Automation Builder
Integrated
engineering suite
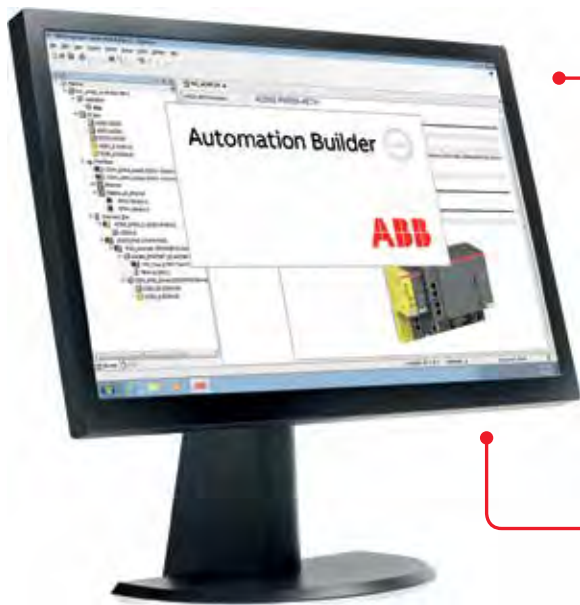
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Download Automation Builder from www.abb.com/automationbuilder
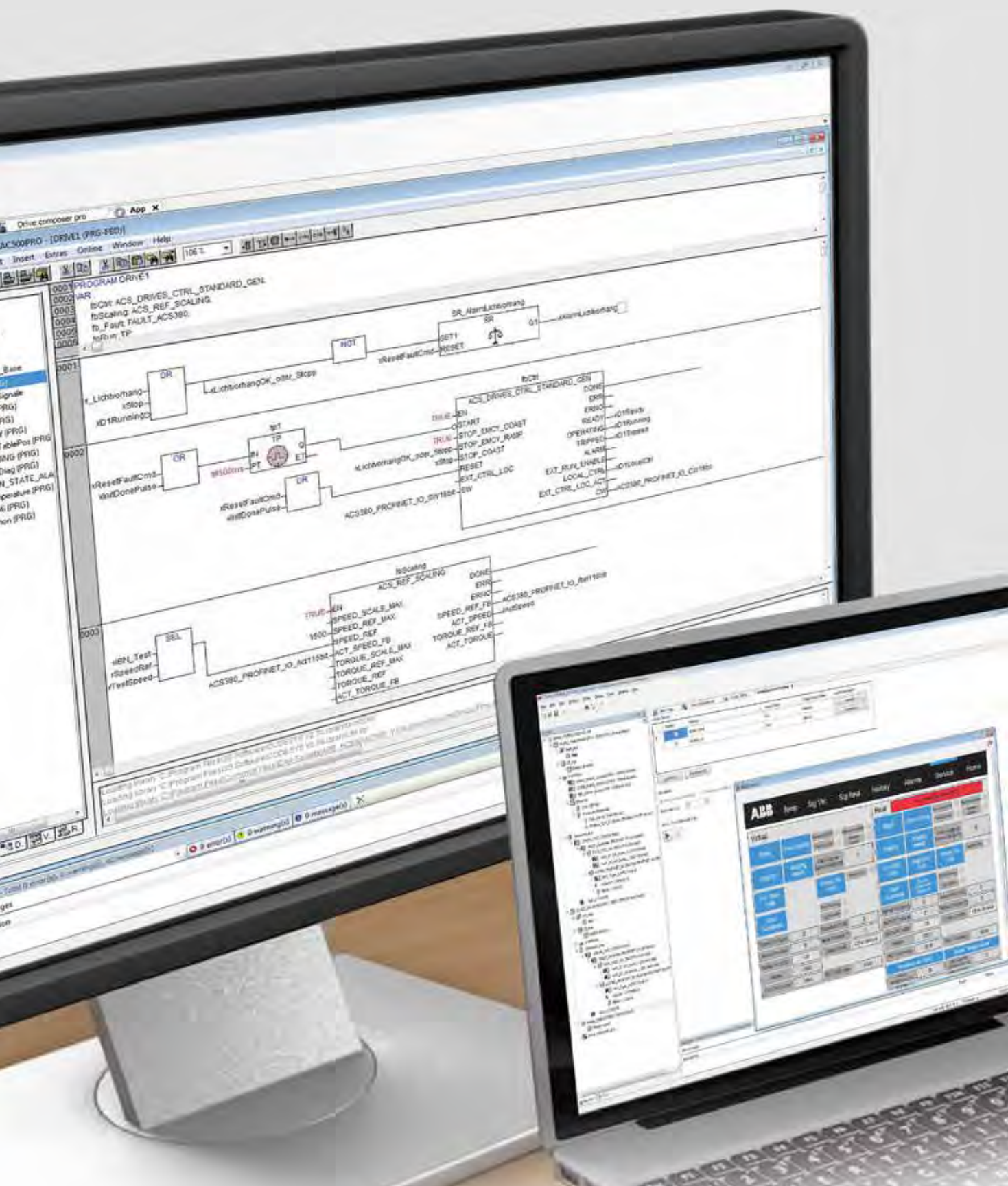
Automation Builder
Key features

