

Contents

Introduction	2
Software Tools Needed	2
Download Needed Files.....	2
GSD Files	2
TIA Portal Integration Guide and Tag Generator	5
DataMan WebUI Communications Section.....	6
PLC Setup.....	7
Cognex DataMan 290/390 Set-up.....	12
Install GSD File	12
Add the DataMan 290/390 to the Project.....	14
Configure Cognex DataMan 290 on PROFINET	16
DataMan 290 Device Overview in Siemens TIA Portal	19
Sample Code	25
Trigger Camera Verification	27
Sample Code	30
Inspection Results.....	30

Introduction

This guide is intended to help first-time users set up communication between Siemens PLCs and Cognex DataMan DM290/390.

Software Tools Needed

- Web browser to connect to the DataMan WebUI
- Siemens TIA Portal
- TIA Portal Integration Guide and Tag Generator V2

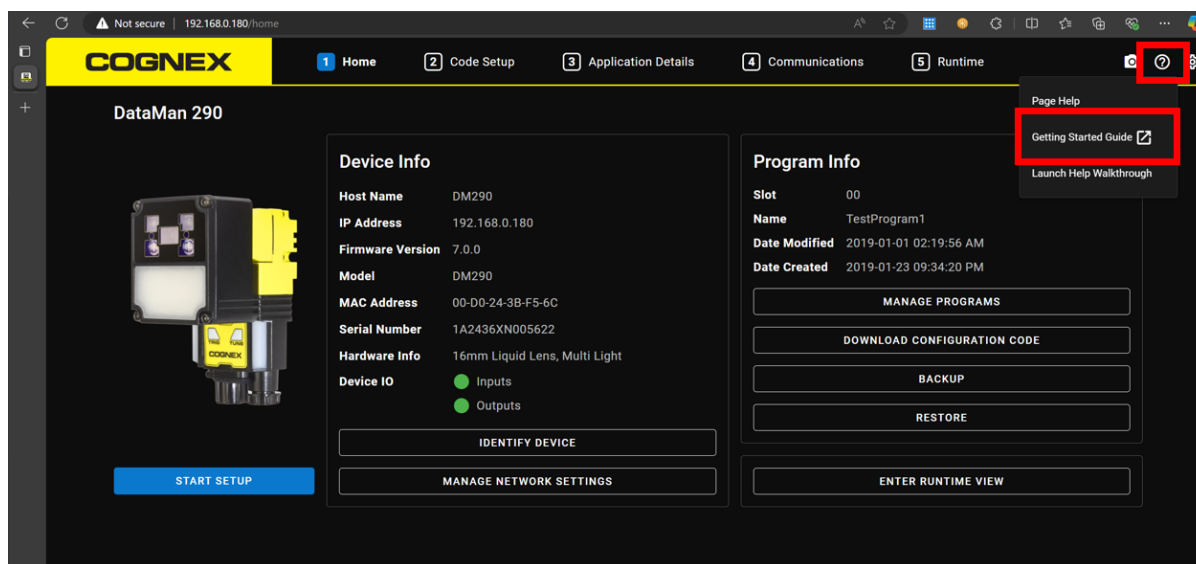
Download Needed Files

GSD Files

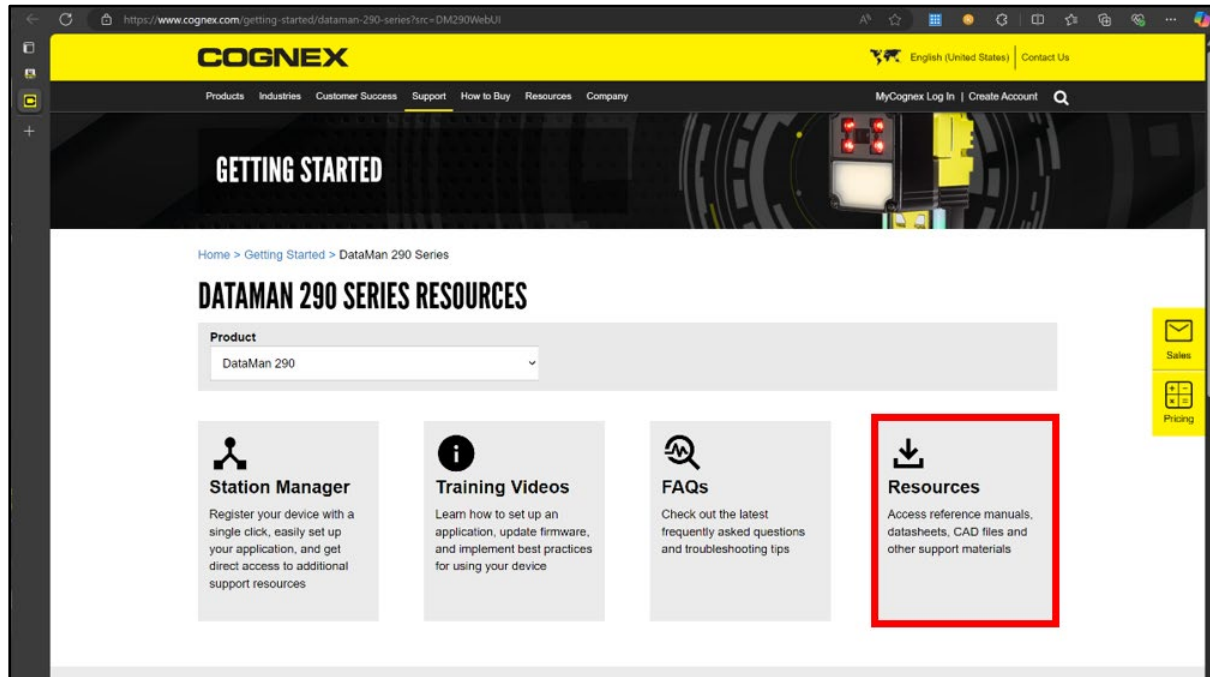
A **GSD file** (General Station Description) is a description of an IO device provided by the device manufacturer. The contents of the GSD consist of configuration information, parameters, modules, diagnostic and alarms, and vendor and device identification. It serves as a "data sheet" for configuring and integrating a device within a networked system.

GSD files can be downloaded from Cognex.com. The recommended way to obtain resources for your device is to use the **DataMan WebUI**. Open your Web Browser and navigate to the assigned IP Address of your device. The DataMan WebUI should appear as shown below.

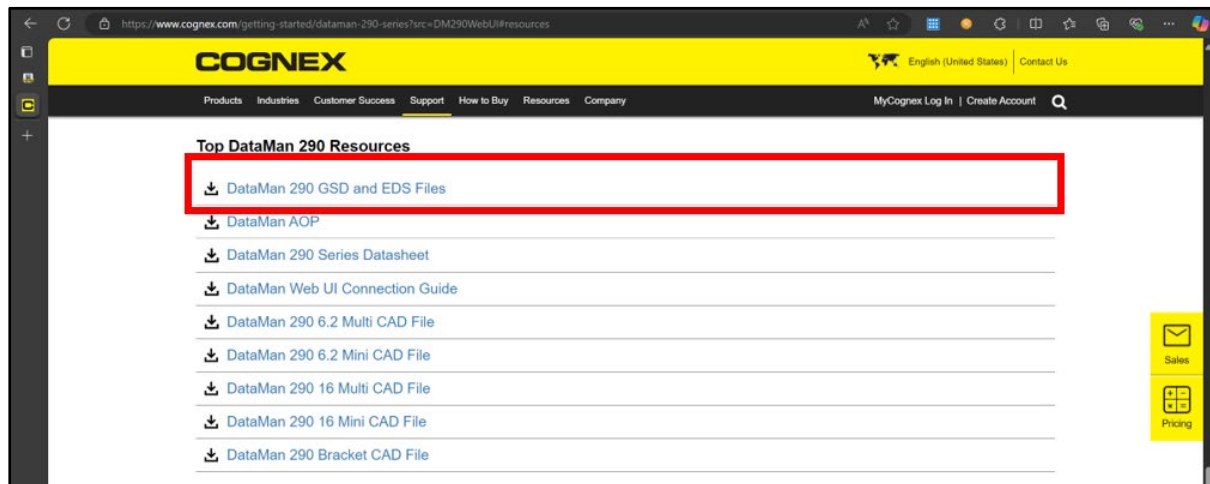
1. Navigate to the **Help** menu in the upper right corner and select **Getting Started Guide**.



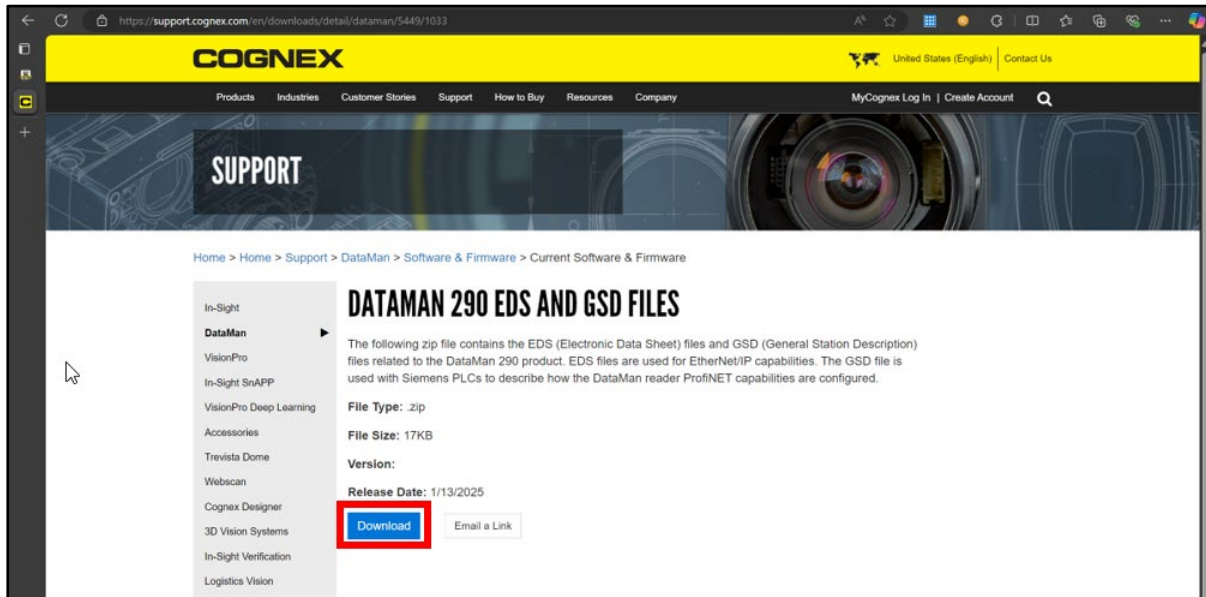
2. Select **Resources**.



3. Select **DataMan 290 GSD and EDS Files** from the Resources list.



4. Click the **Download** button.



5. Unzip and copy the downloaded folder to your PLC programming PC.

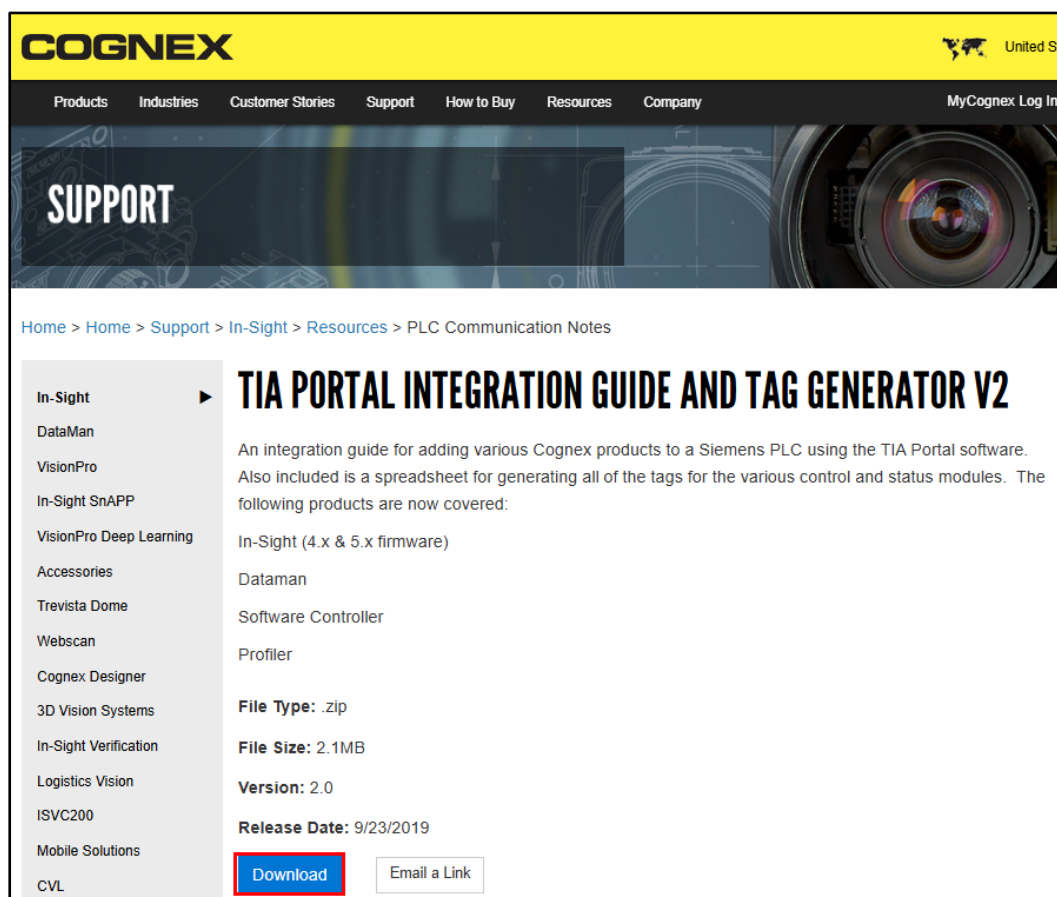
TIA Portal Integration Guide and Tag Generator

The TIA Portal Integration Guide and Tag Generator is an integration guide for adding various Cognex products to a Siemens PLC using the TIA Portal software. Also included is a spreadsheet for generating all of the tags for the various control and status modules.

