Multiuser Engineering with TIA Project-Server

TIA Portal

https://support.industry.siemens.com/cs/ww/en/view/109740141

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1 Introduction

With Multiuser Engineering in TIA Portal, you can work on a project with multiple users simultaneously. By processing different objects in parallel within a multi-user server project, you can significantly shorten project planning and commissioning times.

1.1 Overview

TIA Portal provides you with various server constellations for the functionality of Multiuser Engineering. This application example describes the parallel handling of projects with a project server; the server's functionality is implemented on a dedicated server. The multi-user server projects are also stored on the dedicated server.

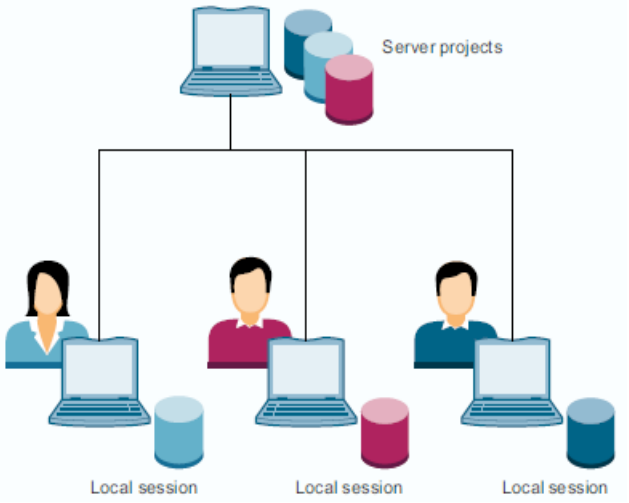
In order to be able to work simultaneously with several agents in a server project within the framework of Multiuser Engineering, each agent must create their own local session. In the local session, the respective editor can insert his changes and then check these changes into the server project and publish them. After check-in, the changes from the local session are available again to all editors in the server project.

In addition to Multiuser Engineering, Multiuser Commissioning allows you to carry out joint commissioning in a team just as conveniently.

Working with Exclusive Engineering allows you to conveniently work on your project as a "single user", but with all the advantages that the TIA Project-Server offers.

The following figure shows the server constellation "Project server as dedicated server".

Figure 1-1: "Project server as dedicated server" server constellation



Project server advantages

- A common project is stored centrally on a server.
- Use project revisions for temporary backups and for archiving project milestones; comment functionality and rollback to older project revisions are also supported.
- Change history provides information about edited projects (exportable for further detailed evaluations).
- Backward compatibility of the project server (one server for all projects) enables mixed operation between TIA Portal and server versions.

Advantages of Multiuser Engineering and Multiuser Commissioning

- Joint engineering and commissioning in a team.
- System-supported synchronization during engineering reduces the coordination effort in the team.
- Consistency between server project and PLC guaranteed with Commissioning Mode.
- No overwriting of changes in the PLC by other operators.
- Multiuser Engineering can be used with the local project server without a license.

Advantages of Exclusive Engineering

- Optimized workflows for editing projects.
- No multi-user license required for Exclusive Engineering.

Note

Further server constellations can be found in the TIA Portal V17 online help or in the system manual "SIMATIC STEP 7 Basic/Professional V17 and SIMATIC WinCC V17":

https://support.industry.siemens.com/cs/ww/en/view/109798671

1.2 Components used

The following hardware and software components were used to create this application example:

Table 1-1: Hardware and software components

Component	Quantity	Item number	Note
SIMATIC Field PG	3	6ES7717-.....-0...	or PC with TIA Portal V17
STEP 7 Professional V17	3	6ES7822-1..07-..	-
WinCC Advanced V17	3	6AV210.-....7-0	-
TIA Portal Multiuser Engineering V17	3	6ES7823-1A.0.-.Y..	-
SCALANCE	1	-	or switch 1 gigabit network

This application example consists of the following components:

Table 1-2: Components

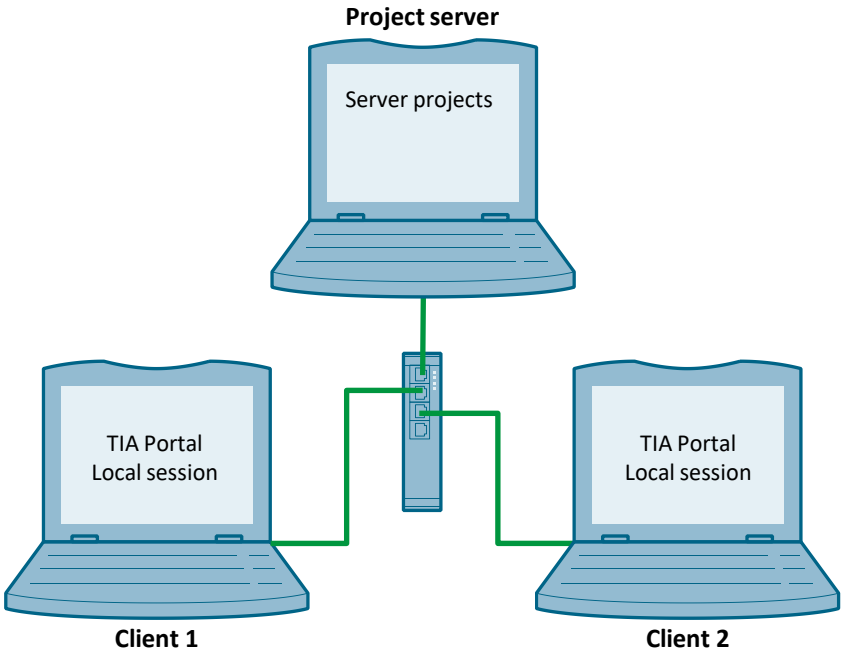
Component	File name	Note
Documentation	109740141_MultiUser_Engineering_DOC_v15_en.pdf	-

2 Engineering

2.1 Hardware setup

The following figure shows the hardware setup of the application. In this application example, the workstations are connected via a switch in an office network.

Figure 2-1: Hardware setup



Note When installing TIA Portal products on the different clients, make sure that the same TIA Portal software products with identical output statuses are installed on all engineering systems used.

Note In order to be able to work with Multiuser Engineering, a network must already be set up taking Windows settings, IP addresses, firewalls, etc. into account.

The network can also be located within a Windows domain.

2.2 Configuration

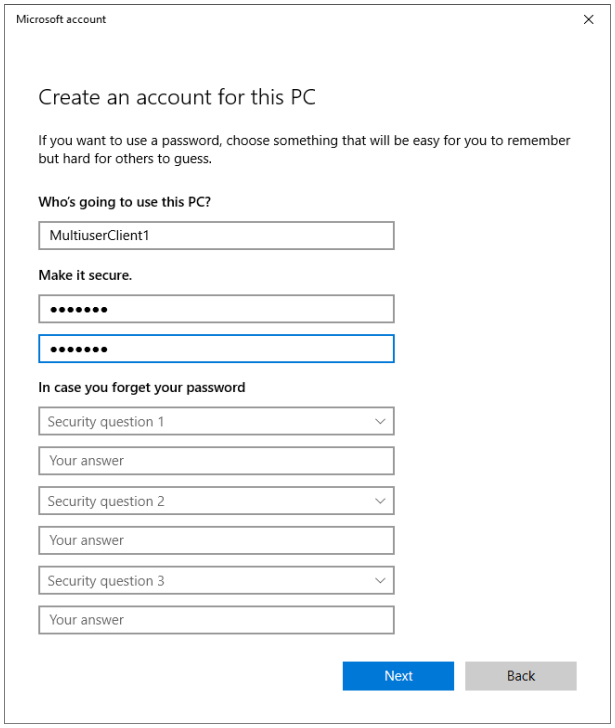
2.2.1 Create user accounts for clients on the project server PC

For the office network described in Figure 2-1, you can create the user accounts for the clients locally on the project server. The accounts must be identical to the accounts of the clients. With this procedure, the server can automatically authenticate a local client account with identical login data to an existing server account.

You can create the accounts on the project server in the Windows Control Panel. In Windows 10, proceed as follows:

1. In the Control Panel, click on "User Accounts > Manage another account > Add a new user in PC settings > Add someone else to this PC".
2. Choose "I don't have this person's sign-in information".
3. Choose "Add a user without a Microsoft account".
4. Enter the user name of the client, e.g. "MultiuserClient1".
5. Assign a password and confirm it.
6. Click "Next" to confirm your entries.

Figure 2-2: Create new account



The new account is created as the default user.

7. Repeat steps 1 through 6 for the accounts of other clients.

Note

If the server and clients are members of the same Windows domain, the server and clients must use the same LAN and be created on the domain controller.

If the server and the clients are in the same Windows domain, you **do not** need to create the clients' accounts on the project server.

Further information can be found in the TIA Portal V17 online help or in the system manual "SIMATIC STEP 7 Basic/Professional V17 and SIMATIC WinCC V17":

https://support.industry.siemens.com/cs/ww/en/view/109798671

Note

The users still have to be assigned the appropriate permissions in the user administration of the TIA Project-Server Administration Tools.
(see chapter 2.2.5.2)

2.2.2 Install TIA Project-Server

You can install the project server together with TIA Portal. You can also install the project server standalone, without TIA Portal.

Note

A description of the automated installation can also be found on the product DVD.

The tools for configuring and managing the project server are now available in all TIA Portal languages.

The various versions of the project server can be used side by side on one device. The current project server also supports older TIA Portal projects, with corresponding functionality.

New project server functions are only available if the new TIA Portal is installed.

To work in a local session, you need a valid multi-user license for each local session.

2.2.3 Install a newer TIA Project-Server without losing data

Make sure to first install the newer project server and then to uninstall the older version of the project server.

Use this procedure to ensure that the user authorizations that exist for the server can also be transferred to the new server. If all existing project servers are completely deleted before the new installation, the user settings are also lost and must be recreated.

If you want to replace an older version of the project server with a newer version and not lose your data, proceed as follows:

1. Stop the service for the "old" project server in the Configuration Tool.
2. Start the installation setup for the new project server by double-clicking on the self-extracting .exe file "TIA_Portal_Projekt_Server_V<x.y>.exe" located in the "Support" folder on the respective project DVD.
3. Select the desired settings and click "Install".
4. Follow the instructions in the setup dialogs.
5. Configure the newly installed project server in the Configuration Tool and select the same save folder that is used in the existing project server.
6. Temporarily assign a new port for the newly installed project server.
7. In the Configuration Tool, install the service for the new project server.
8. Now uninstall the service for the existing project server in the Configuration Tool.
9. Then uninstall the existing project server with the "Add or remove programs" function.
10. Reconfigure the port assigned earlier for the existing project server.
11. Start the service for the newly installed server in the Configuration Tool.
12. You can now continue working with the newly installed project server without any further changes in TIA Portal.

2.2.4 Configure the TIA Project-Server

You can configure the project server with the graphical tool "TIA Project-Server V17 - Configuration".

Follow the steps below:

1. Open the Start menu by clicking "Start > All Programs > Siemens Automation". Click "TIA Project-Server V17 - Configuration" to open the configuration tool.
2. Enter the desired data.

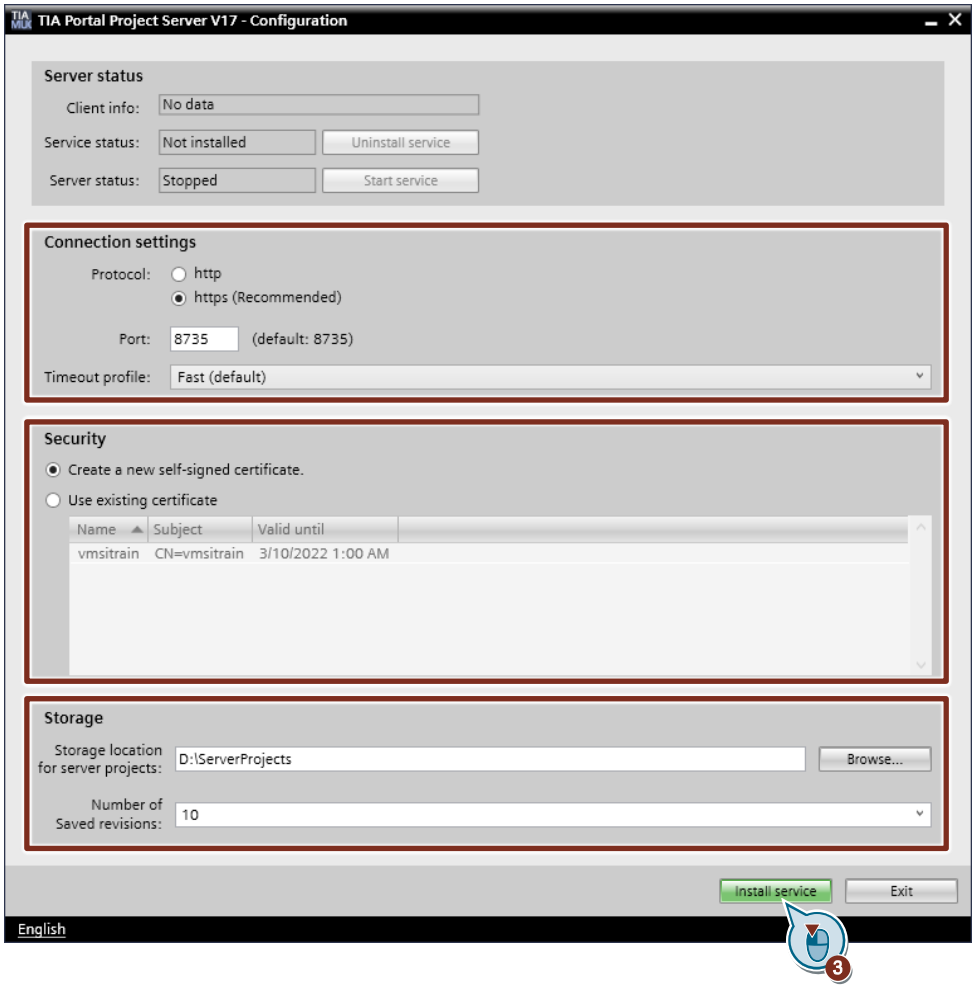
   Select "https" for secure communication and the port.

   If you are using an https connection, you can create a new certificate or use an existing one in the "Security" section.

   Enter a save location for the server projects.

   Under "Number of saved revisions:" select how many project versions should be available as "rollback".
3. Click "Install service".

Figure 2-3: TIA Project-Server - Configuration

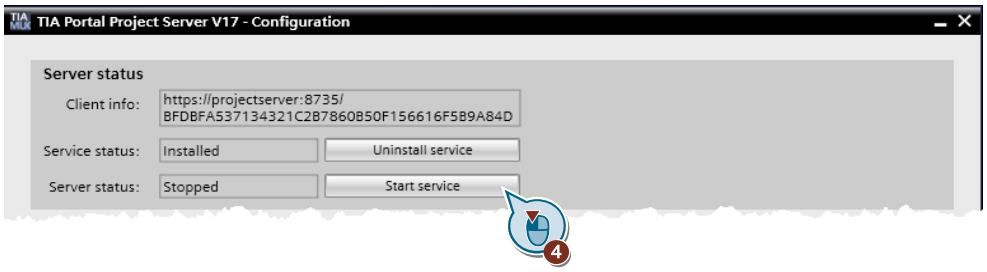


Note

For the project management you need enough free storage space on the project server, depending on the size of the project and the number of project revisions.

