1 General information

Based on Intel ATOM processor technology, X20 CPUs cover a wide spectrum of requirements. They can be implemented in solutions ranging from standard applications to those requiring the high levels of performance.

The series starts with Intel ATOM processor 333 MHz compatible models – X20CP1583 and X20CP3583. With an optimum price/performance ratio, it has the same basic features as all of the larger CPUs.

The basic model includes USB, Ethernet, POWERLINK V1/V2 and replaceable CompactFlash card. The standard Ethernet interface is capable of handling communication in the gigabit range. For even more real-time network performance, the onboard POWERLINK interface supports poll response chaining mode (PRC). Up to 3 more slots are available for additional interface modules to increase flexibility.

- Intel ATOM 1600/1000/600 Performance with integrated I/O processor
- Entry-level CPU is Intel ATOM 333 MHz-compatible with integrated I/O processor
- · Onboard Ethernet, POWERLINK V1/V2 with poll response chaining and USB
- 1 or 3 slots for modular interface expansion
- · CompactFlash as removable application memory
- Up to 512 MB DDR2-SRAM according to performance requirements
- CPU redundancy possible
- Fanless

2 Coated modules

Coated modules are X20 modules with a protective coating for the electronics component. This coating protects X20c modules from condensation and corrosive gases.

The modules' electronics are fully compatible with the corresponding X20 modules.

For simplification purposes, only images and module IDs of uncoated modules are used in this data sheet.

The coating has been certified according to the following standards:

- · Condensation: BMW GS 95011-4, 2x 1 cycle
- · Corrosive gas: EN 60068-2-60, method 4, exposure 21 days



3 Order data - X20CP158x

Model number	Short description
	X20 CPUs
X20CP1583	X20 CPU, Atom 333 MHz (compatible), 128 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply module, 1x terminal block X20TB12, slot cover and X20 end cover plate X20AC0SR1 (right) included, order application memory separately!
X20CP1584	X20 CPU, Atom 0.6 GHz, 256 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply mod- ule, 1x terminal block X20TB12, slot cover and X20 end cover plate X20AC0SR1 (right) included, order application memory separately!
X20cCP1584	X20 CPU, coated, Atom 0.6 GHz, 256 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply module, 1x terminal block X20TB12, slot cover and X20 end cover plate X20AC0SR1 (right) included, order application memory separately!
X20CP1585	X20 CPU, Atom 1.0 GHz, 256 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply mod- ule, 1x terminal block X20TB12, slot cover and X20 end cover plate X20AC0SR1 (right) included, order application memory separately!
X20CP1586	X20 CPU, Atom 1.6 GHz, 512 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply mod- ule, 1x terminal block X20TB12, slot cover and X20 end cover plate X20AC0SR1 (right) included, order application memory separately!
X20cCP1586	X20 CPU, coated, Atom 1.6 GHz, 512 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply module, 1x terminal block X20TB12, slot cover and X20 end cover plate X20AC0SR1 (right) included, order application memory separately!
	Required accessories
0CECPD 0512E 01	CompactFlash cards
0CFCRD.0512E.01 0CFCRD.2048E.01	CompactFlash 512 MB extended temp. CompactFlash 2048 MB extended temp.
5CFCRD.016G-06	CompactFlash 2048 MB extended temp.
5CFCRD.032G-06	CompactFlash 32 GB B&R (SLC)
5CFCRD.0512-06	CompactFlash 512 MB B&R (SLC)
5CFCRD.1024-06	CompactFlash 1 GB B&R (SLC)
5CFCRD.2048-06	CompactFlash 2 GB B&R (SLC)
5CFCRD.4096-06	CompactFlash 4 GB B&R (SLC)
5CFCRD.8192-06	CompactFlash 8 GB B&R (SLC)
	Optional accessories
	Batteries
0AC201.91	Lithium batteries 4 pcs., 3 V / 950 mAh button cell
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell

Table 1: X20CP1583, X20CP1584, X20cCP1584, X20CP1585, X20CP1586, X20cCP1586 - Order data

Included in delivery

Order number	Short description
4A0006.00-000	Backup battery (see also "Battery" on page 17)
-	Interface module slot covers
X20AC0SR1	X20 end cover plate (right)
X20TB12	X20 terminal block, 12-pin, 24 V coding

Table 2: X20 CPUs - Content of delivery

4 X20CP158x - Technical data

Model number	X20CP1583	X20CP1584	X20cCP1584	X20CP1585	X20CP1586	X20cCP1586
Short description						J
Interfaces		1x RS232, 1x Et	hernet, 1x POWERL	INK (V1/V2), 2x U	SB, 1x X2X Link	
System module		,	CP	1 1	,	
General information				-		
B&R ID code	0xD45B	0xC370	0xE21B	0xC3AE	0xC3B0	0xE21C
Cooling			Fanle			
Status indicators		CPU functio	on, Ethernet, POWEF		ash battery	
Diagnostics					aon, battory	
Battery		Yes	s, using LED status i	dicator and softwa	are	
CPU function		100	Yes, using LED states in			
CompactFlash			Yes, using LED s			
Ethernet			Yes, using LED s			
POWERLINK			Yes, using LED s			
Temperature			Yes, using Soft			
			Tes, using solu	ware register		
Support			No			
Controller redundancy possible			Yes			
ACOPOS support						
Visual Components support	0.0.10/	0.0	Yes		0	7 \\\/
Power consumption without interface module and USB	8.2 W	8.6		8.8 W	9.	7 W
Power consumption for X2X Link pow- er supply 1)			1.42	vv		
Power consumption ¹⁾						_
Internal I/O Additional power dissipation caused by actuators (resistive) [W]			0.6	N		
Certifications CE						
			Yes			
ATEX	Zone 2, II 3G Ex nA nC IIA T5 Gc IP20, Ta (see X20 user's manual) FTZÚ 09 ATEX 0083X					
UL	CULus E115267 Industrial control equipment					
HazLoc			cCSAus 2 Process contro	244665		
	for hazardous locations Class I, Division 2, Groups ABCD, T5					
DNV GL	Temperature: B (0 - 55°C) Humidity: B (up to 100%) Vibration: B (4 g)					
LR			EMC: B (bridge a			
KR			Yes			
ABS			Yes			
EAC						
		N/a a	Ye			
KC	-	Yes	-	Ŷ	es	-
CPU and X2X Link power supply						_
Input voltage			24 VDC -15			
Input current			Max. 1			_
Fuse			Integrated, cann			_
Reverse polarity protection			Yes	3		
X2X Link power supply output						
Nominal output power			7 W			
Parallel connection			Yes			-
Redundant operation			Ye	3		
Input I/O power supply						
Input voltage			24 VDC -15	% / +20%		
Fuse		F	Required line fuse: M	ax. 10 A, slow-blow	v	_
Output I/O power supply						
Nominal output voltage			24 VI			
Permissible contact load			10	4		
Power supply - General information						
Status indicators		Overload, or	perating status, modu	ile status, RS232 d	lata transfer	
Diagnostics		, - T				
RS232 data transfer			Yes, using LED s	tatus indicator		
Module run/error		Yes	s, using LED status in		are	_
Overload			s, using LED status in			
Electrical isolation		163				
I/O supply - I/O power supply			No			
CPU/X2X Link supply - CPU/X2X			Yes			
Link power supply			fe			

Table 3: X20CP1583, X20CP1584, X20cCP1584, X20CP1585, X20CP1586, X20cCP1586 - Technical data