1. In your Web Browser navigate to: [Support - TIA Portal Integration Guide and Tag Generator V2 | Cognex](#)

The TIA Portal Integration Guide Webpage displays.

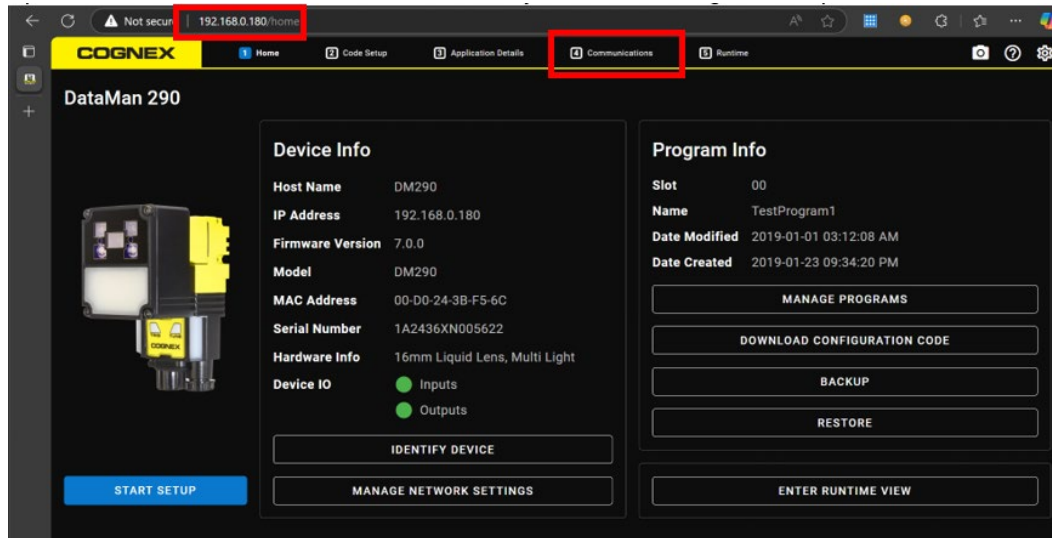
2. Click the **Download** button.



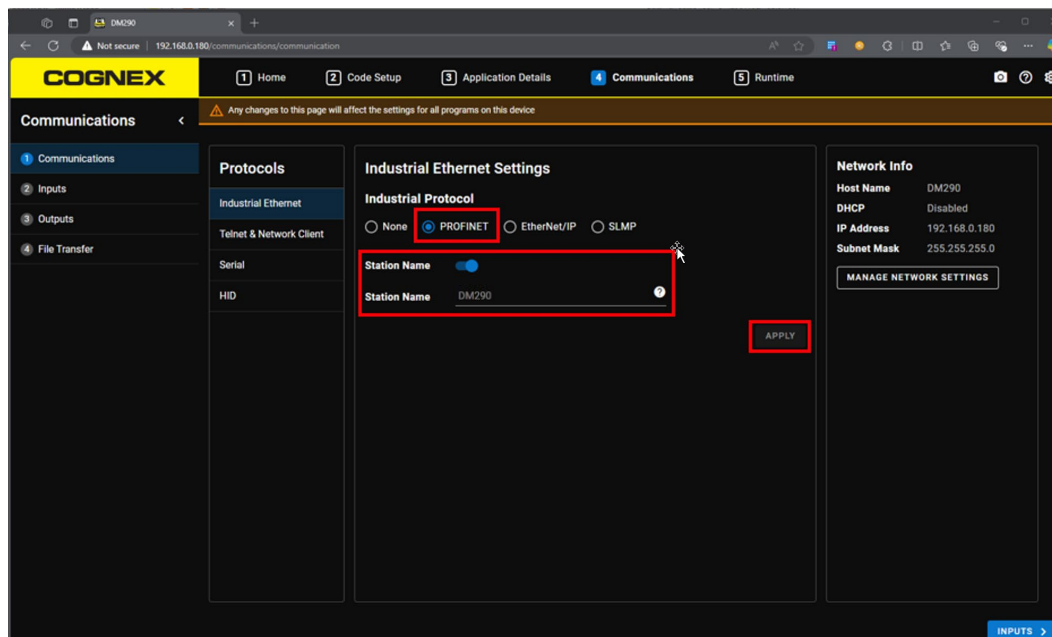
3. Copy this folder to the PLC programming PC.
4. Extract the files. Make note of the file location.

DataMan WebUI Communications Section

1. Open a Web Browser and enter the IP Address of your DataMan 290.
2. Navigate to Step 4 **Communications**.



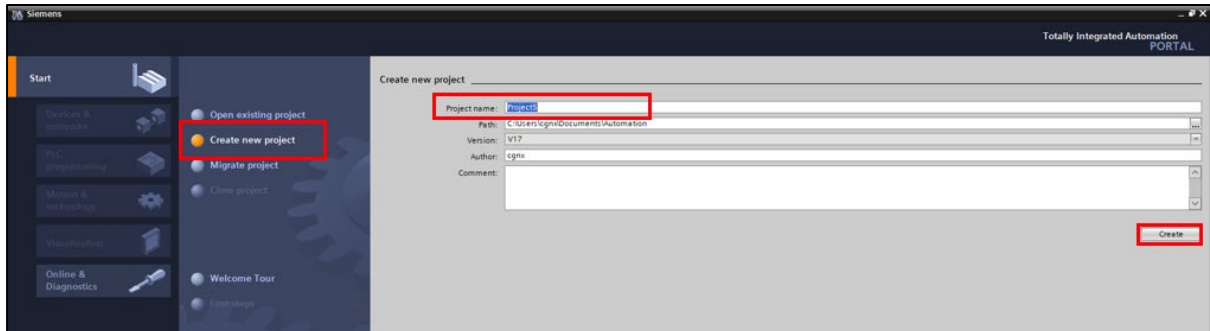
3. Select the **PROFINET** radio button.
4. Toggle the **Station Name** toggle on and enter a unique name in the **Station Name** field.
5. Click the **Apply** button.



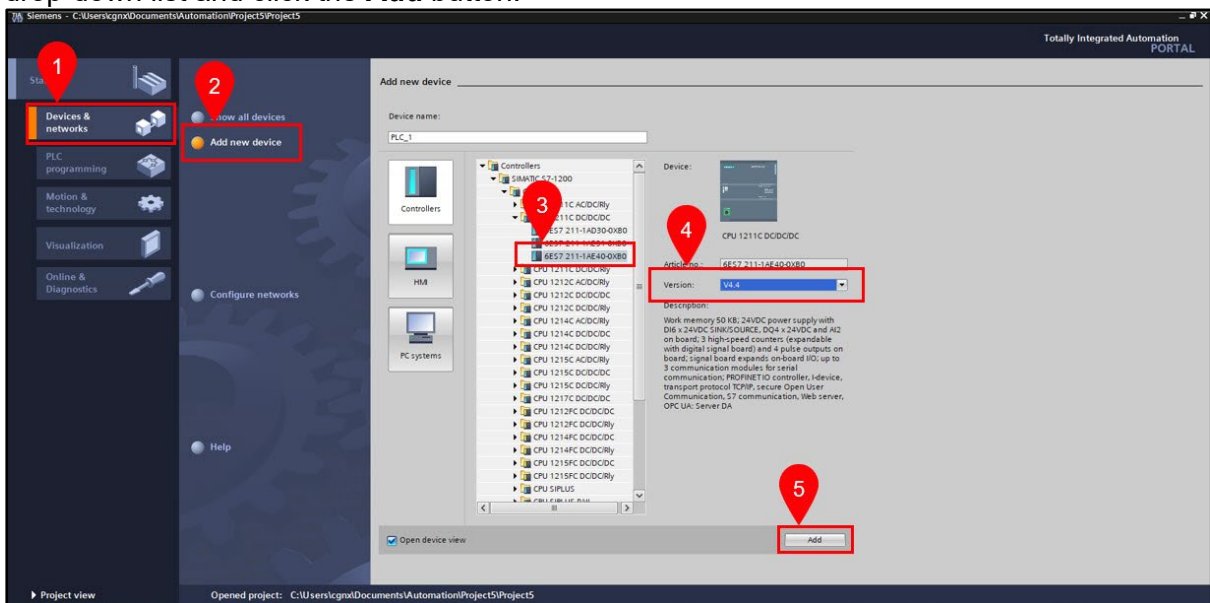
A reboot will be required for the changes to take effect.

PLC Setup

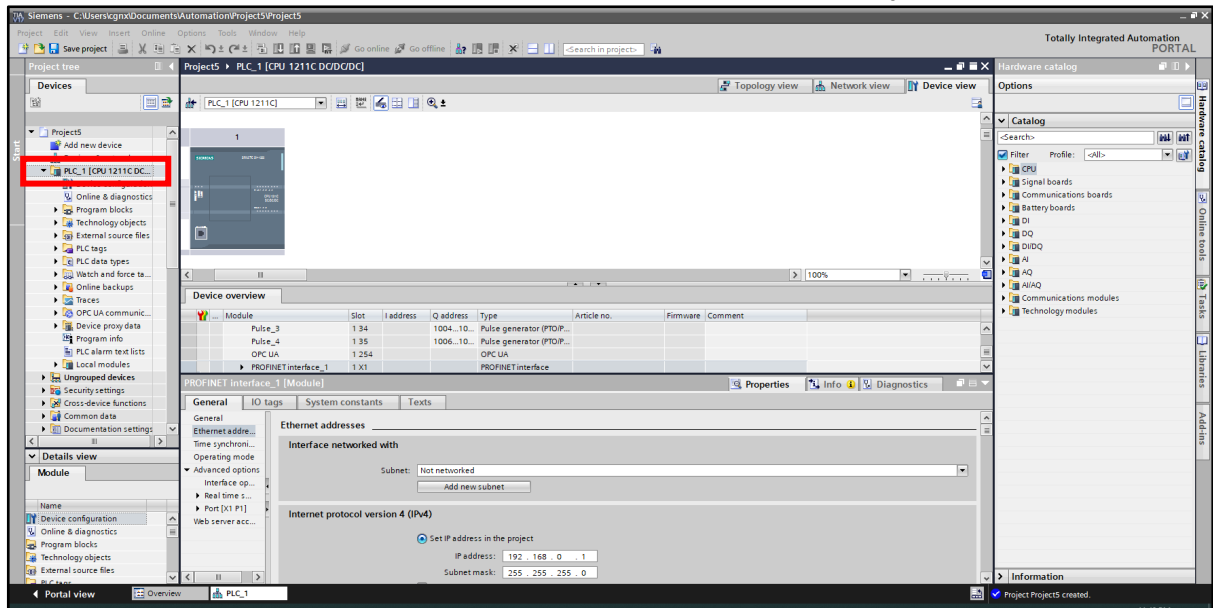
1. After rebooting, open **Siemens TIA Portal**.
NOTE: This example is using TIA Portal Version 17.
NOTE: This example assumes that you have already setup your PLC with a dedicated IP Address.
2. Select **Create new project**, enter the name your project in the **Project Name** field and click the **Create** button.



3. Select **Devices & networks** and select **Add a new device**.
4. Select your PLC hardware from the **Controllers** list, firmware version from the **Version** drop-down list and click the **Add** button.



The TIA Portal workspace opens, and the device is added to the Project tree.

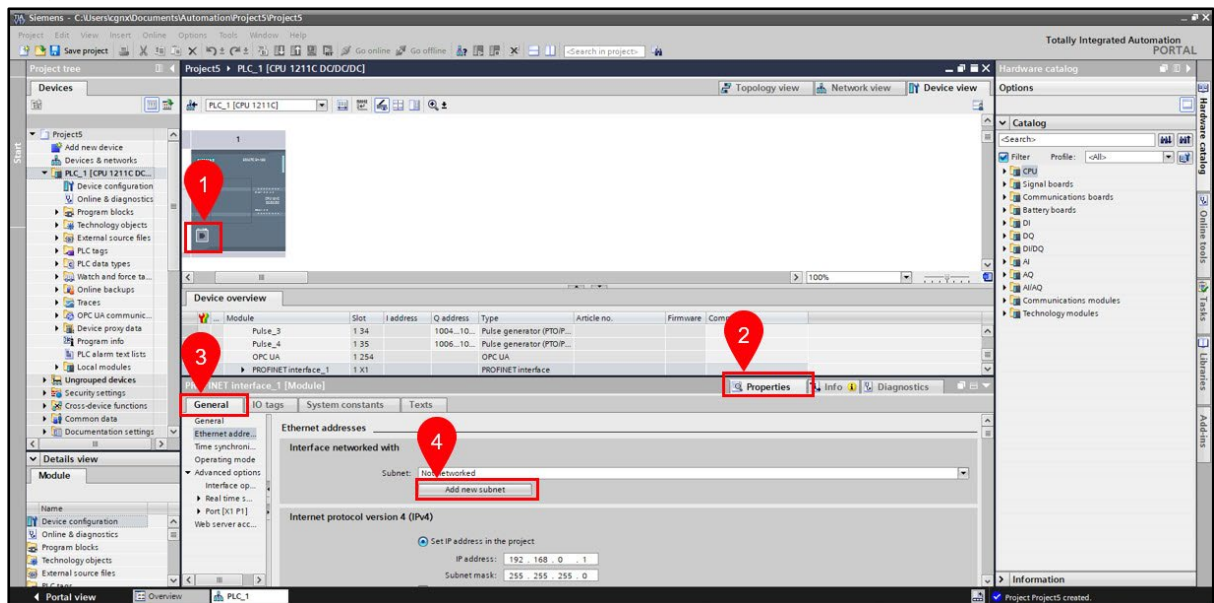


NOTE: You can toggle between the Project view and Portal view in the lower left-hand corner of the IDE.

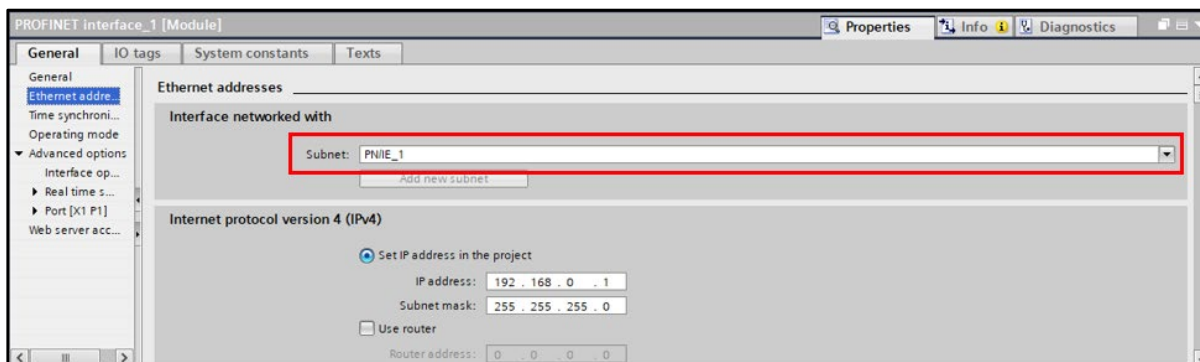
5. Select the **Ethernet** port on the PLC diagram.

NOTE: Selecting different parts of the PLC diagram will show different properties below.

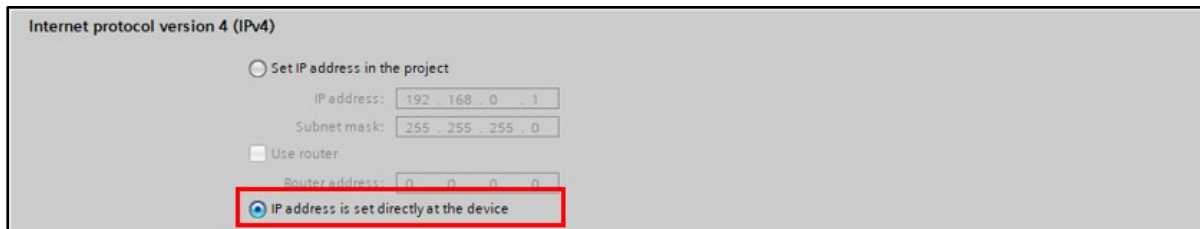
6. Scroll down to the **PROFINET Interface_1 [Module]** settings and select the **Properties** tab, select the **General** tab and click the **Add new subnet** button.



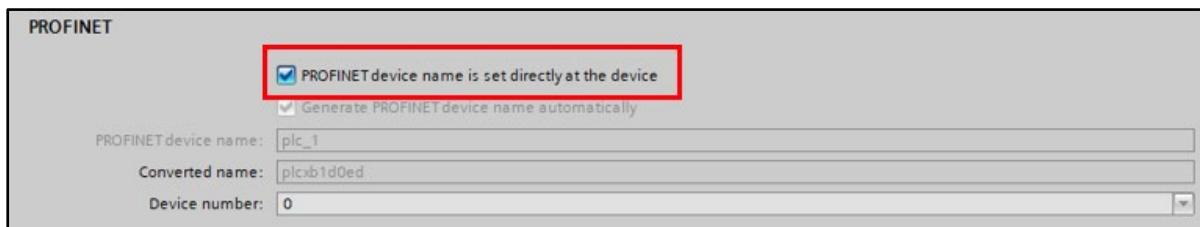
7. Scroll down and select **PN/IE_1** from the **Subnet** drop-down list.



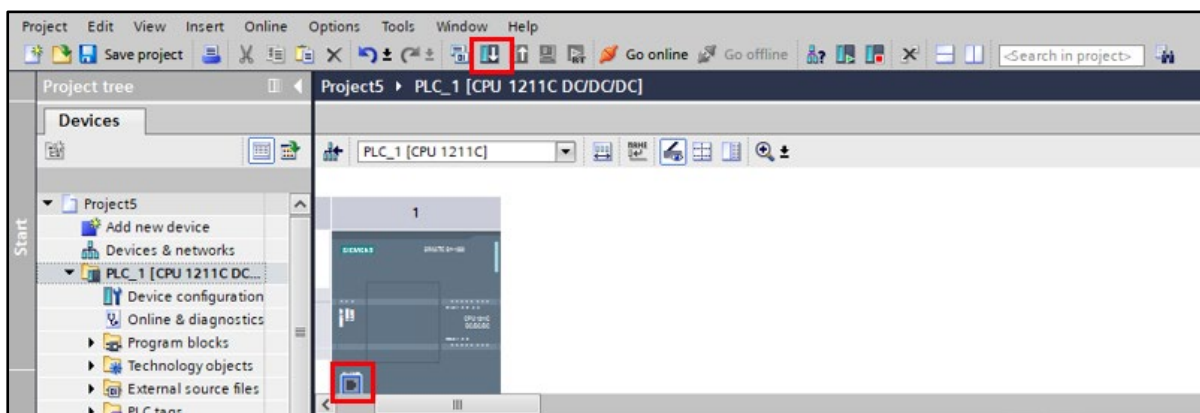
8. Scroll down to the **Internet protocol version 4 (IPv4)** settings. If you have an IP Address click the **IP address is set directly at the device** radio button.



9. Scroll down to the **PROFINET** settings. Check the **PROFINET device name is set directly at the device** checkbox.

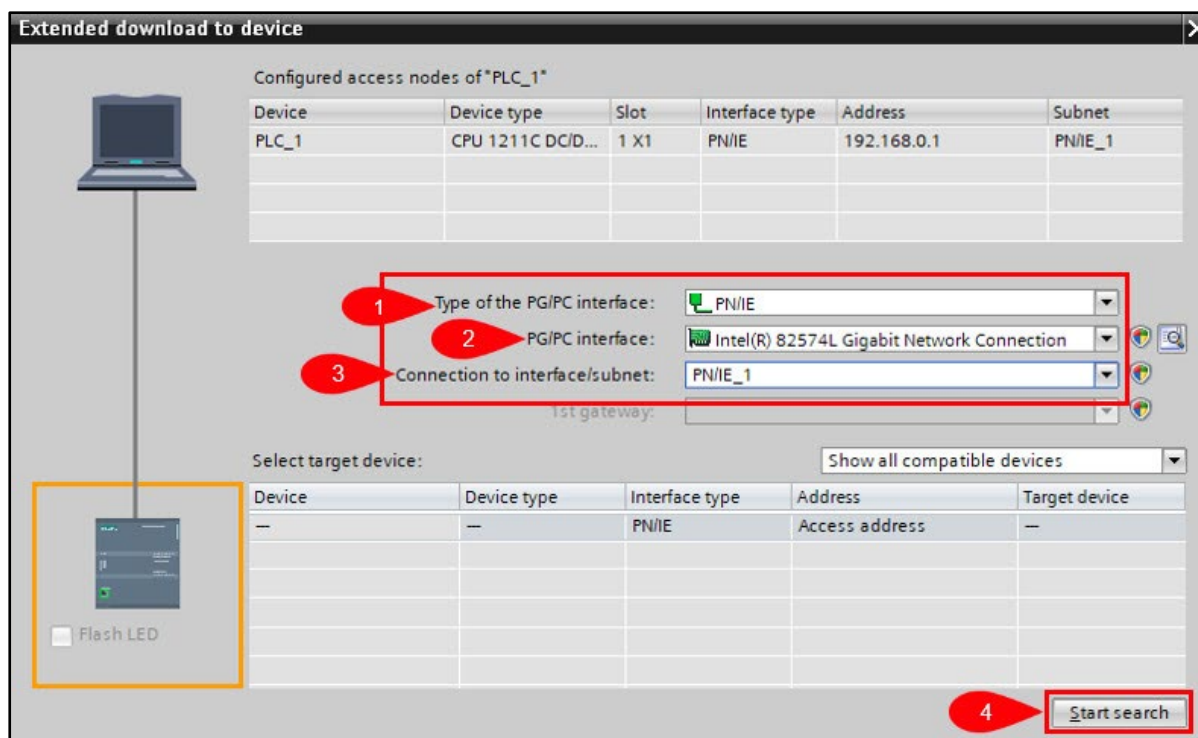


10. Select the **Ethernet port** on the PLC diagram and click the **Download to device** button in the IDE toolbar.

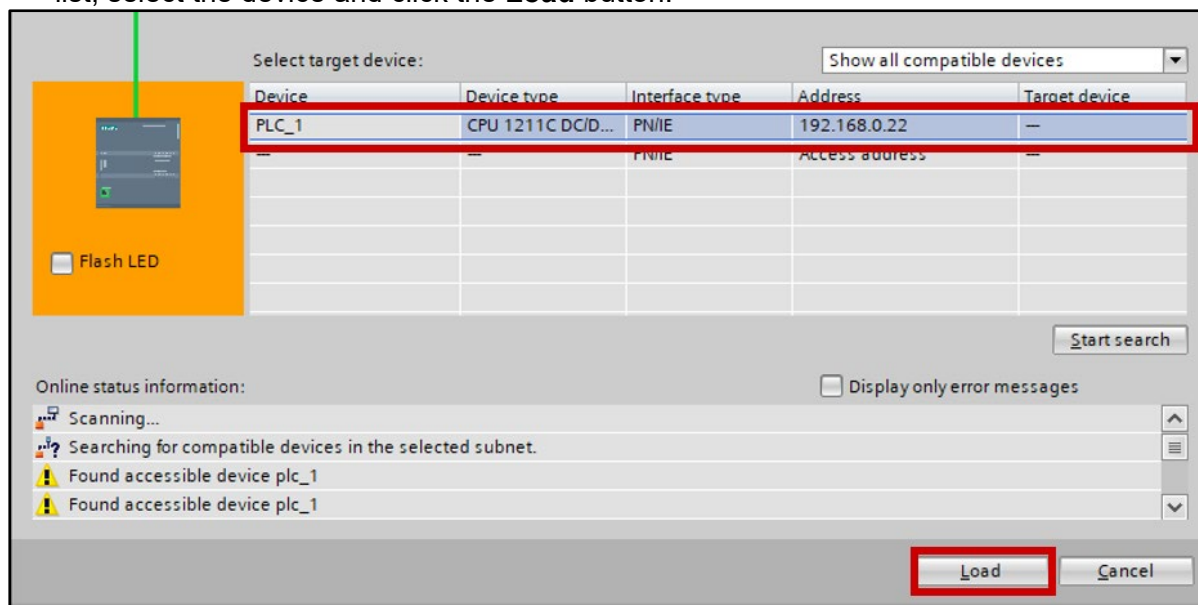


The **Extend download to device** page displays.

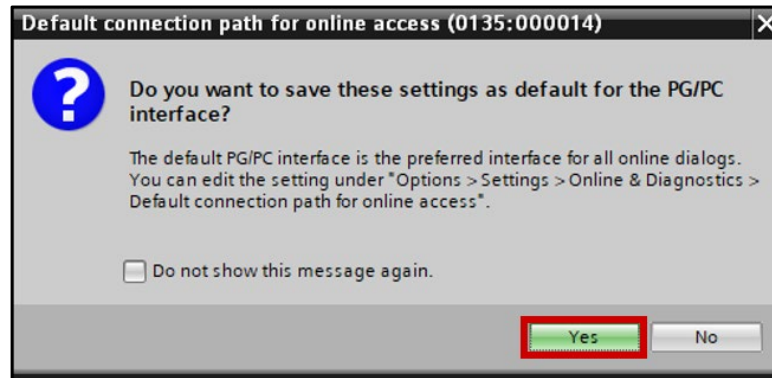
11. Select **PN/IE** from the **Type of the PG/PC interface** drop-down list.
12. Select the **PG/PC interface**, this is NIC the PLC and PC are communicating on.
13. Select **PN/IE_1** from the **Connection to interface/subnet** drop-down list.
14. Click the **Start Search** button.



15. Once the successful connection is made the device will display in the **Select target device** list, select the device and click the **Load** button.



16. The **Default connection path for online access** warning box may display. Click the **Yes** button to continue.

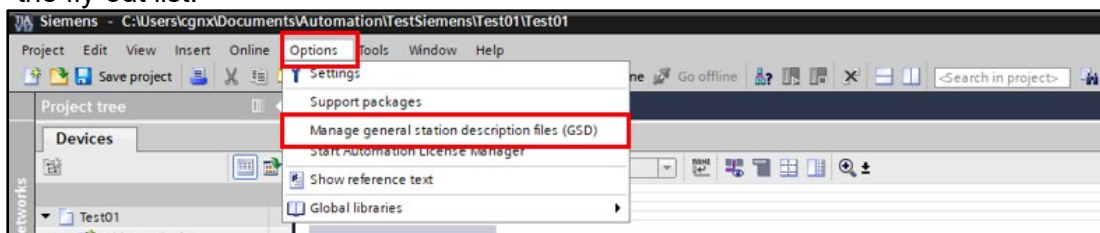


Cognex DataMan 290/390 Set-up

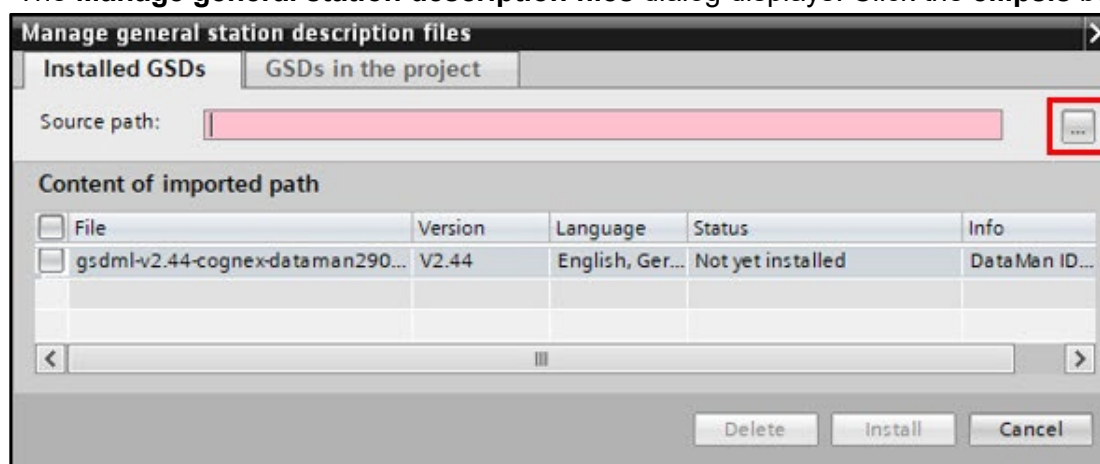
Install GSD File

NOTE: Confirm the PLC is Offline.

