



Q.raxx A101-8 *slimline* RS / EC

Universal Measurement System

The Q.raxx *slimline* product is based on the standardized 19" technology, one rack unit (1 U) and is designed for measurements with a high level of flexibility, reliability and accuracy in the field of stationary testing and assembly.

The EC version includes a Test Controller that offers the user a powerful solution with PAC functionality, synchronized data acquisition, sequencing, mathematics, combinations a Ethernet TCP/IP interface as well as a EtherCAT fieldbus. It is possible to connect three *slimline* basic units to the Test Controller of a *slimline* EC unit.

Beside the pre-defined standard versions customized systems regarding numbers of channels, kind of measurement inputs/connectable sensors as well as the required connectors are configurable.

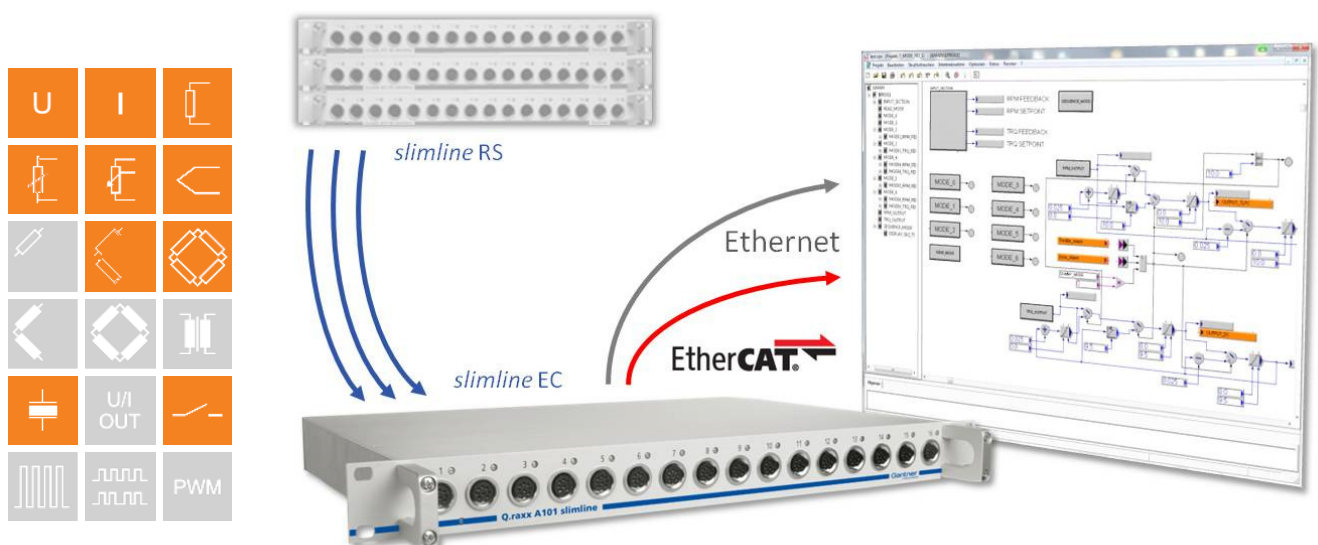
This modularity permits to design an optimized individual solution for any application. Further it is possible to mix different product lines like Q.raxx, Q.bloxx within Q.series.

Most important features:

- **8 universal analog input channels**
voltage, current, resistance, potentiometer, Pt100, Pt1000, thermocouples, full and half bridges, IEPE-sensors
- **Fast high accuracy digitalization**
24 bit ADC, 100 kHz sample rate per channel
- **Signal conditioning**
virtual channels, linearization, digital filter, average, scaling, min/max storage, RMS, arithmetic, alarm
- **Galvanic isolation**
channel to channel to power supply and to interface,
 V_{iso} 500 VDC
- **Electromagnetic Compatibility**
according EN 61000-4 and EN 55011
- **Power supply 10...30 VDC**

With embedded Test Controller (version EC):

