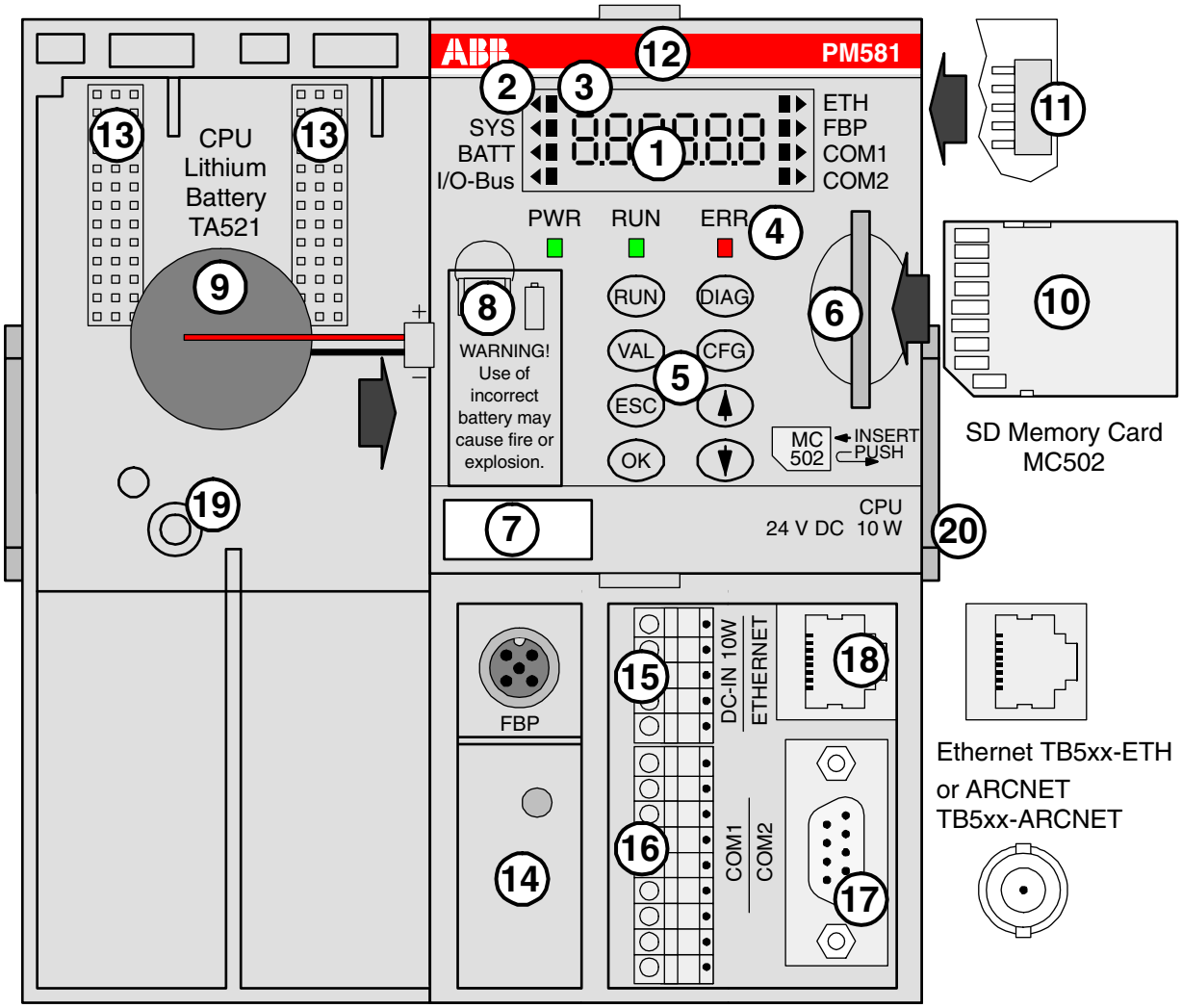
Technical data

Connection of the 24 V DC process voltage	with a 5-pole removable terminal block
Slots	TB511: 1 CPU, 1 communication module
	TB521: 1 CPU, 2 communication modules
	TB541: 1 CPU, 4 communication modules
Interfaces	I/O-Bus, COM1, COM2, FBP
Networking interfaces	TB5xx-ETH: Ethernet
	TB5xx-ARCNET: ARCNET
Connection system	see AC500 system data
Dimensions	for details see AC500 system data
Width x height x depth (with CPU inserted)	TB511: 95.5 x 135 x 75 mm
	TB521: 123.5 x 135 x 75 mm
	TB541: 179.5 x 135 x 75 mm
Weight	TB511: xxx g
	TB521: 215 g
	TB541: xxx g
Mounting position	horizontal or vertical

