Releas Notes AC500 V3 Firmware Version 3.4.1 HF5

Functional changes / New features	***Version***
CAN: CM598-CN: New parameter "Run on config fault"	3.4.1
EtherCAT: Library ABB_EtherCAT_AC500: Additional POU for reading the lost frame count from the master (EcatMasterGetFrameLossCnt)	3.4.1
Display: New parameter "PLC ID" available from the menu "CFG" of the display for read and write, including read access from the application (ReadPLCId).	3.4.1
BACnet: Support of BACnet MS/TP on COM1 of PM5630, PM5650, PM5670 and PM5675	3.4.1
PROFINET: CM579-PNIO: New parameter "Run on config fault"	3.4.1
PROFINET: CM579-PNIO: New parameter "Inhibit error signaling on LED STA2"	3.4.1
System: Increased performance especially for CM579-ETHCAT.	3.4.1
System: "PLC Boot-parameter ""Communication Schema"" with the values: - Default - Communication modules - Onboard Ethernet - Realtime onboard Ethernet"	3.4.1
Devices: "Support of new Option Boards for eCo-V3 PLCs: - TA5101-4DI - TA5105-4DOT - TA5110-2DI2DOT - TA5130-KNXPB - TA5131-RTC - TA5141-RS232I - TA5142-RS485I - TA5142-RS485"	3.4.1
Devices: "Support of new eCo-V3 PLCs: - PM5012-T-ETH, PM5012-R-ETH - PM5032-T-ETH, PM5032-R-ETH - PM5052-T-ETH, PM5052-R-ETH - PM5072-T-2ETH, PM5072-T-2ETHW"	3.4.1
Diagnosis: Availability of diagnosis history	3.4.1
Diagnosis: "Unified representation of timestamp: YYYY-MM-DD; HH:mm:ss.fff"	3.4.1
Ethernet/IP: Support Ethernet/IP scanner (master) as technology preview	3.4.1
Ethernet/IP: Support Ethernet/IP adapter (slave) as technology preview	3.4.1
Hotswap: If properly configured, missing hotswap terminal units are detected for Modbus TCP and Profinet	3.4.1
OPC UA server: Support of complex data types (structures)	3.4.0
Configurable automated reboot behavior after short voltage dip.	3.4.0
New boot parameter "Missed cycle behavior" to change the scheduling behavior when a task is not able to keep its schedule. There are to options to choose, when the cycle time has been exceeded: - "Next" (default): Wait until the next scheduled start time is reached - "Asap": Run the task again as soon as possible	3.4.0
Improved jitter calculation Note: for event tasks (e.g. EtherCAT) the parameter "Interval" in the task configuration must have the same value as the bus cycle time	3.4.0
Diagnosis: Complete handling of Profinet diagnosis via the AC500 V3 diagnosis system	3.4.0
SD Card for creating a boot application: - Including all required files for web visualization	3.4.0

Fixed issues	***ID***
When using the following functions, AC500 V3 PLC does not properly manage its resources, which might lead to unexpected behavior during long-term use without reboot: Connect via MQTT, set the real time clock, read FW versions, read production data, use sysprocessexecutecommand2, use SetRtoMinAsync Workaround: Either upgrade to FW version 3.4.1 HF5 or do not use any of the corresponding features in the PLC application.	CPUFW-8922
Doing online changes on a PLC application with FW version 3.4.1 might set the PLC into stop after some minutes because of missing runtime license “remote target visualization”, although this license is not required by the PLC application. Workaround: Either upgrading to FW version 3.4.1 HF1 or activation of runtime license for remote target visualization (to be obtained from our technical support).	CPUFW-8621

System: Generating certificates fails for PLCs which have never used certificates before system firmware version 3.4.0. Workaround: "Update to system firmware 3.4.1 or newer	CPUFW-8450
EtherCAT: Numeric representation of state outputs (CurState, TargetState) are different from the documentation for these EtherCAT-FBs: EcatBusDiag, EcatSlvGetState, EcatSlvDiag Workaround: "Update to system firmware 3.4.1 or newer Always use enum teEcatDevState for processing the EtherCAT state."	CPUFW-8339
System: Changing the CPU boot parameter "missed cycle behavior" requires a PLC reboot after download. This is currently not indicated by Automation Builder. Workaround: Please reboot PLC after change of parameter "missed cycle behavior".	CPUFW-8261
Modbus TCP: High number (>60) of parallel calls for Modbus device synchronization (FB EthModMast or FB EthModMast2) might lead to unstable ethernet communication in PM5670-2ETH and PM5675-2ETH. Fixed by introducing a new parameter "Communication Schema" that has to be set to "Ethernet". Workaround: Distribute the calls of EthModMast or EthModMast2 to different batches that are called with short breaks in between. Example for 120 parallel connections: Step 0: Time 0 Call EthModMast for connections 1-30 Step 1: Time 0 + 30ms Call EthModMast for connections 31-60 Step 2: Time 0 + 60ms Call EthModMast for connections 61-90 Step 3: Time 0 + 90ms Call EthModMast for connections 91-120 In case of updating from FW 3.1.4 or earlier, carefully monitor the Modbus behavior.	CPUFW-8029
CP600: When using "CODESYS V3 ETH" protocol, the AC500 V3 tags are not accessible. Workarounds: • Use OPC UA or Modbus TCP instead of "CODESYS V3 ETH" • Install patch with fix for Panel Builder PB610 software available from the ABB Library: https://search.abb.com/library/Download.aspx?DocumentID=3ADR010716&Action=Launch	CPUFW-8101
EtherCAT Sync-Task does not keep cycle time if another PLC real time task is used in project with >250 byte process image	CPUFW-8023
BACnet: Mandatory / missing runtime license for BACnet not always shown correctly in the runtime licensing view. Workaround: Always check that the BACnet runtime license is listed as available license in the runtime licensing view.	CPUFW-7992
PLCs set to DHCP will show the configured IP address instead of the one assigned by the DHCP server in Automation Builder communication settings using the scan. Workaround: use the IPConfig scan to find out the assigned IP address, then set communication settings manually	AB-18277
The Download Manager does not support firmware update of V3-PLCs. The V3-PLCs will be added to the Download Manager view and information about a required update can be read. But the firmware update will not be executed successfully. Workaround: For V3-PLCs please use the firmware update via PLC editor page 'Version Information' instead.	AB-18851
Download Manager might report a successful firmware update of AC500 V3 PLCs, but the version information screen still shows the previous firmware version on the PLC. Workaround: In this case please run the PLC firmware update in 'Version information' screen (single update).	AB-18113
Download Manager can't be used for downgrades (target system firmware version lower than current version)	AB-17621
In case limitations are not correctly reflected in the message window, e.g. number of OPC UA tags exceeded, please re-execute "Generate Code" manually.	AB-18005

Known problems	***ID***
AC500 eCo V3: "ETH1" node is marked with a red exclamation mark in online mode for PM5012, PM5032 and PM5052 in case no Interface is defined. However without any effect on the functionality. Workaround: Add "ETH1" as Interface on the "General" tab of the IP settings node	AB-19703
AC500 eCo V3: "Interfaces" node is marked with a red exclamation mark in online mode however without any effect on the functionality. Workaround: not available and also not required	CPUFW-8586

