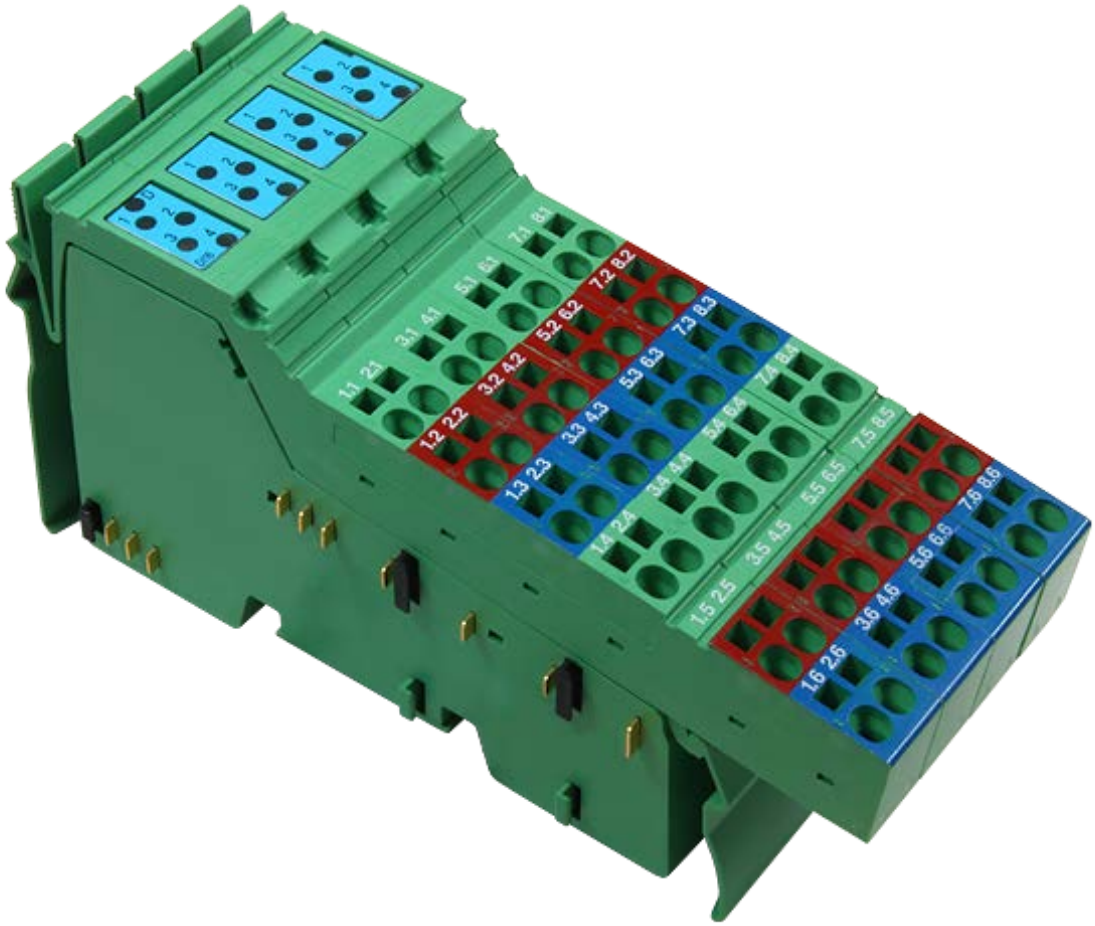
Inline Terminal: 16 digital inputs
ILT 24 DI 16
IB IL 24 DI 16-PAC

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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Content

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.

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

Features

- Connections for 16 digital sensors
- Connection of sensors in 2 and 3-wire technology
- Maximum permissible load current per sensor: 250 mA
- Maximum permissible load current from the terminal: 4.0 A
- Diagnostics and status indicators

2 Order information

Description	Type	Order-Nr.	Pcs./Pkt.
Terminal with 16 digital inputs; complete with accessories (connectors consecutively numbered and labeling fields); transmission speed of 500 kbps	ILT 24 DI 16	1225-100501-01-4	1
Alternative:	IB IL 24 DI 16-PAC	2861250	1

3 Technical data

General data	
Housing dimensions (width x height x depth)	48,8 mm x 140,5 mm x 71,5 mm
Weight	122 g (without connectors), 210 g (with connectors)
Operating mode	Process data mode with 1 word
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 toIEC 60529
Protection class	III, IEC 61140, EN 61140, VDE 0140-1
Connection data for connectors	
Connection method	Spring-cage terminals
Conductor cross-section	0,08 mm² to 1,5 mm² (solid or stranded), AWG 28-16

Interface	
Local bus	through data routing

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

Power consumption	500 kbps	2 MBps
Communications power	7,5 V	7,5 V
Current consumption from the local bus	60 mA maximum	80 mA maximum
Power consumption from the local bus	0,45 W maximal	0,6 W maximum
Segment supply voltage U_S	24 V DC (nominal value)	24 V DC (nominal value)
Nominal current consumption at U_S	4 A maximum	4 A maximum

