

KiDAQ Module 5501A

Universal measurement module



Description

KiDAQ is a general purpose data acquisition system to measure more than 20 different analog and digital signal types. The wide selection of signal conditioning and data acquisition modules enables perfectly fitted system configurations, exactly to the customer's requirements. All modules are available in the KiDAQ housing options Rack, Portable and DIN Rail which allows the use in different applications and environments.

Key features

- **2 analog input signals**
Voltage, current, resistance, potentiometer, resistance thermometer (Pt100, Pt1000), thermocouples (types B,E,J,K,L,N,R,S,T,U), strain gauges, IEPE sensors (Piezotron)
- **2 digital input signals**
Status
- **A/D conversion**
100 kSps sampling rate per channel, 24 Bit resolution
- **Galvanic isolation**
Channel to channel to power supply and to interface isolation voltage 500 VDC



Technical data

Analog inputs

Number	2
Input connector type	Terminal strip 2x10 pole, color blue
Accuracy	0.01% typical
	0.025% in controlled environment ¹⁾
	0.05% in industrial area ²⁾
Linearity error	0.01% of the final value typical
Repeatability	0.003% typical (within 24 h)
Isolation voltage	500 VDC channel to channel to power supply to interface ³⁾

¹⁾ according EN 61326: 2006, appendix B

²⁾ according EN 61326: 2006, appendix A

³⁾ noise pulses up to 1,000 VDC, permanent up to 250 VDC

Measurement voltage	Range [V]	Frequency range (-3 dB) [Hz]	Max. deviation [mV]	Resolution [µV]	Input resistance [MΩ]
	±60	0 ... 10,000	±15	7.2	3
	±10	0 ... 20,000	±2	1.2	1
	±1	0 ... 13,000	±0.2	0.120	>10
	±0.1	0 ... 13,000	±0.05	0.012	>10
Long term drift	<20 µV/24 h, <200 µV/8,000 h			range ±1 V	
Temperature influence	on zero	on sensitivity			
	<50 µV/10 K	<0.01%/10 K			
Signal-noise-ratio	> 90 dB at 1 kHz	>120 dB at 1 Hz			
Measurement current (internal shunt 50 Ω)	Range [mA]	Frequency range (-3 dB) [Hz]	Max. deviation [µA]	Resolution [nA]	
	±25	0 ... 13,000	±5	3.0	
Long term drift	<0.5 µA/24 h, <5 µA/8,000 h				
Temperature influence	on zero			on sensitivity	
	<1 µA/10 K			<0.025%/10 K	

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Measurement resistance/RTD	Range [Ω]	Max. deviation [Ω]	Resolution [mΩ]
Resistance, 2-wire	100,000	±100	12
Resistance, 2- and 4-wire	4,000	±1	0.5
Resistance, 2- and 4-wire	400	±0.1	0.048
Pt100, 2- and 4-wire	-200... +850°C/ -328... 1,562°F	±0.25°C/ 0.45°F	0.2°C/ 0.36°F
Pt1000, 2- and 4-wire	-200 ... +850°C/ -328... 1,562°F	±1°C/1.8°F	0.2°C/ 0.36°F
Long term drift	<0.01°C/24 h; <0.1°C/8,000 h <0.018°F/24 h; <0.18°F/8,000 h		
Temperature influence	on zero (range 400 Ω)	on sensitivity	
	<10 mΩ/10 K	<0.025%/10 K	
Measurement potentiometer	Relative measurement		
Permitted potentiometer resistance	1 kΩ to 10 kΩ		
Long term drift	<0.01%/24 h, <0.1%/8,000 h		
Temperature influence	on zero (range 1)	on sensitivity	
	<0.000 1/10 K	<0.02%/10 K	
Measurement bridge	Full and half bridge, 5-/6-wire, quarter bridge with completion terminal 3-wire		
Accuracy class	0.05 (± 35 μV/V in industrial area)		
Sensor resistance	>100 Ω		
Supply	2.5 V, nominal		
Measurement range	±2.4 mV/V	±20 mV/V	±500 mV/V
Frequency range (-3 dB)	0 ... 6,000 Hz		
Long term drift	<0.12 μV/V/24 h, <1.2 μV/V/8,000 h		
Temperature influence	on zero	on sensitivity	
	<0.2 μV/V/10 K	<0.05%/10 K	

