X20(c)PS9400

1 General information

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.

- Supply for the bus controller, X2X Link and internal I/O supply
- Feed and bus controller / X2X Link supply electrically isolated
- Redundancy of bus controller / X2X Link supply possible by operating multiple supply modules simultaneously
- Service interface (RS232)

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

Model number	Short description	Figure
	System modules for bus controllers	
X20PS9400	X20 power supply module, for bus controller and internal I/O supply, X2X Link supply	
X20cPS9400	X20 power supply module, coated, for bus controller and internal I/O supply, X2X Link supply	
	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 plates X20AC0SL1/X20AC0SR1 (left and right) included	
X20cBB80	X20 bus base, coated, for X20 base module (BC, HB, etc.) and X20 power supply module, X20 end plates X20AC0SL1/X20AC0SR1 (left and right) 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 an X20 add-on module (IF, HB, etc.), X20 locking 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 locking 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 an X20 add-on module (IF, HB, etc.), X20 locking 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 locking plates (left and right) X20AC0SL1/X20AC0SR1 included	
	Terminal blocks	
X20TB12	X20 terminal block, 12-pin, 24 VDC keyed	

Table 1: X20PS9400, X20cPS9400 - Order data

4 Technical data

Product ID	X20PS9400	X20cPS9400
Short description		
Power supply module	24 VDC supply module for bus controller, X2X Link supply and I/O	
Interfaces	1x RS232 service interface	
General information		
B&R ID code	0x1F8C	0xD579
Status indicators	Overload, operating status, module status, RS232	
Diagnostics		
Module run/error	Yes, using status LED and software	
RS232 data transfer	Yes, using status LED	
Overload	Yes, using status LED and software	
Power consumption [1]		
Bus	1.42 W	
Internal I/O	0.6 W	
Additional power dissipation caused by the actuators (resistive) [W]	-	
Electrical isolation		
Bus - RS232	No	
I/O feed - I/O supply	No	
BC/X2X Link feed - BC/X2X Link supply	Yes	
Certification		
CE	Yes	
cULus	Yes	
cCSAus HazLoc Class 1 Division 2	Yes	-
ATEX Zone 2 [2]	Yes	
KC	Yes	-
GL	Yes	
GOST-R	Yes	
Bus controller / X2X Link 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 supply output		
Nominal output power	7 W	
Parallel operation	Yes [3]	

Table 2: X20PS9400, X20cPS9400 - Technical data

Product ID	X20PS9400	X20cPS9400
Redundant operation	Yes	
Overload behavior	Short circuit / temporary overload protection	
Input I/O supply		
Input voltage	24 VDC -15% / +20%	
Fuse	Required line fuse: Max. 10 A, slow-blow	
Reverse polarity protection	No	
Output I/O supply		
Rated output voltage	24 VDC	
Behavior if a short circuit occurs	Required line fuse	
Permitted contact load	10 A	
Interfaces		
Service interface		
Signal	RS232	
Design	Connection made using 12-pin X20TB12 terminal block	
Max. transfer rate	115.2 kbit/s	
Operating conditions		
Mounting orientation		
Horizontal	Yes	
Vertical	Yes	
Installation at elevations above sea level		
0 to 2000 m	No limitations	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
EN 60529 protection	IP20	
Environmental conditions		
Temperature		
Operation		
Horizontal installation	-25 to 60°C	
Vertical installation	-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	Up to 100%, condensing
Storage	5 to 95%, non-condensing	
Transport	5 to 95%, non-condensing	
Mechanical characteristics		
Note	Order 1x X20TB12 terminal block separately Order 1x X20BB8x bus base separately	Order 1x X20TB12 terminal block separately Order 1x X20cBB8x bus base separately
Spacing	12.5 $^{+0.2}$ mm	

