INSEVIS
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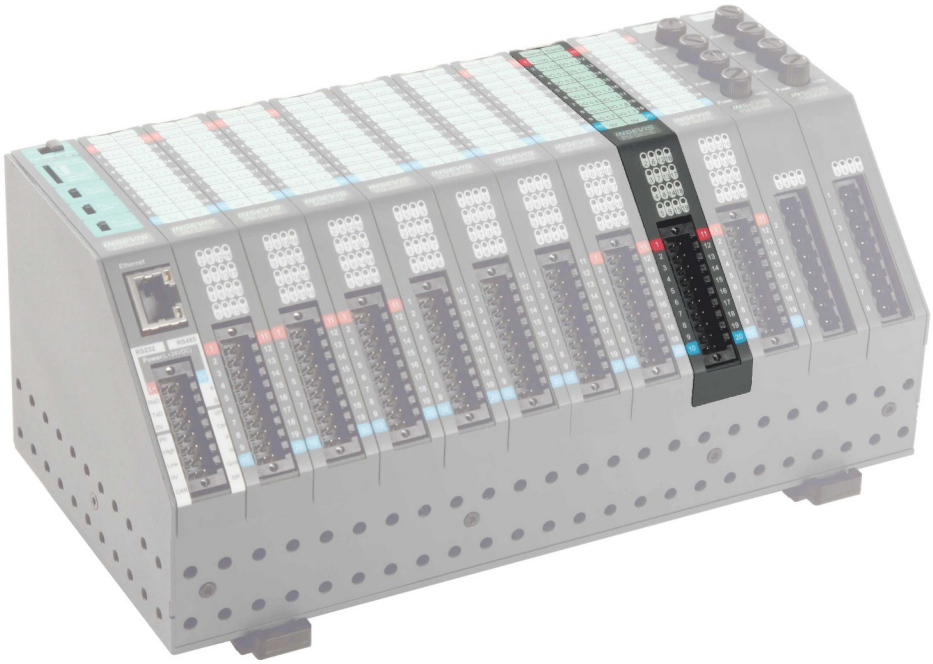
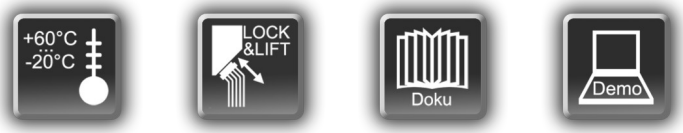
Product information

Periphery module

PM MIO84





Changes to older versions of this document

Rev. 1 → 2: red error flag of a Out deleted, resolution of a In now 12...16 Bit
Rev. 2 → 3: address range in process image corrected
Rev. 3 → 4: LED-references corrected in images
Rev. 4 → 5: Counter description (like PC351)
Rev. 5 → 6: digial input threshold voltage
Rev. 6 → 7: information for disposal of old equipment
Rev. 7 → 8: description for counter inputs improved

Description — for digital signals (2- and 3-/4-wire-switches)

