

# KiDAQ Module 5502A

## 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

- **4 analog input signals**  
Voltage, current, resistance, potentiometer, resistance thermometer (Pt100, Pt1000), thermocouples (types B,E, J,K,L,N,R,S,T,U) and strain gauges
- **A/D conversion**  
20 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	4			
Input connector type	Terminal strip, 2x10 pole, color blue			
Accuracy	0.01% typical			
	0.02% in controlled environment <sup>1</sup>			
	0.05% in industrial area <sup>2</sup>			
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 <sup>3</sup>			
Measurement voltage	Range [V]	Frequency range (-3 dB) [Hz]	Max. deviation [mV]	Resolution [µV]
	±10	0 ... 3 000	±2	1.2
	±1	0 ... 3 000	±0.2	0.120
	±0.100	0 ... 3 000	±0.050	0.012
Input resistance	>470 MΩ			

Temperature influence	Range [V]	on zero [µV / 10K]	on sensitivity [% / 10 K]	
	±10	<500	<0.01	
	±1	<50	<0.01	
Long term drift	Range [V]	24 h [µV]	8 000 h [µV]	
	±10	<200	<2 000	
	±1	<20	<200	
Signal-noise-ratio	±0.100	<2	<20	
	>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]
±25		0 ... 3 000	±5	3.0
Temperature influence	on zero		on sensitivity	
	<1 µA / 10 K		<0.03% / 10 K	
Long term drift	<0.5 µA / 24 h; 5 µA / 8 000 h			

<sup>1</sup> according EN 61326: 2006, appendix B

<sup>2</sup> according EN 61326: 2006, appendix A

<sup>3</sup> noise pulses up to 1 000 VDC, permanent up to 250 VDC

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Measurement resistance/RTD	Range [ $\Omega$ ]	max. deviation [ $\Omega$ ]	Resolution [ $m\Omega$ ]
Resistance, 2-wire	100 000	$\pm 100$	12
Resistance, 2- and 4-wire	4 000	$\pm 1$	0.5
Resistance, 2- and 4-wire	400	$\pm 0.1$	0.048
Pt100, 2- and 4-wire	-200 ... +850 °C / -328...+1 562 °F	$\pm 0.25$ °C / 0.45 °F	0.2 m°C / 0.36 m°F
Pt1000, 2- and 4-wire	-200 ... +850 °C / -28...+1 562 °F	$\pm 1$ °C / 1.8 °F	0.2 m°C / 0.36 m°F
Temperature influence	on zero (range 400 $\Omega$ )	on sensitivity	
	10 m $\Omega$ /10 K $\approx$ 0.05 °C/10 K 10 m $\Omega$ /10 K $\approx$ 0.09 °F/10 K	0.03 % / 10 K	
Long term drift	<10 m $\Omega$ / 24 h; <100 m $\Omega$ / 8 000 h (range 400 $\Omega$ )		
<b>Measurement potentiometer</b>	<b>Relative measurement</b>		
Permitted potentiometer resistance	1 k $\Omega$ to 10 k $\Omega$		
Temperature influence	on zero (range 1)	on sensitivity	
	<10 m $\Omega$ / 10 K	<0.03 % / 10 K	
Long term drift	<0.02 % / 24 h, <0.2 % / 8 000 h		
<b>Measurement bridge</b>			
Accuracy class	0.05		
Bridge Type	full bridge, 4-wire connection, half and quarter bridge with completion terminal		
Sensor resistance	>100 $\Omega$		
Supply	2.5 V nominal		
Measurement range	$\pm 2.5$ mV/V	$\pm 50$ mV/V	$\pm 500$ mV/V
	Frequency range (-3 dB)		
	0 ... 2 300 Hz		
Temperature influence	on zero (range 2.5 mV/V)	on sensitivity	
	<0.2 $\mu$ V/V / 10 K	<0.05 % / 10 K	
Long term drift	<0.12 $\mu$ V/V / 24h; <1.25 $\mu$ V/V / 8 000 h (range 2.5 mV/V)		

Measurement thermocouple	Whole range	-100 °C...upper limit / -148 °F...upper limit
Type B	better than $\pm 5$ °C / $\pm 9$ °F	better than $\pm 2.5$ °C / $\pm 4.5$ °F
Type E, J, K, L, T, U	better than $\pm 1$ °C / $\pm 1.8$ °F	better than $\pm 0.5$ °C / $\pm 0.9$ °F
Type N	better than $\pm 2$ °C / $\pm 3.6$ °F	better than $\pm 1$ °C / $\pm 1.8$ °F
Type R, S	better than $\pm 3$ °C / $\pm 5.4$ °F	better than $\pm 1.5$ °C / $\pm 2.7$ °F
Input resistance	100 M $\Omega$	
Temperature influence	on zero	on sensitivity
	<0.2 °C / 10 K / <0.36 °F / 10 K	<0.025 % / 10 K
Long term drift	<0.02 °C / 24 h; 0.2 °C / 8 000 h <0.036 °F / 24 h; 0.36 °F / 8 000 h	
Uncertainty cold junction compensation	<0.3 °C / <0.54 °F	

