Manual

IVI-KHD2-4HD1

Control Unit
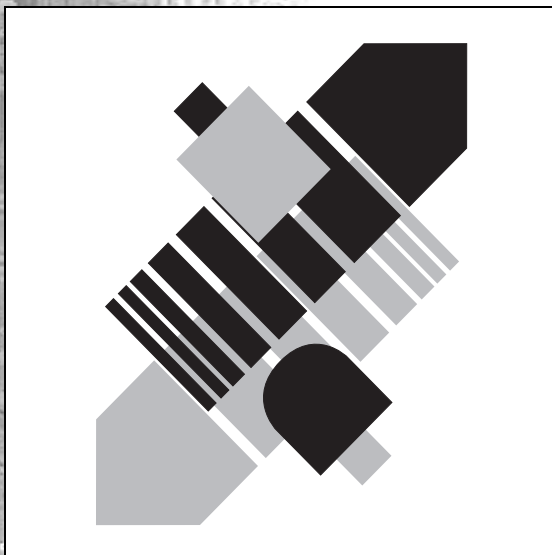
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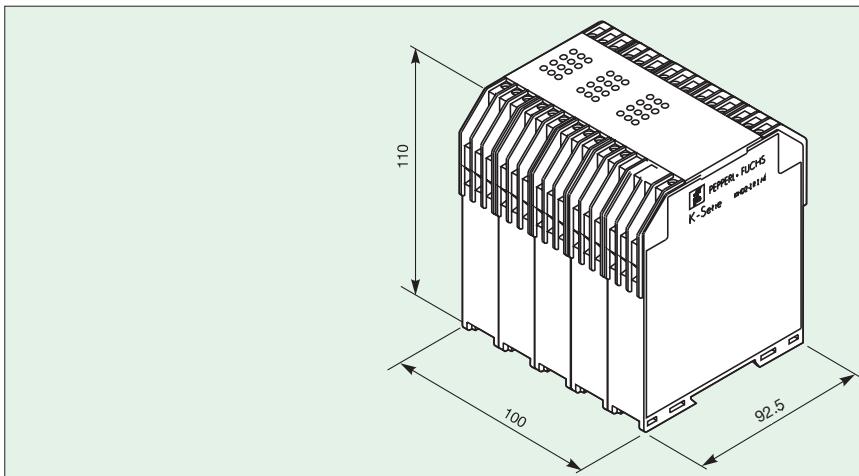
| Model Number	IVI-KHD2-4HD1
Technical Data:	
Number of Read/Write Heads	1 ... 4
Data leads	16 binary inputs/outputs (I/O)
Control leads	Direction control input (I/O CNTL)
	Programming input (PGM)
	Acknowledgement input (ACK)
	Error output (ERROR)
Visual indicators	Power supply: green LED
	Inputs/outputs supply: 2 green LEDs
	Read head active: 4 green LEDs
	Read/write operation successful: 4 yellow LEDS
	Inputs/outputs: one yellow LED for each input/output
	Direction control input: yellow LED
	Programming input: yellow LED
	Error: red LED
Electrical Data	
Supply voltage	18 ... 30 V = residual ripple $\leq$ 10 % (terminals 59 and 60)
	18 ... 30 V = residual ripple $\leq$ 10 % (terminals 47 and 48)
	18 ... 30 V = residual ripple $\leq$ 10 % (terminals 50 and 51)
Current consumption	at 24 V = at terminals 59 and 60
	70 mA quiescent
	150 mA in operation (one read head active, all outputs switched)
	load currents at the outputs flow via terminals 47/48 and 50/51.