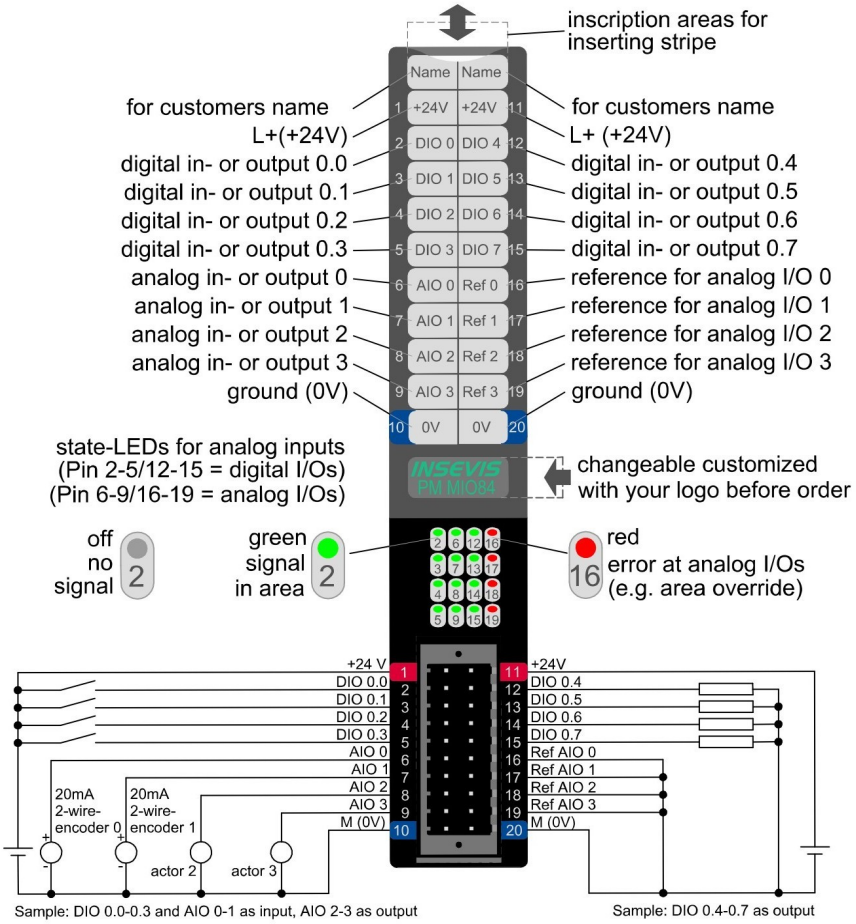
compact periphery module for

8 digital transistor outputs 24V with back-readable inputs

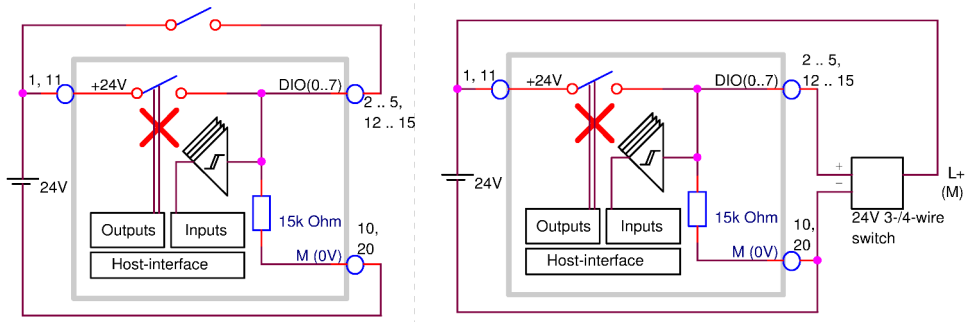
- green diagnostic LED for each in-/ output
- insertion stripe with description field for every signal
- cage-clamp connector with bolt flanges on side
- **Scope of delivery:**
  - technichal information
  - brief instruction

INSEVIS-benefit:

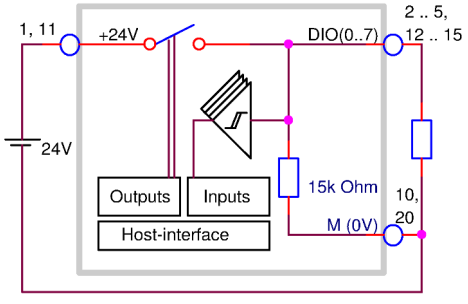
Each single outputs can be switched off, so that you can realize different ratios of I/Os e.g. 6dI and 2dO or 3dI and 5dO. Only the total sum of I/Os must be ≤8.



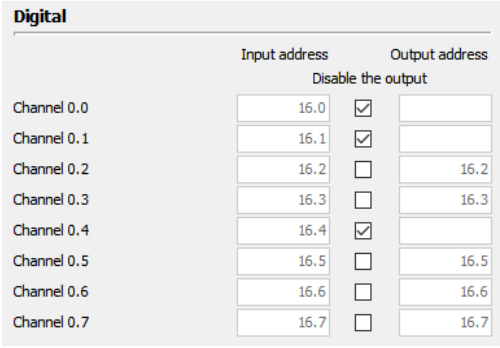
above: Description and wiring of MIO84 for 2-wire switches



above: Block diagram of digital inputs for 2-wire-switches (left) and 3-/4-wire-switches (right)



above: Block diagram of backreadable outputs



above: Configuration block of I/O-parametrizing in the ConfigStage

Description for analog inputs (2-wire-encoders)

