

DATA SHEET

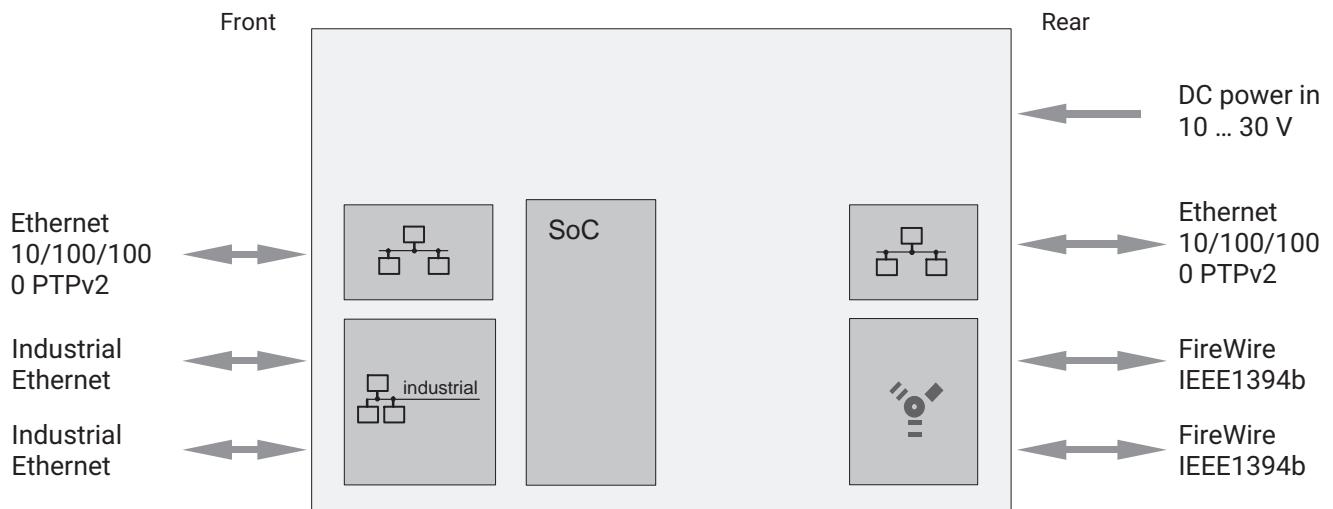
# QuantumX CX27C Industrial Ethernet Gateway

## 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		
<b>Interfaces (quantity)</b>		Industrial Ethernet: EtherCAT <sup>1)</sup> or PROFINET IRT (2), Ethernet Gigabit (2), XCP-over-Ethernet (1), Ethernet Gigabit (2), FireWire (2)
<b>Supply voltage range (DC)</b>	V	10 ... 30, nominal (rated) voltage 24 V
<b>Power consumption</b>	W	< 7
<b>Ethernet (data link)</b>	-	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
<b>FireWire (module synchronization, data link, optional power supply)</b>		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 <sup>2)</sup> , backplane)	-	24
Max. hops in a chain <sup>3)</sup>	-	14
<b>Synchronization options</b>		
EtherCAT		via bus connection CX27C
FireWire		IEEE1394b
Ethernet		IEEE1588:2008 (PTP), NTP
IRIG-B (B000 to B007; B120 to B127)		via MX840B input channel
<b>Protection class</b>		III
<b>Equipment protection level</b>		IP20
<b>Mechanical tests<sup>4)</sup></b>		
Vibration (30 minutes)	m/s <sup>2</sup>	50
Shock (6 ms)	m/s <sup>2</sup>	350
<b>EMC requirements</b>		to EN61326
<b>Nominal (rated) temperature range</b>	°C	-20 ... +65
<b>Storage temperature range</b>	°C	-40 ... +75
<b>Rel. humidity</b>	%	5 ... 95 (non-condensing)
<b>Weight, approx.</b>	g	900
<b>Dimensions, horizontal (HxWxD)</b>	mm	52.5 x 200 x 122 (with case protection) 44 x 174 x 119 (without case protection)

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

<sup>2)</sup> Hub: FireWire node or distributor

<sup>3)</sup> Hop: Transition from module to module/signal conditioning

<sup>4)</sup> 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/s<sup>2</sup> 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/s<sup>2</sup> for a duration of 11 ms, half sine and with shocks in each of the six possible directions.




## SPECIFICATIONS

EtherCAT		
<b>Function</b>		EtherCAT client
<b>Interfaces</b>		100Base-TX Ethernet (switched) with 2x RJ45 socket
<b>Cable length (max.)</b>	m	100
<b>Cable type (min. requirement)</b>		Standard Cat 5, shielded
<b>EtherCAT communication</b>		
Max. number of cyclical process data (PDOs) at 1200 Hz update rate		199
at 2400 Hz update rate		100
at 4800 Hz update rate		30
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
<b>EtherCAT Master layout</b>		Distributed clock, automatic / manual address assignment
<b>Workflow</b>		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 (automatic mapping or manual generation of description file and import in PLC controller software).
<b>Synchronization</b>		
Time distribution / Distributed Clock (DC)		Yes, default = on
Variation of the system time	µs	1
Sync manager, sampling rates		3
PROFINET IRT / RT		
<b>Function</b>		PROFINET device
<b>Interfaces</b>		100Base-TX Ethernet (switched) with 2xRJ45
<b>Cable length (max.)</b>	m	100
<b>Cable type (min. requirement)</b>		Standard Cat 5, shielded
<b>PROFINET communication</b>		
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
<b>Workflow</b>		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 ( $\pm 10\%$ ), 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
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

Article	Description	Ordering number
QuantumX backplane (rack)	QuantumX backplane – rack for a maximum of 9 modules <ul style="list-style-type: none"> <li>- 19" control cabinet installation with handles on left and right</li> <li>- Connection of external modules via FireWire possible</li> <li>- Power supply: 18 ... 30 V DC / max. 5 A (150 W)</li> </ul>	1-BPX002
QuantumX backplane (small)	QuantumX backplane for a maximum of 5 modules <ul style="list-style-type: none"> <li>- Connection of external modules via FireWire possible</li> <li>- Power supply: 11 ... 30 V DC / max. 5 A (90 W)</li> </ul>	1-BPX003
<b>Software and product packages</b>		
catman® AP 	Complete package consisting of catman®Easy and all of the available modules and additional functions. Details at <a href="http://www.hbm.com/catman/">www.hbm.com/catman/</a>	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 <sup>1))</sup>	Universal driver from HBM for LabVIEW™.	1-LabVIEW-DRIVER

1) Further drivers and partners at [www.hbm.com/quantumX/](http://www.hbm.com/quantumX/)