FACTORY AUTOMATION

Manual

IRI-KHD2-4HB5, IRI-KHA6-4HB5

CONTROL INTERFACE UNIT FOR INTERBUS

PEPPERL+FUCHS

Table of Contents

Ausgabedatum 27. 08. 2001.

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1 Declaration of conformity

The Control interfaces IRI-KHD2-4HB5 and IRI-KHA6-4HB5 have been developed and produced in accordance with the applicable European standards and directives.

Note

The declaration of conformity can be ordered from the manufacturer.

The manufacturer of the product, Pepperl+Fuchs Group in D-68307 Mannheim, possesses a certified quality assurance system in accordance with ISO 9001.

CE

ISO9001

Date of issue 27.08.2001

Date of issue 27.08.2001

2 General Information

Warning

This symbol warns the user of possible danger. Failure to heed this warning can lead to personal injury or death and/or damage to equipment.

Attention

This symbol warns the user of a possible failure. Failure to heed this warning can lead to total failure of the equipment or any other connected equipment.

Note

This symbol gives the user important hints.

Date of issue 27.08.2001

Date of issue 27.08.2001

3 Safety

3.1 Intended Use

The control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5 serves as part of the inductive identification system Ident-I from Pepperl+Fuchs to connect to a higher order computer (PLC, PC) with the INTERBUS-S interface (DIN 19 258). The control interface units are only to be used with the read heads and the code carriers from Pepperl+Fuchs.

Warning

The protection of operating personnel and the system against possible danger is not guaranteed if the control interface unit is not operated in accordance with its intended use.

The device IRI-KHD2-4HB5/IRI-KHA6-4HB5 may only be operated by appropriately qualified personnel in accordance with this operating manual.

3.2 General Safety Information

Warning

Safety and correct functioning of the device cannot be guaranteed if any operation other than that described in this operation manual is performed.

The connecting of the equipment and any maintenance work to be carried out with voltage applied to the equipment must only be performed by appropriately qualified electrotechnical personnel.

In the case that a failure cannot be repaired, the device must be taken out of operation and kept from inadvertently put back into operation.

Repair work is to be carried out by the manufacturer only. Additions or modifications to the equipment are not allowed and void the warranty.

Note

The operator is responsible for the observance of local safety standards.

3.3 Functional safety/monitoring

The control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5 operates on a microprocessor basis. Functional disturbances and equipment errors/faults are signalled with the LED 'Run/Error' on the front of the device.

Next to the LED is a function controller for the INTERBUS with which an information field can be requested. Device failure or breakdown of a read head can be detected and indicated by the master unit.

Note

More detailed information can be found in chapter 8 'Fault Diagnostics'.

Date of issue 27.08.2001

Date of issue 27.08.2001

4 Product Description

4.1 Scope of delivery

The following is included with the delivery of the device:

- 1 device IRI-KHD2-4HB5/IRI-KHA6-4HB5
- 1 CD ROM including the manuals as PDF-file (german, english) and the unit description for the commissioning software
- 1 terminal block

4.2 Areas of application

Bus systems, especially the INTERBUS, make the reduction of interconnection cabling possible and allow large data exchange over long distances. The control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5 with an INTERBUS connection is unsurpassed when applied in large systems with many distant and distributed reading stations.
Typical areas of application are:

- high-bay storage systems
- driverless transport systems
- interlinked production lines
- automatic container-identification

4.3 System description

The control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5 takes over the control of the connected read heads that implement the data transmission with the code carriers, prepares the read information and controls the communication and data transmission with an INTERBUS master unit.

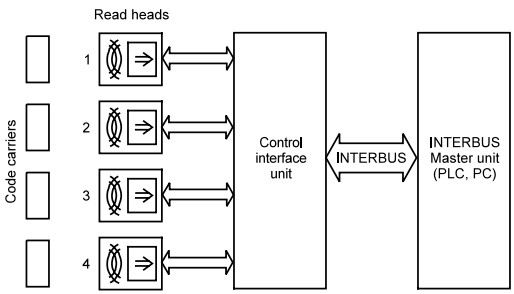


Figure 4.1 Function of the control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5 in the Inductive Identification System R

Date of issue 27.08.2001

It is possible to connect up to 4 read heads to a single IRI-KHD2-4HB5/IRI-KHA6-4HB5 unit.

The control interface unit is operated as an INTERBUS remote bus subscriber. The control interface unit uses 16 bytes in the INTERBUS frame protocol. When communicating from the master to the control interface unit, 8 bytes are used for the command data. 16 bytes are available for the transmission of the read head data from the control interface unit to the master. Here, only the cyclically transmitted process-data channel is used; the parameter channel is not used.

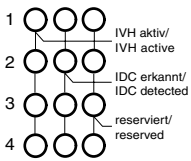
Note

A detailed description of all commands can be found in chapter 7 'Operation with the INTERBUS'.

4.4 LED display indicators

Read heads

The following three LED display indicators, summarized below, are provided for each read head. In addition there is a two-coloured LED between the Sub-D connectors. A description of the flashing signals can be found in *chapter 8 'Fault Diagnostics'*.

