How to add a library in TIA Portal: create, save, and import a function block library

This guide shows you how to add a library in TIA Portal by turning an existing function block into a reusable global library. You first create the library and store a master copy of the block in it. Then you open the library in a new project and insert the block. This lets you reuse the block in other projects without dragging and dropping between open projects.

The example uses a valve control function block, **Valve [FB1]**.

Prerequisites

Before you start, make sure you have the following:

- Siemens TIA Portal installed.
- A project that contains the function block you want to export. In this example, **Valve [FB1]** is under **Program blocks**.
- A project tree visible on the left, showing devices, program blocks, and function blocks.

Part 1: Create a global library from your function block

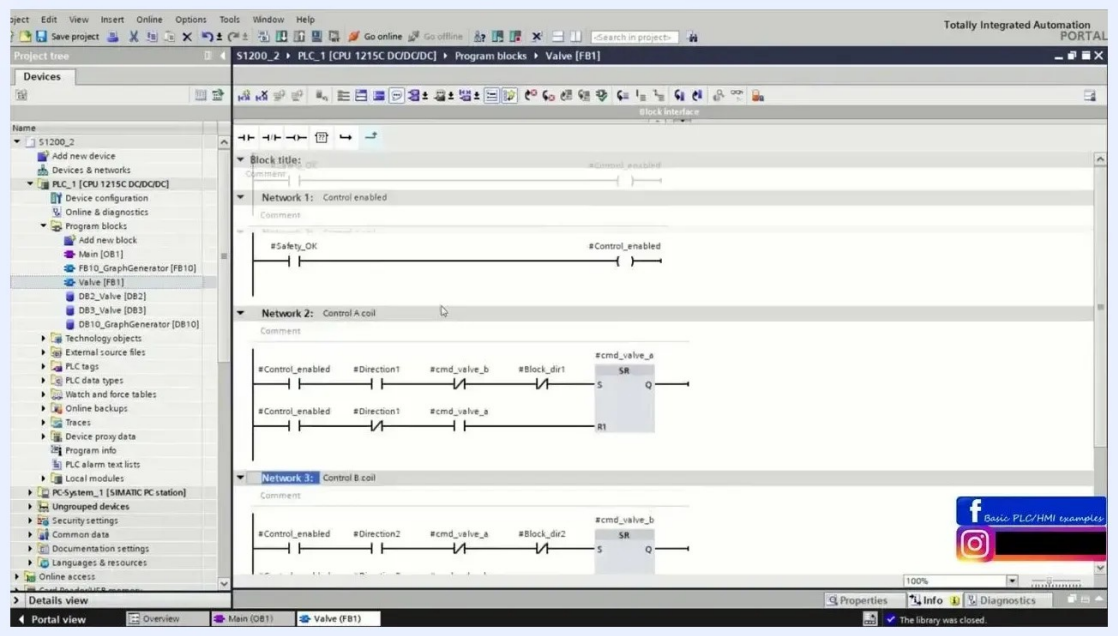
Step 1. Open the project that contains the function block

Launch Siemens TIA Portal and open the project with the function block you want to export. In the project tree, **Valve [FB1]** appears under **Program blocks**, along with **DB2_Valve**, **DB3_Valve**, and **FB10_GraphGenerator**. The main workspace shows the Valve block used in two networks.

Step 2. Review the function block

Open the function block and confirm it contains the logic you need. In this example, the block controls a B-stable pneumatic valve. Check that it has all the necessary inputs, outputs, and internal logic.

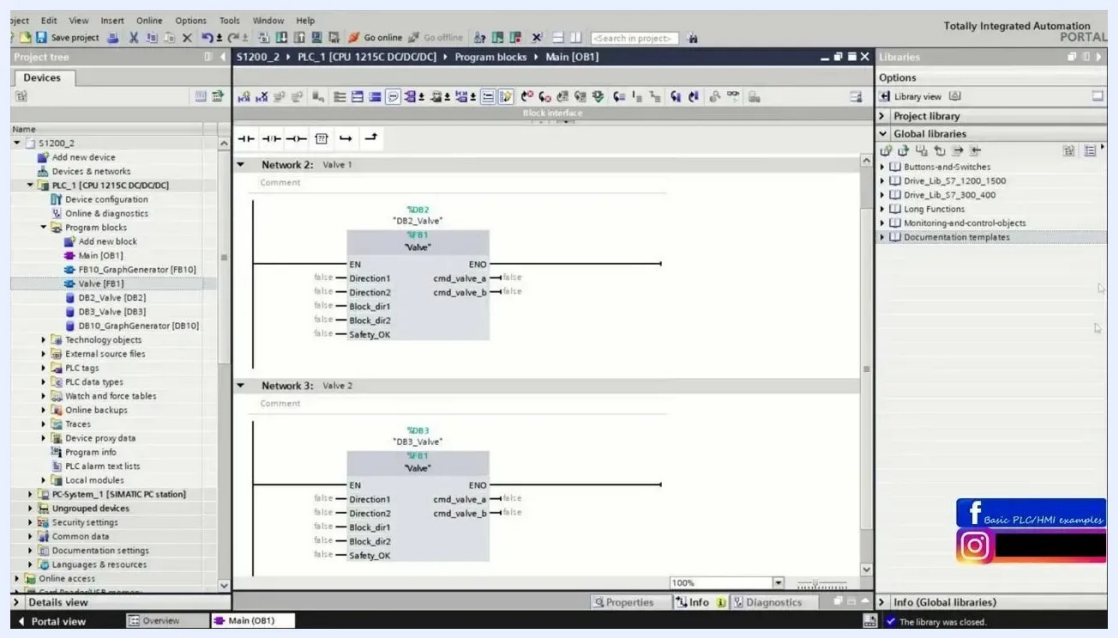
The ladder logic shows networks for control enabled, control A coil, and control B coil.



Ladder logic for the Valve function block, showing networks for control enabled, control A coil, and control B coil

Step 3. Open the Libraries pane

Go to the right side of the TIA Portal interface and locate the **Libraries** pane. Under **Global libraries**, you can see existing libraries and the options for creating a new one.



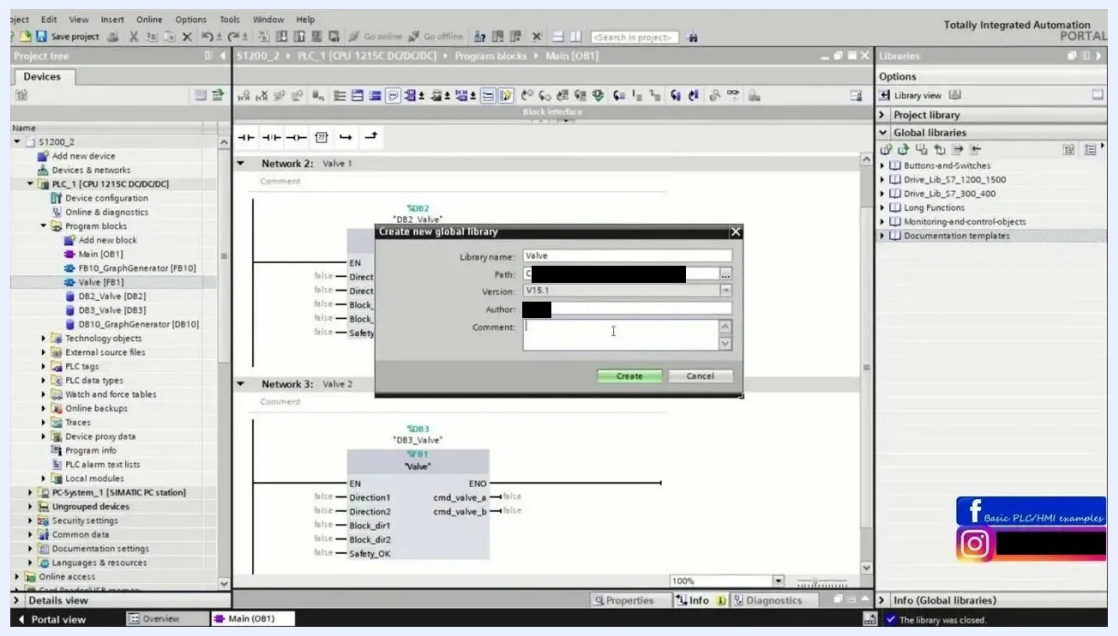
Libraries pane open on the right side of TIA Portal, showing Global libraries and library options

Step 4. Create a new global library

Right-click **Global libraries** in the **Libraries** pane and select **New library**. In the **Create new global library** dialog, enter the following details:

- **Library name:** Enter a descriptive name, for example Valve.
- **Path:** Choose or confirm the save location, for example C:\Users\jangri\Documents\Automation.
- **Version:** Confirm the version, for example V15.1.
- **Author:** Enter your name or initials, for example jangr.

- **Comment:** Optionally, add a description for the library or function block.

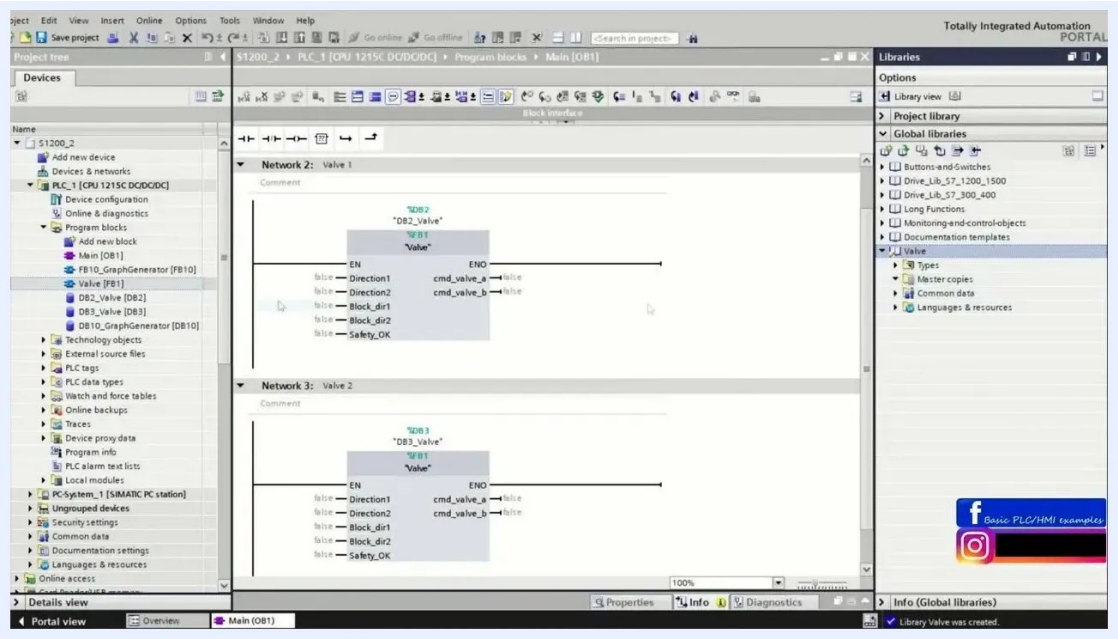


Create new global library dialog with fields for Library name, Path, Version, Author, and Comment, filled with the example values Valve, C:\Users\jangri\Documents\Automation, V15.1, and jangr

Click **Create**. The new global library appears under **Global libraries** in the **Libraries** pane.

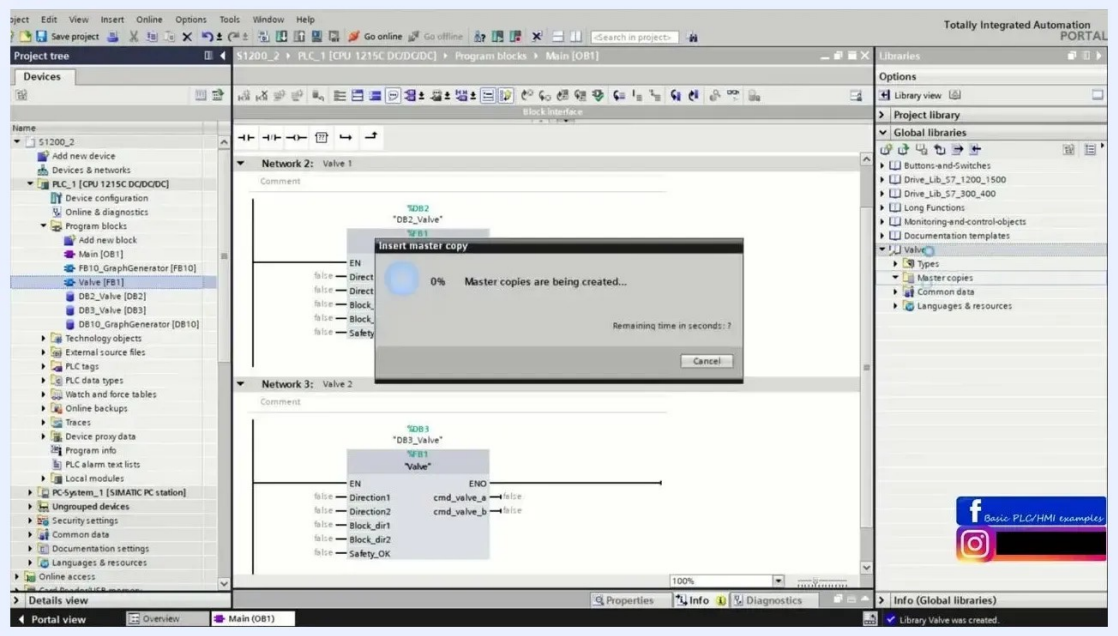
Step 5. Add the function block to the library's master copies

In the project tree, find **Valve [FB1]** under **Program blocks**. Drag it into the **Master copies** folder of your new global library (for example, **Valve**) in the **Libraries** pane. Confirm that the function block now appears under **Master copies**.



The Valve function block being dragged into the Master copies folder of the Valve global library, with the Libraries pane showing the expanded library

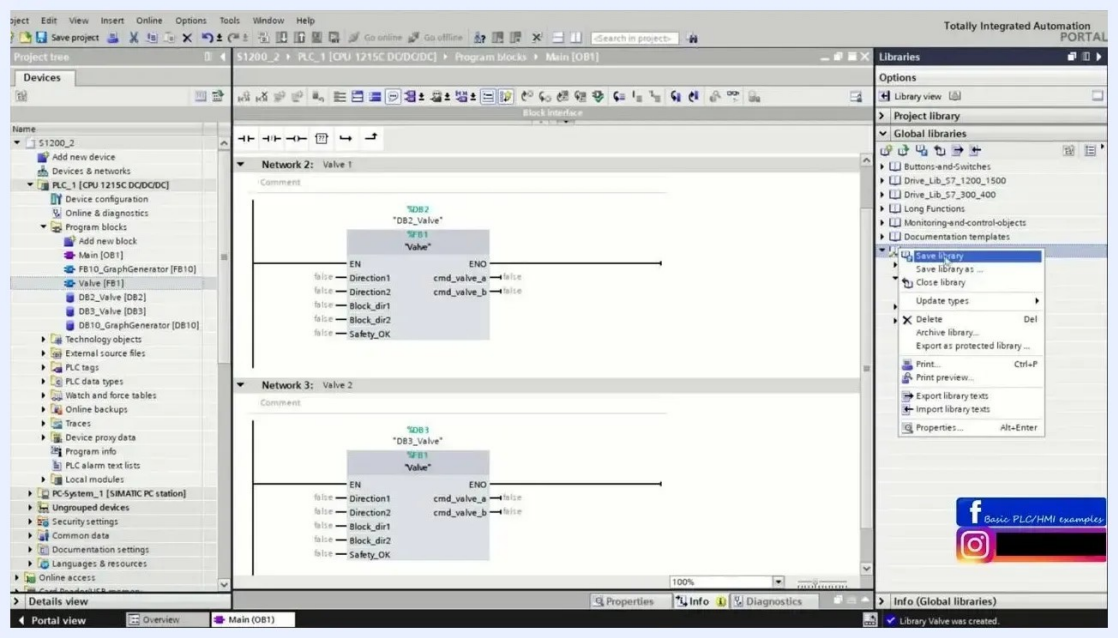
After you drop the block, the **Insert master copy** dialog appears. Wait while the system creates the master copies.