Ordering data

Order No.	Scope of delivery
1SAP 111 100 R0170	TB511-ETH, CPU Terminal Base AC500, slots: 1 CPU, 1 communication module, Ethernet RJ45 connector
1SAP 112 100 R0160	TB521-ARCNET, CPU Terminal Base AC500, slots: 1 CPU, 2 communication modules, ARCNET COAX connector
1SAP 112 100 R0170	TB521-ETH, CPU Terminal Base AC500, slots: 1 CPU, 2 communication modules, Ethernet RJ45 connector
1SAP 114 100 R0170	TB541-ETH, CPU Terminal Base AC500, slots: 1 CPU, 4 communication modules, Ethernet RJ45 connector
1SAP 212 200 R0001	TU515, I/O Terminal Unit, 24 V DC, screw-type terminals
1SAP 212 000 R0001	TU516, I/O Terminal Unit, 24 V DC, spring terminals
1SAP 217 200 R0001	TU531, I/O Terminal Unit, 230 V AC, relays, screw-type terminals
1SAP 217 000 R0001	TU532, I/O Terminal Unit, 230 V AC, relays, spring terminals

AC500 CPUs PM571, PM581, PM582, PM590 and PM591
- PM5xx-ETH: CPU with network interface Ethernet RJ45
- PM5xx-ARCNET: CPU with network interface ARCNET BNC



Elements of the CPU

1 Six 7-segment status displays with background lighting
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Pushbuttons
6 Slot for the SD Memory Card
7 Label
8 Compartment for the Lithium battery
9 Lithium battery TA521
10 SD Memory Card MC502

Elements of the CPU Terminal Base

11 I/O-Bus (10-pole, female) to electrically connect the first I/O Terminal Unit
12 Slot for the CPU (CPU is mounted)
13 Slots for couplers (max. 4)
14 Interface for FieldBusPlug
15 Supply for 24 V DC
16 Serial interface COM1
17 Serial interface COM2
18 Network interface (Ethernet or ARCNET)
19 Holes for wall mounting
20 DIN rail

Figure: CPU PM581-ETH plugged on a Terminal Base TB521

The CPUs PM571, PM581, PM582, PM590 and PM591 are the central units (basic units) of the control system Advant Controller 500 (AC500). The types differ in their performance (memory size, speed etc.). Each CPU must be mounted on a suitable Terminal Base. The Terminal Base type depends on the number of communication modules (couplers) which are used together with the CPU and on the CPU-

own network interface type (Ethernet or ARCNET). At the right side of the CPU, up to 7 I/O expansion modules can be attached.

If both of the following conditions are fulfilled, **max. 10 I/O expansion modules can be connected to the I/O-Bus of the CPU:**
- PS501 as of version V1.2
- CPUs as of firmware V1.2.0

The CPUs have several interfaces.

Note: Mounting, disassembling, electrical connection and dimensioned drawings for the Terminal Bases, CPUs, communication modules, I/O Terminal Units and the I/O expansion modules are described in detail in the AC500 system data chapters.

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Short description

Important: Currently, the AC500 CPU can only be used as slave together with the PROFIBUS DP **"Modular"** FBP V0/V1 (order No. 1SAJ 240 100 R10xx) and the corresponding GSD file ABB_091F.GSD.

Hardware configuration

Each CPU can operate up to 4 couplers through its coupler interface. The couplers are mounted on the left side of the CPU on the same Terminal Base. On the right side of the CPU, up to 7 digital or analog I/O expansion modules can be attached which are automatically interconnected by the I/O-Bus. Each of these modules requires its own I/O Terminal Unit, whose type depends on the module type.

If both of the following conditions are fulfilled, **max. 10 I/O expansion modules can be connected to the I/O-Bus of the CPU:**
- PS501 as of version V1.2
- CPUs as of firmware V1.2.0

Terminal Bases, Terminal Units, I/O modules, couplers and accessories have their own technical descriptions which can be found under "Hardware AC500" and "Hardware S500".