LED-Idication (on the front side)	

Indication and description

Indicators	Description
Ident	3 LEDs per read head status
LED green	Read/write head active (4 LEDs, 1 per head)
LED yellow	Code carrier detected (4 LEDs, 1 per head)
LED red	Functional reserved (4 LEDs, 1 per head)
Bus	1 LED system status (two-coloured)
Run/Error LED green	device ready for operation/communication active
Run/Error LED red	device error
red-green blinking	device ready for operation/communication faulty

Ring closure (on the top side)	 S1 Switch S1: 0 = Ring closure aktiv 1 = Ring closure not aktiv

Date of issue 27.08.2001

4.5 Structure and functioning

The control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5 is the link between the read heads and the INTERBUS master (PLC, PC, etc.). Two independently operating microprocessors, which are connected to each other via an interface, take over the data exchange between the read heads and the INTERBUS master.

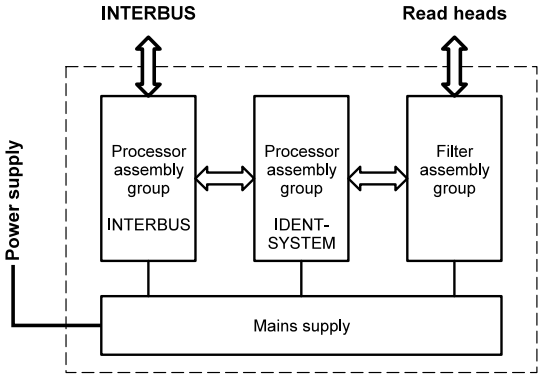


Figure 4.2 Block diagram of the control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5

Both the supply voltage and the bus segments themselves are galvanically isolated within the system.

Date of issue 27.08.2001

4.6 Accessories/product family

The inductive identification system Ident-I from Pepperl+Fuchs offers many different possibilities to combine single components.

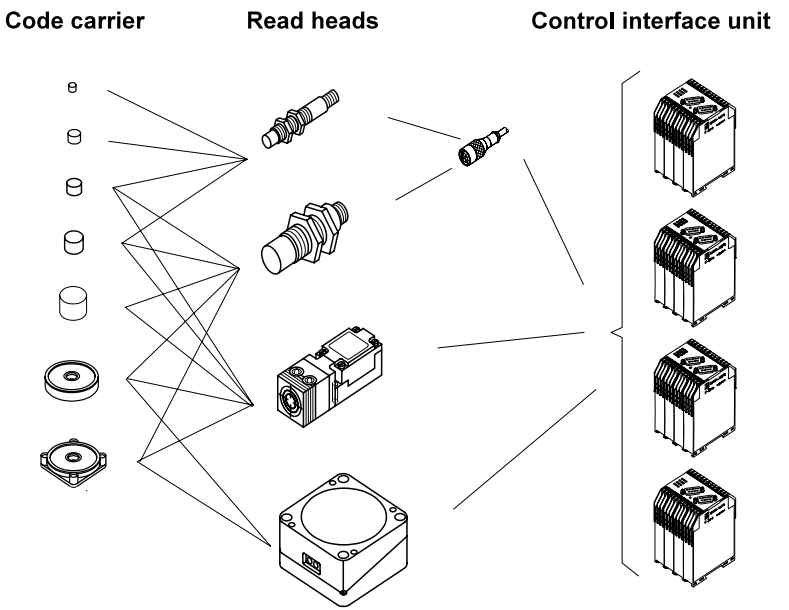


Figure 4.3 Overview of the inductive identification system structure

According to installation requirements, read distance and environmental conditions, one can select appropriate code carriers and read heads.

Note

Further information on the inductive identification system with read functioning (System R) can be found in the Sensor Systems 1 catalogue.

Date of issue 27.08.2001

5 Installation

5.1 Storage and transport

The device must be packed for storage and transport so that it is shock-resistant and protected against humidity. The original packaging offers optimal protection.
The necessary environmental conditions also must be satisfied (see chap. 9 'Technical Data').

5.2 Unpacking

Check that the contents are not damaged. In case of damage, notify the postal service or the forwarding agent and inform the deliverer.

Check the contents of delivery with respect to your order and the delivery papers for:

- correct number of parts
- device type and version according to the name plate
- accessories
- manual(s)

Keep the original packaging in case the device must be repacked and stored or re-shipped.

For any further questions please contact Pepperl+Fuchs GmbH.

Date of issue 27.08.2001

5.3 Mounting

5.3.1 Mounting to a top-hat rail

As with all systems in K-system housings from Pepperl+Fuchs, the control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5 can be snapped onto the 35 mm standard top-hat rail according to DIN EN 50022.

