	
Number	16
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	8 A
Short circuit; overload	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	500 μ s typical
- Lamp nominal load	typisch 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 (1.2 H, 50 Ω) typical

Signal delay upon power down of:	
- Ohmic nominal load	1 ms typical
- Lamp nominal load	1 ms typical
- Inductive nominal load	50 ms (1.2 H, 50 Ω) typical
Switching frequency with:	
- Ohmic nominal load	maximal 300 Hz
 Note: This switching frequency is limited by the selected data rate, the number of devices, the bus structure, the software and the control or computer system used.	
- Lamp nominal load	maximal 300 Hz
 Note: This switching frequency is limited by the selected data rate, the number of 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
Overload response	Auto restart
Response time with ohmic overload (12 W)	appr. 3 s
Restart frequency with ohmic overload	appr. 400 Hz
Restart frequency with lamp overload	appr. 400 Hz
Response with inductive overload	Output may be damaged
Response time in the event of a short circuit	appr. 3 s
Reverse voltage protection against short pulses	Protected against reverse voltages
Resistance to permanently applied reverse voltages	Protected against reverse voltages, permissible current 2 A maximum
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 output follows the supply voltage without delay
Limitation of the voltage induced on circuit interruption	$-15 \text{ V} \leq U_{\text{demag}} \leq -46 \text{ V}$ (U_{demag} = demagnetization voltage)

One-time unsolicited energy	400 mJ maximum
Protective circuit type	integrated 45 V-Zener diode in the output chip
Overcurrent shutdown	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 interrupt	25 mA maximum
Switching power with ground connection interrupt	100 mW at 1 kΩ load resistance, 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 of the Electronics	$P_{EL} = 0,19 \text{ W} + \sum_{n=1}^{16} (0,10 \text{ W} + I_{Ln}^2 \times 0,4 \Omega)$
Where: P_{TOT} = Total power dissipation in the terminal n = Index of the number of set outputs $n = 1$ to 16 I_{Ln} = Load current of output n	
Power dissipation of the housing P_{HOU}	2.7 W, maximum (within the permissible operating temperature)

Limitation of Simultaneity, Derating

Ambient Temperature T_A	Maximum Load Current at 100% Simultaneity	Maximum Load Current at 75% Simultaneity
$-25\text{ °C} \leq T_A < +40\text{ °C}$	0.50 A	0.50 A
$+40\text{ °C} \leq T_A < +45\text{ °C}$	0.45 A	0.50 A
$+45\text{ °C} \leq T_A < +50\text{ °C}$	0.40 A	0.50 A
$+50\text{ °C} < T_A \leq +55\text{ °C}$	0.35 A	0.50 A



With 100% simultaneity, a load current of 0.4 A for each channel is permissible up to 50°C (ambient temperature range) and a load current of 0.35 A from 50°C and higher. If a maximum of twelve channels are used simultaneously in the entire ambient temperature range (75% simultaneity, maximum) a load current of 0.5 A can be tapped.

Safety Equipment

Overload/short circuit in segment circuit	Electronic; with 4-channel driver
Surge voltage	Protective elements in the power terminal; protection up to 33 V DC
Polarity reversal of the supply voltage	Protective elements in the power terminal; The supply voltage must be protected. The power supply unit should be able to supply 4 times (400 %) the -nominal current of the fuse.
Reverse voltage	Integrated reverse voltage protection

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 terminal and the digital output terminal described here using 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 Module/Power Terminal and I/O Terminal

- Test Distance	- Test Voltage
5 V supply outgoing 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