Each CPU can be used as

- bus master within the control system AC500 together with several field buses and networkings
- slave (remote processor together with the FieldBusPlug) within the control system AC500
- stand-alone CPU

The CPUs are powered with 24 V DC.

CAUTION: Removal of energized modules is not permitted. All power sources (supply and process voltages) must be switched off while working on any AC500 system.

The following figure shows a CPU with Terminal Base, couplers and I/O modules.

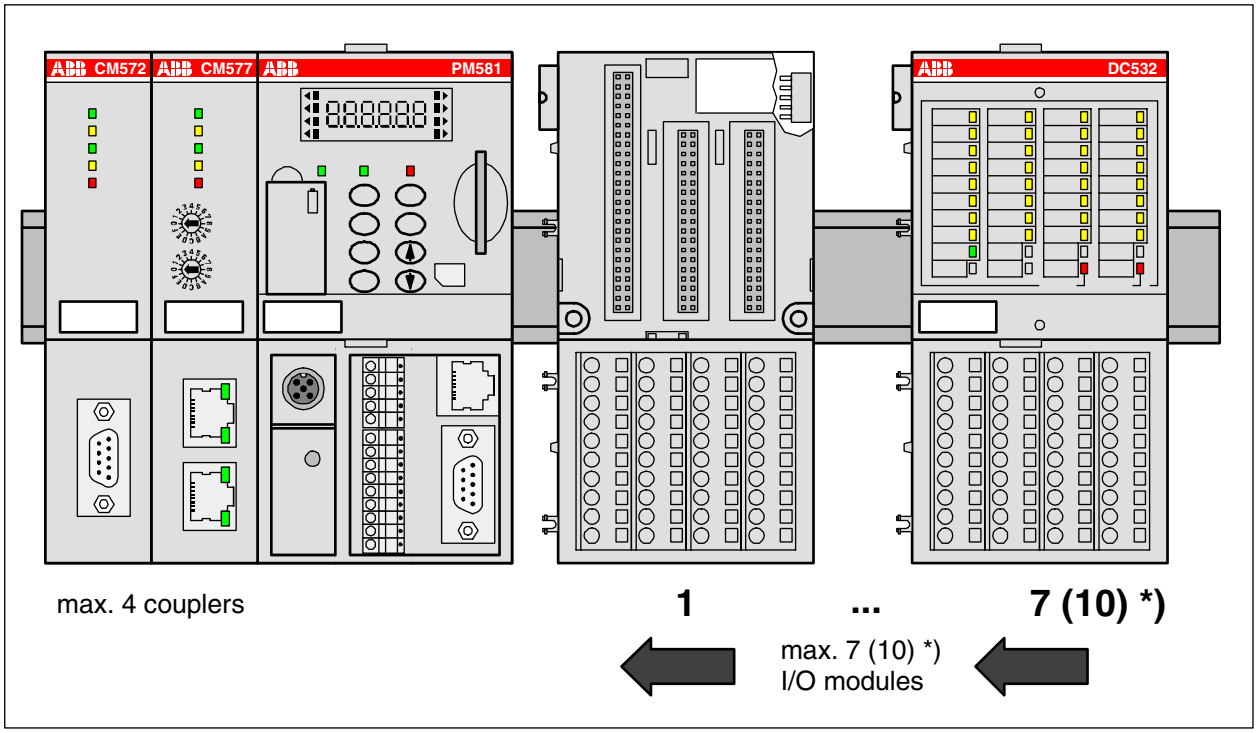


Figure: CPU with Terminal Base, couplers and I/O modules

***)** If both of the following conditions are fulfilled, **max. 10 I/O expansion modules can be connected to the I/O-Bus of the CPU:**
- PS501 as of version V1.2
- CPUs as of firmware V1.2.0

Assortment

CPUs

CPU	Program memory	Cycle time for 1000 instructions	Network interface		Other interfaces	Suitable Terminal Bases
			Ether-net	ARC-NET		
PM571	64 kB	Binary: 0.3 ms Word: 0.3 ms Floating point: 6 ms			Serial interfaces COM1 and COM2, FBP, coupler interface, I/O-Bus	TB5xx-xx
PM571-ETH			yes			TB5xx-ETH
PM581	256 kB	Binary: 0.15 ms Word: 0.15 ms Floating point: 3 ms				TB5xx-xx
PM581-ETH			yes			TB5xx-ETH
PM581-ARCNET				yes		TB5xx-ARCNET
PM582	512 kB					TB5xx-xx
PM582-ETH			yes			TB5xx-ETH
PM590	2 MB	Binary: 0.02 ms Word: 0.01 ms Floating point: 0.02 ms				TB5xx-xx
PM590-ETH			yes			TB5xx-ETH
PM590-ARCNET				yes		TB5xx-ARCNET
PM591	4 MB					TB5xx-xx
PM591-ETH			yes			TB5xx-ETH
PM591-ARCNET				yes		TB5xx-ARCNET

For further information see Technical data and Ordering data

Terminal Bases

Number of slots

Terminal Base	TB511	TB521	TB541
Slots for CPUs	1	1	1
Slots for communication modules	1	2	4

Terminals and interfaces

Terminal Base	TB511-		TB521-		TB541-	
available = (x)	ETH (x)	ARCNET	ETH (x)	ARCNET (x)	ETH (x)	ARCNET
Connection						
I/O-Bus	I/O interface for directly adding up to 7 I/O Terminal Units *)					
Power supply	5-pole removable terminal block					
COM1	serial interface, 9-pole removable terminal block					
COM2	serial interface, 9-pole SUB-D connector (female)					
Network interface (type must be equal to the type of the used CPU)	Ethernet RJ45	ARCNET BNC	Ethernet RJ45	ARCNET BNC	Ethernet RJ45	ARCNET BNC
FBP interface	Fieldbus-neutral slave interface (M12, 5-pole, male, fastening with screw)					

***)** If both of the following conditions are fulfilled, **max. 10 I/O expansion modules can be connected to the I/O-Bus of the CPU:**
- PS501 as of version V1.2
- CPUs as of firmware V1.2.0

Connections

I/O-Bus

The I/O-Bus is the I/O data bus for the S500 expansion modules. Through this bus, I/O and diagnosis data are transferred between the AC500 CPU and the I/O expansion modules. Up to 7 I/O Terminal Units (for 1 I/O expansion module each) can be added to one Terminal Base.

If both of the following conditions are fulfilled, **max. 10 I/O expansion modules can be connected to the I/O-Bus of the CPU:**
- PS501 as of version V1.2
- CPUs as of firmware V1.2.0

The I/O Terminal Units have a bus input at the left side and a bus output at the right side. Thus the length of the I/O-Bus increases with the number of the I/O expansion modules used.

