

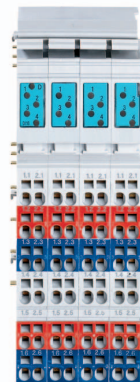
Rexroth Inline terminal with 16 digital inputs

R911170528
Edition 02

Data sheet R-IB IL 24 DI 16-PAC

16 digital inputs
24 V DC

09 / 2016



1 Description

The terminal block has been developed for use in an Inline station. It is used to acquire digital signals.

Features

- Connections for 16 digital sensors
- Connection of 2 or 3-wire sensors
- Maximum permissible load current per sensor: 250 mA
- Maximum permissible load current from the terminal: 4 A
- Diagnostic and status indicators



This data sheet is only valid in association with the “Automation terminals of the Rexroth Inline product range” application description (DOK-CONTRL-ILSYS-INS***-AW..-EN-P, MNR R911317021).



Make sure you always use the latest documentation.

It can be downloaded under
www.boschrexroth.com/electrics.

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3 Ordering data

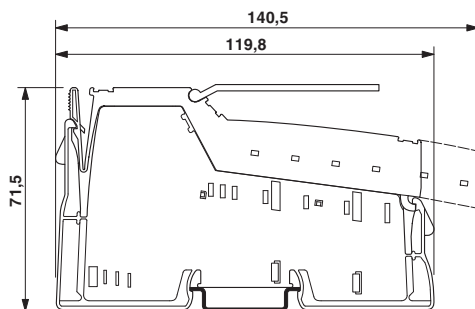
Description	Type	MNR	Pcs./Pkt.
Rexroth Inline, Digital input terminal, Digital inputs: 16, 24 V DC, Connection method: 3-conductor, Transmission speed in the local bus 500 kBit/s, Degree of protection IP20, including Inline connectors and marking fields	R-IB IL 24 DI 16-PAC	R911170752	1
Documentation	Type	MNR	Pcs./Pkt.
Application description	DOK-CONTRL-ILSYSINS***-	R911317021	1
Automation terminals of the Rexroth Inline product range	AW..-EN-P		

Additional ordering data

For additional ordering data (accessories), please refer to the product catalog at www.boschrexroth.com/electrics.

4 Technical data

Dimensions (nominal sizes in mm)



Width	48.8 mm
Height	140.5 mm
Depth	71.5 mm
Note on dimensions	Housing dimensions

General data

Color	gray
Weight	210 g (with connectors)
Operating mode	Process data mode with one word
Ambient temperature (operation)	-25 °C ... 55 °C
Ambient temperature (storage/transport)	-25 °C ... 85 °C
Permissible humidity (operation)	10 % ... 95 % (according to DIN EN 61131-2)
Permissible humidity (storage/transport)	10 % ... 95 % (according to DIN EN 61131-2)
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

Designation	Inline connector
Connection method	Spring-cage connection

Connection data

Conductor cross section solid / stranded	0.2 mm ² ... 1.5 mm ² / 0.2 mm ² ... 1.5 mm ²
Conductor cross section [AWG]	28 ... 16
Stripping length	8 mm

Interface Inline local bus

Connection method	Inline data jumper
Transmission speed	500 kBit/s

Power consumption

Segment circuit supply U_S	24 V DC (nominal value)
Current consumption from U_S	max. 4 A
Communications power U_L	7.5 V DC (via voltage jumper)
Current consumption from U_L	max. 60 mA
Power consumption	max. 0.45 W (at U_L)

Digital inputs

Number of inputs	16
Connection method	Spring-cage connection
Connection method	3-conductor
Description of the input	EN 61131-2 type 1
Nominal input voltage	24 V DC
Nominal input current	min. 3 mA (at nominal voltage)
Input voltage range "0" signal	-3 V DC ... 5 V DC
Input voltage range "1" signal	15 V DC ... 30 V DC
Permissible conductor length to the sensor	30 m
Use of AC sensors	AC sensors in the voltage range $< U_{IN}$ are limited in application (according to the input design)
Short-circuit and overload protection	yes

Programming data (INTERBUS, local bus)

ID code (hex)	BE
ID code (dec.)	190
Length code (hex)	01
Length code (dec.)	01
Process data channel	16 Bit
Input address area	2 Byte
Output address area	0 Byte
Parameter channel (PCP)	0 Byte
Register length (bus)	16 Bit

Configuration and parameter data in a PROFIBUS system

Required parameter data	1 Byte
Need for configuration data	4 Byte

Error messages to the higher level control or computer system

None

Electrical isolation/isolation of the voltage areas

Test section	Test voltage
5 V supply, incoming remote bus/7.5 V supply (bus logics)	500 V AC, 50 Hz, 1 min.
5 V supply, outgoing remote bus/7.5 V supply (bus logics)	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.