Digital inputs	
Number	16
Connection method	Spring-cage connection
Connection method	2, 3-wire
Description of the input	EN 61131-2 Type 1
Input voltage range “0” signal	- 3 V DC ... +5 V DC
Input voltage range “1” signal	+15 V DC ... 30 V DC
Common potentials	Segment supply, ground
Nominal input voltage U_{IN}	24 V DC
Permissible range	-30 V < U_{IN} < +30 V DC
Nominal input current at U_{IN}	3 mA, minimum
Delay time	None
Permissible cable length to sensor	30 m
Use of AC sensors	AC sensors in the voltage range < U_{IN} are limited in application (according to the input design)

Characteristic curve: Current depending on the input voltage and the ambient temperature T_A

Supply voltage	Input current	Input current for t >= 20 s	
		for T_A = 25 °C	for T_A = 55 °C
18 V	3,0 mA	2,9 mA	2,5 mA
24 V	3,9 mA	3,8 mA	3,5 mA
30 V	4,5 mA	4,2 mA	3,0 mA

The current is reduced depending on the ambient temperature T_A and the number of inputs that are switched on (internal module temperature).

Power dissipation	
Formula for calculating the power dissipation of the electronics	$P_{EL} = 0{,}525\ W + \sum_{n=1}^{16} [U_{INn} \times 0{,}003\ A]$

Where:

P_{EL} Total power dissipation in the terminal

n Index of the number of set inputs n = 1 to 16

U_{INn} Input voltage of input n

Power dissipation of the housing P_{HOU}	2.8 W, maximum (within the permissible operating temperature)

Limitation of simultaneity, derating	
Derating	No limitation of simultaneity, no derating

Safety equipment	
Overload in segment circuit	No
Surge voltage	Protective elements of the power terminal
Reverse polarity	Protective elements of the power terminal

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 application description)!

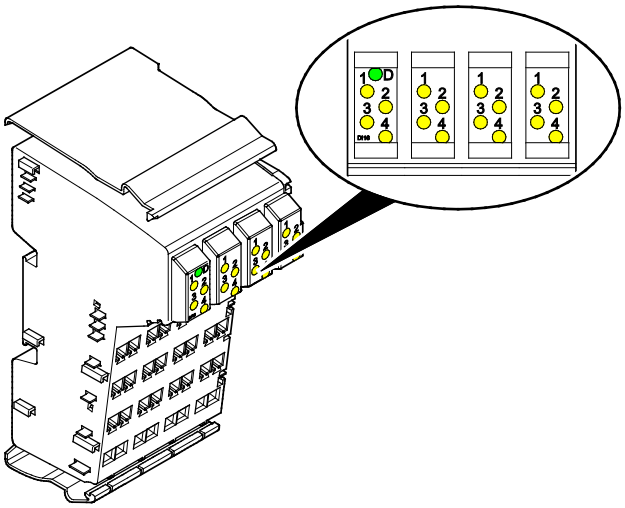
Common potentials
The 24 V main voltage, 24 V segment voltage, and GND have the same potential. FE is a separate potential area.

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 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.

Approvals
For the latest approvals, please visit www.sysmik.de.

4 Local diagnostic and status indicators and terminal point assignment

4.1 Local diagnostics and status indicators



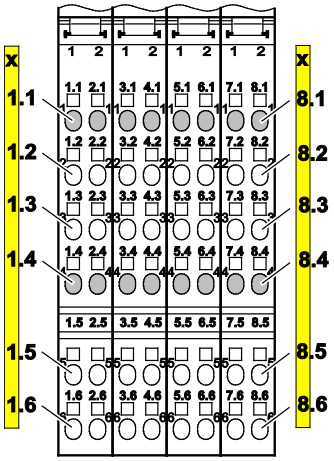
Des.	Color	Meaning
D	green	Diagnostics
For each connector		
1, 2, 3, 4	yellow	Status indicaators for the inputs

Figure 1: Local diagnostic and status indicators

4.2 Functional identification

Light blue

4.3 Terminal point assignment for each connector



Terminal point	Assignment
x.1	Signal input (IN)
x.2	Segment voltage U_S for 2 and 3-wire termination
x.3	Ground contact (GND) for 3-wire termination
x.4	Signal input (IN)
x.5	Segment voltage U_S for 2 and 3-wire termination
x.6	Ground contact (GND) for 3-wire termination

Figure 2: Terminal point numbering – individual connectors – as delivered as one set with the original package of ILT 24 DI 16.