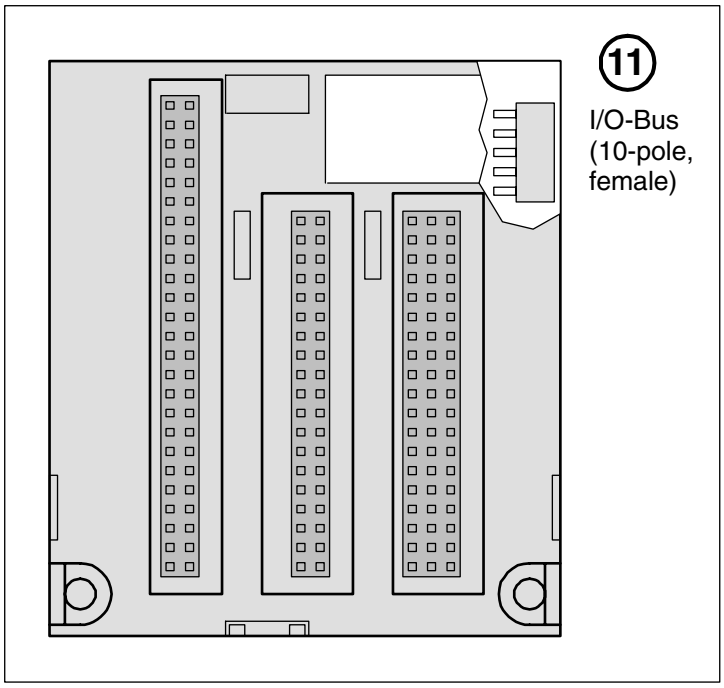
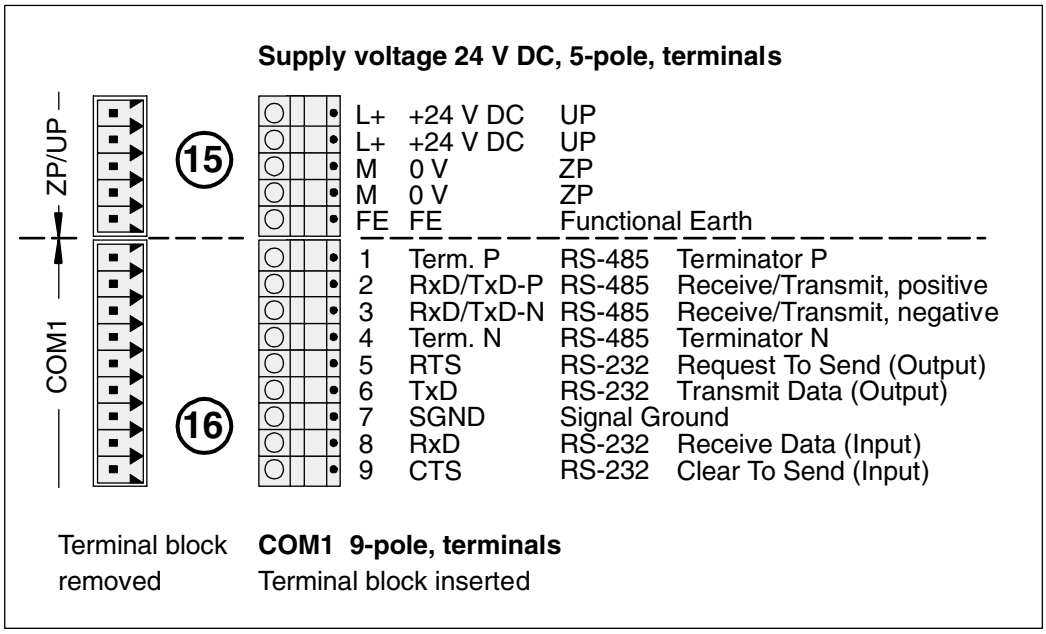


Figure: I/O-Bus

Power supply

The supply voltage of 24 V DC is connected to a 5-pole removable terminal block. ZP and UP exist twice. So it is possible to supply external sensors from these terminals, for instance.

Important: Exceeding the maximum power supply voltage (>30 V DC) for process or supply voltages could lead to unrecoverable damage of the system. The system could be destroyed.



Figure, upper part: Power supply via a 5-pole terminal block
Figure, lower part: Terminal assignment of the serial interface COM1

Bad wiring on power supply terminals

Attention: The product should be installed by trained people who have the knowledge of wiring electronic devices. In case of bad wiring, although the modules are protected against various errors (reverse polarity, short circuit, etc.), some problems could always happen:

- On the CPU Terminal Base, the terminals L+ and M are doubled. If the power supply is badly connected, a short circuit could happen and lead to a destruction of the power supply or its fuse. If no suitable fuse exists, the Terminal Base itself could be destroyed.

- The CPUs (Terminal Bases) and all electronic modules (and Terminal Units) are protected against reverse polarity.

- All necessary measures should be carried out to avoid damages to modules and wiring. Notice the wiring plans and connection examples.

Serial interface COM1 (for terminal assignment see the figure above)

The serial interface COM1 is connected to a removable 9-pole terminal block. It is configurable for RS-232 and RS-485 and can be used for

- an online access (RS-232 programming interface for PC/Control Builder)
- a free protocol (communication via the function blocks COMSND and COMREC)
- Modbus RTU, master and slave or
- a CS31 system bus (RS-485), as master only

A detailed description for COM1 can be found under "Hardware AC500 / System data / System data and System construction / Serial interface COM1 or Serial interfaces".

Serial interface COM2

The serial interface COM2 is connected to a 9-pole SUB-D connector. It is configurable for RS-232 and RS-485 and can be used for

- an online access (RS-232 programming interface for PC/Control Builder)
- a free protocol (communication via the function blocks COMSND and COMREC)
- MODBUS RTU, master and slave

COM2 is not intended to establish a CS31 system bus.

