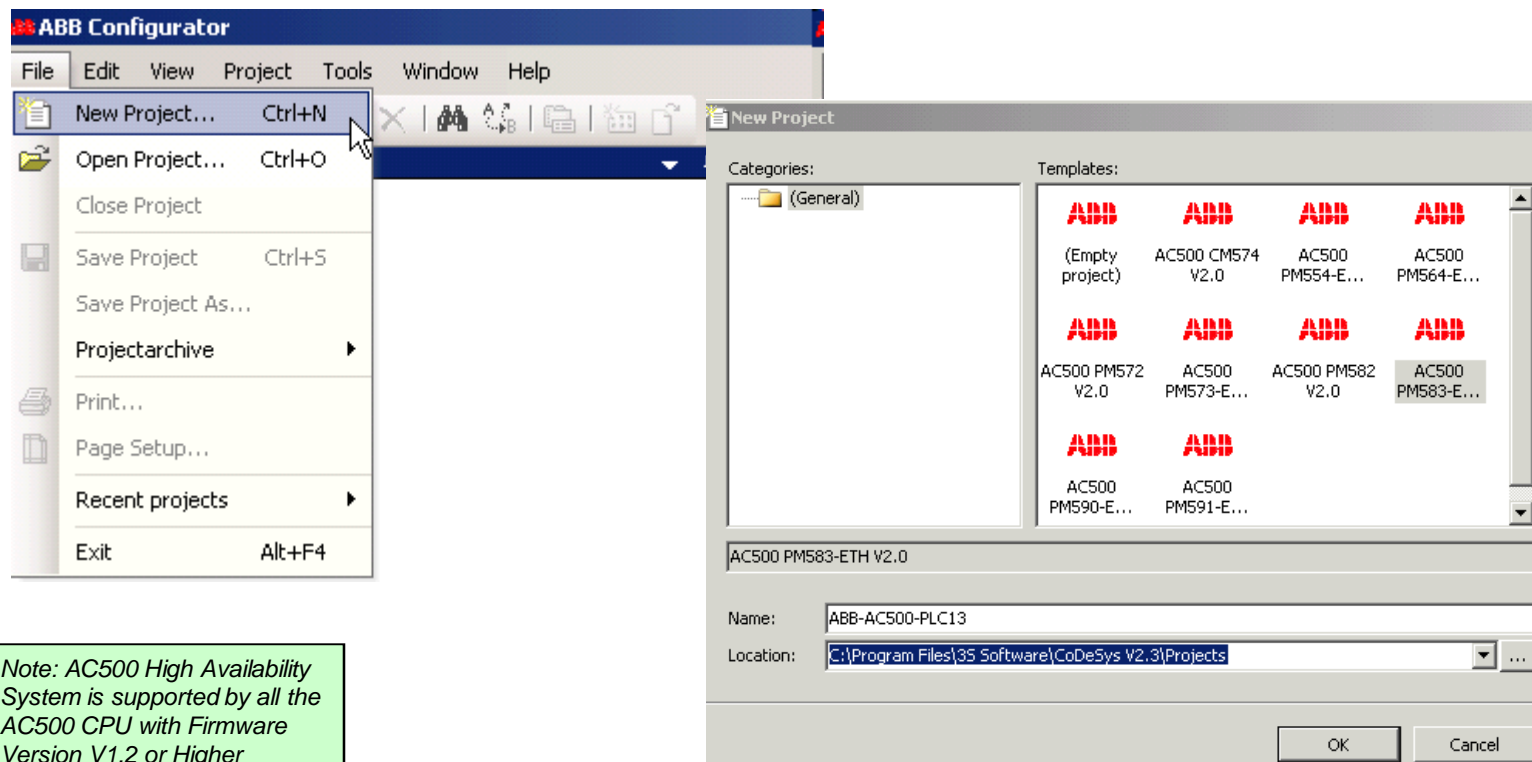


Scalable PLC AC500

AC 500 High Availability HA Application - Getting started

HA Application - Getting started

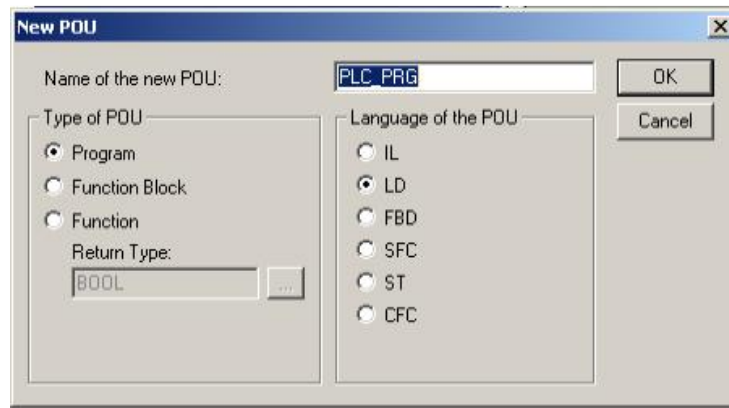
- 1. Select a 'New' Project and select the required AC500 PLC CPU – 'AC500 PM583-ETH V2.0'



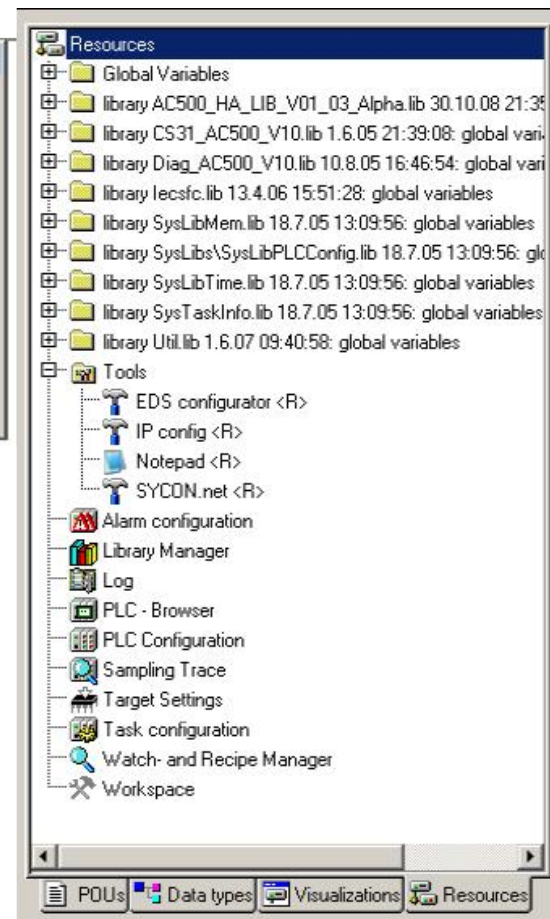
Note: AC500 High Availability System is supported by all the AC500 CPU with Firmware Version V1.2 or Higher

HA Application - Getting started

- 2. Create the Default Program '**PLC_PRG**' by pressing '**OK**'. Select the Programming language of your choice (E.g. LD – LADDER, FBD – Function Block Diagram etc.,).

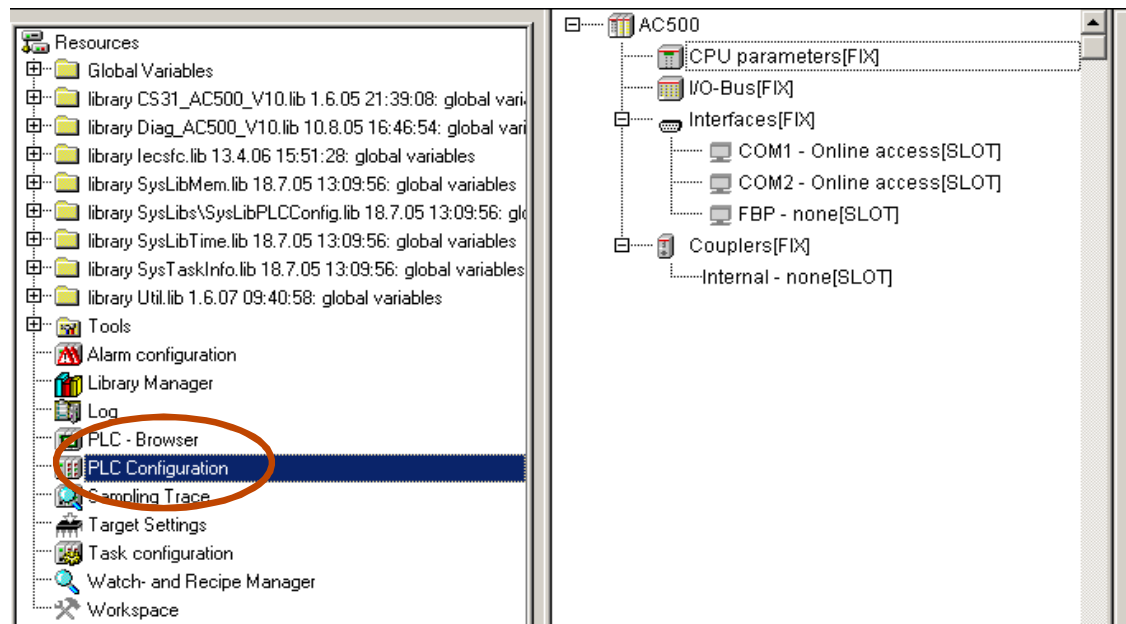


- 3. 'Save' the project and Select the '**Resources Window**' as shown below.



