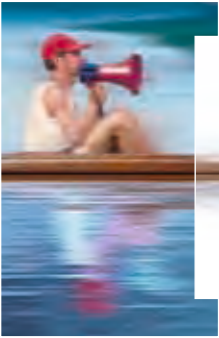


AC500 – the scalable PLC for customized automation

Technical information



The scalable AC500 PLC – flexible, cost-efficient, future-friendly

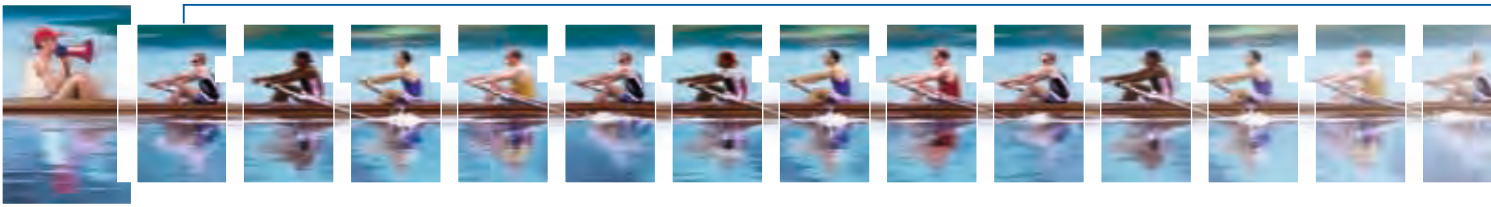
Customers' requirements met to perfection

Simple, consistent expandability, flexible when choosing a field bus, and designed for future market trends – those are some of the demands made on an automation platform, particularly in the mechanical engineering sector, but in plant engineering as well. These needs have been worked out in a close dialog with customers and end-users. And now, they have been realized in the design and high functionality of the new scalable AC500 PLC.

Parallel connection to several buses

The new AC500 consists of different devices that can be combined and flexibly expanded to suit the customer's individual requirements. It is also possible, for instance, to operate several field buses simultaneously in any desired combination with a single control system. Customers can choose between different CPU performance classes, which can even be easily replaced subsequently to meet increasing requirements. Our common engineering tool AC500 Control Builder provides standardized programming of the entire platform according to IEC 61131-3, as well as further features and utilities.





Guarantees your safe investment in future

Besides the high performance capabilities of the system regarding handling, reliability and ease of maintenance, also the long-term availability of the chosen system plays a decisive role: Your safe investment must be ensured in future. With the new AC500, ABB offers a modern high-performance platform which is suitable for future-oriented automation concepts and open for new trends and market requirements.

AC500 – the first choice everywhere

The AC500 is an optimum selection for applications like the following:

- packaging machines
- plastics machines
- printing presses
- crane engineering
- energy optimization
- building engineering
- pumping installations
- marine engineering
- wind power installations
- air-conditioning/refrigeration systems
- tunnel construction
- ...



Everything you need for switching and control

Flexible choice of the field bus

Flexibility in the choice of a field bus without needing to replace any field devices: That's the basic idea behind the field bus plug (FBP). Thanks to this intelligent plug connector, field devices „become“ field-bus-neutral. Thus, changing the field bus (often due to end-user's wishes), only requires the replacement of the plug connector itself – the field devices and terminal wiring can be retained.

The FBP is the link to a communicative series of switching and automation components, which can thus be combined with standard field bus systems in the easiest way.

Bus-neutral field devices:

Circuit-breaker



Universal Motor Controller

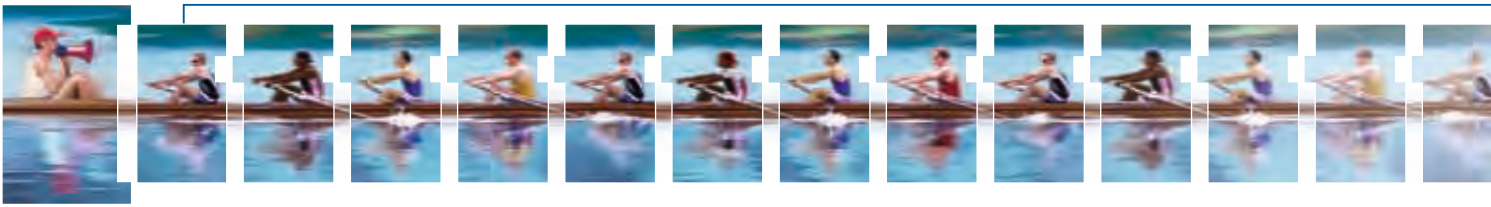


Motor Starter



AC500 Slave





Complete product portfolio

ABB offers a complete range of low-voltage devices from one source: PLC, devices for switching and protection, such as soft starters, contactors, and circuit-breakers, up to standard sensors. Many of these ABB components have already been integrated into the innovative system concept involved. Examples here include the UMC22-FBP Universal Motor Controller for effective motor protection and particularly user-friendly motor control, the interactive circuit-breakers Tmax T4, T5, the PSS soft starter and the wireless proximity switch. With the AC500, the FBP product range has been extended by field-bus-neutral I/O modules and a CPU which can also be used as a field bus slave via the FBP.



S500 remote I/Os

Soft Starters

Wireless Automation



Clear advantages thanks to clear structures

Flexibility as program

Thanks to its scalability, the AC500 PLC can be adapted to the most different automation tasks: The devices concerned can be used and combined in a flexible way. The number of different parts to be kept in stock is correspondingly minimized.

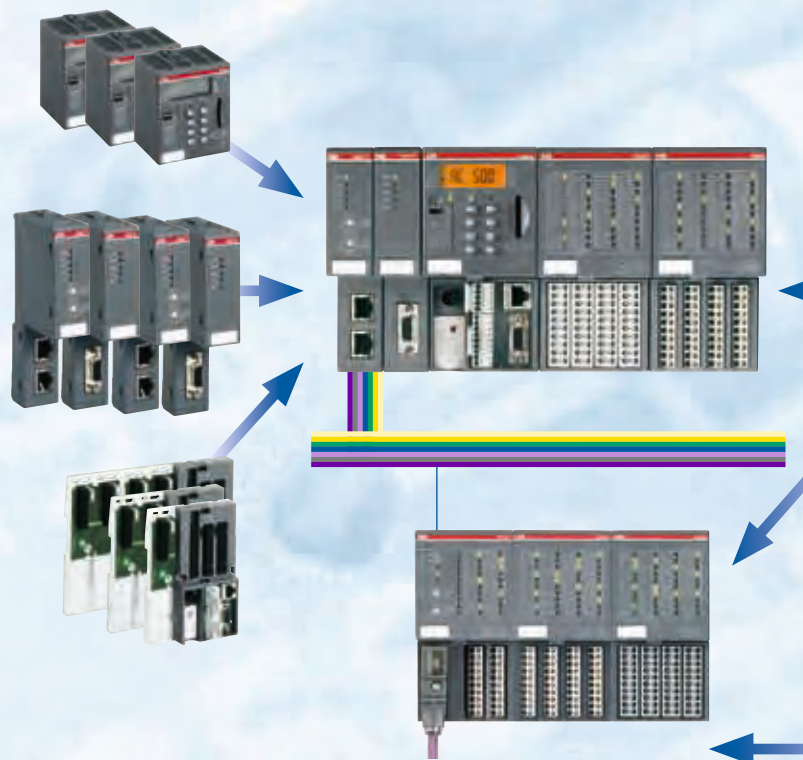
The AC500's system architecture

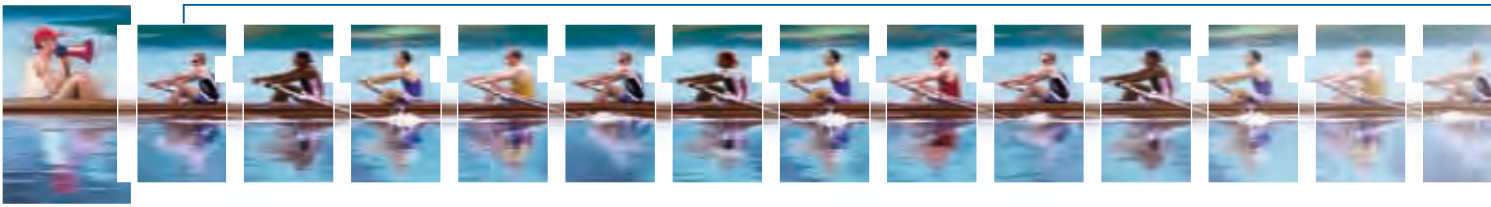
The CPUs

are available in the performance classes PM571, PM581 and PM591, can all be programmed in five different languages, and provide an LCD display, an operator keypad, an SD card slot, and two integrated serial interfaces. The CPUs can be simply plugged onto the CPU terminal base. Optionally, they are also available with integrated Ethernet or ARCNET.

The communication modules

For connection to standard field bus systems and integration into existing networks. Up to four communication modules in any desired combination are allowed at one CPU, resulting in a high degree of communication.





The CPU terminal base

Available in three different versions, enables easy plugging of the CPU and one, two or four communication modules.

The I/O modules

Digital and analog in different versions.

Can be simply plugged onto the terminal units – for local expansion of the CPU (max. seven modules) and decentralized expansion via the FBP interface. Flexible use thanks to configurable channels.

The terminal units

Multi-purpose usage for both digital and analog I/Os, for 1, 2 and 3-wire designs. Enable simple prewiring without electronics. For 24 V DC and 230 V AC, optionally for spring or screw-type terminals.

The FBP interface module

With embedded digital I/Os and a field-bus-neutral interface for connecting the chosen FBP connector. For decentralized expansion by up to seven I/O modules.

The SD card

Optional for data logging, downloading and uploading the user program without a PC or a firmware update for all devices (CPU, couplers or I/O modules).



- 1 Back-lighted LCD display and keypad
- 2 SD card slot
- 3 Plug-in communication modules (1 to max. 4)
- 4 Optionally with integrated Ethernet or ARCNET
- 5 FBP interface (for slave)
- 6 Two serial interfaces for programming, ASCII, Modbus or CS31 field bus (master)
- 7 Expandable by up to seven local I/O modules

AC500 grows to meet requirements

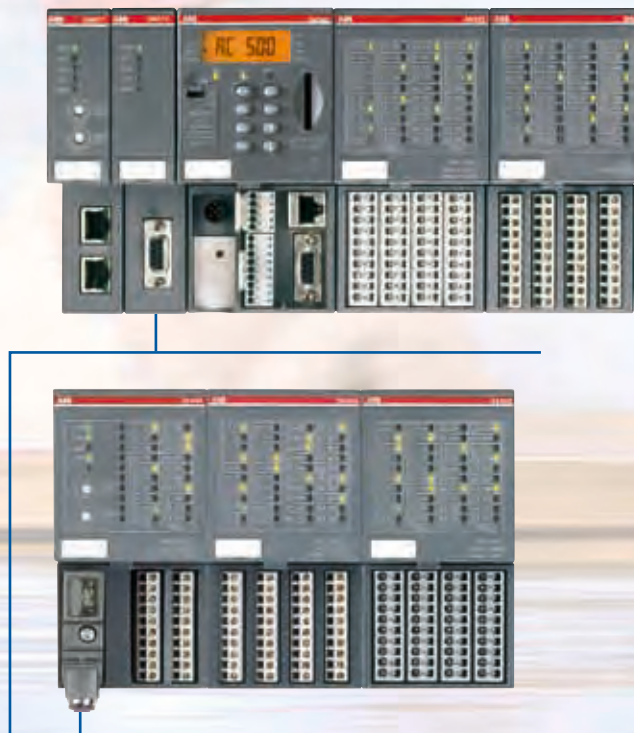
Control + communication:

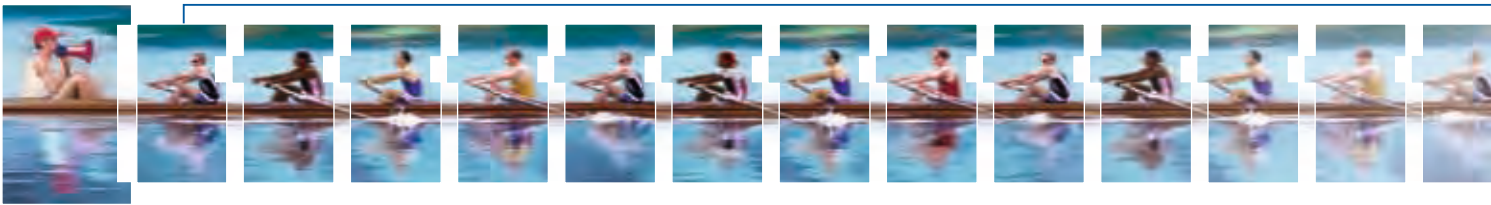


Centralized expansion:

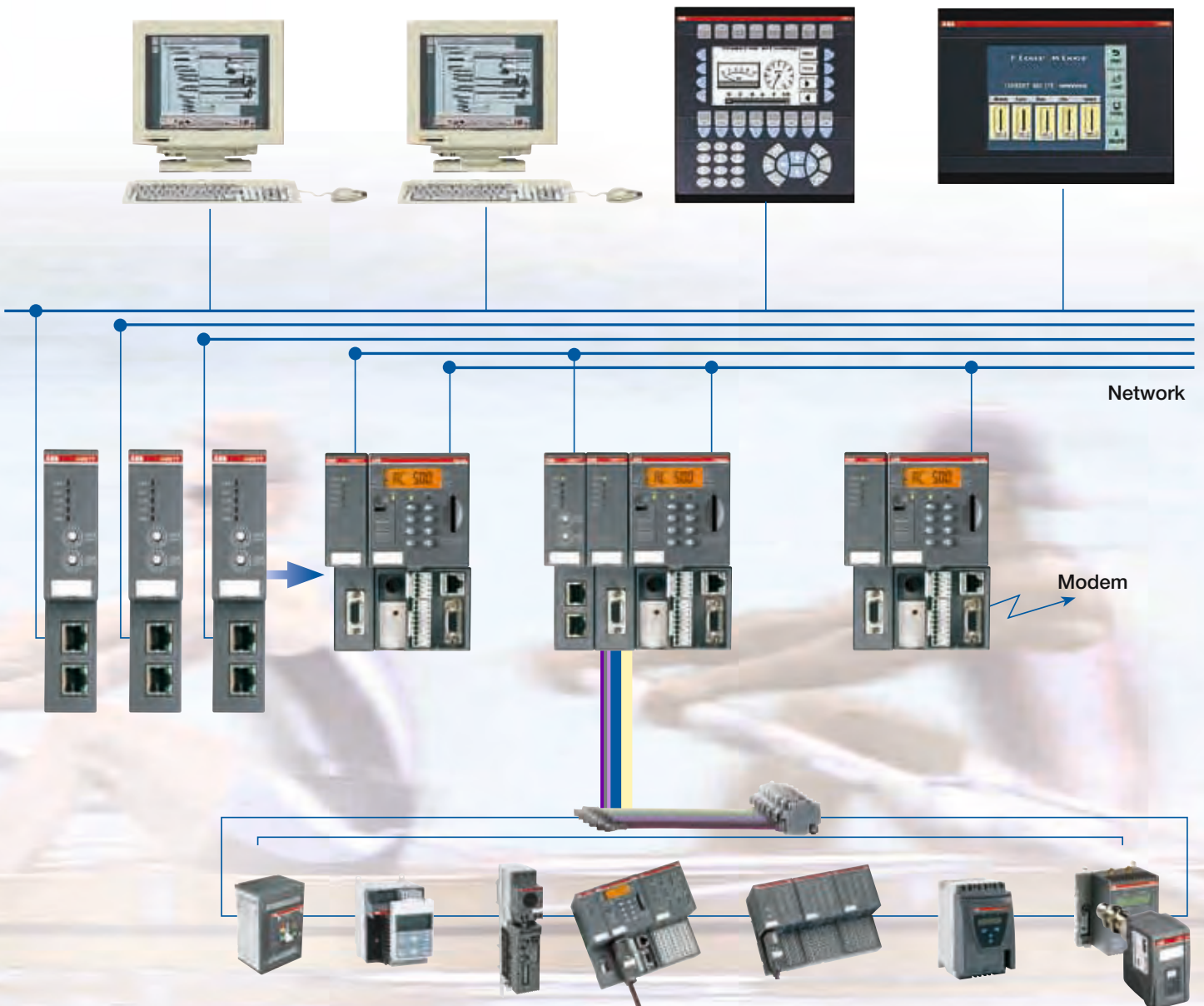


Decentralized expansion:





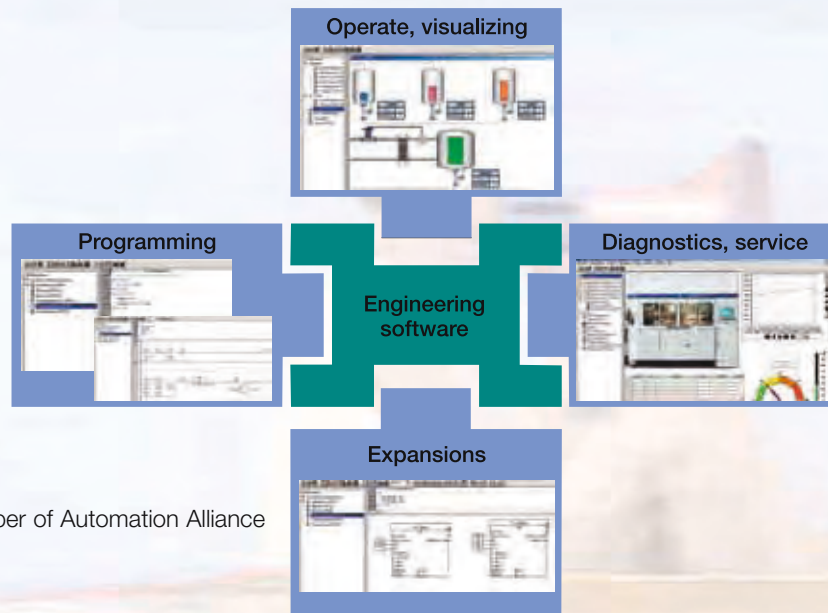
Networked and communicative



Programming

Control Builder AC500

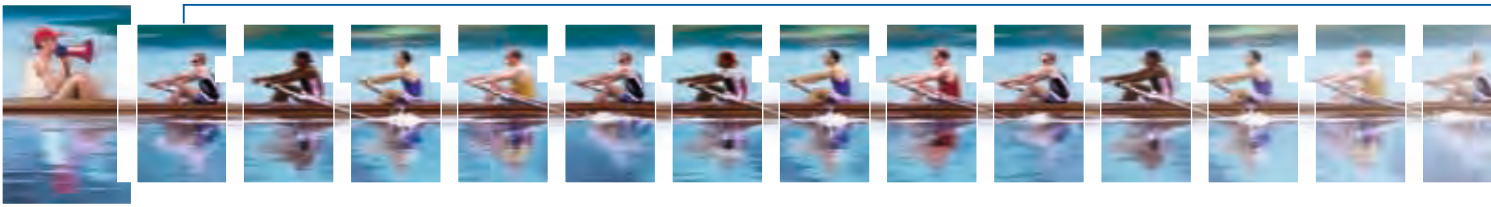
Control Builder AC500 is the engineering tool for all CPU performance classes of the AC500, designed for standardized IEC 61131-3 programming in five different languages. Other features of this tool are: Configuration of the overall system including field buses and interfaces, extensive diagnostic functions, alarm handling, integrated visualization and open software interfaces.



Programming in conformity with IEC 61131-3

Besides the suitable hardware, a high-performance, user-friendly and convenient engineering tool is indispensable for simple planning, programming, testing and commissioning of an automation application. AC500 Control Builder provides the following functionalities:

- Five standardized programming languages:
 - Function Block Diagram (FBD), Instruction List (IL), Ladder Diagram (LD), Structured Text (ST), Sequential Function Chart (SFC)
- Free graphical function chart (CFC)
- Debugging functions for the program test:
 - Single step
 - Single cycle
 - Breakpoint



Offline simulation

IEC 61131-3 commands can be simulated without a PLC being connected, including the relevant mal-functions. After the program test, the application can be downloaded to the control system.

Sampling trace

Timing diagrams for process variables and storage of data in a ring buffer with event trigger.

Recipe management and watch lists

Values of selected variables are displayed. Pre-defined values can be assigned to variables which can then be downloaded to the control system all at once ("Write recipe"). Ongoing values from the control system can also be pre-assigned for reading into the Watch and Recipe Manager, and stored in memory there ("Read recipe).

These functions are also helpful, for example, for setting and entering control parameters.

Visualization

Includes color change, moving elements, bitmaps, text display, allows input of setpoint values and display of process variables read from the PLC, dynamic bar diagrams, alarm and event management, function keys and ActiveX elements.

Configurators of the communication interfaces

For PROFIBUS DP, CANopen, DeviceNet, Ethernet, Modbus and CS31.

Open interfaces

DDE and OPC.

Programming

Serial or via Ethernet or ARCNET networks.

Engineering interface

Provides access from the programming system to an external project database in which the program source code of one or several automation projects is managed. Optionally, a version control system, such as Visual Source Safe, can be used in order to ensure data consistency of the program code for several different users and projects.

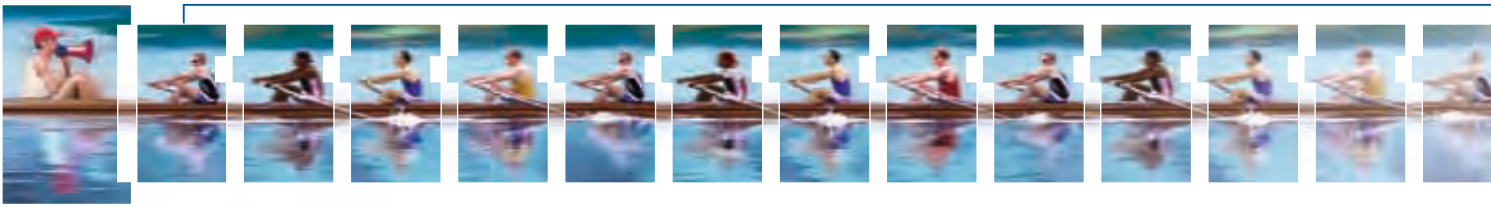
- Comprehensive libraries.
- Windows 32-bit standard.
- Operating systems Windows NT, 2000 and XP.

CP500 – the operator interfaces

Obvious man-machine communication

The AC500 offers as well an extensive range of products for communication between operator and machine. There are many different displays to choose from, which satisfy application-specific demands regarding required operator actions and information density. Whether it's a simple device for displaying text, a graphic-capability device or a touch-panel with color display, the entire range of control terminals meets the requirements for maximized transparency and efficiency for the automation task.





Simple handling

Users can communicate with the AC500's CPUs via the various operator panels, read and write access on device data is possible.

Configuration is quick and easy to perform, using the same software for all devices. Commands and programming languages are identical for all devices. With regard to frequently harsh conditions at the place of installation, all operator panels fulfill IP65 protection at the front.

Operator panels and automation devices are linked either simply via serial interfaces, or in case of complex applications via Ethernet, Modbus or PROFIBUS DP.

Functionalities in line with demand

Depending on the used device type, the operator panels feature the following functions:

- real-time clock
- alarm management in several different groups
- trend curves and datalogger
- recipe management
- report printouts
- password protection
- Flash memory up to 1600 kB



Communication – Ethernet

Ethernet

Ethernet operates with a data rate of 10 MBit/s and as Fast-Ethernet with 100 MBit/s. Ethernet utilizes the producer/consumer

EtherNet™

model. This means that every station possesses equal rights. While it is transmitting, all other stations listen in and accept the data directed to them. Bus access is regulated by the CSMA/CD procedure (Carrier-Sense Multiple-Access with Collision Detection), where each station may autonomously transmit when the bus is free. If a collision occurs, if two stations begin to transmit simultaneously, both of them will stop transmission and wait for a randomly determined time before they transmit again. Ethernet defines the Layers 1 (Physical Link) and 2 (Data Link) of the OSI model.

The AC500 supports transmission and reception of data using TCP/IP and/or UDP/IP. Further application layers can be implemented by subsequent loading. Simultaneous operation of TCP/IP, UDP/IP and application layer is also assured. The IP, TCP, UDP, ARP, RP, BOOTP, and DHCP protocols are supported as a standard feature, as application layer Modbus/TCP.

Topology

Star- or ring-shaped using Ethernet hub or switch.

Data transmission

Max. 10 MB/s with 10 Base T and max. 100 MB/s with Fast-Ethernet.

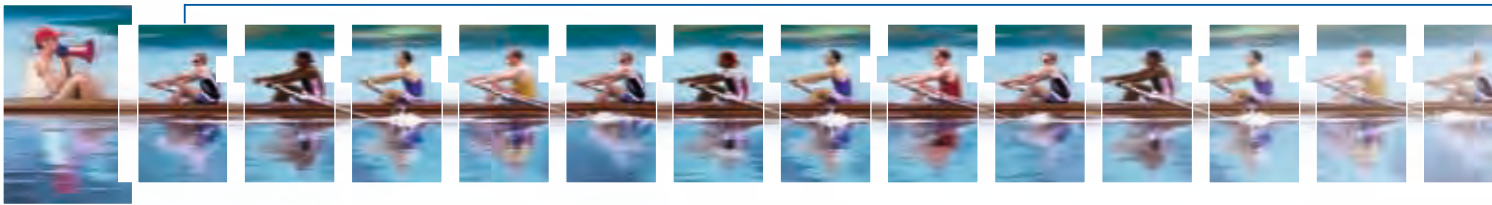
Transmission media

Twisted-pair cables with RJ45 connector. The maximum cable length is 100 m for 100 MB/s.

Diagnostics

Detailed diagnostic messages for rapid troubleshooting are shown on the CPU display.

In addition, the device status is indicated at the communication module by four LEDs.



Ethernet - Functionality at a glance

| Ethernet functionality | AC500 CPU with integrated Ethernet interface | AC500 with communication module CM577-ETH | S500 I/Os with bus interface DC505-FBP |
|-------------------------------|---|--|--|
| Protocols supported | | | No Ethernet interface available |
| Modbus TCP/IP | yes (client/server), up to 8 client/server connections simultaneously. Supported functions: 1, 2, 3, 4, 5, 6, 7, 15, 16 | | |
| Ethernet TCP/IP | for programming only, not for communication | | |
| UDP/IP | yes, using special function blocks and with ABB header | | |
| BOOTP | yes | | |
| DHCP | yes | | |
| ARP | yes | | |
| ICMP | yes | | |
| Associated libraries | for Modbus/TCP and UDP/IP communication | | |
| Diagnosis | | | |
| Error indication | on LCD display of the CPU | using LED's on the communication modul CM577-ETH | |
| Online diagnosis | using SYCON.net tool (part of programming software) | | |
| Error code | yes | | |
| Physical layer | | | |
| Connection | RJ45 10Base-T oder 100Base-TX | | |
| Baud rate | 10 / 100 Mbit/s | | |
| Number of sockets | up to 16 | | |
| Ethernet switch integrated | no | yes | |
| Configuration | using SYCON.net tool (part of programming software) | | |
| Station address configuration | using display and keypad of CPU | using rotary switches | |

Communication – PROFIBUS DP

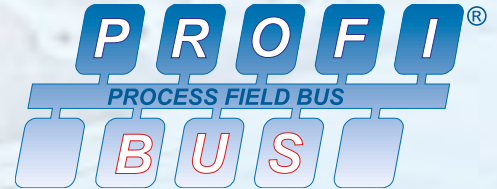
PROFIBUS DP

(Process Field Bus - Decentral Periphery)

PROFIBUS DP is an open, high-speed and widely-used field bus.

It provides multi-master and master-slave communication in the field

area. This field bus can accordingly be used for AC500 and AC31 control system series and for field-bus-neutral FBP devices (decentralized I/Os and intelligent switching devices) via the PROFIBUS-FBP connector.



Communication

The masters rule data traffic on the bus. When in possession of the bus access authorization (token), the masters can transmit data without an external request. The passive devices, known as slaves, do not receive any bus access rights; they acknowledge messages received, or respond to a query from a master. Baud rates from 9.6 kBaud to 12 MBaud are supported. A maximum of 126 devices can be operated on the bus.

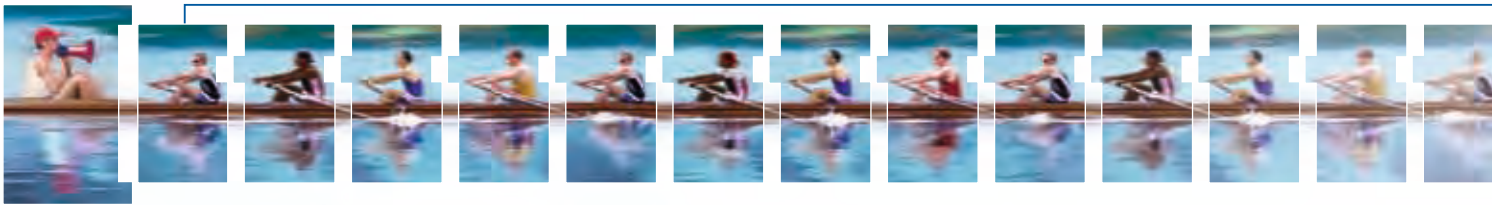
Data exchange

This is handled predominantly in cyclical mode between master and slave. The requisite communication functions have been specified by the PROFIBUS DP

basic functions in accordance with EN 50170. Each master has full write and read access to its assigned slaves, but only read access to the slaves assigned to other bus masters. There is no direct data exchange between masters. Acyclical services (DP-V1) for parameterization and diagnostics between master and slave are also available. This is performed in parallel to the master's cyclical user data traffic.

Diagnostics

Detailed diagnostic messages for rapid troubleshooting are shown on the CPU display. In addition, the device status is indicated at the communication module by four LEDs.



PROFIBUS DP - Functionality at a glance

| Profibus DP functionality | AC500 CPU with CM572-DP | AC500 CPU with Profibus FieldBusPlug (FBP DPV1) | S500 I/Os with bus interface DC505-FBP and Profibus FieldBusPlug (FBP DPV1) |
|---|---|---|---|
| Profibus master | yes | no | no |
| Multi master | yes, bus access via token | no | no |
| Profibus slave | no | yes | yes |
| Protocols supported | | | |
| Profibus DP V0 | yes | yes | yes |
| Profibus DP V1 with service MSAC1_read (read data) + MSCA1_write (write data) | yes | no | yes |
| Diagnosis | | | |
| Error indication | using LEDs on the communication module CM572-DP | on LCD display of the CPU | using LEDs on FBP and on bus interface module |
| Online diagnosis | using SYCON.net tool (part of programming software) | yes | using SYCON.net tool (part of programming software) |
| Error code | yes | no | no |
| Associated function blocks | yes | no | no |
| Physical layer | | | |
| Connection | 9-polig D-Sub | M12 FBP (standard) | |
| Baud rate | up to 12 Mbit/s | | |
| Distance | up to 1200 m at 90 kbit/s | | |
| Max. number of subscribers | 126 subscribers max. (via amplifier) and max. 32 subscribers (master/slave devices) per bus segment | | |
| Configuration | | | |
| Using GSD file | using SYCON.net tool (part of programming software) | using SYCON.net tool (part of programming software), if another AC500 is the master | |
| Station address configuration | yes, using the specific GSD file of the slave device | yes, using the AC500 GSD file | |
| Station address configuration | no | using display and keypad of CPU (99 max.) | using rotary switches (99 max.) |

Communication – Modbus®

Modbus® RTU (developed by Modicon in 1979)

Modbus® RTU is an open master/slave protocol, and can be easily implemented on serial interfaces.

Numerous automation systems have Modbus® RTU interfaces as standard or optional features, and are thus easily able to communicate with the AC500 via its integrated COM1 and COM2 interfaces (RS232 or RS485).

The Modbus® is used not only in industrial applications, but also in building installations, in energy optimization systems, for long-distance data transmission and for linking up operator panels.

Communication

By polling, i.e. the master transmits a request to the slave and then receives the response. Both interfaces COM1 and COM2 can operate simultaneously as Modbus interfaces. The Modbus operating mode of an interface is set using the engineering tool.

Topology

Point-to-point via RS232 or multi-point via RS485. With RS232, a maximum of one master and one slave is possible, while with RS485 one master and a maximum of 31 slaves can be operated. The maximum cable length is 15 m with RS232 and 1.2 km with RS485.

Data transfer

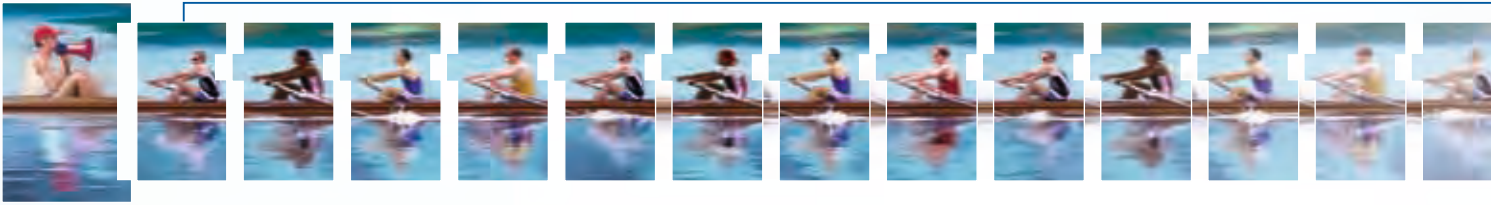
Max. 115.2 kB/s. Each telegram has a 16-bit CRC appended. The telegrams permit process data (input/output data) to be written and read, either individually or in groups. The data are packed in the RTU format.

Transmission media

May vary. One widely used option is the RS485 bus physics, a twisted-pair, shielded cable with terminators.

Diagnostics

Detailed diagnostic messages for rapid trouble-shooting are shown on the CPU display.



Modbus - Functionality at a glance

| Modbus functionality | AC500 CPU with integrated Modbus interface | S500 I/Os with bus interface DC505-FBP |
|-------------------------------|---|--|
| Master or slave at COM1 | yes | No Modbus interface available |
| Master or slave at COM2 | yes | |
| Slave at FBP interface | no | |
| Protocols supported | Modbus RTU | |
| Diagnosis | | |
| Error indication | on LCD display of the CPU | |
| Online diagnosis | yes | |
| Physical layer | RS485 | |
| Connection | 9-pole D-Sub (COM2) or plug (COM1) | |
| Baud rate | up to 115.2 kbit/s | |
| Distance | up to 1200 m (at slow baud rate) | |
| Configuration | using configuration tool (part of programming software) | |
| Station address configuration | using configuration tool (part of programming software) | |

Communication – CANopen and DeviceNet

CANopen



CANopen (Controller Area Network) and DeviceNet

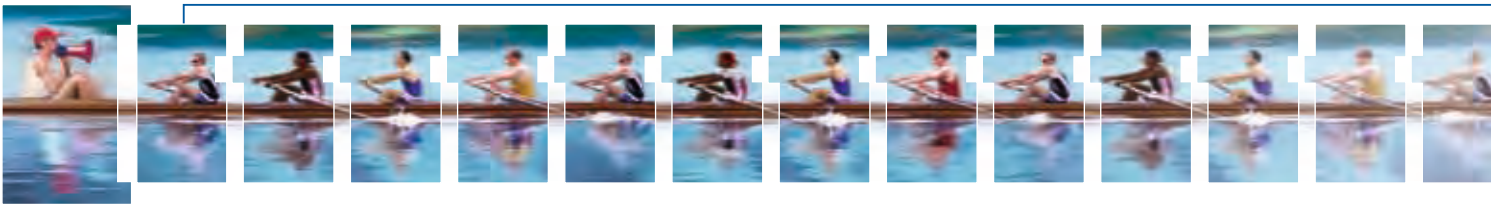
The CAN protocol was originally developed for the European automotive industry, so as to replace expensive cabling by an affordable network cable. Today, it is also used in the field of automation for transmitting process data between control systems, decentralized I/O modules, drives, valves, etc. CAN features a high level of transmission security, since large portions of the monitoring mechanisms have been implemented directly in the CAN chip. DeviceNet and CANopen utilize the physical structure and the data transport mechanisms of CAN (Controller Area Network). The difference lies in the transmission protocols. DeviceNet and CANopen can be used correspondingly for the AC500 and AC31 controller series and for field-bus-neutral FBP devices (decentralized I/Os and intelligent switching devices).

Data transmission

Two types of message have been defined: I/O data transfer and direct link. I/O data transfer is used for time-critical process data, while the direct link can be, for example, used for diagnostic messages.

Bus access for subscribers

The connection ID with the lower address has higher priority on the bus. Data is transmitted by the source, while the sinks (i.e. receivers of the data) have likewise been specified during the configuration phase.



CANopen

The bus operates on the master/slave principle with one master and up to 127 slaves. A shielded twisted-pair cable is used, according to ISO 11898. Cable lengths and transmission rates: from max. 40 m at 1 MBit/s to 1000 m at 20 kBit/s.

DeviceNet

The bus operates on the multi-master and/or the master/slave principle, with up to 64 bus subscribers. Two types of shielded twisted-pair cables are used: trunk cable for the main line and drop cable for the branch line.

| Transmission rate | 125 kBit/s | 250 kBit/s | 500 kBit/s |
|---|--------------------|-------------------|-------------------|
| Max. cable length of trunk line Trunk cable | 500 m (1610 ft) | 250 m (820 ft) | 100 m (328 ft) |
| Max. cable length of trunk line Drop cable | 100 m (328 ft) | 100 m (328 ft) | 100 m (328 ft) |
| Max. cable length per branch line Trunk cable/Drop cable | 6 m (20 ft) | 6 m (20 ft) | 6 m (20 ft) |
| Max. cable length total branch line Trunk cable/Drop cable | 156 m (512 ft) | 78 m (256 ft) | 39 m (128 ft) |

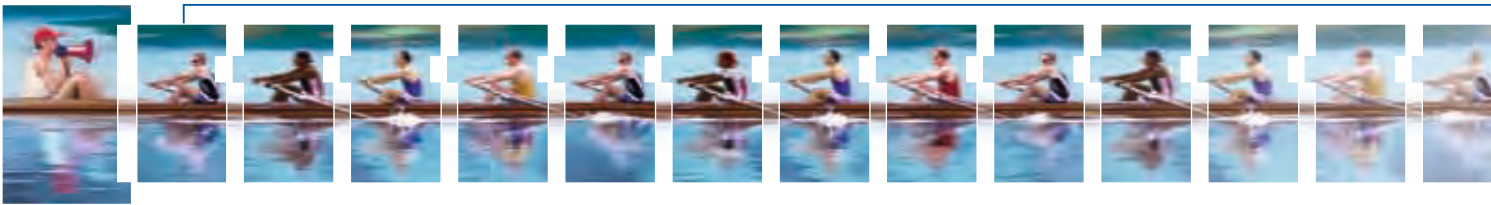
Diagnostics

Detailed diagnostic messages for rapid troubleshooting are shown on the CPU display. In addition, the device status is indicated at the communication module by four LEDs.

Communication – CANopen and DeviceNet

CANopen - Functionality at a glance

| CANopen functionality | AC500 with communication module CM578-CN | AC500 CPU with CanOpen FieldBusPlug (FBP) | S500 I/Os with bus interface DC505-FBP and CANopen FieldBusPlug (FBP) |
|-------------------------------------|---|---|---|
| Master | yes (client) | in preparation | |
| Slave | no | | |
| Protocols supported | | | |
| CAN 2.0A (11 bit identifier) | yes | | |
| CAN 2.0B (29 bit identifier) | yes | | |
| CiA DS401 integrated device profile | yes | | |
| CiA DS402 integrated device profile | yes | | |
| CiA DS406 integrated device profile | yes | | |
| Data transfer | | | |
| Event triggered | yes | | |
| Synchronous | yes | | |
| Cyclic | yes | | |
| Remote PDO transmission | yes | | |
| Node guarding | yes | | |
| Heartbeat | yes | | |
| Diagnosis | | | |
| Error indication | using LEDs on the communication module CM578-CN | | |
| Online diagnosis | using SYCON.net tool (part of programming software) | | |
| Error code | yes | | |
| Associated function blocks | yes | | |
| Physical layer | | | |
| ISO11898 | yes | | |
| Connection | 5-pole Combicon | | |
| Baud rate | up to 1 Mbit/s | | |
| Distance | up to 1000 m at 20 kbit/s | | |
| Configuration | | | |
| Configuration using EDS file | yes, using the specific EDS file of the slave device; non-modular EDS files only. | | |
| Station address configuration | no | | |



DeviceNet - Functionality at a glance

| DeviceNet Functionality | AC500 with communication module CM575-DN | AC500 CPU with DeviceNet FieldBusPlug (FBP) | S500 I/Os with bus interface DC505-FBP and DeviceNet FieldBusPlug (FBP) |
|-------------------------------|--|---|---|
| Master | yes | no | in preparation |
| Slave | no | yes 3 different fixed configurations: 16 bytes + 16 words I/O or 16 bytes I+O or 16 words I+O | |
| Protocols supported | | | |
| DeviceNet (server) | no | yes | |
| DeviceNet (client) | yes | no | |
| Data transfer | | | |
| Polling | yes | yes | |
| State changes | yes | yes | |
| Cyclic | yes | yes | |
| Bit strobe | yes | no | |
| Peer-to-Peer (acyclic) | yes | no | |
| Diagnosis | | | |
| Error indication | using LEDs on the communication module CM575-DN | on LCD display of the CPU | |
| Online diagnosis | using SYCON.net tool (part of programming software) | yes | |
| Error code | yes | no | |
| Associated function blocks | yes | no | |
| Physical layer | | | |
| ISO11898 | yes | yes | |
| Connection | 5-pole Combicon | M12 FBP (standard) | |
| Baud rate | up to 500 kbit/s | up to 125 kbit/s | |
| Distance | up to 500m at 125 kbit/s | | |
| Configuration | | using SYCON.net tool (part of programming software) | |
| Using EDS file | yes, using the specific EDS file of the slave device; non-modular EDS files only | yes, using AC500 EDS file; non-modular EDS files only | |
| Station address configuration | no | using display and keypad of the CPU (99 max.) | |

Communication – ARCNET



ARCNET (Attached Resource Computer NETWORK)

ARCNET is an open, multi-purpose field bus solution with real-time capability. It can be used for multi-master networking and for programming the AC500 and AC31 controller series, but also for connecting additional ARCNET subscribers, e.g. PCs via an appropriate interface card (see catalog).

