How to connect to a PLC in TIA Portal

This guide shows you how to connect to a PLC in TIA Portal from your PC over an Ethernet cable. You create a project, add and detect your Siemens PLC, and establish the connection. You then configure the PLC security settings, compile the project, download it to the PLC, and check the status indicators.

Prerequisites

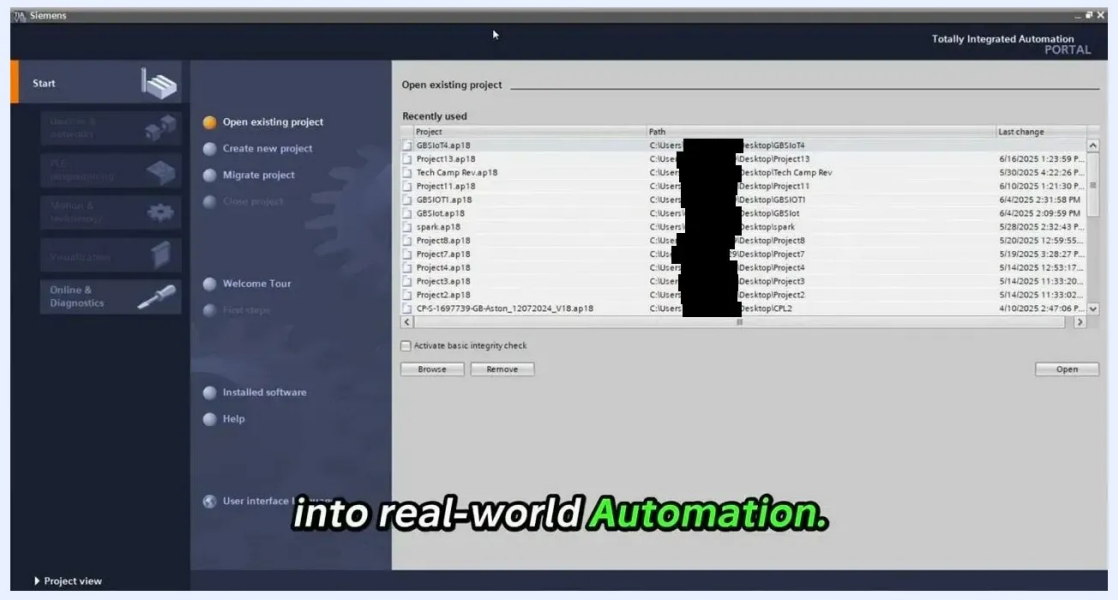
Before you start, make sure you have:

- A PC with Siemens TIA Portal installed
- A Siemens PLC
- An Ethernet cable to connect your PC to the PLC

Create a new project

1. Open TIA Portal

Launch the Siemens TIA Portal software on your PC. Wait for the start screen to load. It shows options such as **Open existing project** and **Create new project**, along with a list of recently used projects.

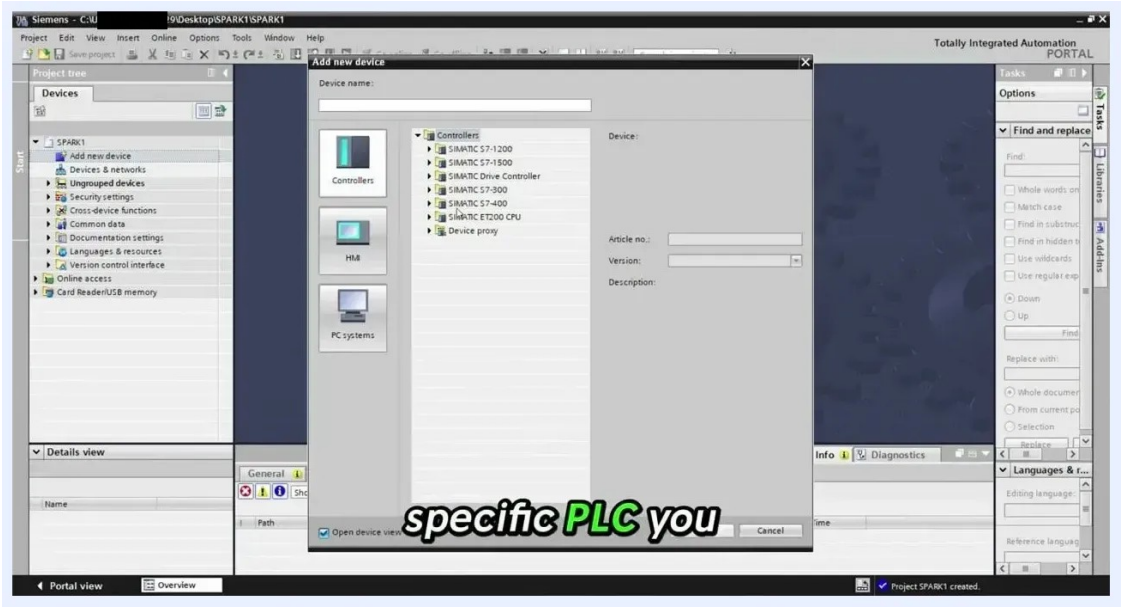


TIA Portal start screen with project options and a list of recently used projects

2. Create a new project

Click **Create new project** in the left sidebar. An input field for the project details appears at the top of the window.

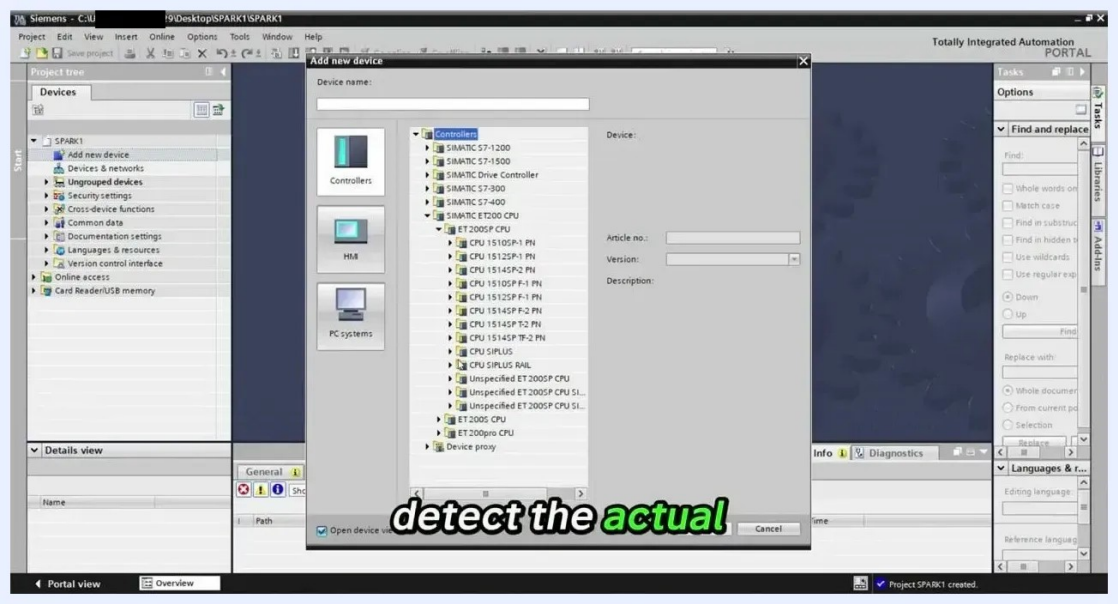
Enter a name for your project. For example, type Spark One. Then click **Create**.



The Create new project option selected, with the project name input field visible

3. Open the project view

If prompted after the project is created, click **Open the project view**. The main TIA Portal interface appears, with the project tree on the left side.



TIA Portal main interface with the project tree and the option to add a new device

Add and detect your PLC

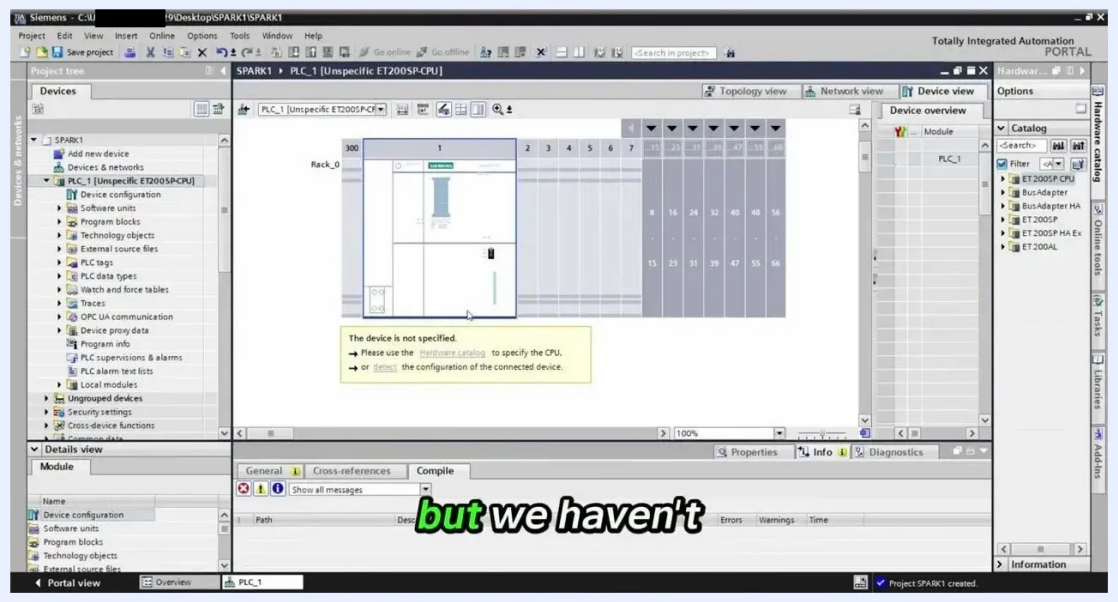
4. Add a new device

In the project tree, right-click your project name (for example, SPARK1) and select **Add new device**. The **Add new device** dialog opens and shows device categories such as Controllers, HMI, and PC systems.

5. Select the PLC model

Under **Controllers**, expand the list and select the specific PLC you are using. In this example, expand **SIMATIC ET200 CPU**.

If you are unsure of the exact model, select **Unspecified ET 200SP CPU**. This lets TIA Portal detect the actual PLC automatically.



Add new device dialog with Controllers expanded and the SIMATIC ET200 CPU options visible

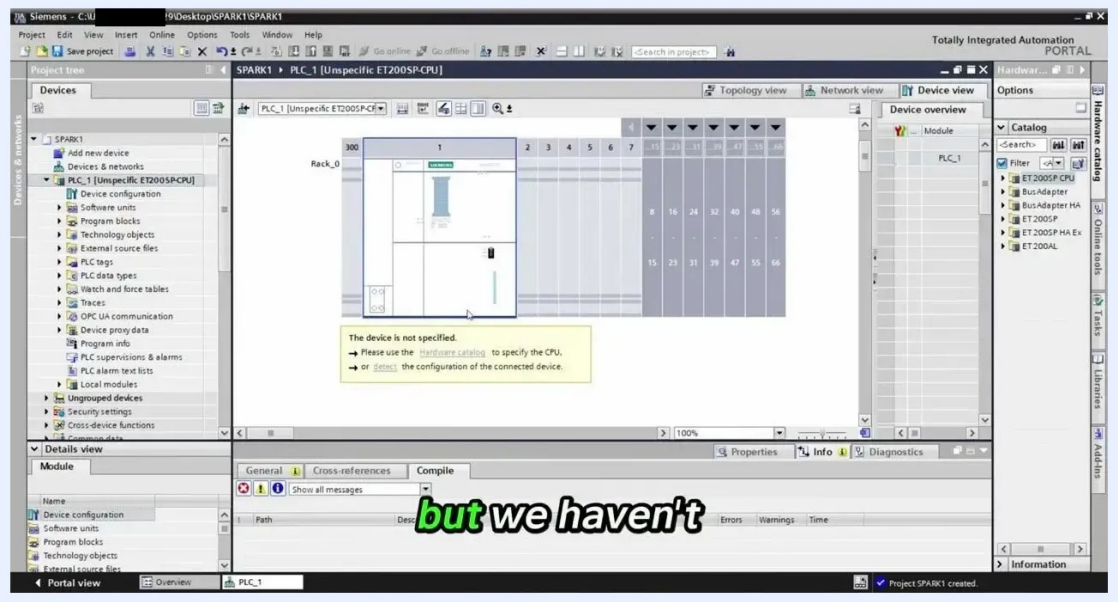
6. Connect the Ethernet cable

Physically connect your PC to the PLC using an Ethernet cable.

7. Start hardware detection

Click **OK** or **Add** to add the unspecified PLC to your project. The device configuration view opens and shows a warning that the device is not specified.

Click the **detect** link or button to start the hardware detection process.

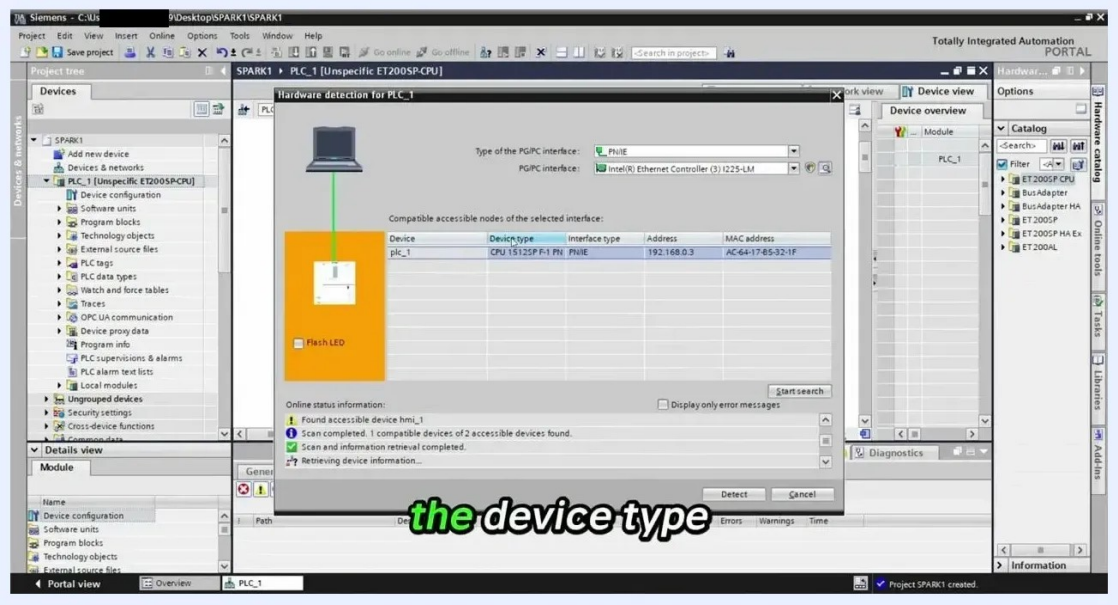


Device configuration view with the unspecified device warning and the detect option highlighted

8. Search for the PLC

In the hardware detection dialog, select the appropriate PG/PC interface (for example, Intel(R) Ethernet Controller). Click **Start search** to scan for connected devices.

When the scan completes, select your PLC from the list. In this example, the entry is Device: plc_1, Device type: CPU 15125P F-1 PN, Address: 192.168.0.3.

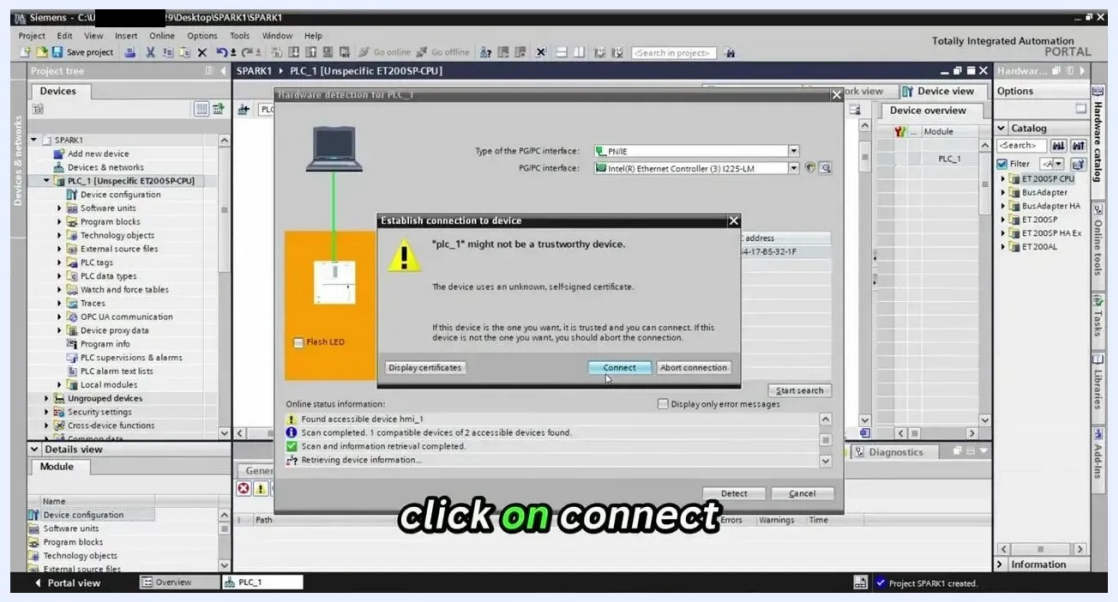


Hardware detection dialog showing the detected PLC device, device type, and address

9. Connect to the PLC

Click **Detect** to confirm the device selection. If a security warning appears (for example, "plc_1 might not be a trustworthy device"), review the certificate information if necessary. Then click **Connect**.

Wait a few seconds for the connection process to complete. The PLC is now connected and ready for further configuration or programming.



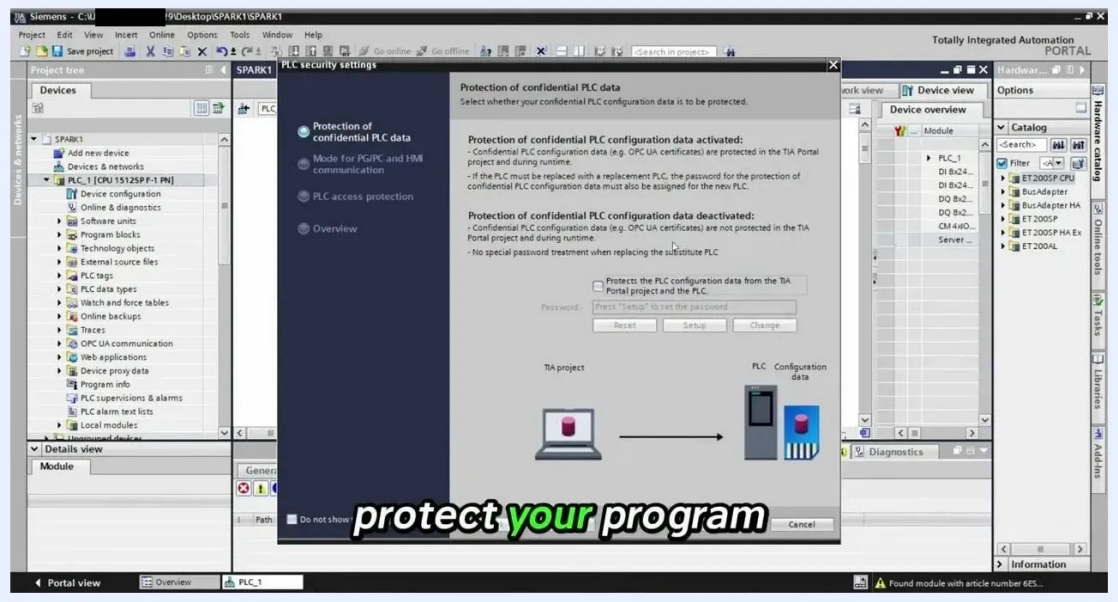
Connection warning dialog with the Connect button highlighted

