X20PS9402

Data sheet
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Translation of the original documentation

Publishing information

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Disclaimer

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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
	System modules for bus controllers	
X20PS9402	X20 power supply module, for bus controller and internal I/O power supply, X2X Link supply, supply not galvanically isolated	
	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	
	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	
	Terminal blocks	
X20TB12	X20 terminal block, 12-pin, 24 VDC keyed	

Table 1: X20PS9402 - Order data

1.3 Module description

The supply module is used together with an X20 bus controller. It is equipped with a feed for the bus controller, the X2X Link and the internal I/O supply.

The module is designed to supply power for smaller X20 systems. Potential groups are able to be formed. An expansion or redundancy of the X2X Link with the X20PS3300 or X20PS3310 supply module is not possible. Expansion of the X20 system with a bus transmitter is not permitted either.

- Supply for the bus controller, X2X Link and internal I/O supply
- Low-cost supply module for small X20 system
- Feed and bus controller / X2X Link supply not electrically isolated
- Expansion or redundancy of bus controller / X2X Link supply not possible by operating multiple supply modules simultaneously

Functions:

- Monitoring the operating limits

Monitoring operating limits

The voltage of the I/O power supply is monitored for voltage overshoot or undershoot.

2 Technical description

2.1 Technical data

Order number	X20PS9402
Short description	
Power supply module	24 VDC supply module for bus controller, X2X Link power supply and I/O
General information	
B&R ID code	0xA389
Status indicators	Operating state, module status
Diagnostics	
Module run/error	Yes, using LED status indicator and software
Overload	Yes, using LED status indicator and software
Power consumption for X2X Link power supply [1)]	1.64 W
Power consumption [1)]	
Internal I/O	0.6 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
DNV	Temperature: **B** (0 to 55°C) Humidity: **B** (up to 100%) Vibration: **B** (4 g) EMC: **B** (bridge and open deck)
CCS	Yes
LR	ENV1
KR	Yes
ABS	Yes
BV	**EC33B** Temperature: 5 - 55°C Vibration: 4 g EMC: Bridge and open deck
KC	Yes
Bus controller / X2X Link power supply input	
Input voltage	24 VDC -15% / +20%
Input current	Max. 0.7 A
Fuse	Integrated, cannot be replaced
Reverse polarity protection	Yes
Bus controller / X2X Link power supply output	
Nominal output power	
Horizontal mounting orientation	7 W at 45°C and 5 W at 55°C
Vertical mounting orientation	7 W at 40°C and 5 W at 50°C
Parallel connection	No
Redundant operation	No
Overload characteristics	Short-circuit proof, temporary overload
Input I/O power supply	
Input voltage	24 VDC -15% / +20%
Fuse	Required line fuse: Max. 10 A, slow-blow
Reverse polarity protection	No
Output I/O power supply	
Nominal output voltage	24 VDC
Behavior on short circuit	Required line fuse
Permissible contact load	10 A
Electrical properties	
Electrical isolation	BC/X2X Link supply not isolated from BC/X2X Link power supply, and I/O supply not isolated from I/O power supply

Table 2: X20PS9402 - Technical data

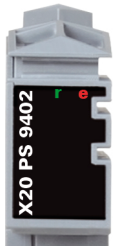
Order number	X20PS9402
Operating conditions	
Mounting orientation	
Horizontal	Yes
Vertical	Yes
Installation elevation above sea level	
0 to 2000 m	No limitation
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Degree of protection per EN 60529	IP20
Ambient conditions	
Temperature	
Operation	
Horizontal mounting orientation	-25 to 60°C
Vertical mounting orientation	-25 to 50°C
Derating	See section "Derating".
Storage	-40 to 85°C
Transport	-40 to 85°C
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 bus base X20BB8x separately.
Pitch	12.5$^{+0.2}$ mm

Table 2: X20PS9402 - Technical data

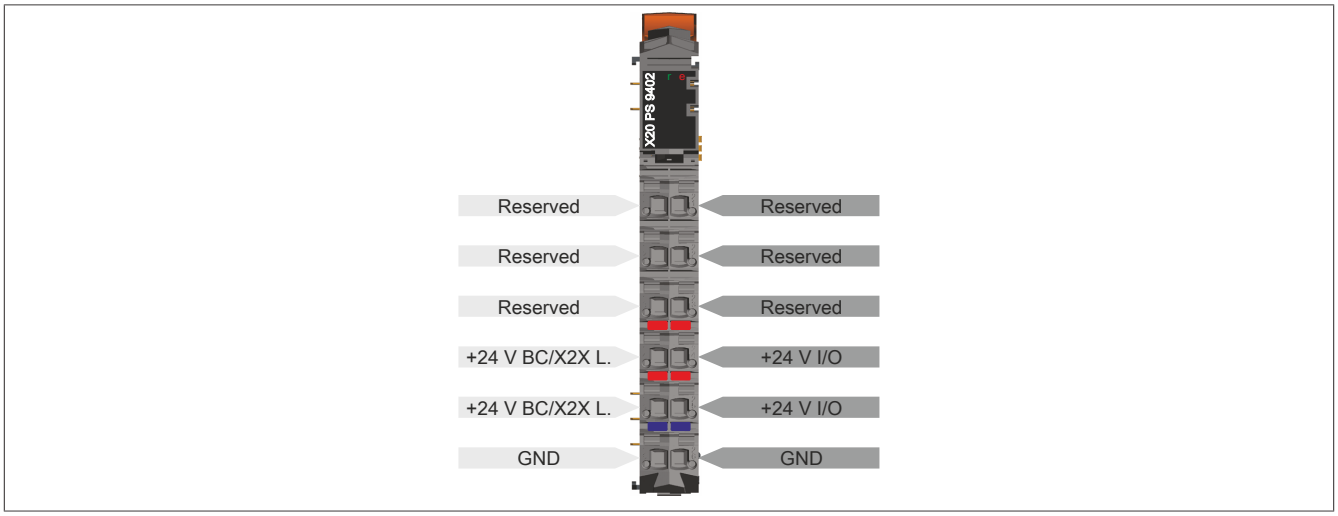
1) The specified values are maximum values. For examples of the exact calculation, see section "Mechanical and electrical configuration" in the X20 system user's manual.

2.2 LED status indicators

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

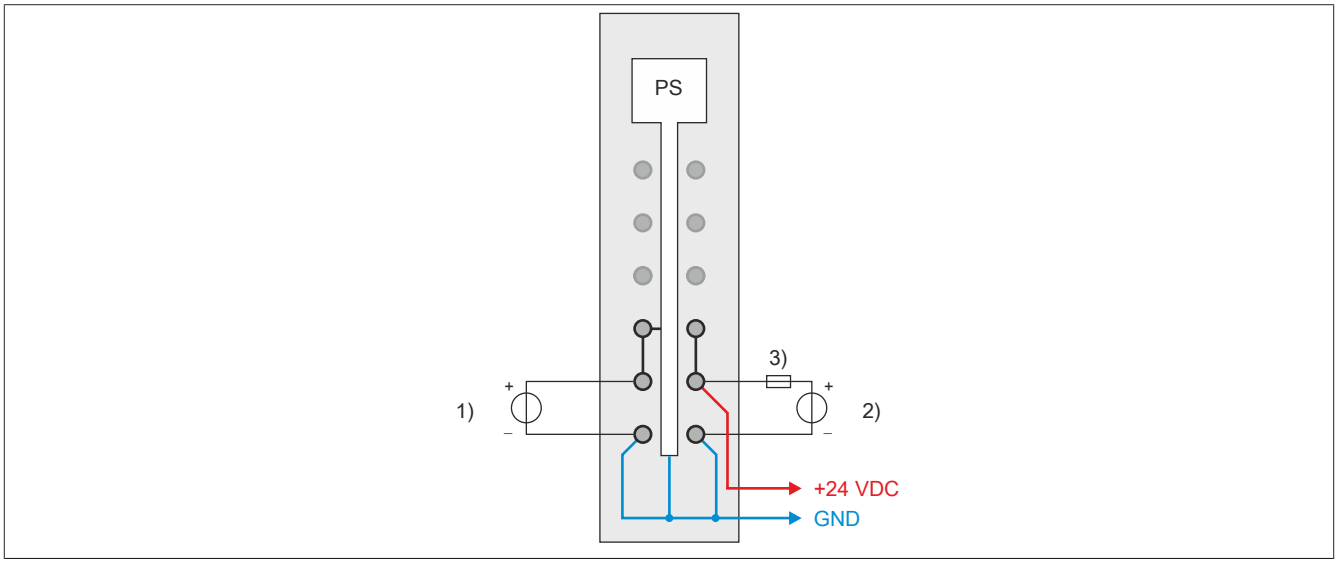
Figure	LED	Color	Status	Description
	r	Green	Off	No power to module
			Single flash	RESET mode
			Blinking	PREOPERATIONAL mode
			On	RUN mode
	e	Red	Off	No power to module or everything OK
			Double flash	LED indicates one of the following states: • The bus controller / X2X Link supply for the power supply is overloaded • I/O supply too low • Input voltage for bus controller / X2X Link supply too low
	e + r	Red on / Green single flash		Invalid firmware