Table 2: X20PS9400, X20cPS9400 - Technical data

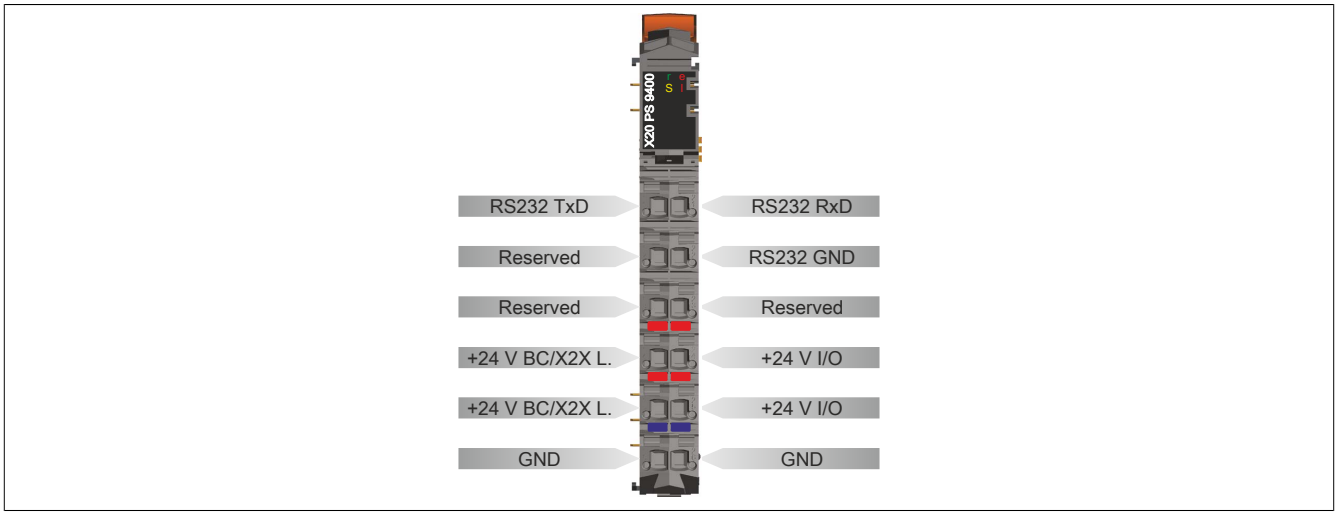
1) The values specified here are maximum values. The exact calculation is also available for download as a data sheet with the other module documentation on the B&R website.
2) Ta min.: 0°C
   Ta max.: See environmental conditions
3) In parallel operation, only 75% of the rated power can be assumed. It is important to make sure that all power supplies operating in parallel are switched on and off at the same time.

5 LED status indicators

For a description of the various operating modes, see the section "re LEDs" in chapter 2 "System characteristics" of the X20 system user's manual.

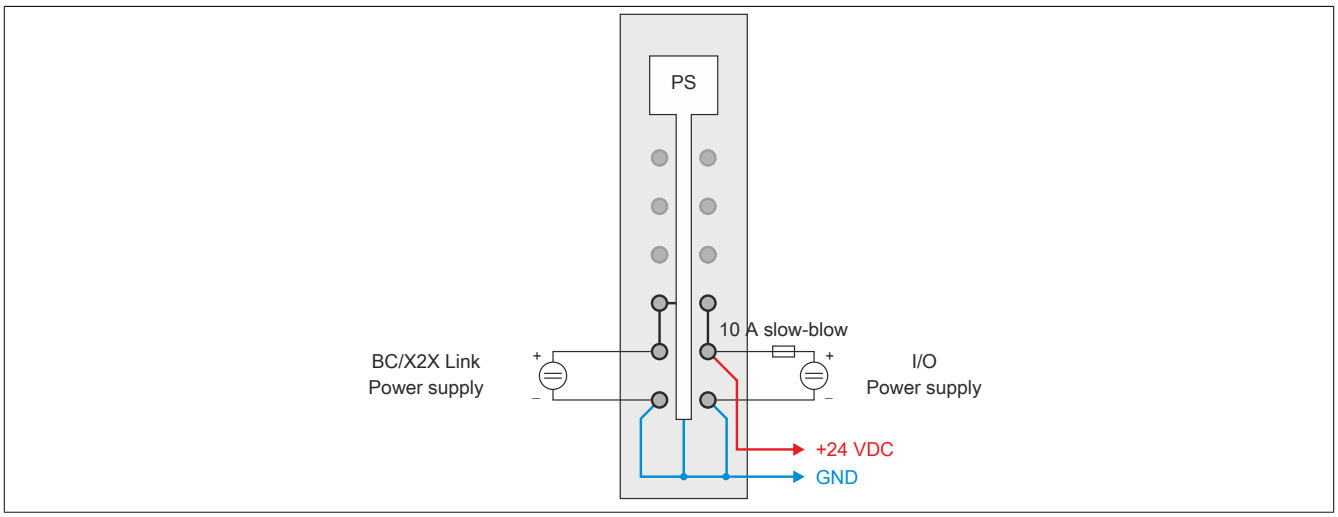
Figure	LED	Color	Status	Description
	r	Green	Off	No power to module
			Single flash	RESET mode
			Blinking	PREOPERATIONAL mode
			On	RUN mode
	e	Red	Off	No power to module or everything OK
			Double flash	LED indicates one of the following states: • The bus controller / X2X Link supply for the power 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
	I	Red	Off	The bus controller / X2X Link supply is within the valid limits
			On	The bus controller / X2X Link supply for the power supply is overloaded
	S	Yellow	Off	No data traffic via service interface
			On	Data is being transmitted via the service interface