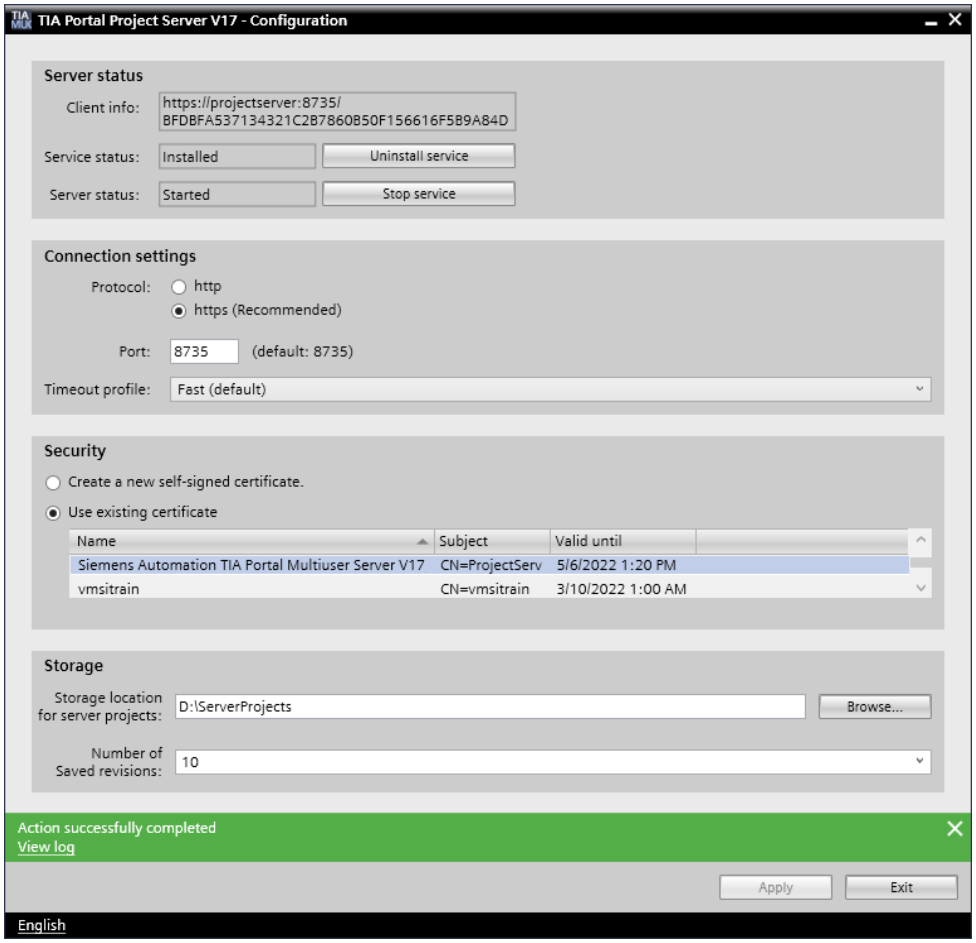
4. Start the new project server by clicking on the "Start service" button in the "Server status" area.

Figure 2-4: TIA Project-Server - Configuration



The project server is now configured and started.

Figure 2-5: TIA Project-Server - Configuration



2.2.5 TIA Project-Server Administration

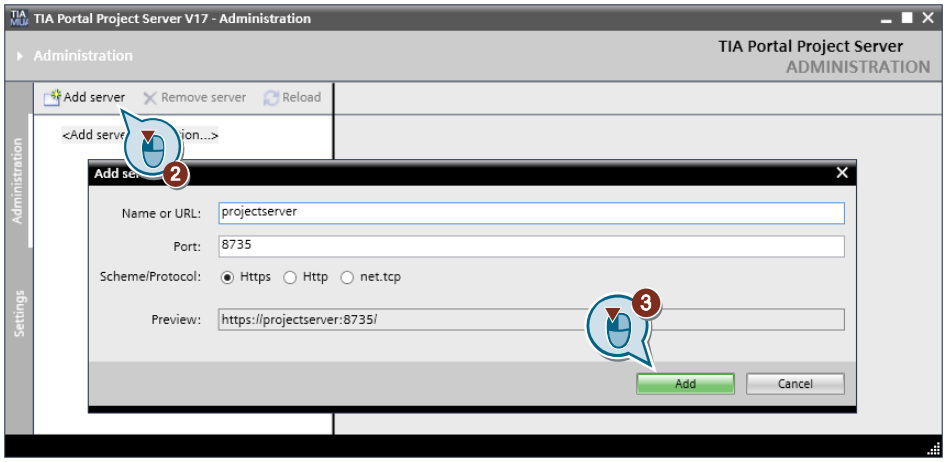
2.2.5.1 Add a new server connection

Add a new server with the graphical tool "TIA Project-Server V17 - Administration".

Follow the steps below:

1. Open the Start menu by clicking "Start > All Programs > Siemens Automation". Click on "TIA Project-Server V17 - Administration" to launch the administration tool.
2. Add a connection to the desired project server by clicking "Add server". In the "Add server" dialog, enter the server administration data. The data can be found in the "Configuration Tool" (see Figure 2-5).
3. Click "Add" to add the server connection.

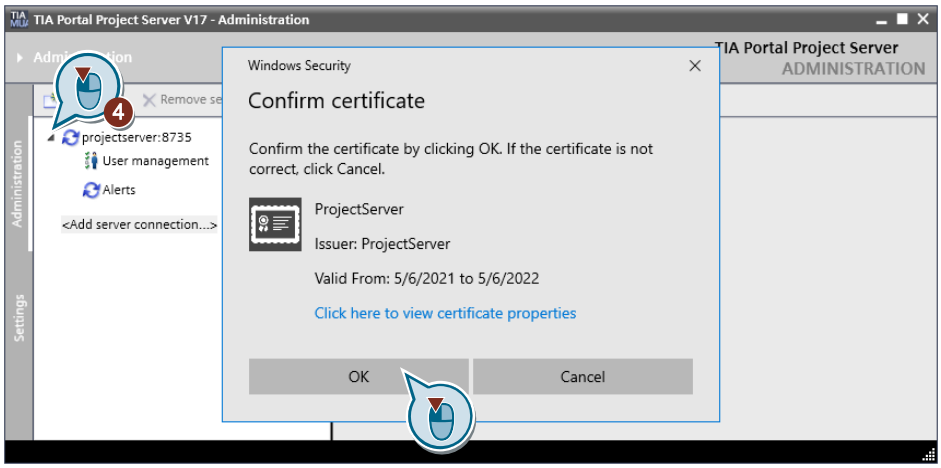
Figure 2-6: TIA Project-Server - Administration



The new server connection appears in the left pane of the Administration Tool.

4. Click on the triangle of the new server connection to activate the connection. Confirm the certificate by clicking "OK".
   You can check the authenticity of the certificate by comparing the fingerprint of the displayed certificate with the certificate that was generated during configuration. The fingerprint can be found in the "Server status" area under "Client info" (see Figure 2-5).

Figure 2-7: TIA Project-Server - Administration



2.2.5.2 Assign access permissions for project server and server projects

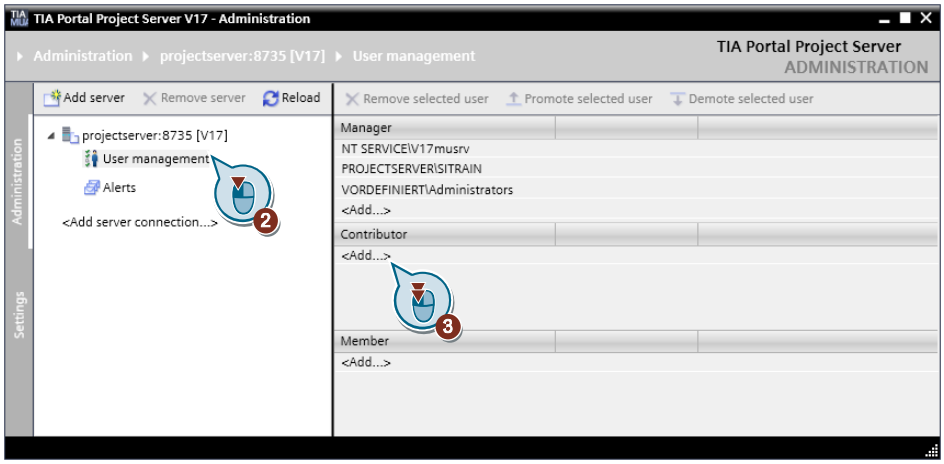
Under "User Management", you will define the permissions for working with project server connections, with server projects and with local sessions. The permissions concept is based on Windows access permissions for folders and files.

Follow the steps below:

1. Open the Start menu by clicking "Start > All Programs > Siemens Automation". Click on "TIA Project-Server V17 - Administration" to launch the administration tool.
2. Click on "User Management". The "User Management" opens and displays the possible settings on the right side.
3. You use "User Management" to define explicit personal authorizations for the following roles:
   - Manager (full access)
   - Contributor (partial access, no deletion)
   - Member (read permission)

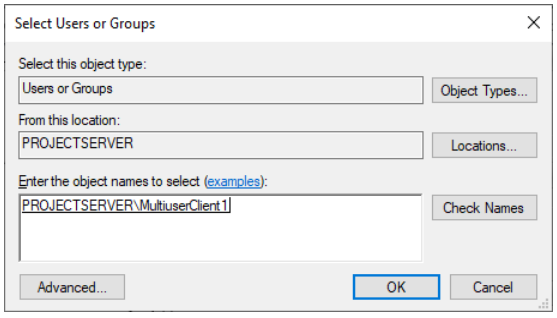
   Double-click "<Add...> to add new users for the displayed roles.

Figure 2-8: TIA Project-Server - Administration



4. In the "Select Users or Groups" dialog, enter the user, e.g. "MultiuserClient1", and click "OK".
   To check your entry, click on "Check Names".

Figure 2-9: "Select Users or Groups" dialog box



The new user is displayed in his or her permission group.

5. Repeat steps 3 and 4 to grant access permissions to other users.

Note As an administrator, it is preferable to add user groups rather than individual users to the user administration.

Note Further information about the TIA Project-Server can be found in the FAQ "In TIA Portal V14 why can you not establish a connection to the Multiuser server?":

https://support.industry.siemens.com/cs/ww/en/view/109741420

Note You can move users up or down into other permission groups with the "Demote selected user" and "Promote selected user" buttons.

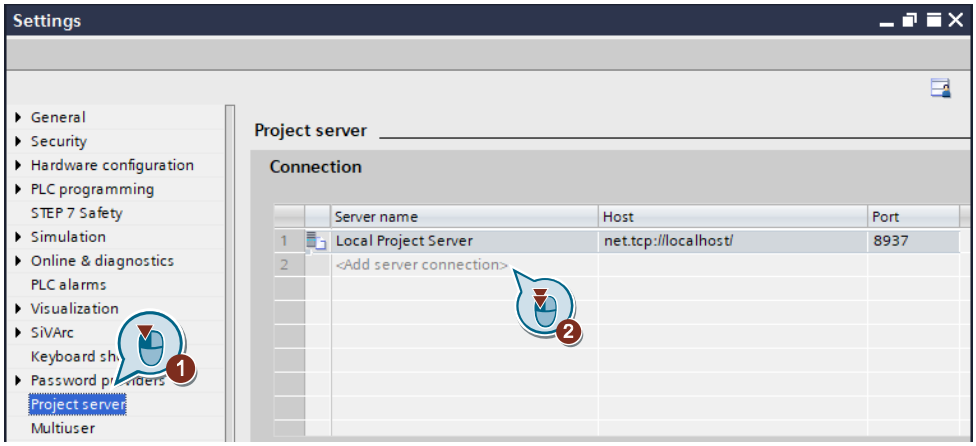
2.2.6 Add project server connections in TIA Portal

In order to work with the new server connection in TIA Portal, add the new server connection to TIA Portal on each client.

Follow the steps below:

1. In TIA Portal, select "Option > Settings > Project server". The "Connection" tab will open. An entry for the local server connection "Local Project Server" already exists.
2. Add a server connection to the desired project server by clicking "Add server connection".

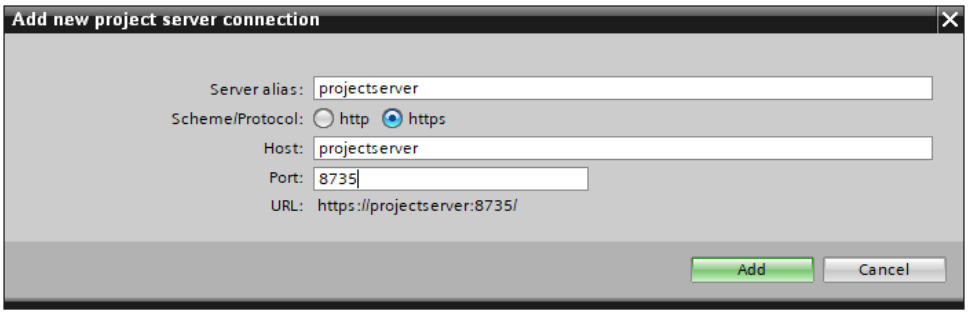
Figure 2-10: Settings for project server connection



3. In the "Add net project server connection" dialog, enter the data for administering the server. The data can be found in the "Configuration Tool" (see Figure 2-5).

   Click "Add" to add the server connection.

Figure 2-11: "Add new project server connection" dialog



The new project server connection is added and displayed.

2.2.7 Create server project

Note

To create a multi-user server project from a single-user project, the single-user project must meet the following requirements:

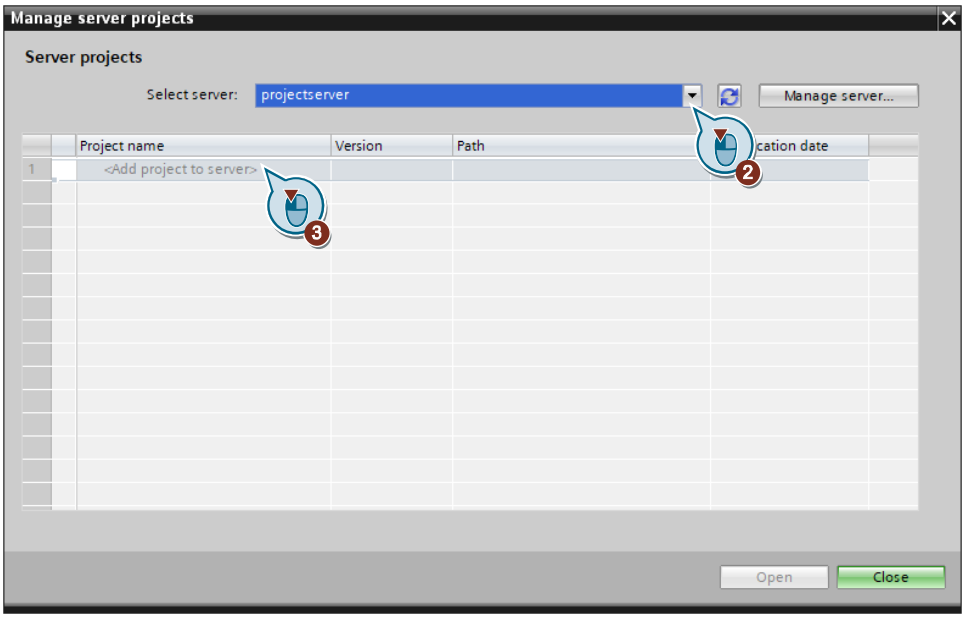
- The project already contains the complete hardware configuration with all connections.
- The project already contains the required building blocks and is divided into technologically oriented groups. With this subdivision, a group can be assigned to the individual agents.
- The project already contains all required project languages.