- **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
- **FTP Server and FTP Client functionality**
configurable function
- **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
- **Connection of additional racks to the Test Controller**
up to 3 *slimline* racks without Test Controller can be connected to a *slimline* EC system with embedded controller

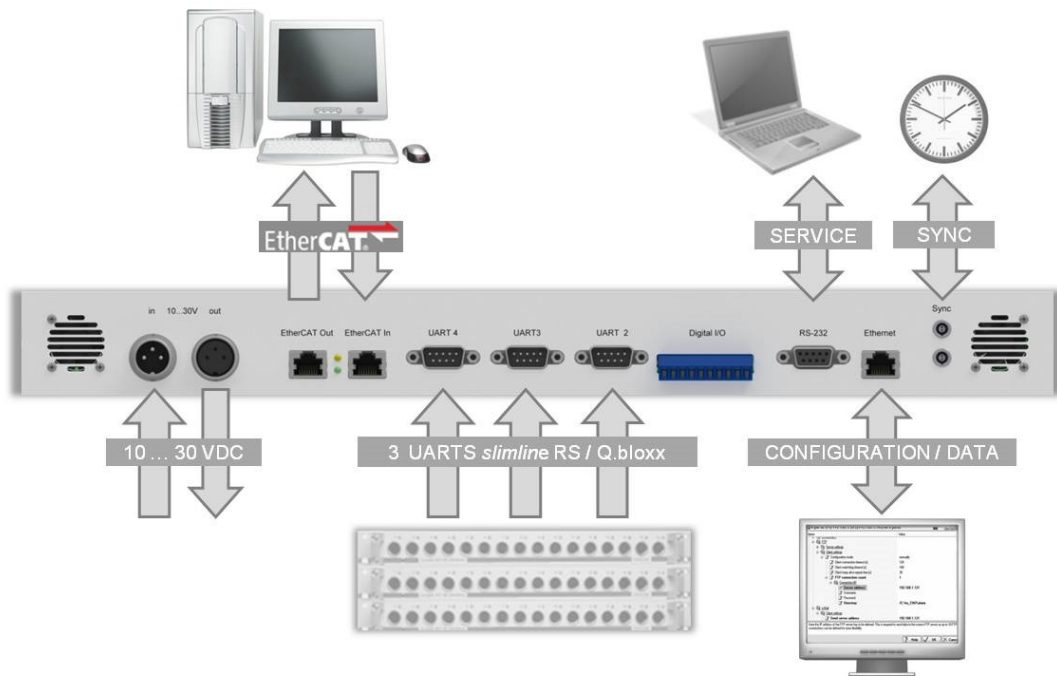




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Connection Diagram Q.raxx *slimline* EC



| Analog Inputs | | | |
|-----------------------|--|-----------------|------------|
| Number | 8 | | |
| 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 |
| | ±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 | | |
| Temperature influence | on zero | on sensitivity | range ±1 V |
| | <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: 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 Current (internal shunt 50 Ω) | Range | max. Deviation | Resolution |
|--|---|----------------------|------------|
| | ±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 | <0.025 % / 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 |
| 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 | |
| Measuring Potentiometer | Relative measurement | | |
| Zulässiger Potentiometer-Widerstand | 1 kΩ bis 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 | <0.025 % / 10 K | |
| Measuring 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 Thermo Couple | 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 | | |
| Langzeitdrift | <0.02°C / 24 h, < 0.2°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 | | |



