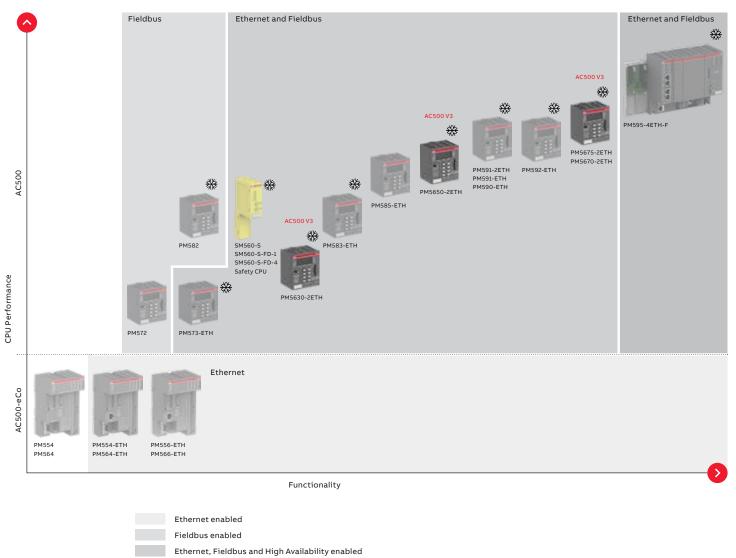PLC AUTOMATION

AC500 V3 PLC
Enhanced connectivity and performance

AC500 V3
Extension of the existing AC500 family

Our four new AC500 V3 CPUs extend the existing AC500 V2 CPU family. The V3 CPUs feature state-of-the-art technology enhancing connectivity, performance and speed as well as expanding the memory of the AC500 family. For your convenience the new CPUs are compatible with the existing AC500 range of products.

This means, no matter whether you are looking for new applications to meet new demands such as cyber security requirements or cloud connectivity or just want to leverage and secure your existing AC500 investment by switching to new state-of-the-art technologies – AC500 V3 will fulfill your requirements.

Fieldbus

Ethernet and Fieldbus

Ethernet and Fieldbus

AC500 V3

AC500 V3

AC500 V3

PM595-4ETH-F

PM5675-2ETH
PM5670-2ETH

PM591-2ETH
PM591-ETH
PM590-ETH

PM592-ETH

PM5650-2ETH

PM585-ETH

PM582

SM560-S
SM560-S-FD-1
SM560-S-FD-4
Safety CPU

PM583-ETH

PM5630-2ETH

PM572

PM573-ETH

AC500

CPU Performance

AC500-eCo

Ethernet

PM554
PM564

PM554-ETH
PM564-ETH

PM556-ETH
PM566-ETH

Functionality

Ethernet enabled

Fieldbus enabled

Ethernet, Fieldbus and High Availability enabled

Ethernet, Fieldbus, High Availability and enlarged memory

eXtreme Conditions version available

AC500 V3
New features and higher performance

The flexibility, scalability and footprint of AC500 V2 have been passed on to the new CPU range. Therefore, AC500 continues to be the perfect fit for various applications or will be the natural successor when you need to introduce new features to existing applications or extend machines and applications to reach for the cloud.

Five new terminal bases
- From 0 to 6 available slots to be used for:
  - Fieldbus communication modules
  - Function modules
  - Safety CPU

Four new process modules
- Same form factor as AC500 V2
- New updated processor
- More performance and memory
- More connectivity

Reuse of existing I/O expansions
- Expandable with existing AC500/AC500-eCo I/O range
- Up to 10 modules locally
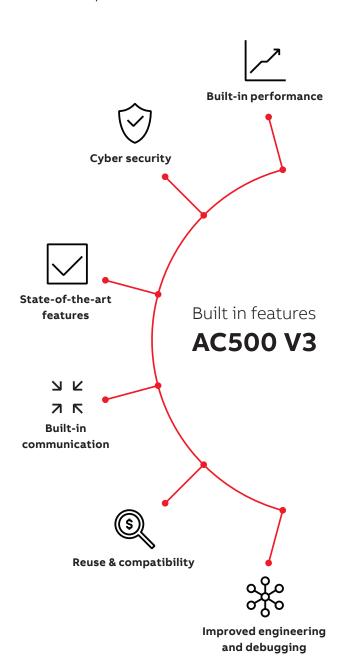- Additional I/O-expansion via fieldbus

