



Main catalogue

Automation products AC500, AC31, CP400, WISA

Power and productivity
for a better world™

ABB

Automation products



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Automation products

Operator panels and PLC families

Fields of application

ABB offers a comprehensive range of scalable PLC's and robust HMI control panels as well as high availability solutions. Since its launch in 2006, the AC500 PLC platform has achieved significant industry recognition for delivering high performance, quality and reliability. Our unique WISA family of IP67 rated wireless Input/Output devices has also now been included into the PLC product catalogue.

ABB delivers scalable, flexible and efficient ranges of automation components to fulfill all conceivable automation applications including:



Operator panels

Touch screen or keypad graphical displays utilizing low cost, user friendly configuration software offering extensive libraries and drivers for most PLC platforms, and other automation devices



Small PLC AC31 series 40...50

Small with high performance; Expandable centrally and decentrally



AC500-eCo

To meet the cost effective demands of the small PLC market whilst offering total inter-operability with the core AC500 range



Member of Automation Alliance

Programming package PS501 control builder

Control Builder conforms to the IEC61131-3 CoDeSys standard offering all 5 programming languages, extensive function block libraries, a powerful embedded simulation/visualization feature. It also supports a number of languages (e.g. French, German, Russian, Spanish etc).



AC500

ABB's powerful flagship PLC offering a wide range of performance levels and scalability within a single, simple concept and where most competitors require multiple product ranges to deliver similar functionality



S500 I/O modules

Digital and analogue modules can be configured to best meet customer requirements as well as offering local and/or remote expansion options using most industry standard communications protocols

Wireless

Factory Automation for high productivity because of reliable sensor and actuator network. The problems with broken cables and wires can be solved using the wireless solution - WISA

Automation products

Operator panels and PLC families

Fields of application

ABB's automation devices deliver the performance and flexibility to enable them to be effectively deployed within diverse industries and applications including: marine, power generation and reticulation, materials handling, manufacturing and many more.

Areas of core focus for ABB include:

Industries

- Water and Waste Water
- Energy generation
- Food and Beverage
- Building Automation
- OEM

Applications

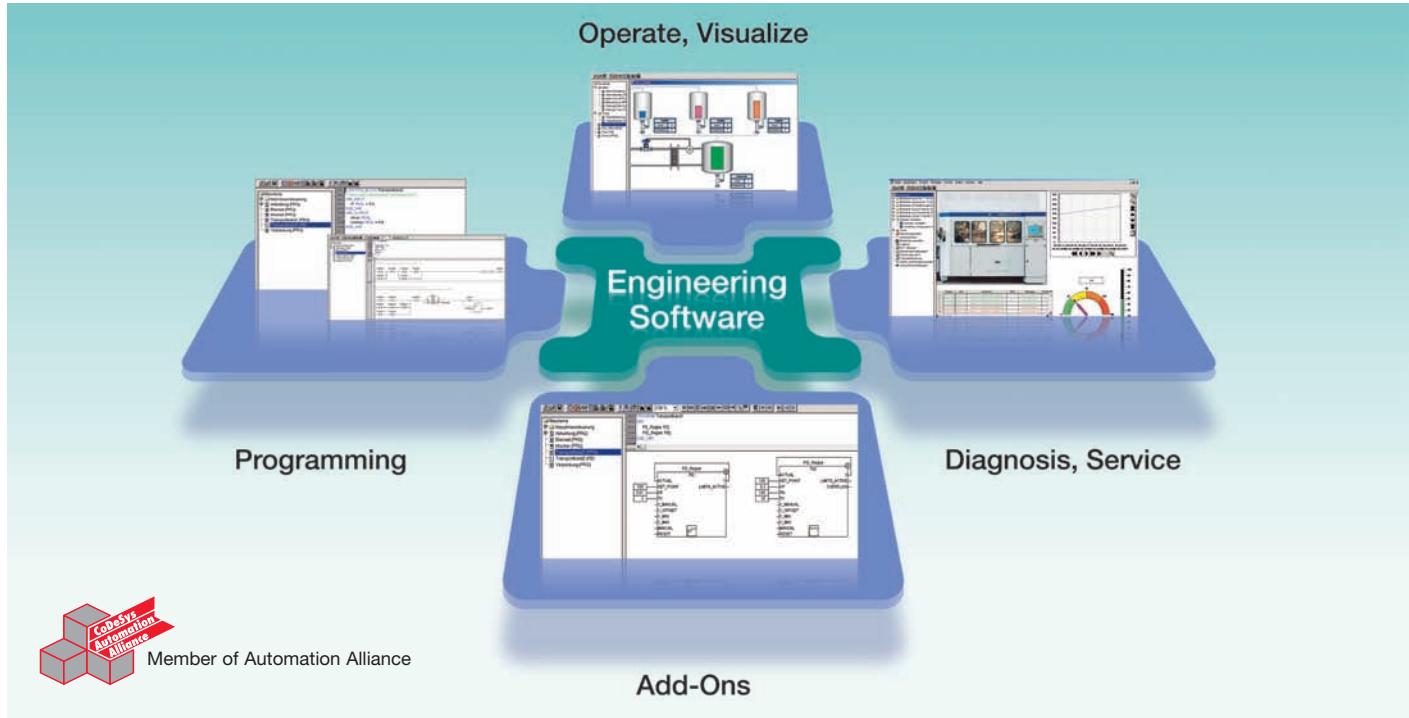
- Pumping and dosing within both water and waste water treatment
- Thermo-solar, photovoltaic, windmill, water turbines, biomass
- Preparation of food, ice cream and baking processing machinery plus packaging
- HVAC, lighting, elevators, tunnel control, access management
- Most applications including robotics, press automation, transfer systems, assembly quality control, tracking



Automation products

Programming

Programming software PS501 and AC1131



This package conforms to the IEC 61131-3 standard, offering all five programming languages. Other features include: Configuration of the overall system including field buses and interfaces, extensive diagnostic functions, alarm handling, integrated visualization and open software interfaces.

Conformity with IEC 61131-3 Standards

For optimal planning, programming, testing and commissioning of an automation application, the following features are also included:

- 5 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 relevant fault conditions. After validation of the PLC program it can then be downloaded to the AC500 thus potentially saving significant commissioning time.

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 simultaneously downloaded to the control system ("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 ("Read Recipe"). These functions are also helpful for setting and entering control parameters.

Visualization feature

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, PROFINET, CANopen, DeviceNet, Ethernet, EtherCAT, Modbus and CS31.

Open interfaces

DDE and OPC alarm and events.

Programming

Serial or via Ethernet or ARCNET networks.

Webserver

The PS542-WEB-PC Web-server software package allows the AC500 PLC to be accessed through your Intranet or of course the Internet.

Automation products

Scalable PLC AC500



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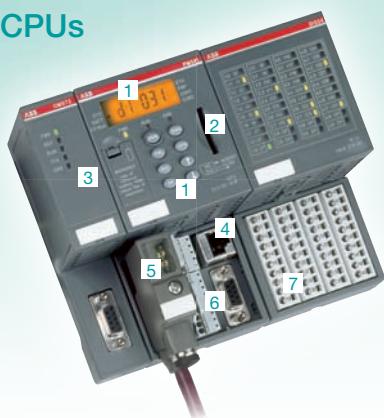
Scalable PLC AC500

The AC500 concept

The AC500 PLC range offers latest generation levels of performance and scalability. It is also supports most industry standard communications variants making it an ideal solution for multi-protocol or multi-domain field bus environments. It is also a very flexible range which offers different levels of CPU performance in a simple product portfolio where our competi-

tors, in most cases, need to supply several disparate platforms to support the same range of applications. This also means that upgrades to meet increasing system performance demands are extremely simple and low cost. The PS501 Control Builder programming software also provides a standard programming package for the whole platform.

CPUs



- 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 Fieldbus-neutral interface for use as slave or for programming | 6 Two serial interfaces for programming, ASCII, Modbus or CS31 field bus (master) | 7 Expandable by up to ten local I/O modules



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.



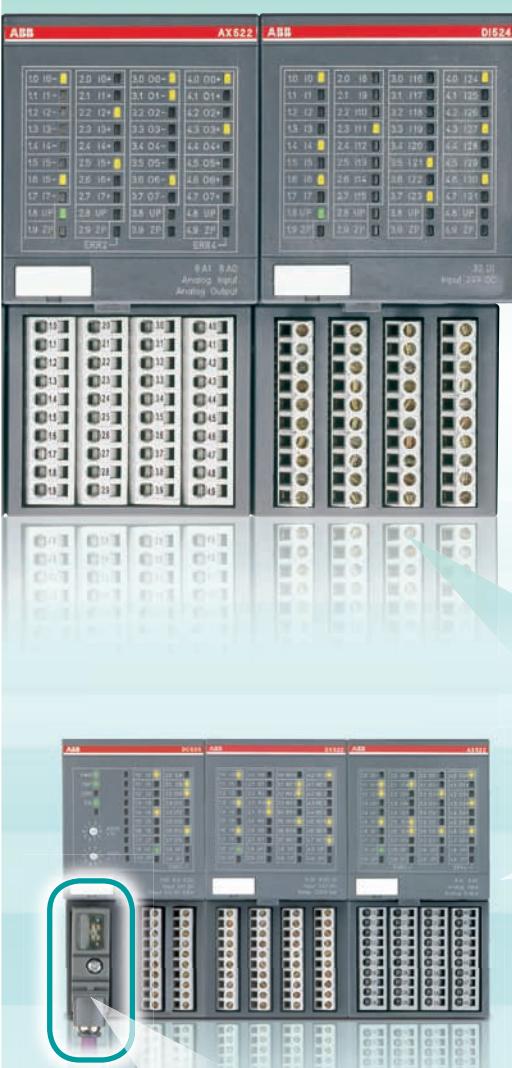
Interface modules

Profibus DP
DeviceNet
CANopen
MODBUS
CS31
RCOM
Ethernet TCP/IP
PROFINET
EtherCAT

Automation products

Scalable PLC AC500

The AC500 concept



CPU's modules

The CPUs are available in different performance classes which can all be programmed in five different languages. They 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.



I/O modules

Digital and analogue modules in different versions. They can be simply plugged onto the terminal units for local expansion of the CPU (max. ten modules for AC500 and seven modules for AC500-eCo) and decentralized expansion via the FBP interface (max. seven modules). Flexible use thanks to configurable channels.

Decentralized expansion

Fieldbus plug (FBP)

With embedded digital I/Os and a field-bus-neutral interface for connecting the chosen FBP connector. For decentralized expansion of the AC500 system by up to seven I/O modules (incl. max. 4 analogue modules). Please refer to the FieldBusPlugs catalog for further information about the FBP connector. The currently available FBP field bus plugs are listed in the catalogue 2CDC 120 141 D0201.

Automation products

Scalable PLC AC500

Motion control PS551-MC

The The PS551-MC is a new type of application program based on PLC open standard specifically intended for OEM machine builders and systems integrators looking for a reliable and easy-to-use high performance motion control drive module in their demanding applications for example in the field of material handling, packaging, plastics, printing and textile industry. It provides accurate positioning in one package without the need of an external motion controller.

Main features of Motion Control:

- Speed control
- Position control
- Position interpolator
- Positioning speed
- Acceleration
- Deceleration
- Standard sequential homing
- Selectable physical units for position values (mm, inch, increment, degree, revolution)
- Complete package of function blocks to work together with ABB Drives



Automation products

Scalable PLC AC500

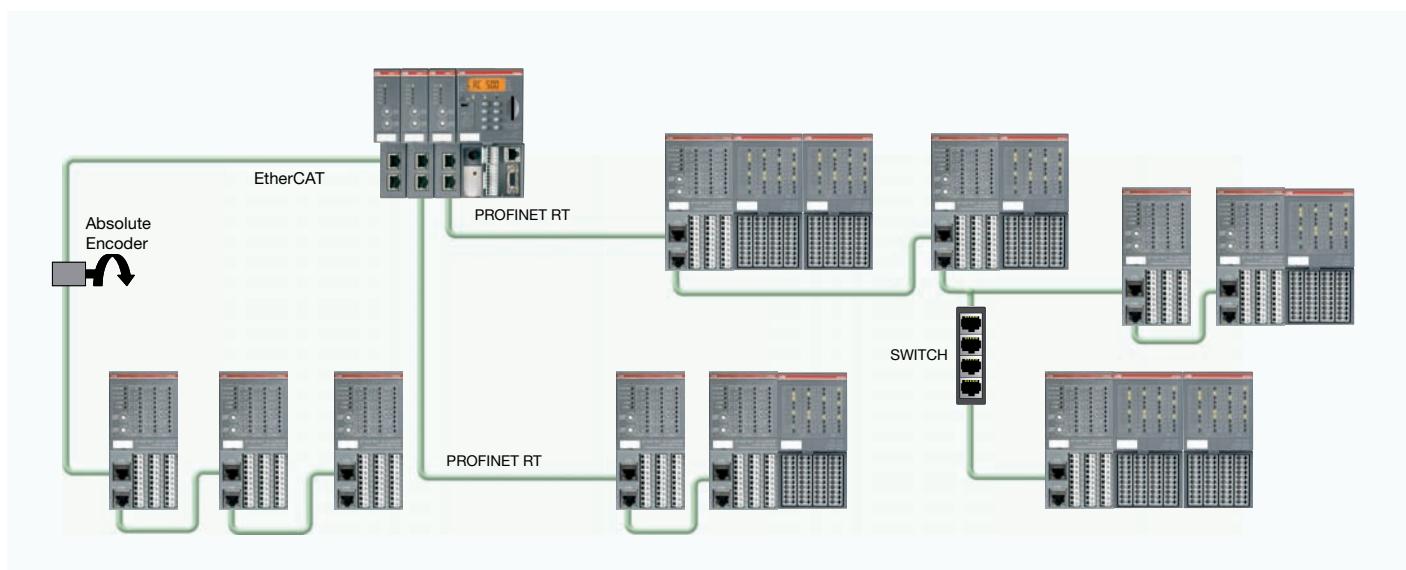
Real-time Ethernet products

The RT-Ethernet modules

The modules are available on two different Bus protocols on Ethernet basis (Profinet IO, EtherCAT). Two new master couplers provide the connection of the AC500 CPUs to the remote I/O modules. Several remote I/O modules offer the possibility to connect I/O modules to the Ethernet networks.

Profinet and EtherCAT network

Networked system without high system requirement for bus cycle time. Standard I/O modules can be used to expand totally the remote Profinet drops



Cam-switch functionality

Modules based on decentralized real-time EtherCAT interface modules but with integrated I/Os and programmed thanks to PLC open function blocks



Automation products

Scalable PLC AC500

AC500 High Availability

Performance is the key

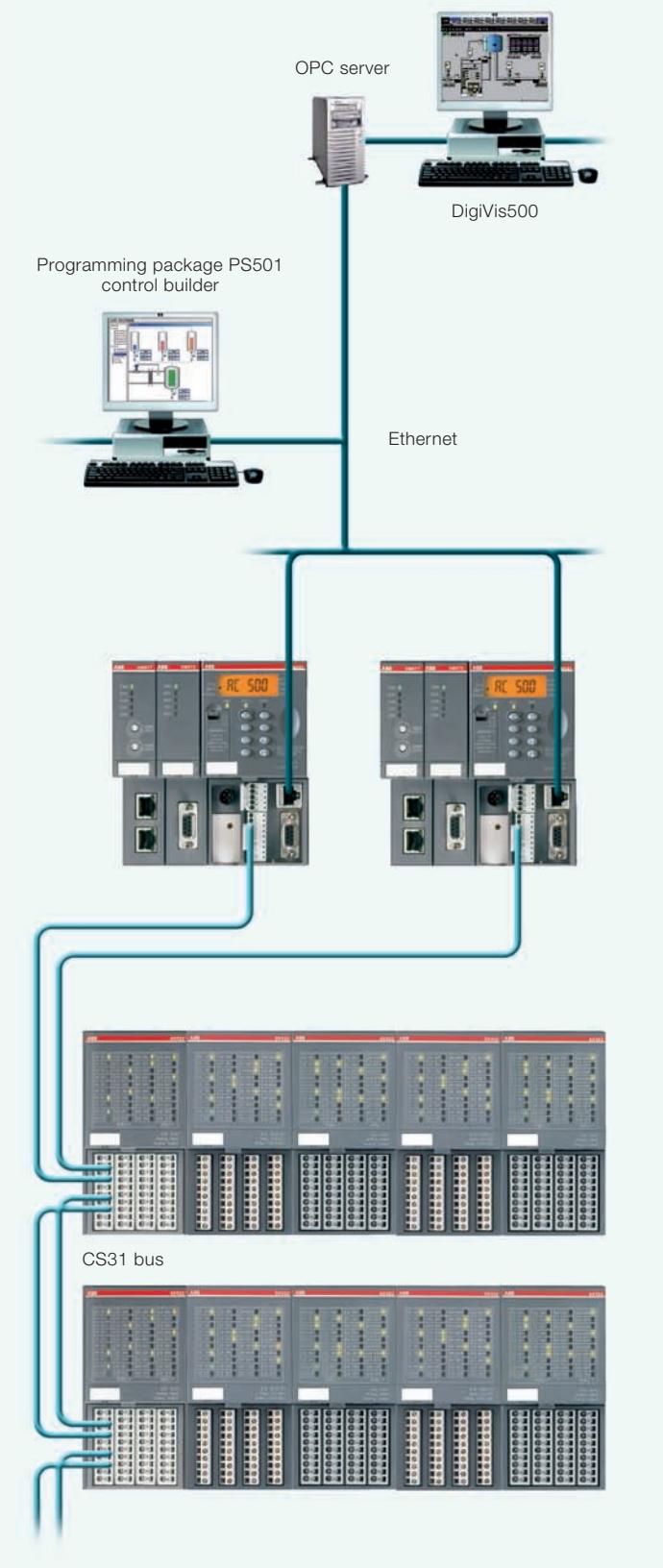
Most downtime is caused by either human error or device malfunction which could be avoided with the right solution. Utilising dual CPU's helps negate the risk of total system failure thus enhancing system availability. If the retention of critical data and the avoidance of downtime are important to your application then the new AC500 High Availability solution is ideal for your plant.

What will a High Availability solution provide you?

- Greater resource utilisation with no downtime through Hardware/Software failure with the double CPU's and communication fieldbus CS31.
- Cost efficiency and easy system maintenance by using standard hardware (only specific library is necessary).
- Standard equipment and high flexibility in your choice by using the smallest CPU to highest performance CPU's.



High Availability - System overview



Automation products

Scalable PLC AC500

CD522 encoder, counter and PWM/PULSE module

Universal encoder and flexible counting module

The CD522 module offers accuracy and dynamic flexibility. It has two independent encoder inputs onboard and is easily configured using the Control Builder software for 10 different operation modes and for frequencies up to 300 kHz.

CD522 module also integrates outputs for PWM pulses as well as normal inputs and outputs, depending on selection of encoder mode.

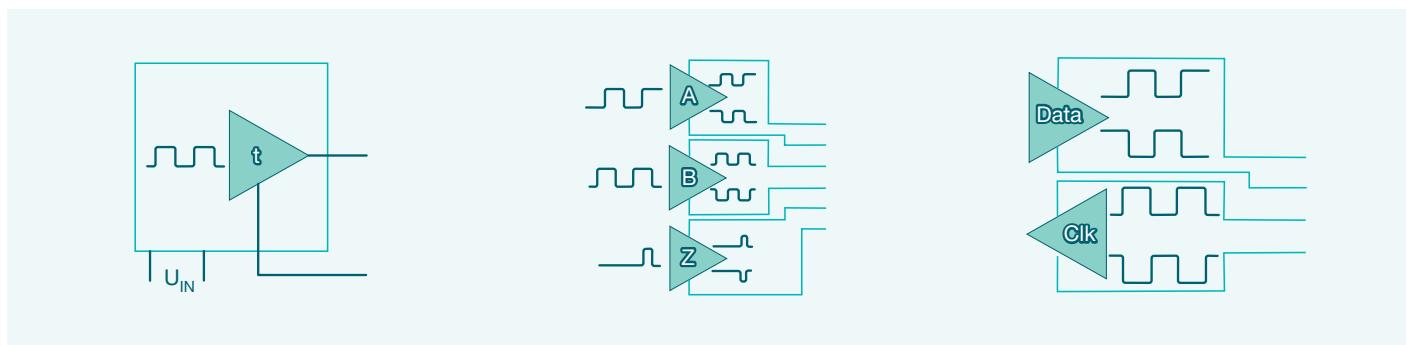
Types of encoders vary and their requirement can be different in terms of signals, voltages, formats and methods of use. This depends heavily on the application, like when measuring a position, an angle or a velocity. Sometimes an incremental encoder is the better choice and in other situations an absolute encoder is the solution.

