



Q.raxx D101-16 *slimline* RS / EC

Digital 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.

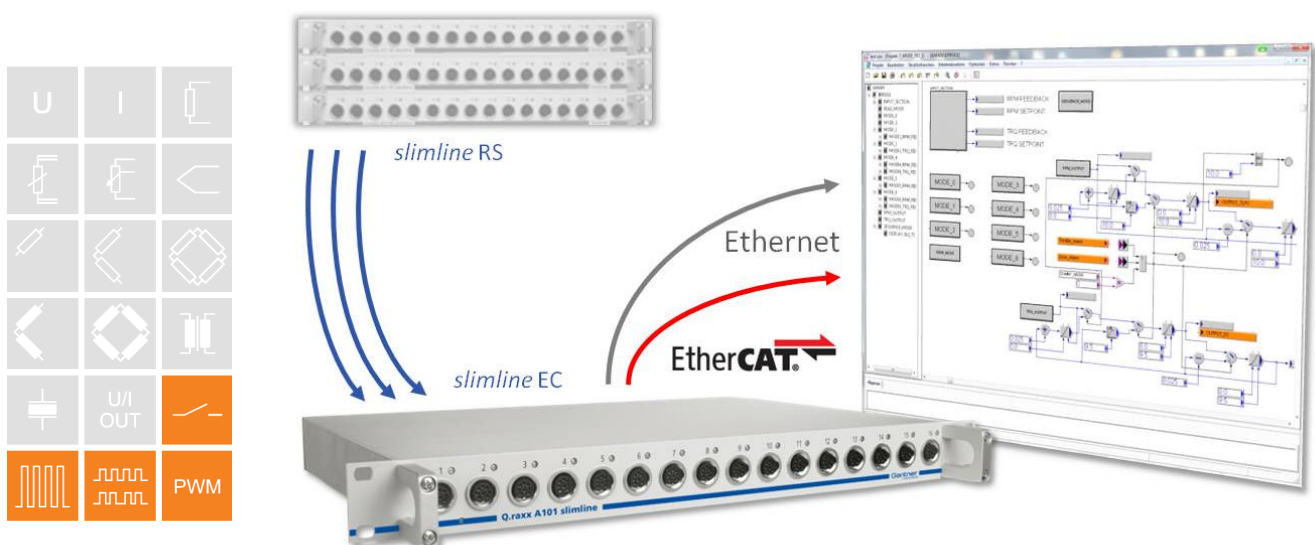
This modularity permits to design an optimized individual solution for any application. Further it is possible to mix different product lines like Q.raxx, Q.bloxx within Q.series.

Die wichtigsten Fakten:

- **12 digital inputs and 8 digital outputs**
configurable as counter, frequency, PWM and time inputs, frequency or PWM output, state in or output
- **State in and outputs**
process- and host controlled
- **Frequency in and outputs**
frequency measurement up to 1 MHz (Chronos method), frequency output up to 10 kHz
- **Counter**
for/backward counter, quadrature counter with reference zero recognition (reset/enable), up to 1 MHz
- **PWM in and outputs**
measurement of duty cycle and frequency, output with variable frequency and/or duty cycle
- **Time measurement**
- **Power supply 10...30 VDC**

With embedded Test Controller (version EC):

- **Optional fieldbus interface EtherCAT**
EtherCAT according specification ETG, 256 read and 256 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

