FACTORY AUTOMATION

Manual

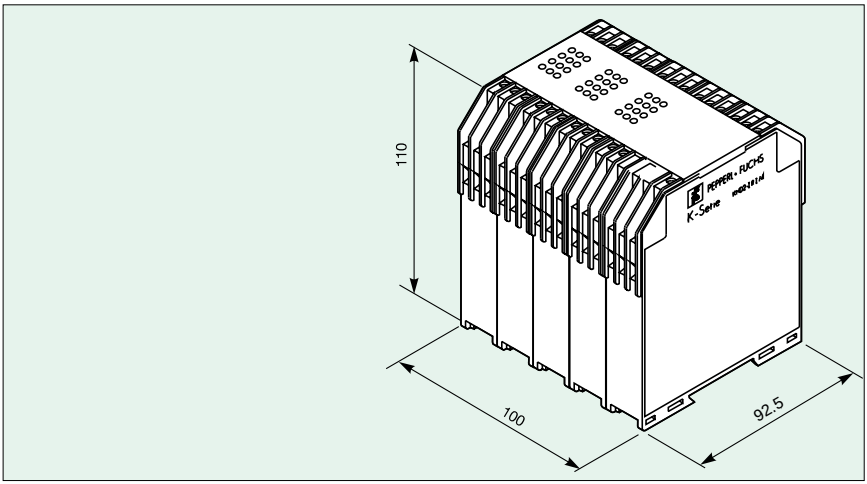
IVI-KHD2-4HD3

Control Unit with
8 Inputs/Outputs

PEPPERL+FUCHS

PEPPERL+FUCHS IDENT-I

Control Unit with 8 Inputs/Outputs
IVI-KHD2-4HD3



Model Number	IVI-KHD2-4HD3
Technical Data:	
Number of read/write heads	1 ... 4
Data leads	8 binary inputs/outputs (I/O 1 ... 8)
Control leads	Direction control input (I/O CNTL) Programming input (PGM) Acknowledgement input (ACK) Error output (ERROR) Output "instruction executed" (I/O 9) Output "checksum error of data carrier" (I/O 10) Inputs/outputs "read head number " (I/O 15 and 16)
Visual indicators	Power supply: LED green Inputs/outputs supply: 2 LEDs green Read head active: 4 LEDs green Read/write operation successfull: 4 LEDS yellow Inputs/outputs: one LED yellow for each input/output Direction control input: LED yellow Programming input: LED yellow Error: LED red
Electrical Data	
Supply voltage	18 V ... 32 V = residual ripple ≤ 10 % (terminals 59 and 60, 47 and 48, 50 and 51) 18 V ... 30 V = residual ripple ≤ 10 % (terminals 47 and 48) 18 V ... 30 V = residual ripple ≤ 10 % (terminals 50 and 51)
Current consumption	Max. 200 mA (one read head active, all outputs switched) Load currents at the outputs flow via terminals 47/48 and 50/51.
Power consumption	5 W