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

—
Reduce risk: Manage complexity and realize connectivity easily

—
Increase efficiency:
Build comprehensive solutions with integrated engineering that add value to your business

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

—
Save time: Test systems effortlessly in virtual time without real hardware using Virtual Commissioning technology

Automation Builder
Ordering data

Automation Builder
- Automation Builder connects the engineering tools for PLC, safety, drives, motion, control panels and SCADA. The software suite integrates products into solutions that create value for your customers, giving you greater control of your projects, reducing risk and saving time.
- Open systems win. They lead to more innovation, value and freedom of choice for your business. Automation Builder enables you to adapt the tool chain to your needs and workflows. The software is open for your specific product and communication technology to build your distinct solution.
- Automation Builder 2.1 provides advanced features, further increasing engineering productivity for discrete automation solutions.
- For details please refer to Automation Builder – Software Features.

Automation Builder Editions

For	Description	Type	Order code	Price
Free 61131-3 engineering for simple PLC solutions	Automation Builder 2.x Basic (1)	-	-	FREE
Integrated Engineering for PLC, drives, motion, SCADA, panels	Automation Builder 2.x Standard (2)	DM200-TOOL	1SAS010000R0102	
	Automation Builder 2.x Standard Upgrade (2)(3)	DM201-TOOL-UPGR	1SAS010001R0102	
	Automation Builder 2.x Standard Network (5)	DM204-TOOL-NW	1SAS010004R0102	
Integrated Engineering for PLC, drives, motion, SCADA, panels and features for engineering productivity and collaboration	Automation Builder 2.x Premium (5)	DM202-PREM	1SAS010002R0102	
	Automation Builder 2.x Premium Upgrade (4)(5)	DM203-PREM-UPGR	1SAS010003R0102	

Automation Builder add-ons

Functional safety engineering	AC500-S Safety PLC programming	DM220-FSE (2) DM221-FSE-NW (5)	1SAS010020R0102 1SAS010021R0102	
Virtual system testing based on Virtual commissioning technology	Virtual Commissioning Platform for Automation Builder 2.x (7)(8)	DM250-VCP (2) DM251-VCP-NW (5)	1SAS010050R0102 1SAS010051R0102	
Collaborative engineering support	Professional Version Control with Subversion for Automation Builder 2.x	DM207-PVC (2) DM214-PVC-NW (5)	1SAS010007R0102 1SAS010014R0102	

Accessories

Automation Builder licensing based on a USB Key	USB Key for Automation Builder without license (6)	DM-KEY	1SAP193600R0001	

All Automation Builder PC software licenses can be installed either on engineering PCs or on USB dongles. Network licenses can also be installed on a license server. The licenses can be transferred between computers or dongles unlimited times. Licenses from a license server can be borrowed for offline use.

