Data sheet

QUANTUMX CX22B-W, CX22B

Data Recorder

Special features

- Stand-alone data acquisition
- Gateway: MX signals to Ethernet
- Connection of QuantumX modules, GPS, camera, touchscreen
- Easy system configuration: trigger, computation, virtual channels, signal analysis online
- Many interfaces: LAN, WLAN (CX22B–W), USB, digital I/O
- Supply voltage (DC):
 10 V ... 30 V, no fan

Block diagram







CX22B-W, CX22B Specifications

General specifications		
Installed software		HBMcatman [®] EASY
Devices that can be connected		All QuantumX- and SOMAT ^{XR} - modules, GPS sensor (USB, RS232), CAN bus (via MX840B, MX471B), Automotive wheel force transducers (Kistler System2000 via Ethernet; AND, MTS, others via CAN), Peripheral devices: USB sticks, keyboard + mouse, video camera, touchscreen, wireless router (LTE, UMTS, EDGE), printer
Max. signal count Analog channels, digital protocol data		1,000
Synchronization		FireWire, Ethernet (NTP, PTP with PTP switch), EtherCAT (CX27), IRIG-B (MX840B input)
Data storage		
System configuration / data access		Remote access via software "HBM Device Scan", direct connection to a PC (Ethernet or WLAN) or to LAN / WAN (DHCP) networks, data access via Windows Explorer, via wireless router (GPRS, UMTS, LTE)
Total recording rate on internal SSD: with dynamic measurement data memory ¹⁾ (*bin) in FastStream mode ²⁾ on built-in CFast:	MS/s MS/s	4 5
with dynamic measurement data memory ¹⁾ (*bin) in FastStream mode ²⁾	MS/s MS/s	3 5
Channel configuration		Manual, via integrated sensor database (all typical transducers, CAN DBC database) Automatically via TEDS (data sheet in the sensor), Microsoft Excel, project file
Data logging mode		Single or multiple parallel independent recordings (multi Recorder)
Trigger signals		Measured value, calculated value, bus signal, digital input, key, time interval, script, system (e.g. Buffer full, Power on)
Trigger type		Edge (rising, falling), level (above, below), logical operator
Trigger actions (alarms and warnings)		Start and stop of tests, control data storage, set digital out, LED, log message, send e-mail, push notifications, change color, control video camera, play sound, script
Number of data rates		4 Example: 10 S/s, 1 kS/s and 100 kS/s and in parallel ultra low sample rate (example: 4 S/hour)
Online signal calculation		Arithmetic, root, rms value, logic, trigonometry, integral, differential, exponential, logarithm, filters, rosette calculation, frequency analysis (FFT + trigger)
Scope of recording		Selected signals, metadata (sensors, measurement configuration, test parameters), statistics log
Recording mode		Standard (catman [®] BIN) Periodic storage without loss of data, long-term measurement (cycle with counter and duration), peak values only (interval), ring buffer (up to 10 minutes), statistic log (ASCII)
Sequences		10 sequential recording configurations (measurement jobs), repetitions

¹⁾ Testing conditions: 14 modules (FireWire), 56 measurement channels, 8 bytes per measured values, 2 sample rate groups, without

²⁾ Testing conditions: 14 modules (FireWire), 56 measurement channels, 8 bytes per measured values, 2 sample rate groups, without visualization objects
 ²⁾ Testing conditions: 14 modules (FireWire), 56 measurement channels, 8 bytes per measured values, 1 sample rate group, without visualization objects

CX22B-W, CX22B specifications (continued)

