

docs

ATOM / Fieldbus / PROFINET / Codesys

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Date: 2025-10-30

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ATOM / Fieldbus / PROFINET / Codesys

In this tutorial, you'll learn how to use Codesys with the SoftPLC emulator to connect to ATOM using Profinet and perform some basic operations and monitor data. You can follow along using the SoftPLC emulator or your own PLC.

We provide examples for both ladder logic and structured text.

If you haven't yet, please review ATOM's [Profinet Profile](#).

If you'd like to skip the tutorial, you can download a completed example project:

- Download [ATOM_Codesys_Profinet_LadderLogic_Example.zip](#)
- Download [ATOM_Codesys_Profinet_StructuredText_Example.zip](#)

Prerequisites

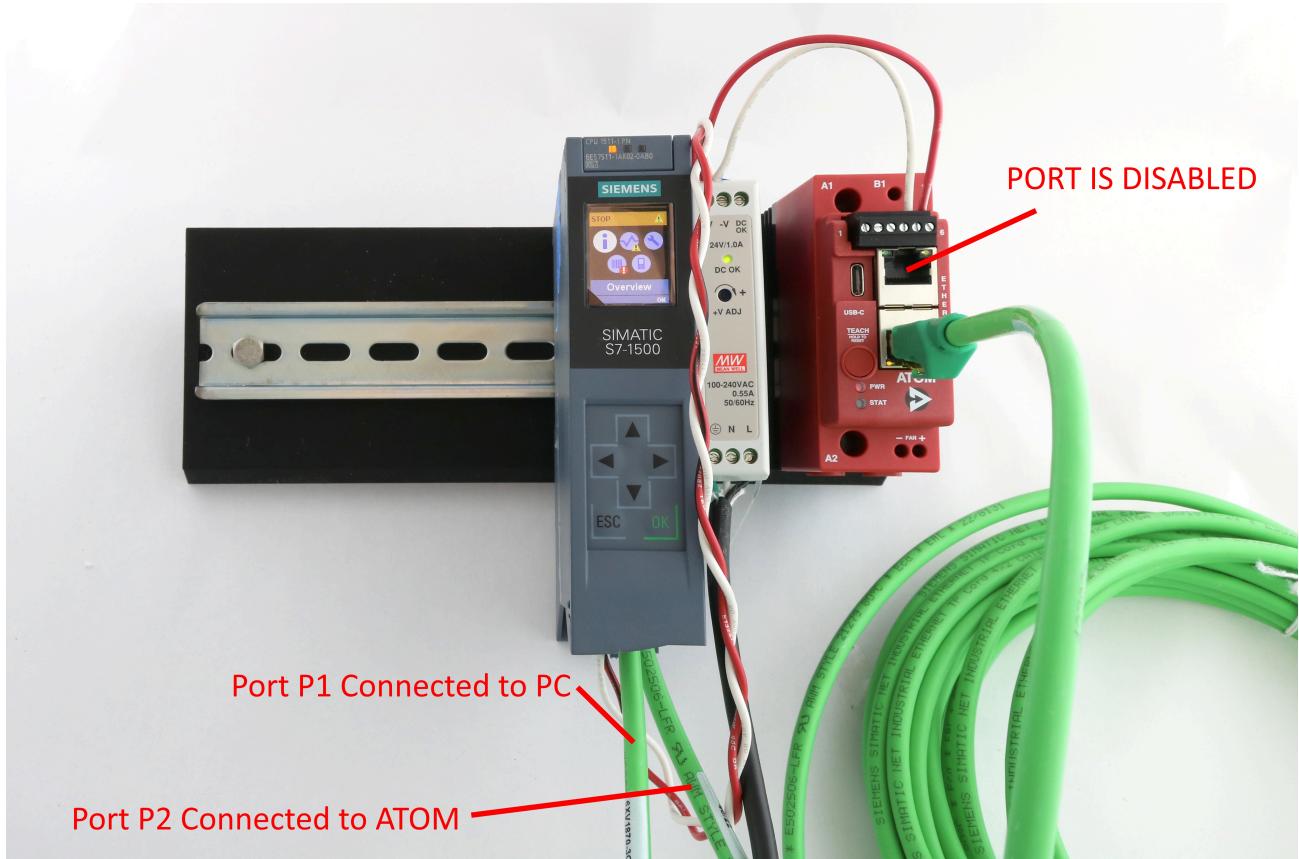
1. Install [Codesys](#)
2. Download ATOM's [GSDML file](#)

Hardware setup

IMPORTANT

When Atom is configured for Profinet, the Ethernet port closest to the 24V power connector is **disabled**. You must use opposing Ethernet port nearest the reset button as shown below or the PLC won't be able to connect to Atom.

Connect 24V to your PLC and Atom unit with the provided power cable. Connect Atom to your PC with an Ethernet cable.



!(info)

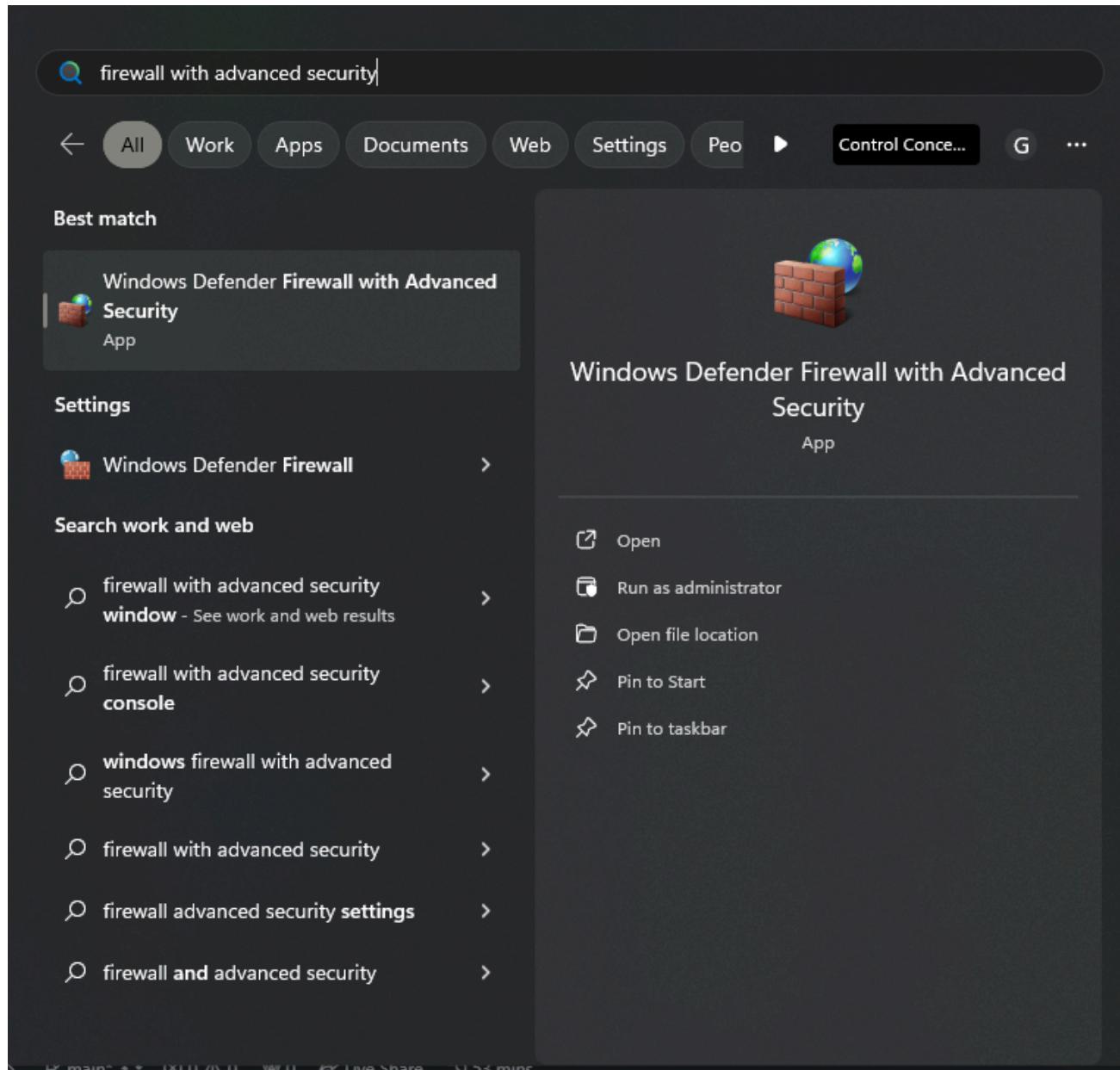
To simplify this diagram, we have not connected a load to Atom. You may connect a load or leave it disconnected, either way is fine for the purposes of this tutorial.

If you do not connect a load, you can still verify your PLC is working by connecting a USB cable to Atom and using Control Panel to watch the parameters change/verify the PLC is receiving the correct monitor data.

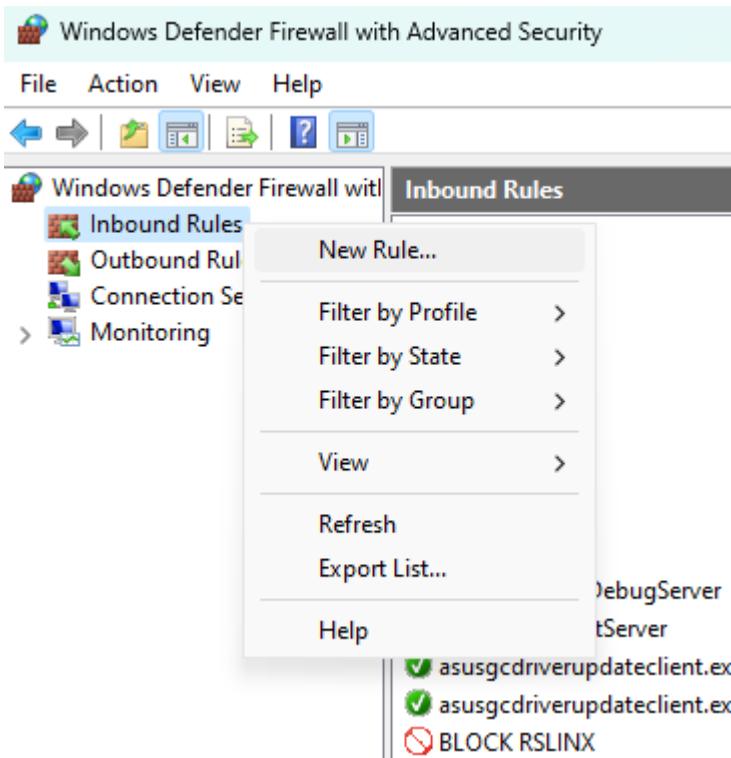
Configure Windows firewall

Codesys requires you to allow incoming Profinet UDP packets through the Windows firewall so that the SoftPLC is able to receive UDP Profinet requests from Atom.

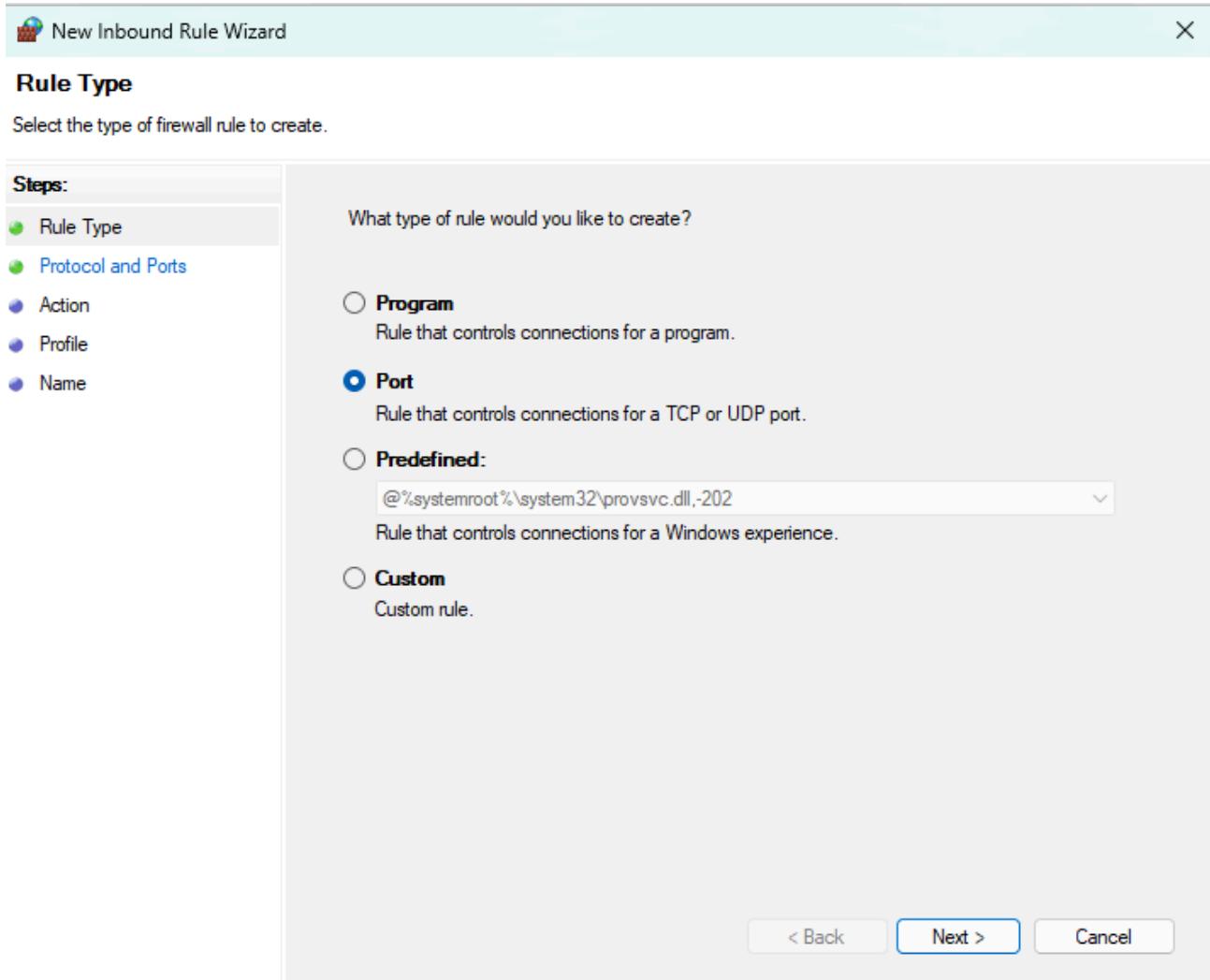
1. First, search for **Windows Defender Firewall with Advanced Security** and open it:



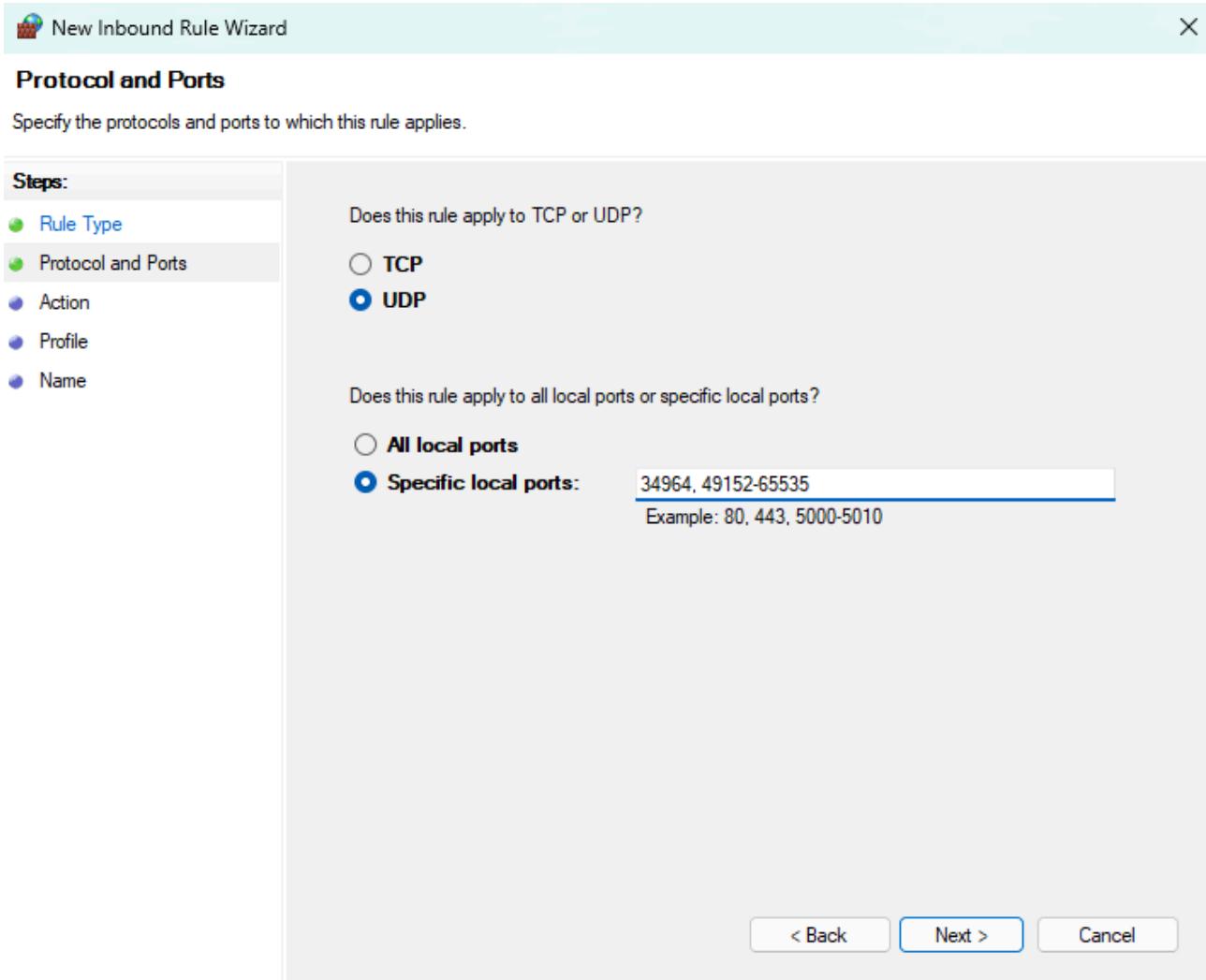
2. Right click on **Inbound Rules** and select **New Rule**:



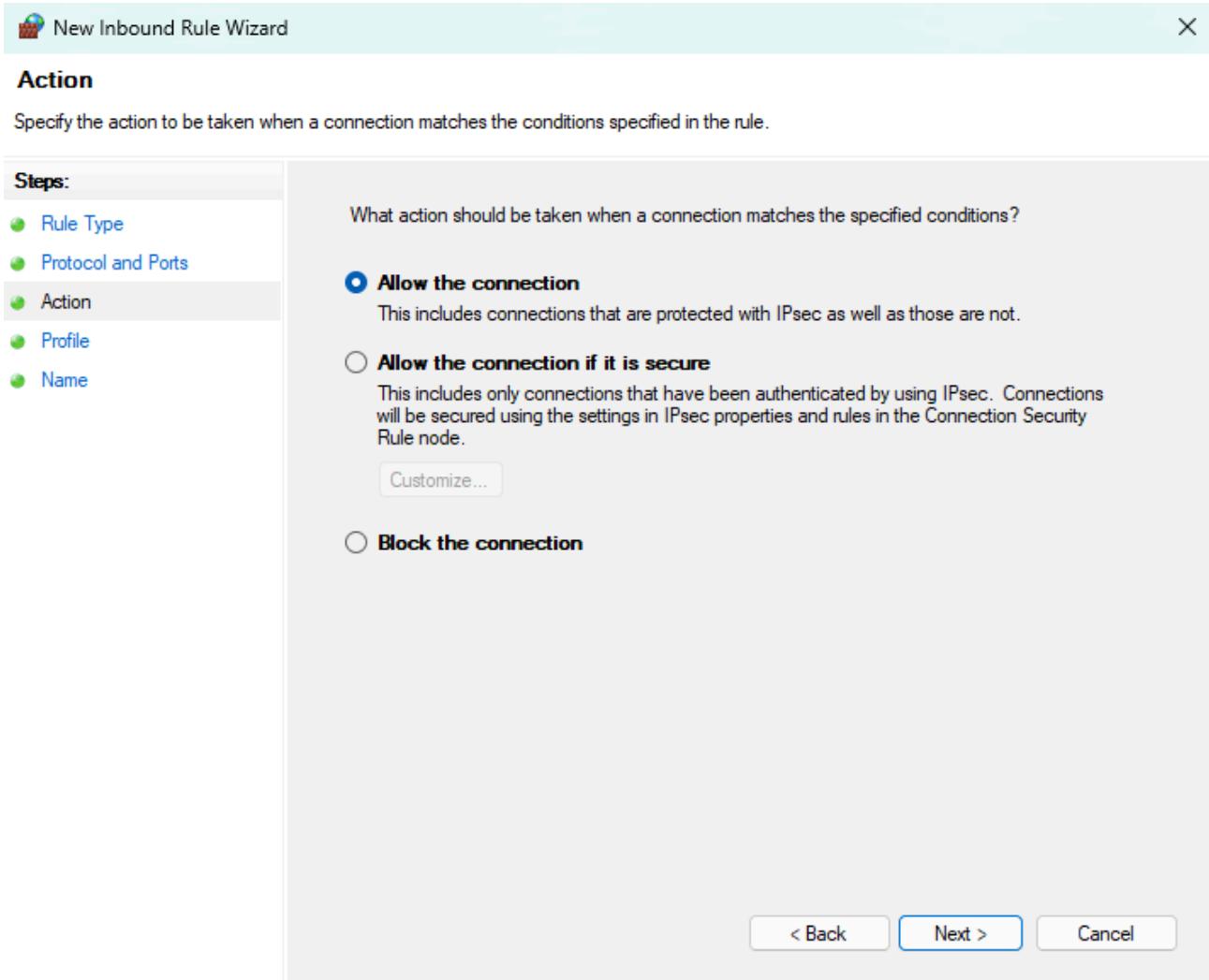
3. Select **Port**, then click **Next**:



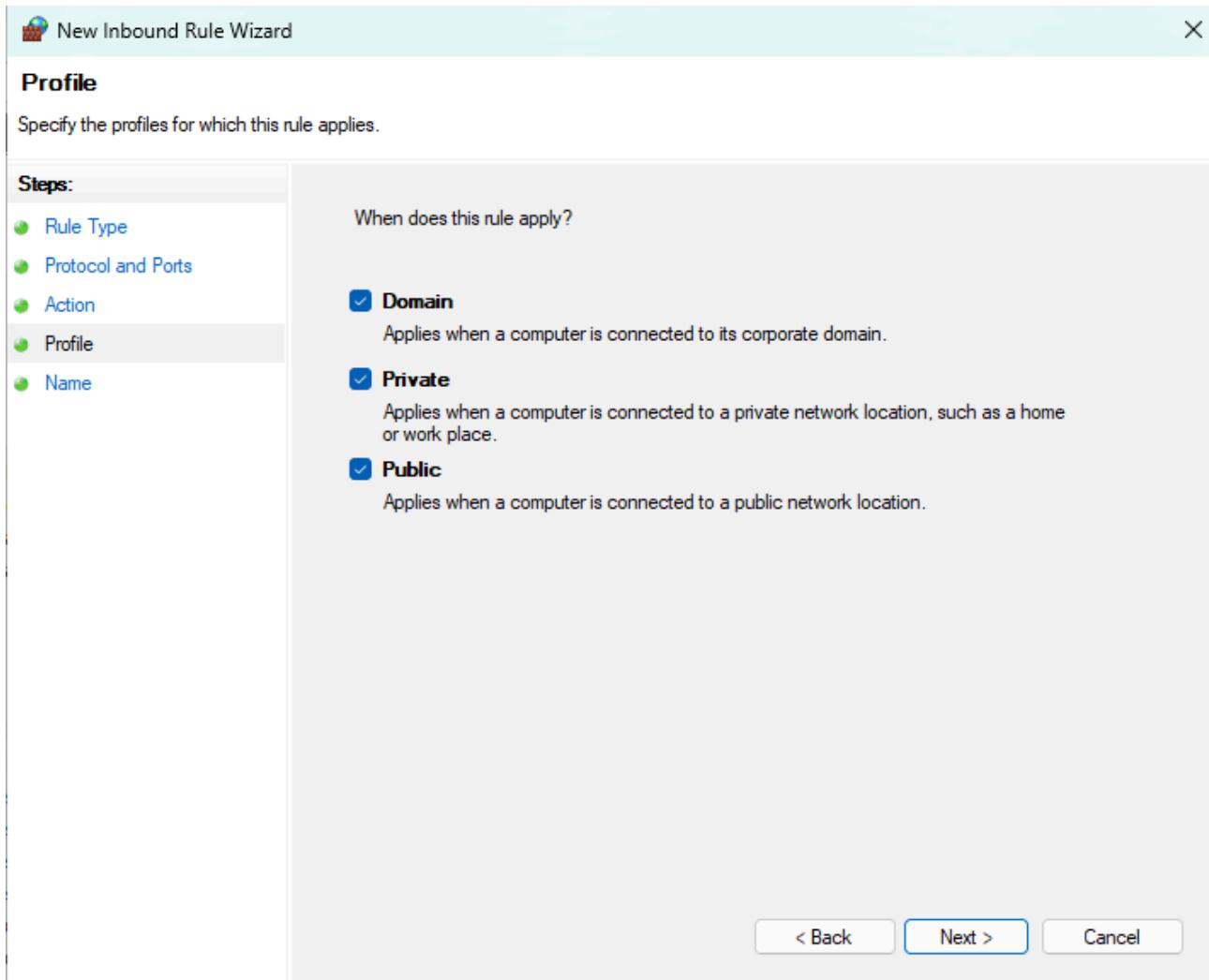
4. Select **UDP**, then select **Specific local ports** and enter **34964, 49152-65535**, then click **Next**:



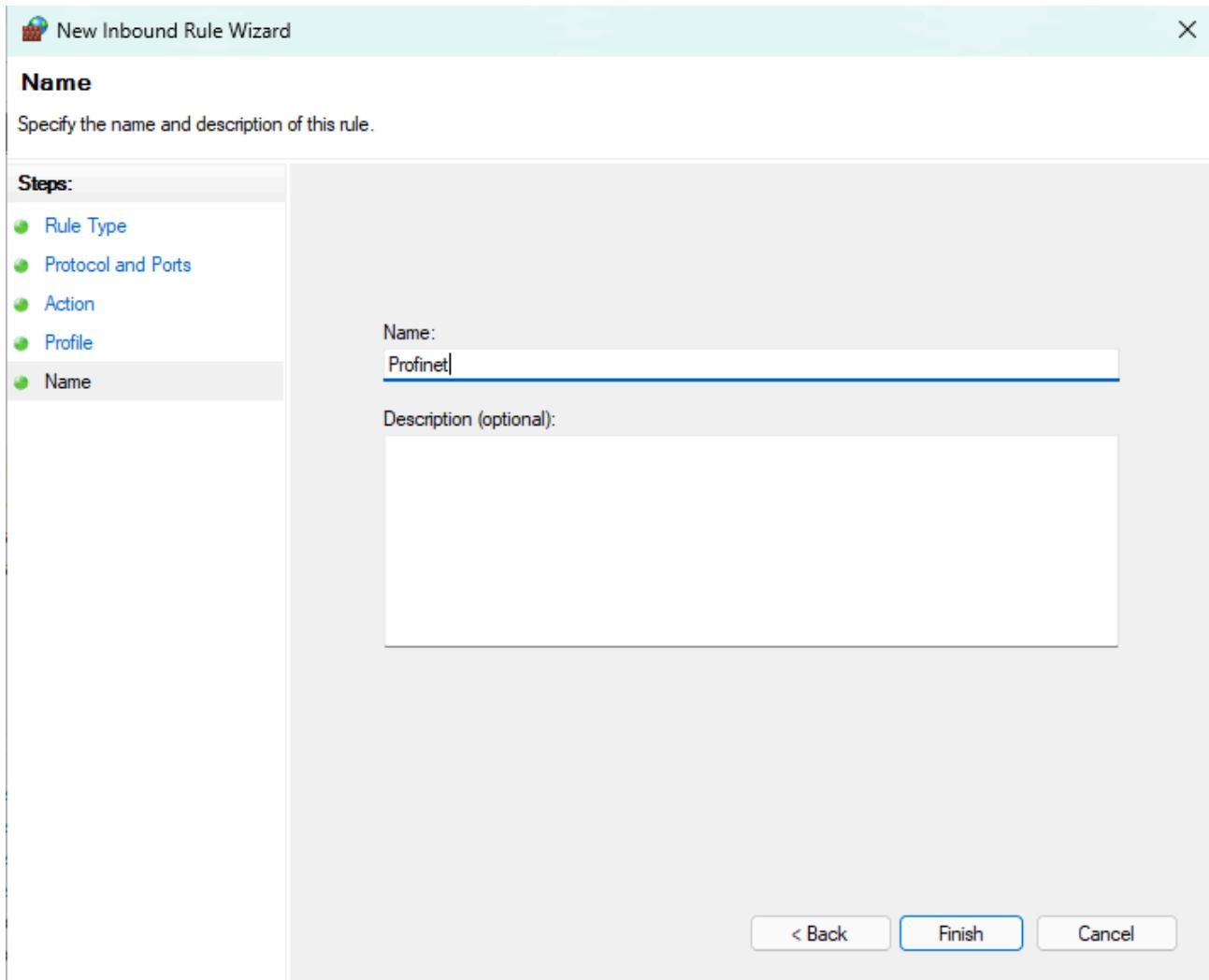
5. Select **Allow the connection**, then click **Next**:



6. Select which network types this rule applies to, then click **Next**:

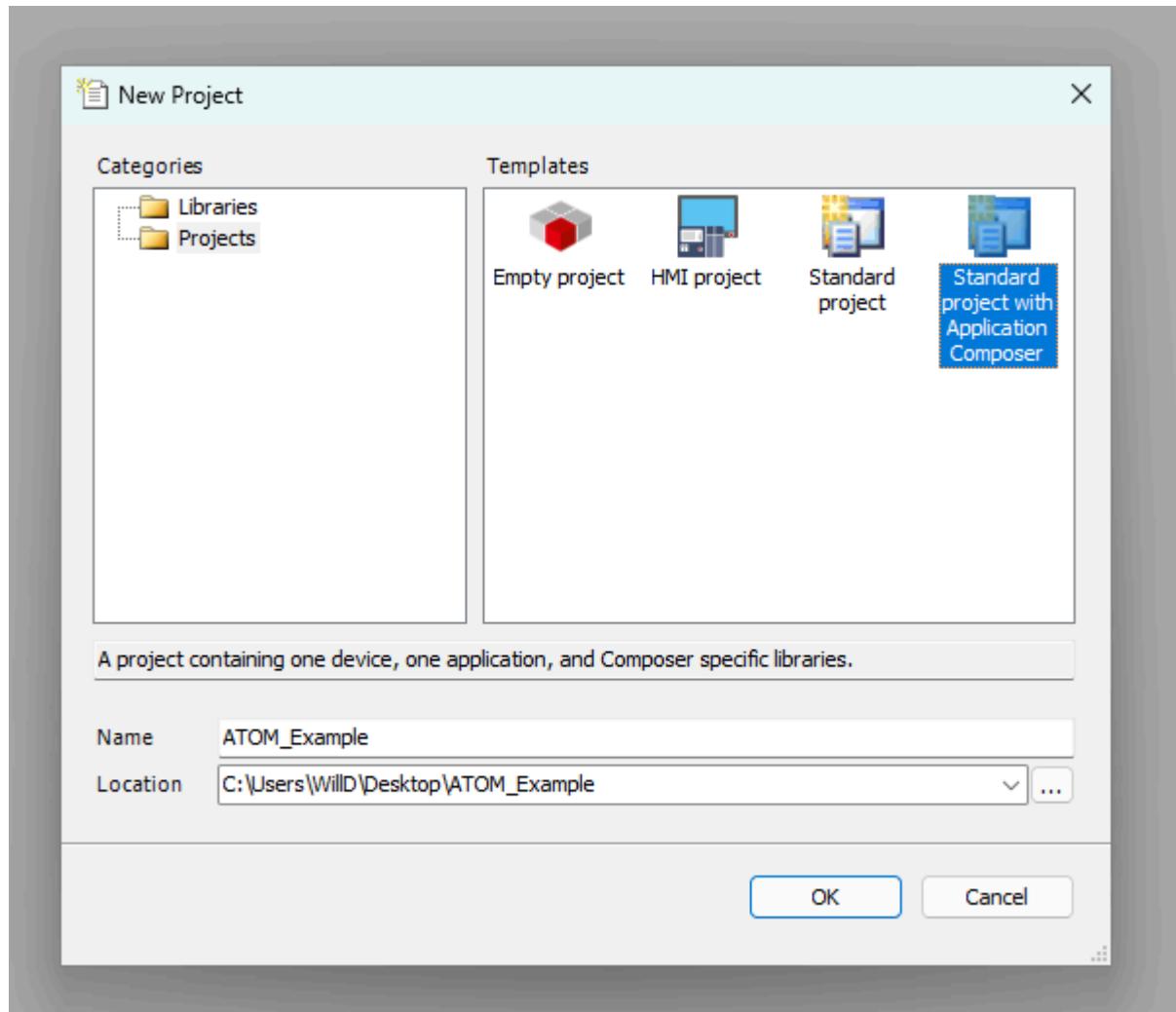


7. Name the rule **Profinet**, then click **Finish**:

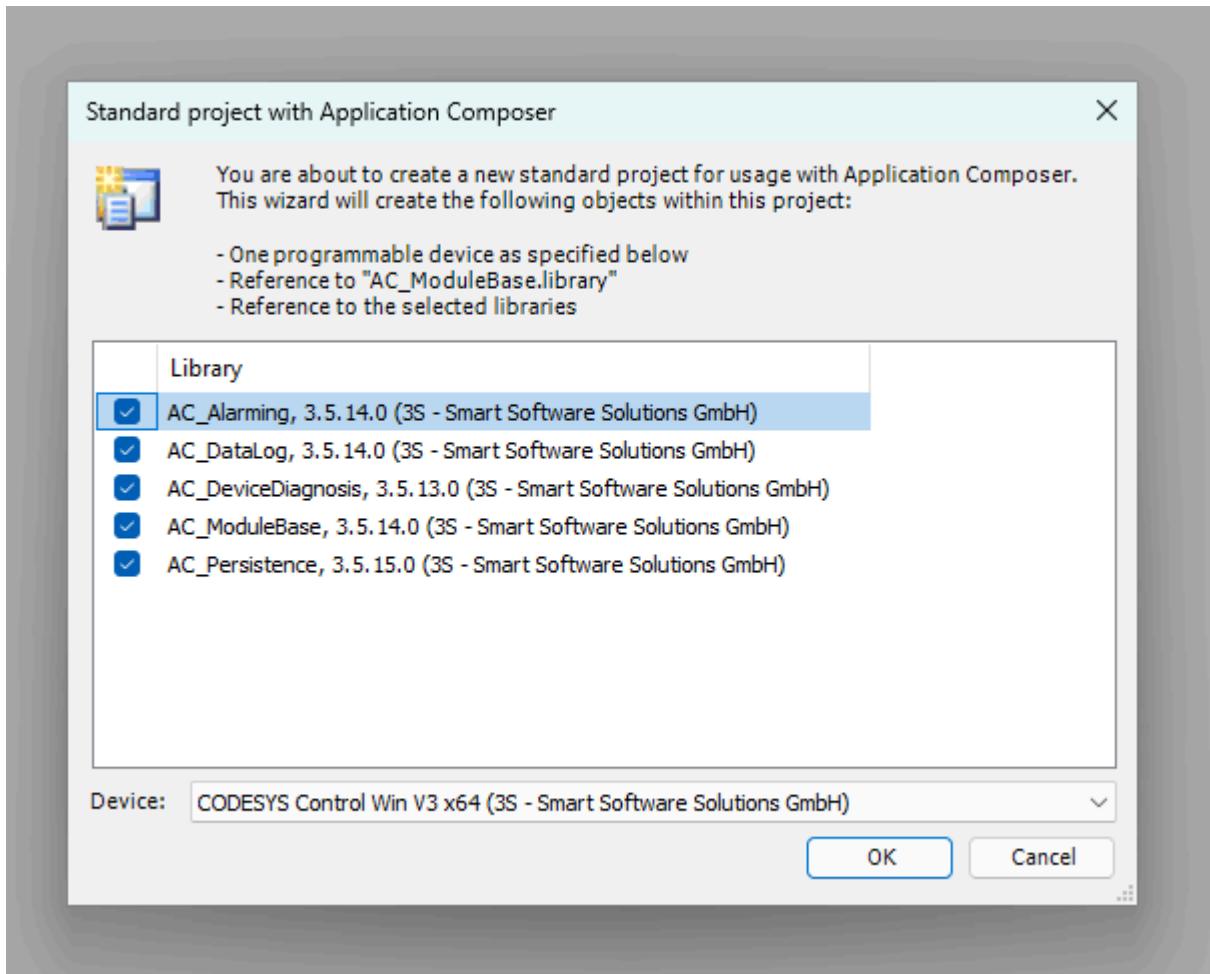


Create a Codesys project

Create a new Codesys project using the **Standard project with Application Composer** template:



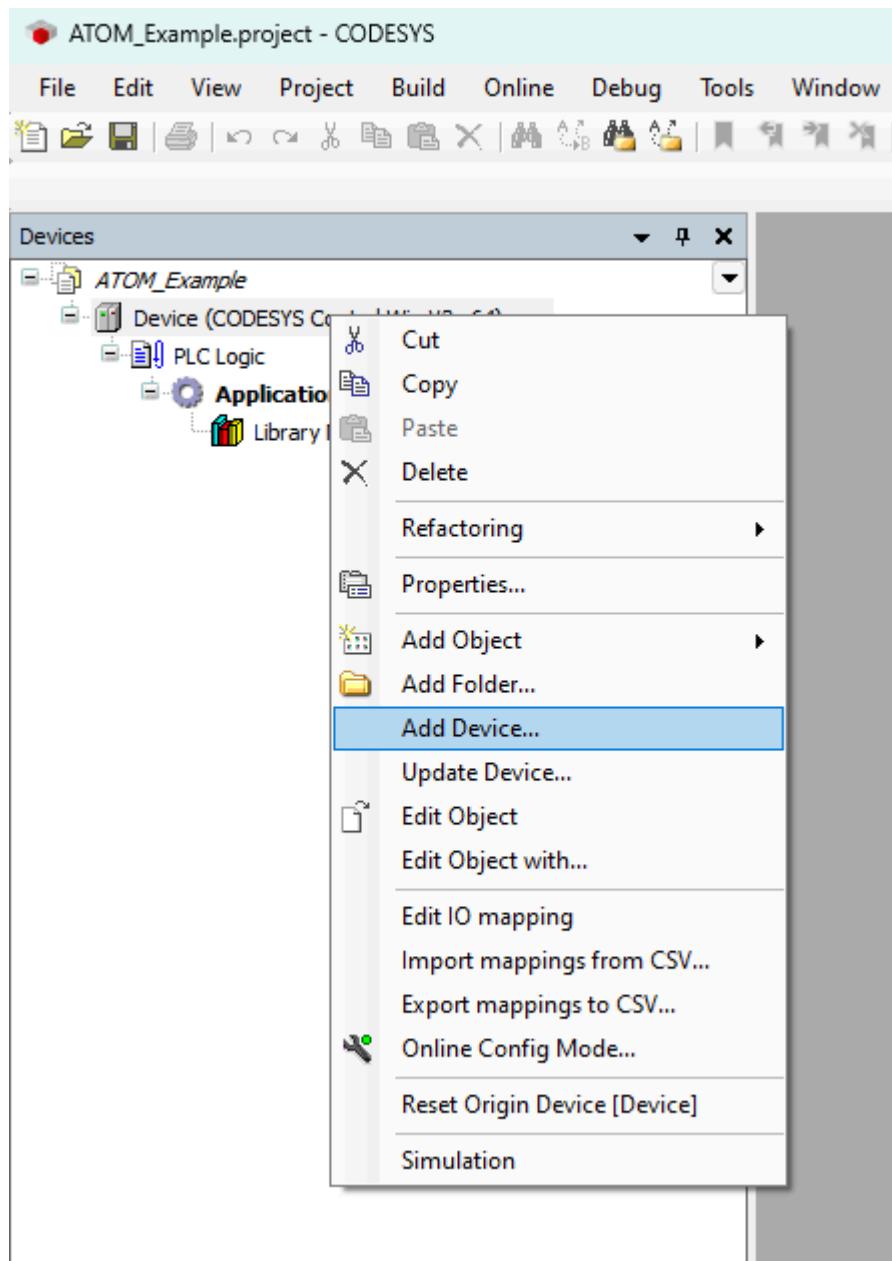
Check each library to include it in the project and select **CODESYS Control WIN V3 x64** as the device:



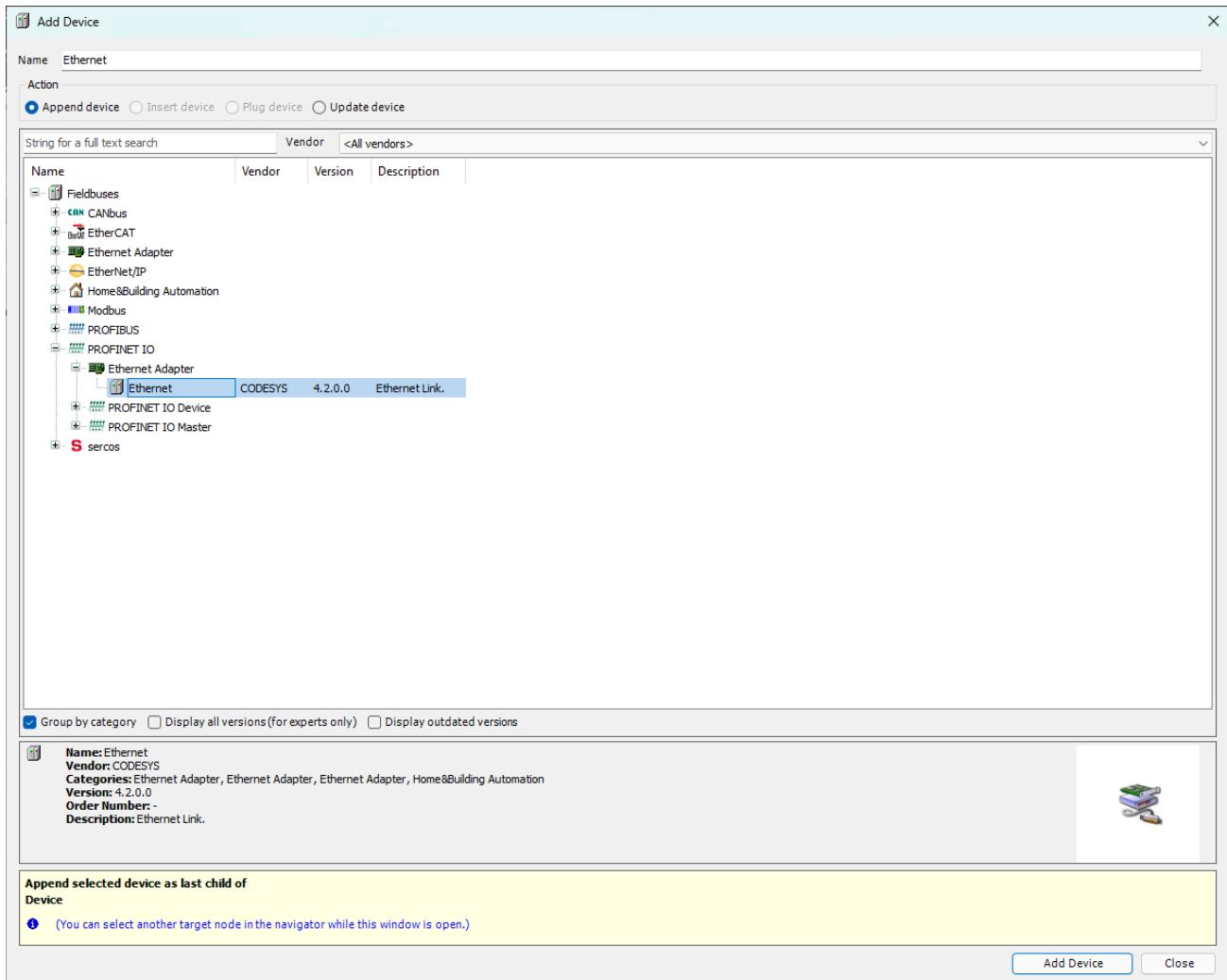
Adding a Profinet Controller

Next we'll add a Profinet Controller device. This allows the SoftPLC to discover Profinet I/O devices on the network (in our case, ATOM) and establish a connection with them.

First, right click **Device** and select **Add Device**:



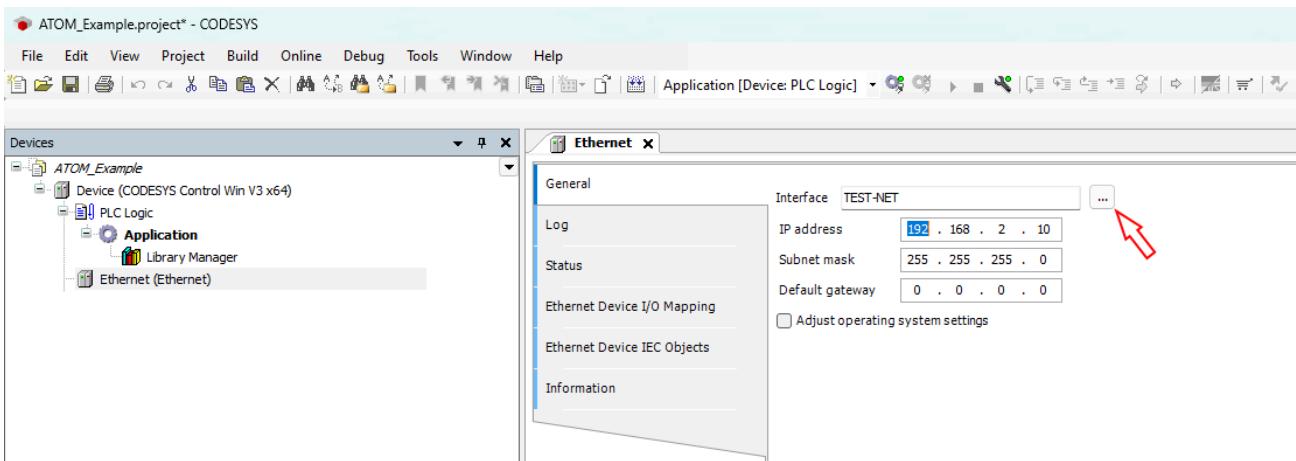
Next, expand **PROFINET IO > Ethernet Adapter** and select **Ethernet**, then click **Add Device**:



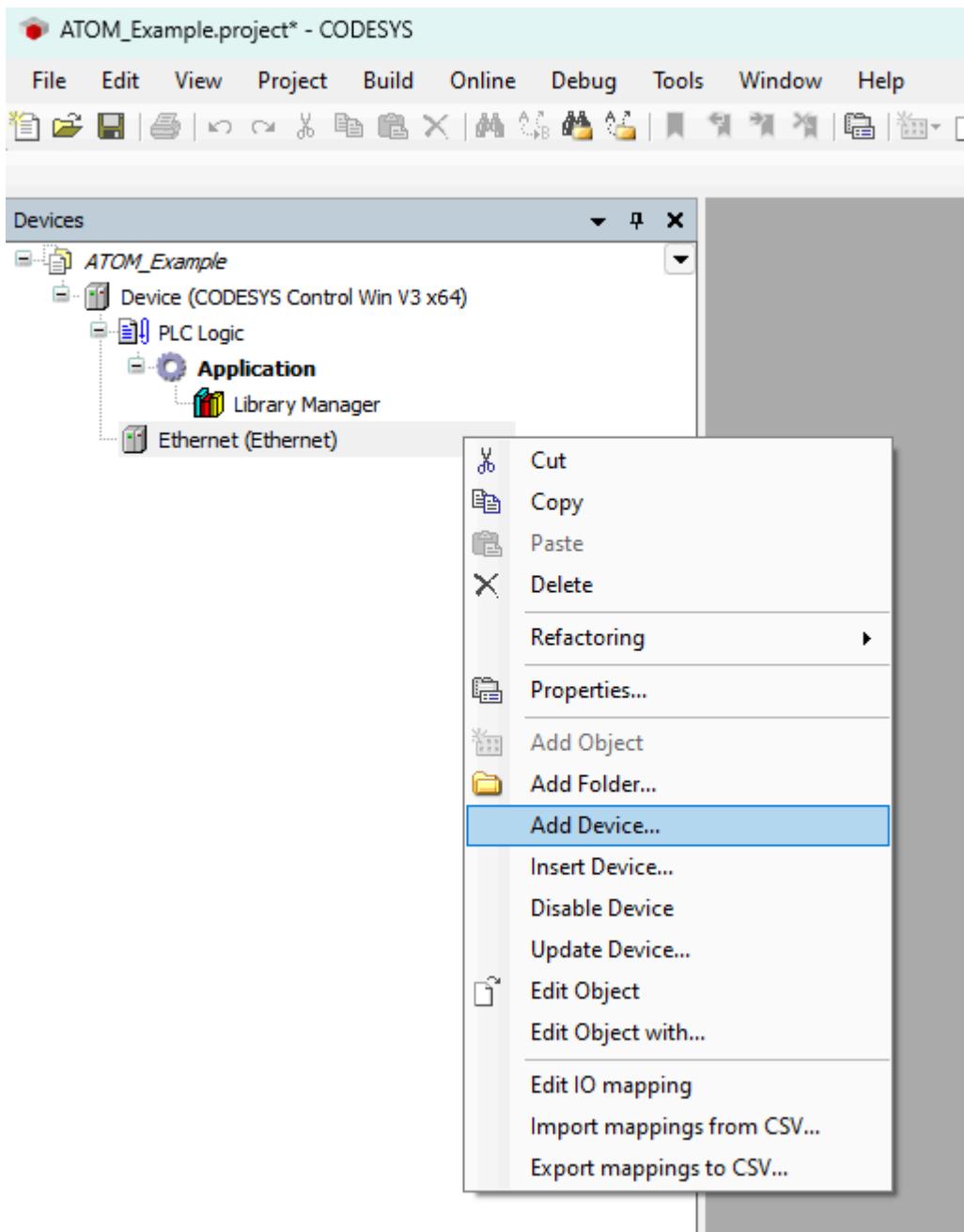
The newly added **Ethernet** device will now appear in the device tree. Double click **Ethernet (Ethernet)** to open its configuration tab. Within the **General** configuration tab, use the button indicated by the red arrow to select the network interface of the host machine that will be used to communicate with ATOM. In our case, we have a **TEST-NET** interface but this will be different for you.

