Q.raxx D101

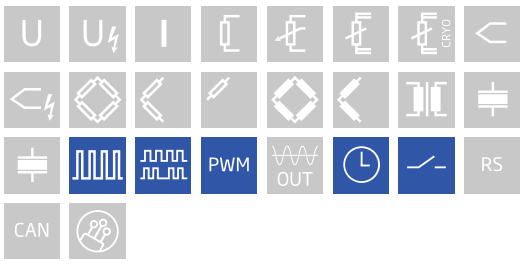
Digital Measurement Module

Q.raxx is the ideal 19" rackmount DAQ solution for applications that require high channel density. Q.raxx DAQ systems can utilize an integrated, high-performance controller for communication, control, and data logging purposes. With a controller, multiple Q.raxx systems can be synchronized to each other allowing for efficient DAQ distribution with low jitter and gradual expansion up to thousands of channels.

- High Density
  up to 13 I/O modules per Q.raxx 3U chassis with up to 16 channels per I/O module
- User Friendly
  front panel indicators for module status, power, and input range error
- Fully Customizable
  multiple front panel termination options available
- Maximum Flexibility
  parallel communication available in TCP/IP, CAN, PROFIBUS, Modbus, and EtherCAT

Key Features

- 8 digital inputs and 8 digital outputs
  configurable as counter, frequency and PWM
  only 4 inputs can be used for frequency
- State in and output
  process- and host controlled
- Frequency in and output
  frequency measurement up to 1 MHz (Chronos method), frequency output up to 10 kHz
- Counter
  for/backward counter, quadrature counter with reference zero recognition and missing teeth detection, up to 1 MHz
- PWM in and output
  measurement of duty cycle and frequency, output with variable frequency and/or duty cycle
- Time measurement
- Galvanic isolation
  I/O-signals (4 x 4 I/Os) to power supply and to interface
  Isolation voltage 500 VDC



Technical Data

Digital Inputs

Channels	8
Logic levels	TTL or 24 VDC according to IEC 61131-2, Type 1
TTL logic voltage	< 0.8 VDC (Low) > 3 VDC (High)
24 VDC logic voltage	-3 to 5 VDC (Low) 11 to 30 VDC (High)
Input voltage	30 VDC max.
Input current	2 mA max.
Isolation voltage	500 VDC, group to group, group to power supply, channel to bus [1]

[1] noise pulses up to 1000 VDC, continuous up to 250 VDC

Function Digital Inputs

Status	
Response 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.
Frequency measurement	
Method	Chronos optimized by combination of the time measurement and pulse counting, recognition of direction of rotation (0 deg./90 deg.)
Frequency range	0.1 Hz to 1 MHz
Time base	0.001 s to 10 s
Reference frequency	48 MHz
Accuracy	0.01% at timebase > 1ms (-20°C to +60°C)
Frequency measurement with recognition of direction of rotation	specification like frequency measurement, for the recognition of the rotation direction the phasing of both inputs is being used
Pulse counting	
Counter depth	32-bit (±31-bit)
Counter frequency	max. 1 Mhz
Forward and reverse counting	with an additional input for the direction of counting
Quadrature counter	with an additional input for the direction recognition for phasing the inputs
Quadrature counter with zero reference and reset/enable	like quadrature counter but with two additional inputs for the 0-reference recognition and enabling the 0-reference recognition
PWM measurement (duty cycle)	
Input frequency	0.1 Hz to 1 MHz
Accuracy	0.01% Freq < 2 kHz, 0.1% 2 kHz to 20 kHz, 3% > 20 kHz (-20°C to +60°C)
Resolution	21 ns

With a D101 - 2 x 4 terminals for digital inputs are available. Those will accept all mentioned signals as it required. The following combinations are possible.

Connector 1				Connector 2			
Terminal 1.6	Terminal 1.7	Terminal 1.8	Terminal 1.9	Terminal 2.6	Terminal 2.7	Terminal 2.8	Terminal 2.9
Status	Status	Status	Status	Status	Status	Status	Status
1 ch. signal	Status	1 ch. signal	Status	1 ch. signal	Status	1 ch. signal	Status
Status	Status	Status	Status	Status	Status	2 channel signal [1]	
Status	Status	Status	Status	2 channel signal [1]		2 channel signal [1]	
Status	Status	Status	Status	4 channel signal [2]			
Status	Status	2 channel signal [1]		2 channel signal [1]		2 channel signal [1]	
Status	Status	2 channel signal [1]		4 channel signal [2]			
2 channel signal [1]		2 channel signal [1]		4 channel signal [2]			
2 channel signal [1]		2 channel signal [1]		2 channel signal [1]		2 channel signal [1]	
4 channel signal [2]				4 channel signal [2]			

[1] All digital functionalities except status and quadrature counter with zero reference and reset/enable

[2] Quadrature counter with zero reference and reset/enable

Time measurement	
Function	Measuring of time between two edges, measuring of high time, low time and high/low relation

Time range	1 µs to 32 s
Resolution	21 ns

Digital Outputs

Channels	8
Output voltage	12 V to30 VDC
Load capacity	30 VDC / 500 mA (ohmic load)
Contact	open drain p-channel MOSFET

Function Digital Outputs

Status			
Response time (depending on load capacity)	>0.5 A	>0.1 A	<0.1 A
	10 µs	100 µs	1000 µs
8-fold bit set	specification such as simple state-output, but the binary coded information of 8 outputs can be transmitted as a single variable. This functionality covers all 8 outputs 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.		
Frequency output			
Frequency range	0.1 Hz to 1 kHz / 10 kHz depending on load capacity		
Accuracy	0.1 %		
Resolution	1 µs		
PWM output			
Frequency range	0.1 Hz to 1 kHz / 10 kHz depending on load capacity		
Accuracy	0.1 %		
Resolution	1 µs		

Communication Interface

Protocols	proprietary Localbus (115200 bps to 24 Mbps, latency <100 ns) ASCII (19200 bps to 115200 bps) Modbus RTU Profibus-DP (19200 bps to 12 Mbps) (special Firmware required)
Data format	8E1
Electrical standard	ANSI/TIA/EIA-485-A, 2-wire

Power Supply

Input voltage	10 to 30 VDC, overvoltage and overcurrent protection
Power consumption	approx. 2 W
Input voltage influence	<0.001 %/V

Environmental

Operating temperature	-20°C to +60°C
Storage temperature	-40°C to +85°C
Relative humidity	5 % to 95 % at 50°C, non-condensing

Remarks

Warm-up time	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

Material	Aluminum
Measurements (W x H x D)	30 x 128 x 118 mm
Weight	approx. 100 g

Ordering Information

Article number	102116

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