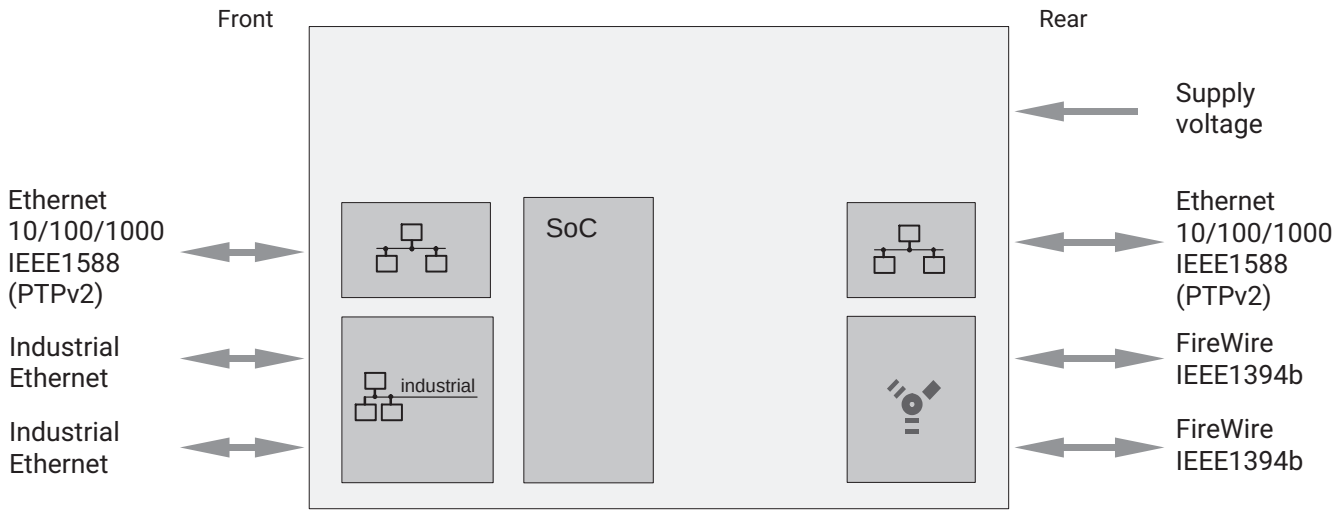
DATA SHEET

SOMAT XR CX27C-R
Industrial Ethernet Gateway

SPECIAL FEATURES

- Gateway between SomatXR measurement modules and Ethernet-based fieldbuses
- Integration in real-time industrial Ethernet: EtherCAT or PROFINET IRT
- Parallel measurement data acquisition via standard Ethernet with high data throughput or via xCP-on-Ethernet for integration into MCD software tools
- Synchronization via PTPv2 (IEEE1588:2008), others
- Use in harsh environments (impact, vibration, temperature, condensation, moisture)

BLOCK DIAGRAM



SPECIFICATIONS FOR CX27C-R

General specifications		
Interfaces (quantity)		Industrial Ethernet: EtherCAT[1)] or PROFINET IRT (1, in/out) Ethernet Gigabit (2) FireWire (2)
Supply voltage range (DC)	V	10 ... 30, nominal (rated) voltage 24 V
Supply voltage interruption, max. (at 24 V)	ms	5 [2)]
Power consumption	W	< 7
Ethernet (module synchronization, data link)	MBit/s	10 / 100 / 1000
Protocol/addressing	-	TCP/IP (static IP, APIPA or DHCP / IPv4 or IPv6)
Plug connection	-	M12 X-coded (socket), 8 pins[3)]
Max. cable length to module	m	100
FireWire (module synchronization, data link, optional power supply)		IEEE 1394b (HBM modules only)
Max. current from module to module	A	1.5
Male connector	-	ODU MINI-SNAP (socket), 8 pins
Max. cable length between nodes	m	5
Max. number of modules connected in series (daisy chain)	-	12 (= 11 hops)[4)]
Max. number of modules in a FireWire system (incl. hubs[5)])	-	24
Max. hops in a chain	-	14
Synchronization options		
FireWire IEEE1394b		FireWire-based synchronization
Ethernet PTPv2 IEEE1588		Ethernet-based Precision Time Protocol
Ethernet NTP		Ethernet-based Network Time Protocol
Nominal (rated) temperature range	°C	-40... +80 dew point resistant
Height-dependent restrictions	-	-
Maximum temperature at 0 m	°C	+80
Maximum temperature at 2500 m	°C	+70
Maximum temperature at 5000 m	°C	+55
Storage temperature range	°C	-40 ... +85
Relative humidity	%	5 ... 100
Protection class		III[6)]
Equipment protection level		IP65/IP67 to EN 60529 (if M12 sockets are plugged in or have a protective cap)
EMC requirements		per EN 61326-1
Mechanical tests		
Vibration		as per MIL-STD202G, method 204D, test condition C
Acceleration	m/s^2	100
Duration	min	450
Frequency	Hz	5 to 2,000
Impact		as per MIL-STD202G, method 213B, test condition B
Acceleration	m/s^2	750
Pulse duration	ms	6
Number of impacts	-	18
Operational height, max.	m	5,000
Dimensions, horizontal (H x W x D)	mm	80 x 205 x 140
Weight, approx.	g	1,700

EtherCAT				
Function		EtherCAT client		
Interfaces		100Base-TX Ethernet (switched) with 2x M12 D-coded (socket), 4 pins[3)]		
Cable length (max.)	m	100		
Cable type (min. requirement)		Standard Cat 5, shielded		
EtherCAT communication				
Sync Manager Layouts (SML) send only (standard) send only (NI Master) receive plus send if necessary		 801 802 803		
Max. number of cyclical process data objects (PDOs) at 1200 Hz update rate at 2400 Hz update rate at 4800 Hz update rate		Send (SML: 801/802) 199 100 30	Receive (SML: 803) 100 50 15	Send + Receive (SML: 803) 100 + 50 50 + 25 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)		
Client 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 2x M12 D-coded (socket), 4 pins[3)]		
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 (*.gsdml) and import in PLC controller software.
Ethernet		
Data rate, max.	Measured values/s	2,000,000
xCP-on-Ethernet		
Function		xCP-on-Ethernet client
Protocol version		1.4
DAQ events		6 (10 Hz … 5 kHz)
Max. number of signals		199
Workflow		The free MX Assistant software can be used to parameterize the input channels of the measurement modules (MX), activate them for isochronous real-time operation, and assign them to the xCP outputs. Generate description file (*.a2l) and load into MCD software.

1) EtherCAT is a registered brand and patented technology, licensed by Beckhoff Automation GmbH, Germany
2) Uninterruptible power supply (UPS) available as accessory for longer interruptions
3) Tighten plug with a torque of max. 2 Nm.
4) Hop: Transition from module to module or signal conditioning/distribution via IEEE1394b FireWire (hub, backplane)
5) Hub: IEEE1394b FireWire node or distributor
6) The DC voltage supply must meet the requirements of IEC 60950-1 on a SELV voltage supply.

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Hottinger Brüel & Kjaer GmbH
Im Tiefen See 45 · 64293 Darmstadt · Germany
Tel. +49 6151 803-0 · Fax +49 6151 803-9100
www.hbkworld.com · info@hbkworld.com