



## AIO202/SI, AIO204/SI, AIO208/SI Universal Analog Input/Output Modules

All conventional analog signals are measured or emitted by modules AIO202/SI, AIO204/SI and AIO208/SI. AIO202/SI has 2 channels, AIO204/SI has 4 channels and AIO208/SI 8 channels isolated compactly and individually in one module. A wide variety of sensors and actuators can be connected using standard current (0 to 20 mA and 4 to 20 mA) and voltage range ( $\pm 10$  V to 100 mV) signal types. A 16-bit resolution also enables measurements from signals that do not make full use of the measuring range (e.g. 0 to 5 V) at sufficiently higher resolution. Temperatures are playing a major role in more and more processes, which is why these modules support Pt100 in 2-, 3-, and 4-wire measurement, as well as all standard type thermoelements.

Input and output are available on every channel. If, for example, the voltage input is used in most instances, the free output as a secondary channel can be used for the current output, for instance, so that double the number of channels are available per module.

This enables virtually all analog signal measuring tasks to be covered easily in a single module instead of using many different modules for each signal type. An economical solution that simplifies logistics and service as well as enabling the flexible use of reserve resources.

Different modes can be combined and set easily using a configuration wizard in the SolutionCenter engineering tool.

Item	Item-No.
AIO202/SI	00023016-00
AIO204/SI	00023017-00
AIO208/SI	00023018-00
AIO208/SI CC	00026636-00

- 2 channels AIO202/SI, 4 channels AIO204/SI, 8 channels AIO208/SI
- Analog inputs or outputs
- Galvanically isolated by channel
- Modes that can be selected per channel:
  - Analog voltage input  $\pm 10$  V to 100 mV
  - Analog current input 4(0) to 20 mA,  $\pm 20$  mA
  - Temperature sensor Pt elements as 2-,3-,4-wire
  - Thermoelements type J, K, T, N, E, R, S, B
  - Analog voltage output  $\pm 10$  V
  - Analog current output 0(4) to 20 mA
- Resolution: input 16 bits, output 14 bits
- Filter adjustable from 4 kHz to 1 Hz per channel
- All outputs overload, short circuit and external voltage-proof
- Measuring range monitoring freely adjustable
- Error message on overload and overtemperature, undervoltage in the supply unit
- Galvanic isolation channel to channel and system 500 V

		AIO202/SI	AIO204/SI	AIO208/SI
<b>Inputs/Outputs</b>				
Quantity		2 channels	4 channels	8 channels
Modes per channel		Analog input		
		Temperature measurement input for Pt elements and thermo couples		
		Analog output		
SYNC signal	In	Analog input, temperature measurement		
	Out	Analog output		
<b>Analog inputs in general</b>				
Digital resolution		16-bit		
Measuring range		±105 % of nominal range		
Measuring range monitoring		Error interrupt/status message on undershoot or overshoot of the nominal range		
Measured value monitoring		Event interrupt/status message on undershoot or overshoot of an adjustable measuring range		
Allowed common mode voltage		Max. ±1 V between primary and secondary channel		
Refresh cycle time		100 µs standard		
Cut-off frequency (3 dB)		4 kHz to 0.5 Hz adjustable channel by channel		
Filtering slope		> 80 dB/decade		
<b>Voltage inputs</b>				
Input voltage		±10 V, ±1 V, ±100 mV nominal range		
Basic accuracy at 25 °C		Max. ±0.05 % FS		
<b>Current inputs</b>				
Input current at -30 to +60 °C		±20 mA or 0 to 20 mA or 4 to 20 mA		
Basic accuracy at 25 °C		Range ±20 mA: max. ±0.1 % FS Range 0 to 20 mA: max. ±0.2 % FS Range 4 to 20 mA: max. ±0.2 % FS		
Input impedance		Typ. 250 Ohm Max. 300 Ohm		
Shunt short-circuit proof		Up to +24 V		
Interference voltage strength		±24 V		
<b>Temperature inputs PTC</b>				
Temperature inputs PTC		Pt100		
Connection type		2-, 3- or 4-wire		
Input impedance		> 100 kOhm		
Temperature range		-100 to +800 °C		
Basic accuracy at 25 °C		Up to 300 °C ±0.15 %		
Value of the LSB		0.1 K		

