Q.bloxx A101

Universal Measurement Module

The Q.series has been designed for the demanding measurements found in today's industrial measuring and testing environments. Applications range from single, stand-alone solutions to networked, multi-channel systems in real-world areas such as component testing, engine testing, materials testing and structural monitoring.

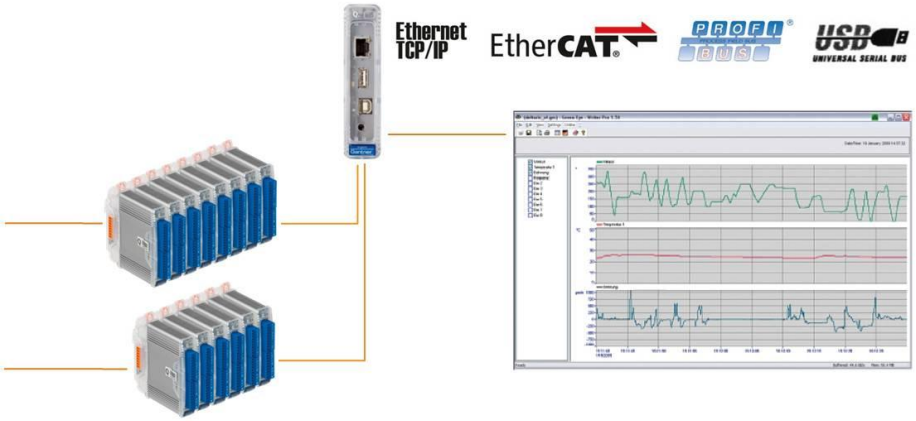
The range and flexibility of the modules allows for an optimized solution for each and every measurement and control point:

- Dynamic signal acquisition up to 100 kHz per channel
- inputs and outputs for all types of signals and sensors
- Galvanic isolation (up to 1200V) of inputs and outputs
- Multi-channel, High-density packaging
- Intelligent signal conditioning on every channel.

All modules connect to a Q.series test controller (Q.gate, Q.pac, or Q.station) for synchronization and buffering, and data exchange between the test controller and automation system is handled via Ethernet TCP/IP, EtherCAT, Profibus-DP, CANopen, or through additional industrial fieldbus standards.

Key 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
- **TEDS**
  class 1 and class 2, according IEEE 1451.4
- **RS485 fieldbus interface**
  up to 48 Mbps: LocalBus
  up to 115.2 kbps: Modbus-RTU, ASCII
- **Connectable to any Test Controller**
  e.g. 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 to 30 VDC**
- **DIN rail mounting (EN 50022)**



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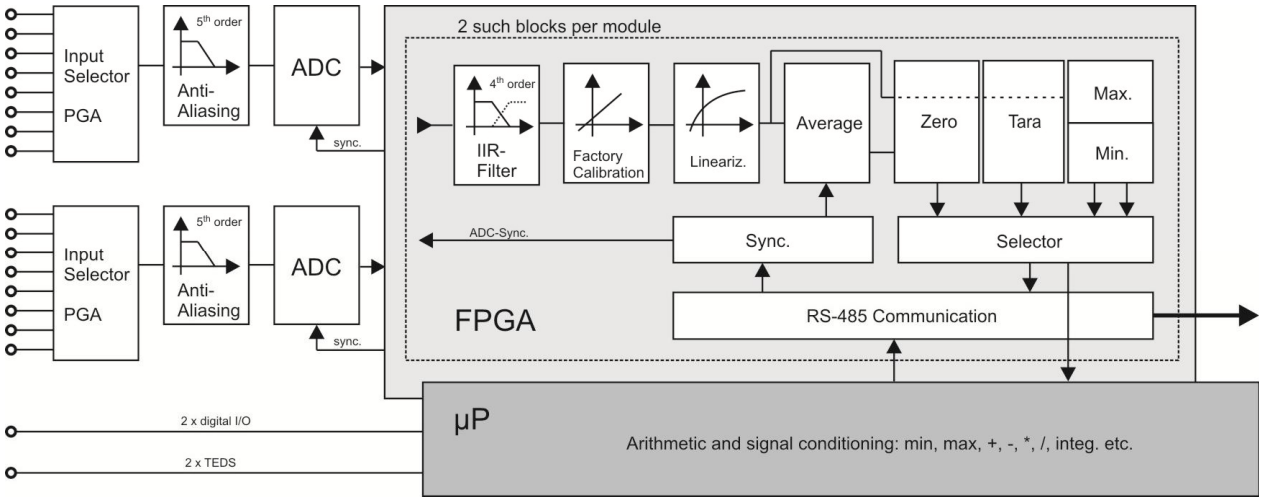
Block Diagram



