X20BC0088

Data sheet
2.45 (August 2025)

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	
X20BC0088	X20 bus controller, 1 EtherNet/IP interface, integrated switch, web interface, 2x RJ45, 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	

Table 1: X20BC0088 - Order data

1.3 Module description

This bus controller makes it possible to connect X2X Link I/O nodes to EtherNet/IP. The bus controller can be operated via interface module X20IF10D1-1 or by 3rd-party systems with EtherNet/IP scanner functionality.

Bus controller properties:

- Auto-configuration of I/O modules
- Manual configuration of I/O modules with Automation Studio version 4.3 or later
- Can be configured by the scanner (master) using configuration assembly
- BOOTP and DHCP are supported.
- Device Level Ring (DLR) is not supported.
- Minimum fieldbus cycle time (also requested packet interval or RPI): 1 ms
- Maximum I/O data size In/Out: 511 bytes / 511 bytes

Functions:

- EtherNet/IP

EtherNet/IP

EtherNet/IP is an Ethernet-based fieldbus. The fieldbus is mainly used in automation technology.

2 Technical description

2.1 Technical data

Order number	X20BC0088
Short description	
Bus controller	EtherNet/IP adapter (slave)
General information	
B&R ID code	0x26D8
Status indicators	Module status, network status, bus function
Diagnostics	
Module status	Yes, using LED status indicator and software
Bus function	Yes, using LED status indicator and software
Network status	Yes, using LED status indicator and software
Power consumption	
Bus	2 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	EtherNet/IP adapter (slave)
Variant	2x shielded RJ45 (switch)
Line length	Max. 100 m between 2 stations (segment length)
Transfer rate	10/100 Mbit/s
Transfer	
Physical layer	10BASE-T/100BASE-TX
Half-duplex	Yes
Full-duplex	Yes
Autonegotiation	Yes
Auto-MDI/MDIX	Yes
Min. cycle time [1]	
Fieldbus	1 ms
X2X Link	500 µs
Synchronization between bus systems possible	No
Electrical properties	
Electrical isolation	EtherNet/IP isolated from bus and I/O
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: X20BC0088 - Technical data

Order number	X20BC0088
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: X20BC0088 - 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.
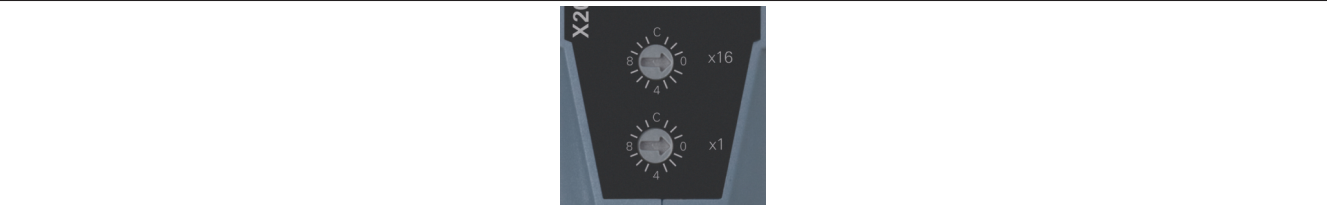
2.2 Operating and connection elements
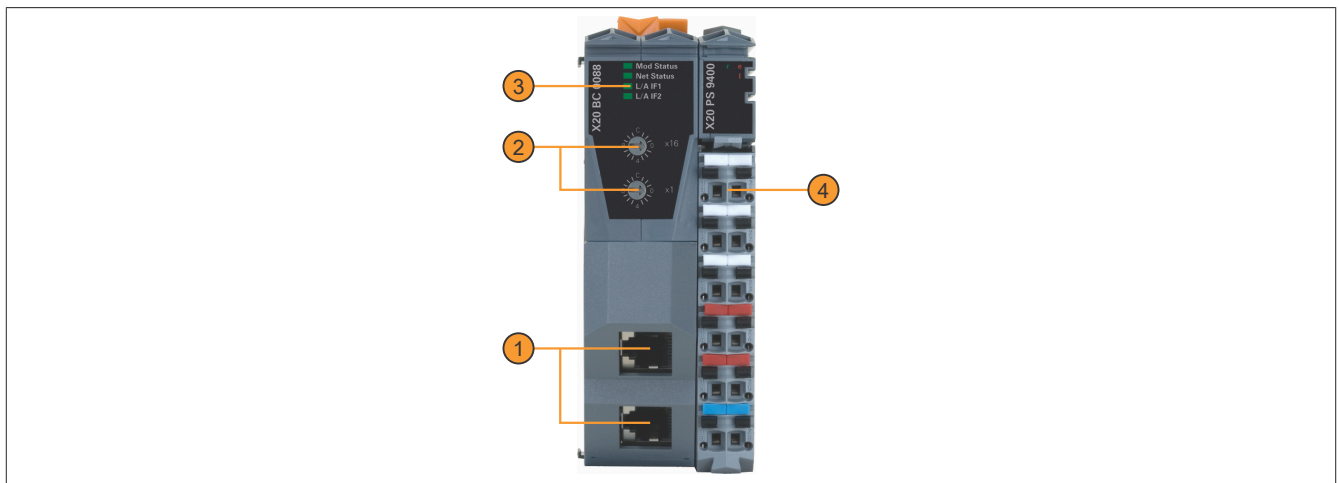
1	EtherNet/IP connection with 2x RJ45 for simple wiring	2	Network address switches
3	LED status indicators	4	Terminal block for bus controller and I/O supply

