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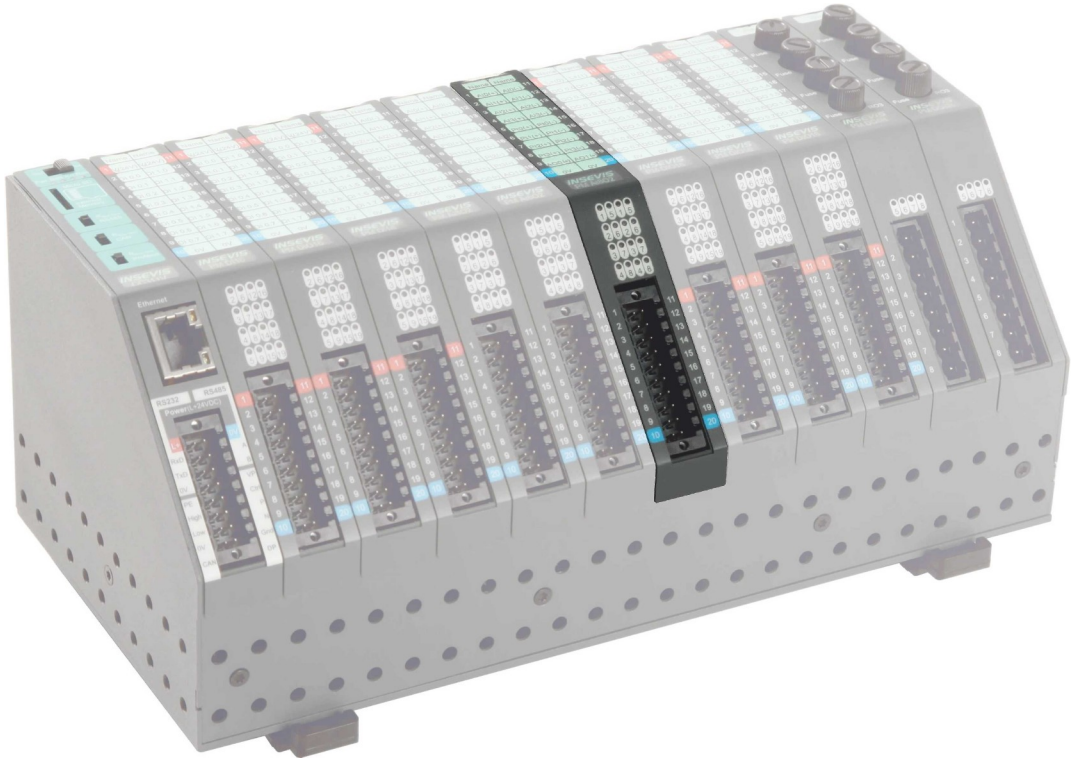
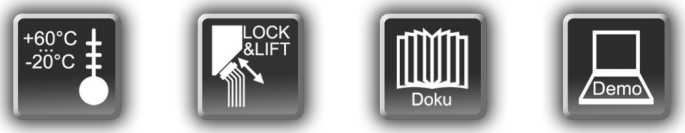
Product Information

Periphery module

PM AI4O4





(valid from 04/2012)

Changes to older versions of this document

Changed in Rev. 5: Increasement of the resolution of analog inputs by expanding the integration time
Changed in Rev. 6: Description of 3-/4-wire connections corrected (0V connected with Ref n)
Changed in Rev. 7: Connectors, new design line
Changed in Rev. 8: Information for disposal of old equipment

Description — for 2-wire encoders

compact periphery module for

- **4 analog inputs to be configured by software**
  0...20mA, 4...20mA, 0...10 V, ±10V, ±5V, ±2,5V

- **4 analog outputs to be configured by software**
  ± 20mA, 4...20mA, ±10V

- Resolution 12 Bit
- green diagnostic LED for each input
  - LED 1 for AI0
  - LED 2 for AI1
  - LED 3 for AI2
  - LED 4 for AI3
  - LED 5 for AO0
  - LED 6 for AO1
  - LED 7 for AO2
  - LED 8 for AO3
- red diagnostic LED for each input for error (sensor-/ broken wire detection)
  - LED 1 for AI0
  - LED 2 for AI1
  - LED 3 for AI2
  - LED 4 for AI3

  (or output error flag)
  - LED 5 for AO0
  - LED 6 for AO1
  - LED 7 for AO2
  - LED 8 for AO3
- Increasement of the resolution of analog inputs by expanding the integration time up to 16Bit
- insertion stripe with description field for every signal
- cage-clamp connector with bolt flanges on side

INSEVIS-benefit:

This module has an internal supply for the 2-wire encoders (4-20mA).
So it is not necessary to care for external supply!