4 Local diagnostic and status indicators and terminal point assignment

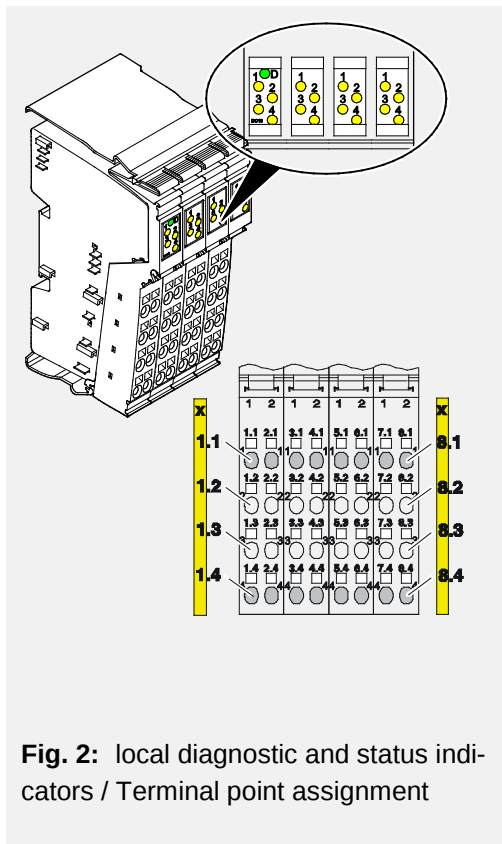


Fig. 2: local diagnostic and status indicators / Terminal point assignment

Designation	Color	Meaning
D	green	Diagnostics
1, 2, 3, 4 (for each connector)	Yellow	Status indicators of the outputs
Funktion identification		Red
Housing / connector color		Green housing, green connectors – coded according to function
Terminal assignment per connector:		
Terminal point	Assignment	
x.1	Signal output (OUT)	
x.2	Ground contact (GND) for 2 and 3-wire termination	
x.3	FE connection for 3-wire termination	
x.4	Signal output (OUT)	

5 Internal circuit

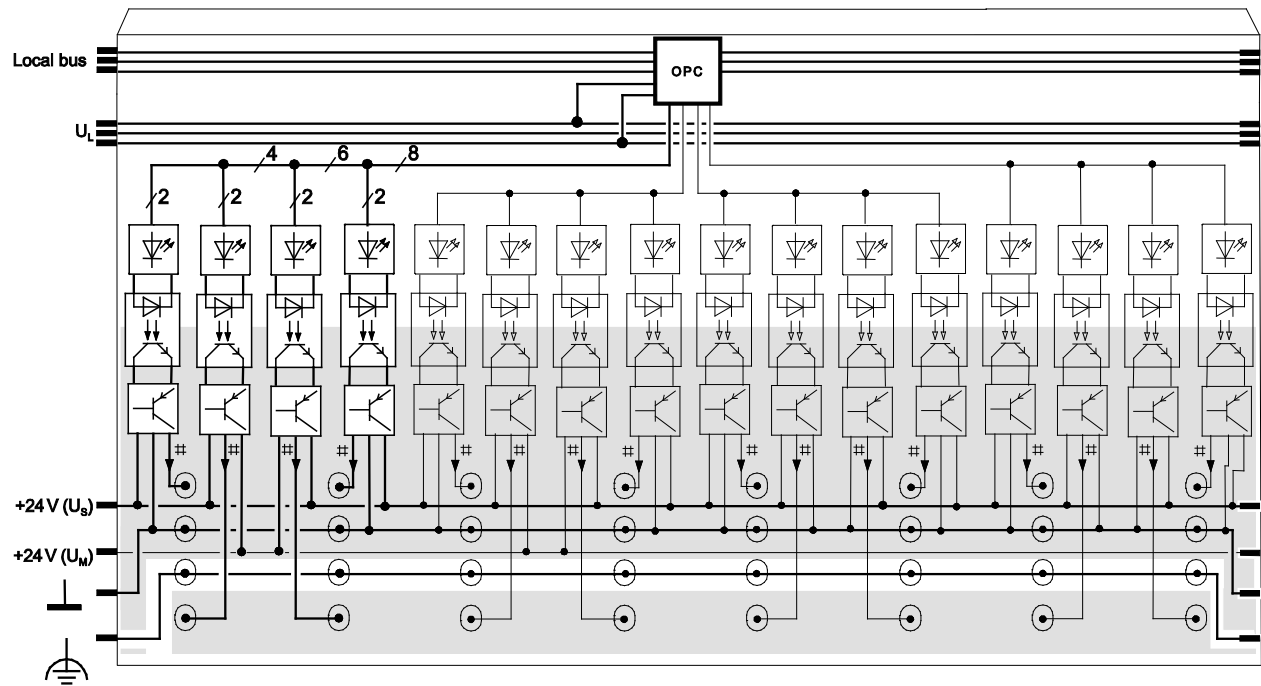
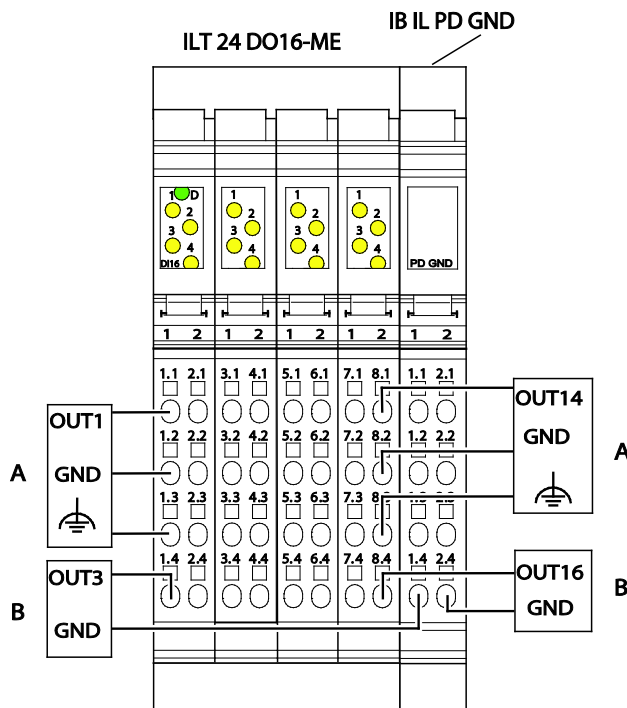