- 4 analog in- or outputs configurable by software

Inputs:
- 0..10V, 0 (4)..20 mA for 2-wire-encoders including encoder supply
- 4..20 mA or ±20 mA for 4-wire-encoders

Outputs:
- 0..10V
- 0 (4)..20 mA

- Resolution 12 …16 Bit (depending on integration time)

- green diagnostic-LEDs
  - LED 6 for A I/O 0
  - LED 7 for A I/O 1
  - LED 8 for A I/O 2
  - LED 9 for A I/O 3

- red diagnostic-LEDs for errors (override or short circuit on AI)
  - LED 16 for A I/O 0
  - LED 17 for A I/O 0
  - LED 18 for A I/O 0
  - LED 19 for A I/O 0

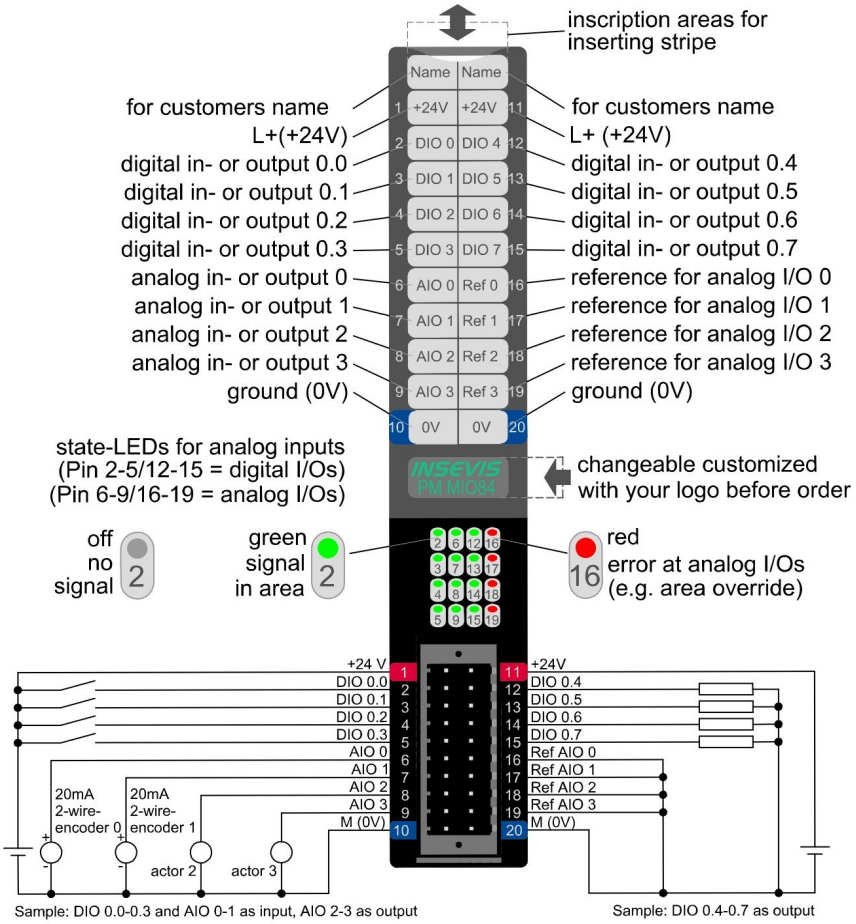
- insertion stripe with description field for every signal

- cage-clamp connector with bolt flanges on side

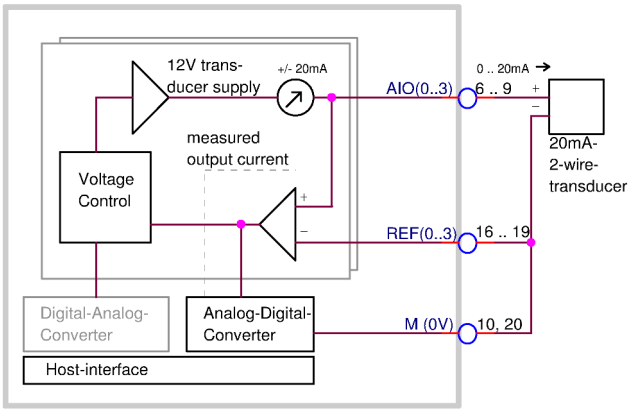
- **Scope of delivery:**
  - technichal information
  - brief instruction