Data format / storage format		HBMcatman [®] binary format (BIN), FastStream, for highly dynamic measurements. Robust in case of sudden power interruption (only last data block lost).
Data export / storage format		ASCII, Microsoft Excel, MTS (RPC III), MathWorks MATLAB (MAT), HBM nCode (DAC), ASAM MDF 3.0/4.0, NI DIAdem (DAC)
Automation		Function keys on the keyboard, automatic tests: Easy Script based on VBA (Required for author stage: EasyScript upgrade or on the host PC. No software upgrade required for running on the data recorder)
Data storage		Internal SSD (64 GB, 16 GB reserved for OS), exchangeable CFast 2.0 (8 GB included in package, can be replaced with 64, 128, 256 or 512 GB), USB stick, external USB hard disk (USB 2.0 or 3.0)
Data transfer		Backed-up to a data server via (S)FTP (pre-installed client)
Gateway		_
System configuration		All signals from MX modules connected via FireWire can be accessed via Ethernet / WLAN
Data throughput ¹⁾	MS/s	3
Screen or remote control	Γ	
Online display Screen recommendation		Freely configurable display and control levels (panels) in full-screen mode 1.024 x 768 pixels. DVI digital
Keyboard		Control via function keys
Display, operation and remote access		
Operation		Via "remote desktop connection" with computer with Windows operating system or OS-X via a direct Ethernet connection (cable or WLAN) or via LAN/WAN/hot-spot. Via directly connected peripheral devices (monitor, keyboard, mouse), Via remote access using a wireless gateway (VPN / Team Viewer installation possible)
Screen recommendation (direct connection)		DeltaVarioMon DMXX1140 or ASUS MB168B+ touchscreen,
O		generally 1,024 x 768 pixels
Display and operation (catman)		Freely configurable display and control levels Multiple levels (panels), full-screen mode
Display elements		Numeric display, chart recorder (y-t, x-y, y-f), polar diagram, frequency diagram / color spectrogram (FFT), table (universal, simple), pointer, bar graph, LED (multi, uni), push button / switch (button), checkbox, list box, background image and text
Keyboard and mouse		Standard, control via function keys
System Integrity		
System change		Enhanced Write Filter (EWF): changes must be explicitly saved.
General specifications		
Operating system		Windows Embedded 8
Protection		Mechanisms provided by Windows Embedded 8 or added, such as VPN access via remote desktop connection (login and password)
Processor		Intel [®] Atom, E3845 Quad Core, 1.9 GHz
Internal storage medium Type Storage capacity	– GBvte	SLC–SSD Net 48
Exchangeable storage medium		
Type Storage capacity	_ GByte	CFast Card 2.0 8, CFast card included in the package. Typical memory cards available: 8, 16, 32, 64, 128, 256, 512

¹⁾ Testing conditions: 9 modules, 36 channels wit 96,000 Hz in bin format

CX22B-W, CX22B specifications (continued)

Module starting time	sec	30
Module interfaces		2 x Gigabit Ethernet
		only CX22B-W: antenna included in the package
		1 x connector strip for installing in BPX backplane
		1 x USB 3.0
		2 x USB 2.0
		1 x DVI–D
		$3 \times$ digital In (start/stop push button) and $3 \times$ digital Out
Supply voltage range (DC) SELV according IEC60950–1	V	10 30, nominal (rated) voltage 24
Power consumption (at 24 V)	W	20, no turning parts (fans)
Ethernet		1000Base-TX / 100Base-TX / 10Base-T
Protocol (addressing)		TCP/IP (fixed IP or DHCP / APIPA)
Plug connection		8P8C plug (RJ-45) with twisted-pair cable (CAT-5)
Max. cable length to module	m	100
WLAN (only CX22B–W)		
Conformity		CE, FCC, IC
Wireless standard		IEEE 802.11 n/ and a/b/g, adhoc support
Data rate max.	MBit	300
Safety protocols		WEP, WPA, WPA2, TKIP, AES
Frequency carrier	GHz	2.4 an 5
Antenna		Standard SMA socket, type RF coaxial, in compliance with the specified standards, with the provided antenna
FireWire (module synchronization, data link, optional voltage supply. Certificates: CE, FCC, IC)		IEEE 1394b (HBM modules only)
Baud rate	MBaud	400
Max. current from module to module	А	1.5
Max. cable length between nodes	m	5
Max. number of modules connected in series (daisy chain)		12 (= 11 hops)
Max. number of modules in a FireWire system (incl.		24
Max hops in a chain ²		14
		14
Version/connection		2 x 2.0 / Standard Highspeed (Host)
Version / connection		1 x 3.0 / Standard (Host)
Cable length, max.	m	5
Devices		GPS, keyboard, mouse, touchscreen, memory stick, external hard disk, printer
RS-232-C		
Connection Baud rate, max	kDavid.	DSUB 9-pin
Daug rate, max. Devices	кваиа	e a GPS (NMEA)
DVI		
Туре		Digital, connection of LCD monitor
••	I	

¹⁾ Hub: FireWire node or distributor

²⁾ Hop: transition from module to module/signal conditioning

CX22B-W, CX22B specifications, (continued)