Configure PLC security settings

10. Deactivate protection of confidential PLC data

In the **PLC security settings** dialog, select **Protection of confidential PLC data**. For learning purposes, make sure **Protection of confidential PLC configuration data deactivated** is selected.

Leave the password fields empty and do not set up a password. Click **Next**.



PLC security settings dialog with protection deactivated and the password fields empty

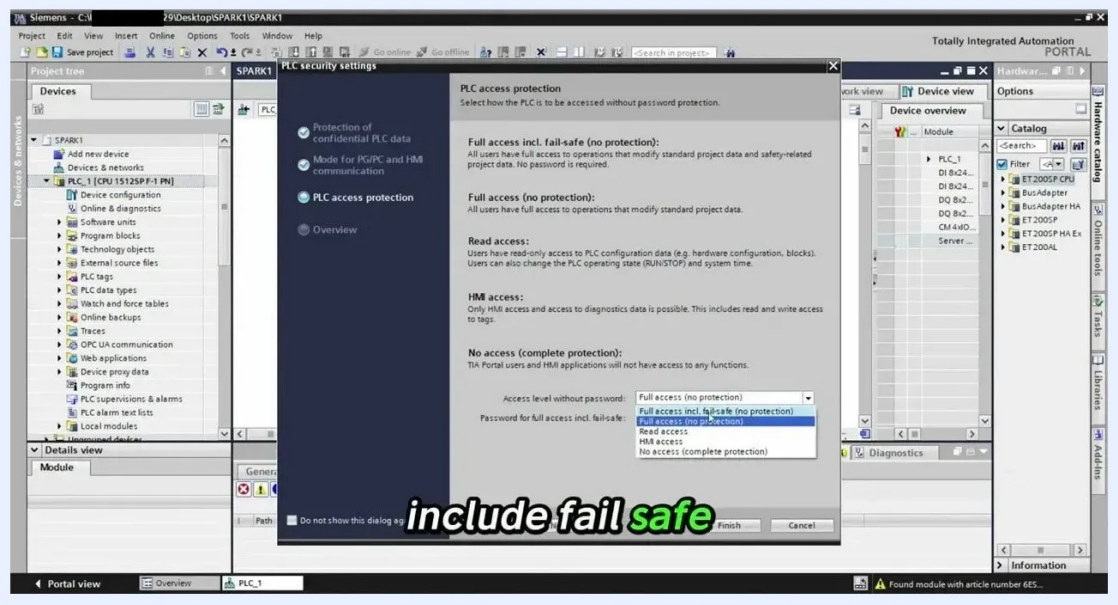
11. Remove secure internet HMI (if prompted)

If you are prompted about secure internet HMI, remove this option for learning purposes. Click **Next** to continue.

12. Set the access level without a password

In the **PLC access protection** section, open the **Access level without password** dropdown menu. Select **Full access incl. fail-safe (no protection)**.

This setting gives all users full access to operations, including safety-related project data, without password protection. Click **Finish** to apply the settings.