Hint:
Connect Ref AIO 0..3 with ground (0V) always

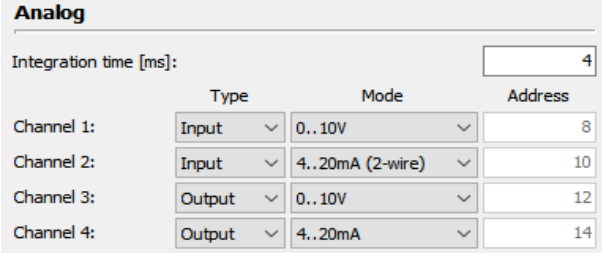
INSEVIS-benefit:
This module has an internal supply for the 2-wire encoders .
So it is not necessary to care for external supply!



above: Description and wiring of all connections of PM MIO84 with 2-wire encoders



above: Block diagram for 2-wire-encoders (0..20mA)



above: Configuration block of I/O-parametrizing in the ConfigStage

Description — for analog inputs (3-/4-wire-encoders)

- **4 analog in- or outputs configurable by software**

Inputs:
- 0..10V, 0 (4)..20 mA for 2-wire-encoders including encoder supply
- 4..20 mA or ±20 mA for 4-wire-encoders

Outputs:
- 0..10V
- 0 (4)..20 mA

- Resolution 12 …16 Bit (depending on integration time)

- green diagnostic-LEDs
  - LED 6 for A I/O 0
  - LED 7 for A I/O 1
  - LED 8 for A I/O 2
  - LED 9 for A I/O 3

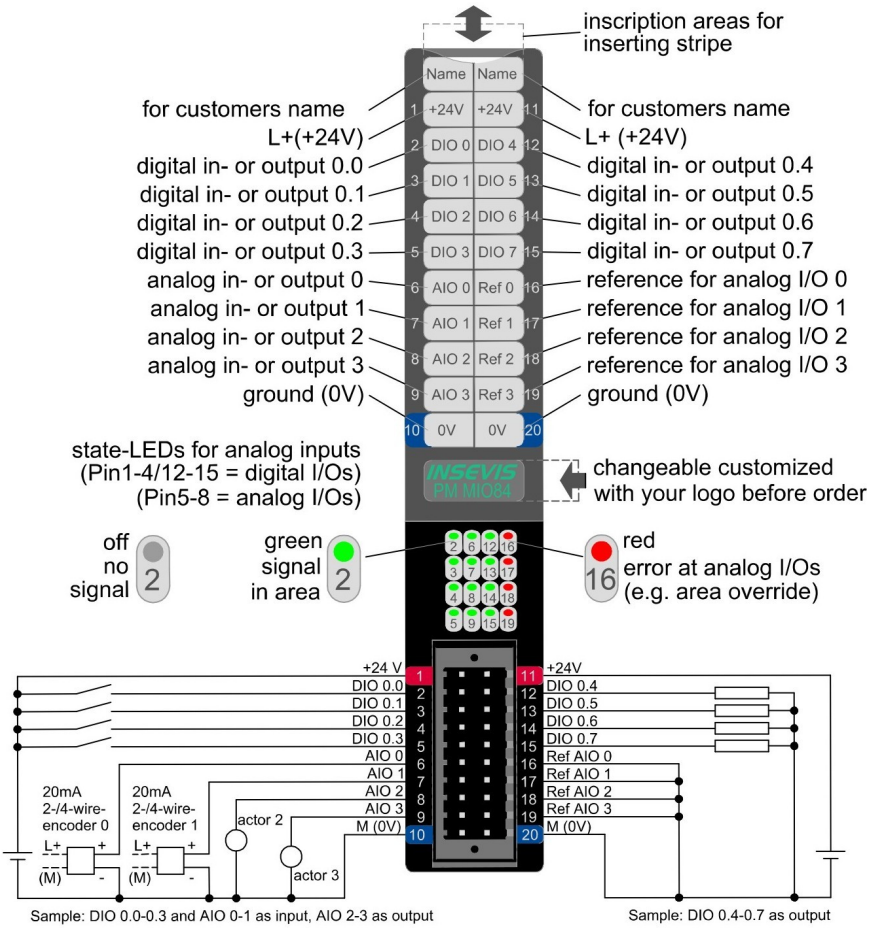
- red diagnostic-LEDs for errors (override or short circuit on AI)
  - LED 16 for A I/O 0
  - LED 17 for A I/O 0
  - LED 18 for A I/O 0
  - LED 19 for A I/O 0

