

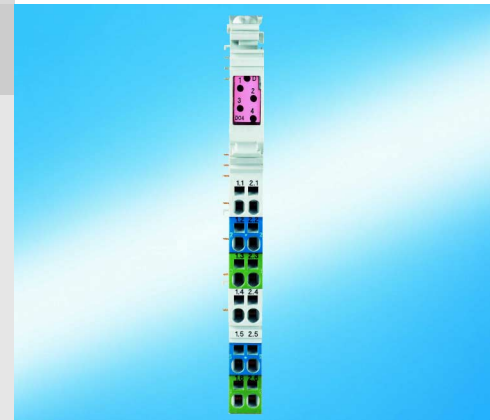
# Rexroth Inline Terminal With Four Digital Inputs

**R911170596**  
Edition 01

## R-IB IL 24 DI 4-PAC

4 digital inputs  
DC 24 V

02/2007



### Description

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

### Features

- Connections for four 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: 1.0 A
- Diagnostic and status indicators



This data sheet is only valid in association with the application descriptions for the Rexroth Inline system (see "[Documentation](#)" on [page 2](#)).



Make sure you always use the latest documentation. It can be downloaded at [www.boschrexroth.com](http://www.boschrexroth.com).

## Ordering Data

### Product

Description	Type	MNR	Pcs./Pkt.
Rexroth Inline Terminal with four digital inputs; complete with accessories (connector and labeling field)	R-IB IL 24 DI 4-PAC	R911170750	1

### Documentation

Description	Type	MNR	Pcs./Pkt.
"Configuring and Installing the Rexroth Inline Product Range for INTERBUS" application description	DOK-CONTRL-IL- SYSPRO***-AW...-EN-P	R9111317023	1
"Automation Terminals of the Rexroth Inline Product Range" application description	DOK-CONTRL-IL- SYSINS***-AW...-EN-P	R9111317021	1



For further ordering data (accessories), please refer to our product catalog at  
[www.boschrexroth.com](http://www.boschrexroth.com).

## Technical Data

### General Data

Housing dimensions (width x height x depth)	12.2 mm x 120 mm x 71.5 mm
Weight	66 g (with connector)
Operating mode	Process data operation with 4 bit (1 nibble)
Transmission speed	500 kbps
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 3,000 m above sea level)
Degree of protection	IP20 according to IEC 60529
Class of protection	Class 3 according to VDE 0106, IEC 60536
Connection data of Inline connector	
Connection method	Spring-cage terminals
Conductor cross-section	0.2 mm <sup>2</sup> to 1.5 mm <sup>2</sup> (solid or stranded), AWG 24 -16

### Interface

Local bus	Through data routing
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### Power Consumption

Communications power	7.5 V DC
Current consumption at U <sub>L</sub>	40 mA, maximum
Power consumption at U <sub>L</sub>	0.3 W, maximum
Segment supply voltage U <sub>S</sub>	24 V DC (nominal value)
Nominal current consumption at U <sub>S</sub>	1.0 A, maximum

### Supply of the Module Electronics and I/O Through Bus Coupler/Power Terminal

Connection method	Through potential routing
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### Digital Inputs

Number	4
Input design	According to EN 61131-2 Type 1
Definition of switching thresholds	
Maximum low-level voltage	U <sub>Lmax</sub> < 5 V
Minimum high-level voltage	U <sub>Hmin</sub> > 15 V
Common potentials	Segment supply, ground
Nominal input voltage U <sub>IN</sub>	24 V DC

**Digital Inputs (Continued)**

Permissible range	-30 V < U <sub>IN</sub> < + 30 V DC
Nominal input current for U <sub>IN</sub>	3 mA, minimum
Delay time	None
Permissible cable length to the sensor	30 m (to ensure conformance with EMC directive 89/336/EEC)
Use of AC sensors	AC sensors in the voltage range < U <sub>IN</sub> are limited in application (corresponding to the input design)

**Characteristic Curve: Current Depending on the Input Voltage and the Ambient Temperature T<sub>U</sub>**

Supply voltage	Input current	Input current in acc. with t ≥ 20 s	
		for T <sub>U</sub> = 25°C	for T <sub>U</sub> = 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<sub>U</sub> and the number of inputs that are switched on (module internal temperature).