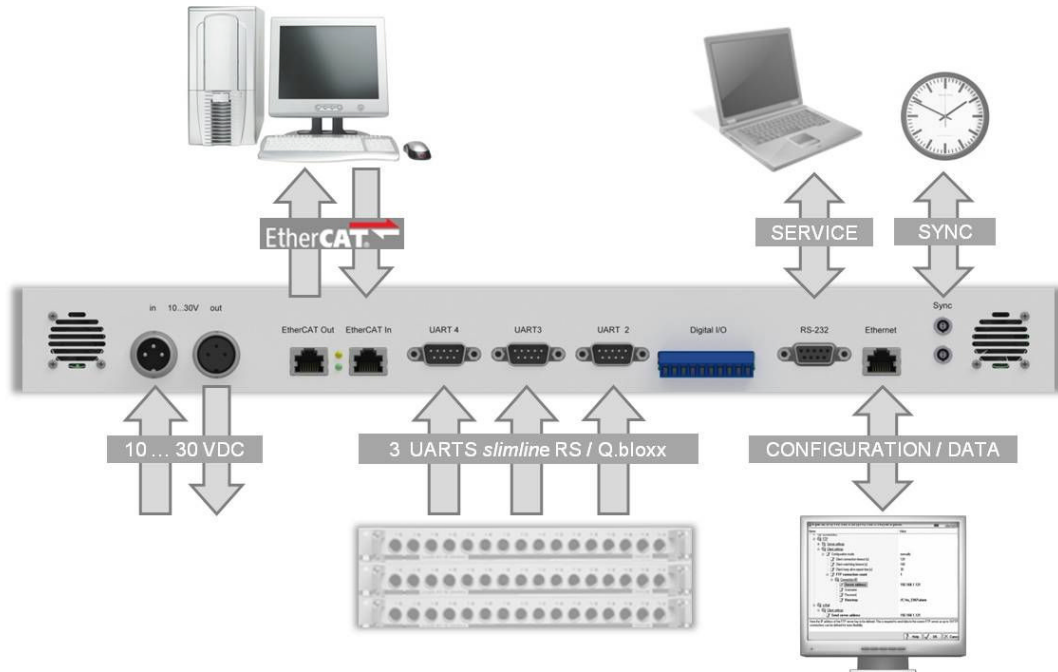




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Connection Diagram Q.raxx *slimline* EC



Digital Inputs	
Number	12
Input voltage	max. 30 VDC
Input current	max. 2 mA
Threshold (programmable)	TTL or
Signal voltage „0“	-3... 5 VDC (EN61131-2, Type1)
Signal voltage „1“	11... 30 VDC (EN61131-2, Type1)
Galvanic isolation	500 VDC group/group and against power supply and interface ¹
Function	
State	
Reaction time	10 µs
8-fold Bit-Set	specification such as simple state-input, but the binary coded information of 8 inputs can be transmitted as a single variable. This functionality covers all 8 inputs even if they are already used by other functionalities such as counter or frequency measurement. In case of a conflict the Bit-Set is lower prior

¹ Noise pulses up to 1000 VDC, permanent up to 250 VDC



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Frequency measurement			
Method	Chronos optimized by combination of time measurement and pulse counting Recognition of the direction of rotation (0°, 90°)		
Frequency range	0.1 Hz up to 1 MHz		
Time base	0.001 up to 10 s		
Counter frequency (reference)	48 MHz		
Resolution	0.002 %		
Frequency measurement with recognition of the direction of rotation	specification like frequency measurement. For the recognition of the direction of rotation the phasing of both inputs is being used.		
Counter			
Counter	32 bit (±31 bit)		
Counter frequency	1 MHz		
Back/forward counter	specification like counter but with an additional input for the direction of counting		
Quadrature counter	specification like counter. For the recognition of the direction the phasing of both inputs is being used.		
Quadrature counter with zero reference and reset/enable	specification like quadrature counter but with an additional input for the „0“ reference recognition and an additional input to activate the counter functionality individually.		
PWM measurement			
Input frequency	0.1 Hz up to 1 MHz		
Resolution	21 ns		
Configuration of the measurement type	counter for duty cycle, frequency		
Time measurement			
Function	Measuring of time between two edges, measuring of high time, low time and high/low relation		
Time range	1 µs up to 32 s		
Resolution	21 ns		
Digital Outputs			
Number	4		
Contact	open drain p-channel MOSFET (short circuit proof)		
Load	30 VDC/500 mA (ohmic Load)		
Function			
State			
Reaction time (depending on load)	>0.5 A	>0.1 A	<0.1 A
	10 µs	100 µs	1000 µs
8-fold Bit-Set	Specification such as a simple state output but 8 outputs can be set with only one variable in binary coding. This functionality covers all 8 outputs even if they are used by other functionalities such as frequency or PWM output. In case of a conflict the Bit-Set is lower prior		



