

APPLICATION EXAMPLE

# AC500 V3 – HOW TO USE HTTP LIBRARY VERSION 2.0.0.X



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## 2 Introduction

### 2.1 Scope of the document

This documentation is an addition to the application example **AC500\_V3\_How to use HTTP Library 2.0.0.x.project** and gives an overview about the structure of the example, the configuration of the PLC and some other additional hints.

The application example itself is used to demonstrate the usage of the AC500\_Http library version 2.0.0.7 and newer.

### 2.2 Compatibility

The application example explained in this document has been used with the below engineering system versions. They should also work with other versions, nevertheless some small adaptations may be necessary, for future versions.

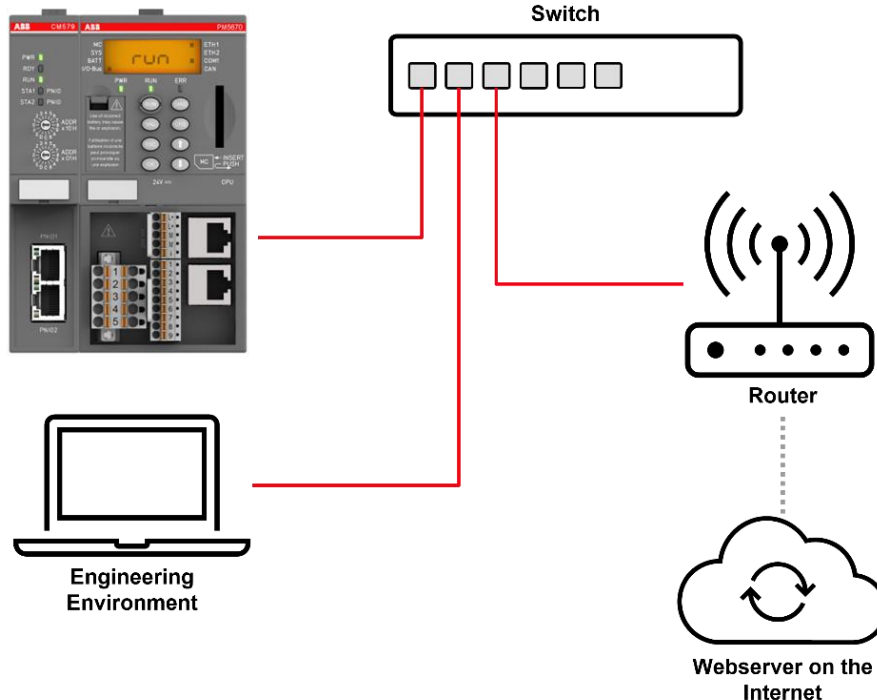
- AC500 V3 PLC
- Automation Builder 2.6.0 or newer
- AC500\_Http library version 2.0.0.8 or newer
- AC500\_Tcp library version 0.0.0.8 or newer



Note: This document does not explain the functionalities of the AC500\_Http library. To learn more about the library itself, please click [here](#).

### 2.3 Overview

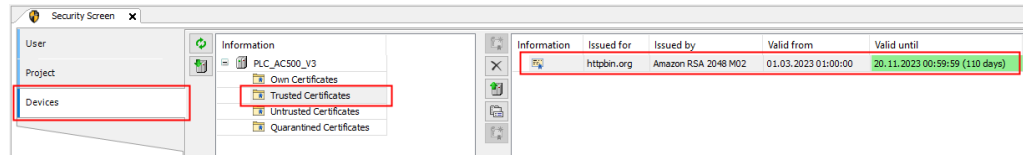
AC500 V3/ AC500-eCo V3  
Client



## 3 Automation Builder Project

### 3.1 Preconditions

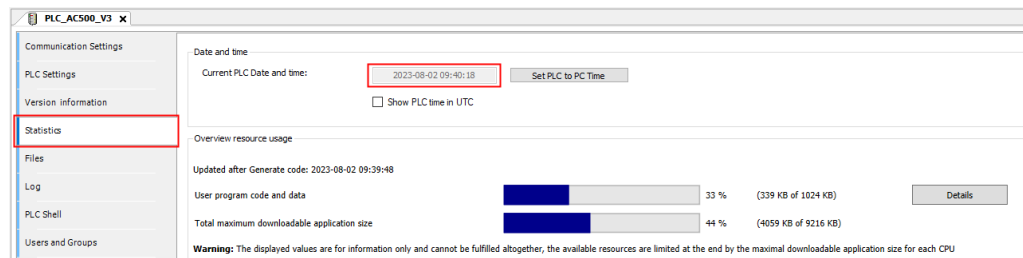
- To make use of the HTTPS functionality, the server certificate must be imported in the Certification Store of Automation Builder (**View > Security Screen**)



**Note:**

The application example uses <https://httpbin.org> as test server. The actual certificate of the server is attached to this application example.

