

# PLC Automation product family

## Overview

ABB offers a comprehensive range of scalable PLCs and robust HMI control panels. Since its launch, the AC500 PLC platform has achieved significant industry recognition for delivering high performance, quality and reliability.

### Comprehensive range

- ABB delivers scalable, flexible and efficient ranges of automation components to fulfill all conceivable requirements of the most diverse automation applications.
- ABB's automation devices deliver solutions with high performance and flexibility to be effectively deployed within various industries and applications including water, building infrastructure, data centers, renewable energy, machinery automation, material handling, marine and many more.

### Engineering suite

- ABB Automation Builder is the integrated software suite for machine builders and system integrators requiring state-of-the-art productive machine and system automation.
- Combining the tools required for configuring, programming, debugging and maintaining automation projects from one common intuitive interface, Automation Builder addresses the largest single cost element of most of today's industrial automation projects - software.

### Programmable Logic Controllers PLCs

- The AC500-eCo, AC500, AC500-XC and AC500-S scalable PLC ranges provide solutions for small, medium and high-end applications.
- Our AC500 PLC platform offers different performance levels and is the ideal choice for high availability, extreme environments, condition monitoring, motion control or safety solutions.
- Our AC500 PLC platform offers interoperability and compatibility in hardware and software from compact PLCs up to high end and safety PLCs.

### Control panels

- CP600-eCo, CP600 and CP600-Pro control panels offer a wide range of features and functionalities for maximum operability.
- ABB control panels are distinguished by their robustness and easy usability, providing all the relevant information from production plants and machines at one single touch.





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## Overview

### Engineering suite



#### Automation Builder

- Automation Builder connects the engineering tools for PLC, safety, control panels, SCADA, drives and motion.
- Automation Builder combines the tools required for configuring, programming, debugging and maintaining automation projects from one common intuitive interface.



#### Library packages

- For efficient engineering of demanding applications.
- Easy-to-use application examples.

### Visualization



#### CP600-eCo

- The economical CP600-eCo control panel is aimed for standard functions and high usability for clear interaction with the operation process.

### Programmable Logic Controllers PLCs



#### AC500-eCo

- Compact PLC offering optimally suited flexible and economical configurations for automation solutions in smaller applications.
- ABB's AC500-eCo has been designed to integrate seamlessly into the broader AC500 PLC platform.

### I/O modules



#### S500-eCo

- Range of modular I/Os for economical configurations in smaller applications.
- The I/O modules can be connected directly to the AC500 or AC500-eCo CPU modules.
- S500-eCo I/O modules can be mixed with standard S500 modules and also used as remote I/O with fieldbus communication interface modules.



**CP600**

- The robust CP600 HMI provides high visualization performance, versatile communication and representative design for machines and systems.



**CP600-Pro**

- The CP600-Pro HMI portfolio comes with high end visualization performance, multi-touch operation, versatile trendsetting communication and representative design.



**AC500**

- Powerful PLC featuring a wide range of performance, communications and I/O capabilities for industrial applications.
- The ideal choice for complex, high-speed machinery and networking solutions.



**AC500-XC**

- Extreme condition PLC variant of the AC500 platform.
- With extended operating temperature, immunity to vibration and hazardous gases, use at high altitudes and in humid environments.



**AC500-S**

- Integrated safety PLC (SIL3, PL e) designed for safety applications involved in factory, machinery or process automation area.
- For simple and complex safety solutions.



**S500**

- Modular I/O assortment with protected outputs and comprehensive diagnosis, covering a wide range of signal types.
- The I/O modules can be installed as remote I/O with a communication interface module or be directly connected to the AC500 CPU.
- Support of different fieldbuses makes it possible to use the S500 I/O modules with PLCs from different manufacturers.



**S500-XC**

- Extreme condition variant of the S500 I/O system.
- With extended operating temperature, immunity to vibration and hazardous gases, use at high altitudes and in humid environments.

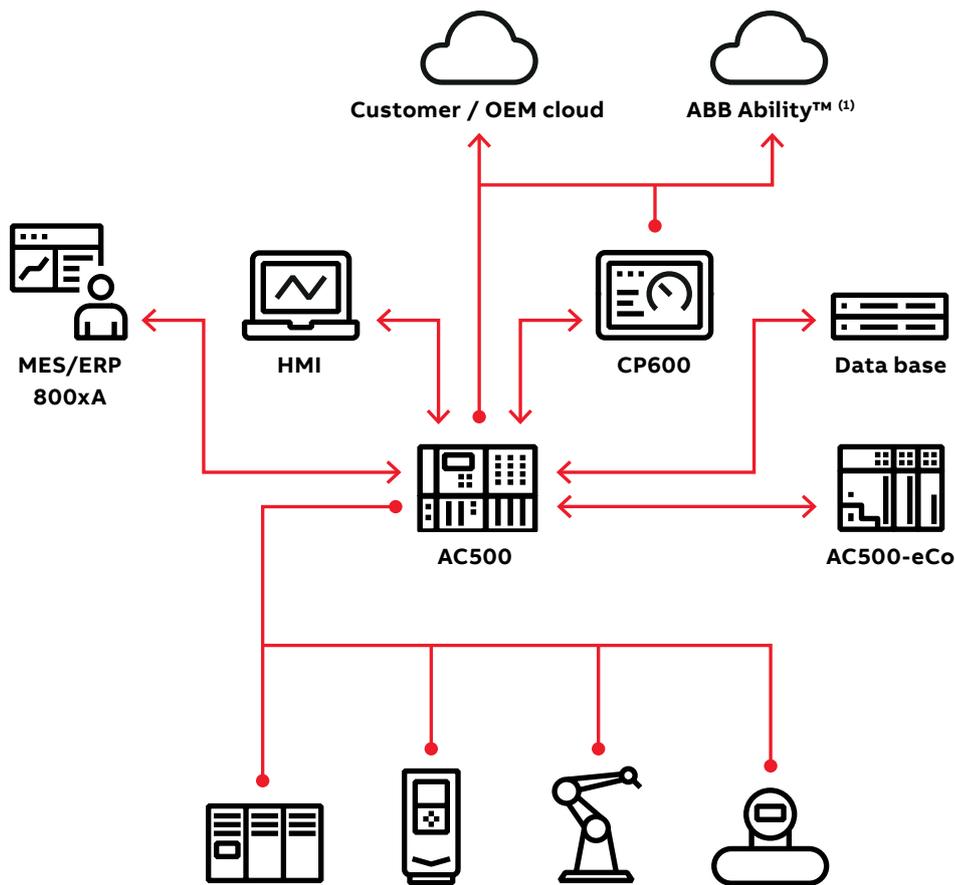


**S500-S**

- Safety variant of the S500 I/O system.
- Extreme condition variants available.

# PLC Automation product family

## Connectivity



(1) In preparation

### IT network / internet

- MQTT
- OPC UA
- HTTP(S)
- FTP(S)
- SNTP

### Factory/site network

- OPC DA/AE
- OPC UA
- UDP
- TCP/IP
- KNX
- BACnet
- MySQL / MSSQL
- HTTP(S)
- FTP(S)
- SNTP
- SNMP

### Control network

- PROFINET
- EtherCAT
- Modbus TCP
- Modbus RTU
- Profibus DP
- IEC 60870-5-104
- IEC 61850
- CANopen

Protocol	Application example
OPC UA	SCADA and cloud connectivity: Give access to selected AC500 variables and objects
MQTT	Certificated based publishing of data to private clouds for dashboards or data analytics
HTTP(S)	Publish HTML5 websites for monitoring and control
HTTP Request	Request information like temperature, humidity etc. from devices with web server functionality
Connector to SQL Database	Save to or get data from MSSQL or MySQL databases
SNMP Agent	Send traps (up to 4096 process alarms per PLC) to a SNMP management tool
SNMP Manager	Act as a SNMP Manager with Set and Get commands
BACnet	Give access to selected AC500 variables and objects
UDP and TCP/IP	Implement specific and efficient own communications
FTP(S)	Server and client for secure and efficient exchange of big data



# PLC Automation product family

## Network architecture

### Communication with AC500 – the perfect solution

Flexibility, real-time capability and maximum data transfer speed are just some of the communication demands automation systems must meet. With AC500, ABB has developed a communication platform offering customer-oriented solutions for the most diverse communication tasks. Simple network configuration and diagnostics options using Automation Builder enable ease of planning, implementation and commissioning thus saving engineering time and project costs. Among others, ABB's AC500 supports the following communication protocols:

#### PROFIBUS DP

PROFIBUS DP provides flexible configuration by means of a mono- and multi-master system structure and data transfer rates of up to 12 Mbit/s with twisted pair cables and/or optical

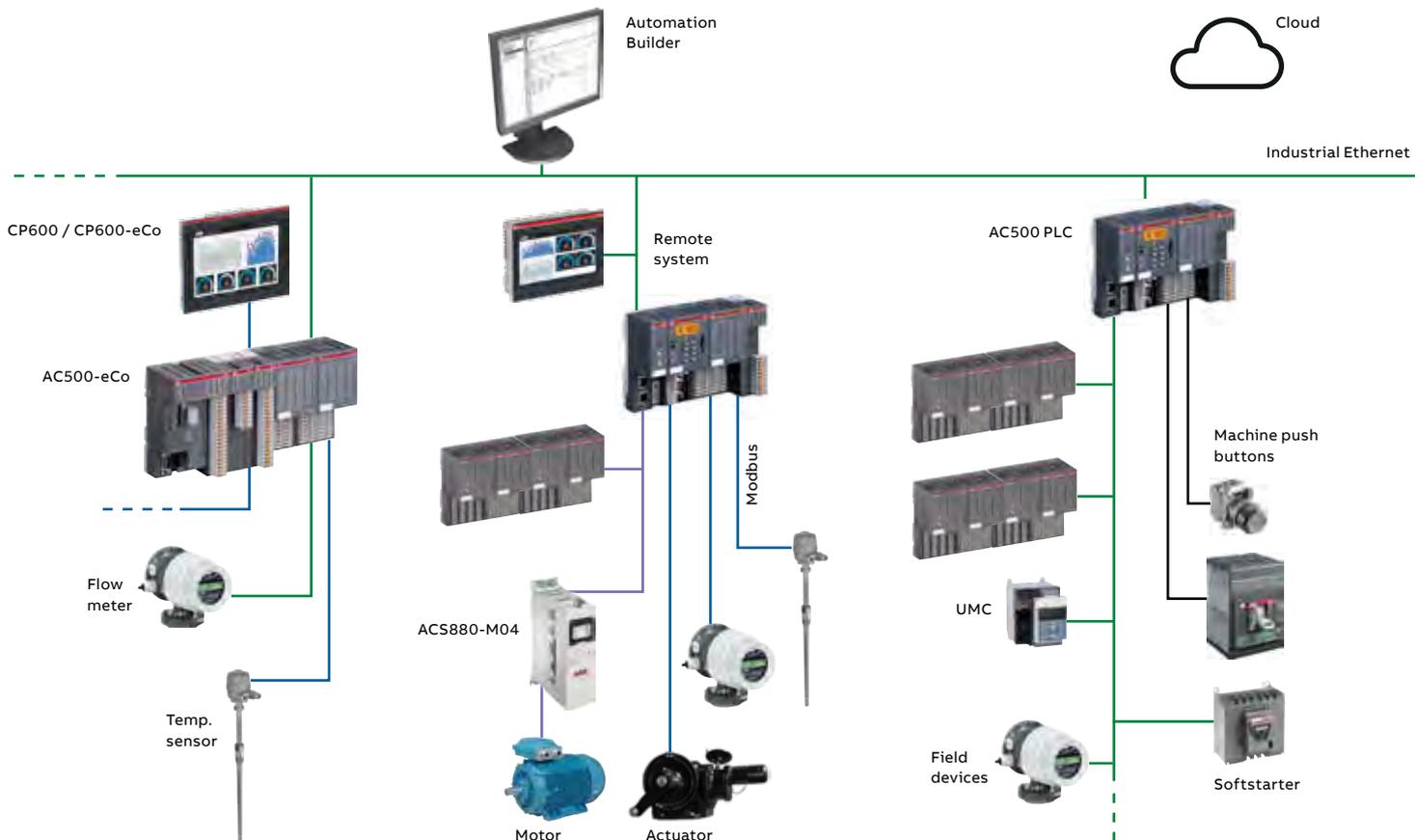
fibers. PROFIBUS DP allows for the connection of up to 126 devices (master/slave) to one bus segment thus enabling simple and reliable communication solutions.

#### PROFINET

PROFINET I/O meets the stringent requirements for real time Ethernet protocols in the world of automation. Very fast data transfer, integrated and standardized network structures from controller to field and flexible network management support users in the implementation of their automation solutions.

#### CANopen

With up to 127 connected devices and transmission speeds of 10 kbit/s up to 1 Mbit/s depending on bus length, CANopen offers high-speed data transfer and high immunity in master/slave network topologies.



**CS31-Bus and RCOM**

CS31-Bus is a high-performance, proprietary ABB communication standard featuring data transfer speeds of up to 187.5 kbit/s and enabling up to 31 network nodes to communicate via RS485, simple telephone cable or optical fiber. RCOM is a proprietary ABB bus protocol for master/slave communication via RS232/485. Expandable to 254 RCOM slaves.

**Modbus TCP & RTU**

Modbus RTU is an open serial data protocol for master/slave networks of up to 31 network nodes. Different bus lengths depending on the type of serial communication interface enable data transfer speeds of up to 115.2 Kbit/s. Modbus TCP is a common Ethernet-based network protocol.

**Ethernet and Internet**

Integrated communication, high data transfer rates and the use of existing data networks enable simple, customer-specific solutions. Supported protocols are:

- HTTP / HTTPs for web server. Visualization for remote operation and maintenance
- FTP / FTPs for data file transfer
- Simple Network Time Protocol (SNTP) offering PLC time synchronization using Internet-hosted time services
- SMTP for e-mails with attachments

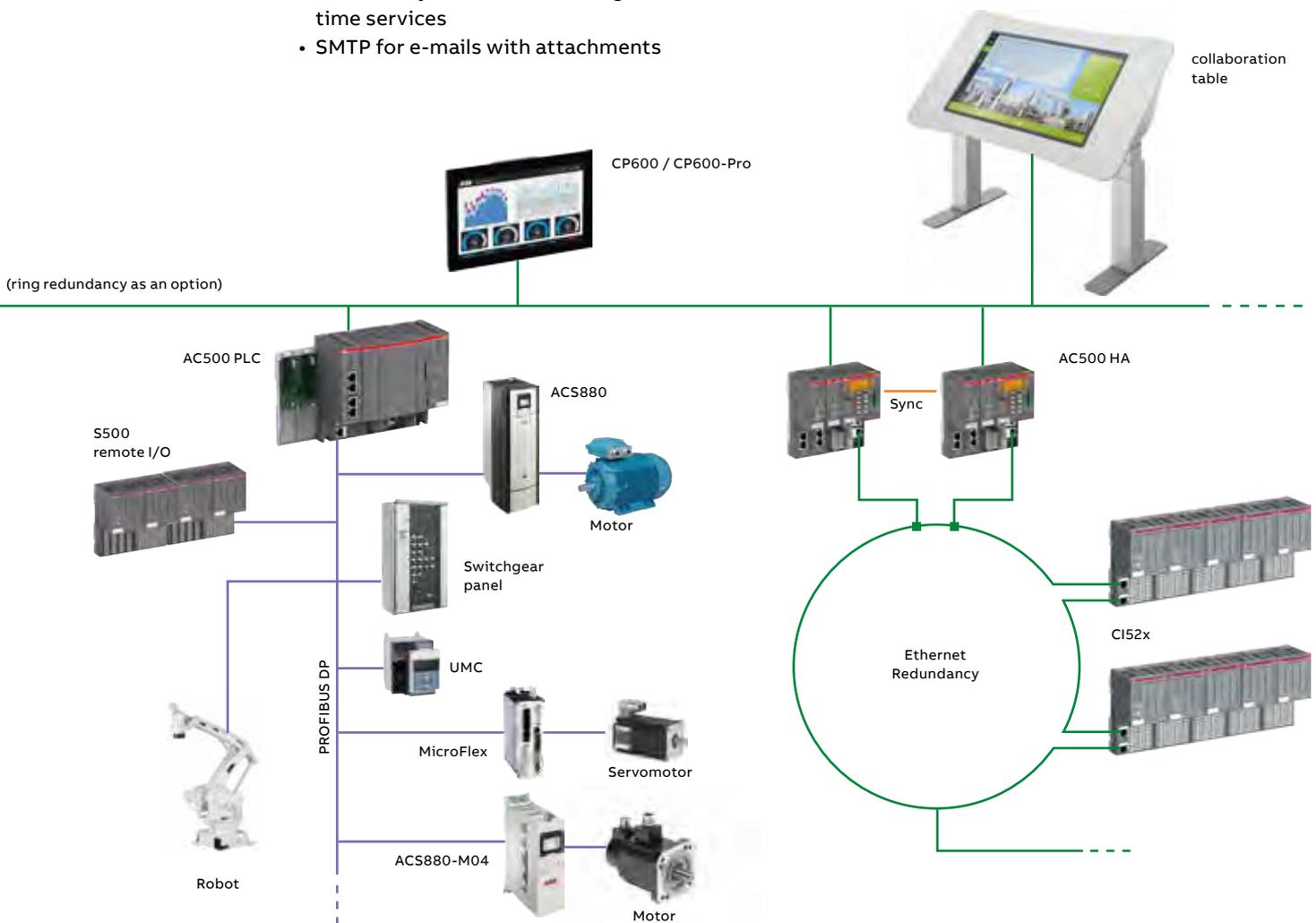
- TCP and UDP ports programmable for project-specific protocols. Library functions available.
- IEC60870-5-104 telecontrol, mainly used for pipelines, water and waste-water. Suitable for protocol configuration with the Automation Builder software suite.
- DHCP for automatic IP address allocation
- PING for checking the connection with other automation devices

**EtherCAT**

EtherCAT is an open Industrial Ethernet standard certified according to international standards IEC 61158, IEC 61784 and ISO 15745-4. Thanks to extremely high data transfer speeds, EtherCAT can serve as real time Ethernet protocol for time critical motion control applications. Whether for "cam switch" functionalities or diverse master/slave network configurations, AC500 delivers the perfect solution for your application.

**BACnet**

An object oriented open Infrastructure and Building Automation protocol supported by a Server Library (B-ASC) for OEM and project use cases.



(ring redundancy as an option)

# PLC Automation product family

## Automation Builder

Engineering productivity for machine builders and system integrators.



### Product license options

	Automation Builder Basic	Automation Builder Standard	Automation Builder Premium
Free	●		
AC500-eCo	●	●	●
AC500 with local I/O & network (1)	●	●	●
AC500 with fieldbus (2)		●	●
AC500-S Safety		○	○
Drive Manager		●	●
Drive application programming (3)	●	●	●
Motion programming	● (4)	●	●
Panel Builder 600	○	●	●
Panel Builder 600 Basic	●	●	●
Integrated engineering (5)		●	●
Productivity features (6)			●
Additional features (7)		○	○

- fully
- partly

(1) TCP protocols, Modbus, IEC60870-5-104, CS31

(2) PROFIBUS, PROFINET, EtherCAT, CAN

(3) Drive application programming for drives with embedded PLC (only available with Automation Builder 2.1 and before). Drive Composer pro license included in Standard and Premium Edition.

(4) No Fieldbus connectivity in Automation Builder Basic

(5) PLC, Safety, Panel, Drive, Motion, SCADA

(6) C/C++, ECAD data exchange, CSV interface extensions, project compare

(7) Virtual Commissioning Platform for virtual system testing, Professional Developer Tools for multi-user engineering



**Discover engineering productivity when designing your automation solutions**

Automation Builder is ABB's integrated programming, simulation, commissioning and maintenance environment for PLCs, safety, drives, motion, control panels and SCADA. Automation Builder combines the proven ABB tools Drive Manager, Drive composer pro, Mint WorkBench, Panel Builder and ABB zenon.

**Always get the right scope of Automation Builder for your automation solutions**

One single software installer helps you to create and maintain your personal Automation Builder configuration - either on your PC or on a server. Any changes or updates are just a matter of a few mouse clicks. The Automation Builder licensing system is designed for supporting most operation scenarios. Licenses can be installed on PCs, USB dongles or license servers. In case of changes in the organization or in the engineering workflows the licenses can easily be transferred to where you need them.

**Next level engineering efficiency**

Improve your engineering efficiency by maximizing data re-use. Data that is available from third party tools can be imported or synchronized, either via dedicated interfaces or generic Excel sheets. Configurations that have been created for the PLC can automatically be re-used e.g. for the configuration of drives or operator panels.

Engineering efforts can be reduced further by using easy-to-use libraries e.g. for wind, water, solar, drives, motion, robotics, safety and building automation applications. And in case building blocks are missing for your automation solution simply create them yourself. Project scripting allows you to automate the creation of any party of your configuration or application.

# PLC Automation product family

## Automation Builder

### **Minimized efforts for project code and data administration**

Configure and program all devices of your automation solution in one single project. This makes it easy to share your solutions with others. For more advanced usage the integrated version control system supports further scenarios like multi-user engineering or product line management.

Managing the life-cycle of your automation solutions is also easy. The annual Automation Builder release also supplies you with the latest versions of device firmware. The decision, whether to use the latest firmware with the latest feature set or to keep the current firmware with the current feature set can be made for each project and independent of the installed Automation Builder version.

### **Speeding up during commissioning and maintenance**

Whenever there is an issue in the automation system, it is required to quickly and efficiently fix it. Automation Builder supports this by a generic three-step approach:

- General diagnosis provides a traffic light view on devices and (sub)systems.
- Detailed diagnosis provides detailed information e.g. about the source and the type of the issue.
- Extended diagnosis is available for some sub-systems such as fieldbuses and offers advanced commissioning functions such as comparing connected vs. configured devices or manual control of bus states.