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| Measurement IEPE sensor | Range | max. Deviation | Resolution |
|---|--|----------------|------------|
| | ±10 V | ±10 mV | 1.2 µV |
| | ±1 V | ±1 mV | 4 µV |
| Supply | Constant current 4 mA | | |
| Minimum input frequency | 0.5 Hz | | |
| Limit frequency | 10 kHz | | |
| Temperature influence | on zero | on sensitivity | |
| | <10 µV / 10 K | 0.05 % / 10 K | |
| 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, 5 th order | | |
| Digital filter | IIR, low pass, high pass, band pass, 4 th order, 1 Hz up to 10 kHz in steps 1, 2, 5 | | |
| Averaging | configurable or automated according the selected data rate | | |
| Digital Inputs (<i>slimline</i> EC only) | | | |
| Function | fixed definition | | |
| Input voltage | max. 30 VDC | | |
| Input current | max. 1.5 mA | | |
| Upper switching threshold | >3.5 V (high) | | |
| Lower switching threshold | <1.0 V (low) | | |
| Digital Outputs (<i>slimline</i> EC only) | | | |
| Function | fixed definition | | |
| Type of output | Open Drain p-Kanal MOSFET | | |
| Output voltage | max. 30 VDC | | |
| Output current | max. 100 mA | | |
| Communication Interface (<i>slimline</i> RS) to connect to a Test Controller | | | |
| 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 | | |
| Host Interface Ethernet (<i>slimline</i> EC only) | | | |
| Protocols | TCP/IP, UDP, PING, ASCII, Modbus TCP/IP | | |
| Services | DHCP, FTP-Server, FTP-Client, e-Mail-Send-Client (SMTP) | | |
| Baud rate | 10/100 Mbps | | |
| Data rate | max. 800 kByte/s | | |
| Number of simultaneous Clients | 10 | | |
| Isolation voltage | 500 V | | |



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| Host Interface EtherCAT (<i>slimline</i> EC only) | | |
|--|--|--|
| Standard | Ethernet | |
| Number of channels | 1024 Byte read and write data, 254 variables | |
| Baud rate | 100 Mbps | |
| Cycle time | ≥100 μs | |
| Isolation voltage | 500 V | |
| Slave Interfaces RS 485 (<i>slimline</i> EC only) to connect further <i>slimline</i> RS, see Connection Diagram | | |
| Number of interfaces | 3 | |
| Standard | RS 485 | |
| Data format | 8E1 | |
| Protocol | Local Bus | |
| Baud rate | 9.6 kbps up to 24 Mbps | |
| Isolation voltage | 500 V | |
| Data Memory (<i>slimline</i> EC only) | | |
| RAM | 16 MByte (optional 90 MByte), cycle buffer | |
| Flash | 128 MByte | |
| Synchronization of a Multi Device System (<i>slimline</i> EC only) | | |
| Interface | RS485 Standard | |
| Mode | Master Slave principle, IRIG standard | DCF77, AFNOR etc, GPS over IRIG standard |
| | GPS NMEA over RS232 | SNTP over Ethernet |
| Power Supply | | |
| Power supply | 10 up to 30 VDC, Überspannungs- und Verpolungsschutz | |
| Power consumption <i>slimline</i> RS | approx. 8 W | |
| Power consumption <i>slimline</i> EC | approx. 13 W | |
| Influence of the voltage | <0,001 %/V | |
| Mechanical | | |
| Type | 19" Standard, 1 unit | |
| Dimensions (W x H x D) | (444 x 44 x 260) mm | |
| Protection system | IP20 | |
| 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 | |
| PAC Functionality (<i>slimline</i> EC only) | | |
| Cycle time | ≥1 ms | |
| Processing | cyclic or synchronized with data acquisition | |

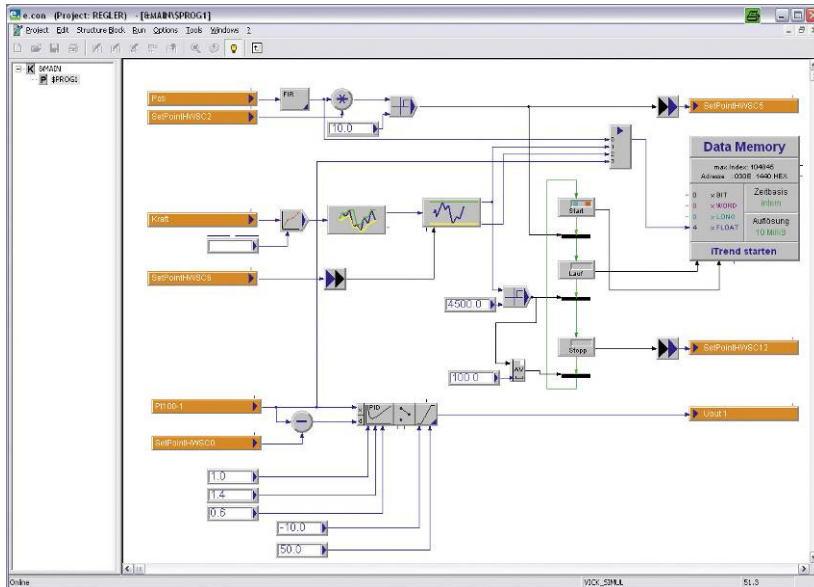


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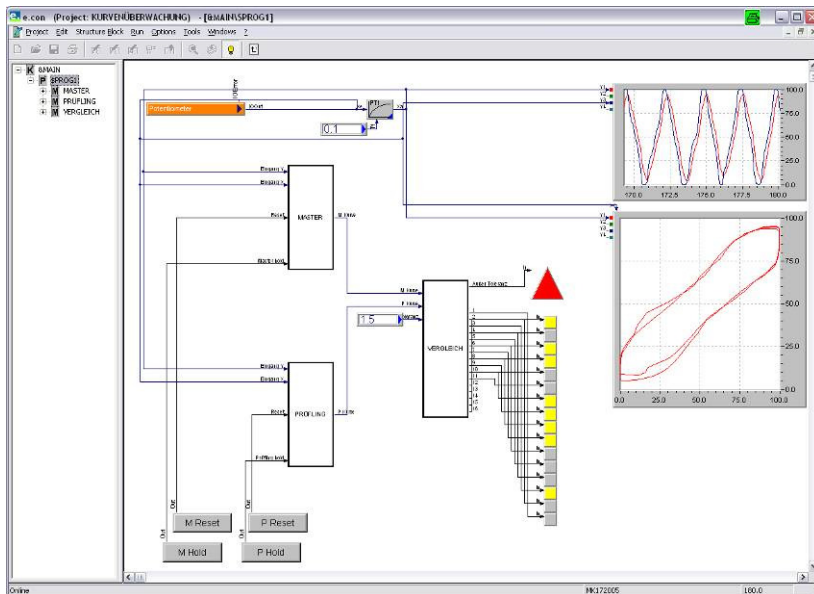
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Programming Tool test.con

Using test.con for programming of the PAC-function in a graphical way:



- Project Libraries
- Advanced System Functions (V1.0)
 - Archive (V 5.0)
 - Arithmetic (Time) V1.0
 - Arithmetic (Word, Long, Float) (V4.0)
 - Comparison (Time) V1.0
 - Control elements (V0.0)
 - Controller (Float)
 - Converter (Bit, Byte, Word, Long, Float, Text) (V4.0)
 - Converter (Time) V1.0
 - Counter (Word)
 - Device Data Access Functions
 - Read access
 - Write access
 - Digital Filter (V1.0)
 - Edge detection (Bit)
 - Extended SFB
 - Flipflops (Bit)
 - Function generator (V 3.0)
 - Global Variables and References (extended)
 - Logic (Bit)
 - Memory (V1.0)
 - Numeric (Float)
 - Operatingsystem-Funcions (V1.0)
 - Parameter (Time) V1.0
 - Parameter blocks (V 1.0)
 - Selection and comparison (Byte, Word, Long, Float)
 - Comparator
 - Limit indicator
 - Limiter
 - Maximum
 - Minimum
 - Multiplexer
 - Switch
 - Sequence blocks
 - Joining transition
 - Preset
 - Splitting transition
 - Step
 - Transition
 - Shift and rotate (Byte, Word, Long)
 - Signal generators (V1.0)
 - Signal processing (V1.0)
 - Standard
 - Standard transmission terms (Float)
 - String Functions
 - Timer (Float)
 - Timer (Time) V2.0
 - Visualization blocks (Time) V2.0
 - Visualization Blocks (V6.0)



Warm Up Time

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

Valid from July 2015. Specification subject to change without notice
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