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Frequency output	
Frequency range	0.1 Hz up to 1 kHz / 10 kHz depending on load
Accuracy	0.1 %
Resolution	1 μ s
PWM output	
Frequency range	0.1 Hz up to 1 kHz / 10 kHz depending on load
Accuracy	0.1 %
Resolution	1 μ s
Digital Inputs Test Controller (<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 Test Controller (<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
Protokolle	Local-Bus: 115.200 bps bis 48 Mbps
	Modbus-RTU, ASCII: 19.200 bps bis 115.200 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	
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 bis 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	



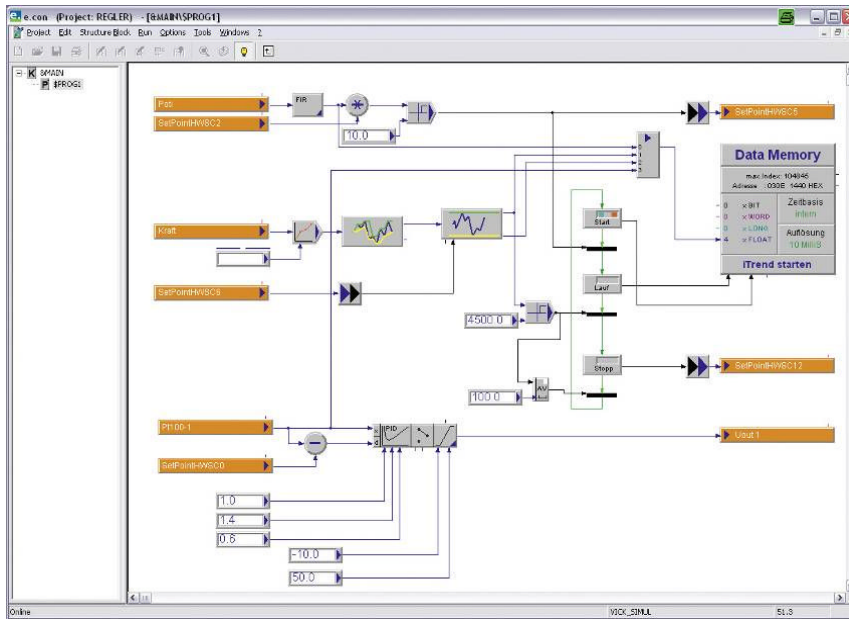
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PAC Functionality (<i>slimline EC only</i>)	
Cycle time	≥1 ms
Processing	cyclic or synchronized with data acquisition

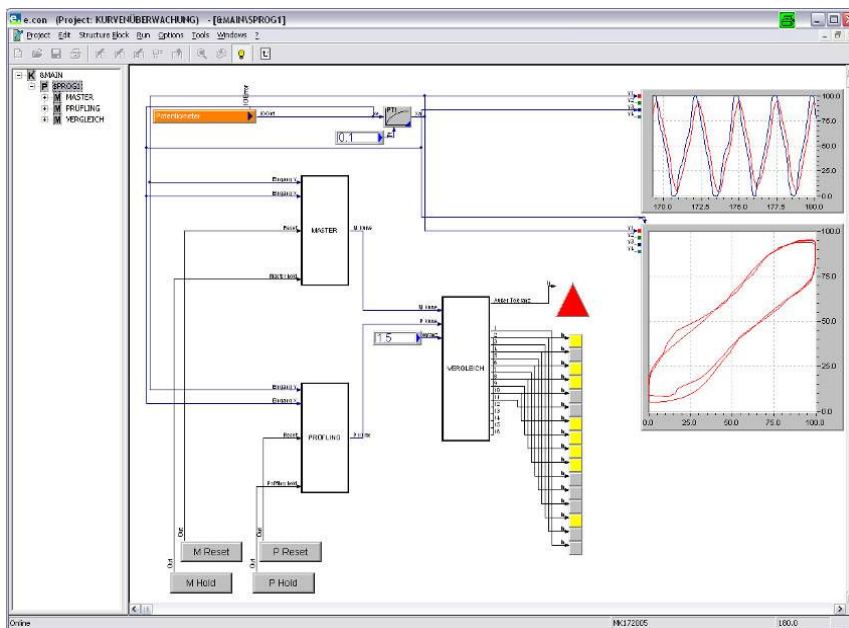
Programming Tool test.con

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-Functions (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 January 2011. Specification subject to change without notice
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