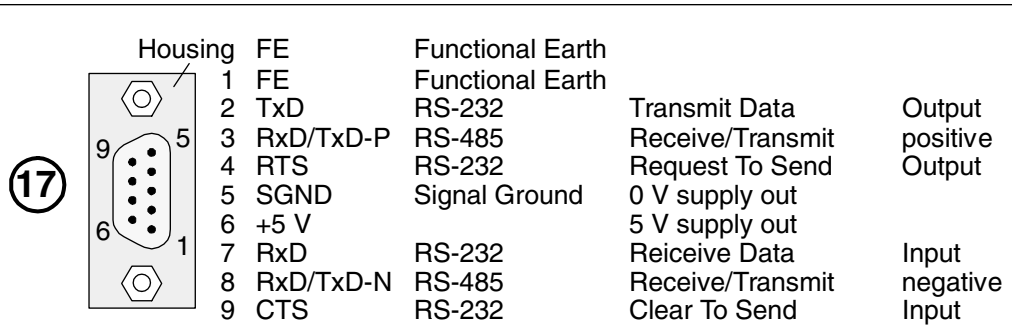


Figure: Pin assignment of the serial interface COM2

A detailed description for COM2 can be found under "Hardware AC500 / System data / System data and System construction / Serial interface COM2 or Serial interfaces".

Network interface Ethernet

This interface is the connection to the internal Ethernet coupler of the CPUs PM5xx-ETH. Applications are:

- TCP/IP for PC/Control Builder (programming)
- UDP (communication via function blocks ETH_UDP_SEND and ETH_UDP_REC)
- Modbus on TCP/IP (Modbus on TCP/IP, master and slave)

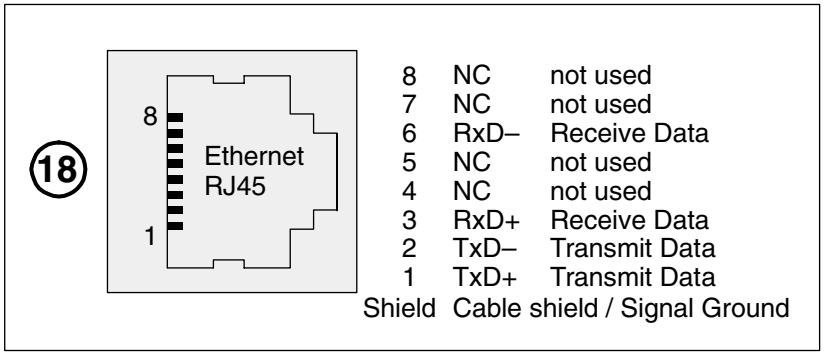


Figure: Pin assignment of the Ethernet interface

Network interface ARCNET

This interface is the connection to the internal ARCNET coupler of the CPUs PM5xx-ARCNET.

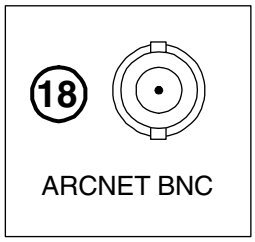


Figure: ARCNET interface

FBP interface

Through this 5-pole fieldbus-neutral interface, the AC500 CPU can be connected **as a slave** to a fieldbus master. The FieldBusPlug is fastened by a screw.

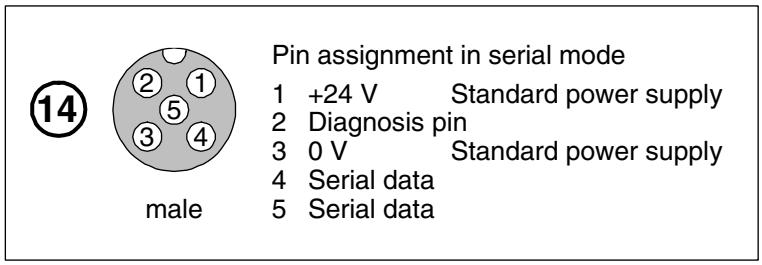


Figure: Pin assignment of the FBP interface

Technical data

The system data of AC500 and S500 are valid here. Only additional details are therefore documented below.

General data of the CPUs and the Terminal Bases

For more information, please refer to the "AC500 System Data" chapters.

