X20PS9600

1 General information

The power supply module is used together with an X20 Compact-S CPU. It has a feed for the Compact-S CPU, X2X Link and the internal I/O power supply.

- Supply for Compact-S CPU, X2X Link and internal I/O power supply
- Electrical isolation of supply and CPU / X2X Link power supply
- Redundancy of CPU / X2X Link supply possible by operating multiple supply modules simultaneously
- RS232 configurable as an online interface
- CAN bus

2 Order data

Model number	Short description	Figure
	System modules for Compact-S CPUs	
X20PS9600	X20 power supply module, for Compact-S CPU and internal I/O power supply, X2X Link power supply	
	Required accessories	
	System modules for Compact-S CPUs	
X20BB52	X20 Compact-S bus base, for Compact-S CPU and Compact-S CPU power supply module, base for integrated RS232 interface, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB57	X20 Compact-S bus base, for Compact-S CPU and Compact-S CPU power supply module, base for integrated RS232 and CAN bus interface, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB62	X20 Compact-S bus base, for Compact-S CPU and Compact-S CPU power supply module, base for integrated RS232 interface, slot for X20 interface module, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB67	X20 Compact-S bus base, for Compact-S CPU and Compact-S CPU power supply module, base for integrated RS232 and CAN bus interface, slot for X20 interface module, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB72	X20 Compact-S bus base, for Compact-S CPU and Compact-S CPU power supply module, base for integrated RS232 interface, 2 slots for X20 interface modules, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
X20BB77	X20 Compact-S bus base, for Compact-S CPU and Compact-S CPU power supply module, base for integrated RS232 and CAN bus interface, 2 slots for X20 interface modules, X20 connection, X20 end cover plates (left and right) X20AC0SL1/X20AC0SR1 included	
	Terminal blocks	
X20TB12	X20 terminal block, 12-pin, 24 VDC keyed	

Table 1: X20PS9600 - Order data

3 Technical data

Model number	X20PS9600
Short description	
Power supply module	24 VDC power supply module for Compact-S CPU, X2X Link power supply and I/O
Interfaces	1x RS232, 1x CAN bus [1]
General information	
B&R ID code	0xEB03
Status indicators	Overload, operating state, module status, RS232, CAN bus [1]
Diagnostics	
Module run/error	Yes, using status LED and software
CAN bus data transfer [1]	Yes, using status LED
RS232 data transfer	Yes, using status LED
Overload	Yes, using status LED and software
Power consumption of X2X Link power supply [2]	1.42 W
Power consumption [2]	
Internal I/O	0.6 W
Additional power dissipation caused by actuators (resistive) [W]	-
Certifications	
CE	Yes
UL	cULus E115267 Industrial control equipment
ATEX	Zone 2, II 3G Ex nA nC IIA T5 Gc IP20, Ta (see X20 user's manual) FTZÚ 09 ATEX 0083X
GOST-R	Yes
CPU / 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
CPU / X2X Link power supply output	
Nominal output power	7 W
Parallel connection	Yes [3]
Redundant operation	Yes
Overload characteristics	Short circuit protection, 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
Interfaces	
Interface IF1	
Signal	RS232
Variant	Connection made using 12-pin terminal block X20TB12
Transfer rate	Max. 115.2 kbit/s
Interface IF3 [1]	
Signal	CAN bus
Variant	Connection made using 12-pin terminal block X20TB12
Transfer rate	Max. 1 Mbit/s
Electrical characteristics	
Electrical isolation	CPU/X2X Link supply isolated from CPU/X2X Link power supply I/O supply not isolated from I/O power supply
Operating conditions	
Mounting orientation	
Horizontal	Yes
Vertical	Yes
Installation elevation above sea level	
0 to 2000 m	No limitations
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Degree of protection per EN 60529	IP20
Environmental 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

Table 2: X20PS9600 - Technical data

Model number	X20PS9600
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 X20BB5x, X20BB6x or X20BB7x Compact-S CPU base separately
Spacing	12.5$^{+0.2}$ mm