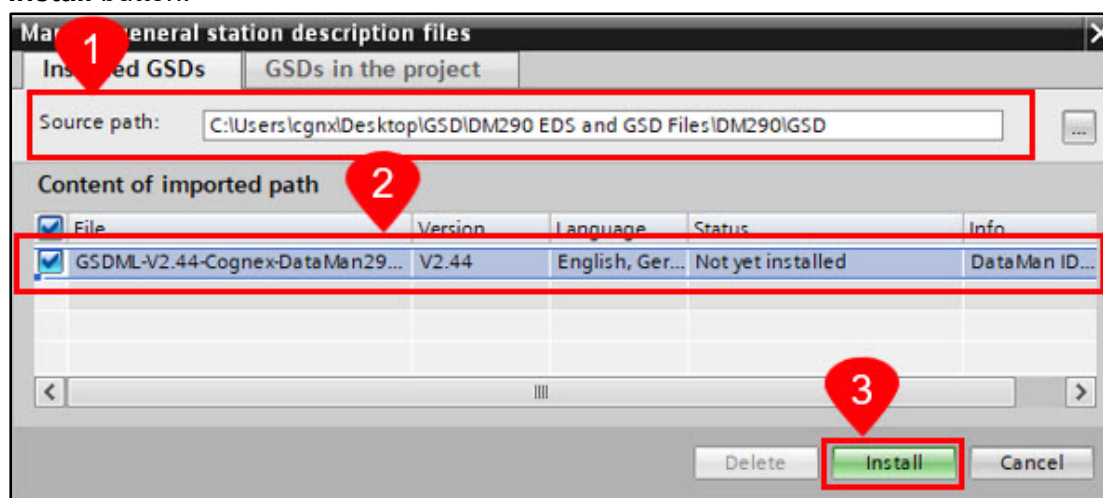
1. Navigate to the downloaded GSD Files.
2. From the **Options** menu select **Manage general station description files (GSD)** from the fly-out list.



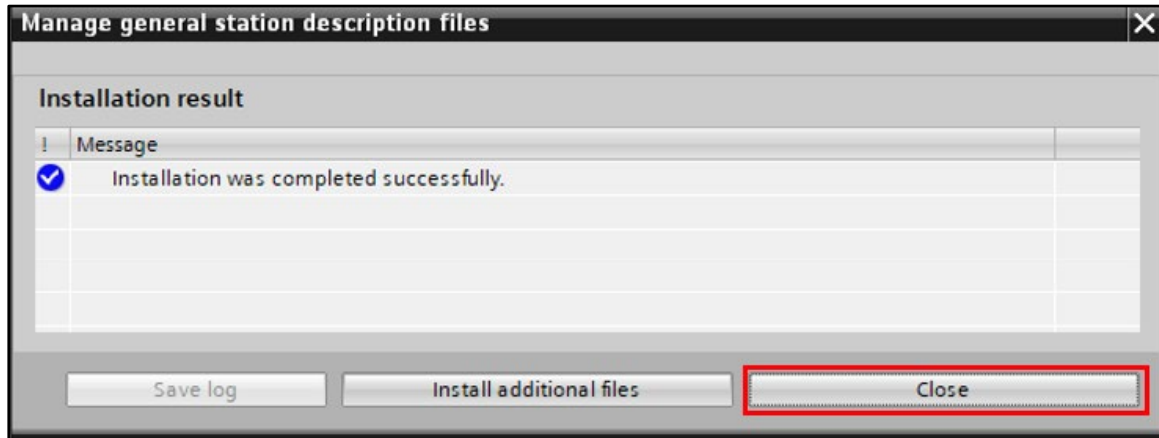
3. The **Manage general station description files** dialog displays. Click the **ellipsis** button.



4. Navigate to the GSD **Source path** on your PC, select the DataMan 290 and click the **Install** button.

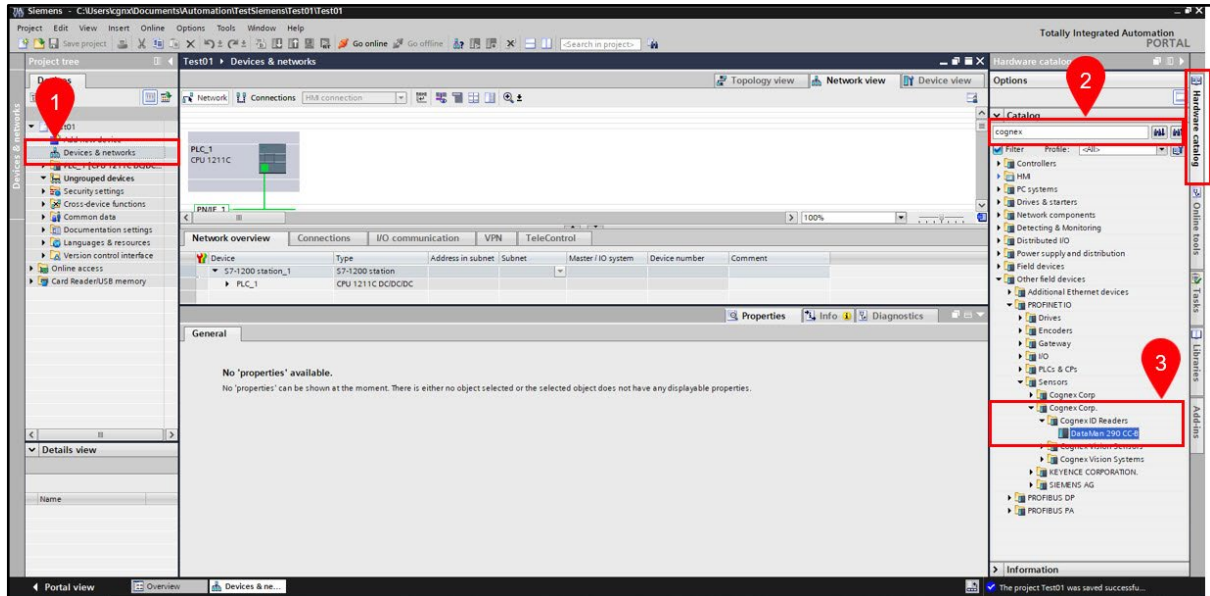


5. The Installation is complete, click the **Close** button.

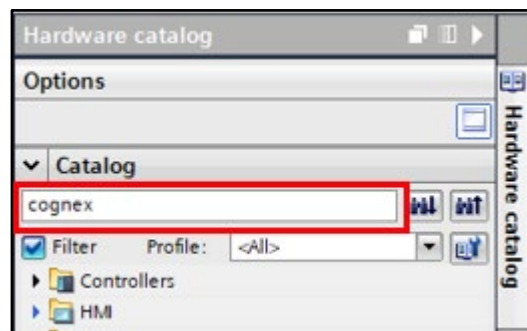


Add the DataMan 290/390 to the Project

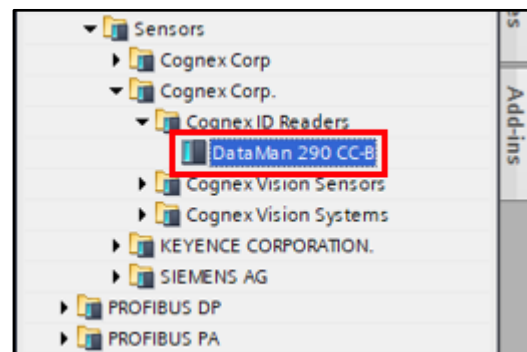
1. Select **Devices & networks** in the Devices pane on the left.



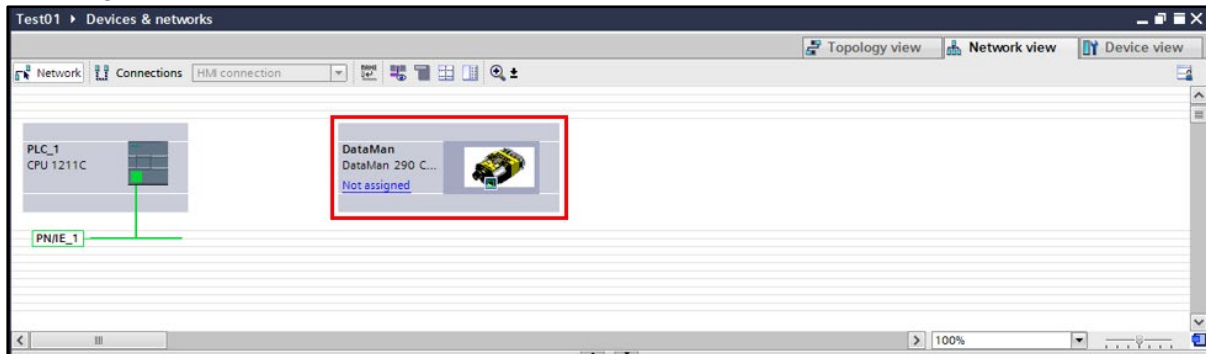
2. Navigate to the Hardware Catalog tab in the right-hand toolbar. Enter **Cognex** in the **Catalog** search field.



3. Scroll down until you find the **DataMan 290** in the device list.



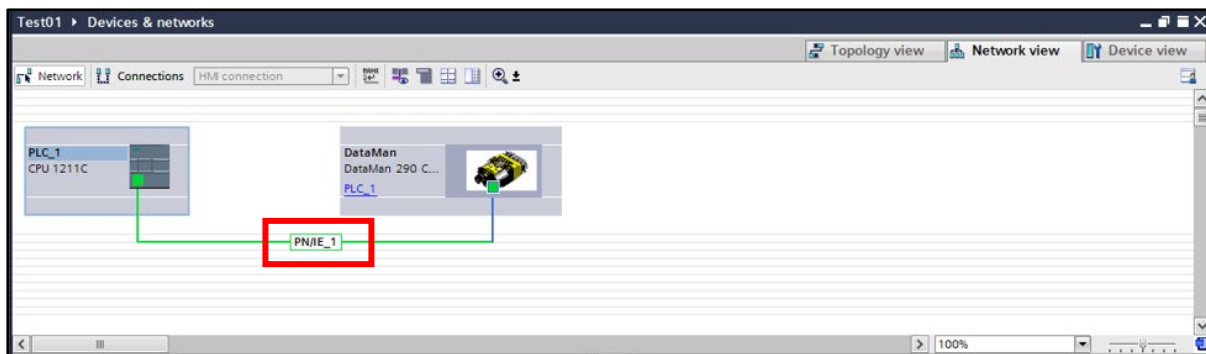
4. Drag the icon into the Device & networks pane and place it next to the PLC icon.



5. Connect the DataMan 290 icon to the PLC.

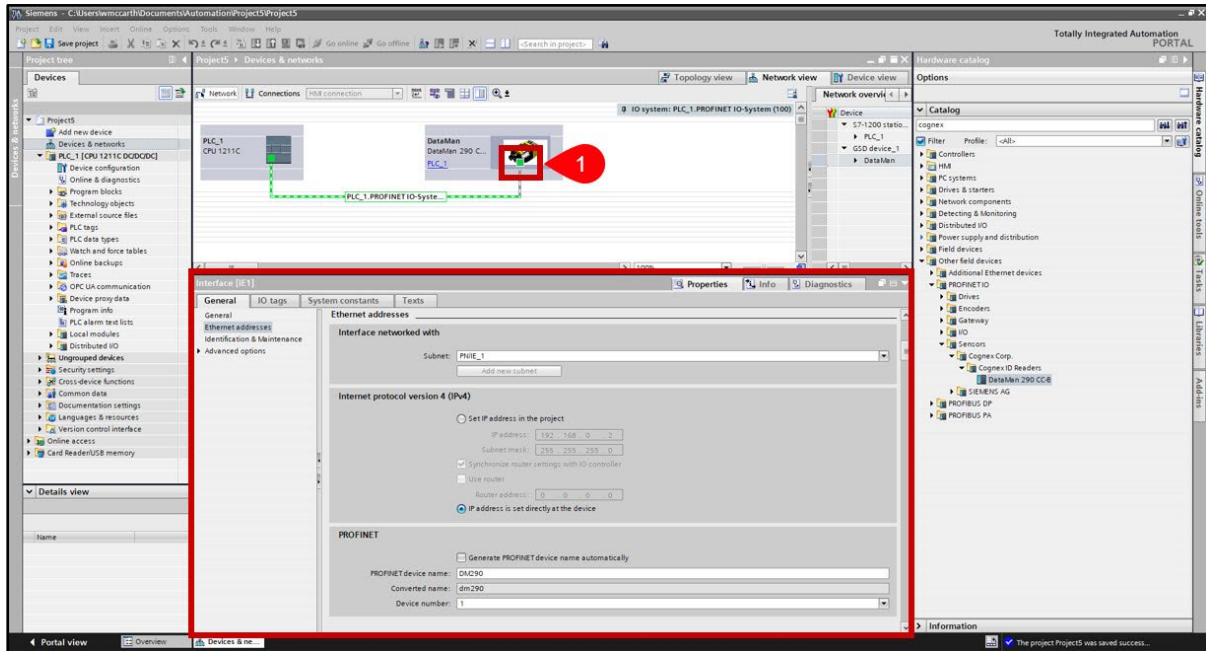
NOTE: Start with the green square in the center of the DataMan icon and connect to the green square on the PLC icon.