The CD522 module can serve all these differing needs. Besides solving counting tasks the CD522 offers pulse outputs and integrated inputs, these make it easy to react very quickly with receiving inputs coming directly from the machine. This will ensure higher productivity and safer operations.

The reduction of function modules, flexible configuration and a library with preconfigured applications will save cost and time.

CD522 Specifications

- Two independent encoders / counters.
- High speed counter input with multiple signal types like SSI, 5 V, 24 V, Sinus with 1 Vpp.
- 12 preconfigured counting modes.
- Two independent PWM/PULSE outputs.
- Two fast inputs for touch operation to freeze the actual counter/encoder value.
- 8 configurable input/outputs.
- Two independent +5 V sensor power supplies.
- Frequency up to 300 kHz.
- Counter can trigger digital outputs.
- Certifications: CE, cUL, GL, DNV, BV, LRS and RINA pending.



Automation products

Scalable PLC AC500 AC500 system data

Operating and environmental conditions - Voltages according to EN 61131-2

24 V DC	Process and supply voltage UP	24 V DC (-15%, +20% without residual ripple)
	Absolute limits	19.2 V ... 30 V incl. residual ripple
	Residual ripple	< 5 %
	Polarity reversal protection	10 s
120 V AC	Supply voltage	120 V AC (-15%, +10%)
	Frequency	47 Hz ... 62.4 Hz/50 ... 60 Hz (-6%, +4%)
230 V AC	Supply voltage	230 V AC (-15%, +10%)
	Frequency	47 Hz ... 62.4 Hz/50 ... 60 Hz (-6%, +4%)
120–240 V AC	Wide voltage input	
	Voltage	102 V ... 264 V/120 V ... 240 V (-15%, +10%)
	Frequency	47 Hz ... 62.4 Hz/50 ... 60 Hz (-6%, +4%)

Power failure bridging time according to EN 61131-2

Failure	DC supply	Failure < 10 ms, time between 2 failures > 1 s, PS2
	AC supply	Failure < 0.5 periods, time between 2 failures > 1 s
Temperature	Operation	0 °C ... +60 °C for horizontal mounting
	Storage	-25 °C ... +75 °C (for AC500) -40 °C ... +70 °C (for AC500-eCo)
	Transport	-25 °C ... +75 °C (for AC500) -40 °C ... +70 °C (for AC500-eCo)
Humidity		95% max., no condensation
Air pressure	Operation	> 800 hPa/< 2000 m
	Storage	> 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)	Acc. to EN 61000-4-2, Zone B, Criteria B
Interference voltage with air discharge	8 kV
Interference voltage with contact discharge	4 kV*

Interference immunity

Against radiated interferences (CW radiated)	Acc. to EN 61000-4-3, Zone B, Criteria A
Test field strength	10 V/m
Against transient interference voltages (burst)	Acc. to EN 61000-4-4, Zone B, Criteria B
Against conduction-bound interferences (CW conducted)	Acc. to EN 61000-4-6, Zone B, Criteria A
Test voltage	3 V Zone B
Impulse voltage	Acc. to EN 61000-4-5, Zone B, Criteria B
Insulation test voltage	Acc. to EN 61131-2
Emitted interferences	Acc. to EN 55011, Group 1, Class A

Mechanical data

Connection type / terminals		
Mounting	Horizontal	
Degree of protection	IP 20	
Housing	Acc. to UL 94	
Vibration resistance	All three axes (for AC500) 2 Hz ... 15 Hz, continuously 3.5 mm 15 Hz ... 150 Hz, continuously 1 g (4 g in preparation)	All three axes (for AC500-eCo) 2 Hz ... 13.2 Hz, continuously 3.5 mm 13.2 Hz ... 150 Hz, continuously 1 g
Vibration resistance with SD card plugged in	15 Hz ... 150 Hz, continuously 1 g	on request
Shock resistance	All three axes 15 g, 11 ms, semi-sinusoidal	
Device mounting		
DIN top-hat rail acc. to DIN EN 50022	35 mm, overall height 7.5 mm or 15 mm	
Screw mounting	Screws with 4 mm diameter	
Torque	1.2 Nm	

* Use with higher interference voltages is possible but requires additional external measures

Automation products

Scalable PLC AC500

AC500 communication - 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		
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		
Station address configuration	No	Using rotary switches (99 max.)

Automation products

Scalable PLC AC500

Overview of AC500-eCo CPUs

AC500-eCo CPUs



Type	PM554			PM564							
	PM554-T	PM554-R	PM554-R-AC	PM564-T	PM564-R	PM564-R-AC					
	Transistor	Relay	Relay	Transistor	Relay	Relay					
Supply voltage	24 V DC		24 V DC or 100-240 V AC	24 V DC or 100-240 V AC							
Program memory	128 KB		128 KB	128 KB							
Integrated data memory (kB)	14 kB thereof 2 kB saved										
Cycle time for 1000 instructions in ms											
Binary	0.1										
Word	0.3										
Floating	6.0										
Onboard I/Os											
Max. digital inputs/outputs	8/6		-	6/6	6/6						
Max. analogue inputs/outputs	-		-	2/1							
Max. number of centralized inputs/outputs											
Digital inputs	224 + 8										
Digital outputs	168 + 6										
Analogue inputs	112										
Analogue outputs	112										
Max. number of expansion I/O modules											
Centralized I/O modules	7										
Decentralized I/O modules	On CS31 bus: up to 31 stations with up to 120 DI / 120 DO each										
Data buffering	In flash										
Real-time clock (option with battery back-up)	X										
Program execution	X										
Cyclical	X										
Time controlled	X										
Multi tasking	No 1 task + 1 interrupt task max.										
Interruption	X										
User program protection by password	X										
Internal interfaces											
COM1:											
- RS485	X										
- Sub-D connection	X										
- Programming, Modbus, ASCII, CS31	X										
COM2 (option):											
- RS485	X										
- Terminal block	X										
- Programming, Modbus, ASCII	X										
Integrated Ethernet	-										
RUN/STOP switch	X										
LED display for power, status and error	X										
Approvals	 -  (pending)										

Automation products

Scalable PLC AC500

Overview of AC500 CPUs

AC500 CPUs



Type	PM571	PM571ETH	PM581	PM581-ETH	PM581-ARC
Supply voltage	24 V DC			24 V DC	
Program memory					
Flash EPROM and RAM (kB)	64 kB			256 kB	
Integrated data memory (kB)	28 kB thereof 8 kB saved			416 kB thereof 160 kB saved	
Plug-in memory card (depending on SD-Card used)			at least 512 MB		
Cycle time for 1000 instructions in ms					
Binary	0.09			0.07	
Word	0.3			0.07	
Floating-point	6.0			1.6	
Max. number of centralized inputs/outputs					
Digital inputs	320			320	
Digital outputs	240			240	
Analogue inputs	160			160	
Analogue outputs	160			160	
Max. number of decentralized inputs/outputs	depends on the used standard field bus e.g. CS31 field bus: up to 31 stations with up to 120 DIs/120 DOs or up to 32 AIs/32 AOs per station				
Data buffering	battery			battery	
Real-time clock (with battery back-up)	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		pluggable terminal block			pluggable 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	-	X	-	X	-
Ethernet connection	-	RJ45	-	RJ45	-
Integrated ARCNET coupler	-	-	-	-	X
ARCNET connection	-	-	-	-	Coax
Display and 8 function keys	X			X	
	RUN/STOP			RUN/STOP	
Function	status, diagnosis		status, diagnosis		
Timers	unlimited		unlimited		
Counters	unlimited		unlimited		
Approvals	 - GL - DNV - BV - LRS - RINA				

Automation products

Scalable PLC AC500

Overview of AC500 CPUs

AC500 CPUs



Type	PM582	PM582-ETH	PM582-ARC	PM590	PM590-ETH	PM590-ARC	PM591	PM591-ETH	PM591-ARC
Supply voltage	24 V DC			24 V DC			24 V DC		
Program memory									
Flash EPROM and RAM (kB)	512 kB			2048 kB			4096 kB		
Integrated data memory (kB)	416 kB thereof 160 kB saved			2560 kB thereof 1024 kB saved			3584 kB thereof 1024 kB saved		
Plug-in memory card (depending on SD-card used)				at least 512 MB					
Cycle time for 1000 instructions (ms)									
Binary	0.07			0.002			0.002		
Word	0.07			0.006			0.006		
Floating-point	1.6			0.006			0.006		
Max. number of centralized inputs/outputs									
Digital inputs	320			320			320		
Digital outputs	240			240			240		
Analogue inputs	160			160			160		
Analogue outputs	160			160			160		
Max. number of decentralized inputs/outputs		depends on the used standard field bus e.g. CS31 field bus: up to 31 stations with up to 120 DIs/120 DOs or up to 32 AIs/32 AOs per station							
Data buffering	battery			battery			battery		
Real-time clock (with battery back-up)	X			X			X		
Program execution									
Cyclical	X			X			X		
Time controlled	X			X			X		
Multi tasking	X			X			X		
User program protection by password	X			X			X		
Internal interfaces									
COM1:									
- RS232/RS485 configurable	X			X			X		
- Connection		pluggable terminal block			pluggable terminal block			pluggable terminal block	
- Programming, Modbus, ASCII, CS31 (Master only)	X			X			X		
COM2:									
- RS232/RS485 configurable	X			X			X		
- Connection		SUB-D			SUB-D			SUB-D	
- Programming, Modbus, ASCII	X			X			X		
Integrated Ethernet coupler	-	X		-	X		-	X	-
Ethernet connection	-	RJ45		-	RJ45		-	RJ45	-
Integrated ARCNET coupler	-	-	X	-	-	X	-	-	X
ARCNET connection	-	-	Coax	-	-	Coax	-	-	Coax
Display and 8 function keys		X			X			X	
		RUN/STOP			RUN/STOP			RUN/STOP	
Function		status, diagnosis			status, diagnosis			status, diagnosis	
Approvals		- GL - DNV - BV - LRS - RINA							

Automation products

Scalable PLC AC500

Overview of digital S500-eCo I/O modules

Digital S500-eCo I/O modules					
Type		DI561	DI562	DI571	DO561
Number of Channels per Module					
Digital Inputs		8	16	8 (AC)	-
Digital Outputs		-	-	-	8
Configurable as Input or Output DC		-	-	-	-
Relays (R) / Transistor (T)		-	-	-	T
Additional configuration of channels as:					
Fast Counter				No	
Digital inputs					
Input signal voltage	24 V DC	24 V DC	24 V DC	110-240 V AC	-
Input time delay		Typically 4...8 ms		Typically 15 ms / 30 ms	-
Input current per channel					
At Input voltage +24 V DC		Typically 5 mA		-	-
At Input voltage +5 V DC		< 1 mA		-	-
At Input voltage +15 V DC		> 2.5 mA		-	-
At Input voltage +30 V DC		< 6.5 mA		-	-
At input voltage 40 V AC		-		< 5 mA	-
At input voltage 159 V AC		-		> 7 mA	-
Output current					
Nominal current per channel	-	-	-	-	0.5 A at UP=24 V
Maximum (total current of all channels)	-	-	-	-	4 A
Residual current at signal state 0	-	-	-	-	< 0.5 mA
Demagnetization when switching off inductive loads	-	-	-	-	Must be provided externally
Switching frequency					
For inductive load	-	-	-	-	Max. 0.5 Hz
For lamp load	-	-	-	-	Max. 11 Hz at max. 5 W
Short circuit / overload proofness	-	-	-	-	No
Overload indication (I>0.7 A)	-	-	-	-	No
Output current limiting	-	-	-	-	No
Proofiness against reverse feeding of 24 V signals	-	-	-	-	No
Contact rating					
For resistive load, max.	-	-	-	-	-
For inductive load, max.	-	-	-	-	-
For lamp load	-	-	-	-	-
Lifetime (switching cycles)					
Mechanical lifetime	-	-	-	-	-
Lifetime under load	-	-	-	-	-
Spark suppression for inductive AC load	-	-	-	-	-
Demagnetization for inductive DC load	-	-	-	-	-
Maximum cable length for connected process signals					
Shielded cable (m)	500	500	500	500	500
Unshielded cable (m)	300	300	300	300	150
Potential isolation					
Per module	X	X	X	X	X
Between the input channels	-	per group of 8	-	X	-
Between the output channels	-	-	-	-	per group of 8
Voltage supply for the module	Internal via I/O bus	Internal via I/O bus	Internal via I/O bus	Internal via I/O bus	Internal via I/O bus
Field bus connection			CI501-PNIO or CI502-PNIO or DC551-CS31		
Address setting			Automatically (internal)		

Automation products

Scalable PLC AC500

Overview of digital S500-eCo I/O modules

Digital S500-eCo I/O modules



Type	DO571	DO572	DX561	DX571	DC561
Number of Channels per Module					
Digital Inputs			8	8	-
Digital Outputs	8	8	8	8	-
Configurable as Input or Output DC	-	-	-	-	16
Relays (R) / Transistor (T)	R	Triac (AC)	T	R	T
Process voltage					
AC	120 V~, 240 V	100 V~, 240 V	-	-	-
DC	24 V	-	24 V	24 V	24 V
Digital inputs					
Input signal voltage	-	-	24 V DC	24 V DC	24 V DC
Input time delay	-	-	-	Typically 4...8 ms	-
Input current per channel					
At Input voltage +24 V DC	-	-	Typically 5 mA	Typically 5 mA	Typically 4 mA
At Input voltage +5 V DC	-	-	< 1 mA	< 1 mA	< 1 mA
At Input voltage +15 V DC	-	-	> 2.5 mA	> 2.5 mA	> 2.5 mA
At Input voltage +30 V DC	-	-	< 6.5 mA	< 6.5 mA	< 6 mA
Output current					
Nominal current per channel	2 A (24 V DC or 230 V AC)	0.3 A at UP=24 V	0.5 A at UP=24 V	2 A (24 V DC or 230 V AC)	0.1 A at UP=24 V
Maximum (total current of all channels)	2 X 8 A	2.4 A / 8 X 0.3 A	4 A	2 X 8 A	1.6 A
Residual current at signal state 0	-	1.1 mA rms at 132 V AC and 1.8 mA rms at 264 V AC	< 0.5 mA	-	< 0.5 mA
Demagnetization when switching off inductive loads	A free-wheeling diode must be circuited in parallel to the inductive load	-	A free-wheeling diode must be circuited in parallel to the inductive load	A free-wheeling diode must be circuited in parallel to the inductive load	Must be performed externally
Switching frequency					
For inductive load	-	-	0.5 Hz max.	-	0.5 Hz max.
For lamp load	1 Hz max.	10 Hz max.	11 Hz max. at max. 5 W	1 Hz max.	-
Short circuit / overload proofness	No	No	No	No	No
Overload indication (I>0.7 A)	No	No	No	No	No
Output current limiting	No	No	No	No	No
Proofness against reverse feeding of 24 V signals	No	No	No	No	No
Contact rating					
For resistive load, max.	-	-	-	-	-
For inductive load, max.	-	-	-	-	-
For lamp load	200 W at 230 V AC 30 W at 24 V DC	-	-	-	-
Lifetime (switching cycles)					
Mechanical lifetime	100 000	-	-	100 000	-
Lifetime under load	100 000	-	-	100 000	-
Spark suppression for inductive AC load	Must be performed externally, according to driven load specification	-	-	Must be performed externally	-
Demagnetization for inductive DC load	Must be performed externally	-	-	Must be performed externally	-
Maximum cable length for connected process signals					
Shielded cable (m)	500	500	500	500	500
Unshielded cable (m)	150	150	150	150	150
Potential isolation					
Per module	-	X	X	-	X
Between the input channels	-	-	-	-	-
Between the output channels	per group of 4	X	-	per group of 4	-
Voltage supply for the module	Internal via I/O bus	Internal via I/O bus	Internal via I/O bus	Internal via I/O bus	Internal via I/O bus
Field bus connection	Via DC551-CS31, CI501-PNIO or CI502-PNIO				
Address setting	Automatically (internal)				

Automation products

Scalable PLC AC500

Overview of digital S500 I/O modules

Digital S500 I/O modules



Type	DI524	DC522	DC523	DC532	DX522	DX531
Number of channels per module						
Digital inputs DI	32	–	–	16	8	8
Digital outputs DO	–	–	–	–	8 relays	4 relays
Configurable channels DC (configurable as inputs or outputs)	–	16	24	16	–	–
Additional configuration of channels as						
Fast counter		Configuration of max. 2 channels per module. Operating modes see table on page 19				–
Occupies max. 1 DO or DC when used as counter	–	X	X	X	–	–
Connection via terminal unit (refer to table on page 32)	X	X	X	X	X	X
Digital inputs						
Input signal voltage		24 V DC				230 V AC or 120 V AC
Frequency range		–				47 ... 63 Hz
Input characteristic acc. to EN61132-2		Type 1				Type 2
0 signal		– 3 V DC ... + 5 V DC				0 ... 40 V AC
Undefined signal state		> + 5 V DC ... < + 15 V DC				> 40 V AC ... < 74 V AC
1 signal		+ 15 V DC ... + 30 V DC				74 ... 265 V AC
Input time delay (0 -> 1 or 1 -> 0)		8 ms typically, configurable from 0.1 up to 32 ms				20 ms typically
Input current per channel						
At input voltage + 24 V DC		5 mA typically				–
At input voltage + 5 V DC		> 1 mA				–
At input voltage + 15 V DC		> 5 mA				–
At input voltage + 30 V DC		< 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	–	–
Readback of output	–	X	X	X	–	–
Relay outputs, supplied via process voltage UP, changeover contacts	–	–	–	–	X	X
Switching of 24 V load	–	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				–
Output current						
Nominal current per channel	–	500 mA at UP = 24 V				–
Maximum (total current of all channels)	–	8 A				–
Residual current at signal state 0	–	< 0.5 mA				–
Demagnetization when switching off inductive loads	–	By internal varistors				–

Automation products

Scalable PLC AC500

Overview of digital S500 I/O modules

Digital S500 I/O modules



Type	DI524	DC522	DC523	DC532	DX522	DX531
Switching frequency						
For inductive load	–		0.5 Hz max.		2 Hz max.	
For lamp load	–		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
Overload indication ($I > 0.7 \text{ A}$)	–		After approx. 100 ms		–	–
Output current limiting		Yes, with automatic reclosure			–	–
Proofness against reverse feeding of 24 V signals	–	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
Maximum ripple	5 %	5 %	5 %	5 %	5 %	5 %
Reverse polarity protection	X	X	X	X	X	X
Fuse for process voltage UP			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
Unshielded cable (m)	600	600	600	600	600	600
Potential isolation						
Per module	X	X	X	X	X	X
Between the input channels	–	–	–	–	–	X (per 2)
Between the output channels	–	–	–	–	X	X
Voltage supply for the module			Internally via extension bus interface (I/O bus)			
Field bus connection			Via AC500 CPU or interface module			
Address setting			Automatically (internal)			

Automation products

Scalable PLC AC500

Overview of S500 I/O modules

Table: Digital I/O modules, "Fast Counter" operating modes. Not applicable for DC541 or eCo-I/O modules (see technical documentation for details)

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	
4	Two up/down counters with 1 counting input inverted	2	0	50 kHz	"End value" interrogation via status byte.
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.

Automation products

Scalable PLC AC500

Overview of analogue S500-eCo I/O modules

Analogue S500-eCo I/O modules						
Type		AI561	AO561	AX561	AI562	AI563
Number of Channels per Module						
Analogue Inputs		4	-	4	2	4
Analogue Outputs		-	2	2	-	-
Inputs, single configurable as						
-2.5 V...+2.5 V: 11 bit + sign		X	-	X	-	-
-5 V...+5 V: 11 bit + sign		X	-	X	-	-
-10 V...+10 V: 11 bit + sign		-	-	-	-	-
0...5 V: 12 bit		X	-	X	-	-
0...10 V: 12 bit		X	-	X	-	-
0...20 mA, 4...20 mA: 12 bit		X	-	X	-	-
Temperature resolution : 0.1°C		-	-	-	X	X
Analogue Inputs Signal configuration per AI						
RTD		-	-	-	2	-
Thermocouple		-	-	-	-	4
Outputs, single configurable as						
-10...+10 V		-	X	X	-	-
0...20 mA		-	X	X	-	-
4...20 mA		-	X	X	-	-
Pt100:						
-50°C...400°C (2/3-wire)		-	-	-	X	-
Pt1000:						
-50°C...+400°C (2/3-wire)		-	-	-	X	-
Ni100/Ni1000:						
-50°C...+150°C (2/3-wire)		-	-	-	X	-
0... 150 Ω / 0... 300 Ω		-	-	-	X	-
Thermocouples of types J, K, T, N, S		-	-	-	-	X
-80 mV... +80 mV		-	-	-	-	X
Potential isolation						
Per module		-	-	-	X	X

Automation products

Scalable PLC AC500

Overview of analogue S500 I/O modules

**Analogue S500-eCo
I/O devices**



Type	AX521	AX522	AI523	AO523	AI531
Number of channels per module					
Analogue inputs AI, individual configuration	4	8	16	–	8
Analogue outputs AO, individual configuration	4	8	–	16	–
Signal resolution for channel configuration					
– 10 V ... + 10 V			12 bits + sign		15 bits + sign
0 ... 10 V			12 bits		15 bits
0 ... 20 mA, 4 ... 20 mA			12 bits		15 bits
Temperature: 0.1 °C	X	X	X	X	X
Monitoring configuration per channel					
Plausibility monitoring	X	X	X	X	X
Wire break & short-circuit monitoring	X	X	X	X	X
Analogue Inputs AI					
Signal configuration per AI					
Max. number per module and with regard to the configuration: Als / Measuring points (depending on the use of 2/3-wire connection or differential input)					
0 ... 10 V	4 / 4	8 / 8	16 / 16	–	8 / 8
– 10 V ... + 10 V	4 / 4	8 / 8	16 / 16	–	8 / 8
0 ... 20 mA	4 / 4	8 / 8	16 / 16	–	8 / 8
4 ... 20 mA	4 / 4	8 / 8	16 / 16	–	8 / 8
Pt100, – 50 °C ... + 400 °C (2-wire)	4 / 4	8 / 8	16 / 16	–	8 / 8
Pt100, – 50 °C ... + 400 °C (3-wire), 2 channels	4 / 2	8 / 4	16 / 8	–	8 / 8
Pt100, – 50 °C ... + 400 °C (4-wire)	–	–	–	–	8 / 8
Pt100, – 50 °C ... + 70 °C (2-wire)	4 / 4	8 / 8	16 / 16	–	8 / 8
Pt100, – 50 °C ... + 70 °C (3-wire), 2 channels	4 / 2	8 / 4	16 / 8	–	8 / 8
Pt100, – 50 °C ... + 70 °C (4-wire)	–	–	–	–	8 / 8
Pt1000, – 50 °C ... + 400 °C (2-wire)	4 / 4	8 / 8	16 / 16	–	8 / 8
Pt1000, – 50 °C ... + 400 °C (3-wire), 2 channels	4 / 2	8 / 4	16 / 8	–	8 / 8
Pt1000, – 50 °C ... + 400 °C (4-wire)	–	–	–	–	8 / 8
Ni1000, – 50 °C ... + 150 °C (2-wire)	4 / 4	8 / 8	16 / 16	–	8 / 8
Ni1000, – 50 °C ... + 150 °C (3-wire), 2 channels	4 / 2	8 / 4	16 / 8	–	8 / 8
Ni1000, – 50 °C ... + 150 °C (4-wire)	–	–	–	–	8 / 8
Thermocouples of types J, K, T, N, S	–	–	–	–	X
0 ... 10 V using differential inputs, 2 channels	4 / 2	8 / 4	16 / 8	–	8 / 8
– 10 V ... + 10 V using differential inputs, 2 channels	4 / 2	8 / 4	16 / 8	–	8 / 8
Digital signals (digital input)	4 / 4	8 / 8	16 / 16	–	8 / 8
Input resistance per channel	Voltage: > 100 kΩ. Current: approx. 330 Ω.			–	Voltage: > 100 kΩ. Current: approx. 330 Ω.
Time constant of the input filter	Voltage: 100 µs. Current: 100 µs.			–	Voltage: 100 µs. Current: 100 µs.
Conversion cycle	2 ms (for 8 AI + 8 AO), 1 s for Pt/Ni...			–	1 ms (for 8 AI + 8 AO), 1 s for Pt/Ni...
Overvoltage protection	X	X	X	–	X
Data when using the AI as digital input					
Input time delay	8 ms typically, configurable from 0.1 up to 32 ms			–	8 ms typically, configurable from 0.1 up to 32 ms
Input signal voltage	24 V DC			–	24 V DC
0 signal	– 30 V ... + 5 V			–	– 30 V ... + 5 V
1 signal	+ 13 V ... + 30 V			–	+ 13 V ... + 30 V

Automation products

Scalable PLC AC500

Overview of analogue S500 I/O modules

Analogue S500 I/O devices



Type	AX521	AX522	AI523	AO523	AI531
Analogue outputs AO					
Possible configuration per AO			Max. number of AOs per module and with regard to the configuration:		
-10 V ... +10 V	4	8 ⁽¹⁾	—	16 ⁽¹⁾	—
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	—
Process voltage UP					
Nominal voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Maximum ripple	5 %	5 %	5 %	5 %	5 %
Reverse polarity protection	X	X	X	X	X
Max. line length of the analogue lines, conductor cross section > 0.14 mm ²	100 m				
Conversion error of analogue values caused by non-linearity, calibration errors ex works and the resolution in the nominal range	0.5 % typically, 1 % max.				
Potential isolation					
Per module	X	X	X	X	X
Voltage supply for the module	Internally via extension bus interface (I/O bus)				

(1) Half can be used on current (the other half remains available)

Automation products

Scalable PLC AC500

CD522 encoder module

The CD522 module offers accuracy and dynamic flexibility. It has two independent encoder inputs onboard and is easily configured using the Control Builder software for 10 different operation modes and for frequencies up to 300 kHz. The CD522 module also integrates outputs for pulses and for PWM as well as normal inputs and outputs, depending on selected encoder mode.

Certification CE, cUL, GL, DNV, BV, LRS and RINA pending

CD522 encoder module



Type

CD522

Functionality

Digital inputs/outputs	24 V DC, dedicated inputs/outputs can be used for specific counting functions: <ul style="list-style-type: none"> - Catch/touch operation, counter value stored in separate variable on external event (rising or falling edge) - Set input to preset counter register with predefined value - Set input to reset counter register - End value output; the output is set when predefined value is reached - Reference point initialization (RPI) input for relative encoder initialization <p>All unused inputs/outputs can be used with the specification of standard input/output range.</p>
High-speed counter/encoder	Integrated, 2 counters (hardware interface with +24 V DC, +5 V DC, differential and 1 Vpp sinus input): <ul style="list-style-type: none"> - 32 bits one counter mode - 16 bits two counter mode - Relative position encoder (X1, X2, X4) - Absolute SSI encoder - Time frequency meter - Frequency input up to 300 kHz
PWM/pulse outputs	2 pulse-width-modulators or pulse outputs Output mode specification: <ul style="list-style-type: none"> - Push-pull output: 24 V DC, 100 mA max. - Current limitation (thermal and over current) PWM mode specification: <ul style="list-style-type: none"> - Frequency from 1 Hz to 100 kHz - Value from 0 to 100 % Pulse mode specification: <ul style="list-style-type: none"> - Frequency from 1 Hz to 15 kHz - Pulse emission from 1 to 65535 pulses - Number of pulses emitted indicator (0 to 100 %) Frequency mode specification: <ul style="list-style-type: none"> - Frequency output = 100 kHz - Duty cycle set to 50 %

Number of Channels per Module

Digital Inputs DI	2
Digital outputs DO	8
Configurable channels DC (configurable as inputs or outputs)	8

Additional configuration of channels as

Fast counter	Integrated 2 counter encoders
Connection via terminal unit (refer to table on page 33)	X

Digital Inputs

Input signal voltage	24 V DC
Input time delay	8 ms typically Configurable from 0.1 up to 32 ms

Input current per channel

At input voltage + 24 V DC	Typically 5 mA
At input voltage + 5 V DC	> 1 mA
At input voltage + 15 V DC	> 5 mA
At input voltage + 30 V DC	< 8 mA

Automation products

Scalable PLC AC500

CD522 encoder module

CD522 encoder module



Type

CD522

Digital outputs

Output voltage at signal state 1	UP – 0.8 V
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Output current

Nominal current per channel	0,5 A at UP = 24 V
Maximum (total current of all channels)	8 A
Residual current at signal state 0	< 0.5 mA
Demagnetization when switching off inductive loads	By internal varistors

Switching frequency

For inductive load	Max. 0.5 Hz
For lamp load	Max. 11 Hz with Max 5 W
Short-circuit / Overload proofness	X
Overload indication ($I > 0.7$ A)	After approx. 100 ms
Output current limiting	X
Proofness against reverse feeding of 24 V signals	

Maximum cable length for connected process signals

Shielded cable (m)	1000
Unshielded cable (m)	600

Potential isolation

Per module	X
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Technical data of the high-speed inputs

Number of channels per module	6
Input Type	24 V DC
Frequency	300 kHz

Technical data of the fast outputs

Number of channels	2
Indication of the output signals	Brightness of the LED depends on the number of pulses emitted (0 % to 100 %) (pulse output mode only)

Output current

Rated value, per channel	100 mA at UP = 24 V
Maximum value (all channels together, configurable outputs included)	8 A
Leakage current with signal 0	< 0.5 mA
Rated protection fuse on UP	10 A fast
De-magnetization when inductive loads are switched off	with varistors integrated in the module (see figure below)
Overload message ($I > 0.1x$ A)	yes, after ca. 100 ms
Output current limitation	yes, automatic reactivation after short-circuit/overload
Resistance to feedback against 24 V signals	yes

Automation products

Scalable PLC AC500

DC541 interrupt I/O and fast counter module

**DC541 interrupt I/O
and fast counter module**



Type

DC541

Number of Channels per Module

Configurable channels DC (configurable as inputs or outputs)	8
--	---

Additional configuration of channels as

Fast counter	Yes
Connection via CPU terminal base. Occupies one communication module slot.	X

Digital Inputs

Input signal voltage	24 V DC
Input characteristic acc. to EN61132-2	Type 1
0 signal	- 3 V DC ... + 5 V DC
Undefined signal state	> + 5 V DC ... < + 15 V DC
1 signal	> + 5 V DC ... < + 15 V DC
Input time delay (0 -> 1 or 1 -> 0)	8 ms typically, configurable from 0.1 up to 32 ms

Input current per channel

At input voltage + 24 V DC	5 mA typically
At input voltage + 5 V DC	> 1 mA
At input voltage + 15 V DC	> 5 mA
At input voltage + 30 V DC	< 8 mA

Digital outputs

Transistor outputs 24 V DC, 0.5 A	X
Readback of output	X
Switching of 24 V load	X
Output voltage at signal state 1	Process voltage UP minus 0.8 V

Output current

Nominal current per channel	500 mA at UP = 24 V
Maximum (total current of all channels)	8 A
Residual current at signal state 0	< 0.5 mA
Demagnetization when switching off inductive loads	by internal varistors

Potential isolation

Per module	X
Voltage supply for the module	Internally via backplane bus
Field bus connection	Via AC500 CPU
Address setting	Automatically (internal)

Interrupt I/O table

Configuration as	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								
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								
Digital I/Os PWM*	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 and pulsed signal with adjustable on-off ratio

* Counter and fast counter data available on technical documentation

Automation products

Scalable PLC AC500

Communication interface modules

For all modules:

Max cable length for connected process signals is 1000 m for shielded cable and 600 m for unshielded ones.

For all Input modules: the signal resolution for channel configuration is:

-10V...+10V: 12 bit + sign
0...10V, 0...20mA, 4...20mA: 12 bits

Temperature: 0.1°C

Communication interface modules



Type	DC505-FBP	DC551-CS31	CI590-CS31 Dedicated to High Availability
Number of Channels per Module			
Digital Inputs DI	8	8	-
Digital outputs DO	-	-	-
Configurable channels DC (configurable as inputs or outputs)	8	16	16
Additional configuration of channels as:			
Fast counter	-	Configuration of max. 2 channels p. module. Operating modes see table on page 19	
Occupies max. 1DO or DC when used as counter	X	X	X
Connection via terminal base TB 5xx (refer to table on page 28)	X	X	X
Digital inputs			
Input signal voltage	24 V DC		
Input characteristic acc. to EN61132-2	Type 1		
0 signal	- 3 V DC... + 5 V DC		
Undefined signal state	> + 5 V DC < + 15 V DC		
1 signal	+ 15 V DC... + 30 V DC		
Residual ripple, range for 0 signal	- 3 V DC... + 5 V DC		
Residual ripple, range for 1 signal	+ 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		
Digital outputs			
Transistor outputs 24 V DC, 0.5 A	X		
Readback of output	X		
Outputs, supplied via process voltage UP	X		
Switching of 24 V load	X		
Output voltage at signal state 1	Process voltage UP - 0.8 V		
Output current			
Nominal current per channel	500 mA at UP = 24 V		
Maximum (total current of all channels)	4 A	8 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		
Potential isolation			
Per module	X	X	X
Voltage supply for the module	Via FBP	By external 24 V DC voltage via terminal	By external 24 V DC voltage via terminal
Field bus connection	Via FBP	CS31 field bus, via terminal	CS31 field bus, via terminal
Address setting	By rotary switch on the front side	By rotary switch on the front side	By rotary switch on the front side

Automation products

Scalable PLC AC500

Interface modules for real-time Ethernet

	PROFINET		EtherCAT	
	CI501-PNIO	CI502-PNIO	CI511-ETHCAT	CI512-ETHCAT
Number of Channels per Module				
Digital Inputs DI	8	8	8	8
Digital outputs DO	8	8	8	8
Analogue Inputs AI	4	-	4	-
Analogue outputs AO	2	-	2	-
Digital configurable channel (configurable as inputs or outputs)	-	8	-	8
Additional configuration of channels as:				
Connection via terminal base TB 5xx (refer to table on page 28)	X	X	X	X
Analogue Inputs AI				
Max. number per module and with regard to the configuration: AIs / Measuring points				
Signal configuration per AI	4	-	4	-
0...10V	4/4	-	4/4	-
-10V...+10V	4/4	-	4/4	-
0...20mA	4/4	-	4/4	-
4...20mA	4/4	-	4/4	-
RTD using 2/3 wire needs 1/2 channel(s)	4/2	-	4/2	-
0...10V using differential inputs, needs 2 channels	4/2	-	4/2	-
-10V...+10V using differential inputs, needs 2 channels	4/2	-	4/2	-
Digital signals (digital input)	4/4	-	4/4	-
Data when using the AI as digital input				
Input time delay	8 ms typically Configurable from 0.1 up to 32 ms	-	8 ms typically Configurable from 0.1 up to 32 ms	-
Input signal voltage	24 V DC	-	24 V DC	-
Outputs, single configurable as				
Possible configuration per AO	X	-	X	-
-10...+10V	X	-	X	-
0...20mA	X	-	X	-
4...20mA	X	-	X	-
Output resistance (load) when used as current output	0...500 Ω	-	0...500 Ω	-
Output loading capability when used as voltage output	±10 mA max.	-	±10 mA max.	-
Potential isolation				
Per module	X	X	X	X
Between the input channels	-	-	-	-
Between the output channels	-	-	-	-

Automation products

Scalable PLC AC500 Ordering data

AC500 CPUs

AC500-eCo CPUs

- 1 internal serial interface, RS485 (2nd is optional)
- Centrally expandable with up to 7 expansion modules
- Optional SD card adapter for data storage and program backup



PM554

All AC500-eCo products are packaged and delivered by 6 units!

AC500-eCo CPUs, type PM554

Type	Program memory	Onboard I/Os	Relay/Transistor outputs	Power supply	Order code	Price per piece	Weight per piece (kg)	SPU*
PM554-T	128 kB	8 / 6 / - / -	Transistor	24 V DC	1TNE 968 900 R0100	0.300	6	
PM554-R ¹⁾	128 kB	8 / 6 / - / -	Relay	24 V DC	1TNE 968 900 R0200	0.400	6	
PM554-R-AC ¹⁾	128 kB	8 / 6 / - / -	Relay	100-240 V AC	1TNE 968 900 R0220	0.400	6	

AC500-eCo CPUs, type PM564

Type	Program memory	Onboard I/Os	Relay/Transistor outputs	Power supply	Order code	Price per piece	Weight per piece (kg)	SPU*
PM564-T **	128 kB	6 / 6 / 2 / 1	Transistor	24 V DC	1TNE 968 900 R1100	0.300	6	
PM564-R ** ¹⁾	128 kB	6 / 6 / 2 / 1	Relay	24 V DC	1TNE 968 900 R1200	0.400	6	
PM564-R-AC ** ¹⁾	128 kB	6 / 6 / 2 / 1	Relay	100-240 V AC	1TNE 968 900 R1220	0.400	6	

**All analogue inputs on AC500 CPU PM564 can be configured as digital inputs.

1) In preparation

AC500 CPUs, type PM571

Type	Program memory	Cycle time in ms 1000 instructions Bit/Word/Float. point	Integrated coupler	Order code	Price	Weight per piece (kg)	SPU*
PM571	64 kB	0.09/0.3/6	—	1SAP 130 100 R0100	0.135	1	
PM571-ETH ²⁾	64 kB	0.09/0.3/6	Ethernet	1SAP 130 100 R0170	0.15	1	

2) Separate communication processor integrated.

AC500 CPUs, type PM581 and PM582

Type	Program memory	Cycle time in ms 1000 instructions Bit/Word/Float. point	Integrated coupler	Order code	Price	Weight per piece (kg)	SPU*
PM581	256 kB	0.07/0.07/1.6	—	1SAP 140 100 R0100	0.135	1	
PM581-ETH ²⁾	256 kB	0.07/0.07/1.6	Ethernet	1SAP 140 100 R0170	0.15	1	
PM581-ARCNET ³⁾	256 kB	0.07/0.07/1.6	ARCNET	1SAP 140 100 R0160	0.16	1	
PM582	512 kB	0.07/0.07/1.6	—	1SAP 140 200 R0100	0.135	1	
PM582-ETH ²⁾	512 kB	0.07/0.07/1.6	Ethernet	1SAP 140 200 R0170	0.15	1	
PM582-ARCNET ³⁾	512 kB	0.07/0.07/1.6	ARCNET	1SAP 140 200 R0160	0.16	1	

2) Separate communication processor integrated.

AC500 CPUs, type PM590 and PM591

Type	Program memory	Cycle time in ms 1000 instructions Bit/Word/Float. point	Integrated coupler	Order code	Price	Weight per piece (kg)	SPU*
PM590	2048 kB	0.002/0.006/0.006	—	1SAP 150 000 R0100	0.135	1	
PM590-ETH ²⁾	2048 kB	0.002/0.006/0.006	Ethernet	1SAP 150 000 R0170	0.15	1	
PM590-ARCNET ³⁾	2048 kB	0.002/0.006/0.006	ARCNET	1SAP 150 000 R0160	0.16	1	
PM591	4096 kB	0.002/0.006/0.006	—	1SAP 150 100 R0100	0.135	1	
PM591-ETH ²⁾	4096 kB	0.002/0.006/0.006	Ethernet	1SAP 150 100 R0170	0.15	1	
PM591-ARCNET ³⁾	4096 kB	0.002/0.006/0.006	ARCNET	1SAP 150 100 R0160	0.16	1	

2) Separate communication processor integrated.

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 10 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	Connection for coupler integrated in the CPU	Order code	Price	Weight per piece (kg)	SPU*
TB511-ETH	1	Ethernet RJ45	1SAP 111 100 R0170			1
TB511-ARCNET	1	ARCNET COAX	1SAP 111 100 R0160			1
TB521-ETH	2	Ethernet RJ45	1SAP 112 100 R0170		0.215	1
TB521-ARCNET	2	ARCNET COAX	1SAP 112 100 R0160			1
TB541-ETH	4	Ethernet RJ45	1SAP 114 100 R0170			1

*SPU: Sales Package Unit

Automation products

Scalable PLC AC500

Ordering data



CM572

Profibus DP communication module

For Profibus DP master V0/V1. Multi master functionality.
Transfer rate: 9.6 kbit/s up to 12 Mbit/s.
Max. no. of subscribers: 126 (V0) or 32 (V1).
CPU interface: 8 kB dual-port memory.
Contains a separate communication processor and 256 kB RAM memory.
No external power supply required.

Type	Interface	Order code	Price	Weight per piece (kg)
CM572-DP	Sub-D socket	1SAP 170 200 R0001		0.115

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.
CPU interface: 8 kB dual-port memory.
Contains a separate communication processor, 256 kB RAM memory and 512 kB flash memory.
No external power supply required.

Type	Protocol	Interfaces	Order code	Price	Weight per piece (kg)
CM577-ETH	TCP/IP, UDP/IP, Modbus TCP	2 X RJ45	1SAP 170 700 R0001		0.115

DeviceNet communication module

For DeviceNet master.
Transfer rate: 125 kbit/s, 250 kbit/s, 500 kbit/s.
CPU interface: 8 kB dual-port memory.
Contains a separate communication processor, 256 kB RAM memory and 512 kB flash memory.
No external power supply required.

Type	Interface	Order code	Price	Weight per piece (kg)
CM575-DN	Plug-in terminal block, spring-type terminals	1SAP 170 500 R0001		0.115

CANopen communication module

For CANopen master.
Transfer rate: 10 kbit/s up to 1 Mbit/s.
CPU interface: 8 kB dual-port memory.
Contains a separate communication processor, 256 kB RAM memory and 512 kB flash memory.
No external power supply required.

Type	Interface	Order code	Price	Weight per piece (kg)
CM578-CN	Plug-in terminal block, spring-type terminals	1SAP 170 800 R0001		0.115

PROFINET I/O RT master communication module

(controller) protocol, integrated 2 ports switch.
Interface to the CPU using Dual Port Memory coupler bus,
Up to 4 communication modules can be used on an AC500 CPU.

Type	Interface	Order code	Price	Weight per piece (kg)
CM579-PNIO	2 X RJ45	1SAP 170 901 R0001		0.115

ETHERCAT master protocol communication module

Interface to the CPU using Dual Port Memory coupler bus,
Up to 4 communication modules can be used on an AC500 CPU.

Type	Interface	Order code	Price	Weight per piece (kg)
CM579-ETHCAT	2 X RJ45	1SAP 170 902 R0001		0.115



CM577



CM579

Automation products

Scalable PLC AC500 Ordering data



CM574

Serial communication module and CPU coprocessor

Stand alone CPU in coupler module housing allowing to be used as standard serial interface or as free programmable serial interface coupler. 2x serial RS-232/485 interfaces COM1 / COM2

CPU interface: dual-port memory

Program memory: 256 KB / Data memory 384 KB not saved

Protocols ASCII / free configurable / 1xCS31 master COM1 only / 2x Modbus Master/Slave , independent internal CPU which can be programmed by the PS501 for own communication protocol or data processing. Interface to the CPU using Dual Port Memory coupler bus. Connection with 2x 9 pole pluggable spring terminals. Up to 4 communication modules can be used on an AC500 CPU.

Type	Interface	Order code	Price	Weight per piece (kg)
CM574-RS	Serial 2x RS-232/485	1SAP 170 400 R0001		0.115

Serial protocol RCOM communication module

2x serial RS-232/485 interfaces with 1x RCOM / 1x Console,

Interface to the CPU using Dual Port Memory coupler bus.

Connection with 2x 9 pole pluggable spring terminals.

Up to 4 communication modules can be used on an AC500 CPU.

Type	Interface	Order code	Price	Weight per piece (kg)
CM574-RCOM	Serial 2x RS-232/485 (1x RCOM / 1x Console)	1SAP 170 401 R0001		0.115

All communication modules require the use of a terminal base TB5xx which is delivered separately.

Automation products

Scalable PLC AC500 Ordering data

 DC532	<p>Digital input/output modules</p> <ul style="list-style-type: none"> - For central expansion of the AC500 CPUs - For decentralized expansion in combination with interface module DC551-CS31, Profinet CI50x modules or DC505-FBP for standard S500 I/Os. - Plug-in electronic modules, terminal unit required (refer to table below) - DC: Channels can be configured individually as inputs or outputs. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th><th>DI/DO/ DC</th><th>Input-signal</th><th>Outputs- type</th><th>Output-signal</th><th>Usable with DC505- FBP</th><th>Order code</th><th>Terminal block 9 poles</th><th>Terminal block 11 poles</th><th>Price per piece</th><th>SPU**</th></tr> </thead> <tbody> <tr> <td>DI561</td><td>8/-/-</td><td>24 V DC</td><td>-</td><td>-</td><td>-</td><td>1TNE 968 902 R2101</td><td>1</td><td>-</td><td></td><td>6</td></tr> <tr> <td>DI562</td><td>16/-/-</td><td>24 V DC</td><td>-</td><td>-</td><td>-</td><td>1TNE 968 902 R2102</td><td>1</td><td>1</td><td></td><td>6</td></tr> <tr> <td>DI571</td><td>8/-/-</td><td>100-240 V AC</td><td>-</td><td>-</td><td>-</td><td>1TNE 968 902 R2103¹</td><td>1</td><td>1</td><td></td><td>6</td></tr> <tr> <td>DO561</td><td>-/8/-</td><td>24 V DC</td><td>Transistor</td><td>24 V DC, 0.5 A</td><td>-</td><td>1TNE 968 902 R2201</td><td>-</td><td>1</td><td></td><td>6</td></tr> <tr> <td>DO571</td><td>-/8/-</td><td>-</td><td>Relay</td><td>24 V DC, 120/240 V AC, 2A</td><td>-</td><td>1TNE 968 902 R2202²</td><td>-</td><td>1</td><td></td><td>6</td></tr> <tr> <td>DO572</td><td>-/8/-</td><td>-</td><td>Triac</td><td>100-240 V AC, 0.3A</td><td>-</td><td>1TNE 968 902 R2203³</td><td>1</td><td>1</td><td></td><td>6</td></tr> <tr> <td>DX561</td><td>8/8/-</td><td>24 V DC</td><td>Transistor</td><td>24 V DC, 0.5 A</td><td>-</td><td>1TNE 968 902 R2301</td><td>1</td><td>1</td><td></td><td>6</td></tr> <tr> <td>DX571</td><td>8/8/-</td><td>24 V DC</td><td>Relay</td><td>24 V DC, 120/240 V AC, 2A</td><td>-</td><td>1TNE 968 902 R2302²</td><td>1</td><td>1</td><td></td><td>6</td></tr> <tr> <td>DC561</td><td>-/-/16</td><td>24 V DC</td><td>Transistor</td><td>24 V DC, 0.1A</td><td>-</td><td>1TNE 968 902 R2001</td><td>HE10-20</td><td>-</td><td></td><td>6</td></tr> </tbody> </table>	Type	DI/DO/ DC	Input-signal	Outputs- type	Output-signal	Usable with DC505- FBP	Order code	Terminal block 9 poles	Terminal block 11 poles	Price per piece	SPU**	DI561	8/-/-	24 V DC	-	-	-	1TNE 968 902 R2101	1	-		6	DI562	16/-/-	24 V DC	-	-	-	1TNE 968 902 R2102	1	1		6	DI571	8/-/-	100-240 V AC	-	-	-	1TNE 968 902 R2103 ¹	1	1		6	DO561	-/8/-	24 V DC	Transistor	24 V DC, 0.5 A	-	1TNE 968 902 R2201	-	1		6	DO571	-/8/-	-	Relay	24 V DC, 120/240 V AC, 2A	-	1TNE 968 902 R2202 ²	-	1		6	DO572	-/8/-	-	Triac	100-240 V AC, 0.3A	-	1TNE 968 902 R2203 ³	1	1		6	DX561	8/8/-	24 V DC	Transistor	24 V DC, 0.5 A	-	1TNE 968 902 R2301	1	1		6	DX571	8/8/-	24 V DC	Relay	24 V DC, 120/240 V AC, 2A	-	1TNE 968 902 R2302 ²	1	1		6	DC561	-/-/16	24 V DC	Transistor	24 V DC, 0.1A	-	1TNE 968 902 R2001	HE10-20	-		6
Type	DI/DO/ DC	Input-signal	Outputs- type	Output-signal	Usable with DC505- FBP	Order code	Terminal block 9 poles	Terminal block 11 poles	Price per piece	SPU**																																																																																																					
DI561	8/-/-	24 V DC	-	-	-	1TNE 968 902 R2101	1	-		6																																																																																																					
DI562	16/-/-	24 V DC	-	-	-	1TNE 968 902 R2102	1	1		6																																																																																																					
DI571	8/-/-	100-240 V AC	-	-	-	1TNE 968 902 R2103 ¹	1	1		6																																																																																																					
DO561	-/8/-	24 V DC	Transistor	24 V DC, 0.5 A	-	1TNE 968 902 R2201	-	1		6																																																																																																					
DO571	-/8/-	-	Relay	24 V DC, 120/240 V AC, 2A	-	1TNE 968 902 R2202 ²	-	1		6																																																																																																					
DO572	-/8/-	-	Triac	100-240 V AC, 0.3A	-	1TNE 968 902 R2203 ³	1	1		6																																																																																																					
DX561	8/8/-	24 V DC	Transistor	24 V DC, 0.5 A	-	1TNE 968 902 R2301	1	1		6																																																																																																					
DX571	8/8/-	24 V DC	Relay	24 V DC, 120/240 V AC, 2A	-	1TNE 968 902 R2302 ²	1	1		6																																																																																																					
DC561	-/-/16	24 V DC	Transistor	24 V DC, 0.1A	-	1TNE 968 902 R2001	HE10-20	-		6																																																																																																					

* In preparation. Terminal block (9 or 11 poles) is necessary for each S500-eCo I/O. They are delivered separately. See page 33.

 DI524	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th><th>Number of DI/DO/DC</th><th>Input signal</th><th>Relay/transistor outputs</th><th>Output signal</th><th>Usable with DC505- FBP</th><th>Order code</th><th>Price per piece</th><th>Weight per piece (kg)</th><th>SPU**</th></tr> </thead> <tbody> <tr> <td>DI524</td><td>32/-/-</td><td>24 V DC</td><td>-</td><td>-</td><td>x</td><td>1SAP 240 000 R0001</td><td>0.2</td><td>1</td><td></td></tr> <tr> <td>DC522</td><td>-/-16</td><td>24 V DC</td><td>Transistor</td><td>24 V DC, 0.5 A</td><td>x</td><td>1SAP 240 600 R0001</td><td>0.2</td><td>1</td><td></td></tr> <tr> <td>DC523</td><td>-/-24</td><td>24 V DC</td><td>Transistor</td><td>24 V DC, 0.5 A</td><td>x</td><td>1SAP 240 500 R0001</td><td>0.2</td><td>1</td><td></td></tr> <tr> <td>DC532</td><td>16/-/16</td><td>24 V DC</td><td>Transistor</td><td>24 V DC, 0.5 A</td><td>x</td><td>1SAP 240 100 R0001</td><td>0.2</td><td>1</td><td></td></tr> <tr> <td>DX522</td><td>8/8/-</td><td>24 V DC</td><td>Relay</td><td>230 V AC, 3 A¹</td><td>x</td><td>1SAP 245 200 R0001</td><td>0.3</td><td>1</td><td></td></tr> <tr> <td>DX531</td><td>8/4/-</td><td>230 V AC</td><td>Relay</td><td>230 V AC, 3 A¹</td><td>x</td><td>1SAP 245 000 R0001</td><td>0.3</td><td>1</td><td></td></tr> </tbody> </table>	Type	Number of DI/DO/DC	Input signal	Relay/transistor outputs	Output signal	Usable with DC505- FBP	Order code	Price per piece	Weight per piece (kg)	SPU**	DI524	32/-/-	24 V DC	-	-	x	1SAP 240 000 R0001	0.2	1		DC522	-/-16	24 V DC	Transistor	24 V DC, 0.5 A	x	1SAP 240 600 R0001	0.2	1		DC523	-/-24	24 V DC	Transistor	24 V DC, 0.5 A	x	1SAP 240 500 R0001	0.2	1		DC532	16/-/16	24 V DC	Transistor	24 V DC, 0.5 A	x	1SAP 240 100 R0001	0.2	1		DX522	8/8/-	24 V DC	Relay	230 V AC, 3 A ¹	x	1SAP 245 200 R0001	0.3	1		DX531	8/4/-	230 V AC	Relay	230 V AC, 3 A ¹	x	1SAP 245 000 R0001	0.3	1	
Type	Number of DI/DO/DC	Input signal	Relay/transistor outputs	Output signal	Usable with DC505- FBP	Order code	Price per piece	Weight per piece (kg)	SPU**																																																														
DI524	32/-/-	24 V DC	-	-	x	1SAP 240 000 R0001	0.2	1																																																															
DC522	-/-16	24 V DC	Transistor	24 V DC, 0.5 A	x	1SAP 240 600 R0001	0.2	1																																																															
DC523	-/-24	24 V DC	Transistor	24 V DC, 0.5 A	x	1SAP 240 500 R0001	0.2	1																																																															
DC532	16/-/16	24 V DC	Transistor	24 V DC, 0.5 A	x	1SAP 240 100 R0001	0.2	1																																																															
DX522	8/8/-	24 V DC	Relay	230 V AC, 3 A ¹	x	1SAP 245 200 R0001	0.3	1																																																															
DX531	8/4/-	230 V AC	Relay	230 V AC, 3 A ¹	x	1SAP 245 000 R0001	0.3	1																																																															

1) Relay outputs, changeover contacts

 AI561	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th><th>Scope of delivery</th><th>Usable with DC505- FBP</th><th>Order code</th><th>Price per piece</th><th>Weight per piece (kg)</th><th>SPU**</th></tr> </thead> <tbody> <tr> <td>CD522</td><td>CD522, Encoder & PWM module, 2 encoder inputs, 2 PWM outputs, 2 digital inputs 24 V DC, 8 digital outputs 24 V DC</td><td>x</td><td>1SAP 260 300 R0001</td><td></td><td>0.125</td><td>1</td></tr> </tbody> </table>	Type	Scope of delivery	Usable with DC505- FBP	Order code	Price per piece	Weight per piece (kg)	SPU**	CD522	CD522, Encoder & PWM module, 2 encoder inputs, 2 PWM outputs, 2 digital inputs 24 V DC, 8 digital outputs 24 V DC	x	1SAP 260 300 R0001		0.125	1
Type	Scope of delivery	Usable with DC505- FBP	Order code	Price per piece	Weight per piece (kg)	SPU**									
CD522	CD522, Encoder & PWM module, 2 encoder inputs, 2 PWM outputs, 2 digital inputs 24 V DC, 8 digital outputs 24 V DC	x	1SAP 260 300 R0001		0.125	1									

2) Multifunctional module, refer to table on page 26 for details

 AI562	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th><th>AI/AO</th><th>Input signal</th><th>Output signal</th><th>Usable with DC505- FBP</th><th>Order code</th><th>Terminal block 9 poles</th><th>Terminal block 11 poles</th><th>Price per piece</th><th>SPU**</th></tr> </thead> <tbody> <tr> <td>AI561</td><td>4 / 0</td><td>-2.5...+2.5 V, -5...+5 V, 0...5 V, 0...10 V, 0...20 mA, 4...20 mA</td><td>-</td><td>-</td><td>1TNE 968 902 R1101</td><td>1</td><td>1</td><td></td><td>6</td></tr> <tr> <td>AI562</td><td>2 / 0</td><td>PT100, PT1000, Ni100, Ni1000, Resistance: 150 Ω, 300 Ω</td><td>-</td><td>-</td><td>1TNE 968 902 R1102</td><td>-</td><td>1</td><td></td><td>6</td></tr> <tr> <td>AI563</td><td>4 / 0</td><td>S, T, R, E, N, K, J, Voltage range : ±80 mV</td><td>-</td><td>-</td><td>1TNE 968 902 R1103</td><td>1</td><td>1</td><td></td><td>6</td></tr> <tr> <td>AO561</td><td>0 / 2</td><td>-</td><td>-10...+10 V, 0...20 mA, 4...20 mA</td><td>-</td><td>1TNE 968 902 R1201</td><td>-</td><td>1</td><td></td><td>6</td></tr> <tr> <td>AX561</td><td>4 / 2</td><td>-2.5...+2.5 V, -5...+5 V, 0...5 V, 0...10 V, 0...20 mA, 4...20 mA</td><td>-10...+10 V, 0...20 mA, 4...20 mA</td><td>-</td><td>1TNE 968 902 R1301</td><td>1</td><td>1</td><td></td><td>6</td></tr> </tbody> </table>	Type	AI/AO	Input signal	Output signal	Usable with DC505- FBP	Order code	Terminal block 9 poles	Terminal block 11 poles	Price per piece	SPU**	AI561	4 / 0	-2.5...+2.5 V, -5...+5 V, 0...5 V, 0...10 V, 0...20 mA, 4...20 mA	-	-	1TNE 968 902 R1101	1	1		6	AI562	2 / 0	PT100, PT1000, Ni100, Ni1000, Resistance: 150 Ω, 300 Ω	-	-	1TNE 968 902 R1102	-	1		6	AI563	4 / 0	S, T, R, E, N, K, J, Voltage range : ±80 mV	-	-	1TNE 968 902 R1103	1	1		6	AO561	0 / 2	-	-10...+10 V, 0...20 mA, 4...20 mA	-	1TNE 968 902 R1201	-	1		6	AX561	4 / 2	-2.5...+2.5 V, -5...+5 V, 0...5 V, 0...10 V, 0...20 mA, 4...20 mA	-10...+10 V, 0...20 mA, 4...20 mA	-	1TNE 968 902 R1301	1	1		6
Type	AI/AO	Input signal	Output signal	Usable with DC505- FBP	Order code	Terminal block 9 poles	Terminal block 11 poles	Price per piece	SPU**																																																				
AI561	4 / 0	-2.5...+2.5 V, -5...+5 V, 0...5 V, 0...10 V, 0...20 mA, 4...20 mA	-	-	1TNE 968 902 R1101	1	1		6																																																				
AI562	2 / 0	PT100, PT1000, Ni100, Ni1000, Resistance: 150 Ω, 300 Ω	-	-	1TNE 968 902 R1102	-	1		6																																																				
AI563	4 / 0	S, T, R, E, N, K, J, Voltage range : ±80 mV	-	-	1TNE 968 902 R1103	1	1		6																																																				
AO561	0 / 2	-	-10...+10 V, 0...20 mA, 4...20 mA	-	1TNE 968 902 R1201	-	1		6																																																				
AX561	4 / 2	-2.5...+2.5 V, -5...+5 V, 0...5 V, 0...10 V, 0...20 mA, 4...20 mA	-10...+10 V, 0...20 mA, 4...20 mA	-	1TNE 968 902 R1301	1	1		6																																																				

Terminal block (9 or 11 poles) is necessary for each S500-eCo I/O. They are delivered separately. See page 33.