Table 2: X20PS9600 - Technical data

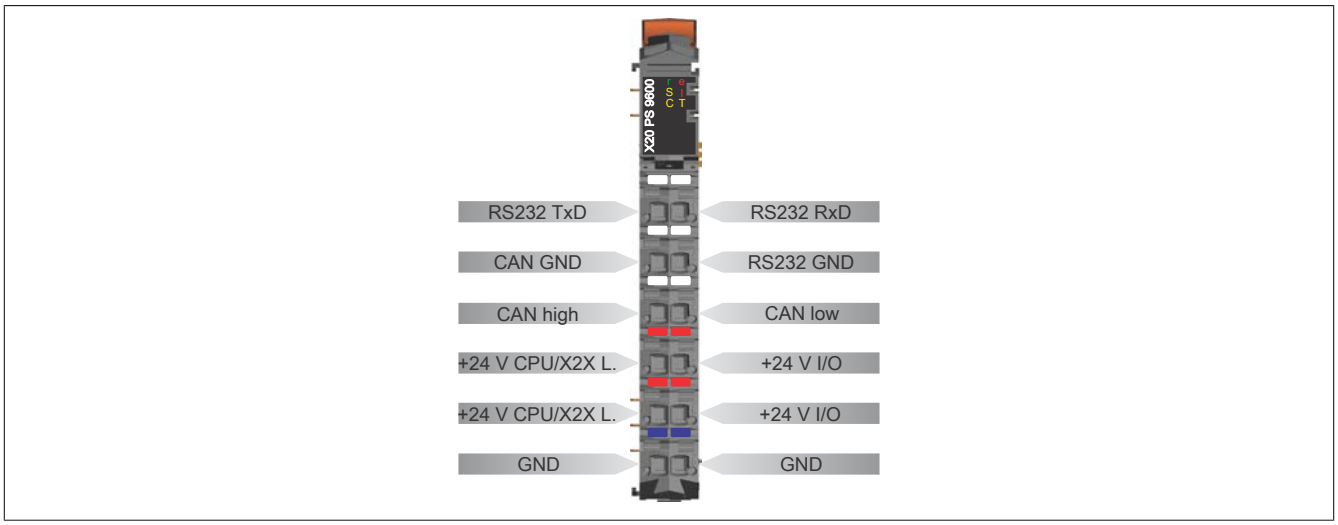
1) CAN bus only when used with bus module X20BB57, X20BB67 or X20BB77.
2) The specified values are maximum values. For examples of the exact calculation, see section "Mechanical and electrical configuration" of the X20 system user's manual.
3) In parallel operation, it is only permitted to assume 75% of the rated power. It is important to make sure that all power supplies operated in parallel are switched on and off at the same time.