Compare Field 1 PRU Name data file, resolution 1, 1, 10 to 10 ppm accuracy 21 25°C PRU Name data file, resolution 1, 1, 10 to 10 ppm accuracy 21 25°C PRU Name data file, resolution 1, 1, 10 to 10 ppm accuracy 21 25°C PRU Name data file, resolution 1, 1, 10 to 10 ppm accuracy 21 25°C PRU Name data file, resolution 1, 10 to 10 ppm accuracy 21 25°C Program code 24 48 Program code 32 48 Program code 32 48 Program code 10 to 10 ppm accuracy 21 accura	Model number	X20CP1583	X20CP1584	X20cCP1584	X20CP1585	X20CP1586	X20cCP1586			
Real-time clock Nonvelatils, resolution 1 1/10 to 10 ppm accuracy at 28° C PRU Yes Atom E4001 Atom E40011 Atom E4001 A	Controller									
PFU Yes Types Atom E620T Atom E640T Atom E640T Atom E640T Types 333 MHz 0.6 CHz 1 CHz 1.0 CHZ	CompactFlash slot									
Processor Image: Control of the second of the	Real-time clock									
Type Atom E807 Atom E807 Atom E807 It e807 It e807 It e807 It e807 L1 cache 0.6 GHz 0.6 GHz 1.0 Hz 1.0 Hz 1.0 Hz 0.6 Hz Data code 22 kB	FPU			Ye	es					
Clock frequency 333 MHz 0.6 GHz 1 GHz 1.6 GHz Data code 24 kB - <td< td=""><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td></td<>						1				
L1 sazba Data code Program code 12 ache Program code 22 kB 12 ache Processer V 48 12 ache Processer V 48 Processer										
Data code 24 kB Program code 32 kB L2 cache - Program code 512 kB Modular Interface slots - Remarent variable Max 6 kB * Max 2 kB * Modular Interface slots - - Remarent variable Max 6 kB * Max 2 kB * Max 1 kB * Shorbet tak class cycle time 600 µ 400 µ 200 µ 100 µ Typical instruction cycle time 0.01 µ 0.0024 µ 0.0024 µ 0.0027 µ Data buffering - - - - - Struction matche cycle time 0.01 µ 0.0027 µ 0.0024 µ 0.0027 µ Data buffering - Max 1.MB SRAM * - Struction matche interpentation - 1.MB SRAM * - Namer Connection match using 12 µst terminal block X20*D12 - - Signal - - - - - - - - - - - - - - </td <td>· · · · · · · · · · · · · · · · · · ·</td> <td>333 MHz</td> <td>0.6</td> <td>GHz</td> <td>1 GHz</td> <td>1.6</td> <td>GHz</td>	· · · · · · · · · · · · · · · · · · ·	333 MHz	0.6	GHz	1 GHz	1.6	GHz			
Program code 32 kB Integrated 102 processor Processes 102 data points in the background Remament variables Max. 46 kB 4 Max. 256 kB 4 Max. 14.84 Remament variables 800 µs 400 µs 200 µs 100 µs Sorbert task class cycle time 800 µs 400 µs 200 µs 0.0024 µs 0.0027 µs Data buffering - <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
L2 ache - 512 k3 Modular Interface slots - Processes 1/0 darpoints in the background Modular Interface slots 1 Max. 256 k8 ⁻⁺ Max. 1 MB ⁺⁺ Shortest task class cycle time 800 µs 400 µs 0.004 µs 0.0027 µs Shortest task class cycle time 0.01 µs 0.0075 µs 0.004 µs 0.0027 µs Shortest task class cycle time 0.01 µs 0.0075 µs 0.004 µs 0.0027 µs Shate Minning - - - 0.004 µs 0.0027 µs State Minning - - - 0.004 µs 0.0027 µs Signal 128 MB DR2 266 MB DR2 SDRAM 512 MB DDR2 SDRAM 512 MB DDR2 SDRAM Signal 1 MB SRAM ⁺¹ 1 MB SRAM ⁺¹ 1 MB SRAM ⁺¹ 1 MB SRAM ⁺¹ Signal - - - - - Max. distance 900 m - - - - Variant - - - - - - - - -							-			
Integrate UC processes // Odda portis in the background Max: 64:89 4 Remanent variables Shortest task class cycle time 0:01 µs 0:0075 µs 0:0027 µs 0:000 µs 0:0000 µs				32						
Max. 36 kth 1 Max. 25 kth Max. 10 kth Max. 25 kth Max. 10 kth Ma		-		1/2 1-1						
Remanent variables Max. 64 HB *1 Max. 202 HB *0 Max. 1 MB *1 Stronter task close cycle time 0.01 µs 0.009 k 0.004 µs 0.0027 µs Data Luffering 0.0075 µs 0.0044 µs 0.0027 µs 0.0044 µs 0.0027 µs Battey monitoring Ves			P			nd				
Shortest Lask class cycle imm 800 ps 400 ps 200 ps 100 ps Oppide instruction cycle imme 0.01 ps 0.007 ps 0.0027 ps 0.0027 ps Data buffering Ves 0.004 ps 0.0027 ps 0.0027 ps Batley monitoring Ves Standard memperature 512 MB DDR2 SDRAM 512 MB DDR2 SDRAM Sandard memory 1 ME SRAM II Itemperature standard memperature 512 MB DDR2 SDRAM 512 MB DDR2 SDRAM User RAM 1 ME SRAM II Itemperature standard memperature standard memp			[Maria				
Typical instruction cycle ime 0.01 µs 0.004 µs 0.0027 µs Battery monitoring Vis Vis Exitery monitoring No.2 years at 23C ambient temperature Vis RAM 128 MB DDR2 SDRAM S12 MB DDR2 SDRAM S12 MB DDR2 SDRAM User RAM 128 MB DDR2 SDRAM S12 MB DDR2 SDRAM S12 MB DDR2 SDRAM Interfaces 1 MB SRAM " Standard regional regiona regional regional regional regional regiona region			10		000					
Data Unfering	-			•						
Battery monitoring interval status Ves Uthum battery interval status Standard memory RAM 128 MB DDR2 SDRAM 512 MB DDR2 SDRAM 512 MB DDR2 SDRAM User RAM 1 MB SRAM ® 1 MB SRAM ® Interfaces 1 MB SRAM ® 1 MB SRAM ® Interfaces 8232 2 Mark minutal block X20TB12 1 MB SRAM ® Signal RS232 2 Mark minutal block X20TB12 1 MB SRAM ® Max 1 MB SRAM ® 1 MB SRAM N2 MS		0.01 µs	0.00	75 µs	0.0044 µs	0.00	27 µs			
Lithium battery Mm. 2 years at 23°C ambient temperature RAM 128 MB DDR2 SDRAM \$12 MB DDR2 SDRAM Name 188 SDRAM \$12 MB DDR2 SDRAM User RAM 1 MB SRAM ** Interfaces \$256 MB DDR2 SDRAM ** Singlad 1 MB SRAM ** Marca (stance) \$250 MB MDR2 SDRAM ** Wariant Connection made using 12-pin terminal block X20TB12 Max. (stance) \$00 m Transfer rate \$250 MB MD NS ** Signal Ethermet Signal \$164 Ads shelded Gable length \$101001000 Mbirs Transfer rate \$101001000 Mbirs Transfer rate \$10100000 Mbirs Transfer rate \$101000000 Mbirs Full-duplex Yes Auto-MD/MD X Yes Auto-MD/MD X Yes Auto-MD/MD X Transfer rate Transfer rate \$100 Mbirs Transfer rate \$100 Mbirs Transfer rate \$100 Mbirs Transfer rate \$100 Mbirs Transfer <t< td=""><td>-</td><td></td><td></td><td>V</td><td></td><td></td><td></td></t<>	-			V						
Standard memory RAM 128 MB DDR2 SDRAM 226 MB DDR2 SDRAM 512 MB DDR2 SDRAM 512 MB DDR2 SDRAM 512 MB DDR2 SDRAM 512 MB DDR2 SDRAM 1MB SRAM ⁹ Interfaces Interface Signal Signal Connection made using 12-pn terminal block X20TB12 Max distance 900 m Transfer rate Signal Connection made using 12-pn terminal block X20TB12 Variant Cable length Transfer rate 104ASE-Tr100EASE-Tr100EASE-Tr100EASE-T Haf-toplex Yes Transfer rate 104ASE Yes Transfer rate 104ASE Yes 104ASE Yes										
RAM 1256 MB DDR2 SDRAM 512 MB DDR2 SDRAM User RAM 1 MB SRAM ** Interfaces 1 MB SRAM ** Interfaces 8232 Signal R5232 Variant Connection made using 12.ph terminal block X20TB12 Max. distance 900 m Tarasfer rate Max. 115.2 Kb/ls Interface IF2 Ethernet Signal Ethernet Variant Cable length Tarasfer rate 1070001000 Mb/ls Tarasfer rate 1070001000 Mb/ls Physical layer 108ASE-T17100BASE-T Half-duplex Yes Autonegolation Yes Autonegolation Yes Fieldbus POWERLINK (V1/2) manging or controlled node Type Type 4* Yes 100 Mb/ls Transfer 100 Mb/ls Fieldbus POWERLINK (V1/2) manging or controlled node Type Type 4* Autonegolation Yes Autonegolation Yes Fieldbus POWERLINK (V1/2) manging or controlled node Type Type 4* Max. 100 no between 2 stations (segment length) Transfer rate 100 Mb/ls Transfer rate 100 Mb/ls <	-					6				
User RAM 1 MB SRAM *> Interfaces 1 Interfaces 1 Signal RS22 Variant Connection made using 12.pin terminal block X20TB12 Max. distance 900 m Transfer rate Max. 115.2 kbits Signal Ethermet Variant KR.45 shelded Cable length Max. 100 m between 2 stations (segment length) Transfer rate 10/100/1000 Mb/s Transfer rate 10/00/1000 Mb/s Fluid-tuplex Yes Fluid-tuplex Yes Auto-MDI/MDIX Yes Transfer rate 10/00/1000 Mb/s Transfer rate Yes Auto-MDI/MDIX Yes Auto-MDI/MDIX Yes Transfer rate 10/00/1000 Mb/s Transfer rate POWERLINK (V1/V2) managing or controlled node Type 4 Yes Auto-MDI/MDIX Yes Transfer rate 1000 Mb/s Transfer rate 100 Mb/s Transfer rate 10/00 Mb/s	,	128 MR 0002	0	56 MB DDR2 SDP4	M	512 MR DF	R2 SDRAM			
User FAM 1 MB SRAM ** Interfaces 1 Signal R5232 Variant Connection made using 12 pin terminal block X20TB12 900 m Transfer rate 000 m Signal Connection made using 12 pin terminal block X20TB12 900 m Transfer rate Max. 115.2 Kub/s Variant Ethernet Variant KR.45 shielded Cable length Max. 100 m block X20TB12 Transfer rate 10/100/1000 Mbt/s Physical layer 10BASE-TV/100BASE-T Half-duplex Yes Full-duplex Yes Autonegolation Yes Autonegolation Yes Autonegolation Yes Transfer rate 100 Mbt/s Transfer rate 100 Mbt/s </td <td>1 G UVI</td> <td></td> <td>2</td> <td>UTA DUNE DUNE OURA</td> <td>••</td> <td></td> <td></td>	1 G UVI		2	UTA DUNE DUNE OURA	••					
hterfaces interfaces i	User RAM		1	1 MB S	RAM ⁵⁾	1				
Interface IF1 R5232 Variant Connection made using 12-pin terminal block X20TB12 Max. distance 900 m Transfer rate 900 m Signal Ethermet Variant 1k RJA5 shielded Cable length Max. 115 2 kbits Transfer rate 10/100/1000 Mbits Transfer rate 10/100/1000 Mbits Physical layer 10BASE-TX/100BASE-TX Physical layer 10BASE-TX/100BASE-TX Half-duplex Yes Full-duplex Yes Auto-MU/MDIX Yes Variant 10/100/1000 Mbits Transfer Yes Interface IF3 Yes Fieldbus POWERLINK (V1/2) managing or controlled node Type 100BASE-TX Yarant 100BASE-TX Half-duplex Power Stations (segment length) Transfer rate 1000 Mbits Transfer rate 100BASE-TX Half-duplex POWERLINK (V1/2) managing or controlled node Transfer rate 100BASE-TX H	Interfaces	L								
Signal RS232 Variant Connection made using 12-pin terminal block X20TB12 Max. distance 900 m Transfer rate Max. 115.2 kbil/s Interface IF2 Interface IF2 Signal Ethermet Signal RAX. 5 kbil/s bil/ded Cable length Max. 100 m between 2 stations (segment length) Transfer rate 10/100/1000 Mbil/s Transfer 10/100/1000 Mbil/s Transfer Rate 10/100/1000 Mbil/s Transfer Rate 10/100/1000 Mbil/s Transfer Rate 10/100/1000 Mbil/s Full-duplex Yes Autonegotation Yes Autonegotation Yes Autonegotation Yes Transfer rate 100 Mbil/s Transfe	Interface IF1									
Variant Connection made using 12-pin terminal block X20TB12 Max. distance 90 m Transfer rate Max. 115.2 kbit/s Interface IF2 Ethermet Signal Ethermet Variant 1x.R.45 shielded Cable length Max. 100 metwere 2 stations (segment length) Transfer rate 10/100/1000 Mbit/s Physical layer 10BASE-T/100BASE-T/100BASE-T Half-duplex Yes Full-duplex Yes Auto-MUMNDIX Yes Variant 10/100/1000 Mbit/s Transfer Yes Full-duplex Yes Auto-MUMNDIX Yes Variant 10/12/12/12 managing or controlled node Type Transfer Transfer 100 Mbit/s Transfer rate 100 Mbit/s <tr< td=""><td></td><td></td><td></td><td>RS</td><td>232</td><td></td><td></td></tr<>				RS	232					
Max. distance 900 m Transfer rate Max. 115.2 kbit/s Signal Ethernet Wariant Ethernet Cable length Max. 100 m between 2 stations (segment length) Transfer rate 101/00/000 Mbit/s Transfer rate 10100/000 Mbit/s Physical layer 10BASE-T/100BASE-T/1100BASE-T Half-duplex Yes Autoregolation Yes Transfer rate 10 Mbit/s Transfer	-		Conne			20TB12				
Interface IF2 Signal Signal Ethernet Signal Ethernet Signal Ethernet Ethere	Max. distance									
Signal Ethernet Variant 1x RJ45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer 10/100/1000 Mbit/s Transfer 10/100/1000 Mbit/s Physical layer 10BASE-T7/100BASE-T/100BASE-T Half duplex Yes Full-duplex Yes Auto-MDIMDIX Yes Auto-MDIMDIX Yes Interface IF3 Fold-but Fieldbuts POWERLINK (V1/V2) managing or controlled node Type Type 4 ··· Variant 1x RJ45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer 100 Mbit/s Transfer 100 Mbit/s Transfer 100 Mbit/s Full-duplex Yes Full-duplex POWERLINK (v1/V2) managing or controlled node Type 4 ··· 1x RJ45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer 100 Mbit/s Transfer Yes Full-duplex Yes	Transfer rate			Max. 115	5.2 kbit/s					
Variant 1x R.45 shieldd Cable length Max. 100 m between 2 stations (segment length) Transfer rate 10/10/000 Mbit/s Transfer rate 108ASE-T/100BASE-TX/100BASE-T Half-duplex Yes Full-duplex Yes Autonegotation Yes Auto-MDI/MDIX Yes Auto-MDI/MDIX Yes Fieldbus POWERLINK (V1/V2) managing or controlled node Type Type 4 % Variant 1x R.45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer rate 100 Mbit/s Transfer rate 100 Mbit/s Transfer rate 100 Mbit/s Transfer rate 100 Mbit/s Fuil-duplex Yes Autonegotation Yes <td>Interface IF2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Interface IF2									
