APPLICATION EXAMPLE

AC500 V3 DIAGNOSIS IN THE IEC APPLICATION EXAMPLE

GET DIAGNOSIS FROM CPU AND FIELDBUS DEVICES IN THE IEC APPLICATION PROGRAM

Contents

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2 Introduction

2.1 Scope of the document

This application example shows how to integrate and use the function blocks to get the diagnosis messages in the IEC601131 program of an AC500-V3 PLC

2.2 Compatibility

The application example explained in this document have 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 2.4.1 or newer

2.3 Overview

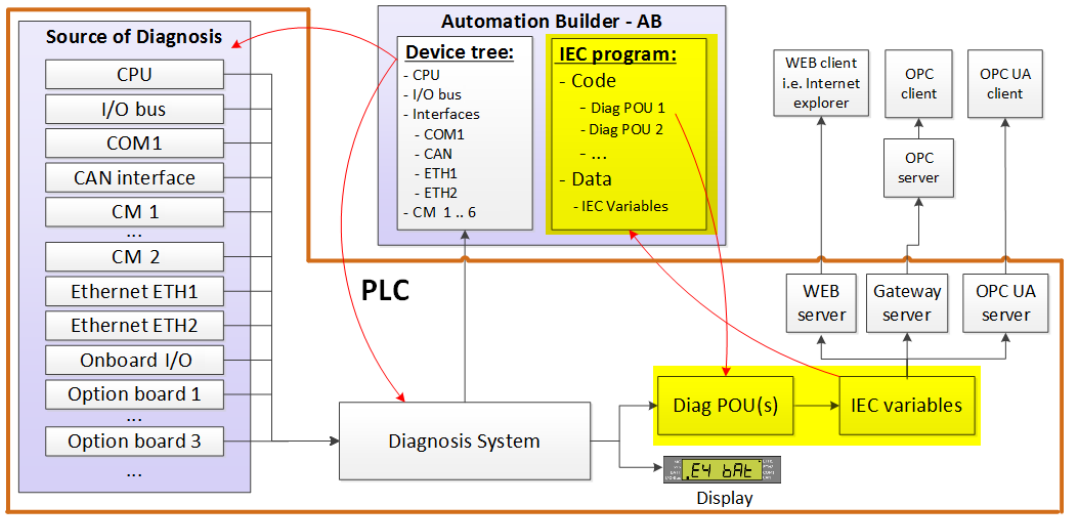
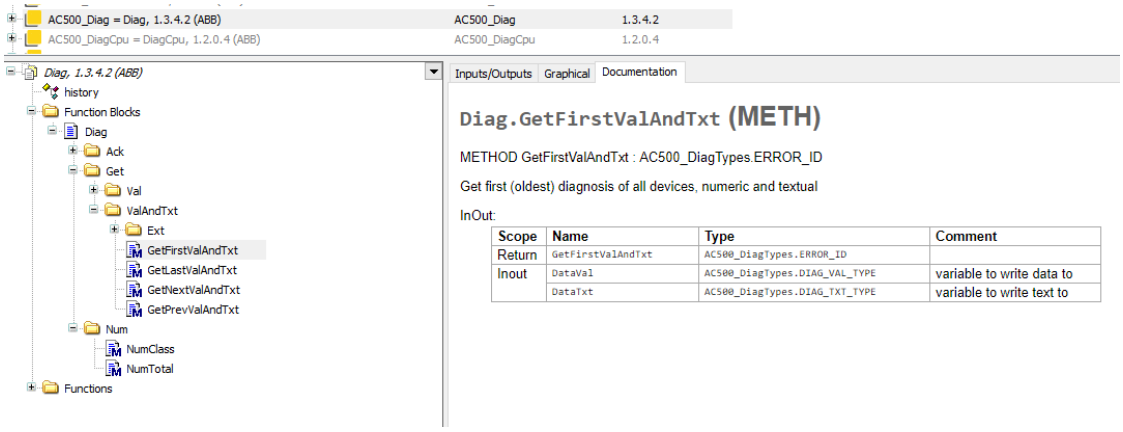