2.2.1 LED status indicators

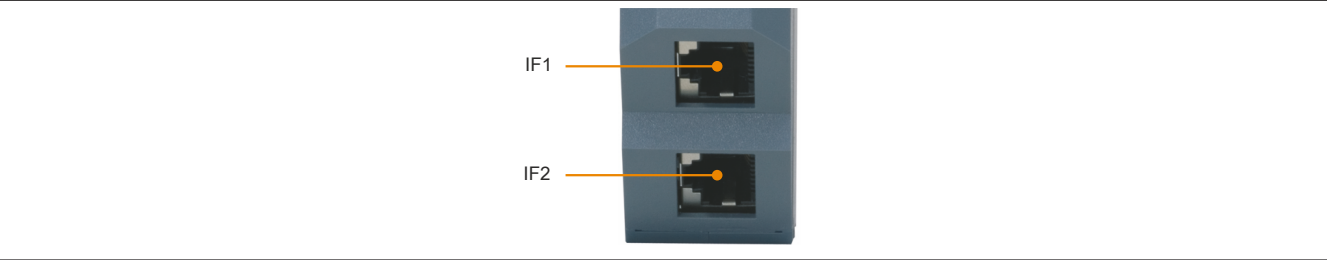| Figure	LED	Color	Status	Description
	Mod status[1]	Green	On	Indicates that there is at least one client connection
			Blinking	Bus controller not yet configured.
			Flickering	HTTP file upload (firmware or configuration file)
		Red	On	Major unrecoverable fault.
			Blinking	Major recoverable fault.
		Green/Red	Blinking	Initialization/Self-test
	Net status[1]	Green	On	Indicates at least one established active scanner (master) connection
			Blinking	Indicates no established active scanner (master) connection
			Off	Indicates no IP address has been assigned
		Rot	On	Indicates an IP address has been used more than once
			Blinking	Indicates a timeout on at least one connection
		Green/Red	Blinking	Initialization/Self-test
	L/A IFx	Green	Blinking	Ethernet activity taking place on the RJ45 interface (IF1, IF2) indicated by the respective LED
			On	Indicates an established connection (link), but no communication is taking place
			Off	Indicates that no physical Ethernet connection exists

1) The "Mod status" and "Net status" LEDs are green/red dual LEDs.
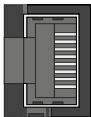
2.2.2 EtherNet/IP address switching positions

