S-DIAS Analog Input Module
AI 046

with 4 analog inputs ±11 V or ±1.1 V

The S-DIAS analog input module AI 046 has four analog inputs with two adjustable measurement ranges with ±11 V or ±1.1 V with an 18-bit resolution. The voltage supply for the analog inputs are monitored for under voltage. The analog inputs are gal-vanically separated from the S-DIAS bus.

Analog Input Specifications

Number of channels	4	
Measurement range	-11 ... +11 V	-1.1 ... +1.1 V
Amplification	1	10
Measurement value	-110,000 ... +110,000 (Mode: 18-bit signed value range) -27,500 ... +27,500 (Mode: 16-bit signed value range)	
Galvanic isolation	500 V (maximum isolation voltage)	
Input type	difference input	
A/D converter	18-bit SAR with simultaneous scanning	
Measurement range resolution	18-bit	
	ca. 84 µV/LSB	ca. 8.4 µV/LSB
Scan rate per channel	≥ 10 µs (minimum S-DIAS cycle time: 100 µs)	
Data memory depth per channel	512 Dwords (32 bits) 1024 words (16 bits)	
Calculation basis for number of values per channel (n)	n = S-DIAS cycle time / scan rate	
Common mode range	±12 V	±6 V
Input resistance	typically 5 MΩ	
Cable break monitor	yes (10 MΩ between AI+ and +12 V, 10 MΩ between AI- and -12 V)	
Input filter hardware	10 kHz, low pass 3rd order (differential mode) 100 kHz, low pass 1st order (common mode)	
Input filter software	configurable	
Maximum allowable input voltage	±30 V	
Total measurement precision	±0.030 % (20-40 °C)	±0.045 % (20-40 °C)
Measurement method: Mode 2, sampling rate 50 µs	±0.045 % (0-55 °C)	±0.060 % (0-55 °C)
Status display	green LED	

Measuring Modes

Scan rate (µs)	Mode 1	Mode 2
	hardware frequency limit in kHz	hardware frequency limit in kHz
10	10	10
20	10	10
25	10	10
50	10	8
100	10	5
200	10	3
250	10	3
500	10	1.5
1000	10	1.5

Measurement Precision

Measurement range	-11 ... +11 V	-1.1 ... +1.1 V
Accuracy incl. calibration error and noise Mode 2, sampling rate 50 µs 25 °C	0.010 %	0.017 %
Temperature drift 20-40 °C 0-55 °C	 0.006 % 0.020 %	 0.008 % 0.025 %
Linearity	0.003 %	0.005 %
Crosstalk	0.003 %	0.003 %
Symmetry	0.009 %	0.010 %
Total error 20-40 °C 0-55 °C	 ±0.030 % (±3.3 mV) ±0.045 % (±5.0 mV)	 ±0.045 % (±0.50 mV) ±0.060 %(±0.66 mV)

Electrical Requirements

	External voltage supply X5	18-30 V DC	
	Current consumption X5	maximum 650 mA (maximum 500 mA for all sensor supplies) typically 60 mA (electronics)	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	0	0
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 30 mA	maximum 35 mA

Voltage Monitor External +24 V Supply

	Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-009-046
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL in preparation
	Approvals	UL, cUL, CE in preparation

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes