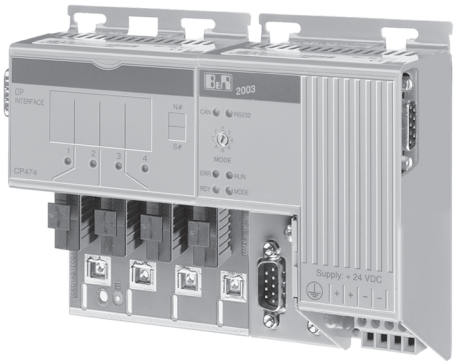
4.12 CP430, CP470, CP474, CP770, CP774

4.12.1 Order Data

CP430, CP470, CP770



CP474, CP774

Model Number	Short Description
7CP430.60-1	2003 CPU, 100 KB SRAM, 256 KB FlashPROM, 24 VDC, 7 W supply, 1 RS232 interface, 1 CAN interface, CAN: electrically isolated, network capable, max. 64 digital / 32 analog I/O points
7CP470.60-1	2003 CPU, 100 KB SRAM, 256 KB FlashPROM, 24 VDC, 14 W supply, 1 RS232 interface, 1 CAN interface, CAN: electrically isolated, network capable, max. 128 digital / 64 analog I/O points
7CP474.60-1	2003 CPU, 100 KB SRAM, 512 KB FlashPROM, 24 VDC, 12.6 W supply, 1 RS232 interface, 1 CAN interface, CAN: electrically isolated, network capable, 4 slots for screw-in modules, max. 208 digital / 80 analog I/O points
7CP770.60-1	2003 CPU, 100 KB SRAM, 256 KB FlashPROM, 100-240 VAC, 14 W supply, 1 RS232 interface, 1 CAN interface, CAN: electrically isolated, network capable, max. 128 digital / 64 analog I/O points
7CP774.60-1	2003 CPU, 100 KB SRAM, 512 KB FlashPROM, 100-240 VAC, 12.6 W supply, 1 RS232 interface, 1 CAN interface, CAN: electrically isolated, network capable, 4 slots for screw-in modules, max. 208 digital / 80 analog I/O points

4.12.2 Technical Data

Module ID	CP430	CP470/CP770	CP474/CP774
General Information			
C-UL-US Listed	in preparation	Yes	Yes
Module Type	B&R 2003 CPU	B&R 2003 CPU	B&R 2003 CPU
Module Width	B&R 2003 single width	B&R 2003 single width	B&R 2003 double width
Module Slot	1	1	1 + 2

Module ID	CP430	CP470/CP770	CP474/CP774
Processor Section			
Command Cycle Time	Average value with 70 % bit and 30 % analog processing		
	1.6 µs	1.6 µs	0.8 µs
Standard Memory User RAM System PROM User PROM	 100 KByte SRAM 256 KByte FlashPROM 256 KByte FlashPROM	 100 KByte SRAM 256 KByte FlashPROM 256 KByte FlashPROM	 100 KByte SRAM 512 KByte FlashPROM 512 KByte FlashPROM
Data Buffering Backup Battery Buffer Current	Lithium battery 3 V / 950 mAh		
Typical Maximum	1.6 µA 60 µA	1.6 µA 60 µA	2.2 µA 110 µA
HW Watchdog	Yes		
Voltage Monitoring	The internal supply is monitored for overvoltage and undervoltage		
Peripheral			
Real-time Clock Resolution	Nonvolatile 1 s		
Status Display	LEDs		
I/O Bus Interface	9 pin D-type socket		
Slots for Screw-in Modules Suitable for IF Modules	No	No	4 1 - 3
Standard Communication Interfaces			
Application Interface IF1 Electrical Isolation Design Max. Distance Max. Baudrate	RS232 No 9 pin D-type plug 15 m / 19200 Baud 115.2 kBaud		
Application Interface IF2 Electrical Isolation Design Max. Distance Max. Baudrate	CAN Yes 9 pin D-type plug 1000 m 500 kBaud		
Power Supply	**CP430**	**CP470/CP474**	**CP770/CP774**
Input Voltage Minimum Nominal Maximum	 18 VDC 24 VDC 30 VDC	 18 VDC 24 VDC 30 VDC	 85 VAC 100 - 240 VAC 264 VAC
Input Voltage Frequency	---	---	47 - 63 Hz
Power Consumption	Max. 9.5 W	Max. 20 W	Max. 20 W
Output Power for I/O Ports	7 W [1)]	14 W [1)] / 12.6 W [1)]	14 W [1)] / 12.6 W [1)]

[1)] Integrated power supply on pin 4 of the RS232 interface for simple PANELWARE controllers, e.g. P120.