Cable length Max. 100 m between 2 stations (segment length) Transfer rate 10/100/1000 Mb//s Physical layer 10BASE-TX/100BASE-T Half-duplex Yes Full-duplex Yes Autoregoliation Yes Autoregoliation Yes Autoregoliation Yes Interface IF3 POWERLINK (V1/V2) managing or controlled node Type Type 4 % Variant 100 Mbit/s Cable length Max. 100 m between 2 stations (segment length) Transfer rate 100 Mbit/s Transfer rate 0.5 A Mutore	Signal			Ethe	rnet					
Transfer rate 10/100/1000 Mbit/s Transfer 10BASE-T/100BASE-TX/1000BASE-T Half-duplex Yes Autonegotiation Yes Transfer rate 1000 moteveen 2 stations (segment length) Transfer rate 1000 Mbit/s Transfer rate 100 Mbit/s Transfer rate 100 Mbit/s Transfer rate 100 Mbit/s Transfer rate 100 Mbit/s Transfer r	Variant	1x RJ45 shielded								
Transfer Interface Physical layer 10BASE-TX10BASE-TX1100BASE-T Half-duplex Yes Full-duplex Yes Autonegotation Yes Autonegotation Yes Autonegotation Yes Autonegotation Yes Autonegotation Yes Autonegotation Yes Statistical IF3 Interface Fieldbus POWERLINK (V1/V2) managing or controlled node Type Type 4:% Variant 1x RJ45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer rate 100 Mbit/s Transfer rate 100 Mbit/s Transfer rate 100 Mbit/s Full-duplex POWERLINK (Not. No / Ethernet mode: Yes Autonegotation Yes Autonegotation Yes Autonegotation Yes Yes USB 1.1/2.0 Yariant 0.5 A Interface IF6 1////////////////////////////////////	Cable length									
Physical layer 10BASE-T/100BASE-TX Haif-duplex Yes Autonegotiation Yes Autonegotiation Yes Autonegotiation Yes Autonegotiation Yes Autonegotiation Yes Interface IF3 POWERLINK (V1/V2) managing or controlled node Type Type 4 % Variant 1x RJ45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer rate 100 BASE-TX Physical layer 100BASE-TX Haif-duplex Yes Full-duplex Yes Autonegotiation Yes Autonegotiation Yes Autonegotiation Yes Autonegotiation Yes Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF6 Interface IF6 Type USB 1.1/2.0 Variant 0.5 A Interface IF6 Interface IF6 Fieldbus	Transfer rate									
Half-duplex Yes Full-duplex Yes Autonegotiation Yes Auto-MDI/MDIX Yes Interface IF3 Yes Fieldbus POWERLINK (V1/V2) managing or controlled node Type Type 4.9 Variant Its XL45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer rate 100 Mbt/s Transfer rate 100 BASE-TX Half-duplex Yes Full-duplex Yes Autonegotiation Yes Autoequitation Yes Interface IF4 Yes Type USB 1.1/2.0 Variant O.5 A Interface IF5 Yes Type A USB 1.1/2.0 Variant O.5 A Interface IF6<	Transfer									
Full-duplex Yes Autonegotiation Yes Auto-MDIMDIX Yes Fieldbus POWERLINK (V1/V2) managing controlled node Fieldbus POWERLINK (V1/V2) managing controlled node Type POWERLINK (V1/V2) managing controlled node Type 4 ° Type 4 ° Variant XR.4/5 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer 100 Mbl/s Transfer 100 Mbl/s Full-duplex Yes Full-duplex Yes Auto-mogotiation Yes Auto-MDI/MDIX Yes Full-duplex output current Yes Auto-MOL/MDIX Yes Auto-MOL/MDIX Yes Auto-MOL/MDIX Yes Variant 0.5 A Interface IF6 100 SB 1.1/2.0 Type A SS 1.1/2.0 Variant 0.5 A Interface IF6 100 SB 1.1/2.0 Type A X2X Link master Electrical properties 10.5 A E	Physical layer	10BASE-T/100BASE-TX/1000BASE-T								
Autonegotiation Yes Auto-MDI/MDIX Yes Interface IF3	-			Ye	es					
Auto-MDI/MDIX Yes Interface IF3				Ye	es					
Interface IF3 Fieldbus POWERLINK (V1/V2) managing or controlled node Type Type 4 ® Variant Transfer Physical layer Haif-duplex Full-duplex Full-duplex POWERLINK mode: No / Ethernet mode: Yes Full-duplex PowerLINK mode: No / Ethernet mode: Yes Full-duplex Fullex Full-duplex Full-duplex Fullex Full-duplex Full-duplex F	-									
Fieldbus POWERLINK (V1/V2) managing or controlled node Type Type 4 % Variant 1x RJ45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer rate 100 Mbit/s Transfer rate 100 Mbit/s Transfer 100 Mbit/s Transfer 100BASE-TX Half-duplex POWERLINK mode: No / Ethernet mode: Yes Autonegotiation Yes Auto-MDI/MDIX Yes Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF4 100 SA Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF5 100 SA Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF6 100 SA Fieldbus X2X Link master Electrical solation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC </td <td></td> <td></td> <td></td> <td>Ye</td> <td>es</td> <td></td> <td></td>				Ye	es					
Type Type 4 % Variant 1x RJ45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer rate 100 Mbit/s Physical layer 100BASE-TX Half-duplex Yes Full-duplex Yes Autonegotilation Yes Auto-MDI/MDIX Yes Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF4 Interface IF5 Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF5 Interface IF6 Type A SZX Link master Electrical isolation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC Operating conditions Yes Horizontal Yes Installation elevation above sea level Yes 0 to 2000 m No limitation	Interface IF3									
Variant 1x RJ45 shielded Cable length Max. 100 m between 2 stations (segment length) Transfer rate 100 Mbit/s Transfer 100 Mbit/s Physical layer 100 Mbit/s Half-duplex Yes Full-duplex Yes Autonegotiation Yes Auto-MDI/MDIX Yes Interface IF4 Yes Type USB 1.1/2.0 Yariant Type A Max. output current 0.5 A Interface IF5 Interface IF5 Type USB 1.1/2.0 Yariant Type A Max. output current 0.5 A Interface IF5 Interface IF5 Type USB 1.1/2.0 Yariant Type A Max. output current 0.5 A Interface IF6 Interface IF6 Fieldbus X2X Link master Electrical properties Electrical isolation Electrical isolation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC			POW			node				
Cable length Max. 100 m between 2 stations (segment length) Transfer rate 100 Mbit/s Transfer 100 BASE-TX Physical layer 100BASE-TX Half-duplex Yes Full-duplex POWERLINK mode: No / Ethernet mode: Yes Autonegotiation Yes Autonegotiation Yes Auto-MDI/MDIX Yes Interface IF4 100 S 1.1/2.0 Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF5 Interface IF5 Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF5 Interface IF6 Fieldbus X2X Link master Electrical properties Electrical isolation Electrical solation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC Operating conditions Yes Mounting orientation Yes Horizontal Yes Vertical Yes <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>										
Transfer rate 100 Mbit/s Transfer 100BASE-TX Physical layer 100BASE-TX Half-duplex Yes Full-duplex POWERLINK mode: No / Ethernet mode: Yes Autonegotiation Yes AutoneDI/MDIX Yes Interface IF4 Yes Type USB 1.1/2.0 Variant 0.5 A Interface IF5 USB 1.1/2.0 Type USB 1.1/2.0 Variant 0.5 A Interface IF5 Interface IF6 Type A USB 1.1/2.0 Variant 0.5 A Interface IF6 Interface IF6 Fieldbus X2X Link master Electrical properties Electrical solation Electrical solation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC Oparating conditions Yes Mounting orientation Yes Horizontal Yes Installation elevation above sea level Yes Installation elevation above sea level Yes On 2000 m Reduction of ambient temperature by 0.5°C per 10										
Transfer Image: Constant of the section o										
Physical layer 100BASE-TX Half-duplex Yes Full-duplex POWERLINK mode: No / Ethernet mode: Yes Autonegotiation Yes Autonegotiation Yes AutoneDI/MDIX Yes Interface IF4 Yes Type USB 1.1/2.0 Variant 0.5 A Interface IF5 Interface IF5 Type USB 1.1/2.0 Variant 0.5 A Interface IF5 Interface IF5 Type USB 1.1/2.0 Variant 0.5 A Interface IF5 Interface IF6 Fieldbus X2X Link master Electrical properties Electrical isolation Electrical isolation Eletrent (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC Operating conditions Yes Monting orientation Yes Horizontal Yes Vertical Yes Vertical Yes Vertical On 0 No limitation Yes				100 N	/bit/s					
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Autonegotiation Yes Auto-MDI/MDIX Yes Interface IF4 USB 1.1/2.0 Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF5 USB 1.1/2.0 Type USB 1.1/2.0 Variant 0.5 A Interface IF5 USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF6 Type A Fieldbus X2X Link master Electrical properties Electrical properties Electrical solation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC Operating conditions Yes Mounting orientation Yes Horizontal Yes Vertical Yes Installation elevation above sea level Yes Installation elevation above sea level No limitation >2000 m Reduction of ambient temperature by 0.5°C per 100 m	•					/				
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Variant Type A Max. output current 0.5 A Interface IF5 USB 1.1/2.0 Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF6 1 Fieldbus X2X Link master Electrical properties 2 Electrical isolation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC Operating conditions 4 Mounting orientation Yes Horizontal Yes Vertical Yes Installation elevation above sea level 0 to 2000 m 0 to 2000 m Reduction of ambient temperature by 0.5°C per 100 m					1/2.0					
Max. output current 0.5 A Interface IF5 0.5 A Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF6 0.5 A Fieldbus X2X Link master Electrical properties X2X Link master Electrical isolation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC Operating conditions Yes Mounting orientation Yes Horizontal Yes Vertical Yes Installation elevation above sea level No limitation 0 to 2000 m Reduction of ambient temperature by 0.5°C per 100 m										
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Type USB 1.1/2.0 Variant Type A Max. output current 0.5 A Interface IF6 Fieldbus X2X Link master Electrical properties Electrical isolation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC Operating conditions Mounting orientation Yes Horizontal Yes Vertical Yes Installation elevation above sea level Yes 0 to 2000 m No limitation >2000 m Reduction of ambient temperature by 0.5°C per 100 m				0.5	///					
Variant Type A Max. output current 0.5 A Interface IF6 0.5 A Fieldbus X2X Link master Electrical properties X2X Link master Electrical isolation Ethernet (IF2), POWERLINK (IF3) and X2X (IF6) isolated from each other, from other interfaces and from PLC Operating conditions Yes Mounting orientation Yes Horizontal Yes Vertical Yes Installation elevation above sea level 0 to 2000 m 0 to 2000 m No limitation >2000 m Reduction of ambient temperature by 0.5°C per 100 m					1/2 0					
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Operating conditions Mounting orientation Horizontal Yetrical Yetrical Installation elevation above sea level 0 to 2000 m >2000 m Reduction of ambient temperature by 0.5°C per 100 m		Ethernet (IF2)	POWERI INK (IE3)	and X2X (IE6) isolate	ed from each other	from other interface	and from PLC			
Mounting orientation Horizontal Yes Vertical Yes Installation elevation above sea level No limitation 0 to 2000 m No limitation >2000 m Reduction of ambient temperature by 0.5°C per 100 m										
Horizontal Yes Vertical Yes Installation elevation above sea level Yes 0 to 2000 m No limitation >2000 m Reduction of ambient temperature by 0.5°C per 100 m										
Vertical Yes Installation elevation above sea level 0 to 2000 m No limitation >2000 m Reduction of ambient temperature by 0.5°C per 100 m	-			Va	ès					
Installation elevation above sea level No limitation 0 to 2000 m No limitation >2000 m Reduction of ambient temperature by 0.5°C per 100 m										
0 to 2000 m No limitation >2000 m Reduction of ambient temperature by 0.5°C per 100 m				Te	~					
>2000 m Reduction of ambient temperature by 0.5°C per 100 m				No lim	itation					
			Reduc			100 m				
	Degree of protection per EN 60529									

