

3.8.2 Four (two) analog inputs for resistance tests - EPM-S404

This module detects up to four analog control signals from the process level and transmits them to the higher-level bus system.

Features

- ▶ 4 analog inputs (for 2-wire technology) or 2 analog inputs (for 3- and 4-wire technology)
- ▶ For resistance-type sensors 0 ... 3000 and resistance temperature sensors Pt100, Pt1000, Ni100 or Ni1000
- ▶ 16-bit resolution
- ▶ Signal function is parameterisable
- ▶ An LED indicates if an input voltage is outside the permitted measuring range



Stop!

Overvoltage at the inputs

The electronics of the electronic module are not protected against too high input signals.

Possible consequences:

- ▶ The module is destroyed

Protective measures:

- ▶ Make sure that the signals and encoders connected match the measuring range parameterised.

Overview

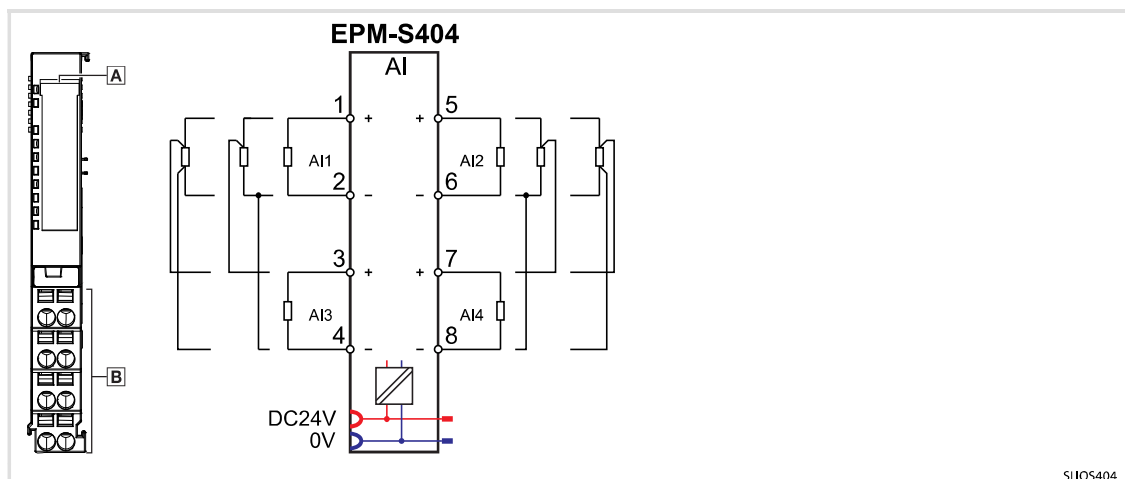


Fig. 3-55 Elements and circuit diagram


- Ⓐ Displays for module status
- Ⓑ Terminals
- 1 ... 8 Connection number

Product description

I/O compound modules - temperature measurement

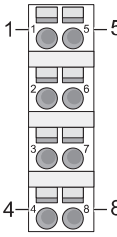
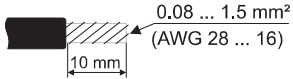
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Status displays

Module status LEDs ^A					
View	Pos.	Designation	Colour	Explanation	
	1	RUN	Green	On: Module is ready for operation (see following table)	
	2	MF	Red	On: Module error (see table below)	
	3	AI1	Red	On: Channel 1, signal outside the measuring range, parameterisation error, open circuit	
	4	AI2	Red	On: Channel 2, signal outside the measuring range, parameterisation error, open circuit	
	5	AI3	Red	On: Channel 3, signal outside the measuring range, parameterisation error, open circuit	
	6	AI4	Red	On: Channel 4, signal outside the measuring range, parameterisation error, open circuit	
	7				
	8				
	9	-	-	-	Not assigned
	10				

Messages of the status LEDs RUN and MF		
RUN	MF	Meaning
On	Off	Module status OK Bus communication is OK
On	On	Module reports error Bus communication is OK
Off	On	Module reports error Bus communication not possible
Off	Off	Error in the bus supply voltage
Blinking	Blinking	Configuration error (📄 274)

Terminals

Module terminals, spring terminals ^B			
View	Designation	Explanation	Terminal data
	1	Analog input AI1 (+)	
	2	Analog input AI1 (GND)	
	3	Analog input AI3 (+)	
	4	Analog input AI3 (GND)	
	5	Analog input AI2 (+)	
	6	Analog input AI2 (GND)	
	7	Analog input AI4 (+)	
	8	Analog input AI4 (GND)	



Note!