Fig. 1: Overview of the diagnosis system

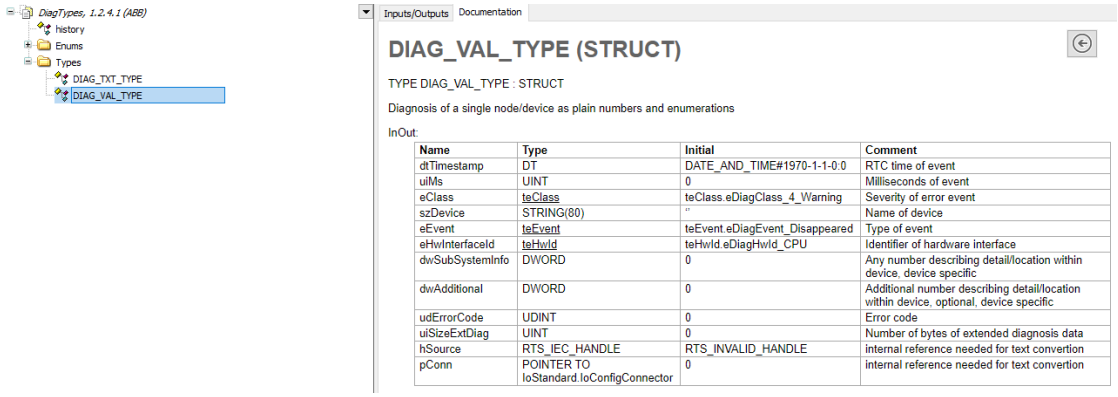
3 Diagnosis in the IEC Code

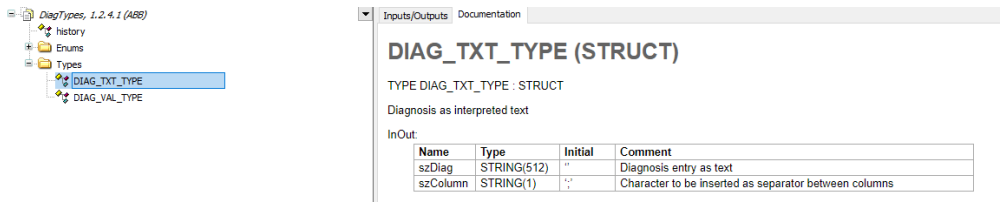
3.1 Diagnosis library

For the diagnosis the ‘Diag’ library is used. With the help of this library and the methods of the Diag function block the diagnostic messages can be read into the IEC code.



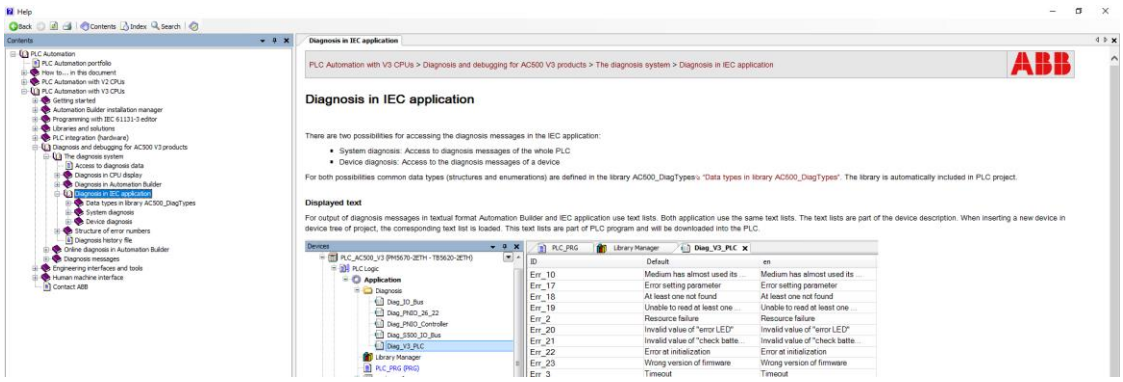
It is possible to get the values in a raw value format or a text format.





The IEC variables in the code can be visualized or shared to any other system.

Further information can be found in the library description or the online help.