To achieve electrical isolation between the logic level and the I/O area, supply these areas from separate power supply units. Connecting the supply devices in the 24 V area is not permitted (see also the "Automation terminals of the Rexroth Inline product range" application description (DOK-CONTRL-ILSYSINS***-AW...-EN-P, MNR R911317017).

Approvals

For the latest approvals, please visit www.boschrexroth.com/electrics.

5 Additional tables**5.1 Input characteristic curve**

Current depending on the input voltage and the ambient temperature T_A			
Supply voltage [V]	Input current [mA]	Input current for $t \geq 20$ s [mA]	
		$T_A = 25^\circ\text{C}$	$T_A = 55^\circ\text{C}$
18	3.0	2.9	2.5
24	3.9	3.8	3.5
30	4.5	4.2	3.0

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

5.2 Power dissipation

Formula for calculating the power dissipation of the electronics

$$P_{EL} = 0,525 \text{ W} + \sum_{i=1}^n (U_{INI} \times 0,003 \text{ A})$$

Where:

P_{EL}	Total power dissipation in the terminal
i	Continuous index
n	Number of set inputs ($n = 1 \dots 16$)
U_{INI}	Input voltage of input i

Power dissipation of the housing

2.8 W, maximum (within the permissible operating temperature)

5.3 Limitation of simultaneity, derating

No limitation of simultaneity, no derating

6 Internal circuit diagram

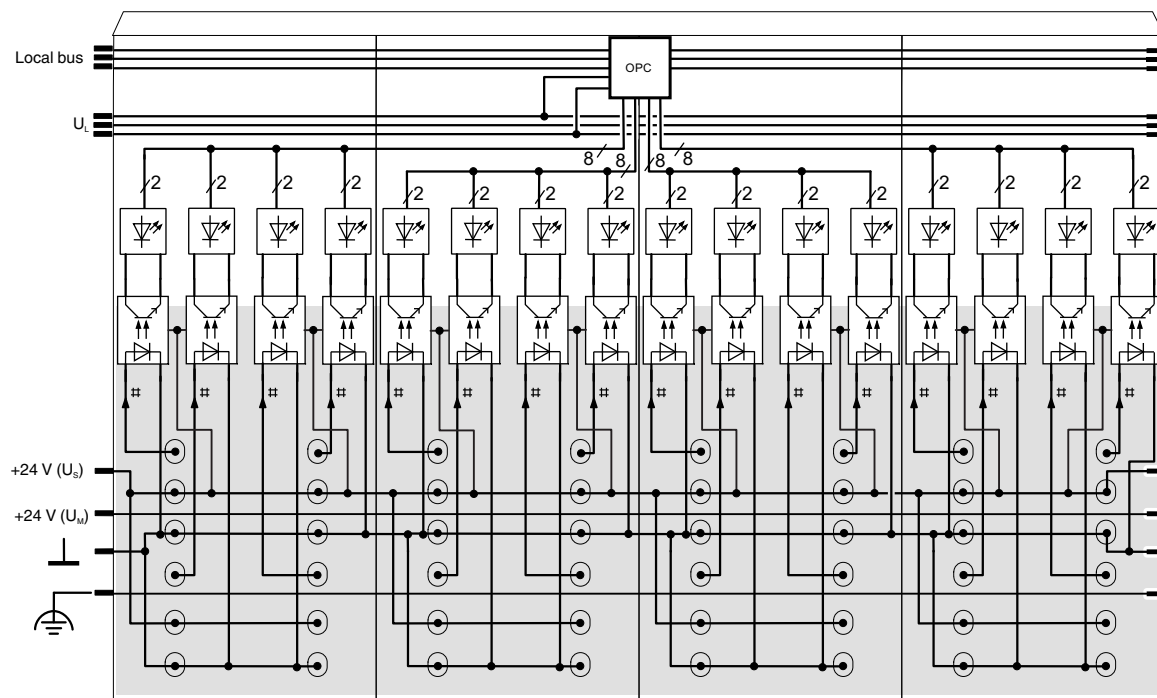







Fig. 1 Internal wiring of the terminal points

Key:

-  Protocol chip
(Bus logic including voltage conditioning)
-  LED (status indicator)
-  Optocoupler
-  Digital input
-  Electrically isolated area



For an explanation of the other symbols used, please refer to the “Automation terminals of the Rexroth Inline product range” application description (DOK-CONTRL-ILSYSINS***-AW..-EN-P, MNR R911317021).