Inputs and Outputs	Input voltage 0 ... 7 V corresponds to logic 0
	Input voltage 13 ... 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	Average 600 mA per group of 4 outputs
	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 kOhm
Environmental conditions	
Operating temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Storage temperature	248 Kelvin ... 358 Kelvin (-25 °C ... +85 °C)
Moisture	max. 75 % relative humidity
Protection class per DIN 40050	IP20
Mechanical:	
Construction	100 mm wide terminal housing
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 instrument terminals, max. conductor csa 2 x 2.5mm^2

Control Unit IVI-KHD2-4HD1
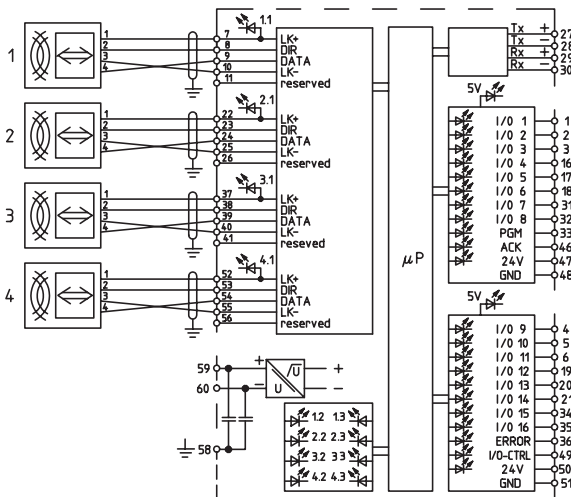
Control Unit IVI-KHD2-4HD1

The read/write cControl Interface is contained in a terminal housing to which 4 read heads can be attached. It controls the reading, writing and error detection for the data carriers. The bit pattern for 16 parallel inputs is written to the data carrier by the program sequence. For 16 parallel outputs, the bit pattern is read from the data carrier by the read sequence. Control inputs are provided to set input or output and control data transfer. For acquiring data from discrete output devices (i.e., sensors or switches), I/O's are changed to inputs and the discrete data is stored on the data carrier. To control discrete input devices (i.e., valves, signal equipment), I/O's are changed to outputs and the control data is read from the data carrier and transferred to the outputs.

Usage and Connection of the Read/Write Heads

The operating voltage DC 18 ... 30V 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 (5V each). The status for each of the two data input/output blocks is indicated by a green LED (24V 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.
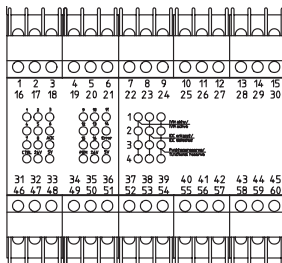
Attention! This interface should only be used with the following read/write heads:
IVH-18GM-V1
IVH-30GM-V1
IVH-30GM-EXM
IVH-M1K
IVH-FP3

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.
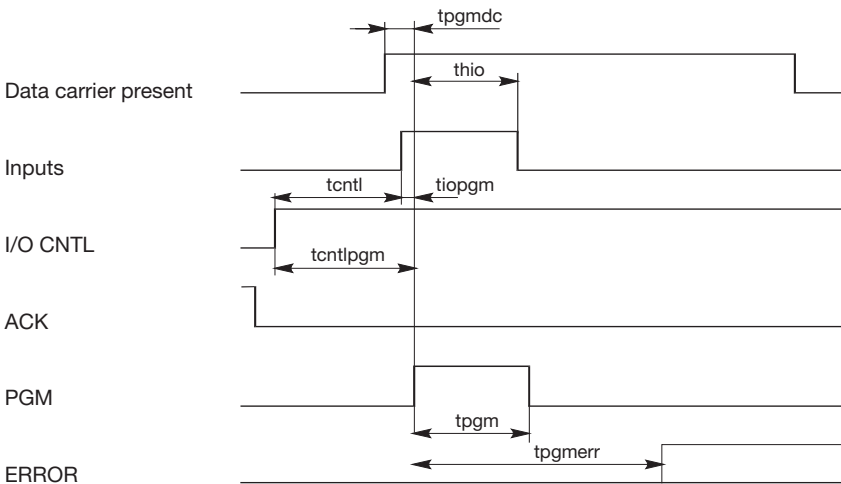
The **left** and **middle** indicator fields show the status of both input/output blocks:
The yellow LEDs (1 ... 16) signal a high level on the respective data input/output lines.
The two green LEDs (5 V) and (24 V) indicate the status of the identification block and the input/output end levels.
4 LEDs 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

The 16 binary inputs/outputs are switched to inputs. The bit pattern (information from sensors, switches or the outputs of plc) is accepted by the control interface unit through these 16 inputs in order to program the data carrier. The control interface unit makes a program attempt at the first connected read/write head. If a data carrier is recognized and successfully programmed, the program sequence is terminated. Otherwise the programming attempt continues with the next read/write head until successful. If all attempts are unsuccessful, then the error output is set.

