



## AIO208, AIO216 Universal Analog Input/Output Module

The AIO208 and AIO216 modules enable the measuring or output of all standard analog signals. The AIO208 offers 8 channels and the AIO216 16 channels compactly in a single module. The standard signal types for current (0 to 20 mA and 4 to 20 mA) and voltage ranges ( $\pm 10$  V to  $\pm 10$  mV) allow the connection of a wide range of sensors and actuators. A minimum 14-bit resolution makes it possible to also measure signals that do not fully utilize the measuring range (e.g. 0 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/Pt1000 in 2, 3 and 4-wire measuring circuits, as well as all standard thermocouples.

For each channel, a second channel with unused signal types can be used in addition to the primary configured signal type. For example, a current output can be assigned to a voltage input so that up to twice the number of channels per module are provided.

This enables one module to cover virtually all analog signal measuring tasks instead of having to use many different modules for each signal type. A cost-effective solution that simplifies logistics and servicing. Different modes can be combined and set simply using a configuration wizard in the SolutionCenter engineering tool.

Item	Item-No.
AIO208	00020628-00
AIO208 CC	On request
AIO216	00020627-00
AIO216 CC	00020631-00

- 8 channels AIO208, 16 channels AIO216
- Analog inputs and outputs
- Modes that can be selected per channel:
  - Analog voltage input  $\pm 10$  V to  $\pm 10$  mV
  - Analog current input 0(4) to 20 mA
  - Temperature sensor Pt elements as 2-,3-,4-wire
  - Thermo couples type J, K, T, N, E, R, S, B
  - Analog voltage output  $\pm 10$  V
  - Analog current output 0(4) to 20 mA
- Resolution: 16-bit input with filter, 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 ( $\pm 105$  %)
- Error message on overload and overtemperature and under-voltage of the supply
- Galvanic isolation from the system 500 V
- Optional condensation-proof ColdClimate (☼)

AIO208, AIO216			
Inputs/Outputs		AIO208	AIO216
Quantity		8 channels	16 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	
Measuring range		±105 % of nominal range	
Measuring range monitoring		Lower and upper measuring range limit, error message as status or measuring range monitoring	
Allowed common mode voltage		Max. ±1 V	
Refresh cycle time		100 µs	
Cut-off frequency		4 kHz to 0.5 Hz adjustable channel by channel	
Filtering slope		>80 dB/decade	
Voltage inputs			
Input voltage		±10 V, ±1 V, ±100 mV, ±10 mV	
Basic accuracy at 25 °C		Range ±10 V: ±0.05 %FS Range ±1 V: ±0.05 %FS Range ±100 mV: ±0.05 %FS Range ±10 mV: ±0.2 %FS	
Current inputs			
Input current		±20 mA or 0 to 20 mA or 4 to 20 mA	
Basic accuracy at 25 °C		Range ±20 mA: ±0.1 %FS Range 0 to 20 mA: ±0.2 %FS Range 4 to 20 mA: ±0.2 %FS	
Input impedance		Max. 300 Ohm	
Shunt short-circuit proof		Up to +24 V	
Interference voltage strength		+24 V	
Temperature inputs PTC			
Temperature inputs		Pt100/Pt1000	
Connection type		2-, 3- or 4-wire	
Input impedance		>100 kOhm	
Temperature range		-100 to +800 °C	
Basic accuracy at 25 °C		PT100/Pt1000: 0.15 % of 900 ° (measuring range -100 to 800 °C)	
Value of the LSB		0.1 K, measurement values in 1/10 Kelvin	

AIO208, AIO216		
<b>Temperature inputs TE</b>		
Temperature elements	Types J, K, T, N, E, R, S, B can be selected	
Temperature ranges per type	J	-100 to +1200 °C
	K	-100 to +1370 °C
	T	-100 to +400 °C
	N	-100 to +1300 °C
	E	-100 to +1000 °C
	R	-50 to +1768 °C
	S	-50 to +1768 °C
	B	+600 to +1820 °C
Ground	Up to ±3 V	
Basic accuracy at 25 °C	Max. ±0.15 % of input current range (S, R, T, B max. ±0.3 %)	
Value of the LSB	0.1 K; measurement 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	
Basic accuracy at 25 °C	Min. 1 kOhm, max. ±0.05 % of 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	80 mA	
Voltage range external	18 to 34 VDC	
Current consumption external 24 V	Typically 200 mA without external load	
Galvanic isolation I/O to system	500 V	
<b>Approvals / Certificates</b>		
General	CE, cULus, CCC	
Marine	DNV GL, LR, ABS, BV	
<b>Ambient conditions</b>		
	Standard	ColdClimate (❄)
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
AIO208	00020628-00	Universal analog input/output module; 8x analog In $\pm 10\text{V}$ $\pm 20\text{mA}$ 0/4 to 20mA Pt TC; 16bit; analog Out $\pm 10\text{V}$ 20 mA; 14bit; configurable analog filter; 100 $\mu\text{s}$ sample and refresh time; threshold monitoring; isolated
AIO208 CC	On request	Like AIO208; ColdClimate (❄)
AIO216	00020627-00	Universal analog input/output module; 16x analog In $\pm 10\text{V}$ $\pm 20\text{mA}$ 0/4 to 20mA Pt TC; 16bit; analog Out $\pm 10\text{V}$ 20 mA; 14bit; configurable analog filter; 100 $\mu\text{s}$ sample and refresh time; threshold monitoring; isolated
AIO216 CC	00020631-00	Like AIO216; ColdClimate (❄)
Accessories		
KS-AIO208 B+C	00023149-00	Terminal set cage clamp small (2 x KS 35/20; 1 x KZ 51/02) with labeling strip and coding elements
KS-AIO216 B+C	00023148-00	Terminal set cage clamp small (4 x KS 35/20; 1 x KZ 51/02) with labeling strip and coding elements