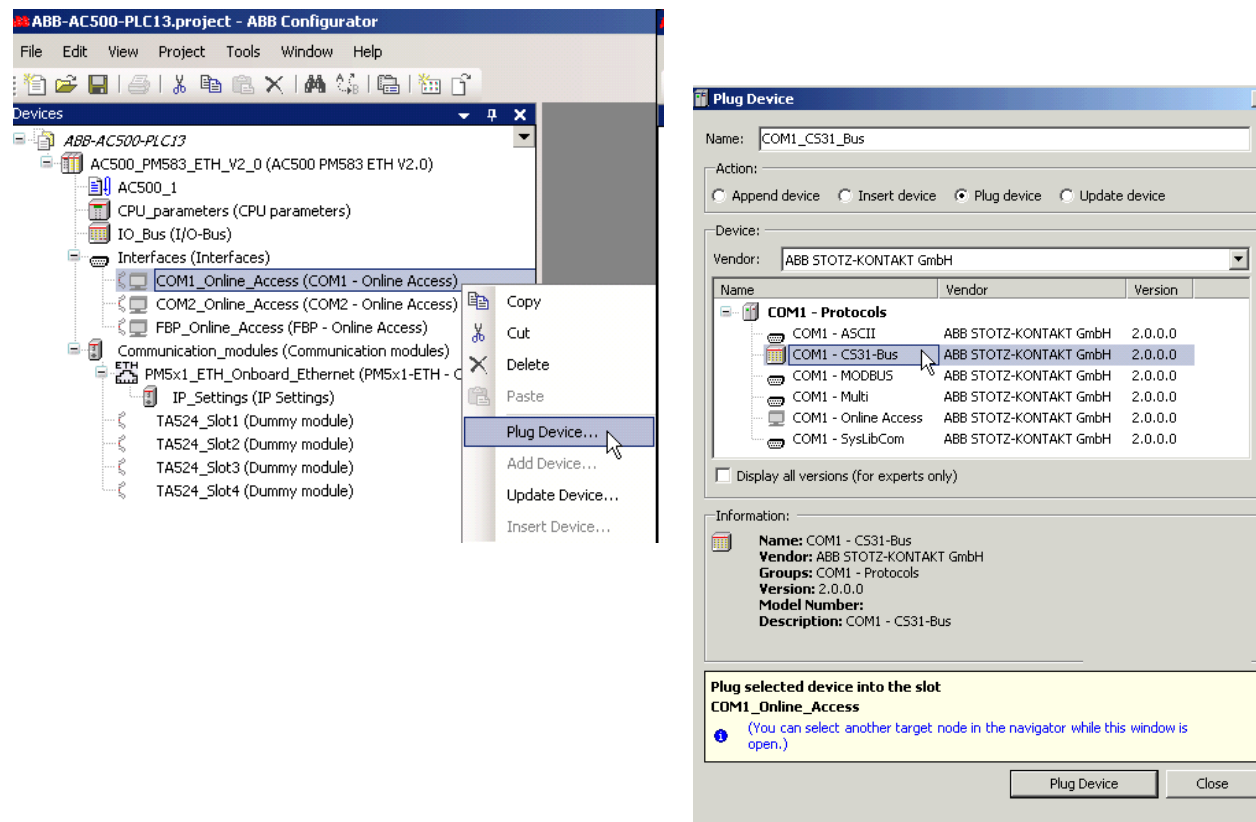
HA Application - Getting started

- 4. Select the 'PLC Configuration'



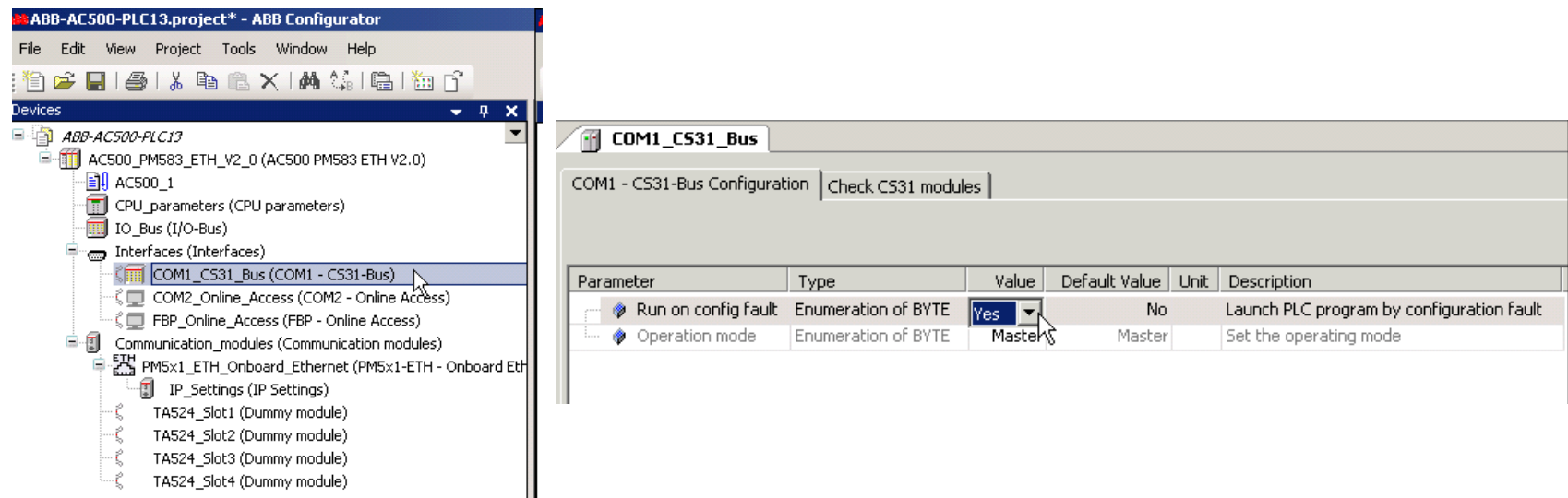
HA Application - Getting started

- 5. Select and right click on '**COM1**' -> '**Plug Device**' and choose '**COM1-CS31-Bus**' as shown below. After validated by '**Plug Device**'



HA Application - Getting started

- 6. Click on the '**COM1 – CS31-Bus**', and in '**COM1 – CS31-Bus Configuration**' select '**Run on config fault**' as '**Yes**' as shown below..

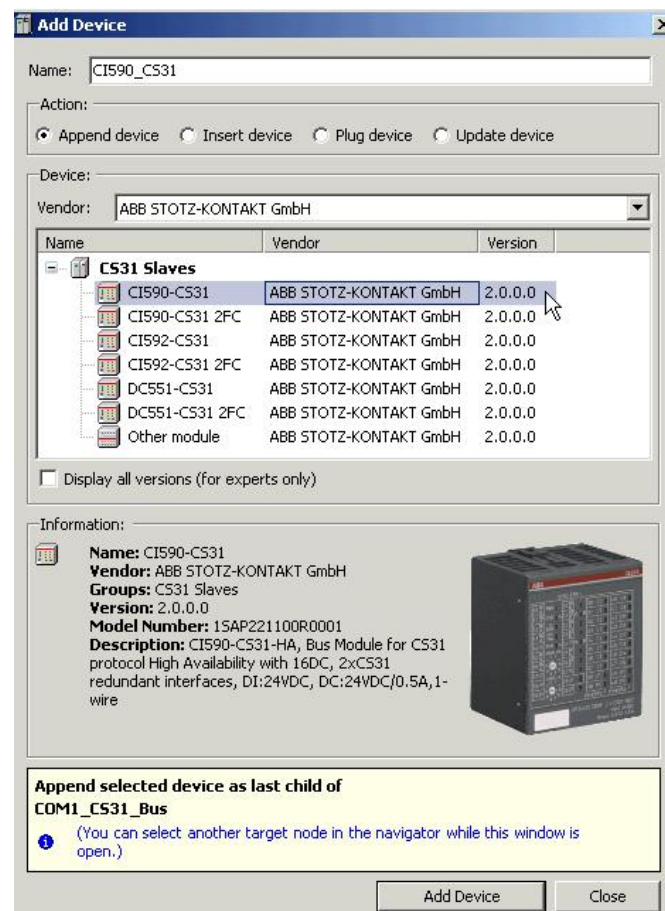
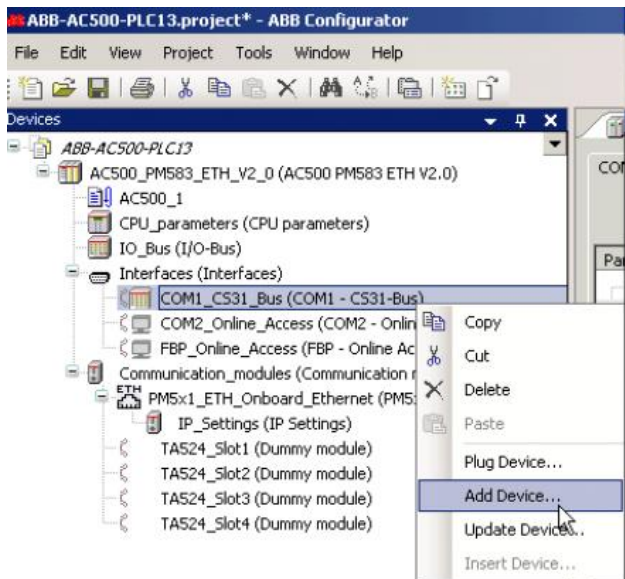


The screenshot shows the ABB Configurator interface. On the left, the 'Devices' tree is expanded to show the 'COM1_CS31_Bus (COM1 - CS31-Bus)' configuration. On the right, the 'COM1_CS31_Bus Configuration' window is open, displaying a table of parameters. The 'Run on config fault' parameter is highlighted, and its value is set to 'Yes'.

