Gantner instruments

Q.bloxx A107

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, 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 universal analog input channels**
  voltage, current, resistance, potentiometer, Pt100, Pt1000, thermocouples, measuring bridges
- **Fast high accuracy digitalization**
  24 bit ADC, 10 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…30 VDC**
- **DIN rail mounting (EN 60715)**

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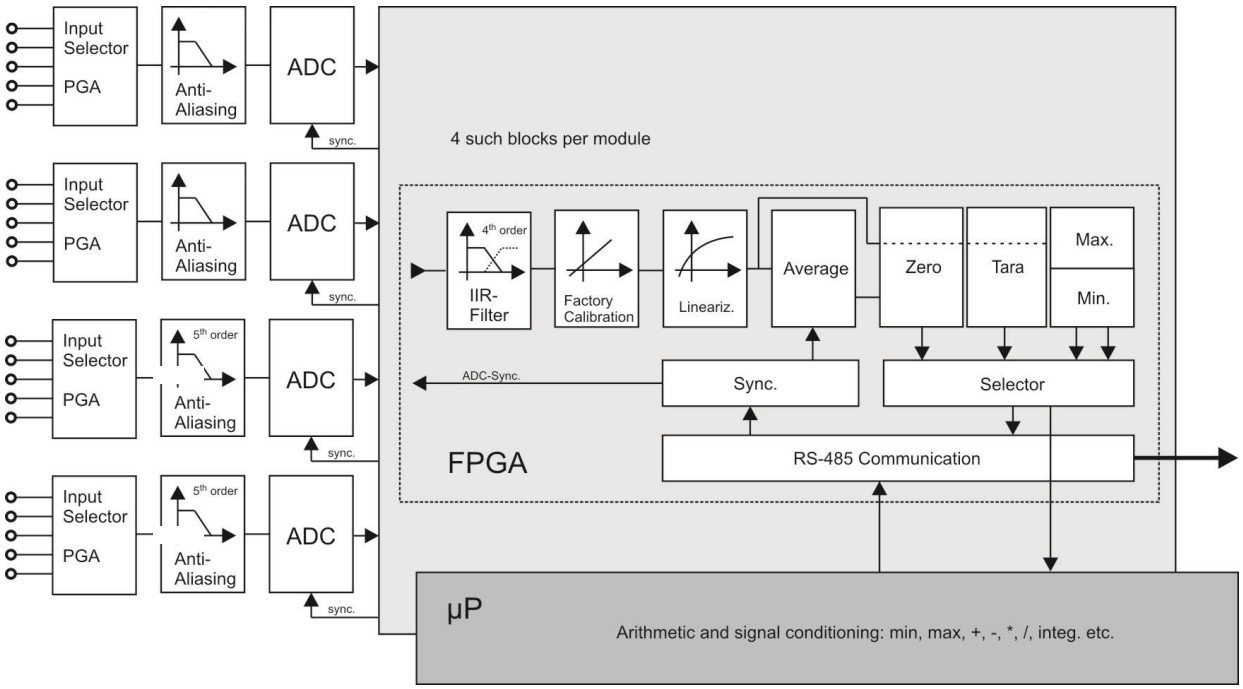
Block Diagram



Analog Inputs			
Number	4		
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]		
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	>100 MΩ		
Temperature influence	**Range**	**on zero**	**on sensitivity**
	±10 V	<500 µV / 10K	<0,01 % / 10 K
	±1 V	<50 µV / 10K	<0,01 % / 10 K
	±100 mV	<5 µV / 10K	<0,01 % / 10 K
Long term drift	**Range**	**24 h**	**8000 h**
	±10 V	<200 µV	<2 mV
	±1 V	<20 µV	<200 µV
	±100 mV	<2 µV	<20 µV
Signal-noise-ratio	>90 dB at 1 kHz	>120 dB at 1 Hz	

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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	
	<0.1 µA / 10 K	<0.03 % / 10 K	
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
Temperature influence	on zero (range 400 Ω)	on sensitivity	
	10 mΩ / 10 K ≙ 0.05°C / 10 K	0.01 % / 10 K	
Long term drift	<10 mΩ / 24 h; <100 mΩ / 8000 h (range 400 Ω)		
Measurement Potentiometer	**Relative measurement**		
Permitted potentiometer resistance	1 kΩ to 10 kΩ		
Long term drift	<0.02 % / 24 h, <0.2 % / 8000 h		
Temperature influence	on zero (range 1)	on sensitivity	
	<0.0001 /10 K	<0.03 % / 10 K	
Measurement Bridge			
Accuracy class	0.05		
Bridge Type	full bridge, 4-wire connection, half and quarter bridge with completion terminal		
Sensor resistance	>100 Ω		
Supply	2.5 V nominal		
Measurement range	±2.5 mV/V	±50 mV/V	±500 mV/V
Temperature influence	on zero (range 2.5 mV/V)	on sensitivity	
	<0.2 µV/V / 10 K	<0.05 % / 10 K	
Long term drift	<0.12 µV/V / 24h; <1.25 µV/V / 8000 h (range 2.5 mV/V)		
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	>100 MΩ		
Long term drift	<0.02 °C/24 h; 0.2 °C/8000 h		
Temperature influence	on zero	on sensitivity	
	<0.02°C / 10 K	<0.025% / 10 K	
Uncertainty cold junction compens.	<0.3°C		

[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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Analog/Digital-Conversion	
Resolution	24 bit
Sample rate	10 kHz, (measurement thermocouple 10 Hz)
Conversion method	Sigma-Delta (group delay time 600 µs)
Anti-aliasing filter	2 kHz, 3rd order
Digital filter	IIR, low pass, high pass, band pass, 4th order, 1 Hz up to 1 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
Accessories	
Cold Junction Compensation	Connection terminal for 2 thermocouples, thermal embedded Pt1000 temperature sensor 2 terminals each module required (4 thermocouples)
Bridge Completion	Connection terminal for ½- and ½- bridge connection 120 Ω or 350 Ω

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

Valid from Mar. 2016. Specification subject to change without notice
gantner-q.bloxx-a107.pdf (Version 0616)

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