If you use these pins 1-4, do not apply external encoder supply!

Always connect Ref0..3 with analog ground (0V)

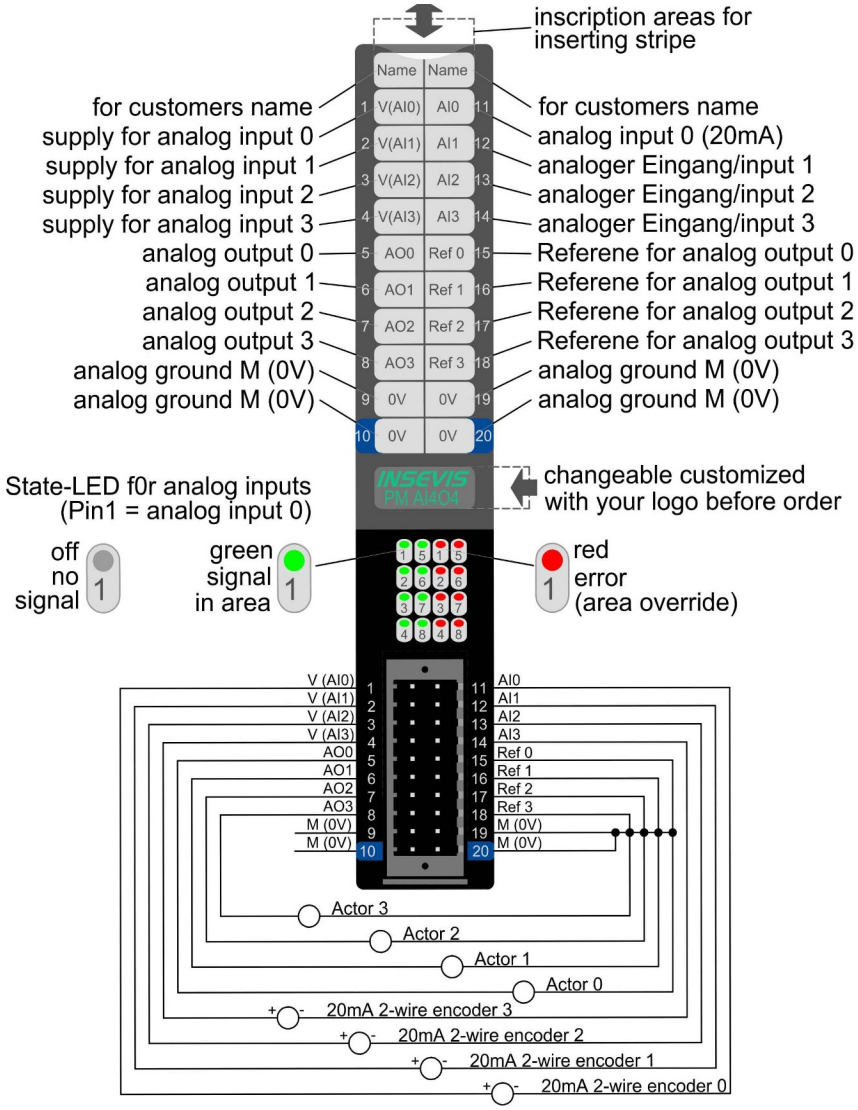


Figure above: Description and wiring of all connections of PM AI4O4 with 2-wire encoders