		AIO202/SI	AIO204/SI	AIO208/SI
<b>Temperature inputs</b>				
Temperature elements		Types J, K, T, N, E, R, S, B can be selected		
Temperature ranges per type	J	-30 to +1200 °C		
	K	-30 to +1370 °C		
	T	-30 to +400 °C		
	N	-30 to +1300 °C		
	E	-30 to +1000 °C		
	R	-30 to +1768 °C		
	S	-30 to +1768 °C		
	B	+600 to +1820 °C		
Ground		Up to ±3 V allowed common mode voltage		
Basic accuracy at 25 °C		Input range max. ± 0.15 % of the measuring range (S, R, T, B max ± 0.3 %)		
Value of the LSB		0.1 K; measured values in 1/10 Kelvin		
<b>Analog outputs in general</b>				
Digital resolution		14-bit		
Output signal range		±105 % nominal range		
<b>Voltage outputs</b>				
Output voltage		±10 V		
Output current		Max. 10 mA (current-limited)		
Basic accuracy at 25 °C		Min. 1 kOhm, max. ±0.05 % of the output range		
<b>Current outputs</b>				
Output current		0(4) to 20 mA		
Basic accuracy at 25 °C		Max. ±0.2 % FS		
Apparent ohmic resistance		Up to 600 Ohm		
<b>Power supply</b>				
Supply internal		Via backplane BS2xx		
Current consumption internal		95 mA	100 mA	110 mA
Voltage range external		18 to 30 VDC		
Current consumption external 24 V		95 mA	160 mA	310 mA
Galvanic isolation system		500 V		
Galvanic isolation of channels		500 V		
<b>Approvals / Certificates</b>				
General		CE, cULus, CCC		
Marine		DNV GL, LR, ABS, BV		
<b>Ambient conditions</b>		<b>Standard</b>		<b>ColdClimate (❄)</b>
Operating temperature		-30 to +60 °C		
Rel. humidity operation		5 to 95 % without condensation	5 to 95 % with condensation	
Storage temperature		-40 to +85 °C		
Rel. humidity storage		5 to 95 % with condensation	5 to 95 % with condensation	
Pollution degree		2 (without condensation; according to IEC 60664-1)	2 (according to IEC 60664-1)	

Order Codes		
Item	Item No.	Description
AIO202/SI	00023016-00	Universal analog input/output module; 2x analog In $\pm 10V \pm 20mA$ 0/4 to 20mA Pt TC; 16bit; analog out $\pm 10V$ 20mA; 14bit; configurable analog filter; 100 $\mu s$ sample and refresh time; threshold monitoring; single isolated
AIO204/SI	00023017-00	Universal analog input/output module; 4x analog In $\pm 10V \pm 20mA$ 0/4 to 20mA Pt TC; 16bit; analog out $\pm 10V$ 20mA; 14bit; configurable analog filter; 100 $\mu s$ sample and refresh time; threshold monitoring; single isolated
AIO208/SI	00023018-00	Universal analog input/output module; 8x analog In $\pm 10V \pm 20mA$ 0/4 to 20mA Pt TC; 16bit; analog out $\pm 10V$ 20mA; 14bit; configurable analog filter; 100 $\mu s$ sample and refresh time; threshold monitoring; single isolated
AIO208/SI CC	00026636-00	Like AIO208/SI; ColdClimate (❄)
Accessories		
KZ-AIO208/SI B+C	00025859-00	Terminal set Phoenix cage clamp (8x KZ 35/05) with labeling strip
KZ-AIO204/SI B+C	00024832-00	Terminal set Phoenix cage clamp (4x KZ 35/05) with labeling strip
KZ-AIO202/SI B+C	00024831-00	Terminal set Phoenix cage clamp (2x KZ 35/05) with labeling strip