3.2 Functionality of the program

The Program *Diagnosis* should be called by any slow task with a low priority. The *Diagnosis* program is reading all active diagnostic messages as values and text type. With the method *CreateVisuDiagStruct* the message in value and text format is stored into a structure.

The *Diagnosis* program is storing these messages into an array. This array *asErrVal* has a maximum size of 100 entries. This size can be changed. It is used for the visualization or can be shared to other systems.

Active diagnostic messages

	Timestamp	Class	Device	Interface	Message
1	DT#2021-08-11-12:05:56	E4	CI502_IO	Coupler 1	Subslot 0x1,S500 Diagnosis, No process voltage UP or UP3 -> Check process voltage
2	DT#2021-08-11-12:05:56	E4	CI502_IO	Coupler 1	Subslot 0x1,S500 Diagnosis, Process voltage UP or UP3 too low -> Check process voltage
3	DT#2021-08-11-12:05:54	E4	CD522	I/O Bus	Process voltage switched off
4	DT#2021-08-11-12:05:54	E3	CD522	I/O Bus	Process voltage too low -> Check process voltage
5	DT#2021-08-11-12:05:44	E4	AX522	I/O Bus	Channel 4 Measurement overflow or not configured module

Further information can be found as comments inside the code.

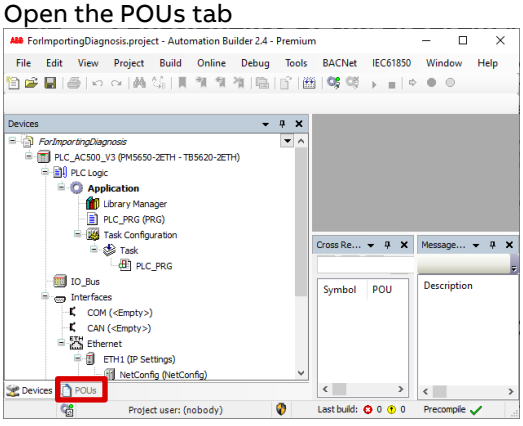
3.3 Including the diagnosis functionality into an existing project

The application example ‘AC500_V3_Diagnosis’ can also be used with other hardware. The export file which is also included in the package can be imported to existing applications.

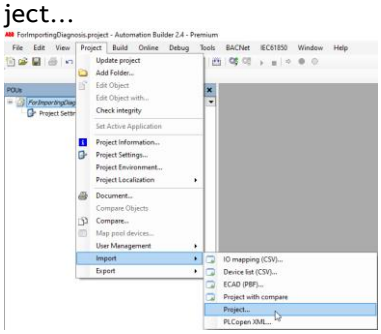
1. Open the project where the diagnosis functionality shall be included

   It is possible to include the export file to the POUs or to any PLC Application. Here the import to the POUs is shown. In case of importing it to the application skip step 2 and select “Application” in step 3.

2. Open the POUs tab

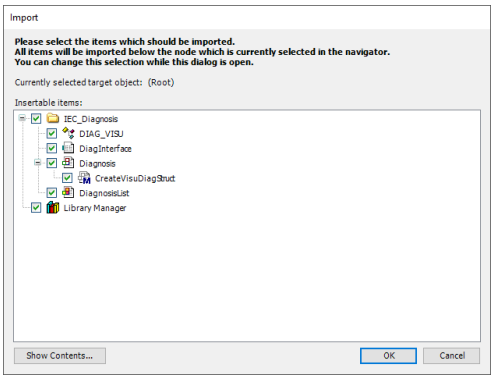


3. Select the project name here ‘ForImportingDiagnosis’ and click Project>Import>Project…



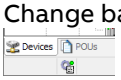
4. Open the AC500_V3_Diagnosis.export file