Parameter	Type	Value	Default Value	Unit	Description
Run on config fault	Enumeration of BYTE	Yes	No		Launch PLC program by configuration fault
Operation mode	Enumeration of BYTE	Master	Master		Set the operating mode

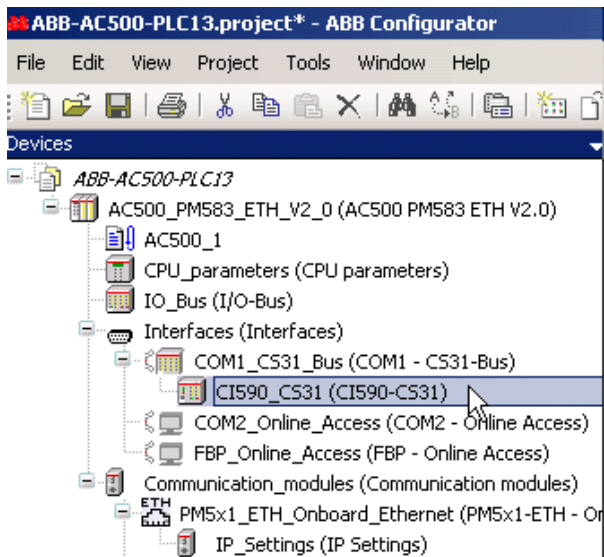
HA Application - Getting started

- 7. Select and right click on 'COM1 – CS31-Bus' -> 'Add Device' and Select 'CI590-CS31 16DC' or 'CI590 16DC + 2 FC' depending on the requirement.



HA Application - Getting started

- 8. Double Click on 'CI590-CS31-Bus' and in the **CI590-CS31 Configuration** – Set the Module Address (Range 1-61). In normal cases address set here should be same as set on the module potentiometer. In case of “Fast Counter”, please note that address to be set on the module potentiometer is equal to (70 + set address in the PLC configuration).

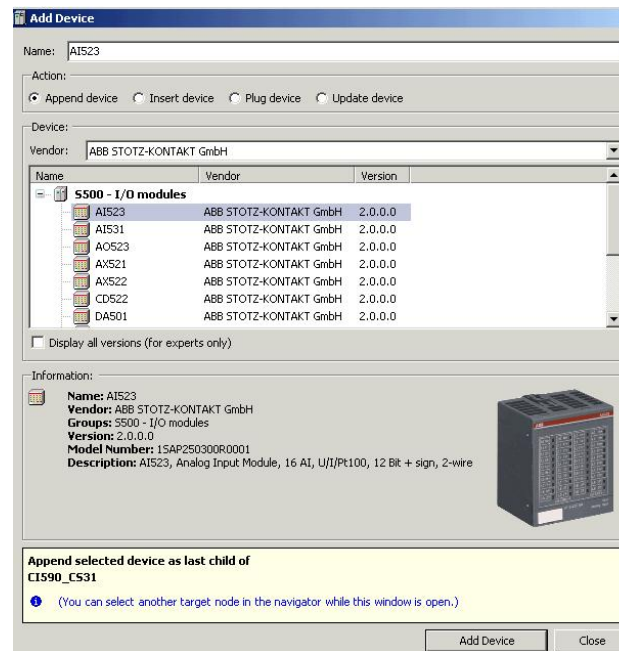
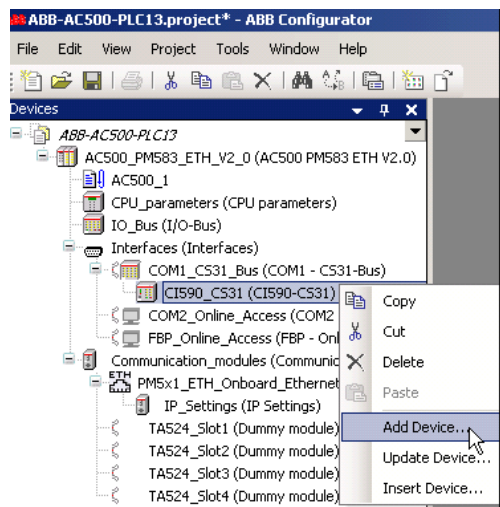


The screenshot shows the 'CI590_CS31' configuration dialog box. The 'CI590-CS31 Configuration' tab is active. The 'Module address' parameter is highlighted, and its value is set to 1. A red circle highlights the value field. The dialog box contains a table of parameters with the following data:

Parameter	Type	Value	Default Value	Unit	Description
Ignore module	Enumeration of BYTE	Yes	No		Module in configuration
Module address	BYTE(0..61)	1	1		Set the address of the CS31 module (same setting as DIP switches 1)
Error LED / Failsafe function	Enumeration of BYTE	Off	On		Error LED off by error class
Stop behaviour	Enumeration of BYTE	Switchover	Switchover		Stop behaviour
Output compare	Enumeration of BYTE	No check	No check		Compare bus1/bus2 outputs
Check supply	Enumeration of BYTE	On	On		Check supply
Input delay	Enumeration of BYTE	8 ms	8 ms		Input delay of digital inputs
Detect short circuit at outputs	Enumeration of BYTE	On	On		Check for short circuit
Behaviour outputs at comm. er...	Enumeration of BYTE	Off	Off		Output value by communication error of I/O-Bus - Substitute value only for digital de
Substitute value	WORD(0..65535)	0	0		Set the substitute value - Bit 15 = Output 15 (C31 / O15) - Bit 8 = Output 8 (C2

HA Application - Getting started

- 9. Right click on the 'CI590 CS31' -> **Add device** -> and Select the I/O Modules in the same order as arranged physically in the Hardware arrangement and parameterize the individual I/O modules as per the requirement.



- 10. Please repeat the Steps 7, 8 and 9 for all the CI590 to be connected on the CS31-Bus.

HA Application - Getting started

- In AC500 High Availability System the synchronization between two CPUs is done through Ethernet Link and UDP Protocol. If on board Ethernet port of the CPU is used for UDP communication it needs to be configured for UDP Protocol. Below is the procedure for the same.
- 11. Right click on 'PM5x1-ETH-Onboard –Ethernet' and select 'Add Device'. Select UDP data exchange and 'Add Device'.

(Note: It is also possible to use **Ethernet Couplers (CM577-ETH)** for synchronization, and then the respective SLOT number should be entered in **HA_CS31_CONTROL Block**)

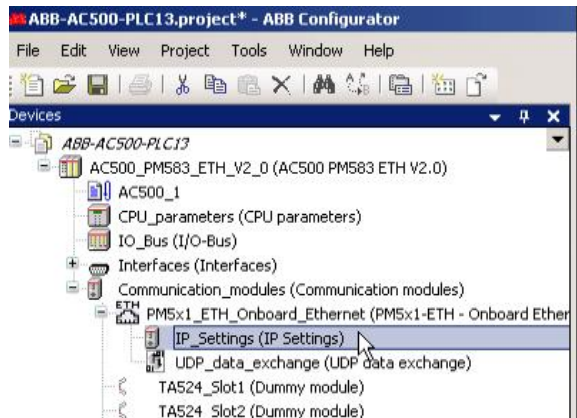
The screenshot shows the ABB Configurator interface with the 'Add Device' dialog box open. The dialog box has the following fields and options:

- Name: UDP_data_exchange
- Action: Append device (selected), Insert device, Plug device, Update device
- Vendor: ABB STOTZ-KONTAKT GmbH
- Device list:

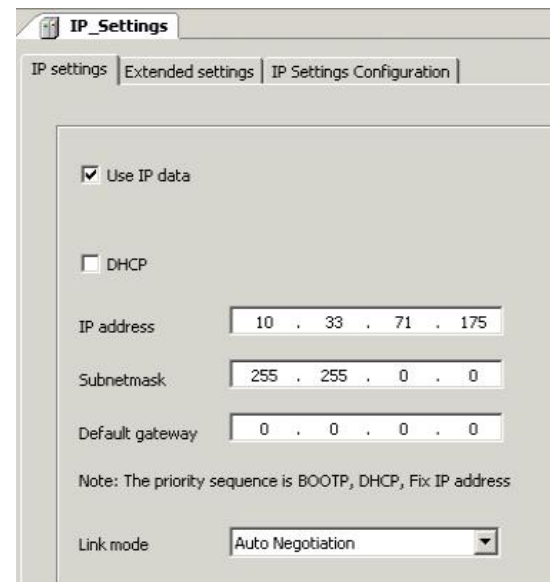
Name	Vendor	Version
IEC 60870-5-104	ABB STOTZ-KONTAKT Gm...	2.0.0.0
MODBUS on TCP/IP	ABB STOTZ-KONTAKT Gm...	2.0.0.0
UDP (no AC31 header)	ABB STOTZ-KONTAKT Gm...	2.0.0.0
UDP data exchange	ABB STOTZ-KONTAKT Gm...	2.0.0.0
- Display all versions (for experts only):
- Information:
 - Name: UDP data exchange
 - Vendor: ABB STOTZ-KONTAKT GmbH
 - Groups:
 - Version: 2.0.0.0
 - Model Number:
 - Description: UDP data exchange
- Append selected device as last child of: PM5x1_ETH_Onboard_Ethernet
- (You can select another target node in the navigator while this window is open.)

