

X20(c)HB8884

1 General information

1.1 Other applicable documents

For additional and supplementary information, see the following documents.

Other applicable documents

Document name	Title
MAX20	X20 System user's manual
MAEMV	Installation / EMC guide

Additional documentation

Document name	Title
MAREDSYS	Redundancy for control systems

1.2 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



1.2.1 Starting temperature

The starting temperature describes the minimum permissible ambient temperature in a voltage-free state at the time the coated module is switched on. This is permitted to be as low as -40°C. During operation, the conditions as specified in the technical data continue to apply.

Information:

It is important to absolutely ensure that there is no forced cooling by air currents in the closed control cabinet, e.g. due to the use of a fan or ventilation slots.

1.3 Order data

Order number	Short description	Figure
X20 redundancy systems		
X20HB8884	X20 Compact link selector, 2x RJ45, order bus base, power supply module and terminal block separately!	
X20cHB8884	X20 Compact link selector, coated, 2x RJ45, order bus base, power supply module and terminal block separately!	
Required accessories		
System modules for X20 redundancy systems		
X20HB2885	X20 hub expansion module, integrated active 2-port hub, 2x RJ45	
X20cHB2885	X20 hub expansion module, coated, integrated active 2-port hub, 2x RJ45	
System modules for expandable bus controllers		
X20BB81	X20 bus base, for X20 base module (BC, HB, etc.) and X20 power supply module, with one expansion slot for X20 add-on module (IF, HB, etc.), X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB82	X20 bus base, for X20 base module (BC, HB, etc.) and X20 power supply module, with 2 expansion slots for 2 X20 add-on modules (IF, HB, etc.), X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20cBB81	X20 bus base, coated, for X20 base module (BC, HB, etc.) and X20 power supply module, with one expansion slot for X20 add-on module (IF, HB, etc.), X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20cBB82	X20 bus base, coated, for X20 base module (BC, HB, etc.) and X20 power supply module, with 2 expansion slots for 2 X20 add-on modules (IF, HB, etc.), X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
System modules for the X20 hub system		
X20HB2880	X20 hub expansion module, integrated 2-port hub, 2x RJ45	
X20PS8002	X20 power supply module, for standalone hub and compact link selector	
X20cHB2880	X20 hub expansion module, coated, integrated 2-port hub, 2x RJ45	
X20cPS8002	X20 power supply module, coated, for standalone hub and compact link selector	
Terminal blocks		
X20TB12	X20 terminal block, 12-pin, 24 VDC keyed	

Table 1: X20HB8884, X20cHB8884 - Order data

1.4 Module description

With the compact link selector module, it is possible to connect any POWERLINK device to a redundant POWERLINK network.

Functions:

- [POWERLINK](#)
- [POWERLINK redundancy system](#)

POWERLINK

POWERLINK is a standard protocol for Fast Ethernet equipped with hard real-time characteristics.

Redundancy system

In cable redundancy systems, data is fed into 2 cable lines simultaneously via a corresponding mechanism.

In ring redundancy systems, multiple nodes are connected within a ring and data packets can be transmitted in both directions if needed.

2 Technical description

2.1 Technical data

Order number	X20HB8884	X20cHB8884
Short description		
POWERLINK compact link selector	Connects POWERLINK devices to a redundant POWERLINK network	
General information		
Status indicators	Module status, bus function	
Diagnostics		
Module status	Yes, using LED status indicator	
Bus function	Yes, using LED status indicator	
Power consumption	2 W	
Certifications		
CE	Yes	
UKCA	Yes	
ATEX	Zone 2, II 3G Ex nA nC IIA T5 Gc IP20, Ta (see X20 user's manual) FTZÜ 09 ATEX 0083X	
UL	cULus E115267 Industrial control equipment	
HazLoc	cCSAus 244665 Process control equipment for hazardous locations Class I, Division 2, Groups ABCD, T5	
DNV	Temperature: B (0 to 55°C) Humidity: B (up to 100%) Vibration: B (4 g) EMC: B (bridge and open deck)	
LR	ENV1	
KR	Yes	
ABS	Yes	
BV	EC33B Temperature: 5 - 55°C Vibration: 4 g EMC: Bridge and open deck	
EAC	Yes	
KC	Yes	-
Interfaces		
Type	POWERLINK compact link selector	
Variant	2x shielded RJ45	
Line length	Max. 100 m between 2 stations (segment length)	
Transfer rate	100 Mbit/s	
Transfer		
Physical layer	100BASE-TX	
Half-duplex	Yes	
Full-duplex	No	
Autonegotiation	Yes	
Auto-MDI/MDIX	Yes	
Hub propagation delay	0.96 to 1 µs	
Electrical properties		
Electrical isolation	Power supply isolated from POWERLINK (IF1 and IF2)	
Operating conditions		
Mounting orientation		
Horizontal	Yes	
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	
Degree of protection per EN 60529	IP20	
Ambient conditions		
Temperature		
Operation		
Horizontal mounting orientation	-25 to 60°C	
Vertical mounting orientation	-25 to 50°C	
Derating	-	
Starting temperature	-	Yes, -40°C
Storage	-40 to 85°C	
Transport	-40 to 85°C	
Relative humidity		
Operation	5 to 95%, non-condensing	Up to 100%, condensing
Storage	5 to 95%, non-condensing	
Transport	5 to 95%, non-condensing	