For downgrading the firmware from version 3.4.1 to version 3.4.0 the downgrade process has to be done twice. Downgrade via Automation Builder: The initial downgrade terminates with a success message, although the version information editor shows 3.0.0 as FW version. The second downgrade then finally results in FW 3.4.0 Downgrade via SD card: The initial downgrade results in the PLC showing “update” in the display. A second power cycle completes the downgrade and installs FW 3.4.0.	AB-19738
Ethernet: Network variables: cyclic transmission of network variables can cause an "omitted cycle watchdog" exception. Workaround: Change properties of used Network Variable List (Sender) from "Cyclic transmission" to "Transmit on change".	CPUFW-8468
PROFINET: CM579-PNIO: The node state of Profinet I/O devices might be false negative in case of consecutive errors. Workaround: Check number of nodes with error state on I/O controller level	CPUFW-8456
CANopen / CAN: CM598-CN errors in PLC log after change from Stop to Run. System works fine, couplers are sending/receiving CAN 2A/2B telegrams correctly. Workaround: Ignore the corresponding log entries	CPUFW-8313 CPUFW-8321
SysLibs: The FB PmProdReadAsync returns the ProductID for PLCs with one Ethernet interface (PM5012, PM5032, PM5052) in output "Mac1" instead of "ProductId". Workaround: Use value from output "Mac1" as "ProductId" for PM5012, PM5032 and PM5052.	CPU_FWLIB-521
Profinet: Configured but missing I/O devices connected to a CI501-PNIO or CI502-PNIO module are not properly represented in the diagnosis system. The I/O device itself has no diagnosis message and therefore is shown as OK (both in the Automation Builder and in the IEC application). Workaround: Check the ModuleDiffBlock of the CI50x-PNIO module for any missing I/O devices.	CPUFW-8272 CPUFW-8268
Firmware update: Unable to update the display firmware (displayFW), if update firmware (updateFW) versions 3.1.2.32 or 3.1.4.82 are installed. Workaround: First update the update firmware (minimum version: 3.3.2.113) before updating the display firmware in a second step.	CPUFW-8252
Diagnosis: The diagnosis system is limited to 1000 active diagnosis messages in parallel. Any additional diagnosis messages will lead to error code ERR_NOMEMORY. Workaround: Decrease the number of active diagnosis messages.	CPUFW-8251
PLC cannot switch to run after project update via SD card when project contains changed boot parameters: - WEB server off/on - COMx: RS232/RS485 selection - OPC UA server off/on - ETH1/ETH2 switch off/on - Missed cycle behavior - Communication Schema Workaround: Additional power cycle required for starting the PLC application.	CPUFW-8230
EtherCAT: The first breakpoint in the EtherCAT sync task is not processed properly. It is always being ignored if there is at least a second breakpoint. Workaround: Always use at least two breakpoints in the EtherCAT sync task considering that the first one will be ignored.	CPUFW-8227
EtherCAT: POU EcatSync outputs ErrInCnt and ErrOutCnt never start at 0 Workaround: Do not use the first output values of EcatSync function block after setting EtherCAT to operation.	CPUFW-7983

Attribute initialize_on_call not working
 	
Workaround: The attribute must be set on the FB additionally to the parameters. This hint is missing in the online help. If you define the FB like this, everything works as expected:
 	
{attribute 'initialize_on_call'}
FUNCTION_BLOCK fb
VAR_INPUT
  {attribute 'initialize_on_call'}
  pInt : POINTER TO INT := 0;
  {attribute 'initialize_on_call'}
  iVal : INT := 0;
END_VAR
	AB-18849