- insertion stripe with description field for every signal

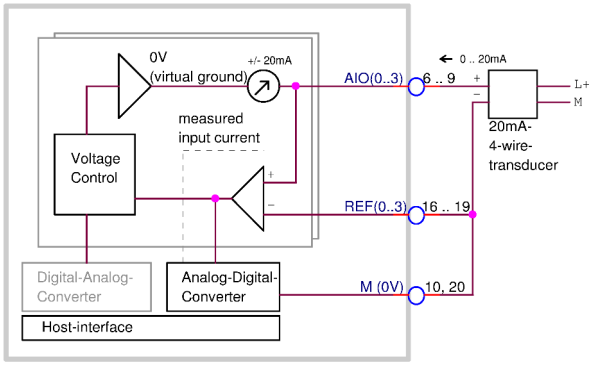
- cage-clamp connector with bolt flanges on side

- **Scope of delivery:**
  - technichal information
  - brief instruction

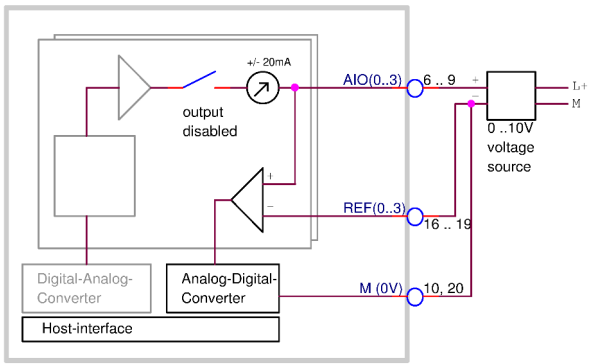
Hint:
Connect Ref AIO 0..3 with ground (0V) always



above: Description and wiring of all connections of PM MIO84 with 3-/4-wire encoders



left: Block diagram for 3-/4-wire-encoders (0...20mA)



left: Block diagram for 3-/4-wire-encoders (0...10V)

Description for analog outputs

- **4 analog in- or outputs configurable by software**

Inputs:
- 0..10V, 0 (4)..20 mA for 2-wire-encoders including encoder supply
- 4..20 mA or ±20 mA for 4-wire-encoders

Outputs:
- 0..10V
- 0 (4)..20 mA

- Resolution 12 …16 Bit (depending on integration time)

- green diagnostic-LEDs
  - LED 6 for A I/O 0
  - LED 7 for A I/O 1
  - LED 8 for A I/O 2
  - LED 9 for A I/O 3