- The PLC clock needs to be set to the actual time. This is required to evaluate the validation time of the Certificate. To set the PLC time via the tab Statistics, Automation Builder needs to be logged in to the PLC.



- If the server is in the internet, the PLC needs to be connected to the internet as well and the Standard Gateway needs to be set accordingly.

## 3.2 IP Setting

The application example uses an URL with hostname address of the server. To use hostnames as URL, the IP settings must be set to DHCP.

- For this, please open Automation Builder and click on **Tools > IP Configuration**
- Scan for your devices and select the ethernet port of your PLC which shall be used for HTTP communication
- Enable **DHCP** mode for this port and write the configuration with “**Send settings**”

Scan Protocols

- ☒ ABB Net config protocol
- ☐ Profinet Dynamic Configuration Protocol (DCP)
- ☐ EtherCAT

IP settings

- ☒ DHCP

Selected device PM5072-T-2ETH ETH1  
SN=00000428  
ID=0x00

IP address 192 . 168 . 4 . 72

Subnet mask 255 . 255 . 240 . 0

Std. gateway 192 . 168 . 0 . 1

Link mode Auto

Send settings

Blink Duration (s): 10



### Note:

The network requires a router with DHCP server and access to a DNS server.

- Make sure the second ethernet port is in another network range

00-24-59-18-14-34	PM5072-T-2ETH	ETH1	00000428	0x00	--	192.168.14.128	192.168.4.72
00-24-59-18-14-34	PM5072-T-2ETH	ETH2	00000428	0x00	--	10.100.16.96	10.100.16.96

If no router with DHCP server is available, the standard gateway should be set to access the internet with the PLC:

Selected device PM5072-T-2ETH ETH1  
SN=00000428  
ID=0x00

IP address 192 . 168 . 4 . 72

Subnet mask 255 . 255 . 240 . 0

Std. gateway 192 . 168 . 0 . 1

Link mode Auto

To resolve the hostnames IP address the windows Command prompt can be used to ping the server. The ping will reply with the servers IP address which then can be used inside the program.

```

C:\Users\...>ping httpbin.org

Microsoft Windows [Version 10.0.19044.3208]
(c) Microsoft Corporation. All rights reserved.

C:\Users\...>ping httpbin.org

Pinging httpbin.org [100.26.90.23] with 32 bytes of data:
Request timed out.

```

Another possibility is to use the **EthDNSResolve** function block from the AC500\_Ethernet library to resolve the hostname dynamically inside the IEC code.



Note:

EthDNSResolve is not part of the application example.

### 3.3 Library manager

To use the application example, the **AC500\_Http** library version 2.0.0.7 and the **AC500\_Tcp** library version 0.0.0.7 must be installed to your library repository.

The screenshot shows the 'Library Manager' window with the following table of libraries used in the application 'PLC\_AC500\_V3.Application':

Name	Namespace	Effective Version
AC500_DiagTypes = DiagTypes, 1.2.6.1 (ABB)	AC500_DiagTypes	1.2.6.1
AC500_Ethernet = Ethernet, 1.4.0.9 (ABB)	AC500_Ethernet	1.4.0.9
AC500_Http = Http, 2.0.0.8 (ABB)	AC500_Http	2.0.0.8
AC500_Async = Async, 1.2.3.10 (ABB)	AC500_Async	1.2.3.10
AC500_StateMachine = StateMachine, 1.0.6.6 (ABB)	AC500_StateMachine	1.0.6.6
AC500_Tcp = Tcp, 0.0.0.8 (ABB)	AC500_Tcp	0.0.0.8
CmpCrypto = CmpCrypto, 3.5.17.0 (System)	CmpCrypto	3.5.17.0
CmpErrors2 Interfaces, * (System)	CmpErrors	3.5.19.0
Standard = Standard, 3.5.18.0 (System)	Standard	3.5.18.0

The 'Contents of selected library 'Http, 2.0.0.8 (ABB)' are shown in the bottom left:

- Http, 2.0.0.8 (ABB)
  - history
  - Enums
  - Function Blocks

The bottom right shows the 'Details about selected library element 'Overview'' with the title 'Http Library Documentation'.

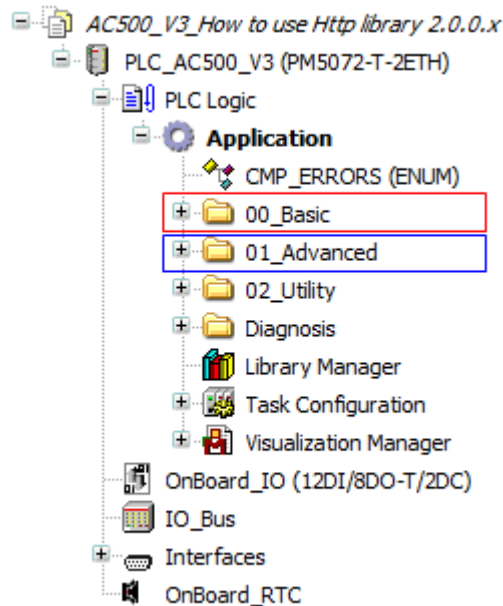


Note:

The libraries are not delivered within Automation Builder installation and needs to be downloaded separately from our internal ABB library.

