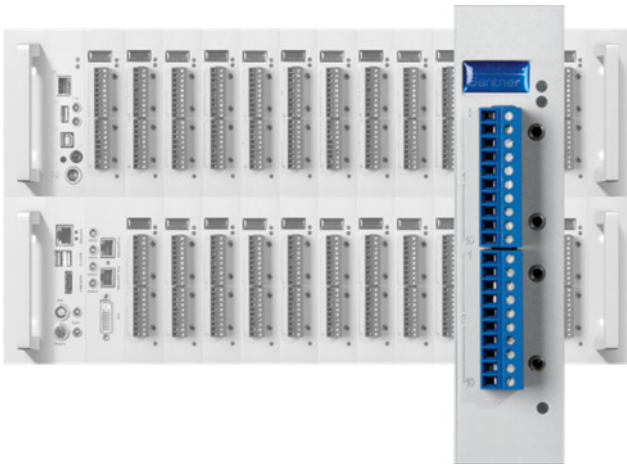




## Q.raxx A109

## Analog Output Plug-in Module with Digital I/Os



The Q.raxx product is based on the standardized 19" technology and is designed for measurements with a high level of flexibility, reliability and accuracy. The range of applications starts from small stand-alone solutions up to networked multi-channel applications in the field of stationary testing and assembly.

The wide range of available plug-in modules and the flexibility of the system configuration allows an optimized solution for each single task. Up to 13 plug-in modules in one system plus a Controller Unit provide a powerful package with PAC functionality, logging possibilities and an Ethernet TCP/IP interface.

Conclusion:

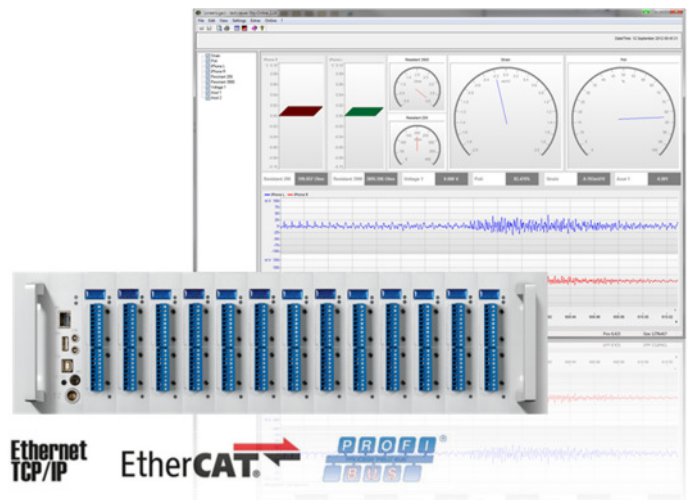
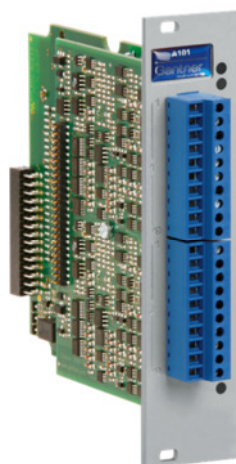
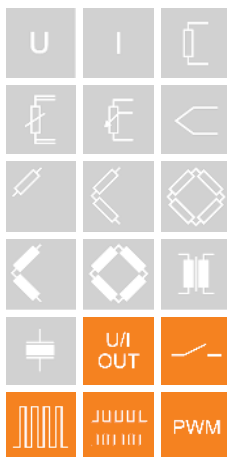
Dynamic signal acquisition up to 100 kHz, inputs and outputs for all types of signals, galvanic isolation of inputs and outputs, multi-channel solutions, high density packaging and intelligent signal conditioning for all kind of test applications.