If you want to work with Multiuser Engineering, create a multi-user server project on a client with the TIA Portal from a single-user project.

Follow the steps below:

1. In TIA Portal, click the menu command "Project > Project server > Manage server projects…".
2. Select the desired server connection from the drop-down list.
   Confirm the certificate by clicking "OK".
3. Click "<Add project to server>" to open a dialog and select the project.

Figure 2-12: "Manage server projects" dialog



The dialog for selecting a project will open.

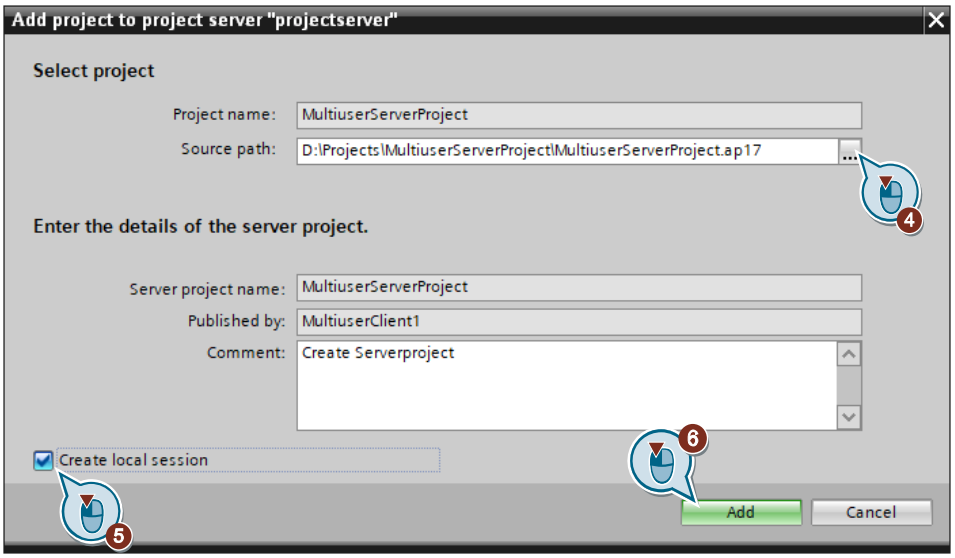
4. Set the desired path to the single-user project in the dialog or navigate to the desired directory via the "..." button. Select the project you want to add as a multi-user server project.

   If the single-user project opens, then enter it automatically.

5. Check the "Create local session" box if you want to create a local session for the newly added multi-user server project.

6. Click "Add" to add the project as a new multi-user server project.

Figure 2-13: Dialog "Add project to project server "<ServerName>"".



The "Create local session" dialog opens.

7. Select the type for the local session, e.g. "Multiuser Engineering".

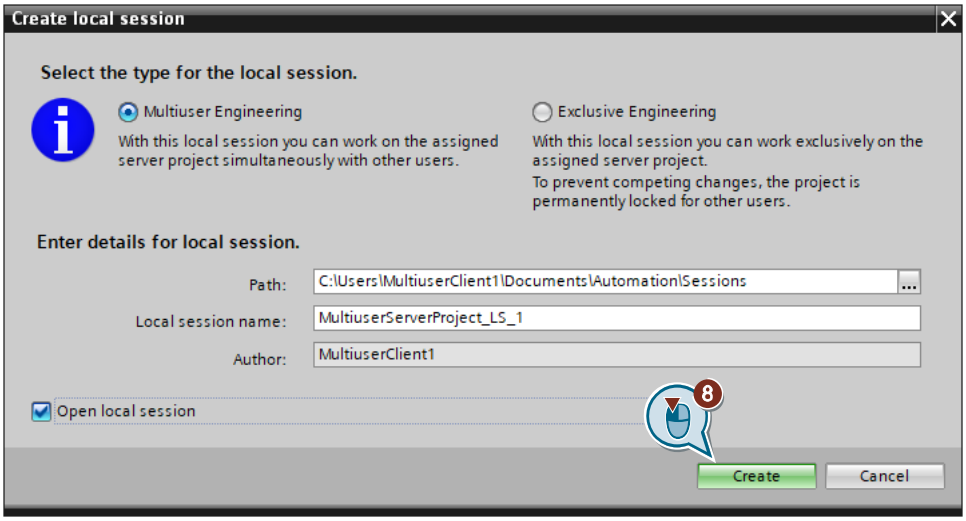
   Set the desired path for the local session in the dialog or navigate to the desired directory using the "..." button.

   Enter the name of the local session.

   If you want to open the new local session immediately, activate the option box "Open local session".

8. Click "Create" to create the new session.

Figure 2-14: "Create local session" dialog box



The local session on the server is created and opened.

2.2.8 Upgrade server projects

To be able to use older multi-user server projects and local sessions with the current version of TIA Portal, these projects must first be upgraded.

Follow the steps below:

1. Before upgrading, save all existing local sessions in the multi-user server project.
2. Save the multi-user server project as a single-user project.
3. Upgrade the single-user project in TIA Portal.
4. After the upgrade, create another multi-user server project from the single-user project.
5. From the upgraded multi-user server project, create the local sessions again for all editors.

2.3 Working with local sessions

In the local session you can select and edit almost all objects of STEP 7 and WinCC.

Note A list of the objects for Multiuser Engineering supported by STEP 7 and WinCC can be found in the TIA Portal V17 online help or in the system manual "SIMATIC STEP 7 Basic/Professional V17 and SIMATIC WinCC V17":

https://support.industry.siemens.com/cs/ww/en/view/109798671

Note You can edit unsupported objects within a local session, but you cannot select them. Changes to unsupported objects are not transferred to the multi-user server project during check-in!

Note Information about Startdrive and Multiuser can be found in the FAQ "Startdrive in TIA Portal V15, V15.1 or V16 with Option Multiuser Engineering".

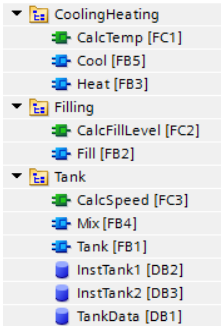
https://support.industry.siemens.com/cs/ww/en/view/109755940

2.3.1 Assign tasks to agents

To enable multiple editors to work together on a project smoothly, you first assign the objects to be edited to the individual editors. In this application example, the program is divided into groups. Each group is assigned to an agent as follows:

- "Tank" group: Agent to " Client 1"
- "Filling" group Agent to " Client 2"
- CoolingHeating Group: Agent to " Client 2"

Figure 2-15: Subdivision of the application example into groups



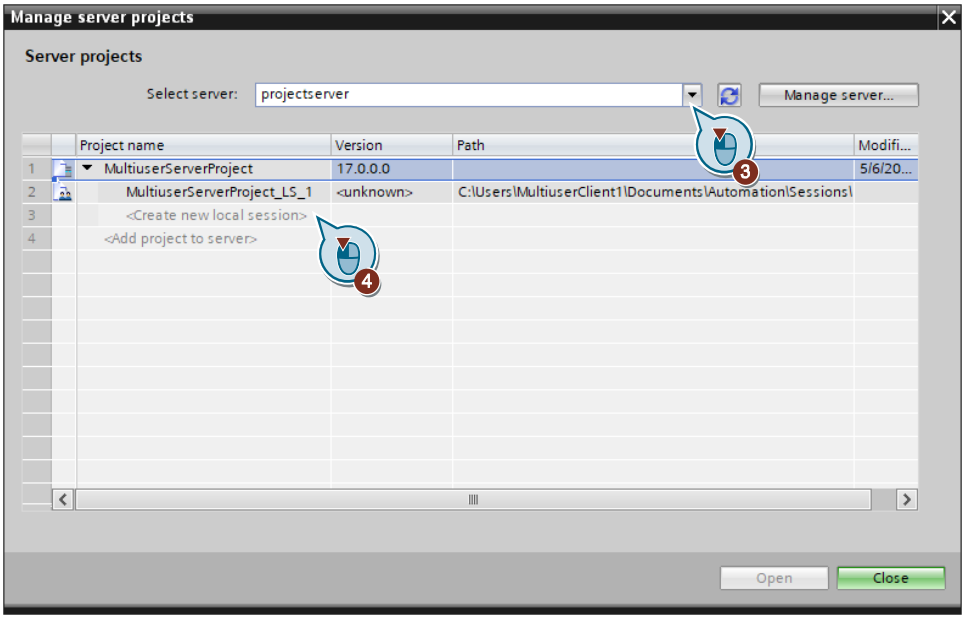
2.3.2 Creating a Local Session

In order to work together on a multi-user server project, you must create local sessions on the respective computers (clients). When creating the multi-user server project, a local session for the client "MultiuserClient1" was already created.

To create additional local sessions for users, proceed as follows:

1. Add the project server connection to TIA Portal on the client (see 2.2.6).
2. In TIA Portal, click the menu command "Project > Project server > Manage server projects…".
3. Select the desired server from the drop-down list.
   If necessary, confirm the certificate by clicking "OK".
4. Select the desired multi-user server project and click on "<Create new local session>".

Figure 2-16: "Manage server projects" dialog



The "Create local session" dialog opens.

5. Select the type for the local session, e.g. "Multiuser Engineering".

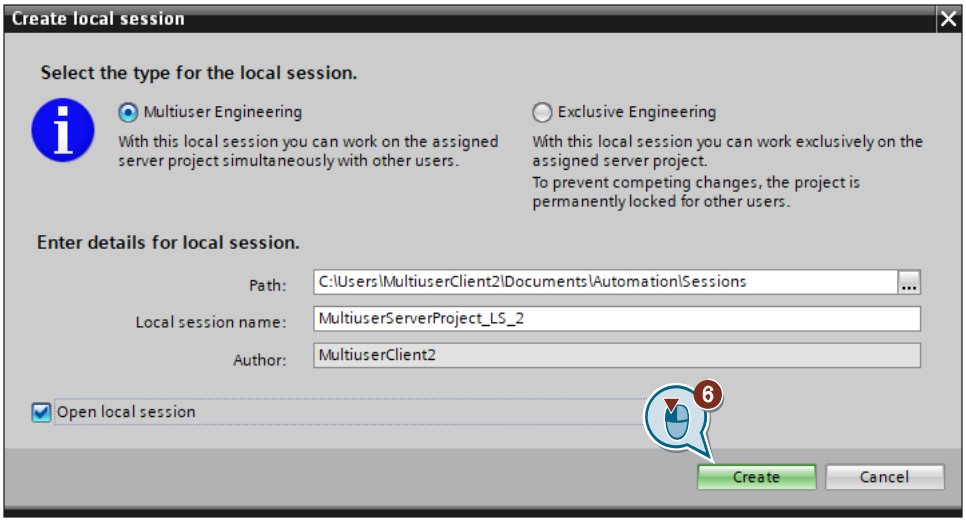
   Set the desired path for the local session in the dialog or navigate to the desired directory using the "..." button.

   Enter the name of the local session.

   If you want to open the new local session immediately, activate the option box "Open local session".

6. Click "Create" to create the new session.

Figure 2-17: "Create local session" dialog box



The local session is created and opened.

7. Repeat steps 1 through 6 to create local sessions for additional users on the respective machines (clients).

Note With TIA Portal V17 or later, local sessions can also be on network drives.

2.3.3 Open local session

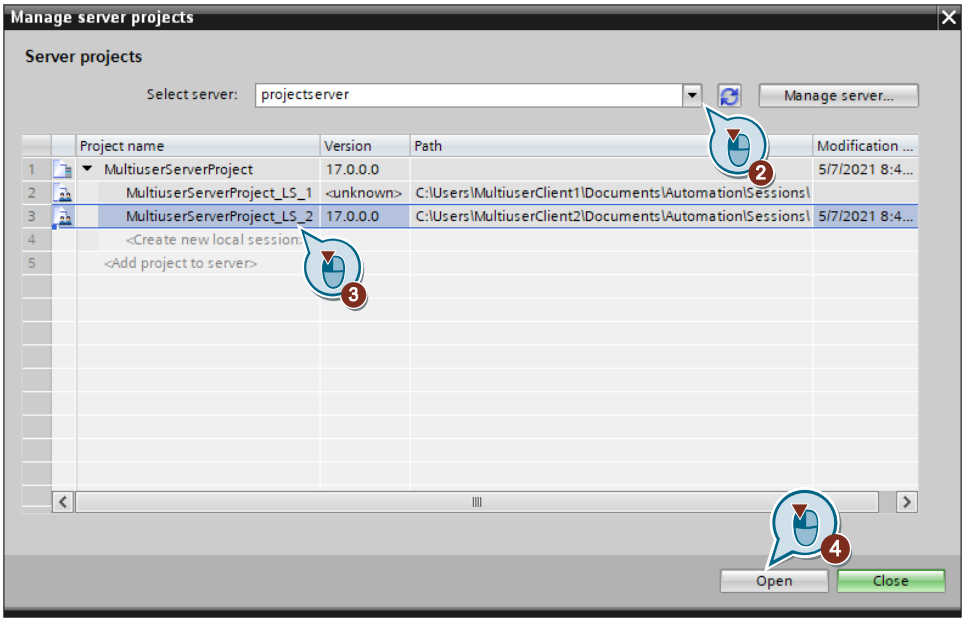
You have the following options for opening a local session:

- In TIA Portal via the associated multi-user server project
- In TIA Portal via "Recently Used Projects"
- When TIA Portal is closed, double-click the local session "<SessionName>.als17" with Windows Explorer.

To open a local session via the associated multi-user server project, proceed as follows:

1. In TIA Portal, click the menu command "Project > Project server > Manage server projects…".
2. Select the desired server from the drop-down list.
3. Select the desired local session.
4. Click on the "Open" button.

Figure 2-18: "Open Local Session" dialog



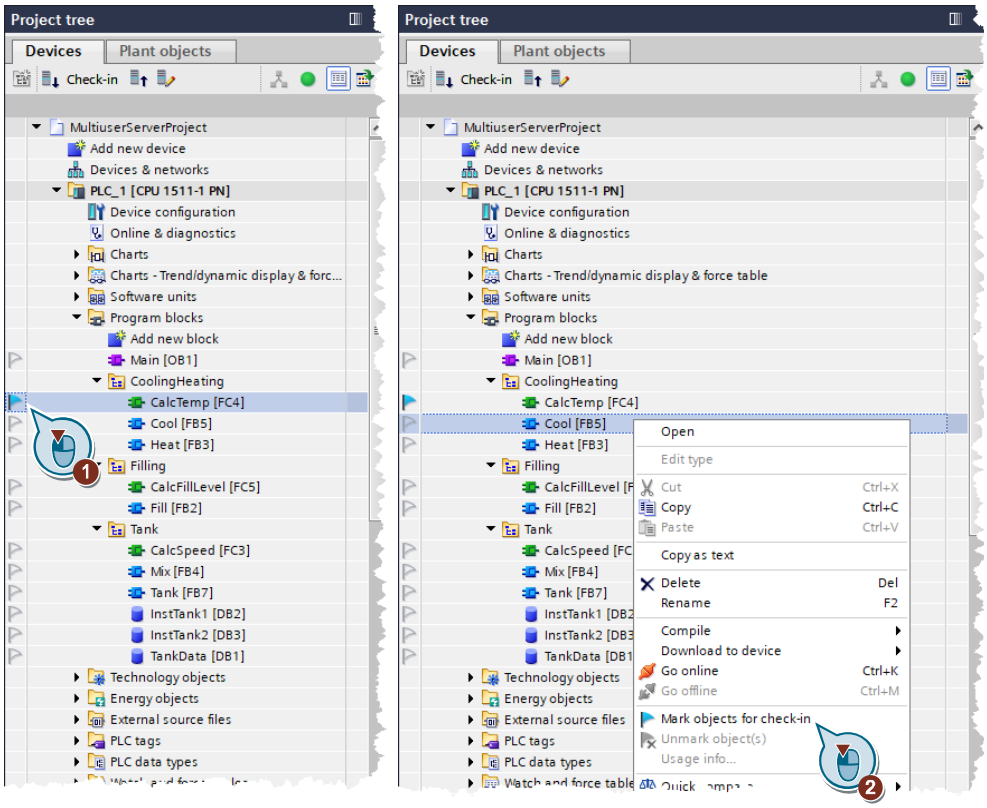
The local session is opened and displayed.

2.3.4 Selecting Objects in the Local Session

To enable you to edit the objects of the multi-user server project in parallel, each agent must select the objects assigned to him in his or her local session that he or she wants to edit. You can select the objects in your local session as follows:

- As soon as you edit, copy, paste or delete an object in the local session in a TIA Portal editor, this object is automatically marked for check-in.
  This also applies to objects that the system creates in the background while the user is editing (e.g. system blocks and the like).
- By clicking (1) on the displayed flags in the project tree.
- Using the context menu command (2) "Mark objects for check-in": In this command, you can select several objects at the same time using multiple selection.

Figure 2-19: Mark objects by clicking (1) or with context menu command (2)



Note

If you want to undo the selections, click the flag again.

To prevent unwanted overwriting in the server project, avoid conflicts (red flags). The last status checked in is taken from the server project.

The flag of the selected object is displayed in color. The colors of the flags have the following meaning:

Table 2-1: Flag color meanings

Symbol	Meaning
	The object can be marked for check-in.
	The object is selected in its own local session.
	The object is marked in another local session that belongs to the same multi-user server project.
	Conflict: The object was selected in several local sessions at the same time.
	Object is obsolete: If one of the above symbols are additionally marked with this overlay, the object no longer corresponds to the latest status of the server project and should absolutely be updated.

The selected object can now be edited in the local session.

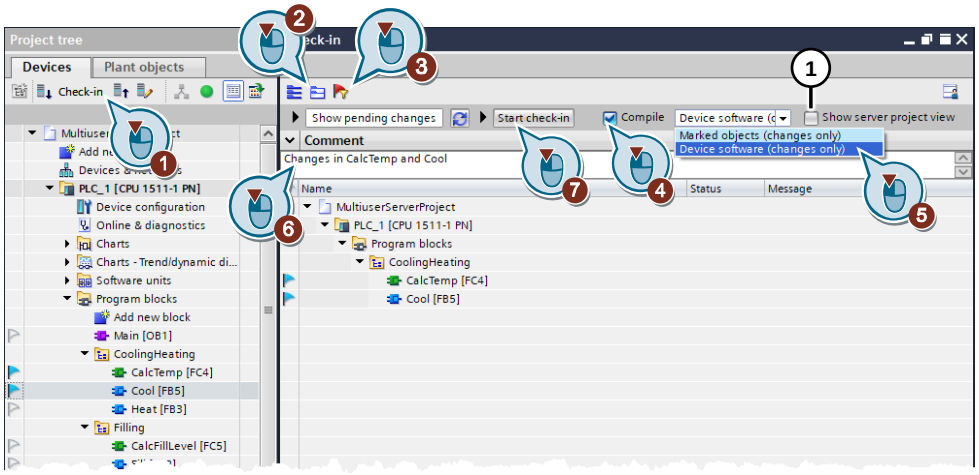
2.3.5 Check in edited objects to the server project

After you have edited the selected objects in the local session, you can check the changes into the server project.

Follow the steps below:

1. Click on the "Check-in" button in the multi-user toolbar. The multi-user editor then opens in the "Check-in" view and displays all objects marked in the local session that are transferred to the server project during check-in.
2. Expand the displayed folders and check the items displayed and selected for check-in.
3. Click on the "Show conflicts" button in the function bar to display any conflicts. Existing conflicts are displayed. Fix the conflicts displayed before check-in to avoid data loss or unwanted overwriting. If there are no conflicts, click this button again to return to the previous "Check In" view.
4. The "Compile" checkbox is ticked by default.
5. Select the compile type from the drop-down list.
   By compiling the pending changes before check-in, you ensure that you check in a project that is error-free and pass it on to other editors.
6. Enter a comment on the change history to document the changes you made in the local session.
7. Click on the "Start check-in" button to check the displayed objects into the multi-user server project.

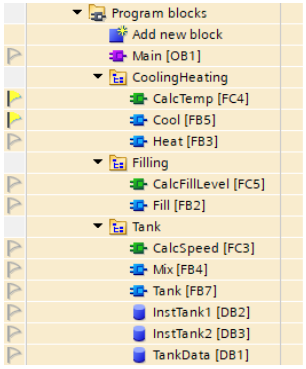
Figure 2-20 Check in edited objects to the server project



Before checking in, you can display the selected objects in the server project view together with the current contents of the server project. Activate the option "Show server project view" for this view (1).

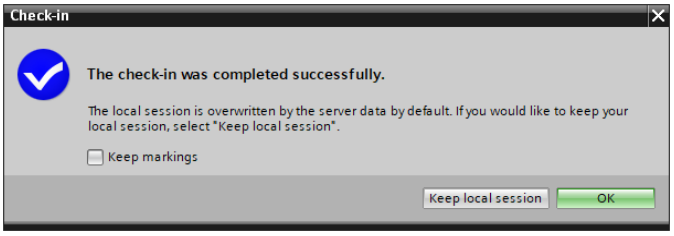
If you click this option, the server project view will open in the project tree before checking in. Click the "Save changes" button to check in your changes. If you click on the "Discard changes" button, your changes will be discarded and not applied to the server project.

Figure 2-21: Server project view



8. If you want to keep the markings in the local session after checking in, enable the Keep markings option. Click the OK button if you want to overwrite the local session with the more current contents of the server project.
   If you want to keep the local session, click the "Keep local session" button.

Figure 2-22: "Check In" dialog



Result

You receive a message that the check-in was completed successfully.

Your local session is updated and opened after the successful check-in with the contents of the server project.

- After the update, the local session contains all changes that have been checked in to the server project in the meantime.
- If new objects were added to the server project, these objects are now also visible in your local session
- If objects were deleted in the server project, these objects are no longer present in your local session.
- Your markings in the local session will be automatically deleted if you did not select the Keep markings option.
- The server connection will be released after check-in. The server status changes in the display within the function bar from "busy" to "available".

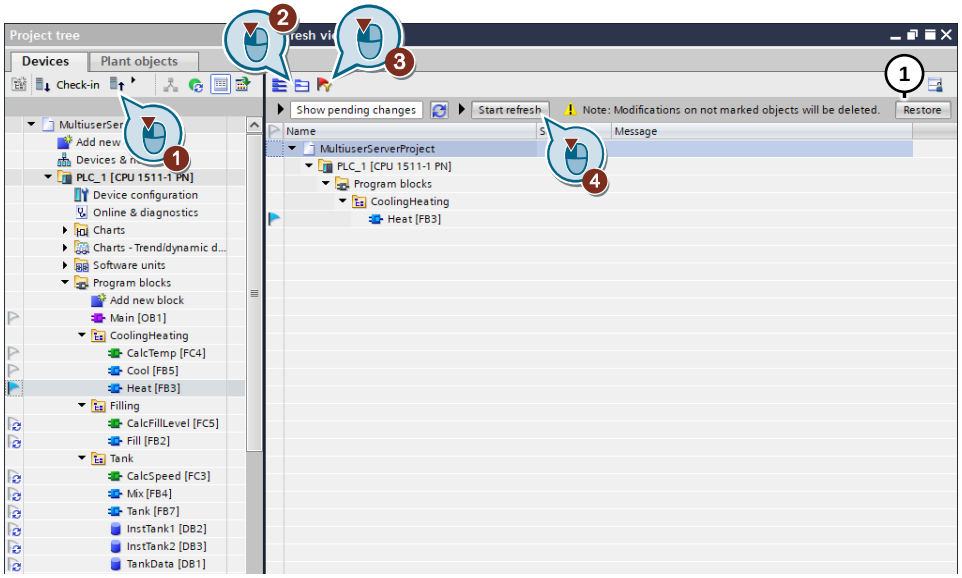
2.3.6 Refresh local session

Objects that other users change and check in are marked as "obsolete" in your local session on the object status icon with the icon (see Table 2-1). If you want to transfer these objects from other users to your local session, refresh your local session.

Follow the steps below:

1. Click the "Refresh local session" button in the multi-user toolbar. The multi-user editor opens in the Update view and displays all objects selected in your local session. The objects you selected are not overwritten when you update. Only objects that are not selected are synchronized with the contents of the server project.
2. Expand the displayed folders and check the items displayed and selected for check-in.
3. Click on the "Show conflicts" button in the function bar to display any conflicts. Existing conflicts are displayed. Fix the conflicts displayed before check-in to avoid data loss or unwanted overwriting. If there are no conflicts, click this button again to return to the previous Check In view.
4. Click on the "Start refresh" button.
5. You receive the message that the update was completed successfully. Click on "OK". If errors occur, you will receive an error message.

Figure 2-23: Refresh local session



All "obsolete" objects in your local session have been updated.

Result

- All unselected objects in your local session have been updated.
- The objects marked in your local session were not synchronized with the server status.

If necessary, you can undo the local session refresh. After refreshing, click on the "Restore" button (1) in the multi-user editor. Your local session will then be restored with the contents from before the refresh.

Note The "Restore" button is only active after a refresh and only as long as the contents of the local session can be restored to the previous state.

2.3.7 Export a local session as a single-user project

You can export a local session as a single-user project. This allows you to continue working on the project, even if there is no project server connection.

If a local session is recognized as invalid on opening, you will be asked whether you want to export as a single-user project. This allows you to save the work results from the local session in a single-user project and continue using them.

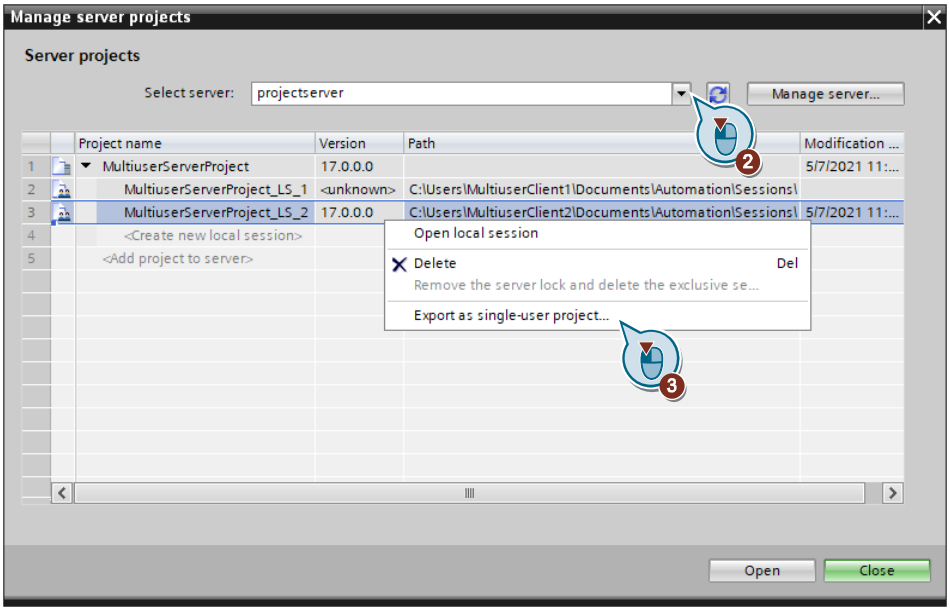
You can copy the objects changed in the single-user project and insert them later to the local session or to the server project.

Note In order to export a local session as a single-user project, it must be closed.

To export a local session as a single-user project, proceed as follows:

1. In TIA Portal, click the menu command "Project > Project server > Manage server projects…".
2. Select the desired server from the drop-down list.
3. Select the local session you want to export and click on the "Export as single-user project..." command in the context menu.

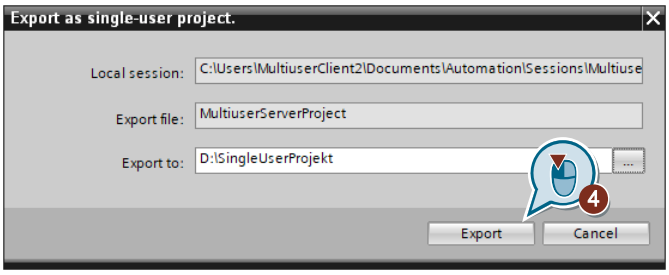
Figure 2-24: "Manage server projects" dialog



In the following dialog, the name for the local session and the storage location are already preset.

4. Enter the desired storage location under "Export to" or navigate to the desired storage location and click on "Export". The storage location (target directory) must be empty.

Figure 2-25: "Export as single-user project" dialog



The local session was exported successfully.

2.3.8 Working offline

If you do not have an existing connection to the project server, you can also work "offline" with Multiuser Engineering if you have TIA Portal V15 or later.

Enable the option in TIA Portal under "Project > Project server > Work offline".

In the local session, the icon for the active server connection changes from a green circle to a light gray circle.

When you switch back to "Work online", the system first checks whether there are any marking conflicts. Fix any existing conflicts. Then you can continue working online in the local session as usual.

2.3.9 Editing library objects in local sessions

Note

Library objects should only be edited in the Server Project view, as this will not cause inconsistencies in the server project.

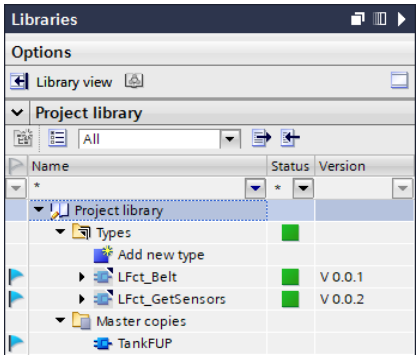
Library objects from the project library can be edited in the local session, but this can lead to inconsistencies in the server project. Therefore it is recommended to only edit and save library objects from the server project view.

Library objects can only be checked in or updated if they are released.

Markings for check-in

The individual library objects within the project library are marked for Multiuser Engineering in the same way as in the project tree (see 2.3.4).

