

5.6 XP152

5.6.1 General Information

The XP152 module is a CPU insert for power supply modules. This means that the CPU does not require its own slot.

Optionally, the XP152 module can be operated as intelligent CAN bus processor together with a CPU (e.g. CP260). With this type of operation, the XP152 cannot access local modules on the 2005 unit. It is controlled by the CPU, collects data from the CAN stations (e.g. I/O) and provides this data to the CPU.

5.6.2 Order Data

Model Number	Short Description	Image
	CPU	
3XP152.60-2	2005 CPU, 118 KB SRAM, 512 KB FlashPROM, 1 RS232 interface, 1 CAN interface, CAN: electrically isolated, network capable, insert for power supply modules	
	Accessories	
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
7AC911.9	Bus connector, CAN	
0AC912.9	Bus adapter, CAN, 1 CAN interface	
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, including 30 cm connection cable	

Table 78: XP152 order data

5.6.3 Technical Data

Product ID	XP152
General Information	
C-UL-US Listed	Yes
B&R ID Code	\$11
Slot	Insert for power supply PS465
Power Consumption 5 V 24 V Total	Max. 4 W --- Max. 4 W
Processor	
Typical Instruction Cycle Time	0.8 µs
SRAM User RAM / DPR System RAM	118 KB 138 KB
FlashPROM User PROM System PROM	512 KB 512 KB
Data Buffering Backup Battery in 2005 Backplane with Battery Module AC240 Battery Monitoring	At least 4 years At least 2 years Yes, when operated as main CPU (starting with Rev. 12.00)
Peripherals	
Real-time Clock Resolution	Nonvolatile (external buffering) 1 s
Reset Button	Yes
Status Display	LEDs
Standard Communication Interfaces	
Application Interface IF1 Design Electrical Isolation Max. Distance Max. Baud Rate	RS232 9-pin DSUB plug No 15 m / 19200 Baud 64 baud
Application Interface IF2 Design Electrical Isolation Max. Distance Max. Baud Rate Bus Length ≤60 m Bus Length ≤200 m Bus Length ≤1,000 m	CAN 9-pin DSUB plug Yes 1,000 m 500 kBits/s 250 kBits/s 50 kBits/s
Mechanical Characteristics	
Dimensions (H, W, D) [mm]	130, 28, 105

Table 79: XP152 technical data

5.6.4 Operational and Connection Elements

On the module, there is a Reset key, status LEDs, two HEX number dials for the CAN bus station number and the connector for a RS232 and a CAN interface.