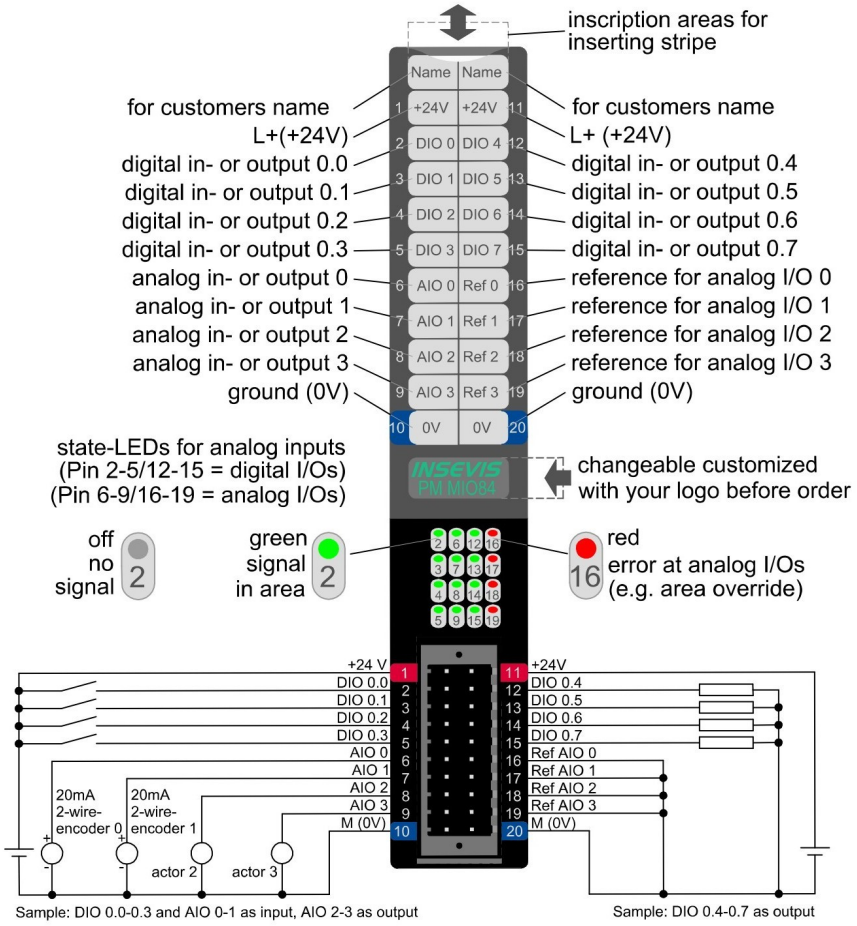
- red diagnostic-LEDs for errors (override or short circuit on AI)
  - LED 16 for A I/O 0
  - LED 17 for A I/O 0
  - LED 18 for A I/O 0
  - LED 19 for A I/O 0

- insertion stripe with description field for every signal

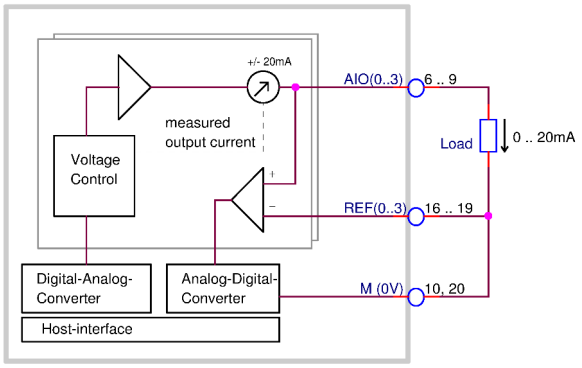
- cage-clamp connector with bolt flanges on side

- **Scope of delivery:**
  - technichal information
  - brief instruction

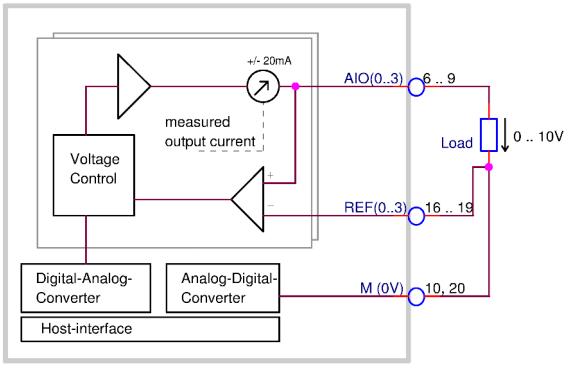
Hint:
Connect Ref AIO 0..3 with ground (0V) always



above: Description and wiring of all connections of PM MIO84 for analog outputs



left: Block diagram for analog outputs (0...20mA)



left: Block diagram for analog outputs (0...10V)

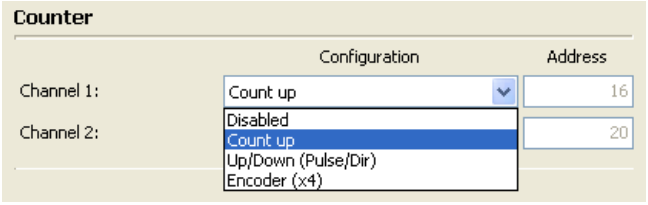
Configuration of the counter inputs

Counter Channel 1 (settings by ConfigStage)