ⓘ INFO

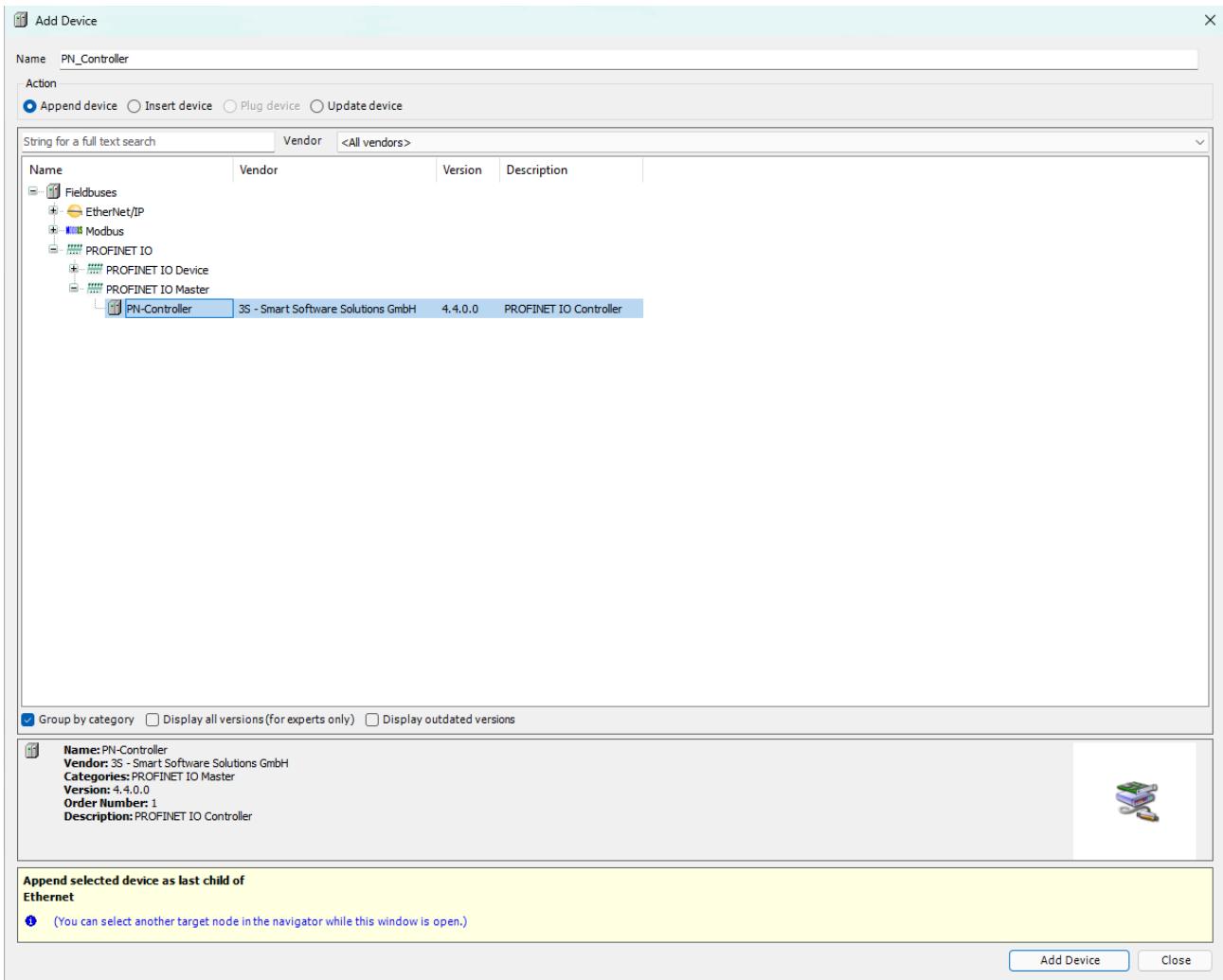
Note, you may get an error dialog displaying "Gateway not configured properly". If this is the case, make sure your SoftPLC is online by right-clicking the Codesys Win SysTray icon and starting the PLC. Navigate to the CODESYS Control Win V3 device in Codesys and use **Scan Network** to make sure the gateway is detected. Then, you can select the network interface.



Next, right click **Ethernet (Ethernet)** and select **Add Device**:



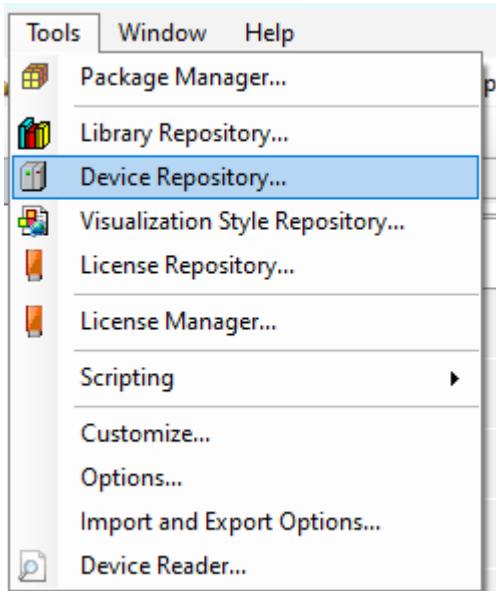
Expand **PROFINET IO > PROFINET IO Master**, select **PN-Controller** then click **Add Device:**



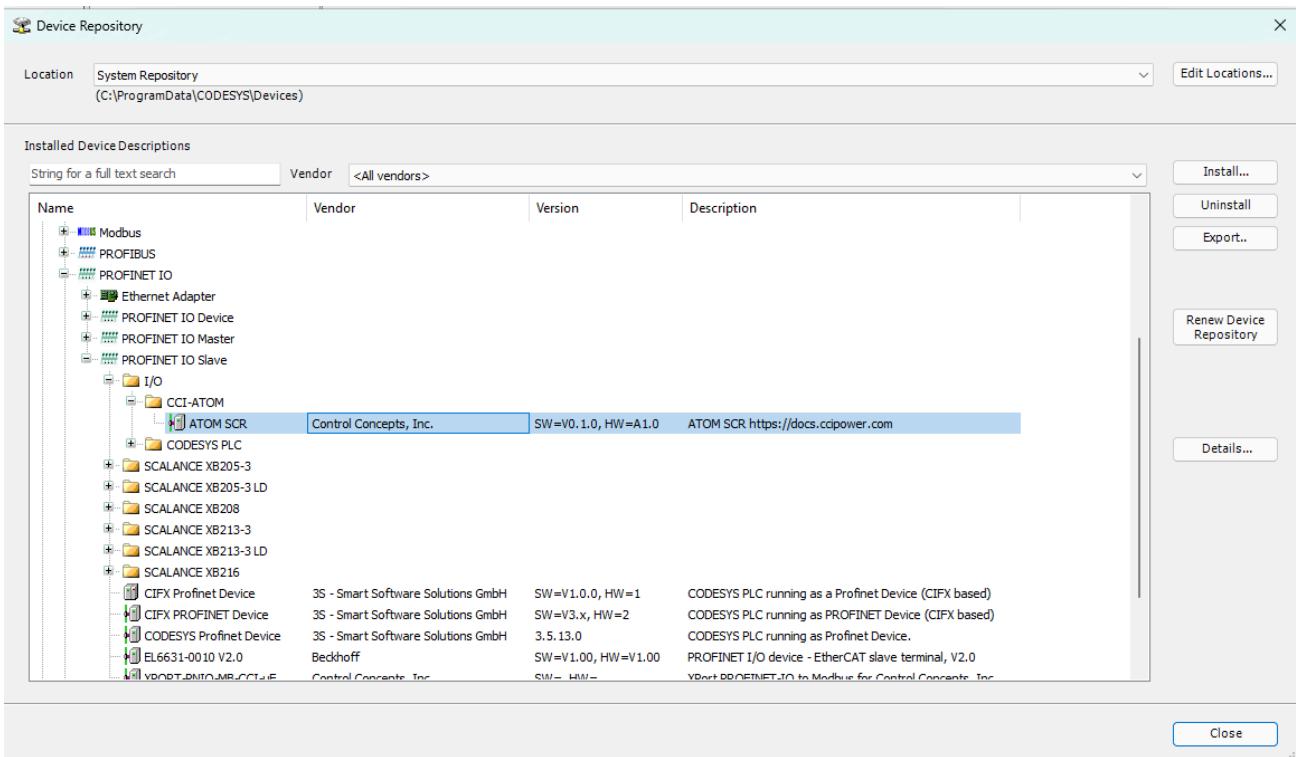
Your device tree should update to include the **PN-Controller** device.

Adding ATOM to the controller

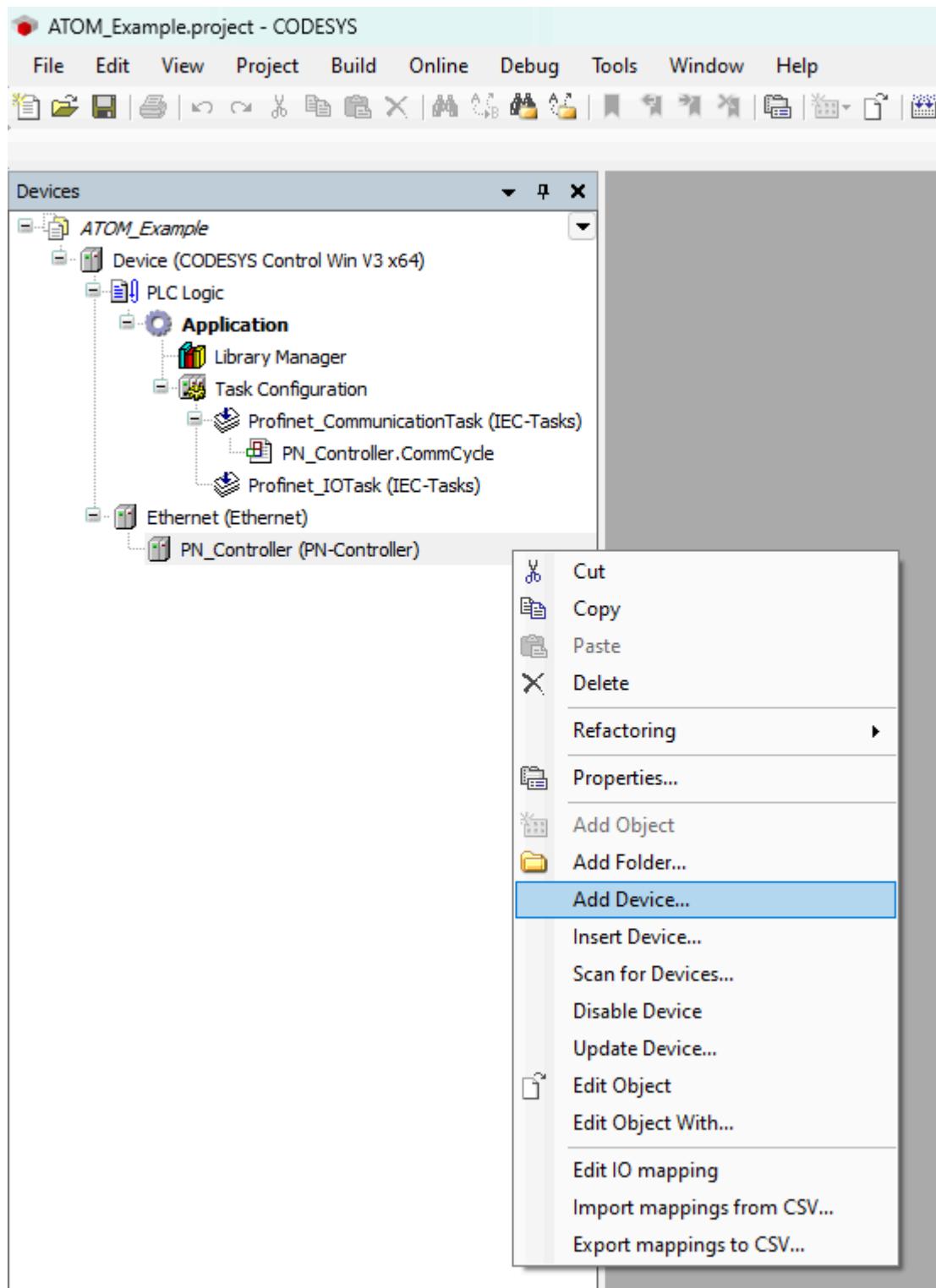
First, we'll import ATOM's GSDML file you downloaded [earlier](#) into our Codesys device library. Open the tools menu and select **Device repository**:



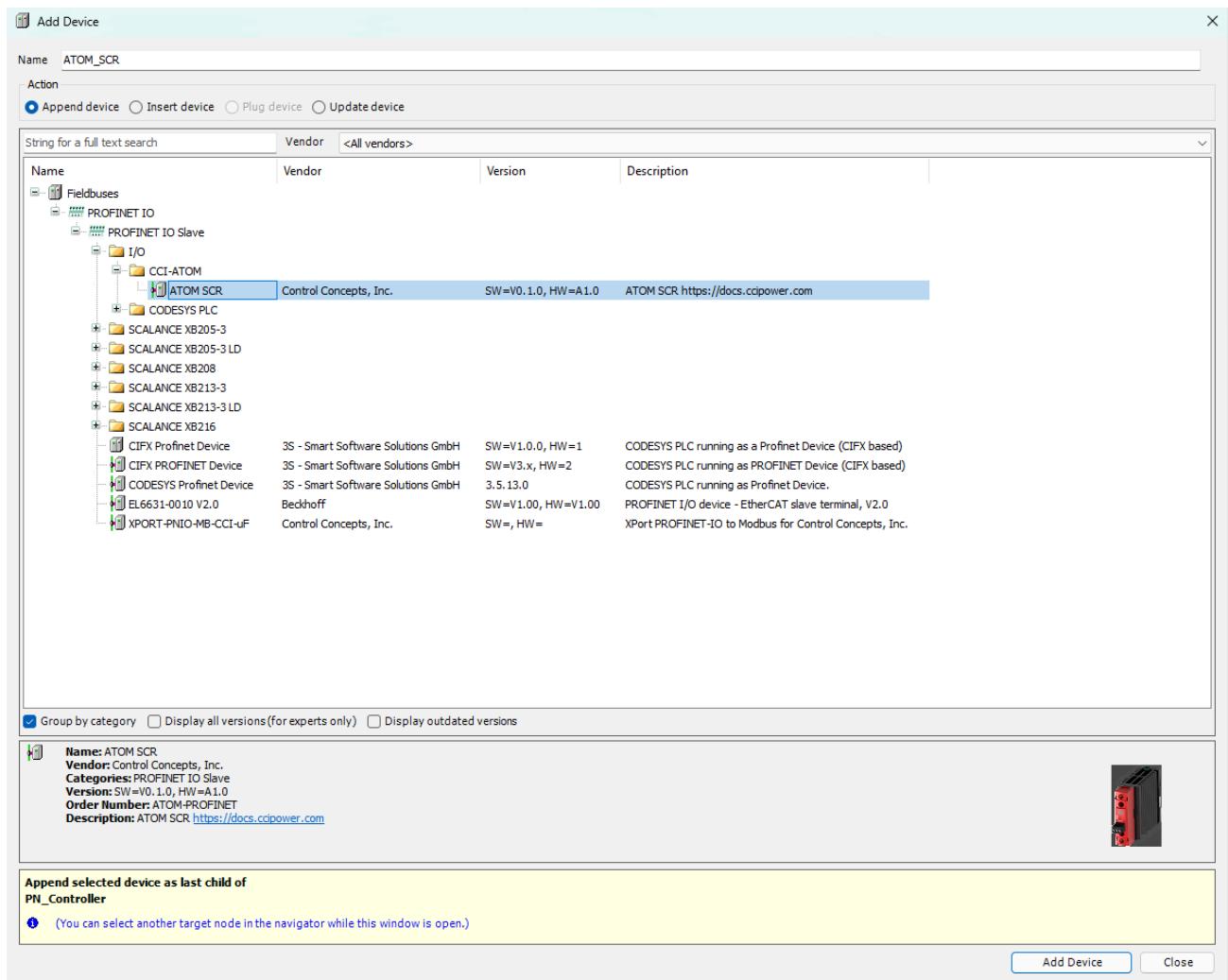
Next, click **Install** and select the `GSDML-V2.43-Control-Concepts-ATOM_20231108.xml` file. After you click install, **Atom** will appear under the **PROFINET IO > PROFINET IO Slave > I/O** category. Click **Close** to dismiss the dialog:



Now, we'll add ATOM to the PN-Controller. Right click **EtherNet/IP Scanner (EtherNet/IP Scanner)** and select **Add Device**:



Expand **PROFINET IO > PROFINET IO Slave > I/O > CCI-ATOM** and select **ATOM SCR**, then click **Add Device**:



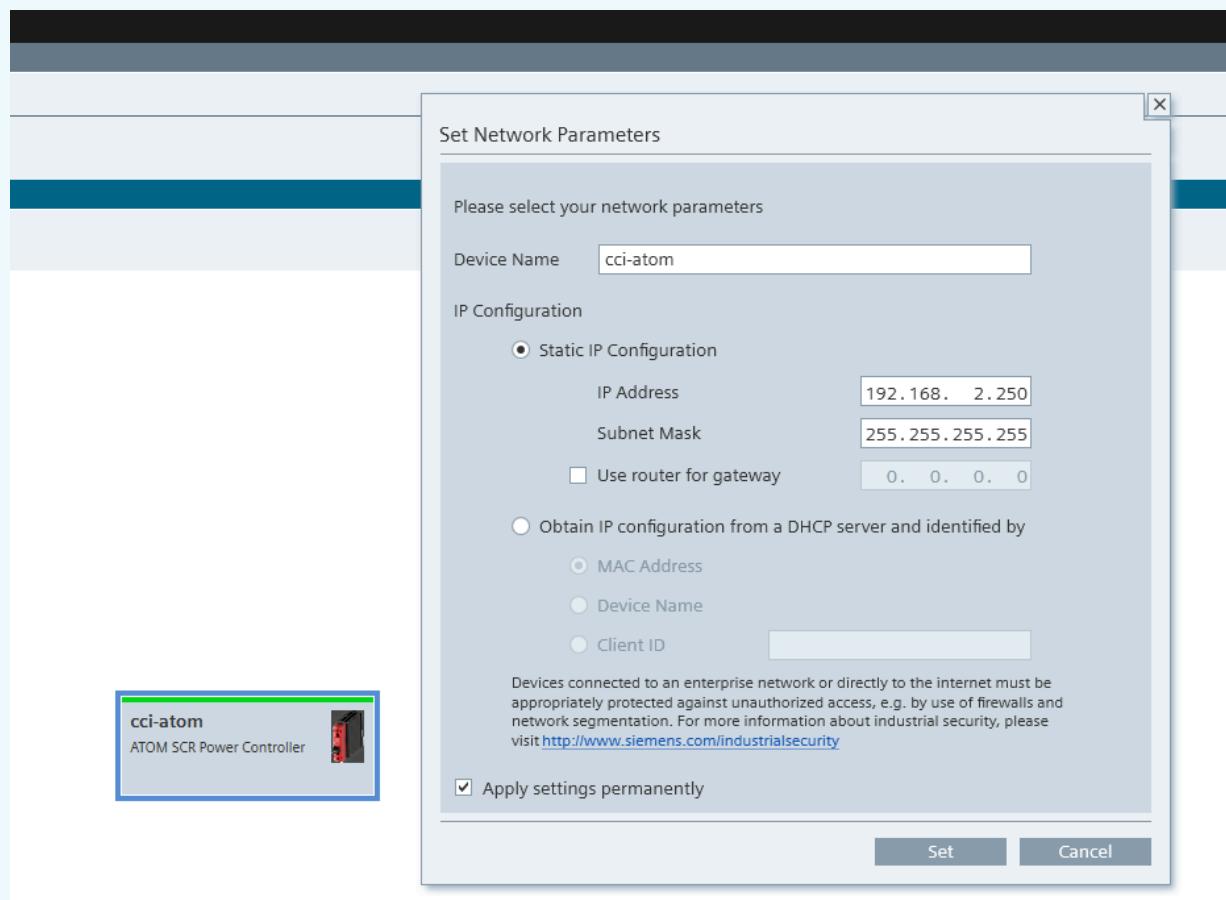
Finally, double click **Atom (Atom)** to open its configuration tab. In the **General** tab, set the **Station name**, **IP Address**, and **Subnet mask** for your ATOM SCR:

ⓘ INFO

You can find or change these parameters in Control Panel, or using a tool like [Proneta](#). Make sure your station name and IP settings on Atom are properly set to the same values you enter here so that Codesys can connect to ATOM.

Proneta

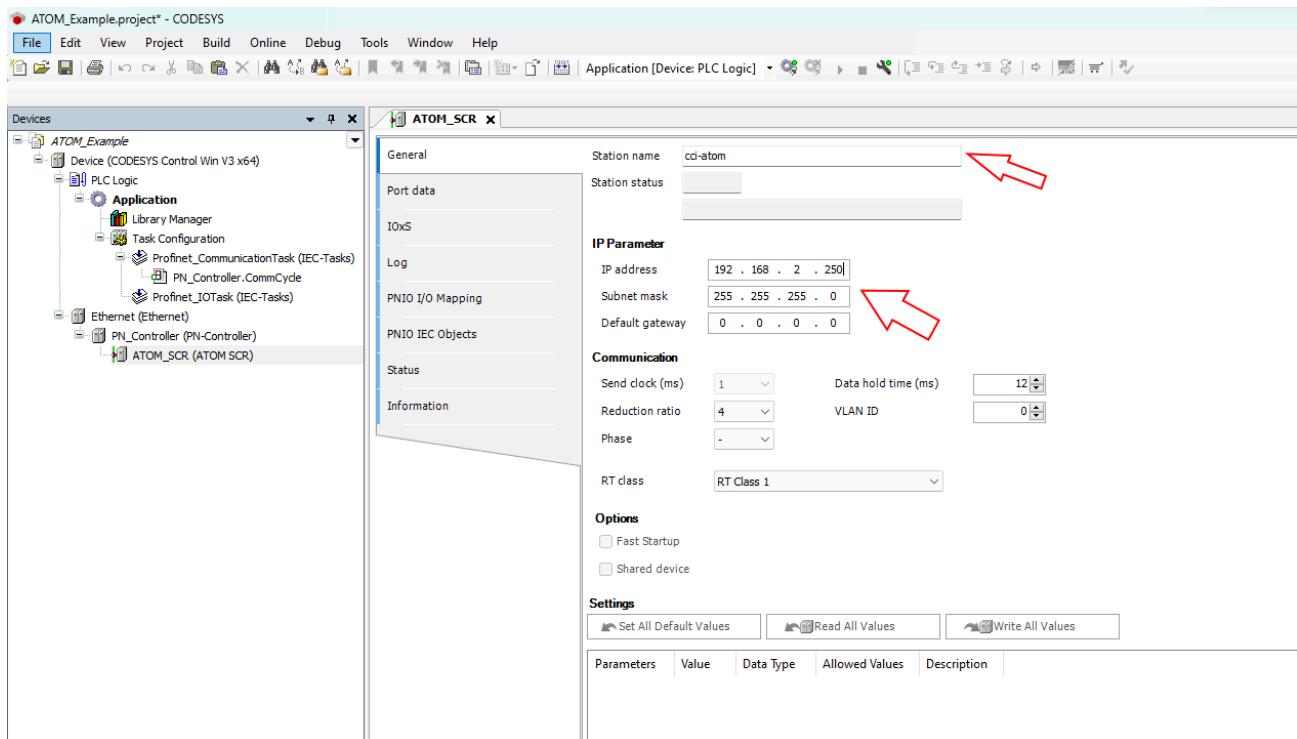
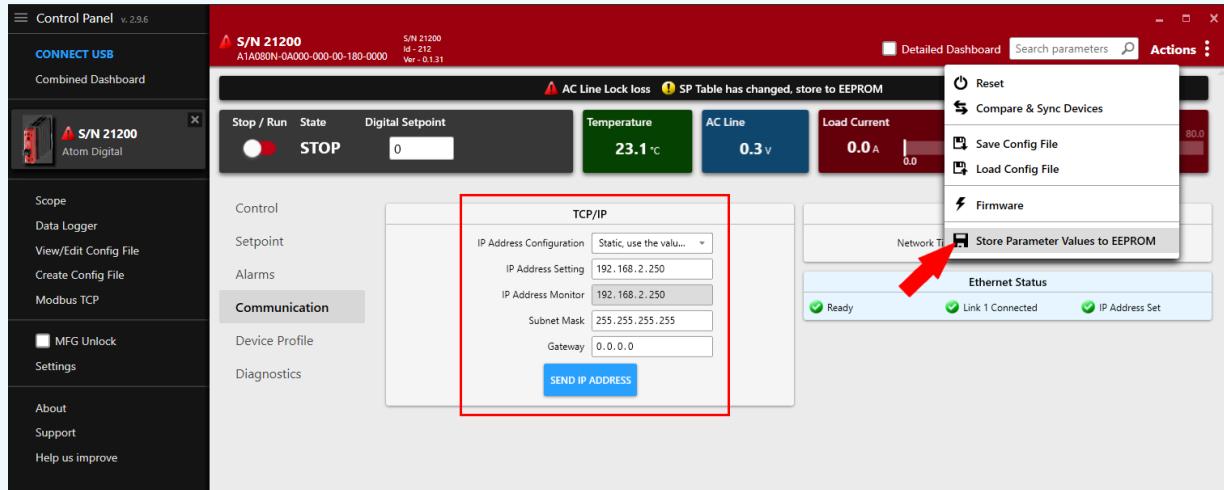
If you're using Proneta, make sure to change the IP settings with **Store permanently** checked.



