Q.brixx XL A106

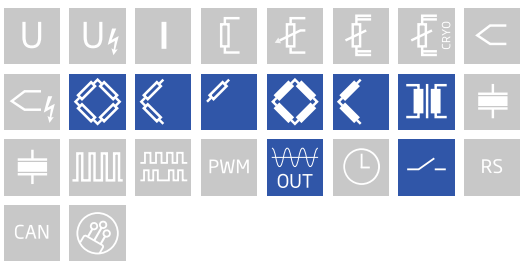
Measurement Module for Strain Gage and LVDT/RVDT

Q.brixx XL is a new addition to the Q.series product family - the ideal DAQ solution for on-the-go applications requiring higher performance in potentially harsh environments. Q.brixx XL DAQ systems consist of up to 16 measurement modules and an integrated, high-performance controller for communication, control, and data logging purposes, all within a robust aluminum housing capable of withstanding severe shock and vibration without sacrificing performance.

- High density and flexibility with16 modules in one system in any constellation
- Connectable to Controller Q.station
- Electromagnetic Compatibility according to EN61000-4 and EN55011
- Power supply 10 ... 30 VDC

Key Features

- **2 galvanically isolated analog inputs channels**
  strain gage and inductive half and full bridges, LVDT, RVDT
  quarter bridge with completion terminal
- **DC and carrier frequency (CF) principle**
  2.5 and 5 VDC excitation, 2.5 and 5 VDCeff excitation carrier frequency, 600 Hz or 4.8 kHz configurable per channel
- **2 Analog output channels**
  ±10 VDC, 20 kHz update rate per channel
- **High-accuracy digitization**
  24-bit ADC, 20 kHz sample rate per channel
- **4 digital I/Os**
  input: state, tare, memory reset, output: state, alarm, threshold
- **Signal conditioning**
  linearization, filtering, average, scaling, min/max, RMS, arithmetic, alarm
- **3-Way galvanic isolation**
  500 VDC channel to channel, channel to power supply, and channel to bus



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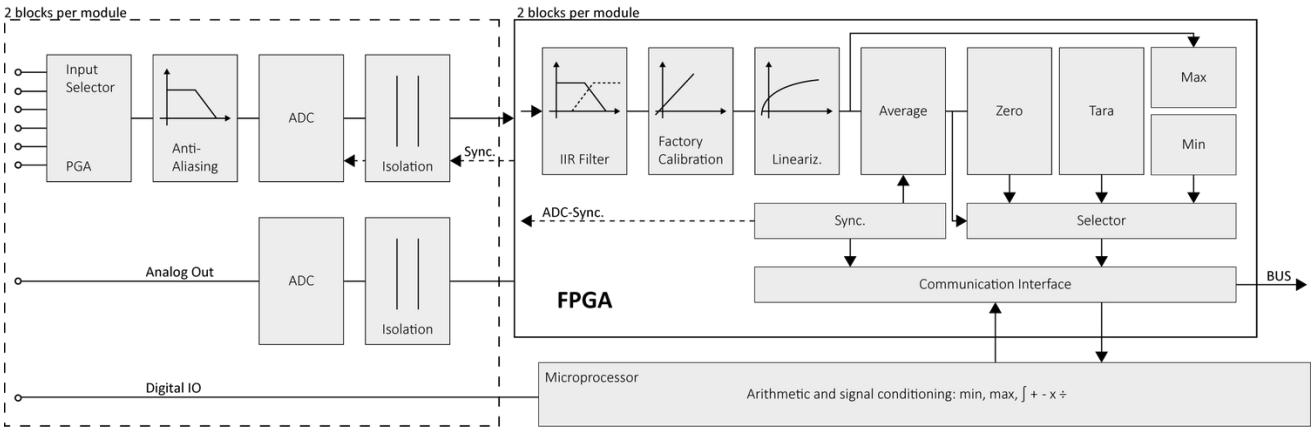
Block diagram



Technical Data

Analog Input

Channels	2
Accuracy	0.02 % typical
	0.05 % in controlled environment[1]
	0.1 % in industrial area[2]
Linearity error	0.02 % typical full-scale
Repeatability	0.01 % typical (within 24 hrs)
Input impedance	>10 MΩ
Isolation voltage	500 VDC channel to channel, to power supply, channel to bus [3]

1 according to EN 61326 2006: appendix B
2 according to EN 61326 2006: appendix A
3 noise pulses up to 1000 VDC, continuous up to 250 VDC

Analog-to-Digital Conversion

Resolution	24-bit
Sample rate	20 kHz per channel
Modulation method	sigma-delta (group delay time 600 µs)
Anti-aliasing filter	2 kHz, 3th order (DC excitation) 1 kHz, 3th order (4.8 kHz CF excitation) 100 Hz, 3th order (600 Hz CF excitation)
Digital filters	Infinite impulse response (IIR), low-pass, high-pass, band-pass, band-stop, Butterworth or Bessel (2nd, 4th, 6th or 8th order), frequency range 0.1 Hz to 1 kHz in steps of 0.1 (adjustable via software)
Averaging	configurable or automatic according to the user-defined data rate

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Measurement Module for Strain Gage and LVDT/RVDT

Analog Output

Channels	2	
Accuracy	0.02 % typical	
Voltage output	±10 VDC	
Allowable load resistance	>2 kΩ	
Long term drift	<1 mV / 24 hrs	<2.5 mV / 8000 hrs
Temperature drift	<1 mV /10 K Offset drift	<0.05 % / 10 K Gain drift
Noise voltage	<2 mV at 10 Hz	<10 mV at 1 kHz

Digital Input & Output

Channels	4 configurable I/Os
Mode(s) of operation	status
Logic voltage	<2 VDC (Low) >10 VDC (High)
Input type	PNP (current sinking)
Input voltage	30 VDC max.
Output voltage	10 to 30 VDC (external supply required)
Contact	open drain p-channel MOSFET
Load capacity	30 VDC / 100 mA (ohmic load)

Strain Gage Measurement

Bridge configuration(s)	resistive full-bridge (4/6-wire) resistive half-bridge (3/5-wire) resistive quarter-bridge 120 Ω or 350 Ω (3-wire, with bridge completion terminal)			
Allowable sensor cable length	<300 m (DC and 600 Hz CF excitation) <100 m[1] (4.8 kHz CF excitation)			
Shunt resistor	100 kΩ internal resistor			
Bridge excitation	2.5 - 5 VDC 2.5 - 5 Veff (Carrier Frequency)			
Bridge excitation stability	<0.01% / 24 hrs			
Bridge excitation drift	<0.02% / 10 K			
	5 VDC	**5 Veff (CF)**	**2.5 VDC**	**2.5 Veff (CF)**
Allowable sensor resistance	>300 Ω	>300 Ω	>100 Ω	>100 Ω
Input range	±1.25 mV/V	±1.25 mV/V	±2.5 mV/V	±2.5 mV/V
	±2.5 mV/V	±2.5 mV/V	±5 mV/V	±5 mV/V
	±25 mV/V	±25 mV/V	±50 mV/V	±50 mV/V
	±50 mV/V	±50 mV/V	±100 mV/V	±100 mV/V
	±100 mV/V	±100 mV/V	±200 mV/V	±200 mV/V
	±200 mV/V	±200 mV/V	±400 mV/V	±400 mV/V
	±500 mV/V	±500 mV/V	±1000 mV/V	±1000 mV/V
Long term stability	<0.2 µV/V / 24 hrs (DC excitation) <0.1 µV/V / 24 hrs (CF excitation)		<2 µV/V / 8000 hrs (DC excitation) <1 µV/V / 8000 hrs (CF excitation)	
Temperature drift (range 2.5 mV/V)	<0.2 µV/V / 10 K Offset drift		<0.05 % / 10 K Gain drift	
Signal-to-noise ratio	<0.3 µV/V at 10 Hz		<1 µV/V at 100 Hz	

[1] low capacity sensor cable is strongly recommended

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LVDT/RVDT Measurement

Sensor connection	4- / 6-wire	
Sensor excitation (selectable)	**5 Veff**	**2.5 Veff**
Allowable sensor resistance	>300 Ω	>100 Ω
Input range	±1.25 mV/V	±2.5 mV/V
	±2.5 mV/V	±5 mV/V
	±25 mV/V	±50 mV/V
	±50 mV/V	±100 mV/V
	±100 mV/V	±200 mV/V
	±200 mV/V	±400 mV/V
	±500 mV/V	±1000 mV/V
Allowable sensor cable length	<100 m[1]	
Long term stability	<0.1 µV/V / 24 hrs	<1 µV/V / 8000 hrs
Temperature drift (range 2.5 mV/V)	<0.2 µV/V / 10 K Offset drift	<0.05 % / 10 K Gain drift
Signal-to-noise ratio	<0.3 µV/V at 10 Hz	<1 µV/V at 100 Hz

[1] low capacity sensor cable is strongly recommended

Digital to Analog Conversion

Resolution	24-bit
Update rate	10 kHz per channel
Settling time	3 µs

Communication Interface Localbus

Protocols	proprietary Localbus (115200 bps to 48 Mbps, latency <100 ns) ASCII (19200 bps to 115200 bps) Modbus RTU
Data format	8E1
Electrical standard	ANSI/TIA/EIA-485-A, 2-wire

Power Supply

Input voltage	10 to 30 VDC, overvoltage and overcurrent protection
Power consumption	2.5 W (approx.)
Input voltage influence	<0.001 % / V

Environmental Specifications

Electromagnetic compatibility (EMC)	according to IEC 61000-4 and EN 55011
Operating temperature	-20°C to +60°C
Storage temperature	-40°C to +85°C
Relative humidity	5 - 95 % at 50°C (non-condensing)

Remarks

Validity of all listed specifications are subject to a warm-up period of at least 45 minutes
Specifications subject to change without notice

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Measurement Module for Strain Gage and LVDT/RVDT

Mechanical information

Material	Aluminum
Measurements (W x H x D)	30x 145 x 135mm
Weight	approx. 500 g

Ordering Information

Article number	522522
Accessories	Terminal B4/120-A106, article number 894387
	Terminal B4/350-A106, article number 894488

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