 AI523	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th><th>Number of AI/AO</th><th>Input signal</th><th>Output signal</th><th>Usable with DC505- FBP</th><th>Order code</th><th>Price per piece</th><th>Weight per piece (kg)</th><th>SPU**</th></tr> </thead> <tbody> <tr> <td>AI523</td><td>16 / 0</td><td>0 ... 10 V, ± 10 V</td><td>-</td><td>x</td><td>1SAP 250 300 R0001</td><td>0.2</td><td>1</td><td></td></tr> <tr> <td>AX521</td><td>4 / 4</td><td>0 / 4 ... 20 mA</td><td>± 10 V</td><td>x</td><td>1SAP 250 100 R0001</td><td>0.2</td><td>1</td><td></td></tr> <tr> <td>AX522</td><td>8 / 8 (max. 4 current outputs)</td><td>Pt100, Pt1000, Ni1000</td><td>0 / 4 ... 20 mA</td><td>x</td><td>1SAP 250 000 R0001</td><td>0.2</td><td>1</td><td></td></tr> <tr> <td>A0523</td><td>0 / 16 (max. 8 current outputs)</td><td>-</td><td>-</td><td>x</td><td>1SAP 250 200 R0001</td><td>0.2</td><td>1</td><td></td></tr> <tr> <td>AI531</td><td>8 / 0</td><td>0...10 V, 0/4...20 mA, Pt100,</td><td>-</td><td>x</td><td>1SAP 250 600 R0001</td><td>0.2</td><td>1</td><td></td></tr> </tbody> </table>	Type	Number of AI/AO	Input signal	Output signal	Usable with DC505- FBP	Order code	Price per piece	Weight per piece (kg)	SPU**	AI523	16 / 0	0 ... 10 V, ± 10 V	-	x	1SAP 250 300 R0001	0.2	1		AX521	4 / 4	0 / 4 ... 20 mA	± 10 V	x	1SAP 250 100 R0001	0.2	1		AX522	8 / 8 (max. 4 current outputs)	Pt100, Pt1000, Ni1000	0 / 4 ... 20 mA	x	1SAP 250 000 R0001	0.2	1		A0523	0 / 16 (max. 8 current outputs)	-	-	x	1SAP 250 200 R0001	0.2	1		AI531	8 / 0	0...10 V, 0/4...20 mA, Pt100,	-	x	1SAP 250 600 R0001	0.2	1	
Type	Number of AI/AO	Input signal	Output signal	Usable with DC505- FBP	Order code	Price per piece	Weight per piece (kg)	SPU**																																															
AI523	16 / 0	0 ... 10 V, ± 10 V	-	x	1SAP 250 300 R0001	0.2	1																																																
AX521	4 / 4	0 / 4 ... 20 mA	± 10 V	x	1SAP 250 100 R0001	0.2	1																																																
AX522	8 / 8 (max. 4 current outputs)	Pt100, Pt1000, Ni1000	0 / 4 ... 20 mA	x	1SAP 250 000 R0001	0.2	1																																																
A0523	0 / 16 (max. 8 current outputs)	-	-	x	1SAP 250 200 R0001	0.2	1																																																
AI531	8 / 0	0...10 V, 0/4...20 mA, Pt100,	-	x	1SAP 250 600 R0001	0.2	1																																																

**SPU: Sales Package Unit

Automation products

Scalable PLC AC500 Ordering data

Terminal units

For digital and analogue expansion modules and interface modules.

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

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



TU505

	For I/O modules		For interface modules		
	TU515/TU516	TU531/TU532	TU505-FBP / TU506-FBP	TU507-ETH / TU508-ETH	TU551-CS31 / TU552-CS31
DI524	X				
DC522	X				
DC523	X				
DC532	X				
DX522		X			
DX531		X			
AI523	X				
AI531	X				
AX521	X				
AX522	X				
AO523	X				
CD522	X				
DC505-FBP			X		
DC551-CS31					X
CI590_CS31					X
CI501-PNIO				X	
CI502-PNIO				X	
CI511-ETHCAT				X	
CI512-ETHCAT				X	

Type	For	Supply	Connection type	Order code	Price	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	
TU507-ETH	Ethernet interface modules	24 V DC	Screw-type terminals	1SAP 214 200 R0001		
TU508-ETH	Ethernet interface modules	24 V DC	Spring-type terminals	1SAP 214 000 R0001		
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	

Connectors for AC500-eCo

Type	Description	Order code	Price*	Weight per piece (kg)	SPU**
L44460901501	9 poles terminal block for S500 I/O eCo modules, Screw Front / Cable Side,	1SSS 444 609 R1100	0.017	6	
L44461101501	11 poles terminal block for S500 I/O eCo modules, Screw Front / Cable Side,	1SSS 444 611 R1100	0.020	6	
L44440901501	9 poles terminal block for S500 I/O eCo modules, Screw Front / Cable Front,	1SSS 444 409 R1100	0.026	6	
L44441101501	11 poles terminal block for S500 I/O eCo modules, Screw Front / Cable Front,	1SSS 444 411 R1100	0.035	6	
L44470901501	9 poles terminal block for S500 I/O eCo modules, Spring Front / Cable Front,	1SSS 444 709 R1100	0.016	6	
L44471101501	11 poles terminal block for S500 I/O eCo modules, Spring Front / Cable Front,	1SSS 444 711 R1100	0.02	6	

* Unit price is given by piece **SPU: Sales Package Unit



Only ABB connectors must be used with AC500-eCo



TU516

Automation products

Scalable PLC AC500

Ordering data



DC505

Communication interface modules

For decentralized I/Os

DC505-FBP	Communication via FieldBusPlug with Profibus DP, DeviceNet or CANopen Fieldbus-dependent FieldBusPlug required*, terminal unit TU505 or TU506 required
DC551-CS31	Communication via internal interface with CS31 system bus Plug-in electronic modules, terminal unit TU551 or TU552 required DC: Channels can be configured individually as inputs or outputs

Type	Number of DI/DO/DC	Input signal	Output signal	Order code	Price	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	

* Please refer to the FieldBusPlugs catalog for information about FBP. The currently available FBP field bus plugs are listed in the catalogue 2CDC 120 141 D02**.

Communication interface modules

Type	Number of DI/DO/DC	Inputs-signal	Outputs-signal	Order code	Price	Weight per piece (kg)
CI590-CS31-HA	-/-/16	24 V DC	Trans. 24 V DC, 0.5	1SAP 221 100 R0001	0.125	

Type	Number of AI/AO/DI/DO/DC	Inputs-signal	Outputs-type	Outputs-signal	Order code	Price	Weight per piece (kg)
CI501-PNIO	4/2/8/8/0	24 V DC / 0...10 V, -10...+10 V, 0...20 mA, 4...20 mA, PT100, PT1000, Ni100, Ni1000	Transistor	24 V DC, 0.5 A / -10...+10 V, 0...20 mA, 4...20 mA	1SAP 220 600 R0001		
CI502-PNIO	0/0/8/8/8	24V DC	Transistor	24 V DC, 0.5 A	1SAP 220 700 R0001		
CI511-ETHCAT	4/2/8/8/0	24 V DC / 0...10 V, -10...+10 V, 0...20 mA, 4...20 mA, PT100, PT1000, Ni100, Ni1000	Transistor	24 V DC, 0.5 A / -10...+10 V, 0...20 mA, 4...20 mA	1SAP 220 900 R0001		
CI512-ETHCAT	0/0/8/8/8	24 V DC	Transistor	24 V DC, 0.5 A	1SAP 221 000 R0001		

Programming package PS501 Control Builder AC500

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	Price	Weight per piece (kg)
PS501	all AC500 CPUs	Programming package PS501 Control Builder AC500	1SAP 190 100 R0002	0.3	
PS541-HMI ¹⁾		License for runtime visualization package. For installation and visualization of images created with the programming package PS501. Delivery includes license code and documentation.	1SAP 190 500 R0001	0.3	
PS542-WEB-PC ^{1,2)}		License enabling package for PC applet for WEBserver visualization. Delivery includes licence code and documentation	1SAP 190 900 R0001	0.3	

1) This package allows granting the license for the software. To install the PC applet WEBserver or HMI software, the PS501 control builder should be purchased separately.

2) PS542-WEB-PC includes visualization package.

Please refer to the FieldBusPlugs catalog for FieldBusPlug (FBP) ordering data . The currently available FBP field bus plugs are listed in the catalogue 2CDC190022D0201.

Motion control library

Type	For	Description	Order code	Price	Weight per piece (kg)
PS551-MC	all AC500 CPUs	Motion control library single license	1SAP 190 600 R0001		
PS551-MC	all AC500 CPUs	Motion control library multiple license	1SAP 190 600 R0101		

Automation products

Scalable PLC AC500

Ordering data

Accessories for AC500-eCo

Type	Description	Order code	Price	Weight per piece (kg)
MC502	SD Memory Card 512 MB needs the MC503 option	1SAP 180 100 R0001	0.02	
MC503	SD Memory Card adapter	1TNE 968 901 R0100	0.100	
TK503	Programming cable USB => RS485 SUB-D, 3 m	1TNE 968 901 R1100	0.400	
TK504 ¹⁾	Programming cable USB => RS485 Terminal block, 3 m	1TNE 968 901 R2100	0.400	
TA560 ¹⁾	Lithium Battery for data buffering (spare part)	1TNE 968 901 R3201	0.100	
TA561-RTC	Real time clock option board, lithium battery is included into the delivery	1TNE 968 901 R3200	0.100	
TA562-RS	Serial communication interface COM2, RS485 non isolated, screw terminal block, option board	1TNE 968 901 R4300	0.100	
TA562-RTC-RS	Serial communication interface COM2 with real time clock, RS485 non isolated, screw terminal block, option board, lithium battery is included into the delivery	1TNE 968 901 R5210	0.100	
TA566 ¹⁾	Wall Mounting Accessory for AC500 eCo CPU and S500 eCo I/O modules	1TNE 968 901 R3107	0.200	
TA570	Set of accessories: 6 x plastic cover for option slot, 6 x 5 pole terminal block for AC500 eCo, 6 x 5 pole screw terminal block for COM2 serial interface	1TNE 968 901 R3203		
PM554-STAKIT	Starter kit: 1 x CPU PM554-T with CPU power supply, 1 x TK503 programming cable, 1 x PS501 promotion CD*, 1 x E-learning DVD, 1 screwdriver	1TNE 968 903 R0100		

* Promotion CD means no licensed product

1) In preparation

Accessories for AC500

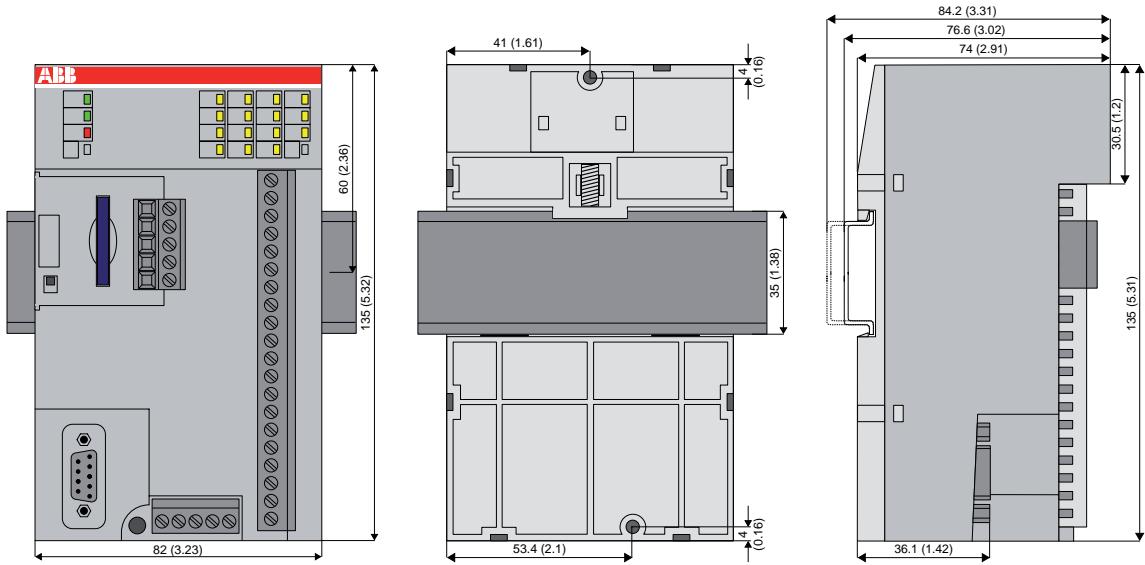
Type	For	Description	Order code	Price	Weight per piece (kg)
TK501	AC500 CPUs COM2	Programming cable Sub-D/Sub-D, length 5 m	1SAP 180 200 R0001	0.4	
TK502	AC500 CPUs COM1	Programming cable Sub-D/terminal block, length 5 m	1SAP 180 200 R0101	0.4	
UTF21-FBP	Cable for programming the AC500 via the integrated fieldbus neutral interface	Connection to PC via USB interface. Includes USB extension cable and installation CD.	1SAJ 929 400 R0001		
MC502	AC500 CPUs	Memory card (SD card) 512 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	0.120	
TA525	I/O modules	White labels, packing unit incl. 10 pcs.	1SAP 180 700 R0001	0.1	
TA526	CPU terminal base	Accessories for mounting, packing unit incl. 10 pcs.	1SAP 180 800 R0001	0.2	
TA527	CPU terminal base	5-pole power plug for AC500. Spare part. Can be plugged to CPU terminal base TB5x1. Packing unit incl. 5 pcs.	1SAP 181 100 R0001	0.2	
TA528	CPU terminal base	9-pole COM1 plug for AC500. Spare part. Can be plugged to CPU terminal base TB5x1. Packing unit incl. 5 pcs.	1SAP 181 200 R0001	0.2	

Automation products

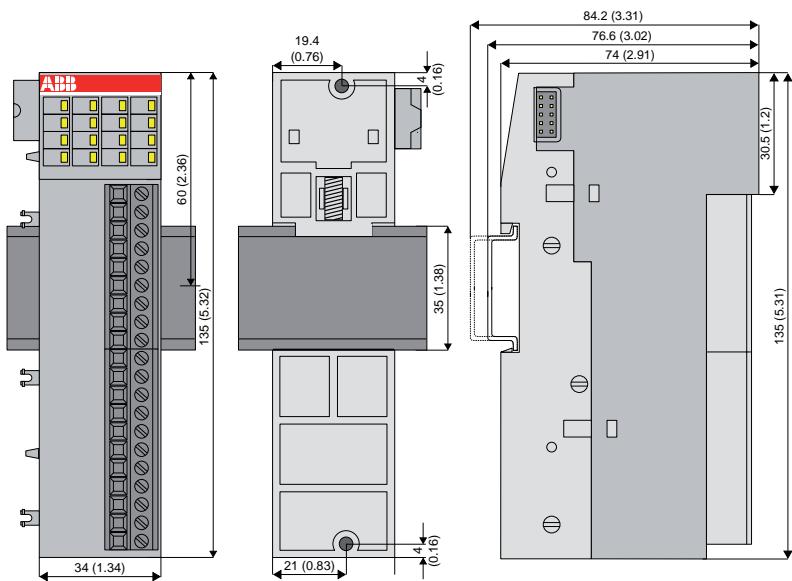
Scalable PLC AC500

AC500-eCo dimensions

CPU AC500-eCo



I/O expansion and interface module

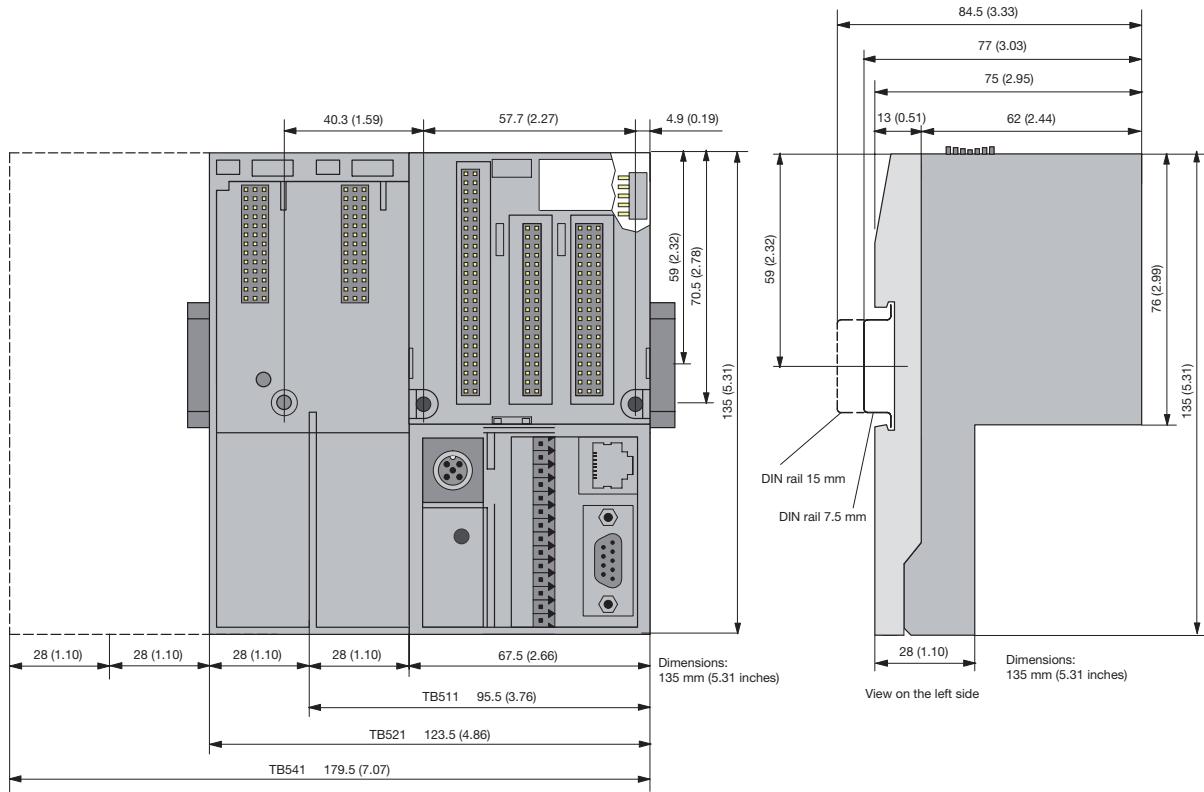


Automation products

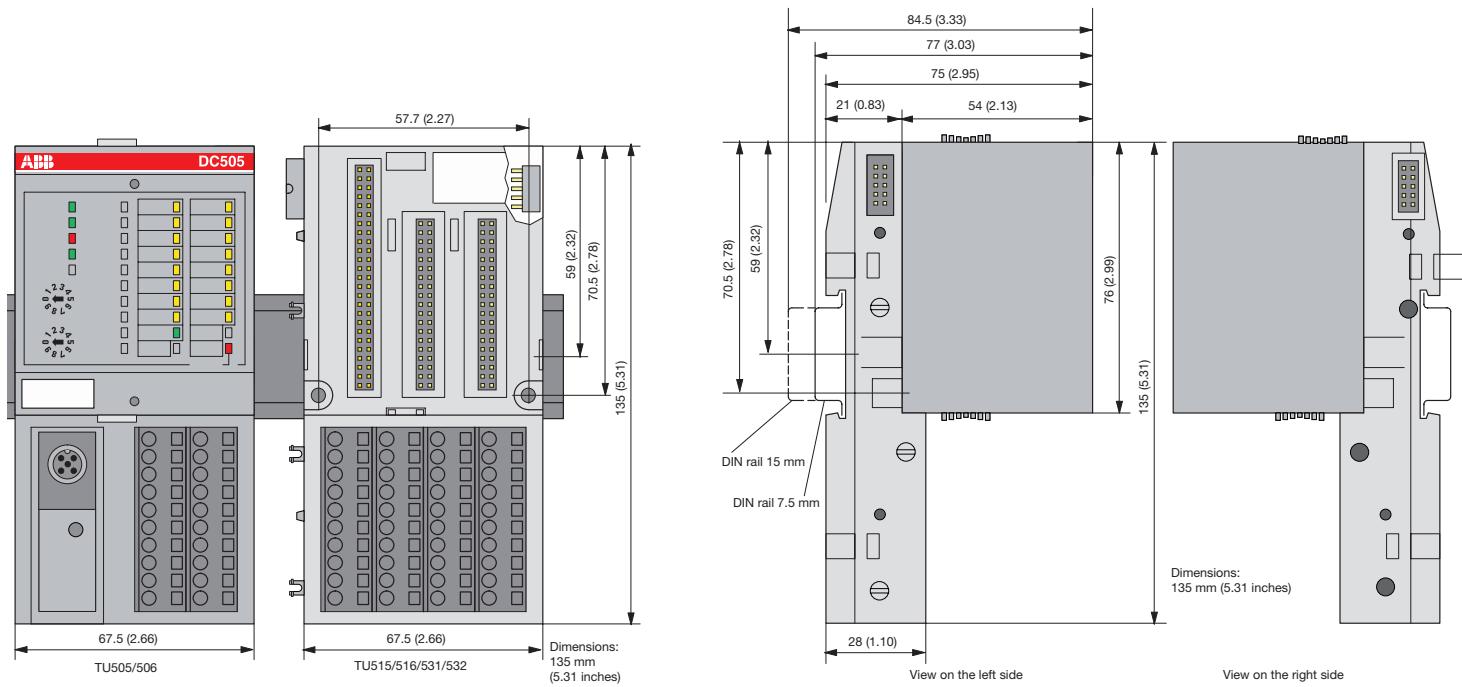
Scalable PLC AC500

AC500 dimensions

CPU terminal base TB511, TB521 and TB541



I/O expansion and interface modules



Automation products

Scalable PLC AC500

Approvals and certifications

Symbols and legends:

- Standard product certified: product sticker wears approval mark when it is obligatory
- In special model certified
- Certified with restrictions
- Approval submitted, date of approval delivery on request
- No general approbation obligation, unless special cases
- Submission planned (no date available, details on request)
- n.a. Not applicable

Symbol	Approvals				Shipping classification companies						
	CE	cUL us LISTED	cTIC	GOST R	ABS	BV	DNV	GL	LRS	RINA	RMRS
Abbreviation	CE	cUL	cTIC	GOST R	USA	France	Norway	Germany	Great Britain	Italy	Russia
TB5xx	■	■	■	■	■	■	■	■	■	■	■
PM5xx	■	■	■	■	■	■	■	■	■	■	■
CM572-DP	■		□	■	■	■	■	■	■	■	■
CM574-RS	■	□	■	■	□	□	□	□	□	□	□
CM574-RCOM	■	□	■	■	□	□	□	□	□	□	□
CM575-DN	■	■	■	■	■	■	■	■	■	■	■
CM577-ETH	■	■	■	■	■	■	■	■	■	■	■
CM578-CN		□	■	■	■	■	■	■	■	■	■
CM579-ETHCAT	■	□	■	■	□	□	□	□	□	□	□
CM579-PNIO	■	□	■	■	□	□	□	□	□	□	□
MC502	n.a.	■	n.a.	■	■	■	■	■	■	■	■
TK501	n.a.	■	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TK502	n.a.	■	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TA521 to TA526	n.a.	■	n.a.	■	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TA510-CASE	■	n.a.	n.a.	n.a.	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.
TA527	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TA528	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
PS501-PROG	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
PS541-HMI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
PS542-WEB-PC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TU505-FBP	■	■	■	■	■	■	■	■	■	■	■
TU506-FBP	■	■	■	■	■	■	■	■	■	■	■
TU507-ETH	■	□	■	■	□	□	□	□	□	□	□
TU508-ETH	■	□	■	■	□	□	□	□	□	□	□
TU515	■	■	■	■	■	■	■	■	■	■	■
TU516	■	■	■	■	■	■	■	■	■	■	■
TU531	■	■	■	■	■	■	■	■	■	■	■
TU532	■	■	■	■	■	■	■	■	■	■	■
TU541	■	■	■	■	■	■	■	■	■	■	■
TU542	■	■	■	■	■	■	■	■	■	■	■
TU551-CS31	■	■	■	■	■	■	■	■	■	■	■
TU552-CS31	■	■	■	■	■	■	■	■	■	■	■
C15xx	■	□	■	■	□	□	□	□	□	□	□
CD522	□	□	■	■	□	□	□	□	□	□	□
DC5xx	■	■	■	■	■	■	■	■	■	■	■
DI524	■	■	■	■	■	■	■	■	■	■	■
DX522	■	■	■	■	■	■	■	■	■	■	■
DX531	■	■	■	■	■	■	■	■	■	■	■
AI523	■	■	■	■	■	■	■	■	■	■	■
AI531	■	□	■	■	□	□	□	□	□	□	□
AO523	■	■	■	■	■	■	■	■	■	■	■
AX521	■	■	■	■	■	■	■	■	■	■	■
AX522	■	■	■	■	■	■	■	■	■	■	■
DC541-CM	■	■	■	■	■	■	■	■	■	■	■
PM554-T	□	□	□	□	□	□	□	□	□	□	□
PM564-T	□	□	□	□	□	□	□	□	□	□	□
MC503	□	□	□	□	□	□	□	□	□	□	□
TK503	□	□	□	□	□	□	□	□	□	□	□
TA561-RTC	□	□	□	□	□	□	□	□	□	□	□
TA562-RS	□	□	□	□	□	□	□	□	□	□	□
TA562-RS-RTC	■	□	□	□	□	□	□	□	□	□	□
Axxxx	■	□	□	□	□	□	□	□	□	□	□
Dxxxx	■	□	□	□	□	□	□	□	□	□	□

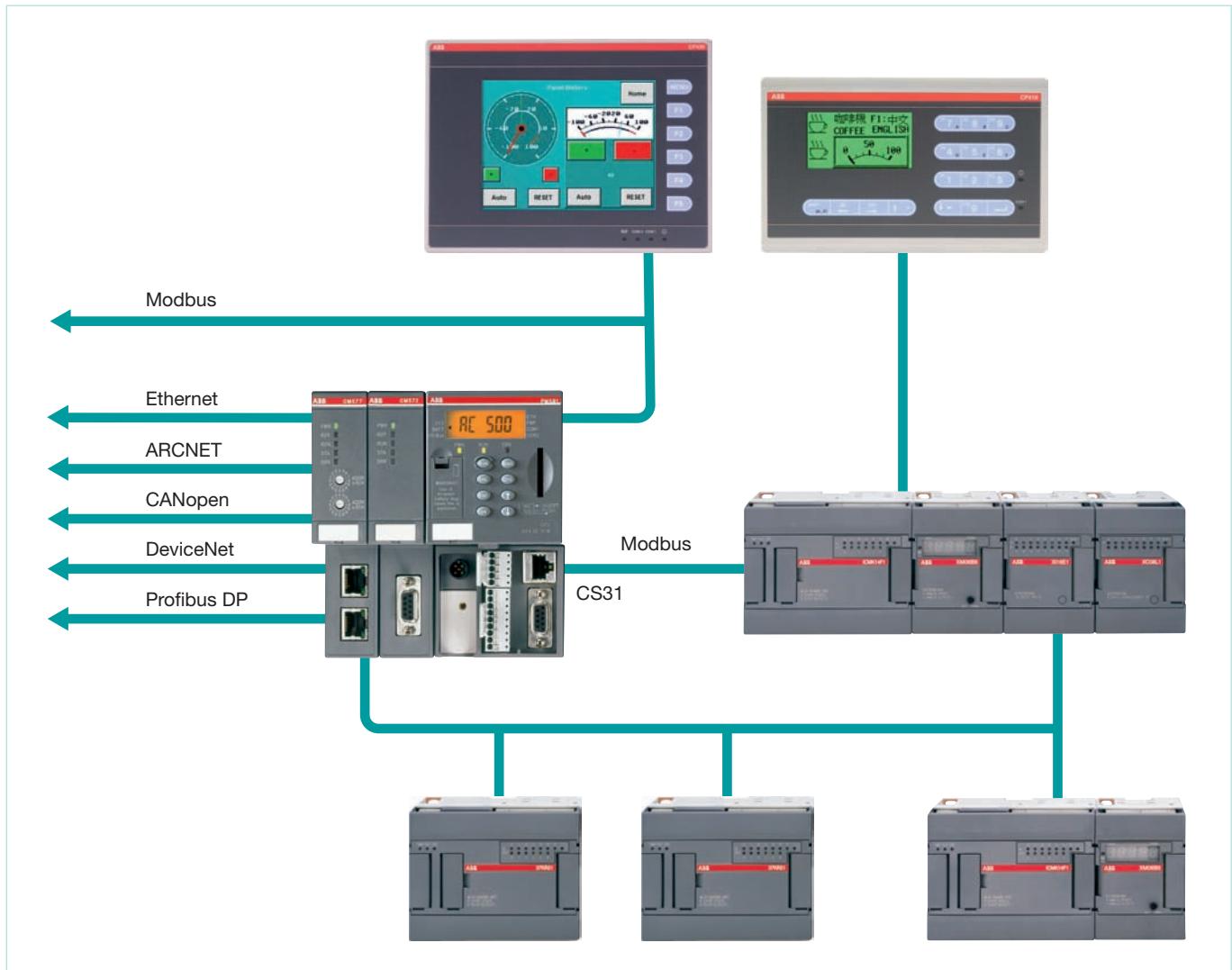
Automation products AC31



Automation products

Small and compact PLCs AC31

The AC31 PLC family



The AC31 PLC family

The AC31 offers compact, high performance CPUs with various configuration options, including decentralized networking.

Both series 40 and 50 utilize the same AC31GRAF software which conforms to the IEC 61131-3 standard. All devices have a very small footprint and offer high levels of functionality with up to 1 MByte of user memory as well as up to 60 integrated I/O connections (analogue and digital) and two serial interfaces (both of which are configurable for MODBUS or ASCII). There is also a plug-in "smart media" card for saving user programs or for data storage. An additional two communication interfaces with their own processors are also available integrated within the CPUs.

Hence the customer can choose varying combinations of integrated field communications network protocols, e.g. Ethernet + PROFIBUS DP, ARCNET + CANopen or CANopen + Ethernet.

The communications couplers are integrated within the standard housing of the CPU in order to save space. Tools for the configuration of the field buses used are already an integral part of the software package 907 AC 1131.

There is a very high degree of integration available across all three series of CPU's.

Automation products

Small and compact PLCs AC31

AC31 system data

System data AC31 series 40..50

Operating and environmental conditions

Environmental conditions

Temperature	operation	horizontal	0 °C to +55 °C
		vertical	0 °C to +40 °C
	storage		-40 °C to +75 °C
Humidity	DIN 40040 Class F, no condensation	annual average	≤ 75%
		for up to 30 days per year	95%
		occasionally	85%
Air pressure	DIN 40050	operation	≥ 800 hPa (≤ 2000 m)
		storage	≥ 600 hPa (≤ 3500 m)

Mechanical data

Degree of protection	IP 20
Housing	UL V2
Vibration resistance	CEI68-2-8 Test Fc
Shock resistance	CEI68-2-27 Test Ea

Supply voltage tolerances

24 V DC	19.2 to 30 V (-20%, +25%)
120 V AC (50 / 60 Hz)	97.75 to 126.5 V (-18.5%, +5.5%)
230 V AC (50 / 60 Hz)	195.5 to 253 V (-15%, +10%)

Automation products

Small and compact PLCs AC31 AC31 system data

Test voltages

230 V circuits (mains, 230 V in-/outputs) against other circuits	2500 V
120 V circuits (mains) against other circuits	1500 V
24 V circuits (supply, 24 V inputs/outputs), if they are potentially isolated against other circuits	500 V
CS31 bus against other circuits	500 V

Electromagnetic compatibility

• Interference immunity against electrostatic discharge (ESD)	acc. to DIN 61000-4-2
- interference voltage with air discharge	8 kV
- interference voltage with contact discharge	4 kV
• Interference immunity against radiated interference (CW radiated)	acc. to DIN 61000-4-5
- Test field strength	10 V/m
• Immunity against transient interference voltages / bursts	acc. to DIN 61000-4-6
- voltage supply (AC/DC)	2 kV
- digital inputs / outputs (24 V DC)	1 kV
- digital inputs / outputs (120/230 V DC)	2 kV
- analog inputs / outputs	1 kV
- CS31 system bus	2 kV
- serial interfaces (COM)	0.5 kV
- ARCnet	0.5 kV
• Interference immunity against conduction-bound interferences (CW conducted)	acc. to DIN 61000-4-6
- test voltage	10 V
• Emitted interferences	acc. to EN 55011 radio interference level A and acc. to EN 55022 radio interference level A (communication modules only)

Mechanical data

Device mounting

DIN top-hat rail acc. to DIN EN 50022, for terminal base ECZ only:	35 mm, height 15 mm height 7.5 mm and 15 mm
Screw mounting	Screws, diameter 4 mm

Interfaces

Between CPU and I/O modules	EIA RS-485 (CS31 system bus)
For programming units and for connection to a terminal, 9-pole D-SUB socket	EIA RS-232

Automation products

Small and compact PLCs AC31

Overview of AC31 CPUs

Small PLC
AC31 series 40..50



Type	07CR41	07CT41	07CR42	07CT42	07KR51	07KT51	07KR52
Program memory							
Flash EPROM and RAM (kB)			34			34	
Supply voltage							
24 V DC	X	X	X	X	X	X	-
120 / 230 V AC	X	-	X	-	X	-	X (230 only)
Plug-in Smart Media Card							
Cycle time for 1 kB (ms)							
100% binary values			0.4			0.4	
65% binary values and 35% words			1.2			1.2	
Number of inputs and outputs							
Digital, internal (DI / DO / DC)	8 / 6 / -		8 / 6 / -		8 / 6 / -		5 / 4 / -
DI/DO maximum	110		110			1000	
Analogue, internal (AI / AO)	- / -		3 / -		- / -		4 / 1
AI/AO maximum	36		36		222		496 / 136
Digital inputs 24 V DC		X			X		-
Digital outputs							
Transistor (T) 24 V DC, 0.5 A	-	X	-	X	-	X	-
Relay (R) 120 / 230 V AC, 2 A	X	-	X	-	X	-	X
Analogue input ranges							
± 10 V		-		X		-	-
0 ... 10 V, 0 ... 5 V, ± 5 V	-		-		-		X
0 ... 20 mA, 4 ... 20 mA	-		-		-		-
PT100 (- 50 °C ... + 400 °C)	-		-		-		-
PT100 (- 30 °C ... + 70 °C)	-		-		-		-
PT100 (- 100 °C ... + 524 °C)	-		X		-		-
Configurable as DI	-		-		-		-
Analogue output ranges							
± 10 V		-			-		X
0 ... 20 mA, 4 ... 20 mA		-			-		-
Data buffering by battery		Integrated			Integrated		
Real-time clock		X			X		
Programming package							
907 AC 1131		X			X		X
907 PC 331		X			X		-
AC31GRAF		X			X		X
Program execution							
Cyclical or time-controlled		X			X		
Multitasking		X			X		
User program protection							
Password		X			X		
Serial interfaces							
RS232 (programming, Modbus, ASCII)		1			1		-
RS485 (CS31, Modbus, programming)	-				1		1
Integrated potentiometers		2			2		
Data memory (kB)		2			2		
Timers	Unlimited (42 at the same time)			Unlimited (42 at the same time)			
Counters	Unlimited (function)			Unlimited (function)			
Fast counters (pieces / frequency)	2 / 7 kHz			2 / 7 kHz			
Interfaces / protocols							
CS1		-			X		
ASCII		X			X		
MODBUS®		X			X		
Ethernet		X			X ¹⁾		X ²⁾
ARCNET	-				-		
Profibus DP	-				-		
CANopen	-				-		
RCOM (additional coupler)	-				-		
Remark	Centrally expandable by up to 6 I/O modules of series 40 ... 50. Up to 110 digital or 36 analogue I/Os or mixed.						

1) With external device e-AC31 - 2) With external device e-ILPH

Automation products

Small and compact PLCs AC31

Overview of AC31 I/O modules

Digital I/O modules		Bus modules series 50 ¹⁾		Series 40 .. 50 Only in connection with bus modules or CPU									
													
Type	ICMK 14 F1	ICMK 14 F1	ICMK 14 N1	XI 16 E1	XO 16 N1	XO 08 Y1	XO 08 R1 ²⁾	XO 08 R2	XC 08 L1	XK 08 F1	XC 32 L1 ³⁾		
Supply voltage	24 V DC	X	-	X						internal			
	230 V AC	-	X	-						internal			
Number of digital input and outputs	(DI / DO / DC)	8 / 6 / -	8 / 6 / -	8 / 6 / -	16 / - / -	- / 16 / -	- / 8 / -	- / 8 / -	- / 8 / -	- / - / 8	4 / 4 / -	- / - / 32	
Digital inputs 24 V DC	X	X	X	X	-	-	-	-	-	X	X	X	
Digital outputs	Relay (R) 120 / 230 V AC, 2 A	X	X	-	-	-	-	X	X	-	X	-	
	Transistor (T) 24 V DC, 2 A	-	-	-	-	-	X	-	-	-	-	-	
	Transistor (T) 24 V DC, 0.5 A	-	-	X	-	X	-	-	-	X	-	X	
Short circuit- / overload-proof	-	-	X	X	X	X	-	-	-	X	-	X	
Interfaces / protocols	CS31 field bus	X	X	X	-	-	-	-	-	-	-	-	
	Profinet DP	-	-	-	-	-	-	-	-	-	-	-	
Connection type (1 = 1 wire, 3 = 3 wires)	spring-type terminal	1	1	1	1	1	1	1	1	1	1	1	with HE10 conn.
	screw-type terminal	1	1	1	1	1	1	1	1	1	1	1	
Remark	<small>*1) Centrally expandable by up to 6 I/O modules of series 40 ... 50. Up to 110 digital or 36 analogue I/Os or mixed. *2) 8 normally open outputs, 4 of these outputs can also be configured as normally closed outputs. *3) 4 counters 20 kHz / 4 frequency meters can be connected to prewiring system INTERFAST.</small>												
Analogue I/O modules		Series 40 .. 50 only with bus module or CPU											
													
Type	XM 06 B5			XE 08 B5			XTC 08 ⁴⁾			XC 32 L2 ⁵⁾			
Supply voltage	24 V DC				internal								
	230 V AC				internal								
Number of analogue inputs and outputs	AI / AO / AC	4 / 2 / -			8 / - / -			8 internal			8 / - / -		
Analogue input signals	0 ... 10 V	-			-			-			X		
	± 10 V	X			X			-			-		
	± 20 mA	X			X			-			-		
	0 ... 20 mA	-			-			-			-		
	4 ... 20 mA	X			X			-			-		
	± 50 mV, ± 500 mV, ± 5 V	-			-			-			-		
	PT100, PT1000	X			X			-			-		
	Thermocouple	-			-			-			-		
Analogue output signals	± 10 V	X			-			-			-		
	0 ... 20 mA, 4 ... 20 mA	X			-			-			-		
	± 20 mA	-			-			-			-		
Short circuit- / overload-proof	X	X			X			X			X		
Interfaces / protocols	CS31 field bus	-			-			-			-		
	Profinet DP	-			-			-			-		
Connection type (1 = 1 wire, 3 = 3 wires)	spring-type terminal	1			1			1			with HE10 connector		
	screw-type terminal	1			1			1			with HE10 connector		
Display of channel number / value	X	X			X			X			-		
Remark	<small>*4) Display for 8 internal channels. *5) Plus 24 configurable digital I/Os (DC). Same as XC 32 L1 but 8 of 32 DC can also be used as AI.</small>												

Automation products

Small and compact PLCs AC31

Ordering data for small PLCs AC31 series 40..50



07 CR 41

CPUs AC31 series 40

Description: see "Overview of CPUs".