## 3.4 IEC programming structure

For easy use of the application example the program has been divided into two parts – Basic and Advanced:

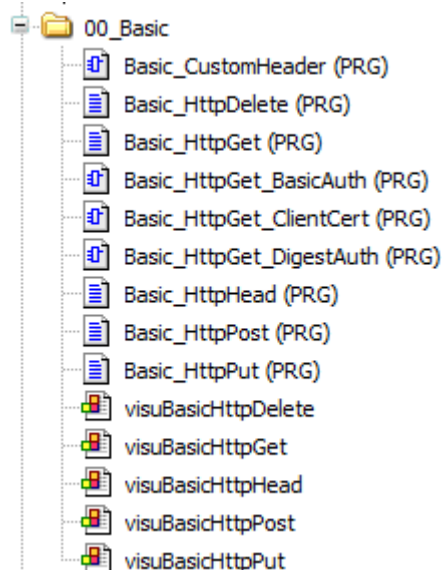


The folder **02\_Utility** includes a simple function to convert and map the components error of the **AddErrNo** output of the function blocks to readable text. The error list is available at the library **AC500\_Http.CmpErrors.Errors**.

### 3.4.1 Basic

As the folder already says, the 02\_Basic part contains basic calls of the AC500\_Http library.

Each HTTP request function block is coded in a separate PROGRAM in structure text (ST). Additionally, HttpGet request with Basic and Digest authentication as well as the client certificate is provided in Function Block Diagram (FBD).





The visualization of the Basic function block calls provides a simple overview where the request can be triggered by clicking on the **SEND** button and the response is seen accordingly.

### AC500 V3 - How to use HTTP library 2.0.0.x

Simple Http Get request

Test URL:  
https://httpbin.org/get

SEND

**Response:**  
HTTP/1.1 200 OK  
Date: Wed, 02 Aug 2023 07:42:44 GMT  
Content-Type: application/json  
Content-Length: 199  
Connection: close  
Server: gunicorn/19.9.0  
Access-Control-Allow-Origin: \*  
Access-Control-Allow-Credentials: true

**Content (Body):**  
{  
 "args": {},  
 "headers": {  
 "Host": "httpbin.org",  
 "X-Amzn-Trace-Id": "Root=1-64ca08f2-62301c810cb9d6a0140aa4e8"  
 },  
 "origin": "37.81.210.229",  
 "url": "https://httpbin.org/get"  
}

BUSY

DONE

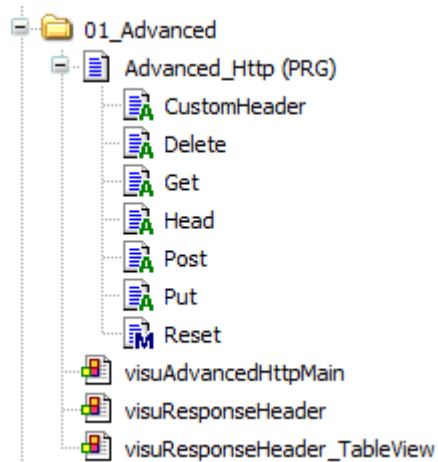
ERROR

Error ID:  
NO\_ERROR  
Additional Error ID:  
ERR\_OK

The URL can be modified and the state of the function blocks is displayed on the right.

## 3.4.2 Advanced

The advanced part in the **01\_Advanced** folder contains one PROGRAM that includes all functionalities of the HTTP Library combined in one:



With the visualization **visuAdvancedHttpMain**, the functionalities can be tested.

Similar to the basic visualization, the URL can be modified and the request is send out by clicking the buttons.

The following picture shows the additional features that can be used with that example.

### AC500 V3 - How to use HTTP library 2.0.0.x

Expert use of library

The screenshot displays the visuAdvancedHttpMain interface with several red annotations highlighting specific features:

- Select your request type:** A red box highlights the GET, HEAD, POST, PUT, and DELETE buttons at the top.
- Create a custom header & check the outcome:** A red box highlights the 'Request to server' section, which shows the details of the outgoing request.
- Use the buttons to display response header in different ways:** A red box highlights the '<' and '>' buttons in the 'Response header' section.
- Enable TLS, Basic or Digest authentication and enter your username and password:** A red box highlights the 'Activate TLS for client certification' checkbox and the authentication method buttons (None, Basic, Digest) along with the Username and Password input fields.

The interface includes a URL input field with 'http://httpbin.org/get', a 'SEND' button, and a 'Response body' section displaying a JSON response from httpbin.org.

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