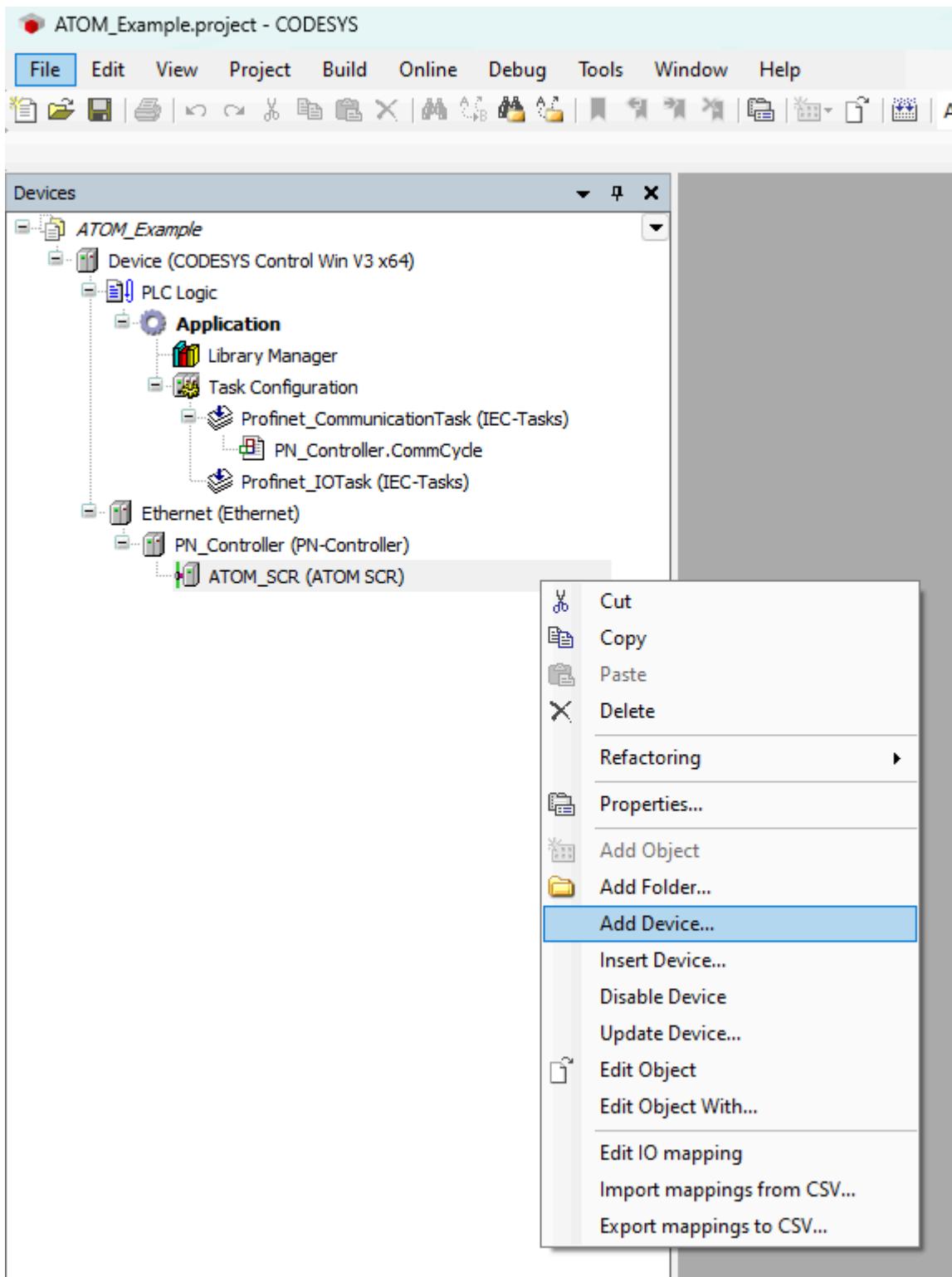
Control Panel

Connect your Atom unit to your PC using a USB cable. Open Control Panel and update your Atom's communication parameters. When you're finished, click **Send IP**

Address, then go to **Actions** in the upper right and select **Store Parameter Values to EEPROM**:

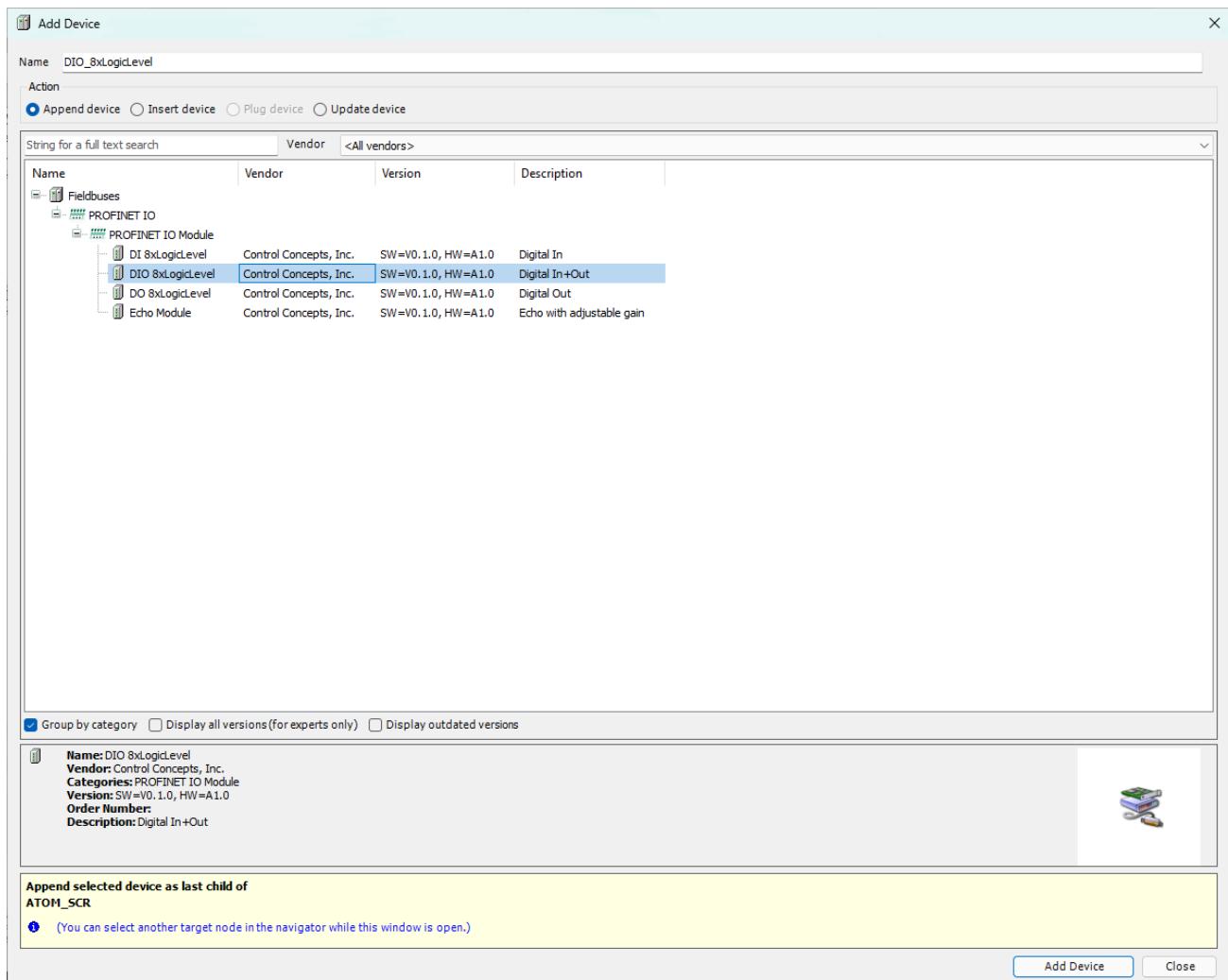


Next, right click **ATOM_SCR (ATOM SCR)** and select **Add Device**:



Here, you can choose which Profinet I/O modules to enable for your Atom. Select **DIO 8xLogicLevel** which allows both input and output of data to/from Atom. You can add other

I/O modules if needed. Then, click **Add Device**:



Create a program

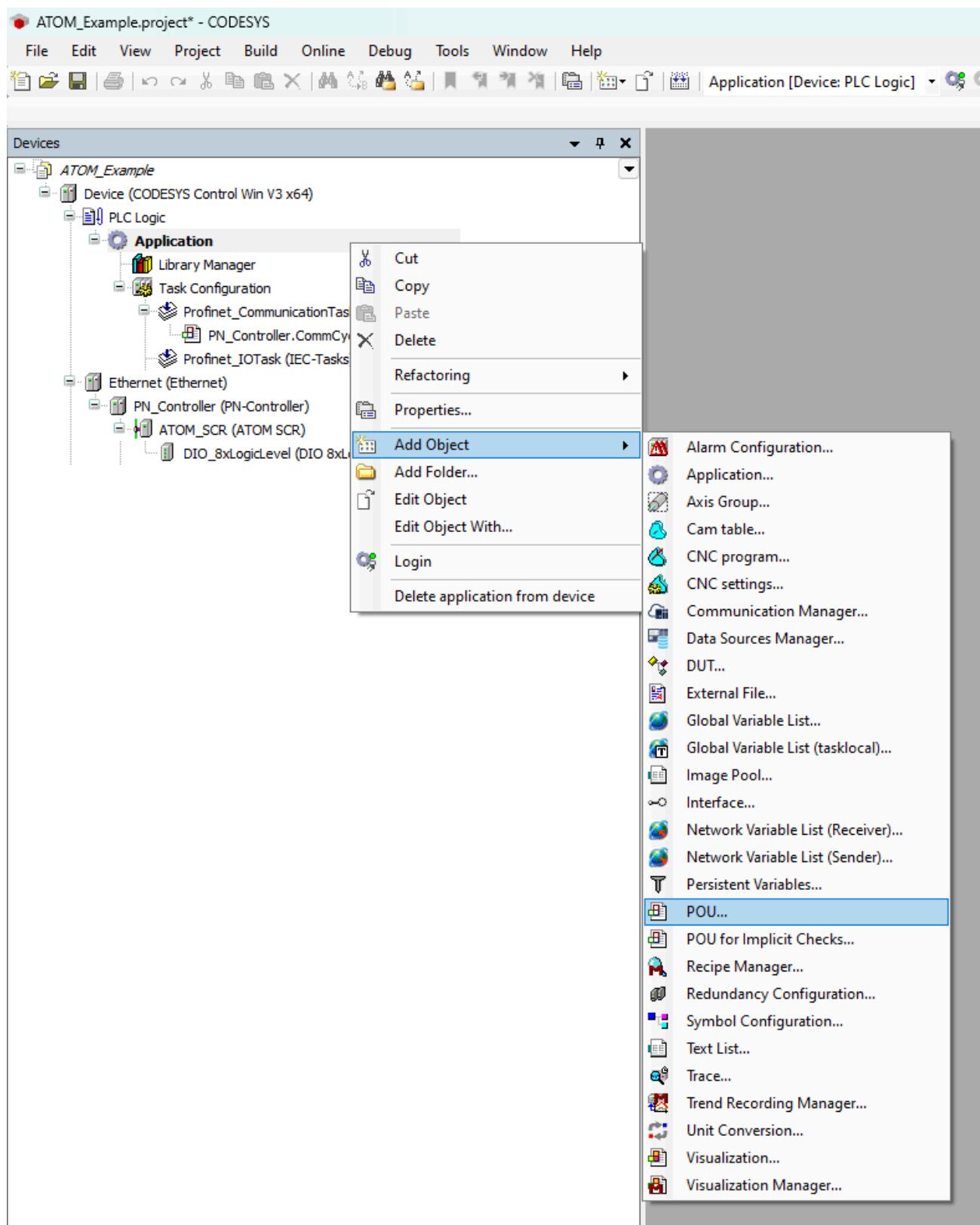
Next, we'll create a PLC program. We provide examples for both ladder logic and structured text:

- Program with ladder logic
- Program with structured text

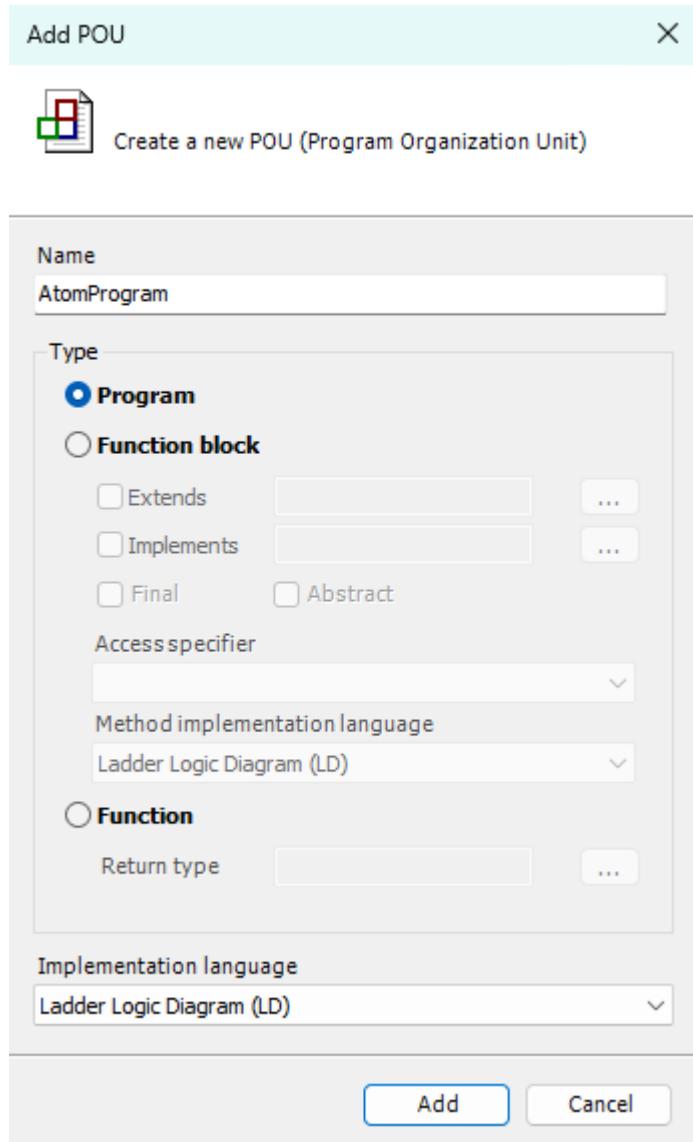
Example: Ladder logic

Creating the program

Right click **Application** and select **Add Object > POU:**



Set the name to **AtomProgram** and select **Ladder Diagram (LD)** as the Implementation language:



Copy the following code into the top panel of the **AtomProgram** editor:

```
PROGRAM AtomProgram
```

```
VAR
```

```
RUN_SWITCH: BOOL;
```

```
SETPOINT: DINT;
```

```
TEMP: REAL;
```

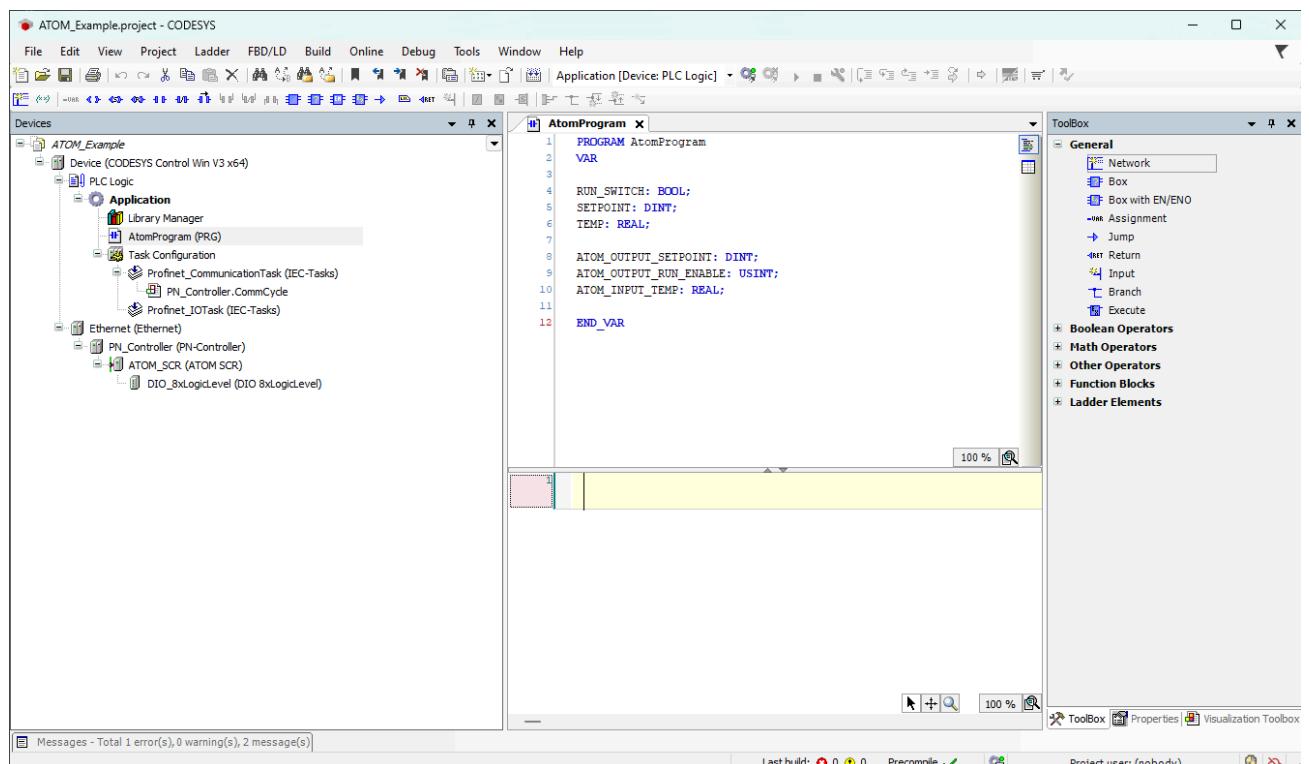
```
ATOM_OUTPUT_SETPOINT: DINT;
```

```
ATOM_OUTPUT_RUN_ENABLE: USINT;
```

```
ATOM_INPUT_TEMP: REAL;
```

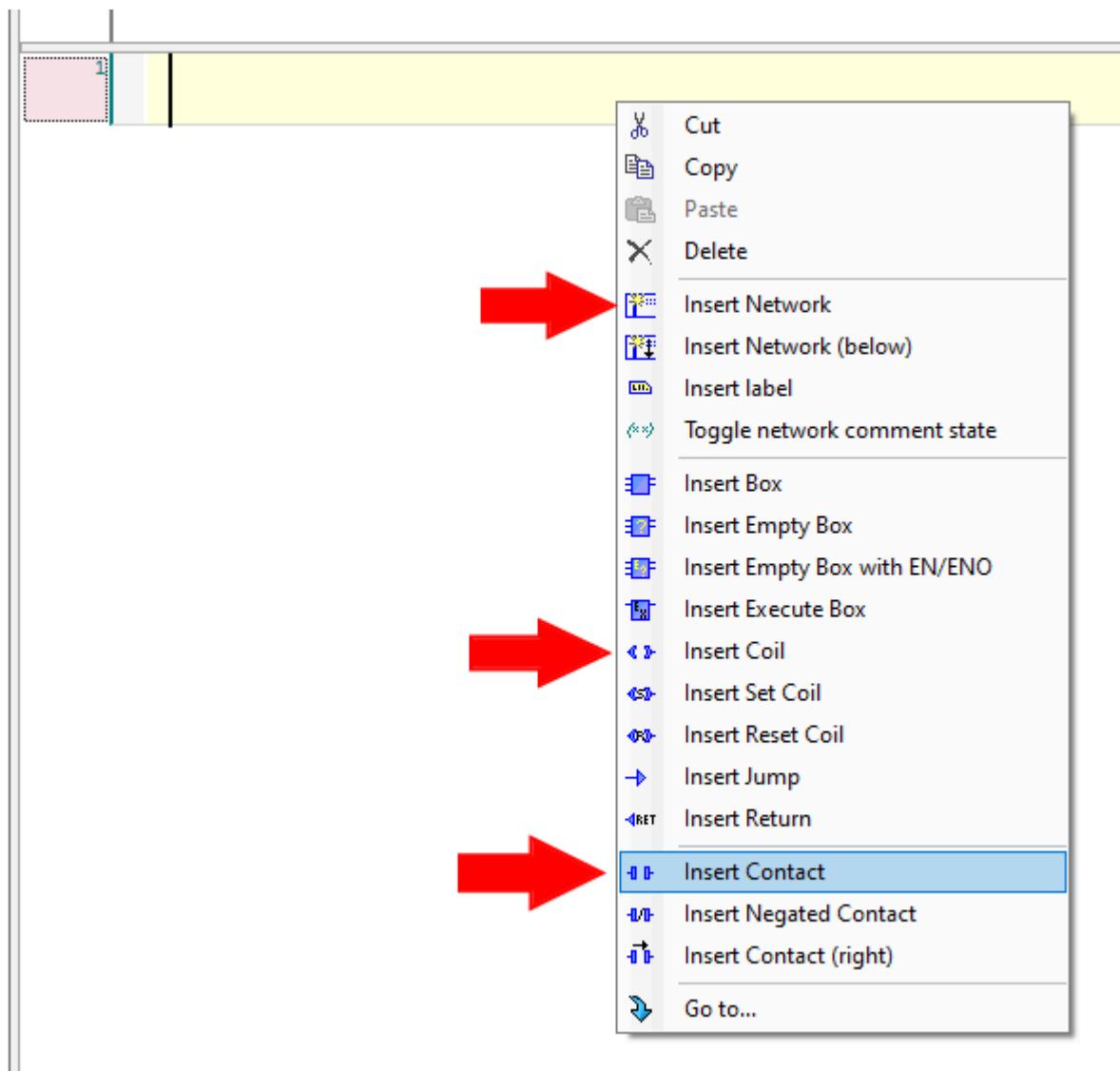
```
END_VAR
```

After you've copied the code over, the editor for **AtomProgram** should look like this:

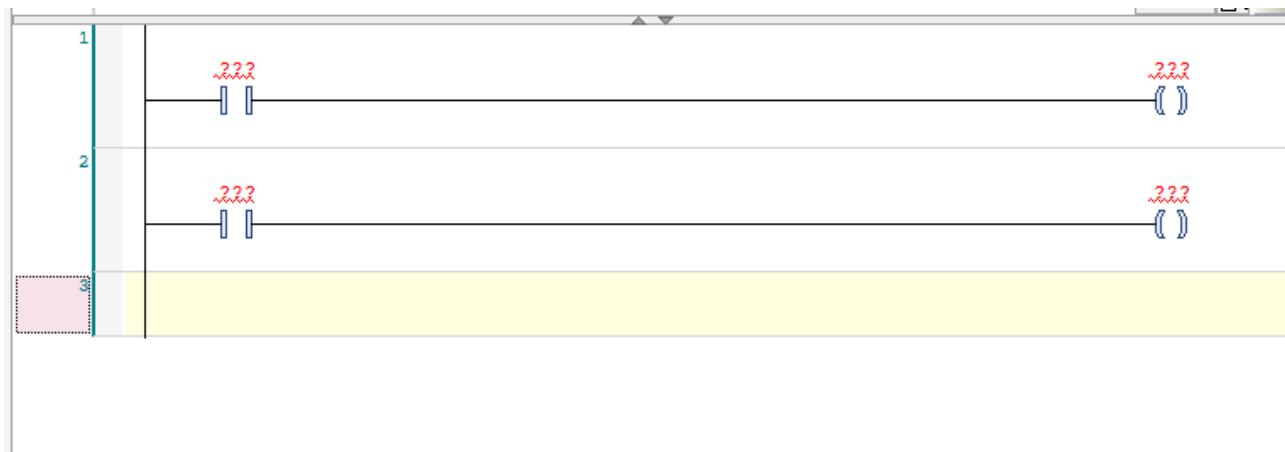


In the bottom panel of the editor, we'll create a simple ladder logic program using the variables we just added above.