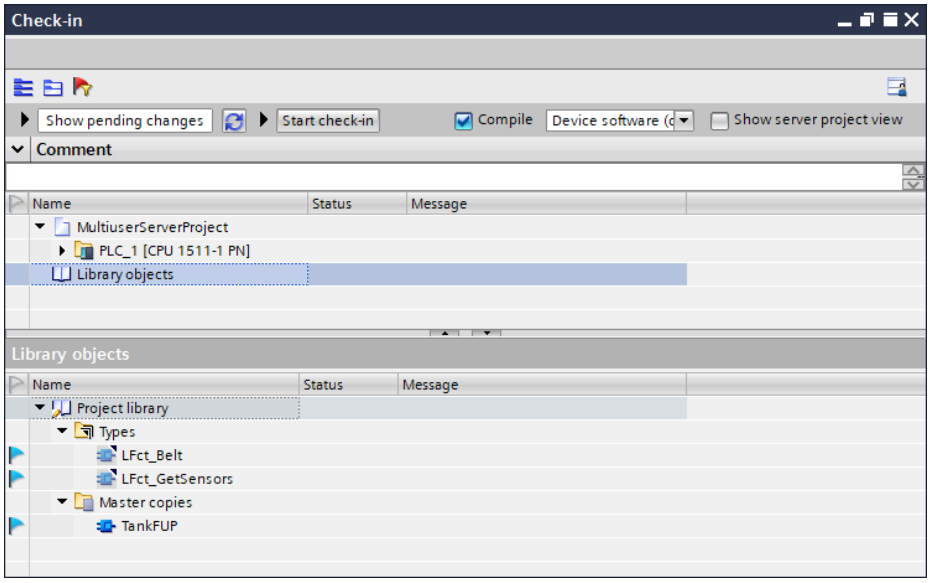
Figure 2-26: Selected library objects in the "Libraries" task card



Checking in types and master copies

You check changes to types and copy templates into the multi-user server project as well as all other objects within the local session (see 2.3.5). When you check in a type, all versions of the type are always checked in.

Figure 2-27: Selected library objects in the "Libraries" task card



Refreshing types and master copies

If you update the local sessions (see 2.3.6), the library objects of the project library are updated at the same time.

2.3.10 General rules

When working in a team with Multiuser Engineering, you should note the following points:

- Edit only the assigned objects / blocks.
- Edit only selected objects
  With TIA Portal Multiuser Engineering V15 onward, objects will be selected automatically.
- Do not make any changes to objects highlighted in yellow.
  Objects are edited by other editors.
- Only check in compiled blocks.
  Under "Options > Settings > Multiuser > Compilation settings", activate the option "Compile before check-in".
- Check changes into the server project only with a meaningful comment.
- Perform the following enhancements/changes only in the server project:
  - Edit the hardware configuration.
  - Rename and move objects.
  - Edit global elements (e.g. PLC data types, DBs).
  - Perform library updates.
  - Change the block interfaces of blocks that exchange data with blocks of other agents.
- Only work in the server project view if absolutely necessary. This will ensure that agents in local sessions are not unnecessarily locked out of the server.

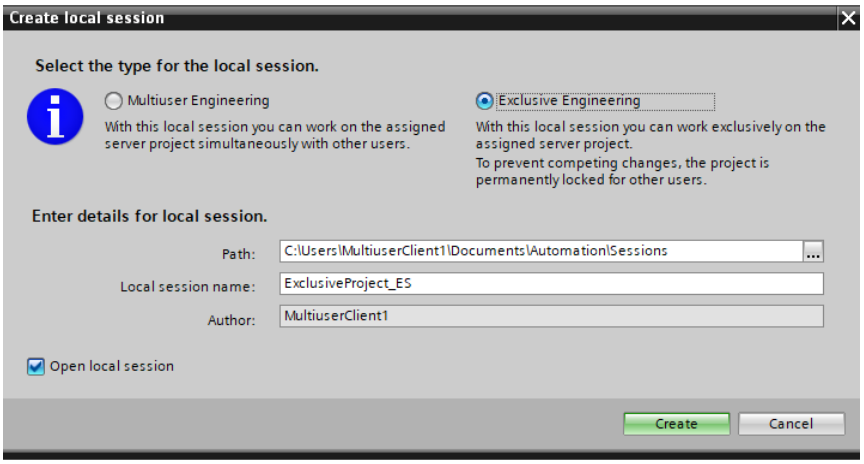
2.4 Exclusive Engineering

Working with an exclusive local session is no different than with single-user engineering. The server project is reserved exclusively for you; other users are denied write access as long as your exclusive local session exists.

2.4.1 Create server project and exclusive local session

The server project is created like a multi-user server project (see chapter 2.2.7). The exclusive local session is created similarly to a local session for Multiuser (see chapter 2.2.7 or chapter 2.3.2), except that you will choose the type "Exclusive Engineering" instead of "Multiuser Engineering".

Figure 2-28 "Create local session" dialog box



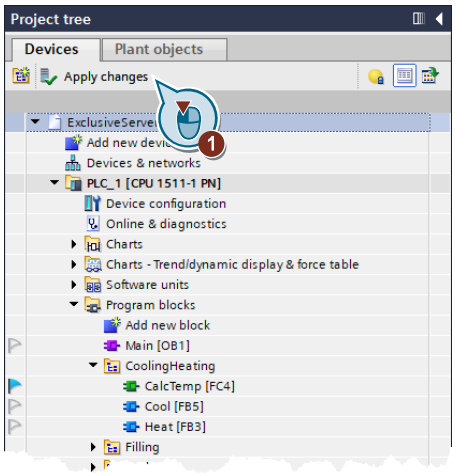
2.4.2 Apply edited objects to the server project

Because you are working exclusively in the local session, you can edit all objects that are contained in your session.

Once you have edited the objects in your exclusive local session, you can apply the changes to the server project as follows:

1. Click "Apply changes" to apply the changes to the server project.

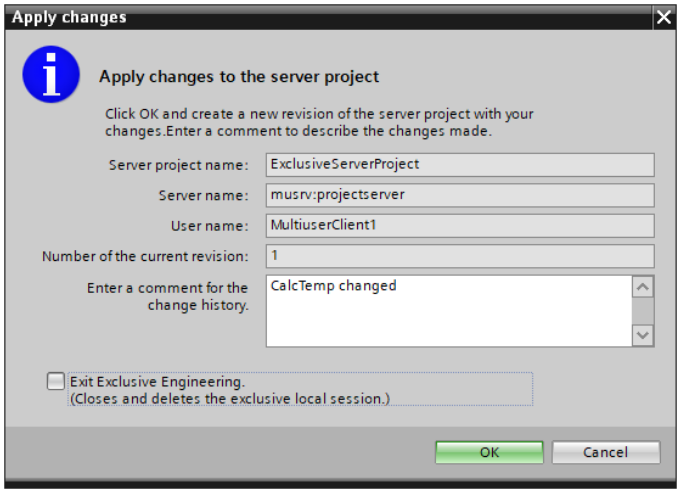
Figure 2-29 Apply edited objects to the server project



2. In the following dialog, enter a comment on the revision history to document the changes you made in the local session. Then click "OK".

   Check the "Exit Exclusive Engineering" box when you wish to end the exclusive local session.

Figure 2-30 "Apply changes" dialog



Result

The changes from the exclusive local session have been applied to the server project.

A new revision of the server project has been created.

Result if you have checked the "Exit Exclusive Engineering" box:

- The block for the project server will be lifted, making the server available for other users.
- The exclusive local session will then be deleted.

Note You can terminate the closed exclusive local session in the "Manage server projects" dialog. To do this, right-click on the exclusive local session and select "Remove the server lock and delete the exclusive se…" in the context menu.

2.5 Working in the Server Project view

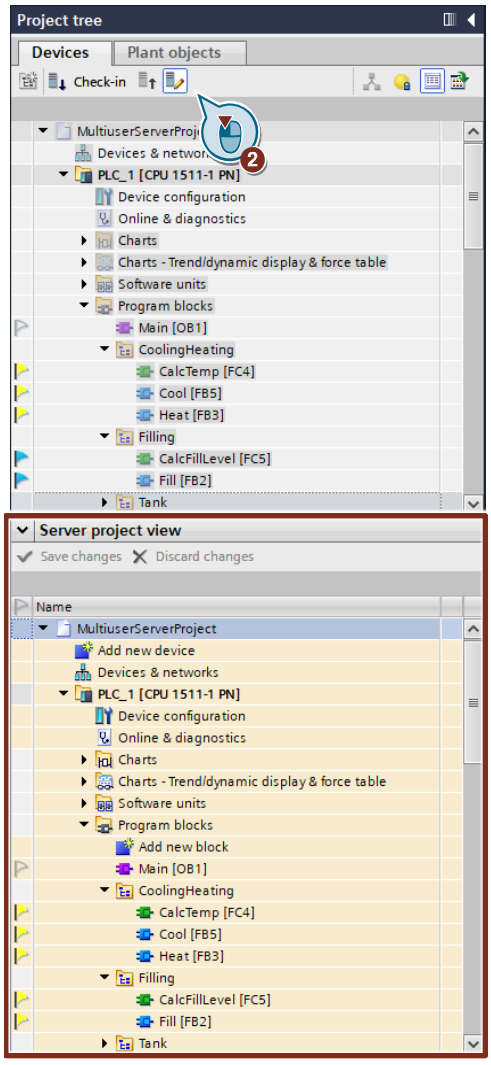
You cannot select and check in all objects in the local session. In Multiuser Engineering, you can insert or edit unsupported objects directly in the server project view.

2.5.1 Open Server Project View

To open the Server Project view, proceed as follows:

1. Open the desired local session.
2. Click the "Open/close server project view" icon in the multi-user toolbar.

Figure 2-31 Open and close server project view



The Server Project view is displayed and the project can be changed in the Server Project view. Add a new block, for example.

The icon  (see Table 2-2) in the multi-user toolbar indicates that the server project is locked in the local session. This means that you cannot check in any local session changes.

Table 2-2: Server status legend

Symbol	Meaning
	**Server status "connected"** This icon indicates that the associated project server is available.
	**Server status "locked"** This symbol indicates that the associated project server is currently being used by a user and is therefore currently locked.
	**Server status "not connected"** This icon indicates that the associated project server is not connected.
	**Server status "Work Offline"** This symbol indicates that there is no connection to the project server because you have activated the "Work Offline" function.
	This overlay symbol indicates that a newer version of the server project is available on the project server.

2.5.2 Close Server Project view

To close the server project view, click the Open/close server project view icon in the multi-user toolbar again.

Click "Yes" in the following dialog to save your changes.

The server project view is then closed. The  icon (see Table 2-2) in the multi-user function bar indicates that the server is free again.

To display the new block in the local sessions, refresh the local session (see 2.3.6).

2.6 Manage history for projects and revisions

2.6.1 History display

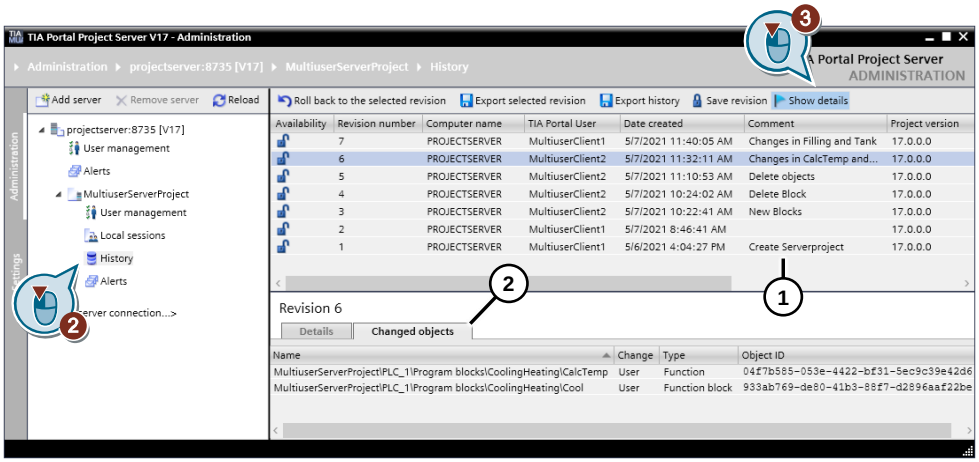
You can use the Administration Tool to display the history of the created projects.

Follow the steps below:

1. Click on "TIA Project-Server V17 - Administration" in the Start menu to launch the administration tool.
2. Click on "History" on the left below the desired multi-user server project. The project history with the saved project revisions (versions) is displayed.
3. Click on the "Show details" button.

The history shows, for example, the check-in comment (1). In the "Changed objects" tab (2) you can see all changed objects for the selected revision.

Figure 2-32 TIA Project-Server - Administration



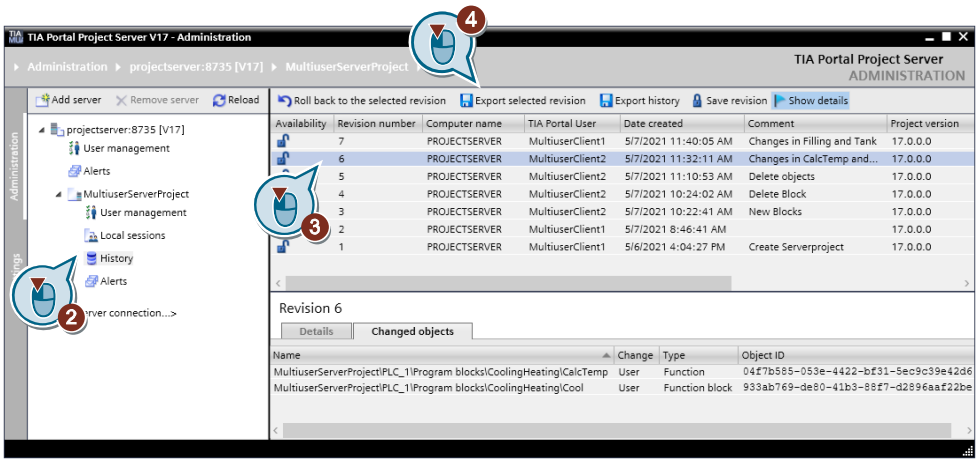
2.6.2 Export server project as single-user project

You can use the Administration Tool to export a revision as a single-user project.

Follow the steps below:

1. Click on "TIA Project-Server V17 - Administration" in the Start menu to launch the administration tool.
2. Click on "History" on the left below the desired multi-user server project. The project history with the saved project revisions (versions) is displayed.
3. Select the revision that you want to export as a single-user project.
4. Click the "Export selected revision" button.

Figure 2-33 TIA Project-Server - Administration



5. In the following dialog, select the desired storage path and click on "OK".

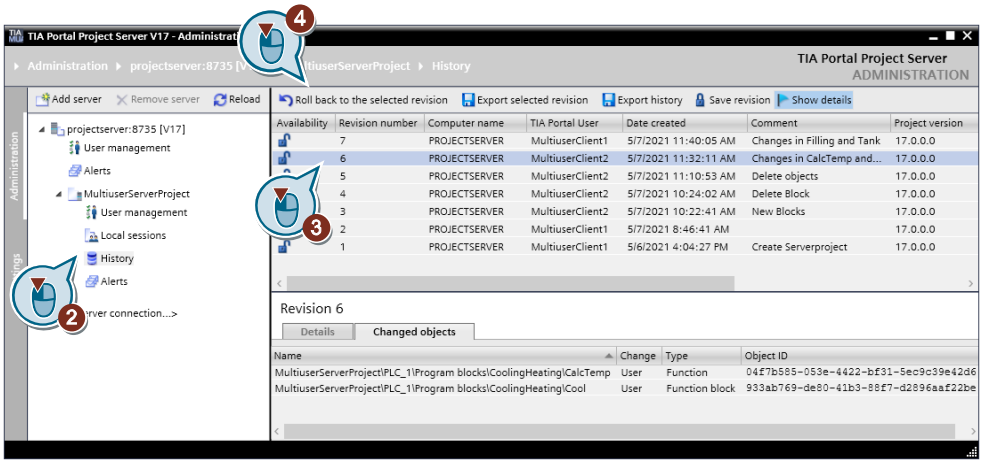
2.6.3 Roll back session to selected revision

With the Administration Tool you can roll back a selected session to the selected revision (version).