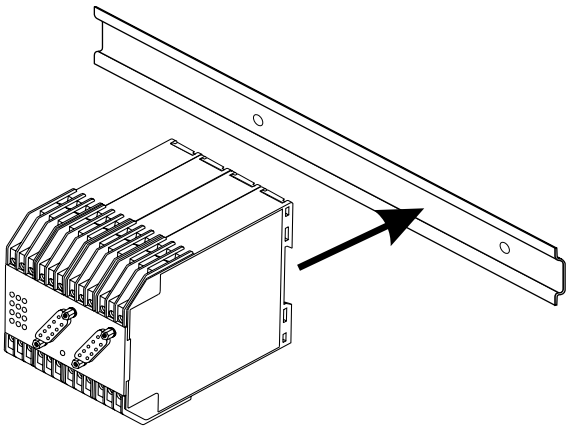


Figure 5.1 Mounting to the top-hat rail according to DIN EN 50022

Hang the unit over the top part of the top-hat rail and press the bottom part of the housing against the rail until it snaps onto the railing. Check that the unit sits firmly on the railing.

Date of issue 27.08.2001

5.3.2 Wall mounting

The control interface unit can also be mounted on the wall using four screws. Simply pull out the four outer brackets on the back side of the unit.
The unit can be easily screwed onto the wall through the holes in the brackets.
The screw pair spacing is 90 mm (max. screw diameter M5).

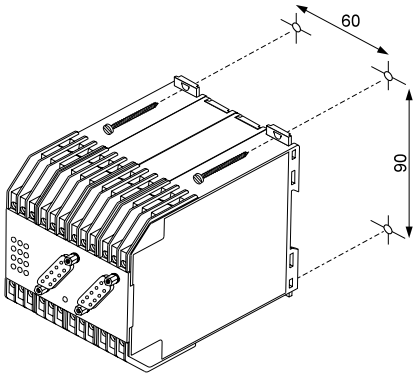


Figure 5.2 Wall mounting

5.4 Electrical connection

Warning

Only qualified personnel are permitted to carry out work under voltage and make electrical connection to the mains.

Ensure that the correct voltage is applied according to the name plate of the unit.

A mains isolating device must be installed close to the device and labelled as such for the IRI-KHD2-4HB5/IRI-KHA6-4HB5.

Date of issue 27.08.2001

5.4.1 Equipment connection

The electrical connection of the control interface unit is made with the self-opening screw terminals on the top and bottom of the unit, max. cross section 2 x 2.5 mm^2.

The INTERBUS connection must be carried out according to the INTERBUS specification via the 9-pole Sub-D sockets on the front of the device. Additionally, the bus connections (DI, /DI, DO, /DO, GND) are also available on the screw terminals.

Connect the read heads and the supply voltage according to the connection diagram and the labelled configuration of the terminals.

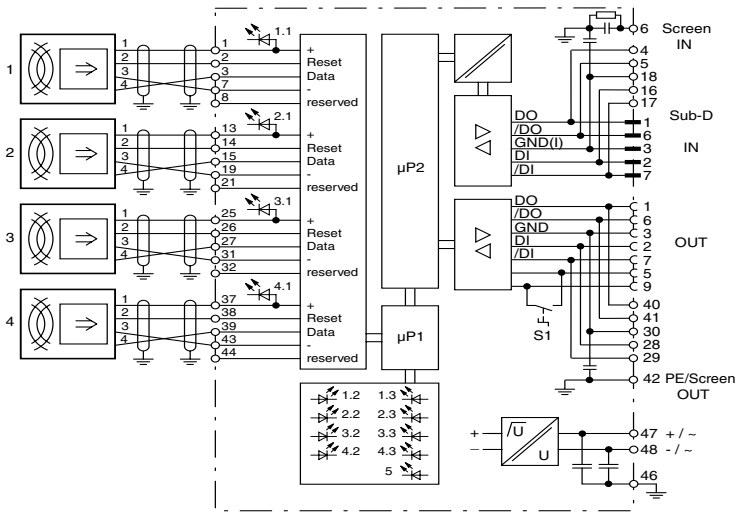


Figure 5.3 Connection diagram for the control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5