The DataMan and the PLC are now connected.

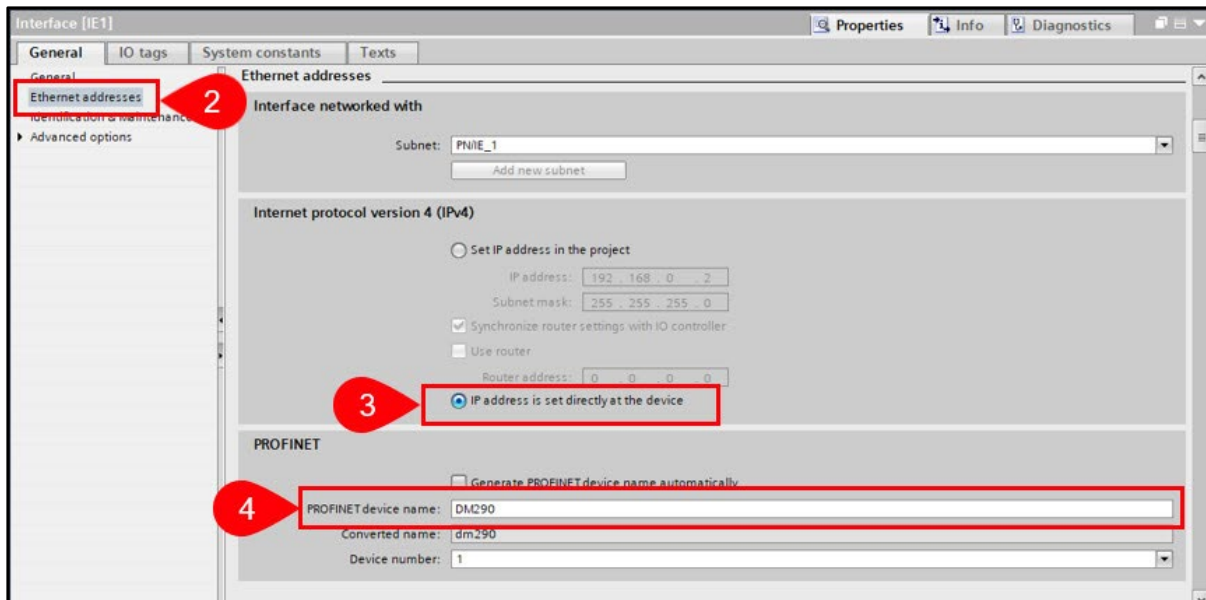


Configure Cognex DataMan 290 on PROFINET

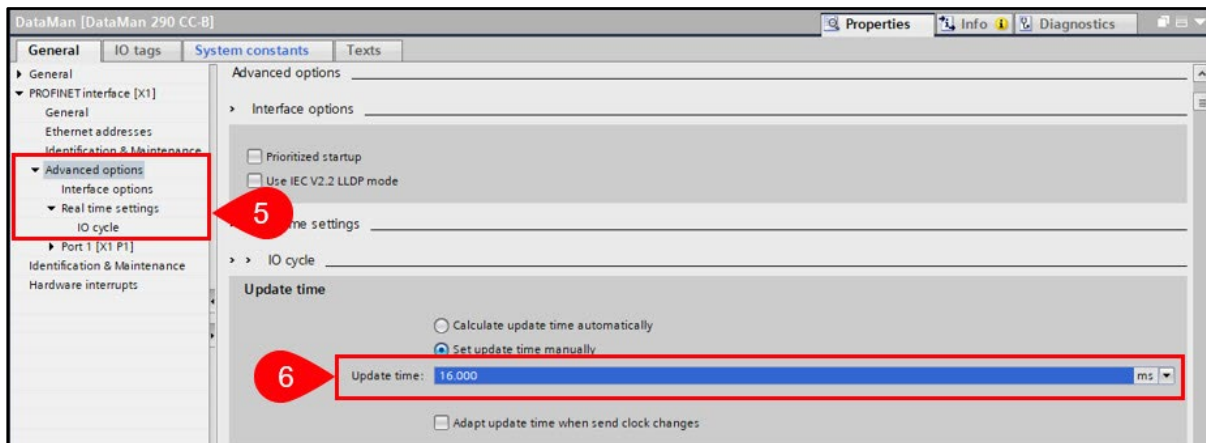
1. Right-click on the Ethernet port on the DataMan 290 icon and select **Properties**.



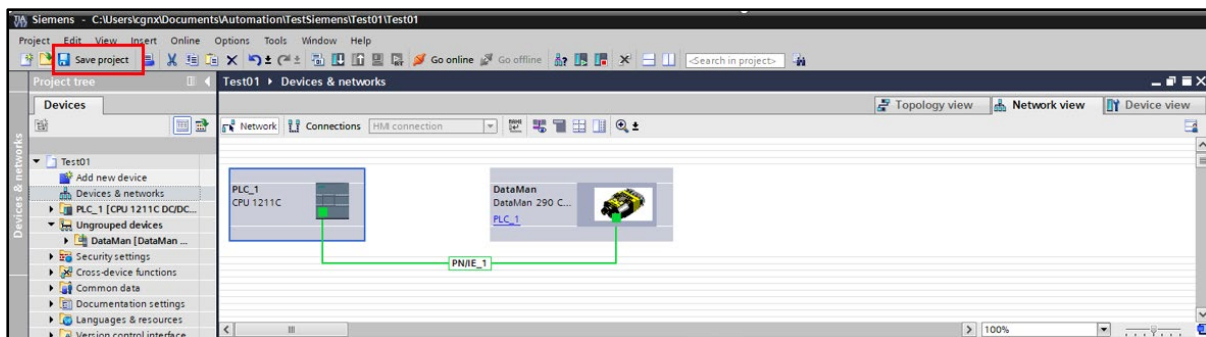
2. Navigate to the **Ethernet Addresses** setting under the **General** Properties tab in the DataMan Properties at the bottom of the interface.
3. Scroll down to the **Internet protocol version 4 (IPv4)** settings and click the **IP address is set directly at the device** radio button.
4. Scroll down to the **PROFINET** settings and confirm the **PROFINET device name** matches what was setup in the DataMan WebUI Communications Section.



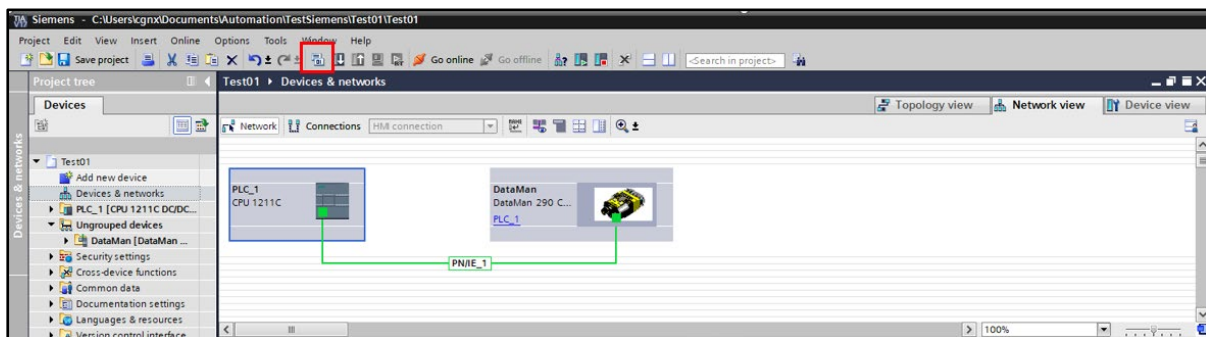
5. Navigate to the **Advanced options** setting under the General Properties tab and navigate to the **IO cycle** setting under the **Real time settings**.
6. Navigate to the **Update time** setting and set the **Update time** accordingly.
NOTE: *The Update time setting is configured separately for each I/O device and determines the time interval in which data is transmitted to and from the PLC to the I/O device (DataMan).*



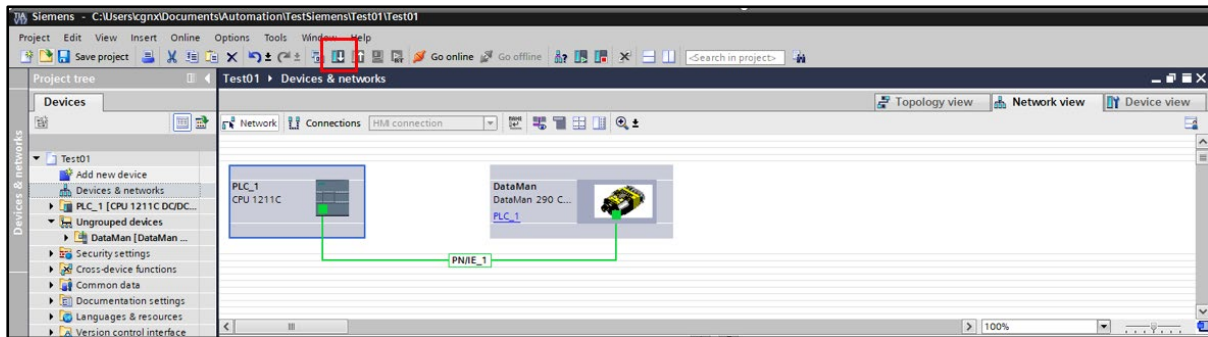
7. Click the **Save Project** button.



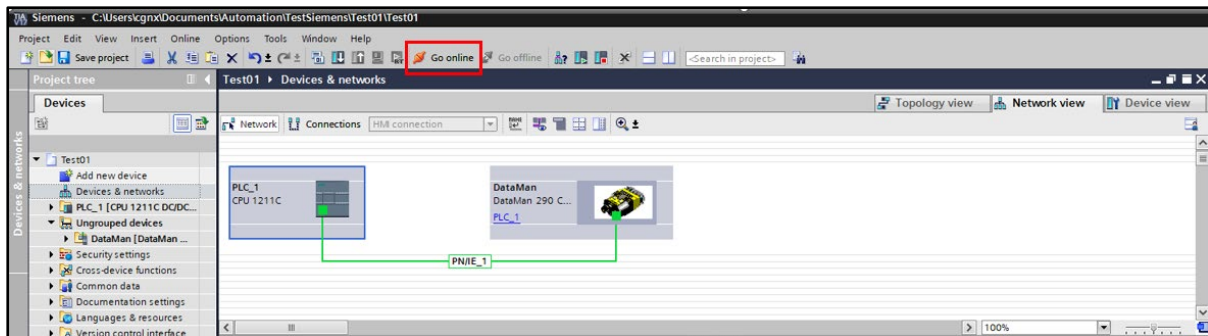
8. Click the **Compile** button.



9. Click the **Download** button.

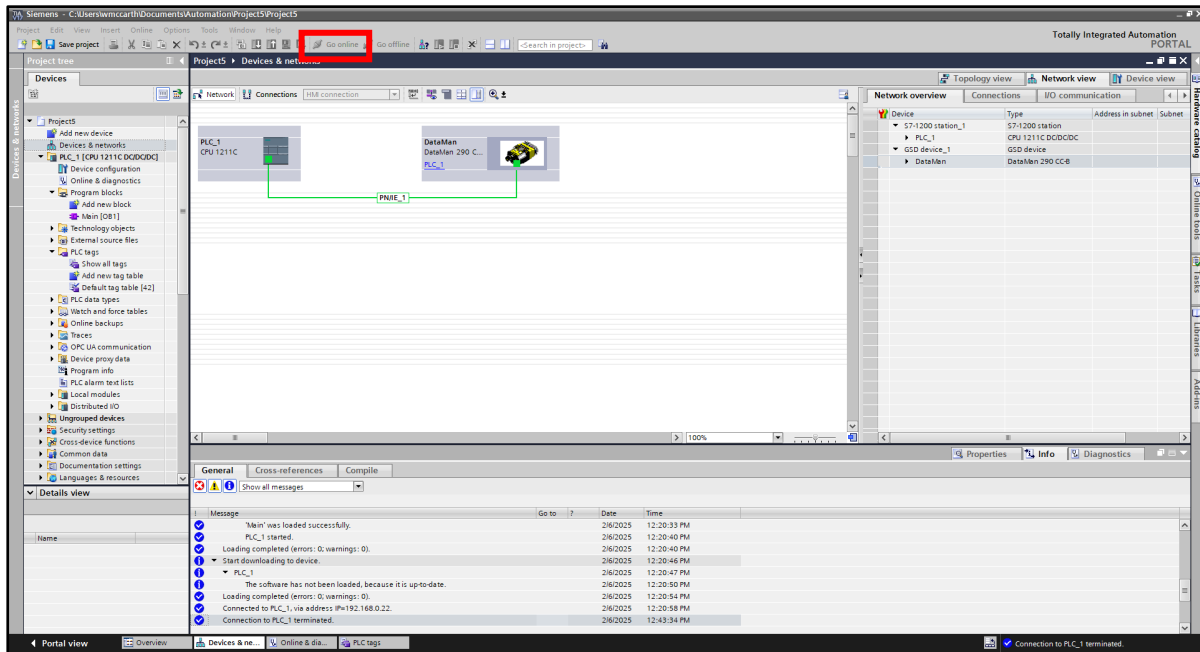


10. Click the **Go Online** button.

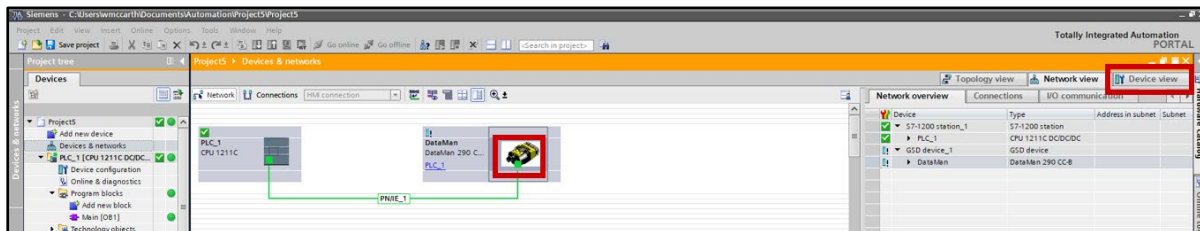


DataMan 290 Device Overview in Siemens TIA Portal

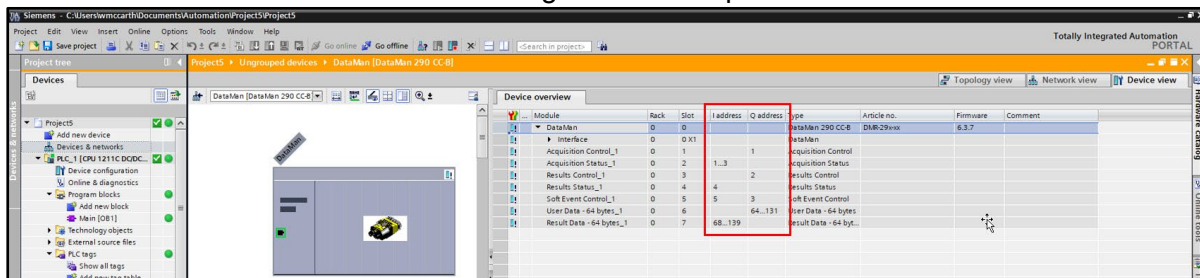
When you are Online the Go online button will be greyed out (inactive).