Ethernet: The function block EthSetRtoMin (part of AC500_Ethernet library) might cause an exception with FW V3.3.1. This also affects the AC500 High Availability - HA-ModbusTCP V3 Library Example, as it is using this function block. Workaround: If using this function block is mandatory, a dedicated hotfix version of the firmware has to be used (available on request from ABB technical support).	CPU_FWLIB-401
BACnet: If server objects of type "BACNet.BacnetSchedule" or "BACNet.BACnetSchedule" are instantiated in the PLC application, the PLC will crash when the project is deleted from the device. Workaround: Only use the BACnet Schedule by adding it below the BACnet Server in the device tree instead of adding it from the PLC application.	CPUFW-7854
Diagnosis: The PLC node might show a diagnosis indicator "!" in the Automation Builder device tree even if no diagnosis exists. In this case the root cause is that the device diagnosis is disabled. Workaround: Activate the device diagnosis in Automation Builder	CPUFW-7519
CM579-PNIO: Sporadic error that diagnosis information of third-party devices are not available. Workaround: Check the device status for third party devices also from status icon in the Automation Builder device tree	CPUFW-7499
CM579-PNIO: Missing error text on disconnected ethernet cable (error code 2) Workaround: Ignore missing error text in case of error number 2 on CM579-PNIO	CPUFW-7498
Ethernet/IP Adapter cannot handle more than one connected scanner (Exclusive Owner). When connecting a 2nd (Listen Only) Ethernet/IP scanner a connection failure occurs Workaround: not available	AB-19326
The names of SNTP Server and SNTP Client have been changed to NTP Server and NTP Client as the solution supports both NTP and SNTP. However, the corresponding function blocks still use "SNTP" in their names.	AB-19328
Persistent memory: Please note that 44 bytes of the persistent memory is reserved by the system for internal data. If the persistent memory is used, the usable area is reduced by this amount.. Workaround: not available	AB-18919
Diagnosis text lists are only downloaded to the PLC if a visualization is added to the application	AB-16465
In case the flag “Enable Diagnosis for devices” (PLC node editor → PLC Settings) is not set the diagnosis indication on the device tree object might not be correct Workaround: either activate the flag “Enable device diagnosis” or open the diagnosis editor of the corresponding device object	AB-17250
Diagnosis text lists are not updated after new GSDML installation/device object update if the text list was already present in the project. Workaround: Delete the diagnosis text lists, save project, restart Automation Builder, and rebuild the project. The updated text lists are now generated into the project	AB-16737
Diagnosis text lists are not transferred to the AC500 V3 PLC if download/login is done without rebuild. Workaround: Please check that a visualization is added to the project, the setting 'enable diagnosis for devices is set and project is rebuilt (clean all → rebuild)	AB-18007
Online values of program code are not correctly refreshed in editor if exception handling is included in code	AB-18215
Firmware update might fail via Automation Builder Workaround: Please check if ETH1 and ETH2 are in different subnets	AB-18004
BACnet EDE file import is not allowing to select an exported file. Workaround: Please rename the exported file to *_EDE.csv and retry the import	AB-18210
Cyclic non-safe data exchange: An initialization of arrays and structures in the non-safe program is not supported by the safety program in CoDeSys v2.3 and creates corresponding errors "Erroneous initial value".	AB-17989
Cyclic non-safe data exchange: Build error "address is already used" occurs if STRING mapping is defined at the end Workaround: In this case add any non-string variable at the end of the mapping or change mapping order	AB-17782
Compile error will occur after renaming "CAN bus" on AC500 V3 PLCs Workaround: Please keep default name	AB-17541
Sync-SDOs parameters are not generated when 'Enable Sync Producing' is disabled: For both communication modules CM578-CAN and CM598-CAN, when the parameter CANopen Master parameter 'Enable Sync Producing' is disable, parameter 'set communication cycle period' and 'Set synchronous windows length' are not generated. When CANopen Master parameter 'window Length' is set to 0, the parameter 'Set synchronous windows length' is also not generated.	AB-14071
Fast counter of DA501/502 does not work if used at a Communication Interface (CI) module on PROFINET, EtherCAT or CAN	AB-16614