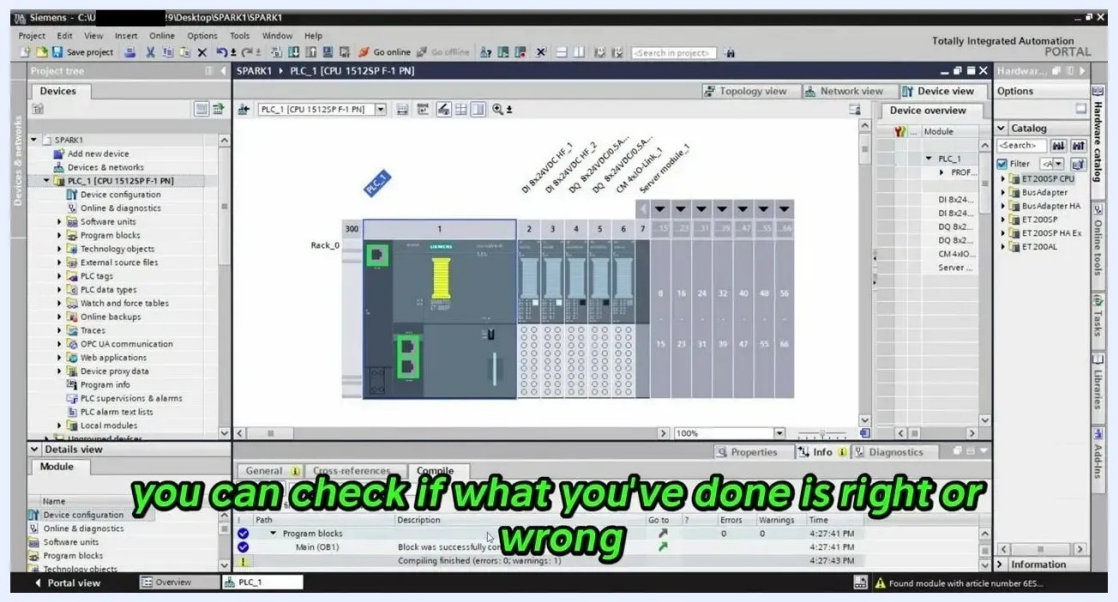
PLC access protection dialog with Full access incl. fail-safe (no protection) selected

Compile and download the project

13. Compile the project

After you finish the security configuration, compile your project to check for errors or warnings. In the main TIA Portal interface, review the results in the **Compile** tab at the bottom.

Make sure the message reads "Compiling finished (errors: 0; warnings: 1)" or similar. A single warning is generally not critical for learning purposes.

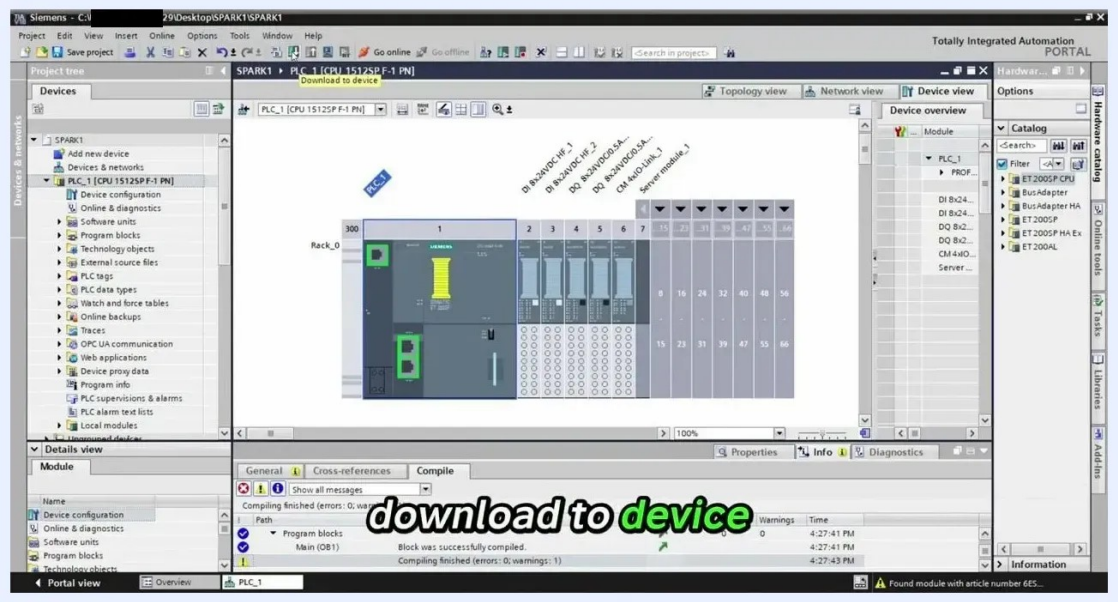


TIA Portal compile results showing 0 errors and 1 warning

14. Start the download to the PLC

Click the **Download to device** button (the downward arrow icon) in the toolbar to start downloading your compiled project to the PLC. Wait a few seconds for the process to start.

If prompted, search for the PLC device again using the same procedure as in step 8.