1. Select the **DataMan 290** and click the **Device View** tab.



The **Device Overview** tab opens. Note the starting I and Q addresses, these are the start addresses that will be entered into the Tag Generator Spreadsheet.



2. Navigate to the location of the **PROFINET Tag Generator spreadsheet** on the PC.
3. Open the spreadsheet.
4. Navigate to the **DataMan** tab. This is where you will find the start address for each module. These are the Start Addresses that will be entered into the PROFINET Tag Generator spreadsheet.

DO NOT MAKE ANY CHANGES RIGHT OF THIS COLUMN

NOTE: The Control and Status modules match what is in the spreadsheet. Note the spreadsheet has a tab for In-Sight cameras, and a tab for DataMan sensors.

NOTE: In the Results Data Module set the Data Type to **Word** for the following cells: DM290-ResultID, DM290-ResultCode, DE290-ResultExtended, DM290-ResultLength

5. Enter the **DataMan 290** sensor name in cell B2.
6. Edit the yellow fields in the Spreadsheet to match the I and Q addresses.

Module	Rack	Slot	I address	Q address	Type	Module Name	Start Address
DataMan	0	0			DataMan 290 CC-B	Acquisition Control Module	1
Interface	0	0 X1			DataMan	Acquisition Status Module	1
Acquisition Control_1	0	1		1	Acquisition Control	Result Control Module	2
Acquisition Status_1	0	2	1...3		Acquisition Status	Result Status Module	4
Results Control_1	0	3		2	Results Control	Soft Event Control Module (Q)	3
Results Status_1	0	4	4		Results Status	Soft Event Status Module (I)	5
Soft Event Control_1	0	5	5	3	Soft Event Control	User Data Module	64
User Data - 64 bytes_1	0	6		64...131	User Data - 64 bytes	Results Data Module	68
Result Data - 64 bytes_1	0	7	68...139		Result Data - 64 bytes		

7. Copy cells F6 – H71.

Table to be copied into TIA Portal

Module Name	Start Address	Tag Name	Tag Type	Tag Address
Acquisition Control Module	1	AcquisitionControlModule	Bool	%I0.1
Acquisition Status Module	2	AcquisitionStatusModule	Bool	%I0.2
Result Control Module	3	ResultControlModule	Bool	%I0.3
Result Status Module	4	ResultStatusModule	Bool	%I0.4
Soft Event Control Module	5	SoftEventControlModule	Bool	%I0.5
Soft Event Status Module	6	SoftEventStatusModule	Bool	%I0.6
User Data Module	7	UserDataModule	Bool	%I0.7
Results Data Module	8	ResultsDataModule	Bool	%I0.8

DO NOT MAKE ANY CHANGES RIGHT OF THIS COLUMN

8. Return to the Siemens TIA Portal.

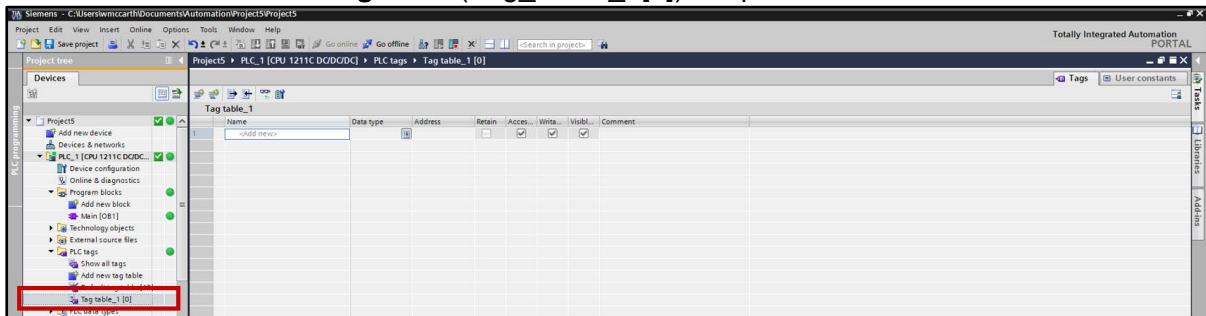
9. Expand the PLC tags setting and double-click Add new tag table.

Siemens - C:\Users\wmccarth\Documents\Automation\Project5\Project5

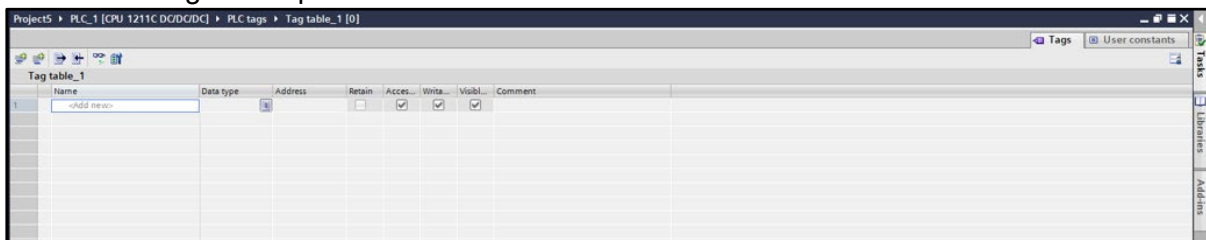
Project tree

- Project5
 - Devices & networks
 - PLC_1 [CPU 1211C DCDC]
 - PLC tags
 - Add new tag table

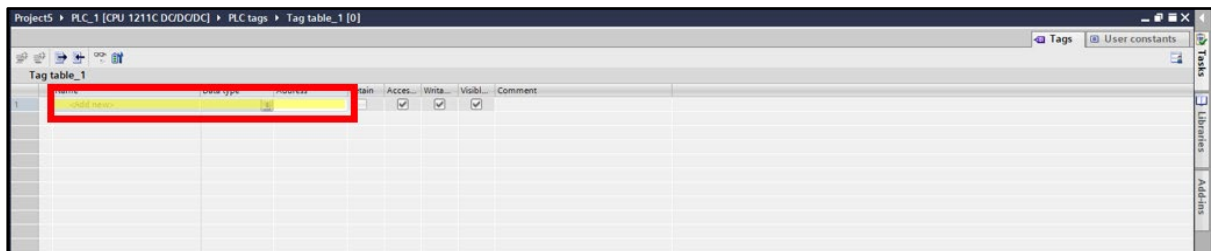
10. Double-click the **new Tag table** (Tag_Table_1[0]) to open.



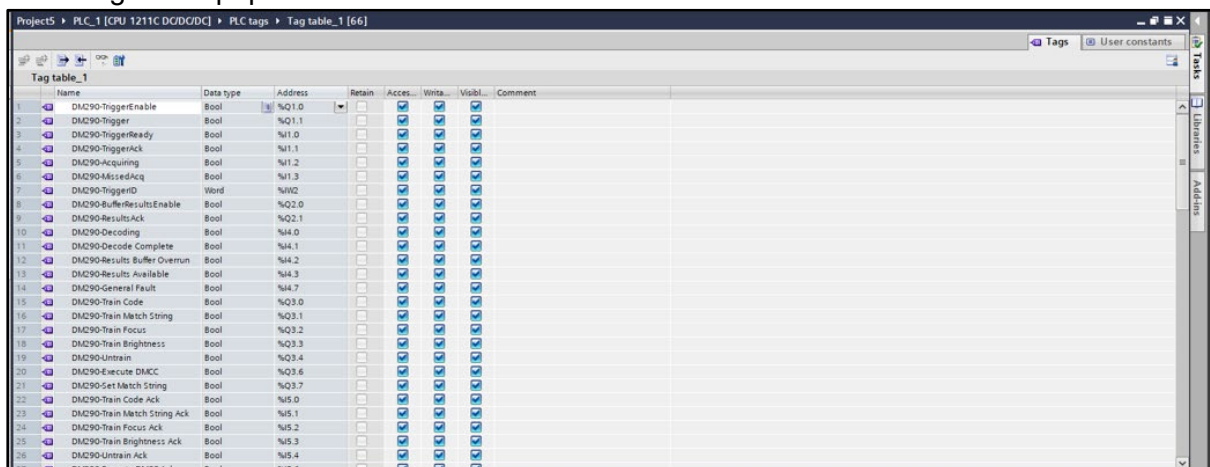
The new tag table opens.



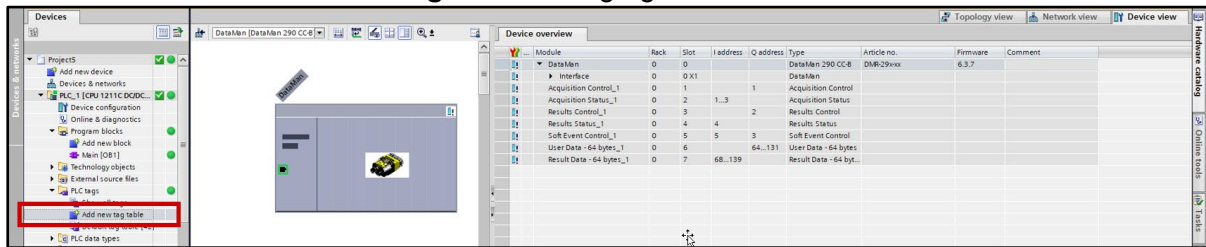
11. Select the first three cells in the table.



12. Right-click and select **Paste**.
The Tag Table populates the information.

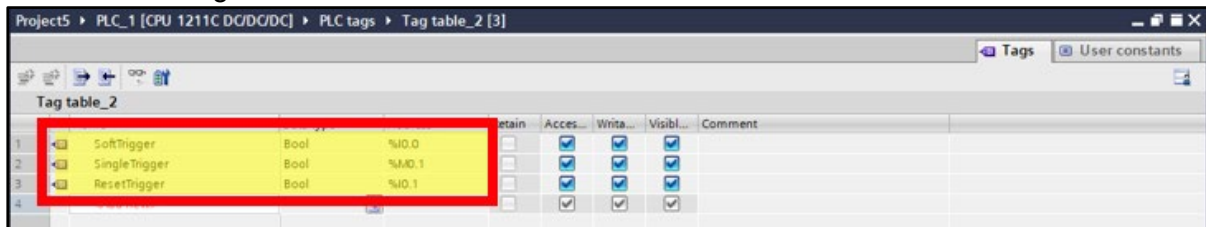


13. Double-click the **Add new tag table** setting again.

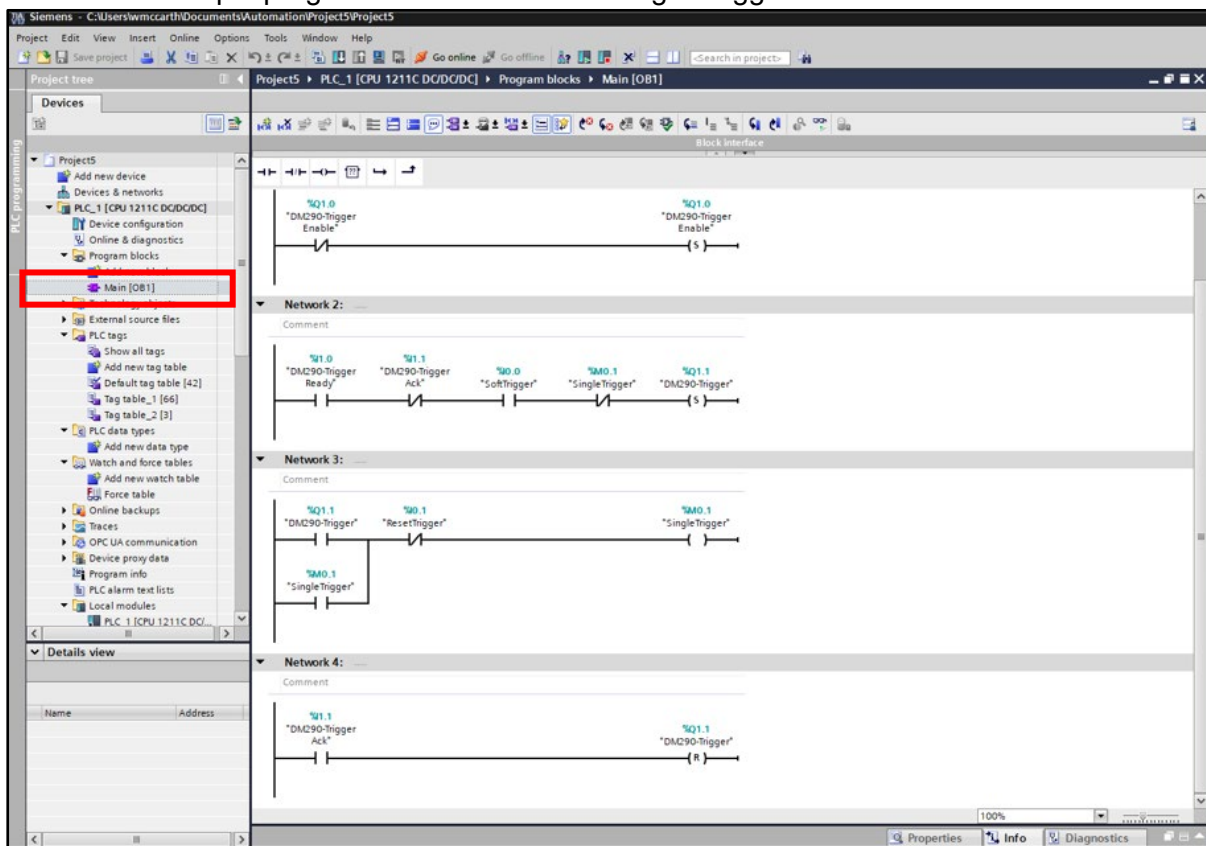


A blank table displays.

