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KiDAQ Module 5517A

Measurement module for strain gauges

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

- **8 analog input signals for bridges**
  Strain gauge bridges (full, half, quarter) 8 real parallel inputs, neither scanned nor multiplexed
- **Measuring range**
  Quarter bridge ±1 mV/V or ±10 mV/V
  Full & half bridge ±2.5 mV/V or ±10 mV/V
- **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	8
Input connector type	Harting, 68 pole
Sensor connection	68 pole Harting Har-Mik, connecting cable 1m length is not included and is available as accessory
Accuracy	0.02 % typical
	0.05 % in controlled environment[1]
	0.1 % in industrial area[2]
Repeatability	0.01 % typical (within 24 h)
Input resistance	>10 MΩ
Isolation voltage	500 VDC channel to power supply to interface[3]
Measurement bridge	**resistive full bridge (4/6 wire), resistive half bridge (3/5 wire), resistive quarter bridge 120 Ω and 350 Ω (3 wire incl. cable compensation)**
Bridge completion resistor	120 Ω und 350 Ω, temperature stability 0.05 ppm / K
Permitted sensor cable length	<300 m full and half bridge, <100 m quarter bridge
Sensor excitation	2 VDC and 4 VDC selectable
Permitted sensor resistance	full bridge >300 Ω, half bridge >200 Ω, quarter bridge >100 Ω
Measuring range full and half bridge	±2.5 mV/V and ±10 mV/V
Measuring range quarter bridge	±1 mV/V and ±10 mV/V (±2 000 µm/m and ±20 000 µm/m at k=2)
Frequency range (–3 dB)	0 ... 1 000 Hz
Temperature influence on zero	<0.2 µV/V / 10 K
Temperature influence on sensitivity	<0.05 % / 10 K
Long term drift	<0.2 µV/V / 24 h , <2 µV/V / 8 000h
Linearity error	<0.02 % f.s.
Noise voltage at 10 Hz	<0.3 µV/V
Common mode rejection (CMR)	120 dB

[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

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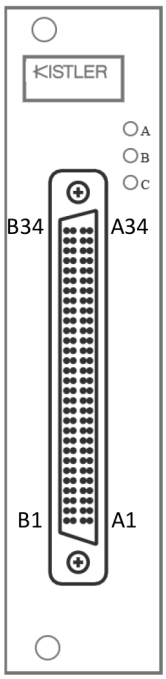
Analog digital conversion	
Resolution	24 bit
Sample rate	20 kSps per channel
Conversion method	Sigma-Delta (group delay time 600 µs)
Digital filter	IIR, low pass, high pass, band pass, Butterworth 4th order, 1 Hz up to 10 kHz in steps 1, 2, 5
Averaging	configurable or automated according the selected data rate

Further technical data please refer to data sheet "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
A1	–
A2	–
A3	U_{Exc1+}
A4	U_{Exc1-}
A5	U_{Sen1-}
A6	–
A7	U_{Exc2+}
A8	U_{Exc2-}
A9	U_{Sen2-}
A10	–
A11	U_{Exc3+}
A12	U_{Exc3-}
A13	U_{Sen3-}
A14	–
A15	U_{Exc4+}
A16	U_{Exc4-}
A17	U_{Sen4-}
A18	–
A19	U_{Exc5+}
A20	U_{Exc5-}
A21	U_{Sen5-}
A22	–
A23	U_{Exc6+}
A24	U_{Exc6-}
A25	U_{Sen6-}
A26	–
A27	U_{Exc7+}
A28	U_{Exc7-}
A29	U_{Sen7-}
A30	–
A31	U_{Exc8+}
A32	U_{Exc8-}
A33	U_{Sen8-}
A34	–

Pin No.	Function
B1	–
B2	–
B3	U_{Sig1+}
B4	U_{Sen1+}
B5	U_{Sig1-}
B6	–
B7	U_{Sig2+}
B8	U_{Sen2+}
B9	U_{Sig2-}
B10	–
B11	U_{Sig3+}
B12	U_{Sen3+}
B13	U_{Sig3-}
B14	–
B15	U_{Sig4+}
B16	U_{Sen4+}
B17	U_{Sig4-}
B18	–
B19	U_{Sig5+}
B20	U_{Sen5+}
B21	U_{Sig5-}
B22	–
B23	U_{Sig6+}
B24	U_{Sen6+}
B25	U_{Sig6-}
B26	–
B27	U_{Sig7+}
B28	U_{Sen7+}
B29	U_{Sig7-}
B30	–
B31	U_{Sig8+}
B32	U_{Sen8+}
B33	U_{Sig8-}
B34	–