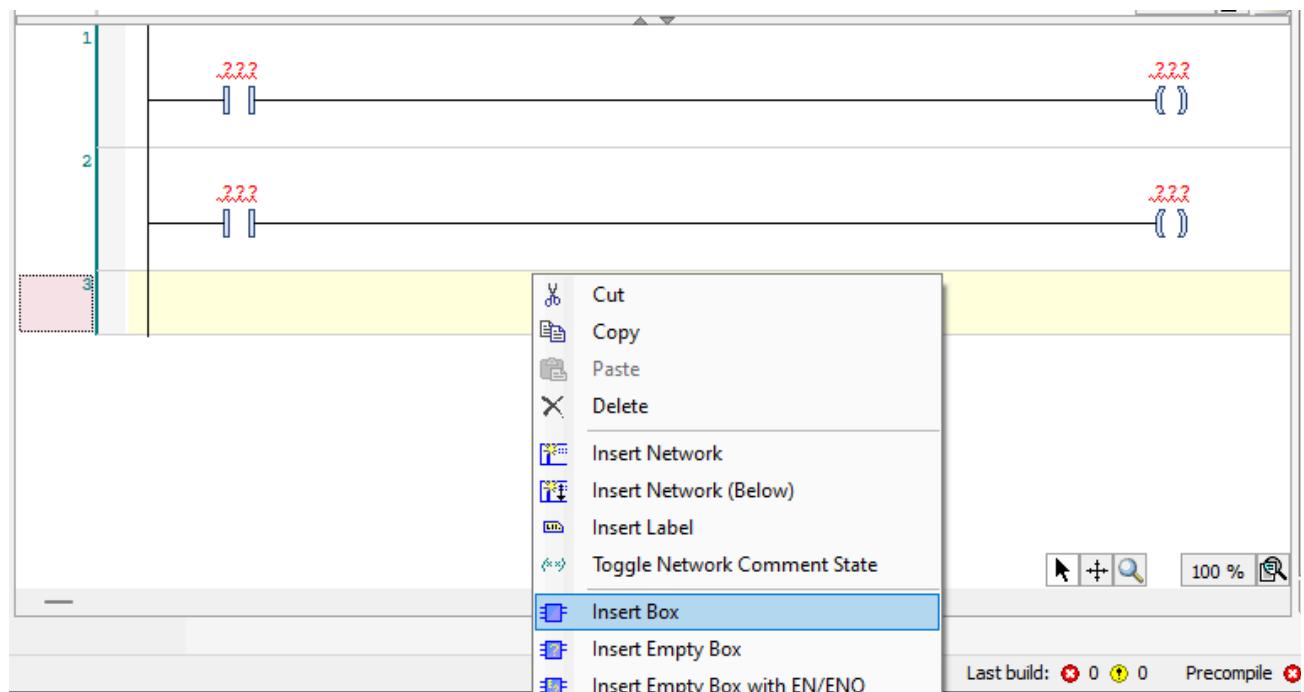
1. Create **3** networks total by right-clicking and selecting **Insert Network** three times.
2. For the first two rungs (networks), insert a contact and a coil.



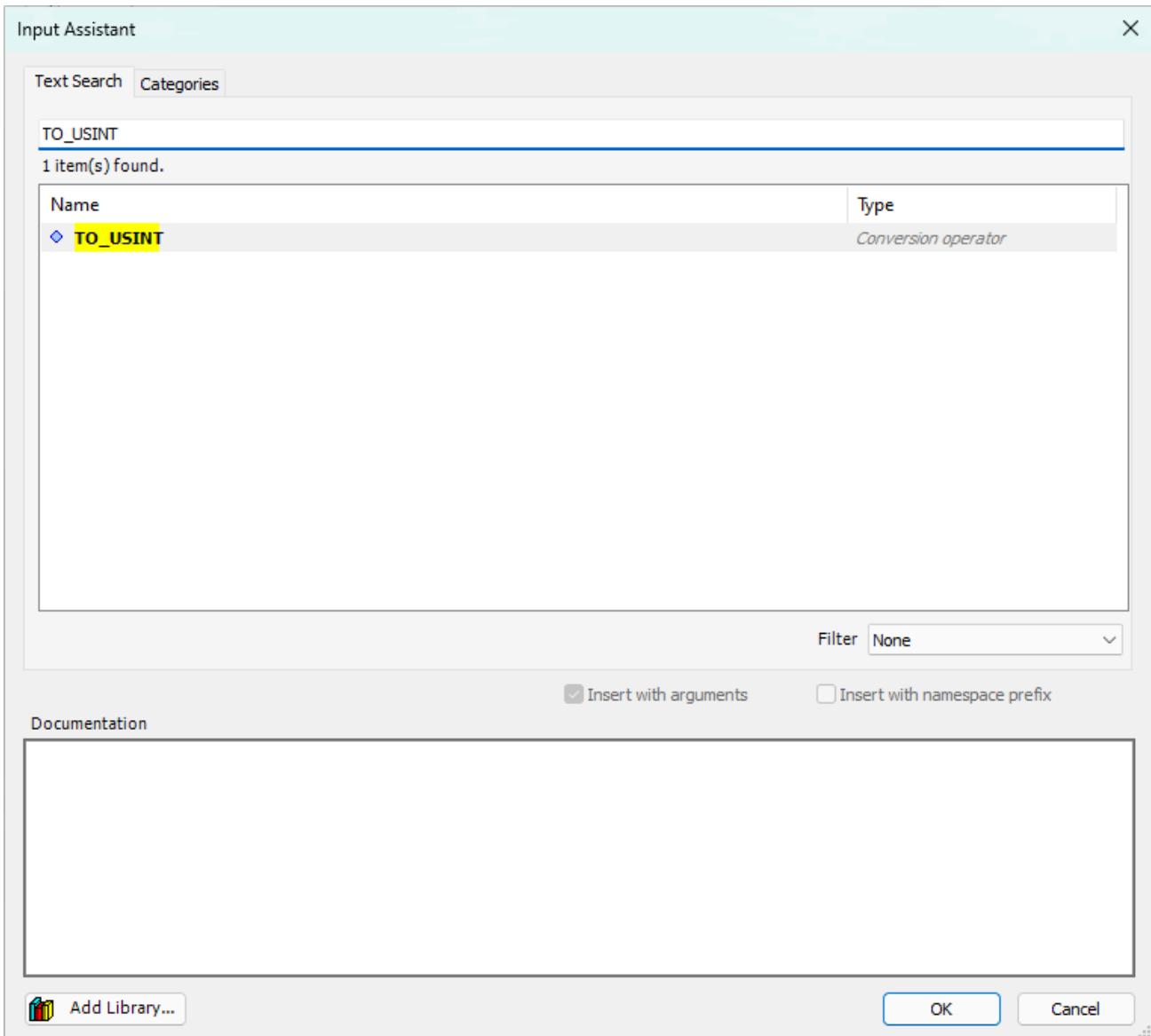
After you're finished, your ladder logic program should look like:



On the third rung, right click and select **Insert Box**:



Add a **TO_USINT** box:



For the first two rungs, replace the `???` with the corresponding variables:

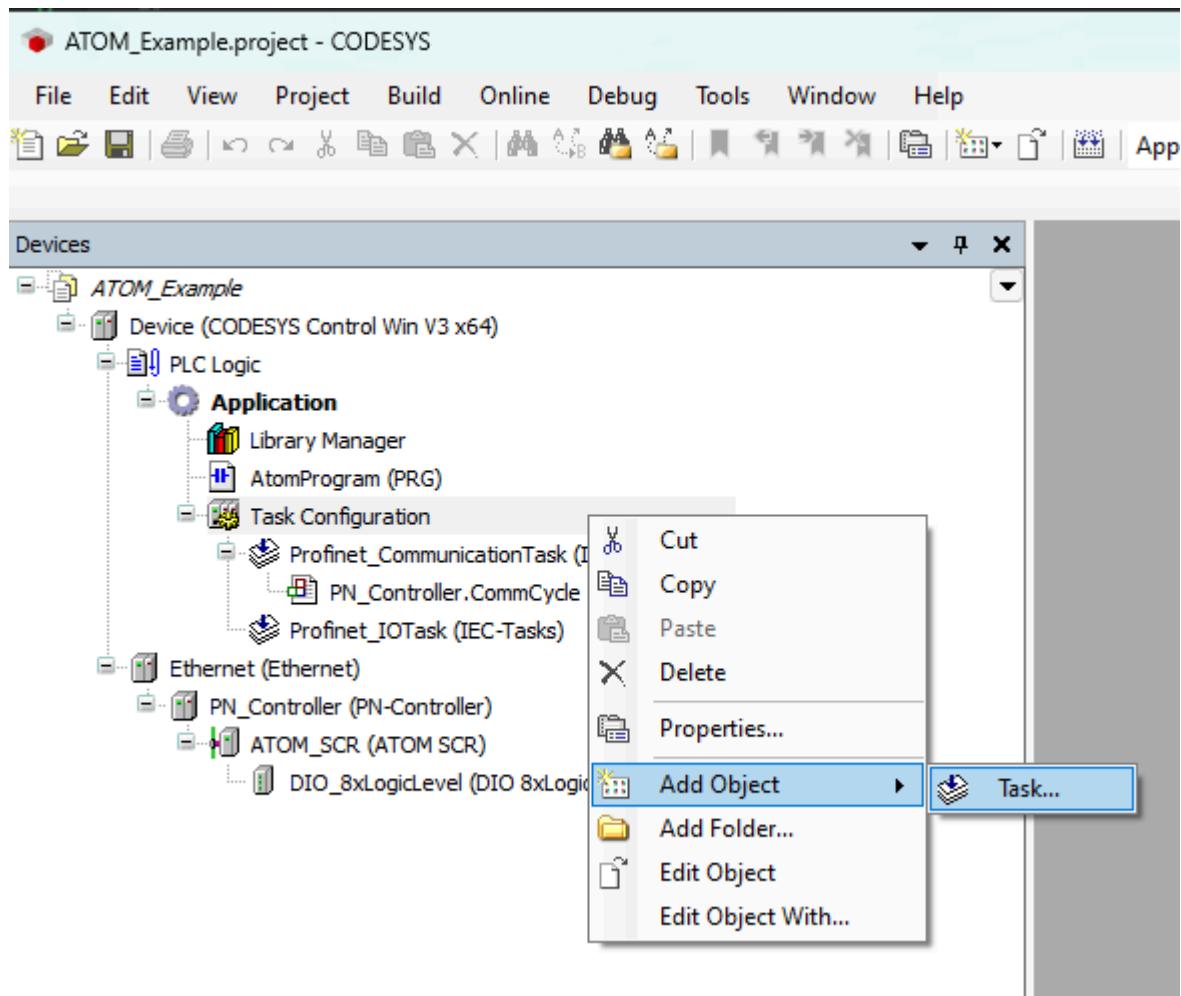
1. **Rung #1** - `ATOM_INPUT_TEMP` and `TEMP`
2. **Rung #2** - `SETPOINT` and `ATOM_OUTPUT_SETPOINT`

On the third rung, set the input to `EN` to `TRUE` and set the input parameter to `RUN_SWITCH` and output parameter to `ATOM_OUTPUT_RUN_ENABLE`. After you're finished, your ladder logic program should look like:

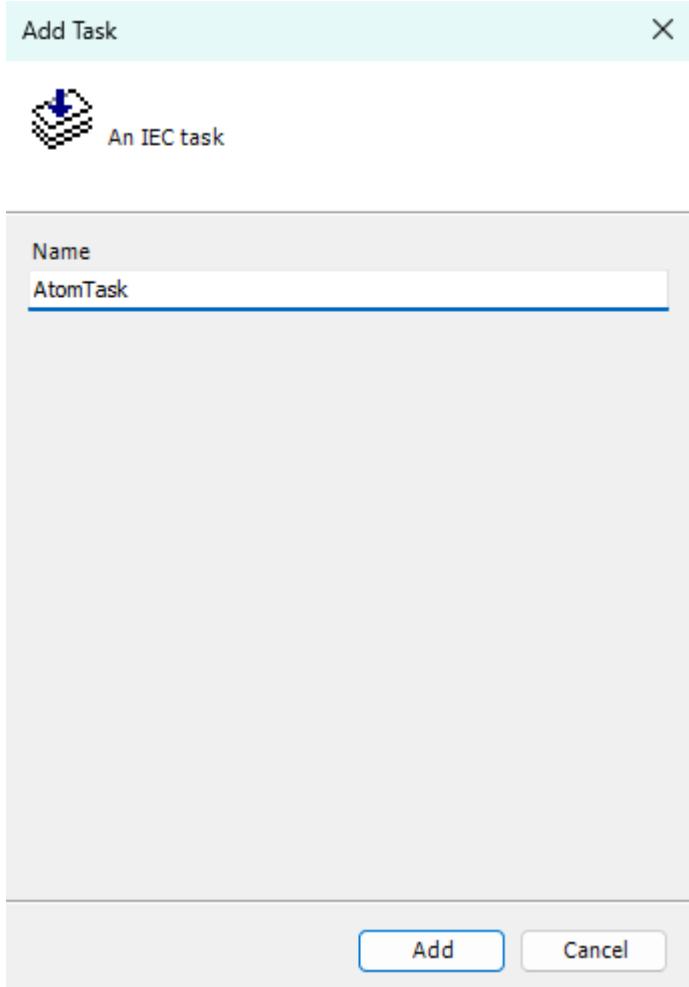


Finally, we'll add a task to call **AtomProgram** from the PLC's control loop:

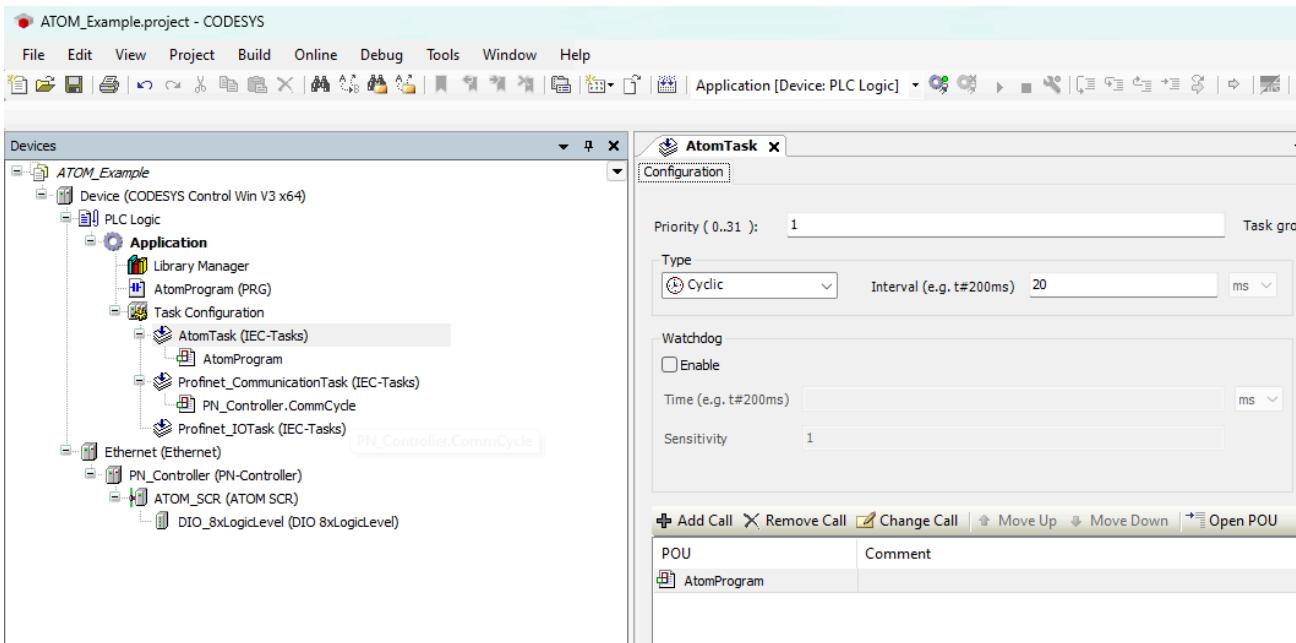
Right click **Task Configuration** and select **Add Object > Task**:



Name your task **AtomTask** and click **OK**:



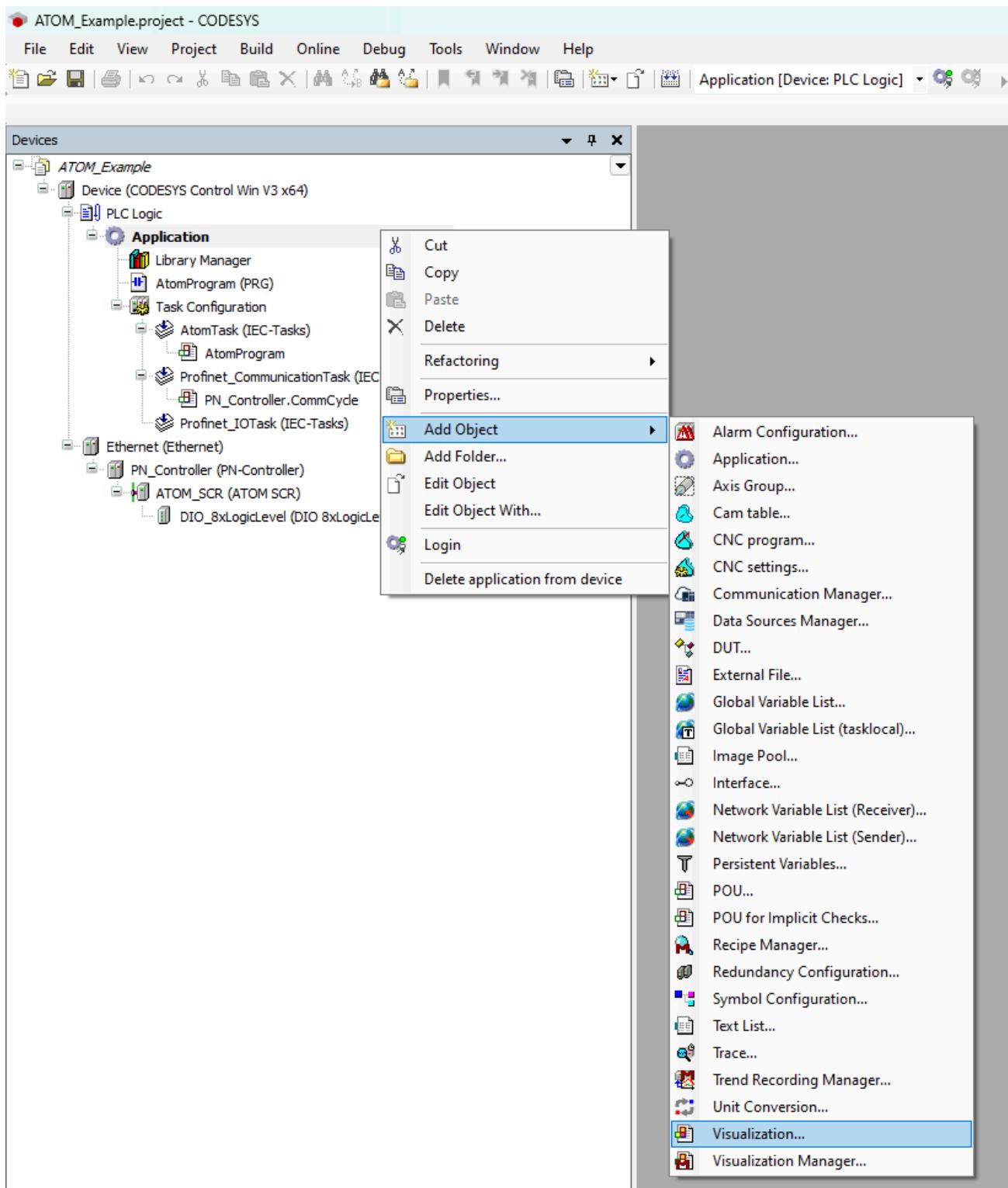
Next, double click **AtomTask (IEC-Tasks)** to open its configuration tab. Click **Add Call** and select **Application > AtomProgram**. After doing so, AtomTask's configuration should look like:



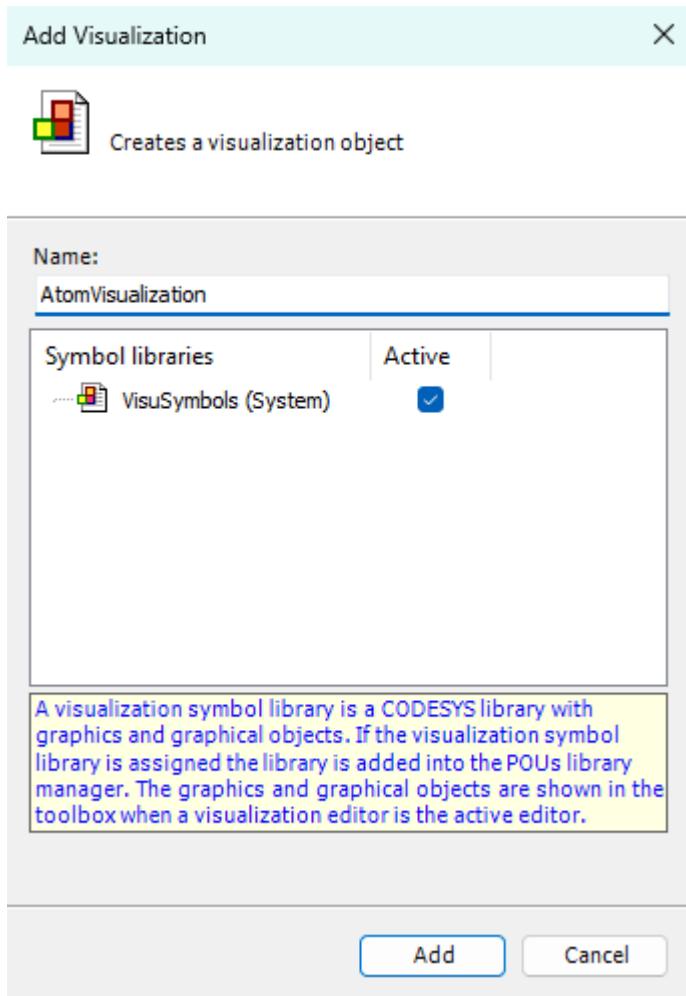
Setting up visualization

Next, we'll set up a simple visualization display to control and monitor ATOM.