Topology

ARCNET is one of the few networks that can be operated in every conceivable topology. Options include bus, star, or tree topologies, or mixtures of these. This means that ARCNET can be used for a broad field of different applications.

Bus assignments

ARCNET operates on the token-passing procedure, where each subscriber has equal rights.

Configuration mechanisms

ARCNET allows to add and to remove subscribers from the network during runtime. When a new subscriber is added, the entire network will be re-configured.

| ARCNET functionality | AC500 CPU with integrated ARCNET interface | S500 I/Os with bus interface DC505-FBP |
|---|---|--|
| ARCNET for programming | yes | No ARCNET interface available |
| ARCNET for communication | in preparation | |
| Collision-free data transmission | yes | |
| Guaranteed response times | yes | |
| Real-time support through token passing | yes | |
| Handshake protocol between sender and recipient | yes | |
| Variable network topology: Bus, tree and star topologies incl. mixed topologies | yes | |
| Variable use of media for networking: Coax cable, twisted-pair cable and optical fibre | yes | |
| Automatic connect/disconnect of subscribers | yes | |
| Diagnosis | | |
| Error indication | on LCD display of the CPU | |
| Online diagnosis | yes | |
| Error code | yes | |
| Physical layer | Token-passing system | |
| Connection | Coax cable, type RG62/U 93Ω | |
| Baud rate | 2.5 Mbit/s | |
| Max. number of stations | 255, with max. 8 stations per segment | |
| Maximum length of segments | 300m | |
| Hub/switch integrated | no | |
| Configuration | using configuration tool (part of programming software) | |
| Station address configuration | using display and keypad of the CPU | |

ARCNET



Security mechanisms

A 16-bit CRC is appended to every data packet, and checked by the recipient. If the token is lost, a reconfiguration routine will be initiated, and the network will automatically be restructured. Additionally, diagnostic registers are available.

Physical characteristics

ABB recommends coaxial cables as transmission medium, for direct connection to the CPU. But also twisted-pair cables or (glass, plastic) fiber-optic cables can be connected via bus converters. The line lengths that can be achieved without any intermediate amplifiers depend not only on the used medium, but also on the selected baud rate and the number of subscribers. The ranges per segment vary from approximately 120 m for a simple two-wire bus, up to 3 km for fiber-optics, in each case at 2.5 MBit/s. By providing appropriate hubs, different topologies and transmission media can be combined with each other and the transmission distance can be increased. The coaxial cables used are a type with 93 Ohm, e.g. RG 62.

The permissible twisted-pair cables are specified in IEEE 802.3i-1990. At 2.5 MBit/s and with coaxial cables, for example, the maximum length of a bus segment is 300 m with eight subscribers and without a hub. With twisted-pair cables, under the same conditions, a maximum length of approximately 120 m can be achieved. The maximum transmission length depends on the number of connected subscribers. With coaxial cables, a maximum of 16 km can be achieved; with twisted-pair cables approximately 6 km, in each case at 2.5 MBit/s. The fiber-optic link provides the highest degree of interference immunity. With glass fiber-optics, distances of up to 3 km are possible at 2.5 MBit/s; with plastic fiber-optic cables only small distances of up to approximately 100 m. The baud rate plays no significant role in fiber-optic cable transmission. Here, the range can as well be extended using hubs.

Diagnostics

Detailed diagnostic messages for rapid troubleshooting are shown on the CPU display.

Communication – CS31

CS31 (Communication Serial Field Bus, developed by ABB in 1989) for continuity and migration

CS31 is a proprietary master/slave field bus. It is characterized by simple handling, easy configuration, and inexpensive installation. The COM1 interface of the AC500 can be configured as a CS31 field bus master.

Communication

Is handled using polling, i.e. the master sends a request to the slave and then receives the response. The CS31 operating mode of COM1 is set using the engineering tool.

Topology

Multi-point line, RS485, approved without branch lines. A system consists of one master and up to 31 slaves. The maximum cable length is 500 m, or 2 km with an amplifier. Slaves are primarily decentralized input/output modules with integrated CS31 bus connection.

Data transmission

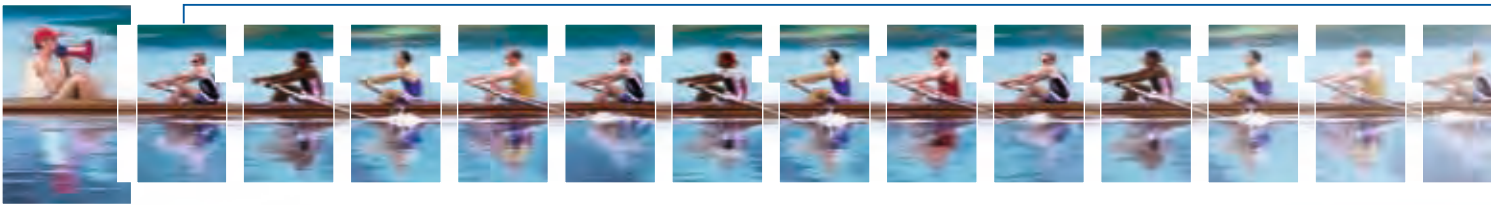
Is performed at 187.5 kB/s. Each telegram has an 8-bit CRC appended. The telegrams enable process data (input/output data) to be written and read.

Transmission medium

Primarily a twisted-pair, shielded cable with terminators. Other transmission media: fiber-optic cables via a converter (glass fibers max. 3 km, plastic max. 100 m), contact lines, slip rings (bus length max. 50 m) and data photocells.

Diagnostics

Detailed diagnostic messages for rapid troubleshooting are shown on the CPU display.



CS31

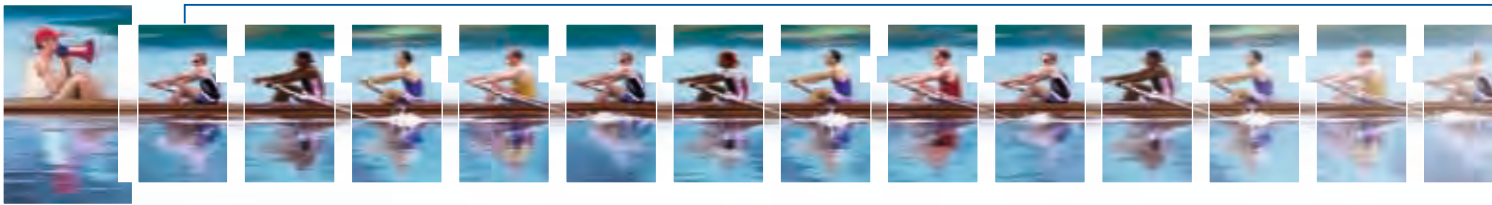


| CS31 functionality | AC500 CPU with integrated CS31 interface | S500-FBP I/O with bus interface DC551-CS31 |
|------------------------------------|---|--|
| Master | yes, at COM1 | no |
| Slave | no | yes |
| Protocols supported | ABB CS31 protocol | |
| Diagnosis | | |
| Error indication | on LCD display of the CPU | via module LEDs |
| Online diagnosis | yes | |
| Error code | errors are recorded in the diagnosis system of the CPU | |
| Associated function blocks | yes | |
| Physical layer | RS485 | |
| Connection | plug at COM1 | screw-type or spring-type terminals |
| Baud rate | 187.5 kbit/s | |
| Distance | up to 500 m; up to 2000 m using a repeater | |
| Max. number of modules on fieldbus | 31 modules max. Please note: The DC551 bus interface occupies one or two module addresses (if counters are configured onboard). Depending on the configuration, connected extension modules can occupy further module addresses. | |
| Configuration | using configuration tool (part of programming software) | |
| Station address configuration | no | using rotary switches (99 max.) |

Scalable automation system

AC500

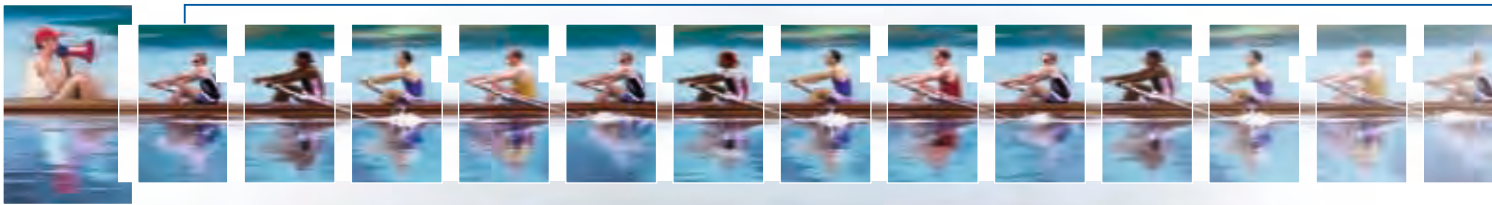
| Details/Type: | PM571 | PM571-ETH | PM581 | PM581-ETH | PM581-ARC |
|---|---------------------------------|-----------|-------------------------------|-----------|-----------|
| Supply voltage | 24 V DC | | 24 V DC | | |
| Total memory | | | | | |
| SDRAM (kB) | 2048 | | 6147 | | |
| Flash (kB) | 512 | | 1024 | | |
| SRAM (kB) | 128 | | 512 | | |
| Program memory | | | | | |
| Flash EPROM and RAM [kB] | 64 | | 256 | | |
| Integrated data memory [kB] | 21, incl. 1 KB RETAIN | | 288, incl. 32 KB RETAIN | | |
| Plug-in memory card [SD card] | 128 MB | | 128 MB | | |
| Cycle time for 1000 instructions in ms | | | | | |
| binary | 0,3 | | 0,15 | | |
| word | 0,3 | | 0,15 | | |
| floating-point | 6 | | 3 | | |
| Max. number of centralized inputs/outputs | | | | | |
| Digital inputs | 224 | | 224 | | |
| Digital outputs | 168 | | 168 | | |
| Analog inputs | 112 | | 112 | | |
| Analog outputs | 112 | | 112 | | |
| Max. number of decentralized inputs/outputs | depends on the used field bus | | | | |
| Data buffering | battery | | battery | | |
| Real-time clock | x | | x | | |
| Program execution | | | | | |
| cyclical | x | | x | | |
| time-controlled | x | | x | | |
| multi tasking | x | | x | | |
| User program protection | | | | | |
| by password | x | | x | | |
| Internal interfaces | | | | | |
| COM1: | | | | | |
| RS232/RS485 configurable | x | | x | | |
| Connection | terminal block | | terminal block | | |
| Programming, Modbus, ASCII, CS31 | x | | x | | |
| COM2: | | | | | |
| RS232/RS485 configurable | x | | x | | |
| Connection | SUB-D | | SUB-D | | |
| Programming, Modbus, ASCII | x | | x | | |
| Integrated Ethernet coupler | | | | | |
| Ethernet connection | x RJ45 | | x RJ45 | | |
| Integrated ARCNET coupler | | | | | |
| ARCNET connection | | | x Coax | | |
| Display and 8 function keys | x | | x | | |
| Function | RUN/STOP status, diagnosis | | RUN/STOP status, diagnosis | | |
| Timers | unlimited | | unlimited | | |
| Counters | unlimited | | unlimited | | |
| Function Block Diagram (FBD) | x | | x | | |
| Instruction List (IL) | x | | x | | |
| Ladder Diagram (LD) | x | | x | | |
| Structured Text (ST) | x | | x | | |
| Sequential Function Chart (SFC) | x | | x | | |
| Continuous Function Chart (CFC) | x | | x | | |
| Approvals | CE, GL, DNV, BV, LRS, cUL, RINA | | | | |