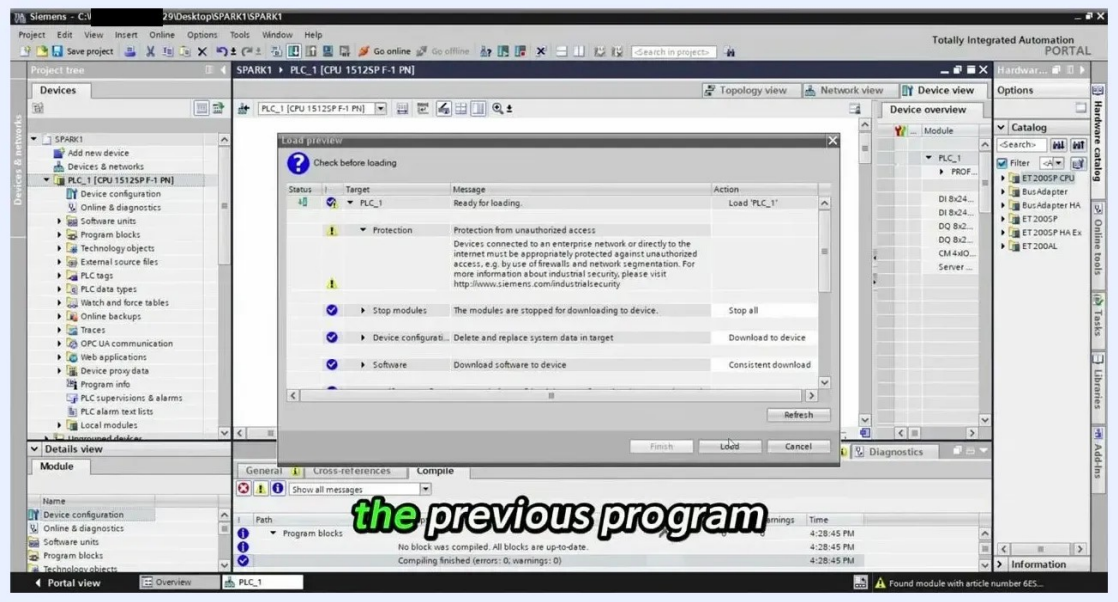
The Download to device button highlighted in the TIA Portal toolbar

15. Check the load preview

In the **Load preview** dialog, review the checklist before you load:

- Make sure the target PLC is correct (for example, PLC_1).
- Review any protection or warning messages.
- Confirm actions such as **Stop modules**, **Delete and replace system data in target**, and **Download software to device**.

Click **Load** to download the project to the PLC.

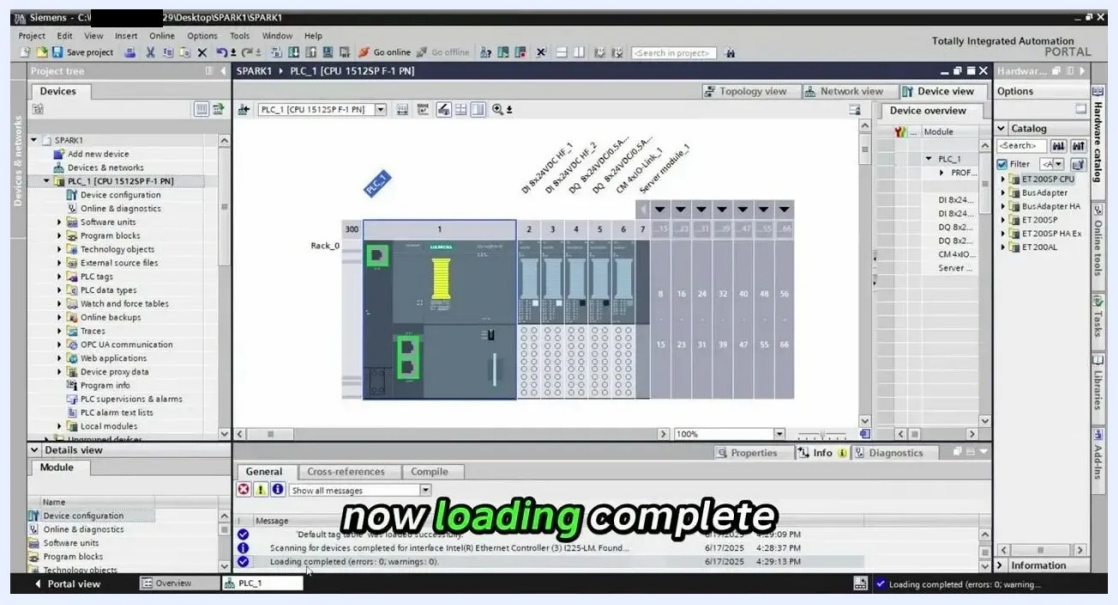


Load preview dialog with the checklist and the Load button

16. Wait for loading to complete

Wait for the loading process to finish. The new project overwrites any previous program on the PLC.

Check the status in the **Messages** or **Info** tab at the bottom of the screen. A message such as "Loading completed (errors: 0; warnings: 0/1)" indicates a successful download.