Measurement thermocouple	Type	Adjusted with cold junction compensation	Not adjusted, with a random CJC terminal	
Deviation in the relevant input range	Type B (400°C to 1,820°C) (752°F to 3,308°F)	< ±1.5°C < ±2.7°F	< ±2.5°C < ±4.5°F	
	Type E, J, K (-100 °C to 1,000°C) (-148 °F to 1,832°F)	< ±0.7°C < ±1.26°F	< ±1.2°C < ±2.16°F	
	Type E (-270°C to 1,000°C) (-454 °F to 1,832°F)	< ±1°C < ±1.8°F	< ±1.2°C < ±2.16°F	
	Type K (-270°C to 1,372°C) (-454 °F to 2,501°F)	< ±1°C < ±1.8°F	< ±1.2°C < ±2.16°F	
	Type L (-200°C to 900°C) (-328 °F to 1,652°F)	< ±0.7°C < ±1.26°F	< ±1.2°C < ±2.16°F	
	Type N (-100°C to 1,000°C) (-148 °F to 1,832°F)	< ±0.7°C < ±1.26°F	< ±1.2°C < ±2.16°F	
	Type N (-270°C to 1,300°C) (-454 °F to 2,372°F)	< ±1°C < ±1.8°F	< ±1.2°C < ±2.16°F	
	Type R, S (-50°C to 1,768°C) (-58 °F to 3,214 °F)	< ±1.2°C < ±2.16°F	< ±1.5°C < ±2.7°F	
	Type T, U (-100°C to 400°C) (-148 °F to 752°F)	< ±0.7°C < ±1.26°F	< ±1.2°C < ±2.16°F	
	Type T (-270°C to 400°C) (-454 °F to 752°F)	< ±1°C < ±1.8°F	< ±1.2°C < ±2.16°F	
	The specifications are valid with activated mains rejection 50 Hz resp. 60 Hz			
Input resistance	> 10 MΩ			
Long term drift	<0.1°C/24 h, <0.2°C/8,000 h <0.18°F/24 h, <0.36°F/8,000 h			
Temperature influence	on zero			
	<0.1°C/10 K			
Uncertainty cold junction compens.	<0.3°C/ <0.54°C			
Measurement IEPE sensor	Range [V]	Frequency range (-3 dB) [Hz]	Max. deviation [mV]	Resolution [μV]
	±10	0.5 ... 20,000	±10	40
	±1	0.5 ... 20,000	±1	4
Sensor supply voltage	24 V (±10%)			
Sensor supply current	4 mA (±10%)			
Temperature influence	on zero (range 10 V)		on sensitivity	
	<10 μV/10 K		<0.025%/10 K	

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Analog/digital-conversion	
Resolution	24 bit
Sample rate	100 kSps (measurement thermocouple 8 Sps) per channel
Conversion method	Sigma-Delta (group delay time 380 µs)
Digital filter	IIR, low pass, high pass, band pass, Butterworth 4 th order, 1 Hz up to 10 kHz in steps 1, 2, 5
Averaging	configurable or automated according the selected data rate

Digital in/outputs ¹⁾	
Number	2 (1 digital I/O per channel)
Response time	0.2 ms
Input	state, tare, reset
Input voltage/input current	max. 30 VDC/max. 0.5 mA
Lower/upper threshold	<2.0 V (low)/>10 V (high)
Output	state, alarm
Contact	open drain p-channel MOSFET
Load	30 VDC/100 mA (ohmic load)

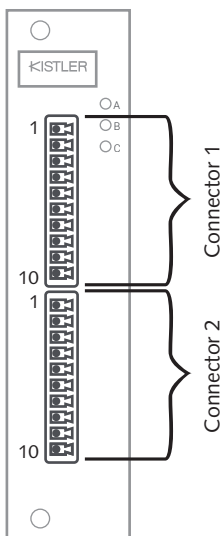
¹⁾ Digital outputs are not yet supported in the software

Further technical data please refer to "KiDAQ System Datasheet"003-335e.

