Q.bloxx A111

Measurement Module for IEPE Sensors and Voltages

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, process performance 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:

- **4 galvanic isolated analog input channels**
  IEPE sensors, voltages
- **Fast high accuracy digitalization**
  24 bit ADC, 100 kHz sample rate per channel
- **Signal conditioning**
  16 virtual channels, linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- **RS485 fieldbus interface**
  up to 48 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 to 30 VDC**
- **DIN rail mounting (EN 60715)**

Gantner Instruments Incorporated
9835 Carroll Centre Road, Suite 100
San Diego, CA 92126 USA

www.gantnerinstruments.com
Toll Free: (877) 725-6997 (877 QBLOXXS)
Direct: (858) 537-2060

info@gantnerinstruments.com
Toll Free Fax: (800) 303-9381
Direct Fax: (858) 537-2064

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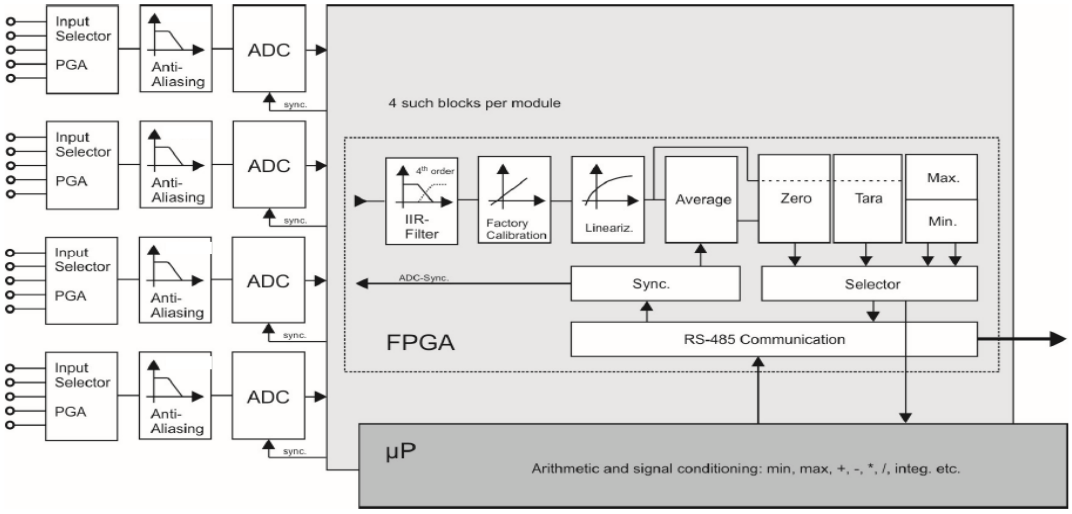
Block Diagram



Analog Inputs			
Number	4		
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]		
Sensor identification	TEDS		
Measurement Voltage	**Range**	**max. Deviation**	**Resolution**
	±10 V	±2 mV	1.2 µV
	±1 V	±0.2 mV	120 nV
	±100 mV	±20 µV	12 nV
Input resistance	>1 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	

[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 IEPE sensor	Range	max. Deviation	Resolution
	±10 V	±10 mV	40 µV
	±1 V	±1 mV	4 µV
	±100 mV	±0.1 mV	0.4 µV
Supply	Constant current 4 mA		
Minimum input frequency	0.5 Hz		
Limit frequency	20 kHz		
Temperature influence	on zero	on sensitivity	
	<10 µV / 10 K	<0.025 % / 10 K	

Analog/Digital-Conversion	
Resolution	24 bit
Sample rate	100 kHz
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
Power Supply	
Power supply	10 up to 30 VDC, overvoltage and overload protection
Power consumption	approx. 2.5 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
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 October 2015. Specification subject to change without notice
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