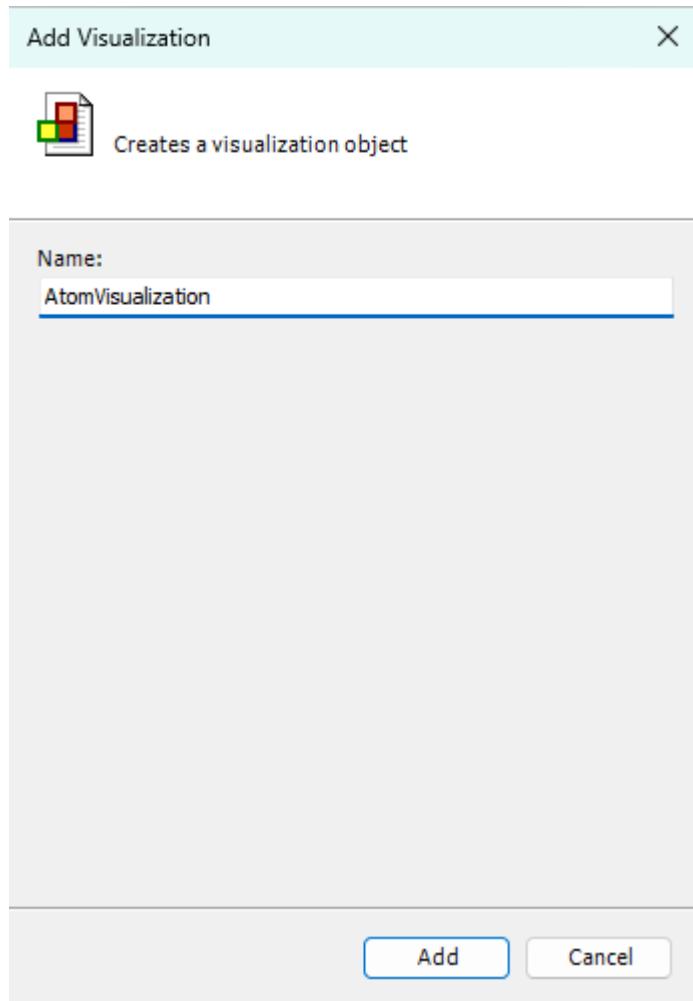
Right click **Application** and select **Add Object > Visualization**:



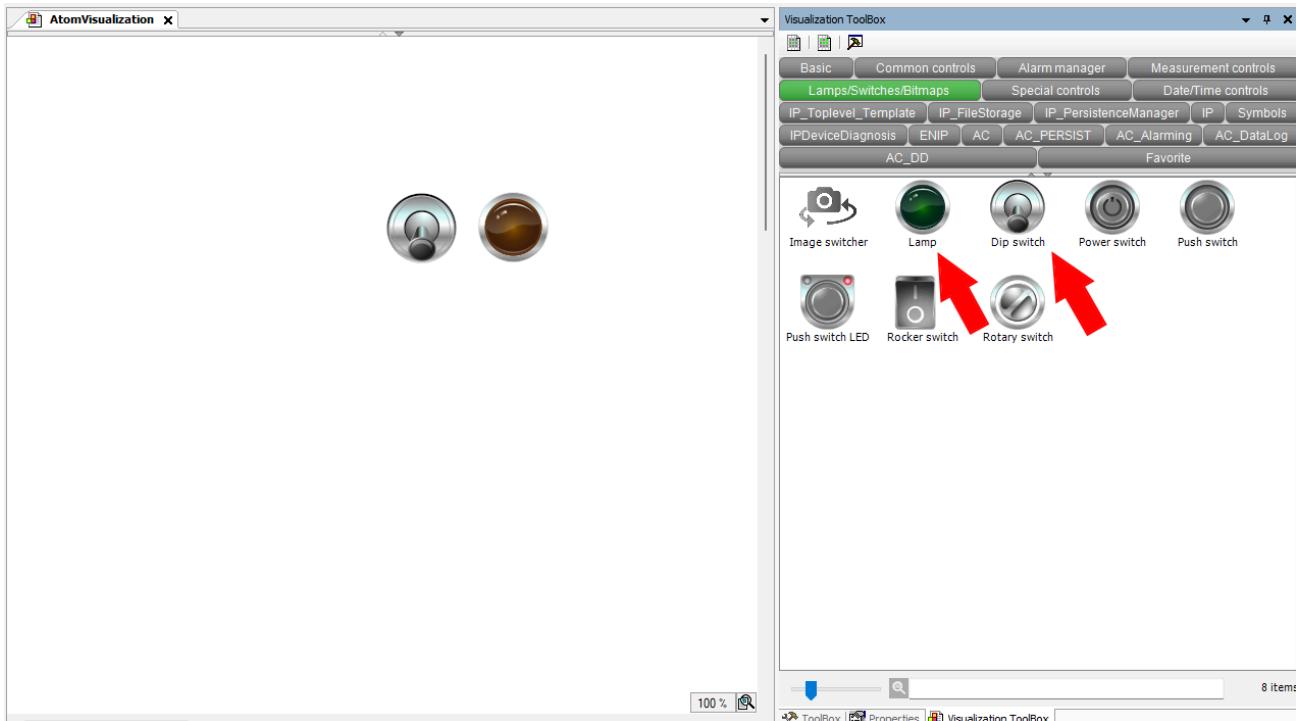
Make sure to check **Active** for **VisuSymbols (System)**, then click **Add**:



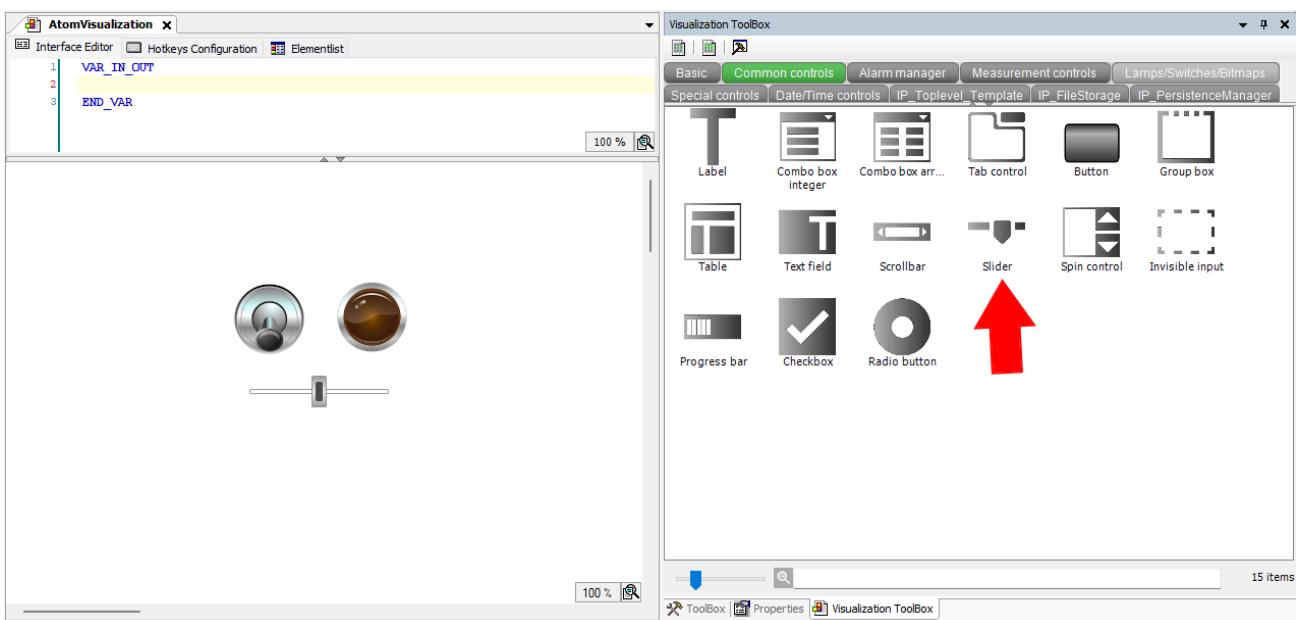
Name your visualization **AtomVisualization** and click **Add**:



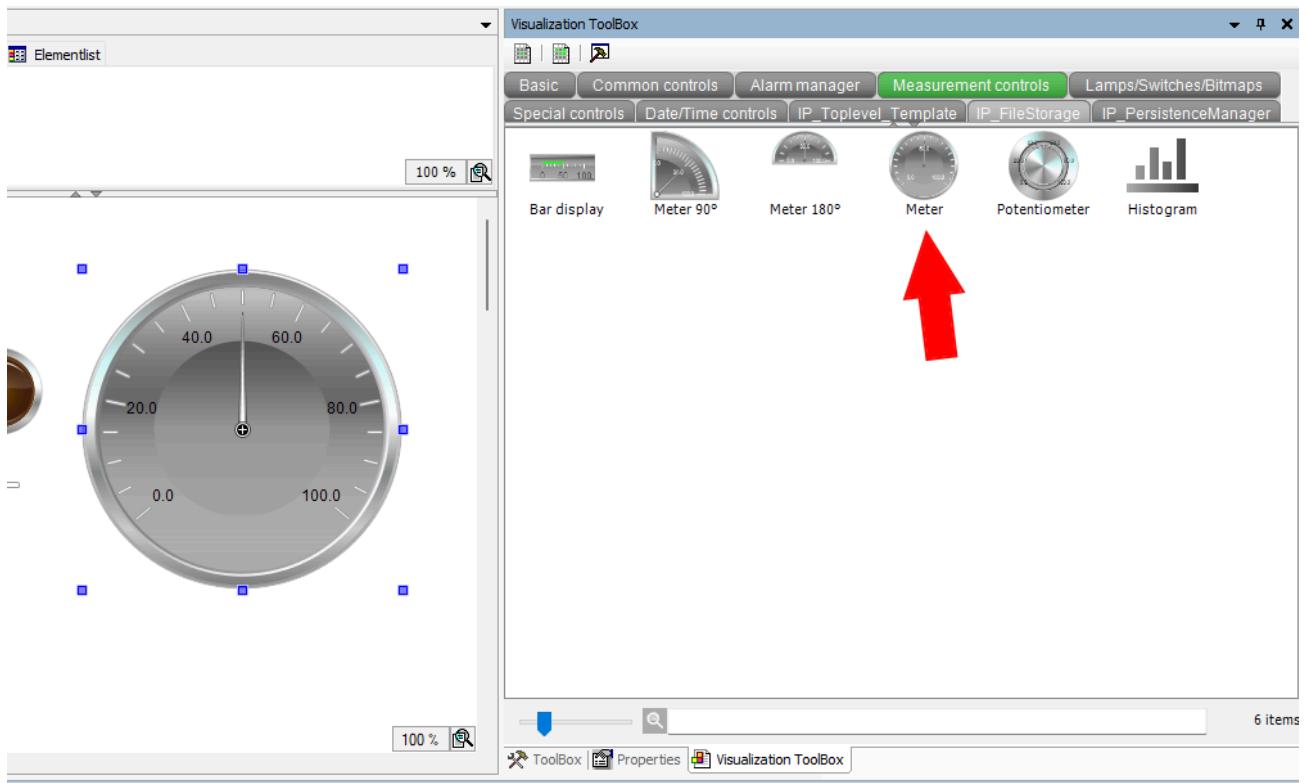
Double click **AtomVisualization** to open its configuration editor. From the **Visualization ToolBox** panel on the right, select the **Lamps/Switches/Bitmaps** category and add a lamp and a dip switch:



Next, in the **Common controls** category, add a slider:

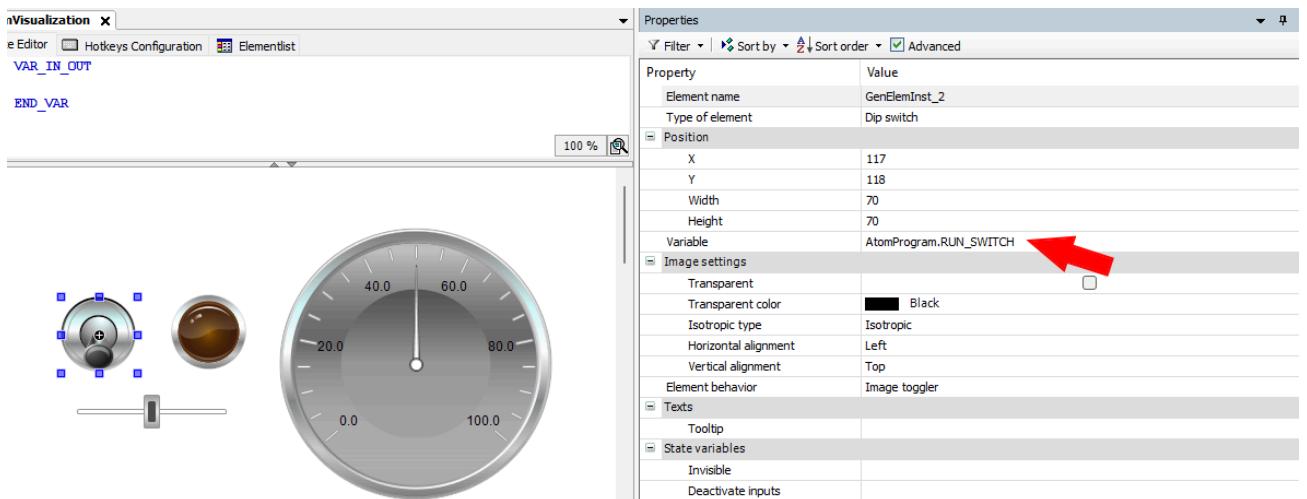


Finally, in the **Measurement controls** category, add a meter:

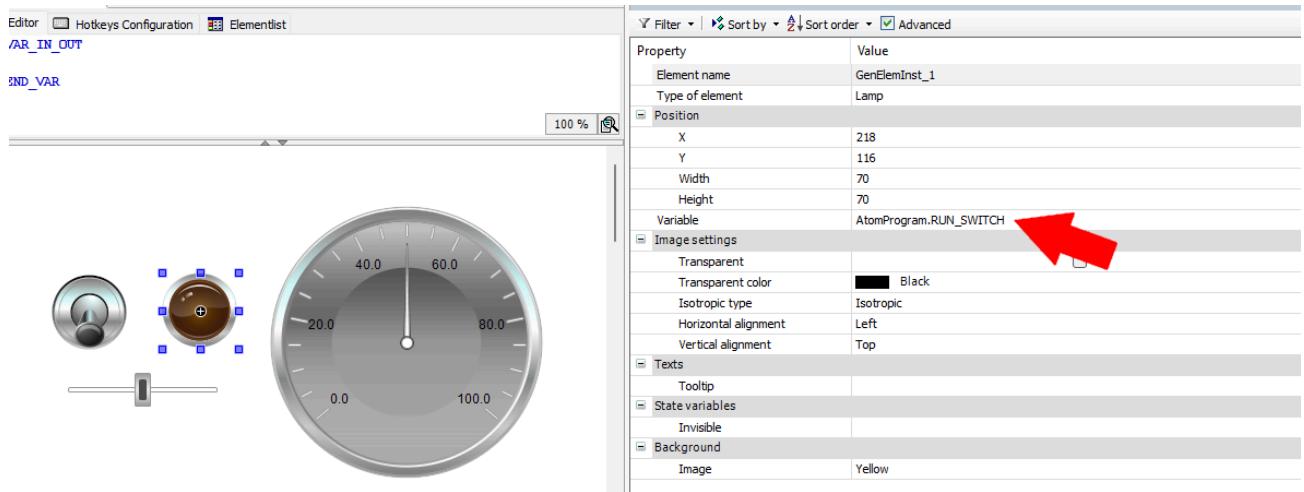


Wiring up the controls

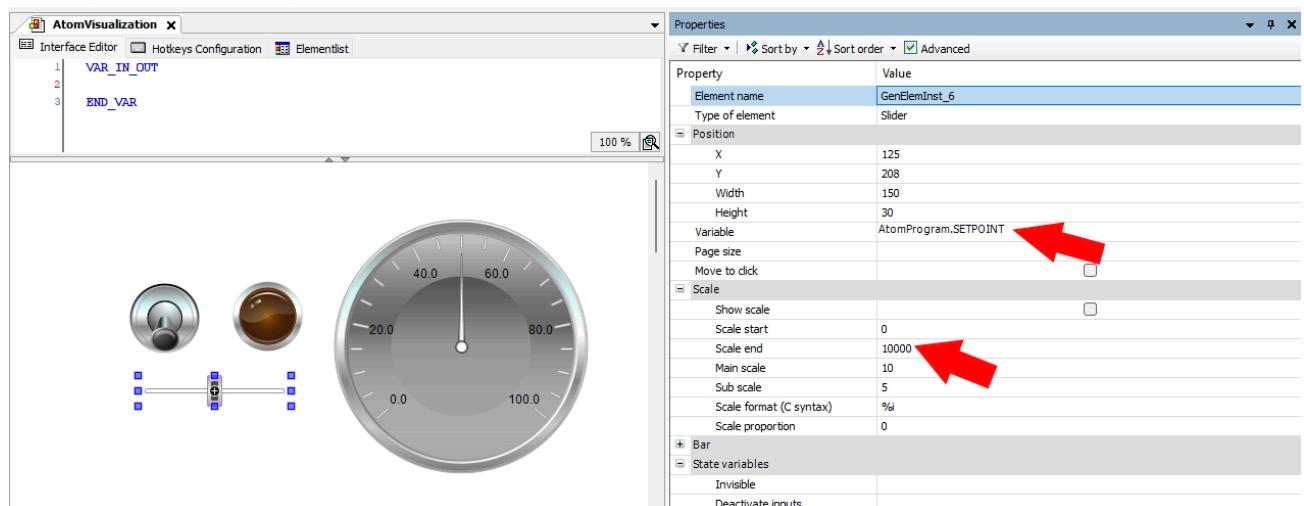
Next, we'll connect the controls to our PLC program. Select the dip switch and set the **Variable** field to `AtomProgram.RUN_SWITCH` as indicated by the red arrow:



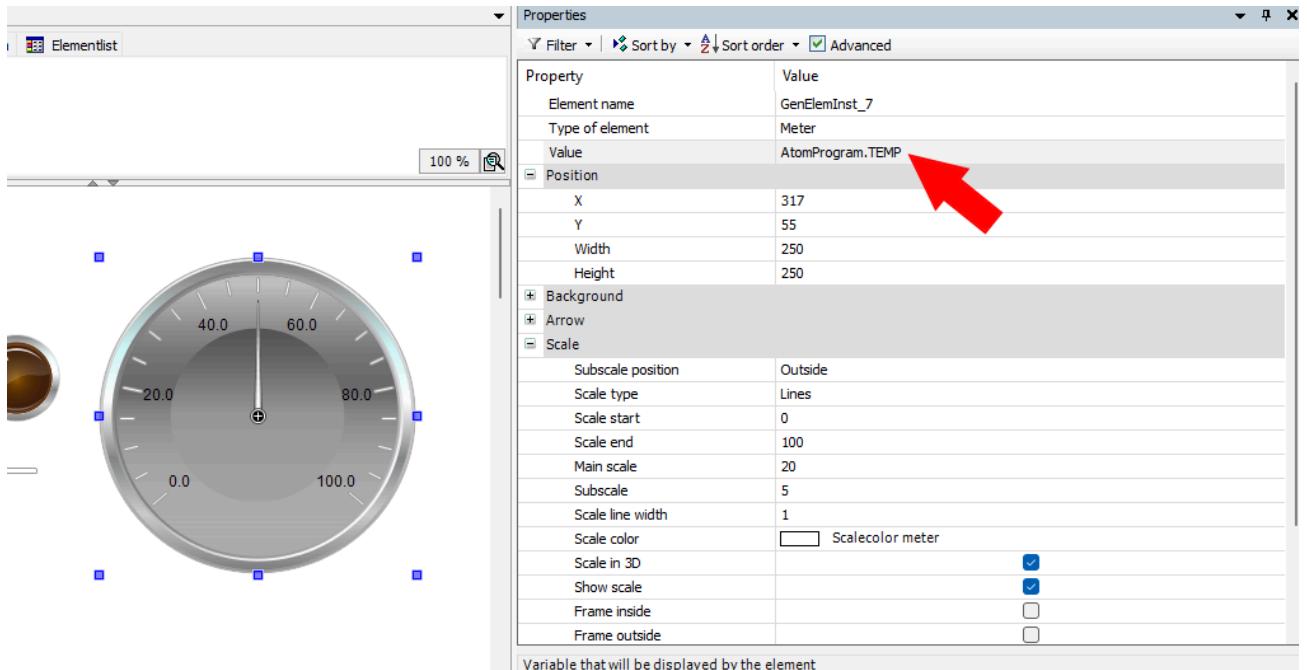
Select the lamp and set the **Variable** field to `AtomProgram.RUN_SWITCH` as indicated by the red arrow:



Select the slider and set the **Variable** field to `AtomProgram.SETPOINT` and set **Scale end** to `10000`:

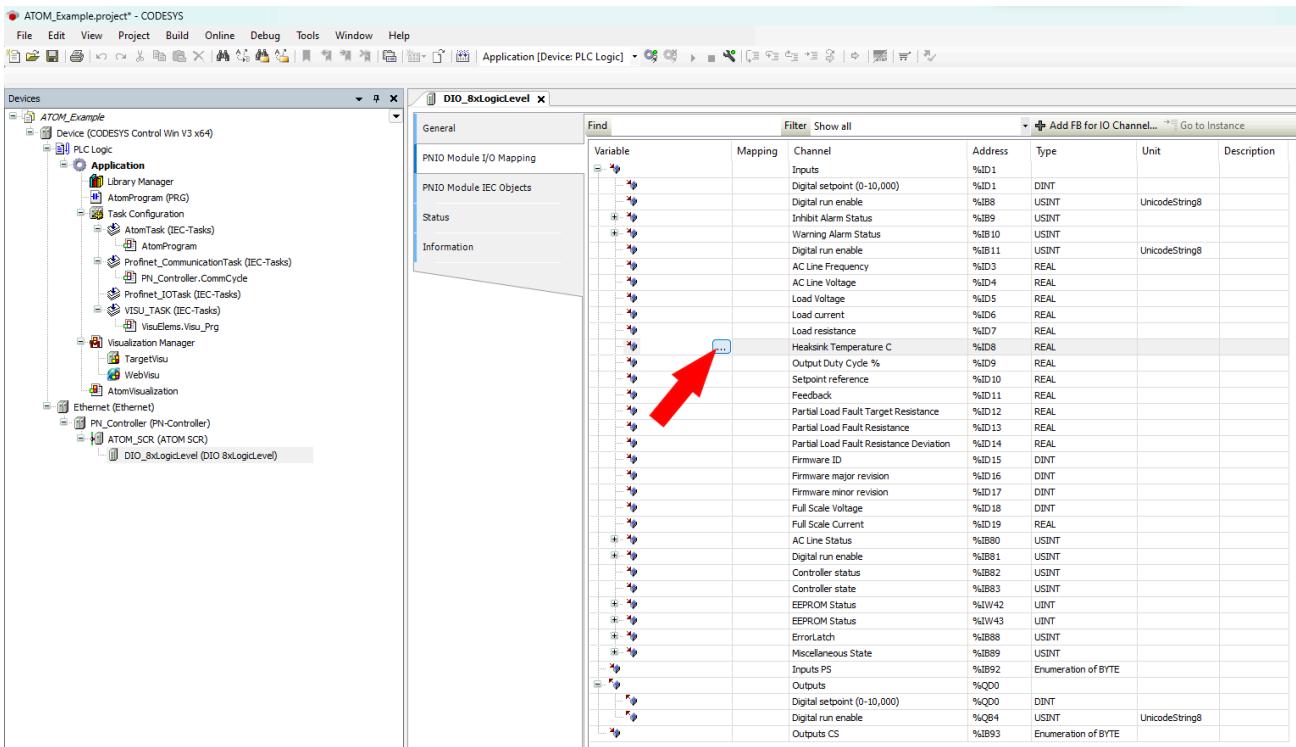


Select the meter and set the **Variable** field to `AtomProgram.TEMP`:



Mapping variables

Finally, we'll map our PLC variables to ATOM. Double click **DIO_8xLogicLevel (DIO 8xLogicLevel)** in the device tree to open its configuration window. Select the **PNIO Module I/O Mapping** tab:



Above, select the button indicated by the red arrow. This will open the **Input Assistant** dialog. Select **Application > AtomProgram > ATOM_INPUT_TEMP** and click **Add**:

Input Assistant

Text Search Categories

Variables

Name	Type	Address	Origin
{ AC	Library		AC_ModuleBase, 4...
{ Application	Application		
AtomProgram	PROGRAM		
ATOM_INPUT_TEMP	REAL		
ATOM_OUTPUT_RUN_ENABLE	USINT		
ATOM_OUTPUT_SETPOINT	DINT		
RUN_SWITCH	BOOL		
SETPOINT	DINT		
TEMP	REAL		
IoConfig_Globals	VAR_GLOBAL		
{ IoDrvEthernet	Library		IoDrvEthernet, 4.2....

ATOM_INPUT_TEMP: REAL(VAR)

Structured view Filter None

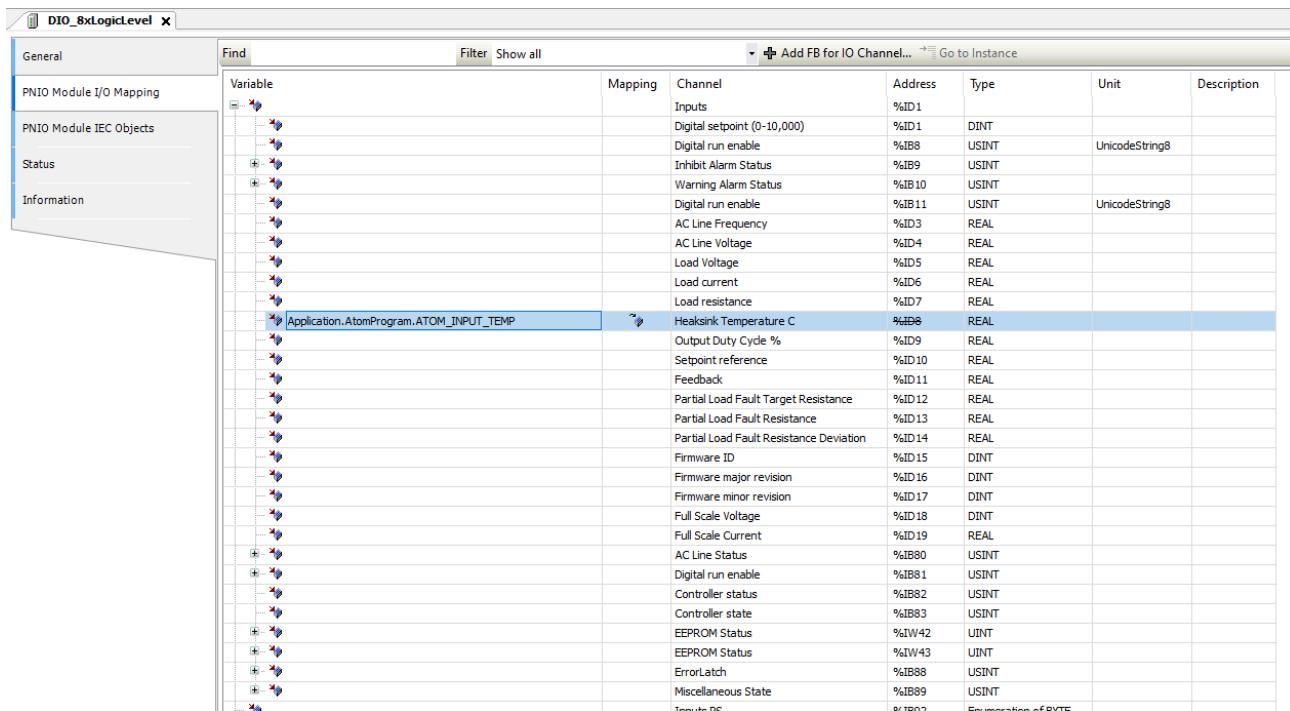
Documentation

Insert with arguments Insert with namespace prefix

Add Library... OK Cancel

The screenshot shows the 'Input Assistant' dialog box. On the left, there's a 'Text Search' and 'Categories' tab, and a 'Variables' section. The main area displays a hierarchical tree of variables under 'Name'. It includes variables from the 'AC' library, the 'Application' library, and the 'AtomProgram' program. A specific variable, 'ATOM_INPUT_TEMP', is highlighted in blue. The table lists variables with their types and addresses. At the bottom, there's a documentation section with a note about 'ATOM_INPUT_TEMP: REAL(VAR)'. There are checkboxes for 'Insert with arguments' and 'Insert with namespace prefix'. At the bottom right are 'OK' and 'Cancel' buttons.