HA Application - Getting started

- 12. Double Click on IP_Settings

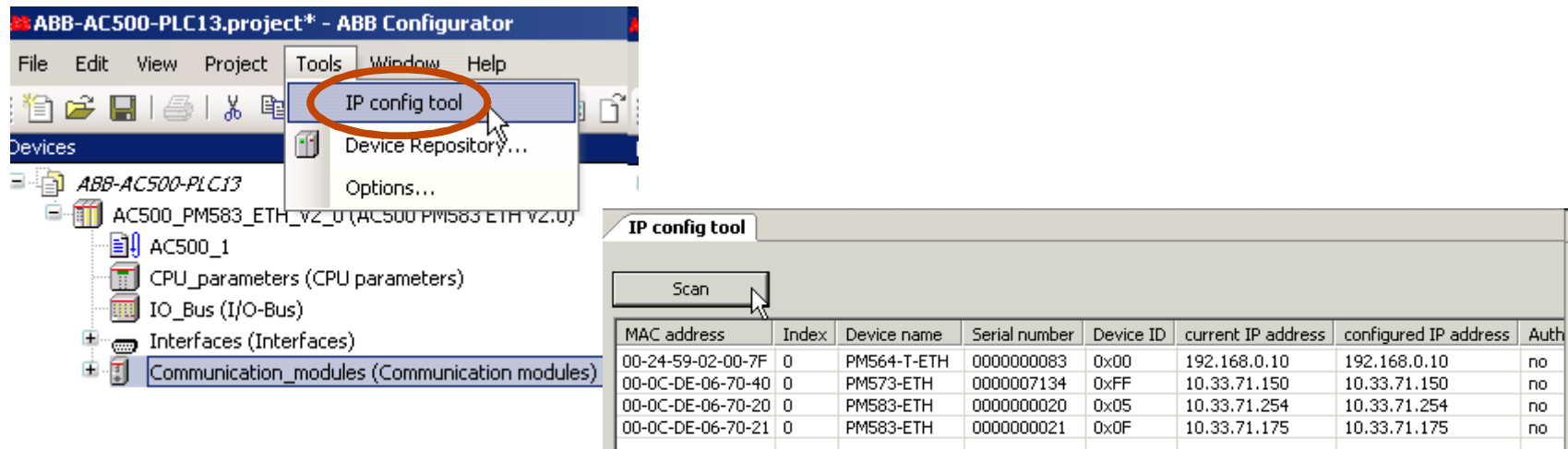


- 13. choose your IP address ,
Your subnetmask and if it's
necessary your default gateway



HA Application - Getting started

- 14. To download the Configuration from Ethernet port, we should know the IP address of the available AC500 CPUs. If not below is the Procedure to find the IP address and set desired IP address to the CPUs. Select '**Tools**' -> Double click on the '**IP config tool**' as shown below. Click on '**Scan**' button, then '**IP config tool**' software searches all the AC500 CPU available in the network and lists the same as shown below.



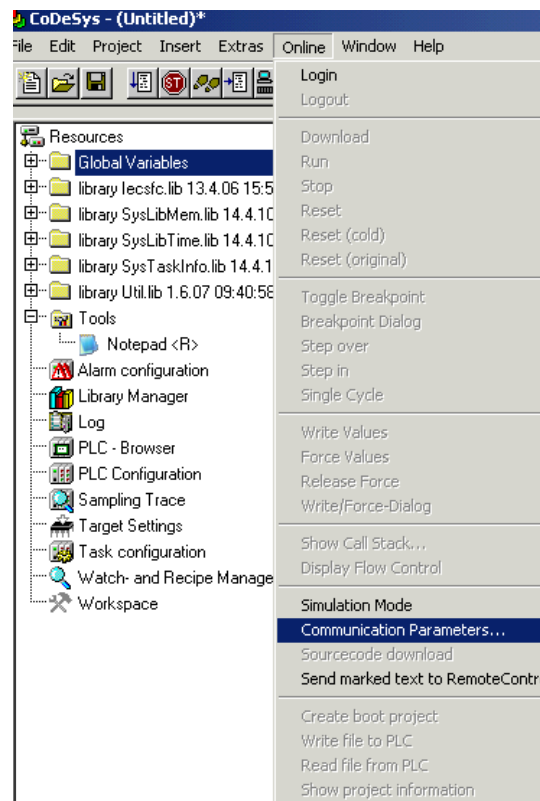
The screenshot shows the ABB Configurator interface. The 'Tools' menu is open, and 'IP config tool' is highlighted. Below it, the 'Device Repository...' and 'Options...' options are visible. The main project tree on the left shows the hierarchy: ABB-AC500-PLC13 > AC500_PM583_ETH_V2_0 (AC500 PM583 ETH V2.0) > AC500_1 > CPU_parameters (CPU parameters) > IO_Bus (I/O-Bus) > Interfaces (Interfaces) > Communication_modules (Communication modules).

The 'IP config tool' window is open, showing a 'Scan' button and a table of discovered devices. The table has the following data:

MAC address	Index	Device name	Serial number	Device ID	current IP address	configured IP address	Auth
00-24-59-02-00-7F	0	PM564-T-ETH	0000000083	0x00	192.168.0.10	192.168.0.10	no
00-0C-DE-06-70-40	0	PM573-ETH	0000007134	0xFF	10.33.71.150	10.33.71.150	no
00-0C-DE-06-70-20	0	PM583-ETH	0000000020	0x05	10.33.71.254	10.33.71.254	no
00-0C-DE-06-70-21	0	PM583-ETH	0000000021	0x0F	10.33.71.175	10.33.71.175	no

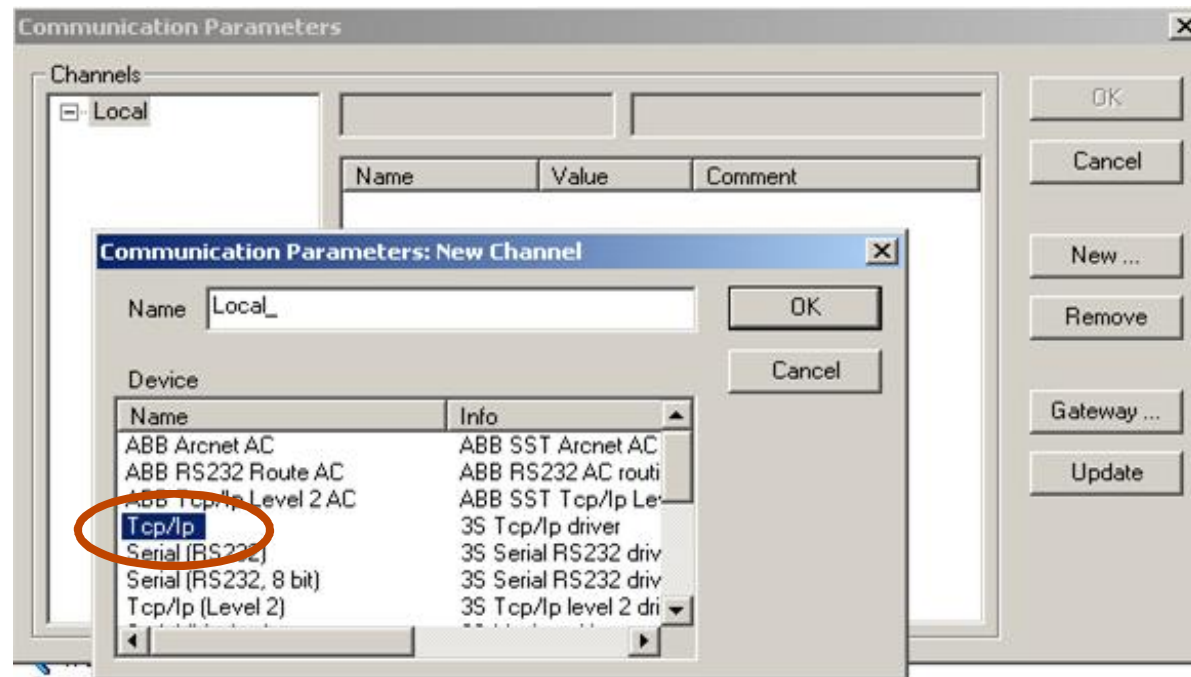
HA Application - Getting started

- 15. After setting the IP address, Go to the PS501 Window and click on '**online**' menu and select '**Communication Parameters**'.



