

# Rexroth Inline Terminal With 32 Digital Inputs

**R911170554**  
Edition 01

**R-IB IL 24 DI 32/HD-PAC**

32 Digital Inputs  
24 V DC

02/2007



## Description

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

## Features

- Connections for 32 digital sensors
- Connection of sensors in single-wire technology
- 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./Pck.
Inline terminal with 32 digital inputs; complete with accessories (connectors and labeling fields)	R-IB IL 24 DI 32/HD-PAC	R911170753	1

### Documentation

Description	Type	MNR	Pcs./Pck.
"Automation Terminals of the Rexroth Inline Product Range" application description	DOK-CONTRL-ILSYSINS***-AW..-EN-P	R911317021	1
"Configuring and Installing the Rexroth Inline Product Range for INTERBUS" application description	DOK-CONTRL-ILSYSPRO***-AW..-EN-P	R911317023	1



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

## Technical Data

General Data	
Housing dimensions (width x height x depth)	48.8 mm x 120 mm x 71.5 mm
Weight	185 g (with connectors)
Operating mode	Process data mode with 4 bytes
Transmission speed	500 kbps
Connection method for sensors	Single-wire technology
Ambient temperature (operation)	-25°C to +55°C
Ambient 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
Connection data for 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), 24 - 16 AWG
Interface	
Local bus	Through data routing
Power Consumption	
Communications power	7.5 V DC
Current consumption at U <sub>L</sub>	90 mA, maximum
Power consumption at U <sub>L</sub>	0.675 W, maximum
Supply of the Module Electronics and I/O Through Bus Coupler/Power Terminal	
Connection method	Through potential routing

**Digital Inputs**

Number	32
Input design	According to EN 61131-2 Type 1
Definition of switching thresholds	
Maximum low-level voltage	$U_{Lmax} < 5 \text{ V}$
Minimum high-level voltage	$U_{Hmin} > 15 \text{ V}$
Common potentials	Segment supply, ground
Nominal input voltage $U_{IN}$	24 V DC
Permissible range	$-3 \text{ V} < U_{IN} < +30 \text{ V DC}$
Nominal input current for $U_{IN}$	2.8 mA, typical
Delay time	
$t_{on}$	2 ms
$t_{off}$	4 ms
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 $< U_{IN}$ are limited in application (according to the input design)

**Input Characteristic Curve**

Input Voltage (V)	Typical Input Current (mA)
$-30 < U_{IN} < 0.7$	0
3	0.46
6	1.87
9	2.66
12	2.70
15	2.73
18	2.76
21	2.78
24	2.81
27	2.83
30	2.86

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

$$P_{TOT} = 0.675 \text{ W} + \sum_{i=1}^n [ U_{INi} \times I_{INi} ]$$

Where

 $P_{TOT}$  Total power dissipation in the terminal  
 $i$  Index $n$  Number of set inputs ( $n = 1$  to 32) $U_{INi}$  Input voltage of input  $i$  $I_{INi}$  Input current of input  $i$  according to the input characteristic curve**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/Isolation of the Voltage Areas****CAUTION**

To provide electrical isolation between the logic level and the I/O area, it is necessary to supply the station bus coupler and the digital input terminal described here 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**

24 V I/O 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)

5 V supply outgoing remote bus/7.5 V supply (bus logic)

7.5 V supply (bus logic)/24 V supply (I/O)

24 V supply (I/O)/functional earth ground

**- Test Voltage**

500 V AC, 50 Hz, 1 min.

500 V AC, 50 Hz, 1 min.

500 V AC, 50 Hz, 1 min.

500 V AC, 50 Hz, 1 min.

**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 and Status Indicators and Terminal Point Assignment

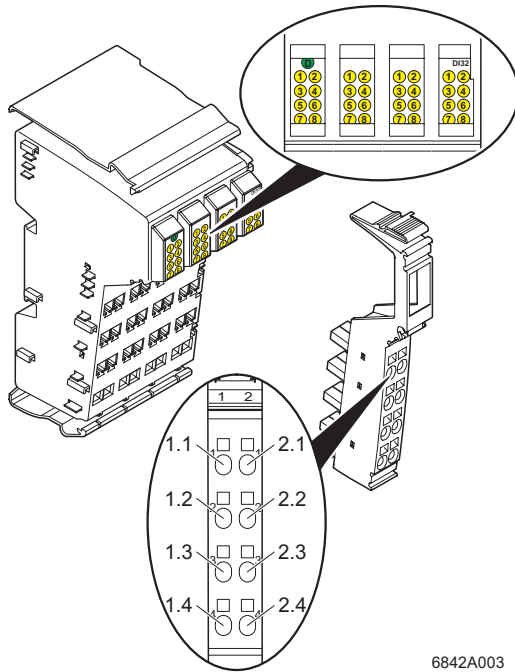


Fig. 1 Terminal with one of the appropriate connectors

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### Local Diagnostic and Status Indicators