Configuration **„counting forward (up)“**
→ rising edges at input DI 0.0 will be counted

Configuration **„counting for- / backwards (down)“**
→ rising edges at input DI 0.0 will be counted and
→ input DI 0.1 is used as direction bit
(0=backwards, 1=forward)

Configuration **„Encoder“**
→ inputs DI 0.0 and DI 0.1 represent the encoder interface with quadruple evaluation



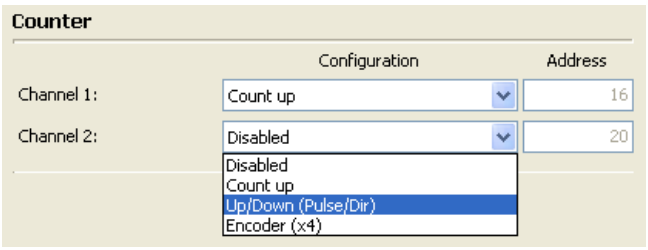
In " Address " the number of the input double word is displayed, which contains the counter value.

Counter Channel 2 (settings by ConfigStage)

Configuration **„counting forward (up)“**
→ rising edges at input DI 0.2 will be counted

Configuration **„counting for- / backwards (down)“**
→ rising edges at input DI 0.2 will be counted and
→ input DI 0.3 is used as direction bit
(0=backwards, 1=forward)

Configuration **„Encoder“**
→ inputs DI 0.2 and DI 0.3 represent the encoder interface with quadruple evaluation



In " Address " the number of the input double word is displayed, which contains the counter value.

Hints for usage of the counter inputs

All following addresses are specified as offset related to configured start address of the MIO84 module!

onboard:

- read in counter by reading of ED16 / ED20 (synchronous to control point)
- set counter by writing to PAD16 / PAD20 (by direct periphery access only)
- this configuration can be modified in runtime with Step7 too:

  configuration word for counter 1 is PAW24
  configuration word for counter 2 is PAW28

“inactive”	0x00
“counting forward / up”	0x01
“for- / backward (pulse, direction)”	0x02
“encoder (x4)”	0x03

decentral:

- read in counter by reading of ED12 / ED16 (synchronous to control point)
- direct periphery access is implemented for decentral periphery only for data which are mapped into the process image.
- to set counters or write configuration use CANopen objects via SDO access.

configuration word for counter 1	object index 0x3010 + slot-1, subindex 6
configuration word for counter 2	object index 0x3010 + slot-1, subindex 7
setpoint counter 1 (dw)	object index 0x3100 + slot-1, subindex 1
setpoint counter 2 (dw)	object index 0x3100 + slot-1, subindex 2

Technical data	digital in-/ outputs		
Load voltage L+ Power dissapation Connection technology	24V DC (10 V ... 30 V DC) internal limited cage clamp technology for cross section up to max. 1,5mm²	Wire length unshielded (max.) shielded (max.)	 30 m 100 m
Digital in- / outputs Diagnostic LEDs	8 in- or outputs 8, green	Outputs: switch on delay switch off delay Inputs: switch on delay switch off delay	 50 µs (typ.) 30 µs (typ., without load) 25µs
Output current for signal 0 for signal 1	 0,5 mA (max.) 0,5 A (max. to 60°C)	Max. switching frequency of outputs	100 Hz with ohmic load
Cumulated current	2 A (max. to 60°C)	Counter Frequency limit	2 each as forward counter, forward/backward counter or incremental encoder 10 kHz
Broken wire detection Error diagnostic Potential seperation to PLC	 no no	Signal level of outputs for signal 0 for signal 1 Signal level of intputs for signal 0 for signal 1	 1,0 V at 500 Ω (max.) L+ - 1,0 V at 0,5 A load (min.) 0V ... +5 V +10,5V ... +30 V