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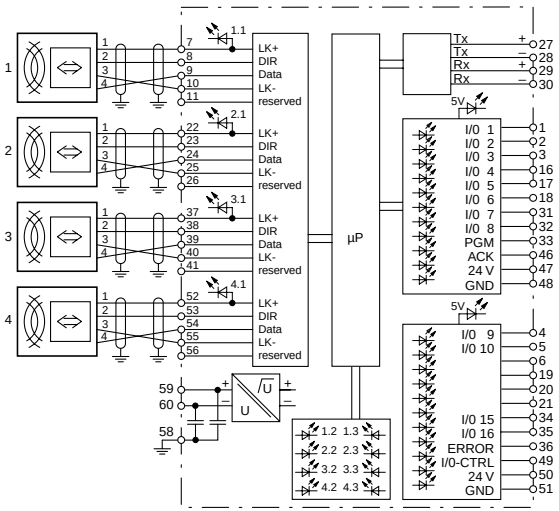
Inputs and Outputs	
	Input voltage 0 V ... 7 V corresponds to logic 0 Input voltage 13 V ... 30 V corresponds to logic 1
Output voltage	Data outputs: min. supply voltage -0.5 V Control outputs: min. supply voltage -1.0 V Positive switching outputs; i. e. for logic 0 the output potential is indeterminate. Short circuit proof, all outputs switch off if overloaded
Output current	150 mA per data output (average) Max. 600 mA per group of 4 outputs Groups: 1/2/3/16, 17/18/31/32, 4/5/6/19, 20/21/34/35 Control outputs current: max. 20 mA Data and control inputs resistance: typically 74 kΩ
Ambient conditions	
Operating temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Storage temperature	248 Kelvin ... 358 Kelvin (-25 °C ... +85 °C)
Climatic conditions	max. 75 % relative humidity
Protection class per EN 60529	IP20
Mechanical:	
Construction	K-system, 100 mm (5 TE)
Mounting	By snapping on to DIN 46277 rail or by screws through extendable tabs (per DIN 43602)
Housing material	Makrolon 6485
Flammability class	UL94
Electrical connection	Self-opening connection terminals, max. conductor csa 2 x 2.5mm²

Control Unit IVI-KHD2-4HD1



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Control unit IVI-KHD2-4HD3

This control/interface unit enables bit patterns of 8 bits in the data carrier to be programmed or read. When programming, the inputs/outputs are switched as inputs to which the bit pattern (I/O CTRL=1) that is to be programmed is applied. The desired read head number is preset on the intputs I/O 15 and I/O 16 (0 0 corresponds to read head 1, 0 1 corresponds to read head 2, etc.). The programming sequence is initiated via the programming input. The data carrier must be in front of the selected read head. When reading, the inputs/outputs are switched as outputs. If a data carrier is positioned in front of a connected read/write head, the data carrier is read and the bit pattern is switched to the outputs I/O 1 … I/O 8. The number of the read head that has carried out the read operation is output via outputs I/O 15 and I/O 16.

Usage and connection of the read/write heads

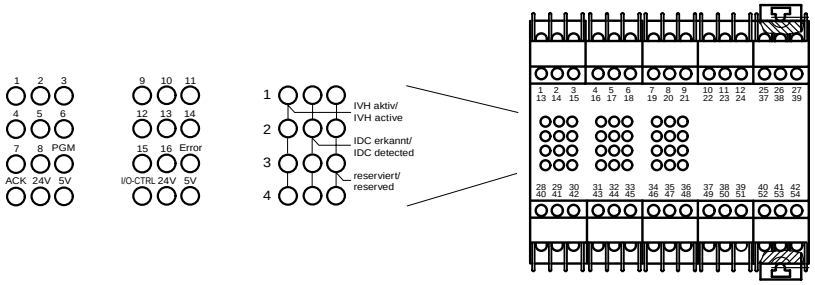
The operating voltage DC 18 V ... 30 V must be connected in three places (terminals 48, 51, 60 = GND; terminals 47, 50, 59 = +). The operational status of the identification block is indicated by 2 green LEDs (5 V each). The status for each of the two data input/output blocks is indicated by a green LED (24 V each).
The 4 read/write heads are connected according to the above diagram. The green LEDs (IVH 1 ... 4) indicate the readiness of the connected heads.

Attention! This interface should only be used with the following read/write heads:
IVH-18GM-V1
IVH-30GM-V1
IVH-30GM-EXM
IVH-M1K
IVH-FP1
IVH-F61

Serial interface

The connections of the RS422 interface shown in the wiring diagram are meaningless to the user. They are used for in-house testing.

Visual indicators



There are 3 indicator fields on the faceplate, each with 12 LEDs. The **right** field shows the status of the 4 read/write heads (IVH 1 ... 4); each head is assigned 3 LEDs. The green LEDs indicate whether the corresponding head is on (IVH active). A yellow LED indicates when a program, write or read sequence has been successfully completed (IDC detected). The red LEDs (reserve function) are for future functions.