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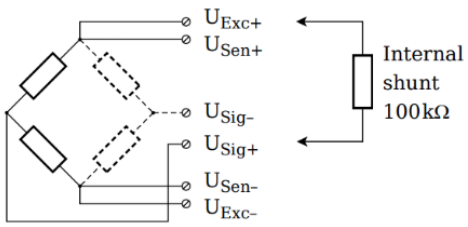
Full and half bridge



Input 1	
U_{Exc+}	A3
U_{Exc-}	A4
U_{Sen+}	B4
U_{Sen-}	A5
U_{Sig+}	B3
U_{Sig-}	B5

Input 2	
U_{Exc+}	A7
U_{Exc-}	A8
U_{Sen+}	B8
U_{Sen-}	A9
U_{Sig+}	B8
U_{Sig-}	B9

Input 3	
U_{Exc+}	A11
U_{Exc-}	A12
U_{Sen+}	B12
U_{Sen-}	A13
U_{Sig+}	B11
U_{Sig-}	B13

Input 4	
U_{Exc+}	A15
U_{Exc-}	A16
U_{Sen+}	B16
U_{Sen-}	A17
U_{Sig+}	B15
U_{Sig-}	B17

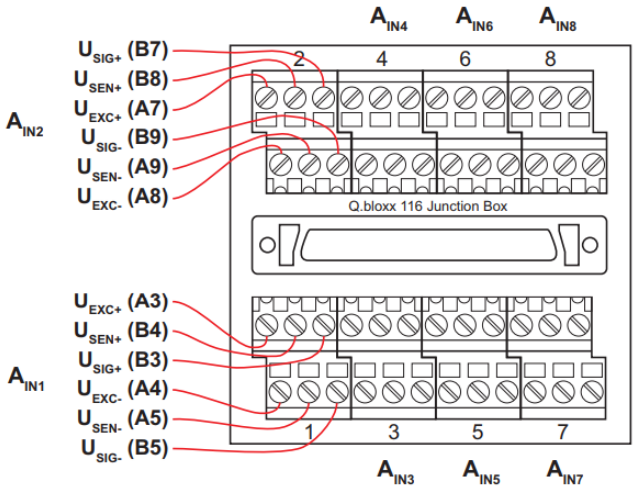
Input 5	
U_{Exc+}	A19
U_{Exc-}	A20
U_{Sen+}	B20
U_{Sen-}	A21
U_{Sig+}	B19
U_{Sig-}	B21

Input 6	
U_{Exc+}	A23
U_{Exc-}	A24
U_{Sen+}	B24
U_{Sen-}	A25
U_{Sig+}	B23
U_{Sig-}	B25

Input 7	
U_{Exc+}	A27
U_{Exc-}	A28
U_{Sen+}	B28
U_{Sen-}	A29
U_{Sig+}	B27
U_{Sig-}	B29

Input 8	
U_{Exc+}	A31
U_{Exc-}	A32
U_{Sen+}	B32
U_{Sen-}	A33
U_{Sig+}	B31
U_{Sig-}	B33

Full and half bridge with connection terminal Type 5587A1



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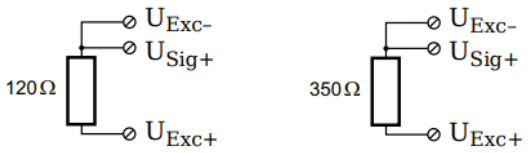
Quarter bridge