Insert master copy dialog showing "Master copies are being created..." at 0%

Step 6. Save the global library

In the **Libraries** pane, right-click the **Valve** library and select **Save library**. This stores the function block permanently in the library for future use.



Context menu open on the Valve library in the Libraries pane, with the Save library option highlighted

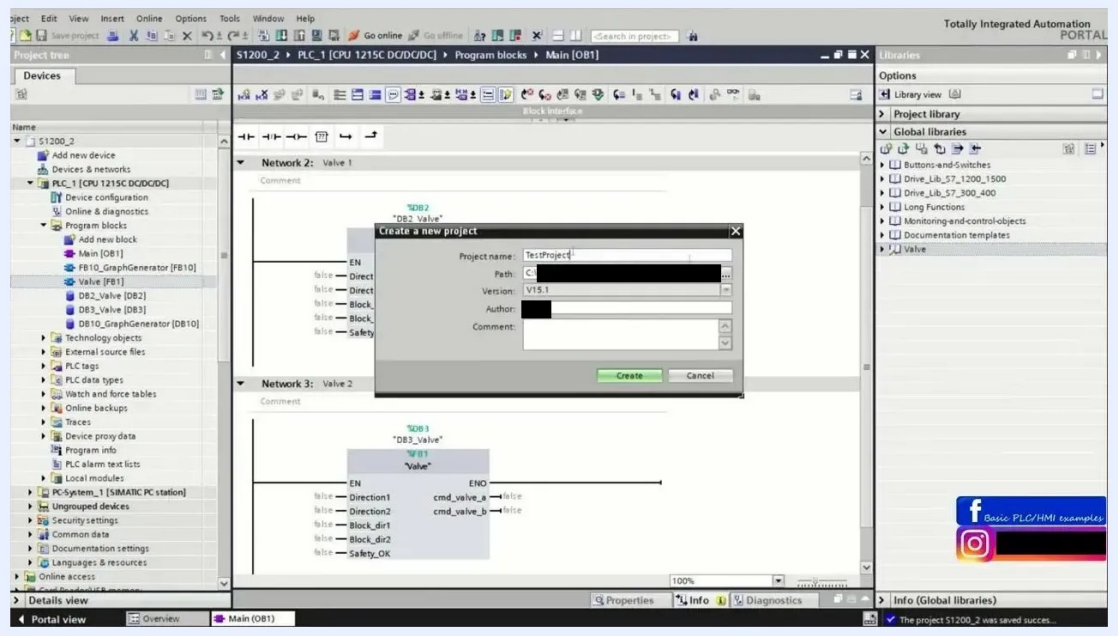
Part 2: Prepare a new project for import testing

Step 7. Create a new project

From the main menu, select the option to create a new project. In the **Create a new project** dialog, enter the following details:

- **Project name:** TestProject
- **Path:** C:\Users\jangri\Desktop\AUSYS\Temp_video\TestProject
- **Version:** V15.1
- **Author:** jangr
- **Comment:** Optional

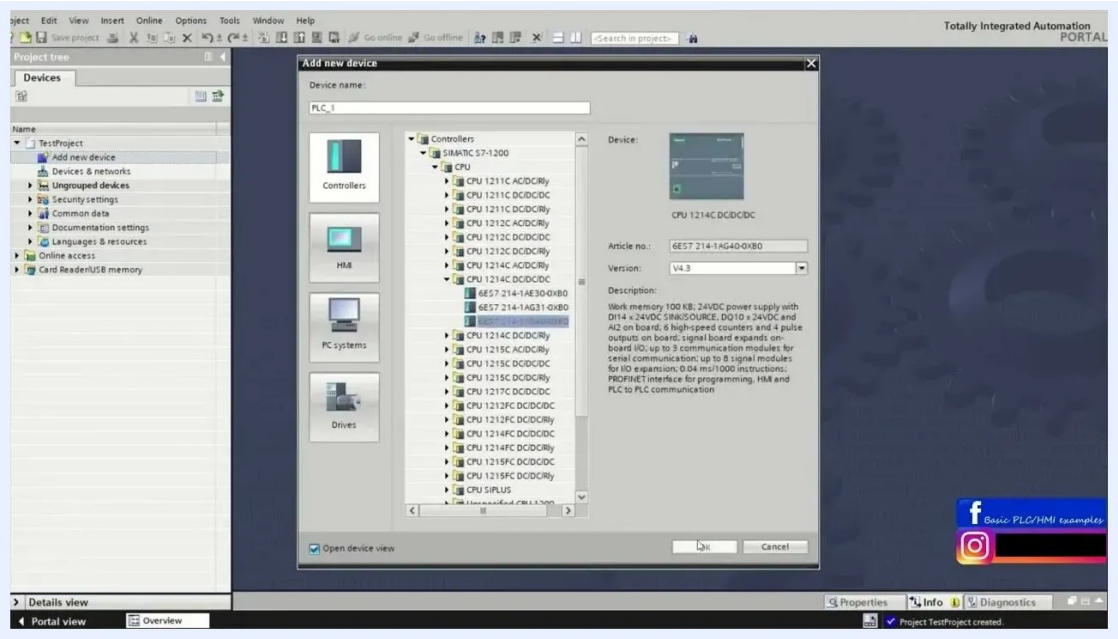
Click **Create** to generate the project.



