Selmo

Demo projects with Bosch Rexroth ctrlX

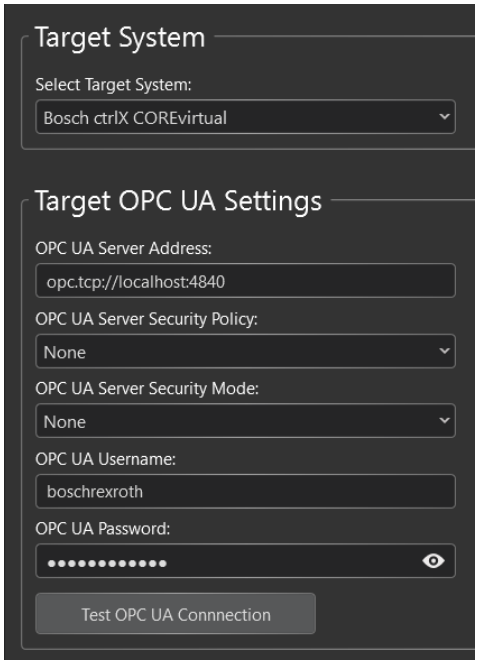
See also Selmo Help Center

Content

Customizing the Selmo Studio Project (SEO)

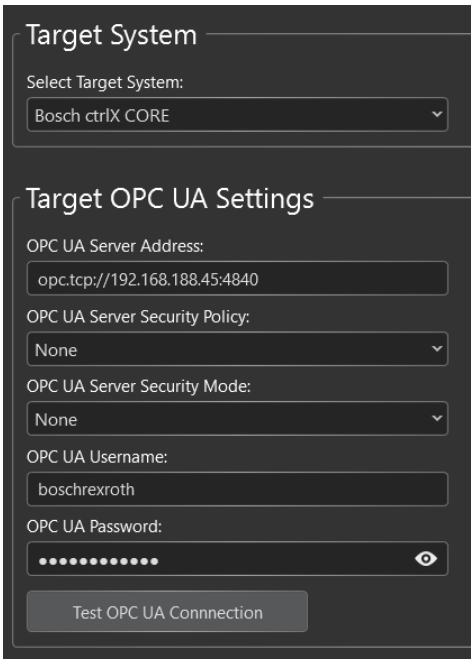
As part of a new Selmo Studio project, the decision has to be made in which control system the PLC program will be used. Although the main part of the program is identical, there are differences, especially in terms of communication and the use of internal libraries.

In Selmo Studio, the selection of the appropriate controller is done in the Target System section. In this case: "Bosch ctrX COREvirtual". The OPC-UA communication protocol is used for this. The settings that were made during the installation and configuration of the OPC-UA server are entered here.



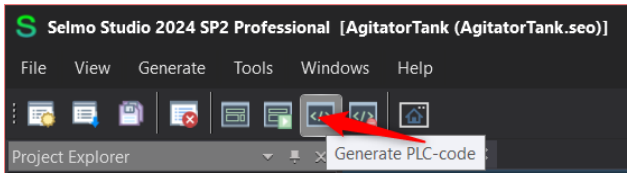
If a virtual PLC is used on the local PC, "Bosch ctrlX COREvirtual" must be entered with the server address localhost and the set port, usually 4840. "boschrexroth" must be entered as username and password. These credentials can be changed if necessary.

Here, communication can then be tested.

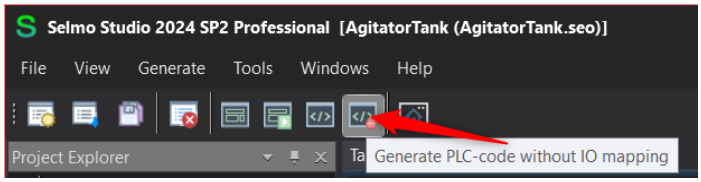


In the case of a hardware PLC, the target "Bosch ctrlX CORE" must be selected. In the "Server Address" field, enter the IP address of the PLC. In addition, the login data must be entered according to the settings in the OPC-UA server.

After completion of the modeling, the PLC code is generated and exported in an XML file. It should be noted that the entire PLC program must be exported during the first export.

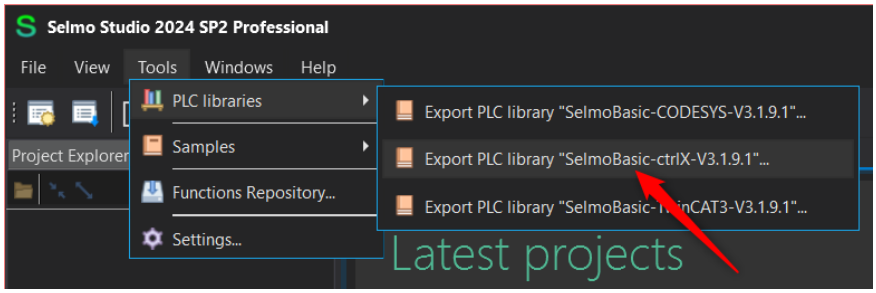


Afterwards, the export should take place without the IO mapping modules. These building blocks are edited in ctrlX (see below) and could be overwritten in a complete export. It should be noted that any links could be lost.



It is essential that this export and subsequent import into ctrlX is carried out in the Selmo Studio every time you make a change. For this reason, it is recommended not to make changes in the exported blocks in ctrlX, as they will be overwritten the next time they are imported.

The SelmoBasic library is still required for the integration of the internal functions. This can be obtained via the export function in the Selmo Studio.



It should always be ensured that the version of the library used in ctrlX matches the version of Selmo Studio. The procedure for import and activation is explained in the corresponding documentation.

Installation and configuration of Bosch Rexroth ctrlX

First, download ctrlX WORKS and then perform the installation. The installation can be done using the default settings, but the following prerequisites should be met:

- MS Windows version 10 or 11.
- Selmo Studio in the current version 2024 SP2
- Currently used version of ctrlX WORKS is 2.6.3
- An OPC UA server is installed as part of the installation.
- A demo license is used locally, and a temporary license can be created online for the HW-PLC.

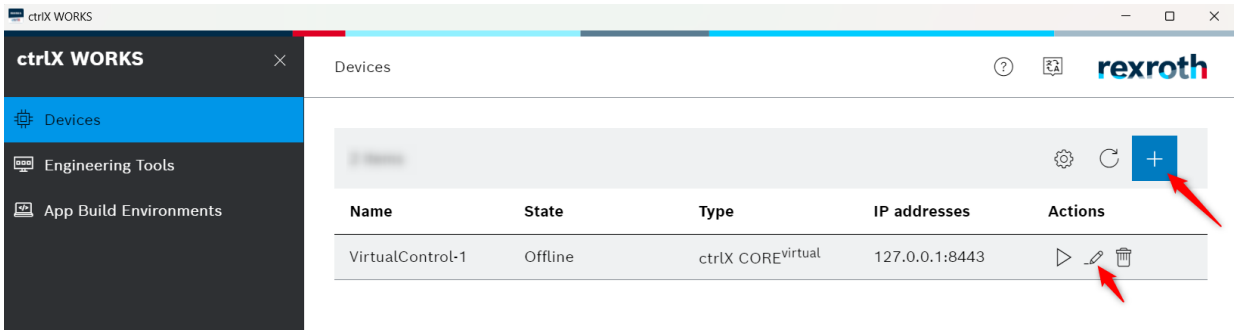
Optionally, UaExpert can be installed to monitor and diagnose UPC-UA communication.

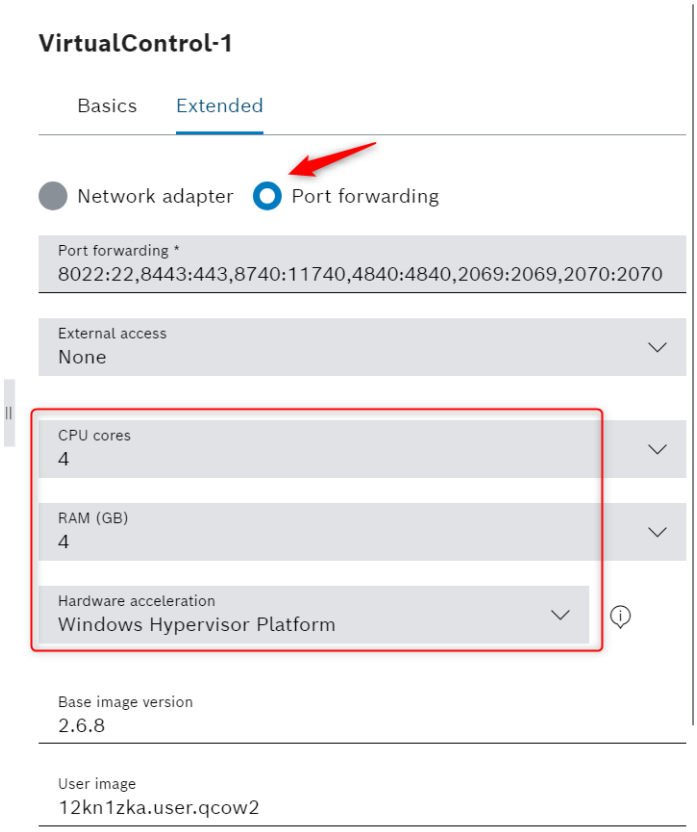
Please also check which versions are current and what dependencies exist on the other components. It should also be ensured that the following ports are not blocked in the operating system:

Service	Ports (Inbound)
ctrlX CORE Web Interface:	443/TCP (HTTPS, inbound)
ctrlX Data Layer:	2069/TCP (inbound)
OPC UA:	4840/TCP (inbound)
MQTT:	1883/TCP (inbound) and 8883/TCP (secure, inbound)
Modbus TCP:	502/TCP (inbound)
EtherCAT:	34980/UDP (incoming)

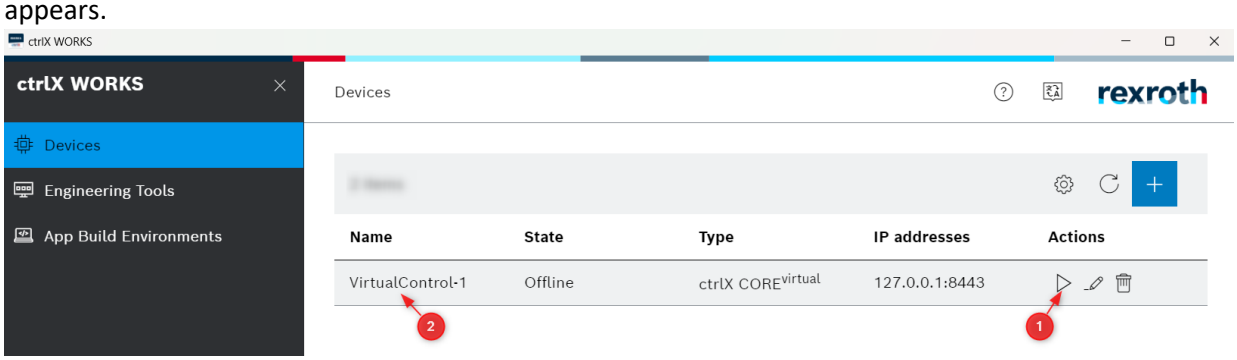
Setting up Virtual Control

After successful installation of ctrlX WORKS, a virtual PLC can be created in the Devices section with the following settings:

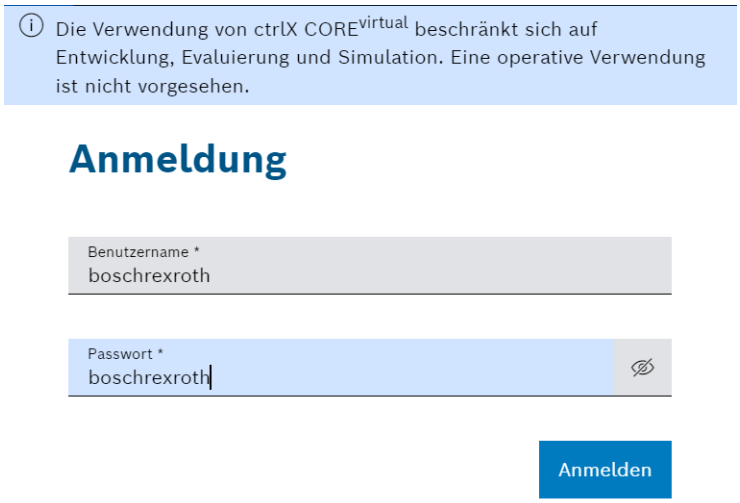




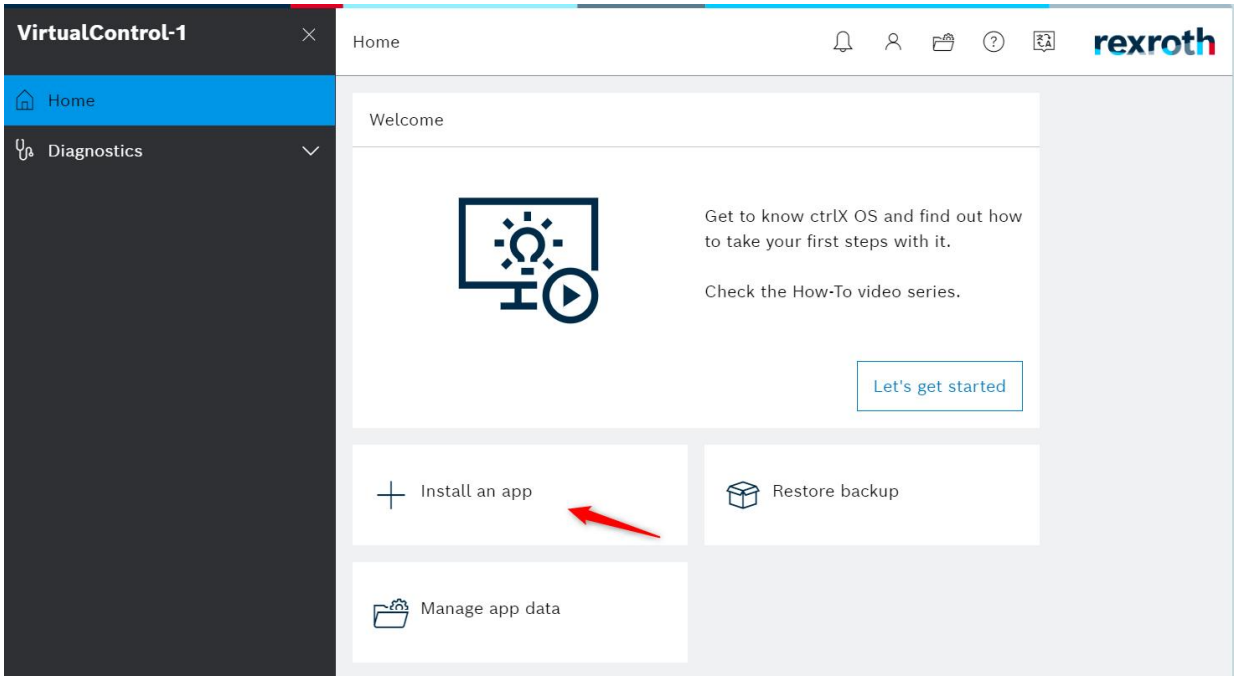
Start Virtual Control and log in by clicking on "Virtual Control-1" as soon as the status "Online" appears.



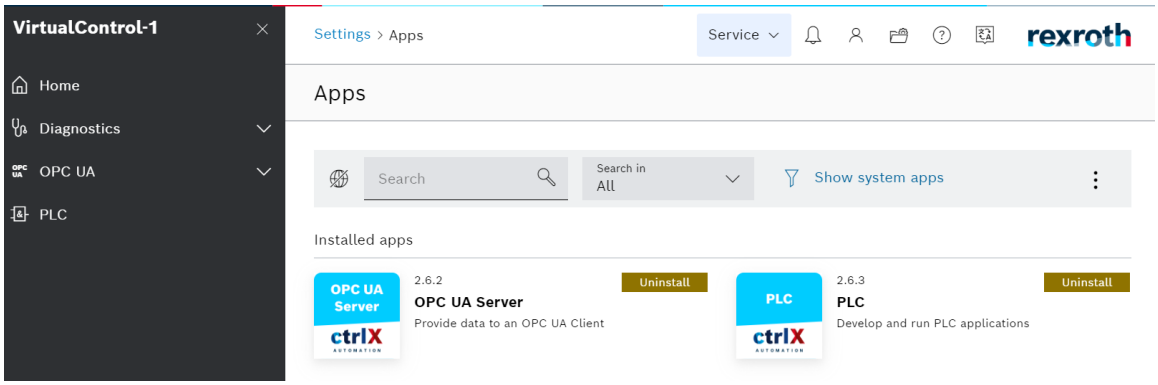
Log in with the user data "boschrexroth" and the corresponding password.