4.12.3 Status Display

LED	Meaning
CAN	Data transfer to or from CAN controller
RS232	Indicates if data is being transmitted or received
ERR	Lit in Service mode
RUN	Lit in RUN and in Service mode
RDY	Leuchtet im Service-Modus
MODE	Lit when programming FlashPROM
1, 2, 3, 4	These LEDs show the operating state of the respective screw-in module.
Not lit	Screw-in module defective or not inserted
Blinking slowly	Communication error with screw-in module
Blinking quickly	Screw-in module is new or has been exchanged with another module type
Lit	Screw-in module is ready for operation

4.12.4 Power Supply

The CPUs are either supplied with 24 VDC or with 100 to 240 VAC. The pin assignments are printed on the module.

CP430, CP470, CP474	CP770, CP774
Both + pins are connected and both – pins are connected internally	Both **N** pins are connected and both **L** pins are connected internally
	

4.12.5 Interfaces

The CPU has two interfaces:

CAN RS232

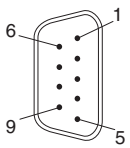
4.12.6 CAN Bus

The electrically isolated standard field bus interface is used for the following tasks:

- Communication with other control systems
- Remote I-O expansion using B&R 2003 components and a CAN bus controller

It is recommended that you use the T-connector AC911 (see Chapter 7 "General Accessories") when coupling to a CAN network. A terminal resistance is integrated into the T-connector for the bus termination, which can be switched on or off.
For more information on wiring CAN field bus systems, see chapter 2, "Project Planning and Installation", section "CAN Field Bus".

9 pin D-type plug

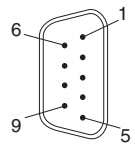


Pin	Assignment
1	n. c.
2	CAN_L
3	CAN_GND
4	n. c.
5	n. c.
6	res.
7	CAN_H
8	n. c.
9	n. c.

4.12.7 RS232 Interface

This non-electrically isolated interface is primarily intended for programming the CPU. The RS232 interface can also be used as a general interface (e.g. P121 visualization, printer, bar code reader, etc.).

9 pin D-type plug



Pin	Assignment	
1	n. c.	Reserved
2	RXD	Receive Signal
3	TXD	Transmit Signal
4	+5 VDC / max. 500 mA	Panel Supply
5	GND	Ground
6	n. c.	Reserved
7	RTS	Request To Send
8	CTS	Clear To Send
9	n. c.	Reserved

4.12.8 MODE Switch

The operating mode is set with the MODE switch. 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.

Switch Position	Description
0	Programming System Flash (see respective section)
1 - 8	Freely available for use in an application (e.g. CAN node number)
9 - E	Reserved for B&R expansions – these settings are **not** allowed to be used!
F	Diagnose mode

4.12.9 Programming System Flash

General Information

The CPUs are delivered with an operating system. The operating system can be updated using the programming system.

An operating system update is possible using PG2000 V 2.41 and higher.

Automation Studio™ Support: See Automation Studio™ Help starting with V 1.40

Operating System Update

When updating the operating system, the following procedure must be followed:

1) Establish online connection between programming device (PC or Industrial PC) and the CPU.
2) Start PG2000 programming system.
3) In PG2000, call the function *PCCSW Update* (see menu item *Service* in the pull-down menu *System*).
4) A dialog box is shown where you can set the transfer rate (baudrate) for the update procedure and the PC interface used for the online connection (e.g. 57600 Baud, COM1).
5) Another dialog box is opened when you select [OK].
6) The operating system version can be selected in this dialog box. After closing this dialog box by selecting [Yes], the system ROM is deleted (incl. operating system). Then the selected operating system version is transferred to the system ROM. The update progress is shown in the message line.