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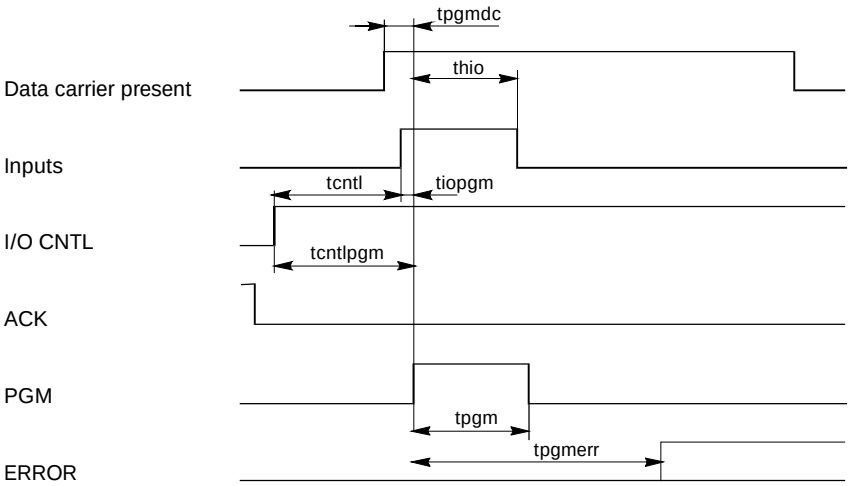
The **left** and **middle** indicator fields show the status of both input/output blocks:
The yellow LEDs (1 ... 16) signal a high level on the respective data input/output lines.
The two green LEDs (5 V) and (24 V) indicate the status of the identification block and the input/output end levels.
4 LEDs display the high levels of the control lines in the middle field:
Yellow, (PGM) programming input.
Yellow, (ACK) acknowledgement input.
Yellow, (I/O CNTL) direction control input (high = input/data carrier programming)
Red, (ERROR) error output.

Programming/writing to a data carrier

If the direction control input is set to logic 1, the inputs/outputs are switched as inputs. The programming of data carriers is now permitted. The bit pattern that is to be programmed is applied to these 8 inputs (I/O 1 ... I/O 8). The programming sequence is started by changing the logic state from 0 to 1 at the programming input. At the selected read/write head, an attempt is now made to program a data carrier (via I/O 15, I/O 16). If a data carrier has been successfully programmed, the programming sequence is terminated. If the result of the attempt is negative, the error output is set. The signal at the programming input must remain on logic 1 for at least 100 µs to be detected with certainty. The programming takes approx. 100 ms.

Data carrier programming:



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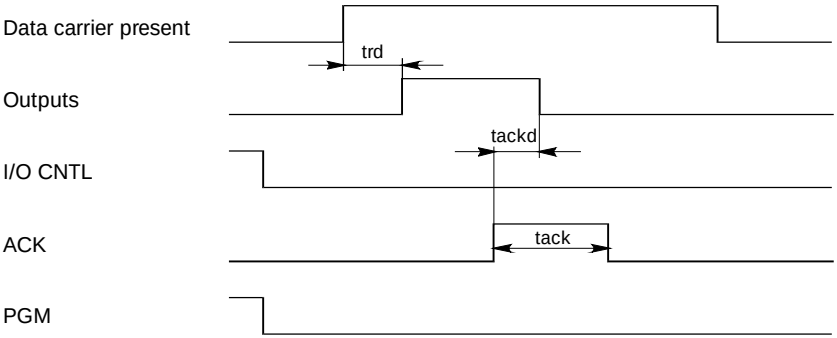
	min.	max.	Units	Description
tcntl		40	ms	I/O CNTL = 1 until outputs high resistance
tpgm	100		µs	Pulse duration PGM
tpgmdc	0		ms	IDC in write range until PGM = 1
tioprm	0		ms	Inputs active until PGM = 1
thio	100		µs	Holding time input data after PGM = 1
tcntlpgm	40		ms	I/O CNTL = 1 until PGM = 1
tpgmerr		100 + tpgm	ms	PGM = 1 until ERROR = 1

