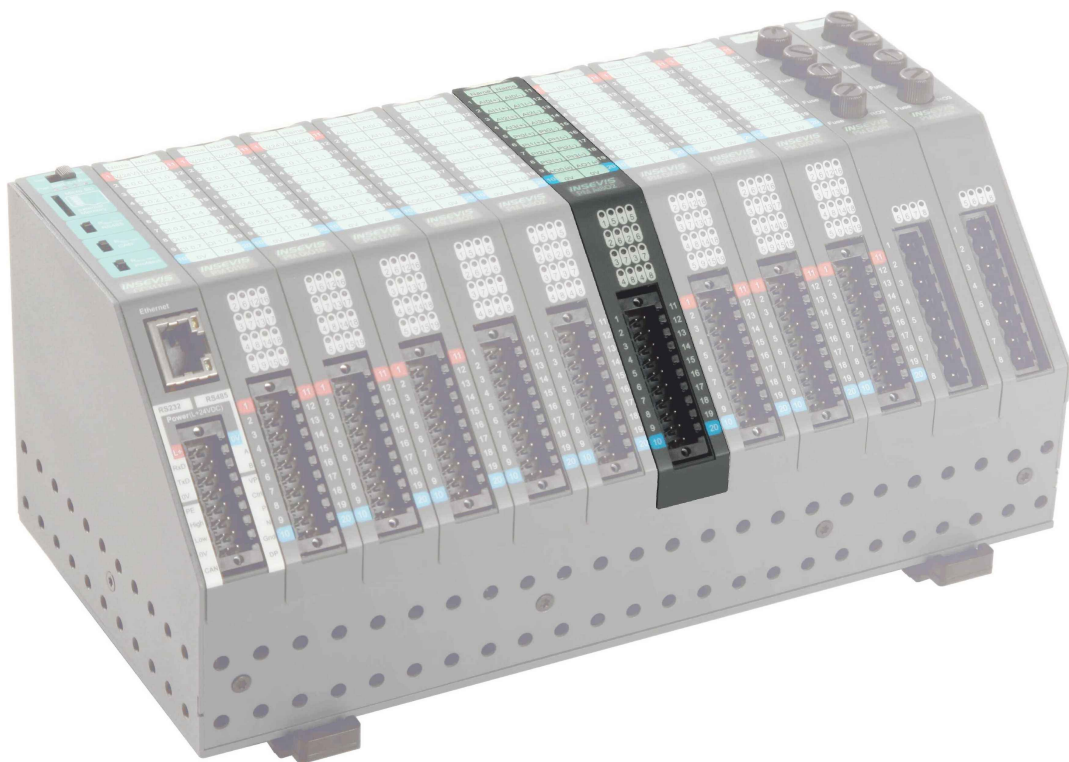**Product Information**

Periphery module

PM AI4O4

(valid from 04/2012, for all PLCs PC/CCxxxx-03 with OS 2.0.28 and with ConfigStage 1.0.13)

Description — for 2-wire encoders

compact periphery module for

- **4 analog inputs to be con-figured 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

- insertion stripe with description field for every signal

- cage-clamp connector with self-lock and 2 lift arms

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

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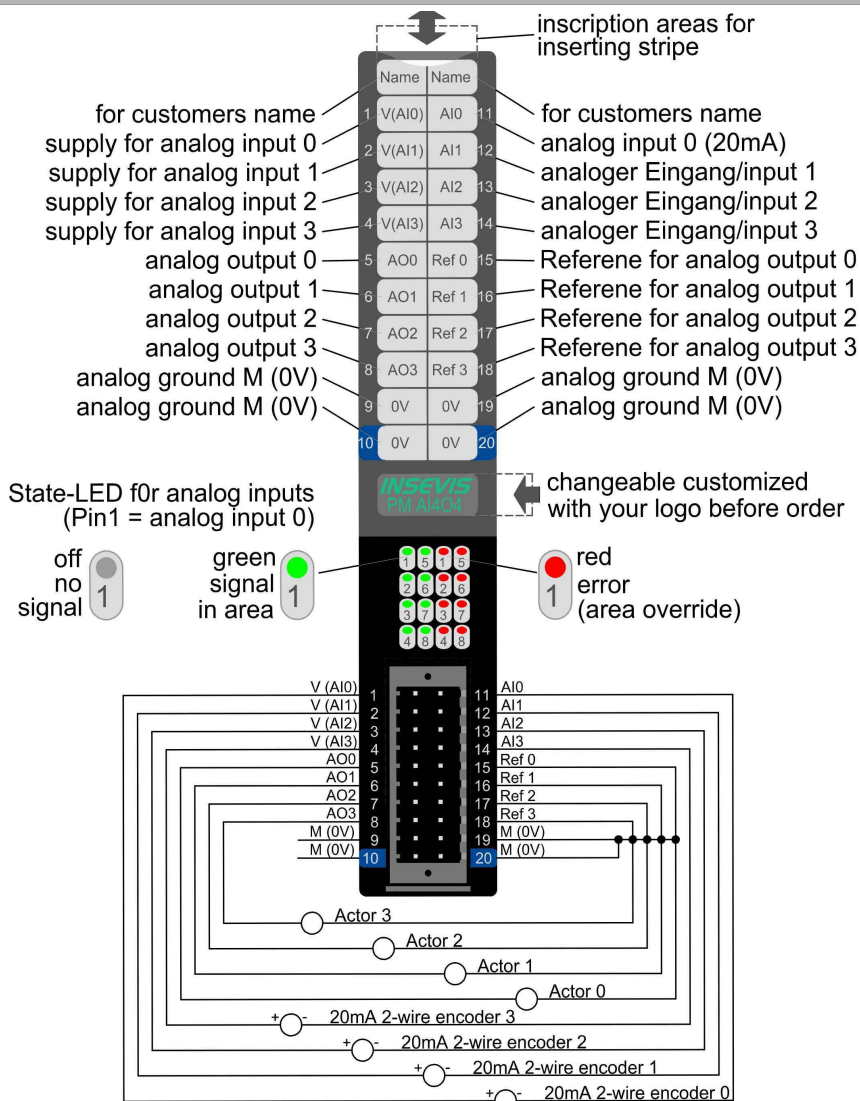So it is not necessary to care for external supply!