**Power Dissipation****Formula to Calculate the Power Dissipation of the Electronics**

$$P_{TOT} = 0.24 \text{ W} + \sum_{i=1}^n [U_{INi} \times 0.003 \text{ A}]$$

Where

P<sub>TOT</sub> Total power dissipation in the terminal

n Number of set inputs (n = 1 to 4)

i Index

U<sub>INi</sub> Input voltage of the input i**Power Dissipation of the Housing P<sub>HO</sub>**

0.6 W, maximum (within the permissible operating temperature)

**Limitation of Simultaneity, Derating**

No limitation of simultaneity, no derating

**Safety Equipment**

Overload in segment circuit	No
Surge voltage	Protective elements of the power terminal
Polarity reversal	Protective elements of the power terminal

**Electrical Isolation****CAUTION**

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 coupler 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 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 Coupler/Power Terminal and I/O Terminal****- Test Distance**

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

**- Test Voltage****Error Messages to the Higher-Level Control or Computer System**

None

**Approvals**

For the latest approvals, please visit [www.boschrexroth.com](http://www.boschrexroth.com).

Local Diagnostic/Status Indicators and Terminal Point Assignment

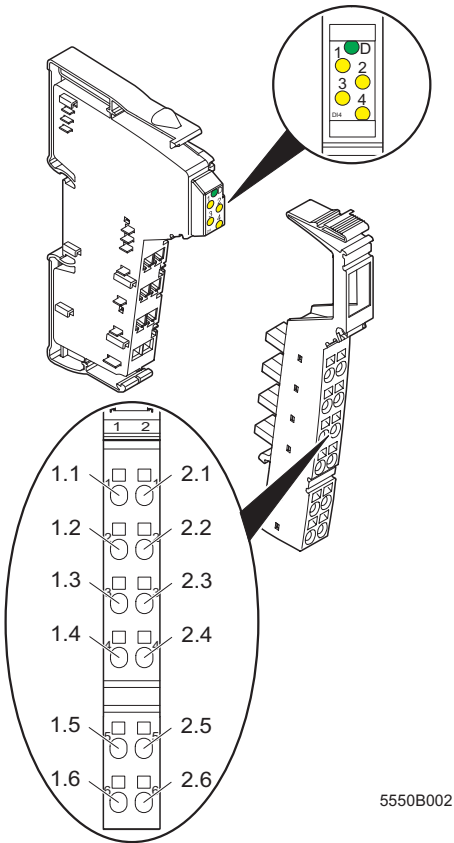


Fig. 1 The terminal with the appropriate connector

Local Diagnostic and Status Indicators

Des.	Color	Meaning
D	Green	Diagnostics
1, 2, 3, 4	Yellow	Status indicators of the inputs

Function Identification

Light blue

Terminal Point Assignment

Terminal Point	Assignment
1.1	Signal input 1 (IN 1)
2.1	Signal input 2 (IN 2)
1.2, 2.2	Segment voltage $U_S$ for 2 and 3-wire termination
1.3, 2.3	Ground contact (GND) for 3-wire termination
1.4	Signal input 3 (IN 3)
2.4	Signal input 4 (IN 4)
1.5, 2.5	Segment voltage $U_S$ for 2 and 3-wire termination
1.6, 2.6	Ground contact (GND) for 3-wire termination