2.3 Pinout



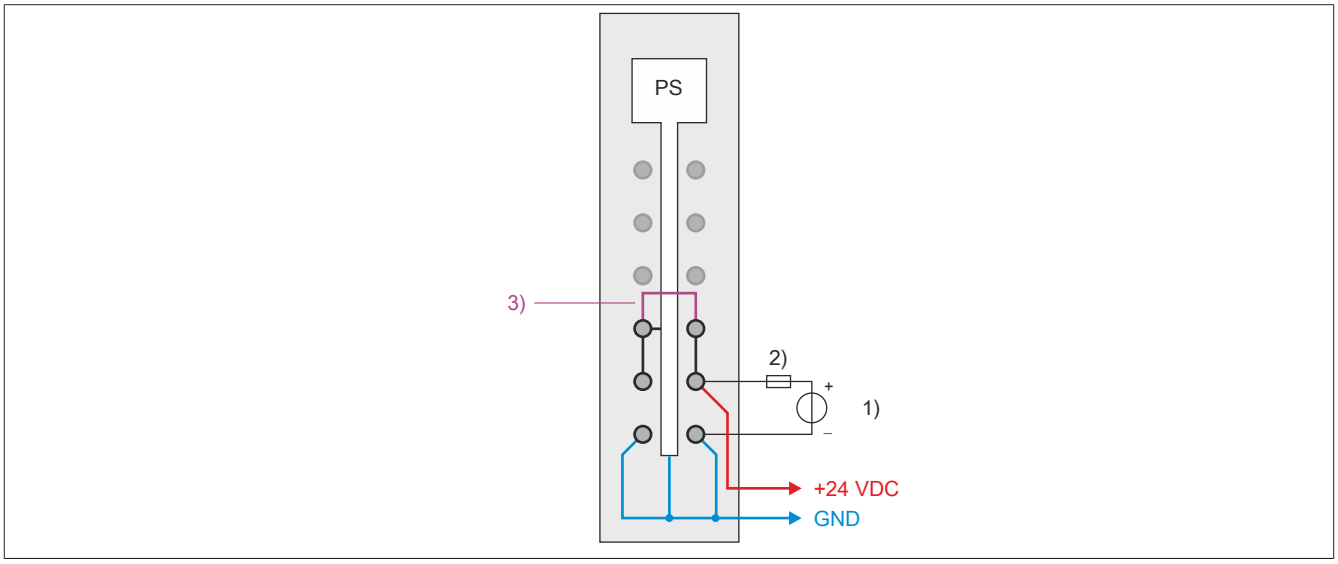
2.4 Connection examples

With 2 isolated power supplies



1) Supply for the bus controller or X2X Link power supply
2) Supply for the I/O power supply
3) Fuse, 10 A slow-blow

