

1.1 CP570

1.1.1 General Information

The CP570 is a powerful B&R SYSTEM 2003 CPU that requires one slot.

It is equipped with an insert slot for aPCI interface modules, a Compact Flash slot for CF memory cards and a floating point unit. An RS232 programming interface, a USB interface and a 10/100 BASE-T ETHERNET interface are available.

The aPCI insert slot for interface modules makes it possible to connect this CPU to different bus and network systems.

The Compact Flash slot allows the size of the memory to be adjusted to suit the memory requirements of diverse applications.

This CPU is especially useful for applications where lower cycle times are required, very large amounts of data must be processed, or for applications using the FPU.

1.1.2 Order Data

Model Number	Short description	Image
	CPU	
7CP570.60-1	2003 CPU, Celeron 300 compatible, 64 MB DRAM, 512 KB SRAM, 24 VDC, 15 W supply, exchangeable application memory: CompactFlash, 1 insert slot for aPCI modules, 1 USB interface, 1 RS232 interface, 1 Ethernet interface 100 Base-T, program memory must be ordered separatly.	
	Required Accessory	
5CFCRD.0032-02	CompactFlash 32 MB ATA/IDE SanDisk	
5CFCRD.0064-02	CompactFlash 64 MB ATA/IDE SanDisk	
5CFCRD.0128-02	CompactFlash 128 MB ATA/IDE SanDisk	
5CFCRD.0256-02	CompactFlash 256 MB ATA/IDE SanDisk	
5CFCRD.0512-02	CompactFlash 512 MB ATA/IDE SanDisk	
5CFCRD.1024-02	CompactFlash 1 GB ATA/IDE SanDisk	
5CFCRD.2048-02	CompactFlash 2 GB ATA/IDE SanDisk	
	Optional Accessory	
4A0006.00-000	Lithium Battery, 3 V / 950 mAh, button cell	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	

Table 1: CP570 Order Data

1.1.3 Technical Data

Product ID	CP570
Short Description	
System Module	CPU
Processor	Celeron 300
Interfaces	1 x RS232, 1 x Ethernet, 1 x USB
Controller	
Typical Instruction Cycle Time	0.018 μ s
Data and Program Code L1 Cache	2 x 16 KB
L2 Cache	128 KB
Standard Memory RAM User RAM	64 MB SDRAM 496 KB SRAM
Remanent Variables	32 KB
FPU	Yes
Integrated I/O Processor	Processes I/O data points in the background
Data Buffering Lithium Battery Battery Monitoring	At least 3 years Yes
Compact Flash Slot	1
Real-Time Clock	Nonvolatile memory, resolution 1 second
Reset Button	Yes
Insert Slots	1 for IF7xx aPCI interface modules
I/O Bus Interface	9-pin DSUB socket
interfaces	
Interface IF1 Type Design Maximum Transfer Rate	RS232 9 pin DSUB connector 115.2 kBit/sec
Interface IF2 Type Design Maximum Transfer Rate	Ethernet RJ45 socket 10/100 MBit/s
Interface IF3	USB Rev. 1.1
Power Supply	
Input Voltage	24 VDC
Voltage Range	20.4 VDC to 30 VDC
Power Input	30 W
Output power for I/O and aPCI modules Horizontal installation Vertical installation	15.0 W at 50° C and 10.0 W at 60° C 15.0 W at 40° C and 10.0 W at 50° C

Table 2: CP570 Technical Data

Product ID	CP570
General Information	
Status Display	CPU function, battery, Compact Flash, RS232, Ethernet
Diagnostics	
CPU Funktion	Yes, with status LED
Battery	Yes, with status LED and software status
Compact Flash	Yes, with status LED
RS232	Yes, with status LED
Ethernet	Yes, with status LED
Certification	CE, C-UL-US (in development), GOST-R
Operation on the Module Slot	1
Maximum Number of Logical Module Slots	18
Maximum Number of Analog Module Slots	9
Possible module addresses for analog modules	1 - 18
Electrical Isolation	
PLC - IF1/IF3	No
PLC - IF2	Yes
IF1/IF3 - IF2	Yes
IF1 - IF3	No
Mechanical Characteristics	
Module Width	System 2003 single-width
Protection	IP20
Operating Temperature	
Horizontal installation	0 °C to +60 °C
Vertical Installation	0 °C to +50 °C
Storage Temperature	-20 °C to +60 °C
Humidity	5 to 95% (non-condensing)
Note	Program memory (CompactFlash) sold separately. Backup battery included in delivery.

Table 2: CP570 Technical Data (cont.)