HA Application - Getting started

- 16. Click on the **'New' button**. Enter a Symbolic Name (e.g. CPU1) and Select **'Tcp/ip' (3S Tcp/ip driver)** and click on **'OK' button**



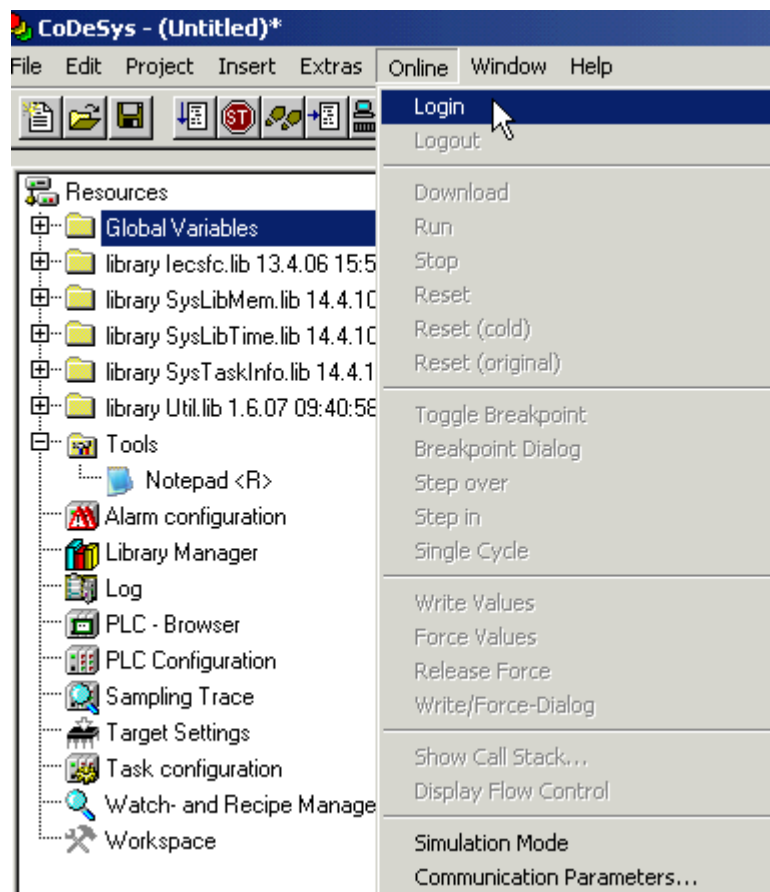
HA Application - Getting started

- 17. Click on '**localhost**' and enter the IP address of the CPU (e.g. 10.33.71.238) and set the parameters as given below - '**Port**' to **1201** '**Motorola byteorder**' to '**Yes**' (Double click on 'No'). At last click on '**OK**' button.



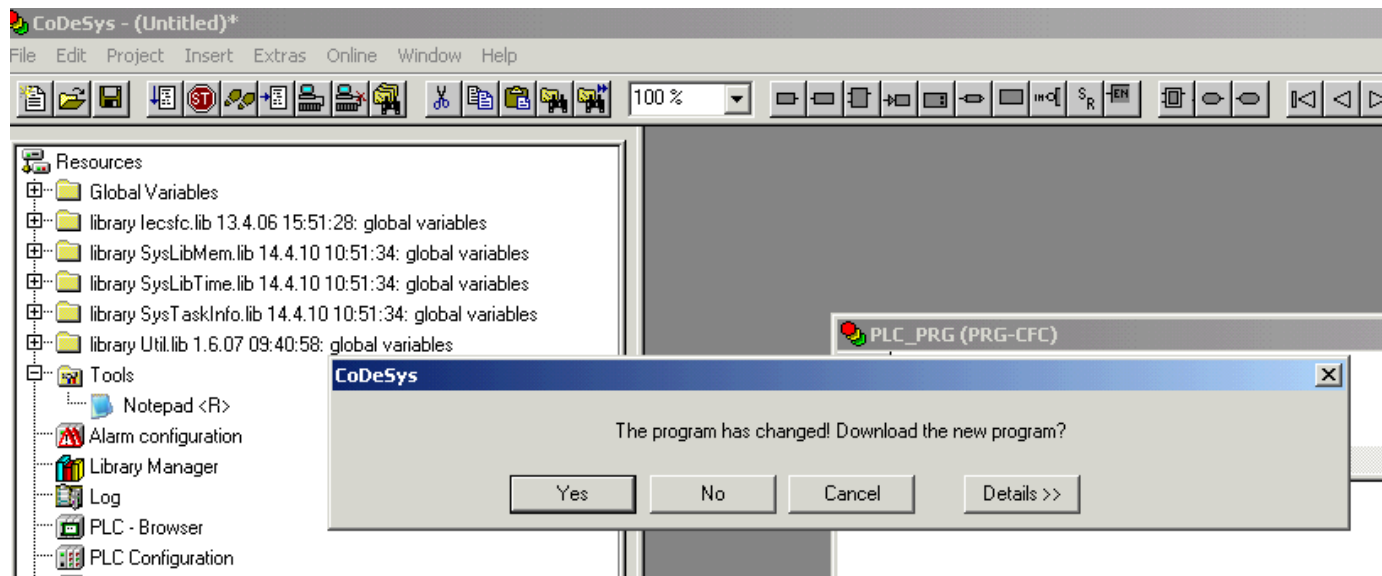
HA Application - Getting started

- 18. Click on '**online**' menu and select '**Login**'.



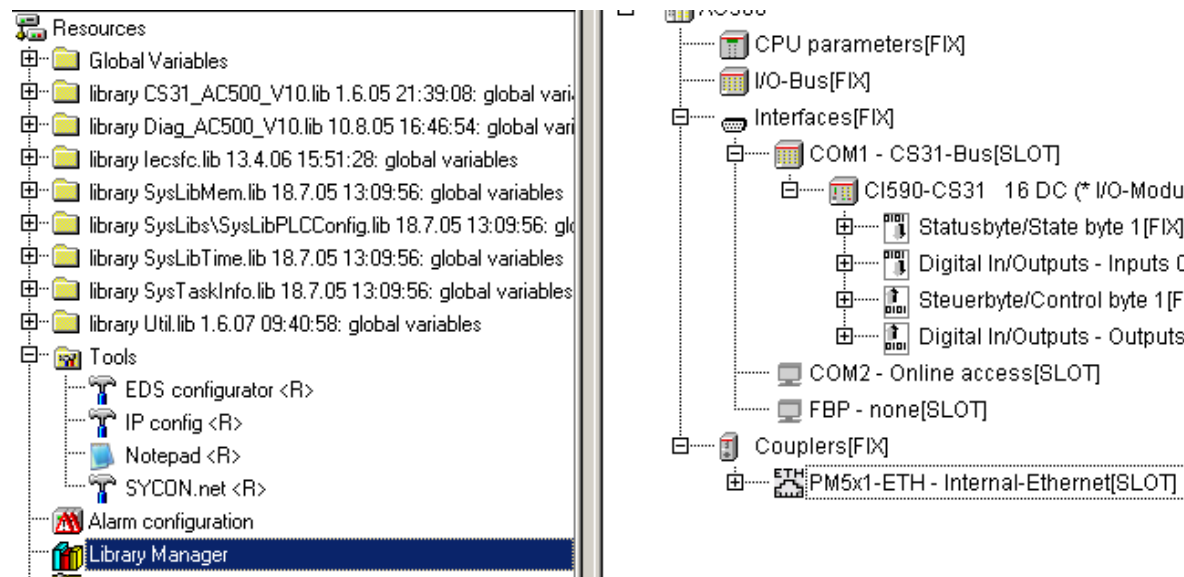
HA Application - Getting started

- 19. After connection is established and if there is no program in the CPU, following dialog appears on the screen. Select '**Yes**' and the Program will be downloaded to the CPU.



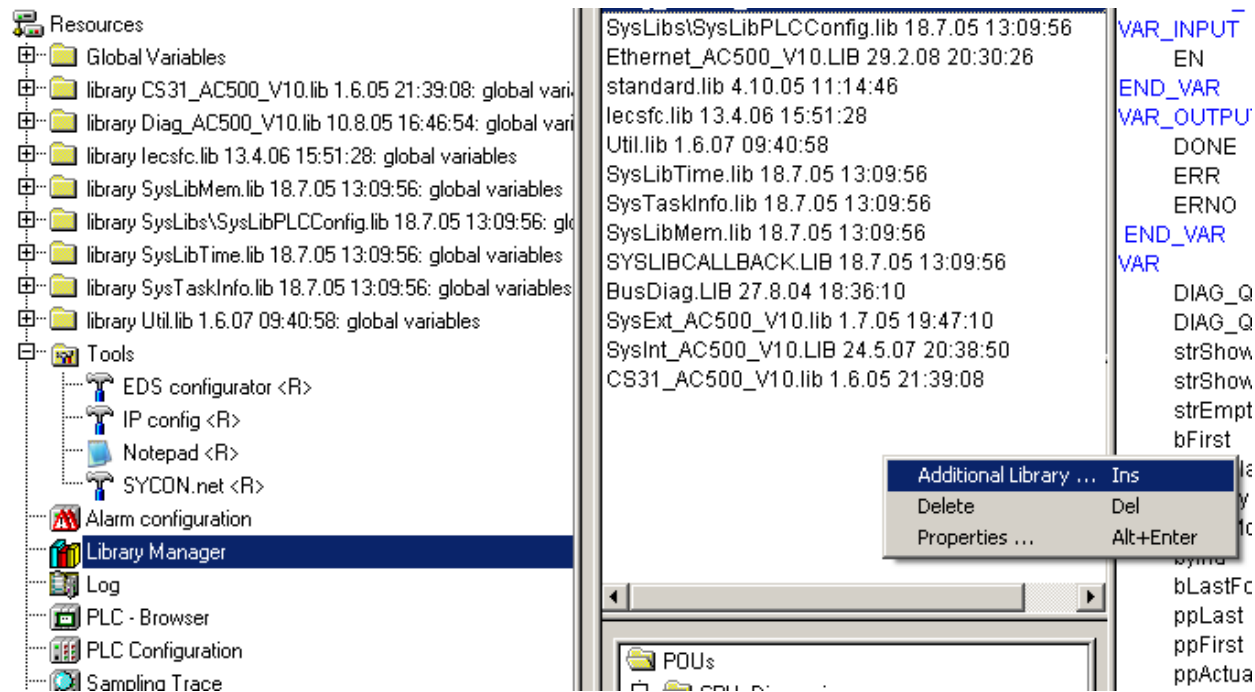
HA Application - Getting started

- 20. Please copy the AC500_High_Availability.lib in the following path – **C:\Program Files\Common Files\CAA-Targets\ABB_AC500\AC500_V12\Library**
- 21. Now in the PS501, select the **'Resources'** window and double click on the **'Library Manager'**.