Analog Inputs			
Number	2		
Accuracy	0.01 % typical		
	0.02 % 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]		
Sensor identification	TEDS		
Measurement Voltage	**Range**	**max. Deviation**	**Resolution**
	±60 V	±0.2 V	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	<10 µV / 24 h, <25 µV / 8000 h		range ±1 V
Temperature influence	on zero	on sensitivity	
	<1 µV / 10 K	<0,05 % / 10 K	
Signal-noise-ratio	> 90 dB at 1 kHz	>120 dB at 1 Hz	
Measurement Current (internal shunt 50 Ω)	**Range**	**max. Deviation**	**Resolution**
	±25 mA	±5 µA	3.0 nA
Long term drift	<0.2 µA / 24 h, <0.5 µA / 8000 h		
Temperature influence	on zero	on sensitivity	
	<0.1 µA / 10 K	<0.03 % / 10 K	

[1] according EN 61326: 1997, appendix B
[2] according EN 61326: 1997, 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	<0.02°C / 24 h; <0.05°C / 8000 h		
Temperature influence	on zero (range 400 Ω)	on sensitivity	
	<0.4 mΩ / 10 K	<0.03 % / 10 K	
Measurement Potentiometer	**Relative measurement**		
Permitted potentiometer resistance	1 kΩ to 10 kΩ		
Long term drift	<0.02 % / 24 h, <0.05 % / 8000 h		
Temperature influence	on zero (range 1)	on sensitivity	
	<0.0001 / 10 K	<0.03 % / 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	<1 µV/V / 24 h, <2.5 µV/V / 8000 h		
Temperature influence	on zero	on sensitivity	
	<1 µV/V / 10 K	<0.05 % / 10 K	
Measurement Thermocouple	**Whole range**	**-100°C...upper limit**	
Type B	better than ±5°C	better than ±2.5°C	
Type E, J, K, L, T, U	better than ±1°C	better than ±0.5°C	
Type N	better than ±2°C	better than ±1°C	
Type R, S	better than ±3°C	better than ±1.5°C	
Input resistance	> 10 MΩ		
Long term drift	<0.05°C / 24 h, <0.15°C / 8000 h		
Temperature influence	on zero	on sensitivity	
	<0.025°C / 10 K	<0.02% / 10 K	
Uncertainty cold junction compens..	<0.3°C		
Measurement IEPE sensor	**Range**	**max. Deviation**	**Resolution**
	±10 V	±10 mV	1.2 µV
Supply	Constant current 4 mA		
Minimum input frequency	2 Hz		
Limit frequency	10 kHz		
Temperature influence	on zero	on sensitivity	
	<10 µV / 10 K	<0.05 % / 10 K	

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Analog/Digital-Conversion	
Resolution	24 bit
Sample rate	100 kHz (measurement thermocouple 10 Hz)
Conversion method	Sigma-Delta (group delay time 380 µs)
Anti-aliasing filter	20 kHz, 5th 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	max. 30 VDC
Input current	max. 0.5 mA
Upper threshold	>10 V (high)
Lower threshold	<2.0 V (low)
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
Data format	8e1
Protocols	Local-Bus: 115200 bps up to 48 Mbps
	Modbus-RTU, ASCII: 19200 bps up to 115200 bps
Connectable devices	max. 32
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.

Specification subject to change without notice
gantner-q.bloxx-a101.pdf (Version 0511)

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