1.1.4 Further Technical Data

Product ID	CP570
Controller	
Compact Flash Slot	1
Connection	ATA / True IDE
Memory Size	32 MB to 2048 MB (as of 06/2004)
Interfaces	
Maximum Distance	
IF1, RS232	15 m / 19,200 baud
IF2, Ethernet	100 m
General Information	
B&R ID Code	-

Table 3: CP570 Further Technical Data

1.1.5 Status Display

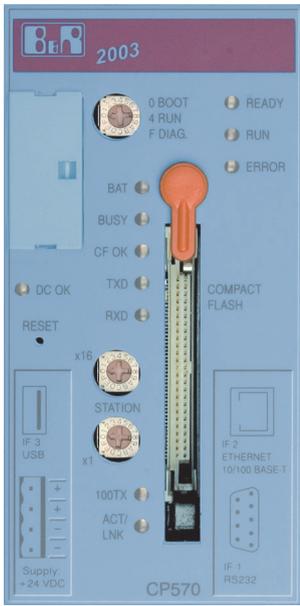
Image	LED	Description	
 <p>The image shows the front panel of the CP570 CPU. At the top left, there is a display showing 'Be' and '2003'. Below this are several status LEDs: '0 BOOT', '4 RUN', and 'F DIAG.' on the left; 'READY', 'RUN', and 'ERROR' on the right. A large orange push-button is labeled 'COMPACT FLASH'. Below the button are LEDs for 'BAT', 'BUSY', 'CF OK', 'TXD', and 'RXD'. Further down are 'DC OK', '100TX', and 'ACT/LNK'. At the bottom left, there are ports for 'IF 3 USB' and 'Supply +24 VDC'. At the bottom right, there are ports for 'IF 2 ETHERNET 10/100 BASE-T' and 'IF 1 RS232'. A 'RESET' button is also visible.</p>	READY	CPU is active	
	RUN	Application running	
	ERROR	SERVICE Mode	
	BAT	CPU battery empty or not present	
	BUSY	CompactFlash BUSY	
	CF OK	CompactFlash OK	
	TXD	Data being sent - RS232	
	RXD	Data being received - RS232	
	DC OK	Supply voltage OK	
	100TX	10/100 MBaud Ethernet	
	ACT/LNK	Ethernet activity/link	

Table 4: CP570 Status Display

1.1.6 Operational and Connection Elements

All operational and display elements can be accessed from the front, as can the insert slot for aPCI interface modules, the slot for program memory and the battery compartment. The connector for the RS232 interface, the RJ45 socket for the ETHERNET interface and the USB interface are found in the sloped section on the bottom of the module.

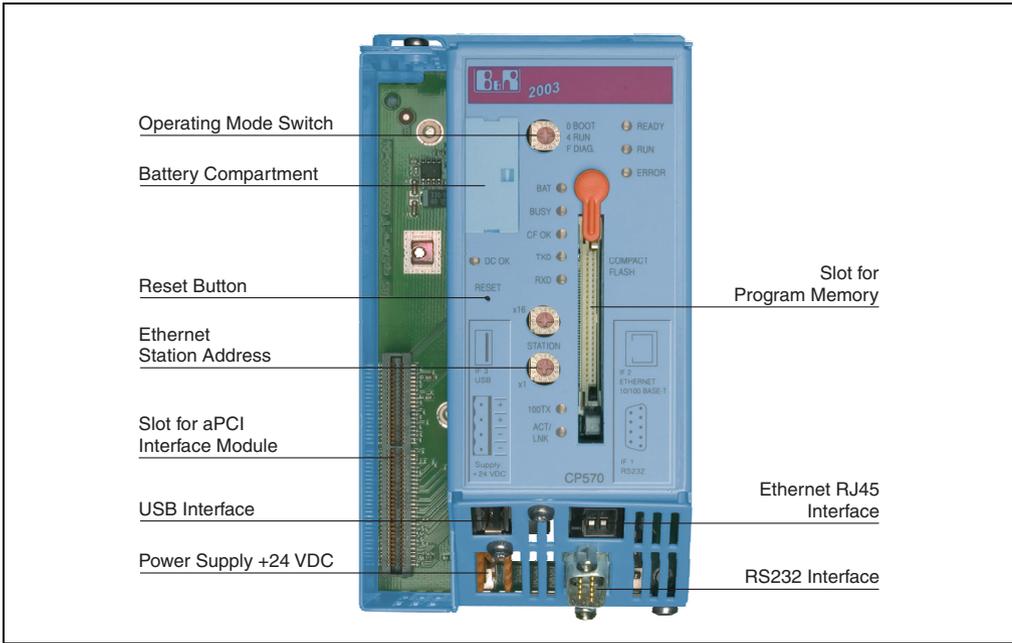


Figure 1: CP570 operational and connection elements

1.1.7 Power Supply

The CPU CP570 is supplied with 24 VDC. Both + pins and both ⊥ pins are connected to each other internally.

