

DATA SHEET

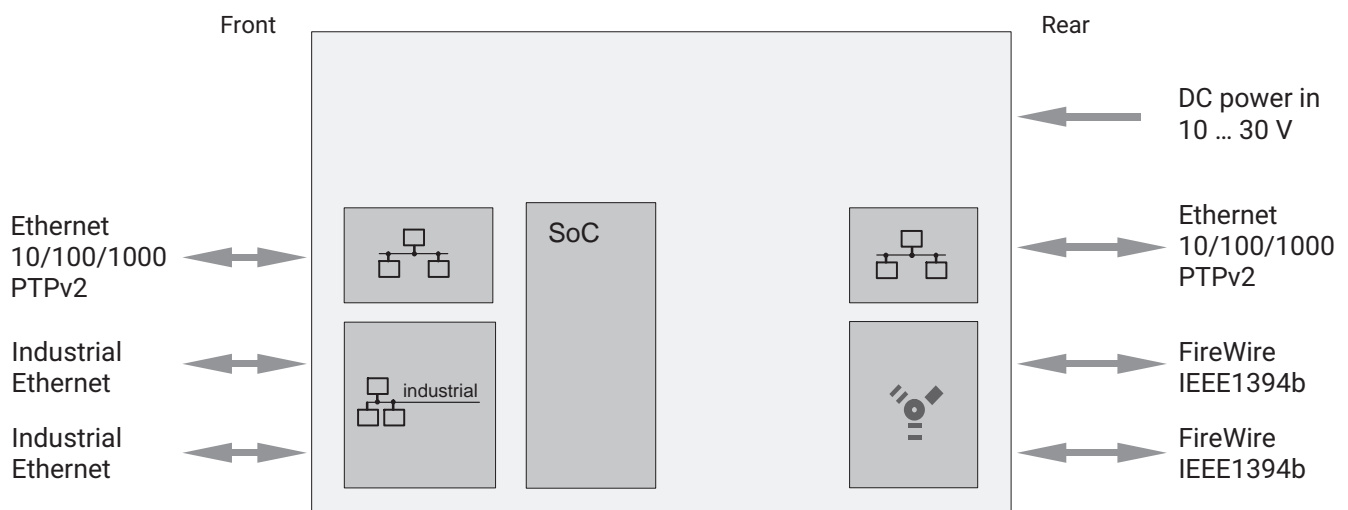
QuantumX CX27C Industrial Ethernet Gateway

SPECIAL FEATURES

- Gateway between QuantumX measurement modules and Ethernet-based fieldbuses
- Integration in real-time industrial Ethernet: EtherCAT or PROFINET IRT
- Parallel integration in standard Ethernet to record measurement data with a high data throughput rate
- XCP-over-Ethernet Client
- Lots of synchronization options



BLOCK DIAGRAM



SPECIFICATIONS

General specifications		
Interfaces (quantity)		Industrial Ethernet: EtherCAT ¹⁾ or PROFINET IRT (2), Ethernet Gigabit (2), XCP-over-Ethernet (1), Ethernet Gigabit (2), FireWire (2)
Supply voltage range (DC)	V	10 ... 30, nominal (rated) voltage 24 V
Power consumption	W	< 7
Ethernet (data link)	-	1000Base-TX/100Base-TX/10Base-T
Protocol/addressing	-	TCP/IP (static IP/DHCP, IPv4/IPv6)
Plug connection	-	8P8C plug (RJ-45) with twisted-pair cable (Cat 5)
Max. cable length to module	m	100
FireWire (module synchronization, data link, optional power supply)		IEEE 1394b (HBM modules only)
Baud rate	MBaud	400 (approx. 50 MBytes/s)
Max. current from module to module	A	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 (including hubs ²⁾ , backplane)	-	24
Max. hops in a chain ³⁾	-	14
Synchronization options EtherCAT FireWire Ethernet IRIG-B (B000 to B007; B120 to B127)		via bus connection CX27C IEEE1394b IEEE1588:2008 (PTP), NTP via MX840B input channel
Protection class		III
Equipment protection level		IP20
Mechanical tests⁴⁾		
Vibration (30 minutes)	m/s ²	50
Shock (6 ms)	m/s ²	350
EMC requirements		to EN61326
Nominal (rated) temperature range	°C	-20 ... +65
Storage temperature range	°C	-40 ... +75
Rel. humidity	%	5 ... 95 (non-condensing)
Weight, approx.	g	900
Dimensions, horizontal (HxWxD)	mm	52.5 x 200 x 122 (with case protection) 44 x 174 x 119 (without case protection)

¹⁾ EtherCAT is a registered brand and patented technology, licensed by Beckhoff Automation GmbH, Germany

²⁾ Hub: FireWire node or distributor

³⁾ Hop: Transition from module to module/signal conditioning

⁴⁾ Mechanical stress is tested in accordance with European standards EN60068-2-6 for vibration and EN60068-2-27 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 acceleration of 200 m/s² for a duration of 11 ms, half sine and with shocks in each of the six possible directions.