Technical data	analog in-/ outputs		
Load voltage L+	24V DC (17 V ... 30 V DC) connected by device supply	Wire length unshielded (max.) shielded (max.)	 30 m 100 m
Analog inputs Input areas	4 (alternatively to outputs what is to be configured by software) ±20 mA, 4...20 mA, 0..10 V	Valid voltage between inputs and A-GND (max.)	-1 V ... +24 V DC
Diagnostic LEDs	4 green: signal in valid area 4 red: override or saturation no displaying broken wires and open inputs	Error message during override metering area	adjustable diagnosis- and limit value alert on request
Value number format	9400 ... 6C00 (hexadecimal) for range ± 20 mA all other 0000 ... 6C00 (hexadecimal)	Broken wire detection	by overrun / shortfall of metering area
Override area	20 mA ... 22 mA 10V … 11,3 V	Acces of sensor	unsymetric against A-GND (single ended)
Imput resitance	0Ω (typ.) for metering area current 1MΩ (typ.) for metering area voltage	Metering priciple / conversion priciple Resolution	successive approximation 12…16Bit (depending on integration time assigned in ConfigStage)
Sampling cycle time = Integration time	adjustable 1ms ... 35767 ms default: 100 ms (=line frequency filter 50Hz and 60Hz)	Deviation (based on input area)	< 1%
Analog outputs Output area (nominal values)	4 (alternatively to inputs what is to be configured by software) 0(4)...20 mA, 0...10V	Value number format	0000 ... 6C00 (hexadecimal)
Resolution	15 Bit ΣΔ-Modulation	Short cut protection	yes
Diagnostic LEDs	4 green: signal in valid area 4 rot: override or Load error	Override area	20 ... 23 mA 10 ... 11,3 V
Setting time: response time τ (typ)	 1,5 ms	Short cut current (typ.)	20 mA (at 10V) 32 mA (at mA)
Load resistance against A-GND	mA: 500 Ω (max.) V: 1 kΩ (min.)	Deviation (based on output area)	< 1%

Configuration of the **process image onboard:**
module allocates 24 bytes of process data input and output.

Offset	I/O	Function	Description
0, 2, 4, 6	I	Input AI 0..AI 3	Measuring range according to configuration - in voltage output mode: measure of output current - in current output mode: measure of output voltage
0, 2, 4, 6	O	Output AO0..AO 3	Measuring range according to configuration - in input mode: ignored
8	I	Digital inputs .0 to .7	(**Byte** access)
8	O	Digital outputs .0 to .7	(**Byte** access)
9 … 15	I/O	Reserved	
16, 20	I/O	Counter 0, 1	Counter value (**DINT, DWORD** access)

Configuration of the **process image as decentral periphery:**
module allocates 20 bytes of process data input and 9 bytes of process data output.

Offset	I/O	Function	Description
0, 2, 4, 6	I	Input AI 0..AI 3	Measuring range according to configuration
0, 2, 4, 6	O	Output AO0..AO 3	Measuring range according to configuration
8	I	Digital inputs .0 to .7	(**Byte** access)
8	O	Digital outputs .0 to .7	(**Byte** access)
9 … 11	I	Reserved	
12,16	I	Counter 0, 1	Counter value (**DINT, DWORD** access)

Ordering data module

Identification	Order-no.	Packaging unit
Periphery module **MIO84**	PM-MIO84-02	PU: 1 piece
Connector 2x10pin with pin markings and bolt flanges on side	E-CONS20D-00	PU: 1 piece

Qualified personnel
All devices described in this manual may only be used, built up and operated together with this documentation. Installation, initiation and operation of these devices might only be done by instructed personnel with certified skills, who can prove their ability to install and initiate electrical and mechanical devices, systems and current circuits in a generally accepted and admitted standard.

Manuals, sample programs
Additional documentation by manuals is available as well sample applications at the download area of www.insevis.com in English language for free download.

Disclaimer
All technical details in this documentation were created by INSEVIS with highest diligence. Anyhow mistakes could not be excluded, so no responsibility is taken by INSEVIS for the complete correctness of this information. This documentation will reviewed regularly and necessary corrections will be done in next version. With publication of this data all other versions are no longer valid.

Disposal
Do not throw old appliances in the household waste! In the interest of environmental protection, old appliances must be collected separately from unsorted municipal waste. You can find out more about the proper disposal / return of your old appliance at www.insevis.com/disposal.
Attention: The deletion of personal data on the old devices to be disposed of is the responsibility of the end user.

With publication of this information all other versions are no longer valid.