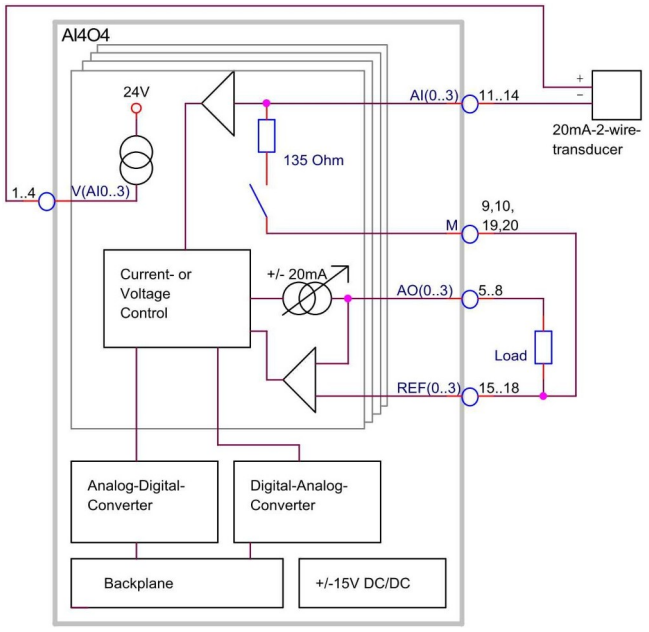


Figure above: Block diagram of PM AI4O4 with 2-wire encoders

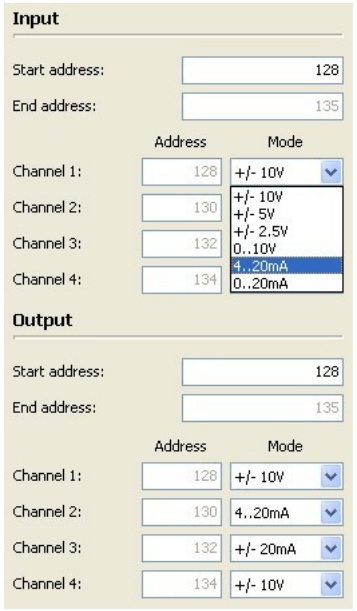


Figure above: configuration block of start-/end addresses of AI4O4-i/o´s (in words) in the ConfigStage

Description — for 3-/ 4-wire encoders or ±10V voltage source

compact periphery module for

- 4 analog inputs to be configured by software
0...20mA, 4...20mA, 0...10 V, ±10V, ±5V, ±2,5V

4 analog outputs to be configured by software
± 20mA, 4...20mA, ±10V

- Resolution 12 Bit
- green diagnostic LED for each input
  - LED 1 for AI0
  - LED 2 for AI1
  - LED 3 for AI2
  - LED 4 for AI3
  - LED 5 for AO0
  - LED 6 for AO1
  - LED 7 for AO2
  - LED 8 for AO3
- red diagnostic LED for each input for error (sensor-/ broken wire detection)
  - LED 1 for AI0
  - LED 2 for AI1
  - LED 3 for AI2
  - LED 4 for AI3

  (or output error flag)
  - LED 5 for AO0
  - LED 6 for AO1
  - LED 7 for AO2
  - LED 8 for AO3
- Increasement of the resolution of analog inputs by expanding the integration time up to 16 Bit
- insertion stripe with description field for every signal
- cage-clamp connector with bolt flanges on side

Attention!

This module has an internal supply for the 2-wire encoders (4-20mA).

Do not connect pins 1-4 when using 3/4-wire encoders!

Always connect Ref0..3 with analog ground (0V)

