X20BC0063

Data sheet
2.30 (August 2025)

1247782280417-2.30

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

1.2 Order data

Order number	Short description	Figure
	Bus controllers	
X20BC0063	X20 bus controller, 1 PROFIBUS DP interface, 9-pin DSUB connector, order bus base, power supply module and terminal block separately!	
	Required accessories	
	System modules for bus controllers	
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 power supply module, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20PS9400	X20 power supply module, for bus controller and internal I/O power supply X2X Link power supply	
X20PS9402	X20 power supply module, for bus controller and internal I/O power supply, X2X Link supply, supply not galvanically isolated	
	Terminal blocks	
X20TB12	X20 terminal block, 12-pin, 24 VDC keyed	
	Optional accessories	
	Infrastructure components	
0G1000.00-090	Bus connector, RS485, for PROFIBUS networks	

Table 1: X20BC0063 - Order data

1.3 Module description

The bus controller makes it possible to connect X2X Link I/O nodes to PROFIBUS DP. It supports PROFIBUS DP with all of its options and other additional properties. The configuration of the modular system is optimally supported by PROFIBUS DP.

X20 or other modules based on X2X Link can be connected to the bus controller.

- Comprehensive device diagnostics, module diagnostics and channel diagnostics in accordance with the PROFIBUS DP standard
- Communication with X2X Link I/O nodes still works even if some I/O nodes are missing or de-energized.

Functions:

- PROFIBUS DP

PROFIBUS DP

PROFIBUS DP is designed for efficient data exchange at the field level. Data exchange with the decentralized devices based on X2X Link is primarily cyclic.

2 Technical description

2.1 Technical data

Order number	X20BC0063
Short description	
Bus controller	PROFIBUS DP V0 slave
General information	
B&R ID code	0x1F1C
Status indicators	Module status, bus function, data transfer
Diagnostics	
Module status	Yes, using LED status indicator and software
Bus function	Yes, using LED status indicator
Data transfer	Yes, using LED status indicator
Power consumption	
Bus	2.3 W
Additional power dissipation caused by actuators (resistive) [W]	-
Certifications	
CE	Yes
UKCA	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 244665 Process control equipment for hazardous locations Class I, Division 2, Groups ABCD, T5
KC	Yes
Interfaces	
Fieldbus	PROFIBUS DP V0 slave
Variant	9-pin female DSUB connector
Max. distance	1200 m
Transfer rate	Max. 12 Mbit/s
Default transfer rate	Automatic transfer rate detection
Min. cycle time [1]	
Fieldbus	No limitation
X2X Link	400 µs
Synchronization between bus systems possible	No
Electrical properties	
Electrical isolation	PROFIBUS isolated from I/O PROFIBUS not isolated from bus
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	-
Storage	-40 to 85°C
Transport	-40 to 85°C

Table 2: X20BC0063 - Technical data

Order number	X20BC0063
Relative humidity	
Operation	5 to 95%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Mechanical properties	
Note	Order 1x terminal block X20TB12 separately. Order 1x power supply module X20PS9400 or X20PS9402 separately. Order 1x bus base X20BB80 separately.
Pitch [2]	37.5$^{+0.2}$ mm

Table 2: X20BC0063 - Technical data

1) The minimum cycle time specifies how far the bus cycle can be reduced without communication errors occurring.
2) Pitch is based on the width of bus base X20BB80. In addition, power supply module X20PS9400 or X20PS9402 is always required for the bus controller.

2.2 Operating and connection elements
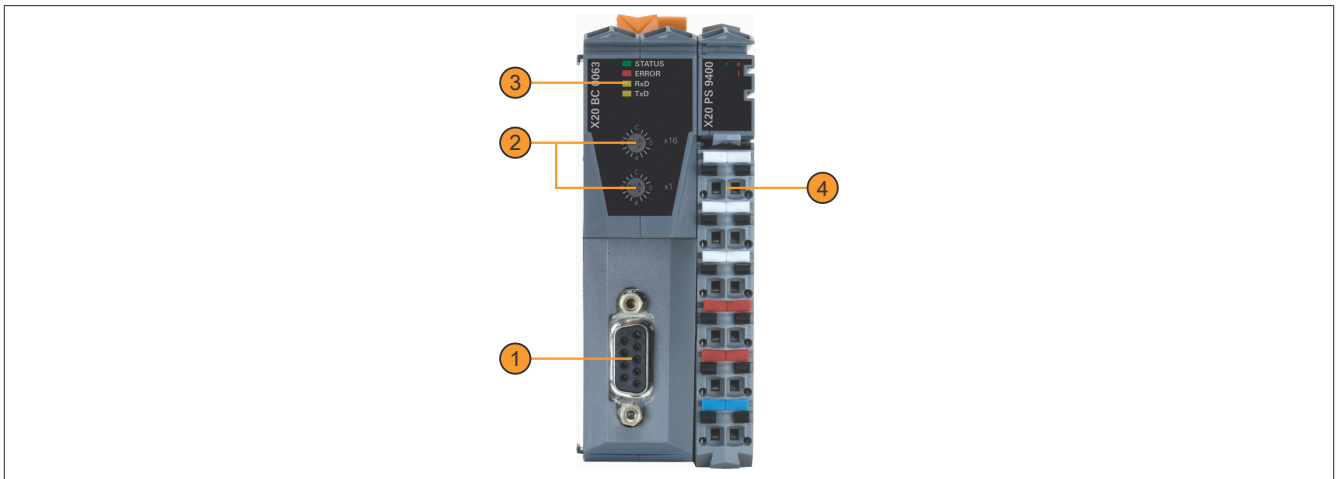
1	PROFIBUS DP connection	2	Node number switches
3	LED status indicators	4	Terminal block for bus controller and I/O supply

2.2.1 LED status indicators

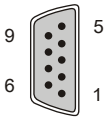| Figure	LED	Description			
	STATUS and ERROR	Status indicator for PROFIBUS DP bus controller.			
		STATUS (green)	**ERROR (red)**	**Description**	
		Off	Off	HARDWARE FAULT / POWER FAIL	
		On	On	BUS OFF	
		On	Blinking	WAIT FOR CONFIG	
		Blinking	Off	DATA EXCHANGE - DIAGNOSTICS	
		On	Off	DATA EXCHANGE - NO ERROR	
		Blinking	Blinking	CONFIG ERROR	
		Off	Blinking	SERVICE MODE - BOOT	
		Single flash	Single flash	HARDWARE FAULT	
		For a more detailed description see "State diagnostics via the Status/Error LEDs" on page 6.			
	RxD	This yellow LED lights up when the bus controller is receiving data from the PROFIBUS DP fieldbus.			
	TxD	This yellow LED lights up when the bus controller is sending data via the PROFIBUS DP fieldbus.			

2.2.1.1 State diagnostics via the Status/Error LEDs

Diagnostics about the state of the PROFIBUS DP bus controller is performed with the LEDs "STATUS" and "ERROR".

STATUS (green)	ERROR (red)	Explanation	Workaround
Off	Off	HARDWARE FAULT / POWER FAILURE	• Check the wiring of the supply voltage.
On	On	BUS OFF • Baud rate not detected • No connection to the DP master • DP master not active	• Check the PROFIBUS network. • Check the PROFIBUS master.
On	Blinking	WAIT FOR CONFIG • The baud rate has been detected, but the PROFIBUS master has not yet configured the bus controller.	• Check the node number switch • Check the slave address in the master configuration
Blinking	Off	DATA EXCHANGE - DIAGNOSTICS • The bus controller is still initializing the I/O modules. • The I/O modules configured by the master cannot be found • One or more I/O modules have an error message (short circuit, etc.).	• Initialization can take a few seconds depending on the number of I/O modules connected. • Check the wiring and power supply for the I/O modules • Read the diagnostic messages in the respective PROFIBUS master's engineering tool.
On	Off	DATA EXCHANGE • Cyclic data exchange with the PROFIBUS DP master	
Blinking	Blinking	CONFIG ERROR • One or more I/O modules found do not match with the configuration of the PROFIBUS DP master • The configuration received from the PROFIBUS master is invalid.	• Check the wiring of the X2X Link and the order of I/O modules • Check configuration of the PROFIBUS master • Read the diagnostic messages in the respective PROFIBUS master's engineering tool. • Check the configuration being used; it is possible that the number of configured I/O modules is too high.
Off	Blinking	SERVICE MODE - BOOT • The bus controller's node number has been set to 255 (0xFF) - after 2 s the bus controller starts in service mode	• Set a valid node number
Single flash	Single flash	HARDWARE FAULT	

2.2.2 PROFIBUS DP interface

A shielded line must be used for the interface.

Interface	Pinout		
	Pin	**RS485**	
	1	Reserved	
	2	Reserved	
	3	RxD/TxD-P	Data[1]
9-pin female DSUB connector	4	CNTR-P	Transmit enable
	5	DGND	Power supply
	6	VP	Power supply
	7	Reserved	
	8	RxD/TxD-N	Data\[2]
	9	CNTR-N	Transmit enable\
	CNTR ... Direction switch for external repeaters		

1) Cable color: Red
2) Cable color: Green

2.2.3 PROFIBUS DP node number switches

The PROFIBUS DP node number is configured using both number switches of the bus controller.
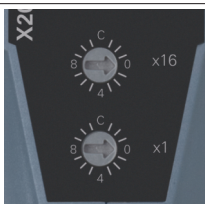
Switch position	Node number
0x00	Not allowed
0x01 - 0x7D	1 to 125
0x7E - 0xFF	Not allowed

3 Function description

3.1 PROFIBUS DP

PROFIBUS DP is designed for efficient data exchange at the field level. Data exchange with the decentralized devices based on X2X Link is primarily cyclic. The communication functions required for this are defined by the DP basic functions. Beyond these basic functions, DP also offers acyclic communication services.

PROFIBUS DP is based on the physics of the RS485 interface. Data transfer is controlled using a hybrid bus access procedure: Active stations receive communication rights via a token passing procedure and can then access all stations on the network according to the master-slave principle. The maximum time of circulation for a token can be configured, which results in a defined cycle time.

Access represents various services for the user for both cyclic and for acyclic data transfer.

In addition to the device, module and channel diagnostics provided in the PROFIBUS standard, there are other possibilities such as switching to the slot diagnostics option in S7 format.

For additional information, see the PROFIBUS bus controller user's manual.

4 Commissioning

4.1 Additional documentation and import files (EDS)

Additional documentation about bus controller functions as well as the necessary import files for the master engineering tool are available in the Downloads section of the B&R website (www.br-automation.com).

> **Information:**
>
> **With multifunction modules, the bus controller supports only the default function model in the event of automatic configuration by the bus controller (see the respective module description).**
>
> **Automation Studio V4.3 or later can be used to easily create configuration files (e.g. DCF files). All other function models are also supported by transferring configuration data to the bus controller (e.g. via the master environment with an SDO download).**
>
> **Automation Studio can be downloaded at no cost from the B&R website (www.br-automation.com). The evaluation license is permitted to be used to create complete configurations for fieldbus bus controllers at no cost.**

4.2 Automatic transfer rate detection

After startup or after a communication timeout, the bus controller enters state "Baud search". This means that the bus controller behaves passively with respect to the bus.

The bus controller always starts the search for the set transfer rate with the highest transfer rate. If no telegram has been received completely and without errors during the monitoring time, the search is continued with the next lower transfer rate.

Transfer rate
12 Mbit/s
6 Mbit/s
3 Mbit/s
1.5 Mbit/s
500 kbit/s
187.5 kbit/s
93.75 kbit/s
45.45 kbit/s
19.2 kbit/s
9.6 kbit/s