5. Click “OK”



6. Find the new objects in the POUs tree or below the Application

7. Change back to Devices

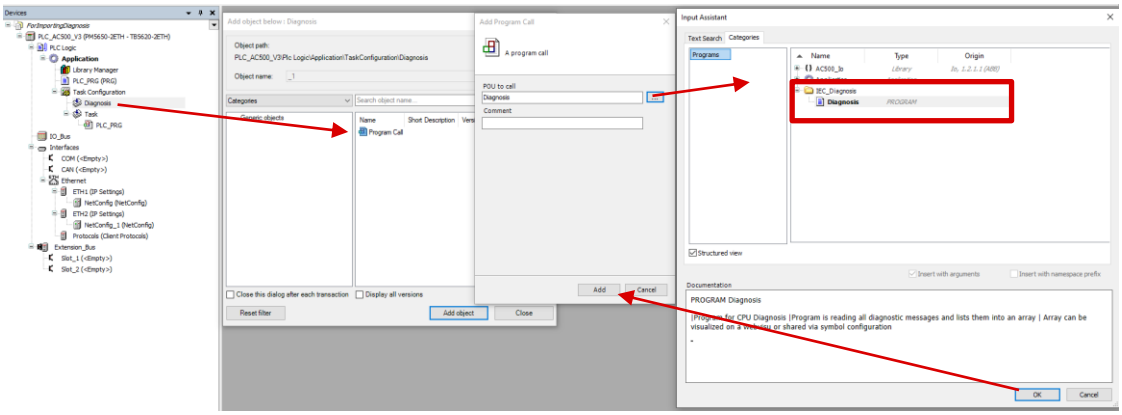


8. Right-click the Task Configuration and select ‘Add object’

9. Add another task to the project

10. Add another object to the new task and select Program Call

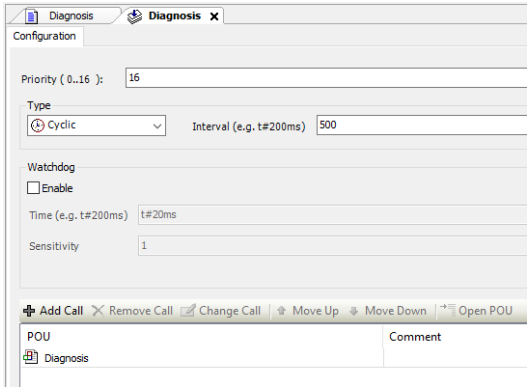
11. With the input assistant browse to ‘Diagnosis’



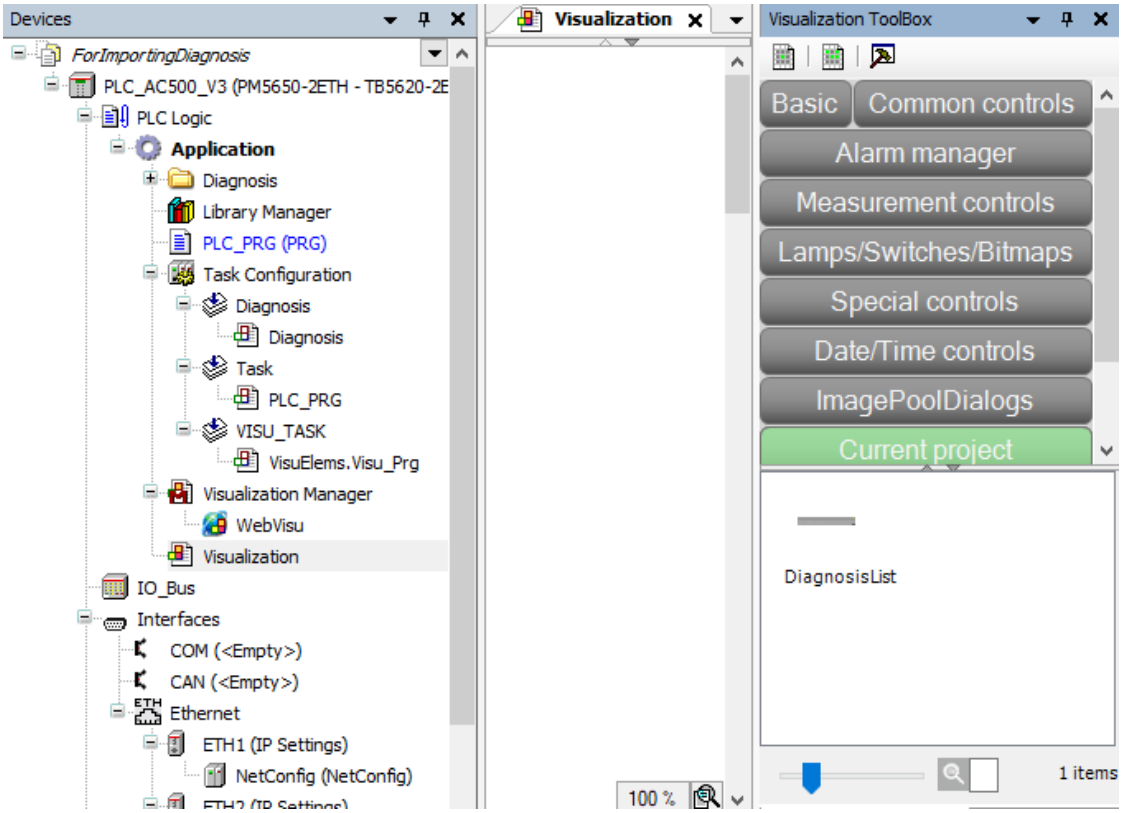
12. Confirm with ‘OK’ and ‘Add’