The programming of data carriers is possible when a read/write head recognizes a data carrier and the direction control input is set to logic 1 (inputs/outputs are switched to inputs). The program sequence is initiated by a change of logic 0 to logic 1 at the program input. The signal must be consistent for at least 100μs in order to be properly recognized. The programming requires 150ms per read/write head, for a total of 600ms with 4 heads connected.

Data Carrier Programming:

Data carrier present
Inputs
I/O CNTL
ACK
PGM
ERROR

tpgmdc
thio
tcntl
tiopgm
tcntlpgm
tpgm
tpgmerr

Pepperl+Fuchs Group · Tel.: (6 21) 7 76-11 11 · USA (3 30) 4 25 35 55 · Singapore 7 79 90 91 · Internet http://www.pepperl-fuchs.com

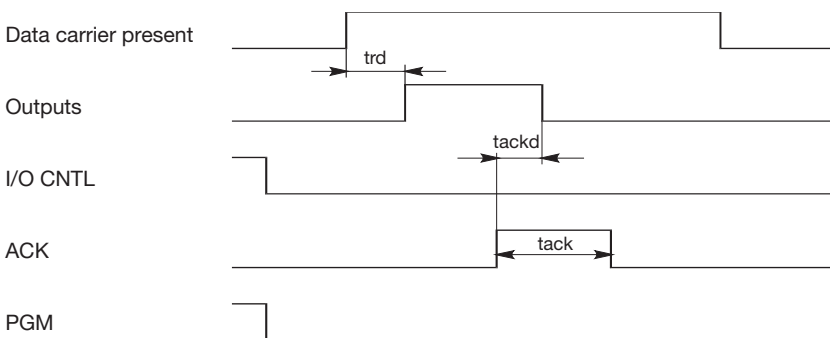|	min.	max.	Units	Description
tcntl		40	ms	I/O CNTL = 1 until outputs high resistance
tpgm	100		µs	Pulse duration PGM
tpgmdc	0		ms	IDC in write range until PGM = 1
tioprm	0		ms	Inputs active until PGM = 1
thio	100		µs	Holding time input data after PGM = 1
tcntlpgm	40		ms	I/O CNTL = 1 until PGM = 1
tpgmerr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

Data Carrier Information
The 16 bits are programmed into the 0 and 1 bytes of the data carrier. For self-checking, the 16 bits are inverted in the subsequent two bytes.

Read Data Carrier

The data inputs/outputs are switched to outputs when the direction control input is at logic 0. The control interface unit activates all connected read/write heads and initiates read attempts in succession. The bit pattern is sent to the 16 parallel outputs once a head registers a data carrier. The main control must confirm the transfer of data through activators, signal equipment or controllers. It sets the acknowledgement input to logic 1 for at least 40ms. The control interface unit reacts to the acknowledgement by resetting all inputs/outputs to logic 0.

If another data carrier is read before acknowledgement of the data by the control, the control interface then sets the error outputs and terminates the read sequence. The bit pattern of the last data carrier read is only switched to the outputs after acknowledgement.

Data carrier present

Outputs

I/O CNTL

ACK

PGM

	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

Data Carrier Information
The 16 bits are read from bytes 0 and 1.

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 ... 7 V means logic low and the range 13 ... 30 V means logic high.

Control Lines
An open input or voltage range 0 ... 7 V means logic low and 13 ... 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 16 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.

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

Service Area

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