| Details/Type: | PM582 | PM582-ETH | PM591 | PM591-ETH | PM591-ARC |
|---|---------------------------------|-----------|---------------------------|-----------|-----------|
| Supply voltage | 24 V DC | | 24 V DC | | |
| Total memory | | | | | |
| SDRAM (kB) | 8192 | | 32768 | | |
| Flash (kB) | 2048 | | 8192 | | |
| SRAM (kB) | 512 | | 2048 | | |
| Program memory | | | | | |
| Flash EPROM and RAM [kB] | 512 | | 4096 | | |
| Integrated data memory [kB] | 288, incl. 32 KB RETAIN | | 3072, incl. 512 KB RETAIN | | |
| Plug-in memory card [SD card] | 128 MB | | 128 MB | | |
| Cycle time for 1000 instructions in ms | | | | | |
| binary | 0,15 | | 0,02 | | |
| word | 0,15 | | 0,01 | | |
| floating-point | 3 | | 0,02 | | |
| Max. number of centralized inputs/outputs | | | | | |
| Digital inputs | 224 | | 224 | | |
| Digital outputs | 168 | | 168 | | |
| Analog inputs | 112 | | 112 | | |
| Analog outputs | 112 | | 112 | | |
| Max. number of decentralized inputs/outputs | depends on the used field bus | | | | |
| Data buffering | battery | | battery | | |
| Real-time clock | x | | x | | |
| Program execution | | | | | |
| cyclical | x | | x | | |
| time-controlled | x | | x | | |
| multi tasking | x | | x | | |
| User program protection | | | | | |
| by password | x | | x | | |
| Internal interfaces | | | | | |
| COM1: | | | | | |
| RS232/RS485 configurable | x | | x | | |
| Connection | terminal block | | terminal block | | |
| Programming, Modbus, ASCII, CS31 | x | | x | | |
| COM2: | | | | | |
| RS232/RS485 configurable | x | | x | | |
| Connection | SUB-D | | SUB-D | | |
| Programming, Modbus, ASCII | x | | x | | |
| Integrated Ethernet coupler | | | | | |
| Ethernet connection | | | x | | |
| | | | RJ45 | | |
| Integrated ARCNET coupler | | | | | |
| ARCNET connection | | | | | x |
| | | | | | Coax |
| Display and 8 function keys | x | | x | | |
| Function | RUN/STOP | | RUN/STOP | | |
| | status, diagnosis | | status, diagnosis | | |
| Timers | unlimited | | unlimited | | |
| Counters | unlimited | | unlimited | | |
| Function Block Diagram (FBS) | x | | x | | |
| Instruction List (IL) | x | | x | | |
| Ladder Diagram (LD)) | x | | x | | |
| Structured Text (ST) | x | | x | | |
| Sequential Function Chart (SFC) | x | | x | | |
| Continuous Function Chart (CFC) | x | | x | | |
| Approvals | CE, GL, DNV, BV, LRS, cUL, RINA | | | | |

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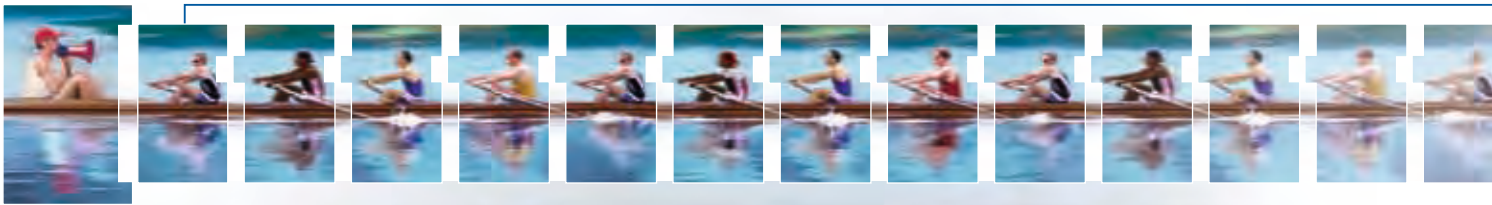
| | Digital I/O modules | | | | | | | Interface modules | | |
|---|--|-----------------------|-------|-------|-------|-------------------------|---|---|---|---|
| | DI524 | DC522 | DC523 | DC532 | DX522 | DX531 | DC541 | DC505-FBP | DC551-CS31 | |
| Number of channels per module | | | | | | | | | | |
| Digital inputs DI | 32 | – | – | 16 | 8 | 8 | – | 8 | 8 | |
| Digital outputs DO | – | – | – | – | 8 | 4 | – | – | – | |
| Configurable channels DC (configurable as inputs or outputs) | – | 16 | 24 | 16 | – | – | 8 | 8 | 16 | |
| Additional configuration of channels as | | | | | | | | | | |
| fast counter | Configuration of max. 2 channels per module. Operating modes see table on page 33. | | | | | – | Yes. See table on page 34 for possible configurations | – | Configuration of max. 2 channels p. module. Operating modes see table on page 33. | |
| pulse-width modulator | – | – | – | – | – | – | | – | | – |
| rpm, time and frequency counter | – | – | – | – | – | – | | – | | – |
| interrupt I/O | – | – | – | – | – | – | | – | | – |
| Occupies max. 1 DO or DC when used as counter | – | x | x | x | – | – | – | – | x | |
| Connection via terminal block TB5xx | x | x | x | x | x | x | – | x | x | |
| Connection via CPU terminal base. Occupies one communication module slot. | – | – | – | – | – | – | x | – | – | |
| Digital inputs | | | | | | | | | | |
| Input signal voltage | 24 V DC | | | | | 230 V AC or 120 V AC | 24 V DC | 24 V DC | 24 V DC | |
| Frequency range | – | | | | | 47 ... 63 Hz | – | – | – | |
| Input characteristic acc. to EN61132-2 | Type 1 | | | | | Type 2 | Type 1 | Type 1 | Type 1 | |
| 0 signal | – 3 V DC ... + 5 V DC | | | | | 0 ... 40 V AC | – 3 V DC ... + 5 V DC | – 3 V DC ... + 5 V DC | | |
| Undefined signal state | > + 5 V DC ... < + 15 V DC | | | | | > 40 V AC ... < 74 V AC | > + 5 V DC ... < + 15 V DC | > + 5 V DC ... < + 15 V DC | | |
| 1 signal | + 15 V DC ... + 30 V DC | | | | | 74 ... 265 V AC | > + 5 V DC ... < + 15 V DC | + 15 V DC ... + 30 V DC | | |
| Residual ripple, range for 0 signal | – 3 V DC ... + 5 V DC | | | | | – | – 3 V DC ... + 5 V DC | – 3 V DC ... + 5 V DC | | |
| Residual ripple, range for 1 signal | + 15 V DC ... + 30 V DC | | | | | – | + 15 V DC ... + 30 V DC | + 15 V DC ... + 30 V DC | | |
| Input time delay (0 -> 1 or 1 -> 0) | 8 ms typically, configurable from 0.1 up to 32 ms | | | | | 20 ms typically | 8 ms typically, configurable from 0.1 up to 32 ms | 8 ms typically, configurable from 0.1 up to 32 ms | | |
| Input current per channel | | | | | | | | | | |
| at input voltage + 24 V DC | 5 mA typ. | | | | | – | 5 mA typ. | 5 mA typ. | | |
| at input voltage + 5 V DC | > 1 mA | | | | | – | > 1 mA | > 1 mA | | |
| at input voltage + 15 V DC | > 5 mA | | | | | – | > 5 mA | > 5 mA | | |
| at input voltage + 30 V DC | < 8 mA | | | | | – | < 8 mA | < 8 mA | | |
| at input voltage 159 V AC | – | | | | | > 7 mA | – | – | – | |
| at input voltage 40 V AC | – | | | | | < 5 mA | – | – | – | |
| Digital outputs | | | | | | | | | | |
| Transistor outputs 24 V DC, 0.5 A | – | x | x | x | – | – | x | x | x | |
| Readback of output | – | x | x | x | – | – | x | x | x | |
| Relay outputs, supplied via process voltage UP, changeover contacts | – | – | – | – | x | x | – | x | – | |
| Switching of 24 V load | – | x | x | x | x | x | x | x | x | |
| Switching of 230 V load | – | – | – | – | x | x | – | – | – | |
| Output voltage at signal state 1 | Process voltage UP minus 0.8 V | | | | – | – | Process voltage UP minus 0.8 V | Process voltage UP minus 0.8 V | | |
| Output current | | | | | | | | | | |
| Nominal current per channel | – | 500 mA at UP = 24 V | | | – | – | 500 mA at UP = 24 V | 500 mA at UP = 24 V | | |
| Maximum (total current of all channels) | – | 8 A | | | – | – | 8 A | 4 A | 8 A | |
| Residual current at signal state 0 | – | < 0.5 mA | | | – | – | < 0.5 mA | < 0.5 mA | | |
| Demagnetization when switching off inductive loads | – | by internal varistors | | | – | – | by internal varistors | by internal varistors | | |



| | Digital I/O modules | | | | | | | Interface modules | |
|--|---|------------------------|---------|---------|---|------------------------|------------------------------|------------------------|--|
| | DI524 | DC522 | DC523 | DC532 | DX522 | DX531 | DC541 | DC505-FBP | DC551-CS31 |
| Switching frequency | | | | | | | | | |
| for inductive load | – | 0.5 Hz max. | | | 2 Hz max. | | 0.5 Hz max. | 0.5 Hz max. | |
| for lamp load | – | 11 Hz max. at max. 5 W | | | xx Hz max. | 11 Hz max. at max. 5 W | 11 Hz max. at max. 5 W | 11 Hz max. at max. 5 W | |
| Short-circuit / overload proofness | – | x | x | x | by external fuse / circuit breaker. 6 A gL/gG per channel | | x | x | x |
| Overload indication (I > 0.7 A) | – | after approx. 100 ms | | | – | – | – | after approx. 100 ms | |
| Output current limiting | – | 0.7 A typ. | | | – | – | 0.7 A typ. | Automatic reclosure | |
| Proofness against reverse feeding of 24 V signals | – | x | x | x | – | – | x | x | x |
| Contact rating | | | | | | | | | |
| for resistive load, max. | – | – | – | – | 3 A at 230 V AC 2 A at 24 V DC | | – | – | – |
| for inductive load, max. | – | – | – | – | 1.5 A at 230 V AC 1.5 A at 24 V DC | | – | – | – |
| for lamp load | – | – | – | – | 60 W at 230 V AC 10 W at 24 V DC | | – | – | – |
| Lifetime (switching cycles) | | | | | | | | | |
| Mechanical lifetime | – | – | – | – | 300.000 | | – | – | – |
| Lifetime under load | – | – | – | – | 300 000 at 24 V DC/ 2 A 200 000 at 120 V AC/ 2 A 100 000 at 230 V AC/ 3 A | | – | – | – |
| Spark suppression for inductive AC load | – | – | – | – | External measure depending on the switched load | | – | – | – |
| Demagnetization for inductive DC load | – | – | – | – | External measure: Free-wheeling diode connected in parallel to the load | | – | – | – |
| Process voltage UP | | | | | | | | | |
| Nominal voltage | 24 V DC | 24 V DC | 24 V DC | 24 V DC | 24 V DC | 24 V DC | 24 V DC | 24 V DC | 24 V DC |
| Maximum ripple | 5 % | 5 % | 5 % | 5 % | 5 % | 5 % | 5 % | 5 % | 5 % |
| Reverse polarity protection | x | x | x | x | x | x | x | x | x |
| Fuse for process voltage UP | 10 A miniature fuse | | | | | | | 10 A miniature fuse | |
| Connections for sensor voltage supply. Terminal + 24 V and 0 V for each connection. Permitted load for each group of 4 or 8 connections: 0.5 A | – | 8 | 4 | – | – | – | – | – | – |
| Short-circuit and overload proof 24 VDC sensor supply voltage | – | x | x | – | – | – | – | – | – |
| Maximum cable length for connected process signals | | | | | | | | | |
| Shielded cable [m] | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| Unshielded cable [m] | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| Potential isolation | | | | | | | | | |
| per module | x | x | x | x | x | x | x | x | x |
| between the input channels | – | – | – | – | – | – | – | – | – |
| between the output channels | – | – | – | – | x | x | – | – | – |
| Voltage supply for the module | internally via extension bus interface (I/O bus) | | | | | | internally via backplane bus | via FBP | by external 24 V DC voltage via terminal |
| Field bus connection | via AC500 CPU or interface module | | | | | | via AC500 CPU | via FBP | CS31 field bus, via terminal |
| Address setting | via software | | | | | | via software | via FBP | by code switch on the front side |
| Operating state indicators | | | | | | | | | |
| Yellow LED for I/O state | 32 | 16 | 24 | 32 | 16 | 12 | 8 | 16 | 24 |
| Green LED for voltage supply | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Red LED for module and group errors | 4 | 4 | 4 | 4 | 2 | 2 | 1 | 2 | 1 |
| Mounting position | 1. Horizontal mounting. 2. Vertical mounting possible with restrictions (max. output load per group: 50 % at 40 °C). | | | | | | | | |
| Cooling | Cooling by natural convection must not be obstructed by cable ducts or other interior components of the switchgear cabinet. | | | | | | | | |