More built-in interfaces
- One COM1 serial interface
- One CAN interface
- Two Ethernet interfaces to be used as:
  - Switch
  - 2 port independent
  - Licensed protocol

Enhanced control interface onboard
- Enhanced display on CPU for diagnostic information
  - Settings can be made without software
  - IP and COM addresses change
  - Indicating the status of High Availability CPUs
  - Control buttons to operate the CPU

Improved engineering and debugging
- Object-oriented programming
- New optimized editors for IEC 61131-3
- Integrated HTML5 web server

The new V3 features provide even more flexibility and freedom when it comes to connectivity and functions supplied onboard without the need of additional devices as couplers or switches. AC500 V3 is ready for the requirements of IoT and digitalization and secure cloud connectivity via new protocols and functions.

Built in features
AC500 V3

Built-in performance

Cyber security

State-of-the-art features

Built-in communication

Reuse & compatibility

Improved engineering and debugging

Built-in performance
- Faster CPUs with more powerful processors
- More CPU memory allocated freely
- Modern, state-of-the-art components

Cyber security
- Digitally signed firmware updates protected by hardware security chip
- Secure communication protocols: HTTPS, FTPS, OPC UA, MQTT
- Encrypted communication with engineering system ABB Ability™ Automation Builder and boot application

State-of-the-art features
- OPC UA for easy connectivity to SCADA systems or operator panels
- MQTT for lightweight cloud messaging
- Onboard HTML5 web server technology

Built-in communication
- Two Ethernet interfaces for use as switches or independent ports
- Onboard Ethernet protocol as Ethernet IP*
- CANopen master interface, CAN2A/2B, J1939
- KNX and BACnet
- OPC UA server, OPC DA alarm and event
- IEC 61850
- IEC 60870-5-104 Telecontrol
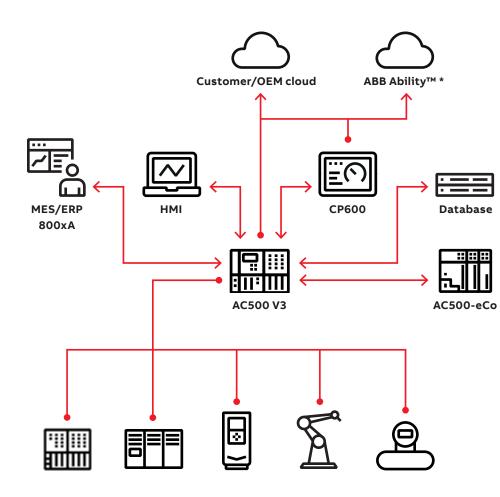
Reuse & compatibility
- Reuse with AC500 platform:
  - S500/S500-eCo I/O modules
  - Communication modules
- Project conversion and code re-use

Improved engineering and debugging
- Professional version control with subversion
- Application project management
- Object-oriented programming
- Optimized IEC 61131-3 editors
- Offline simulation capabilities*

* In preparation

AC500 V3
Connectivity

Customer/OEM cloud   **ABB Ability™ ***

MES/ERP 800xA   **HMI**   **CP600**   **Database**

AC500 V3   **AC500-eCo**

IT network/internet
- MQTT
- OPC UA
- HTTP(S)
- FTP(S)
- SNTP

Factory/site network
- OPC DA/AE
- OPC UA
- IEC 60870-5-104
- IEC 61850
- UDP
- TCP/IP
- KNX
- BACnet
- HTTP(S)
- FTP(S)
- SNTP

Control network
- PROFINET
- EtherCAT
- Ethernet IP*
- Modbus TCP
- Modbus RTU
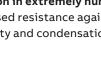- PROFIBUS DP*
- IEC 60870-5-104
- IEC 61850
- CANopen
- CAN 2A/2B

* In preparation

AC500-XC V3
Extreme conditions

Operation in extremely humid environments
- Increased resistance against 100 % humidity and condensation.

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

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

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

Extended immunity to corrosive gases and salt mist
- G3, 3C2 / 3C3 immunity
- Salt mist EN 60068-2-52 / EN 60068-2-11.

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

AC500 V3
Ethernet example features at a glance

OPC UA server

Data connectivity
OPC UA, Unified Architecture, is a protocol for information exchange for industrial communication. This means that OPC UA is a standardized vendor-independent Ethernet protocol, scalable for a lean data access between a client and server. OPC UA is widely adopted in many different industries like automotive, food and beverage, utilities and infrastructure.

OPC UA fulfills the requirements of IoT and Industry 4.0. Security is established based on certificates. AC500 V3 supports the OPC UA services "Data access", "User management" and "Alarm and conditions".

MQTT

Cloud connectivity
MQTT is a TCP/IP messaging protocol mainly used for lightweight messaging to the cloud. In the environment of MQTT, edge devices like controllers act as clients and communicate with a broker situated in the cloud.
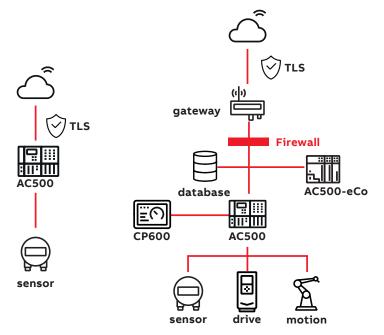
They publish data based on events using topics. Other clients like SCADA systems or monitoring applications can subscribe to these topics and receive data as they arrive. This enables the easy and low-bandwidth connection of many devices. AC500 V3 uses TLS encryption to establish secure communication.

AC500 cloud demo

https://dashboard.ac500.abb.com/

OPC UA and MQTT - Security with AC500 V3

Secure connectivity

Remote units
AC500 works as edge-gateway and is directly connected to the cloud. Security is established through TLS encryption.
• No additional gateway required
• Low latency
Application:
Small systems with non-critical data transfer.

Network security
Connection of the whole AC500 network to the cloud using a separate gateway. Enhanced security is provided through additional firewall and/or VPN.
• Advanced level of security
• Easy integration of many edge devices
Application:
Large systems with many devices which need higher protection.

KNX and BACnet

Intelligent building automation
KNX is a standard protocol for intelligent control and supervision of all systems in a building. The KNX standard has already been used successfully for over 20 years in the building automation segment. ABB has a huge number of KNX devices in the portfolio and great experience with KNX solutions.

By adding the KNX protocol to AC500 V3, ABB can now offer a powerful and freely programmable KNX building automation controller with flexible expandable I/O modules. With KNX and BACnet the AC500 product portfolio is now also available for innovative building automation.

The proven ABB Ability™ Automation Builder engineering tool is integrated with the ETS and ETS apps to assist you in building your application.

IEC61850

Substation communication
IEC61850 is a standard defining TCP/IP protocol for electrical substations. The protocol is well known and widely used. Using that TüV certified protocol, AC500 PLC can act as an IED providing an IEC 61850 MMS server for standardized data exchange or use GOOSE publisher/subscriber communication for higher priority data.

ABB's ABB Ability™ Automation Builder engineering suite integrates the IED configuration and data mapping for seamless and easy combination with the application program.
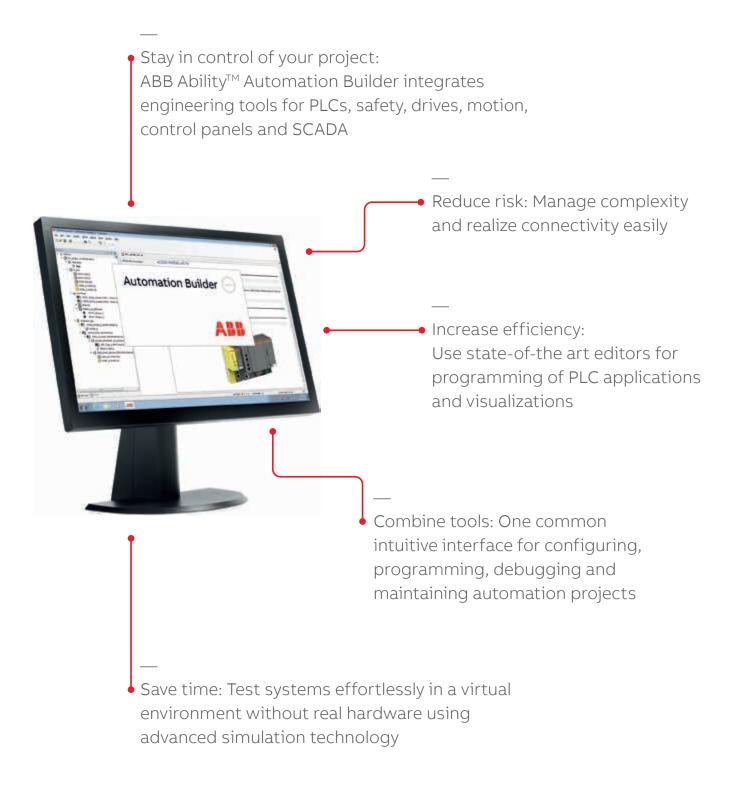
AC500 V3
Web Visualization via HTML5

Better support on portable devices with HTML5 web server technology
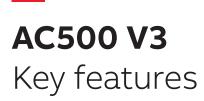All AC500 V3 CPUs come with an integrated web server based on the HTML5 technology. This technology is supported by nearly all browsers, and is therefore also available on devices with OS and/or Android. Web visualization enables easy and convenient remote access, monitoring, service and diagnosis of a system over the internet. Web visualization offers a large number of basic elements and controls with many adaptation options. Using these, the user can quickly and easily create attractive and high-quality visualization interfaces for widely varying applications in the automation industry. State of the art visualization can be created using standard tools suit from ABB Ability™ Automation Builder.

Within the AC500 portfolio, the control panel range CP600 can be used to display the integrated HTML5 WEB visualization.

—
ABB Ability™ Automation Builder
Engineering suite

—
Stay in control of your project:
ABB Ability™ Automation Builder integrates
engineering tools for PLCs, safety, drives, motion,
control panels and SCADA

—
Reduce risk: Manage complexity
and realize connectivity easily

—
Increase efficiency:
Use state-of-the art editors for
programming of PLC applications
and visualizations

—
Combine tools: One common
intuitive interface for configuring,
programming, debugging and
maintaining automation projects

—
Save time: Test systems effortlessly in a virtual
environment without real hardware using
advanced simulation technology

AC500 V3
Key features

Extension of existing AC500 platform

IEC 61311-3 editors updated with new look and feel

Enhanced connectivity features

Webserver technology based on HTML5

Embedded fieldbus protocol

State-of-the-art technology open for secure cloud connectivity via built-in protocol MQTT and OPC UA

Reusability, same form factor as previous AC500 platform

Available for extreme condition applications

—
AC500 V3 and AC500-XC V3
Ordering data

AC500 V3 CPUs

Program, Data and Web memory	Cycle time in µs per instruction min.	Integrated communication	Type	Order code	Price	Weight (1 pce)
MB	Bit/Word/Float. point					kg
8	0.020 / 0.020 / 0.120	2 x Ethernet with configurable protocol EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5630-2ETH (1) (4)	1SAP131000R0278		0.135
80	0.010 / 0.010 / 0.010	2 x Ethernet with configurable protocol EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5650-2ETH (1) (4)	1SAP141000R0278		0.135
160	0.002 / 0.002 / 0.002	2 x Ethernet with configurable protocol EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5670-2ETH (1) (4)	1SAP151000R0278		0.135
160 / 8GB Flash disk	0.002 / 0.002 / 0.002	2 x Ethernet with configurable protocol EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5675-2ETH (1) (4)	1SAP151500R0278		0.150

(1) Ethernet communication provides integrated web server, IEC 60870-5-104 remote control protocol and OPC UA Server on each interface independently.
(2) In preparation
(3) Some communication protocols are licensed see page 15
(4) See table Terminal base compatibility page 14

