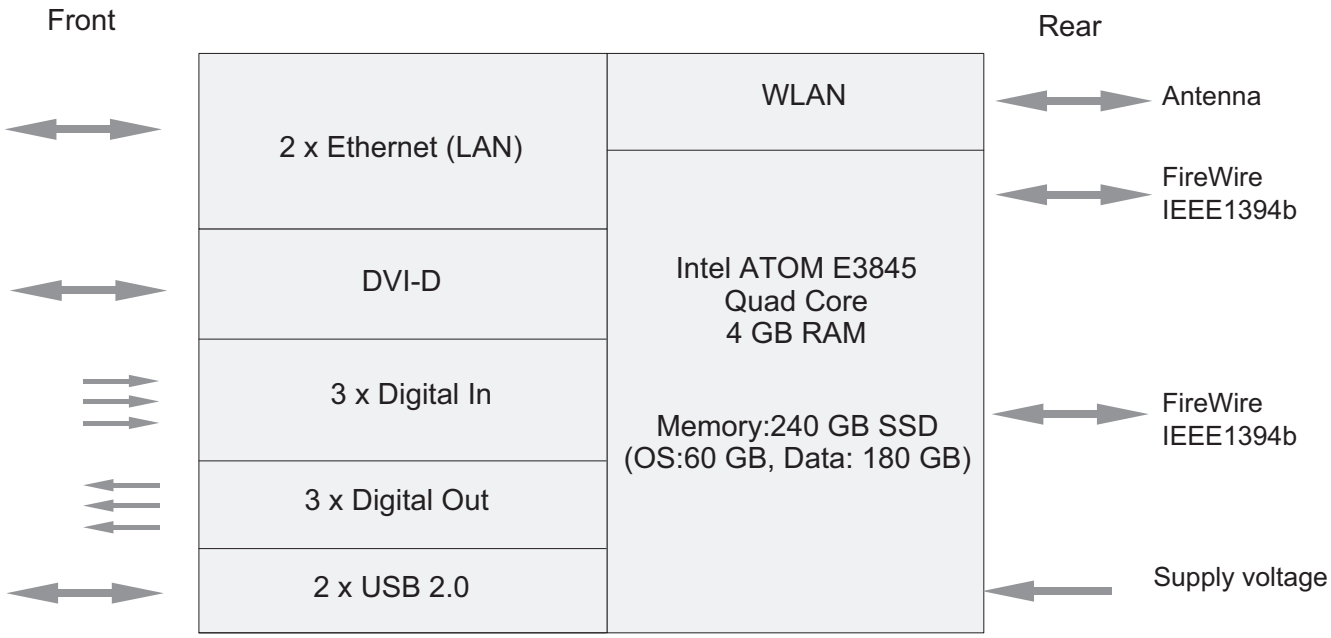
DATA SHEET

SOMAT XR
CX22B-R-W
Data recorder

SPECIAL FEATURES

- Black-Box-Recording and interactive data acquisition without a PC
- Gateway: MX modules to PC/cloud
- Connection of Somat^{XR} modules, GPS, camera, touchscreen (DVI)
- Easy system configuration: Trigger, computation, virtual channels, signal analysis
- Many interfaces: LAN, WLAN, USB, digital I/O
- Supply voltage (DC): 10 V...30 V, no fan
- Use in harsh environments (shock, vibration, temperature, dewing, moisture)