- ▶ Use parameter setting to deactivate unused inputs.
- ▶ If thermal detectors are connected in a 3-wire or 4-wire setup, channels 3 and/or 4 must be deactivated.
- ▶ The module does not provide any auxiliary supply for sensors.

2-wire, 3-wire, 4-wire measurement

From the above terminal assignment you can see how to connect your sensors for 2-wire, 3-wire or 4-wire measurement.

- ▶ All channels are suitable for 2-wire measurement.
- ▶ A 3-wire measurement is only possible on channels 1 and 2.
 - Please note that in the event of 3-wire measurement you always have to deactivate the corresponding channel by parameterisation. The corresponding channel of channel 1 is channel 3 and the one of channel 2 is channel 4.
 - Deactivate any unused channels by parameterisation.
- ▶ A 4-wire measurement is only possible on channels 1 and 2.
 - The measuring current for channel 1 is output at pins 1 and 2. The measurement for channel 1 takes place at pins 3 and 4. The analog value for channel 1 is represented in the input word 0.
 - The measuring current for channel 2 is output at pins 5 and 6. The measurement for channel 2 takes place at pins 7 and 8. The analog value for channel 2 is represented in the input word 1.
 - Please note that in the event of 4-wire measurement you always have to deactivate the corresponding channel by parameterisation. The corresponding channel of channel 1 is channel 3 and the one of channel 2 is channel 4.
- ▶ Use parameter setting to deactivate unused inputs.

Product description

I/O compound modules - temperature measurement
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Technical data

EPM-S404: Rated data	
Module identifier	1030 _{dec}
Current consumption/power loss	
Current consumption from backplane bus	75 mA
Power loss	1 W
Analog inputs	
Number of inputs	4
Cable length	
shielded	200 m
Load voltage	
Nominal value	DC 24 V
Current consumption from load voltage L+	30 mA (without load)
Resistor inputs	
Resistance ranges	0 ... 60 Ω 0 ... 600 Ω 0 ... 3000 Ω
Operational error limit	±□ 0.4 %
Basic error limit	±□ 0.2 %
Resistance thermometer inputs	
Resistance thermometer ranges	Pt100 Pt1000 Ni100 Ni1000
Operational error limit	±□ 0.4 %
Basic error limit	±□ 0.2 %
Measuring principle	Sigma-delta
Resolution	16 bits
Basic conversion time	4.2 ... 324.1 ms (50 Hz) per channel 3.8 ... 270.5 ms (60 Hz) per channel
Interference voltage suppression for a frequency of	> 80 dB at 50 Hz (UCM < 60 V)
Destruction limit (input voltage)	9 V
Temperature error (relating to input range)	±□ 0.005 %/K
Linearity distortion (relating to input range)	±□ 0.005 %
Repeat accuracy (in steady-state vibration at 25°C, relating to the input range)	±□ 0.05 %
Input data size	8 bytes

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EPM-S404: Rated data**Status, alarm, diagnostics**

Status display	Yes
Alarms	Yes, parameterisable
Process alarm	Yes, parameterisable
Diagnostic alarm	Yes, parameterisable
Diagnostic function	Yes
Diagnostic information can be read out	Possible
Module status	Green LED
Module error display	Red LED
Channel error display	Red LEDs per channel

Electrical isolation

Between the channels and the backplane bus	Yes
Between the channels and the voltage supply	Yes
Max. potential difference between inputs (U_{cm})	DC 6 V
Max. potential difference between the analog channel (e.g. input) and the I/O supply	DC 75 V / AC 60 V
Insulation checked with	DC 500 V