Warm up time

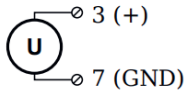
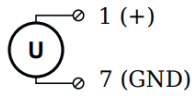
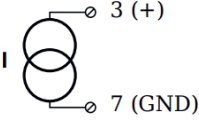
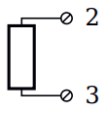
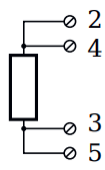
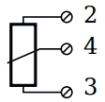
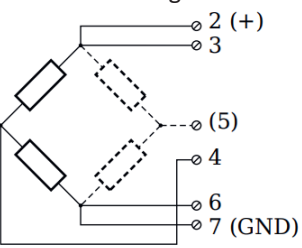
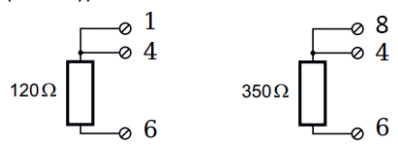
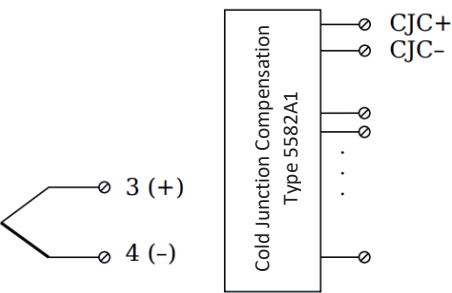
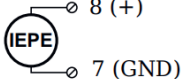
All declarations are valid after a warm up time of 45 minutes.

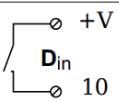
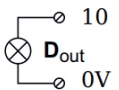
Pin assignment



Pin No.	Function
1	60 V
2	UF
3	A _{in} 1
4	A _{in} 2
5	A _{in} 3
6	A _{in} 4
7	GND
8	IEPE
9	TEDS
10	DIO

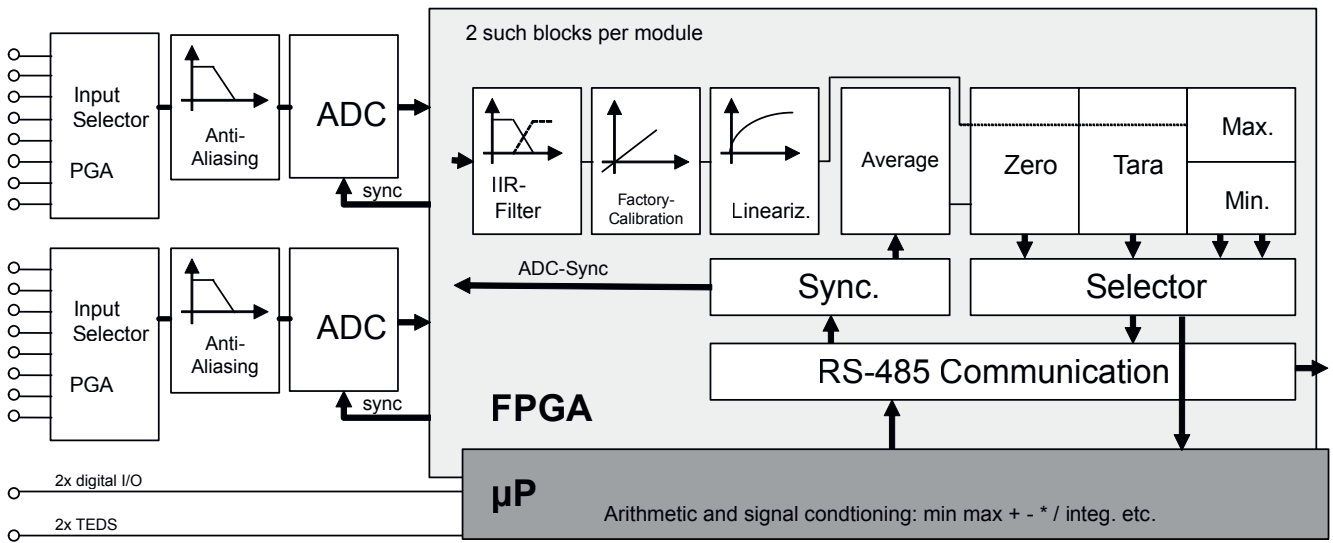
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Measurement	Pin assignment	
Voltage	Voltages up to ± 10 V 	Voltages up to ± 60 V 
Current		
Resistance/RTD	2-wire circuit 	4-wire circuit 
Potentiometer		
Bridge	Full and half bridge 	Quarter bridge (with bridge completion Type 5583A1R120 (120 Ω) or 5583A1R350 (350 Ω)) 
Thermocouple		
IEPE sensor		

Digital I/O	Pin assignment
Digital input	
Digital output	

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Block diagram



Optional accessories

- Cold Junction Compensation
- Bridge Completion
Completion for 1/4-bridge 120 Ω
Completion for 1/4-bridge 350 Ω

Type
5582A1

5583A1R120
5583A1R350