(1) Free license
(2) Single user license - bound to PC or DM-KEY (USB Key)
(3) Purchase this option to upgrade Automation Builder 1.x Standard to Automation Builder 2.x Standard
(4) Purchase this option to upgrade Automation Builder 1.x Premium to Automation Builder 2.x Premium. Edition upgrade licenses from Automation Builder 2.x Standard to Automation Builder 2.x Premium are available on demand.
(5) Network license for shared usage within a local area network. Per license one user can use the license at the same time.
(6) Does not contain license. Automation Builder license must be purchased separately. Can carry an arbitrary number of licenses.
(7) Enables virtual Drives (ACS380, ACS580, ACS880) and virtual PLCs (AC500 V2, AC500 V3)
(8) Expert function - only available on request

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Automation Builder

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Automation Builder
Ordering data

AC500 Library Licenses

For	Description	Type	Order code	Price
all AC500 V2 CPUs	Solar library	PS562-SOLAR	1SAP195000R0101	
all AC500 V2 CPUs	Water library	PS563-WATER	1SAS030000R0101	
all AC500 V2 CPUs	Motion Control library, Extended	PS552-MC-E	1SAP192100R0102	
all AC500 V2 CPUs	Temperature control library	PS564-TEMPCTRL	1SAS030010R0101	
all AC500 V2 CPUs	BACnet library B-ASC profile	PS565-BACnet-ASC	1SAP195500R0101	

Delivery includes a single user license, which can be used for creating applications for an unlimited number of CPUs. All library licenses can be installed on engineering PCs, on USB dongles or on a license server. The licenses can be transferred between computers or dongles unlimited times. Licenses from a license server can be borrowed for offline use.

AC500 Runtime Licenses

For	Description	Type	Order code	Price
All AC500 CPUs	Modbus TCP HA runtime license	PS5601-HA-MTCP	1SAP195400R0101	
All AC500 V3 CPUs	IEC 61850 protocol runtime license	PS5602-61850	1SAP195600R0101	
All AC500 V3 CPUs	KNX IP protocol runtime license	PS5604-KNX	1SAP195800R0101	

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 Automation Builder or via SD card that has been prepared by Automation Builder for license activation.
The licenses can be transferred between AC500 V3 CPUs unlimited times.

Further application libraries and examples:
Please check and download further libraries and examples from: www.abb.com/plc
Use English language setting, then click on "Application Examples".
Application Examples explain functionality by using e.g. standard Automation Builder libraries and functions in simple examples. They are tested in the described example configuration and functionality only, they come with documentation and are free of charge.
Applications Examples help to minimize valuable programming and testing time for specific applications.

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AC500 libraries

Automation Builder
Software features

Automation Builder 2.0		Basic	Standard	Premium
Features and target hardware		**Basic system engineering FREE**	**Integrated system engineering**	**Productivity and collaboration**
Productive engineering	Integrated engineering for PLCs, safety, robots, motion, drives, SCADA and control panels	○	●	●
	Integrated tool suite installation and maintenance (online and offline)	●	●	●
	Project handling including project archive and backup features	●	●	●
	Project lifecycle support (version profiles and project migration)	●	●	●
	Native language support in EN, DE, ES, FR, CN	●	●	●
	Support of standardization and re-use by flexible configurations of machine variants and advanced IO device handling	●	●	●
	Support of re-use by cross project and cross Automation Builder instance copy&paste	●	●	●
	ECAD roundtrip engineering - AC500 and EPLAN / Zuken E3			●
	ECAD roundtrip engineering for 3rd party devices - PLC and EPLAN / Zuken E3			●
	Bulk data import/export with change control to any tool via CSV (also via copy&paste)			●
	Bulk data import/export of device and I/O lists and IEC 60870-5-104			●
	Change management support by project compare			●
	Device type editor for Open Device Integration			●
	Virtual system testing based on Virtual Commissioning Technology		◎	◎
	Collaborative engineering support by Professional Version Control with Subversion		◎	◎
PLC engineering (AC500 V2)	**For: AC500-eCo, AC500 V2, AC500-XC, AC500-S Safety, AC500 local I/O modules, AC500 extension modules**			
	PLC application programming (IL, LD, FBD, SFC, ST) plus CFC	●	●	●
	PLC firmware update, download and online change to single or several PLCs	●	●	●
	PLC simulation, diagnosis and debugging	●	●	●
	Integrated firmware identification and update (PM and CM devices)	●	●	●
	Configuration of communication protocols for TCP/IP, Modbus, CS31, IEC60870-5-104	●	●	●
	Open device integration for Modbus devices		●	●
	Configuration of communication protocols for PROFINET, PROFIBUS, EtherCAT, CAN		●	●
	C/ C++ application programming (GNU compiler)			●
	Virtual system testing including PLCs based on Virtual Commissioning Technology		◎	◎
PLC engineering (AC500 V3)	**For: AC500 V3 and supported AC500 local I/O modules and AC500 extension modules**			
	PLC application programming (LD, FBD, SFC, ST) plus CFC	●	●	●
	PLC firmware update, download and online change to single PLC	●	●	●
	PLC diagnosis and debugging	●	●	●
	Integrated firmware identification and update (PM and CM devices)	●	●	●
	Configuration of communication protocols for TCP/IP, Modbus TCP, Modbus RTU, IEC60870-5-104, CAN	●	●	●
	Configuration of communication protocols for PROFINET, EtherCAT, CM Devices		●	●
	Virtual system testing including PLCs based on Virtual Commissioning Technology		◎	◎
Safety PLC engineering (integrated solutions)	**For: AC500-S Safety CPU, Safety I/Os and PROFIsafe devices**			
	Safety PLC application programming (LD, FBD, ST)		◎	◎
	Fieldbus protocol engineering for PROFIsafe		◎	◎
Safety PLC engineering (stand-alone solutions)	**For: Pluto Safety PLC**			
	Safety Engineering with Pluto Manager	◎	◎	◎
SCADA engineering	**For: ABB zenon**			
	Integrated SCADA and PLC engineering with ABB zenon Editor		◎	◎

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Automation Builder
Software features

Automation Builder 2.0 Features and target hardware	Basic Basic system engineering FREE	Standard Integrated system engineering	Premium Productivity and collaboration
Control Panel engineering — **For: CP600, CP600-Pro, CP600-eCo, CP600-WEB, PB610-R**			
CP600 and CP600-Pro panel configuration with PB610 Panel Builder 600	○	●	●
CP600-eCo panel configuration with PB610 Panel Builder 600	●	●	●
PLC tag data import	●	●	●
Control Panel simulation for Virtual Commissioning Technology	●	●	●
Drive engineering — **For: ACS355, ACS380, ACS480, ACS550, ACS580, ACS850, ACQ810, ACS880, DCS880, ACSM1**			
Drive management, configuration and diagnosis with common process data editor (Drive - PLC)		●	●
Drive engineering in Drive composer pro	○	●	●
Virtual system testing including Drives based on Virtual Commissioning Technology (only for ACS880)		◎	◎
Motion engineering — **For: MicroFlex e150, Motiflex e180, Motiflex e190**			
Motion application engineering with Mint WorkBench	●	●	●
PLC tag data import	●	●	●
Modbus TCP engineering — **For: CI521-MODTCP, CI522-MODTCP**			
Configuration and diagnosis of unbundled Modbus TCP CI (communication interface) devices	●	●	●
Solution engineering — Drive library	●	●	●
Motion Control for AC500 V2 PLCopen Motion library (PS552-MC-E)	◎	◎	◎
Solar library (PS562-SOLAR)	◎	◎	◎
Water library (PS563-WATER)	◎	◎	◎
Temperature Control library (PS564)	◎	◎	◎
BACnet – ASC library (PS565)	◎	◎	◎
AC500 High Availability HA-CS31 library		●	●
AC500 High Availability HA-Modbus TCP library V2/V3 (1)		◎	◎
KNX-protocol (1)		◎	◎
IEC61850 for AC500 V3 (1)		◎	◎
PackML Library (*)		●	●
FTP client Library (PS554) (*)		●	●
Signal Processing Package (*)		●	●
Pumping Library (PS571) (*)		●	●
HVAC Library (*)		●	●
Further features — PLC Multidownload tool for large installations		●	●
OPC server and clients, service tool, PLC gateway, IP configuration and visualization		●	●
Operating systems — Recommended: Windows 7 32/64-bit, Windows 8.1 32/64-bit, Windows 10 32/64-bit (2)	●	●	●
PC requirements — Minimum: 1 GHz, 3 GB RAM, 14 GB free disk space	●	●	●

● included
◎ optional (additional license required) as integrated tool / feature / library
○ optional (additional license required) as standalone tool / feature - not integrated in Automation Builder
(1) additional runtime license per PLC required
(2) Limited support for Windows server operating systems - please contact ABB for further information
(*) Technology Preview: Technology Previews are non-final versions of our product and should not be taken as a measure of the fit, finish, capability, and overall quality of the product. While we don't stop using these versions in projects, we don't recommend it if data loss and the usual quirks of preview software cannot be afforded.

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Automation Builder
Libraries features

PS562-SOLAR	**PS563-WATER**	**PS564-TEMPCTRL**
Solar tracker solution library	**Water solution library**	**Temperature control library**

Library for solar tracking applications enabling fast engineering, especially together with ABB's drives and motors	Library supporting the most common functions in many water applications	Library packet for advanced temperature control applications
Covers different tracker configurations and different algorithms for accuracy needs • Control of trackers in parabolic trough, power tower, PV and CPV applications.	Flexible data logging options: • Especially suited for remote communication like GSM/GPRS • Timestamp in logging • Integrated variants for simple use with IEC 60870-5-104 • Logging to files: storage capacity only dependent on memory availability • Flexible log conditions (cyclic, event or tolerance based).	Includes extended, flexible PID functionality with Auto-tune for temperature control • Enhanced response time and reduced overshoots and oscillations • Option to optimize control for very different heating and cooling characteristics. • Enhanced tolerance to thermocouple input noise • Normal and standby- setpoints • Multi-level temperature monitoring and alarms provides flexible operation and protection for machine and process • Logging enables complete overview of the actual situation and past behavior • Configurable output timing, synchronization for peak load shaving in multi-zone setups • Simulation blocks enable off-line setup and pre-test of a new project • Group-programming

Complete library package for different tracking use cases, plug and play:
Example program with detailed explanations and visualizations
• Control of the tracker adaptable to different needs and conditions, to achieve maximum efficiency of installation
• Exact positioning of different axes with the following accuracies:
  - NOAA algorithm 0.03 Grad
  - NREL algorithm 0.0003 Grad.
• Input / sensor adaptation
• Communication
• Different actuators / drives control
• All needed modes for simple commissioning and manual operation:
  - Fast and simple calibration of the trackers, offering manual repositioning and fine tuning
  - Safety positions
  - Back tracking.
	Support for pumping station functions with different operation modes
	• Standard multidrive functions (PLC based)
	• Advanced functionality together with ABB ACS and ACQ810 drives
	• Detailed diagnosis
	• Energy efficiency functions
	• Multidrive functions
	• Flow estimation.
	
	Control Panel CP600 support for ACQ810:
	Fast and simple configuration for pumping stations with reduced programming effort via pre-built visualization screen templates.
	
	Application examples for fast engineering and startup.
		Example projects, including adaptable HMI project for CP600 family, well suited for multi zone and grouped temperature control e.g. in Extrusion:
		• Easy to use operator interface
		• Provides quick access to setup, monitoring and tuning screens for multiple zones
		• Easily expandable to a large number of zones
		• Zones: heat-, cool-only or heat-and-cool

License Package (Software is part of Automation Builder)		
All AC500 V2 CPUs NOAA: PM554-XX and above NREL: PM573-ETH and above.	All AC500 V2 CPUs Logging: PM573 and above.	All AC500 V2 CPUs.