Location of the connection terminals

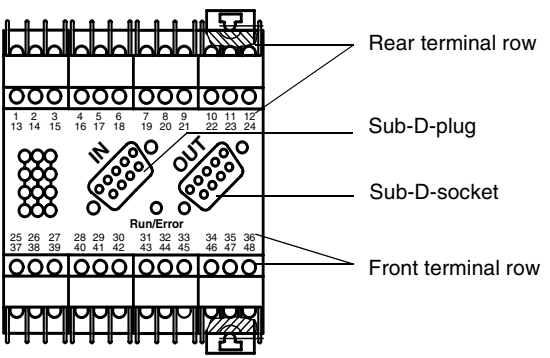


Figure 5.4 Assignment of connection terminals

Date of issue 27.08.2001

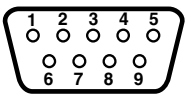
List of terminal assignments

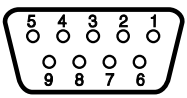
Terminal	Function
1	supply voltage read head 1 positive
2	„direction“ read head 1
3	„data“ read head 1
4	DO INTERBUS IN
5	/DO INTERBUS IN
6	Shield INTERBUS IN
7	supply voltage read head 1 negative
8	reserved
9	reserved
10	reserved
11	reserved
12	reserved
13	supply voltage read head 2 positive
14	„direction“ read head 2
15	„data“ read head 2
16	DO INTERBUS IN
17	/DO INTERBUS IN
18	GND INTERBUS IN
19	supply voltage read head 2 negative
20	reserved
21	reserved
22	reserved
23	reserved
24	reserved
25	supply voltage read head 3 positive
26	„direction“ read head 3
27	„data“ read head 3
28	DO INTERBUS OUT
29	/DO INTERBUS OUT
30	Shield INTERBUS OUT
31	supply voltage read head 3 negative
32	reserved
33	reserved
34	reserved
35	reserved
36	reserved
37	supply voltage read head 4 positive
38	„direction“ read head 4

Date of issue 27.08.2001

Terminal	Function
39	„data“ read head 4
40	DO INTERBUS OUT
41	/DO INTERBUS OUT
42	protective earth PE / Shield INTERBUS OUT
43	supply voltage read head 4 negative
44	reserved
45	reserved
46	ground power supply
47	power supply +
48	power supply -

Assignment of the 9-pole Sub-D plug and socket





PIN	INTERBUS IN	INTERBUS OUT
1	DO	DO
2	DI	DI
3	GND	GND
4	reserved	reserved
5	reserved	reserved
6	/DO	/DO
7	/DI	/DI
8	reserved	reserved
9	reserved	ring closure

Date of issue 27.08.2001

5.4.2 Read head/cable lengths

The connecting cables to the read heads must be shielded. The cross section of the cables must be at least 0.14 mm^2.

The screen of the read head lead is connected on both sides to earth (PE) with low resistence and low induction. For that the attached terminal block can be used (see figure 5.5.). Please make sure that the screen is kept as small as possible.

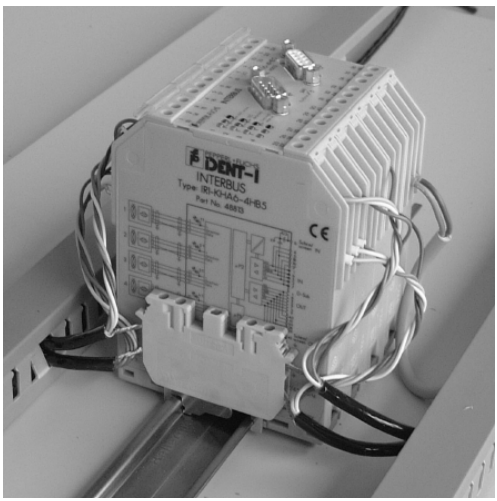


Figure 5.5 Terminal block with connecting cables

Read head cable lengths up to 50 m or 100 m are possible if the following conditions are satisfied.

up to 50 m read head cable:	cross sectional area of at least 4 x 0.25 mm^2 maximum resistance 78 Ohm/km maximum capacitance 90 pF/m (e.g. LIYC11C, Mukkenhaut & Nusselt MUNFLEX C11Y)
up to 100 m read head cable:	cross sectional area of at least 4 x 0.5 mm^2 maximum resistance 37 Ohm/km maximum capacitance 90 pF/m

Attention

With a cable length of 100 m, a series resistor of 82 Ohm must be fitted in the cable connected to the 'Reset' terminal of the read heads.

Since more EM interference can result with longer cable lengths, the maximum cable lengths given above might not be possible for some applications.

Date of issue 27.08.2001

If leads with double shielding are used, e.g. metallic wire mesh and metallic foil, they must be connected to each other using a low impedance connection at one end of the cable.

Note *Many noise impulses come from the supply cables, e.g. switch-on current of a motor. For this reason, running the supply cables in parallel with the data/signal cables, especially in the same cable duct, should be avoided.*

5.4.3 Special connection information for the INTERBUS cable

Ring closure switch

A key feature of the INTERBUS system is its physical ring structure. Each connected unit lies in the bus between two other subscribers. If this is not the case, e.g. a bus terminal at the end of a branch, the ring line in the affected unit must be closed.

This ring closure takes place automatically when the Sub-D connections are used. If you use the screw terminals on the IRI-KHD2-4HB5/IRI-KHA6-4HB5 to connect the bus line, you must move the rotary switch labelled "S1" for the ring closure to the proper position (see figure 5.6). The ring closure switch is located on the top of the unit.