Connection of the supply voltage 24 V DC at the Terminal Base of the CPU	at a 5-pole removable terminal block with spring connection
Current consumption from 24 V DC	PM571: 50 mA PM571-ETH: 110 mA
	PM581: 50 mA PM581-ETH: 110 mA PM581-ARCNET: 110 mA
	PM582: 50 mA PM582-ETH: 110 mA
	PM59x: 90 mA PM59x-ETH: 150 mA PM59x-ARCNET: 150 mA
Inrush current at 24 V DC	PM571: 1 A^2s PM571-ETH: 1 A^2s
	PM581: 1 A^2s PM581-ETH: 1 A^2s PM581-ARCNET: 1 A^2s
	PM582: 1 A^2s PM582-ETH: 1 A^2s
	PM59x: 1 A^2s PM59x-ETH: 1 A^2s PM59x-ARCNET: 1 A^2s
Max. power dissipation within the module	10 W
Slots on the Terminal Bases	TB511: 1 CPU, 1 communication module
	TB521: 1 CPU, 2 communication modules
	TB524: 1 CPU, 4 communication modules
CPU interfaces at the Terminal Bases	I/O-Bus, COM1, COM2, FBP
CPU network interfaces at the Terminal Bases	TB5xx-ETH / PM5xx-ETH: Ethernet
	TB5xx-ARCNET / PM5xx-ARCNET: ARCNET
Connection system	see AC500 system data
Dimensions	further details see AC500 system data
Width x height x depth	TB511 with CPU: 95.5 x 135 x 75 mm
	TB521 with CPU: 123.5 x 135 x 75 mm
	TB541 with CPU: 179.5 x 135 x 75 mm
Weight (CPU without Terminal Base)	PM571: 135 g PM571-ETH: 150 g
	PM581: 135 g PM581-ETH: 150 g PM581-ARCNET: 160 g
	PM582: 135 g PM582-ETH: 150 g
	PM59x: 135 g PM59x-ETH: 150 g PM59x-ARCNET: 160 g
Mounting position	horizontal or vertical with derating (50 % output load, reduction of temperature to 40°C)

Detailed data of the CPUs

CPU	PM571	PM571 -ETH	PM58x	PM58x -ETH	PM581-ARCNET	PM59x	PM59x -ETH	PM59x-ARCNET
Program memory Flash EPROM and RAM	64 kB		PM581: 256 kB PM582: 512 kB			PM590: 2048 kB PM591: 4096 kB		
Data memory, integrated	24 kB, incl. 4 kB RETAIN		288 kB, incl. 32 kB RETAIN			PM590: 2048 kB, PM591:3072 kB, incl. 512 kB RETAIN		
Expandable memory	none		none			none		
Pluggable SD Memory Card for: - User data storage - Program storage - Firmware update	128 MB		128 MB			128 MB		
Cycle time for 1000 instructions - Binary - Word - Floating point	 0.3 ms 0.3 ms 6.0 ms		 0.15 ms 0.15 ms 3.0 ms			 0.05 ms 0.05 ms 0.5 ms		
Max. number of central inputs and outputs (up to 7 exp. modules): - Digital inputs - Digital outputs - Analog inputs - Analog outputs	 224 168 112 112		 224 168 112 112			 224 168 112 112		
Max. number of central inputs and outputs (up to 10 exp. modules): *) - Digital inputs - Digital outputs - Analog inputs - Analog outputs	 320 240 160 160		 320 240 160 160			 320 240 160 160		
Number of decentralized inputs and outputs	depends on the used field bus (as an info on the CS31 bus: up to 31 stations with up to 120 DI / 120 DO each)							
Data backup	battery		battery			battery		
Data buffering time at 25°C	about 3 years							
Battery low indication	warning indication issued about 2 weeks before the battery charge becomes critical							
Real-time clock - with battery back-up	X		X			X		
Program execution - cyclic - time-controlled - multitasking	 X X X		 X X X			 X X X		
Protection of the user program by a password	X		X			X		
Serial interface COM1 - Physical link: - Connection: - Usage:	configurable for RS-232 or RS-485 (from 0.3 to 187.5 kB/s) pluggable terminal block, spring connection for programming, as Modbus (master/slave), as serial ASCI communication, as CS31 master							
Serial interface COM2 - Physical link: - Connection: - Usage:	configurable for RS-232 or RS-485 (from 0.3 to 187.5 kB/s) SUB-D connector for programming, as Modbus (master/slave), as serial ASCI communication							
Integrated coupler, ETH = Ethernet RJ45 ARCNET = ARCNET BNC		ETH		ETH	ARCNET		ETH	ARCNET