SPECIFICATIONS

EtherCAT				
Function		EtherCAT client		
Interfaces		100Base-TX Ethernet (switched) with 2x RJ45 socket		
Cable length (max.)	m	100		
Cable type (min. requirement)		Standard Cat 5, shielded		
EtherCAT communication				
Sync Manager Layouts (SML)				
send only (standard)		801		
send only (NI Master)		802		
receive plus send if necessary		803		
Max. number of cyclical process data objects (PDOs)		Send (SML: 801/802)	Receive (SML: 803)	Send + Receive (SML: 803)
at 1200 Hz update rate		199	100	100 + 50
at 2400 Hz update rate		100	50	50 + 25
at 4800 Hz update rate		30	15	15 + 7
Minimum latency from MX input to EtherCAT	µs	1000		
Process data configuration		Service Data Objects (SDO), Device Description File (DDF)		
Profile		CANopen DS404 plus enhancements		
Services		SDO read, write, information		
Used IP core		Beckhoff ET1810		
EtherCAT Master layout		Distributed clock, automatic / manual address assignment		
Workflow (send)		Use the free MX Assistant software to parameterize the input channels of the measurement module (MX), activate them for isochronous real-time operation, and assign them to the fieldbus (automatic mapping or manual). Generate the description file and import it in the PLC controller software.		
Workflow (receive)		Use the EtherCAT Master software to link the CX27C outputs to EtherCAT input signals (CX27 in Init mode), activate CX27C channels in the MX Assistant and, optionally: define signal names and units, set the CX27C to Operational mode, and receive signals (also possible via catman)		
Synchronization				
Time distribution / Distributed Clock (DC)		Yes, default = on		
Variation of the system time	µs	1		
Sync manager, sampling rates		3		
PROFINET IRT / RT				
Function		PROFINET device		
Interfaces		100Base-TX Ethernet (switched) with 2xRJ45		
Cable length (max.)	m	100		
Cable type (min. requirement)		Standard Cat 5, shielded		
PROFINET communication				
Max. number of cyclical process data (PDOs)		199 (2048 bytes of process data [input])		
Max. number of slots/subslots (cycle)		32/199 (≥500 µs) 32/180 (250 µs)		
Minimum cycle time	µs	250 (IRT)		
Minimum latency from MX input to PROFINET	µs	1500		
PROFINET specification		V2.3		
Conformity classes		B, C		

Media Redundancy Protocol (MRP)		supported
Process data configuration		MX Assistant, GSDML
Diagnosis		Status byte
Workflow		The free MX Assistant software can be used to parameterize the input channels of the measurement module (MX), activate them for isochronous real-time operation, and assign them to the fieldbus. Generate description file and import in PLC controller software.
Ethernet		
Data rate, max.	Measured values/s	2,000,000
XCP-on-Ethernet		
Function		XCP client (issue measured data and calculated signals)
Interfaces	1	100 Base-TX-Ethernet (front) with RJ45
Cable length (max.)	m	100
Cable type		Recommended: Standard Cat 5, shielded
XCP communication		
Max. number of cyclical measured data		199
Minimum cycle time	ms	1
Minimum latency from MX input to XCP-on-Ethernet	µs	1500
Workflow		Use the free MX Assistant software to activate isochronous operation for the signals being transferred and drag and drop to assign to XCP-on-Ethernet. Generate description file in A2L format and load on the MCD page. The IP address for the CX27C is in the A2L file.

ACCESSORIES, TO BE ORDERED SEPARATELY

Article	Description	Ordering number
Power supply		
AC/DC power pack / 24 V	Input: 100 ... 240 V AC (± 10%), 1.5 m cable Output: 24 V DC, max. 1.25 A, 2 m cable with ODU male connector	1-NTX001
3 m cable - QuantumX supply	3 m cable to supply power to QuantumX modules; suitable plug (ODU Medi-Snap S11M08-P04MJGO-5280) at one end and exposed wires at the other.	1-KAB271-3
Communication		
Ethernet cable	Ethernet patch cable for direct operation of devices on a PC or notebook, length 2 m, type CAT6A	1-KAB239-2
IEEE1394b FireWire cable (module to module)	FireWire connection cable between QuantumX or SomatXR modules, fitted with suitable plugs on both ends; lengths 0.2 m (angled) / 0.2 m / 2 m / 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-W-0.2 1-KAB272-0.2 1-KAB272-2 1-KAB272-5
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

Article	Description	Ordering number
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 (big)	QuantumX backplane for a maximum of 9 modules - Wall or control cabinet installation (19") - Connection of external modules via FireWire possible - Power supply: 18 ... 30 V DC / max. 5 A (150 W)	1-BPX001
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: 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 via FireWire possible - Power supply: 11 ... 30 V DC / max. 5 A (90 W)	1-BPX003
Software and product packages		
catman [®] AP 	Complete package consisting of catman [®] Easy and all of the available modules and additional functions. Details at www.hbm.com/catman/	1-CATMAN-AP
catman [®] EASY 	This basic software package for data acquisition includes simple 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, analysis and processing of measurement data with many mathematical functions, data export and reporting.	1-CATEASY-PROCESS
LabVIEW [™] driver ¹⁾	Universal driver from HBM for LabVIEW [™] .	1-LABVIEW-DRIVER

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

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