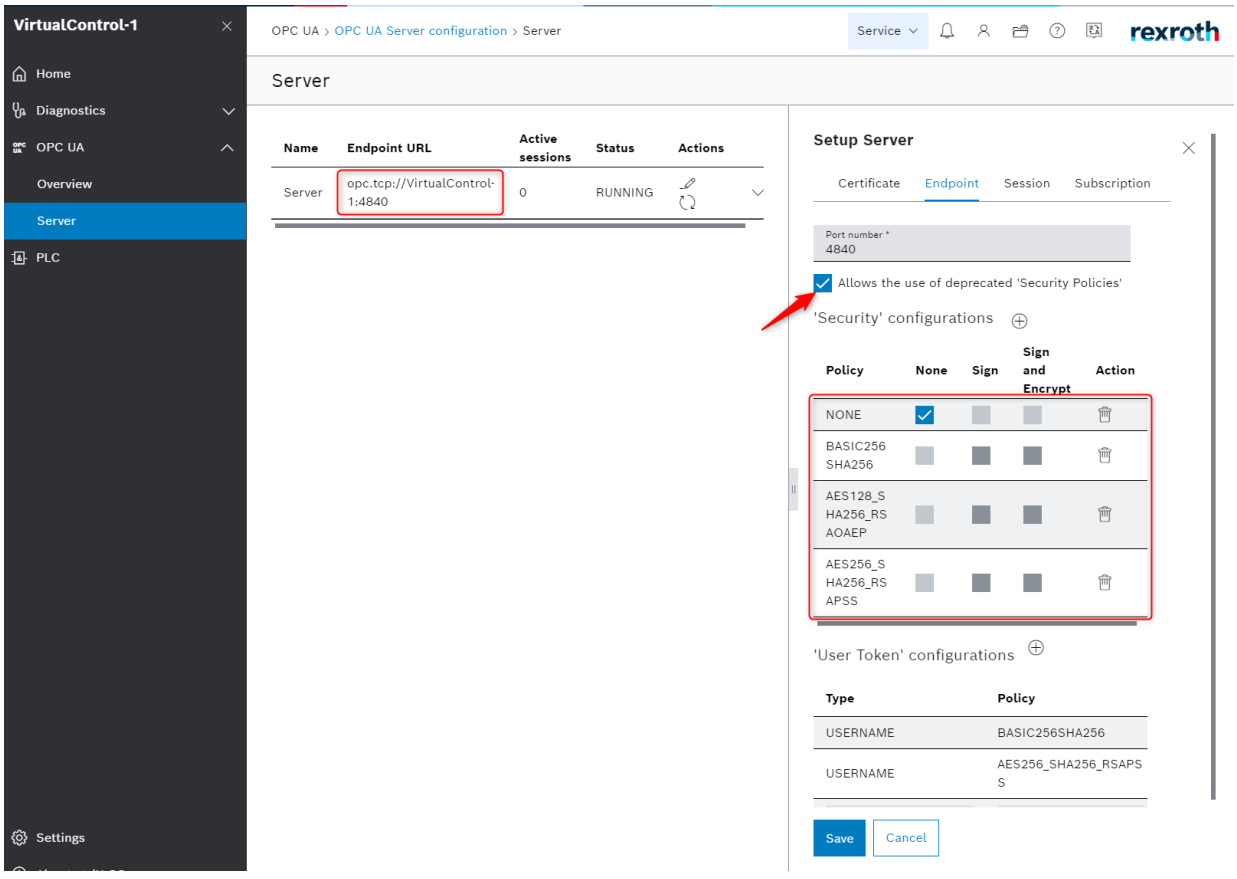
Click on "Install an app" and then select the desired apps from the local directory via "Install from file". These can be selected in the downloaded demo folder.



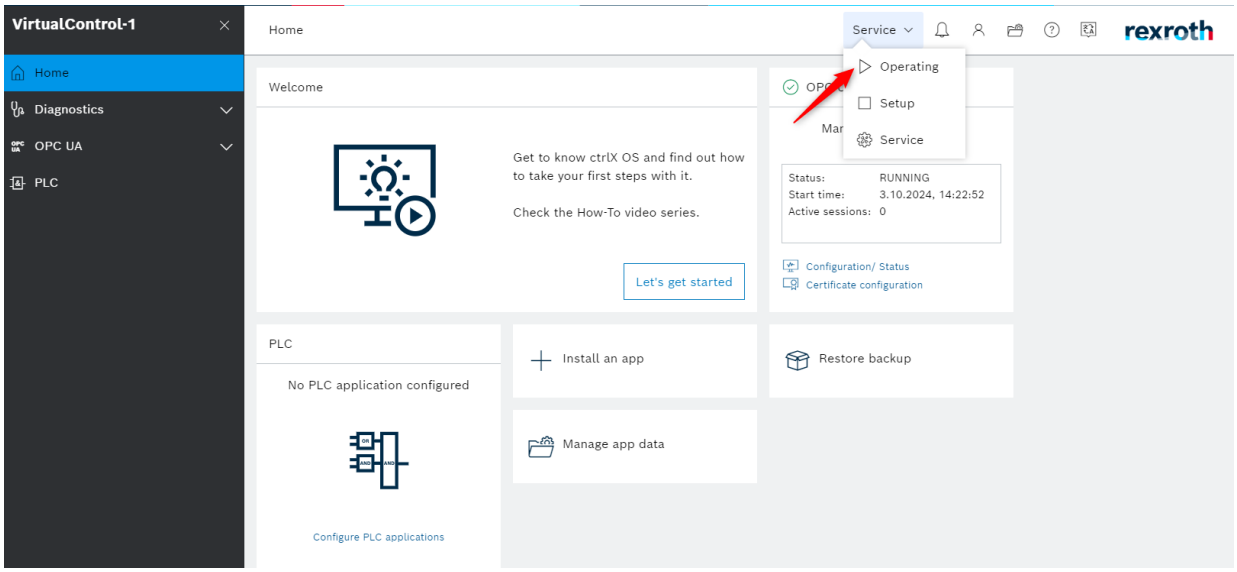
The apps "PLC" and "OPC UA Server" are required:



In the settings of the OPC UA server, activate the option "NONE" and set the check mark to "Allows the use of deprecated 'Security Policies'". Then restart the server.



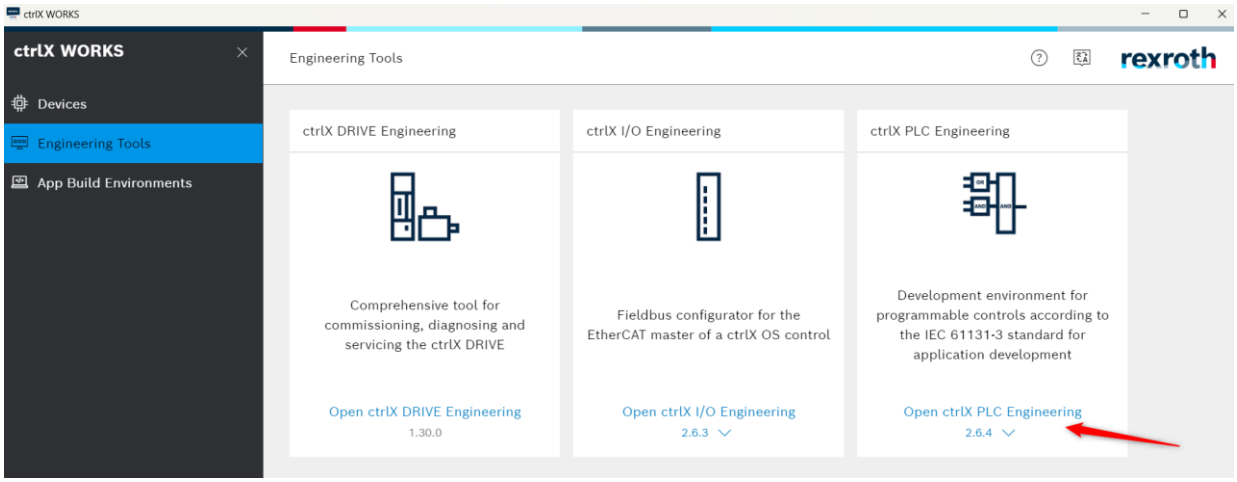
Then set the operating mode back to Operating.



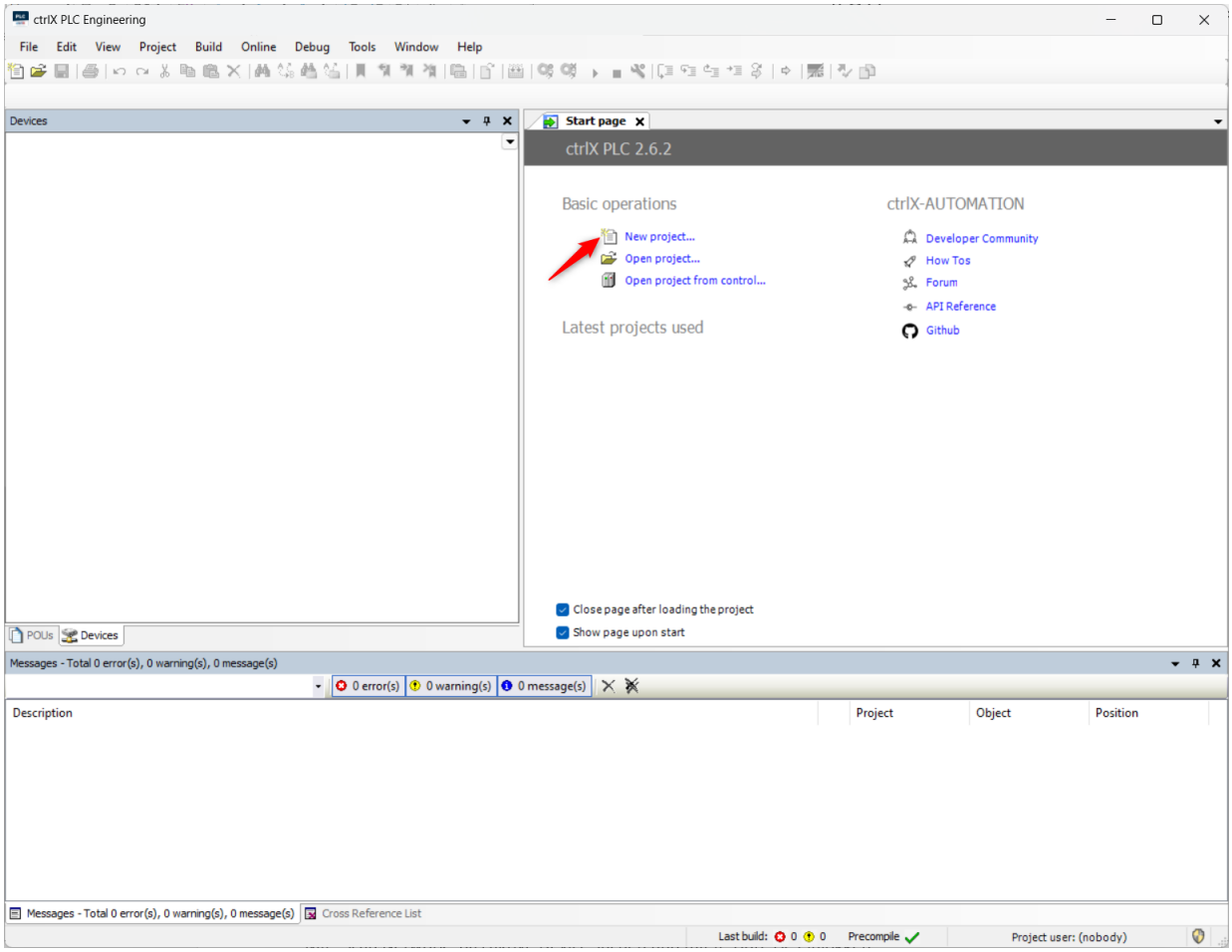
The settings for a ctrlX CORE controller are similar, you also have to transfer the licenses and set the IP address.