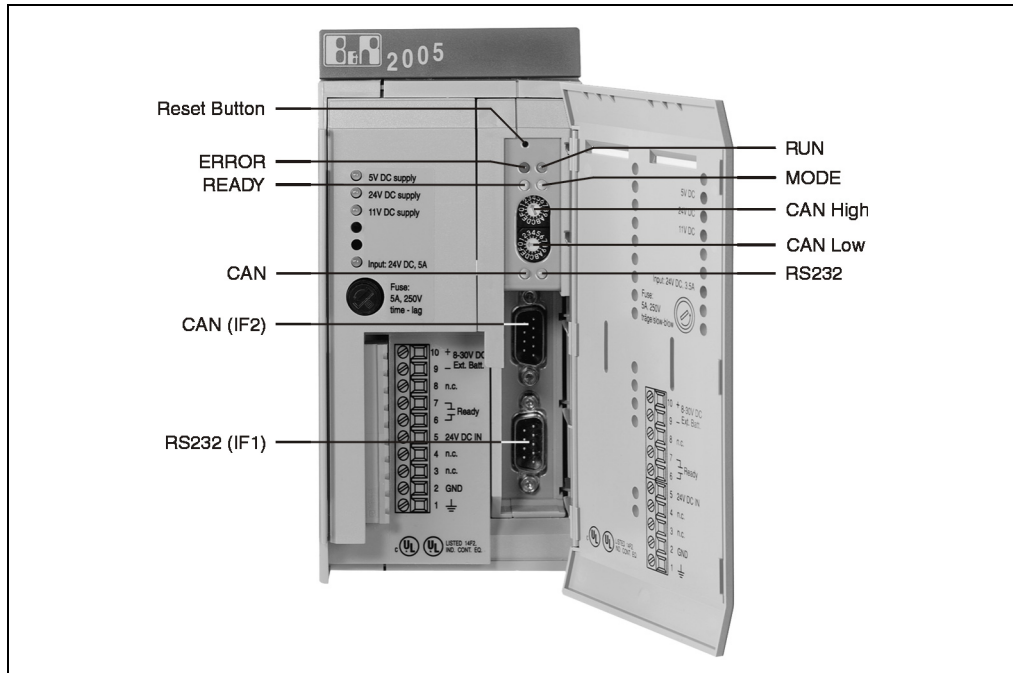


Figure 73: XP152 operational and connection elements

5.6.5 Status LEDs

LED	Description
ERROR	Lit in Service and diagnostics mode
RUN	Lit in Run, Service and diagnostics mode
READY	Lit in Service and diagnostics mode
MODE	Lit when programming FlashPROM
CAN	Lit during data exchange via the CAN interface
RS232	Lit during data exchange via the RS232 interface

Table 80: XP152 status LEDs

All LEDs are lit when the reset button is pressed. They are still lit for another 0.4 s after being released.

5.6.6 Reset Button

The reset button can be pressed with any small pointed object (e.g. paper clip). The reset button is protected by the module door. Depending on the operating mode, pressing the reset buttons has different effects.

Operating Mode	Effects
CAN Bus Processor	Local Reset - All XP152 application programs are stopped
CPU	Local reset and global bus reset - All application programs are stopped - All outputs are set to zero

Table 81: XP152 reset button

5.6.7 CAN Node Number Switch

The CAN node number is set with the two hex switches. The switch setting can be evaluated by the application program at any time. If the switch position is changed during operation, a warning can be generated. The operating system only interprets the switch position when switched on.

The settings \$00, and \$FF are reserved for special functions.

Switch Position	Function
\$00	In this switch position, the operating system can be programmed via the online interface. User Flash is only deleted after the update begins. The bootstrap loader mode is only required when PCCSW < 2.0 is installed. The procedure is the same as described in Section 5.6.12 "Programming System Flash", on page 182. In an additional dialog box, the baud rate and the interface must only be set, from which a connection to the PLC is created.
\$FF	diagnostics mode

Table 82: XP152 CAN node number switch

5.6.8 RS232 Interface (IF1)

An RS232 cable is available from B&R for connecting the CPU and PG (PC).

Model No. 0G0001.00-090

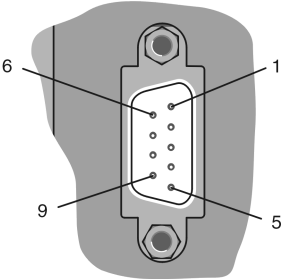
Interface	Description	Pin Assignments	
Application interface RS232  9-pin DSUB plug	The RS232 interface is not electrically isolated. The RS232 status LED is lit when data is transferred via the RS232 interface. Max. Baud Rate: 64 kBaud Max. Cable Length: 15 m	Pin	RS232
		1	
		2	RXD
		3	TXD
		4	
		5	GND
		6	
		7	RTS
		8	CTS
		9	

Table 83: XP152 RS232 Interface (IF1)

5.6.9 CAN Interface (IF2)

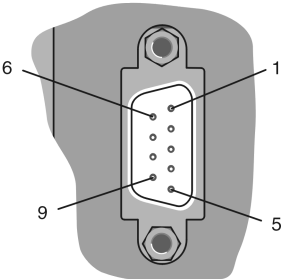
Interface	Description	Pin Assignments	
Application interface CAN  9-pin DSUB plug	The 82527 processor is used as the CAN controller. The interface is electrically isolated. The connection is made using a T-connector (7AC911.9). The CAN status LED is lit when data is transferred via the CAN interface. Max. Baud Rate: 500 kBit/s Bus Length: ≤60 m 250 kBit/s Bus Length: ≤200 m 50 kBit/s Bus Length: ≤1,000 m	Pin	CAN
		1	
		2	CAN_L
		3	CAN_GND
		4	
		5	
		6	res.
		7	CAN_H
		8	
		9	

Table 84: XP152 CAN interface (IF2)

5.6.10 Data/Real-time Buffering

The following areas are buffered

- User RAM
- System RAM
- Real-time clock

The backup battery is either in the B&R 2005 rack or in the AC240 battery module. Data can also be buffered by module with a rechargeable battery such as e.g. CP260.

Battery Monitoring

If the XP152 is operated as the CPU, it carries out cyclical monitoring of the battery voltage. The cyclic load test of the battery does not considerably shorten the battery life, instead it gives an early warning of weakened buffer capacity.