After doing so, your input I/O mappings should look like:



The screenshot shows the 'DIO_8xLogicLevel' configuration window. On the left, there's a sidebar with tabs: General, PNIO Module I/O Mapping (selected), PNIO Module IEC Objects, Status, and Information. The main area is a table titled 'Variable' with columns: Variable, Mapping, Channel, Address, Type, Unit, and Description. The table lists various parameters and their mappings:

Variable	Mapping	Channel	Address	Type	Unit	Description
Digital setpoint (0-10,000)		%ID1		DINT		
Digital run enable		%IB8		USINT		UnicodeString8
Inhibit Alarm Status		%IB9		USINT		
Warning Alarm Status		%IB10		USINT		
Digital run enable		%IB11		USINT		UnicodeString8
AC Line Frequency		%ID3		REAL		
AC Line Voltage		%ID4		REAL		
Load Voltage		%ID5		REAL		
Load current		%ID6		REAL		
Load resistance		%ID7		REAL		
Heatsink Temperature C	Application.AtomProgram.ATOM_INPUT_TEMP	%ID8		REAL		
Output Duty Cycle %		%ID9		REAL		
Setpoint reference		%ID10		REAL		
Feedback		%ID11		REAL		
Partial Load Fault Target Resistance		%ID12		REAL		
Partial Load Fault Resistance		%ID13		REAL		
Partial Load Fault Deviation		%ID14		REAL		
Firmware ID		%ID15		DINT		
Firmware major revision		%ID16		DINT		
Firmware minor revision		%ID17		DINT		
Full Scale Voltage		%ID18		DINT		
Full Scale Current		%ID19		REAL		
AC Line Status		%IB80		USINT		
Digital run enable		%IB81		USINT		
Controller status		%IB82		USINT		
Controller state		%IB83		USINT		
EEPROM Status		%IW42		UINT		
EEPROM Status		%IW43		UINT		
ErrorLatch		%IB88		USINT		
Miscellaneous State		%IB89		USINT		
Intrinsic PC		%TR02		Enumeration of RYTF		

Repeat this for your output I/O mappings:

1. Map **Digital setpoint** to Application.AtomProgram.ATOM_OUTPUT_SETPOINT
2. Map **Digital run enable** to Application.AtomProgram.ATOM_OUTPUT_RUN_ENABLE

Change the **Filter** to **Show only outputs** and repeat the process for the outputs. Map **Digital setpoint** to Application.AtomProgram.ATOM_OUTPUT_SETPOINT and **Digital RUN Enable** to Application.AtomProgram.ATOM_OUTPUT_RUN_ENABLE.

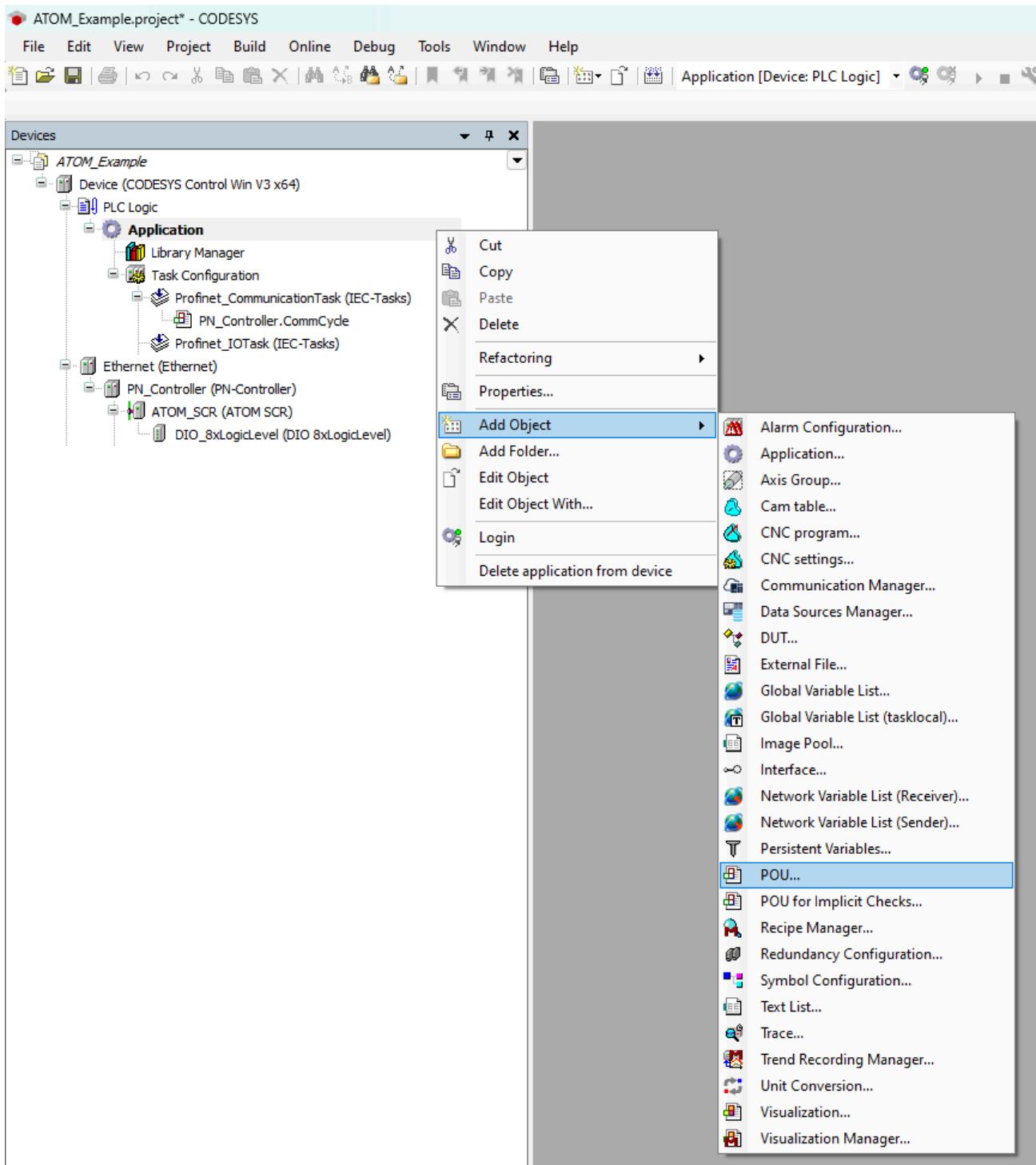
DIO_BxLogicLevel x								
General	Find	Filter Show all	Add FB for IO Channel...	Go to Instance				
Variable	Mapping	Channel	Address	Type	Current Value	Prepared Value	Unit	Description
PNI0 Module I/O Mapping		Inputs	%ID1	DINT	Only subelements updated			
PNI0 Module IEC Objects		Digital setpoint (0-10,000)	%ID1	DINT	Not updated (check tooltip)			
Status		Digital run enable	%ID8	USINT	Not updated (check tooltip)		UnicodeString8	
Information		Inhibit Alarm Status	%IB9	USINT	Not updated (check tooltip)			
		Warning Alarm Status	%IB10	USINT	Not updated (check tooltip)			
		Digital run enable	%IB11	USINT	Not updated (check tooltip)		UnicodeString8	
		AC Line Frequency	%ID3	REAL	Not updated (check tooltip)			
		AC Line Voltage	%ID4	REAL	Not updated (check tooltip)			
		Load Voltage	%ID5	REAL	Not updated (check tooltip)			
		Load current	%ID6	REAL	Not updated (check tooltip)			
		Load resistance	%ID7	REAL	Not updated (check tooltip)			
	Application.AtomProgram.ATOM_INPUT_TEMP	Heatsink Temperature C	%EB8	REAL	29.2			
		Output Duty Cycle %	%ID9	REAL	Not updated (check tooltip)			
		Setpoint reference	%ID10	REAL	Not updated (check tooltip)			
		Feedback	%ID11	REAL	Not updated (check tooltip)			
		Partial Load Fault Target Resistance	%ID12	REAL	Not updated (check tooltip)			
		Partial Load Fault Resistance	%ID13	REAL	Not updated (check tooltip)			
		Partial Load Fault Resistance Deviation	%ID14	REAL	Not updated (check tooltip)			
		Firmware ID	%ID15	DINT	Not updated (check tooltip)			
		Firmware major revision	%ID16	DINT	Not updated (check tooltip)			
		Firmware minor revision	%ID17	DINT	Not updated (check tooltip)			
		Full Scale Voltage	%ID18	DINT	Not updated (check tooltip)			
		Full Scale Current	%ID19	REAL	Not updated (check tooltip)			
		AC Line Status	%EB80	USINT	Not updated (check tooltip)			
		Digital run enable	%IB81	USINT	Not updated (check tooltip)			
		Controller status	%EB82	USINT	Not updated (check tooltip)			
		Controller state	%EB83	USINT	Not updated (check tooltip)			
		EEPROM Status	%IV42	UDINT	Not updated (check tooltip)			
		EEPROM Status	%IV43	UDINT	Not updated (check tooltip)			
		ErrorLatch	%EB88	USINT	Not updated (check tooltip)			
		Miscellaneous State	%EB89	USINT	Not updated (check tooltip)			
		Inputs PS	%IB92	Enumeration of BYTE	Not updated (check tooltip)			
		Outputs	%QD0	Only subelements updated				
		Digital setpoint (0-10,000)	%QB66	DINT	5000			
		Digital run enable	%QB64	USINT	1		UnicodeString8	
		Outputs CS	%IB93	Enumeration of BYTE	Not updated (check tooltip)			

You're all set! Go to the [Running the program with SoftPLC](#) section to run your program.

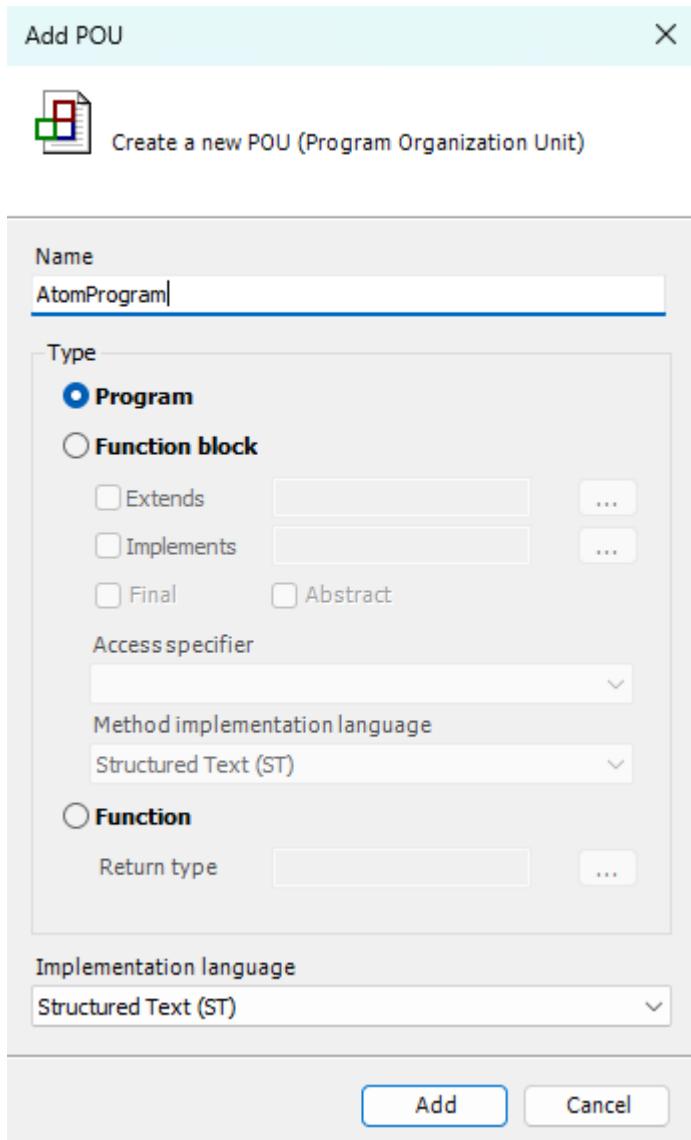
Example: Structured text

Creating the program

Right click **Application** and select **Add Object > POU:**



Name your **POU** **AtomProgram** and select **Structured Text (ST)** as the language:



Next, let's create a basic program. We'll check to make sure no alarms are active and then write a setpoint value of `8000` and set run enable to `true`.

Copy the following code into the top panel of the **AtomProgram** editor:

```
PROGRAM AtomProgram
VAR

ATOM_OUTPUT_SETPOINT: DINT;
ATOM_OUTPUT_RUN_ENABLE: USINT;
ATOM_INPUT_INHIBIT_ALARM: BYTE;

END_VAR
```

Copy the following code into the main program section:

```
IF (ATOM_INPUT_INHIBIT_ALARM = 0) THEN
    ATOM_OUTPUT_SETPOINT := 8000;
    ATOM_OUTPUT_RUN_ENABLE := 1;
END_IF
```

Your editor should look like:

The screenshot shows a software editor window titled "AtomProgram". The code is displayed in a text-based programming language. The original code is as follows:

```
PROGRAM AtomProgram
VAR

ATOM_OUTPUT_SETPOINT: DINT;
ATOM_OUTPUT_RUN_ENABLE: USINT;
ATOM_INPUT_INHIBIT_ALARM: BYTE;

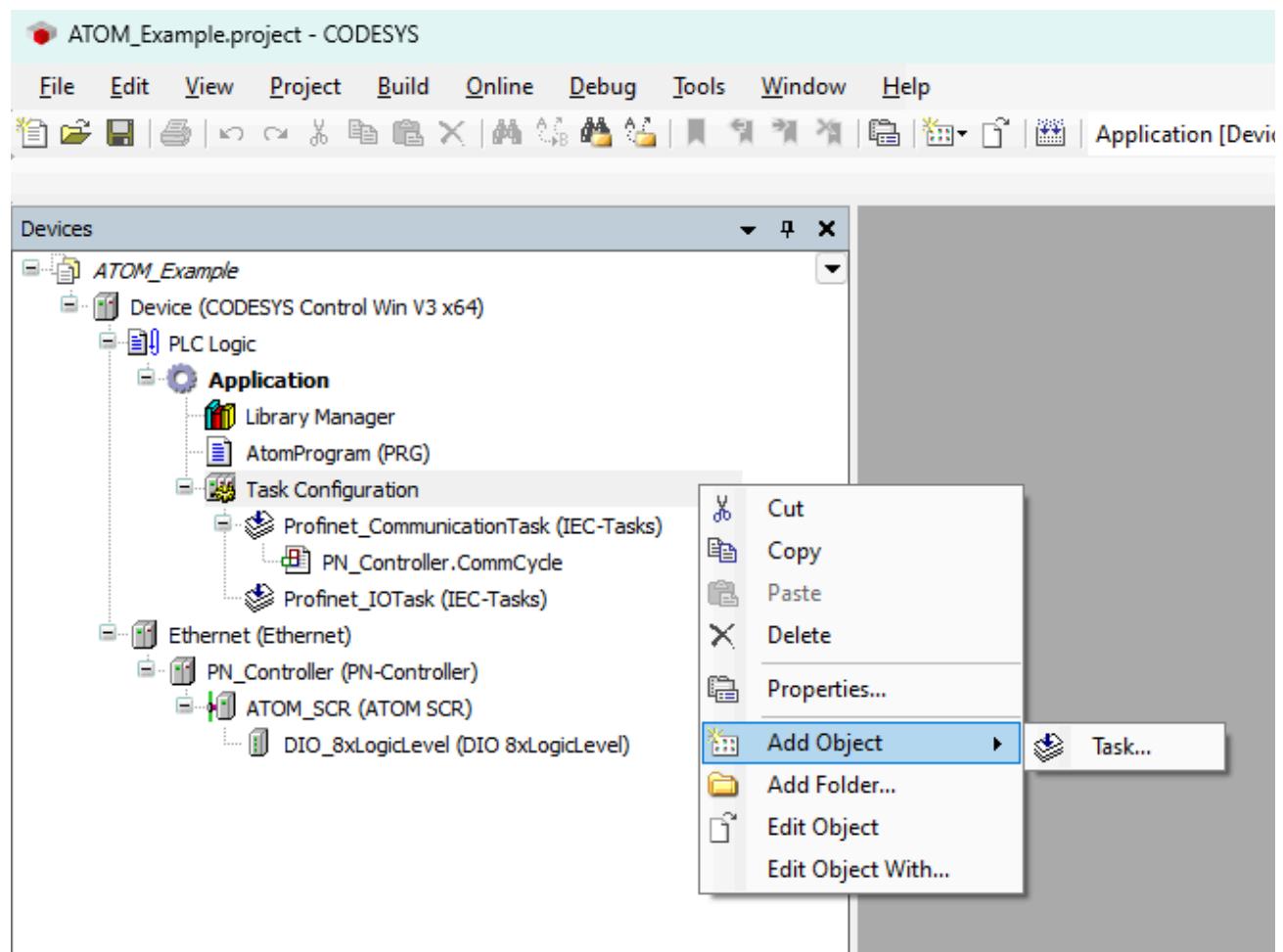
END_VAR
```

An additional IF block has been inserted at the bottom of the code:

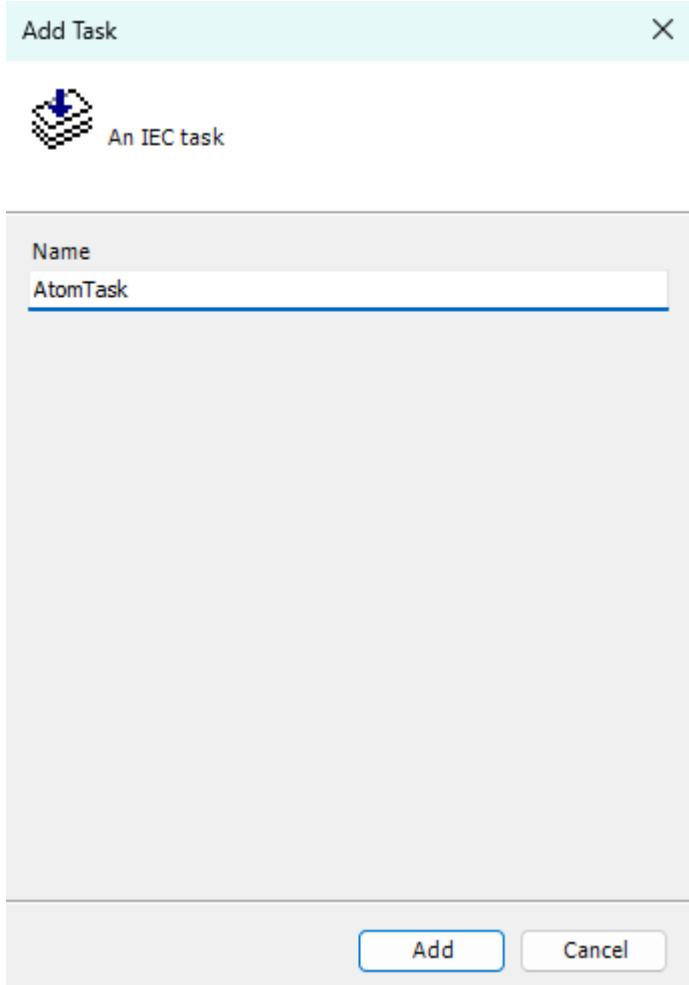
```
IF (ATOM_INPUT_INHIBIT_ALARM = 0) THEN
    ATOM_OUTPUT_SETPOINT := 8000;
    ATOM_OUTPUT_RUN_ENABLE := 1;
END_IF
```

The code is color-coded for readability, with keywords in blue and variable names in black. The editor interface includes a toolbar at the top and a vertical scroll bar on the right side of the code area.

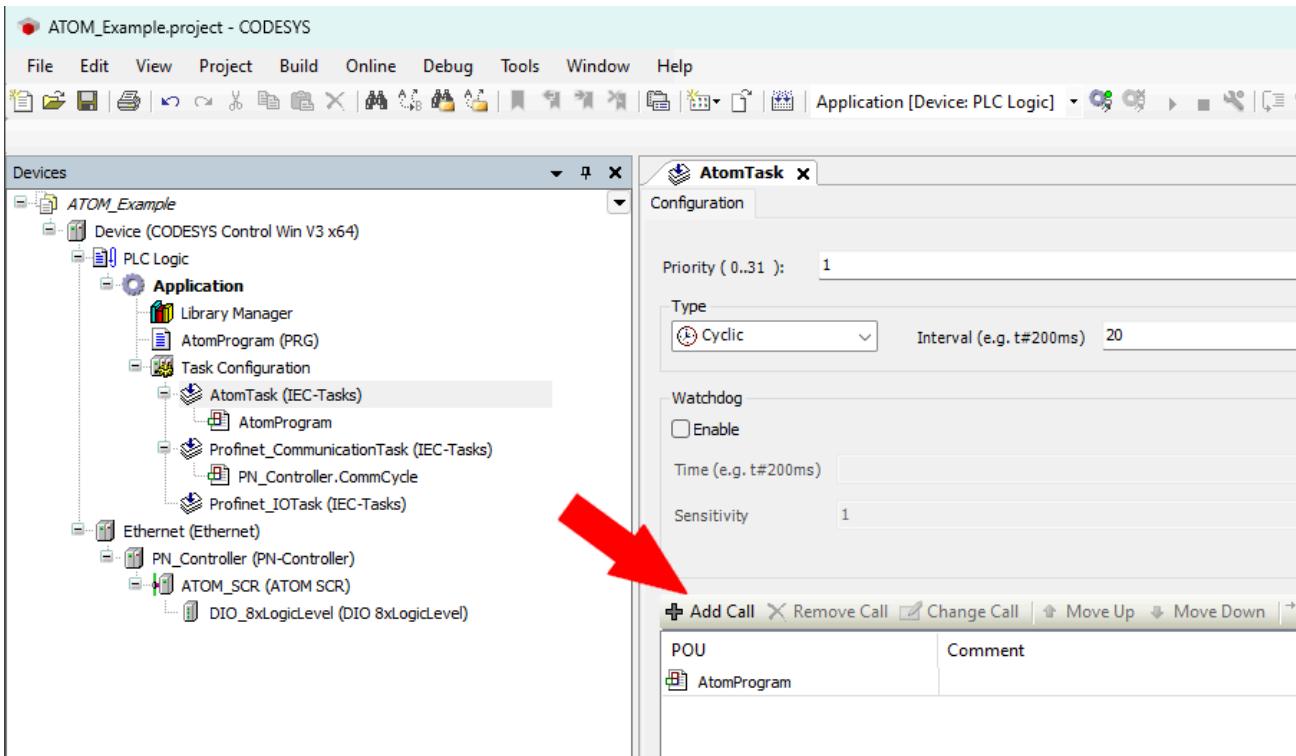
Next, we'll add a new task to call our program. Right click **Task Configuration** and Select **Add Object > Task**:



Name your task **AtomTask** and click **Add**:

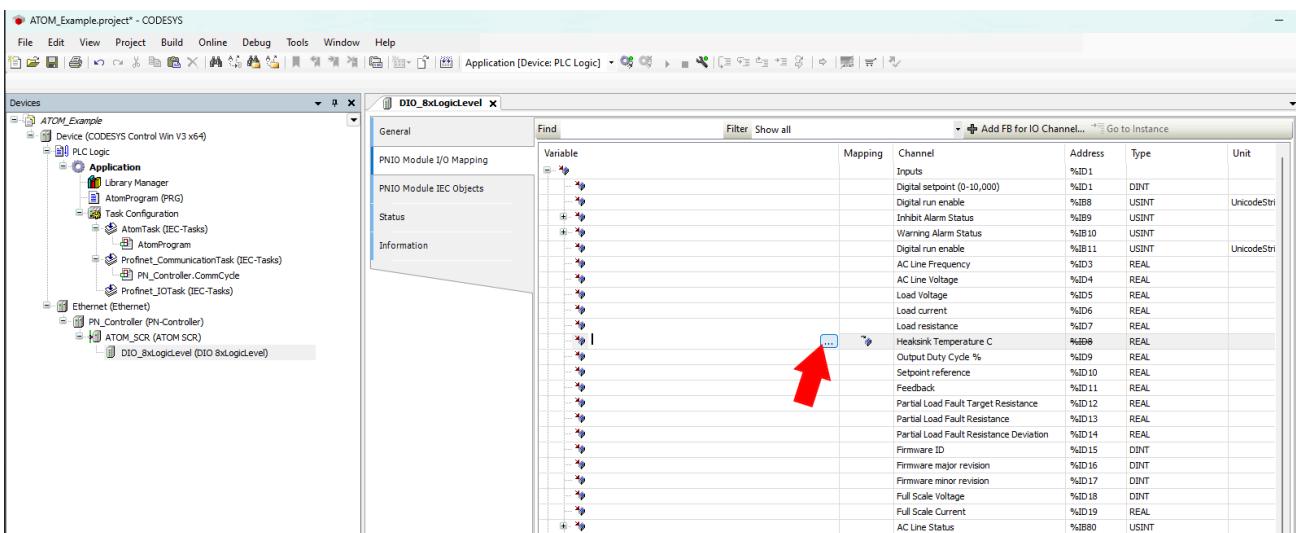


Next, double click **AtomTask (IEC-Tasks)** to open its configuration tab. Click **Add Call** and select **Application > AtomProgram**. After doing so, **AtomTask**'s configuration should look like:

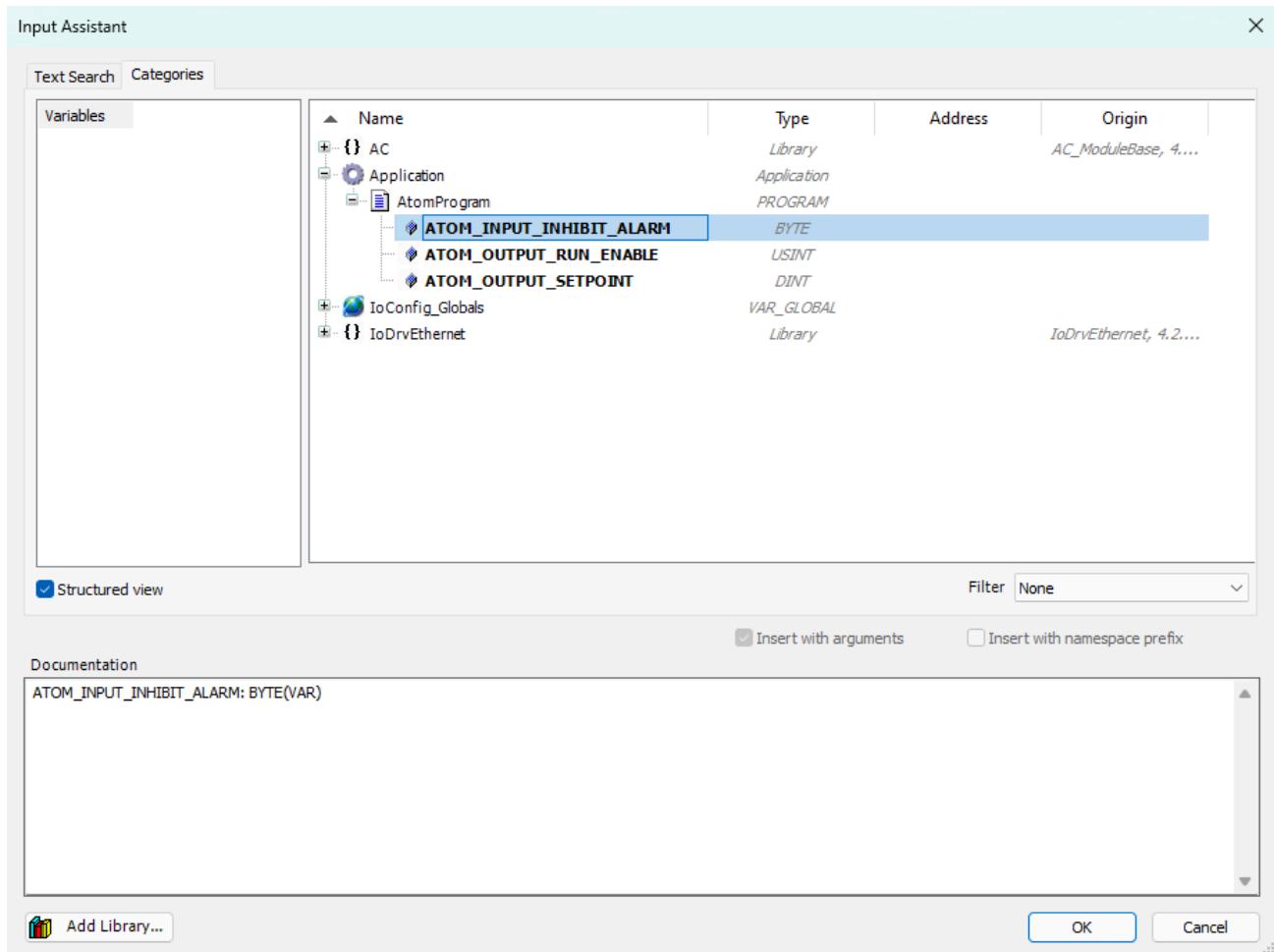


Mapping variables

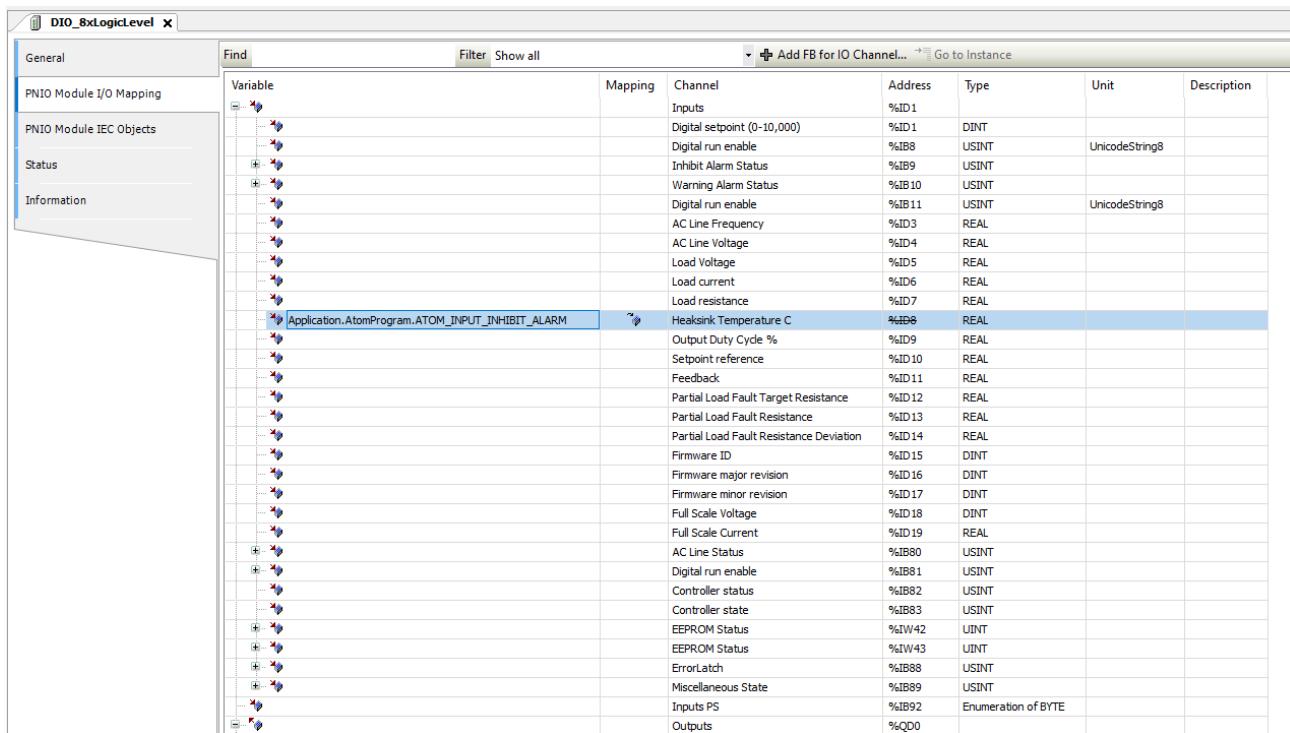
Finally, we'll map our PLC variables to ATOM. Double click **DIO_8xLogicLevel (DIO 8xLogicLevel)** in the device tree to open its configuration window. Select the **PNIO Module I/O Mapping** tab:



Above, select the button indicated by the red arrow. This will open the **Input Assistant** dialog. Select **Application > AtomProgram > ATOM_INPUT_INHIBIT_ALARM** and click **Add:**



After doing so, your input I/O mappings should look like:



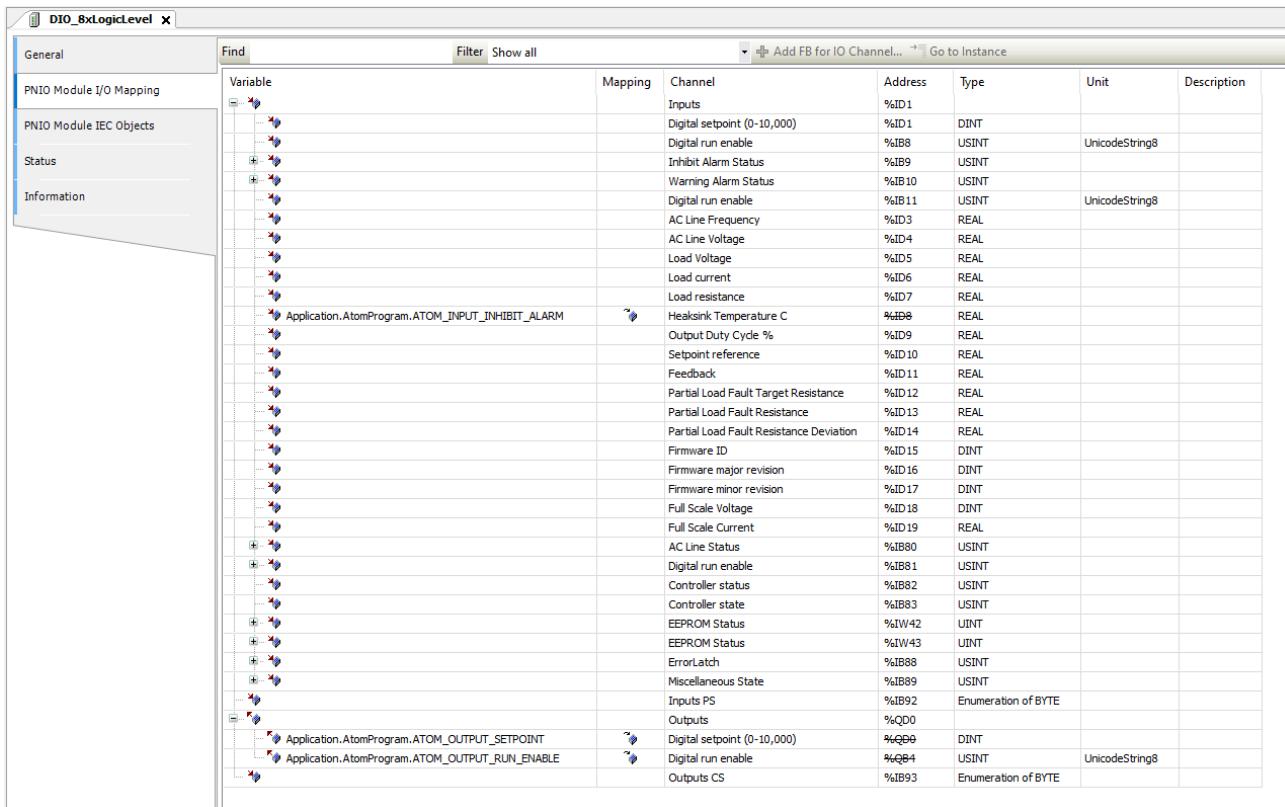
The screenshot shows the 'DIO_8xLogicLevel' configuration window. On the left, there's a sidebar with tabs for 'General', 'PNIO Module I/O Mapping' (which is selected), 'PNIO Module IEC Objects', 'Status', and 'Information'. The main area is a table titled 'Variable' with columns for 'Mapping', 'Channel', 'Address', 'Type', 'Unit', and 'Description'. A search bar at the top of the table area includes 'Find', 'Filter', 'Show all', and buttons for 'Add FB for IO Channel...' and 'Go to Instance'. The table lists various variables, many of which are collapsed under '+' icons. One row is highlighted in blue, showing 'Application.AtomProgram.ATOM_INPUT_INHIBIT_ALARM' in the 'Mapping' column and '%ID0' in the 'Address' column. Other visible rows include 'Digital setpoint (0-10,000)', 'Digital run enable', 'Inhibit Alarm Status', 'Warning Alarm Status', 'Digital run enable', 'AC Line Frequency', 'AC Line Voltage', 'Load Voltage', 'Load current', 'Load resistance', 'Heatsink Temperature C', 'Output Duty Cycle %', 'Setpoint reference', 'Feedback', 'Partial Load Fault Target Resistance', 'Partial Load Fault Resistance', 'Firmware ID', 'Firmware major revision', 'Firmware minor revision', 'Full Scale Voltage', 'Full Scale Current', 'AC Line Status', 'Digital run enable', 'Controller status', 'Controller state', 'EEPROM Status', 'EEPROM Status', 'ErrorLatch', 'Miscellaneous State', 'Inputs PS', and 'Outputs'.

Variable	Mapping	Channel	Address	Type	Unit	Description
Digital setpoint (0-10,000)	%ID1	DINT				
Digital run enable	%IB8	USINT		UnicodeString8		
Inhibit Alarm Status	%IB9	USINT				
Warning Alarm Status	%IB10	USINT				
Digital run enable	%IB11	USINT		UnicodeString8		
AC Line Frequency	%ID3	REAL				
AC Line Voltage	%ID4	REAL				
Load Voltage	%ID5	REAL				
Load current	%ID6	REAL				
Load resistance	%ID7	REAL				
Heatsink Temperature C	%ID0	REAL				
Output Duty Cycle %	%ID9	REAL				
Setpoint reference	%ID10	REAL				
Feedback	%ID11	REAL				
Partial Load Fault Target Resistance	%ID12	REAL				
Partial Load Fault Resistance	%ID13	REAL				
Partial Load Fault Resistance Deviation	%ID14	REAL				
Firmware ID	%ID15	DINT				
Firmware major revision	%ID16	DINT				
Firmware minor revision	%ID17	DINT				
Full Scale Voltage	%ID18	DINT				
Full Scale Current	%ID19	REAL				
AC Line Status	%IB80	USINT				
Digital run enable	%IB81	USINT				
Controller status	%IB82	USINT				
Controller state	%IB83	USINT				
EEPROM Status	%IW42	UINT				
EEPROM Status	%IW43	UINT				
ErrorLatch	%IB88	USINT				
Miscellaneous State	%IB89	USINT				
Inputs PS	%IB92	Enumeration of BYTE				
Outputs	%QD0					

Repeat this for your output I/O mappings:

1. Map **Digital setpoint** to `Application.AtomProgram.ATOM_OUTPUT_SETPOINT`
2. Map **Digital run enable** to `Application.AtomProgram.ATOM_OUTPUT_RUN_ENABLE`

Change the **Filter** to **Show only outputs** and repeat the process for the outputs. Map **Digital setpoint** to `Application.AtomProgram.ATOM_OUTPUT_SETPOINT` and **Digital RUN Enable** to `Application.AtomProgram.ATOM_OUTPUT_RUN_ENABLE`.



The screenshot shows the 'DIO_8xLogicLevel' configuration window. On the left, there's a sidebar with tabs: General, PNIO Module I/O Mapping (selected), PNIO Module IEC Objects, Status, and Information. The main area is a table titled 'Variable' with columns: Find, Filter, Show all, Add FB for IO Channel..., Go to Instance, Mapping, Channel, Address, Type, Unit, and Description. The table lists various variables mapped to specific addresses and types. For example, 'Digital setpoint (0-10,000)' is mapped to %ID1 (DINT). Other entries include 'Digital run enable', 'Inhibit Alarm Status', 'Warning Alarm Status', 'Digital run enable', 'AC Line Frequency', 'AC Line Voltage', 'Load Voltage', 'Load current', 'Load resistance', 'Heatsink Temperature C', 'Output Duty Cycle %', 'Setpoint reference', 'Feedback', 'Partial Load Fault Target Resistance', 'Partial Load Fault Resistance', 'Partial Load Fault Resistance Deviation', 'Firmware ID', 'Firmware major revision', 'Firmware minor revision', 'Full Scale Voltage', 'Full Scale Current', 'AC Line Status', 'Digital run enable', 'Controller status', 'Controller state', 'EEPROM Status', 'EEPROM Status', 'ErrorLatch', 'Miscellaneous State', 'Inputs PS', 'Outputs', 'Digital setpoint (0-10,000)', 'Digital run enable', and 'Outputs CS'. Most variables are of type DINT or REAL, with some being USHORT or UnicodeString8.

You're all set! Go to the [Running the program with SoftPLC](#) section to run your program.

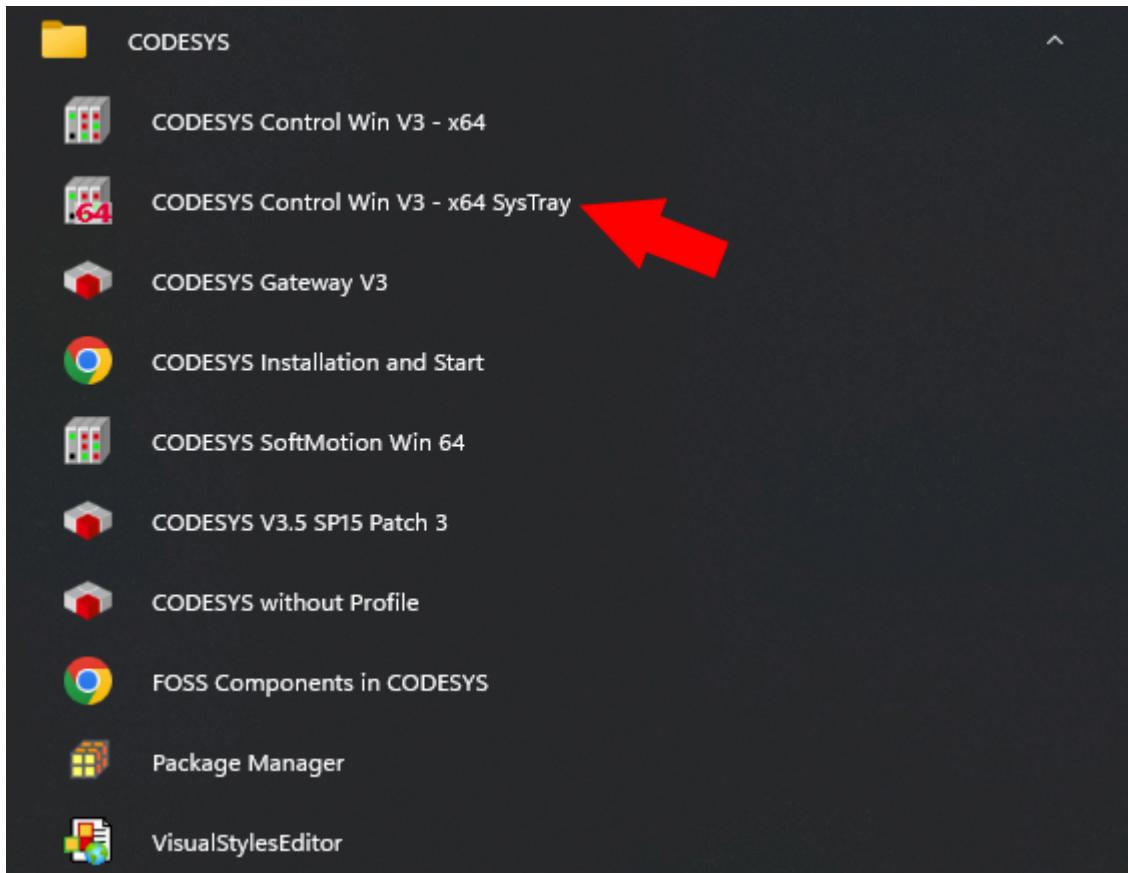
Running the program with SoftPLC

INFO

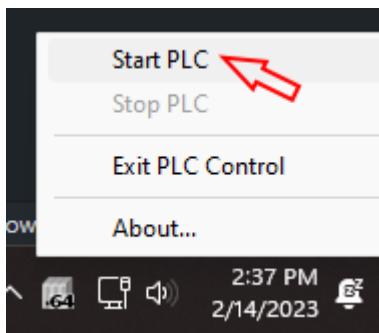
The instructions to run your program are the same regardless of whether you are using ladder logic or structured text.

The only difference is that in the ladder logic example, a visualization window will open that allows you to control ATOM.

To debug the program, first make sure you start **Codesys WIN Control V3 - x64 SysTray**

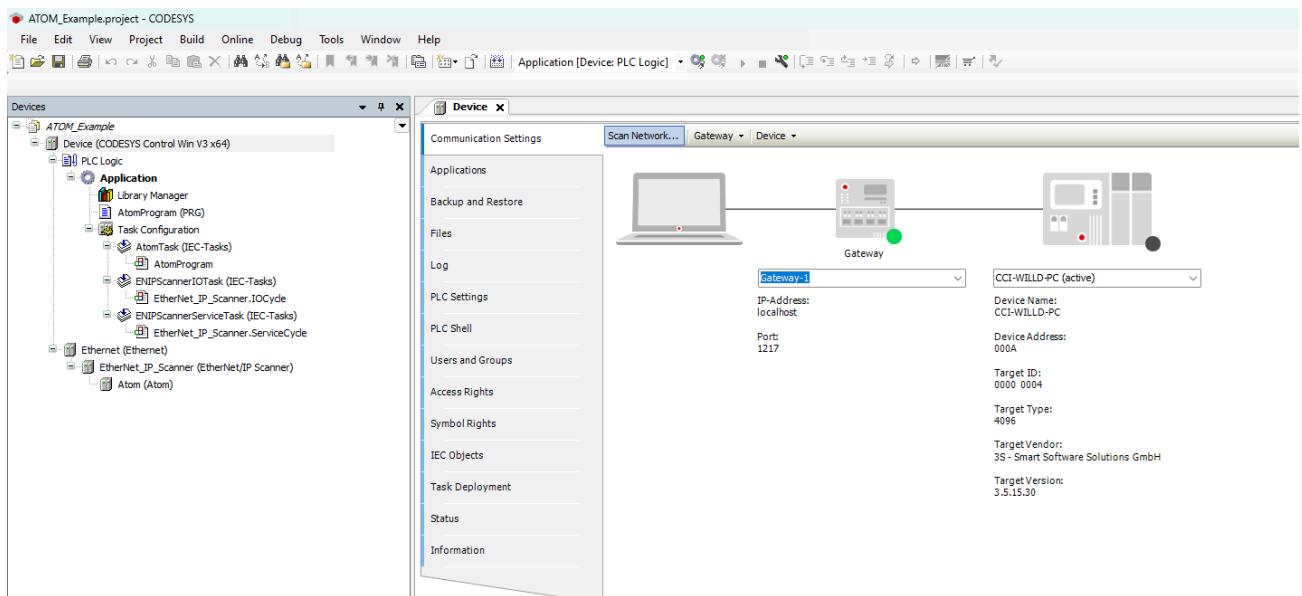


This will launch the Codesys SoftPLC. You should see an icon appear in your systray and you can right click it and select **Start PLC** to start the SoftPLC:

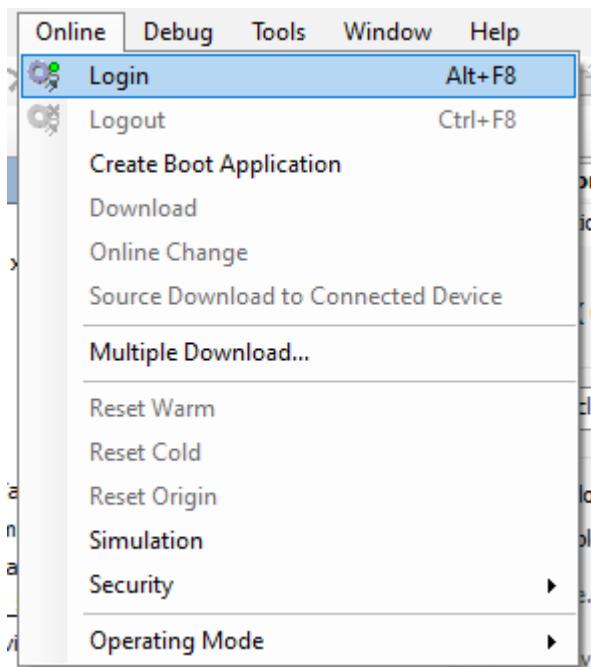


Next, connect your Atom to your PC via an Ethernet cable, ensuring to use the network interface you specified in the [Adding a Profinet controller](#) section.

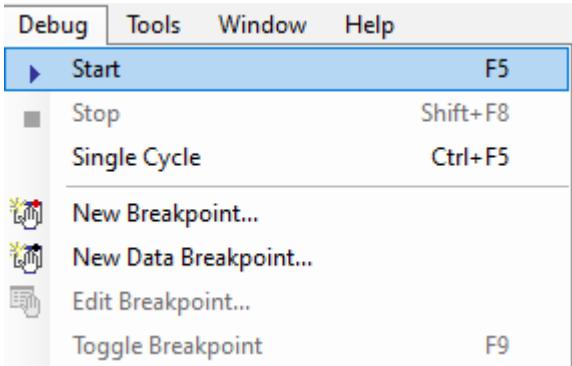
Next, in Codesys double click **Application** to open its configuration window. Here you can select **Scan Network** to discover your SoftPLC:



Finally, **Login** to your SoftPLC:



Then you can start debugging the program:



If you use Control Panel to monitor ATOM, you should see the **Stop / Run** state and the **Digital Setpoint** values change to reflect the PLC program's instructions. If you followed the structured text example, the values will change once and remain fixed. If you followed the ladder logic example, a visualization control panel will appear. Flipping the dip switch or adjusting the slider will immediately update ATOM and the changes should reflect in real-time:

