Q.bloxx A101

Universal Measurement Module

The Q.series has been designed for demanding measurements found in todays most industrial measuring and testing environments. The range of applications starts from single stand-alone solutions up to networked multi-channel applications in the field of component testing, engine testing, process performance testing and structural monitoring.

The range and flexibility of the modules allows an optimized solution for each single task:
Dynamic signal acquisition up to 100 kHz, inputs and outputs for all types of signals, galvanic isolation of inputs and outputs, multi-channel solutions, high density packaging and intelligent signal conditioning.

Data exchange between Test Controller and automation level is communicated via Ethernet TCP/IP or fieldbus systems like EtherCAT or Profibus-DP and additional Ethernet-based industrial standards.

Most important features:

- **2 universal analog input channels**
  voltage, current, resistance, potentiometer, Pt100, Pt1000, thermocouples, measuring bridges, IEPE-sensors
- **Fast high accuracy digitalization**
  24 bit ADC, 100 kHz sample rate per channel
- **1 digital in or output per channel**
  input: state, tare, memory reset
  output: state, alarm, threshold
- **Signal conditioning**
  16 virtual channels, linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- **RS485 fieldbus interface**
  up to 24 Mbps: LocalBus
  up to 115.2 kbps: Modbus-RTU, ASCII
- **Connectable to any Test Controller**
  e.g. Q.station, Q.gate or Q.pac
- **Galvanic isolation**
  channel to channel to power supply and to interface
  Isolation voltage 500 VDC
- **Electromagnetic Compatibility**
  according EN 61000-4 and EN 55011
- **Power supply 10…30 VDC**
- **DIN rail mounting (EN 60715)**

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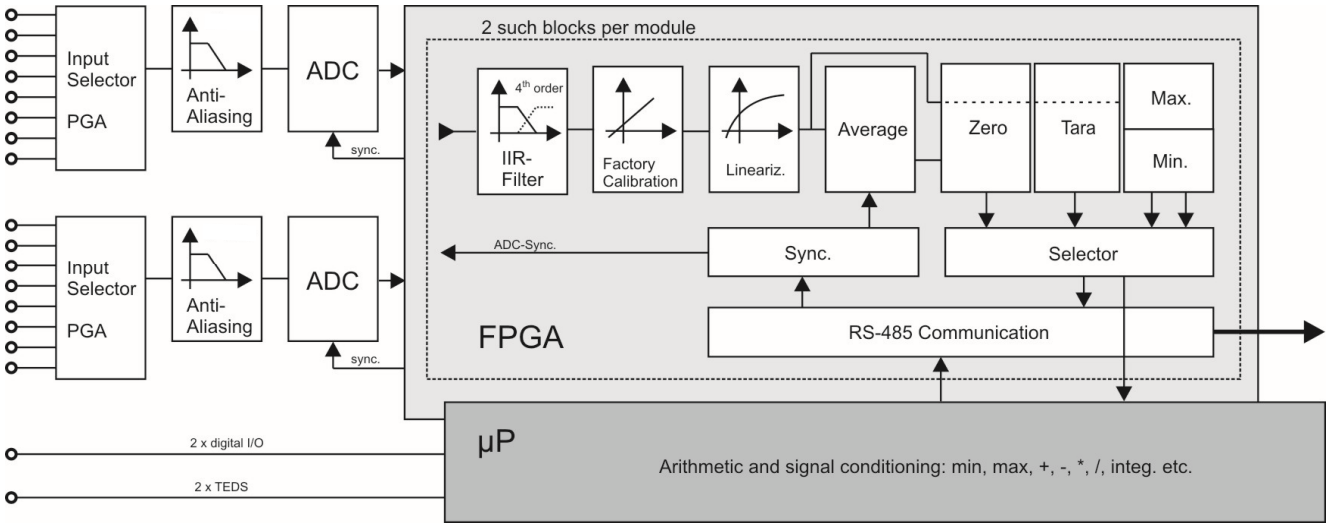
Block Diagram



Analog Inputs			
Number	2		
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]		
Measurement Voltage	**Range**	**max. Deviation**	**Resolution**
	±60 V	±15 mV	7.2 µV
	±10 V	±2 mV	1.2 µV
	±1 V	±0.2 mV	120 nV
	±100 mV	±20 µV	12 nV
Input resistance	>10 MΩ (range ±10 V: 1 MΩ; range ±60 V: 3 MΩ)		
Long term drift	<20 µV / 24 h, <200 µV / 8000 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	**Range**	**max. Deviation**	**Resolution**
(internal shunt 50 Ω)	±25 mA	±5 µA	3.0 nA
Long term drift	<0.5 µA / 24 h, <5 µA / 8000 h		
Temperature influence	on zero	on sensitivity	
	<1 µA / 10 K	<0.025 % / 10 K	

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

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Measurement Resistance / RTD	Range	max. Deviation	Resolution
Resistance, 2-wire	100 kΩ	±100 Ω	12 mΩ
Resistance, 2- and 4-wire*	4 kΩ	±1 Ω	0.5 mΩ
Resistance, 2- and 4-wire*	400 Ω	±0.1 Ω	48 µΩ
Pt100, 2- and 4-wire*	-200 up to +850°C	±0.25°C	0.2 m°C
Pt1000, 2- and 4-wire*	-200 up to +850°C	±1°C	0.2 m°C
Long term drift	<0.01°C / 24 h; <0.1°C / 8000 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 % / 8000 h		
Temperature influence	on zero (range 1)	on sensitivity	
	<0.0001 / 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		
Sensor resistance	>100 Ω		
Supply	2.5 V, nominal		
Measurement range	±2.4 mV/V	±20 mV/V	±500 mV/V
Long term drift	<0.12 µV/V / 24 h, <1.2 µV/V / 8000 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 1820°C)	< ±1,5 °C	< ±2,5°C
	Type E, J, K	(-100 to 1000°C)	< ±0,7°C	< ±1,2°C
	Type E	(-270°C to 1000°C)	< ±1°C	< ±1,2°C
	Type K	(-270°C to 1372°C)	< ±1°C	< ±1,2°C
	Type L	(-200°C to 900°C)	< ±0,7°C	< ±1,2°C
	Type N	(-100°C to 1000°C)	< ±0,7°C	< ±1,2°C
	Type N	(-270°C to 1300°C)	< ±1°C	< ±1,2°C
	Type R, S	(-50°C to 1768°C)	< ±1,2°C	< ±1,5°C
	Type T, U	(-100°C to 400°C)	< ±0,7°C	< ±1,2°C
	Type T	(-270°C to 400°C)	< ±1°C	< ±1,2°C
	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 / 8000 h	
Temperature influence	on zero	on sensitivity
	<0.1°C / 10 K	<0.02% / 10 K
Uncertainty cold junction compens.	<0.3°C	

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Measurement IEPE sensor	Range	max. Deviation	Resolution
	±10 V	±10 mV	40 µV
	±1 V	±1 mV	4 µV
Supply	Constant current 4 mA		
Input frequency range	0.5 Hz to 10 kHz		
Temperature influence	on zero (range 10 V) <10 µV / 10 K	on sensitivity <0.025 % / 10 K	
Analog/Digital-Conversion			
Resolution	24 bit		
Sample rate	100 kHz (measurement thermocouple 8 Hz)		
Conversion method	Sigma-Delta (group delay time 380 µs)		
Anti-aliasing filter	20 kHz, 3rd order		
Digital filter	IIR, low pass, high pass, band pass, 4th order, 1 Hz up to 10 kHz in steps 1, 2, 5		
Averaging	configurable or automated according the selected data rate		
Digital In/Outputs			
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)		
Power Supply			
Power supply	10 up to 30 VDC, overvoltage and overload protection		
Power consumption	approx. 2 W		
Influence of the voltage	<0.001 %/V		
Environmental			
Operating temperature	-20°C up to +60°C		
Storage temperature	-40°C up to +85°C		
Relative humidity	5 % up to 95 % at 50°C, non condensing		
Communication Interface			
Standard	RS-485, 2-wire		
Protocols	Local-Bus: 115200 bps up to 24 Mbps, Format 8e1		
	Modbus-RTU, ASCII: 19200 bps up to 115200 bps		
Mechanical			
Case	Aluminum and ABS		
Dimensions (W x H x D)	(27 x 120 x 105) mm		
Weight	approx. 200 g		
Mounting	DIN EN-rail		

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

Valid from April 2017. Specification subject to change without notice
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