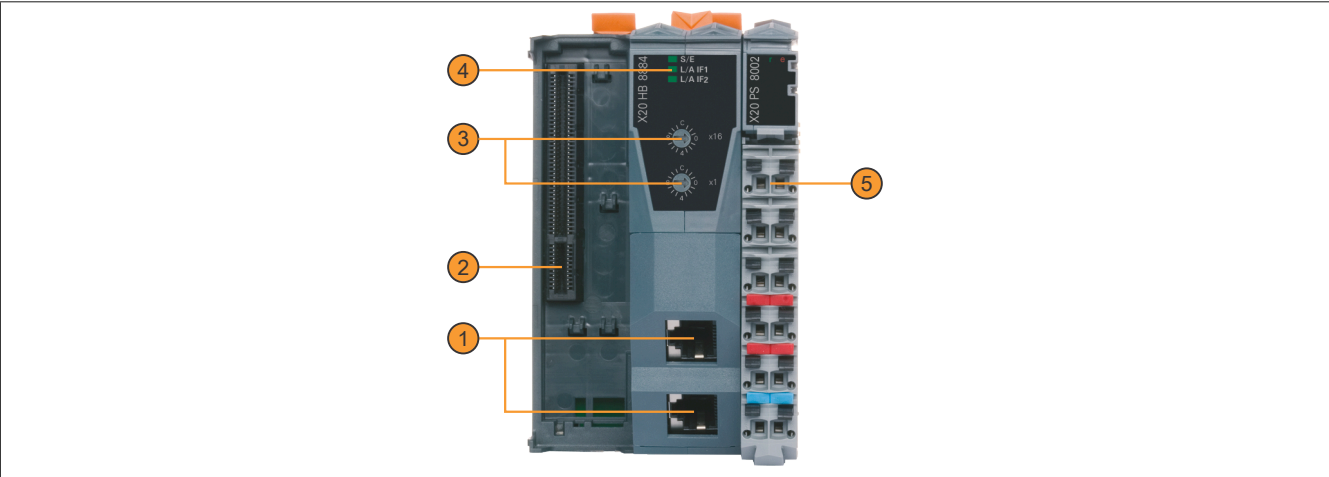
Table 2: X20HB8884, X20cHB8884 - Technical data

Order number	X20HB8884	X20cHB8884
Mechanical properties		
Note	Order 1x terminal block X20TB12 separately. Order 1x power supply module X20PS8002 separately. Order 1x hub expansion module X20HB2880 or 2x hub expansion module X20HB2885. Order 1x bus base X20B-B81 or X20BB82 separately.	Order 1x terminal block X20TB12 separately. Order 1x power supply module X20cPS8002 separately. Order 1x hub expansion module X20cHB2880 or 2x hub expansion module X20cHB2885. Order 1x bus base X20cB-B81 or X20cBB82 separately
Pitch ¹⁾		
X20BB81	62.5 ^{+0.2} mm	
X20BB82	87.5 ^{+0.2} mm	

Table 2: X20HB8884, X20cHB8884 - Technical data

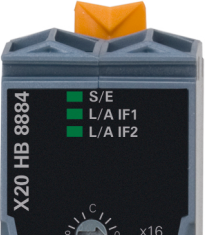
1) Pitch is based on the width of bus base X20BB81 or X20BB82. 1 X20HB2880 hub expansion module or 2 X20HB2885 hub expansion modules and 1 X20PS8002 power supply module are also always required for the compact link selector.