Protection class ¹⁾ It is essential to distinguish between the protection class and the degree of protection classified by the IP code (Ingress Protection per IEC 60529). While protection classes define measures providing protection to ensure that no dangerous voltage can become exposed, the IP codes describe the degree of protection the enclosure provides against contact, foreign objects and water.		
Degree of protection		IP20
Mechanical tests ²⁾		
Vibration (30 minutes)	m/s²	50
Shock (6 ms)	m/s²	350
EMC requirements		to EN 61326
Application temperature range (affected by dew point)	°C	–20 °C +65 °C [–5.8 149 °F]
Storage temperature range	°C	–40 °C +75 °C [–40 167 °F]
Rel. humidity at 31 °C [87.8 °F]	%	80 (non-condensing) linear reduction to 50 at 40 °C [104 °F]
Max. operating altitude	m	2,000
Weight, approx.	g	1,100
Dimensions, horizontal (HxWxD)	mm	53 x 200 x 128 (with case protection) 44 x 174 x 119 (without case protection)
Time		
Clock error		max. 1.2 minutes per month
Time buffering		battery
Time zone (factory settings)		UTC (Universal Time, Coordinated)
Digital inputs and outputs		
Number of inputs/outputs		6
		3 inputs (terminal 1, 2, 3, START/STOP button connected to terminal 3)
		3 outputs (terminal 4, 5, 6)
Type of connection		Screw terminals
		Plug: MC 1.5/7–ST–3.5 (Phoenix Contact)
LEDs (number) Output state		3
Cable length, max.	m	3
Cable type (required in the event of interference)		shielded
Input signal range TTL		
Max. allowed input level	V	-0.5 5.5
Input level High, min.		4
Internal pullup resistors	kOhm	100
Output signal range TTL		
Output High	V	5
Output Low	V	0
Max. output current	mA	1

¹⁾ Protection class III involves use of a safety extra low voltage. With power supply from the mains, a DIN VDE 0570–2–6 or EN 61558–2–6–compliant safety transformer is required. Power supply from batteries or rechargeable batteries in the permissible supply voltage range does not require any further measures.

²⁾ Mechanical stress is tested in accordance with European standards EN 60068–2–6 for vibration and EN 60068–2–27 for shock. The devices are exposed to an acceleration of 25 m/s² within the frequency range 5...65 Hz in all 3 axes. Duration of this vibration test: 30 minutes per axis. The shock test is implemented at a nominal (rated) acceleration of 200 m/s² for a duration of 11 ms, half sine and with shocks in each of the six possible directions.

CX22B-W, CX22B accessories, to be ordered separately

CX22B-W accessories				
Article	Description	Ordering no.		
Voltage supply				
AC/DC power supply / 30 W	Input: 100 240 V AC (±10%), 1.5 m cable	1-NTX001		
	Output: 24 V DC, max. 1.25 A, 2 m cable with ODU plug			
QuantumX supply cable	3 m cable for voltage supply of QuantumX modules; suitable plug (ODU Medi-Snap S11M08–P04MJGO–5280) at one end and exposed stranded wires at the other.	1-KAB271-3		
Communication				
Ethernet crossover cable	Ethernet crossover cable for direct operation of devices on a PC or notebook, length 2 m, type CAT5+	1-KAB239-2		
IEEE1394b cable (module to module), IP68	Connection cable between the data recorder and QuantumX modules, fitted with suitable plugs at both ends; lengths 0.2 / 2 or 5 m. Note: Voltage can also be supplied to the modules via the cable (max. 1.5 A, from source to last acceptor).	1-KAB272-0.2 1-KAB272-2 1-KAB272-5		
IEEE1394b hub to module cable, IP68	Connection cable between HUB and module For data transfer from QuantumX modules and HUB. Fitted with suitable plugs at both ends. Length: 3 m	1-KAB276-3		
Mechanical				
Connecting elements for QuantumX modules	Connecting elements (clips) for QuantumX modules; set comprising 2 connecting elements and including assembly material for fast connection of 2 modules.	1-CASECLIP		
Connecting elements for QuantumX modules	Mounting plate for installing QuantumX modules using connecting elements (1–CASECLIP), lashing strap or cable ties. Basic fastening by 4 screws	1-CASEFIT		
QuantumX backplane (standard)	QuantumX backplane for a maximum of 9 modules	1-BPX001		
	- Connection of external modules via FireWire possible			
	- 24 V DC / max. 5 A (150 W) power supply			
QuantumX backplane (rack)	QuantumX backplane – rack for a maximum of 9 modules; – 19" control cabinet installation with handles on left and right; – Connection of external modules via FireWire possible; – Power supply: 24 V DC / max 5 A (150 W)	1-BPX002		
Periphery				
GPS-Empfänger (USB)	Navilock NL8012–U Multi GNSS Receiver einzeln verpackt	1-GPS-USB-18Hz		
Präzisions GPS-Empfänger	Präzisions GPS-Empfänger, Aktualisierungsrate 200 Hz	1-EGPS200-B-2		
Präzisions GPS-Empfänger	Präzisions GPS-Empfänger Plus – Aktualisrate 200 Hz	1-EPGS200-P-2		
Additional software extending data recorder f	unctionality			
EasyRoadLoad	 Software package for driving dynamics and determination of load data including Ethernet integration of Kistler RoaDyn[®] measuring wheels for measuring forces and torques, Running scripts created with EasyScript. 	1-CATEASY-ROADLOAD		
EasyVideoCam	Integration of video cameras	1-CATEASY-VIDEOCAM		
EasyMonitoring	EasyMonitoring Modul for catman [®] Easy	1-CATEASY-MONITORING		