Scalable automation system AC500

| | Analog I/O modules | | | |
|---|--|-------|---------|--------------|
| | AX521 | AX522 | AI523 | AO523 |
| Number of channels per module | | | | |
| Analog inputs AI, individual configuration | 4 | 8 | 16 | |
| Analog outputs AO, individual configuration | 4 | 8 | – | 16 |
| Signal resolution for channel configuration | | | | |
| – 10 V ... + 10 V: 12 bits + sign | x | x | x | x |
| 0 ... 10 V: 12 bits | x | x | x | x |
| 0 ... 20 mA, 4 ... 20 mA: 12 bits | x | x | x | x |
| Temperature: 0.1 °C | x | x | x | x |
| Monitoring configuration per channel | | | | |
| Plausibility monitoring | x | x | x | x |
| Wire break & short-circuit monitoring | x | x | x | x |
| Analog Inputs AI | | | | |
| Signal configuration per AI | Max. number per module and with regard to the configuration: AIs / Measuring points (depending on the use of 2/3-wire connection or differential input) | | | |
| 0 ... 10 V | 4 / 4 | 8 / 8 | 16 / 16 | – |
| – 10 V ... + 10 V | 4 / 4 | 8 / 8 | 16 / 16 | – |
| 0 ... 20 mA | 4 / 4 | 8 / 8 | 16 / 16 | – |
| 4 ... 20 mA | 4 / 4 | 8 / 8 | 16 / 16 | – |
| Pt100, – 50 °C ... + 400 °C (2-wire) | 4 / 4 | 8 / 8 | 16 / 16 | – |
| Pt100, – 50 °C ... + 400 °C (3-wire), occupies 2 AIs | 4 / 2 | 8 / 4 | 16 / 8 | – |
| Pt100, – 50 °C ... + 70 °C (2-wire) | 4 / 4 | 8 / 8 | 16 / 16 | – |
| Pt100, – 50 °C ... + 70 °C (3-wire), occupies 2 AIs | 4 / 2 | 8 / 4 | 16 / 8 | – |
| Pt1000, – 50 °C ... + 400 °C (2-wire) | 4 / 4 | 8 / 8 | 16 / 16 | – |
| Pt1000, – 50 °C ... + 400 °C (3-wire), occupies 2 AIs | 4 / 2 | 8 / 4 | 16 / 8 | – |
| Ni1000, – 50 °C ... + 150 °C (2-wire) | 4 / 4 | 8 / 8 | 16 / 16 | – |
| Ni1000, – 50 °C ... + 150 °C (3-wire), occupies 2 AIs | 4 / 2 | 8 / 4 | 16 / 8 | – |
| 0 ... 10 V using differential inputs, occupies 2 AIs | 4 / 2 | 8 / 4 | 16 / 8 | – |
| – 10 V ... + 10 V using differential inputs, occupies 2 AIs | 4 / 2 | 8 / 4 | 16 / 8 | – |
| Digital signals (digital input) | 4 / 4 | 8 / 8 | 16 / 16 | – |
| Input resistance per channel | Voltage: > 100 kΩ, Current: approx. 330 Ω | | | – |
| Time constant of the input filter | Voltage: 100 μs, Current: 100 μs | | | – |
| Conversion cycle | 2 ms (for 8 AI + 8 AO), 1 s for Pt/Ni... | | | – |
| Overvoltage protection | x | x | x | – |
| Data when using the AI as digital input | | | | |
| Input time delay | 8 ms typ., configurable from 0.1 up to 32 ms | | | – |
| Input signal voltage | 24 V DC | | | – |
| 0 signal | – 30 V ... + 5 V | | | – |
| 1 signal | + 13 V ... + 30 V | | | – |
| Analog outputs AO | | | | |
| Possible configuration per AO | Max. number of AOs per module and with regard to the configuration: | | | |
| – 10 V ... + 10 V | 4 | 8 | – | 16 |
| 0 ... 20 mA | 4 | 4 | – | 8 |
| 4 ... 20 mA | 4 | 4 | – | 8 |
| Output resistance (burden) when used as current output | 0 ... 500 Ω | | – | 0 ... 500 Ω |
| Output loading capability when used as voltage output | max. ± 10 mA | | – | max. ± 10 mA |



| | Analog I/O modules | | | |
|--|---|---------|---------|---------|
| | AX521 | AX522 | AI523 | AO523 |
| Process voltage UP | | | | |
| Nominal voltage | 24 V DC | 24 V DC | 24 V DC | 24 V DC |
| Maximum ripple | 5 % | 5 % | 5 % | 5 % |
| Reverse polarity protection | x | x | x | x |
| Max. line length of the analog lines, conductor cross section > 0.14 mm ² | 100 m | | | |
| Conversion error of analog values caused by non-linearity, calibration errors ex works and the resolution in the nominal range | 0.5 % typ., 1 % max. | | | |
| Potential isolation | | | | |
| per module | x | x | x | x |
| between the input channels | - | - | - | - |
| between the output channels | - | - | - | - |
| Voltage supply for the module | internally via extension bus interface (I/O bus) | | | |
| Operating state indicators | | | | |
| Yellow LED for I/O state | 8 | 16 | 16 | 16 |
| Green LED for voltage supply | 1 | 1 | 1 | 1 |
| Red LED for module and group errors | 2 | 2 | 2 | 2 |
| Mounting position | 1. Horizontal mounting. 2. Vertical mounting possible with restrictions (max. output load per group: 50 % at + 40 °C). | | | |
| Cooling | Cooling by natural convection must not be obstructed by cable ducts or other interior components of the switchgear cabinet. | | | |

Table: Digital I/O modules, „fast counter“ operating modes. Not applicable for DC541

| Operating mode, configured in the user program of the AC500 | Occupied inputs DI or DC | Occupied outputs DO or DC | Maximum counting frequency | Notes |
|--|--------------------------|---------------------------|----------------------------|--|
| 0 No counter | 0 | 0 | - | - |
| 1 One count-up counter with „end value reached“ indication | 1 | 1 | 50 kHz | Note for input module DI524: It is not possible to set an output directly. |
| 2 One count-up counter with „enable“ input and „end value reached“ indication | 2 | 1 | 50 kHz | As an alternative, the status byte should be evaluated and applied to another output in the system. |
| 3 Two up/down counters | 2 | 0 | 50 kHz | „End value“ interrogation via status byte. |
| 4 Two up/down counters with 1 counting input inverted | 2 | 0 | 50 kHz | |
| 5 One up/down counter with „dynamic set“ input | 2 | 0 | 50 kHz | Acts to the rising signal edge (0->1). „End value“ interrogation via status byte. |
| 6 One up/down counter with „dynamic set“ input | 2 | 0 | 50 kHz | Acts to the falling signal edge (1->0). „End value“ interrogation via status byte. |
| 7 One up/down counter with directional discriminator. For synchro transmitters using two counting pulses with an offset of 90° (track A and B). | 2 | 0 | 50 kHz | For synchro transmitters with 24 V signals. In case of 5 V synchro transmitters, the signal has to be increased to 24 V. The zero track of the synchro transmitter is not processed. Interrogation of the „end value“ indication via the status byte. Single evaluation. |
| 8 - | 0 | 0 | - | - |
| 9 One up/down counter with directional discriminator and double evaluation. For synchro transmitters using two counting pulses with an offset of 90° towards each other (track A and B). | 2 | 0 | 30 kHz | See operating mode 7. Difference: Double evaluation, i.e. evaluation of the rising edge and the falling edge of track A -> higher accuracy due to the double number of counting pulses. |
| 10 One up/down counter with directional discriminator and fourfold evaluation. For synchro transmitters using two counting pulses with an offset of 90° towards each other (track A and B). | 2 | 0 | 15 kHz | See operating mode 7. Difference: Fourfold evaluation, i.e. evaluation of the rising edge and the falling edge of track A and track B -> higher accuracy due to the fourfold number of counting pulses. |

Scalable automation system

AC500

Table: Possible configurations for the multifunctional module DC541

| Configuration as | Function/ Configuration for channel no. | Chan. 0 | Chan. 1 | Chan. 2 | Chan. 3 | Chan. 4-7 | Max. no. of channels for this function | Remarks and notes regarding possible alternative combinations of the remaining channels (a and b) |
|--|---|--|---------|---------|---------|-----------|--|---|
| Mode 1: Interrupt functionality, mutually exclusive with mode 2 (counting functionality) | | | | | | | | |
| Interrupt | Digital input | 1 | 1 | 1 | 1 | 4 | 8 | Each channel can be configured individually as interrupt input or interrupt output. |
| | Digital output | 1 | 1 | 1 | 1 | 4 | 8 | |
| Mode 2: Counting functionality and multifunctional I/Os, mutually exclusive with mode 1 (interrupt functionality) | | | | | | | | |
| Multifunctional I/Os, digital I/Os, PWM, counter, time and frequency measurement | Digital input | 1 | 1 | 1 | 1 | 4 | 8 | Usual input. |
| | Digital output | 1 | 1 | 1 | 1 | 4 | 8 | Usual output. |
| | PWM, resolution 10 kHz | 1 | 1 | 1 | 1 | 4 | 8 | Outputs a pulsed signal with an adjustable on-off ratio. |
| | Up/down counter, 50 kHz | 1 | 1 | OK *1) | OK *1) | OK *1) | 2 | *1) a) Both channels (0 and 1) configured as 50 kHz counters => channels 2 to 7 can be configured as digital I/Os. b) Only one channel (0 or 1) configured as 50 kHz counter => the second channel can be configured as counter < 50 kHz or for time/frequency measurement with a max. resolution of 200 µs. The remaining channels (2 to 7) can be configured as digital I/Os. |
| | Up/down counter, 5 kHz | 1 | 1 | 1 | 1 | OK *2) | 4 | *2) a) Four channels (0 to 3) configured as 5 kHz counters => channels 4 to 7 can be configured as digital I/Os. b) Not all of the four channels 0 to 3 configured as 5 kHz counter => the remaining channels (of chan. 0 to 3) can be configured as counters for 2.5 kHz or for time/frequency measurement with a max. resolution of 200 µs as desired. The remaining channels (4 to 7) can be configured as digital I/Os. |
| | Up/down counter, 2.5 kHz | 1 | 1 | 1 | 1 | 4 | 8 | |
| | Time/frequency measurement, resolution 50 µs | 1 | OK *3) | OK *3) | OK *3) | OK *3) | 1 | *3) Channel 0 configured for a max. resolution of 50 µs => channels (1 to 7) can be configured as digital I/Os. |
| | Time/frequency measurement, resolution 100 µs | 1 | 1 | OK *4) | OK *4) | OK *4) | 2 | *4) a) Both channels (0 and 1) configured for a max. resolution of 50 µs => chan. 2 to 7 can be configured as digital I/Os. b) Only one channel (0 or 1) configured for a max. resolution of 50 µs => the second channel can be configured as counter < 50 kHz or for time/frequency measurement with a max. resolution of 200 µs. The remaining channels (2 to 7) can be configured as digital I/Os. |
| Time/frequency measurement, resolution 200 µs | 1 | 1 | 1 | 1 | 4 | 8 | Times, frequencies and rotational speeds are measured with a maximum resolution of 200 µs. | |
| Fast counter | Bidirectional 32 bit counter, 50 kHz max. | Channels 0 to 3: track A, track B, zero track, touch trigger | | | | OK *6) | 1 | For connection of an incremental transmitter. For signals up to 50 kHz (corresponds to a motor with a rotational speed of 3000 rpm). The counter always occupies the first 4 channels (0 to 3). *6) The remaining channels (4 to 7) can be configured as limit values, as 5 kHz counters, for time/frequency measurement with a resolution of 200 µs or as digital I/Os. |
| | Shaft (endless counting) | 1 | | | | OK *7) | 1 | „Endless“ forward counting. An overflow occurs corresponding to the 32 bit value. *7) The remaining channels can be configured as limit values, as 5 kHz counters, for time/frequency measurement with a resolution of 200 µs or as digital I/Os. |
| | 32 bit counter incl. sign | 1 | | | | OK *8) | 1 | *8) The remaining channels can be configured as limit values, as 5 kHz counters, for time/frequency measurement with a resolution of 200 µs or as digital I/Os. |
| | Limit values for 32 bit counter | OK *9) | | | | 1 | 1 | Various counting values of the 32 bit counter can be displayed directly via these outputs. *9) In this case, the channels 0 to 3 are used as 32 bit counters. |

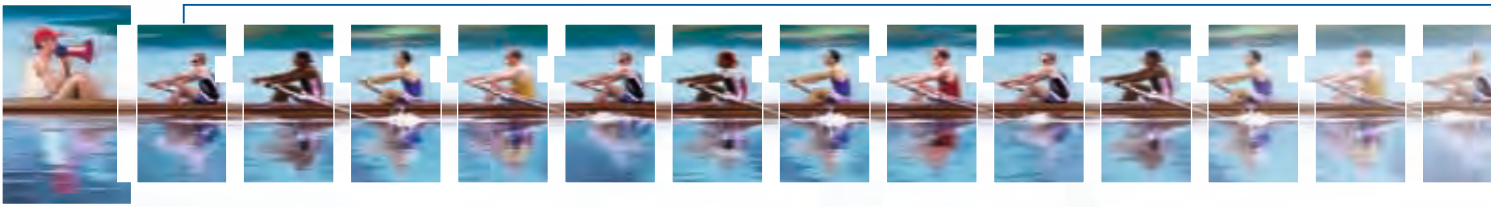
| Operating and environmental conditions / System data | | |
|---|--|--|
| Voltages according to EN 61131-2 | | |
| 24 V DC | Process and supply voltage Absolute limits Residual ripple Polarity reversal protection | 24 V DC (-15%, +20% without residual ripple) 19.2 V ... 30 V incl. residual ripple < 5 % 10 s |
| 120 V AC | Supply voltage Frequency | 120 V AC (-15%, +10%) 47 Hz ... 62.4 Hz/50 ... 60 Hz (-6%, +4%) |
| 230 V AC | Supply voltage Frequency | 230 V AC (-15 %, +10%) 47 Hz ... 62.4 Hz/50 ... 60 Hz (-6%, +4%) |
| 120–240 V AC | Wide voltage input Voltage Frequency | 102 V ... 264 V/120 V ... 240 V (-15%, +10%) 47 Hz ... 62.4 Hz/50 ... 60 Hz (-6%, +4%) |
| Power failure bridging time according to EN 61131-2 | DC supply AC supply | Failure < 10 ms, time between 2 failures > 1 s, PS2 Failure < 0.5 periods, time between 2 failures > 1 s |
| Temperature | Operation Storage Transport | 0 °C ... +60 °C for horizontal mounting -25 °C ... +75 °C -25 °C ... +75 °C |
| Humidity | | 95% max., no condensation |
| Air pressure | Operation Storage | > 800 hPa / < 2000 m > 660 hPa / < 3500 m |
| Creepage distances and clearances | | |
| The creepage distances and clearances correspond to Overvoltage Category II, Pollution Severity 2 | | |
| Electromagnetic compatibility | | |
| Interference immunity | | |
| against electrostatic discharge (ESD) interference voltage with air discharge interference voltage with contact discharge | | acc. to EN 61000-4-2, Zone B, Criteria B 8 kV 6 kV |
| Interference immunity | | |
| against radiated interferences (CW radiated) Test field strength | | acc. to EN 61000-4-3, Zone B, Criteria A 10 V/m |
| Interference immunity | | |
| against transient interference voltages (burst) | | acc. to EN 61000-4-4, Zone B, Criteria B |
| Interference immunity | | |
| against conduction-bound interferences (CW conducted) Test voltage | | acc. to EN 61000-4-6, Zone B, Criteria A 3V Zone B |
| Impulse voltage | | |
| | | acc. to EN 61000-4-5, Zone B, Criteria B |
| Emitted interferences | | |
| | | acc. to EN 55011, Group 1, Class A |
| Mechanical data | | |
| Connection type / terminals Mounting Degree of protection Housing Vibration resistance | | horizontal IP 20 acc. to UL 94 all three axes 2 Hz ... 15 Hz, continuously 3.5 mm 15 Hz ... 150 Hz, continuously 1 g (4 g in preparation) 15 Hz ... 150 Hz, continuously 1 g |
| Vibration resistance with SD card plugged in Shock resistance | | all three axes 15 g, 11 ms, semi-sinusoidal |
| Device mounting DIN top-hat rail acc. to DIN EN 50022 Screw mounting Torque | | 35 mm, overall height 7,5 mm or 15 mm Screws with 4 mm diameter 1.2 Nm |