Follow the steps below:

1. Click on "TIA Project-Server V17 - Administration" in the Start menu to launch the administration tool.
2. Click on "History" on the left below the desired multi-user server project. The project history with the saved project revisions (versions) is displayed.
3. Select the revision to which you want to roll back.
4. Click the "Roll back to the selected revision" button.

Figure 2-34: TIA Project-Server - Administration



A new line will be created to display the new revision.

Note

How many revisions are available as "rollback" is already set when configuring the project server. The number of revisions is unlimited.

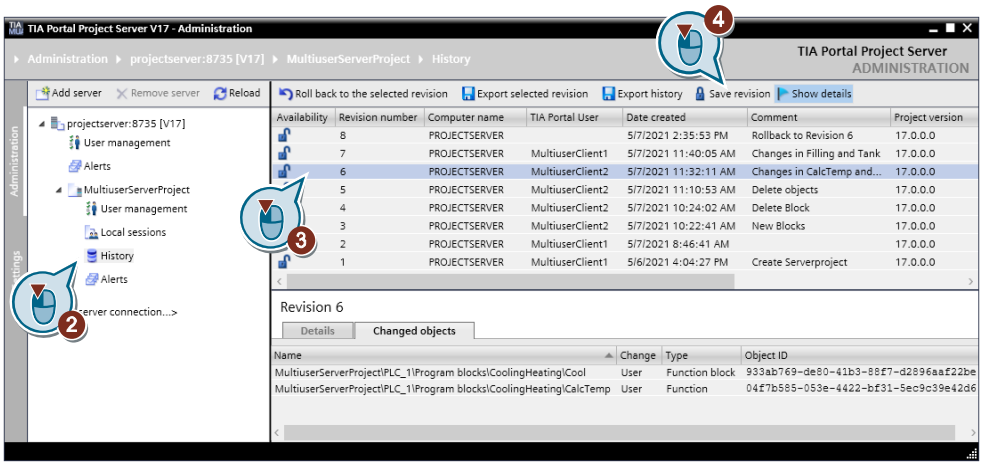
2.6.4 Save revision

To prevent revisions from being deleted automatically, you can save revisions worth preserving.

Follow the steps below:

1. Click on "TIA Project-Server V17 - Administration" in the Start menu to launch the administration tool.
2. Click on "History" on the left below the desired multi-user server project. The project history with the saved project revisions (versions) is displayed.
3. Select the revision you want to save.
4. Click the "Save revision" button.
5. If desired, enter a comment for the revision and confirm the prompt for saving the selected revision.

Figure 2-35: TIA Project-Server - Administration



The "Availability" column then displays a closed lock as an icon.

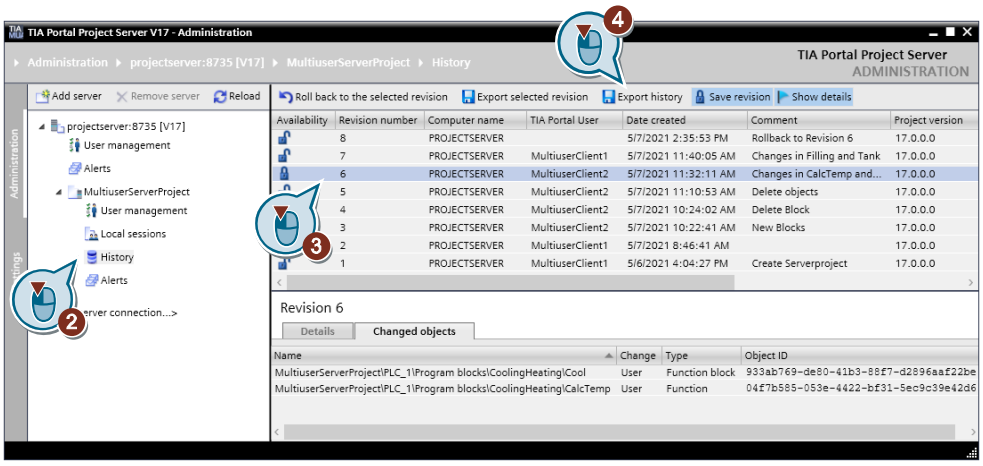
2.6.5 Export of the project history

You can export the project history to XML for further evaluations.

Follow the steps below:

1. Click on "TIA Project-Server V17 - Administration" in the Start menu to launch the administration tool.
2. Click on "History" on the left below the desired multi-user server project. The project history with the saved project revisions (versions) is displayed.
3. Select the desired revisions.
4. Click on the "Export history" button.

Figure 2-36: TIA Project-Server - Administration



5. Select the desired storage path in the following dialog and click on "Save" to save the desired history entries in XML format.

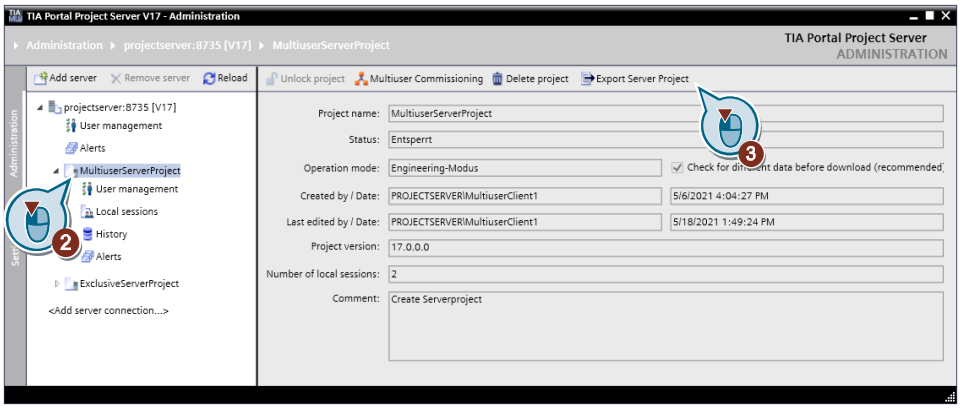
2.7 Migrate server projects from server A to server B

If you use your own project server, for example when commissioning, then you can migrate the server projects to this commissioning server. The PG/PC of a user can in that case be used as a temporary project server. Before you migrate the server project, all changes in the local sessions must be checked into the server project.

Proceed as follows to migrate a server project:

1. Click on "TIA Project-Server V17 - Administration" in the Start menu to launch the administration tool.
2. Select the server project you wish to migrate.
3. Click "Export Server Project".

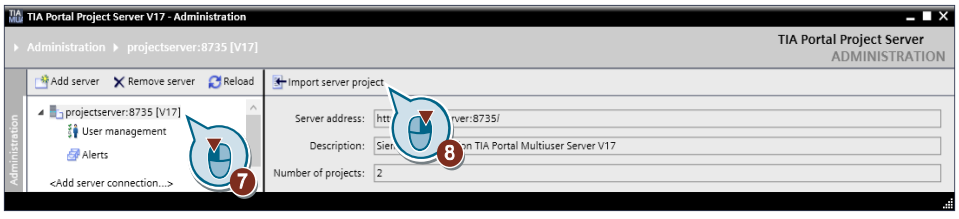
Figure 2-37: TIA Project-Server - Administration



4. In the subsequent dialog, select the save location for the export and click "OK".

   The server project and all its contents have been exported to the save location.
5. Switch to your new project server. If you have no access to the export files with your new project server, copy them there.
6. Click on "TIA Project-Server V17 - Administration" in the Start menu to launch the administration tool.
7. Select the new project server.
8. Click "Import Server Project".

Figure 2-38: TIA Project-Server - Administration



9. In the subsequent dialog, select the save location for the exported server project and click "OK".

   The server project will be opened and displayed with all its contents.
10. Delete the server project on the original project server so that nobody continues to work on it by mistake.

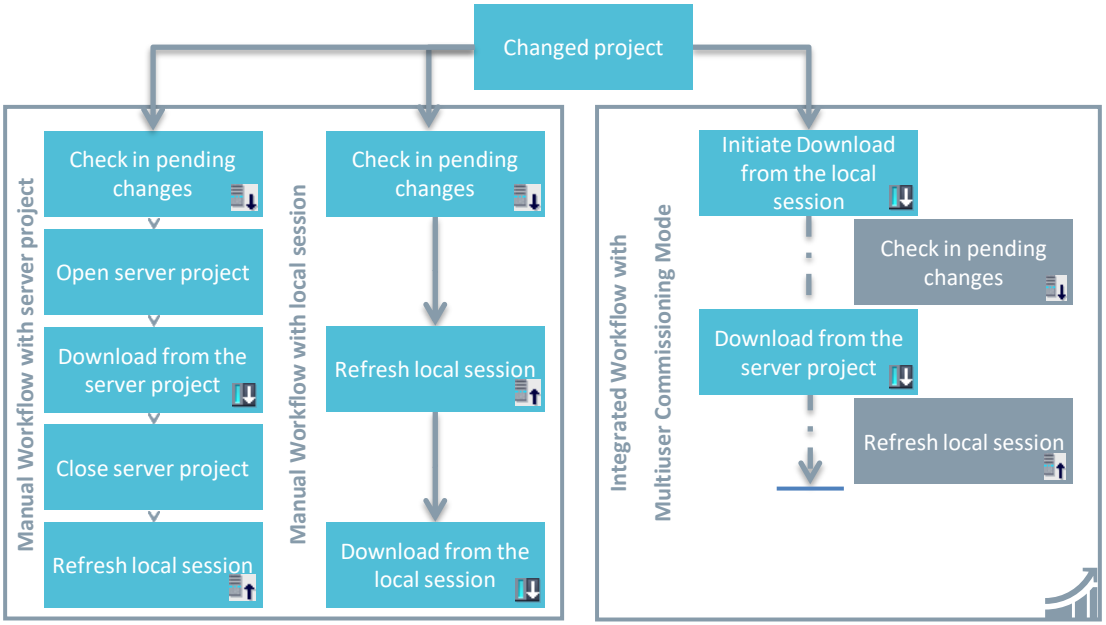
3 Joint commissioning in a team

The joint commissioning in the team can be carried out with or without multi-user commissioning. In order to ensure consistency between the server project and the PLC, we recommend commissioning with multi-user commissioning. Without multi-user commissioning, the agents themselves must ensure consistency between the server project and the PLC.

By loading a project status that is always synchronized both in the server project and on the PLC and is therefore consistent, fewer errors are passed on to other editors.

The following figure on the left shows the manual workflow for downloading the server project and with the local session. On the right side the workflow with Multiuser Commissioning is shown. Here only the download has to be started in the local session. All further steps are performed automatically.

Figure 3-1: Workflow for manual Download <> Download with Commissioning Mode

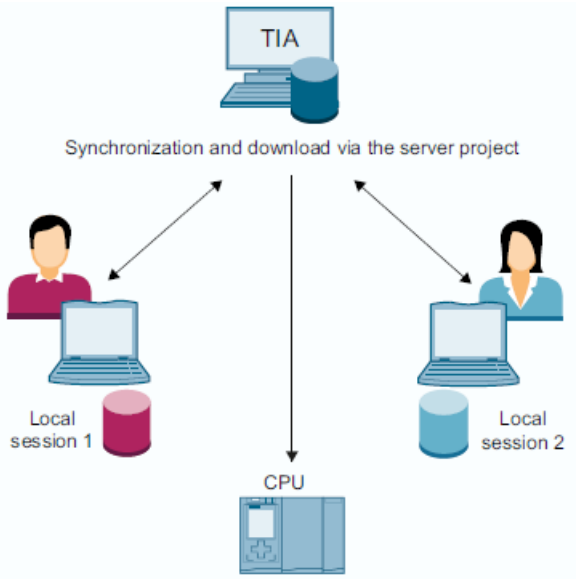


3.1 Commissioning with Multiuser Commissioning

In commissioning mode, the changes are automatically checked into the server project when loading into the PLC from the local session, compiled and loaded from there into the device.

The following figure shows the synchronization and loading via the server project.

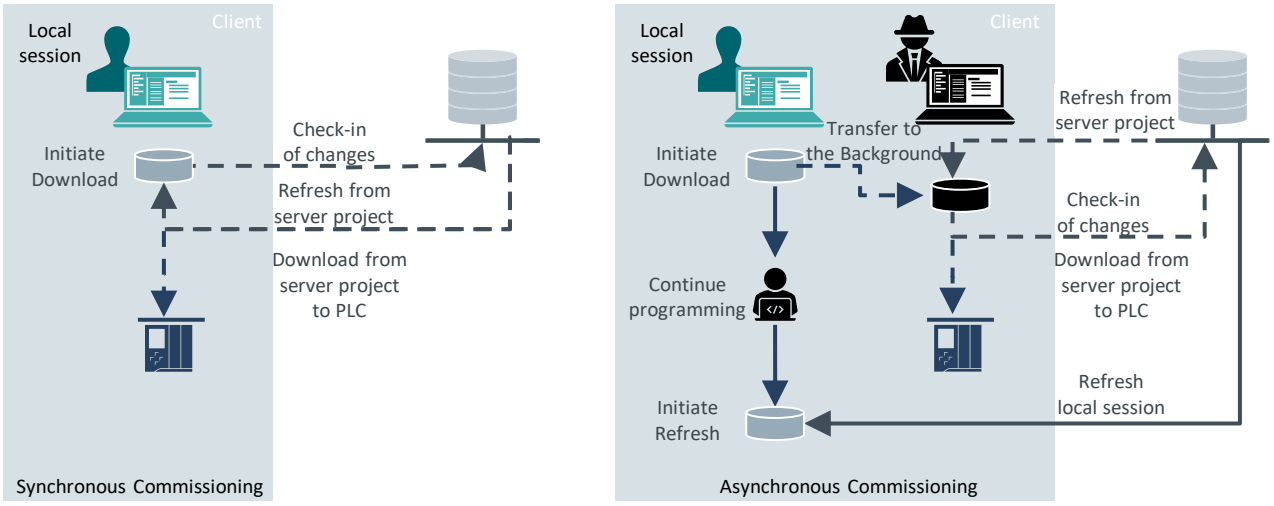
Figure 3-2: Synchronizing and loading via the server project



With TIA Portal V16 or later, you have access to Multiuser Commissioning in "synchronous mode" and in "asynchronous mode".

The following figure shows a comparison of the workflows in the two modes.

Figure 3-3: Workflow in synchronous mode <> in asynchronous mode



3.1.1 Synchronous mode

In synchronous mode, start the download to device and the download will be performed automatically. The local session will be automatically refreshed after downloading. You cannot continue your work in TIA Portal during the download process. Synchronous mode offers maximum synchronicity of data between local session, server project and PLC.

3.1.2 Asynchronous mode

In asynchronous mode, downloading to device is performed in the background by a second instance of TIA Portal.

- This significantly reduces the times for downloading to device in asynchronous mode.
- The local session is ready for editing again immediately after transferring the download.
- As a user, you will only receive a notification when decisions and actions are needed for downloading to the device. If no user decisions are needed, the download to device will run asynchronously in the background.
- If errors occur during compilation or downloading and user decisions are needed, you will be notified in the Multiuser Commissioning editor.

Tips for working in asynchronous mode

- If you use other logon information for the project server than you do for your Windows logon, you must add the logon information for the project server to the Windows Credential Manager. Refer to chapter 4.4, Credential Manager, for the procedure.