Table 3: X20CP1583, X20CP1584, X20cCP1584, X20CP1585, X20CP1586, X20cCP1586 - Technical data

Model number	X20CP1583	X20CP1584	X20cCP1584	X20CP1585	X20CP1586	X20cCP1586
Ambient conditions						
Temperature	-					
Operation						
Horizontal mounting orientation			-25 to	60°C		
Vertical mounting orientation			-25 to	50°C		
Derating			See section	n "Derating".		
Storage			-40 to	85°C		
Transport			-40 to	85°C		
Relative humidity						
Operation	5 to 95%, non	-condensing	Up to 100%, condensing	5 to 95%, no	n-condensing	Up to 100%, condensing
Storage			5 to 95%, no	n-condensing		
Transport			5 to 95%, no	n-condensing		
Mechanical properties						
Note		Order application memory (CompactFlash) separately Backup battery included in delivery X20 end cover plate (right) included in delivery 12-pin X20 terminal block included in delivery Interface module slot covers included in delivery				
Dimensions						
Width	150 mm					
Height	99 mm					
Depth			85	mm		
Weight			40	0 g		

Table 3: X20CP1583, X20CP1584, X20cCP1584, X20CP1585, X20CP1586, X20cCP1586 - Technical data

1) The specified values are maximum values. For examples of the exact calculation, see section "Mechanical and electrical configuration" in the X20 system user's manual.