4 LED status indicators

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

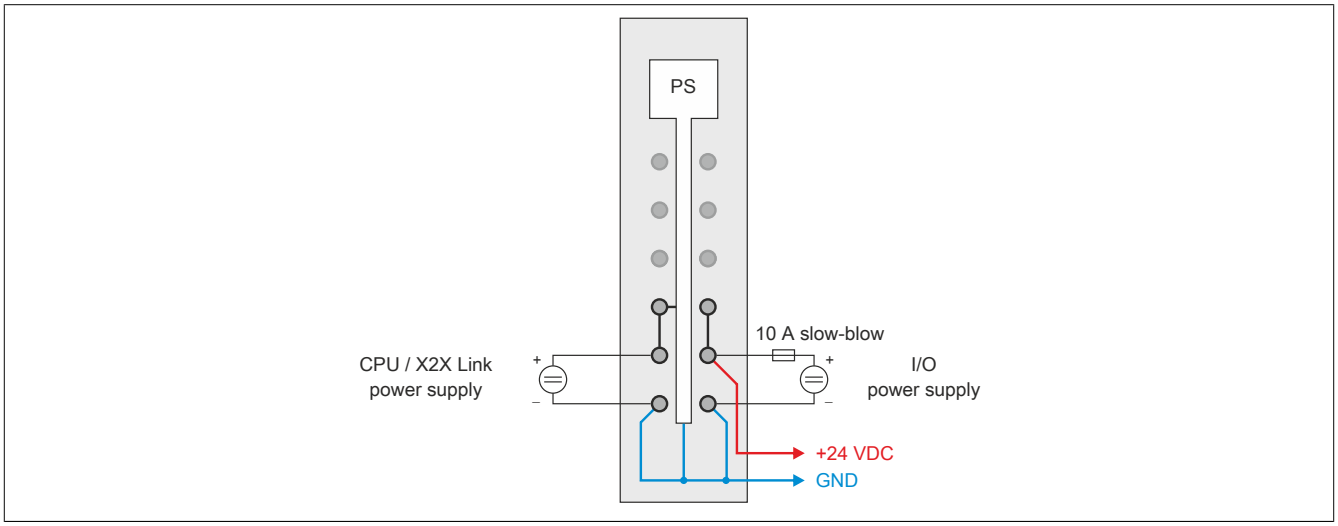
Figure	LED	Color	Status	Description
	r	Green	Off	No power to module
			Single flash	RESET mode
			Blinking	PREOPERATIONAL mode
			On	RUN mode
	e	Red	Off	No power to module or everything OK
			Double flash	LED indicates one of the following states: • Power supply for CPU / X2X Link overloaded • I/O power supply too low • Input voltage for CPU / X2X Link power supply too low
	e + r	Solid red / Single green flash		Invalid firmware
	I	Red	Off	CPU / X2X Link power supply within valid range
			On	Power supply for CPU / X2X Link overloaded
	S	Yellow	Off	CPU not transmitting data via the RS232 interface
			On	CPU transmitting data via the RS232 interface
	C	Yellow	Off	CPU not transmitting data via the CAN bus interface
			On	CPU transmitting data via the CAN bus interface
	T	Yellow	Off	Terminating resistor integrated in bus module X20BB57, X20BB67 or X20BB77 switched off
			On	Terminating resistor integrated in bus module X20BB57, X20BB67 or X20BB77 switched on