4-Pin Terminal Block	Terminal	Assignment
	1	+24 VDC
	2	+24 VDC
	3	⊥
	4	⊥

Table 5: CP570 Power Supply

1.1.8 Slot for Program Memory

Program memory is required to operate the CPU. The program memory is CompactFlash. It is not included with the delivery of the CPU, instead it must be ordered as an accessory.

1.1.9 Reset Button

The reset button can be pressed with any small pointed object (e.g. paper clip). Pressing the reset button triggers a hardware reset, which means:

- All application programs are stopped.
- All outputs are set to zero.

The PLC then goes into SERVICE mode.

1.1.10 Operating Mode Switch

The CPU is equipped with a hex switch which acts as an operating mode switch.

Switch Position	Operating Mode	Description
\$0	Boot	In this switch position the default B&R Automation Runtime™ (AR) is started, and the runtime system can be installed using the online interface (B&R Automation Studio™). User Flash is deleted after the download begins.
\$4	Run	RUN Mode
\$F	Diagnostics	The CPU boots in Diagnostics mode. Program sections in User RAM and User FlashPROM are not initialized. After diagnostics mode, the CPU always boots with a warm restart .

Table 6: CP570 Operating Modes

1.1.11 RS232 Interface (IF1)

The RS232 interface is not electrically isolated. It can be used as an online interface for communicating with the programming device.

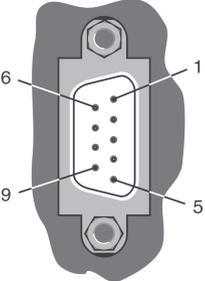
Interface	Description	Pin Assignments		
<p>PG interface RS232</p>  <p>9-pin DSUB connector</p>	<p>The RS232 interface operates as an online interface.</p> <p>Online connection to the PG is achieved using a standard RS232 cable that is available from B&R:</p> <p>Module ID RS232 Cable Model No. 0G0001.00-090</p> <p>Max. baud rate: 115.2 KB Max. cable length: 15 m</p>	RS232		
		1	DCD	Data Carrier Detect
		2	RXD	Receive Signal
		3	TXD	Transmit Signal
		4	DTR	Data Terminal Ready
		5	GND	Ground
		6	DSR	Data Set Ready
		7	RTS	Request To Send
		8	CTS	Clear To Send
		9	RI	Ring Indicator

Table 7: CP570 RS232 Interface (IF1)

1.1.12 ETHERNET Interface (IF2)

IF2 is an ETHERNET interface. The connection is made using a 10/100 BASE-T Twisted Pair RJ45 socket in the sloped section on the bottom of the module.

The INA2000 station number for the ETHERNET interface is set with both hex switches.

Information:

The onboard ETHERNET interface is not suitable for ETHERNET Powerlink.

1.1.13 USB Interface (IF3)

The IF3 is a USB interface. The connection is made using a USB interface for Rev. 1.1 in the sloped section on the bottom of the module.

The USB interface can only be used for devices which have been released by B&R (e.g. floppy disk drive, DiskOnKey or dongle).

Information:

The USB interface (IF3) cannot be used as an online communication interface.

1.1.14 Insert Slot

The CPU is equipped with an insert slot for aPCI interface modules.

The B&R SYSTEM 2003 can be connected to various bus or network systems using plug-in interface modules.

The following aPCI interface modules can be operated presently in the CPUs:

Module	Description
3IF722.9	aPCI interface module, 1 RS422/RS485 interface, electrically isolated and network capable, 1 RS485 interface, electrically isolated and network capable, 1 CAN interface
3IF761.9	aPCI interface module, 1 PROFIBUS DP interface, electrically isolated and network capable, 1 RS232 interface
3IF762.9	aPCI interface module, 1 PROFIBUS DP interface, electrically isolated and network capable, 1 RS422/RS485 interface, electrically isolated and network capable
3IF771.9	aPCI interface module, 1 CAN interface
3IF772.9	aPCI interface module, 1 RS232 interface, 2 CAN interfaces
3IF779.9	aPCI interface module, 1 RS422/RS485 interface, electrically isolated and network capable, 1 CAN interface, 1 X2X Link Master interface, electrically isolated. Order TB704 terminal blocks separately.
3IF781.9	aPCI interface module, 1 Ethernet interface 10/100 Base-T
3IF782.9	aPCI interface module, 1 RS485 interface, electrically isolated and network capable, 1 ETHERNET Powerlink interface, manager or controller function
3IF786.9	aPCI interface module, 1 ETHERNET Powerlink interface, manager or controller function, 1 RS232 interface
3IF787.9	aPCI interface module 1 ETHERNET Powerlink interface, manager or controller function, 1 CAN interface , max. 500 kbps, object buffer in send and receive direction, network capable, electrically isolated. Order TB704 terminal blocks separately.
3IF789.9	aPCI interface interface module, 1 ETHERNET Powerlink interface, manager or controller function, 1 X2X Link Master interface, electrically isolated. Order TB704 terminal block separately.
3IF791.9	aPCI interface module, 1 X2X Link Master interface, electrically isolated. Order TB704 terminal block separately.
3IF792.9	aPCI interface interface module, 1 RS232 interface, 2 X2X Link Master interfaces, electrically isolated. Order TB704 terminal block separately.
3IF797.9	aPCI interface interface module, 1 RS232 interface, 1 CAN interface, 1 X2X Link Master interface, electrically isolated. Order TB704 terminal block separately.

Table 8: CP570 aPCI Interface Module Inserts

1.1.15 Data / Real-time Buffering

The following areas are buffered:

- Remanent Variables
- User RAM
- System RAM
- Real-Time Clock

Buffering is achieved using the lithium battery in the CPU.

Battery Monitoring

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 system library function "BatteryInfo".

Battery Change Interval

The battery should be changed every 4 years. The change interval refers to the average life span and operating conditions and is recommended by B&R. It does not correspond to the maximum buffer duration.

1.1.16 Changing the Lithium Battery

The CPU is equipped with a lithium battery. The lithium battery is placed in a separate compartment and protected by a cover.

Buffer battery data

Model Number 4A0006.00-000 0AC201.9	1 piece 5 piece
Short description	Lithium battery, 3 V / 950 mAh, button cell
Storage Temperature	-20 to +60°C
Storage Time	Max. 3 years at 30°C
Humidity	0 to 95 % (non-condensing)

Table 9: CP570 Buffer Battery Data

The product design allows the battery to be changed with the PLC switched either on or off. In some countries, safety regulations do not allow batteries to be changed while the module is switched on. To prevent data loss, the battery must be changed within 1 min. with the power off.

Procedure for Changing the Battery

- 1) Touch the mounting rail or ground 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.