Settings in the ctrlX PLC project

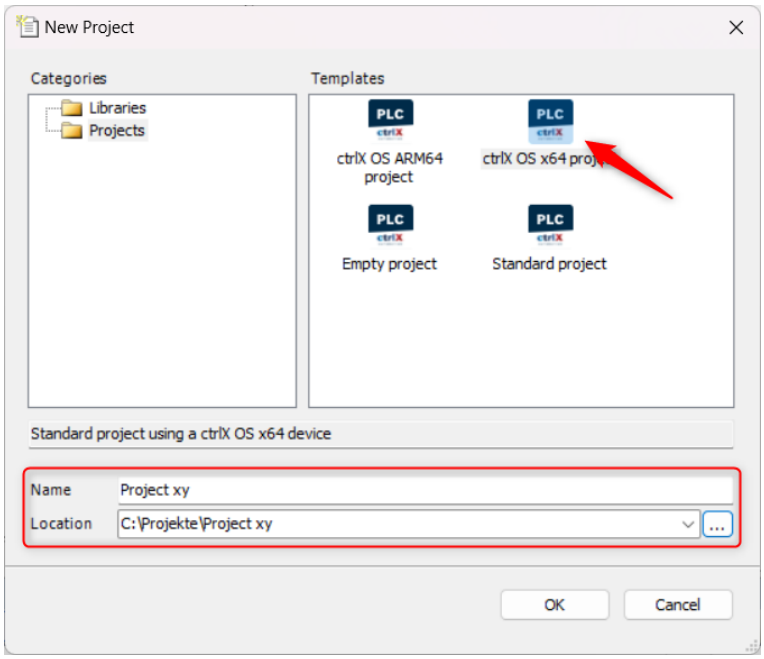
In the Engineering Tools section, open the program "ctrlX PLC-Engineering".



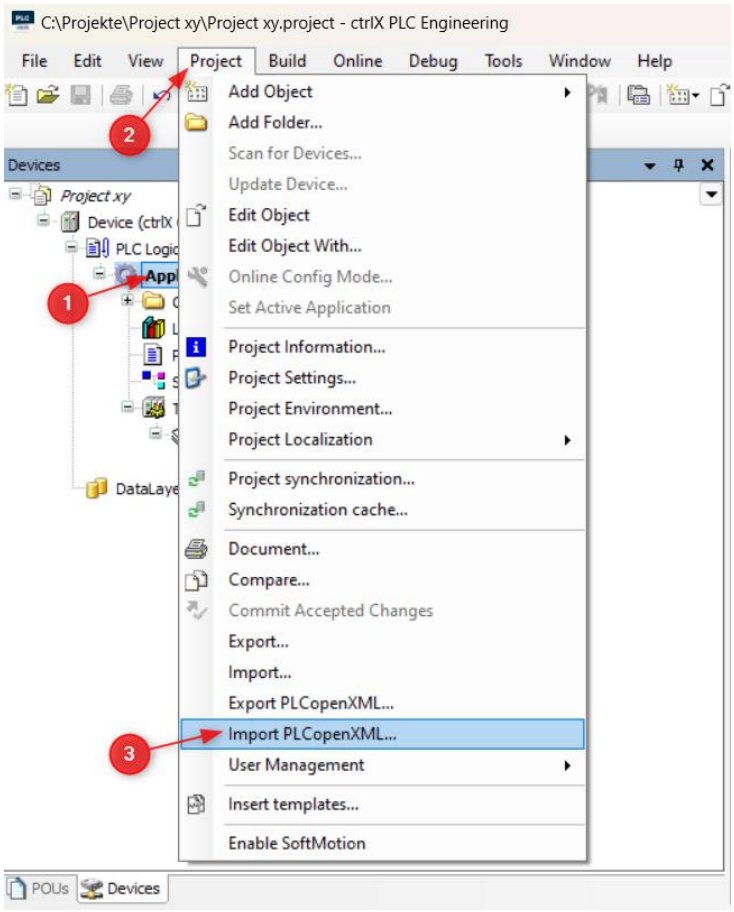
Create a new project and choose a name and path for the project:



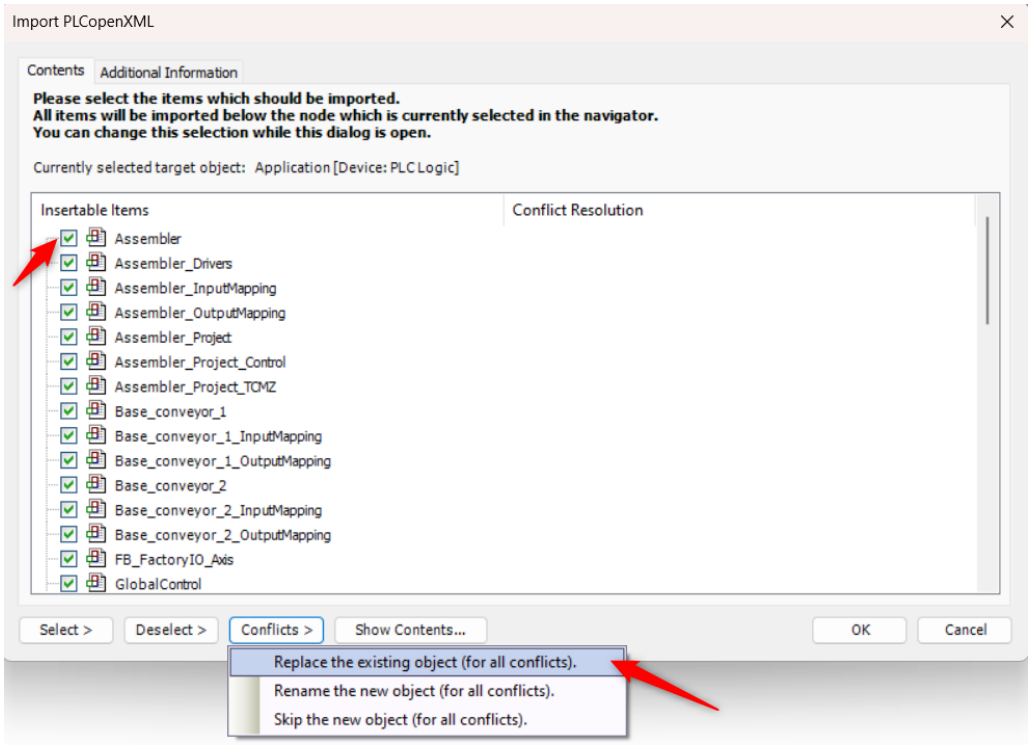
Select "ctrlX OS x64 project" as the template and select name and save path.



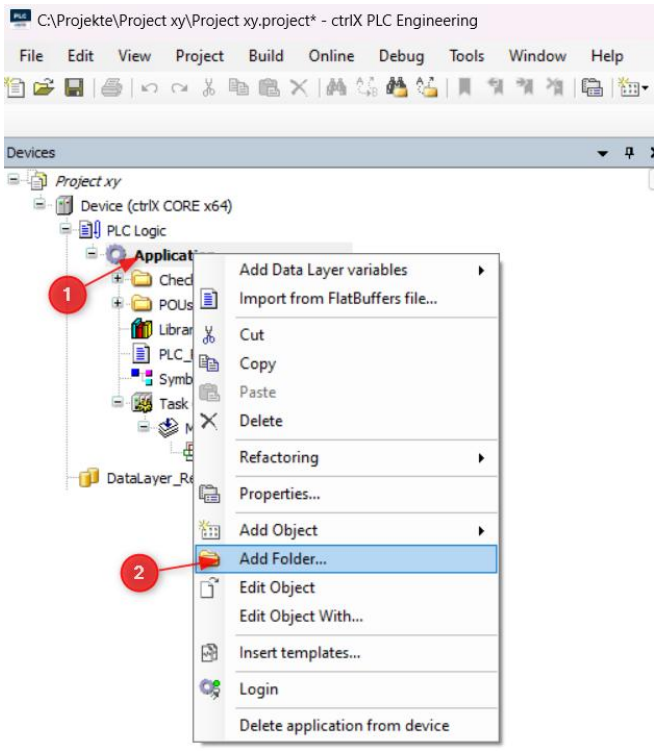
It is then necessary to import the PLCopenXML file from the Selmo Studio. First, select "Application" and then click on "Project". In the following menu, select the option "Import PLCopenXML".