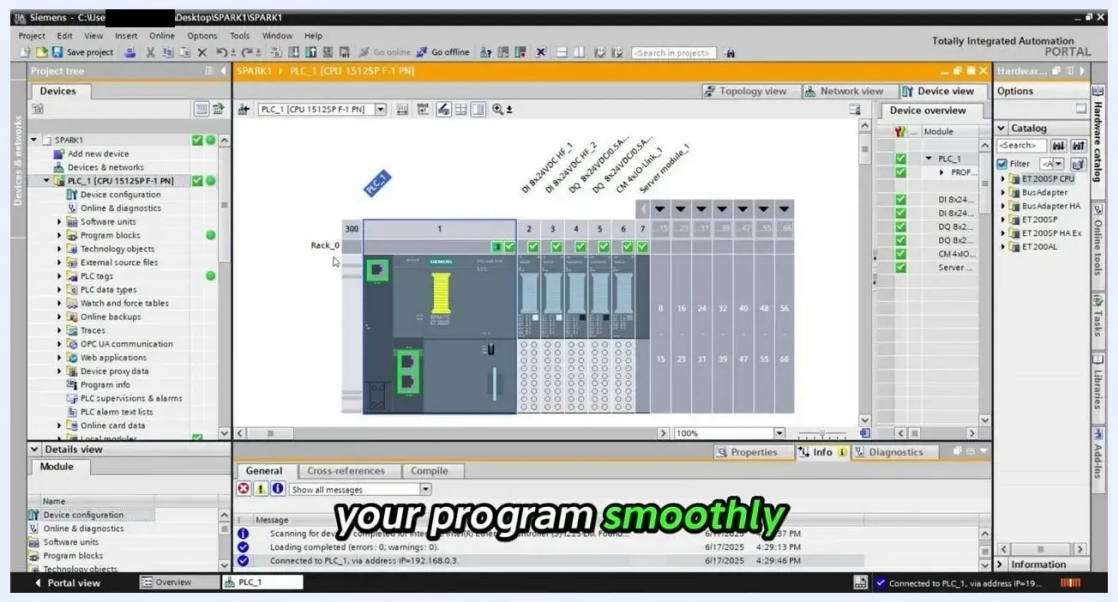
Loading completed message in TIA Portal with 0 errors and 1 warning

Verify the connection status

17. Check the project tree status indicators

Look at the project tree on the left side of the TIA Portal interface. Make sure all modules and devices display a green checkmark icon.

Green checkmarks indicate that your program is correct and all components are functioning as expected.

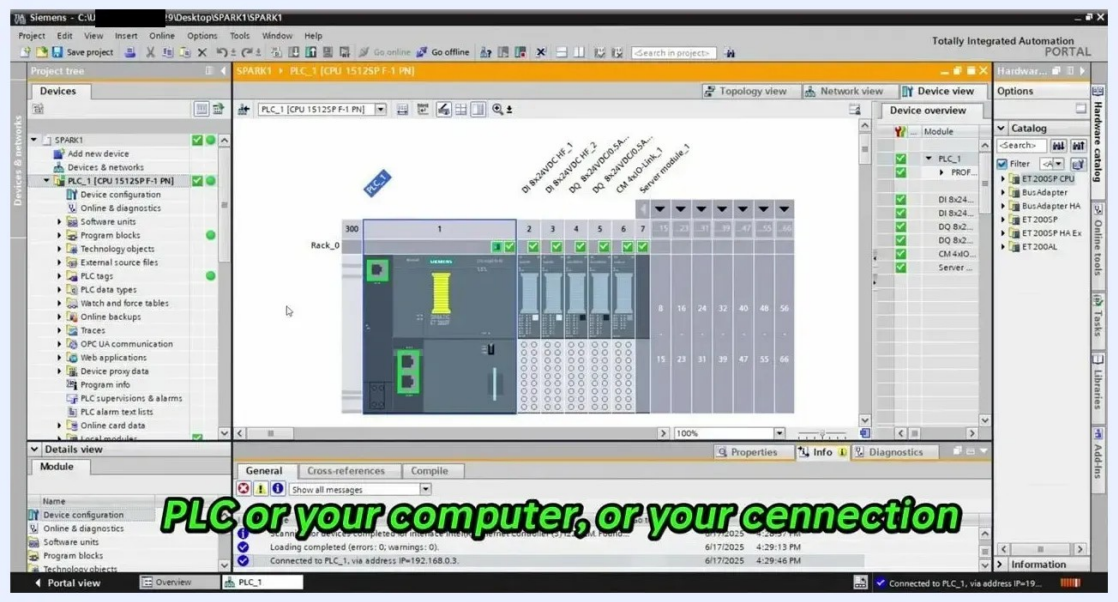


TIA Portal project tree with all modules showing green checkmarks, indicating a correct configuration with no errors

18. Interpret status colors

A color other than green, such as yellow or amber, on the project tree or device overview signals a problem. These indicators may point to issues with your PLC, your computer, or the connection between them.

To investigate, review the warnings or errors in the **Details view** or the **Messages** tab at the bottom of the screen.



TIA Portal device overview and project tree, showing why green status indicators matter

Summary

You now know how to connect to a PLC in TIA Portal. You created a project, added and detected a Siemens PLC over Ethernet, and connected to it. You then configured the security settings for learning purposes, compiled the project, and downloaded it to the PLC. Finally, you confirmed the result with the green status indicators in the project tree.