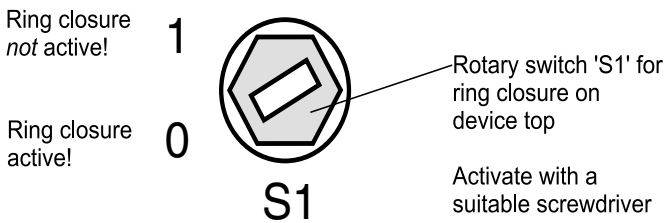


Figure 5.6 Ring closure switch

Attention *The ring closure must only be activated at an open branch end! All subsequent units will otherwise be cut off from communications.*

Date of issue 27.08.2001

Cable

The bus connecting cables must have the following characteristics:

• cable construction	1 + 2 x 2, twisted pairs
• cross sectional area	≥ 0.25 mm^2
• intrinsic impedance	100 ... 130 Ω (f > 100 kHz)
• capacitance per unit length	≤ 120 nF/km
• DC resistance	≤ 150 Ω/km

Use only shielded cables consisting of two twisted cable pairs.
Only by using shielded cables can the noise immunity be optimised.

Length of leads

Depending of the type of cable used and the extent of external noise sources, the distance between two units can be up to 400 meters. The total length of an INTERBUS system can extend up to 13 kilometers. The number of units connected to the bus is limited to 512.

Date of issue 27.08.2001

5.5 Disassembly, packing and disposal

Repacking

The unit must be protected against humidity and shock when packing for later use. The original packaging offers optimal protection.

Disposal

Note

Electronic waste can be hazardous. Pay attention to local regulations when disposing of this unit.

The control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5 does not contain internal batteries which must be removed before disposal.

Date of issue 27.08.2001

6 Commissioning

Warning

Before proceeding with the commissioning, make sure that no danger to the system can arise from the device, e.g. due to uncontrolled control processes.

Attention

Check again all connections before proceeding with the commissioning.

Prepare for the commissioning by familiarising yourself with the communication between the INTERBUS master and the control interface unit (see chap. 7 and 8). The commissioning requires a good knowledge of the INTERBUS and the programming of the master unit.

6.1 Preparation

Due to the complexity of field bus programming with the INTERBUS, it is, unfortunately, difficult to give a valid general description on how to perform the commissioning.

A very important aspect for the operation of an inductive identification system using the control interface unit IRI-KHD2-4HB5/IRI-KHA6-4HB5 on the INTERBUS is the response time of the total system. The question "How much time is required for data to be available in my computer once the code carrier is positioned in front of the read head?" can be determined from the design of the INTERBUS protocol using the following formula.

$$t_t = [13 \cdot (6 + n) + 1,5 \cdot m] \cdot t_{Bit} + t_{SW}$$

t_t = transmission time

n = number of used data bytes (specify either input or output data byte for each subscriber)

m = number of installed external bus subscribers

t_{Bit} = bit length, where t_{Bit} = 2 µs at 500 kBit/s

t_{sw} = software runtime, where t_{sw} = 200 µs

For larger projects or if you have limited experience with setting up a project with an INTERBUS system, you should first construct a test system for your particular application and to test the transmission of data to the INTERBUS master.

Note

The manufacturer-independent program "CMD" is available for planning, commissioning and diagnosing INTERBUS networks. For additional information regarding this program and other relevant INTERBUS topics, contact

INTERBUS-S-Club, Postfach 1108, 32817 Blomberg, GERMANY; Telephone (+49)5235/342100, Telefax (+49)5235/341234

Date of issue 27.08.2001

6.2 Self-test

After switching on the supply voltage, the control interface unit checks the internal memory area with a self-test. If the error 'RAM failure' or 'ROM failure' occurs, communication is not activated. The error is indicated with the LED 'Run/Error' (see chapter 8.1 'LED error indicators'). If no error is present, the connection to the INTERBUS master is made automatically.

Note

If the bus connection to the control interface unit is made, the LED 'Run/Error' will be green and permanently illuminated.

Date of issue 27.08.2001

7 Operation with the INTERBUS

7.1 General information on the INTERBUS

The INTERBUS is a standardised field bus that can exchange data between PLCs, PCs, operating and monitoring systems as well as sensors and actuators.

The framework of this operating manual can be considered as an extensive introduction to the INTERBUS. For substantial information, one is referred to the INTERBUS standard DIN 19258 and the relevant literature.

Note

The INTERBUS-S-Club publishes information brochures and an INTERBUS product catalogue. The address can be found on page 23.

The following explanation of the data structure of the IRI-KHD2-4HB5/IRI-KHA6-4HB5 assumes knowledge of the construction of the INTERBUS sum-frame protocol.

7.2 Data structure

The IRI-KHD2-4HB5/IRI-KHA6-4HB5 occupies a total of 16 bytes in the INTERBUS frame protocol. Its use is, therefore, limited to the cyclically transmitted process-data channel.

This means:

- Commands for adjusting the control interface unit are also updated with each cycle.
- The parameter channel of the INTERBUS is not placed under any additional load.
- The control interface unit is designed as a remote bus station. The identification code is 03.

7.2.1 Read data

After connecting to the system supply voltage all connected read heads are registered and cyclically read. A four-byte-long data field is reserved for each read head and is divided as follows:

- 1 Bit status
- 3 Bit read number
- 28 Bit code carrier data

The status bit indicates whether or not a code carrier is currently in the acquisition range. The read number is increased by 1 with each new reading.