  Program modifications which require a safety password can be loaded in synchronous mode or in asynchronous mode. For loading in asynchronous mode, you will need a configured user administration (UMAC) with the permission "Edit safety-related project data" for the safety project.
  For additional information on user administration, refer to the manual "SIMATIC STEP 7 Basic/Professional V17 and SIMATIC WinCC V17" in the chapter entitled "Managing users and roles" at the following link:
  https://support.industry.siemens.com/cs/ww/en/view/109798671/143165332491

  Refer to the following link for a description of the "Edit safety-related project data" permission:
  https://support.industry.siemens.com/cs/ww/en/view/109798671/142143616267
- Your local session will **not** be automatically refreshed after loading. Remember to refresh for local session at regular intervals in order to apply changes on the server project from other agents to your local session.
- When working in asynchronous mode, renaming objects must only be performed in the Server Project view, otherwise the asynchronous download will be terminated.

3.1.3 Requirements

As of TIA Portal V15.1, you can commission your project together as a team with Multiuser Commissioning. In order to use multi-user commissioning, the following prerequisites apply:

1. All changes to the local sessions are checked in to the multi-user server project.
2. All local sessions are updated.
3. All selections in the local sessions have been removed.
4. The multi-user server project was loaded into the PLC (see 3.1.4).
5. The "Multiuser Commissioning" mode has been enabled in the "TIA Project-Server V17 - Administration" tool (see 3.1.5).

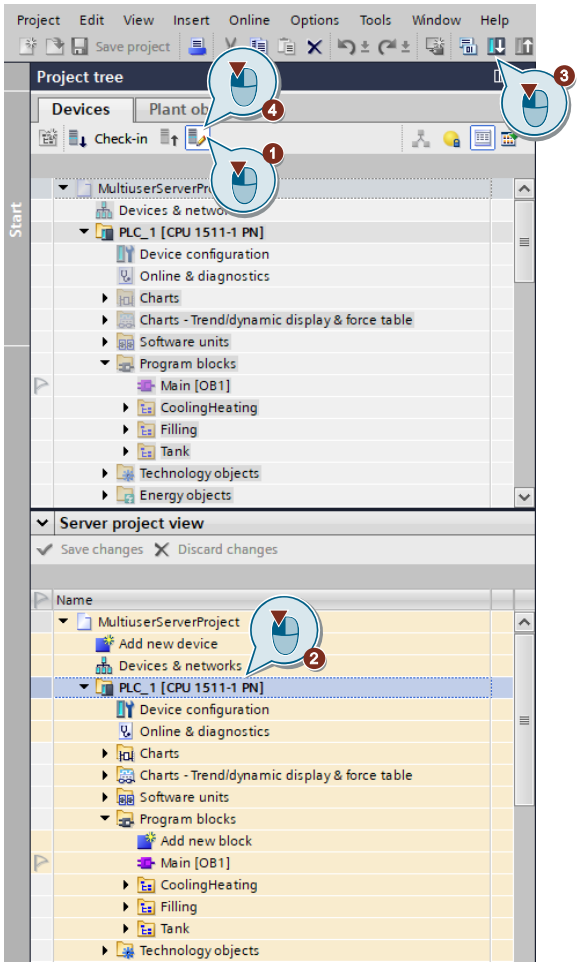
3.1.4 Load multi-user server project

Before multi-user commissioning can be used, the updated multi-user server project must be loaded into the PLC.

To load the server project from your local session, proceed as follows:

1. Open the Server Project View by clicking the Open/Close Server Project View button.
2. In the server project view, select the PLC you want to load.
3. Click the "Download to device" button.
4. Exit the server project view by clicking the "Open/close server project view" button again.

Figure 3-4: TIA Portal server project view



Note

If the server project is open, a download from the local sessions is not possible. The server status is displayed as locked in the local session.

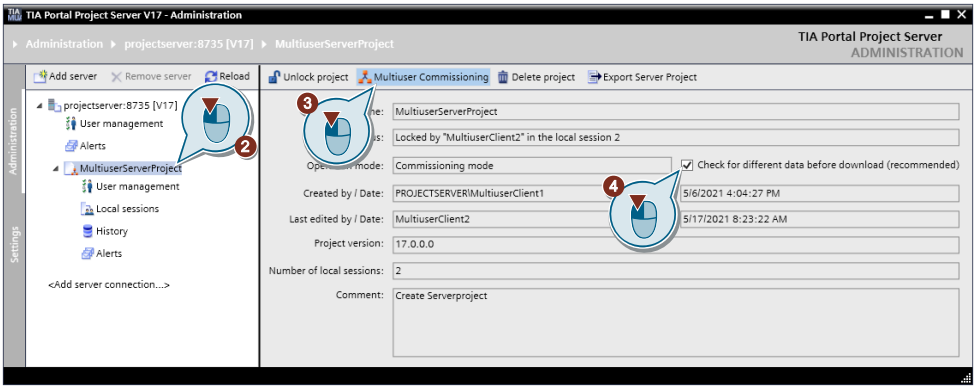
3.1.5 Enable and disable Multiuser Commissioning

The Multiuser Commissioning function is enabled and disabled with the graphical tool "TIA Project-Server V17 - Administration".

Follow the steps below:

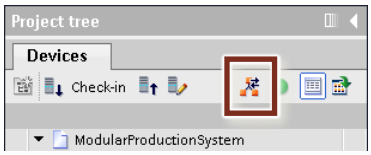
1. Click on "TIA Project-Server V17 - Administration" in the Start menu to launch the administration tool.
2. Select the server and the project you want to start.
3. Click on the "Multiuser Commissioning" button to activate or deactivate the commissioning mode.
   The commissioning mode is activated when the button is highlighted in blue.
4. The option "Check for different data before download (recommended)" is automatically activated. This option should only be deactivated when using SIMATIC S7-300 / S7-400 CPUs.

Figure 3-5: TIA Project-Server - Administration



If the "Multiuser Commissioning" mode is activated, this is indicated by the corresponding icon (see Figure 3-6) in all local sessions.
If the "Multiuser Commissioning" mode is deactivated, the icon is displayed in grey.

Figure 3-6: Local session project tree

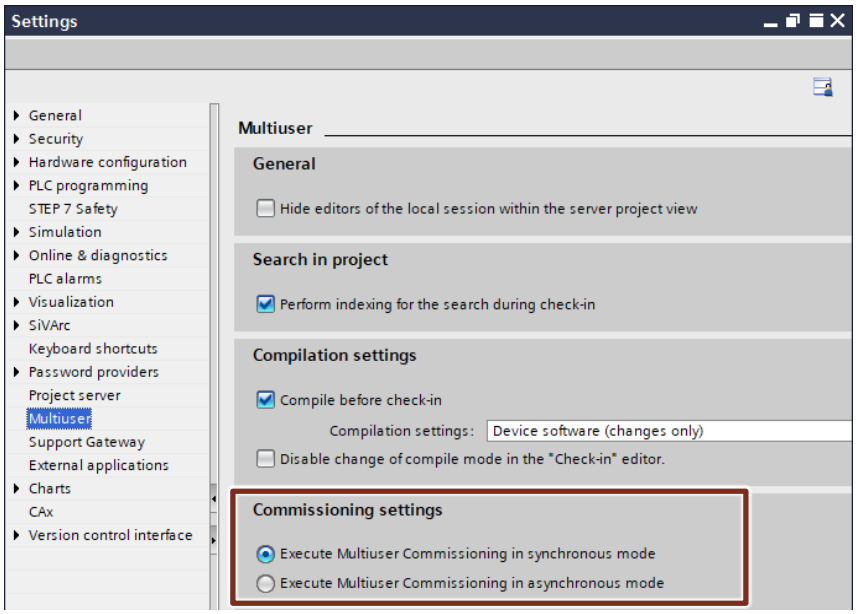


3.1.6 Change commissioning mode in TIA Portal

Default setting in TIA Portal

In TIA Portal, you can switch between "synchronous mode" and "asynchronous mode" with "Options > Settings > Multiuser > Commissioning settings". When opening a local session, the commissioning mode set here will be applied.

Figure 3-7: Commissioning settings



Changeover in current session

For the current session, you can also change modes with the button in the project tree. However, this change will only stay active until the session is closed again. If you reopen the local session, the default setting from TIA Portal will apply.

The color of the button will tell you which commissioning mode is active. "Synchronous mode" appears in orange while "asynchronous mode" appears in blue.

Figure 3-8: Mode change in the project tree

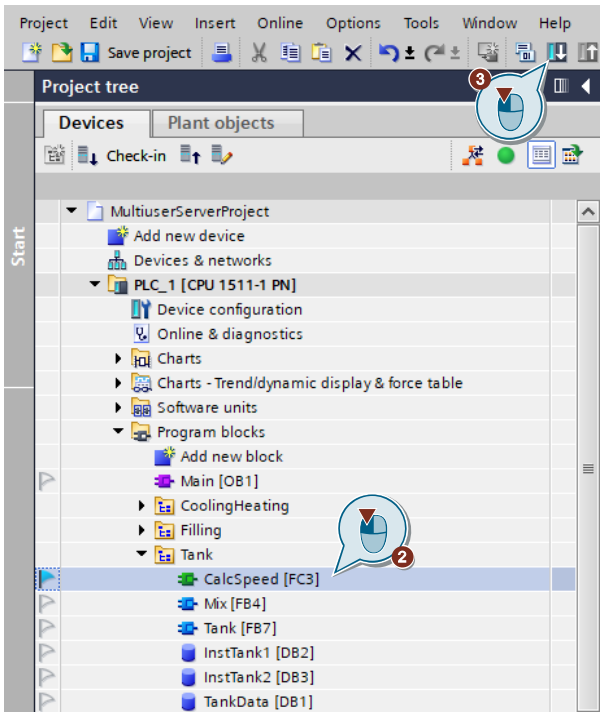
3.1.7 Working with local sessions

The distribution of tasks among the editors and the local sessions can be retained from Multiuser Engineering. You continue to work in the local session in commissioning mode as usual.

To put the programs and changes into operation in your local session, proceed as follows:

1. Compile your changes.
2. In the local session, select the changes that you want to load.
3. Click the "Download to device" button.
   Confirm the download in the following dialog.

Figure 3-9: Load program into PLC



When loading into the PLC, the changes are automatically checked into the server project.

After each download, a new revision is created on the project server.

Note

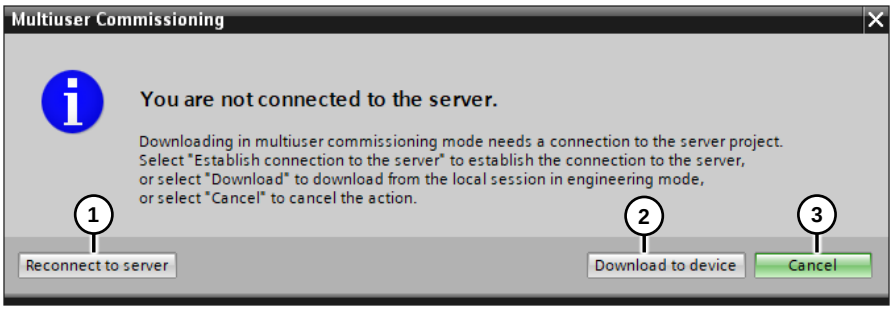
This procedure automatically ensures consistency between the server project and the PLC.

In contrast to the manual workflow, the download in commissioning mode performs better while also maintaining consistency.

Project server not reachable during download

If the project server cannot be reached when loading into the PLC, the following dialog will appear:

Figure 3-10: Dialog: Project server not reachable during download



The dialog offers the following options:

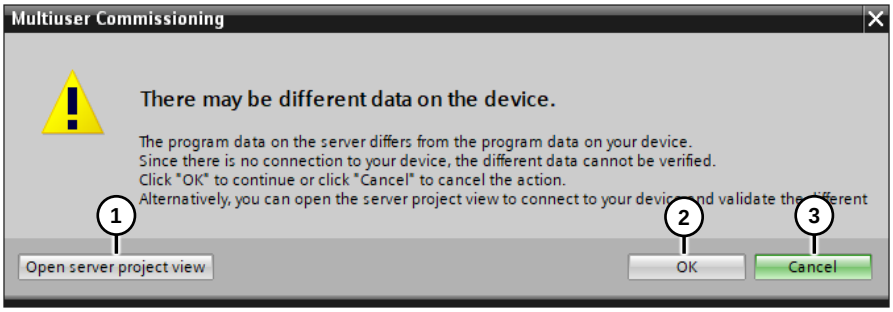
1. You can attempt to reconnect to the server with the "Reconnect to server" button.
2. You can download the program from the local session to the PLC with the "Download to device" button. The server project is not updated.

   Once the connection to the project server has been restored, you can check in your changes to the server project.
3. Use the Cancel button to cancel the action.

PLC not reachable during loading

The following dialog will appear if the PLC cannot be reached while downloading:

Figure 3-11: Dialog: PLC not reachable during loading



The dialog offers the following options:

1. With the button "Open server project view" you can try to establish the connection to the PLC via the server project.
2. You can continue with the "OK" button. If no connection can still be established, a corresponding message is issued.
   The Server Project view opens. The server project is not updated.
3. Use the Cancel button to cancel the action.

3.1.8 General rules

Working in a team with multi-user commissioning is basically subject to the same rules as engineering. You should also note the following points:

- Compile your changes before loading. If errors occur during compiling, correct them beforehand.
- Avoid uploading from the PLC. An upload from the PLC should only be carried out if changes are lost and only in the server project.

3.2 Commissioning without Multiuser Commissioning

Joint commissioning in a team is also possible without multi-user commissioning.

3.2.1 Download about Server Project

To download changes in the local session into the PLC via the server project, proceed as follows:

1. Check your changes into the server project (see 2.3.5).
2. Open the server project view (see 2.5.1).
3. Download the server project to the PLC (see 3.1.4).
4. Close the server project view (see 2.5.2).
5. Refresh the local session (see 2.3.6).

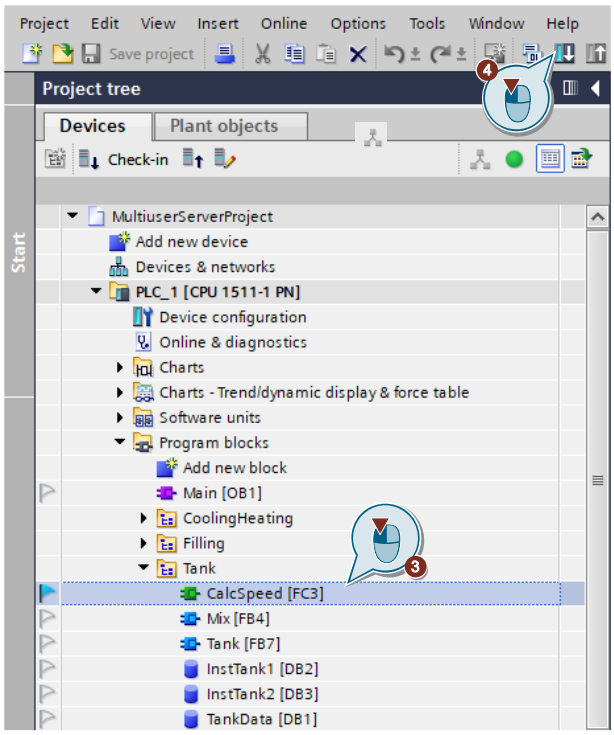
Note In the server project view only one user can work at a time. The server project is locked for all other users.