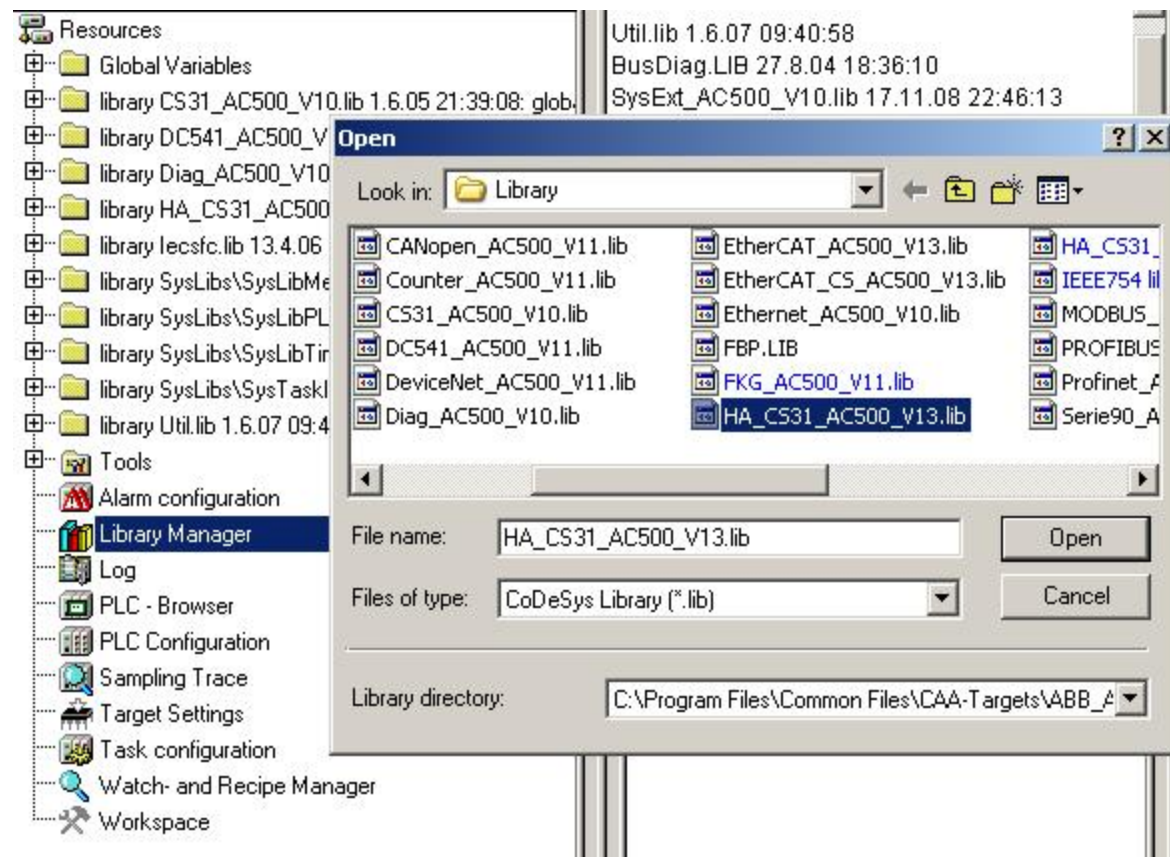
HA Application - Getting started

- 22. Right click on the library window; Select the 'Additional Library'



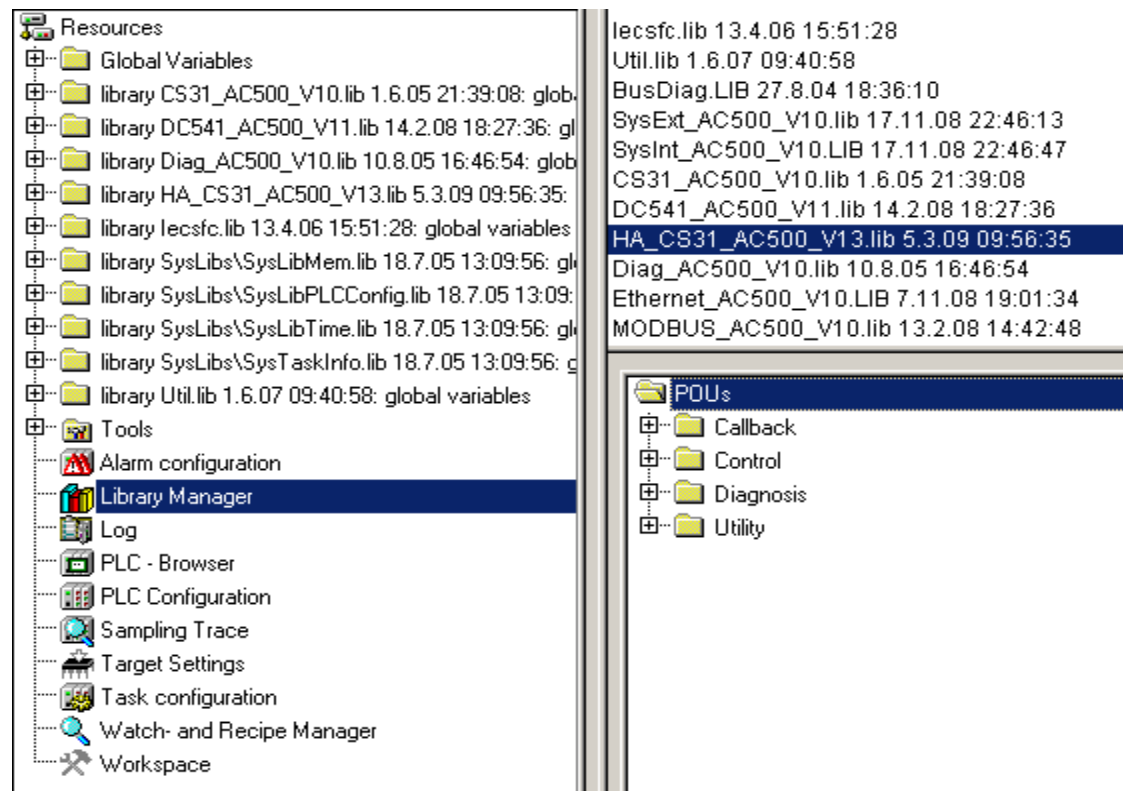
HA Application - Getting started

- 23. Select the '**AC500 High availability**' library and click on '**open**' button.



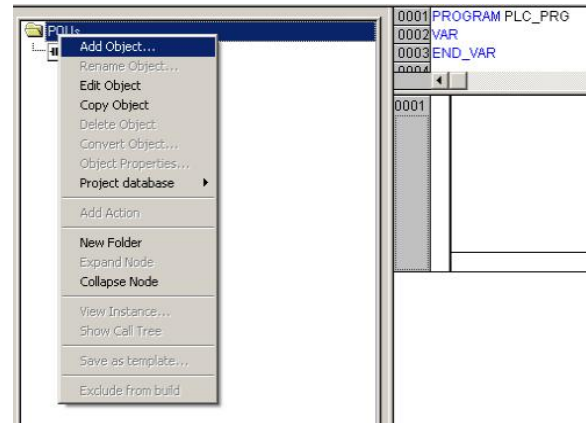
HA Application - Getting started

- 24. Now the '**AC500 High Availability**' library will be added to the list as shown. For the detailed description, please refer to the Library Document.

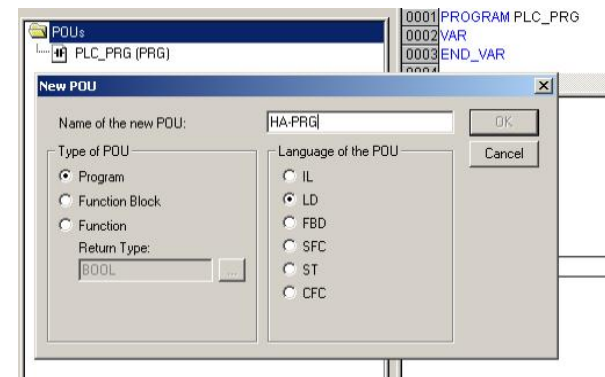


HA Application - Getting started

- 25. We recommend having separate POU (Program Type) for AC500 High Availability program. Below is the procedure to create the same. -Select the 'POUs' window and right click on 'POUs' folder and select 'Add Object' as shown.