13. Double click the new task here called ‘Diagnosis’

14. Use a low priority for this task and a high cycle time. Disable the watchdog.
Here Prio 16 and task cycle time 500ms is used



15. To visualize the Diagnosis messages, drag and drop the ‘DiagnosisList’ from the ‘Current project’ to any existing visualization



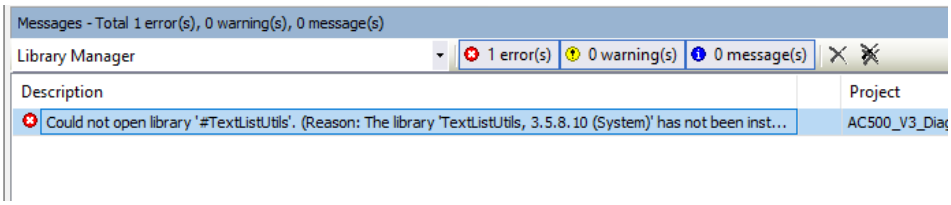
16. The project can now be compiled and downloaded including the diagnosis features. All active diagnostic messages will be displayed in the visu and are available in the program in the array ‘asErrVal’

Active diagnostic messages

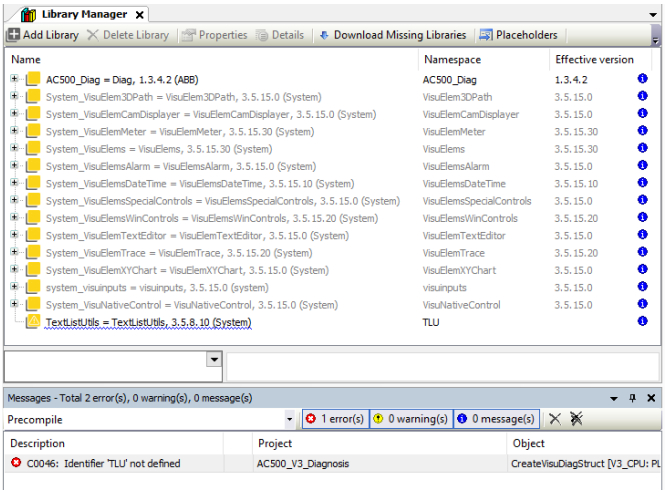
	Timestamp	Class	Device	Interface	Message
1	DT#2021-08-11-12:05:56	E4	CI502_IO	Coupler 1	Subslot 0x1,S500 Diagnosis, No process voltage UP or UP3 -> Check process voltage
2	DT#2021-08-11-12:05:56	E4	CI502_IO	Coupler 1	Subslot 0x1,S500 Diagnosis, Process voltage UP or UP3 too low -> Check process voltage
3	DT#2021-08-11-12:05:54	E4	CD522	I/O Bus	Process voltage switched off
4	DT#2021-08-11-12:05:54	E3	CD522	I/O Bus	Process voltage too low -> Check process voltage
5	DT#2021-08-11-12:05:44	E4	AX522	I/O Bus	Channel 4 Measurement overflow or not configured module