BLOCK DIAGRAM



SPECIFICATIONS FOR CX22B-R-W

General specifications		
Processor		Intel® Atom, E3845 Quad Core, 1.9 GHz
Operating system		Windows 10 IoT Enterprise 2019 LTSC
Internal storage medium		
Type		MLC-SSD
Storage capacity	GB	240
Module starting time	s	30
Module interfaces		2 x Gigabit Ethernet 1 x WLAN (antenna included in the package) 2 x FireWire 2 x USB 2.0 1 x DVI-D 3 x Digital In and 3 x Digital Out
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	< 20
Ethernet		1000Base-TX/100Base-TX/10Base-T
Protocol (addressing)		TCP/IP (static IP, APIPA or DHCP / IPv4 or IPv6)
Plug connection		M12, x-coded[3)]
Max. cable length to module	m	100
WLAN		
Conformity		CE, FCC, IC
Wireless standard		IEEE 802.11 n/ and a/b/g, ad hoc support
Maximum data transfer rate	Mbit	300
Safety protocols		WEP, WPA, WPA2, TKIP, AES
Frequency carrier	GHz	2.4 and 5
Antenna		Standard SMA jack, type RF Coax, in accordance with the stated standards with the supplied antenna
FireWire (data link, optional power supply)		IEEE 1394b (HBM modules only)
Baud rate	MBaud	400
Max. current from module to module	A	1.5
Max. cable length between nodes	m	5 (optical:100)
Max. number of modules connected in series (daisy chain)		12 (= 11 hops)
Max. number of modules in a FireWire system (including hubs[4)], backplane)		24
Max. hops in a chain[5)]		14
USB		
Version/connection		2 x 2.0/Host, compatible with version 1.1
Cable length, max.	m	5
Devices		GPS, keyboard, mouse, touchscreen, memory stick, external hard disk, printer
DVI-D, type		Digital, connection of LCD monitor
Nominal (rated) temperature range	°C	-40 ... +80 dew point resistant
Altitude de-rating	-	-
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[6)]		III
Equipment protection level		IP65/IP67 as per EN 60529
EMC requirements		per EN 61326-1
Mechanical tests		
Vibration		as per MIL-STD202G, method 204D, test condition C
Acceleration Duration Frequency	m/s^2 min Hz	100 450 5 to 2,000
Impact		as per MIL-STD202G, method 213B, test condition B
Acceleration Pulse duration Number of impacts	m/s^2 ms -	750 6 18
Operational height, max.	m	5,000
Dimensions, horizontal (HxWxD)	mm	80 x 205 x 140
Weight, approx.	g	2,000
Security/data access		
Secure access to the CX22B-R		Mechanisms provided by Windows or added, such as VPN access via remote desktop connection (login and password)
System configuration/data access		Remote access via software "HBM Device Manager", Direct connection to a PC (LAN or WLAN) or to LAN/WAN (DHCP) networks, Data access via Windows Explorer
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, 3 outputs)
Plug		ODU MINI-SNAP, 14 pins
LEDs (number)		2
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	V	4
Input level Low	V	0.7
Internal pullup resistors	kOhm	100
Output signal range TTL		
Output High	V	5
Output Low	V	0
Max. output current	mA	1
FireWire Ethernet Gateway		
System configuration		Access via LAN/WLAN to all signals of MX modules connected via FireWire
Data throughput[7)]	MS/s	3

Software & connectivity		
Installed software		HBM DAQ software (catmanEasy®) as well as other tools (MX Assistant, HBM Device Manager, CX22 Shell, VNC Viewer)
Devices that can be connected		All QuantumX and SOMAT^{XR} modules, GPS sensor (USB, RS232 with adaptor, CAN via MX840/MX471), CANbus (via MX840, MX471), Wheel force sensors (Kistler System2000 or KiRoad via Ethernet[10]; A&D, Michigan Scientific, MTS via CAN via MX840/MX471), Peripherals: USB stick, keyboard + mouse, video camera, touchscreen, wireless router (e.g. 5G, LTE, UMTS)

1) If the connected MX modules are also buffered accordingly with a UPS
2) Uninterruptible power supply (UPS) available as accessory for longer interruptions
3) Tighten plug with a torque of max. 2 Nm.
4) Hub: FireWire node or distributor
5) Hop: Transition from module to module/signal conditioning
6) The DC voltage supply must meet the requirements of IEC 60950-1 on a SELV voltage supply.
7) Test conditions:9 modules, 36 channels with 96,000 S/s in BIN format