The status information, "Battery OK" is available to the user from the SYS_lib function "SYS_battery".

Battery Change Interval

See section "Backup Battery" in sections 2 "Module Racks" and 17.2 "AC240" (battery module).

5.6.11 Module Fastener

The XP152 is equipped with a module fastener starting from revision 12.00. The module fastener prevents the power supply from falling out of the CPU during transport.

A screwdriver is required to install the module. The screwdriver should be inserted between the power supply and XP152 at the same height as the sloped marking (see figure below). By simultaneously levering the screwdriver in the direction of the power supply and pulling the XP152, the CPU is taken out from its bracing and can be removed from the power supply.

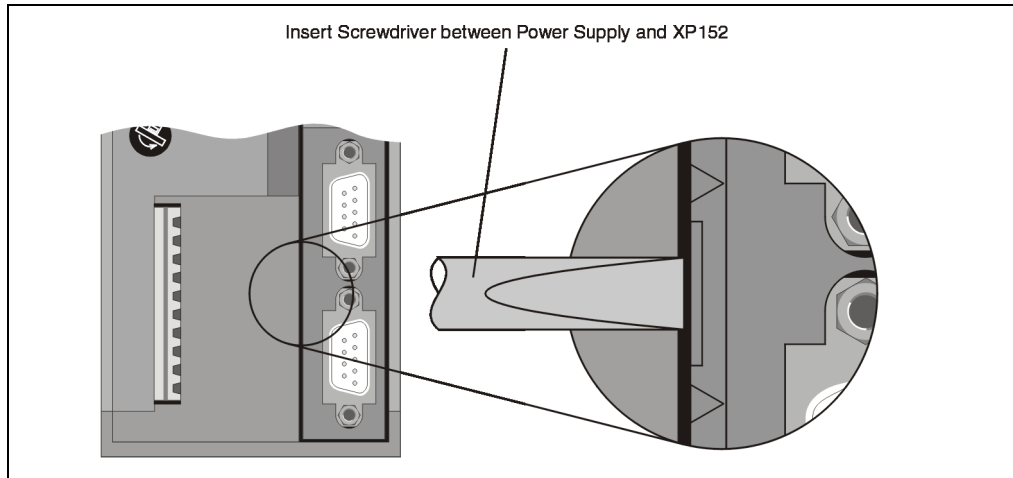


Figure 74: XP152 module fastener

5.6.12 Programming System Flash

General Information

CPUs are delivered with a runtime system. The CAN node number switch is set to switch position 00 at delivery i.e. the bootstrap loader mode is set.

A switch position must be set in order to boot the PLC in RUN mode (see Section 5.6.7 "CAN Node Number Switch", on page 179). A runtime system update is only possible in RUN mode.

Runtime System Update

The runtime system can be updated using the programming system. When updating the runtime system (online runtime system update), the following procedure must be carried out:

- 1) An online runtime system update is only possible, if the processor is in RUN mode.
- 2) Switch on the supply voltage.
- 3) Establish online connection (online cable) between programming device (PC or Industrial PC) and the XP152. An online runtime update is possible using the serial RS232 onboard interface.
- 4) Start B&R Automation Studio™.
- 5) Start the update procedure by calling the **Services** command from the **Project** menu. Select **Transfer Operating System...** from the menu shown. Follow the instructions from B&R Automation Studio™.
- 6) A dialog box is displayed for configuring the runtime system version. The runtime system version is already preselected by the user's project settings. Using the drop-down menu, the runtime system versions stored in the project can be selected. Clicking on the **Browse** button allows the selected runtime system version to be loaded from the hard drive or from the CD.

Pressing **Next >** opens a pop-up window, which allows the user to select whether the modules should be downloaded with SYSTEM ROM target memory using the following runtime system update. Otherwise, modules can also be downloaded using a later application download.

After pressing **Next >** a dialog box appears where the user can set the CAN baud rate, CAN ID and the CAN node number (the CAN node number set here is only relevant if an interface module does not contain a CAN node number switch). Assigning a unique node number is especially important with online communication over a CAN network (INA2000 protocol).

- 7) The update procedure is started by pressing **Next >**. The update progress is shown in a message window.



User Flash will be deleted.

- 8) When the update procedure is complete, the online connection is automatically established again.
- 9) The PLC is now ready for use.

An operating system update is not only possible through an online connection, but also through a CAN network, serial network (INA2000 protocol) or an ETHERNET network, depending on the system configuration.