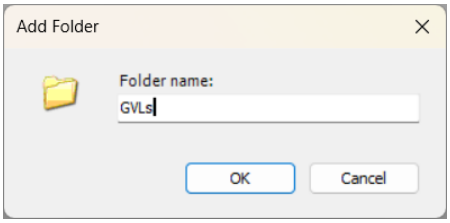


Check all the "Insertable Items" you need and then press "Ok". If you have already created the project and only want to apply changes, select the option "Replace the existing objects (for all conflicts)".

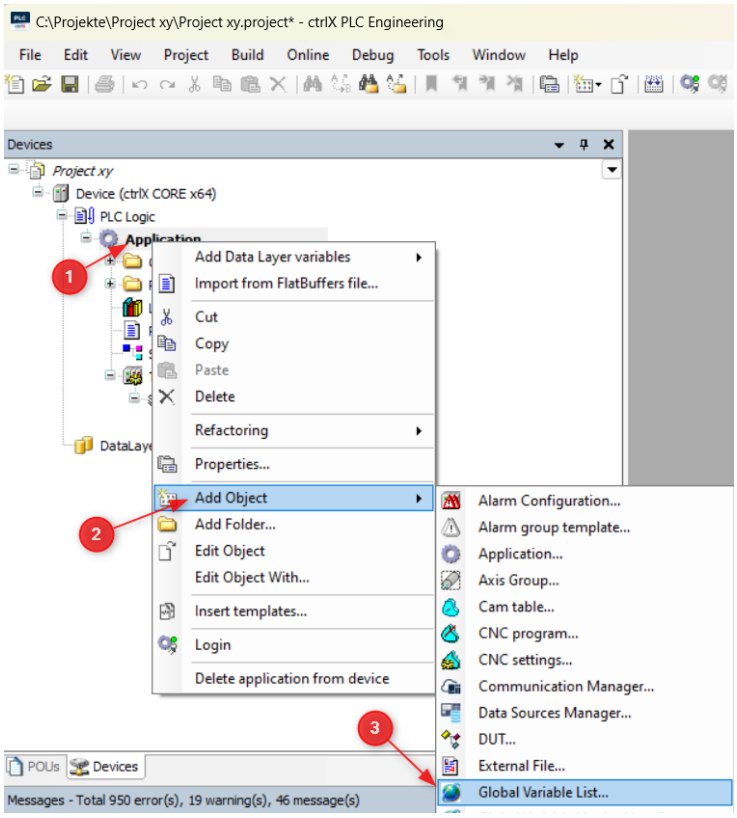


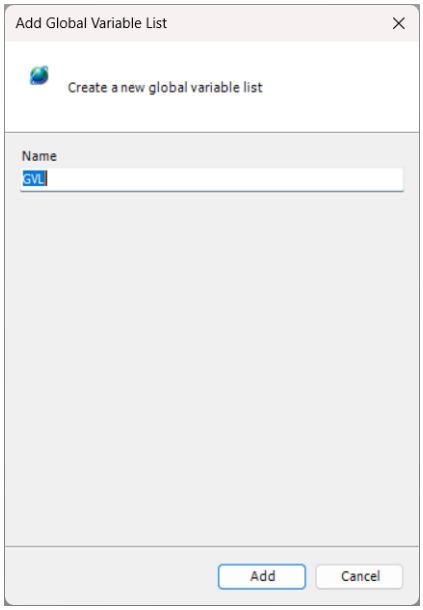
Under "Application", add a new folder named "GVLs".



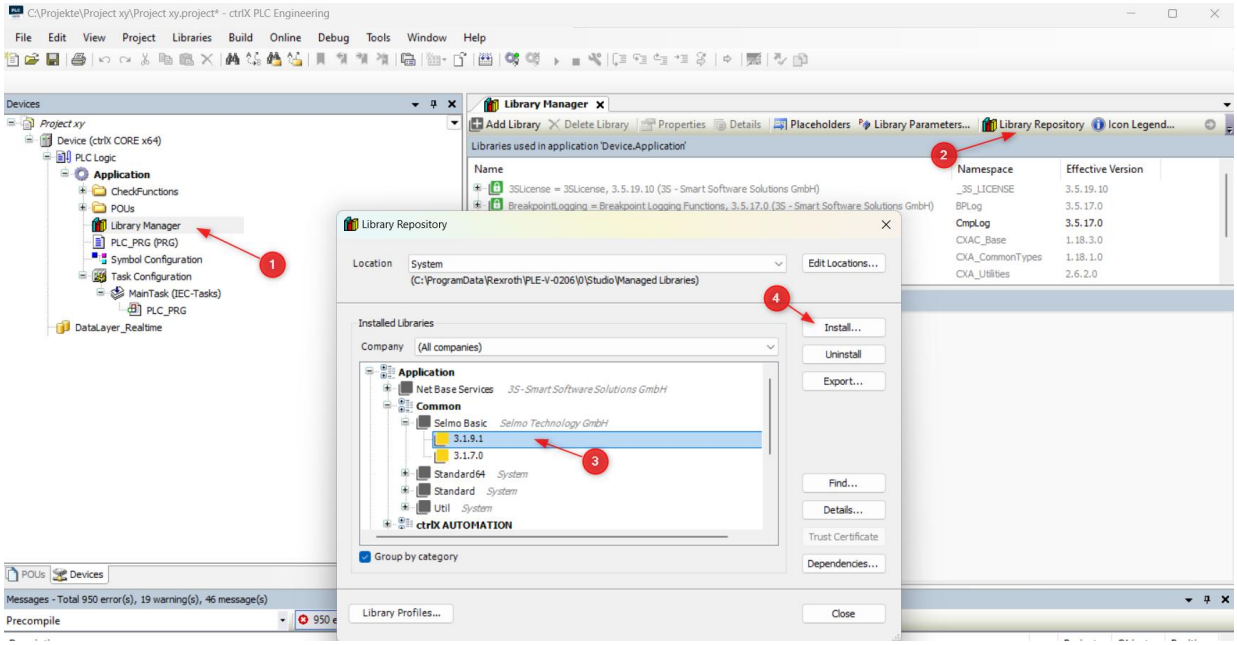


Right-click the new GVLs folder, and then select Add Object. Then select "Global Variable List..." from.