inscription areas for inserting stripe

for customers name
supply for analog input 0
supply for analog input 1
supply for analog input 2
supply for analog input 3
analog output 0
analog output 1
analog output 2
analog output 3
analog ground M (0V)
analog ground M (0V)

Name	Name
1 V(AI0)	AI0 11
2 V(AI1)	AI1 12
3 V(AI2)	AI2 13
4 V(AI3)	AI3 14
5 AO0	Ref 0 15
6 AO1	Ref 1 16
7 AO2	Ref 2 17
8 AO3	Ref 3 18
9 0V	0V 19
10 0V	0V 20

for customers name
analog input 0 (20mA)
analoger Eingang/input 1
analoger Eingang/input 2
analoger Eingang/input 3
Referene for analog output 0
Referene for analog output 1
Referene for analog output 2
Referene for analog output 3
analog ground M (0V)
analog ground M (0V)

INSEVIS PM AI4O4

changeable customized with your logo before order

State-LED f0r analog inputs
(Pin1 = analog input 0)

off no signal 1

green signal in area 1

red error (area override) 1

V (AI0) 1 — 11 AI0
V (AI1) 2 — 12 AI1
V (AI2) 3 — 13 AI2
V (AI3) 4 — 14 AI3
AO0 5 — 15 Ref 0
AO1 6 — 16 Ref 1
AO2 7 — 17 Ref 2
AO3 8 — 18 Ref 3
M (0V) 9 — 19 M (0V)
M (0V) 10 — 20 M (0V)

Actor 3
Actor 2
Actor 1
Actor 0
+ − 20mA 2-wire encoder 3
+ − 20mA 2-wire encoder 2
+ − 20mA 2-wire encoder 1
+ − 20mA 2-wire encoder 0

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

AI4O4
24V
AI(0..3) 11..14
20mA-2-wire-transducer
135 Ohm
1..4 V(AI0..3)
9,10, 19,20 M
+/- 20mA
Current- or Voltage Control
AO(0..3) 5..8
Load
REF(0..3) 15..18
Analog-Digital-Converter
Digital-Analog-Converter
Backplane
+/-15V DC/DC

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

Input

| Start address: | 128 |
| End address: | 135 |

	Address	Mode
Channel 1:	128	+/- 10V
Channel 2:	130	+/- 10V / +/- 5V / +/- 2.5V / 0..10V / 4..20mA / 0..20mA
Channel 3:	132	
Channel 4:	134	

Output

| Start address: | 128 |
| End address: | 135 |

	Address	Mode
Channel 1:	128	+/- 10V
Channel 2:	130	4..20mA
Channel 3:	132	+/- 20mA
Channel 4:	134	+/- 10V

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

- insertion stripe with description field for every signal

- cage-clamp connector with self-lock and 2 lift arms

INSEVIS-benefit:

This module has an internal supply for the 2-wire encoders.
So it is not necessary to care for external supply!
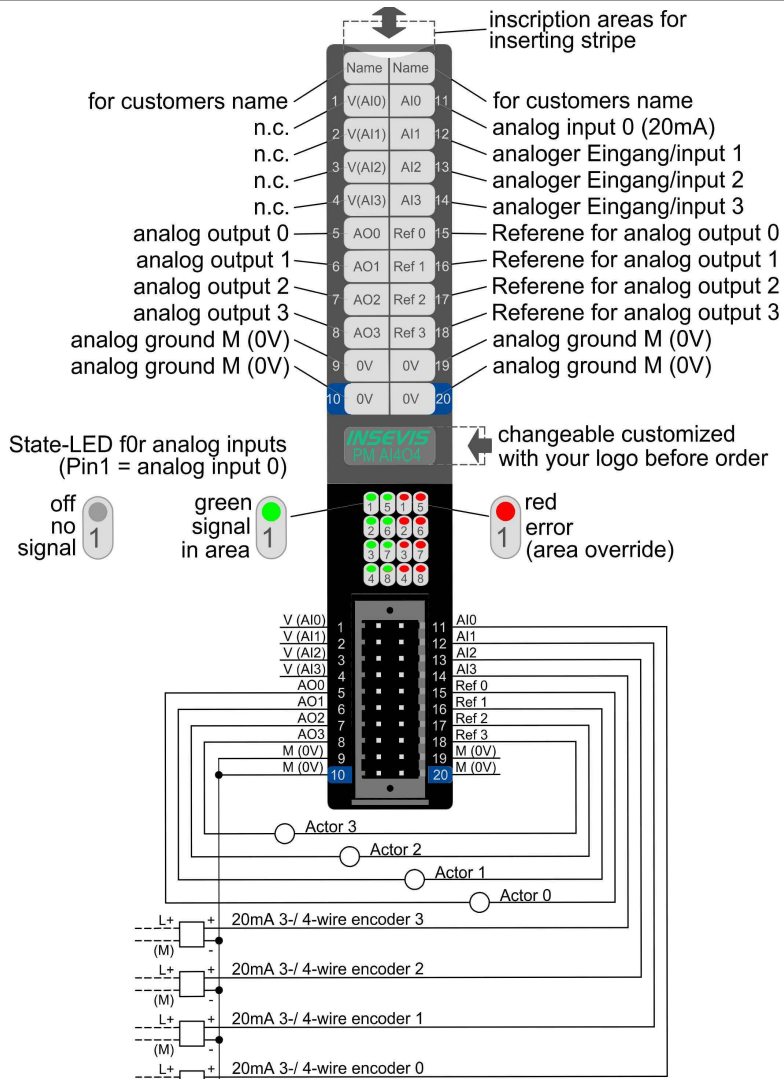
Figure above: Description and wiring of all connections of PM AI4O4 with 3-/ 4-wire encoders or ±10V
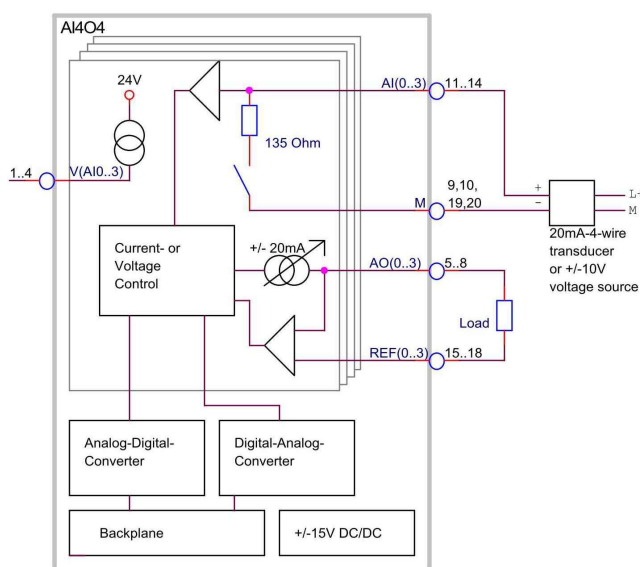
Figure above: Block diagram of PM AI4O4 with 4-wire encoders or ±10V voltage source

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	unlockable connector with self-lock and 2 lift-arms
	(cage clamp technology) for cross section up to max. 1mm^2
		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)	Acces of sensor	unsymetric against A-GND (single ended)
Input resistance	150Ω (typ.) metering area current 100kΩ (typ.) metering area voltage	Metering priciple / conversion priciple Resolution	successive approximation 12 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	ja
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
Resolution	12 Bit	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%

Configuration of 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
			  ati ±10V: output current 0 ... 20mA

Hardware version 2.0:
The module allocates 8 input words and 4 output words in the process image.

Documentation and samples

	web:	www.insevis.com		web:	www.insevis.com
	register: download:	Products / Periphery TI-PM xxxx.pdf		register:	Service Periphery
	register: download:	Documentation Manual Periphery.pdf		It will be provided documented samples for all functions to be downloaded free of charge.	

Ordering data module

Identification	Order-no.	Packaging unit
Peripheriy module **AI4O4**	PM-AI4O4-02	PU: 1 piece

Ordering data accessoires

Identification	Order-no.	Packaging unit
Connector 2x10pin	E-CON20-00	PU: 1 piece
Inserting stripe for description fields, 2x11 fields *	E-LABES22-00	PU: 20 pieces
Inserting stripe V for logo and identification for rear side	E-LABV-00	PU: 100 pieces

* (1x already part of first deliveries scope)