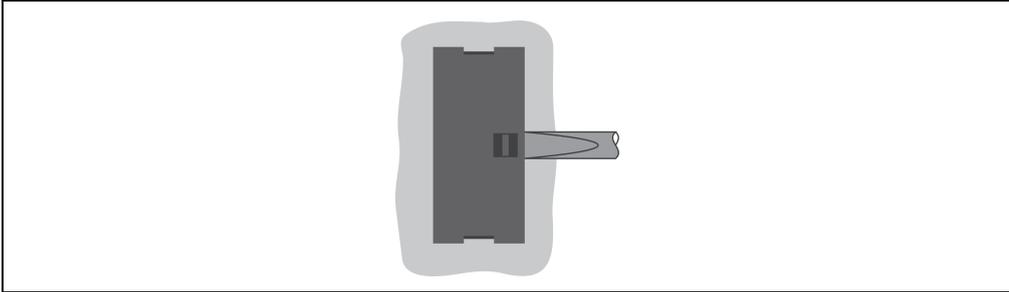


Figure 2: Removing the CP570 cover for the lithium battery

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

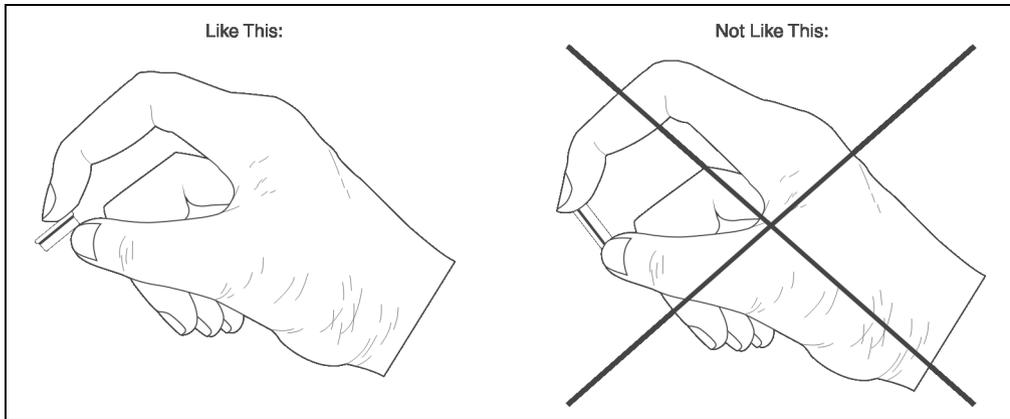


Figure 3: Correct grip for the CP570 battery

- 4) Insert the new battery with correct polarity. The removal strip should be pulled to the right of the battery holder and the "+" side of the battery should be facing left. In order to be able to remove the battery again in future, the removal strip **must** be on the right side of the battery.

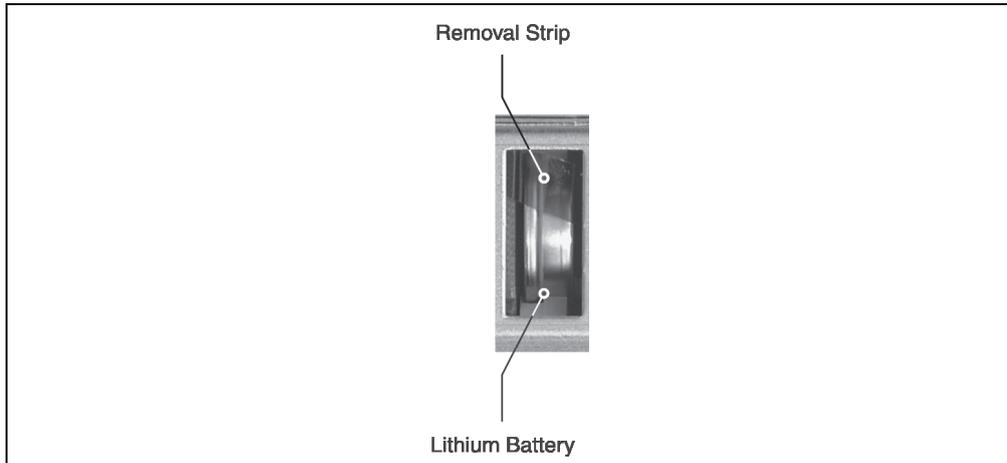


Figure 4: CP570 removal strip should be pulled to the right

- 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. Insert the lower edge of the cover in the battery holder opening. Press the upper end of the cover home firmly.

Information:

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

1.1.17 Programming System Flash

General Information

The CPU is delivered with a default B&R Automation Runtime™ (with limited functions) already installed. This runtime system is started in boot mode (operating mode switch position 0). It initializes and operates the serial RS232 onboard interface, allowing a runtime system download via INA2000 protocol.

This runtime system download is carried out during the commissioning of the CPU. The runtime system is stored in the program memory (CompactFlash) of the processor. A runtime system update can be carried out later.

A runtime system download or update is made using the programming system (starting with B&R Automation Studio™ V2.1).

Runtime System Download

When installing the runtime system (runtime system download) the following procedure must be carried out:

- 1) Turn off power to the PLC.
- 2) A runtime system download is only possible if the processor is in boot mode. To do this, the operating mode switch must be turned to 0.
- 3) Switch on the power supply again.
- 4) Establish an online connection between the programming device (PC or Industrial PC) and the CPU. A runtime system download is only possible using the serial RS232 onboard interface.
- 5) Start B&R Automation Studio™.
- 6) Start the download procedure by selecting **Services** from the **Project** menu. Select **Transfer Operating System...** from the menu shown. Follow the instructions from B&R Automation Studio™.
- 7) 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 download. Otherwise, modules can also be downloaded using a later application download.

Pressing **Next >** brings the user to a control box where the current settings are displayed.

- 8) The download procedure is started by pressing **Next >**. Download progress is shown in a message window.

Information:

The User Flash is cleared.

- 9) The operating mode switch must be turned to 4 when the download procedure is completed.
- 10) Turn PLC off and then on again.
- 11) The PLC is now ready for use.

Runtime System Update

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. To do this, the operating mode switch must be turned to 4.
- 2) Switch on the power.
- 3) Establish online connection (online cable) between the programming device (PC or Industrial PC) and the CPU. An online runtime system update is only possible using the CPU interfaces.
- 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.

Pressing **Next** > brings the user to a control box where the current settings are displayed.

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

Information:

The User Flash is cleared.

- 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.