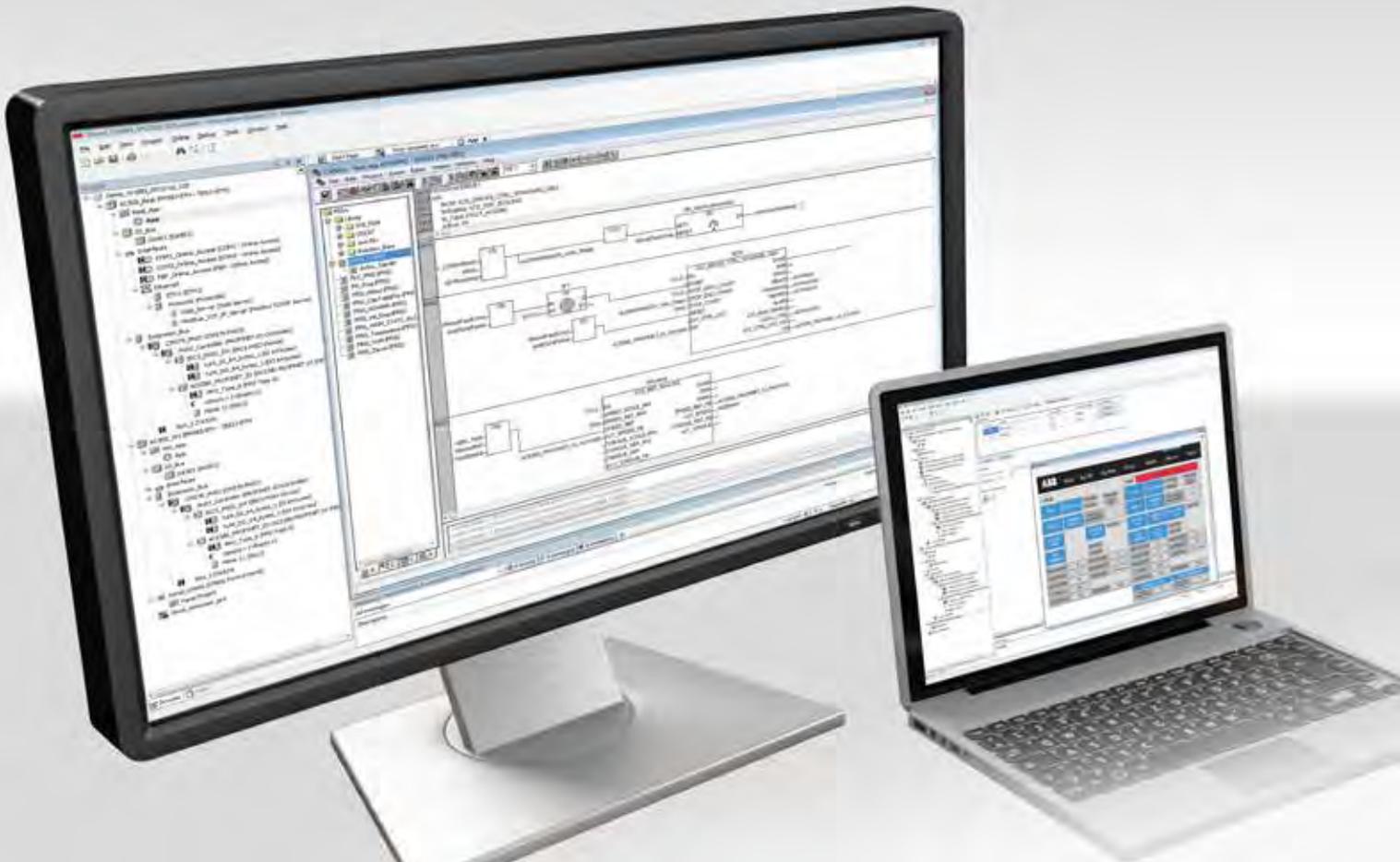
The diagnosis information is accessible not only via Automation Builder, but also via the AC500 display, the PLC application or operator panels.

### **Easily create a connected world**

To achieve advanced connectivity, the ABB zenon software has been added to Automation Builder. The advantage of the ABB zenon software is that it provides high quality documentation for easy traceability and high transparency of automation system states as required in machine building or in infrastructure projects. It incorporates an energy data management system and comprehensive security features to unlock the potential of the Internet of Things.

### **Virtual commissioning – a game changer in engineering**

Simulate and automate all kinds of applications with minimum effort. Test the complete system seamlessly before involving real hardware. Even complex systems can be built up efficiently, ensuring smooth interaction of all components and operator training at an early stage.



**Download Automation Builder from**  
[www.abb.com/automationbuilder](http://www.abb.com/automationbuilder)  
Familiarize yourself with Automation Builder  
using the 30-day test license.

# PLC Automation product family

## AC500 libraries and software

A good investment for system integrators and end-users, AC500 libraries and software improve stability while reducing warranty costs and service. Library and software packages contain functions or protocols and easy-to-use examples for minimal programming effort and quick implementation of complex and demanding applications.





AC500 libraries and software deliver the seamless integration of PLCs, drives and HMI required to build and commission automation solutions quickly and easily. AC500 libraries and software by ABB are maintained to ensure that your programs can also be used with less risk.

#### **Solar library**

Library package for solar trackers increasing energy efficiency, providing quick commissioning and excellent positioning accuracy.

#### **Water library**

Library package with energy efficiency functionalities offering quick commissioning of water applications, such as pump stations with remote communication.

#### **Temperature control library**

Library package for the advanced PID temperature control of demanding applications, for example extrusion.

#### **HA-CS31 library**

Library package adds high availability system functionality for redundant hot standby over serial CS-31 bus.

#### **Drive integration library**

Library package for the quick integration of ABB ACS drives using different fieldbusses.

#### **Motion control library**

Library package for decentral, central and coordinated motion according to the PLCopen standard.

#### **BACnet library**

Library package adds BACnet-ASC Device Profile for communication to BMS Building Management Systems in larger infrastructure projects.

#### **HA-Modbus TCP library**

Library package adds High Availability System functionality for redundant hot standby over Ethernet field network via Modbus TCP.

#### **KNX protocol**

Engineering and protocol package which seamlessly integrates ETS and Automation Builder.

#### **61850 protocol**

Adds engineering tool and library for 61850 Ed.1 MMS Server and GOOSE publish and subscribe functionalities.

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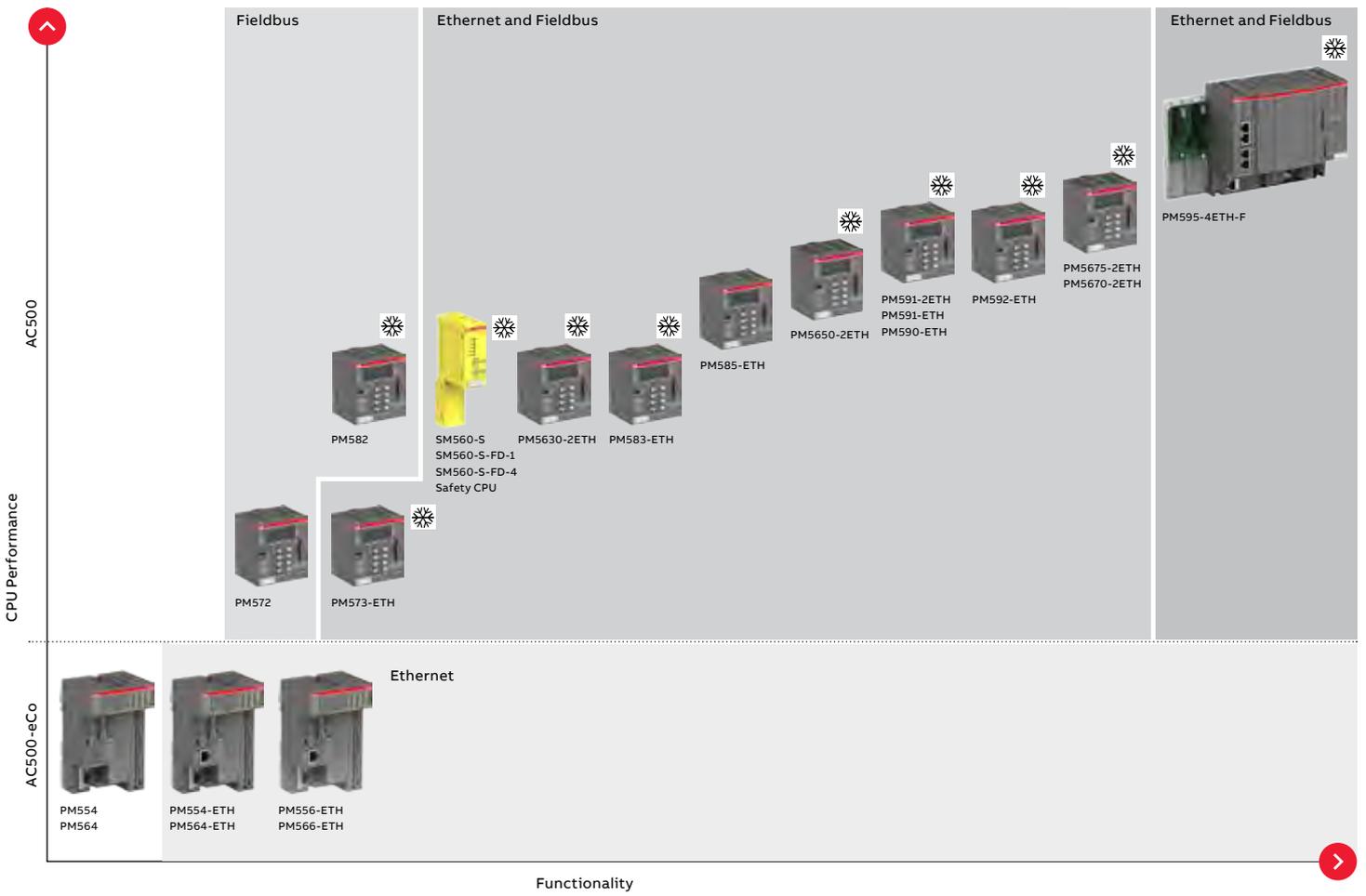
## PLCs at a glance...

AC500 Programmable Logic Controllers with scalable, state-of-the-art technology for better performance.

Standard industrial communication fieldbus, network and protocols supported by the 'One Platform' solution make the AC500 the perfect automation solution in even the most demanding

environments. Flexible and scalable superior CPUs deliver performance whenever and wherever you need it.





# PLC Automation product family

## PLCs at a glance...

	AC500-eCo	AC500	AC500 V3	AC500-S (2)
<b>System configuration and application programming</b>				
Automation Builder (common programming tool)	●	●	●	●
Application Features				
Extended temperature range				
Functional safety		●	● (5)	●
Support of simple motion with FM562 module (1)	●	●	● (3)(5)	●
Support of coordinated motion (1)		●	● (3)(5)	●
Support of High Availability (HA)		●	●	
Hot Swap of attached I/Os mounted on Hot Swap terminal unit		● (9)	●	
<b>CPU features</b>				
	<b>AC500-eCo</b>	<b>AC500</b>	<b>AC500 V3</b>	<b>AC500-S (2)</b>
Performance (time per binary instruction)	0.08 μs	0.0006...0.06 μs	0.001...0.02 μs	0.05 μs
Program memory	128...512 kB	128 kB...16 MB	8...160 MB (8)	1...1.3 MB
User data memory	14...130 kB	128 kB...16 MB	8...160 MB (8)	1024 kB
Remanent data (= saved)	2 kB	12 kB...3 MB	256 kB ... 1.5 MB	120 kB
Serial communication				
RS232		●	●	●
RS485	●	●	●	●
Isolated interface	Option TA569-RS-ISO	●	●	●
CAN communication interface on CPU				
CANopen Master, J1939 and CAN 2A/2B protocols			●	
Ethernet features on CPU with integrated Ethernet or external communication module				
Online access (Programming)	● only onboard	●	● only onboard	●
ICMP (Ping), DHCP, IP configuration protocol	● only onboard	●	● only onboard	●
UDP data exchange, Modbus TCP	● only onboard	●	● only onboard	●
Ethernet features on CPU with integrated Ethernet only				
HTTP / HTTPS (integrated web server)	● / -	● / -	● / ●	● / -
HTML 5			●	
SNTP (Time synchronization)	●	●	●	●
FTP / FTPS server	● / -	● / -	● / ●	● / -
FTP client	● (7)	● (7)		● (7)
SMTP client (Simple Mail Transfer Protocol)	○	●	● (5)	●
IEC 60870-5-104 remote control protocol		●	●	●
KNX protocol			● (4)	
IEC61850 MMS Server, Goose			● (4)	
Network variables on UDP			●	
Socket programming		●	●	●
OPC DA (AC500 V2 and V3)	●	●	●	●
OPC UA server (AC500 V3 only)			●	
BACnet (B-ASC profile)	○ (4)	● (4)	● (4)	● (4)
Selectable protocol				
EtherCAT Master		● (6)	● (4)(5)	
PROFINET IO Controller		● (6)	● (4)(5)	
EthernetIP Adapter			● (4)(5)	
IEC 61850 protocol (MMS Server, GOOSE)			● (4)	
Capability to connect Fieldbus Modules		●	●	●
I/Os integrated on CPU	●			
<b>I/O modules features</b>				
	<b>S500-eCo</b>	<b>S500</b>	<b>S500</b>	<b>S500-S (2)</b>
Analog modules				
Configurable		●	●	
Dedicated	●			●
Digital modules				
Configurable	○	●	●	
Dedicated	●	●	●	●
Transistor outputs short circuit protected		●	●	●
Output diagnosis		●	●	●
Hot Swap of I/O modules (10)		●	●	
Extension with S500-eCo and S500(-XC) I/O modules	●	●	●	● (2)

AC500-XC	AC500-XC V3	AC500-S-XC (2)
●	●	●
●	●	●
●	● (5)	●
●	● (3)(5)	●
●	● (3)(5)	●
●	●	
● (9)	●	
AC500-XC	AC500-XC V3	AC500-S-XC (2)
0.0006...0.06 μs	0.001...0.02 μs	0.05 μs
128 kB...16 MB	8...160 MB (8)	1...1.3 MB
128 kB...16 MB	8...160 MB (8)	1024 kB
12 kB...3 MB	256 kB...1.5 MB	120 kB
●	●	●
●	●	●
●	●	●
	●	
●	● only onboard	●
●	● only onboard	●
●	● only onboard	●
● / -	● / ●	● / -
●	●	●
● / -	● / ●	● / -
● (7)		● (7)
● (5) for V3	● (5) for V3	●
●	●	●
	● (4)	
	●	
●	●	●
●	●	●
	●	
● (4)	● (4)	● (4)
● (6)	● (4)(5)	
● (6)	● (4)(5)	
	● (4)(5)	
	● (4)	
●	●	●
S500-XC	S500-XC	S500-S-XC (2)
●	●	●
●	●	●
●	●	●
●	●	●
●	●	●
●	●	●
●	●	● (2)

- fully
- partly
- (1) Requires Library PS552-MC-E
- (2) AC500-S and AC500-S-XC require AC500 or AC500-XC modules to operate. The latter support all communication interfaces.
- (3) Requires new V3 Library
- (4) Licensed features
- (5) In preparation
- (6) PM595 and/or CPU V3 only
- (7) Application library download from "application examples"
- (8) Memory size is complete size for program and data with AC500 V3 CPU
- (9) As of PM585-ETH
- (10) Mounted on Hot Swap terminal unit when attached to AC500 CPU V2 as of PM585-ETH or AC500 CPU V3 or communication interface modules for Modbus TCP, PROFINET (CI501-PNIO, CI502-PNIO) or PROFIBUS.

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## CPU Selector

	AC500-eCo		AC500	
	PM5x4	PM5x6	PM57x	PM5630 V3
<b>What does your project need?</b>				
<b>Basic</b>				
Compactness and onboard I/Os ?	●	●	○	○
230 V AC power supply onboard ?	●	●	○	○
Standard operational temperature ?	●	●	●	●
Extreme environmental conditions (e.g. high temperature, humidity or vibrations) ?	-	-	●(XC)	●(XC)
Functional Safety up to SIL3 ?	○	○	●	○ / ●(1)
<b>Application feature</b>				
Simple motion with PTO ?	●	●	●	●
High-speed motion or interpolated motion ?	-	-	-	-
Data logging ?	-	-	-	○
Condition monitoring CMS ?	-	-	-	-
High availability with CS31 protocol ?	-	-	○	-
High availability with Ethernet Modbus TCP protocol ?	-	-	○	●
HTML5 web server ?	-	-	-	●
Telecontrol with IEC 60870-5-104 ?	-	-	○	●
<b>Application performance</b>				
More than 1 Cyclic and 1 Interrupt IEC61131 Task ?	○	○	●	●
4 or more IEC61131 Tasks ?	-	-	-	○
More than 2 kB retain variables ?	-	-	●	●
User program / User memory ?	128KB/14KB	512KB/130KB	512KB/512KB	8MB (2)
Large flash disc for data collecting ?	-	-	-	○
Web server data ≤ 1MB ?	●	●	●	○
Web server data ≥ 4MB ?	-	-	-	see above (2)
Floating point arithmetic calculation ?	-	-	-	●
Number of Ethernet Sockets for parallel connection ?	≤ 13	≤ 13	≤ 13	Unlimited (3)
Number of Modbus TCP Sockets (part of Ethernet Sockets) ?	≤ 12	≤ 12	≤ 12	30
CPU performance (ns per bit instruction) ?	80ns	80ns	60ns	20ns
<b>Communication/Fieldbus</b>				
Decentralized I/Os or communication on serial CS31 fieldbus ?	●	●	●	-
Decentralized I/Os or communication on serial Modbus RTU fieldbus ?	●	●	●	●
Decentralized I/Os or communication on PROFIBUS DP master / slave fieldbus ?	-	-	● / ●	● / ●(1)
Decentralized I/Os or communication on CAN/CANopen master / slave fieldbus ?	-	-	● / ●	● / ●
Decentralized I/Os or communication on Modbus TCP network ?	●	●	●	●
Decentralized I/Os or communication on PROFINET IO controller / device network ?	-	-	● / ●	● / ●
Decentralized I/Os or communication on EtherCAT master network ?	-	-	●	●
Two or more onboard Ethernet interfaces ?	-	-	-	●
Onboard selectable protocols PROFINET IO / EtherCAT / EthernetIP ?	-	-	-	● / ● / ●(1)(4)
IEC61850 MMS / GOOSE protocol ?	-	-	-	○(4)
OPC UA server?	-	-	-	●

- Not possible

○ Possible but not optimal solution

● Possible with additional devices

● Possible and best selection

(1) In preparation

(2) Total memory for code, data and web server

(3) Number of ETH Socket total is basically not limited, but depends on: CPU load, priority of application tasks, kind of used protocols, amount of data transferred, network structure

(4) Feature(s) is (are) licensed

PM58x	PM585-ETH	PM5650 V3	PM59x-ETH	PM591-2ETH	PM5670 V3	PM592-ETH	PM5675 V3	PM595-4ETH
●	●	●	●	●	●	●	●	●
○	○	○	○	○	○	○	○	○
●	●	●	●	●	●	●	●	●
● (XC)	-	● (XC)	● (XC)	● (XC)	● (XC)	● (XC)	● (XC)	● (XC)
●	●	○ / ● (1)	●	●	○ / ● (1)	●	○ / ● (1)	●
●	●	●	●	●	●	●	●	●
-	●	-	●	●	-	●	-	●
○	○	●	●	●	●	●	●	●
-	-	-	-	-	-	●	-	-
●	●	-	●	●	-	●	-	●
○	●	●	●	●	●	●	●	●
-	-	●	-	-	●	-	●	-
○	○	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●
○	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●
1MB/1MB	1MB/2MB	80MB (2)	2-4MB/2-4MB	4MB/4MB	160MB (2)	4MB/4MB	160MB (2)	16MB/16MB
○	○	○	○	○	○	4GB	8GB	4GB
○	○	○	○	○	○	○	○	○
4MB	4MB	see above (2)	8MB	8MB	see above (2)	8MB	see above (2)	16MB
-	●	●	●	●	●	●	●	●
≤ 22	≤ 29	Unlimited (3)	≤ 29	≤ 61	Unlimited (3)	≤ 29	Unlimited (3)	≤ 61
≤ 12	≤ 12	50	≤ 12	≤ 28	120	≤ 12	120	≤ 28
50ns	4ns	10ns	2ns	2ns	2ns	2ns	2ns	0.6ns
●	●	-	●	●	-	●	-	●
●	●	●	●	●	●	●	●	●
● / ●	● / ●	● / ● (1)	● / ●	● / ●	● / ● (1)	● / ●	● / ● (1)	● / ●
● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●
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-	-	● (4)	-	-	● (4)	-	● (4)	-
-	-	●	-	-	●	-	●	-



AC500-eCo



AC500



AC500-XC



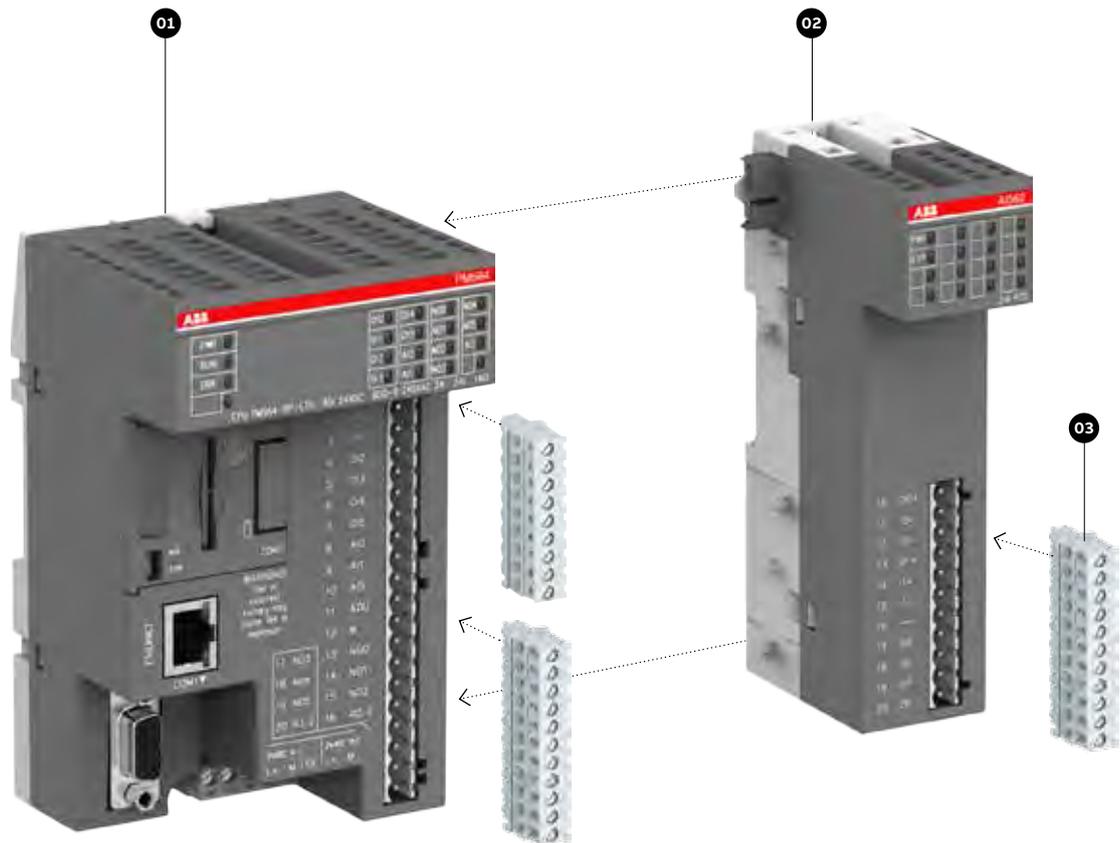
AC500-S



AC500-S-XC

# PLC Automation product family

## AC500-eCo – modular concept



### 01 – AC500-eCo central processing unit (CPU)

- Different memory options
- Integrated communication option.

### 02 – S500-eCo I/O modules

- Up to 10 expansions
- Decentralized extension available.

### 03 – Terminal blocks

- Three types of pluggable terminal blocks available.

# PLC Automation product family

## AC500 and AC500-XC – modular concept



### 01 – Terminal base

- Common for all AC500 CPU types
- For 1, 2 or 4 communication modules
- With serial interfaces
- With 1 or 2 Ethernet interfaces
- New specific terminal base only for AC500 V3 CPU with 2 Ethernet interfaces and CAN interface.

### 02 – Communication modules

- For PROFIBUS DP, Ethernet, Modbus TCP, EtherCAT, CANopen, PROFINET IO or serial programmable
- Up to 4 pluggable
- Up to 6 pluggable for AC500 V3 CPU in development.

### 03 – AC500 central processing unit (CPU)

- Different performance, memory, network, operating conditions options
- Integrated communication
- New AC500 V3 CPU with large memory and high performance (requires new specific terminal base).

### 04 – S500 I/O modules

- Up to 10 expansions
- Decentralized extension available.

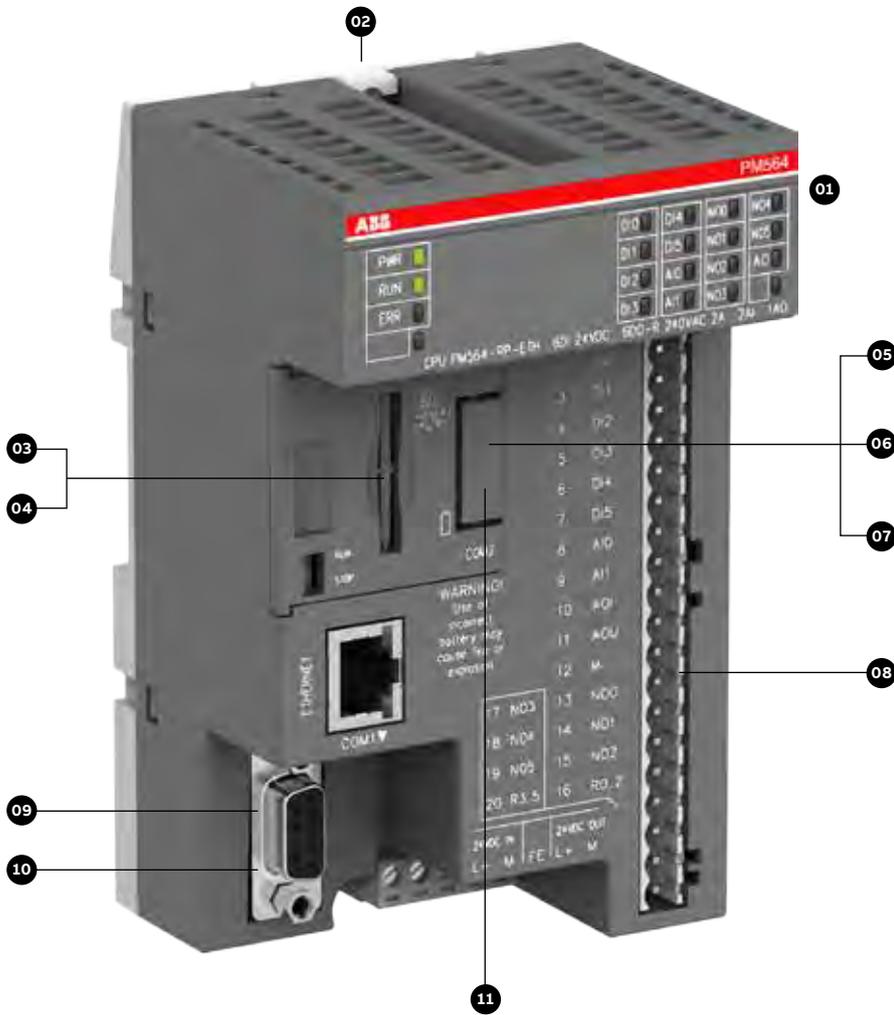
### 05 – Terminal units

- Up to 10 terminal units
- Decentralized extension available.

# PLC Automation product family

## AC500-eCo system characteristics

Locally, AC500-eCo CPUs are expandable with up to 10 I/O modules. AC500-eCo CPUs with different performance levels are available.



—  
01 AC500-eCo CPUs are locally expandable with up to 10 I/O modules (standard S500 and S500-eCo I/O modules can be mixed).

—  
02 Wall mounting

—  
03 SD-card adapter

—  
04 SD-card

—  
05 Adapter with realtime clock

—  
06 Adapter with COM2 & realtime clock

—  
07 Adapter with COM2

—  
08 Terminal blocks

—  
09 RS485 isolator for COM1

—  
10 COM1 USB

—  
11 COM2 USB programming cable

—  
12 AC500-eCo Starter kit. For more information, see page 226

—  
13 Input simulator



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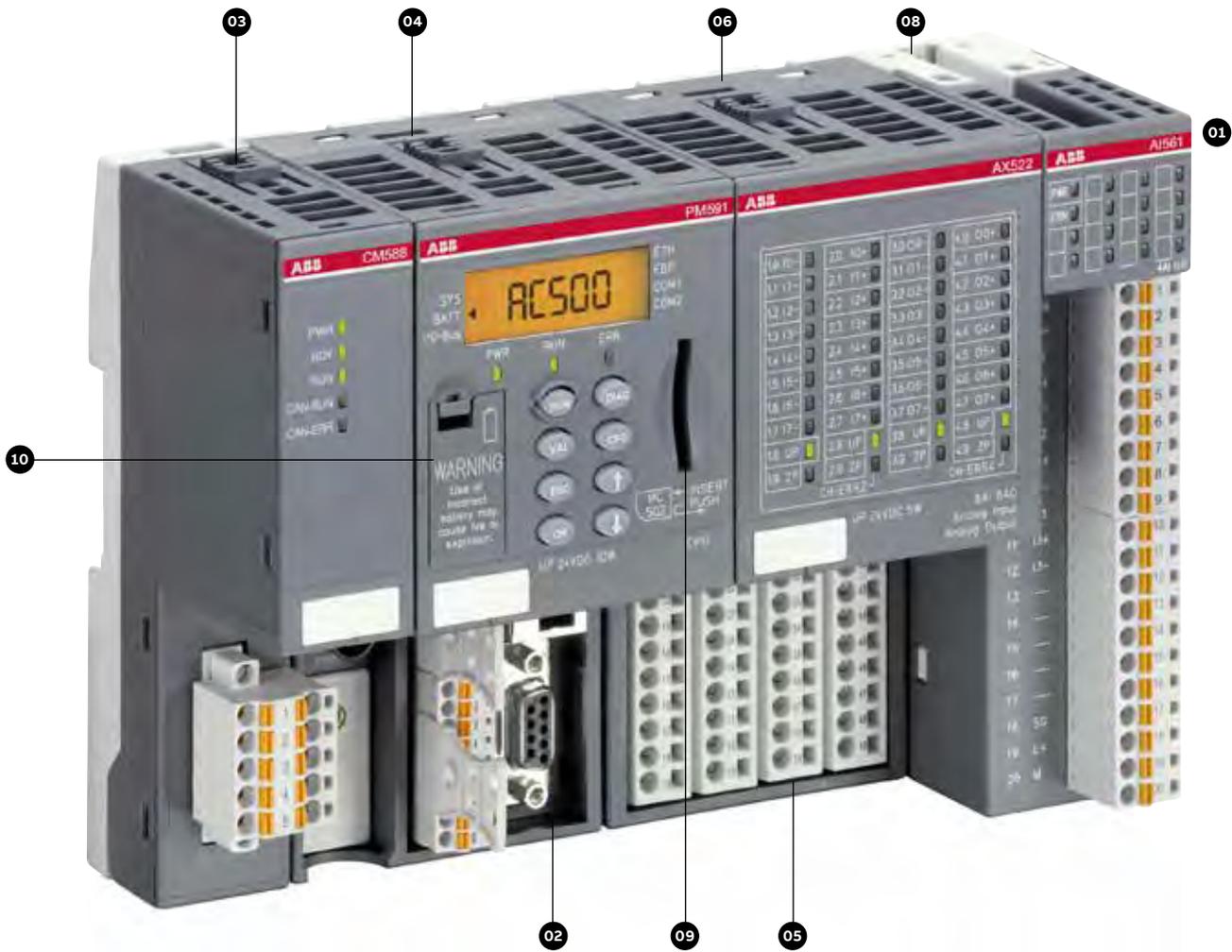


13

# PLC Automation product family

## AC500 system characteristics

AC500 offers superior local expansion capabilities for I/O communication, best-in-class CPU functionality and industry-leading performance.



—  
01 AC500 CPUs are locally expandable with up to 10 I/O modules (standard S500 and S500-eCo I/O modules can be mixed).

—  
02 Terminal base / Terminal base V3

—  
03 Communication module  
Up to 4 modules for multiple combinations to communicate on nearly every protocol available  
Up to 6 modules can be used with AC500 V3 CPU

—  
04 CPU module / CPU V3 module

—  
05 S500 Terminal unit

—  
06 S500 I/O module

—  
07 Pluggable marker holder for S500 I/O modules with template

—  
08 S500-eCo I/O module

—  
09 SD-card

—  
10 Battery



01



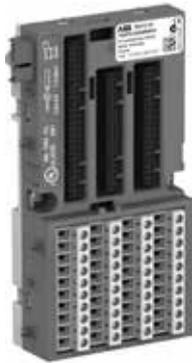
02



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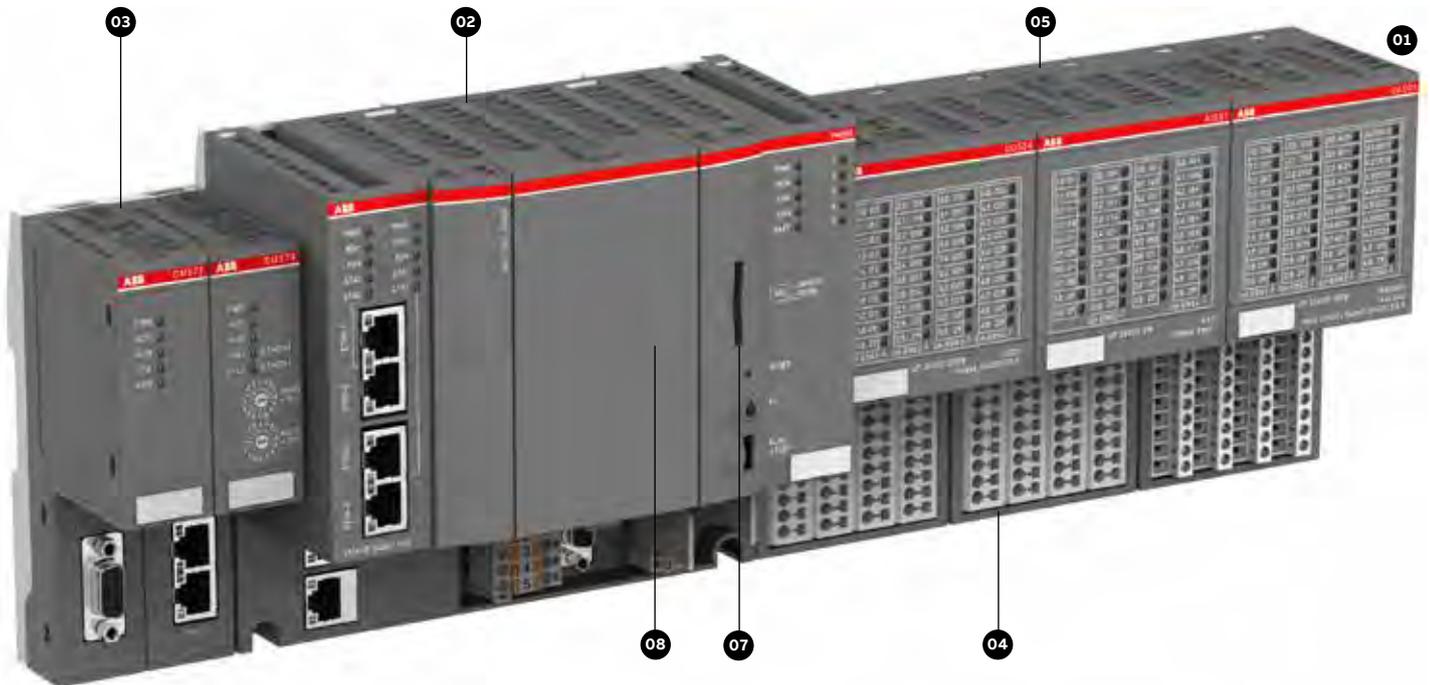
# PLC Automation product family

## AC500 PM595 Controller system characteristics

The flagship of the AC500 platform, the AC500 PM595 Controller, was designed to be as scalable, flexible and efficient as the entire AC500 range.

With the AC500 CPU PM595, ABB launched a new core for machine control applications. Its high-performance processor with generous memory offers performance, security and reliability for the upcoming challenges of automation applications.

A variety of connectivity capabilities, integrated safety and utilizability even under rough environment provide machine builders with valuable benefits when performing their automation tasks.



—  
01 AC500 CPUs are locally expandable with up to 10 I/O modules (standard S500 and S500-eCo I/O modules can be mixed).

—  
02 CPU with integrated connectivity and terminal base

—  
03 Communication module.  
Up to 2 modules for multiple combinations to communicate on nearly every protocol available and to include functional safety

—  
04 S500 Terminal unit

—  
05 S500 I/O module

—  
06 S500-eCo I/O module

—  
07 SD-card

—  
08 Battery

—  
09 Pluggable marker holder for S500 I/O modules with template



01



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04



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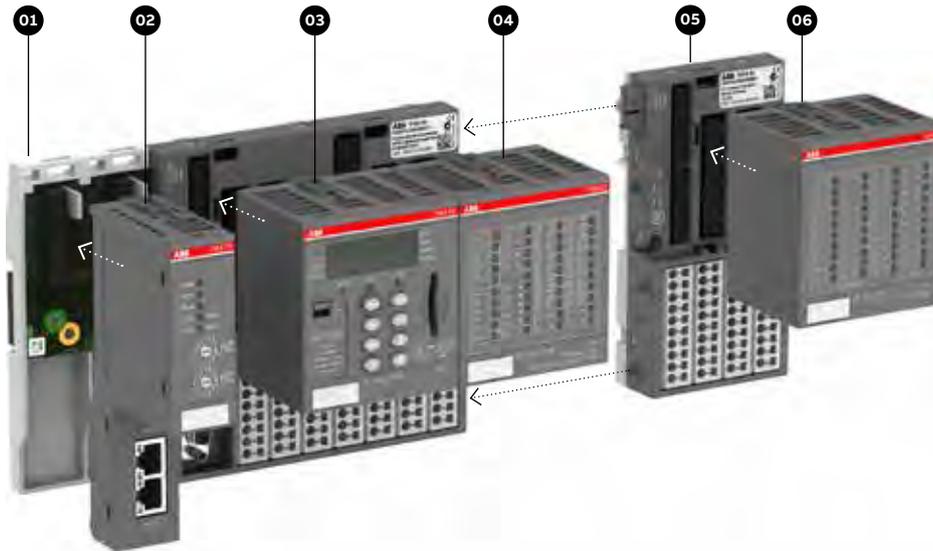
# PLC Automation product family

## Condition monitoring system CMS based on AC500

Predictable performance for your operations

Optimize your assets with a condition monitoring system (CMS) based on the proven AC500 platform. The new FM502 module can help you to improve your operations resulting in greater efficiency and higher reliability while minimizing service and operating costs.





- 01 Terminal base: TF501 or TF521
- 02 Accomodating: 0 - 2 communication modules
- 03 PM592 CPU
- 04 FM502 CMS module
- 05 Expandable by I/O terminal units
- 06 Expandable by further I/O modules

**Add predictable performance and productivity**

The new CMS module brings further reliability and easy integration with all kinds of machinery systems, enabling precise management of the real-time condition of your operation. This transparency takes your business and productivity to a new level with more efficient machines, predictable performance and significant reduction in maintenance costs.

No matter whether as stand-alone condition monitoring or integrated into machine or process control, the module is perfectly suited to build optimized, self-analyzing automation solutions that simultaneously perform condition monitoring, control, protection, safety and data logger functions with one controller. The fast data logger function also contributes to consistent high quality production, due to the possibility to combine control and production information directly.

CMS also protects against machine failures, unforeseen sudden damage, incorrect installation, and reduces maintenance and wear. Virtually no unscheduled downtimes boost plant availability and reliability.

**Advantages**

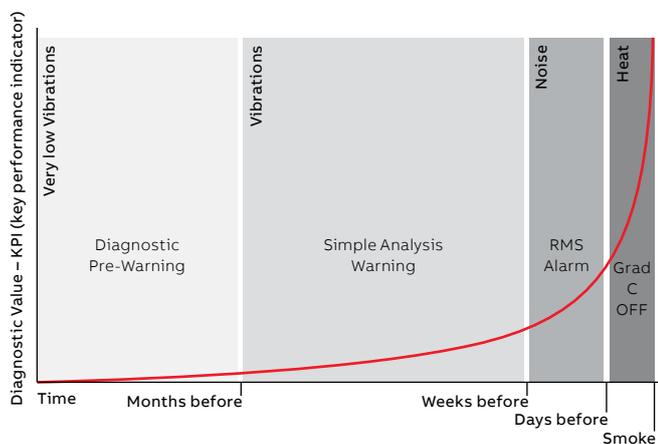
- Planned maintenance rather than spontaneous repair ensures predictable performance
- Approaching damage is identified very early
- Protection against spontaneous failures and operation in critical conditions
- Reduction of costs in maintenance and lost production time
- Plant availability is increased
- Optimum utilization of the aggregates until real end of life
- Simple to use, maintain, adapt or expand

**AC500 + CMS = increased machine efficiency**

All based on the AC500 platform modularity provides ultimate flexibility: Communication and I/O modules can be added and combined with Safety.

**Expandable, robust and proven**

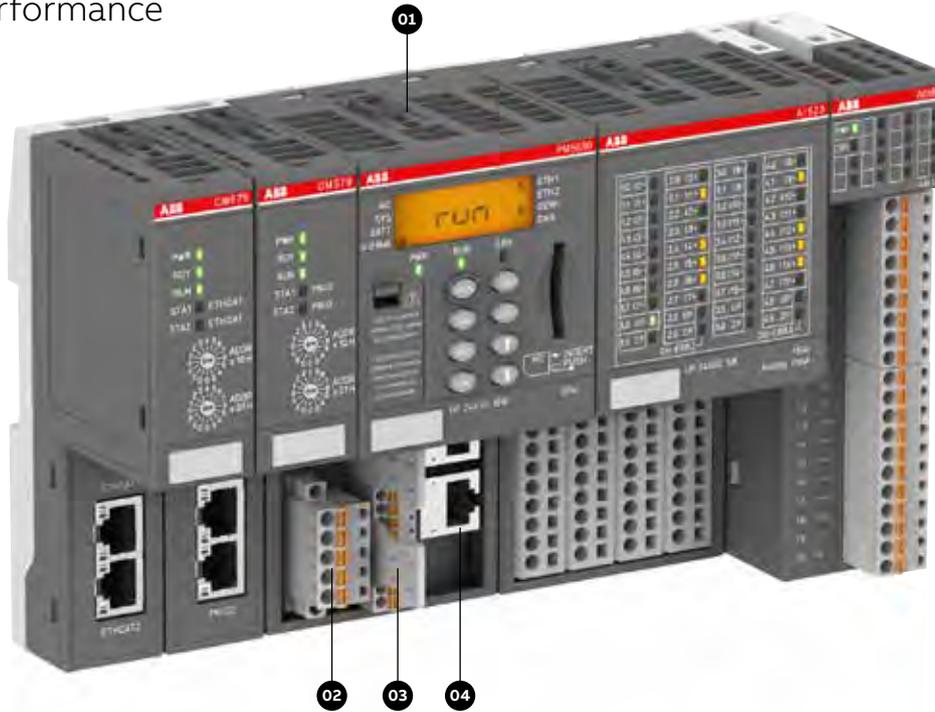
- Stand-alone CMS or control integrated
- Expandable by AC500 communication modules and S500 I/O modules
- Proven and future proof, as based on AC500 platform
- Extreme conditions XC version available
- Fast data logger, e. g. for production quality
- Condition monitoring and fast protection (vibration, current, voltage, speed/encoder)



# PLC Automation product family

## AC500 V3

AC500 V3 delivers new features and higher performance



- 01 PM5650-2ETH CPU module
- 02 One CAN serial interface
- 03 One COM1 serial interface
- 04 Two Ethernet interfaces on RJ45

New CPU range PM56xx with higher hardware performance and state-of-the-art features, such as OPC UA, WebVisu, Object oriented programming, selectable fieldbus protocols, and much more.

### Improved features and performance

The AC500 platform features a new more powerful CPU with larger memory for various automation solutions ranging from simple to complex motion control applications.

Configurable Ethernet fieldbus protocols, such as PROFINET IO (\*), EtherCAT (\*) or EthernetIP (\*) running on standard Ethernet interfaces, enable the CPU to be used for applications with embedded protocols. The integrated Ethernet switch simplifies the network architecture, making additional external switches obsolete, and thereby also saving cabinet space. Fewer hardware types facilitate spare-parts stocking thus increasing flexibility.

The CPU also provides an integrated CAN / CANopen interface offering an easy-to-use and

fast connection to remote I/Os or drives. Various CAN protocols, e.g. CANopen Master and Slave (\*), J1939 or CAN 2A/2B are available, and modular CAN is also supported.

### Improved application flexibility and facilitated customer engineering

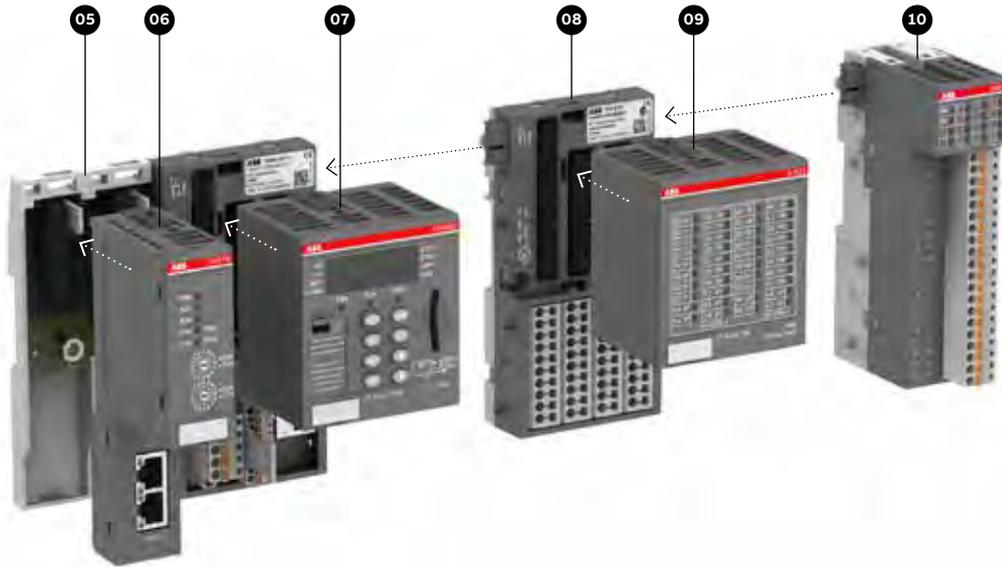
Fewer hardware products but more configurable and licensed features allow for customizing the product according to your specific application.

From 8 MB to up to 160 MB of memory and dynamic allocation to User Data, Program or Web Server, the new CPU meets almost every application requirement by adapting its configuration according to your needs.

### State-of-the-art features tailored to your needs

Improved communication features integrated in the CPUs lower hardware costs and reduce the number of versions. Compatibility (\*) with existing S500 / S500-eCo I/O modules, communication modules, communication interface modules and AC500-S safety modules of the existing AC500 PLC platform.

(\*) in preparation



- 05 Terminal base: TB5xxx-2ETH
- 06 Accommodating: 0, 1, 2, 4 or up to 6 communication modules
- 07 PM56xx-2ETH CPU module
- 08 Expandable by I/O terminal units
- 09 Expandable by further I/O modules from the S500 product range
- 10 or S500-eCo product range

### Connection to third-party systems in open architecture

The integrated EthernetIP protocol (\*) enables to connect existing applications or third-party systems. Standardized protocols or features such as OPC UA save time and costs and simplify the connection to SCADA.

### New Web Server based on HTML 5

Two embedded Ethernet Interfaces:

- Independent (2xMAC) or Switched
- A lot of onboard ETH features:
  - OPC UA Server (easier connection to SCADA, panels, third-party, IoTSP)
- Ethernet IP adapter (\*)
- Modbus TCP client/server
- IEC 60870 (with new features)
- Network variables (UDP)
- IEC 61850 protocol licensed

### Reduced cabinet space with more integrated features

Integrated interfaces and configurable protocols reduce the CPU size thus saving cabinet space.

### Reliability and security

Signed boot project, Firmware and secure download protect your application from unauthorized changes and HTTPs and FTPs strengthen your protection.

### Functional safety

Reusing AC500-S safety solutions (\*) provides state-of-the-art safety features and reduces engineering time.

### Protection of customer investment

Reusing AC500/S500 products protects your investments and allows easy upgrades / migration from current applications to the latest technology for the coming years.

The PM56xx CPU can be used only with the new terminal base range TB56xx but can reuse many existing AC500 platform products like I/O modules, communication modules, etc.

### Improved engineering, programming and debugging

Running on the new AC500 V3 CPU, several new features of the Automation Builder software make the AC500 platform more powerful and easier to use:

- Professional Version Control with subversion - application project management
- Object-oriented programming
- New optimized editors for IEC programming languages
- Virtual commissioning

For details, please refer to Automation Builder 2.0, section Highlights - productivity features page 59.

(\*) in preparation

# PLC Automation product family

## Extreme conditions

AC500-XC – the rugged variant of AC500 for extreme indoor and outdoor conditions.

The PLC AC500-XC is reliable, functionally safe and operational even under rough environmental conditions.





01



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**Operation in extremely humid environments**

- Increased resistance against 100 % humidity and condensation.



**Extended operating temperature**

- -40 °C up to +70 °C operating temperature.



**Reliable in high altitudes**

- Operation in altitudes up to 4000 m above sea level or air pressures up to 620 hPa.



**Extended immunity to corrosive gases and salt mist**

- G3, 3C2 / 3C3 immunity
- Salt mist EN 60068-2-52 / EN 60068-2-11.



**Extended immunity to vibration**

- 4 g rms random vibration up to 500 Hz
- 2 g sinusoidal vibration up to 500 Hz.



**Extended EMC requirements**

- EN 61000-4-5 surge immunity test
- EN 61000-4-4 transient / burst immunity test.

- 01 Terminal base
- 02 Extreme conditions communication module
- 03 Extreme conditions CPU
- 04 Extreme conditions CPU with integrated connectivity and terminal base
- 05 Extreme conditions S500 terminal unit
- 06 Extreme conditions S500 I/O module

# PLC Automation product family

## Functional Safety

AC500-S safety PLC is the solution for both simple and complex machine safety applications requiring maximum reliability, efficiency and flexibility.

This safety PLC protects people, machines and processes, the environment and investments - the ideal choice for wind turbine, crane, material handling, hoist, robot and other factory and process applications.





01



02



03

- 01 Safety CPU
- 02 S500 Safety I/O module
- 03 Safety terminal unit

**Better integration and ease of programming**

Featuring a consistent look and feel across the entire range, the AC500 is the PLC of choice for applications where uncompromised flexibility, comprehensive integration and seamless communication are a must. Automation Builder seamlessly integrates your safety application in ABB PLC, Safety, Drives, Motion and HMI. Through integrated standard languages, such as IEC 61131-3, Automation Builder is easy to use, thus, allowing you to get started in virtually no time at all. And what is more: intuitive system configuration using one single tool ensures optimal transparency.

The AC500-S safety PLC, ABB's latest addition to the AC500 family, facilitates the implementation of even most complex safety applications. Support of safety-relevant calculations, such as COS, SIN, TAN, ASIN, ACOS and LOG makes the AC500-S the ideal solution for crane engineering, wind power generation, robotics and hoisting applications. Safety programming with Structured Text (ST) and full support for Function Block Diagram (FBD) and Ladder Diagram (LD) programming and advanced features in PROFIsafe over PROFINET communication, like Shared Device functions, gives you greater flexibility and simplifies safety application development. The AC500-S safety PLC is also available in a version for extreme conditions.

# PLC Automation product family

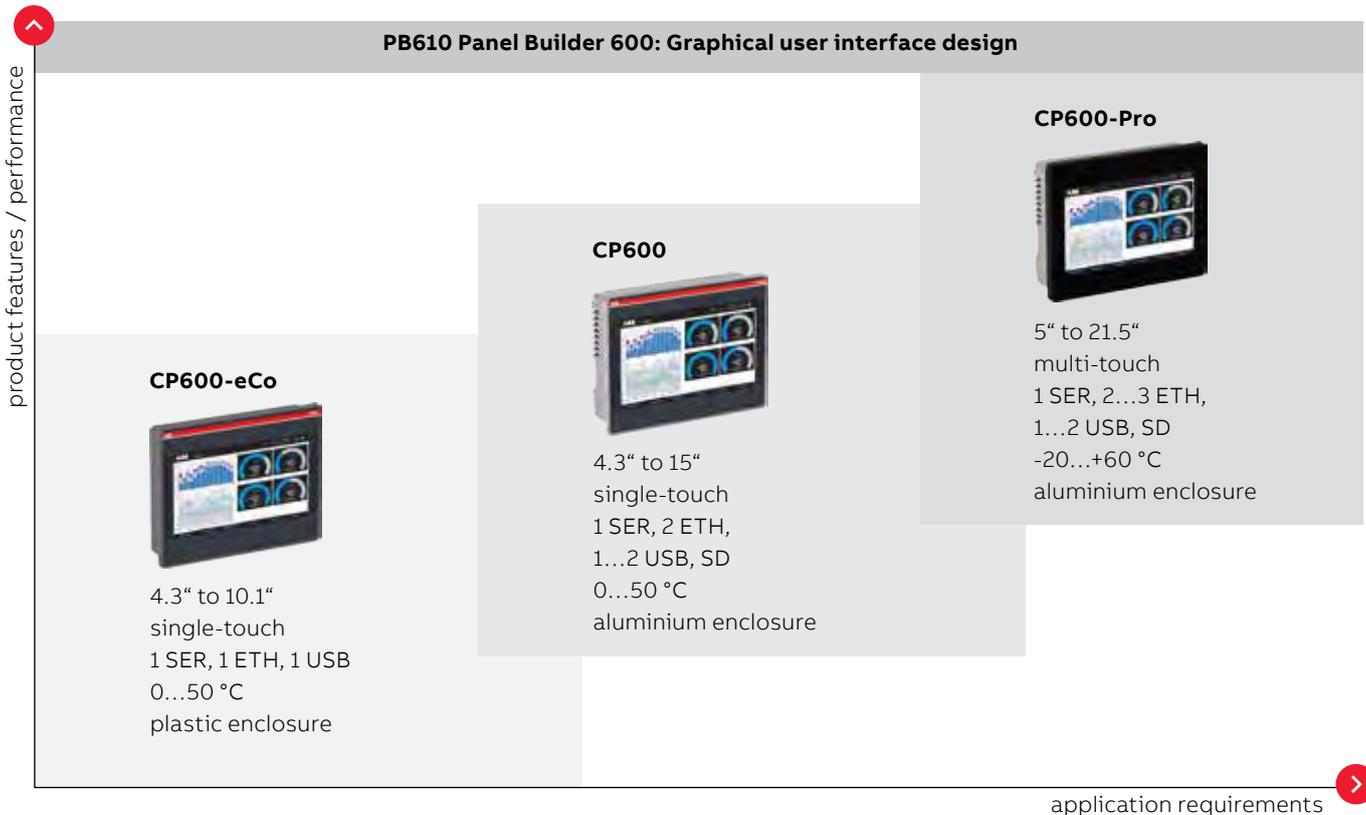
## CP600-eCo, CP600 and CP600-Pro control panels at a glance ...

ABB offers a wide range of scalable PLCs and robust HMI control panels.

With comprehensive but easy-to-use functionalities, ABB control panels stand out from competitor products. At one single touch, they intuitively provide operators with tailor-made operational

information for production plants and machines. CP600-eCo, CP600 and CP600-Pro control panels make machine operation efficient, predictable and user-friendly.

Comprehensive CP600 control panels platform for different applications





**CP600-eCo, CP600, CP600-Pro**

Wide range of control panel offerings in three assortments. Ideal choice for visualization of AC500 PLC platform automation solution.

The economical CP600-eCo control panel is aimed for standard functions and high usability for clear interaction with the operation process.

The robust CP600 HMI provides high visualization performance, versatile communication and representative design for machines and systems.

The CP600-Pro HMI comes with high end visualization performance, multi-touch operation, versatile trendsetting communication and representative design.

Due to the good scalability between CP600-eCo, CP600 and CP600-Pro, CP600-eCo HMI applications can be re-used easily for CP600 or CP600-Pro control panels and vice versa.

**PB610 Panel Builder 600**

PB610 Panel Builder 600 is the engineering tool for the entire CP600 control panels platform. PB610 Panel Builder 600 software is integrated in the Automation Builder engineering suite. For integration into a couple of third party automation systems, drivers are available. OPC UA client and server support future-orientated communication solutions.

**What does your application need ?**

	CP600-eCo	CP600	CP600-Pro
Screen sizes	sizes from 4" to 10" 4.3", 7", 10.1"	various sizes from 4" to 15" 4.3", 5.7", 7", 10.4", 12.1", 13.3", 15"	wide range from 5" to 21" 5", 7", 10.1", 15.6", 21.5"
Operation	single-touch	single-touch	multi-touch
Communication	1 SER, 1 ETH, 1 USB	1 SER, 2 ETH, 2 USB <sup>1)</sup> , 1 SD	1 SER, 3 ETH <sup>2)</sup> , 2 USB <sup>3)</sup> , 1 SD
Operating temperature	0...50 °C	0...50 °C	-20...+60 °C
Enclosure	plastic / glass + front foil	aluminium / glass + front foil	aluminium / real glass
Operating system	Linux	Win CE 6.0	Linux
PB610 application	60 MB	30...60 MB	240 MB <sup>4)</sup>

<sup>1)</sup> CP620: 1 USB, <sup>2)</sup> CP6605: 2 ETH, <sup>3)</sup> CP6605: 1 USB, <sup>4)</sup> CP6605: 60 MB

# PLC Automation product family

## CP600-eCo control panels



### Economic HMI range for basic applications

Control panels in three different screen sizes from 4.3" to 10.1" in ABB design or just black provide HMI functions typically required for basic applications. The engineering tool PB610 Panel Builder 600, part of Automation Builder, ensures easy scalability on the CP600 platform.

### Designed for basic applications

- The widescreens available in 4.3", 7" and 10.1" are suitable for many applications.
- Protocols for ABB PLCs, machinery and motion drives for Ethernet and serial connection make these control panels first choice for ABB automation solutions.
- OPC UA client and server functions make them well prepared for future communication solutions.
- Engineering by means of PB610 Panel Builder 600, part of ABB's Automation Builder, facilitates integration into automation packages and enables good scalability on the CP600 platform for different applications.

### Slim industrial design

The slim plastic enclosure in attractive industrial design with a mounting depth of 29 mm enables installation even in narrow spaces. All connectors are located on one side. Landscape and portrait mounting options provide installation flexibility and various HMI presentations. These devices are available either in ABB design or in black.

### State-of-the-art connectivity

- Ethernet interface 10/100 Mbit for easy connectivity to ABB automation components.
- Flexible serial connectivity to automation components without Ethernet interface.
- USB host for flexible data storage and easy updating.

# PLC Automation product family

## CP600 control panels



### Comprehensive HMI range for versatile applications

Various control panels in screen sizes from 4.3" to 15" provide comprehensive HMI functions for a wide range of applications. The range is completed by panels in sanitary design (page 42) as well as black variants. The engineering tool PB610 Panel Builder 600, part of Automation Builder, ensures easy scalability on the CP600 platform.

### Various designs for diverse applications

- Seven different screen sizes with standard aspect ratio or widescreen from 4.3" to 15" are suitable for the most diverse applications.
- Protocols for ABB PLCs, machinery and motion drives for Ethernet and serial connection make these control panels first choice for ABB automation solutions. The IRC5 protocol enables easy direct communication with ABB robot controllers.
- OPC UA client and server functions make them well prepared for future communication solutions.

- Engineering by means of PB610 Panel Builder 600, part of ABB's Automation Builder, facilitates integration into automation packages and enables good scalability on the CP600 platform for versatile applications.

### Solid aluminum design

The robust aluminum enclosure in attractive industrial design, providing all connectors on one side, enables installation in various environments. Landscape and portrait mounting options provide installation flexibility and various HMI presentations.

### Various options for flexible connectivity and data storage

- 2 Ethernet interfaces 10/100 Mbit with integrated switch for easy connectivity to ABB automation components.
- Flexible serial connectivity to automation components without Ethernet interface.
- USB hosts for the flexible connection of accessories or data storage and easy updating.
- SD card slot for easy data storage and updating.

# PLC Automation product family

## CP600 sanitary design control panels



### Control panels in sanitary design for demanding applications

Hygienic standards and cleaning procedures in food & beverage applications typically require a special design of the relevant automation components. Human machine interfaces (HMIs) for meat processing have to comply with really challenging requirements. As a consequence e.g. mixers and cutters for meat processing are usually still equipped with conventional lamps and switches instead of state-of-the-art HMIs.



The CP635-FB and CP635-FW control panels are especially designed for reliable operation in harsh environments such as mixers in meat processing. These panels withstand the demanding cleaning procedures in meat processing better than most of the similar products in the market: stainless steel frame, rounded edges and front protection class IP69K make them withstand harsh cleaning procedures with high-pressure hot water jets directed at the equipment in different angles according to the relevant hygienic standards.

The displays of the control panels CP635-FB and CP635-FW are brighter than standard units, because of real glass screens. This ensures clear information for operators/users even in bright environments. Capacitive touch screens enable quick and easy operation even with gloves.

# PLC Automation product family

## CP600-Pro control panels



### Outstanding HMI range designed for challenging applications

New control panels in screen sizes from 5" to 21.5" provide comprehensive HMI functions with multi-touch operation for a wide range of applications. Real glass fronts and an increased operating temperature range of -20...+60 °C make them first choice even for harsh environments. The engineering tool PB610 Panel Builder 600, part of Automation Builder, ensures easy scalability on the CP600 platform.

### New multi-touch control panels for high-end applications

- The portfolio includes five screen sizes from 5" to 21.5", all widescreen, with multi-touch real glass screens for demanding high-end applications.
- The wide range of operating temperatures of -20...+60 °C makes them suitable for versatile applications and first choice for demanding ones.
- Protocols for ABB PLCs, machinery and motion drives for Ethernet and serial connection make these control panels preferred option for ABB automation solutions.
- OPC UA client and server functions make them well prepared for future communication solutions.

- Engineering by means of PB610 Panel Builder 600, part of ABB's Automation Builder, facilitates integration into automation packages and enables good scalability on the CP600 platform for versatile applications.

### Real glass front and solid aluminum enclosure

CP600-Pro control panels have real glass fronts and robust aluminum enclosures in attractive industrial design, with all connectors located on one side, for installation in various even demanding environments. Landscape and portrait mounting options support installation flexibility for various HMI presentations.

### Flexible connectivity and data storage with a view to the future

- Up to 3 Ethernet networks with different physical layers for easy connectivity to ABB automation components for upcoming networking concepts.
- Flexible serial connectivity to automation components without Ethernet interface.
- USB hosts for connecting printers and accessories, data storage and updating.
- SD card slot for easy data storage and updating.

# PLC Automation product family

## Mobile / remote access to HMI

### Mobile / remote access to HMI

All control panels of the CP600 platform provide a web server for flexible access to HMI applications via mobile devices: PB610 Panel Builder 600 enables easy creation of HTML5 pages for mobile devices like smartphones, tablets etc. within standard HMI applications. Remote devices can log in to the HMI application without installation of an app.



# PLC Automation product family

## PB610 Panel Builder 600

### Engineering tool for easy design of tailor-made graphical user interfaces for the entire CP600 platform

PB610 Panel Builder 600 software is integrated in the Automation Builder engineering suite and can be downloaded via Automation Builder installer.

Tailor-made human machine interface (HMI)

- For the efficient design of flexible HMI applications in versatile automation solutions.
- Vector graphics (\*.SVG) for precise, easily scalable and dynamic HMI design.
- Alpha blending for realistic transparency effects.
- Libraries including rich sets of widgets – ready-to-use graphical objects.
- Easy creation of customized widgets through the combination/modification of standard widgets.
- Customized widgets clearly arranged in user galleries.

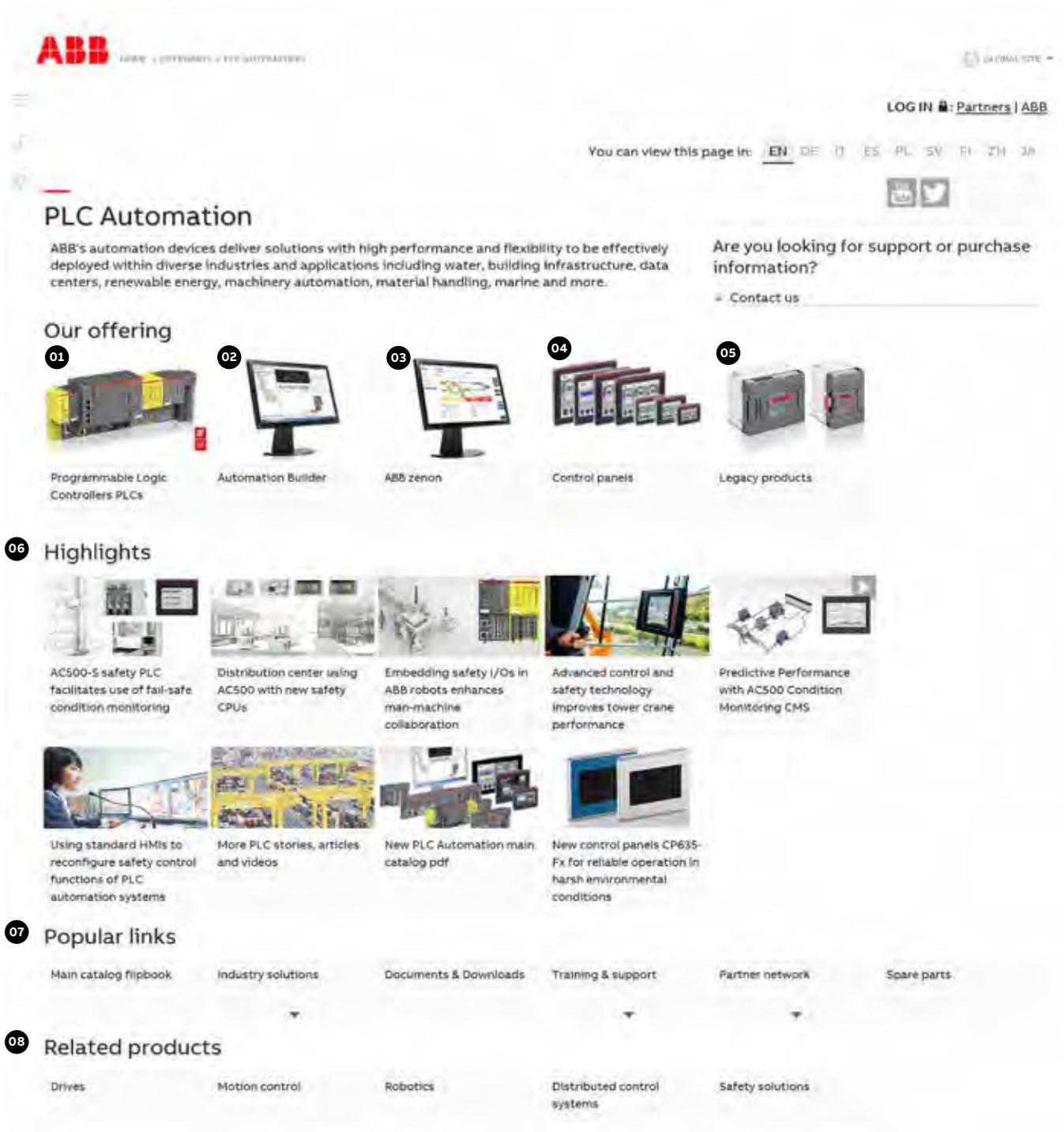
- Page templates for professional design.
- Numerous configuration options for all HMI elements.
- Realization of customized functions and individual dynamic manipulation via Java Script with debugger.
- Easy data acquisition and trend presentation.
- Reliable user management and secure access control.
- Rich set of configurable features: dynamic objects, data acquisition, alarm handling, multi-language applications, recipes, ...
- HMI simulation for efficient commissioning.
- Numerous drivers for easy connection to e.g. PLCs, drives, robots.
- OPC UA client and server for future-orientated cloud connectivity and IoT.
- Gateway function for easy data exchange between different protocols and systems.



# PLC Automation product family

## PLC Automation website – online tools

The [www.abb.com/plc](http://www.abb.com/plc) website is a mine of information on our products and documentation.



## 09 Contact information

What would you like to do?

I need more information

ABB Form

### Submit your inquiry

Country / region

Select Country/region

Name

Company

E-Mail

Phone

Your message

→ Privacy policy

Cancel

### Your local ABB Sales Team

Please select country from the list

#### 01 – Programmable Logic Controllers PLCs

- AC500-eCo (CPUs, S500-eCo I/O modules, Accessories)
- AC500 (CPUs, Communication modules, Communication interface modules, S500 I/O modules, Accessories, Condition Monitoring CMS)
- AC500-XC (CPUs, Communication modules, Communication interface modules, S500 I/O modules, Accessories, Condition Monitoring CMS)
- AC500-S (CPUs, S500 I/O modules)

#### 02 – Automation Builder engineering suite

- Download link  
[www.abb.com/automationbuilder](http://www.abb.com/automationbuilder)

#### 03 – ABB zenon

#### 04 – Control panels

- CP600-eCo (Devices, Software, Accessories)
- CP600 (Devices, Software, Accessories)
- CP600-Pro (Devices, Software, Accessories)

#### 05 – Legacy products

- AC31 and previous series
- CP400
- CP500
- DigiVis 500
- Wireless products

#### 06 – Highlights

- Articles, videos, product news, success stories and more

#### 07 – Popular links

- Main catalog
- Industry solutions
- Documents & Downloads
- Training & support
- Partner network
- Spare parts

#### 08 – Related products

- Drives
- Motion control
- Robotics
- Distributed control systems
- Safety solutions

#### 09 – Contact information for your country

Please watch our videos on our ABB PLC YouTube channel:



[www.youtube.com/user/abbplc](http://www.youtube.com/user/abbplc)