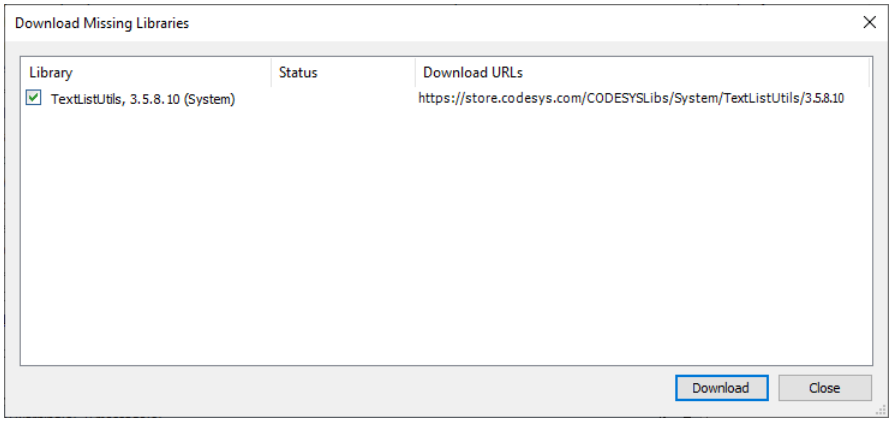
3.4 Missing TextListUtils library

Depending on the used Automation Builder installation it could be that the TextListUtils library is not installed to your library repository. If this is the case an error like shown below will be visible.



To solve it open the library manager. Depending on where you inserted the code the library manager in the Devices or POUs tree. The missing TextListUtils library can be installed by clicking “Download Missing Libraries”. Then the library is downloaded and installed from the CODESYS store.


Library Manager
Add Library
Delete Library
Properties
Details
Download Missing Libraries
Placeholders
Name
Namespace
Effective version
AC500_Diag = Diag, 1.3.4.2 (ABB)
AC500_Diag
1.3.4.2
System_VisuElem3DPath = VisuElem3DPath, 3.5.15.0 (System)
VisuElem3DPath
3.5.15.0
System_VisuElemCamDisplayer = VisuElemCamDisplayer, 3.5.15.0 (System)
VisuElemCamDisplayer
3.5.15.0
System_VisuElemMeter = VisuElemMeter, 3.5.15.30 (System)
VisuElemMeter
3.5.15.30
System_VisuElems = VisuElems, 3.5.15.30 (System)
VisuElems
3.5.15.30
System_VisuElemsAlarm = VisuElemsAlarm, 3.5.15.0 (System)
VisuElemsAlarm
3.5.15.0
System_VisuElemsDateTime = VisuElemsDateTime, 3.5.15.10 (System)
VisuElemsDateTime
3.5.15.10
System_VisuElemsSpecialControls = VisuElemsSpecialControls, 3.5.15.0 (System)
VisuElemsSpecialControls
3.5.15.0
System_VisuElemsWinControls = VisuElemsWinControls, 3.5.15.20 (System)
VisuElemsWinControls
3.5.15.20
System_VisuElemTextEditor = VisuElemTextEditor, 3.5.15.0 (System)
VisuElemTextEditor
3.5.15.0
System_VisuElemTrace = VisuElemTrace, 3.5.15.20 (System)
VisuElemTrace
3.5.15.20
System_VisuElemXYChart = VisuElemXYChart, 3.5.15.0 (System)
VisuElemXYChart
3.5.15.0
system_visuinputs = visuinputs, 3.5.15.0 (system)
visuinputs
3.5.15.0
System_VisuNativeControl = VisuNativeControl, 3.5.15.0 (System)
VisuNativeControl
3.5.15.0
TextListUtils = TextListUtils, 3.5.8.10 (System)
TLU
Messages - Total 2 error(s), 0 warning(s), 0 message(s)
Precompile
1 error(s)
0 warning(s)
0 message(s)
Description
Project
Object
C0046: Identifier 'TLU' not defined
AC500_V3_Diagnosis
CreateVisuDiagStruct [V3_CPU: PL


Download Missing Libraries
Library
Status
Download URLs
TextListUtils, 3.5.8.10 (System)
https://store.codesys.com/CODESYSLibs/System/TextListUtils/3.5.8.10
Download
Close

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