Date of issue 27.08.2001

In the default state, the four data fields are read in a cycle one after the other.

LK1	LK2	LK3	LK4
4 x 32 bits = 16 bytes			

The sequence is maintained by the bus:

Byte 0	Byte 1	Byte 2	Byte 3	•••	Byte 0	Byte 1	Byte 2	Byte 3
Read head 1					Read head 4			

The individual read head data are arranged as follows:

Bit No.	7		0	7	0	7	0	7	0
Byte No.	0			1		2		3	
Read head 1	E2/E3	LN	W1	W2	W3	D1	D2	D3	D4
Read head 2	E2/E3	LN	W1	W2	W3	D1	D2	D3	D4
Read head 3	E2/E3	LN	W1	W2	W3	D1	D2	D3	D4
Read head 4	E2/E3	LN	W1	W2	W3	D1	D2	D3	D4
	1 Bit	3 Bit	Code (28 Bit)						

E2/E3: Status bit 0: Code carrier is in front of the read head
1: Code carrier is not in front of the read head

LN: Read number. Is increased by 1 with each new reading; in event of overflow (7_{hex}) the counter is reset.

Wx: Wafer number in binary form (12 bit)

Dx: Chip number in binary form (16 bit)

7.2.2 Command data

Eight bytes are available for control of the identification system. Of these, however, only the first four are used. The base structure of these four command data bytes is as follows:

Bit No.	7	6	5	4	3	2	1	0
Byte 0	UC	✗	DS	DC	SS4	SS3	SS2	SS1
Byte 1	✗	✗	✗	✗	✗	✗	✗	✗
Byte 2	✗	✗	✗	✗	ST4	ST3	ST2	ST1
Byte 3	✗	✗	✗	✗	SUB			
Byte 4 ... 7	✗	✗	✗	✗	✗	✗	✗	✗

Date of issue 27.08.2001

X:	not used
SS 1:	Start/Stop-Bit for read head 1; Start = 1
SS 2:	Start/Stop-Bit for read head 2; Start = 1
SS 3:	Start/Stop-Bit for read head 3; Start = 1
SS 4:	Start/Stop-Bit for read head 4; Start = 1
DC:	Security Bit; DC = 1: data carriers are not read as code carries
DS:	Doublesided Read Bit; DS = 1: doublesided read switched on
UC:	User Configuration Bit; UC = 1: parameters are written in EEPROM and taken over from there the next time the unit is switched on
ST1:	Data field of read head 1 is replaced with information field
ST2:	Data field of read head 2 is replaced with information field
ST3:	Data field of read head 3 is replaced with information field
ST4:	Data field of read head 4 is replaced with information field
SUB:	Sub-addresses for more precise definition of the information data

In the basic setting, after switch-on of the operating voltage, the bits DC, DS and UC are not set.

Note

For a more detailed explanation of commands ST1 ... ST4 see chapter 7.2.3 'Information fields'.

An example of a command sequence can be found in chapter 7.2.4 'Example of a command sequence'.

Date of issue 27.08.2001

7.2.3 Information fields

By placing bits ST1 ... ST4 in control byte 2, the data fields of the corresponding read heads are replaced with an information field. Information fields are used for failure diagnostics as well as for reading out the unit identification, software version and set parameters. The selection of an information field is made using the sub-address SUB.

Failure diagnostics; SUB = 0 ... 3

After setting the sub-address SUB = 0 ... 3, the information field is output with failure diagnostics (see also: "Status"). The contents of the field are as follows:

Bit No.	7	6	5	4	3	2	1	0
Byte 0	0	0	0	0	EO/4	EO/3	EO/2	EO/1
Byte 1	0	0	0	0	0	0	0	0
Byte 2	0	0	0	NI	EK	0	0	XK
Byte 3	0	0	0	0	EA	RA	IA	XA

EO/1 = 1: read head 1 not connected or defective
EO/2 = 1: read head 2 not connected or defective
EO/3 = 1: read head 3 not connected or defective
EO/4 = 1: read head 4 not connected or defective
XK = 1: external RAM on communication processor faulty
EK = 1: EEPROM on communication processor faulty
NI = 1: internal interface error
XA = 1: external RAM on identifcation circuit board faulty
IA = 1: internal RAM on identification circuit board faulty
RA = 1: EEPROM on identification circuit board faulty
EA = 1: EEPROM on identification circuit board faulty

Date of issue 27.08.2001

Device identification; SUB = 9

After setting sub-address SUB = 9, the device identification is output in bytes 0 and 1. Bytes 2 and 3 have the value 0.

Software version; SUB = 10

For service purposes the software version is output after setting the sub-address SUB = 10. The contents of the field are as follows:

Bit No.	7	6	5	4	3	2	1	0
Byte 0	Index					Ser. No.		
Byte 1	Index					Ser. No.		

Bytes 2 and 3 have the value 0.