Centrally expandable with up to 6 I/O modules. CRxx: relay outputs, CTxx: transistor outputs.

Program memory without / with online changes: 34 kB / 17 kB.

Type	Integrated I/Os DI/ DO/AI	Integrated counter inputs/ pulse/ outputs	Supply voltage	Connection type	Order code	Price	Weight per piece kg
07 CR 41	8 / 6 / -	2 / -	24 V DC	Screw-type termin.	1SBP 260 020 R1001	0.400	
				Spring-type termin.	1SBP 260 520 R1001	0.400	
			120/230 VAC	Screw-type termin.	1SBP 260 021 R1001	0.800	
				Spring-type termin.	1SBP 260 521 R1001	0.800	
07 CT 41	8 / 6 / -	2 / 1	24 V DC	Screw-type termin.	1SBP 260 022 R1001	0.400	
				Spring-type termin.	1SBP 260 522 R1001	0.400	
07 CR 42	8 / 6 / 3	2 / -	24 V DC	Screw-type termin.	1SBP 260 023 R1001	0.400	
			120/230 VAC	Screw-type termin.	1SBP 260 024 R1001	0.800	
07 CT 42	8 / 6 / 3	2 / 1	24 V DC	Screw-type termin.	1SBP 260 025 R1001	0.400	



07 KR 51

CPUs AC31 series 50

Description: see "Overview of CPUs". Integrated CS31 field bus.

Centrally expandable with up to 6 I/O modules, decentrally with up to 31 I/O modules.

KRxx: relay outputs, KTxx: transistor outputs.

Program memory without / with online changes: 34 kB / 17 kB.

Type	Integrated I/Os DI/ DO/AI/AO	Integrated counter inputs/ pulse/ outputs	Supply voltage	Connection type	Order code	Price	Weight per piece kg
07 KR 51	8 / 6 / - / -	2 / -	24 V DC	Screw-type termin.	1SBP 260 010 R1001	0.400	
				Spring-type termin.	1SBP 260 510 R1001	0.400	
			120/230 V AC	Screw-type termin.	1SBP 260 011 R1001	0.800	
				Spring-type termin.	1SBP 260 511 R1001	0.800	
07 KT 51	8 / 6 / - / -	2 / 1	24 V DC	Screw-type termin.	1SBP 260 012 R1001	0.400	
				Spring-type termin.	1SBP 260 512 R1001	0.400	
07 KR 52	5 / 4 / 4 / 1	2 / -	230 V AC	Screw-type termin.	1SBP 260 034 R1001	0.800	

Automation products

Small and compact PLCs AC31

Ordering data for small PLCs AC31 series 40..50



ICMK 14 F1

Bus modules series 50

Description: see "Overview of I/O modules". Integrated CS31 field bus.
Centrally expandable with up to 6 I/O modules.

Type	Number of DI/DO	Relay/transistor outputs	Supply voltage	Connection type	Order code	Price	Weight per piece kg
ICMK 14 F1	8 / 6	Relay	24 V DC	Screw-type termin.	1SBP 260 050 R1001	0.400	
				Spring-type termin.	1SBP 260 550 R1001	0.400	
ICMK 14 F1	8 / 6	Relay	120/230 V AC	Screw-type termin.	1SBP 260 051 R1001	0.800	
				Spring-type termin.	1SBP 260 551 R1001	0.800	
ICMK14 N1	8 / 6	Transistor	24 V DC	Screw-type termin.	1SBP 260 052 R1001	0.400	
				Spring-type termin.	1SBP 260 552 R1001	0.400	

Description: see "Overview of I/O modules". Integrated MODBUS RTU slave. Automatic baudrate adaptation. Centrally expandable with up to 6 I/O modules (digital or analogue modules).

Type	Number of DI/DO	Relay/transistor outputs	Supply voltage	Connection type	Order code	Price	Weight per piece kg
ICMK 14 F1-M	8 / 6	Relay	24 V DC	Screw-type termin.	1SBP 260 053 R1001	0.400	
ICMK 14 F1-M	8 / 6	Relay	120/230 V AC	Screw-type termin.	1SBP 260 054 R1001	0.800	
ICMK14 N1-M	8 / 6	Transistor	24 V DC	Screw-type termin.	1SBP 260 055 R1001	0.400	

Replacement for series 30 CS31 I/O devices

I/O modules of series 30 that are no longer available can be replaced by the module ICMK-CS31 and a corresponding expansion module (standard I/O for AC31 series 40..50). Further information can be obtained on request.

Type	Supply voltage	Order code	Price	Weight per piece kg
ICMK 14-CS31	24 V DC	1SBP 260 056 R1001	0.400	
ICMK14-CS31	120/230 V AC	1SBP 260 057 R1001	0.800	

Automation products

Small and compact PLCs AC31

Ordering data for small PLCs AC31 series 40..50

Digital I/O modules series 40..50

Description: see "Overview of I/O modules".



XI 16 E1

Type	Number of DI/DO/DC	Input signal	Output signal	Connection type	Order code	Price	Weight per piece kg
XI 16 E1	16 / - / -	24 V DC	-	Screw-type termin.	1SBP 260 100 R1001	0.220	
				Spring-type termin.	1SBP 260 600 R1001	0.220	
XO 16 N1	- / 16 / -	-	24 V DC, 0.5 A	Screw-type termin.	1SBP 260 105 R1001	0.220	
				Spring-type termin.	1SBP 260 605 R1001	0.220	
XO 08 Y1	- / 8 / -	-	24 V DC, 2 A	Screw-type termin.	1SBP 260 108 R1001	0.220	
				Spring-type termin.	1SBP 260 608 R1001	0.220	
XO 08 R1	- / 8 / -	-	250 VAC, 2 A	Screw-type termin.	1SBP 260 101 R1001	0.220	
				Spring-type termin.	1SBP 260 601 R1001	0.220	
XO 08 R2 ^{a)}	- / 8 / -	-	250 VAC, 2 A	Screw-type termin.	1SBP 260 109 R1001	0.220	
				Spring-type termin.	1SBP 260 609 R1001	0.220	
XC 08 L1	- / - 8	24 V DC	24 V DC, 0.5 A	Screw-type termin.	1SBP 260 102 R1001	0.220	
				Spring-type termin.	1SBP 260 602 R1001	0.220	
XK 08 F1	4 / 4 / -	24 V DC	250 VAC, 2 A	Screw-type termin.	1SBP 260 104 R1001	0.220	
				Spring-type termin.	1SBP 260 604 R1001	0.220	
XC 32 L1 ^{b)}	- / - 32	24 V DC	24 V DC, 0.5 A	HE10 connector	1SBP 260 110 R1001	0.220	

^{a)} 8 normally open outputs, 4 of them can also be configured as normally closed outputs

^{b)} 4 counters 20 kHz / 4 frequency meters can be connected to prewiring system INTERFAST. HE10 not included.

Analogue I/O modules series 40..50

Description: see "Overview of I/O modules".



XM 06 B5

Type	Number of AI/AO	Input signal	Output signal	Connection type	Order code	Price	Weight per piece kg
XM 06 B5	4 / 2	$\pm 10\text{ V}$, $\pm 20\text{ mA}$ 4...20 mA PT100, PT1000	$\pm 10\text{ V}$, 0...20 mA 4...20 mA	Screw-type termin.	1SBP 260 103 R1001	0.220	
				Spring-type termin.	1SBP 260 603 R1001	0.220	
XE 08 B5	8 / -	$\pm 10\text{ V}$, $\pm 20\text{ mA}$ 4...20 mA PT100, PT1000	-	Screw-type termin.	1SBP 260 106 R1001	0.220	
				Spring-type termin.	1SBP 260 606 R1001	0.220	
XC 32 L2 ^{a)}	8 / -	0 - 10 V	-	HE10 connector	1SBP 260 111 R1001	0.220	

^{a)} Plus 24 configurable digital I/Os (DC). Same as XC 32 L1 but 8 of 32 DC can also be used as analogue inputs.

4 counters 20 kHz / 4 frequency meters can be connected to prewiring system INTERFAST. HE10 not included.

Communication modules for CPUs of series 40..50

Networking interface for small PLC AC31 series 40..50. Connection to CPU via ribbon cable. Voltage supply from CPU. Cable: see accessories.

Type	Protocol	Software	Interface	Order code	Price	Weight per piece kg
07 KP 53	MODBUS	Included (in AC1131 & AC31GRAF)	Modbus RTU, Master or Slave (RS232/RS485)	1SBP 260 162 R1001	0.220	

Ethernet interface for series 40 ..50 CPU

External accessory connected to the serial mini DIN of CPU - powered by CPU.

Type	Protocol	Interface	Order code	Price	Weight per piece kg
e-AC31	MODBUS TCP programming	RJ45	1SBP 260 165 R1002	0.200	

Automation products

Small and compact PLCs AC31

Ordering data - Accessories for series 40..50



07 SK 50



07 ST 50

Display series 40..50

External 24 V DC supply.

Type	Description	Order code	Price	Weight per piece kg
XTC 08	Display for 8 internal channels (4 digits + sign + selected channel)	1SBP 260 107 R1001		0.500

Accessories for series 40..50

Type	Accessory for	Description	Order code	Price	Weight per piece kg
07 SK 50		Programming cable. PC-Sub D, 9 poles	1SBN 260 200 R1001		0.220
07 SK 52	CPUs series 40..50	Programming cable without connector on PC side	1SBN 260 202 R1001		0.220
07 SG 50		Simulation device for CPUs, 8 switches	1SAY 110 811 R0001		0.100
07 SK51	CPUs series 40..50, MODBUS coupler KP53	Communication cable MODBUS/ASCII, PC-Sub D9 plug	1SBN 260 201 R1001		0.220
07 SK 53		Communication cable MODBUS/ASCII, without connector on PC side	1SBN 260 203 R1001		0.220
LAF100/HE10-20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side, cable length : 1 m	1SNA 039 007 R0600		0.154
LAF150/HE10-20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side, cable length : 1.5 m	1SNA 039 008 R2500		0.189
LAF200/HE10-20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side, cable length : 2 m	1SNA 039 009 R0600		0.224
LAF300/HE10-20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side, cable length : 3 m	1SNA 039 011 R0400		0.294
LAF500/HE10-20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side, cable length : 5 m	1SNA 039 013 R2200		0.434
07 ST 50	CPUs and bus modules series 40..50, digital I/O modules	2-tier screw-type terminal for digital 3-wire sensors / actuators, 2 pieces	1SBN 260 300 R1001		0.220
07 ST 51	XM06B5, XE08B5	2-tier screw-type terminal for analogue 3-wire sensors, 2 pieces	1SBN 260 301 R1001		0.220
07 ST 52		2-tier spring-type terminal for digital 3-wire sensors / actuators, 2 pieces	1SBN 260 302 R1001		0.052
07 ST 54	CPUs and bus modules series 40..50	Set of spring-type terminals	1SBN 260 311 R1001		0.052
07 ST 55	XI16E1, XO16N1, XE08B5	Set of spring-type terminals	1SBN 260 312 R1001		0.052
07 ST 56	XO08R1, XC08L1, XK08F1	Set of spring-type terminals	1SBN 260 313 R1001		0.052
07 ST 57	XM06B5	Set of spring-type terminals	1SBN 260 314 R1001		0.052
Documentation	Series 40..50	Labels for marking of I/O channels	1SBN 260 310 R1001		
Documentation	Series 40..50	English	1SBC 260 400 R1001		0.200
Documentation	Series 40..50	French	1SBC 260 401 R1001		0.200

*) refer to prewiring system INTERFAST documentation for additional information.

INTERFAST harnesses are also available for series 40..50 CPUs + remote modules XI16E1, XO16N1, DC92.

Automation products

Small and compact PLCs AC31

Ordering data - Accessories for series 40..50

Programming package AC31GRAF (based on IEC61131-3)

For small PLC AC 31 series 40..50. Operating system: Windows 98 / NT / 2000 / XP.

Description: See "Overview of Programming Packages".

Programming cable: See Accessories.

Includes: 4 programming languages, debugging, visualization and many more.
Can be used with previous PLCs of type 30 series and 07KR91 ... 07KT94.

Scope of delivery: Software, libraries and documentation on CD-ROM.

Type	Manual language	Description	Order code	Price	Weight per piece kg
AC31GRAF	English	Programming package	1SBS 260 250 R1001		
AC31GRAF	French	Programming package	1SBS 260 251 R1001		
AC31GRAF	Italian	Programming package	1SBS 260 252 R1001		

Bus repeater for CS31 field bus

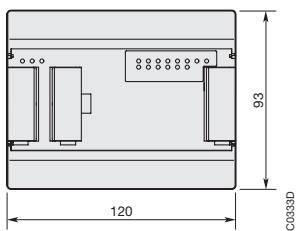
Type	Voltage supply	Description	Order code	Price	Weight per piece kg
NCB	24 V DC	Repeater for CS31 bus, max. length 2000 m (3 repeaters)	FPR3 471 200 R1002		0.34
NCBR	24 V DC	Repeater for CS31 bus, fro redundant, ring- or star-shaped bus configuration	FPR3 471 300 R1002		0.34

Automation products

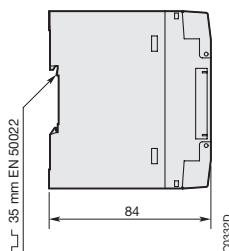
Small and compact PLCs AC31

Dimensions

CPU series 40..50 and bus modules

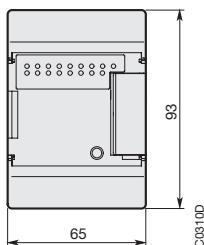


**07CR41/42, 07CT41/42, 07KR51, 07KT51
and ICMK 14 F1/N1**



W X H X D (mm)	120 X 93 X 84
W X H X D (inches)	4.72 X 3.66 X 3.31
Mounting	35 mm DIN rail acc. to DIN EN 50 022 or screw mounting

I/O modules and communication modules series 40..50



**XI16E1, XO16N1, XO08R1, XO08Y1, XC08L1, XK08F1,
XM06B5, XE06B5, 07KP53**

W X H X D (mm)	65 X 93 X 84.5
W X H X D (inches)	2.56 X 3.66 X 3.33
Mounting	35 mm DIN rail acc. to DIN EN 50 022 or screw mounting

Approvals



Germanischer Lloyd



Lloyds Register of Shipping

Automation products

Displays and Operator panels



Human Machine Interfaces

ABB operator panels are distinguished by their easy yet comprehensive functionality. These devices make comprehensive operational information for production plants and machines available at a single touch.

This enables an operator to intervene manually at any time to stop or modify the production process.

Individual solutions for each application

The ABB range of HMI operator panels offers an excellent diversity of features and functionality to facilitate maximum operator comfort at a price to meet requisite budgetary needs.

ABB operator panels offer highly efficient and effective functionality such as alarm and event management, graphics, animation, macro and Ladder Diagram functionality and recipe management. The range is available from a compact 3 inches monochrome version up to a large 10.4 inches colour TFT display.

RS232 & 485 Modbus are standard communications options across the whole range with Ethernet being available on most products. Other options include Ethernet plus CF Memory card slot and USB ports.

Most models are available in either STN or TFT screen format.

Displays and operator panels

CP400: graphics and text displays, touch panels

	CP410M	CP415M	CP420B	CP430B	CP430BP	CP430BP-ETH
Display type	LCD-STN 16 grey	Touch Mono FSTN 16 grey	Touch 16 blue STN		Touch 16 blue, STN	
Display size	3"	3.5"	4.7"		5.7"	
Resolution (Pixels)	160 x 80	240 x 240	240 x 128		320 x 240	
Brightness (cd/m ²)	36	90	110		110	
Contrast adjustment	Via VR (variable resistance)	Via touch panel	Via touch panel		Via touch panel	
Back-light type	LED	LED	CCFL		CCFL	
Back-light life	75 000 hours	40 000 hours	50 000 hours		50 000 hours	
Touch screen (number of times)	-	> 1 million	> 1 million		> 1 million	
Function keys / other keys	16 keys (10 of which may be function keys)	-	-		5 keys + 1 key menu	
Application flash eprom	4 MB	4 MB	4 MB		4 MB	
RTC (rechargeable lithium battery)	•	•	•	•	•	•
Ethernet	-	-	-	-	-	•
Alarm management	-	•	•	•	•	•
Recipe management	-	-	-	-	•	•
Data/Recipe	-	-	-		512 KB	
Trends	-	•	•	•	•	•
Data storage (CF card)	-	-	-	-	•	•
Communication interface	1	1	2		2	
USB 2.0	-	-	-	-	1 host + 1 device	
Printer port	-	-	-	-		USB
UL certificate	•	in preparation	•	•	in preparation	in preparation
Ambient temperature				0 °C to + 50 °C		
Storage temperature				- 10 °C to + 60 °C		
Relative humidity				20 % to 90 %		
Consumption	< 330 mA	< 330 mA	< 500 mA		< 840 mA	
Dimensions mm L x H x D (external)	173 x 106 x 52	96 x 96 x 40.6	170 x 103 x 45		195 x 145 x 60	
Weight (kg)	0.65	0.23	0.47		0.81	

For the entire range:

- 32 bit RISC CPU
- Graphics and text
- Macro and Ladder
- On-line and off-line simulation
- Real time clock
- Password protection
- 24 V DC ± 15% supply voltage
- IP65 class protection
- Conform to ROHS
- UL certified

Displays and operator panels

CP400: graphics and text displays, touch panels

CP430T	CP430T-ETH	CP435T	CP435T-ETH	CP440C-ETH	CP450T	CP450T-ETH		
Touch 64K colors, TFT	Touch 64K colors, TFT		Touch 64K colors, STN	Touch 64K colors, TFT				
5.7"	7"		7.5"	10.4"				
320 x 240	800 x 480		640 x 480	640 x 480				
300	250		350	350				
-	-		Via touch panel	-				
CCFL	CCFL		CCFL	CCFL				
60 000 hours	30 000 hours		45 000 hours	50 000 hours				
> 1 million	> 1 million		> 1 million	> 1 million				
5 keys + 1 key menu	6 keys + 1 key menu		6 keys + 1 key menu	7 keys + 1 key menu				
4 MB	8 MB		8 MB	8 MB				
●	●		●	●				
-	-		●	-				
●	●		●	●				
●	●		●	●				
512 KB	512 KB		512 KB	512 KB				
●	●		●	●				
●	●		●	●				
2	3		3	3				
1 host + 1 device	2 hosts + 1 device		2 hosts + 1 device	2 hosts + 1 device				
USB	USB		USB	USB				
in preparation	in preparation		in preparation	●				
	0 °C to + 50 °C			●				
	- 10 °C to + 60 °C			●				
	20 % to 90 %			●				
< 840 mA	< 1 A		< 1 A	< 1.25 A				
195 x 145 x 60	231 x 176 x 47		231 x 176 x 47	297 x 222 x 52				
0.81	1.20		1.20	1.90				

Displays and operator panels

Ordering data for CP400 operator panels



CP450

Operator panels with graphics display

LCD screen with backlight

Type	Pixels	Display	Order code	Price	Weight per piece (kg)
CP410M	160 x 80	3", 16 grey levels	1SBP 260 181 R1001		0.65

Operator panels with touch display

Type	Pixels	Display	Order code	Price	Weight per piece (kg)
CP415M	240 x 240	3.5", 16 grey levels	1SBP 260 191 R1001		0.23
CP420B	240 x 128	4.7", 16 blue levels	1SBP 260 182 R1001		0.47
CP430B	320 x 240	5.7", 16 blue levels	1SBP 260 183 R1001		0.81
CP430BP	320 x 240	5.7", 16 blue levels	1SBP 260 192 R1001		0.81
CP430BP-ETH	320 x 240	5.7", 16 blue levels	1SBP 260 194 R1001		0.81
CP430T	320 x 240	5.7", 64,000 colors TFT	1SBP 260 195 R1001		0.81
CP430T-ETH	320 x 240	5.7", 64,000 colors TFT	1SBP 260 196 R1001		0.81
CP435T	800 x 480	7", 64,000 colors TFT	1SBP 260 193 R1001		1.20
CP435T-ETH	800 x 480	7", 64,000 colors TFT	1SBP 260 197 R1001		1.20
CP440C-ETH	640 x 480	7.5", 64,000 colors STN	1SBP 260 187 R1001		1.20
CP450T	640 x 480	10.4", 64,000 colors TFT	1SBP 260 188 R1001		1.90
CP450T-ETH	640 x 480	10.4", 64,000 colors TFT	1SBP 260 189 R1001		1.90

Programming cables CP400

Type	Plug on CP400 side	Description	Order code	Price	Weight per piece (kg)
TK401	SubD9	Connection to COM1 of CP400. Length: 4 m	1SBN 260 216 R1001		0.18
TK402	SubD25	Connection to COM2 of CP400. Length: 4 m	1SBN 260 217 R1001		0.23

Communication cables CP400 (connection operator panel <-> PLC)

Type	Plug on PLC side	PLC	Order code	Price	Weight per piece (kg)
TK403	MiniDin	AC31 series 40..50	1SBN 260 218 R1001		0.12
TK405	SubD9	AC500	1SBN 260 221 R1001		0.13
TK406	SubD9	AC500-eCo	1SBN 260 224 R1001		0.13

Programming software

Type	Description	Order code	Price	Weight per piece (kg)
CP400Soft	Programming software for CP400 operator panels. Delivery includes the programming software and corresponding documentation on CD-ROM.	1SBS 260 284 R1001		0.07

Notes



Automation products
Wireless automation devices
WISA



Wireless automation devices

WISA Overview

Wireless Interface for sensors and actuators

WISA is a wireless sensor and actuator network technology that ABB developed to meet the demands of realtime factory automation applications, particularly multi-axis motion scenarios. It covers both:

- Wireless communication (WISA-COM) and
- The optional wireless power supply (WISA-POWER).