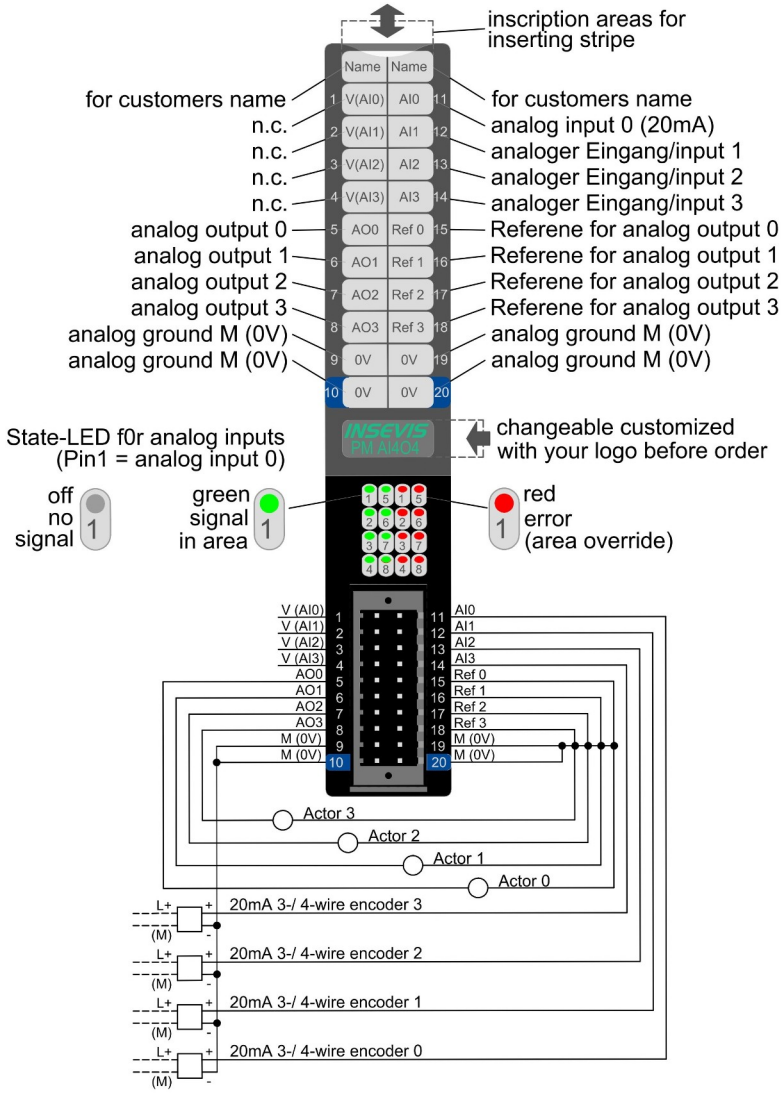


Figure above: Description and wiring of all connections of PM AI4O4 with 3-/ 4-wire encoders or ±10V

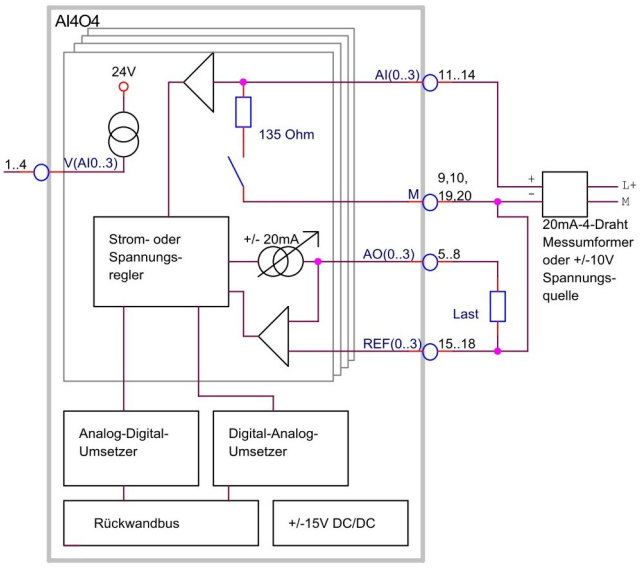


Figure above: Block diagram of PM AI4O4 with 4-wire encoders or ±10V voltage source

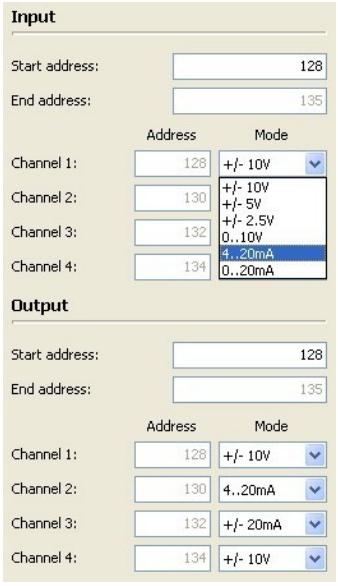


Figure above: configuration block of 3-/ start-/ end addresses of AI4O4-i/o´s (in words) in the ConfigStage