2) When operated at temperatures above 55°C, a derating of the nominal output power to 5 W for the X2X Link power supply must be taken into account.

3) In parallel operation, it is only permitted to expect 75% of the nominal power. It is important to make sure that all power supply units operated in parallel are switched on and off at the same time.

4) The memory size for remanent variables is configurable in Automation Studio.

5) 1 MB SRAM minus the configured remanent variables.

6) For additional information, see section "Communication / POWERLINK / General information / Hardware - IF/LS" in Automation Help.

5 Order data - X20CP358x

Model number	Short description
	X20 CPUs
X20CP3583	X20 CPU, Atom 333 MHz (compatible), 128 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 3 insert slots for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply module, 1x terminal block X20TB12, slot covers and X20 end cover plate X20AC0SR1 (right) included, order application memory separately!
X20CP3584	X20 CPU, Atom 0.6 GHz, 256 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 3 insert slots for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply mod- ule, 1x terminal block X20TB12, slot covers and X20 end cover plate X20AC0SR1 (right) includ- ed, order application memory separately!
X20cCP3584	X20 CPU, coated, Atom 0.6 GHz, 256 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply module, 1x terminal block X20TB12, slot cover and X20 end cover plate X20AC0SR1 (right) included, order application memory separately!
X20CP3585	X20 CPU, Atom 1.0 GHz, 256 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 3 insert slots for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply mod- ule, 1x terminal block X20TB12, slot covers and X20 end cover plate X20AC0SR1 (right) includ- ed, order application memory separately!
X20CP3586	X20 CPU, Atom 1.6 GHz, 512 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 3 insert slots for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply mod- ule, 1x terminal block X20TB12, slot covers and X20 end cover plate X20AC0SR1 (right) includ- ed, order application memory separately!
X20cCP3586	X20 CPU, coated, Atom 1.6 GHz, 512 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000BASE-T, 1 POWERLINK interface, including power supply module, 1x terminal block X20TB12, slot cover and X20 end cover plate X20AC0SR1 (right) included, order application memory separately!
	Required accessories
	CompactFlash cards
0CFCRD.0512E.01	CompactFlash 512 MB extended temp.
0CFCRD.2048E.01	CompactFlash 2048 MB extended temp.
5CFCRD.016G-06	CompactFlash 16 GB B&R (SLC)
5CFCRD.032G-06	CompactFlash 32 GB B&R (SLC)
5CFCRD.0512-06	CompactFlash 512 MB B&R (SLC)
5CFCRD.1024-06	CompactFlash 1 GB B&R (SLC)
5CFCRD.2048-06	CompactFlash 2 GB B&R (SLC)
5CFCRD.4096-06	CompactFlash 4 GB B&R (SLC)
5CFCRD.8192-06	CompactFlash 8 GB B&R (SLC)
	Optional accessories
	Batteries
0AC201.91	Lithium batteries 4 pcs., 3 V / 950 mAh button cell
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell

Table 4: X20CP3583, X20CP3584, X20cCP3584, X20CP3585, X20CP3586, X20cCP3586 - Order data

Included in delivery

Order number	Short description
4A0006.00-000	Backup battery (see also "Battery" on page 17)
-	Interface module slot covers
X20AC0SR1	X20 end cover plate (right)
X20TB12	X20 terminal block, 12-pin, 24 V coding

Table 5: X20 CPUs - Content of delivery

6 X20CP358x - Technical data

Model number	X20CP3583	X20CP3584	X20cCP3584	X20CP3585	X20CP3586	X20cCP3586
Short description		II	L			
Interfaces		1x RS232, 1x Et	thernet, 1x POWERL	INK (V1/V2), 2x US	SB, 1x X2X Link	-
System module		· · · · · · · · · · · · · · · · · · ·	CP			
General information				-		
B&R ID code	0xD45C	0xC3AD	0xE21D	0xC3AF	0xBF2B	0xE21E
Cooling		II	Fanle	ess	I	
Status indicators		CPU function	on, Ethernet, POWER	RLINK, CompactFla	ash, battery	
Diagnostics			, , .	,	,,	
Battery		Ye	s, using LED status i	ndicator and softwa	are	
CPU function			Yes, using LED s			
CompactFlash			Yes, using LED s			
Ethernet			Yes, using LED s			
POWERLINK			Yes, using LED s			
Temperature			Yes, using soft			
Support						
Controller redundancy possible	No			Yes		
ACOPOS support			Ye	5		
Visual Components support			Ye	 S		
Power consumption without interface	8.2 W	8.6	W	8.8 W	9.	7 W
module and USB						
Power consumption for X2X Link pow-			1.42	W		
er supply 1)						
Power consumption 1)						
Internal I/O			0.6	W		
Additional power dissipation caused			-			
by actuators (resistive) [W]						
Certifications						
CE			Ye	5		
ATEX			Zone 2, II 3G Ex r			
			IP20, Ta (see X20			
			FTZÚ 09 AT			
UL			cULus E			
			Industrial contr			_
HazLoc			cCSAus : Process contro			
			for hazardou			
			Class I, Division 2, (
DNV GL			Temperature:	•		
			Humidity: Β (ι	up to 100%)		
	Vibration: B (4 g)					
			EMC: B (bridge a			
LR			EN\			
KR			Ye	5		_
ABS			Ye	5		
EAC			Ye			
KC	-	Yes	-	Y	es	-
CPU and X2X Link power supply						_
Input voltage			24 VDC -15	% / +20%		
Input current			Max. 1	.5 A		
Fuse			Integrated, cann	ot be replaced		
Reverse polarity protection			Ye	6		
X2X Link power supply output						
Nominal output power			7 W	2)		
Parallel connection			Yes	3)		
Redundant operation			Ye	6		
Input I/O power supply						
Input voltage			24 VDC -15	% / +20%		
Fuse		F	Required line fuse: M		v	
Output I/O power supply						
Nominal output voltage			24 V	DC		
Permissible contact load			10			
Power supply - General information						
Status indicators		Overload, or	perating status, modu	ule status, RS232 d	lata transfer	
Diagnostics						_
RS232 data transfer			Yes, using LED s	status indicator		
Module run/error		Va	s, using LED status i		are	_
Overload			s, using LED status i			
Electrical isolation						_
I/O supply - I/O power supply			No	<u> </u>		
CPU/X2X Link supply - CPU/X2X			Ye			
Link power supply			re	5		

Table 6: X20CP3583, X20CP3584, X20cCP3584, X20CP3585, X20CP3586, X20cCP3586 - Technical data

Model number	X20CP3583	X20CP3584	X20cCP3584	X20CP3585	X20CP3586	X20cCP3586				
Controller	[L	1	I		1				
CompactFlash slot				1		_				
Real-time clock	Nonvolatile, resolution 1 s, -10 to 10 ppm accuracy at 25°C									
FPU			Ye	es						
Processor						_				
Туре		Atom E620T			E680T					
Clock frequency	333 MHz	0.6	GHz	1.6	GHz					
L1 cache										
Data code			24			_				
Program code		32 kB								
L2 cache	-	512 kB Processes I/O data points in the background								
Integrated I/O processor		P			10					
Modular interface slots Remanent variables	Max. 64 kB 4)	[Max. 256 kB 4)	3	Mov	1 MB ⁴⁾				
	800 µs	400) µs	200 µs						
Shortest task class cycle time Typical instruction cycle time	0.01 µs		75 μs	0.0044 µs		0 μs 27 μs				
Data buffering	0.01 µ3	0.00	ι ο μο	0.004 μ3	0.00	21 μ5				
Battery monitoring			V	es						
Lithium battery			Vin. 2 years at 23°C		<u></u>					
Standard memory					-	_				
RAM	128 MB DDR2	2	56 MB DDR2 SDRA	M	512 MB DI	DR2 SDRAM				
	SDRAM									
User RAM			1 MB S	RAM ⁵⁾						
Interfaces										
Interface IF1										
Signal				232						
Variant		Connection made using 12-pin terminal block X20TB12								
Max. distance		900 m								
Transfer rate			Max. 11	5.2 kbit/s		-				
Interface IF2						_				
Signal				ernet		_				
Variant		1x RJ45 shielded								
Cable length	Max. 100 m between 2 stations (segment length)									
Transfer rate	10/100/1000 Mbit/s									
Transfer						_				
Physical layer				E-TX/1000BASE-T		_				
Half-duplex				es		_				
Full-duplex				es		_				
Autonegotiation				es		_				
Auto-MDI/MDIX			Ye	es						
Interface IF3		DOM								
Fieldbus		POW	ERLINK (V1/V2) ma		node					
Type Variant			,,	shielded						
		Max			(ath)	_				
Cable length Transfer rate		Max. 100 m between 2 stations (segment length) 100 Mbit/s								
Transfer			1001	10105						
Physical layer			10004	SE-TX		_				
Half-duplex				es						
Full-duplex		Dr	OWERLINK mode: N		/es					
Autonegotiation				es		_				
Auto-MDI/MDIX				es						
Interface IF4										
Туре			USB 1	1.1/2.0						
Variant	Type A									
Max. output current			,,	5 A						
Interface IF5										
Туре			USB 1	1.1/2.0		_				
Variant	Туре А									
Max. output current				5 A						
Interface IF6										
Fieldbus			X2X Lin	k master						
Electrical properties										
Electrical isolation	Ethernet (IF2),	POWERLINK (IF3)	and X2X (IF6) isolate	ed from each other,	from other interface	s and from PLC				
Operating conditions										
Mounting orientation										
Horizontal				es						
Vertical			Ye	es						
Installation elevation above sea level										
0 to 2000 m				itation						
>2000 m		Reduc	tion of ambient temp	erature by 0.5°C per	100 m					
Degree of protection per EN 60529				20						