6 Pinout

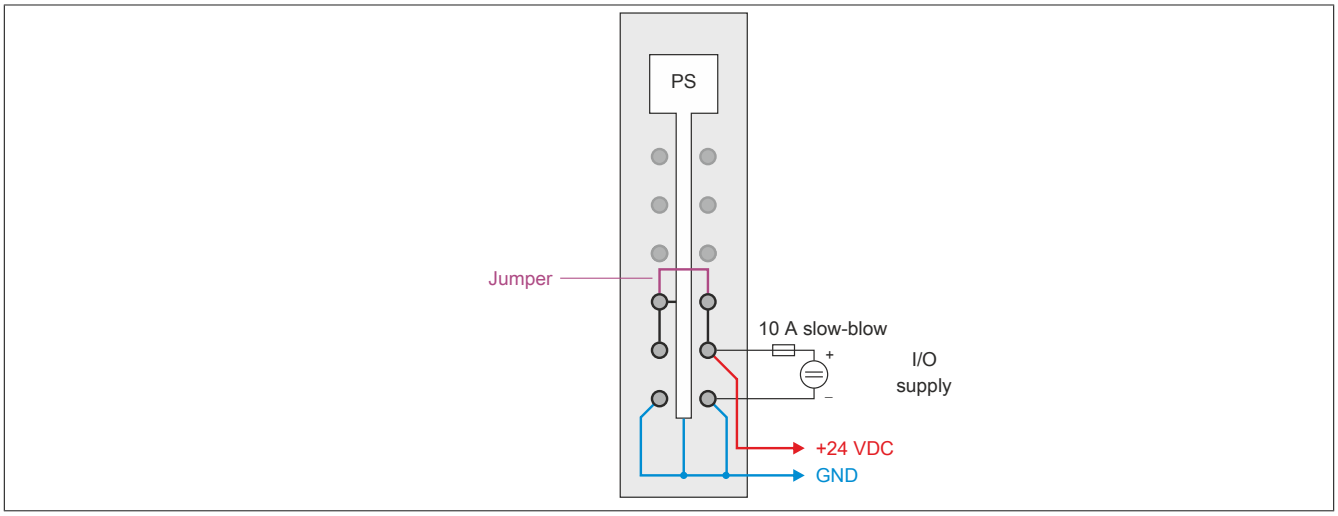


7 Connection examples

With 2 separate supplies

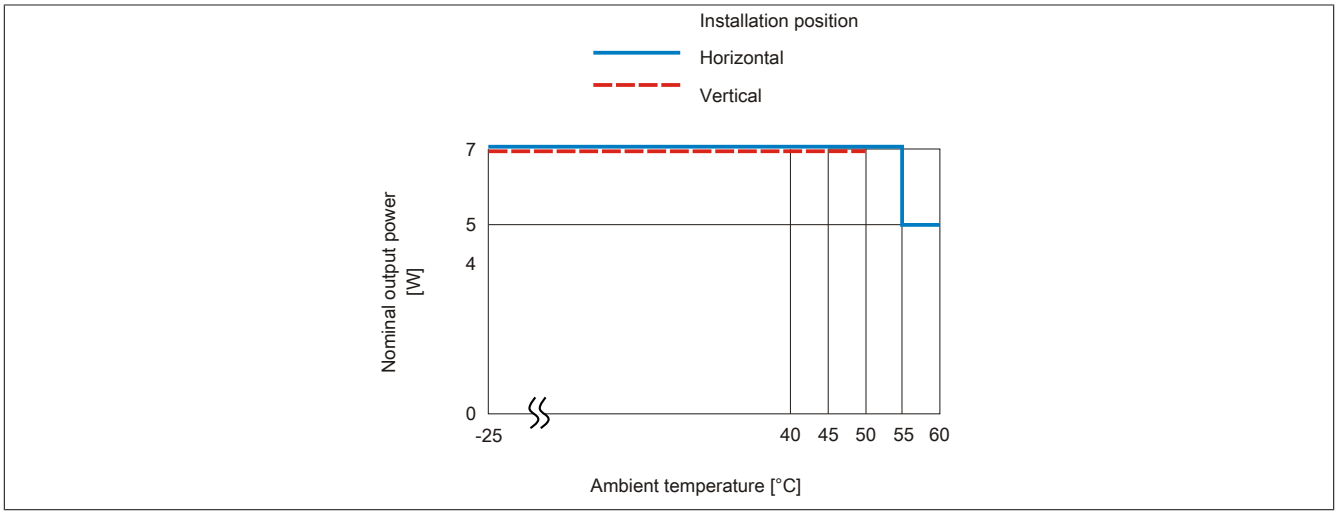


With a supply and jumper



8 Derating

The rated output current for the supply is 7 W. Derating must be taken into consideration based on mounting orientation.



9 Using the service interface

The RS232 service interface is not for use in a machine or system application. It is only intended to be used to update the firmware on various bus controllers and X2X modules as well as to save settings.

10 Register description

10.1 General data points

In addition to the registers listed in the register description, the module also has other more general data points. These are not specific to the module but contain general information such as serial number and hardware version.

These general data points are listed in the "General data points" section of chapter 4 "X20 system modules" in the X20 system user's manual.

10.2 Function model 0 - Standard

Register	Name	Data type	Read		Write	
			Cyclic	Non-cyclic	Cyclic	Non-cyclic
0	Module status	USINT	•			
	StatusInput01	Bit 0				
	StatusInput02	Bit 2				
2	SupplyCurrent	USINT	•			
4	SupplyVoltage	USINT	•			

10.3 Function model 254 - Bus controller

Register	Offset[1)]	Name	Data type	Read		Write	
				Cyclic	Non-cyclic	Cyclic	Non-cyclic
0	0	Module status	UINT	•			
		StatusInput01	Bit 0				
		StatusInput02	Bit 2				
2	2	SupplyCurrent	UINT	•			
4	4	SupplyVoltage	UINT	•			

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