Input 1	
U_{Exc+}	A3
U_{Exc-}	A4
U_{Sig+}	B3

Input 2	
U_{Exc+}	A7
U_{Exc-}	A8
U_{Sig+}	B8

Input 3	
U_{Exc+}	A11
U_{Exc-}	A12
U_{Sig+}	B11

Input 4	
U_{Exc+}	A15
U_{Exc-}	A16
U_{Sig+}	B15

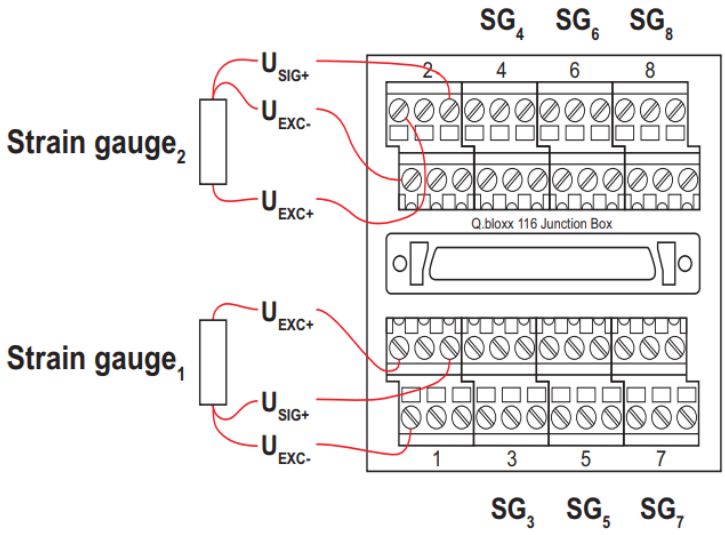
Input 5	
U_{Exc+}	A19
U_{Exc-}	A20
U_{Sig+}	B19

Input 6	
U_{Exc+}	A23
U_{Exc-}	A24
U_{Sig+}	B23

Input 7	
U_{Exc+}	A27
U_{Exc-}	A28
U_{Sig+}	B27

Input 8	
U_{Exc+}	A31
U_{Exc-}	A32
U_{Sig+}	B31

Quarter bridge with connection terminal Type 5587A1



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Cable Type 5588A1 (Harting 68 pin to open-end)

Input/cable bundle	Pairing	Cable color	Sensor connection	Socket connection
1	Pair 1	Light brown	U_{Exc+}	A3
		Light brown/red	U_{Exc-}	A4
	Pair 2	Light green	U_{Sen+}	B4
		Light green/black	U_{Sen-}	A5
	Pair 3	White	U_{Sig+}	B3
		White/black	U_{Sig-}	B5
2	Pair 1	Red/white	U_{Exc+}	A7
		Red/blue	U_{Exc-}	A8
	Pair 2	Yellow/red	U_{Sen+}	B8
		Yellow/blue	U_{Sen-}	A9
	Pair 3	Grey/red	U_{Sig+}	B7
		Grey/blue	U_{Sig-}	B9
3	Pair 1	Blue	U_{Exc+}	A11
		Blue/white	U_{Exc-}	A12
	Pair 2	Pink/red	U_{Sen+}	B12
		Pink/blue	U_{Sen-}	A13
	Pair 3	Light green/yellow	U_{Sig+}	B11
		Light green/green	U_{Sig-}	B13
4	Pair 1	Green/white	U_{Exc+}	A15
		Light green/white	U_{Exc-}	A16
	Pair 2	Light blue/blue	U_{Sen+}	B16
		Light blue/red	U_{Sen-}	A17
	Pair 3	Black	U_{Sig+}	B15
		Black/white	U_{Sig-}	B17
5	Pair 1	Pink	U_{Exc+}	A19
		Pink/black	U_{Exc-}	A20
	Pair 2	Orange/white	U_{Sen+}	B20
		Grey/white	U_{Sen-}	A21
	Pair 3	White/red	U_{Sig+}	B19
		White/blue	U_{Sig-}	B21
6	Pair 1	Light green/red	U_{Exc+}	A23
		Green/blue	U_{Exc-}	A24
	Pair 2	Red	U_{Sen+}	B24
		Red/black	U_{Sen-}	A25
	Pair 3	Purple	U_{Sig+}	B23
		Purple/white	U_{Sig-}	B25
7	Pair 1	Green	U_{Exc+}	A27
		Green/black	U_{Exc-}	A28
	Pair 2	Light blue/green	U_{Sen+}	B28
		Light blue/yellow	U_{Sen-}	A29
	Pair 3	Light yellow	U_{Sig+}	B27
		Light yellow/red	U_{Sig-}	B29
8	Pair 1	Grey	U_{Exc+}	A31
		Grey/black	U_{Exc-}	A32
	Pair 2	White/yellow	U_{Sen+}	B32
		White/green	U_{Sen-}	A33
	Pair 3	Brown	U_{Sig+}	B31
		Brown/white	U_{Sig-}	B33