Operating and displaying

Operator panels CP500 – Overview



| | CP501 | CP502 | CP503 | CP511 | CP512 |
|----------------------------------|-------------------------|-------------------------|-------------------------|--------------------------|-------------------------------|
| Ident. Nr. | 1SBP 260170 R1001 | 1SBP 260171 R1001 | 1SBP 260172 R1001 | 1SBP 260173 R1001 | 1SBP 260174 R1001 |
| Display type | STN-LCD with backlight | STN-LCD with backlight | STN-LCD with backlight | STN-LCD with backlight | S/W-STN-LCD with backlight |
| Display | Text | Text | Text | graphics and text | graphics and text |
| Display size | 2 lines x 16 characters | 2 lines x 20 characters | 4 lines x 20 characters | 240 x 64 pixels | 240 x 128 pixels |
| Display area W x H (mm) | 55.7 x 11.0 | 73.5 x 11.5 | 70.4 x 20.8 | 5.2" 127.2 x 33.9 | 5.3" 120.0 x 64.0 |
| Text height (mm) | 5 | 5 | 5 | variable | variable |
| LEDs | | | 5 (2 colors) | 16 (2 colors) | 16 (2 colors) |
| Function keys/ other keys | 4 | 3 / 20 | 5 / 22 (with labels) | 8 (with labels) | 16 (8 with labeling strip) |
| Web functions | | | | ● | ● |
| Buzzer | | | | ● | ● |
| Alarm management | | | 1 group | 4 groups | 4 groups |
| Time channel | | ● | ● | ● | ● |
| Real-time clock | | ● | ● | ● | ● |
| Trend curves | | | | real-time | historical |
| Data logger | | | | | |
| Recipe management | | ● | ● | ● | ● |
| Report printing | | ● | ● | ● | ● |
| Password protection | | 8 levels | 8 levels | 8 levels | 8 levels |
| Multilanguage support | | ● | ● | ● | ● |
| Application memory | 16 kB Flash | 64 kB Flash | 64 kB Flash | 400 kB Flash | 400 kB Flash |
| Voltage supply | 5 / 24 V DC | 24 V DC | 24 V DC | 24 V DC | 24 V DC |
| Current consumption | | | 150 mA | 450 mA | 450 mA |
| Ambient temperature | 0 – 50 °C | 0 – 50 °C | 0 – 50 °C | 0 – 50 °C | 0 – 50 °C |
| Communication interfaces | RS232 oder RS422 | RS232, RS422 RS485 | RS232, RS422 | RS232, RS422 Ethernet | RS232, RS422 |
| Expansion slot | – | – | – | 1 | 1 |
| Degree of protection front cover | IP65 | IP65 | IP65 | IP65 | IP65 |
| Dimensions W x H x D (mm) | 104 x 69 x 38 | 142 x 100 x 29 | 147 x 163,5 x 38 | 211 x 198 x 69 | 214 x 232 x 87 |
| Weight (kg) | 0.2 | 0.5 | 0.7 | 1.5 | 1.4 |



| CP551 | CP552 | CP554 |
|-----------------------------------|-----------------------------|---------------------------------|
| 1SBP 260176 R1001 | 1SBP 260177 R1001 | 1SBP 260178 R1001 |
| Touch-S/W-STN with backlight | Touch-LCD 16 gray levels | 256 Colors TFT touch display |
| graphics and text | graphics and text | graphics and text |
| 320 x 240 pixels | 320 x 240 pixels | 320 x 240 pixels |
| 3.8" 78.0 x 58.5 | 5.7" 115.2 x 86.4 | 5.7" 115.2 x 86.4 |
| variable | variable | variable |
| ● | ● | ● |
| ● | ● | ● |
| 4 groups | 5 groups | 5 groups |
| ● | ● | ● |
| ● | ● | ● |
| historical | historical | historical |
| ● | ● | ● |
| ● | ● | ● |
| ● | ● | ● |
| 8 levels | 8 levels | 8 levels |
| ● | ● | ● |
| 400 kB Flash | 400 kB Flash | 400 kB Flash |
| 24 V DC | 24 V DC | 24 V DC |
| 450 mA | 400 mA | 450 mA |
| 0 – 50 °C | 0 – 50 °C | 0 – 50 °C |
| Ethernet RS232, RS422 RS485 | RS232, RS422/RS485 | RS232, RS422/RS485 |
| - | 1 | 1 |
| IP65 | IP65 | IP65 |
| 138 x 100 x 30 | 200 x 150 x 69 | 200 x 150 x 69 |
| 1.4 | 1.5 | 1.5 |

Ordering data

The AC500 CPU's

- 2 serial interfaces integrated, RS232/RS485 configurable
- Display and 8 function keys for diagnosis and status
- Centrally expandable with up to 7 expansion modules
- Up to 4 external communication modules simultaneously and in any desired combination
- Optional: SD card for data storage and program backup
- As a slave via FieldBusPlug (FBP) at Profibus DP



| AC500 CPUs, type PM571 | | | | | |
|------------------------|----------------|--|--------------------|--------------------|---------------------|
| Type | Program memory | Cycle time in ms 1000 instructions Bit/Word/Float. point | Integrated coupler | Order code | Weight per piece/kg |
| PM571 | 64 KB | 0.3/0.3/6 | - | 1SAP 130 100 R0100 | 0.135 |
| PM571-ETH | 64 KB | 0.3/0.3/6 | Ethernet | 1SAP 130 100 R0170 | 0.15 |

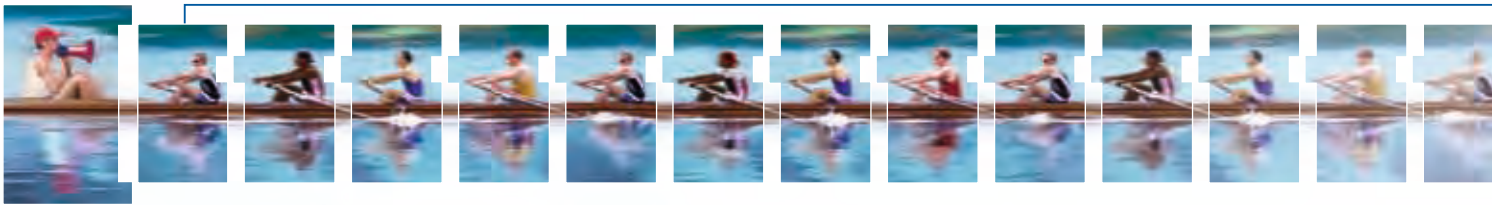
| AC500 CPUs, type PM581 and PM582 | | | | | |
|----------------------------------|----------------|--|--------------------|---------------------|---------------------|
| Type | Program memory | Cycle time in ms 1000 instructions Bit/Word/Float. point | Integrated coupler | Order code | Weight per piece/kg |
| PM581 | 256 KB | 0.15/0.15/3 | - | 1SAP 140 100 R0100 | 0.135 |
| PM581-ETH | 256 KB | 0.15/0.15/3 | Ethernet | 1SAP 140 100 R0170 | 0.15 |
| PM581-ARCNET | 256 KB | 0.15/0.15/3 | ARCNET | 1SAP 140 100 R0160* | 0.16 |
| PM582 | 512 KB | 0.15/0.15/3 | - | 1SAP 140 200 R0100 | 0.135 |
| PM582-ETH | 512 KB | 0.15/0.15/3 | Ethernet | 1SAP 140 200 R0170 | 0.15 |

* in preparation

| AC500 CPUs, type PM591 | | | | | |
|------------------------|----------------|--|--------------------|---------------------|---------------------|
| Type | Program memory | Cycle time in ms 1000 instructions Bit/Word/Float. point | Integrated coupler | Order code | Weight per piece/kg |
| PM591 | 4096 KB | 0.05/0.05/0.5 | - | 1SAP 150 100 R0100 | 0.135 |
| PM591-ETH | 4096 KB | 0.05/0.05/0.5 | Ethernet | 1SAP 150 100 R0170 | 0.15 |
| PM591-ARCNET | 4096 KB | 0.05/0.05/0.5 | ARCNET | 1SAT 150 100 R0160* | 0.16 |

* in preparation

| Ethernet communication module | | | | | |
|---|----------------------------|------------|-------------------------|--------|--|
| 10/100 Mbit/s, full/half duplex with auto-sensing | | | | | |
| 2-port switch integrated | | | | | |
| Transport protocols TCP/IP, UDP/IP, Modbus TCP | | | | | |
| Simultaneous operation of max. 4 CM577-ETH modules at one CPU | | | | | |
| No external power supply required | | | | | |
| Type | Protocol | Interfaces | Order code per piece/kg | Weight | |
| CM577-ETH | TCP/IP, UDP/IP, Modbus TCP | 2 x RJ45 | 1SAP 170 700 R0001 | 0.115 | |



| Profibus DP communication module | | | | |
|--|--------------|--|--------------------|---------------------|
| Profibus DP master with up to 12 Mbit/s Simultaneous operation of max. 4 CM572-DP modules at one CPU No external power supply required | | | | |
| Type | Interface | | Order code | Weight per piece/kg |
| CM572-DP | Sub-D socket | | 1SAP 170 200 R0001 | 0.115 |

| DeviceNet communication module | | | | |
|--------------------------------|------------------------|-----------------------|---------------------|---------------------|
| Type | Interface | | Order code | Weight per piece/kg |
| CM575-DN | Plug-in terminal block | Spring-type terminals | 1SAP 170 500 R0001* | 0.115 |

* in preparation

| CANopen communication module | | | | |
|------------------------------|------------------------|-----------------------|---------------------|---------------------|
| Type | Interface | | Order code | Weight per piece/kg |
| CM578-CN | Plug-in terminal block | Spring-type terminals | 1SAP 170 800 R0001* | 0.115 |

* in preparation

| Terminal base | | | | | |
|--|-------------------------|------|--|--------------------|---------------------|
| For mounting and connection of the CPUs and communication modules 1 to 4 plug-in communication modules Connection for communication coupler integrated in the CPU I/O interface for direct connection of up to 7 expansion modules Fieldbus-neutral FieldBusPlug-Slave interface Connection COM1: 9-pole pluggable terminal block Connection COM2: 9-pole SUB-D (socket) | | | | | |
| Type | Number of coupler slots | Type | Connection for coupler integrated in the CPU | Order code | Weight per piece/kg |
| TB511-ETH | 1 | | Ethernet RJ45 | 1SAP 111 100 R0170 | 0.215 |
| TB511-ARCNET | 1 | | ARCNET COAX | 1SAP 111 100 R0160 | |
| TB521-ETH | 2 | | Ethernet RJ45 | 1SAP 112 100 R0170 | |
| TB521-ARCNET | 2 | | ARCNET COAX | 1SAP 112 100 R0160 | |
| TB541-ETH | 4 | | Ethernet RJ45 | 1SAP 114 100 R0170 | |

| Interface modules | | | | | |
|------------------------|--|--------------|-----------------------|--------------------|---------------------|
| For decentralized I/Os | | | | | |
| DC505-FBP | Communication via FieldBusPlug with Profibus DP (in preparation: CANopen, DeviceNet) Fieldbus-dependent FieldBusPlug required | | | | |
| DC551-CS31 | Communication via internal interface with CS31 system bus Plug-in electronic modules, terminal block TU5xx required DC: Channels can be individually configured as inputs or outputs | | | | |
| Type | Number of DI/DO/DC | Input signal | Output signal | Order code | Weight per piece/kg |
| DC505-FBP | 8/-/ 8 | 24 V DC | Trans. 24 V DC, 0.5 A | 1SAP 220 000 R0001 | 0.3 |
| DC551-CS31 | 8/ -/16 | 24 V DC | Trans. 24 V DC, 0.5 A | 1SAP 220 500 R0001 | 0.3 |

Ordering data

Digital input/output modules

- For central expansion of the AC500 CPUs (up to 7 digital or analog modules in any combination)
- For decentralized expansion in combination with interface module DC505-FBP or DC551-CS31 (up to 7 digital or analog modules with a maximum of 4 analog modules)
- Plug-in electronic modules, terminal block TU5xx required
- Exception: DC541 (occupies one communication module slot on the CPU terminal base, no terminal block required)
- DC: Channels can be configured individually as inputs or outputs.