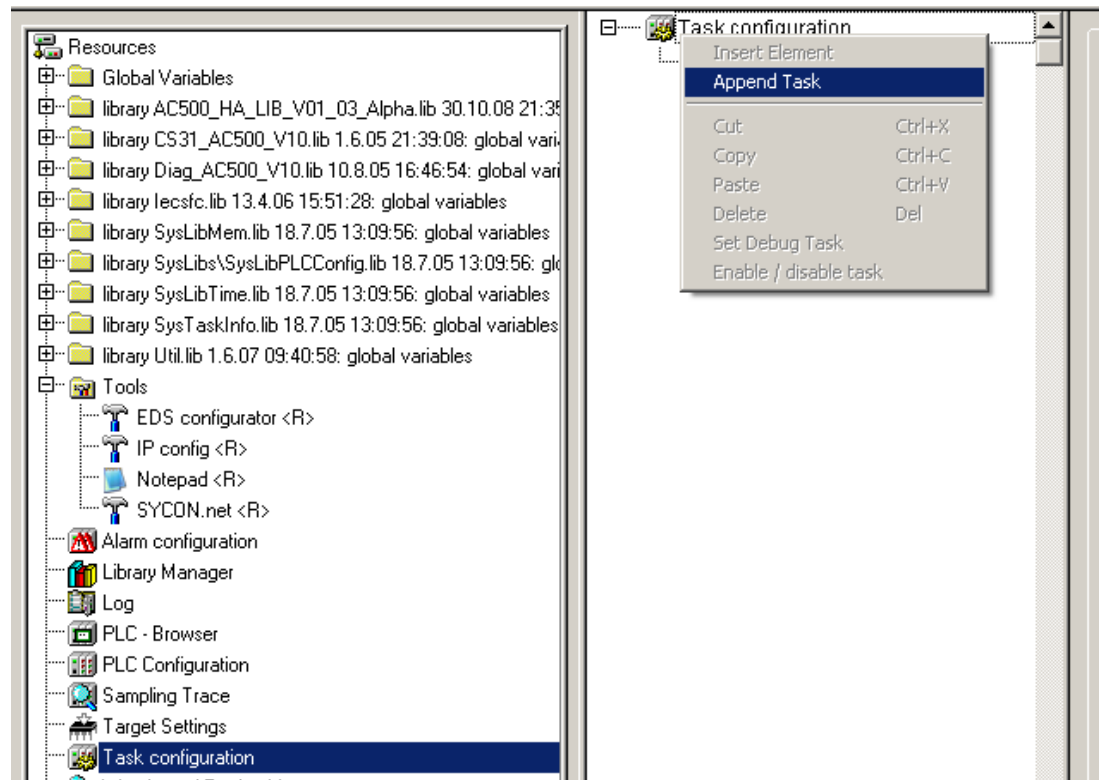


- 26. Create a new program type POU with any choice of language (e.g. HA_PRG).



HA Application - Getting started

- 27. After creating the HA_PRG, Select the Resources window, double click on 'Task configuration'. In the next window, right click on the 'Task configuration' and select the 'Append Task'.



HA Application - Getting started

- 28. A new task will be added. Give a name to the task (e.g. HA_Task). Select Type '**Cyclic**' task and Interval as **t#10ms**. Interval can be adjusted between t#10ms to 60ms depending on the system configuration.

Task configuration

- System events
- NewTask

Taskattributes

Name: HA Task

Priority(0..31): 10

Type

- cyclic
- freewheeling
- triggered by event
- triggered by external event

Properties

Interval (e.g. t#200ms): t#10ms ms

Watchdog

Activate watchdog

Time(e.g. t#200ms): %

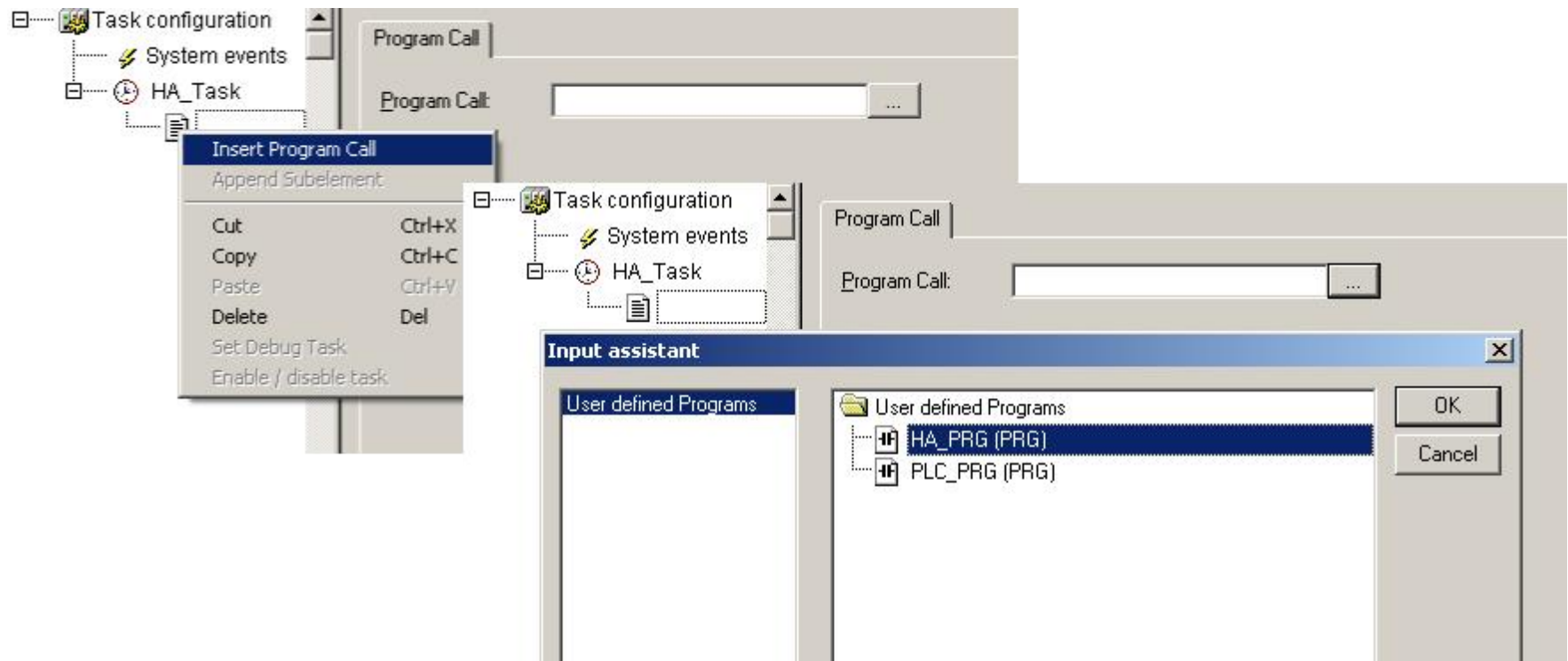
Sensitivity: 1

Error in task name HA Task!
The name for a task must be a valid IEC-identifier.

Note: HA_Task should have higher priority than any other Task in the project (0 – Highest and 31- Lowest).

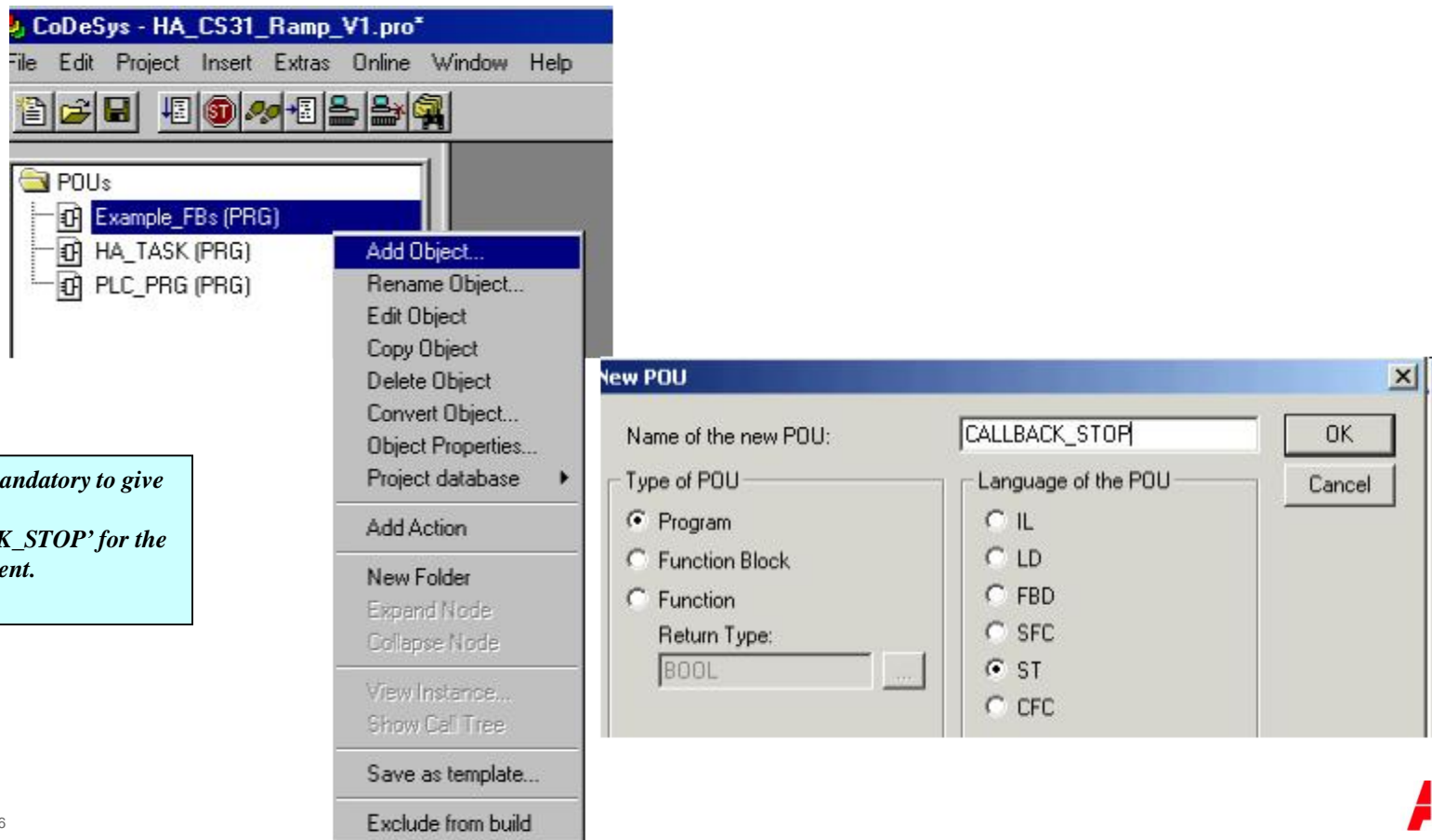
HA Application - Getting started

- 29. Right click on the 'NewTask' and select 'Append Program Call' as shown. Select the HA_PRG and Save the project.