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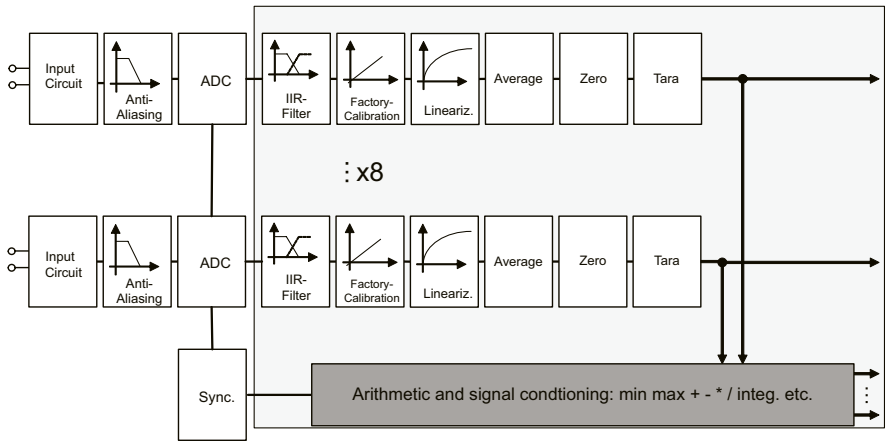
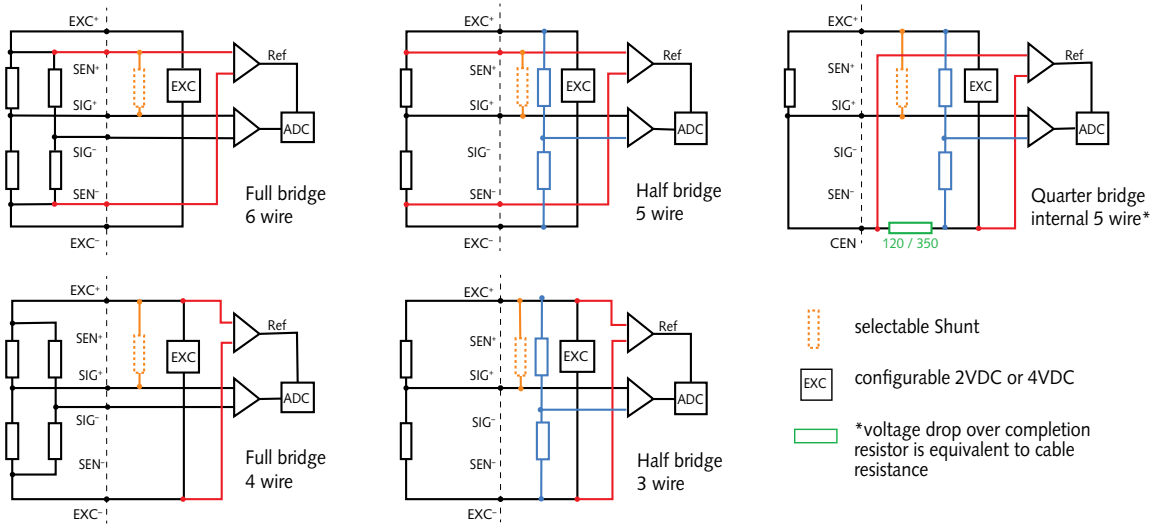
Block diagram



Input circuit



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Optional accessories	Type
• Connection Terminal Patching 8 x 6 connections onto screw terminals, inclusive connection cable (Type 5588A2) to terminal, assembly on DIN rail.	5587A1
• Connection Board Patching 8 x 6 connections onto 8 pluggable screw terminals and in parallel onto 8 RJ-45 sockets, assembling on a wall, as well as the structure under test itself. Cable not included.	5587A2
• Cable open Connector (Harting 68 pin) to open-end cable, grouped for 8 bridge sensors with 6 wires each, length 1 m	5588A1
• Cable to Connection Board Connector (Harting 68 pin) on both sides, length 5 m	5588A2