Des.	Color	Meaning
D	Green	Diagnostics
<b>For Each Connector</b>		
1 to 8	Yellow	Status indicators of the inputs

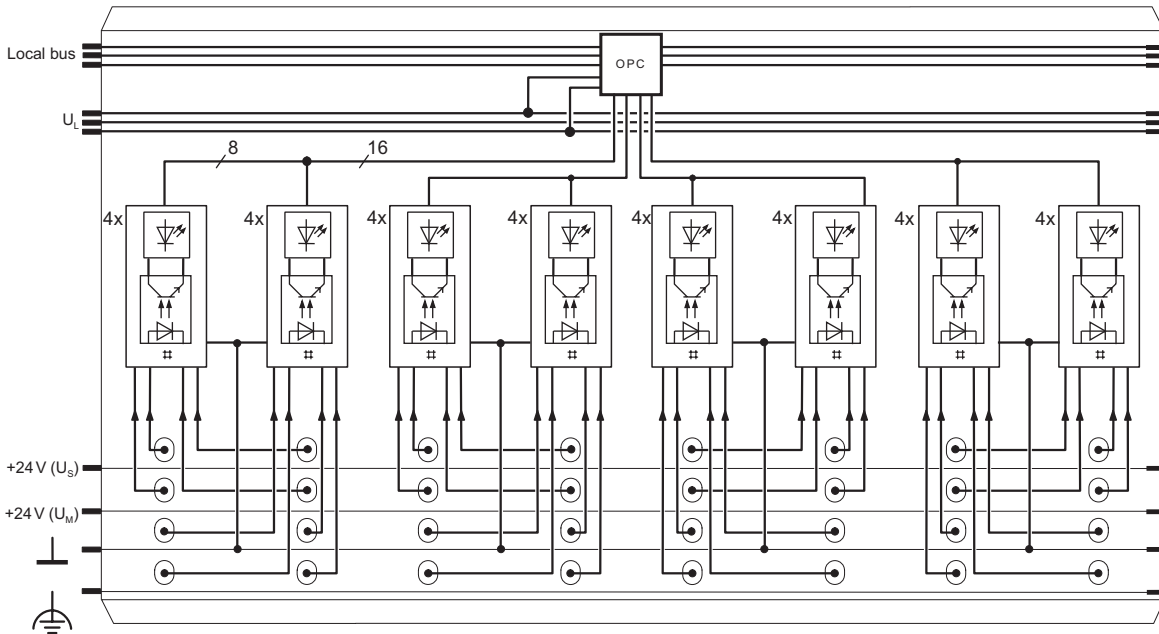
### Function Identification

Light blue

### Terminal Point Assignment for Each Connector

Terminal Point	Assignment
1.1/2.1	Signal input (IN 1/IN 2)
1.2/2.2	Signal input (IN 3/IN 4)
1.3/2.3	Signal input (IN 5/IN 6)
1.4/2.4	Signal input (IN 7/IN 8)
3.1/4.1	Signal input (IN 9/IN 10)
3.2/4.2	Signal input (IN 11/IN 12)
3.3/4.3	Signal input (IN 13/IN 14)
3.4/4.4	Signal input (IN 15/IN 16)
5.1/6.1	Signal input (IN 17/IN 18)
5.2/6.2	Signal input (IN 19/IN 20)
5.3/6.3	Signal input (IN 21/IN 22)
5.4/6.4	Signal input (IN 23/IN 24)
7.1/8.1	Signal input (IN 25/IN 26)
7.2/8.2	Signal input (IN 27/IN 28)
7.3/8.3	Signal input (IN 29/IN 30)
7.4/8.4	Signal input (IN 31/IN 32)





### Internal Circuit Diagram



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Fig. 2 Internal wiring of the terminal points

Key:

-  Protocol chip (bus logic including voltage conditioning)
-  LED (status indicator)
-  Optocoupler
-  Digital input



Other symbols used are explained in the DOK-CONTRL-ILSYSPRO\*\*\*-AW..-EN-P application description or the application description for your bus system.

## Connection Notes and Examples



**CAUTION**

Please note that the terminal must be provided with supply voltage  $U_S$ , as it is used internally as the auxiliary voltage.



**CAUTION**

When connecting the sensors observe the assignment of the terminal points to the process data (see [page 9](#)).



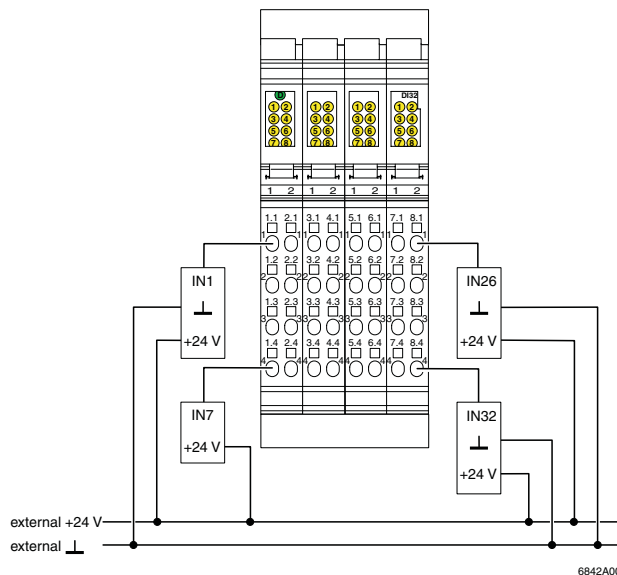
**CAUTION**

The sensors and  $U_S$  must be supplied from the same voltage supply (see [Fig. 4](#)).