Create a new project dialog with Project name TestProject, the example path, Version V15.1, and Author jangr

Step 8. Add a PLC to the project

In the project tree, double-click **Add new device** under **TestProject**. In the **Add new device** dialog, select **Controllers > SIMATIC S7-1200 > CPU > CPU 1214C DC/DC/DC**. Use article number 6ES7 214-1AG40-0XB0 and version V4.3. Click **OK** to add the PLC.



Add new device dialog with CPU 1214C DC/DC/DC selected and the device details displayed

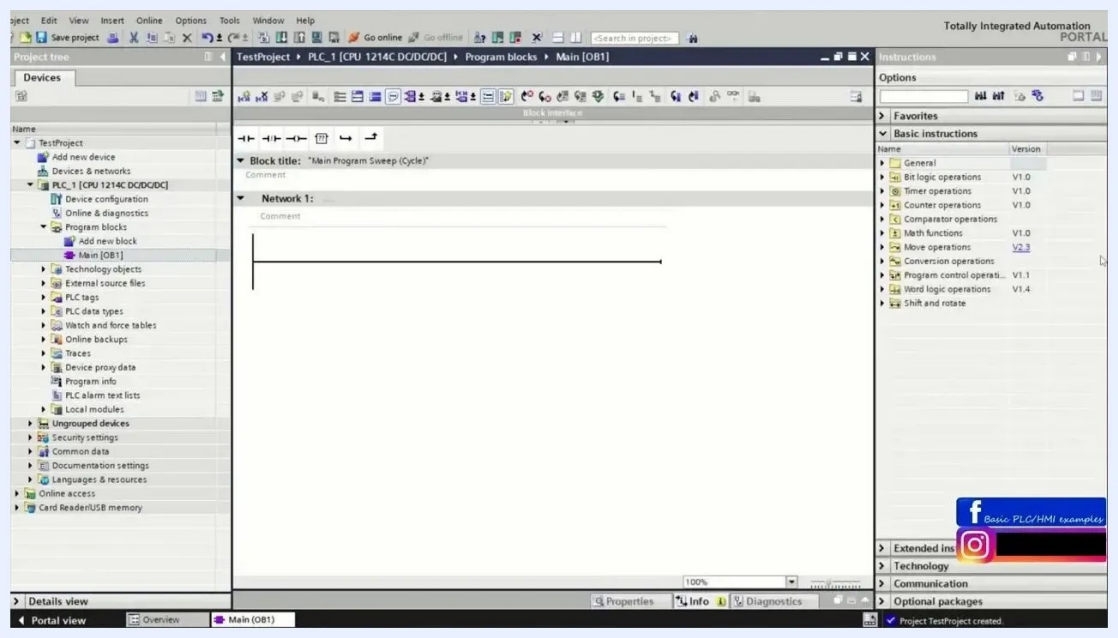
Step 9. Open the main organization block (OB1)

In the project tree, expand the new PLC device and go to **Program blocks**. Double-click **Main [OB1]** to open the main program sweep (cycle) block. The ladder logic editor opens, ready for you to insert logic or blocks.