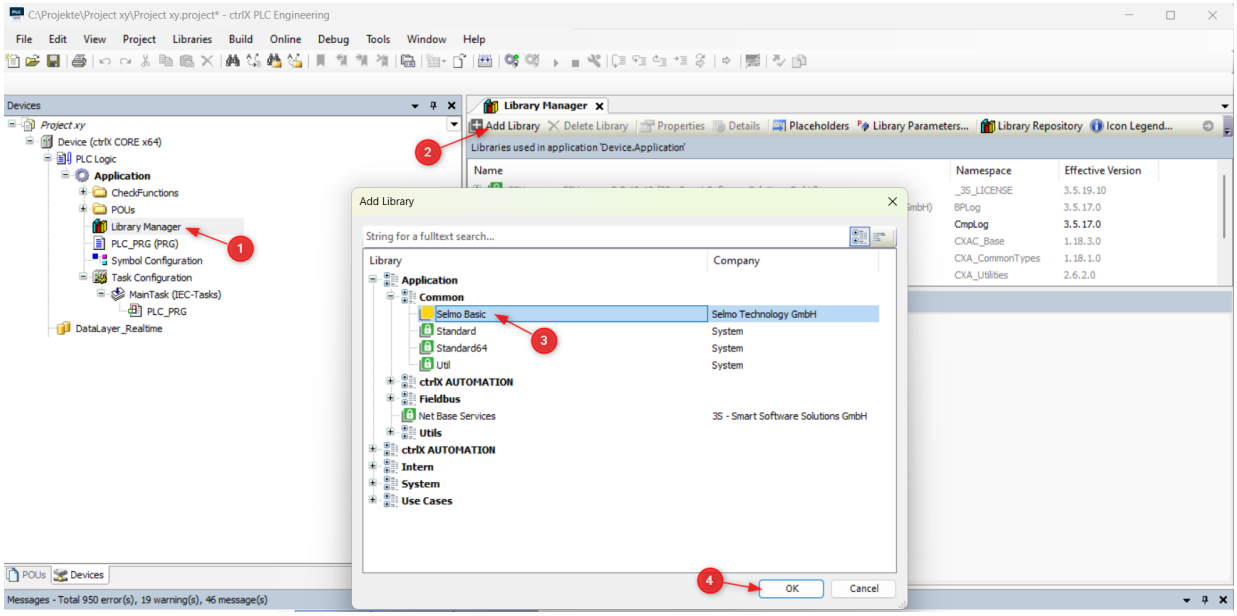




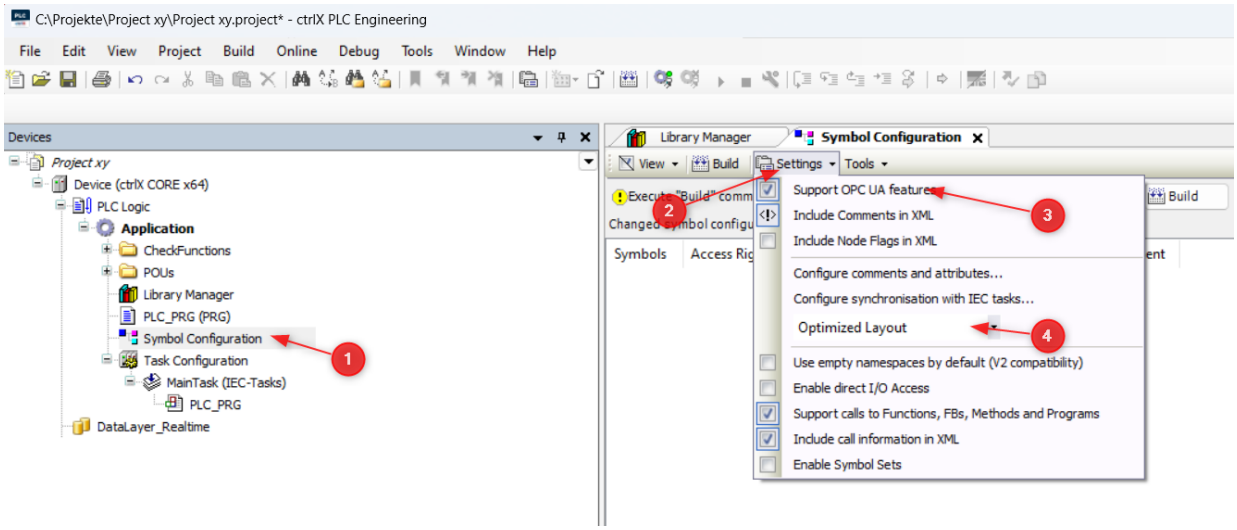
Furthermore, check whether the current "Selmo Basic" library is already installed. To do this, first select the "Library Manager" menu item and then select the "Library Repository" menu item. In the selection there, under "Application → Common", the library "Selmo Basic" should be available in the version that was previously exported from the Selmo Studio. Otherwise, you will need to reinstall the library via the "Install" menu item.



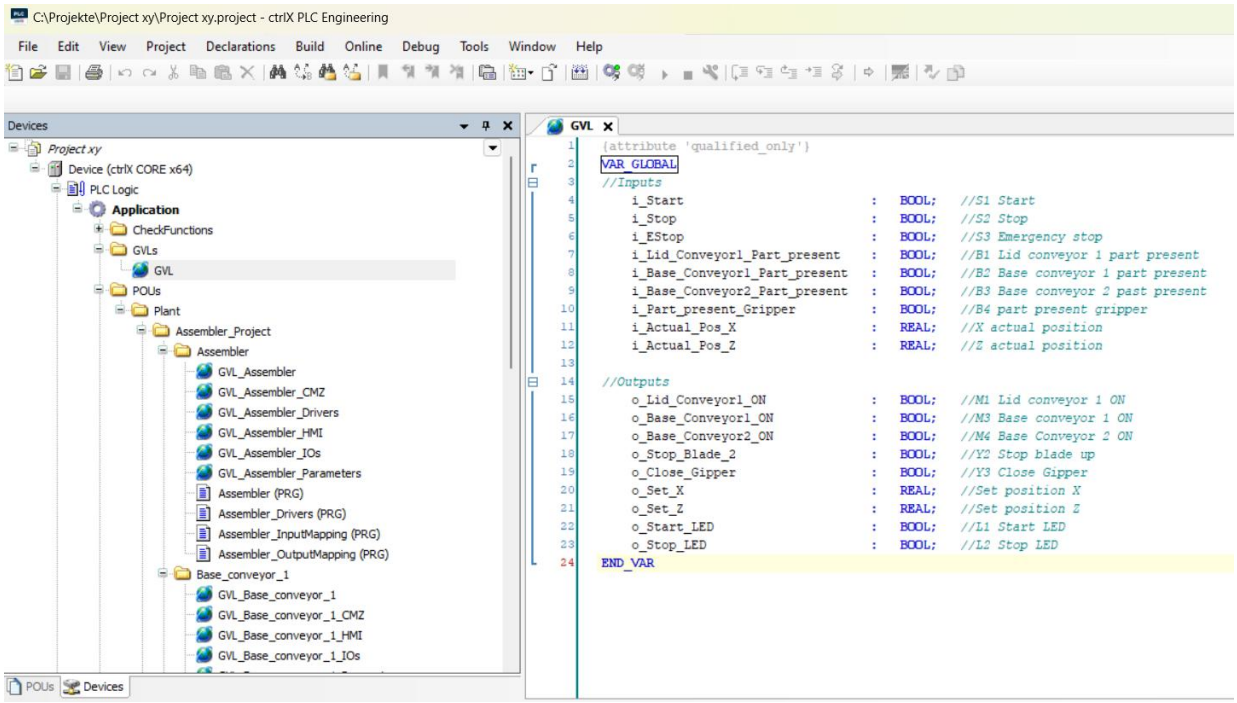
If the library exists, it must be accessed via "Add Library..." can be added to the project.



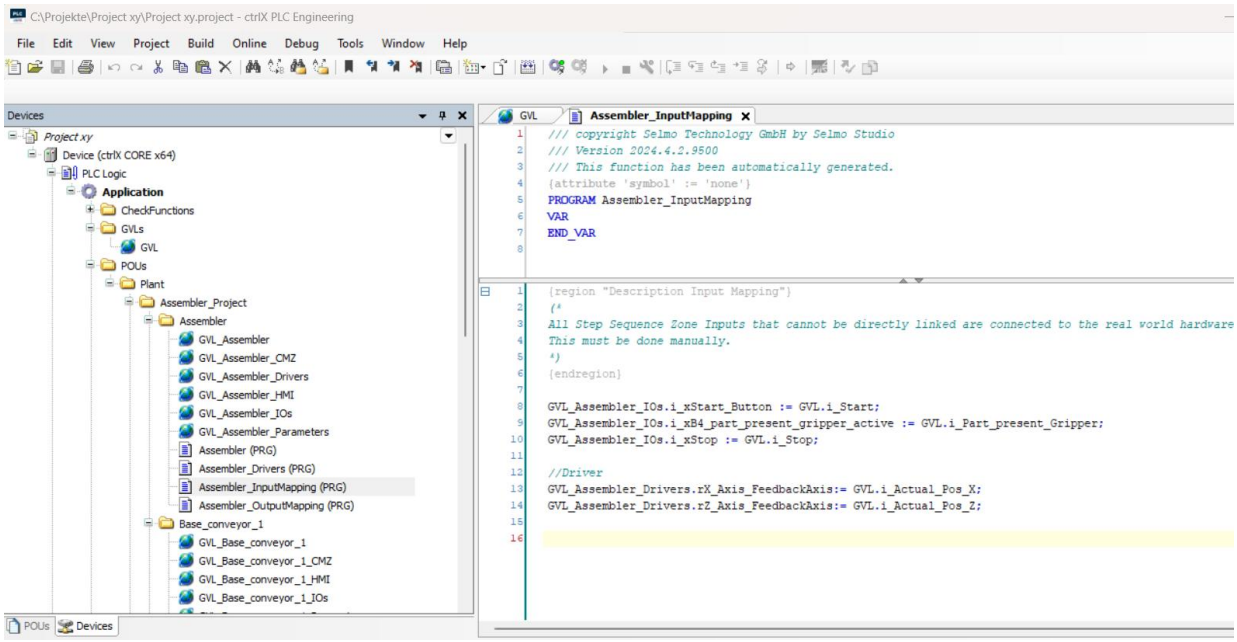
In the menu item "Symbol Configuration...", check whether the options "Support OPC UA features" and "Optimized Layout" are selected.



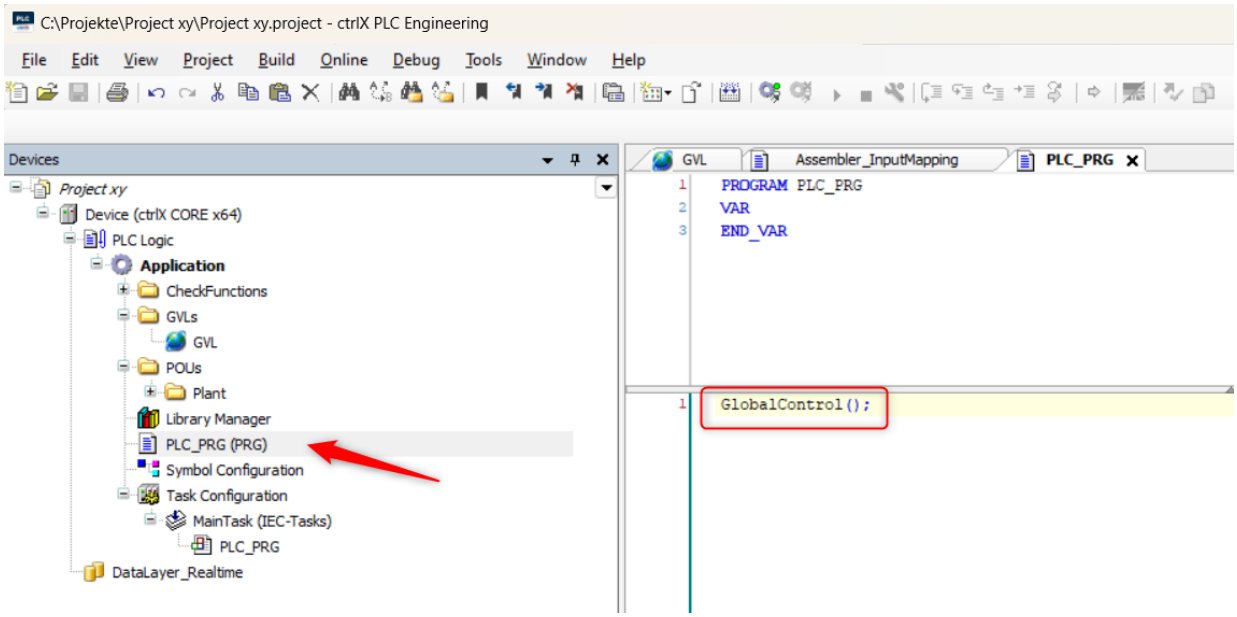
In the following, the inputs and outputs in the GVL are written, which can be found in the documentation of the demo program. The use of these specific labels is crucial to ensure optimal communication with the simulation.