WISA advantages

- Higher reliability compared to moving cables and connectors providing outstanding productivity.
- Ideally suited for retrofits and sensor/actuator extensions.
- Can replace slip rings and contacts moving on tool changers (swivels) for higher reliability and cost reduction.
- Real-time capability: Cycle time of 2 ms for up to 120 field devices. For mapping operation, delay of 7 ms. When connected to a PLC, typical delay below 20 ms until the signal is available on the field bus.
- High node density of up to 624 field devices without loss of performance.
- Free from frequency/radio planning.
- Coexistence with Bluetooth, WLAN, and other common radio systems.

WISA field devices for wireless automation

Wireless I/O pad (WIOP100, WIOP208)

Wireless I/O pads are particularly suitable for the integration of conventional sensor technology and actuators into WISA systems. These devices communicate via radio transmission to replace fieldbus cables and are supplied with conventional 24 V DC supply voltage.

TrueWireless proximity switches WSIX

The WSIX is primarily a control, communication and power module. Both data and power are wireless. As sensors, switches can be used. Secondly, it accommodates the WSIF or WSIN inductive proximity switches..

TrueWireless sensor pad (WSP100)

Similar to WSIX, the WSP100 accommodates up to eight WISA sensor heads (WSIF..., WSIN...) or switches (limit switches, reed/auxiliary contacts, pushbuttons, etc.)

WISA COM: Reliable industrial real-time communication

WISA field devices communicate by radio technology (WISA COM) with an input/output module (WDIO100) which transmits/receives the signals via a pair of antennas (WAT100). Communication is based on IEEE802.15.1 in the license-free 2.4 GHz band. This is the globally available Industrial, Scientific and Medical ISM band. One input/output module can support up to 120 wireless proximity switches or up to 13 WISA pads assigned or a mixed configuration of different WISA field devices. Periodical diagnostic signals of all WISA field devices enable continuous monitoring and advanced fault recognition. Up to three WDIO100 modules can be operated inside a machine or a cell without loss of performance. The connection between the WDIO100 and the control (PLC, e.g. AC500 from ABB) is done via a field bus. For this purpose, the WDIO100 is equipped with a FieldBusPlug (FBP) interface. Depending on the selected FieldBusPlug, data exchange can take place via Profibus DP, DeviceNet, Modbus, etc. Stand-alone operation is possible, too (called "Mapping"). This is useful for cable-replacement.

WISA COM advantages

- Higher reliability than moving cables and connectors
- Real-time capability: Deterministic protocol, delays are independent of the number of WISA field devices used.
- High node density (up to 360 sensors/actuators are possible inside a working area without loss of performance, practically unlimited number of nodes inside a plant hall).

WISA-POWER: Optional wireless power supply

Utilising the proven principles of air-core transformers, the WSP and WSIX wireless field devices receive their operating energy from magnetic fields: The power supply WPU100 produces a sinusoidal current at 120 kHz to generate the magnetic field, so-called primary loops that are connected to the WPU100 are applied around the working area like a cord around a package. Typically, two WPU100 modules with one pair of primary loops connected each are required to supply a volume of 3 x 3 x 3 m3. Using further power supplies and primary loops, this arrangement can be extended to a volume of up to 6 x 6 x 3 m3. Modular structures of several cells are possible. Using WISA-POWER, it is also possible to implement circular, line and spot supply concepts of wireless power supply. From small to large - there are many opportunities. Easy design and setup guides are available from ABB, e.g. on the WISA System CD-ROM or in Internet.

Wireless automation devices

WISA

Overview of modules



Wireless I/O pad	WIOP100-8DI8DC	WIOP208-8DC
Number of inputs	8, digital (type 3 in accordance with IEC 61131) p switching	
Number of configurable (as Input or Output, DC)	8, digital; 0.5 A	8, digital; 0.5 A
Module/actuator supply	Separate, 24 V each in 7/8" mini plug, loopable through to next pad	24 V DC in M12 plug
Communication band [GHz]	2.4 ISM band	
Range of radio communication	5 m (industrial environment; typically 10 m)	
Diagnostics	Block by block for sensors, actuators; continuous radio monitoring	
Status LEDs	Status of inputs/outputs, input/output diagnostics, voltages, communication	
Addressing	By pushbutton and WDIO100-CON-FBP	
Protection category in accordance with IEC 60529	IP67	
Ambient temperature (°C)	0 ... +55	0 ... +70
Data transmission	WISA COM radio system, real-time capable ABB radio standard (see WDIO100)	
Dimensions (H x W x D) [mm]	213 x 60 x 39.5	205.5 x 30 x 40.5
Accessories	- Plug, 7/8" socket ("Mini") 5-pole for power supply - M12 standard Y-splitter SZC1-YU0 for 2 sensors/actuators at one connection	



WDIO100-CON-FBP input/output module	
Configuration for 1 I/O module; max. 3 I/O modules possible	Choice of: - 13 WIOPxxx wireless I/O pads or - 56 wireless sensors + 7 WIOPxxx wireless I/O pads or - 120 wireless sensors
Number of WDIO100 per machine unit/manufacturing cell	1 ... 3 without significant loss of performance
Communication band [GHz]	2.4 ISM band
Range of radio communication	5 m (industrial environment; typically 10 m)
Connection to machine control system	FieldBusPlug (FBP: PROFIBUS, DeviceNet, Modbus, CANopen, ...)
Operator display	- LCD display, two lines with 16 characters each - 4 membrane pushbuttons
Supply voltage	24 V DC; 15 W max.
Protection category in accordance with IEC 60529	IP20
Ambient temperature (°C)	0 ... +50
Mounting	On 35 mm DIN rail in accordance with EN 60715 or screw mounting
Dimensions H x W x D (mm)	140 x 120 x 85 (housing: 120 x 120 x 80)
Total delay (for 99.9% of signals)	20 ms until the signal is available on fieldbus
Mapping function	Easy to setup, fast radio transmission of the inputs of one WISA field device (e.g. WIOP100) to the outputs of another (without PLC, fieldbus)
Accessories	For connection to the control system (PLC): ABB FieldBusPlug, available for PROFIBUS, DeviceNet, CANopen, Modbus

Antennas

WAT100-x	Panel antenna, 70 degree beam width x = R, L (right, left-handed circular polarisation)
Dimensions H x W x D (mm)	101 x 95 x 32
WAC100-N0x	Antenna cable in lengths x = 3 m or 5 m
Accessories	WAM100 antenna mounting for mast mounting

Wireless automation devices

WISA

Overview of modules

Sensor heads for wireless sensor pad and communication module

Type (diameter as metric thread, pitch)	M8x1	M12x1	M18x1	M30x1,5
Designation (inductive, flush)	WSIF015-M8N	WSIF020-M12N	WSIF050-M18N	WSIF100-M30N
Designation (inductive, non-flush)	WSIN020-M8N	WSIN040-M12N	WSIN080-M18N	WSIN150-M30N
Nominal operating distance Sn (flush /non-flush) (mm)	1.5 / 2	2 / 4	5 / 8	10 / 15
Assured operating distance Sa flush/non-flush) (mm)	0...1.21 / 0...1.62	0...1.62 / 0...3.24	0...4.05 / 0...6.5	0...8.1 / 0...12.15
Reduction factor rV2A/rAl/rCu				
flush	0.75 / 0.4 / 0.4	0.75 / 0.3 / 0.25	0.75 / 0.35 / 0.3	0.75 / 0.45 / 0.25
non-flush	0.75 / 0.4 / 0.4	0.8 / 0.45 / 0.4	0.75 / 0.45 / 0.4	0.7 / 0.45 / 0.35
Overall length/thread (mm)	50 / 30	60 / 50	60 / 50	60 / 50
Nominal signal transmission rate (1/s)	5 (min.; signal change per second, higher in individual cases, see below)			
Ambient temperature (°C)	-25 ... +70 (0 ... +55 for wireless modules)			
Protection category in accordance with IEC 60529	IP67			

Wireless sensor pad and communication module

		
WSP100-8i sensor pad		WSIX100 communication module
Number of inputs	8 for WISA sensor heads and dry contacts (limit switches)	1 for WISA sensor heads and dry contacts (limit switches)
Nominal signal transmission rate 1/s	≥5 (signal change per second per input up to 40/s for individual sensor head); also higher, dependent on available power/field strength of magnetic field	≥5 (signal change per second)
Range of radio communication	5 m (industrial environment; typically 10 m)	
Switching status indicator	LED, yellow per input	LED, yellow
Operating indicator	LED, green	
Addressing/diagnostics	By membrane pushbutton and WDIO100-CON-FBP; captive storage	
Operating temperature range (°C)	0 ... +55	
Protection category in accordance with IEC 605299	IP67	
Connections	4 M12 device sockets, 2 inputs WISA pin assignment, regular 4-pin cable can be used each Sensor signals on contacts 4 and 1 (!)	1 M12 device socket
Weight	550 g	125 g
Sensor head supply	Pin 2; 2.8 VDC (1 mW max.)	
Power supply	WISA-POWER (120 kHz magnetic field)	
Data transmission	WISA-COM radio system, real-time capable ABB radio standard (see WDIO100)	
Accessories	M12 WISA Y-splitter WSC1-YU0 for 2 sensors on a single connection	WSC100 extension cable, mounting between WSIX communication module and WSI/WSIF sensor head: 0.3 / 0.6 / 0.75 / 1m



WPU100-24M power supply

Volume supplied by one pair WPU100 (m3)	1 x 1 x 1 to 3 x 3 x 3 or 2.5 x 2.5 x 5
Primary loop size (m2)	1 x 1 to 3 x 6
Expandability	with several WPU100-24M up to 6 x 6 x 3 m
Frequency of power transmission (kHz)	120
Protection category in accordance with IEC 60529	IP65
Ambient temperature (°C)	0 ... +45
Distance of heart pacemaker wearers	0.8 – 2.5 m depending on cell size or electricity
Mounting	Screw mounting



WPC100-Nxx primary loop conductor

Length (m)	10 to 28 in steps of 1
Connection type	Lug for direct connection to WPU100

Wireless automation devices

WISA

Ordering data



WDIO100



WSIX100



WIOP100

Input/output module

Type	Description	Order code	Price	Weight per piece (kg)
WDIO100-CON-FBP	Basic infrastructure for WISA. I/O module	1SAF 960 300 R2000	0.410	

Antennas for input module

The antennas WAT100 transmit and receive the signals between an input module and the wireless proximity switches. Please order one WAT100-R and one WAT100-L per WDIO.

Type	Description	Order code	Price	Weight per piece (kg)
WAT100-R	Right circular polarized antenna	1SAF 900 600 R0001	0.100	
WAT100-L	Left circular polarized antenna	1SAF 900 600 R0002	0.100	

Antenna cables for input module

Type	Description	Order code	Price	Weight per piece (kg)
WAC100-N03	3 m coaxial cable	1SAF 900 600 R1030	0.370	
WAC100-N05	5 m coaxial cable	1SAF 900 600 R1050	0.600	

Antenna mounting bracket

Type	Description	Order code	Price	Weight per piece (kg)
WAM100-N	Antenna mounting bracket, one per antenna	1SAF 900 900 R0001	0.095	

Wireless Proximity switches and wireless sensor pads

Sensor heads

Type	Description	Order code	Price	Weight per piece (kg)
WSIF015-M8N	1.5 mm switching distance, M8x1 flush mounted	1SAF 108 911 R3000	0.025	
WSIN020-M8N	2 mm switching distance, M8x1 non flush mounted	1SAF 108 921 R3000	0.025	
WSIF020-M12N	2 mm switching distance, M12x1 flush mounted	1SAF 112 911 R3000	0.030	
WSIN040-M12N	4 mm switching distance, M12x1 non flush mounted	1SAF 112 921 R3000	0.025	
WSIF050-M18N	5 mm switching distance, M18x1 flush mounted	1SAF 118 911 R3000	0.060	
WSIF080-M18N	8 mm switching distance, M18x1 non flush mounted	1SAF 118 921 R3000	0.055	
WSIF100-M30N	10 mm switching distance, M30x1.5 flush mounted	1SAF 130 911 R3000	0.140	
WSIF150-M30N	15 mm switching distance, M30x1.5 non flush mounted	1SAF 130 921 R3000	0.120	

IP67 Input/Output Pads, Input Pad

Communication module, I/O pads, sensor pad

Type	Description	Order code	Price	Weight per piece (kg)
WSIX100-B50NF	WISA Communication module	1SAF 900 100 R4000	0.125	
WIOP100-8DI8DC	WISA I/O Pad, 8DI/8DC	1SAF 960 100 R3000	0.350	
WIOP208-8DC	WISA I/O Pad, 8DC	1SAF 975 100 R1000	0.165	
WSP100-8I	WISA Sensor pad, 8E	1SAF 968 100 R3000	0.550	

Wireless automation devices

WISA

Ordering data



WPU100



WPC100

Connection cables/ holder for WSIX

Type	Description	Order code	Price	Weight per piece (kg)
WSC100-N000	Bracket f. WSIX, M12 recept., no cable	1SAF 900 100 R1000		0.070
WSC100-N003	Bracket f. WSIX, M12 recept., 0,30m cable	1SAF 900 100 R1003		0.085
WSC100-N006	Bracket f. WSIX, M12 recept., 0,60m cable	1SAF 900 100 R1006		0.095
WSC100-N007	Bracket f. WSIX, M12 recept., 0,75m cable	1SAF 900 100 R1007		0.100
WSC100-N008	Bracket f. WSIX, M12 recept., 0,85m cable	1SAF 900 100 R1008		0.105
WSC100-N010	Bracket f. WSIX, M12 recept., 1,00m cable	1SAF 900 100 R1010		0.110

Optional Power supplies (only when WSIX or WSP is used)

Type	Description	Order code	Price	Weight per piece (kg)
WPU100-24M	Power supply 24A mod.	1SAF 960 200 R0001		17.000

Primary loops for optional WISA-POWER (only when WSIX or WSP is used)

The primary loops WPC100 emit an electromagnetic field of 120kHz with the help of the connected power supply for WPU. Please inquire ABB for applications in paint shops of automotive industry.

Type	Description	Order code	Price	Weight per piece (kg)
WPC100-N10	10m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1100		1.280
WPC100-N11	11m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1110		1.410
WPC100-N12	12m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1120		1.535
WPC100-N13	13m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1130		1.665
WPC100-N14	14m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1140		1.790
WPC100-N15	15m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1150		1.920
WPC100-N16	16m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1160		2.050
WPC100-N17	17m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1170		2.175
WPC100-N18	18m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1180		2.305
WPC100-N19	19m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1190		2.430
WPC100-N20	20m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1200		2.550
WPC100-N21	21m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1210		2.690
WPC100-N22	22m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1220		2.815
WPC100-N23	23m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1230		2.945
WPC100-N24	24m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1240		3.070
WPC100-N25	25m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1250		3.200
WPC100-N26	26m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1260		3.330
WPC100-N27	27m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1270		3.455
WPC100-N28	28m prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors	1SAF 900 800 R1280		3.585

Wireless automation devices

WISA

Ordering data

Y-connectors (Data ports; Splitters)

Type	Description	Order code	Price	Weight per piece (kg)
SZC1-YU0	Y-distributor M12-2xM12 f. 2 SA, for WIOP100	1SAF 912 910 R1000	0.035	
SZC8-YU0	Y-distributor M12-2xM8 f. 2 SA, for WIOP100	1SAF 912 911 R1000	0.045	
WSC1-YU0	Y-distributor M12-2xM12, for WSP	1SAF 912 990 R1000	0.035	

7/8" connectors 5 poles (Power connectors for WIOP100)

Type	Description	Order code	Price	Weight per piece (kg)
SZC7-5POL-P	Power connector for WIOP100. Plug 7/8"	1SAF 937 780 R1000	0.045	
SZC7-5POL-S	Power connector for WIOP100. Socket 7/8"	1SAF 937 781 R1000	0.045	

Documentation

Type	Description	Order code	Price	Weight per piece (kg)
CD-ROM	English/German documentation and use-case videos	2CDC 171 007 E0405	0.020	

Notes:

Videos about WISA Application Reports and Use Cases

Robot Application, ABB Robotics Manufacturing Västeras/Sweden:

<http://www.youtube.com/watch?v=gYvasEUokvo>

Cable Armoring, ABB High Voltage Cables, Karlskrona/Sweden:

<http://www.youtube.com/watch?v=tx8DwEpqB9Q>

To download the above videos in High Definition Video format:

<http://www.abb.us/product/seitp329/c9c850a941f3612cc12570cb0027bd75.aspx?productLanguage=us&country=US&tabKey=5>

Pick & Place, Discrete Manufacturing, ABB Manufacturing Heidelberg/Germany:

<http://www.youtube.com/watch?v=suuuaFZFj0HM> Spanish Language

http://www.youtube.com/watch?v=r_kUF8ejxGM French Language

<http://www.youtube.com/watch?v=xxd9uFJ3cow> English Language

<http://www.youtube.com/watch?v=8r-Oc5lsVk> Portugese Language

<http://www.youtube.com/watch?v=yIqFHmSK8IA> Swedish Language

From non-ABB manufacturing sites:

FORD Motors, Inc., Detroit

<http://www.youtube.com/watch?v=cr9Lsb7WImY>

Food Packaging in USA/South Carolina

<http://www.youtube.com/watch?v=UmxLow7yzqM>

Comprehensively customer support

ABB has many years of demonstrable experience in low-voltage engineering thus enabling us to provide you with a comprehensive range of support services, which are available worldwide. There is always a contact person available in your country sales offices who will be happy to assist with any automation engineering queries.

Life-cycle management

ABB's PLC life-cycle management model maximizes the value of your investment by maintaining high availability, eliminating unplanned repair costs and extending the lifetime of the device.

Life-cycle management includes:

- Availability of spare parts and expertise throughout each products life cycle
- Providing efficient product support for improved reliability
- Ongoing product upgrades to maximize functionality
- Ensuring a smooth transition to latest technologies at the end of the life cycle

Training

PLC product training can be provided where required. A range of training programs is offered from basic standard tutorials to programs tailored to the customer's specific needs.

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