**Analog/digital-conversion**

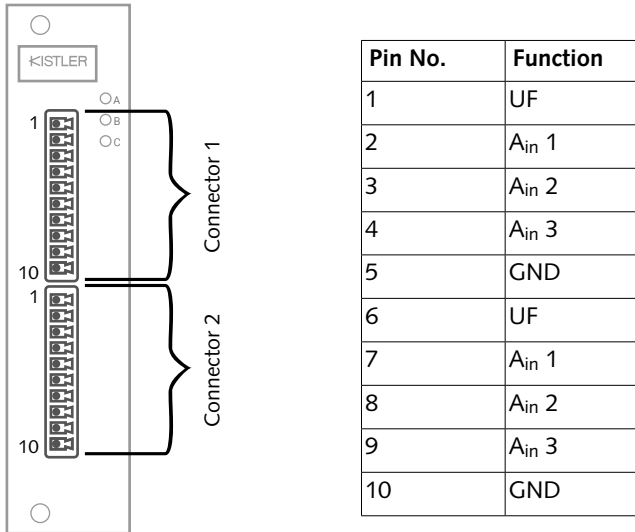
Sample rate	20 kSps (measurement thermocouple 10 Sps) per channel
Conversion method	Sigma-Delta (group delay time 600 $\mu$ s)
Digital filter	IIR, low pass, high pass, band pass, Butterworth 4 <sup>th</sup> order, 0.1 Hz up to 1 kHz in steps 1, 2, 5
Averaging	configurable or automated according the selected data rate

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.

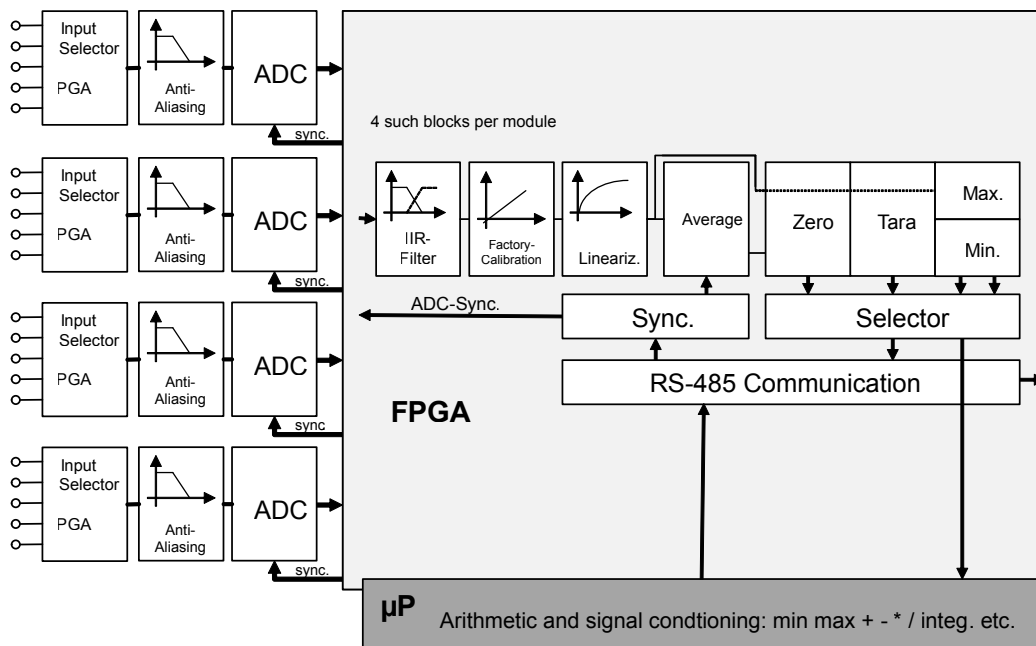
**Pin assignment**



Measurement	Pin assignment		
Voltage			
Current			
Resistance/RTD	2-wire circuit 	4-wire circuit 	
Potentiometer			
Bridge	Full bridge 	Half bridge 	Quarter bridge (with bridge completion Type 5583A3R120 (120 Ω) or Type 5583A3R350 (350 Ω)) 
Thermocouple			

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**Block diagram**



**Optional accessories**

- Cold Junction Compensation  
Connection terminal for 2 thermocouples,  
thermal embedded Pt1000 temperature sensor  
2 terminals each module required (4 thermocouples)
- Bridge Completion  
Completion for 1/4-bridge 120 Ω                    5583A3R120  
Completion for 1/4-bridge 350 Ω                    5583A3R350

**Type**  
5582A3