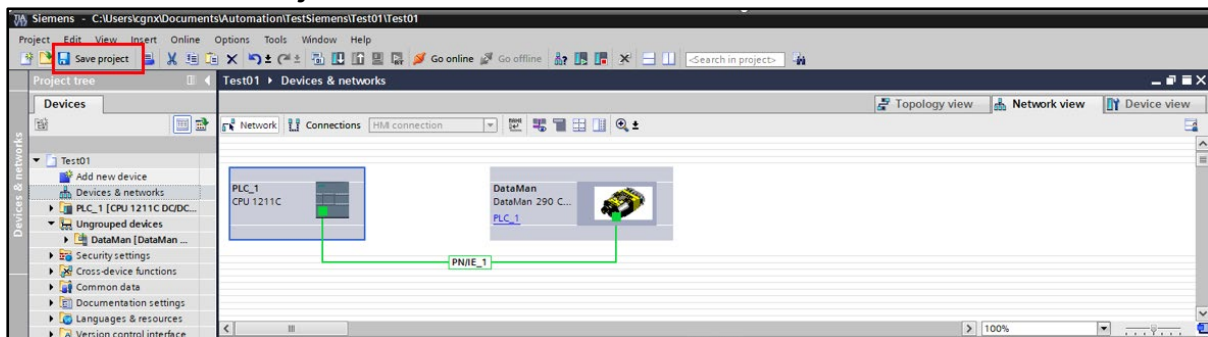
14. Add three tags as shown below.



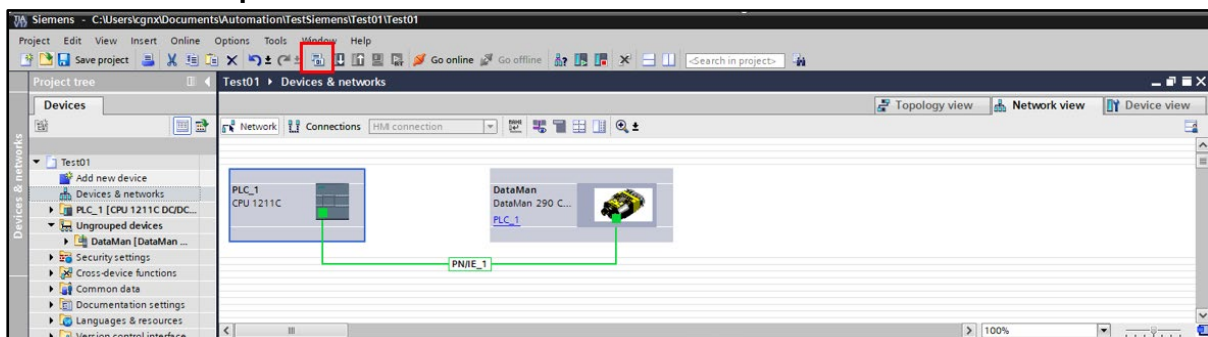
15. Double-click on the **Main [OBJ1]** setting and add logic as shown below .
This is a simple program to demonstrate a Single Trigger.



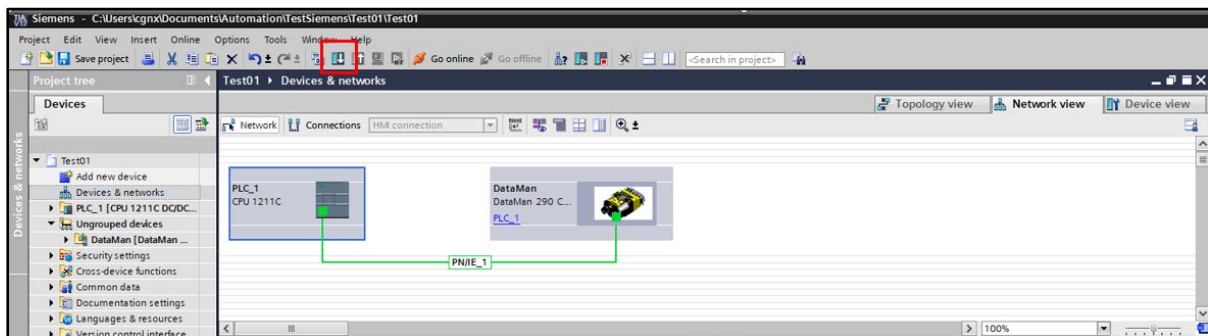
16. Click the **Save Project** button.



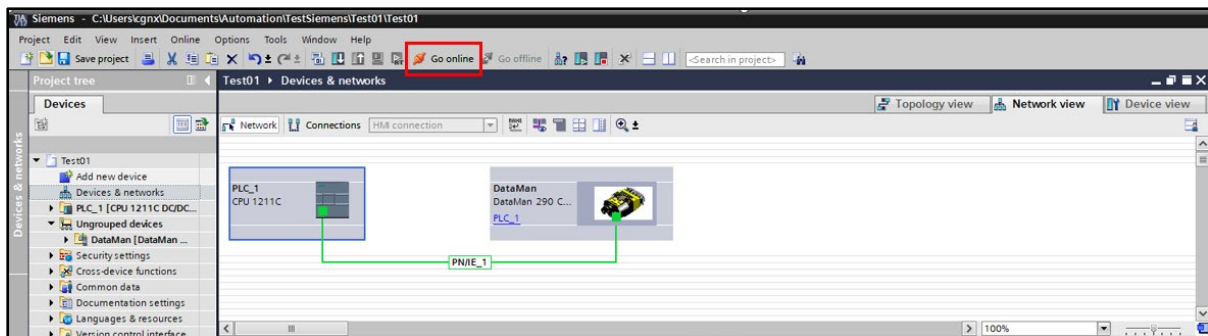
17. Click the **Compile** button.



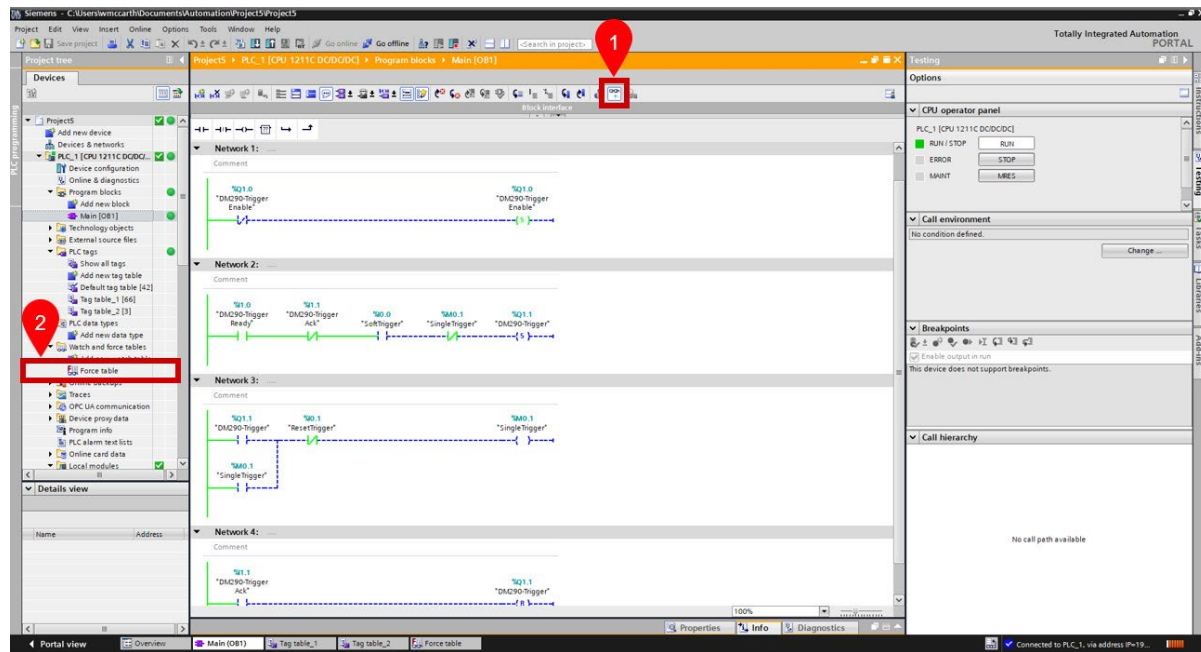
18. Click the **Download** button.



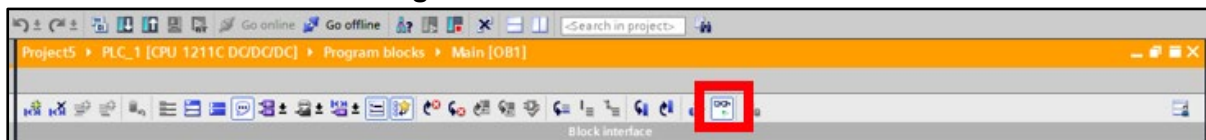
19. Click the **Go Online** button.



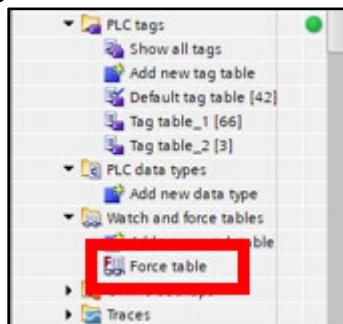
Sample Code



1. Click the **Enable Monitoring** button.



2. Open the **Force table** setting.



3. Add two tags as shown below.

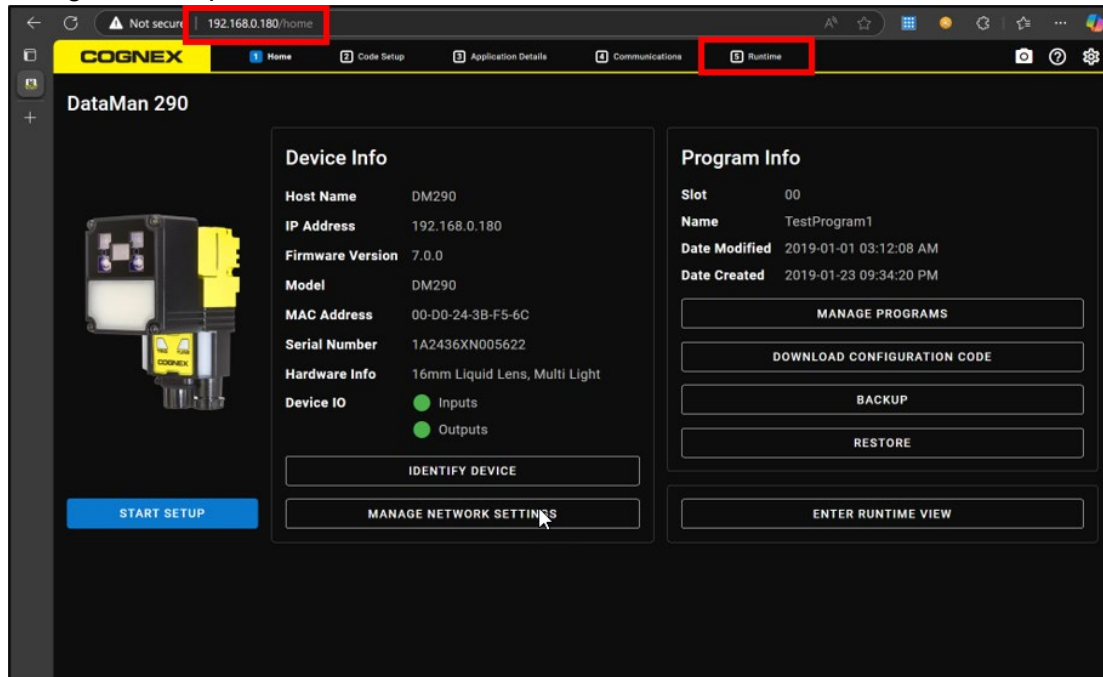


NOTE: It is recommended that the Force table is set to Floating as we will want to see the logic while forcing values.