Data carrier information
The programmed 8 bits are programmed in the first byte of the data carriers. For safety, 8 bits are deposited inverted in the following byte. On reading, the two bytes are compared. If they are not identical, the error output is set (and the output I/O 10).

Read data carrier
After the interface unit has been switched on and if the direction control input is on logic 0, all connected read/write heads are activated and the read attempt starts. When a data carrier is read, the 8 bits that have been read are output at the inputs/outputs I/O 1 ... 8, the read head numbers I/O 15 and I/O 16 are output and the acknowledge input is interrogated. As long as a data carrier is in the read range, I/O 9 is set to 1. After the read operation, the connected control accepts the data and confirms the acceptance by setting the acknowledge input to logic 1 for at least 100 ms. The inputs/outputs are then switched to logic 0 again.

Data carrier information
The 8 bits are read from Byte 0.



	min.	max.	Units	Description
trd		40	ms	IDC in read range until output set
tack	40		ms	Pulse duration ACK
tackd	3	40	ms	ACK =1 until outputs reset

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Data lines

Data output (I/O CNTL = low)

The output drivers are short circuit proof (all outputs are switched off by an overload) and at logic 1 the output is combined with the positive supply voltage of the input/output switches minus the voltage drop (positive switching).

Data input (I/O CNTL = high, LED)

The input voltage range 0 V ... 7 V means logic low and the range 13 V ... 30 V means logic high.

Control lines

An open input or voltage range 0 V ... 7 V means logic low and 13 V ... 30 V means logic high.

Direction control input (I/O CNTL)

The direction control input determines whether the inputs/outputs are switched to the input or output position. All inputs/outputs are configured as outputs in a logic low state (during read sequence). In a logic high state all data is deleted and the inputs/outputs are switched to inputs (during program sequence).

Program input (PGM)

A change from logic 0 to logic 1 starts the program sequence. This input is buffered so that push buttons may also be used.

Acknowledgement input (ACK)

The acknowledgement input is at logic 0 when inactive. During the read data carrier sequence, the main control acknowledges the data transfer from the 8 outputs by applying logic 1 to this input. An error signal at the error output is acknowledged and reset in the same manner.

Error output (ERROR)

It can be used for an error control input of PLC and remains active until the acknowledgement input is set to high.

The following situations cause the error output to be switched:

1. General
   – If no head is found during intialization.
   – If a head fails during operation.
   – If an output is short circuited.
2. Reading
   – If a new data carrier is read before the previous bit pattern has been acknowledged.
3. Programming
   – If no data carrier was found.
   – If a detected data carrier is unable to be successfully programmed after 3 attempts.

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Notes

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One Company, Two Divisions.

Factory Automation Division

Product Range

- Digital and analogue sensors
- in different technologies
  - Inductive and capacitive sensors
  - Magnetic sensors
  - Ultrasonic sensors
  - Photoelectric sensors
- Incremental and absolute rotary encoders
- Counters and control equipment
- Identification Systems
- AS-Interface

Areas of Application

- Machine engineering
- Conveyor or transport
- Packaging and bottling
- Automotive industry

Process Automation Division

Product Range

- Signal conditioners
- Intrinsically safe interface modules
- Remote Process Interface (RPI)
- Intrinsically safe field bus solutions
- Level control sensors
- Process measuring and control systems engineering at the interface level
- Intrinsic safety training

Areas of Application

- Chemical industry
- Industrial and community sewage
- Oil, gas and petrochemical industry
- PLC and process control systems
- Engineering companies for process systems

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