Technical data			
Operating temperature range Storage temperature range Dimensions W x H x D (mm) Weight	-20°C ... +60°C (without condens.) -30°C ... +80°C 20 x 108 x 70 mm ca. 150 g	Load voltage L+ Current consumption Power dissapation	24V DC (10V ... 30V DC, connected by device supply) 250 mA (max.) 4 W (max.)
Connection technology	connector with cage clamp technology for cross section up to max. 1,5mm²	Wire length unshielded (max.) shielded (max.)	 30 m 100 m
Analog inputs Input area (nominal values)	4 (to be configured by software) 0...20mA, 4...20mA ±10V, ±5V, ±2,5V, 0..10V	Valid voltage between inputs and A-GND (max.)	-15 V ... +24 V DC
Diagnostic LEDs	4 green: signal in valid area 4 red: override (mA) 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	0000 ... 6C00 (hexadecimal) for range mA and 0 ... 10V all other 9400 ... 6C00 (hexadecimal)	Broken wire detection	by overrun / shortfall of metering area
Override area	20 mA ... 22 mA (only at mAs)	Access of sensor	unsymmetric against A-GND (single ended)
Input resistance	150Ω (typ.) metering area current 100kΩ (typ.) metering area voltage	Metering principle / conversion principle Resolution depending on integration time *	successive approximation 12 Bit … 16 Bit
Sampling cycle time = Integration time *	adjustable 1ms ... 35767 ms default: 100 ms (=Net frequency filter 50Hz and 60Hz)	Specifity (based on input area)	< 1%
Analog outputs Output area (nominal values)	4 (to be configured by software) ±20mA , 4...20mA, ±10V	Value number format	0000 ... 6C00 (hexadecimal) for range mA and 0 ... 10V all other 9400 ... 6C00 (hexadecimal)
Resolution	12 Bit	Short cut protection	yes
Diagnostic LEDs	4 green: signal in valid area 4 rot: override (mA) or short circuit	Override area	20 ... 23 mA, -20 ... -23 mA 10 ... 11,3V, -10 ... -11,3V
Setting time: response time τ (typ)	 1,5 ms	Short cut current (typ.)	32 mA
Load resistance against A-GND	mA: 500 Ω (max.) V: 1 kΩ (min.)	Specifity (based on output area)	< 1%

*** Increasement of the resolution of analog inputs by expanding the integration time (configurable in ConfigStage at the PM-AI4O4 directly)**

for 0..10V:	0...16ms → 13Bit	17...64ms → 14Bit	65...256ms → 15Bit	
for 0(4)..20mA:	0...16ms → 12Bit	17...64ms → 13Bit	65...256ms → 14Bit	> 265ms → 15Bit
for ±2,5V, ±5V, ±10V:	0...16ms → 12Bit *(+sign)*	17...64ms → 13Bit *(+sign)*	65...256ms → 14Bit *(+sign)*	> 265ms → 15Bit *(+sign)*

Configuration of the process image Hardware version 2.0:

The module allocates 8 input words and 4 output words in the process image.

Offset	I/O	Function	Description
0,2,4,6	I	Input AI0..AI3	Measuring range according to configuration
0,2,4,6	O	Output AO0..AO3	Measuring range according to configuration
8,10, 12,14	I	State of the (backreadable) outputs AO0..AO3	.0 FCM Common-Mode Over-Range .1 FLD Load Error .2 FOT Over Temperature .15 ... .3 0 ... 6C00 (hex) at mA: output voltage 0 ... 10V at ±10V: output current 0 ... 20mA

Ordering data module

Identification	Order-no.	Packaging unit
Periphery module **AI4O4**	PM-AI4O4-02	PU: 1 piece
Connector 2x10pin with pin markings and bolt flanges on side	E-CONS20A-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.