QUANTUMX

MX879B

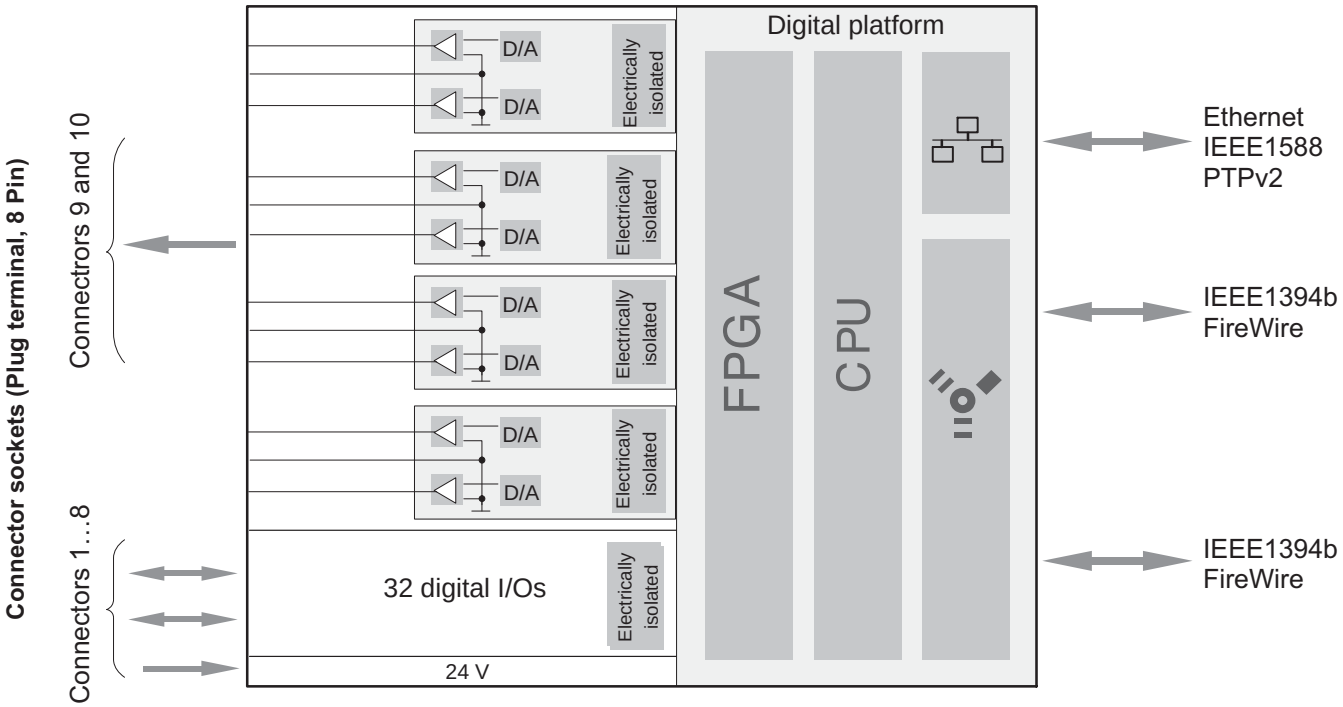
Multi879B

Data sheet

Special features

- **8 individually configurable analog voltage outputs**
- **32 individually configurable digital I/Os**
- **Mathematics unit in real time**
- **Signal generator: Standard types or arbitrary (load profile)**
- **Signal monitoring (limit switch)**
- **PID controller**