Switch position	Description
0x00	The IP address stored in flash memory is used. The adapter is started via DHCP if attribute 3 (configuration control) of the TCP/IP interface object was set to DHCP.
0x01 to 0x7F	The last position of the IP address saved in flash memory is changed to the address switch value. The IP address saved in flash memory is not changed. All other adapter parameters are read from the flash memory and are applied unchanged.
0x80 to 0xEF	In this range, the bus controller operates in DHCP mode. The DNS server is informed of the current hostname. A hostname is generated according to how the network address switches are set. Example: The generated hostname is composed of three elements: "br" + "mb" + Address switch number (three decimal places). This means, for example, that the following hostname is generated with address switch number 0xD7 (dec. 215): "breip215".
0xF0 to 0xFD	Reserved (same function as position 0xFF).
0xFE	Initializes all bus controller parameters with default values during booting. No values are read from flash memory. The communication parameters correspond to the values assigned with switch setting 0xFF.
0xFF	Initializes all communication parameters with default values. All other bus controller parameters are read from flash memory. Default parameters: • IP address: 192.168.100.1 • Subnet mask: 255.255.255.0 • Gateway: 192.168.100.254 • Primary NetBIOS name: "br" + MAC address • Secondary NetBIOS name: "br" + "eip" + address switch number (decimal) • X2X Link configuration: 1 ms cycle time • X2X Link cable length: 0 m

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

3 Function description

3.1 EtherNet/IP

EtherNet/IP (Ethernet industrial protocol) is an open Common Industrial Protocol (CIP) based fieldbus standard developed by Rockwell Automation and the Open DeviceNet Vendor Association (ODVA).

EtherNet/IP supports the provider-consumer principle for data exchange between individual network nodes.

For additional information, see the [Ethernet/IP bus controller user's manual](#).

4 Commissioning

> **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. EDS files, binary files). All other function models are also supported by transferring configuration data to the bus controller (e.g. using the scanner via a "configuration assembly").**
>
> **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 Node numbers

4.2.1 Setting the IP address (default value)

Changes to the network address switches only become active after a restart (power cycle). If the bus controller is restarted with the address switch number 0xFF, it is initialized with IP address 192.168.100.1. This address is also the factory default setting.
This IP address can be used to establish a connection to the bus controller. The internationally unique MAC address is listed on the housing side of the bus controller. The combination of "br" and the MAC address results in a unique name (primary NetBIOS name) that also makes it possible to access the bus controller.

Example of the primary NetBIOS name:

MAC address:	00-60-65-00-49-02
Resulting NetBIOS name:	br006065004902

This means that, without additional parameter modifications, either the default IP address (192.168.100.1) or NetBIOS name "br+MAC" can be used to communicate with the bus controller.

Since NetBIOS is being used, the bus controller can only be accessed via this name if there are no intermediary routers or gateways in the way.

4.2.2 Automatic IP assignment by a DHCP server

With an address switch position between 0x80 and 0xEF, the bus controller attempts to request an IP address from the DHCP server. The assigned IP address can be queried with command "ping" together with the hostname. The bus controller registers this hostname on the DHCP server, which should forward it to a DNS server.

Example: The hostname (DNS name) is made up of three elements:
"br" + "mb" + Address switch value (three decimal places).
This means, for example, that the following hostname is generated with address switch value 0xD7 (dec. 215): "breip215".

If DNS service is not available on the network, the bus controller's two NetBIOS names can also be used for access. The secondary NetBIOS name is identical to the hostname; for address switch value 0x00, it is identical to the primary NetBIOS name. The bus controller can only be reached via its NetBIOS name if no other routers or gateways are in the way.

4.2.3 Changing the IP address with the network address switches

The address switches can be used to change the last byte in the IP address configured on the bus controller. The IP address saved in flash memory is not changed. If the address switches are set to 0x00, the bus controller applies the IP address last saved to flash memory. Switch positions between 0x01 and 0x7F cause the last position of the IP address (the lowest byte) to be overwritten by the value of the address switch. This provides the user a quick and easy way to address a large number of bus controllers. In short, an IP address between 192.168.100.1 and 192.168.100.127 can be selected for a bus controller using the address switches without requiring any additional software configuration.

4.2.4 Saving an IP address to flash memory

The IP parameters in flash memory can be changed via the EtherNet/IP protocol or Telnet interface (see the EtherNet/IP user's manual). If the IP address should be set via the TCP/IP object (class 0xF5), then the new address is only stored to flash memory if instance attribute 3 (configuration control) of the TCP/IP object is set to 0 (see the CIP specification).