Table 6: X20CP3583, X20CP3584, X20cCP3584, X20CP3585, X20CP3586, X20cCP3586 - Technical data

Model number	X20CP3583	X20CP3584	X20cCP3584	X20CP3585	X20CP3586	X20cCP3586
Ambient conditions						
Temperature						-
Operation						
Horizontal mounting orientation			-25 to	o 60°C		
Vertical mounting orientation			-25 to	o 50°C		
Derating			See section	n "Derating".		
Storage			-40 to	0 85°C		
Transport			-40 to	0 85°C		
Relative humidity						
Operation	5 to 95%, non	-condensing	Up to 100%, condensing	5 to 95%, no	n-condensing	Up to 100%, condensing
Storage			5 to 95%, no	n-condensing		
Transport			5 to 95%, no	n-condensing		
Mechanical properties						
Note	Order application memory (CompactFlash) separately Backup battery included in delivery X20 end cover plate (right) included in delivery 12-pin X20 terminal block included in delivery Interface module slot covers included in delivery					
Dimensions						
Width	200 mm					
Height	99 mm					
Depth			85	mm		
Weight			47	0 g		

Table 6: X20CP3583, X20CP3584, X20cCP3584, X20CP3585, X20CP3586, X20cCP3586 - Technical data

1) The specified values are maximum values. For examples of the exact calculation, see section "Mechanical and electrical configuration" in the X20 system user's manual.

2) When operated at temperatures above 55°C, a derating of the nominal output power to 5 W for the X2X Link power supply must be taken into account.

3) In parallel operation, it is only permitted to expect 75% of the nominal power. It is important to make sure that all power supply units operated in parallel are switched on and off at the same time.

4) The memory size for remanent variables is configurable in Automation Studio.

5) 1 MB SRAM minus the configured remanent variables.

6) For additional information, see section "Communication / POWERLINK / General information / Hardware - IF/LS" in Automation Help.

7 LED status indicators

7.1 X20 CPUs - LED status indicators

Figure	LED	Color	Status	Description
	R/E	Green	On	Application running
and the second se			Blinking	System startup boot mode: The CPU is initializing the application, all bus systems and I/O modules. ¹⁾
R/E			Double flash	Mode BOOT (during firmware update) ¹⁾
RDY/F S/E PLK		Red	On	Mode SERVICE
			Blinking	If LED "R/E" blinks red and LED "RDY/F" blinks yellow, a license violation has occurred.
ETH	RDY/F	Yellow	On	Mode SERVICE or BOOT
CF DC			Blinking	If LED "RDY/F" blinks yellow and LED "R/E" blinks red, a license violation has occurred.
	S/E	Green/Red		Status/Error LED. LED states are described in section "LED "S/E" (LED "Sta- tus/Error")" on page 10.
	PLK	Green	On	The link to the POWERLINK remote station is established.
			Blinking	The link to the POWERLINK remote station is established. The LED blinks if Ethernet activity is taking place on the bus.
	ETH	Green	On	The link to the Ethernet remote station is established.
			Blinking	The link to the Ethernet remote station is established. The LED blinks if Ethernet activity is taking place on the bus.
	CF	Green	On	CompactFlash inserted and detected
		Yellow	On	CompactFlash read/write access
	DC	Yellow	On	CPU power supply OK
		Red	On	Backup battery empty

1) This process can take several minutes depending on the configuration.

7.1.1 LED "S/E" (LED "Status/Error")

This LED is a green/red dual LED and indicates the state of the POWERLINK interface. The LED states have a different meaning depending on the operating mode of the POWERLINK interface.

7.1.1.1 Ethernet mode

In this mode, the interface is operated as an Ethernet interface.

LED "S/E"		
Green	Red	Description
On	Off	The interface is operated as an Ethernet interface.

Table: LED "S/E": Interface in Ethernet mode

7.1.1.2 POWERLINK V1 mode

LED "S/E"		
Green	Red	Current state of the POWERLINK node
On	Off	The POWERLINK node is running with no errors.
Off	On	A system error occurred. The type of error can be read using the PLC logbook. An irreparable problem has occurred. The system can no longer properly carry out its tasks. This state can only be changed by resetting the module.
Blinking alt	ernately	The POWERLINK managing node has failed. This error code can only occur when operated as a controlled node. This means that the set node number lies within the range 0x01 - 0xFD.
Off	Blinking	System stop. The red blinking LED indicates an error code (see "System stop error codes" on page 12).
Off	Off	The interface is either not active or one of the following states or errors is present:
		The device is switched off.
		The device is in the startup phase.
		The interface or device is not configured correctly in Automation Studio.
		The interface or device is defective.

Table 7: LED "S/E": POWERLINK V1 mode

7.1.1.3 POWERLINK V2 mode

Error message

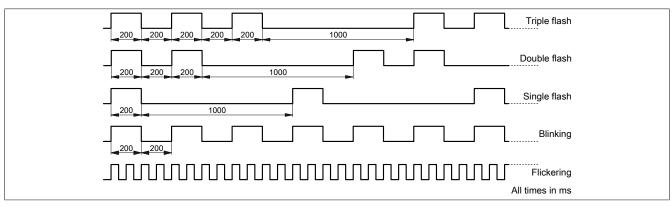
Red	Description
On	The interface is in error mode (failed Ethernet frames, increased number of collisions on the network, etc.). Note: Several red blinking signals are displayed immediately after the device is switched on. These are not errors, however.
On	If an error occurs in the following modes, then the green LED blinks over the red LED: PRE_OPERATIONAL_1 PRE_OPERATIONAL_2 READY_TO_OPERATE Status green t LED "S/E" t
	On

Table: LED "S/E" - Error message (interface in POWERLINK mode)

Interface s	lalus	
LED "S/E"		
Green	Red	Description
Off	Off	Mode: NOT_ACTIVE The interface is either in mode NOT_ACTIVE or one of the following modes or errors is present:
		The device is switched off.
		The device is switched on: The device is in the startup phase.
		 The interface or device is not configured correctly in Automation Studio.
		The interface of device is not configured confectly in Automation Studio.
		Managing node (MN)
		The network is monitored for POWERLINK frames. If a frame is not received within the configured time window (timeout), the
		interface immediately enters mode PRE_OPERATIONAL_1.
		If POWERLINK communication is detected before the time has elapsed, however, the MN is not started.
		Controlled node (CN)
		The network is monitored for POWERLINK frames. If a frame is not received within the configured time window (timeout), the
		interface immediately enters mode BASIC_ETHERNET. If POWERLINK communication is detected before this time expires, however, the interface immediately enters mode PRE_OPERATIONAL_1.
Flickering	Off	Mode: BASIC ETHERNET
(approx.		The interface is in mode BASIC_ETHERNET. The interface is operated in Ethernet mode.
10 Hz)		
		Managing node (MN) This mode can only be exited by resetting the controller.
		Controlled node (CN)
		If POWERLINK communication is detected during this mode, the interface enters mode PRE_OPERATIONAL_1.
Single flash (approx. 1 Hz)	Off	Mode: PRE_OPERATIONAL_1 The interface is in mode PRE_OPERATIONAL_1.
(approx. T Hz)		
		Managing node (MN)
		The MN is in "reduced cycle" mode. The CNs are configured in this mode.
		Cyclic communication is not yet taking place.
		Controlled node (CN)
		The CN can be configured by the MN in this mode. The CN waits until it receives an SoC frame and then switches to mode
	0	PRE_OPERATIONAL_2.
	On	Controlled node (CN) If the red LED lights up in this mode, this means that the MN has failed.
Double flash	Off	Mode: PRE OPERATIONAL 2
(approx. 1 Hz)	-	The interface is in mode PRE_OPERATIONAL_2.
		Managing node (MN) The MN starts cyclic communication (cyclic input data is not yet evaluated).
		The CNs are configured in this mode.
		Controlled node (CN) The CN can be configured by the MN in this mode. A command then switches the mode to READY TO OPERATE.
	On	Controlled node (CN)
	0	If the red LED lights up in this mode, this means that the MN has failed.
Triple flash	Off	Mode: READY_TO_OPERATE
(approx. 1 Hz)		The interface is in mode READY_TO_OPERATE.
		Managing node (MN)
		Cyclic and asynchronous communication. Received PDO data is ignored.
		Controlled node (CN) The configuration of the CN is completed. Normal cyclic and asynchronous communication. The transmitted PDO data corre-
		sponds to the PDO mapping. However, cyclic data is not yet evaluated.
	On	Controlled node (CN)
		If the red LED lights up in this mode, this means that the MN has failed.
On	Off	Mode: OPERATIONAL
Blinking	Off	The interface is in mode OPERATIONAL. PDO mapping is active and cyclic data is evaluated. Mode: STOPPED
(approx.		The interface is in mode STOPPED.
2.5 Hz)		
		Managing node (MN)
		This mode does not occur for the MN.
		Controlled node (CN)
		Output data is not being output, and no input data is being provided. This mode can only be reached and exited by a corre-
		sponding command from the MN.