Block diagram



Specifications MX879

General specifications		
Supply voltage range (DC)	V	10 ... 30 (24 V nominal (rated) voltage)
Supply voltage interruption		max. for 5 ms at 24 V
Power consumption	W	7
Module functions		Analog outputs, digital I/O, mathematics unit real-time computation
Analog outputs	Number	8, electrically isolated from each other and from the supply
Digital In/Outputs	Number	32, individually freely configurable as input or output
Type of connection		Plug terminal: Phönix Contact FMC-1,5/8-ST-3,5-RF (plug included in scope of supply)
Ethernet (data link) Protocol/addressing Connection Max. cable length to module	 - - m	10Base-T/100Base-TX TCP/IP (static IP/DHCP, IPv4/IPv6) 8P8C plug (RJ-45) with twisted pair cable (CAT-5) 100
FireWire (module synchronization, data link, optional supply voltage) Baud rate Max. current from module to module Max. cable length between the nodes Max. number of modules connected in series (daisy chain) Max. number of modules in a FireWire system (including hubs[1], backplane) Max. chain of hops[2]	 MBaud A m - - -	IEEE 1394b (HBM modules only) 400 (approx. 50 MByte/s) 1.5 5 12 (=11 hops) 24 14
Synchronization EtherCAT®[4] IRIG-B (B000 to B007; B120 to B127) IEEE1588v2 (PTP), NTP PROFINET		IEEE1394b FireWire (only QuantumX, automatically) via CX27/B EtherCAT-Gateway via any MX840/B channel via Ethernet
Nominal (rated) temperature range	°C [°F]	-20 ... +60 [-4 … +140]
Operating temperature range	°C [°F]	-20 ... +65 [-4 … +149]
Storage temperature range	°C [°F]	-40 ... +75 [-40 … +167]
Rel. humidity	%	5 ... 95 (non condensing)
Protection class		III
Degree of protection		IP20 per EN60529
Mechanical tests[3] Vibration (30 min) Shock (6 ms)	 m/s^2 m/s^2	 50 350
EMC requirements Compliance with emission per EN55011, class B : with snap-on ferrite on power supply cable, to be mounted at 12 cm distance from the device. Ferrit included. Compliance with emission emission per EN55011, class A: without snap-on ferrite.		per EN 61326
Dimensions, horizontal (W x H x D)	mm mm	52.5 x 200 x 122 (with case protection) 44 x 174 x 119 (without case protection)
Weight, approx.		980
Analog outputs		
Accuracy class		0.1
Number of outputs	-	8
Signal sources	-	**Real-time output:** QuantumX system signals, e.g. inputs (analog, digital, CANbus), internal signal generator (sine, rectangle, triangle), internal buffer (replay of any data / arbitrary), computed signals (see functions) **Online output:** Default signals from PC level (observe min. latency of 50 ms)
Type of connection	-	Plug terminal: Phönix Contact FMC-1,5/8-ST-3,5-RF
Cable length, max.	m	30
Nominal (rated) voltage	V	±10

Reference signal		2 output each with common ground, electrically isolated from supply and housing. Max. potential difference 60V
D/A converter resolution	Bit	16
Max. Update rate (intern)	kS/s	100
Min. Update rate (extern)	kS/s	5
Noise (peak to peak)	mV	< 15
Permissible load impedance	Ω	> 2,000 / <2 nF
Crosstalk attenuation	dB	> 90
Zero drift	%/10 K	< 0.05 of full scale value
Full-scale drift	%/10 K	< 0.05 of output value
Cut-off frequency (-1 dB)	kHz	10
Additional adjustable filter	Hz	0.1 ... 10 000
Output resistance	Ω	< 2
Digital inputs & outputs		
Number		32, can be individually parameterized as input or output
Type of connection		Plug terminal
Cable length, max.	m	30
Update rate	kS/s	5
Status display : Light-emitting diodes		
Input / output status (electrically)	Number	32
24 V display		4
Input signal range		
Permissible input signal range, max.	V	36
Adjustable threshold (5 V internal supply mode, 24 V external supply mode)		
Activation threshold external supply	V	8
Deactivation threshold external supply	V	6.8
Activation threshold internal supply	V	3.2
Deactivation threshold internal supply	V	2
Input resistance (nominal)	kΩ	6.9
External supply of the digital I/O	V	5.5 … 36
Output with external supply, 24 V terminal		
Level min., active High, at 100 mA load	V	(voltage supply digital I/O) - 1
Output current, max.	mA	200 (short-circuit-protected)
Short-circuit current max. , typical	mA	500
Output with internal excitation, U_{INT}		
Voltage, typ.	V	5.4
Total current, max.	mA	32
Level at active high	V	4.9 - 5.6
Real-time computation on the module		
Mathematics unit Number of computations Max. input rate Max. output rate	 kS/s kS/s	 4 5 5
Root mean square value (RMS), adjustable observation period with 4,800 Hz input rate	ms	2 … 1,200
Logic (AND, NAND, OR, NOR, XOR)	Number	4 Calculations
Matrix computation (e.g. compensation matrix of customized HBM transducers) Number of input signals Number of output signals Number of coefficients		 6 6 36
Add&Multiply Number of input signals Number of coefficients Formula		 2 4 a0+a1*S1+a2*S2+a3*S1*S2