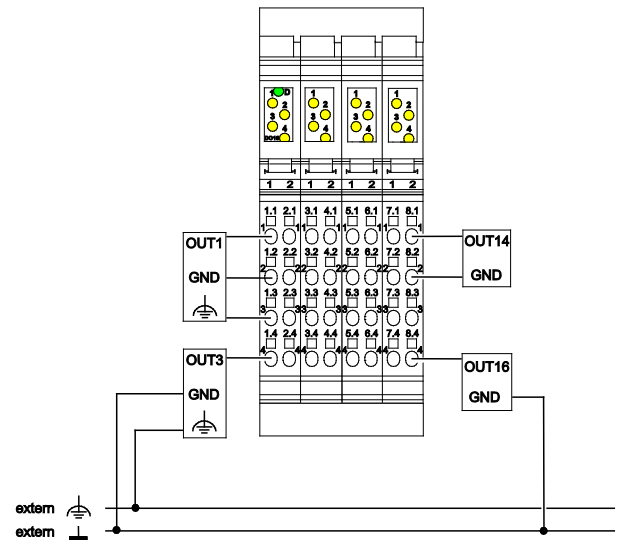
Fig. 3: Internal wiring of the terminal points

	Protocol chip (bus logic including voltage conditioning)		Digital output
	LED		Electrically isolated area
	Optocoupler		
	Note: Other symbols are explained in the user manual IL SYS INST UM or in the manual of your used bus system.		

6 Connection notes and examples



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



A 3-wire connection

B 2-wire connection



Note: When connecting the sensors, observe the assignment of the terminal points to the process data (see Terminal Point Assignment).



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

Fig. 4: Typical actuator connection

Fig. 5: Typical connection of sensors when using external busbars