Part 3: Add the library in TIA Portal and use the function block

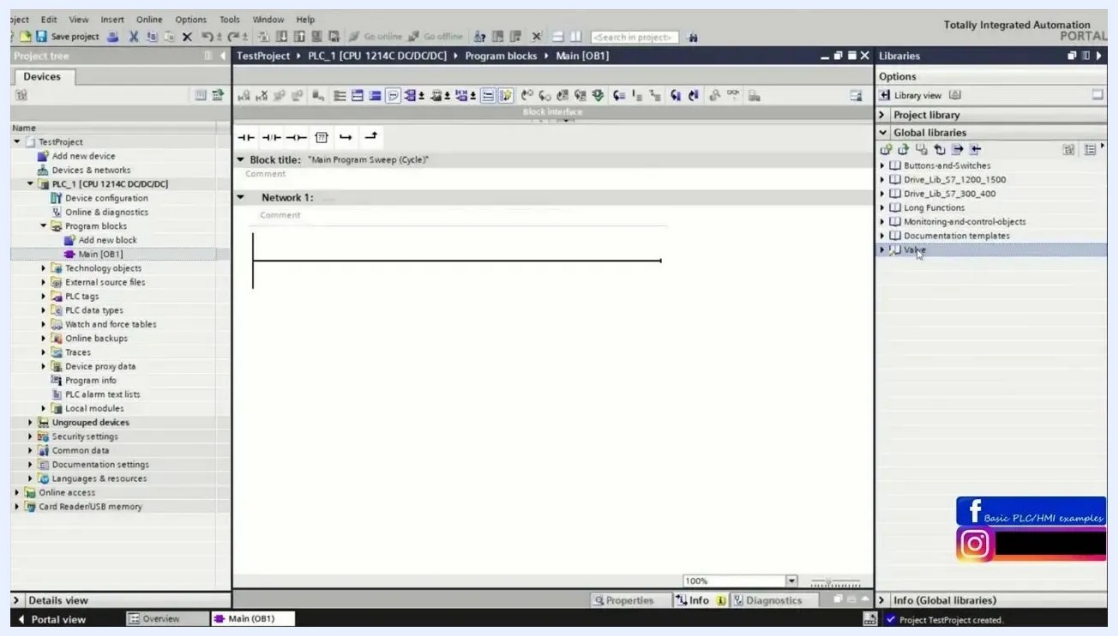
Step 10. Open the Libraries pane and choose Open library

In the main workspace, find the **Libraries** pane on the right and click **Libraries** to expand it. Under **Global libraries**, you may see previously imported libraries, such as **Valve**. Your desired library is typically not listed yet.



Workspace with the Libraries pane open, showing the Global libraries section and the Valve library highlighted, with the main program sweep block open in the center

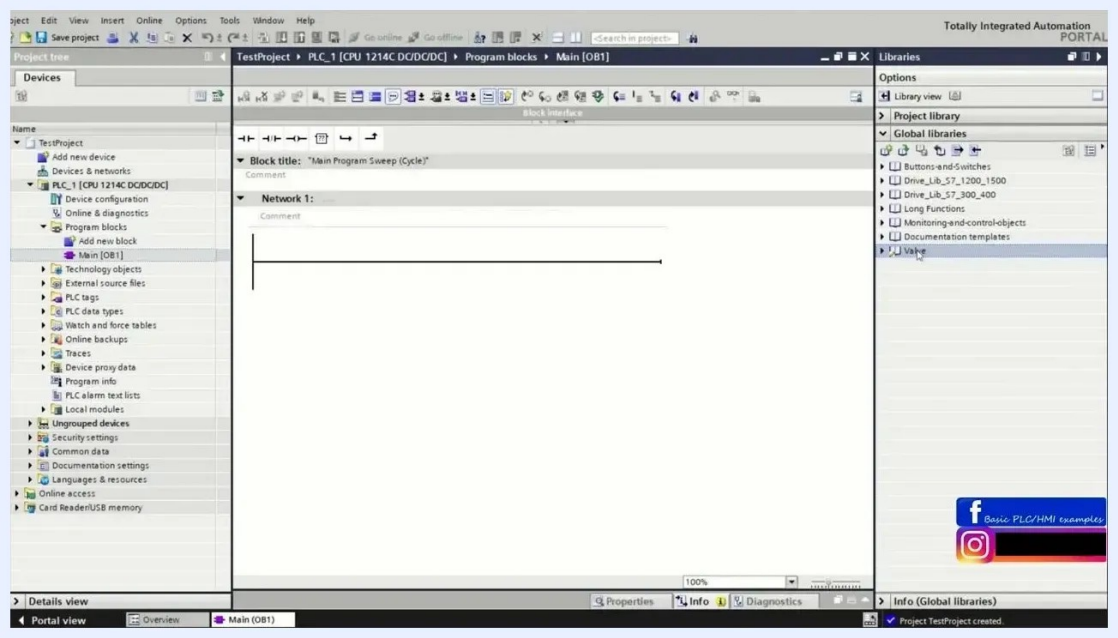
Right-click in the **Global libraries** section and select **Open library**. A file browser dialog appears so you can navigate to your saved library.



Context menu in the Libraries pane showing options such as Save library as..., Close library, and Open library

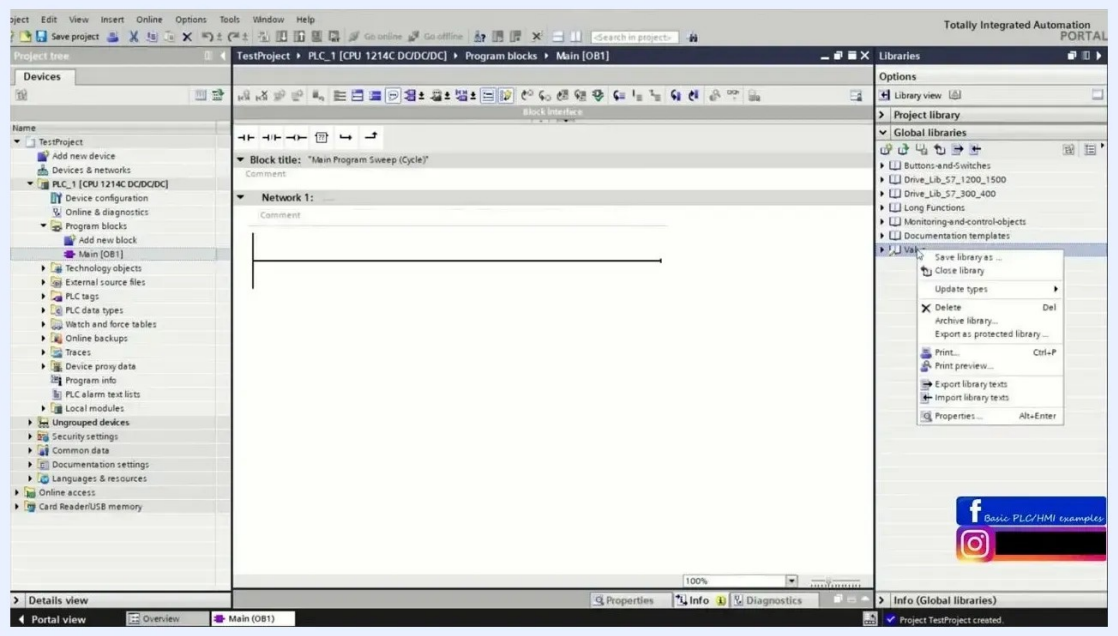
Step 11. Select the library file to add a library in TIA Portal