Table: LED "S/E" - Interface state (interface in POWERLINK mode)

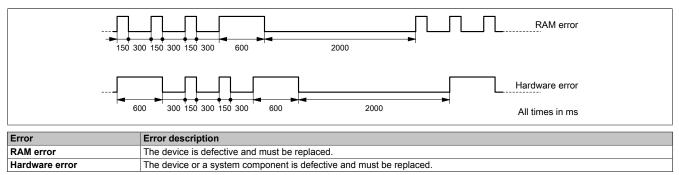
Blink times



7.1.2 System stop error codes

A system stop error can occur due to incorrect configuration or defective hardware.

The error code is indicated by LED "S/E" blinking red. The blinking signal of the error code consists of 4 switch-on phases with short (150 ms) or long (600 ms) duration. The error code is repeated every 2 seconds.



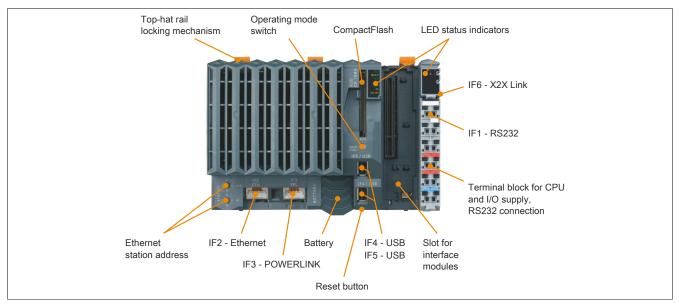
7.2 LED status indicators for the integrated power supply

For a description of the various operating modes, see section "Additional information - Diagnostic LEDs" in the X20 system user's manual.

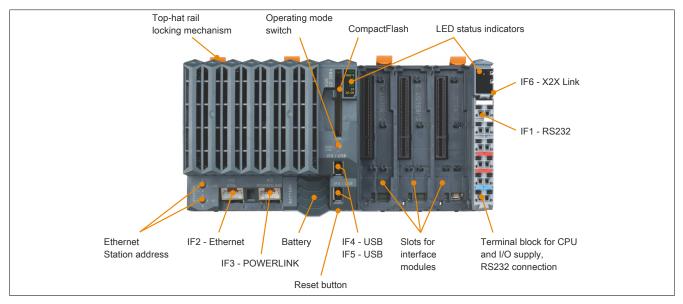
Figure	LED	Color	Status	Description
	r	Green	Off	No power to module
			Single flash	Mode RESET
			Blinking	Mode PREOPERATIONAL
			On	Mode RUN
	е	Red	Off	Module not supplied with power or everything OK
S Ĩ			Double flash	The LED indicates one of the following states:
				The X2X Link power supply of the power supply is overloaded.
				I/O power supply too low
				The input voltage for the X2X Link power supply is too low.
	e + r	Solid red / Sing	gle green flash	Invalid firmware
	S	Yellow	Off	No RS232 activity
			On	The LED lights up when data is being transmitted or received via the RS232
				interface.
	1	Red	Off	The X2X Link power supply is within the valid range.
			On	The X2X Link power supply of the power supply is overloaded.

8 Operating and connection elements

X20CP158x



X20CP358x



8.1 Operating mode switch

The operating mode switch is used to set the operating mode.

		RUN BOOT- DIAG
Switch position	Operating mode	Description
BOOT	BOOT	In this switch position, Boot AR is started and the runtime system can be installed via the online interface (B&R Automation Studio). User flash memory is erased only when the download begins.
RUN	RUN	Mode RUN
DIAG	DIAGNOSE	The CPU boots in diagnostic mode. Program sections in User RAM and User FlashPROM are not initialized. After diagnostic mode, the CPU always boots with a warm restart.

Table 8: X20 CPUs - Operating mode

Information:

A switch position other than those described here is not permitted!

8.2 Reset button



The reset button is located below the USB interfaces on the bottom of the housing. It can be pressed with any small pointed object (e.g. paper clip). Pressing the reset button triggers a hardware reset, which means:

- All application programs are stopped.
- All outputs are set to zero.

The PLC then starts up in service mode by default. The startup mode that follows after pressing the reset button can be set in Automation Studio.

8.3 Slot for application memory

Program memory is required to operate the CPUs. The application memory is provided in the form of a Compact-Flash card. It is not included with the CPUs, but must be ordered separately as an accessory.

Information:

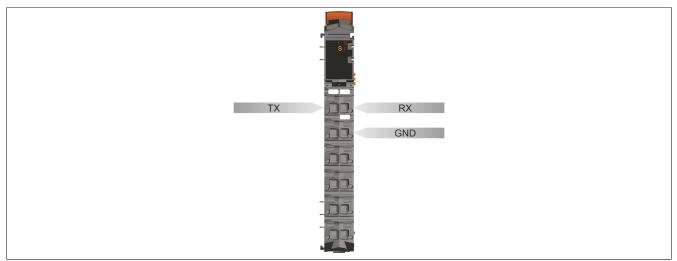
The CompactFlash card must not be removed during operation.

8.4 Project installation

Project installation is described in "Project management - Project installation" in Automation Help.

8.5 RS232 interface (IF1)

The non-electrically isolated RS232 interface is designed as an online interface for communication with the programming device.



8.6 Ethernet interface (IF2)



The IF2 is executed as the10 BASE-T / 100 BASE-TX / 1000 BASE-T gigabit Ethernet interface.

The INA2000 station number of the Ethernet interface is set using the two hex switches.

For information about wiring X20 modules with an Ethernet interface, see section "Mechanical and electrical configuration - Wiring guidelines for X20 modules with Ethernet cables" in the X20 user's manual.

Information:

The Ethernet interface is not suitable for POWERLINK.

When using the POWERLINK interface, the Ethernet interface is not permitted to be operated with an IP address from the POWERLINK address range. POWERLINK address range: 192.168.100.x

Pinout

Interface		Pir	iout
	Pin	Ethernet	
	1	D1+	Data 1+
	2	D1-	Data 1-
	3	D2+	Data 2+
	4	D3+	Data 3+
	5	D3-	Data 3-
	6	D2-	Data 2-
Shielded RJ45 port	7	D4+	Data 4+
	8	D4-	Data 4-

8.7 POWERLINK interface (IF3)

The CPUs are equipped with a POWERLINK V1/V2 interface.

POWERLINK V1

By default, the POWERLINK interface is operated as a managing node (MN). In the managing node, the node number is set to a fixed value of 0.

If the POWERLINK node is operated as a controlled node (CN), a node number from 1 to 253 can be set in the POWERLINK configuration in Automation Studio.

POWERLINK V2

Setting in Automation Studio

By default, the POWERLINK interface is operated as a managing node (MN). In the managing node, the node number is set to a fixed value of 240.

If the POWERLINK node is operated as a controlled node (CN), a node number from 1 to 239 can be set in the POWERLINK configuration in Automation Studio.

Setting with hex switches

The POWERLINK node number can also be set with the two onboard hex switches. These are normally used to set the INA2000 station number of the Ethernet interface. Switching takes place in the POWERLINK configuration in Automation Studio.

Node numbers from 0x01 to 0xF0 are permitted.

Switch position	Description
0x00	Reserved, switch position not permitted.
0x01 - 0xEF	Node number of the POWERLINK node. Operation as a controlled node (CN).
0xF0	Operation as a managing node (MN).
0xF1 - 0xFF	Reserved, switch position not permitted.

Ethernet mode

In this mode, the interface is operated as an Ethernet interface. The INA2000 station number is set using the B&R Automation Studio software.