—
PM5630-2ETH

—
PM5650-2ETH

—
PM5670-2ETH

—
PM5675-2ETH

AC500 V3 Terminal base

Number of coupler slots	Connection for coupler integrated in the CPU	Type	Order code	Price	Weight (1 pce)
					kg
0	2x RJ45 for Ethernet, 1x serial COM1 with pluggable spring connector and 1x2x5 poles pluggable spring connector for CAN/CANopen interface	TB5600-2ETH	1SAP110300R0278		0.165
1		TB5610-2ETH	1SAP111300R0278		0.190
2		TB5620-2ETH	1SAP112300R0278		0.215
4		TB5640-2ETH	1SAP114300R0278		0.265
6		TB5660-2ETH	1SAP116300R0278		0.315

—
TB5600-2ETH

—
TB5610-2ETH

—
TB5620-2ETH

—
TB5640-2ETH

—
TB5660-2ETH

Terminal base compatibility

	PM5630	PM5650	PM5670	PM5675
TB5600	●	●	●	●
TB5610				
TB5620	●			
TB5640		●		
TB5660			●	●

AC500 V3 and AC500-XC V3
Ordering data

AC500-XC V3 CPUs

Program, Data and Web memory	Cycle time in µs per instruction min.	Integrated communication	Type	Order code	Price	Weight (1 pce)
MB	Bit/Word/Float. point					kg
8	0.020 / 0.020 / 0.120	2 x Ethernet with configurable protocol EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5630-2ETH-XC (1) (4)	1SAP331000R0278		0.135
80	0.010 / 0.010 / 0.010	2 x Ethernet with configurable protocol EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5650-2ETH-XC (1) (4)	1SAP341000R0278		0.135
160	0.002 / 0.002 / 0.002	2 x Ethernet with configurable protocol EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5670-2ETH-XC (1) (4)	1SAP351000R0278		0.135
160 / 8GB Flash disk	0.002 / 0.002 / 0.002	2 x Ethernet with configurable protocol EthernetIP (2)(3), 1 x serial, 1x CAN interface	PM5675-2ETH-XC (1) (4)	1SAP351500R0278		0.150

(1) Ethernet communication provides integrated web server, IEC 60870-5-104 remote control protocol and OPC UA Server on each interface independently.
(2) In preparation
(3) Some communication protocols are licensed see page 15
(4) See table Terminal base compatibility page 14

PM5630-2ETH-XC	PM5650-2ETH-XC	PM5670-2ETH-XC	PM5675-2ETH-XC

AC500-XC V3 Terminal base

Number of coupler slots	Connection for coupler integrated in the CPU	Type	Order code	Price	Weight (1 pce)
					kg
0	2x RJ45 for Ethernet, 1x serial COM1 with pluggable spring connector and 1x2x5 poles pluggable spring connector for CAN/CANopen interface	TB5600-2ETH-XC	1SAP310300R0278		0.165
1		TB5610-2ETH-XC	1SAP311300R0278		0.190
2		TB5620-2ETH-XC	1SAP312300R0278		0.215
4		TB5640-2ETH-XC	1SAP314300R0278		0.265
6		TB5660-2ETH-XC	1SAP316300R0278		0.315

TB5600-2ETH-XC	TB5610-2ETH-XC	TB5620-2ETH-XC	TB5640-2ETH-XC	TB5660-2ETH-XC

Feature licenses

License Type	CPU runtime license to be used on internal Ethernet interface	Type	Order code	Price
HW	Modbus TCP HA runtime license	PS5601-HA-MTCP	1SAP195400R0101	
HW	IEC 61850 protocol runtime license	PS5602-61850	1SAP195600R0101	
HW	KNX IP protocol runtime license	PS5604-KNX	1SAP195800R0101	
HW	BACnet protocol B-BC; runtime license	PS5607-BACnet-BC	1SAP195550R0101	

For using runtime licensed features one license per CPU is required. The license has to be installed on the AC500 V3 CPU either by connecting it to ABB Ability™ Automation Builder or via SD card that has been prepared by ABB Ability™ Automation Builder for license activation.
The licenses can be transferred between AC500 V3 CPUs unlimited times.

ABB

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ABB Automation Products GmbH

Eppelheimer Straße 82
D-69123 Heidelberg / Germany
Tel.: +49 62 21 701 1444
Fax: +49 62 21 701 1382

www.abb.com/plc

www.abb.com/automationbuilder