7 Terminal point assignment

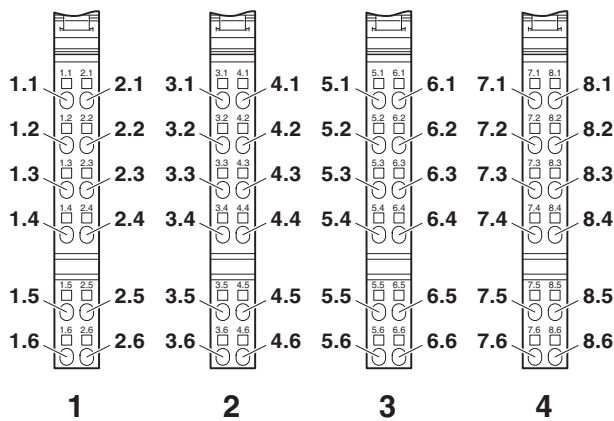


Fig. 2 Terminal point assignment

Terminal point	Assignment
1.1 / 2.1	Signal input (IN01 / IN02)
1.2 / 2.2	Segment voltage U_S for 2 and 3-wire connection
1.3 / 2.3	Ground contact (GND) for 3-wire connection
1.4 / 2.4	Signal input (IN03 / IN04)
1.5 / 2.5	Segment voltage U_S for 2 and 3-wire connection
1.6 / 2.6	Ground contact (GND) for 3-wire connection

Terminal point	Assignment
3.1 / 4.1	Signal input (IN05 / IN06)
3.2 / 4.2	Segment voltage U_S for 2 and 3-wire connection
3.3 / 4.3	Ground contact (GND) for 3-wire connection
3.4 / 4.4	Signal input (IN07 / IN08)
3.5 / 4.5	Segment voltage U_S for 2 and 3-wire connection
3.6 / 4.6	Ground contact (GND) for 3-wire connection

Terminal point	Assignment
5.1 / 6.1	Signal input (IN 9 / IN 10)
5.2 / 6.2	Segment voltage U_S for 2 and 3-wire connection
5.3 / 6.3	Ground contact (GND) for 3-wire connection
5.4 / 6.4	Signal input (IN 11 / IN 12)
5.5 / 6.5	Segment voltage U_S for 2 and 3-wire connection
5.6 / 6.6	Ground contact (GND) for 3-wire connection

Terminal point	Assignment
7.1 / 8.1	Signal input (IN 13 / IN 14)
7.2 / 8.2	Segment voltage U_S for 2 and 3-wire connection
7.3 / 8.3	Ground contact (GND) for 3-wire connection
7.4 / 8.4	Signal input (IN 15 / IN 16)
7.5 / 8.5	Segment voltage U_S for 2 and 3-wire connection
7.6 / 8.6	Ground contact (GND) for 3-wire connection

8 Connection notes and examples

NOTICE Malfunction

The supply voltage U_S is used internally as the auxiliary supply. If it is not present, the terminal will not operate properly. Make sure that the supply voltage U_S is available.



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

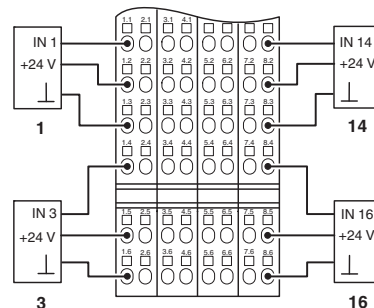


Fig. 3 Typical connection of sensors

9 Local diagnostic and status indicators

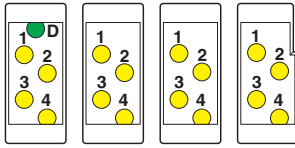


Fig. 4 Local diagnostic and status indicators

Designation	Color	Meaning
D	Green	Diagnostics (bus and logic voltage)
For each plug		
1 ... 4	Yellow	Status of the inputs

Function identification

Light blue

10 Process data

Assignment of the terminal points to IN process data

(Word.bit) view	Word	Word 0															
	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
(Byte.Bit) view	Byte	Byte 0								Byte 1							
	Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Assignment	Slot	4				3				2				1			
	Terminal point (signal)	4.4	3.4	4.1	3.1	2.4	1.4	2.1	1.1	8.4	7.4	8.1	7.1	6.4	5.4	6.1	5.1
	Terminal point (24 V)	4.5	3.5	4.2	3.2	2.4	1.4	2.2	1.2	8.5	7.5	8.2	7.2	6.5	5.5	6.2	5.2
	Terminal point (GND)	4.6	3.6	4.3	3.3	2.6	1.6	2.3	1.3	8.6	7.6	8.3	7.3	6.6	5.6	6.3	5.3
Status indicator	Slot	4				3				2				1			
	LED	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1