Peak-value unit		
Number of peak values		4
Max. input rate	kS/s	5
Max. output rate	kS/s	5
Limit value unit		
Number of limit values/Signal monitoring		32
Update rate	kS/s	5
Signalgenerator		
Standard mode		
Signalt ype		Constant, sine, rectangle, triangle
Max. Output rate	kS/s	5
Parameter		Amplitude, frequency, duty ratios
Arbitrary mode		
Signal type / format		Any (ASCII)
Data format		Float
Number of buffers		2
Number of signal values per buffer		10.000
Max. output rate	kS/s	100
Parameter		Repeat, trigger, continuous, buffer change
PID controller		
Number of		4
Max. input rate	kS/s	5
Max. output rate	kS/s	5
30 Watt AC / DC power pack (1-NTX001)		
Nominal (rated) input voltage (AC)	V	100 ... 240 (±10 %)
No-load power consumption at 230 V	W	0.5
Nominal (rated) loading		
U_A	V	24
I_A	A	1.25
Static output data		
U_A	V	24±4%
I_A	A	0 ... 1.25
U_{Br} (output ripple voltage; peak to peak))	mV	≤120
Current limiting, typically from	A	1.6
Isolation primary - secondary		electrical, by optical coupler and converter
Creepage and clearance distances	mm	≥8
High-voltage test	kV	≥4
Ambient temperature	°C [°F]	0 ... +40 [-40 ... +104]
Storage temperature	°C [°F]	-40 ... +70 [-40 ... +158]

1) Hub: FireWire node or distributor
2) Hop: Transition from module to module/signal conditioning
3) Mechanical stress is tested according to European Standard EN60068-2-6 for vibrations and EN60068-2-27 for shock. The equipment is subjected to an acceleration of 50 m/s^2 in a frequency range of 5...65 Hz in all 3 axes. Duration of this vibration test: 30min per axis. The shock test is performed with a nominal acceleration of 350 m/s^2 for 6 ms, half sine pulse shape, with 3 shocks in each of the 6 possible directions.
4) EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

Accessories MX879B, to be ordered separately

Article	Description	Order No.
Power		
AC/DC power supply / 30 W	Input : 100 ... 240 V AC (±10%), 1.5 m cable Output: 24 V DC, max. 1.25 A, 2 m cable with ODU connector	1-NTX001
3m cable - QuantumX supply	3 m cable for voltage supply of QuantumX modules; Suitable plug (ODU Medi-Snap S11M08-P04MJGO-5280) on one side and open strands on the other end.	1-KAB271-3
Communication		
Ethernet cable	Ethernet cable for direct operation between a PC or Notebook and a module / device, length 2 m, type CAT5+	1-KAB239-2
FireWire cable (module-to-module)	FireWire connection cable for QuantumX or SomatXR-modules; with matching plugs on both sides. Length 0.2 m/2 m/5 m Note: The cable enables modules to be supplied with power (max. 1.5 A, from the source to the last drain).	1-KAB272-W-0.2 1-KAB272-2 1-KAB272-5
Mechanic		
Connecting elements for QuantumX modules	Connecting elements (clips) for QuantumX modules; Set comprising 2 case clips including mounting material for fast connection of 2 modules.	1-CASECLIP
Connecting elements for QuantumX modules	Fitting panel for mounting of QuantumX modules using case clips (1-CASECLIP), lashing strap or cable tie. Basic fastening by 4 screws.	1-CASEFIT
QuantumX Backplane (Standard)	QuantumX Backplane – for a maximum of 9 modules; - Mounting on wall or control cabinet (19") - Connection of external modules by FireWire possible - Power supply: 18 … 30 V DC / max. 5 A (150 W)	1-BPX001
QuantumX Backplane (Rack)	QuantumX Backplane – Rack for maximum 9 modules; - 19" rack mounting with handles left and right - Connection of external modules via FireWire possible - Power supply: 18 … 30 V DC / max. 5 A (150 W)	1-BPX002
QuantumX Backplane (small)	QuantumX Backplane - for a maximum of 5 modules - Connection of external modules by FireWire possible - Power supply: 11 … 30 V DC/ max. 5 A (90 W)	1-BPX003
Plug		
Push-In connector (8 Pins), Gold	10 push-In-connectors, Phönix Contact, 8 pins Gold	1-CON-S1015
Software and product packages		
catman®AP	Complete package including catman®Easy functionality plus additional modules such as integration of video cameras (EasyVideoCam), complete post-process analysis (EasyMath), automation of recurring processes (EasyScript), offline preparation of measurement projects (EasyPlan) as well as additional functions such as calculating electrical power, special filters, frequency spectrum, etc. More details at www.hbm.-com\catman\	1-CATMAN-AP
catman®EASY	The basic software package for measurement data acquisition comprises convenient channel parameterization using TEDS or the sensor database, measurement job parameterization, individual visualization, data storage and reporting.	1-CATMAN-EASY
catman®PostProcess	Post Process edition for visualization, preparation and analysis of measurement data, including many mathematical functions, data export and reporting.	1-CATEASY-PROCESS
LabVIEW™ driver[1)]	Universal driver from HBM for LabVIEW™.	1-LabVIEW-DRIVER
CANape® driver	QuantumX driver for the software CANape® from Vector Informatik. CANape versions from 10.0 are supported.	1-CANAPE-DRIVER

1) More drivers and partners at www.hbm.com/quantumX/

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