SOFTWARE CX22B-R-W

Data acquisition with HBM catman®		
Max. signal count Analog channels, digital protocol data		1,000
Maximum cumulative recording rate internal SSD		
With dynamic measurement data storage[8] (*bin)	MS/s	4
In FastStream mode[9]	MS/s	5
Channel configuration		Via integrated sensor database (all typical transducers, CAN DBC data base) Automatically via TEDS (data sheet in the sensor), Microsoft Excel, project file
Data logging		Single or multiple parallel[10] recordings
Start/stop conditions		Manual, trigger, defined time and duration
Trigger type		Pre-trigger and post-trigger
Limit value and event monitoring		Level crossing, undershooting, frequency spectrum, channel in overload, digital input, time interval, keyboard event, script, error, CAN message reception
Actions for limit value and event monitoring		Send e-mail, set digital output, log message, play sound file, start/stop measurement, save individual values, trigger start/stop trigger, run script, start/stop video recording[10]
Number of data rates		3 Example: 10 S/s, 1 kS/s, and 100 kS/s
Online signal calculation		Basic algebra, statistics, integral calculation, differential calculation, trigonometry functions, rosette calculation, classifying
Scope of recording		Selected signals, metadata (sensor technology, measurement settings, test parameters), statistics journal (min, max, mean, and instantaneous value)
Data storage mode		Take into account all measurement data, manual check, check via script, peak value per time interval, cycle-dependent and time-dependent intervals, Fast Stream
Data format/storage format		HBM catmanEasy® binary format (*.bin)
Data export/storage format		ASCII, Microsoft Excel, MTS RPC III MathWorks MATLAB, HBM nCode s3t and nSoftDAC, ASAM MDF 3.0/4.0, NI DIAdem UFF58

Automation		Load project and start measurement after starting catman, Easy Script based on VBA[11)]
Data storage		Internal SSD (180 GB), USB stick, external USB hard disk (USB 2.0)
Data rate		Automatic uploading of measurement files to an FTP/SFTP server
Cloud integration		Continuous data transfer to Microsoft Power BI for visualization of data on the web[10)]
Display elements		Real-time graphics (y(t). y(x)), digital display, simple and flexible measured value table, analog meter, single and multiple bar graph indicator, frequency spectrum, polar diagram, cursor graph, LED, CANraw table, spectogram[12)], angle-synchronous graph[12)]
catman® expansions		
EasyMath		Mathematics module and auto sequences for catman Easy
EasyScript		Free VBA programming in measurement and analysis mode
Upgrade to CatmanAP®		Catman® complete package for acquisition, visualization, and analysis of measurement data

8) Test conditions: 14 modules (FireWire), 56 measurement channels, 8 bytes per measured value, 2 data rate groups, no visualization objects
9) Test conditions: 14 modules (FireWire), 56 measurement channels, 8 bytes per measured value, 1 data rate group, no visualization objects
10) catmanAP module required
11) Implementation only, EasyScript module or catman AP necessary for script creation
12) catmanAP or EasyMath module required

CX22B-R-W OPERATION

Display, operation, and accessories	
Local operation	Via directly connected peripheral devices (monitor, keyboard, mouse)
Monitor	Standard DVI-D (touch) monitor Recommended display resolution: min. 1024 x 768 pixels
Keyboard and mouse	Standard USB control possible via function keys
Operation remote	Via remote desktop connection with computer with operating system Windows or Macintosh
Stand-alone (black box recording)	Set the measuring job as “unattended test”, then select it in the shell and again set as “unattended test”
Global navigation satellite system (GNSS)	Standard USB or CAN (in conjunction with MX840 or MX471)
Video camera[10)]	Standard USB or Ethernet
Mobile phone router (e.g. 5G, LTE, UMTS)	Standard Ethernet

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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