The User Flash will be deleted!

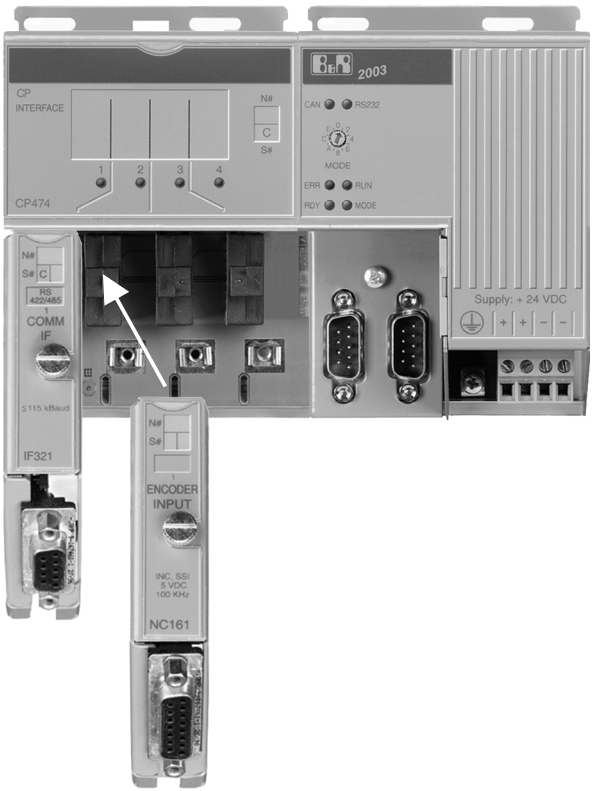
7) Switch PCC off and then on again.
8) The PCC is now ready for use.

The operating system update is not only possible via an online connection, it is also possible via a CAN network or a serial network (INA2000 protocol).

4.12.10 CP Interface

The CPUs CP474 and CP774 are equipped with four slots for screw-in modules. The required screw-in modules are inserted into the CP interface and screwed firmly into place.

The screw-in interface modules can be used with slots 1, 2 and 3.



Overview

The following screw-in modules can be used on the CP Interface.

Module	Type	Description
7AI261.7	Analog IN	1 input to evaluate a full-bridge strain gauge
7AI294.7	Analog IN	4 inputs for potentiometer displacement gauge
7AI351.70	Analog IN	1 x ±10 V or 1 x 0 - 20 mA (1 x ±20 mA also possible) Potentiometer operation
7AI354.70	Analog IN	4 x ±10 V
7AI774.70	Analog IN	4 x 0 - 20 mA (4 x ±20 mA also possible)
7AO352.70	Analog OUT	2 x ±10 V / 0 - 20 mA
7AT324.70	Analog IN	4 x Temperature sensor (PT100, PT1000, KTY10 or KTY84)
7AT352.70	Analog IN	2 x PT100 3-wire
7AT664.70	Analog IN	4 x Thermocouple
7DI135.70	Digital IN	4 x 24 VDC, 50 kHz
7DO135.70	Digital OUT	4 x 12 - 24 VDC, 0.1 A, 100 kHz
7DO164.70	Digital OUT	4 x 48 - 125 VAC, 50 mA, nonvolatile input
7IF311.7	Interface	1 x RS232
7IF321.7	Interface	1 x RS485/RS422
7IF361.70-1	Interface	1 x PROFIBUS DP-Slave
7IF371.70-1	Interface	1 x CAN
7NC161.7	Encoder Module	1 x 100 kHz, 5 / 24 VDC

Commands

The following commands can be used on the CP Interface:

- Reading the screw-in module type
- Switching off automatic mode
- Switching on automatic mode

The commands are described in section "AF101".

4.12.11 Legend Sheets

A legend sheet can be slid into the front of the CPUs CP474 and CP774 from above. These sheets can be used for labelling the screw in modules.

4.12.12 Data/Real-time Clock Buffering

The battery voltage is checked cyclically. 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 from the B&R-TRAP function, "SYS_battery".

4.12.13 System Variable SYS2003

General Information

The system variable SYS2003 is a structure containing the elements "io_scan" and "io_refresh". It must be declared in a task as PCC global.