5 Pinout

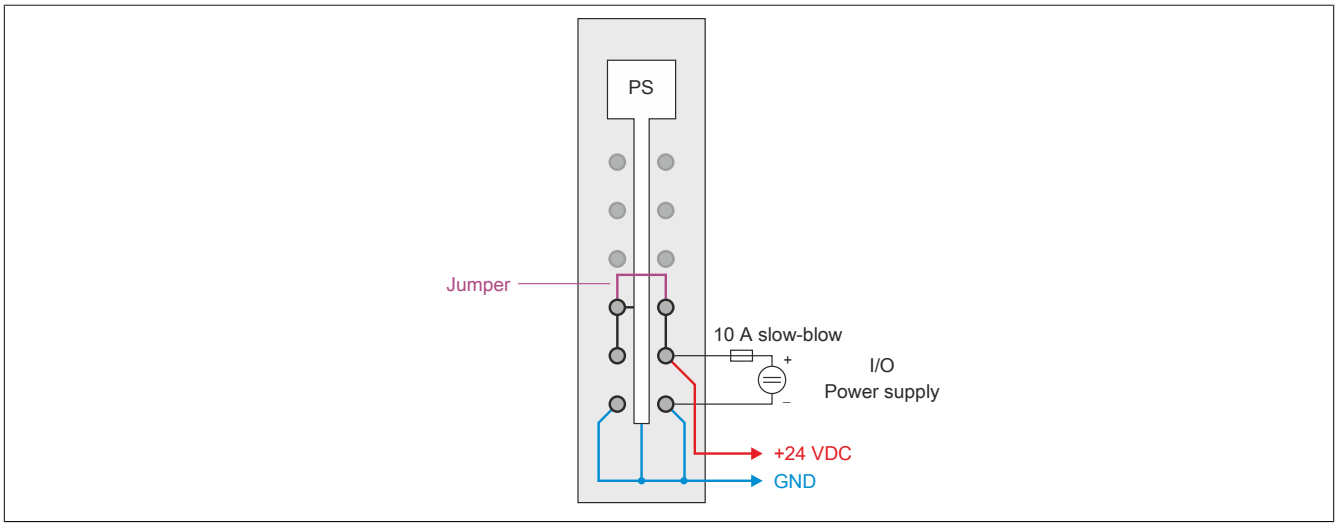


6 Connection examples

With 2 isolated power supplies



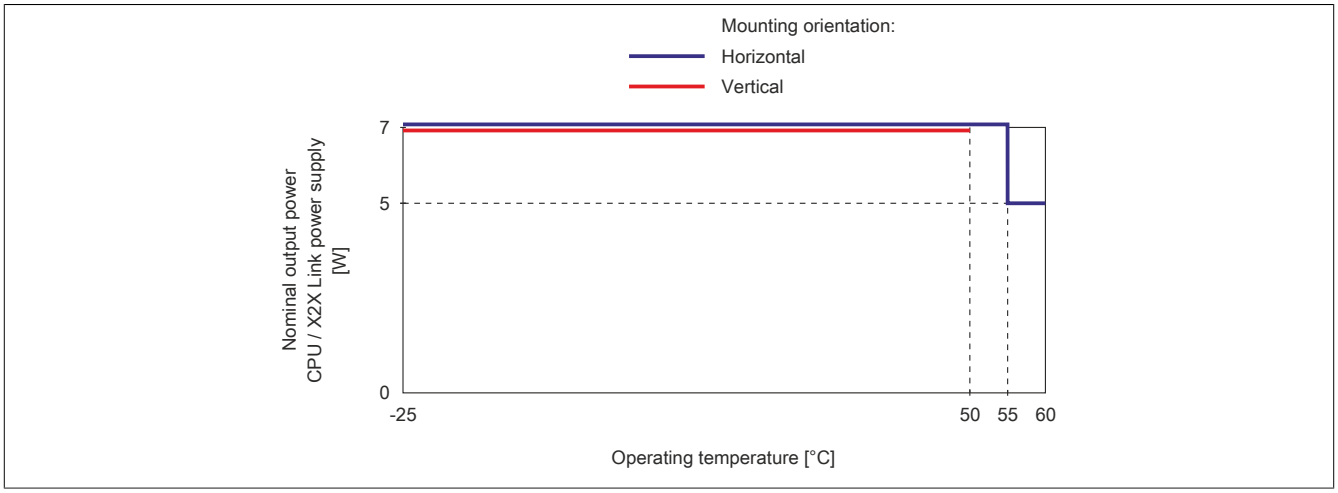
With 1 power supply and jumper



7 Derating

7.1 CPU / X2X Link power supply

The nominal output power for CPU / X2X Link power supply is 7 W. Derating may occur depending on the mounting orientation.



7.2 I/O power supply

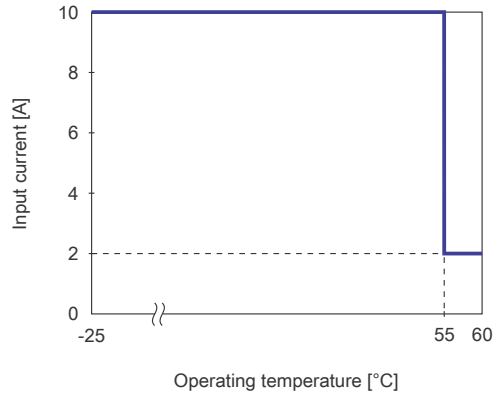
> **Information:**
>
> **The specified maximum temperature and derating values are based on worst-case conditions. The CPU contains an internal temperature sensor that triggers a reset if 95°C is exceeded. Depending on the environmental conditions (artificial convection), maintaining the internal temperature at <90°C can prevent derating.**