CX22B-W, CX22B accessories, (continued)

Additional software for a host PC							
HBM Device Manager	The free "HBM Device Manager" application enables data recorder to be easily found in networks and a connection to be established. The application is included in the QuantumX software package/free of charge. www.hbm.com	free					
catman PostProcess	Analysis and processing of measurement data with various mathematics functions, data export and report generation. Data cleansing and processing: curve operations, statistics, video analysis.	1-CATEASY-PROCESS					
catman [®] AP	Full package, comprising catman [®] Easy functionality plus add-on modules allowing for data upload via FTP, sending messages by email or Push (Easy Monitoring) as well as video camera integration (EasyVideoCam), full post-process analysis (EasyMath), automation of recurrent activity (EasyScript), preparing measurement projects offline (EasyPlan), and additional functions such as electrical power calculation, special filters, frequency spectrum, etc. Details at www.hbm.com\catman\	1-CATMAN-AP					

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QuantumX overview

	QuantumX Module Overview															
	Inputs / Measurement Modules Recorder / Bus Connection / Multi IC											Multi IO				
	Universal		Precision		M/n	High C	High Channel Count		Isola	Isolated		Recorder /Gateway	Gateway	Mu	lti IO	
	MX840B	MX440B	MX410B	MX430B	MX238B	MX460B	MX1601B	MX1615B MX1616B	MX1609 ¹⁾	MX809B	MX403B	MX471B	CX22B-W	CX27B	MX878B	MX879B
Channel count	8	4	4	424			16	16	16	8	4	4	-	-	8	8 + 32
Sample rate[kS/s]	40	40	100	40	40	100	20	20	0,5	0,5	100	-	-			-
El. Voltage	•	•	•				•	•								
El. Voltage, isolated 5 V (CAT II / III)	• ²⁾	• ²⁾	•2)							••						
El. Voltage 10, 100, 1000 V (CAT II / III)											•					
El. Current (0 / 4 20 mA)	•	•	•				•									
Strain gage full bridge	•	•	•	••				•								
Strain gage half bridge	•	•	•					•								
Strain gage quarter bridge	•3)	•3)	•3)	•3)	•3)			•								
Inductive full bridge	•	•	•													
Inductive half bridge	•	•	•													
LVDT	•	•														
Potentiometer	•	•						•								
SSI absolute encoder (protocol)	•	•														
Current fed piezo electric (IEPE, ICP ^(R))	•	•	•				•									
Piezo resistive transducer	•	•	•													
Thermocouple	•	•							•	•						
Thermometer, RTD, PT	•	•						•								
Resistiance input (R)	•	•						•								
Frequency, pulse count (timer, TTL)	•	•				•										
Inkremental encoder (timer, TTL)	•	•				•										
Inductive pick-up (AC coupled), crank						•										
Pulse-width measurement (timer)						•										
U Analog output (+/- 10 V)			•	•											••	
Digital input (static)													•	•		•
Digital output (static)													•	•		•
CAN CANbus (receive, transmit)	•											•				
문국 CCP / xCP-on-CAN												•				
Ether CAT.														•		
GPS connection (RS232, USB)													•			
Data recording													•			

1) MX1609KB supports thermocouple type K, MX1609TB = thermocouple type T. 2) with isolated voltage adapter SCM-HV.

3) with quarter bridge adapter SCM-SG120 / 350 / 700 / 1000 Ohm.

Subject to modifications.

All product descriptions are for general information only. They are not to be understood as a guarantee of quality or durability.

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