Number of external couplers	up to 4 communication couplers like PROFIBUS DP, Ethernet, CANopen, DeviceNet. There is no restriction concerning the coupler types and coupler combinations (e.g. up to 4 PROFIBUS DP couplers are possible)		
LEDs, LCD display, 8 function keys	for RUN/STOP switch-over, status displays and diagnosis		
Number of timers	unlimited	unlimited	unlimited
Number of counters	unlimited	unlimited	unlimited
Programming languages - Instruction List IL - Function Block Diagram FBD - Ladder Diagram LD - Sequential Function Chart SFC - Continuous Function Chart (CFC)	 X X X X X	 X X X X X	 X X X X X
Certifications	CE, GL, DNV, BV, RINA, LRS, cUL		

***)** If both of the following conditions are fulfilled, **max. 10 I/O expansion modules can be connected to the I/O-Bus of the CPU:**
- PS501 as of version V1.2
- CPUs as of firmware V1.2.0

Ordering data

Order No.	Scope of delivery
1SAP 130 100 R0100	PM571, CPU, memory 64 kB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display
1SAP 130 100 R0170	PM571-ETH, CPU, memory 64 kB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display, integrated coupler Ethernet TCP/IP
1SAP 140 100 R0100	PM581, CPU, memory 256 kB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display
1SAP 140 100 R0160	PM581-ARCNET, CPU, memory 256 kB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display, integrated coupler ARCNET
1SAP 140 100 R0170	PM581-ETH, CPU, memory 256 kB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display, integrated coupler Ethernet TCP/IP
1SAP 140 200 R0100	PM582, CPU, memory 512 kB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display
1SAP 140 200 R0170	PM582-ETH, CPU, memory 512 kB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display, integrated coupler Ethernet TCP/IP
1SAP 150 000 R0100	PM590, CPU, memory 2 MB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display
1SAP 150 000 R0160	PM590-ARCNET, CPU, memory 2 MB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display, integrated coupler ARCNET
1SAP 150 000 R0170	PM590-ETH, CPU, memory 2 MB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display, integrated coupler Ethernet TCP/IP
1SAP 150 100 R0100	PM591, CPU, memory 4 MB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display
1SAP 150 100 R0160	PM591-ARCNET, CPU, memory 4 MB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display, integrated coupler ARCNET
1SAP 150 100 R0170	PM591-ETH, CPU, memory 4 MB, 24 V DC, Memory Card Slot, interfaces 2 x RS-232/485 (programming, Modbus/CS31), 1 x FBP, Display, integrated coupler Ethernet TCP/IP
1SAP 180 300 R0001	TA521, Lithium Battery
1SAP 180 100 R0001	MC502, SD Memory Card 128 MB
1SAP 180 200 R0001	TK501, Programming cable SUB-D / SUB-D, length: 5 m
1SAP 180 200 R0101	TK502, Programming cable terminal block / SUB-D, length: 5 m
1SAP 180 800 R0001	TA526, Wall Mounting Accessory
1SAP 111 100 R0170	TB511-ETH, CPU Terminal Base AC500, slots: 1 CPU, 1 communication module, Ethernet RJ45 connector
1SAP 112 100 R0160	TB521-ARCNET, CPU Terminal Base AC500, slots: 1 CPU, 2 communication modules, ARCNET COAX connector
1SAP 112 100 R0170	TB521-ETH, CPU Terminal Base AC500, slots: 1 CPU, 2 communication modules, Ethernet RJ45 connector
1SAP 114 100 R0170	TB541-ETH, CPU Terminal Base AC500, slots: 1 CPU, 4 communication modules, Ethernet RJ45 connector
1SAP 212 200 R0001	TU515, I/O Terminal Unit, 24 V DC, screw-type terminals
1SAP 212 000 R0001	TU516, I/O Terminal Unit, 24 V DC, spring terminals
1SAP 217 200 R0001	TU531, I/O Terminal Unit, 230 V AC, relays, screw-type terminals
1SAP 217 000 R0001	TU532, I/O Terminal Unit, 230 V AC, relays, spring terminals