The slot numbering corresponds to the connector labeling of the recommended connector set R-IB IL DI/DO 8-PLSET or the original PAC version.

The sensors can be connected via external busbars. Ensure that the sensors and  $U_S$  are supplied from the same voltage supply.



**Fig. 3** Typical connection of sensors when using external busbars

### Application Example

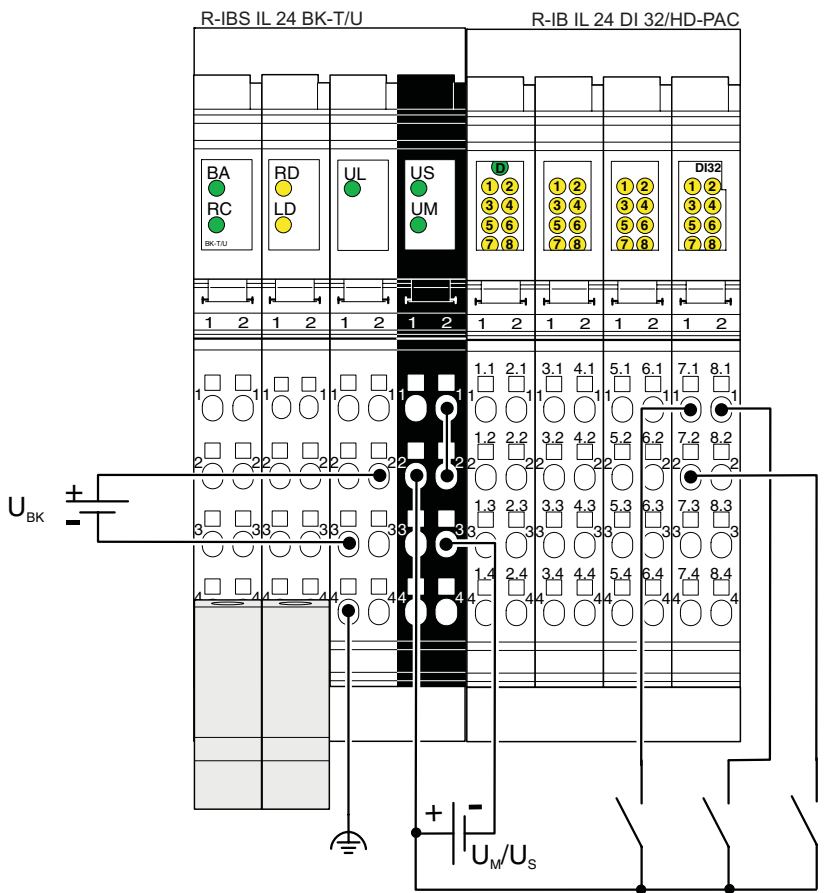


Fig. 4 Connection of sensors when using external busbars

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## Process Data

### Assignment of the Terminal Points to the IN Process Data

(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
Module	Terminal point (signal)	2.4	1.4	2.3	1.3	2.2	1.2	2.1	1.1	4.4	3.4	4.3	3.3	4.2	3.2	4.1	3.1
Status indicator	Slot	1								2							
	LED	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1

(Byte.bit) view	Byte	Byte 2								Byte 3							
	Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Module	Terminal point (signal)	6.4	5.4	6.3	5.3	6.2	5.2	6.1	5.1	8.4	7.4	8.3	7.3	8.2	7.2	8.1	7.1
Status indicator	Slot	3								4							
	LED	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1

## Programming Data

### Local Bus

ID code	BE <sub>hex</sub> (190 <sub>dec</sub> )
Length code	02 <sub>hex</sub>
Input address area	4 bytes
Output address area	0 bytes
Parameter channel (PCP)	0 bytes
Register length (bus)	4 bytes

### Other Bus Systems



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

## Notes:

DOK-CONTRL-ILDI32/  
HD\*\*-KB01-EN-P

Bosch Rexroth AG  
Electric Drives and Controls  
P.O.Box 13 57  
97803 Lohr, Germany  
Bgm.-Dr.-Nebel-Str. 2  
97816 Lohr, Germany  
Tel. +49-(0) 93 52 - 40-50 60  
Fax. +49-(0) 93 52 - 40-49 41  
service.svc@boschrexroth.de  
[www.boschrexroth.com](http://www.boschrexroth.com)

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