Q.raxx EC slimline A106 -8

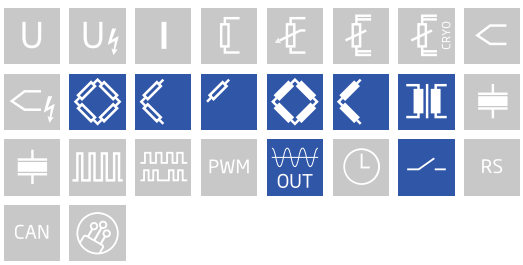
Measurement Module for Strain Gage and LVDT/RVDT

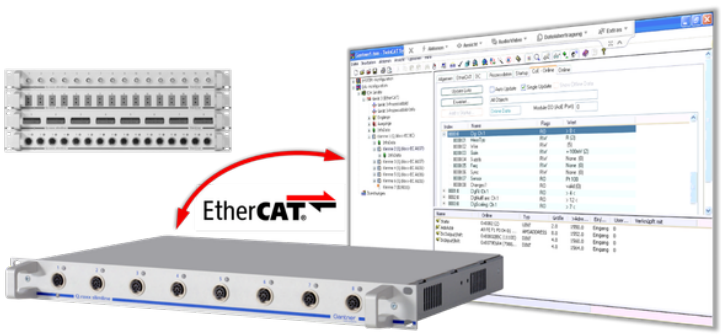
Q.raxx EC slimline is Q.series' highest density 19" 1U rackmount EtherCAT DAQ system - the ideal solution for boom box installations or applications that require maximum channel density and custom sensor terminations. The Q.raxx EC slimline utilizes an integrated EtherCAT bus coupler for communication and is capable of sampling up to 100 kHz with short cycle times and low jitter for accurate synchronization. In addition to available variations, the Q.raxx EC slimline is fully customizable to your specific measurement needs.

- FTP Server and FTP Client functionality configurable function
- Optional fieldbus interface EtherCAT, EtherCAT according specification ETG, 254 read and 254 write variable with 10 kHz
- Ethernet interface for configuration and data output FTP, TCP/IP, UDP
- High data rate over Ethernet, 16 real variables with 10 kHz (block transfer), 64 real variables with 300 Hz (online)
- Data buffer memory dyn. 16 MByte (RAM), stat. 128 MByte (flash) data buffer at block transfer of measurements
- PAC functionality

Key Features

- **8 Analog input channels**
  strain gauge 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
- **8 Analog output channels**
  ±10 VDC, 10 kHz update rate per channel
- **High-accuracy digitization**
  24-bit ADC, 10 kHz sample rate per channel
- **4 digital I/Os**
  input: state, tare, memory reset, output: state, alarm, threshold
- **16 Digital inputs or outputs**
  status, trigger, tare, alarm, command
- **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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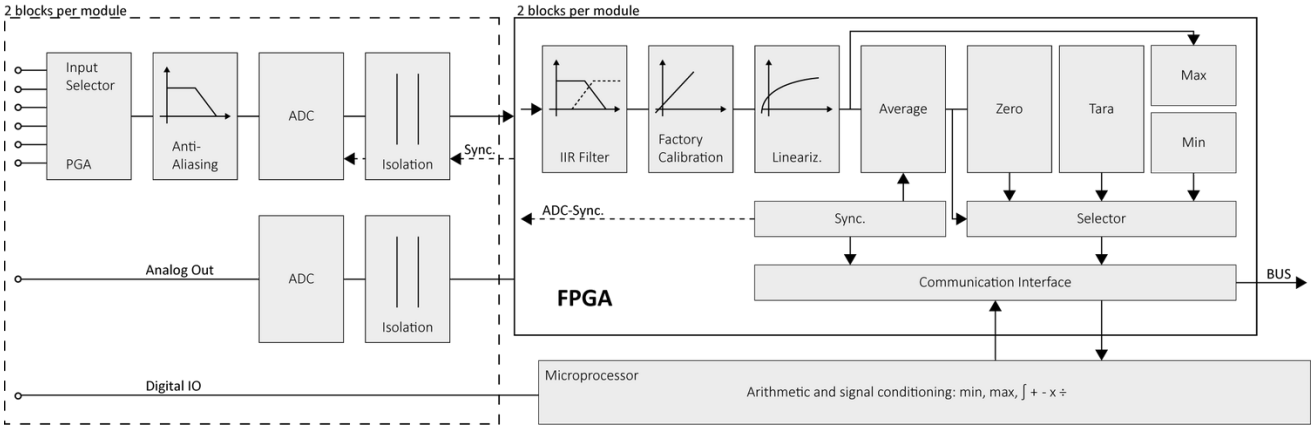
Block diagram



Technical Data

Analog Input Slimline

Channels	8
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	10 kHz per channel
Modulation method	sigma-delta
Anti-aliasing filter	2 kHz, 3rd order (DC excitation) 1 kHz, 3rd order (4.8 kHz CF excitation) 100 Hz, 3rd order (600 Hz CF excitation)
Digital filters	Infinite impulse response (IIR), low-pass, high-pass, band-pass, band-stop, to 8th order Butterworth or Bessel, 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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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	16-bit
Update rate	10 kHz per channel
Settling time	3 µs

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

Mechanical information

Type	19" Standard, 1 Unit
Measurements (W x H x D)	444 x 44 x 260 mm
Weight	approx. 2000 g

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Ordering Information

Article number	463021

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