| Type | Number of DI/DO/DC | Input signal | Relay/transistor outputs | Output signal | Order code | Weight per piece/kg |
|-------|---------------------|--------------|--------------------------|-----------------------------|--------------------|---------------------|
| DI524 | 32 /-/- | 24 V DC | - | - | 1SAP 240 000 R0001 | 0.2 |
| DC522 | -/-/16 | 24 V DC | Transistor | 24 V DC, 0.5 A | 1SAP 240 600 R0001 | 0.2 |
| DC523 | -/-/24 | 24 V DC | Transistor | 24 V DC, 0.5 A | 1SAP 240 500 R0001 | 0.2 |
| DC532 | 16/-/16 | 24 V DC | Transistor | 24 V DC, 0.5 A | 1SAP 240 100 R0001 | 0.2 |
| DX522 | 8/8/- | 24 V DC | Relay | 230 V AC, 3 A ¹⁾ | 1SAP 245 200 R0001 | 0.3 |
| DX531 | 8/4/- | 230 V AC | Relay | 230 V AC, 3 A ¹⁾ | 1SAP 245 000 R0001 | 0.3 |
| DC541 | -/-/8 ²⁾ | 24 V DC | Transistor | 24 V DC, 0.5 A | 1SAP 270 000 R0001 | 0.1 |

¹⁾ Relay outputs, changeover contacts

²⁾ Multifunctional module, refer to table on page 29 for details

Analog input/output modules

- For central expansion of the AC500 CPUs (up to 7 digital or analog modules in any combination)
- For decentralized expansion in combination with interface module DC505-FBP or DC551-CS31 (up to 7 digital or analog modules with a maximum of 4 analog modules)
- Plug-in electronic modules, terminal block TU5xx required
- Range can be configured individually for each channel
- Resolution: 12 bits + sign

| Type | Number of AI/AO | Input signal | Output signal | Order code | Weight per piece/kg |
|-------|---------------------------------|-------------------------|--------------------------|--------------------|---------------------|
| AI523 | 16 / 0 | 0 ... 10 V, ±10 V | - | 1SAP 250 300 R0001 | 0.2 |
| AX521 | 4 / 4 | 0/4 ... 20 mA | - | 1SAP 250 100 R0001 | 0.2 |
| AX522 | 8 / 8 (max. 4 current outputs) | Pt100, Pt1000 Ni1000 | ±10 V 0 / 4 ... 20 mA | 1SAP 250 000 R0001 | 0.2 |
| AO523 | 0 / 16 (max. 8 current outputs) | - | - | 1SAP 250 200 R0001 | 0.2 |

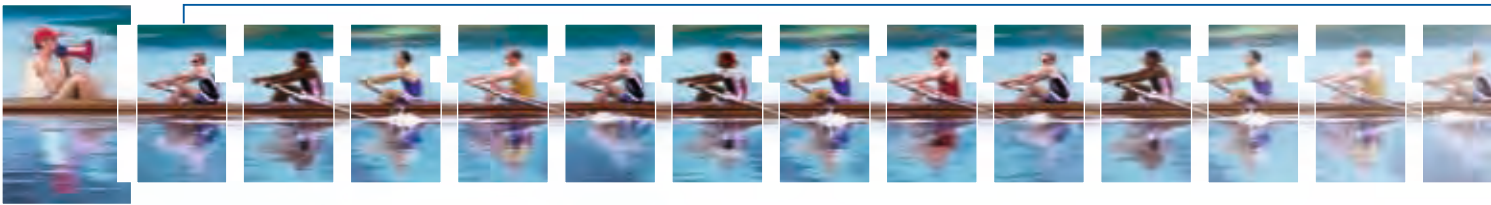
Terminal blocks

For digital and analog expansion modules and interface modules.

Please note: For modules with relay outputs, terminal blocks for 230 V AC (TU531/TU532) are required!

For the module-terminal block assignments, please consult the table!

| | for I/O modules | | | | for interface modules | | | |
|------------|------------------|-------------------|------------------|-------------------|-----------------------|-----------------------|-----------------------|------------------------|
| | TU515 screw-type | TU516 spring-type | TU531 screw-type | TU532 spring-type | TU505-FBP screw-type | TU506-FBP spring-type | TU551-CS31 screw-type | TU552-CS31 spring-type |
| DI524 | x | x | | | | | | |
| DC522 | x | x | | | | | | |
| DC523 | x | x | | | | | | |
| DC532 | x | x | | | | | | |
| DX522 | | | x | x | | | | |
| DX531 | | | x | x | | | | |
| AI523 | x | x | | | | | | |
| AX521 | x | x | | | | | | |
| AX522 | x | x | | | | | | |
| AO523 | x | x | | | | | | |
| DC505-FBP | | | | | x | x | | |
| DC551-CS31 | | | | | | | x | x |



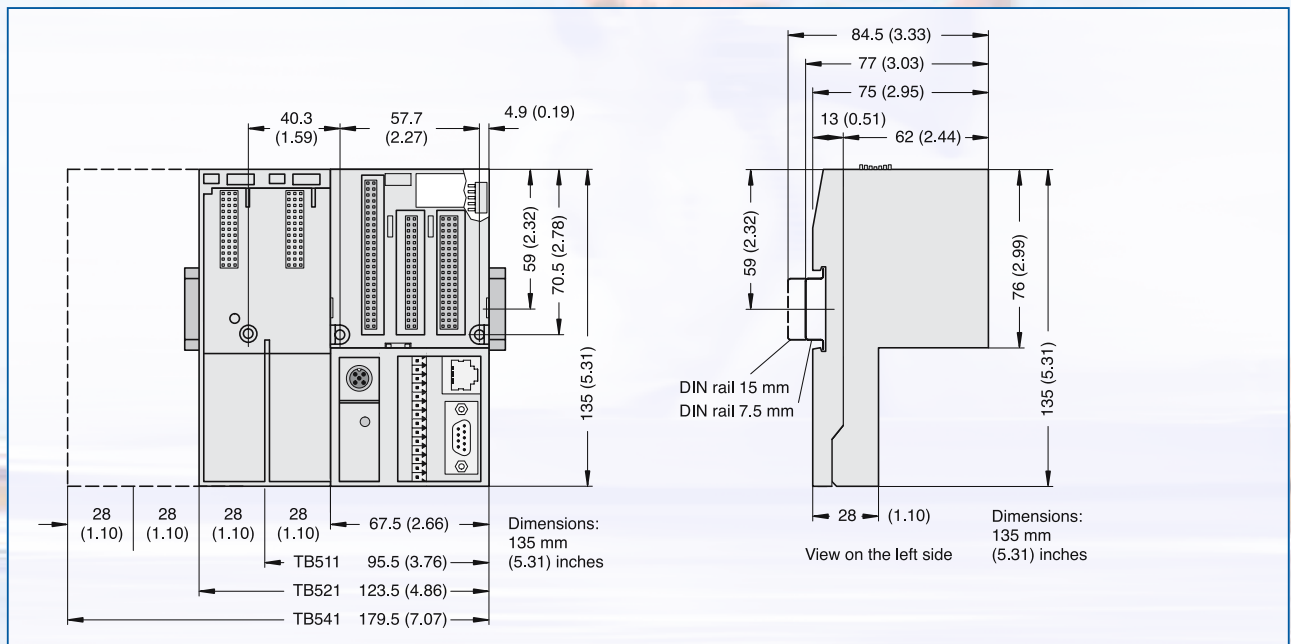
| Type | for | Supply | Connection type | Order code | Weight per piece/kg |
|------------|------------------------|----------|-----------------------|--------------------|---------------------|
| TU505-FBP | FBP interface modules | | Screw-type terminals | 1SAP 210 200 R0001 | 0.3 |
| TU506-FBP | FBP interface modules | | Spring-type terminals | 1SAP 210 000 R0001 | 0.3 |
| TU515 | I/O modules | 24 V DC | Screw-type terminals | 1SAP 212 200 R0001 | 0.3 |
| TU516 | I/O modules | 24 V DC | Spring-type terminals | 1SAP 212 000 R0001 | 0.3 |
| TU531 | I/O modules AC / relay | 230 V AC | Screw-type terminals | 1SAP 217 200 R0001 | 0.3 |
| TU532 | I/O modules AC / relay | 230 V AC | Spring-type terminals | 1SAP 217 000 R0001 | 0.3 |
| TU551-CS31 | CS31 interface modules | 24 V DC | Screw-type terminals | 1SAP 210 600 R0001 | 0.3 |
| TU552-CS31 | CS31 interface modules | 24 V DC | Spring-type terminals | 1SAP 210 400 R0001 | 0.3 |

| Accessories for AC500 | | | | | |
|-----------------------|--------------------|--|--------------------|---------------------|--|
| Type | for | Description | Order code | Weight per piece/kg | |
| TK501 | AC500 CPUs COM2 | Programming cable Sub-D/Sub-D, length 5 m | 1SAP 180 200 R0001 | 0.4 | |
| TK502 | AC500 CPUs COM1 | Programming cable Sub-D/ terminal block, length 5 m | 1SAP 180 200 R0101 | 0.4 | |
| MC502 | AC500 CPUs | Memory card (SD card) 128 MB | 1SAP 180 100 R0001 | 0.1 | |
| TA521 | AC500 CPUs | Lithium battery for data buffering | 1SAP 180 300 R0001 | 0.1 | |
| TA523 | I/O modules | Pluggable marker holder for I/O modules, packing unit incl. 10 pcs. | 1SAP 180 500 R0001 | 0.3 | |
| TA524 | Terminal base | Communication module, dummy housing | 1SAP 180 600 R0001 | | |
| TA525 | I/O modules | White labels, packing unit incl. 10 pcs. | 1SAP 180 700 R0001 | 0.1 | |
| TA526 | CPU terminal base | Accessories for back plate mounting, packing unit incl. 10 pcs. | 1SAP 180 800 R0001 | 0.2 | |

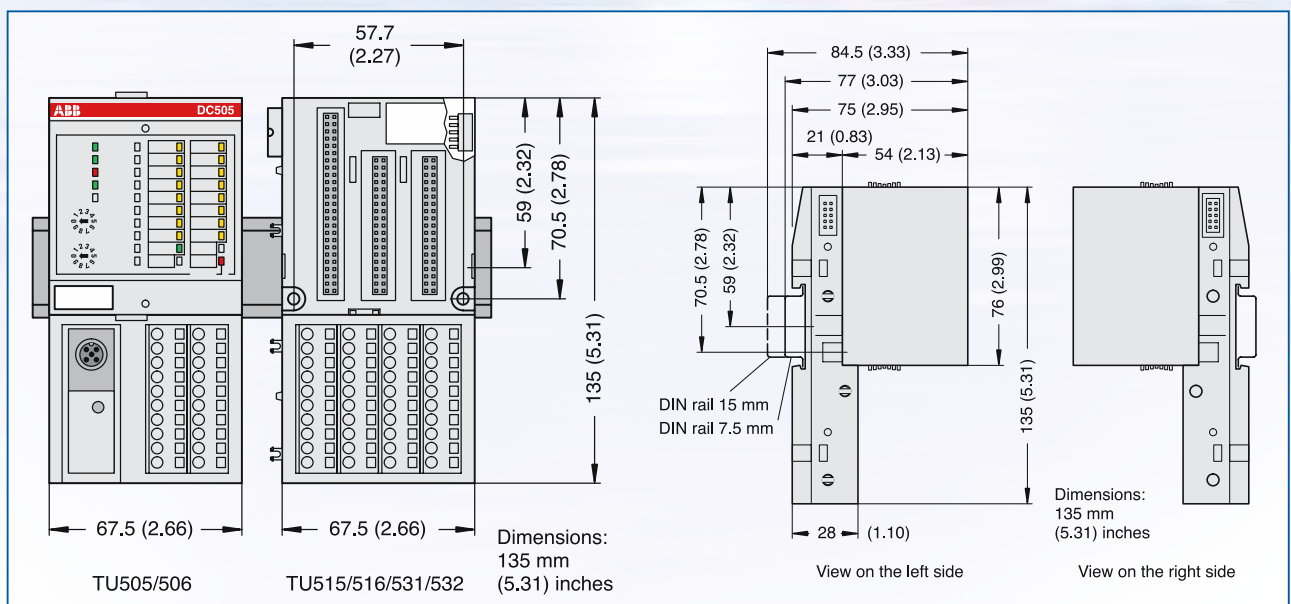
| Programming package PS501 Control Builder | | | | | |
|--|---|---------------------------|--------------------|---------------------|--|
| For all AC500 CPUs | | | | | |
| All programming languages according to IEC 61131-3 | | | | | |
| Contains: 5 programming languages, sampling - trace, debugging, offline simulation, integrated visualization, trace recording (multi-channel), recipe management, Continuous Function Chart | | | | | |
| Languages: German / English / French | | | | | |
| Scope of delivery: Software, libraries and documentation (PDF) on CD-ROM | | | | | |
| Type | for | Description | Order code | Weight per piece/kg | |
| PS501 | all AC500 CPUs Control Builder AC500 | Programming package PS501 | 1SAP 190 100 R0002 | 0.3 | |

Dimensions

CPU terminal base TB511, TB521 and TB541



I/O expansion and interface module terminal unit



Relevant approvals

Like all ABB products, the AC500 components, are as well tested in conformity with the applicable European, North American and international guidelines, and approved by the organizations responsible. These include GL, DNV, BV, RINA, LRS and cUL. The products bear the CE symbol.

Certified quality

The entire process involved in creating an ABB product – from the original idea to the actual sale – is, of course, monitored by a quality management process certified under DIN ISO 9001.

In harmony with the natural environment

Protection of the natural environment is integral to ABB's corporate philosophy. This includes both resource-economy and the avoidance of problematical substances, plus recycling-friendly construction and long-lived products. These aspects are taken fully on board by an integrated eco-management system conforming to ISO 14001, whose implementation is repeatedly verified by regular eco-audits. And for newly developed products ABB now conducts a lifecycle assessment as well.

AC500 approvals



cUL, USA, Canada



GL, Germany



DNV, Norway



BV, France



RINA, Italy

Lloyd's
Register Of
Shipping

LRS, United Kingdom