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.
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 digitization and secure cloud connectivity via new protocols and functions.

**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*

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* In preparation
AC500 V3 Connectivity

- 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.

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, ACS500 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.
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.
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
- Enhanced connectivity features
- Embedded fieldbus protocol
- Reusability, same form factor as previous AC500 platform
- IEC 61311-3 editors updated with new look and feel
- Webserver technology based on HTML5
- State-of-the-art technology open for secure cloud connectivity via built-in protocol MQTT and OPC UA
- Available for extreme condition applications
AC500 V3 and AC500-XC V3

Ordering data

AC500 V3 CPUs

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

(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

AC500 V3 Terminal base

<table>
<thead>
<tr>
<th>Number of coupler slots</th>
<th>Connection for coupler integrated in the CPU</th>
<th>Type</th>
<th>Order code</th>
<th>Price (1 pce)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2x RJ45 for Ethernet, 1x serial COM1 with pluggable spring connector and 1x2x5 poles pluggable spring connector for CAN/CANopen interface</td>
<td>TB5600-2ETH</td>
<td>1SAP110300R0278</td>
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<td>TB5610-2ETH</td>
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<td>2</td>
<td></td>
<td>TB5620-2ETH</td>
<td>1SAP112300R0278</td>
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<tr>
<td>4</td>
<td></td>
<td>TB5640-2ETH</td>
<td>1SAP114300R0278</td>
<td>0.265</td>
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<tr>
<td>6</td>
<td></td>
<td>TB5660-2ETH</td>
<td>1SAP116300R0278</td>
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Terminal base compatibility

<table>
<thead>
<tr>
<th>PM5630</th>
<th>PM5650</th>
<th>PM5670</th>
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<tr>
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<td>TB5610</td>
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<td>TB5620</td>
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AC500 V3 and AC500-XC V3

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<tbody>
<tr>
<td></td>
<td>8</td>
<td>2 x Ethernet with configurable protocol EthernetIP (2) / (3), 1 x serial, 1 x CAN interface</td>
<td>PM5630-2ETH-XC (1)</td>
<td>1SAP31000R0278</td>
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<tr>
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<td>80</td>
<td>2 x Ethernet with configurable protocol EthernetIP (2) / (3), 1 x serial, 1 x CAN interface</td>
<td>PM5650-2ETH-XC (1)</td>
<td>1SAP341000R0278</td>
<td>0.135</td>
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<tr>
<td></td>
<td>160</td>
<td>2 x Ethernet with configurable protocol EthernetIP (2) / (3), 1 x serial, 1 x CAN interface</td>
<td>PM5670-2ETH-XC (1)</td>
<td>1SAP351000R0278</td>
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<td></td>
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<tr>
<td></td>
<td>160 / 8GB Flash disk</td>
<td>2 x Ethernet with configurable protocol EthernetIP (2) / (3), 1 x serial, 1 x CAN interface</td>
<td>PM675-2ETH-XC (1)</td>
<td>1SAP351500R0278</td>
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<td></td>
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<td>1SAP311300R0278</td>
<td>0.190</td>
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### Feature licenses

<table>
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<tr>
<th>License Type</th>
<th>CPU runtime license to be used on internal Ethernet interface</th>
<th>Type</th>
<th>Order code</th>
<th>Price</th>
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<tbody>
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<td>HW</td>
<td>Modbus TCP HA runtime license</td>
<td>PSS601-HA-MTCP</td>
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<tr>
<td>HW</td>
<td>IEC 61850 protocol runtime license</td>
<td>PSS602-61850</td>
<td>1SAP195600R0101</td>
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<td>HW</td>
<td>KNX IP protocol runtime license</td>
<td>PSS604-KNX</td>
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<td>HW</td>
<td>BACnet protocol B-BC runtime license</td>
<td>PSS607-BACnet-BC</td>
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</tbody>
</table>

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.