5 Internal circuit diagram

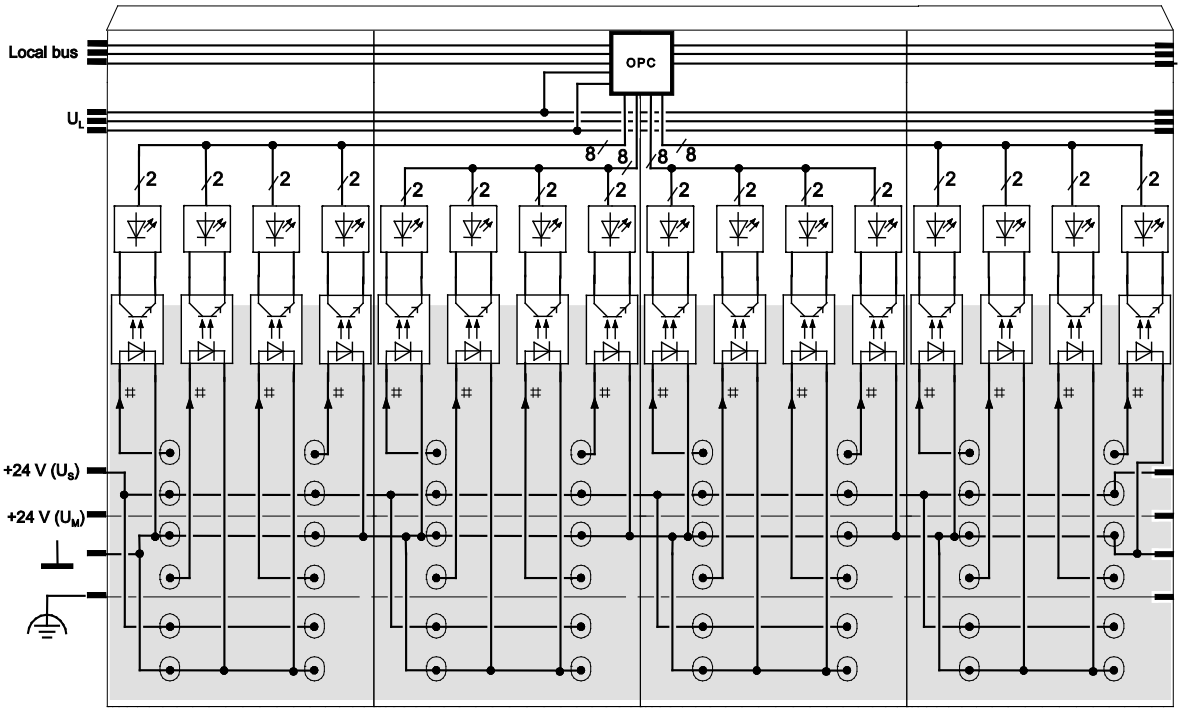


Figure 3: Internal wiring of the terminal points

Key:

OPC	Protocol chip (bus logic including voltage conditioning)	#	Digital input
	LED		Electrically isolated area
	Optocoupler		

Note: Other symbols used are explained in the IL SYS INST UM user manual

6 Connection notes and connection example

NOTE: Malfunction
The terminal must be provided with supply voltage U_S, as it is used internally as the auxiliary supply!

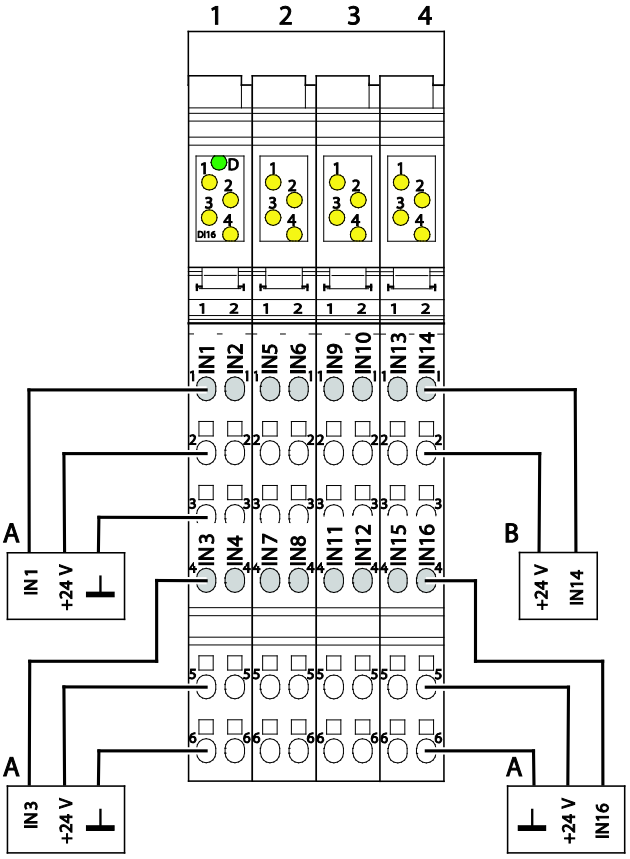


Figure 4: Typical connection of sensors

A 3-wire termination

B 2-wire termination

The numbers shown above the module indicate the connector slots.