Pinout



For information about wiring X20 modules with an Ethernet interface, see section "Mechanical and electrical configuration - Wiring guidelines for X20 modules with Ethernet cables" in the X20 user's manual.

Interface		Pir	nout
	Pin	Ethernet	
	1	RXD	Receive data
	2	RXD\	Receive data\
	3	TXD	Transmit data
	4	Termination	
	5	Termination	
	6	TXD\	Transmit data\
Shielded RJ45	7	Termination	
	8	Termination	

8.8 USB interfaces (IF4 and IF5)



IF4 and IF5 are non-galvanically isolated USB interfaces. The abbreviation USB stands for "Universal Serial Bus". Both USB interfaces support the USB 1.1 and 2.0 standards.

Information:

USB peripheral devices can be connected to the USB interfaces. Due to the variety of USB devices available on the market, B&R cannot guarantee their functionality. The functionality of USB devices available from B&R is ensured.

Information:

- The USB interfaces cannot be used as online communication interfaces.
- Only devices isolated from GND are permitted to be connected to the USB interfaces.
- Current-carrying capacity is listed in the technical data.

8.9 Slots for interface modules

The CPUs have one or three slots for interface modules.

Different bus or network systems can be flexibly integrated into the X20 system by selecting the appropriate interface module.

8.10 Battery

X20 CPUs are equipped with a lithium battery. The lithium battery is located in a separate compartment and protected by a cover.

Backup battery data

Order number	
4A0006.00-000	1 pcs.
0AC201.91	4 pcs.
Short description	Lithium battery, 3 V / 950 mAh, button cell
Storage temperature	-40 to 85°C
Storage time	Max. 3 years at 30°C
Relative humidity	0 to 95% (non-condensing)

The following areas are buffered:

- Remanent variables
- User RAM
- System RAM
- Real-time clock

Battery monitoring

The battery voltage is checked cyclically. The cyclic load test of the battery does not considerably shorten its service life; instead, it gives an early warning of weakened buffer capacity.

Status information "Battery OK" is available from system library function "BatteryInfo" and the CPU's I/O mapping.

Replacement interval for battery

The battery should be replaced every 4 years. The replacement intervals recommended by B&R reflect the batteries' average service life and operating conditions. They do not correspond to the maximum buffer duration!

Important information about the battery exchange

The product design allows the battery to be changed when the power to the PLC is switched off as well as when the power to the PLC is switched on. In some countries, safety regulations do not allow batteries to be changed while the module is switched on. To prevent data loss, the battery must be changed within 1 min when the power is switched off.

Warning!

The battery is only permitted to be replaced by a Renata CR2477N battery. The use of another battery may present a fire or explosion hazard.

The battery can explode if handled improperly. Do not recharge, disassemble or dispose of the battery in fire.

Procedure for replacing the battery

- 1. Perform electrostatic discharge at the top-hat rail or at the ground connection (do not reach into the power supply unit!)
- 2. Remove the cover for the lithium battery. Do this by sliding it down and away from the CPU.



Figure 1: X20 CPUs - Remove lithium battery cover

- 3. Push the empty battery out of the holder.
- 4. It is important to ensure that the new battery is not handled with moist or greasy fingers. Plastic tweezers can also be used. Do not touch the battery with pliers or metal tweezers → short circuit!
- 5. To insert the battery into the holder, place it with the "+" side up on the right part of the battery holder. Then press the battery into the battery holder.
- 6. Replace the cover.

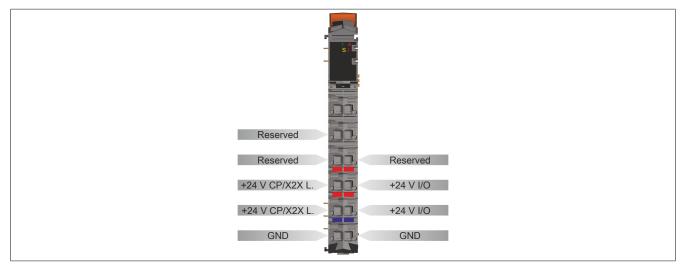
Information:

Lithium batteries are hazardous waste! Used batteries should be disposed of in accordance with applicable local regulations.

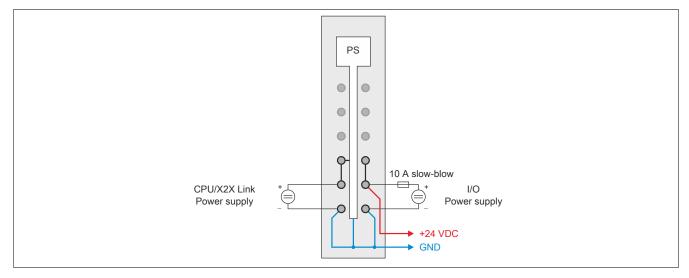
9 CPU power supply

A power supply unit is integrated in the X20 CPUs. It is equipped with a supply for the CPU, X2X Link and the internal I/O power supply. The bus power supply and internal I/O power supply are galvanically isolated from each other.

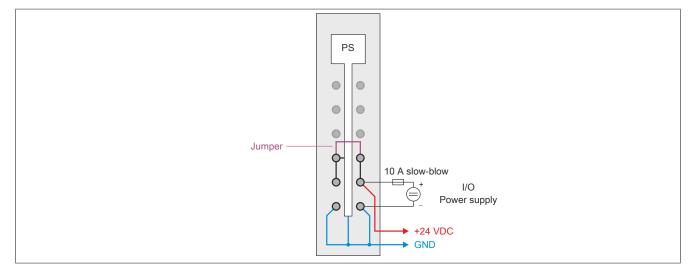
Integrated power supply unit - Pinout



Connection example with 2 separate power supplies

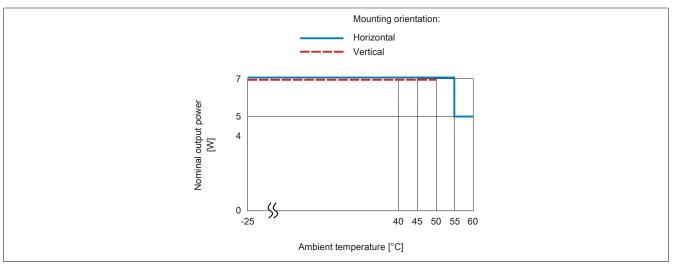


Connection example with power supply and jumper



10 Derating

There is no derating when operated below 55°C. Above 55°C, the nominal output power for the X2X Link power supply must be reduced to 5 W.



11 Overtemperature shutdown

To prevent damage, the CPU is switched off - reset state - at 110°C processor temperature or 95°C board temperature.

The following errors are entered in the logbook in the event of shutdown:

Error number	Short error text
9204	PLC restart triggered by the PLC CPU's temperature monitoring.
9210	Warning: Halt/Service after watchdog or manual reset.

12 Information about migrating from the X20CPx48x to the X20CPx58x

A hardware upgrade is required for some X20 IFxxxx interface modules. This can be installed from Automation Studio by selecting **Tools / Upgrades** from the menu.
 In addition, a certain hardware revision is required for some modules. The following table provides an overview:

Order number	Minimum upgrade version	Minimum hardware revision
X20IF1020	1.1.5.1	HO
X20IF1030	1.1.5.1	10
X20IF1041-1	-	-
X20IF1043-1	-	-
X20IF1051-1	-	-
X20IF1053-1	-	-
X20IF1061	-	E0
X20IF1061-1	-	-
X20IF1063	1.1.5.0	-
X20IF1063-1	-	-
X20IF1065	-	-
X20IF1072	1.0.5.1	-
X20IF1082	1.2.2.0	-
X20IF1082-2	1.2.1.0	-
X20IF1086-2	1.1.1.0	-
X20IF1091	1.0.5.1	-
X20IF10A1-1	-	-
X20IF10D1-1	-	-
X20IF10D3-1	-	-
X20IF10E1-1	-	-
X20IF10E3-1	-	-
X20IF10G3-1	-	-
X20IF10H3-1	-	-
X20IF2772	1.0.6.1	-
X20IF2792	1.0.5.1	-

Table 9: X20 CPUs - Minimum upgrade version and minimum hardware revision for X20 IFxxxx interface modules

- X20CPx58x CPUs are supported starting with B&R Automation Studio V3.0.90.20.
- If an X20CPx48x should be replaced by an X20CPx58x in an existing Automation Studio configuration, the X20CPx58x may not be listed as one of the available options even though the upgrade for the CPU has already been installed. In such a case, an upgrade of the X20CPx48x is required.
- Starting with Automation Runtime 4.x, USB devices are integrated in Automation Runtime dynamically so that they no longer must be configured in Automation Studio. In order to use a USB device, its internal device name must be obtained at runtime. For an example, see Automation Help for the library "AsUSB / Examples".

13 General data points

This CPU is equipped with general data points. These are not CPU-specific; instead, they contain general information such as system time and heat sink temperature.

General data points are described in section "Additional information - General data points" in the X20 system user's manual.