Internal Circuit Diagram

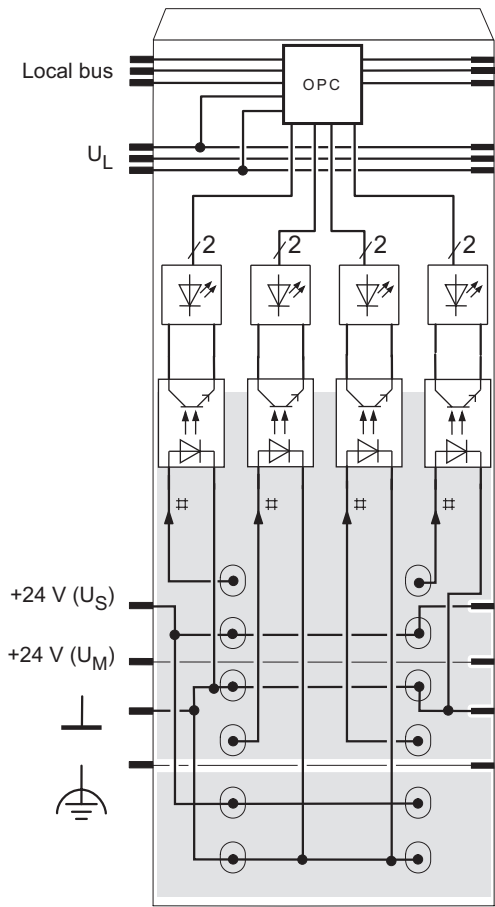



Fig. 2 Internal wiring of the terminal points

Key:

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

Other symbols used are explained in the Rexroth Inline application descriptions or the application description for your bus system.

Connection Example



**CAUTION**

When connecting the sensors observe the assignment of the terminal points to the process data (see [page 5](#)).

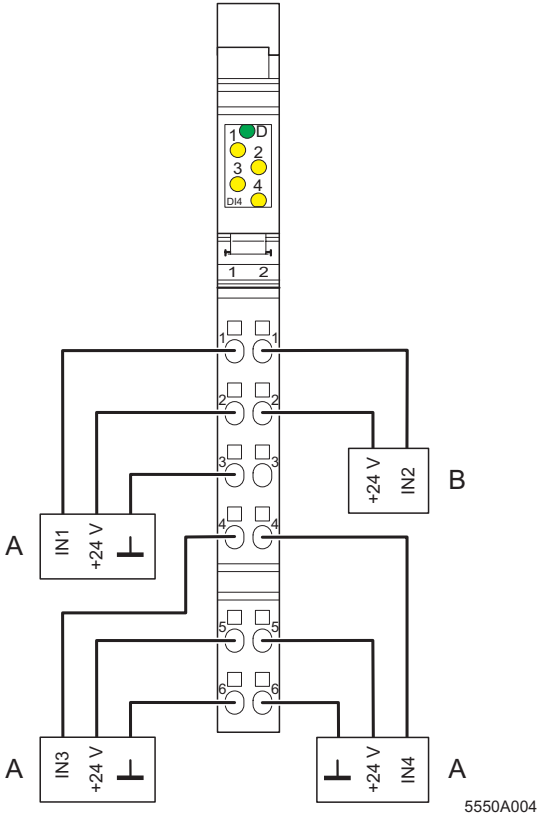



Fig. 3 Typical sensor connections  
A: 3-wire termination  
B: 2-wire termination

Programming Data/Configuration Data

Local Bus	
ID code	BE <sub>hex</sub> (190 <sub>dec</sub> )
Length code	41 <sub>hex</sub>
Input address area	4 bits
Output address area	0 bits
Parameter channel (PCP)	0 bits
Register length (bus)	4 bits

Other Bus Systems



For the programming data/configuration data of other bus systems, please refer to the corresponding electronic device data sheet (e.g., GSD, EDS).

Process Data

Assignment of the Terminal Points to the IN Process Data		0.3	0.2	0.1	0.0
(Byte.bit) view	Byte.bit				
Module	Terminal point (signal)	2.4	1.4	2.1	1.1
	Terminal point (+24 V)	2.5	1.5	2.2	1.2
	Terminal point (GND)	2.6	1.6	2.3	1.3
Status indicator	LED	4	3	2	1

## Notes:

DOK-CONTRL-  
ILD14\*\*\*\*\*-KB01-EN-P

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