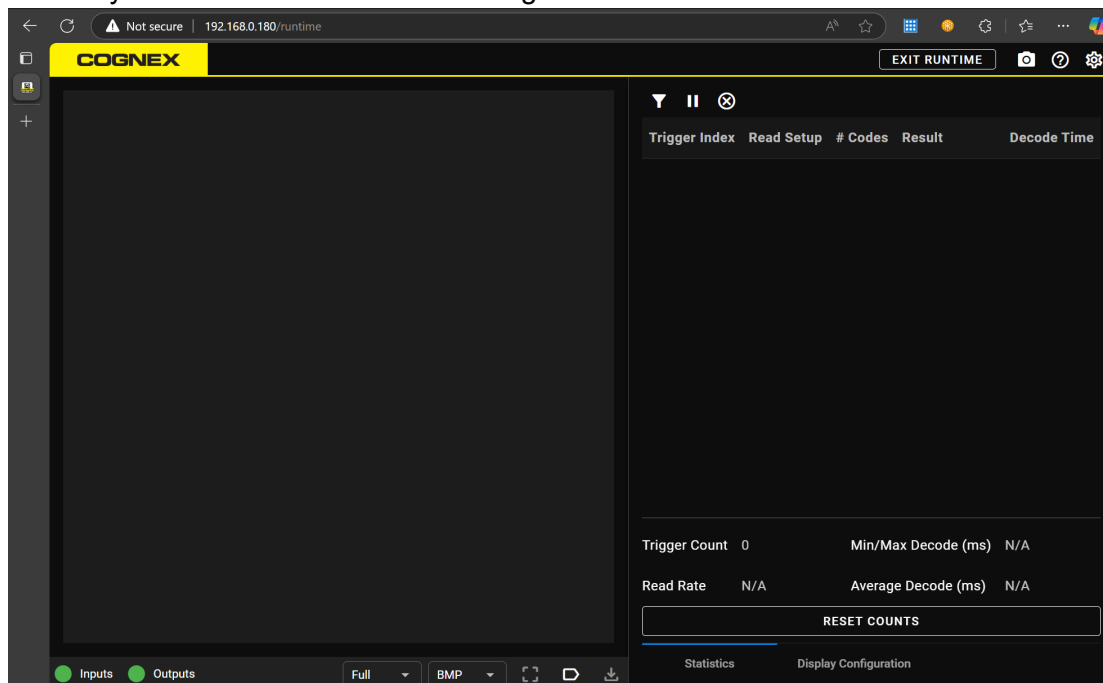
	Name	Address	Display format	Monitor value	Force value		Comment
1	*SoftTrigger":P	%I0.0:P	Bool		TRUE	☒	
2	*ResetTrigger":P	%I0.1:P	Bool		TRUE	☒	
3		<Add new>				☐	

Trigger Camera Verification

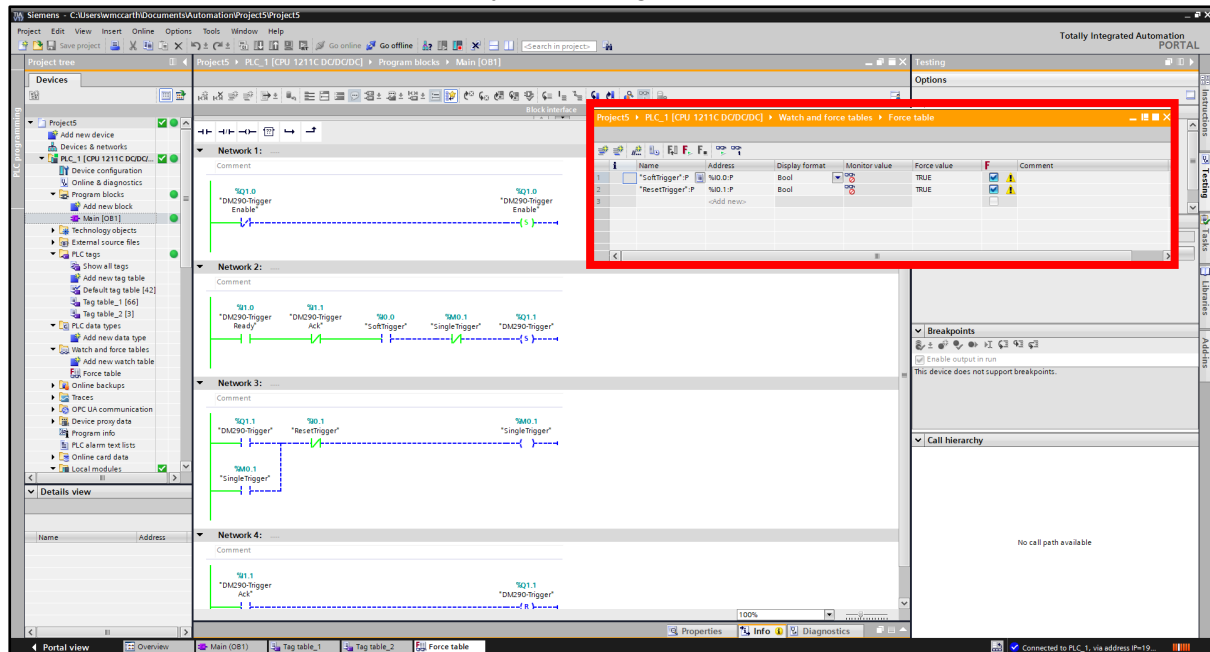
1. Return to the Cognex DataMan WebUI. Open a Web Browser and enter the IP Address of your DataMan 290.
2. Navigate to Step 5 Runtime.



3. Ensure your Runtime looks like this image.

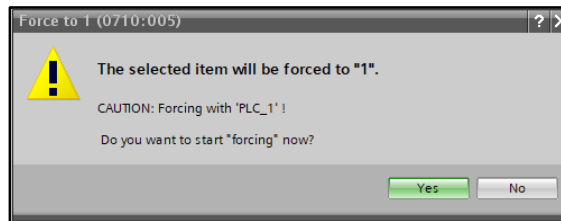


4. In the Siemens TIA Portal, select your floating **Force table** window.



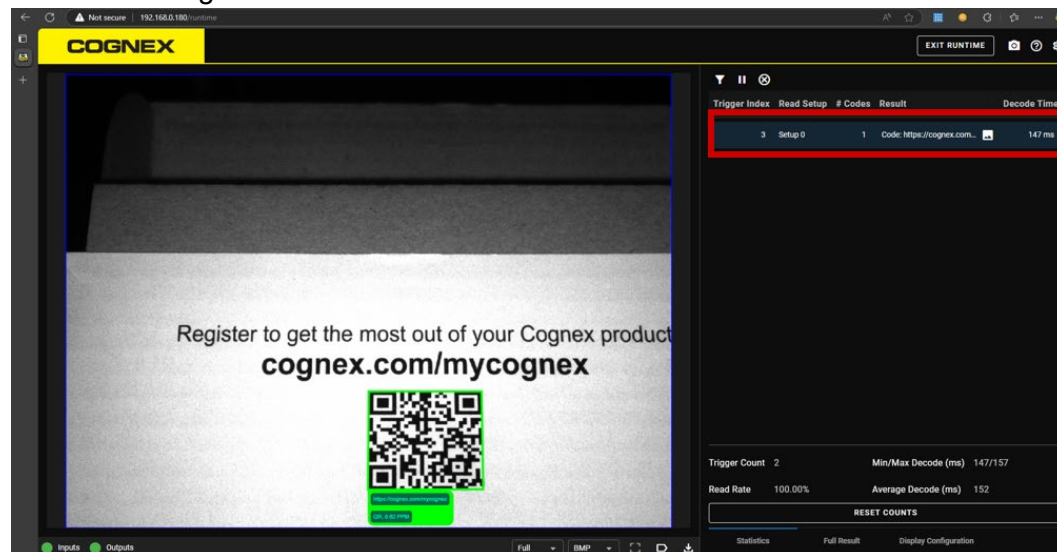
5. Right-click on the **SoftTrigger** Tag and select Force to 1.

6. Click the **Yes** button to allow **The selected item will be forced to "1"** prompt.



7. Return to the Cognex WebUI.

Notice the image with the code read!

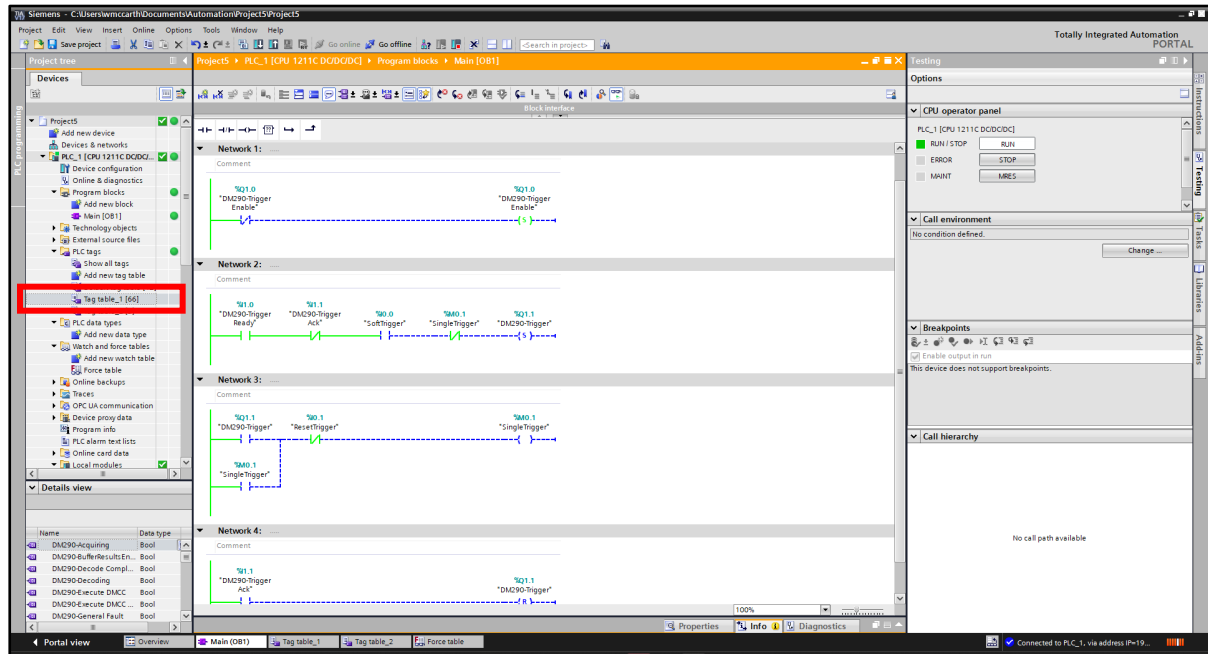


8. Navigate back to the Siemens TIA Portal,
9. Navigate to the floating Force table, right-click on the **SoftTrigger** tag and select **Force-Stop Forcing** – notice the Single Trigger Tag is still *latched* in the logic.
10. Navigate to the floating Force table, right-click on the **ResetTrigger** tag and select **Force-Force to 1** – notice the SingleTrigger tag is now *unlatched*.
11. Navigate to the floating Force table, right-click on the ResetTrigger tag and select **Force-Stop Forcing**.
12. You may repeat this process for Single Trigger testing.

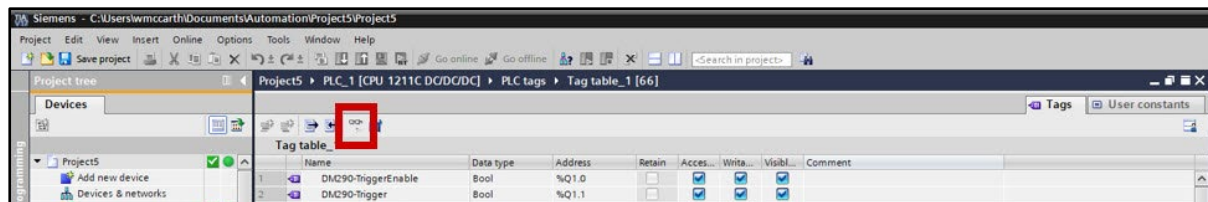
Sample Code

Inspection Results

1. Navigate to the **Siemens TIA Portal**.
2. Double-click on **Tag table_1**.



3. Click the **Monitor All** button.



4. Scroll down to the **InspectionResults** Byte Tags.

Tag table_1									
		Name	Data type	Address	Retain	Access...	Write...	Visibl...	Monitor value
43		DM290-UserData[12]	Byte	%QB80		☒	☒	☒	16#00
44		DM290-UserData[13]	Byte	%QB81		☒	☒	☒	16#00
45		DM290-UserData[14]	Byte	%QB82		☒	☒	☒	16#00
46		DM290-UserData[15]	Byte	%QB83		☒	☒	☒	16#00
47		DM290-ResultID	Word	%IW68		☒	☒	☒	16#381C
48		DM290-Result Code	Word	%IW70		☒	☒	☒	16#0001
49		DM290-Result Extended	Word	%IW72		☒	☒	☒	16#0000
50		DM290-Result Length	Word	%IW74		☒	☒	☒	16#001B
51		DM290-InspectionResults[0]	Byte	%IB76		☒	☒	☒	16#68
52		DM290-InspectionResults[1]	Byte	%IB77		☒	☒	☒	16#74
53		DM290-InspectionResults[2]	Byte	%IB78		☒	☒	☒	16#74
54		DM290-InspectionResults[3]	Byte	%IB79		☒	☒	☒	16#7D
55		DM290-InspectionResults[4]	Byte	%IB80		☒	☒	☒	16#73
56		DM290-InspectionResults[5]	Byte	%IB81		☒	☒	☒	16#3A
57		DM290-InspectionResults[6]	Byte	%IB82		☒	☒	☒	16#2F
58		DM290-InspectionResults[7]	Byte	%IB83		☒	☒	☒	16#2F
59		DM290-InspectionResults[8]	Byte	%IB84		☒	☒	☒	16#63
60		DM290-InspectionResults[9]	Byte	%IB85		☒	☒	☒	16#6F

5. From the Monitor Value tags you can view the Hex value stored in the byte of the Result.

Example:

- a. InspectionResults[0] value is 68, hex of this value is "h"
- b. InspectionResults[1] value is 74, hex of this value is "t"
- c. InspectionResults[2] value is 74, hex of this value is "t"
- d. InspectionResults[3] value is 70, hex of this value is "p"

As you can see from the result on the browser the read result is:

<https://cognex.com/mycognex>.

This is evidence that you have successfully triggered the DataMan 290, Read a Code, and Sent the Value to the PLC.

NOTE: *Now that the value is in the PLC it can be copied into other logic as needed.*

NOTE: *The Result Array is 16 bytes, this can be increased using the PROFINET Tag Generator spreadsheet.*