In the file browser, go to the folder where your global library is stored. In this example, open the **Automation** directory and select the **Valve** folder.



File browser open to the Automation directory with the Valve folder highlighted and the file type set to Global library

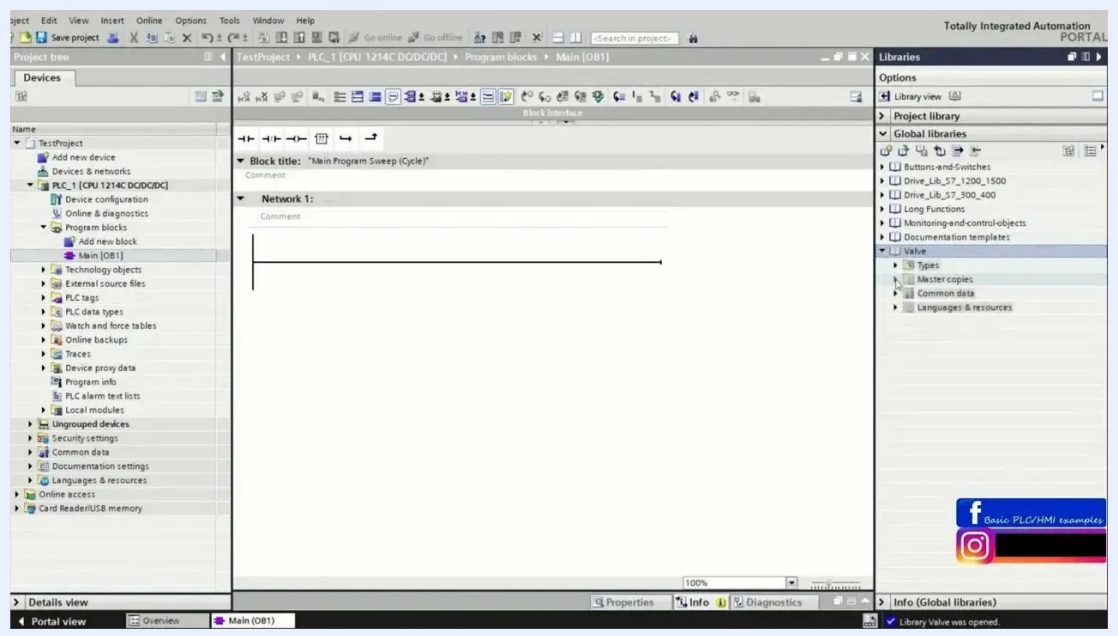
Inside the **Valve** folder, select the **Valve** library file (type: Siemens TIA Portal Library). Click **Open** to import the library into your TIA Portal project.



File browser inside the Valve folder with the Valve library file of type Siemens TIA Portal Library selected

Step 12. Expand the imported library

The **Valve** library now appears under **Global libraries** in the **Libraries** pane. Expand the **Valve** library node, then expand **Master copies** to see the available function blocks, such as **Valve**.