Element	Variable Type	Description
io_scan	INT16	Duration of the last I/O cycle in µs
io_refresh	INT8	0 .... I/O data is older than one cycle 1 .... I/O data is current

If digital I/O variables are used in the HSTC, the system variable SYS2003 will also be placed in the HSTC. Values in lower task classes will therefore not be consistent. If no digital I/Os are placed in the HSTC, the SYS2003 variable will use the 10 ms operating system clock.

4.12.14 Exchanging the Battery

Battery Data

Lithium Battery	3 V / 950 mAh
Model Number	0AC201.9 (5 lithium batteries)
Storage Time	Max. 3 years at 30 °C
Relative Humidity	0 to 95 % (non-condensing)

Buffer Duration

Buffer Current	CP470 / CP770	CP474 / CP774
Typical	1.6 µA	2.2 µA
Maximum	60 µA	110 µA

B&R recommend changing the batteries after five years of operation.

Procedure

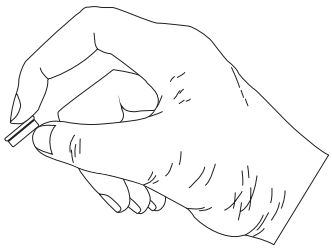
The product design allows battery changing to be carried out with the PCC switched on of off. In some countires, safety regulations do not allow batteries to be changed while the module is switched on.

Data stored in RAM will be lost if the battery is changed with the PCC switched off!

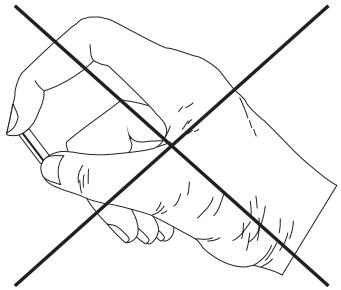
1) Touch the mounting rail or earth connection (not the power supply!) in order to discharge any electrostatic charge from your body.
2) Remove the cover from the lithium battery holder using a screwdriver.

3) Remove the battery from the holder by pulling the removal strip (don't use uninsulated tools -> risk of short circuiting).
The battery should not be held by its edges. **Insulated** tweezers may be used for removing the battery.

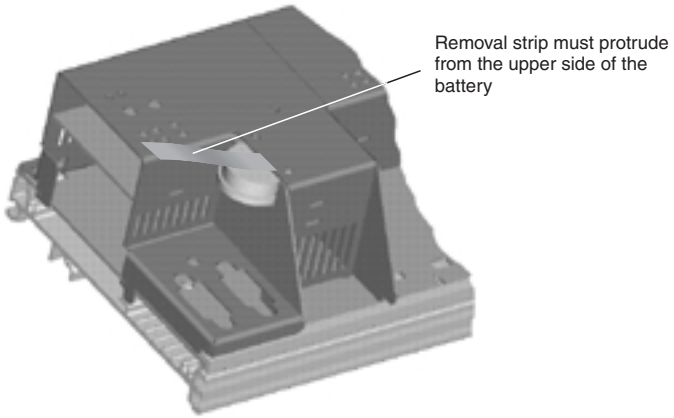
Right:



Wrong:

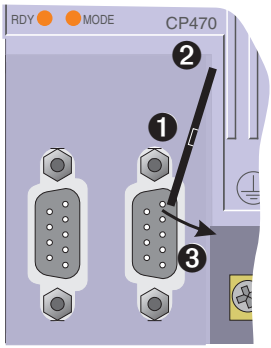


4) Insert the new battery with correct polarity. The removal strip should be protruding from the battery holder and the "+" side of the battery should be facing downward.
In order to be able to remove the battery again in future, the removal strip **must** protrude from the **upper side** of the battery.



5) Now wrap the end of the removal strip over the top of the battery and insert it underneath the battery so that it does not protrude from the battery holder.

6) Replace cover. Ensure that the slot in the edge of the cover faces the front of the module ❶. Insert the upper edge of the cover in the battery holder opening ❷. Press the lower end of the cover home firmly ❸.



Lithium batteries are considered hazardous waste! Used batteries should be disposed of accordingly.