IO mapping: use only mappings available in the IO mapping editor, avoid manual variable declarations using AT % operations	AB-16521
FW 3.2.0: Downgrade of AC500 PLCs from firmware 3.2.x version to previous versions via Automation Builder 2.1.X is not supported. Workaround: Please prepare SD-card with desired firmware versions and execute firmware version update via SD-card	n.a.
Sometimes the display firmware is not updated within the first “Update Firmware” process (display shows “bAdFIr”). Please start the “Update Firmware” process a second time.	AB-17204
PM5630: There might be not sufficient memory for boot projects when visualizations are used or had been used and downloaded before. Workaround: In case you are running into memory issues please check that visu files which are no longer required are deleted using the "Files" tab in the editor of the main CPU node (delete the files in 'PlcLogic/visu/').	AB-15729
The "Scan for devices" functionality does not work when the "Log" Editor of the V3 PLC is opened, After the call of "Scan for devices" it is also no longer possible to add any object in the device tree (as long as the "Log" Editor is active). Workaround: select another editor tab and call "Scan for devices" again	AB-15749
CM589-PNIO: not supported with FW 3.2.4 or later Workaround: Use FW 3.2.3, if CM589-PNIO is required. Support of CM589-PNIO will be available in future version again.	CPUFW-7462
Division by zero for REAL and LREAL variables does not raise exceptions in IEC user program. Workaround: Check results of division in IEC program for "FIN".	CPUFW-7429
EtherCAT: EtherCAT ENI files are not deleted, e.g. after changing the slot of a CM579-ETHCAT device Workaround: Delete ENI files manually	CPUFW-7183
Counter: Fast counter word order is wrong for devices on PROFINET and EtherCAT. Workaround: Swap in- and outputs accordingly.	CPU_FWLIB-279
CAA_File: POU FILE_MOVE is missing Workaround: Use File copy + File delete	CPU_FWLIB-242
CommFB: The library CommFB is not supported for CM579-PNIO Workaround: Use library ABB_PnioCntrl_AC500.library	CPU_FWLIB-140
Trend: Storage size limitation does not work properly. Limitation by file size does not work, as limitation by maximum number of records works. Otherwise PLC can run out of memory. Workaround: Use limitation by maximum number of records	CPUFW-7172 CPUFW-7173
PROFINET and CM589-PNIO: As of 2nd download coupler does not work, 1st DL and boot project are ok. Workaround: Start project as boot project.	CPUFW-6641
System: IEC task watchdog followed by Online -> Reset warm leads to crash of PLC.	CPUFW-6142
CM579-ETHCAT: In some configurations, the state of the last EtherCAT slave is shown as red circle in AB device tree, even if slave works fine. Workaround: Ignore wrong state and/or check state with POU.	CPUFW-6134
Deleting of an AC500 V3 PLC in the tree might fail if there is an invalid AlarmConfiguration task configured. An error message "Invalid object guid..." might be displayed and the PLC cannot be removed. Workaround: Delete AlarmManagerTask below task configuration and delete then the PLC node.	AB-15554
Runtime licensing: Return license feature of runtime license is working on AC500 firmware versions 3.1.3 and higher. Please update AC500 firmware first to this version and then return licenses. Otherwise runtime licensing on this PLC will become unusable!	FW 3.1.0
Projects created with AC500 V3 PLCs in Automation Builder 2.0 require to manually exchange the following libraries: AC500_ExtUtils -> AC500_PM AC500_IntUtils -> AC500_Io, AC500_PM AC500_EthernetUtils -> AC500_Ethernet The V3.1 library "AC500_Ethernet" contains all Function blocks from the V3.0 library "AC500_EthernetUtils" The V3.1 library "AC500_Io" contains Function blocks from the V3.0 library "AC500_IntUtils" The V3.1 library "AC500_Pm" contains Function blocks from the V3.0 library "AC500_IntUtils" and "AC500_ExtUtils"	LIB-1424 LIB-1421 LIB-1419