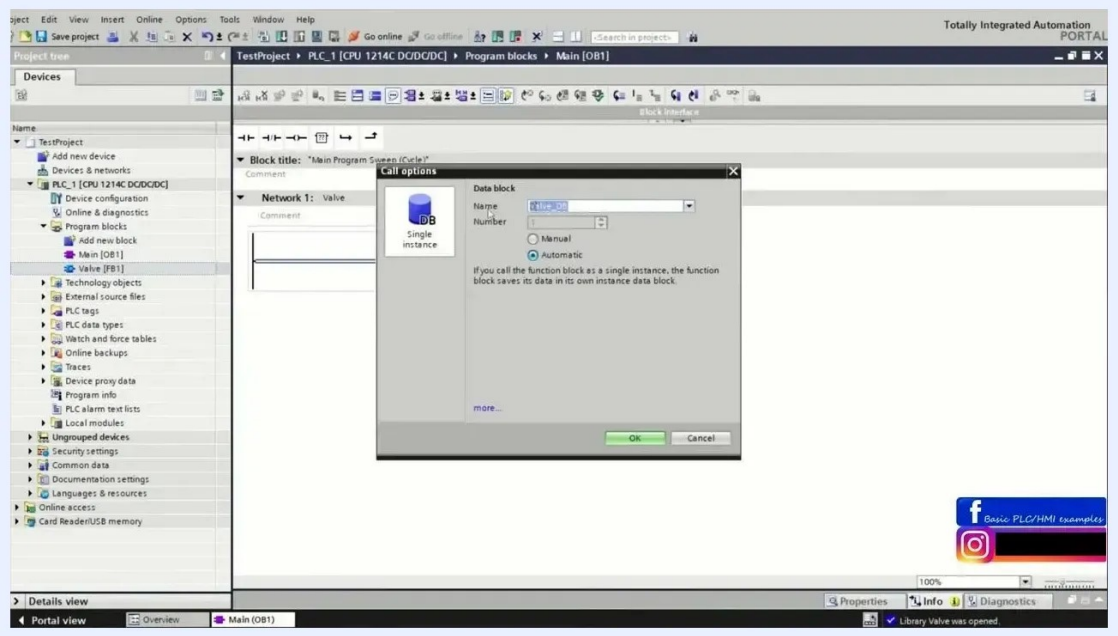


Libraries pane with the Valve library expanded, showing Master copies and the Valve function block

Step 13. Insert the function block into your program

Drag the **Valve** function block from **Master copies** into a network in your **Main [OB1]** program block. The function block is now available under **Program blocks** in your project tree.

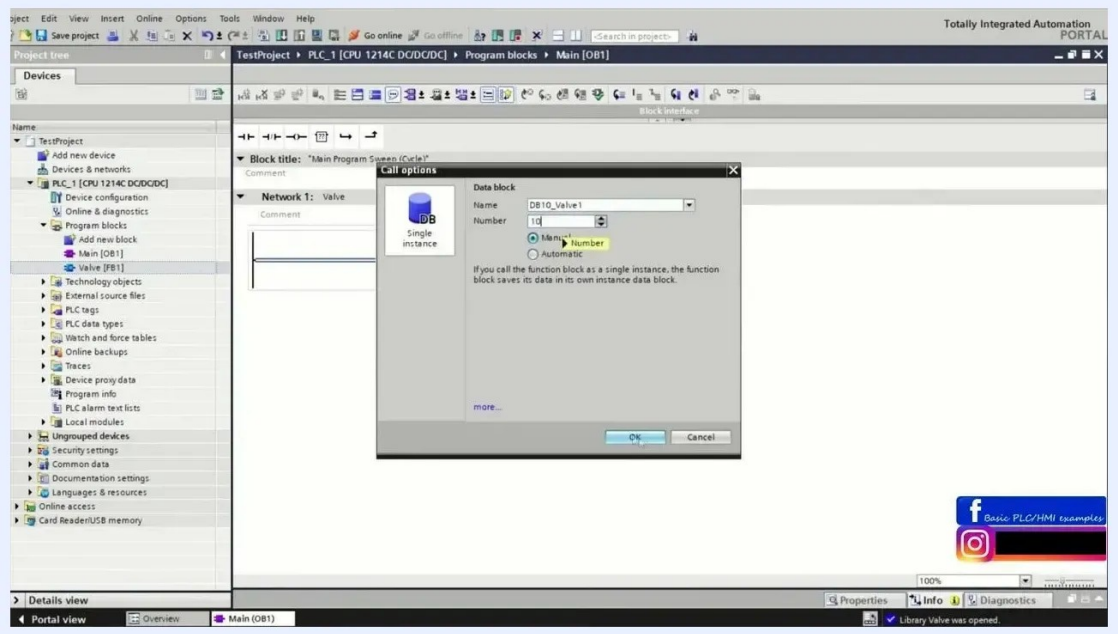
A **Call options** dialog appears. In the **Data block** section, set **Name** to DB10_Valve1, select **Manual** for the number, and enter 10. Click **OK**. This creates a single instance data block (DB10) for the first valve.



Call options dialog with Name DB10_Valve1, Number 10, Manual selected, and the OK button highlighted

Step 14. Add a second instance of the function block

Drag the **Valve** function block into another network to create a second instance. In the **Call options** dialog, set **Name** to DB11_Valve2, select **Manual** for the number, and enter 11. Click **OK**. This creates a second single instance data block (DB11) for the second valve.



Call options dialog with Name DB11_Valve2, Number 11, Manual selected, and the OK button highlighted

Step 15. Verify both instances in the main program

In **Main [OB1]**, confirm that both instances are present:

- **Network 1** contains the first instance, labeled DB10_Valve1, using the Valve function block.
- **Network 2** contains the second instance, labeled DB11_Valve2, using the Valve function block.

Each instance shows its input and output parameters, such as EN, Direction1, Direction2, Block_dir1, Block_dir2, Safety_OK, ENO, cmd_valve_a, and cmd_valve_b. The project tree lists both data blocks, DB10_Valve1 and DB11_Valve2, under **Program blocks**.

Summary

You created a global library from an existing function block, stored it as a master copy, and saved the library. You then opened it in a new project. By following these steps to add a library in TIA Portal, you inserted two instances of the function block, each with its own data block for independent operation.

What's next

You can repeat the **Open library** steps in any other TIA Portal project to reuse the same function block there.