



AIO202/SI, AIO204/SI, AIO208/SI Universal analog input/output module

These modules enable the measuring or output of all standard analog signals. AIO202/SI offers 2 channels, AIO204/SI offers 4 channels and AIO208/SI 8 channels isolated compactly and individually in one module. The standard signal types for current (0 mA to 20 mA and 4 mA to 20 mA) and voltage ranges (± 10 V to ± 100 mV) allow the connection of a wide range of sensors and actuators. A 16 bit resolution makes it possible to also measure signals that do not fully utilize the measuring range (e.g. 0 V to 5 V) with a sufficiently high resolution. Temperatures are playing an important role in an increasing number of processes. These modules therefore also support Pt100 in 2-, 3- and 4-wire measuring circuits, as well as all standard thermocouples.

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. A cost-effective solution that simplifies logistics and service as well as enabling the flexible use of reserve resources.

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

Features

- 2 channels AIO202/SI, 4 channels AIO204/SI, 8 channels AIO208/SI
- Analog inputs and outputs
- Galvanically isolated by channel
- Modes that can be selected per channel:
 - Analog voltage input ± 10 V to ± 100 mV
 - Analog current input 0(4) mA to 20 mA, ± 20 mA
 - Temperature sensor Pt elements as 2-,3-,4-wire
 - Thermocouples type J, K, T, N, E, R, S, B
 - Analog voltage output ± 10 V
 - Analog current output 0(4) mA to 20 mA
- Resolution: 16 bit input, 14 bit output
- Filter adjustable from 4 kHz to 0.5 Hz per channel
- All outputs overload, short-circuit and external voltage-proof
- Measuring range monitoring freely adjustable
- Error message on overload, temperature rise and undervoltage of the supply
- Galvanic isolation channel to channel and channel to system 500 V

Part type designation	Part number
AIO202/SI	00023016-00
AIO204/SI	00023017-00
AIO208/SI	00023018-00
AIO208/SI CC	00026636-00

AIO202/SI, AIO204/SI, AIO208/SI

Inputs/Outputs		AIO202/SI	AIO204/SI	AIO208/SI
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		
Analog inputs in general				
Digital resolution		16 bit		
Measurement range		$\pm 105\%$ of nominal range		
Measurement 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		
Permitted common mode voltage		Max. ± 1 V between primary and secondary channel		
Refresh cycle time		100 μ s standard		
Cutoff frequency (3 dB)		4 kHz to 0.5 Hz adjustable channel by channel		
Filter slope		> 80 dB/decade		
Voltage inputs				
Input voltage		± 10 V, ± 1 V, ± 100 mV nominal range		
Accuracy at 25 °C		Max. $\pm 0.05\%$ FS		
Current inputs				
Input current at -30 °C to +60 °C		± 20 mA or 0 mA to 20 mA or 4 mA to 20 mA		
Accuracy at 25 °C		Range ± 20 mA: max. $\pm 0.1\%$ FS Range 0 mA to 20 mA: max. $\pm 0.2\%$ FS Range 4 mA to 20 mA: max. $\pm 0.2\%$ FS		
Input impedance		Typ. 250 Ω Max. 300 Ω		
Shunt short-circuit proof		Up to +24 V		
Overvoltage protection		± 24 V		
Temperature inputs				
Temperature inputs PTC		Pt100		
Bus interface		2-, 3- or 4-wire		
Input impedance		> 100 k Ω		
Temperature range		-100 °C to +800 °C		
Accuracy at 25 °C		Up to 300 °C $\pm 0.15\%$		
Value of LSB		0,1 K		
Temperature inputs TE				
Temperature elements		Types J, K, T, N, E, R, S, B can be selected		
Temperature ranges per type	J	-30 °C to +1200 °C		
	K	-30 °C to +1370 °C		
	T	-30 °C to +400 °C		
	N	-30 °C to +1300 °C		
	E	-30 °C to +1000 °C		
	R	-30 °C to +1768 °C		
	S	-30 °C to +1768 °C		

Temperature inputs TE			
	B	+600 °C to +1820 °C	
Ground		Up to ±3 V allowed common mode voltage	
Accuracy at 25 °C		Max. ±0.15% of input current range (S, R, T, B max. ±0.3%)	
Value of LSB		0.1 K; measured value in 1/10 Kelvin	
Analog outputs in general			
Digital resolution		14 bit	
Output signal range		±105 % nominal range	
Voltage outputs			
Output voltage		±10 V	
Output current		Max. 10 mA (current-limited)	
Accuracy at 25 °C		Min. 1 kΩ, max. ±0.05 % FS	
Current outputs			
Output current		0(4) mA to 20 mA	
Accuracy at 25 °C		Max. ±0.2 % of output range	
Burden		Up to 600 Ω	
Power supply			
Internal supply		Via BS2xx backplane	
Internal current consumption	95 mA	100 mA	110 mA
External voltage range	18 V DC to 30 V DC		
External current consumption 24 V under full load	95 mA	160 mA	310 mA
Galvanic isolation system	500 V		
Isolation voltage between channels	500 V		
Approvals/Certificates			
General	CE, UKCA, cULus		
Marine	ABS, BV, DNV, KR, LR, NK, RINA		
Environmental conditions		Standard	ColdClimate (❄️)
Operating temperature	-30 °C to +60 °C		
Relative humidity, operation	5 % to 95 % noncondensing	5% to 95% with condensation	
Storage temperature	-40 °C to +85 °C		
Relative humidity, storage	5% to 95% with condensation	5% to 95% with condensation	
Pollution degree acc. IEC 60664-1	2 (noncondensing)	2	

Order data

Part type designation	Part number	Description
AIO202/SI	00023016-00	Universal analog input/output module; 2x analog In ± 10 V, ± 20 mA, 0/4 mA to 20 mA, Pt TC; 16 bit; analog out ± 10 V, 20 mA; 14 bit; configurable analog filter; 100 μ s sample and refresh time; threshold monitoring; single isolated
AIO204/SI	00023017-00	Universal analog input/output module; 4x analog In ± 10 V, ± 20 mA, 0/4 mA to 20 mA Pt ATC; 16 bit; analog out ± 10 V, 20 mA; 14 bit; configurable analog filter; 100 μ s sample and refresh time; threshold monitoring; single isolated
AIO208/SI	00023018-00	Universal analog input/output module; 8x analog In ± 10 V, ± 20 mA, 0/4 mA to 20 mA, Pt TC; 16 bit; analog out ± 10 V, 20 mA; 14 bit; configurable analog filter; 100 μ s sample and refresh time; threshold monitoring; isolated
AIO208/SI CC	00026636-00	Like AIO208/SI; ColdClimate (❄)

Accessories

Part type designation	Part number	Description
KZ-AIO202/SI B+C	00024831-00	Terminal set Phoenix cage clamp (2x 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-AIO208/SI B+C	00025859-00	Terminal set Phoenix cage clamp (8x KZ 35/05) with labeling strip