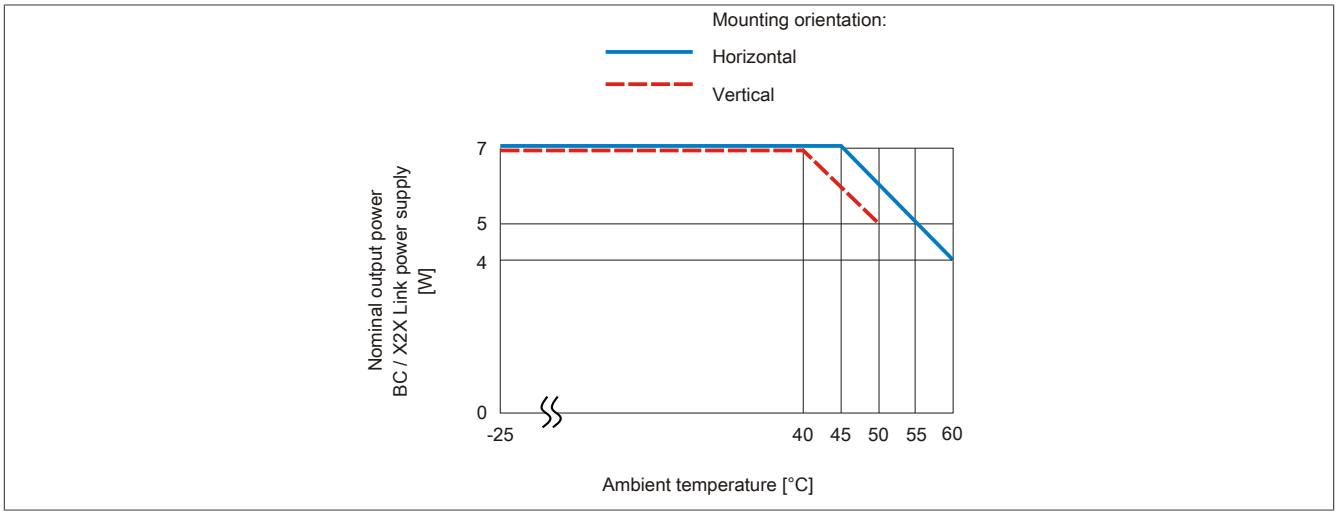
With 1 power supply and jumper



1) Supply for the I/O power supply
2) Fuse, 10 A slow-blow
3) Jumper

2.5 Derating for bus controller / X2X Link supply

The rated output current for the bus controller / X2X Link supply is 7.0 W. Derating must be taken into consideration based on mounting orientation.



3 Function description

3.1 Monitoring the operating limits

The status of the bus supply voltage can be read out.

Bit	Description
0	No error
1	Warning for undervoltage (<4.7 V)

The status of the I/O supply voltage can be read out.

Bit	Description
0	I/O power supply above the warning limits of (20.4 V)
1	I/O power supply below the warning limits (20.4 V)

Information:

The register is described in "Status of the module" on page 10.

4 Commissioning

4.1 Using the module on the bus controller

Function model 254 "Bus controller" is used by default only by non-configurable bus controllers. All other bus controllers can use other registers and functions depending on the fieldbus used.

For detailed information, see section "Additional information - Using I/O modules on the bus controller" in the X20 user's manual (version 3.50 or later).

4.1.1 CAN I/O bus controller

The module occupies 1 analog logical slot on CAN I/O.

5 Register description

5.1 General data points

In addition to the registers described in the register description, the module has additional general data points. These are not module-specific but contain general information such as serial number and hardware variant.

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

5.2 Function model 0 - Standard

Register	Fixed offset	Name	Data type	Read		Write	
				Cyclic	Acyclic	Cyclic	Acyclic
0	1	Status of the module	USINT	•			
		StatusInput01	Bit 0				
		StatusInput02	Bit 2				
4	3	SupplyVoltage	USINT	•			

Fixed modules require their data points to be in a specific order in the X2X frame. Cyclic access occurs according to a predefined offset, not based on the register address.

Acyclic access continues to be based on the register numbers.

5.3 Function model 254 - Bus controller

Register	Offset[1)]	Name	Data type	Read		Write	
				Cyclic	Acyclic	Cyclic	Acyclic
0	0	Status of the module	UINT	•			
		StatusInput01	Bit 0				
		StatusInput02	Bit 2				
4	4	SupplyVoltage	UINT	•			

1) The offset specifies the position of the register within the CAN object.

5.4 Status of the module

Name:
Module status

The following module power supply voltages are monitored in this register:

Bus supply voltage:	Bus supply voltage <4.7 V is displayed as a warning.
24 VDC I/O supply voltage:	I/O supply voltage <20.4 V is displayed as a warning.

Function model	Data type	Values
0 - Standard	USINT	See the bit structure.
254 - Bus controller	UINT	See the bit structure.

Bit structure:

Bit	Name	Value	Information
0	StatusInput01	0	No error
		1	Bus power supply warning - Undervoltage (<4.7 V)
1	Reserved	0	
2	StatusInput02	0	I/O power supply above the warning limit of 20.4 V
		1	I/O power supply below the warning limit of 20.4 V
3 - x	Reserved	0	

5.5 Bus supply voltage

Name:
SupplyVoltage

This register indicates the measured bus supply voltage with a resolution of 0.1 V.

Information:

The nominal bus supply voltage is 5 V and should not fall below 4.7 V.

Function model	Data type
0 - Standard	USINT
254 - Bus controller	UINT

5.6 Minimum cycle time

The minimum cycle time specifies how far the bus cycle can be reduced without communication errors occurring. It is important to note that very fast cycles reduce the idle time available for handling monitoring, diagnostics and acyclic commands.

Minimum cycle time
100 µs

5.7 Minimum I/O update time

The minimum I/O update time specifies how far the bus cycle can be reduced so that an I/O update is performed in each cycle.

Minimum I/O update time
2 ms