### Most important features of the system:

- **High density and flexibility**  
up to 13 plug-in modules in one system in any constellation, flexible plug selection
- **Test Controller Q.station or Q.gate selectable**  
Ethernet TCP/IP for configuration and data transfer, EtherCAT, internal memory expandable by USB device, logging features, PAC functionality, IRIG synchronization for details please see separate Test Controller data sheets
- **Robust and reliable**  
stable and compact aluminum housing, easy to carry  
electromagnetic compatibility according EN 61000-4 and EN 55011  
Temperature range -20 up to +60°C  
power supply 10 up to 30 VDC

### Most important features of the plug-in A109:

- **4 galvanic isolated analog output channels**  
voltage  $\pm 10$  V, current 0...20 mA selectable, isolation voltage 500 VDC
- **DAC-resolution 16 bit**  
100 kHz with 1 channel, 10 kHz with 4 channels
- **4 digital inputs and 4 digital outputs**  
configurable as 2 counter, 2 frequency, or 2 PWM inputs, 2 frequency or PWM output, state in or output
- **Frequency in and outputs**  
frequency measurement up to 1 MHz (Chronos),  
frequency output up to 1 kHz
- **Counter**  
For/backward counter, quadrature counter with reference zero recognition (reset/enable), up to 1 MHz
- **PWM in and output**  
measurement of duty cycle and frequency





## Q.raxx A109

## Analog Output Plug-in Module with Digital I/Os

Analog Outputs		
Number	4	
Accuracy	0.02 %	
Output type	configurable voltage or current output	
Isolation voltage	500 VDC channel to channel to power supply to interface <sup>1</sup>	
Output voltage	±10 VDC	
Perm. load resistance	>2 kΩ	
Temperature influence	on zero	on sensitivity
	<2 mV / 10 K	<0.05 % / 10 K
Noise voltage	<10 mV at 1000 Hz	<2 mV at 10 Hz
Long term drift	<1 mV / 24 h; <2,5 mV / 8000 h	
Output current	0...20 mA	
Permitted burden	<400 Ω	
Burden influence	accuracy at 100 Ω	on sensitivity
	±4 μA	<0.1 μA / Ω
Temperature influence	on zero	on sensitivity
	<4 μA / 10 K	<0.05 % / 10 K
Noise current	<20 μA at 1000 Hz	<4 μA at 10 Hz
Long term drift	<2 μA / 24 h; <5 μA / 8000 h	
Digital/Analog-Conversion		
Resolution	16 bit	
Sample rate	100 kHz per channel	
Settling time	3 μs	
Digital Inputs		
Number	4	
Input voltage	max. 30 VDC	
Input current	max. 2 mA	
Threshold	TTL or	
Signal voltage „0“	-3... 5 VDC (EN61131-2, Type1)	
Signal voltage „1“	11... 30 VDC (EN61131-2, Type1)	
Isolation voltage	500 VDC group/group and against power supply and interface <sup>1</sup>	

<sup>1</sup> noise pulses up to 1000 VDC, permanent up to 250 VDC



## Q.raxx A109

## Analog Output Plug-in Module with Digital I/Os

<b>Function Digital Inputs</b>	
<b>State</b>	
Reaction time	10 $\mu$ s
<b>Frequency measurement</b>	
Method	Chronos
	Optimized by combination of time measurement and pulse counting <b>Recognition of the direction of rotation (0°, 90°)</b>
Frequency range	0.1 Hz up to 1 MHz
Time base	0.001 up to 1 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.
<b>PWM measurement</b>	
Input frequency	0.1 Hz up to 1 MHz
Resolution	21 ns
Configuration of the measurement type	Counter for duty cycle, frequency
<b>Counter</b>	
Counter	32 bit ( $\pm$ 31 bit)
Counter frequency	1 MHz
For/backward 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 „0“ reference recognition individually.
<b>Digital Outputs</b>	
Number	4
Contact	open drain p-channel MOSFET (short circuit proof)
Load	30 VDC/500 mA (ohmic Load)



## Q.raxx A109

## Analog Output Plug-in Module with Digital I/Os

<b>Function Digital Outputs</b>			
<b>State</b>			
Reaction time (depending on load)	>0.5 A	>0.1 A	<0.1 A
	10 µs	100 µs	1000 µs
<b>Frequency output</b>			
Frequency range	0.1 Hz up to 1 kHz / 10 kHz depending on load		
Accuracy	0.1 %		
Resolution	1 µs		
<b>PWM output</b>			
Frequency range	0.1 Hz up to 1 kHz / 10 kHz depending on load		
Accuracy	0.1 %		
Resolution	1 µs		
<b>Power Supply</b>			
Power supply	10 up to 30 VDC, overvoltage and overload protection		
Power consumption	approx. 2 W		
Influence of the voltage	<0.001 %/V		
<b>Environmental</b>			
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		
<b>Dimension</b>			
Front plate (W x H)	(30 x 128) mm		
Depth	118 mm		

### 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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