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Automation Builder
Libraries features

PS565-BACnet-ASC

BACNet communication library

This library enables AC500 PLCs to connect OEM or infrastructure applications to BMS (Building Management Systems) or other controllers.

The PS565-BACnet-ASC library enables AC500 to serve as BACnet server device, complying with the B-ASC Device Profile and interfacing control requirements, and acting as hardwired or Modbus-to-BACnet gateway.

It supports BACnet IP (Ethernet) and BACnet MS/TP (serial) networks. The scalable AC500 platform is compatible with the BACnet library starting from eCo PM5x6 with larger memory (~ 300 objects) up to PM595 (more than 5000 objects).

The very transparent, object-oriented publish and subscribe approach of BACnet allows efficient and well-documented engineering and collaboration of many different parties in large infrastructure projects.

Highlights
• Easy-to-use BACnet communication directly in the CPU
• No coupler or gateways required
• Cost-efficient particularly for OEMs and projects
• Interfacing other non-BACnet devices to BMS.

PS565 for AC500 is BTL-approved and certified

PS552-MC-E

Motion control library

Library enabling fast and standardized engineering according to PLCopen standard when using ABB's AC500 PLC for motion control, especially together with ABB's motion control Drives.

Covers different motion control options for single and multiaxis motion control applications:
• Drive-Based and PLC-Based motion
• In PLC based motion, the position control loop could be closed in the PLC or drive (with synchronized network)
• Single axis, multiaxis and coordinated motion
• Defined Jerk limitation by polynomial interpolation
• Spline interpolation or polynomial interpolation for cam curves, position velocity or acceleration profiles available
• Possible to switch over between different movements and cam curves directly
• latch functionality by utilizing fast drive inputs for ACS350, ACS800, ACSM1
• Drive based motion: commands from PLC, drives perform interpolation and control loop
• Supports the new Pulse Train Output module FM562.

PLCopen functions:
• Administrative Function Blocks
• Single axis Function Blocks
• Multiple axis Function Blocks
• Homing Function Blocks
• Coordinated Motion Function Blocks
• Additional ABB specific Function Blocks for further simplification.

License Package (Software is part of Automation Builder)

All AC500 V2 CPUs, starting from PM5x6 (~300 objects) up to PM595 (>5000 objects)	All AC500 V2 CPUs (options and no. of blocks/functions and performance will depend on CPU size and memory).

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Automation Builder
License features

PS5604-KNX	**PS5602-61850**	**PS5601-HA-MTCP**
KNX IP communication	**IEC 61850 MMS server and GOOSE communication**	**High availability library using Ethernet (Modbus TCP)**

This runtime license enables the AC500 V3 PLC to connect to KNX IP.	This runtime license enables the AC500 V3 PLC to connect to substation type equipment (IEDs) or act as IED.	Runtime license per CPU to download library into the CPU.
The protocol and configuration options are part of Automation Builder and FW. The runtime license is needed for download.	The protocol library and configuration tool are part of Automation Builder. The runtime license is needed for download.	Same philosophy as proven serial/CS31 based library.
Support of • Up to 1000 group objects • Programming the physical address via ETS • Downloading the KNX group address linking via ETS	61850 server edition 1 allows: • sending MMS messages to ensure a safe data communication – no real time support • publishing and subscribing to GOOSE messages for high priority peer-to-peer data exchange between different servers to ensure a data transmission with minimal delay • up to 5 client connections per server • up to 50 entries per dataset • up to 20 datasets	Enables hot-standby redundancy and bumpless transfer with standard AC500 CPUs. Supports 3 redundancy levels: • CPU • I/O • SCADA communication
Highlights • Easy to use KNX communication directly in CPU due to tight ETS5 and Automation Builder integration via DCA • No coupler or gateways needed • Cost-efficient especially for OEMs and projects • Enables holistic building automation solutions.	Automation Builder used as IED configuration tool • Import / export of SCL files formats • ICD – IED capability description file • SCD – substation configuration description file • CID – configured IED description file	Library package containing libraries based on Modbus TCP for field communication and using CI52x communication interface modules as I/O clusters with redundant connection.
	Basic display options	Ethernet redundancy based on externally managed switches: Ethernet network can be independent of the redundancy mechanism used. • Daisy chain in ring configuration of CI52x with MRP as redundancy protocol • Fast reaction and switchover nearly independent of the number of clusters • Possibility of integrating other devices e.g. ABB drives into the redundancy scheme.
	Highlights • Wide set of Logical Nodes provided • Further Logical Nodes can be defined • Implementation can be programmed freely in IEC61131.	Scalable redundancy, where CPUs can also be placed far away from each other (…kilometers if fiber-optic networks are used).
		Includes the AC500 Bulk Data Manager as a tool for efficient configuration and cluster engineering. • Configuration and export of projects, clusters, modules/parameters, signal names, visualization ("code generation")
		Application examples for fast engineering and startup.