10.4 Module status

Name:
Module status

The following voltage and current states of the module are monitored in this register:

Bus supply current:	A bus supply current of >2.3A is displayed as a warning.
Bus supply voltage:	A bus supply voltage of <4.7V is displayed as a warning.
24 VDC I/O supply voltage:	An I/O supply voltage of <20.4 V is displayed as a warning.

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

Bit structure:

Bit	Name	Value	Information
0	StatusInput01	0	No error
		1	Warning - overcurrent (>2.3 A) or undervoltage (<4.7 V)
1	Reserved	0	
2	StatusInput02	0	I/O supply above the warning level of 20.4 V
		1	I/O supply below the warning level of 20.4 V
3 - x	Reserved	0	

10.5 Bus supply current

Name:
SupplyCurrent

This register displays the bus supply current measured at a resolution of 0.1 A.

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

10.6 Bus supply voltage

Name:
SupplyVoltage

This register displays the bus supply voltage measured at a resolution of 0.1 V.

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

10.7 Minimum cycle time

The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring. It should be noted that very fast cycles decrease the idle time available for handling monitoring, diagnostics and acyclic commands.

Minimum cycle time
100 µs

10.8 Minimum I/O update time

The minimum I/O update time defines how far the bus cycle can be reduced while still allowing an I/O update to take place in each cycle.

Minimum I/O update time
2 ms