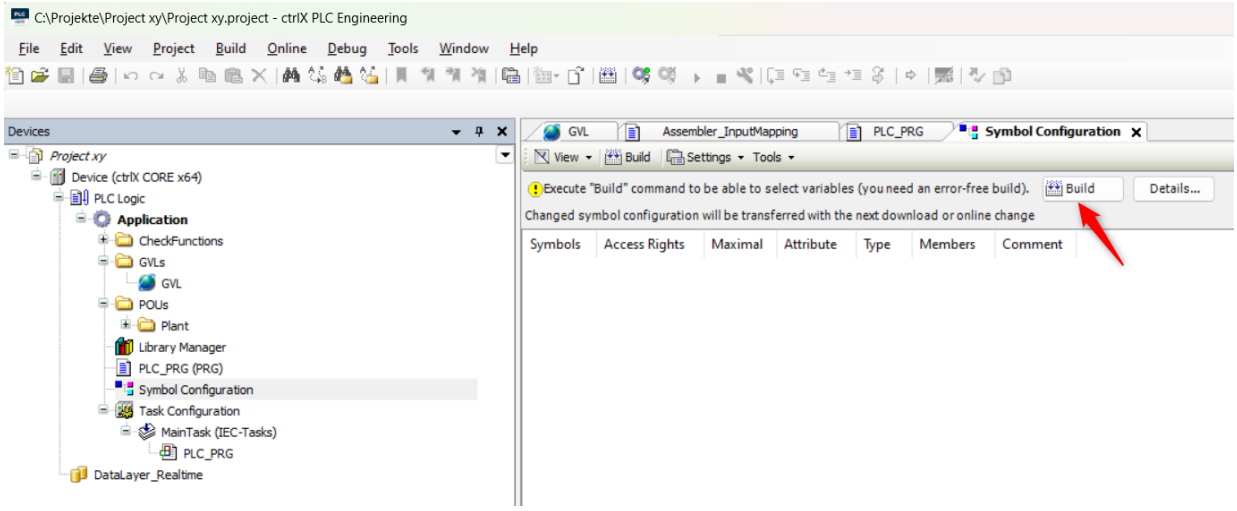
The variables are linked to the prepared I/Os of the respective sequences in the corresponding "xxx_InputMapping" or "xxx_OutputMapping" modules. For this purpose, it is necessary to remove the comment of the lines and to read or write the variables from the GVL.



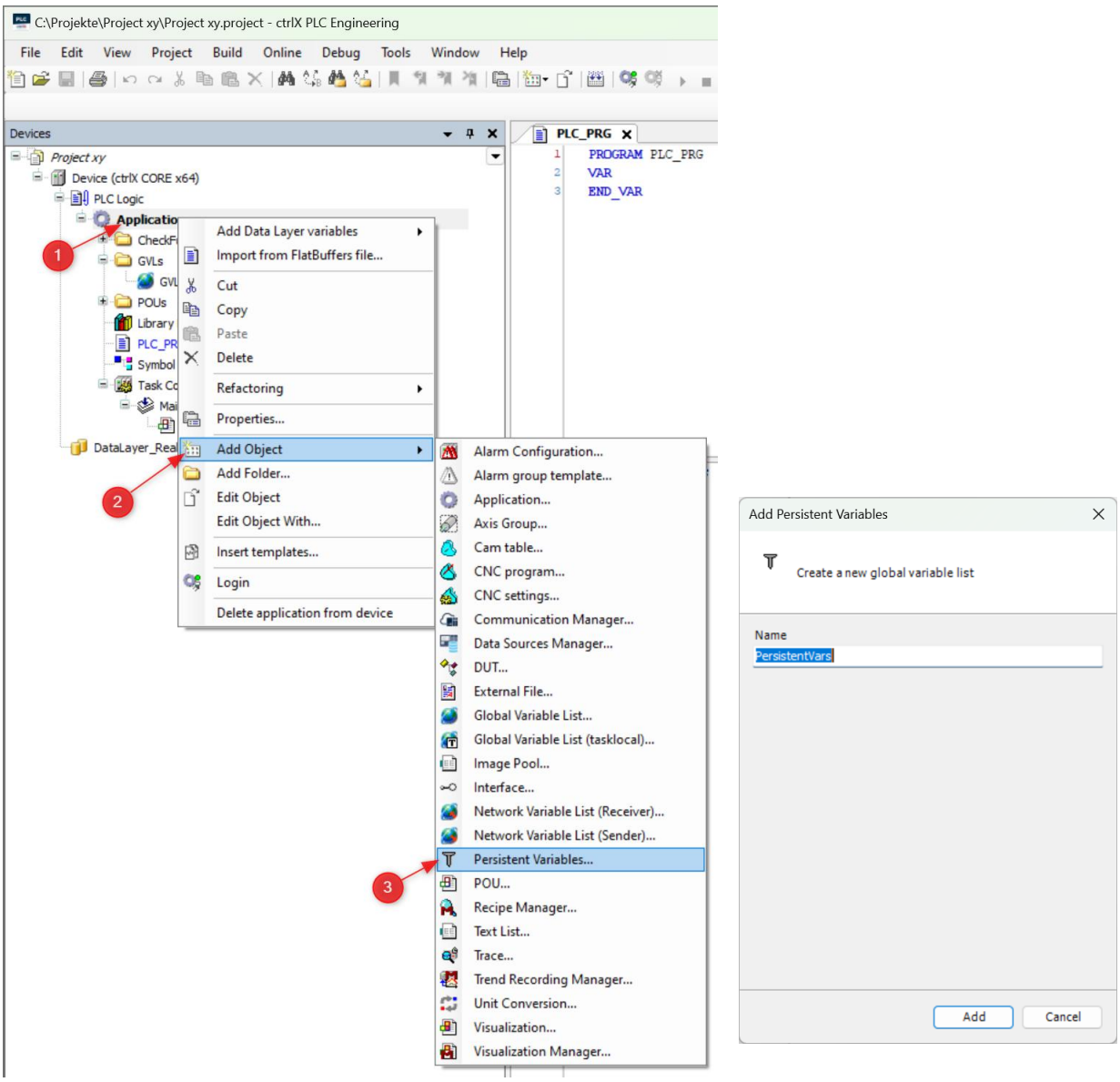
Open PLC_PRG (PRG) and enter "GlobalControl ();".



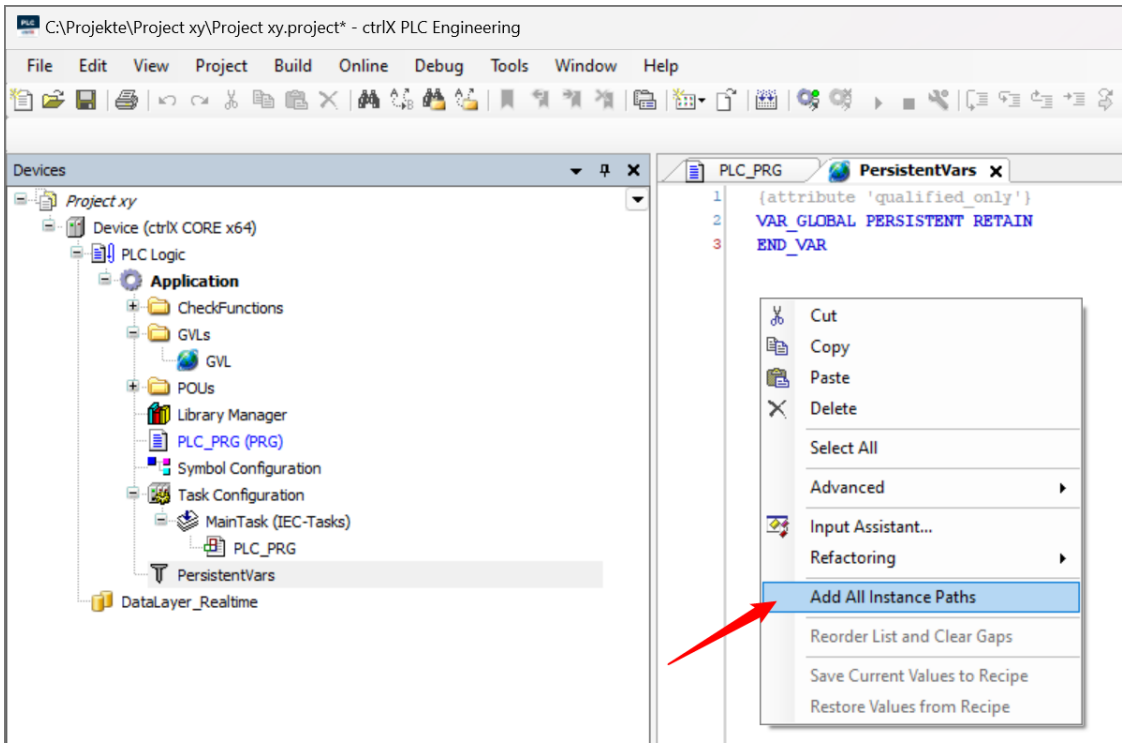
Go to the icon configuration and click on "Build".