HA Application - Getting started

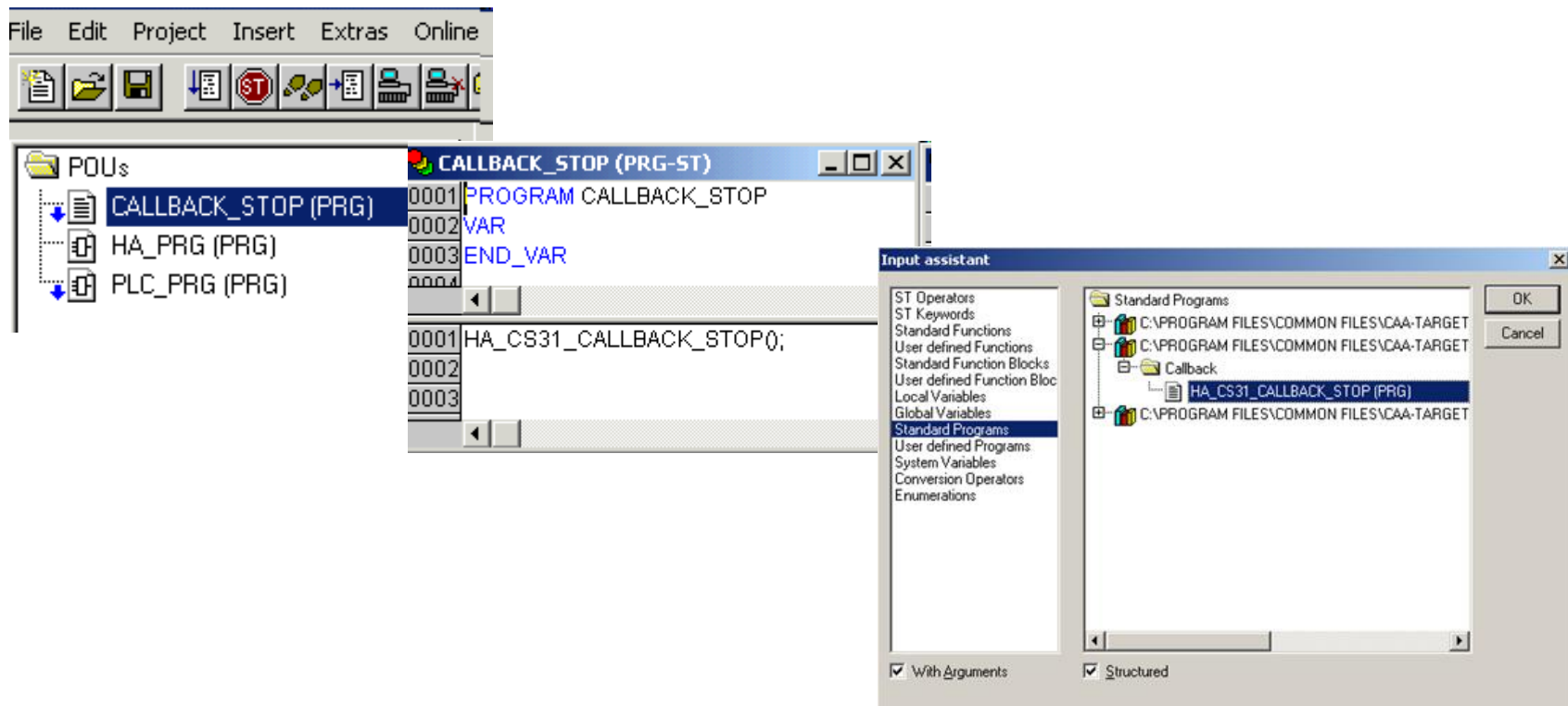
- 30. Creation of CPU STOP event program. In the 'POUs' select "Add Object" and create a Program and give the as "CALLBACK_STOP"



Note: It is mandatory to give the name 'CALLBACK_STOP' for the CPU stop event.

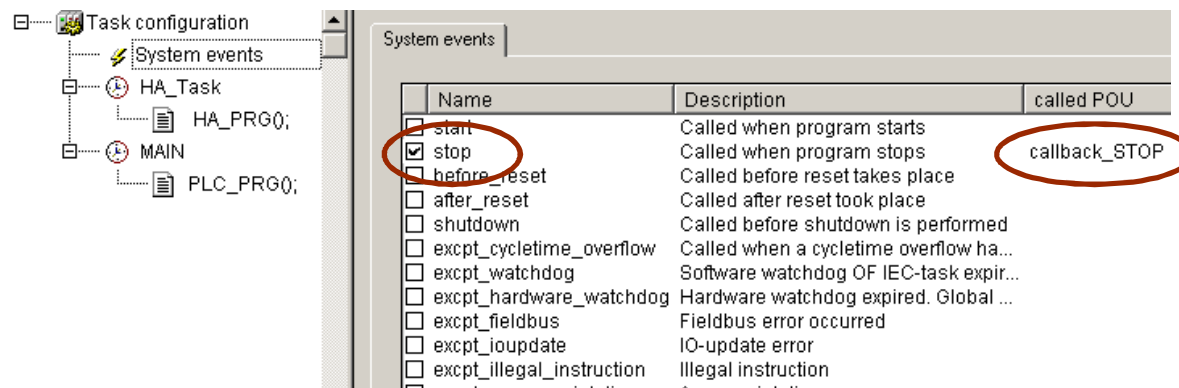
HA Application - Getting started

- 31. Select and open 'CALLBACK_STOP' and call an instance of 'HA_CS31_CALLBACK_STOP'.



HA Application - Getting started

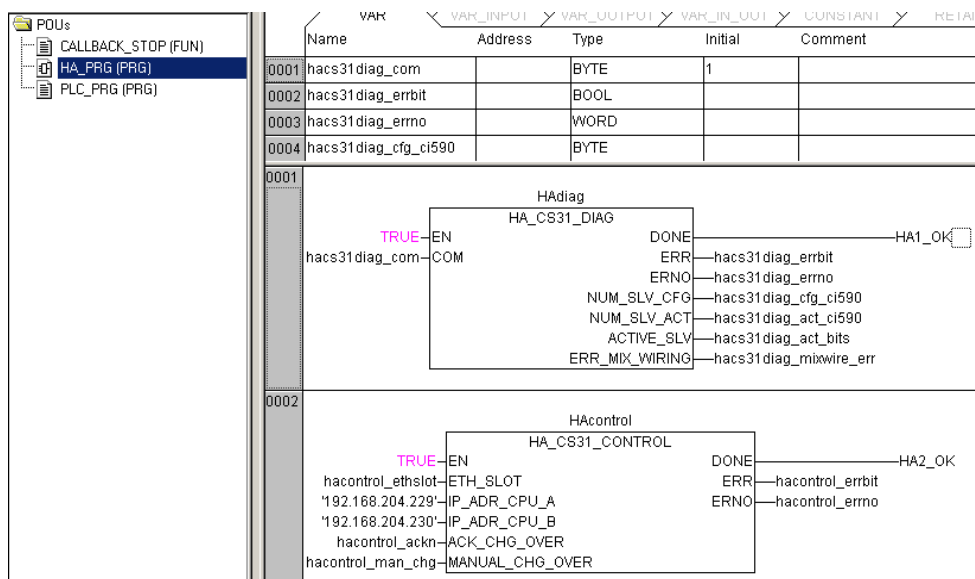
- 32. Select 'Task configuration', click on the system events. Select 'stop' and type 'CALLBACK_STOP' in called POU as shown below.



HA Application - Getting started

- 34. Select the '**AC500 High Availability**' library and add required Function Block (e.g. HA_CS31_DIAG) to HA_PRG. Parameterize the Function Blocks and download the program to both the CPUs. The High availability project will be common for both the CPUs except the Sycon configuration. Any changes in the Sycon configuration should be downloaded to individual CPUs. But otherwise the project is common for both CPUs.

Note: For AC500 High Availability it is mandatory to configure HA_CS31_DIAG and HA_CS31_CONTROL. HA_CS31_EXT_DIAG is an optional block and HA_CS31_DATA_SYNC is for Data Synchronization.



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