Status; SUB = 11

After setting the sub-address SUB = 11, the device status is output. The contents of the field are as follows:

Bit No.	7	6	5	4	3	2	1	0
Byte 0	0	0	0	0	EA	RA	IA	XA
Byte 1	0	0	0	NI	EK	0	0	XK

Bytes 2 and 3 have the value 0. For a description of the error bits, see "Failure Diagnostics" on page 26.

Parameter; SUB = 12

After setting the sub-address SUB = 12, the current device parameters are output. The information field corresponds here to the contents of control bytes 0 and 1.

Note

SUB 4 .. 8 and 13 ... 15 are not used.

Date of issue 27.08.2001

7.2.4 Example of a command sequence

Bit No.	7	6	5	4	3	2	1	0
Byte 0	UC=1	✗	DS=1	DC=1	SS4=0	SS3=0	SS2=1	SS1=1
Byte 1	✗	✗	✗	✗	✗	✗	✗	✗
Byte 2	✗	✗	✗	✗	ST4=1	ST3=0	ST2=0	ST1=0
Byte 3	✗	✗	✗	✗	SUB=0001 (bin)			

Byte 0: read heads 1 and 2 are activated (SS1 ... SS4)
data carriers are not read as code carriers (DC = 1)
doublesided reading switched on (DS = 1)
parameters are saved in EEPROM (UC = 1)

Byte 1: not usedt

Bytes 2 and 3: instead of the data information for read head 4 (ST4 = 1), an information field with the status is output (SUB = 0001)

Date of issue 27.08.2001

8 Fault Diagnostics

8.1 LED error indicators

The 'Run/Error' LED indicates the status of the control interface unit IRI-KHD2-4HB5/ IRI-KHA6-4HB5:

Signal	Meaning
permanently green	device ready for operation / communication active
once 0.3 s green;5 s red	communication error
three time 0.3 s green; 0.3 s red; 5 s red	ROM error
four times 0.3 s green; 0.3 s red; 5 s red	RAM error

The following figure illustrates the LED signals:

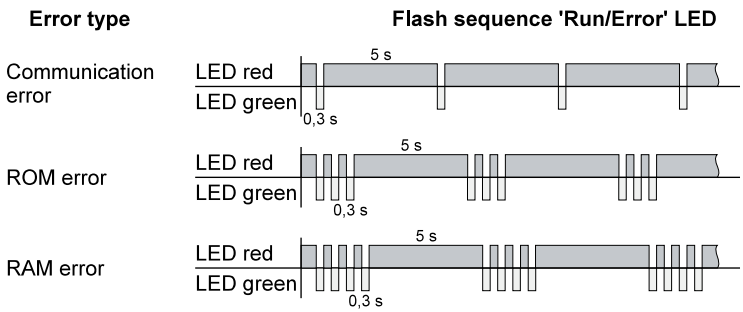


Figure 8.1 Flash sequence of the LED 'Run/Error' in event of malfunction

8.2 Error indication by means of an information field

The detailed error status can be queried in an information field by means of the INTERBUS.

A description of this can be found in *chapter 7.2.3 'Information fields'*.

Date of issue 27.08.2001

Date of issue 27.08.2001

9 Technical Data

9.1 General specifications

The control interface unit is operated as an INTERBUS remote bus subscriber. The control interface unit uses 16 bytes in the INTERBUS frame protocol. When communicating from the master to the control interface unit, 8 bytes are used for the command data. 16 bytes are available for the transmission of the read head data from the control interface unit to the master. Here, only the cyclically transmitted process-data channel is used; the parameter channel is not used.

Up to 4 read heads can be connected to the control interface unit. After connecting to the system supply voltage, all connected read heads are registered and cyclically read.

Each read head has a corresponding 4 byte data field which contains the read code in 28 bit format. In addition, each data field contains a 3 bit read number which is incremented with every new code read. The read number makes it possible to manage, in the higher-order control system, the codes which have been read. In this way it is possible, for example, to determine whether a new code is pending or if the same code has been read multiple times. An additional status bit indicates whether or not a code carrier is currently in the acquisition range.

Futures

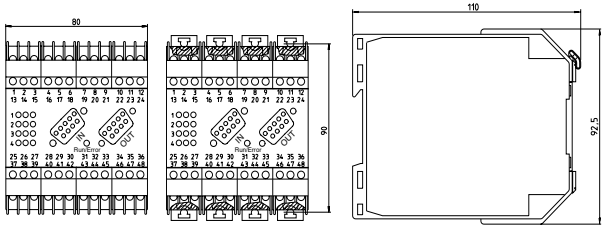
- INTERBUS-remote bus subscriber
- 4 read heads can be connected
- transmission of all read fix codes in one cycle
- 3 LEDs per read head for function indicatio
- LED for power on / bus communicationn
- RS 485 interface
- ID-code: 03

9.2 Electrical data

Order code	IRI-KHD2-4HB5	IRI-KHA6-4HB5
Power supply		
Supply voltage	18 V DC ... 32 V DC	85 V AC ... 253 V AC, 50 Hz ... 60 Hz
Ripple	≤ 10 %	
Current	200 mA	50 mA
Quiescent current	≤ 110 mA / 24 V DC (typ)	
with activ heads	190 mA	45 mA
Power consumption	5 W	10 VA