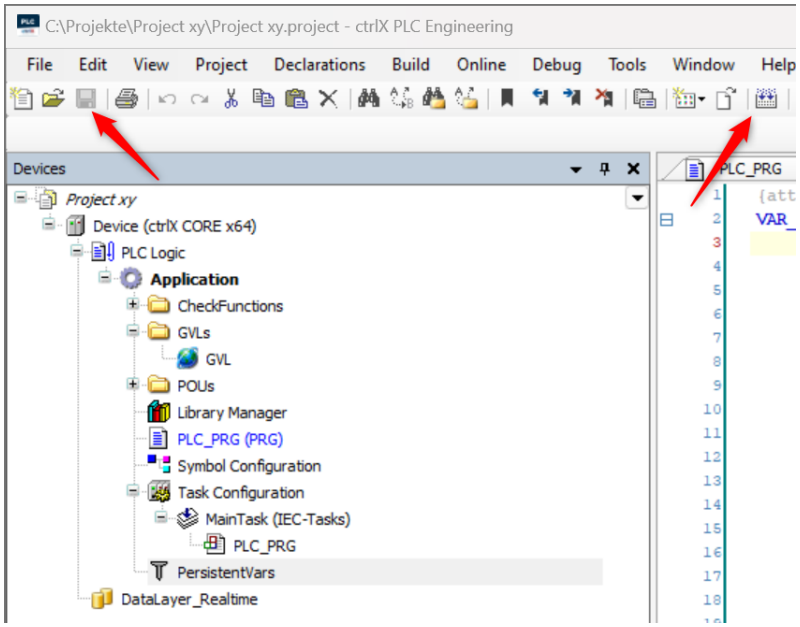
Right-click the context menu and select "Application" and then "Add Object". Then select "Persistent Variables..." from.



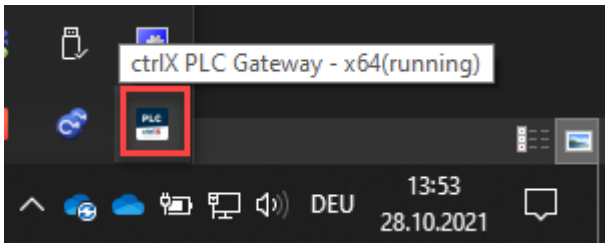
Open "Persistent Variables", right-click and go to "Add All Instance Paths".



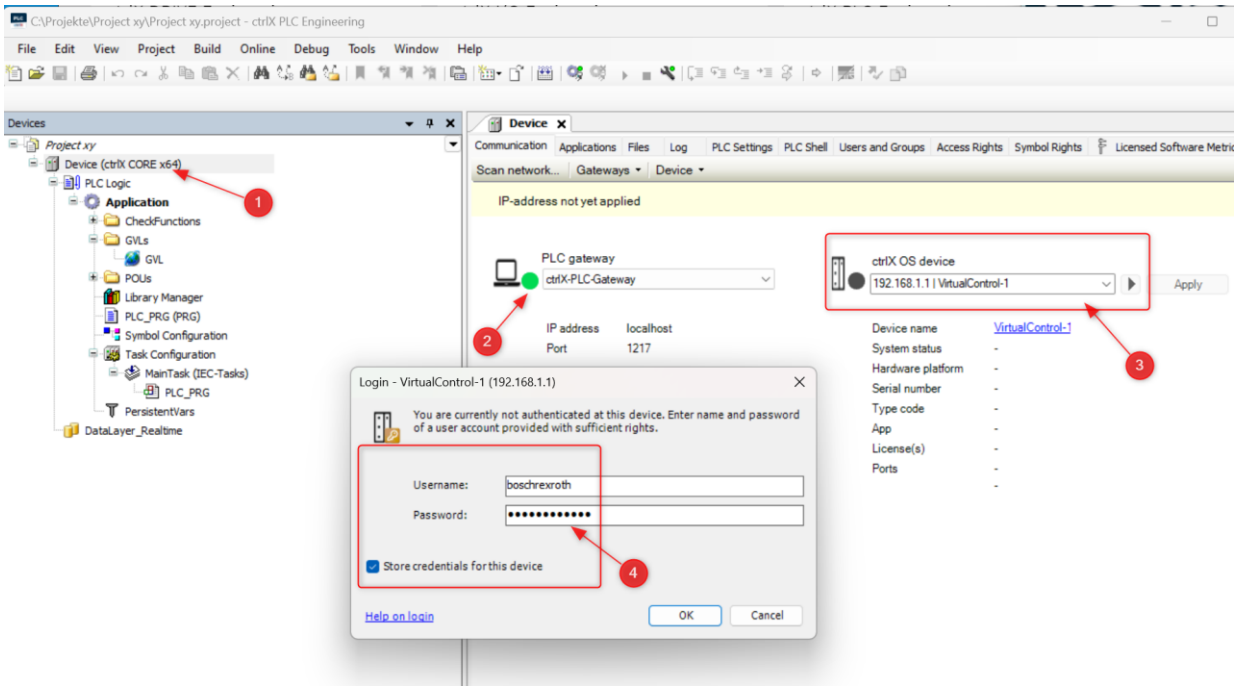
Press F11 or "Build", after which you can save the project.



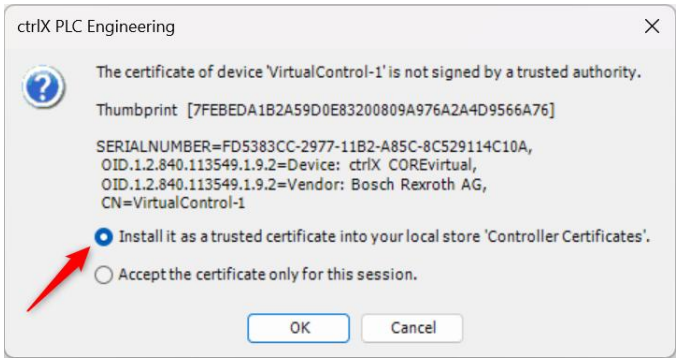
Make sure that "ctrlX PLC Gateway - x64" is running.



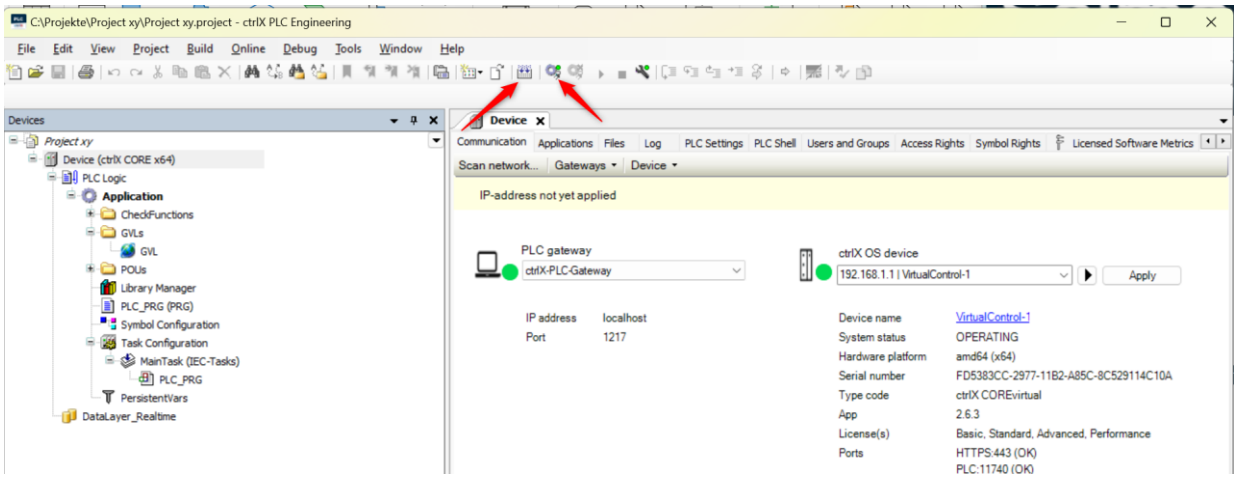
Next, select the network path to the controller. Use "Scan Network" to find the active device and log in with an IP address:



You may be asked to accept the controller's certificate and install it.



Now you can generate the code (F11) and log in. In the process, the code is transmitted.



The controller can now be started and you can observe, set/reset the variables online, etc.