Projects for AC500 V3 PLCs created with Automation Builder 2.0 need manual update if CM modules had been used as slot numbering is changed now in Automation Builder 2.1. If POUs with a "slot" parameter are used, the slot needs to be adapted to the physical CM position (from 1 to 6) on the terminal base. If EtherCAT is used in "synchronous mode", the event tasks need to be changed (e.g. "EventTask1" for the first slot, "EventTask3" for the third slot).	AB-12531
System: PLCShell command "date" and "rtc-set" cannot set a date after 2038	CPUFW-5870
Ethernet: FTP server: FTP server: If FTP server is configured on booth Ethernet interfaces ETH1 and ETH2, FTP server will be activated on ETH1 with configuration of ETH1. The FTP server configuration of ETH2 will be ignored. Workaround: Configure FTP server only on one Ethernet interface ETH1 OR ETH2.	CPUFW-5869
Network Variables (NV): does not work with default Broadcast address 255.255.255.255 Workaround: Use another Broadcast address as 255.255.255.255, e.g. 192.168.0.0	CPUFW-5803
TLS/SSL self-signed certificates can't have an End-date after 2038.	CPUFW-5765
Modbus TCP server: fast On/Off switching of server can lead to incomplete log entries (e.g. missing IP address)	CPUFW-5763
CAA-File: If the user disk is full; the PLC won't create the INI file with production data on the SD card. Workaround: - Don't fill user disk to 100% (proposed space is 10%). - Login via PLC Shell and remove files from the user disk manually.	CPUFW-5734
Diagnosis: In AC500 V3 CPU, the system diagnostic should be done using function blocks in user program or with Automation Builder using online diagnostic and Device Tree. The CPU ERR Led doesn't indicate the errors. Workaround: - Use Automation Builder or User program for diagnosis. - New POU SetLEDErr in IntUtils library in 3.0.2.	CPUFW-5221 CPUFW-5259
SD-Card: In some cases, If the SD card is removed while in PLC is in RUN mode and SD card is accessed and is put back, the PLC don´t recognize that the SD Card is put back. If you try to write on a File on the SD Card there is Error NOT_EXIST but the file is there. Workaround: Do not to remove the SD card while actively accessing it. Note: On display activity of SD card is shown as long as a file is open on it.	CPUFW-5099
Modbus TCP: It's not possible to use multiple connections to one server with Modbus TCP. Workaround: Use only one connection per Modbus TCP server.	CPUFW-5076
LIB: CommFB POUs: GETIO_PART/SETIO_PART do not work. Status code 16#40820000 will be returned. As of V3.1.0 error code "NOT_IMPLEMENTED" will be returned. Workaround: Do not use the POUs	CPUFW-4927
If the SD card is removed during a read / write process, the SD card won't remounted from the PLC after replug. POU FileClose does not output a Done or Error and remains in Busy status. Workaround: Do not remove the SD card during read/write process.	CPUFW-4684
Modbus TCP: POU ETHx_MOD_MAST and EthxModMast with wrong input data length for FCT=22, 23 leads to access violation Workaround: Check the input parameters for valid values	LIB-1615 CPU_FWLIB-104
Modbus TCP: POU ETHx_MOD_MAST with wrong input parameters leads to exception: ADDR := 16#FFFF, NB := 0 Workaround: Check the input parameters for valid values	LIB-1559 CPUFW-6154
CAA_File: FILE.close: exception in case file handle is zero. POU stays forever is state busy. Workaround: Check file handle before call FILE.close. (Must be >0)	LIB-1532 CPUFW-5060
Function Code 7 for Modbus TCP not working. Workaround: FCT=7 cannot be used until issue is fixed.	LIB-1192 CPU_FWLIB-118
Function code 23 for ETHx_MOD_TCP has different max data length (write 121, read 125) then V2 (write 125, read 125). The values in V3 are according to Modbus specification. Workaround: Use data length according to Modbus specification.	LIB-1167LIB-1167 CPU_FWLIB-125
CAA-File: The maximum number of files opened at the same time is limited to 1024. The runtime system already opened some files. So, the limit for the CAA file applications is less 1024, e.g. 1007. Workaround: Consider this limitation for CAA file application.	AB-13406 LIB-1183 CPU_FWLIB-94

CAA-File: "The files to be accessed from IEC (user) applications go to directories that are not visible for the user (e.g. /mytemp). The PLC takes the filename specified by the user and appends it to this IecFilePath, and this complete name has a length <= 255. So, the maximum length of a file name for the CAAFile user is 255 minus the length of the Iec Path." Workaround: Consider the Iec Path in the IecFilePath.	AB-13406 LIB-1176 CPU_FWLIB-9
Modbus TCP: Function code 23 for ETHx_MOD_TCP has different max data length (write 121, read 125) then V2 (write 125, read 125). The values in V3 are according to Modbus specification. Workaround: Use NOT_EXIST for both use cases	LIB-1167 CPU_FWLIB-125
CAA-File: POU FileOpen doesn't distinguish if the SD card is write-protected or if there is no SD card inserted (in both cases the error message is NOT_EXIST). Workaround: Use NOT_EXIST for both use cases	LIB-1140 CPU_FWLIB-19
OPC UA server: Property MaxMonitordItemsPerCall has been reduced to 100. If this property is read by OPC UA clients, it returns no value (null)	n.a.

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