Date of issue 27.08.2001

9.3 Mechanical data



Ambient conditions	
Operating temperature	-25 °C ... +70 °C (248 Kelvin ... 343 Kelvin
Storage temperature	-25 °C ... +85 °C (248 Kelvin ... 358 Kelvin)
Humidity	max. 75 % rel. humidity
Mechanical specifications	
Protection degree	IP20 acc. EN 60529
Connection possibilities	self-opening apparatus terminals, max. cross sectional area 2 x 2.5 mm^2 9-pin Sub-D built-in connector
Housing material	Makrolon 6485
Construction type	K-System, 80 mm (4 TE)
Mounting	snaps onto 35 mm standard rail according to DIN EN 50022 or screw-mountable with 2 screws through pull-out brackets in 90 mm spacing

9.4 Indicating/operating means

LED green	Read/write head active (4 LEDs, 1 per head)
LED yellow	Code carrier detected (4 LEDs, 1 per head)
LED red	Functional reserved (4 LEDs, 1 per head)
LED red/green permanently green red-green blinking	device status device ready for operation/communication activev device error: 1 x 0.3 s green, 5 s red - communication error 3 x 0.3 s red/green blinking, 5 s red - ROM-error 4 x 0.3 s red/green blinking, 5 s red - RAM-error
Rotary switch	ring closure 0 = ring closure activ 1 = ring closure not activ

9.5 Software

Software	The unit description for the commissioning software is included in the scope of delivery.

Date of issue 27.08.2001

10 Appendix

10.1 List of abbreviations

BIN	-	binary
EEPROM	-	electronically erasable and programmable ROM
EMC	-	electromagnetic compatibility
HEX	-	hexadecimal
L	-	line, phase for mains connection (230 V AC)
LED	-	light emitting diode
µP	-	microprocessor
N	-	neutral for mains connection (230 V AC)
PC	-	personal computer
PE	-	protective earth
RAM	-	random access memory
ROM	-	read only memory
PLC	-	programmable logic controller

Issue date 27.07.98

10.2 Table of ASCII characters

hex	dez.	ASCII	hex	dez.	ASCII	hex	dez.	ASCII	hex	dez.	ASCII
00	0	NUL	20	32	Space	40	64	@	**60**	**96**	**‘**
01	1	SOH	21	33	!	41	65	A	**61**	**97**	**a**
02	2	STX	22	34	“	42	66	B	**62**	**98**	**b**
03	3	ETX	23	35	#	43	67	C	**63**	**99**	**c**
04	4	EOT	24	36	$	44	68	D	**64**	**100**	**d**
05	5	ENQ	25	37	%	45	69	E	**65**	**101**	**e**
06	6	ACK	26	38	&	46	70	F	**66**	**102**	**f**
07	7	BEL	27	39	‘	47	71	G	**67**	**103**	**g**
08	8	BS	28	40	(	48	72	H	**68**	**104**	**h**
09	9	HT	29	41	)	49	73	I	**69**	**105**	**i**
0A	10	LF	2A	42	*	4A	74	J	**6A**	**106**	**j**
0B	11	VT	2B	43	+	4B	75	K	**6B**	**107**	**k**
0C	12	FF	2C	44	,	4C	76	L	**6C**	**108**	**l**
0D	13	CR	2D	45	-	4D	77	M	**6D**	**109**	**m**
0E	14	SO	2E	46	.	4E	78	N	**6E**	**110**	**n**
0F	15	SI	2F	47	/	4F	79	O	**6F**	**111**	**o**
10	16	DLE	30	48	0	50	80	P	**70**	**112**	**p**
11	17	DC1	31	49	1	51	81	Q	**71**	**113**	**q**
12	18	DC2	32	50	2	52	82	R	**72**	**114**	**r**
13	19	DC3	33	51	3	53	83	S	**73**	**115**	**s**
14	20	DC4	34	52	4	54	84	T	**74**	**116**	**t**
15	21	NAK	35	53	5	55	85	U	**75**	**117**	**u**
16	22	SYN	36	54	6	56	86	V	**76**	**118**	**v**
17	23	ETB	37	55	7	57	87	W	**77**	**119**	**w**
18	24	CAN	38	56	8	58	88	X	**78**	**120**	**x**
19	25	EM	39	57	9	59	89	Y	**79**	**121**	**y**
1A	26	SUB	3A	58	:	5A	90	Z	**7A**	**122**	**z**
1B	27	ESC	3B	59	;	5B	91	[	**7B**	**123**	**{**
1C	28	FS	3C	60	<	5C	92	\	**7C**	**124**	**|**
1D	29	GS	3D	61	=	5D	93	]	**7D**	**125**	**}**
1E	30	RS	3E	62	>	5E	94	^	**7E**	**126**	**~**
1F	31	US	3F	63	?	5F	95	_	**7F**	**127**	**DEL**

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