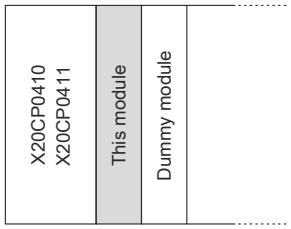
7.2.1 X20CP0410 and X20CP0411

Horizontal installation

Derating is not required in the temperature range -25 to 55°C. 1 of the following 2 derating variants must be applied at temperatures above 55°C:

Variant 1	Variant 2
Max. 2 A input current on the I/O power supply.	A dummy module must be connected next to the power supply module.





Vertical installation

Derating is not required in the vertical mounting orientation.

7.2.2 X20CP0482, X20CP0483 and X20CP0484

Horizontal installation

Derating is not required in the temperature range -25 to 50°C. The following 2 derating variants must be applied at temperatures above 50°C:

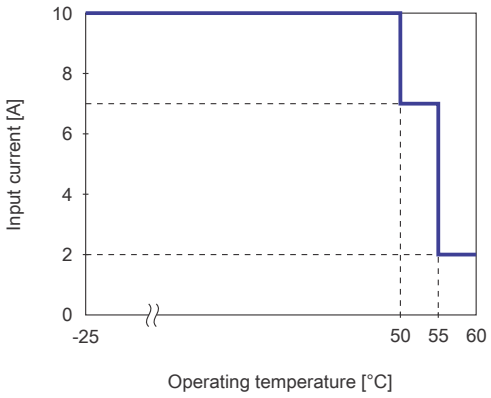
Information:

Both derating variants must always be applied!

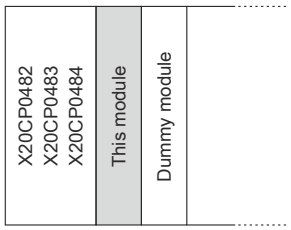
Derating

The input current on the I/O power supply must be reduced:

- Max. 7 A up to 55°C
- Max. 2 A up to 60°C



A dummy module must be connected next to the power supply module.



Vertical installation

Derating is not required in the temperature range -25 to 40°C. The following 2 derating variants must be applied at temperatures above 40°C:

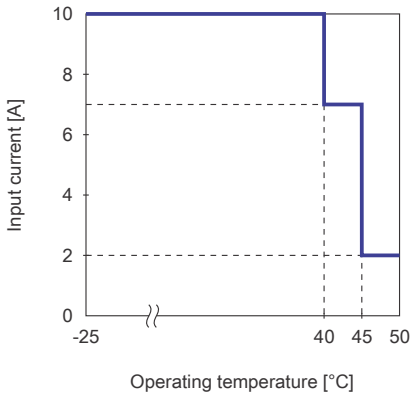
Information:

Both derating variants must always be applied!

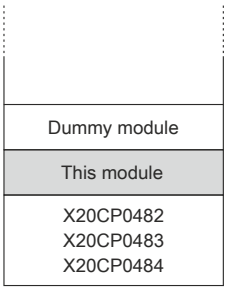
Derating

The input current on the I/O power supply must be reduced:

- Max. 7 A up to 45°C
- Max. 2 A up to 50°C



A dummy module must be connected next to the power supply module.



8 Register description

8.1 General data points

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

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

8.2 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				
2	2	SupplyCurrent	USINT	•			
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.

8.3 Status of the module

Name:
Module status

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

Bus supply current:	Bus supply current >2.3 A is displayed as a warning.
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.

Data type	Values
USINT	See the bit structure.

Bit structure:

Bit	Name	Value	Information
0	StatusInput01	0	No error
		1	Warning if overcurrent (>2.3 A) or 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	

8.4 Bus power 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

8.5 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

8.6 Minimum cycle time

The minimum cycle time defines 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

8.7 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