2.2 Operating and connection elements



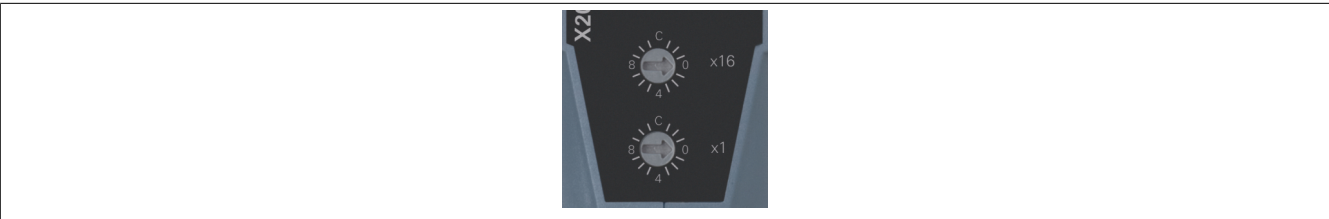
1	POWERLINK connection with 2x RJ45 for simple wiring	2	Slot for hub expansion module
3	POWERLINK node number	4	LED status indicators
5	Terminal block for compact link selector power supply	6	-

2.2.1 LED status indicators

Figure	LED	Color	Status	Description
	S/E ¹⁾	Green	On	An active POWERLINK network was detected on both networks.
		Red	Single flash	Network 2 is active. Disturbances detected on network 1 or there is no POWER-LINK network active. Note: Several red blinking signals are displayed immediately after the device is switched on. This is not an error, however.
			Double flash	Network 1 is active. Disturbances detected on network 2 or there is no POWER-LINK network active. Several red blinking signals are displayed immediately after the device is switched on. This is not an error, however.
		On	Failure of both networks.	
	L/A IFx	Green	Blinking	A link to the peer station has been established. The LED blinks when Ethernet activity is taking place on the bus.
		On	A link to the remote station has been established.	

1) The Status/Error LED is a green/red dual LED.

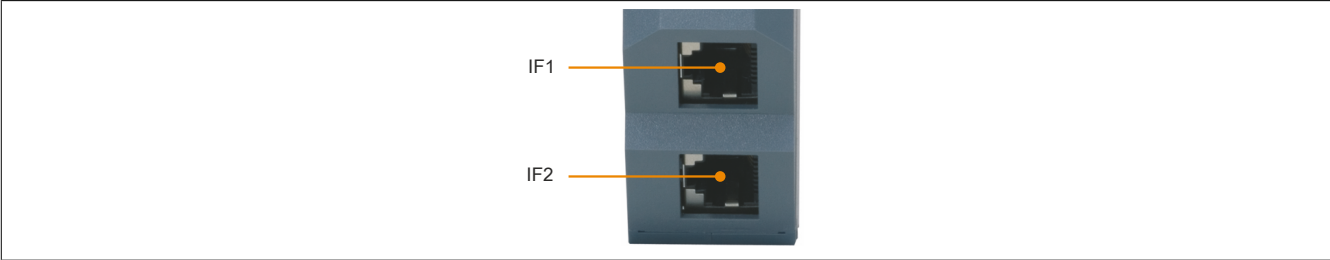
2.2.2 POWERLINK node numbers

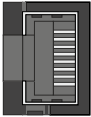


The number switches have no function during operation. They are only used for product testing.

2.2.3 Ethernet interface

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

3 Function description

3.1 POWERLINK

POWERLINK is an Ethernet-based, real-time capable fieldbus. POWERLINK extends the IEEE 802.3 Ethernet standard by a deterministic access method and also defines a CANopen-compatible fieldbus interface. POWERLINK distinguishes between process and service data in the same way as CANopen. Process data (PDO) is exchanged cyclically in the cyclic phase, while service data (SDO) is transferred acyclically. Service data objects are transmitted in the acyclic phases of POWERLINK using a connection-oriented protocol. The cyclic transfer of data in PDOs is enabled by "mapping".

For additional information, see [POWERLINK bus controller user's manual](#) and www.br-automation.com/en/technologies/powerlink.

3.2 POWERLINK redundancy system

It is often indispensable to have redundant network cabling, especially in systems that handle technical processes. The potential for danger, especially to the lines that run through the system, is disproportionately high in relation to the need to keep communication active in all operating situations. This risk is effectively reduced with double cabling that is routed separately.

The POWERLINK cable redundancy system is based on the principle of doubling transfer paths and their constant and simultaneous monitoring. This means that data is fed into 2 cable lines simultaneously via a corresponding mechanism. The same mechanisms are used to receive these telegrams again from the redundant network. In contrast to ring redundancy, cable redundancy eliminates the sometimes problematic cable return routing. The design of arbitrary tree structures is therefore possible.

Information:

Details about the structure of a redundancy system can be found in the "Redundancy for control systems" user's manual. The user's manual is available in the Downloads section of the B&R website www.br-automation.com.

3.2.1 Link selector

POWERLINK can be used to implement systems with redundant cable routing. Data is always transferred via the best quality network line using the link selector function built into the device.