Runtime license (Software is part of Automation Builder)		
All AC500 V3 CPUs	All AC500 V3 CPUs	All AC500 V2 and V3 CPUs

Automation Builder
Productivity features

Object-oriented programming of AC500 V3 CPUs

All essential features of standard object-oriented programming are included in Automation Builder's object-oriented programming:

- Better structured program code with "separation of concerns" and information hiding
- Flexible extensibility by new types of objects (e.g. software representations of new types of drives)
- Reuse of code for defining specialized sub-classes (inheritance), reuse of code operating on different implementations of an interface (polymorphism)
- New optimized editors for IEC programming languages
- Continuous Function Chart (CFC) with auto routing of connections between POUs, unrestricted definition and display of the execution order
- Structured Text (ST) with Support for quick editing with common help, such as grouping, collapsible tree structure, and indented brackets

HMI integration

Synchronization of connection settings and access to tags on the AC500 PLC.

Drive integration

Seamless integration of ABB Drives connected to AC500 PLCs:

- Common configuration of cyclic data exchange
- Access to the drive via the AC500 PLC - no need for point-to-point connections
- Upload, download and offline editing of drive parameters

Integrated configuration of AC500 software features

All required AC500 software features can be selected and configured by Automation Builder, e.g.

- KNX gateway for connecting to building automation devices
- IEC 60870 protocol for data exchange with substations
- Time synchronization via SNTP
- Shared variables with other AC500 PLCs

Professional version control – management of the application project

Professional Version Control is an integrated link to the version control system Subversion (SVN). End users can use this tool to manage independently both the complete IEC 61131-3 project version, as well as the individual application objects. End users benefit from automated management of the source code when developing a project in various teams or over a long period of time.

Automation Builder
Virtual Commissioning Platform – virtual system testing

Automation Builder 2.0 introduces virtual system testing which allows machine builders and system integrators to simulate and automate all kinds of applications with minimum effort. This gives seamless testing of the complete system at an early stage, even when all the necessary hardware is not yet ready. Even complex systems can be built up quickly and efficiently, ensuring smooth interaction of all the components.

Virtual Commissioning Technology builds on ABB's proven engineering tools RobotStudio and Automation Builder as basis for simulation. It lets you build simulation models from virtual devices and manage the virtual time and signal exchange between the virtual devices.

Virtual devices emulate real hardware. They function as real hardware, provide signals (onboard, local, fieldbus/remote IOs) and variables. Virtual time lets you control the execution of the simulation. Speed up, slow down or freeze the execution for testing and debugging.

Additional components can be included to these models. This allows to simulate the real system including physical inputs or actuators. The flexible architecture of the Virtual Commissioning Technology allows to extend your simulation to more advanced aspects, e.g. the dynamic system behavior.

Save time

Simulate effortless
Debug realistic systems without real hardware

Accelerate commissioning
Synchronized system integration using virtual time

Reduce risk

Ensure quality
Verify logic, detect errors, prove quality

Efficient re-use
Same data in simulation, reality and across projects

Increase efficiency

Ease operator training
3D simulation in best-in-class tool RobotStudio

Convince your customers
Create insight and trust with functional models

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Virtual Commissioning
Technology – Benefits