3.2.2 Download via local session

To download changes in the local session directly into the PLC, proceed as follows:

1. Check your changes into the server project (see 2.3.5).
2. Refresh the local session (see 2.3.6).
3. In the local session, select the changes that you want to load.
4. Click the "Download to device" button.
   Confirm the download in the following dialog.

Figure 3-12: Load program into PLC



Note

This procedure is only recommended if you work alone in the project and therefore do not have to pay attention to consistency. This means that you can load your project directly from the local session into the PLC without first updating the server project.

Another exception to this procedure is when there are several PLCs in the project and each operator is working on only one PLC.

If several editors are working on the project on one PLC, this procedure is not recommended because the consistency between the server project and the PLC is not automatically ensured. There is also the danger that when loading changes from the local session to the PLC, the changes of other users are overwritten.

4 Useful information

4.1 Multiuser and Project Server function overview

The following table is an overview of the functions of Multiuser and Project Server in the various versions. The functions listed are available in the specified version onward.

Table 4-1

	V14	V15	V15.1	V16	V17
Auto-Marking	✕	✔	✔	✔	✔
Advanced Checkin Functions	✕	✔	✔	✔	✔
Change log & history	✕	✔	✔	✔	✔
Commissioning	✕	✕	✔	✔	✔
Async. Commissioning	✕	✕	✕	✔	✔
Exclusive Engineering	✕	✕	✕	✔	✔
Safety and Protected PLC download support for Async. Commissioning	✕	✕	✕	✕	✔
Openness Support & API for Multiuser functions	✕	✕	✕	✕	✔

4.2 Alternative solutions: "Command line tools"

Chapters 2.2.4 and 2.2.5 describe the configuration and administration of the project server with graphical tools. The project server can also be configured and managed with the command line tools Multiuser Administrative Tools and Multiuser Power Tools. You need administrator rights to use the tools.

4.2.1 Configure project server with "musrv" Administrative Tools

Proceed as follows to configure the project server with the administrative tool:

1. In Windows Explorer, navigate to the installation directory of the project server (default: "C:\Program Files\Siemens\Automation\Multiuser Server V17") and open the folder "Bin".
2. Double-click on the file "start-musrv.bat" to open the administrative tool.
3. Enter the desired command with the parameters into the command line and confirm the entry with the "Return" key.

   Example of input using the "Install" command:

```
musrv install -r c:\ServerProjects -p 8735 -b https -h
<certificatehash>
```

Note

Further information and an overview of the possible commands and their parameters can be found in the TIA Portal V17 online help or in the system manual "SIMATIC STEP 7 Basic/Professional V17 and SIMATIC WinCC V17":

https://support.industry.siemens.com/cs/ww/en/view/109798671

4.2.2 Manage project server with "mupt" power tools

Proceed as follows to manage the project server with this power tool:

1. In Windows Explorer, navigate to the installation directory of the project server (default: "C:\Program Files\Siemens\Automation\Multiuser Server V17") and open the folder "Bin".
2. Double-click on the file "start-mupt.bat" to open the power tool.
3. Enter the desired command with the parameters into the command line and confirm the entry with the "Return" key.

   Example for the input with the command "Display project":

```
mupt project show -s https://projectserver:8735/
```

Note

Further information and an overview of the possible commands and their parameters can be found in the TIA Portal V17 online help or in the system manual "SIMATIC STEP 7 Basic/Professional V17 and SIMATIC WinCC V17":

https://support.industry.siemens.com/cs/ww/en/view/109798671

4.3 Backup concept

So far, the current project state is usually only stored on the PG/PC of the individual programmer. With TIA Portal Multiuser, the project state is also backed up centrally on the project server.

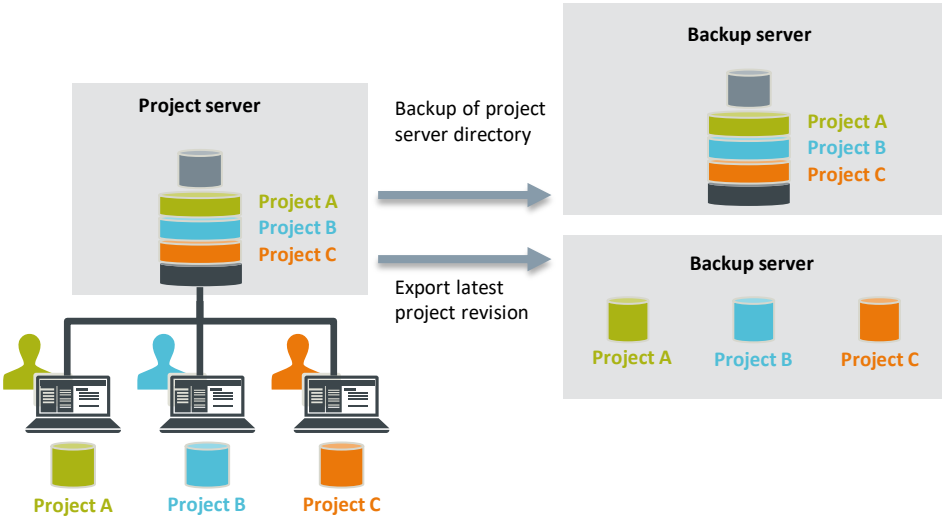
With the project history on the project server, project states can also be backed up and restored.

Thanks to central project storage on the project server, a backup of the entire project server directory on one backup server is possible. The directory can also be backed up automatically using Windows functions. The project server can be restored by copying the directory contents from the backup server.

However, you can also export single project revisions as single-user projects (see 2.3.7), specifying the backup server as the target directory. The export can also be automated with the Multiuser Power Tools (command line tool). In order to restore the multi-user functionality of the exported project, a multi-user project must first be created.

The following figure shows an overview of how you can back up your projects.

Figure 4-1: Overview of project backups



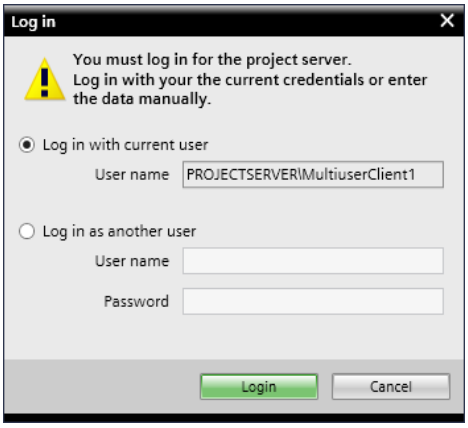
4.4 Credential Manager

Login credentials are required if you want to connect to a project server.

If your current Windows user is a domain user with the required access rights, you can connect to the project server without entering your credentials.

In other cases, you will need to enter your credentials each time you restart TIA Portal and connect to a project server.

Figure 4-2

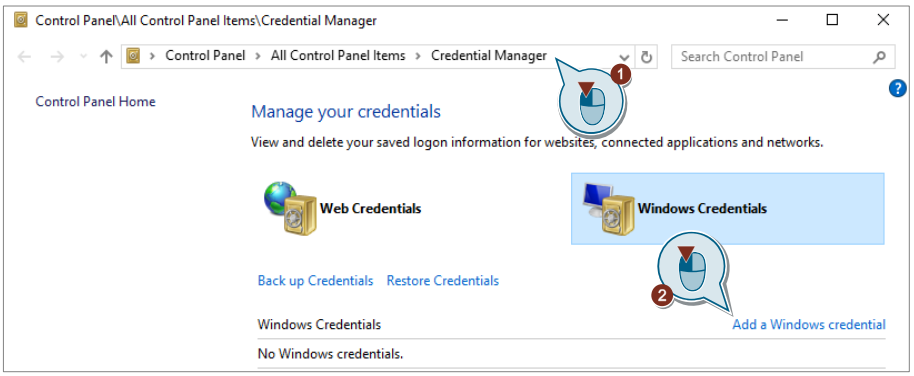


You can save your credentials in the Windows Credential Manager so that you don't have to enter them each time.

Follow the steps below:

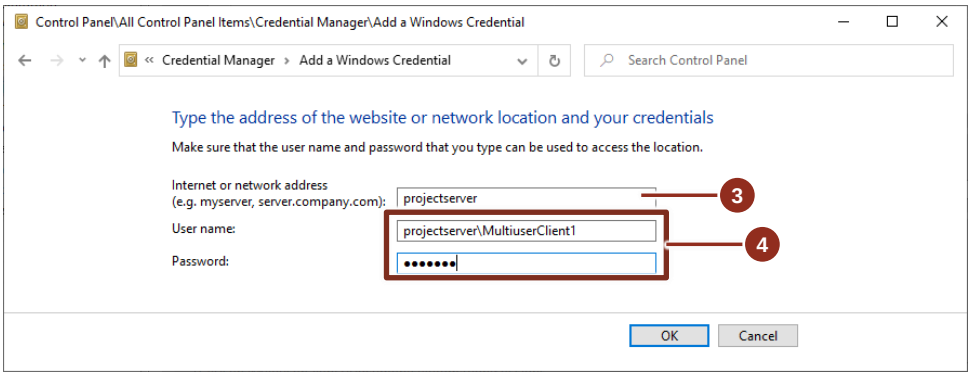
1. Open the Credential Manager "Control Panel > All Control Panel Items > Credential Manager".
2. Click "Add a Windows credential".

   Figure 4-3



3. Enter the required project server address. You can find this in your TIA Portal settings, for example: "Options > Settings > Project server > Connection".
4. Enter the login information and confirm your entries with "OK".

   Figure 4-4



5. Repeat steps 2 to 4 for additional project servers.

4.5 Improving performance

The following settings are available to increase performance when loading the program, refreshing the server, and creating local sessions with Multiuser.

1. Project server network profiles and compression (Network profiles)
2. Search in project

4.5.1 Multiuser network profiles and compression

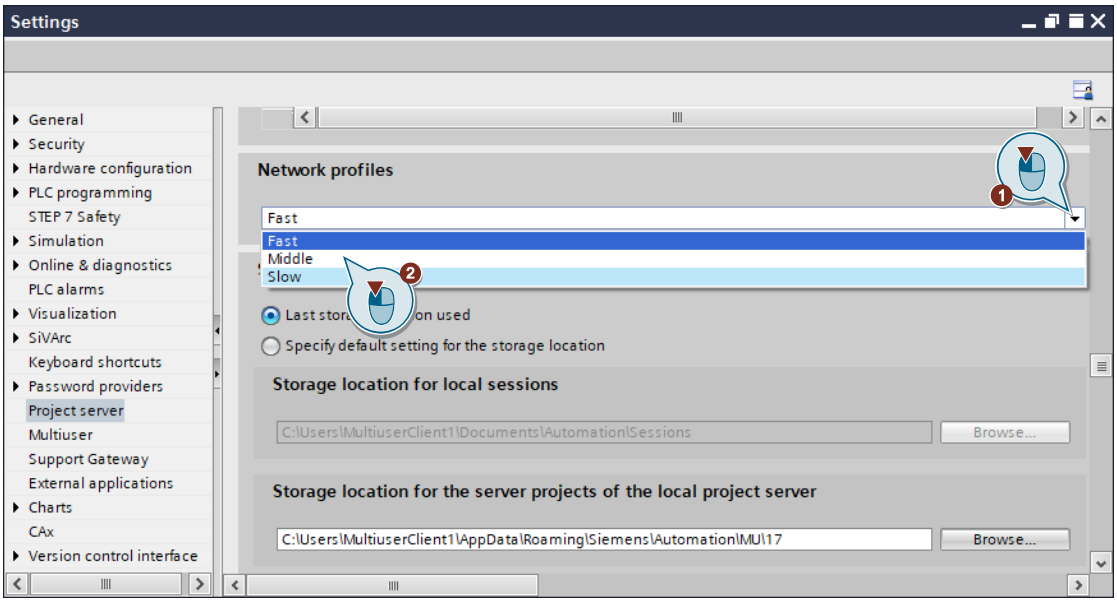
Depending on the performance of your own network, you can choose between three different network profiles ("Fast", "Medium", "Slow"). For the network profiles ("Medium" and "Slow"), compression for data transmission is activated. The following applies to the selection:

- Fast: Network >= 1 Gbit / s
- Medium, slow: Network < 1 Gbit / s

In most cases the network profile "Medium" can be used.

You will find this setting in TIA Portal under "Options > Settings > Project server > Network profiles".

Figure 4-5: Project server settings



Note

Multiuser network profiles and compression can only be set with TIA Portal Multiuser Engineering V15.1 onwards.

The change of network profile only becomes effective after a restart of the Multiuser client or the project server.

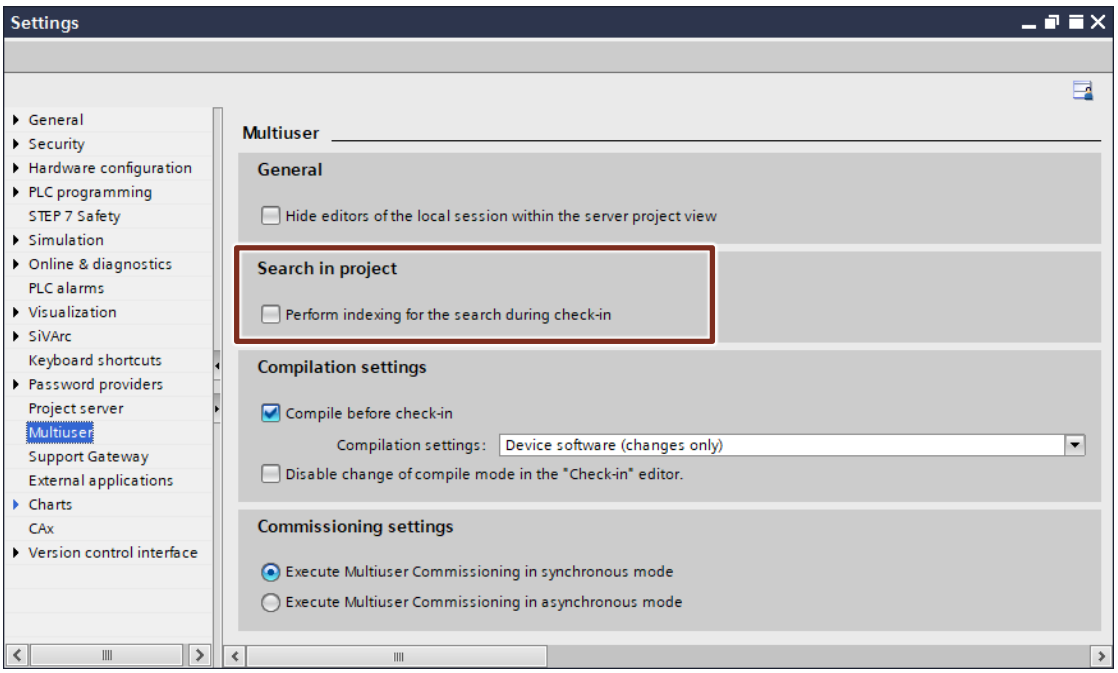
4.5.2 Search in project

Disable the "Perform indexing for the search during check-in" option to improve check-in and update times.

If you deactivate this option, indexing is not performed during check-in, but rather at other times.

You can find this setting in TIA Portal under "Options > Settings > Multiuser > Search in project".

Figure 4-6: Multiuser settings



4.6 Comparison of the local session with the server project

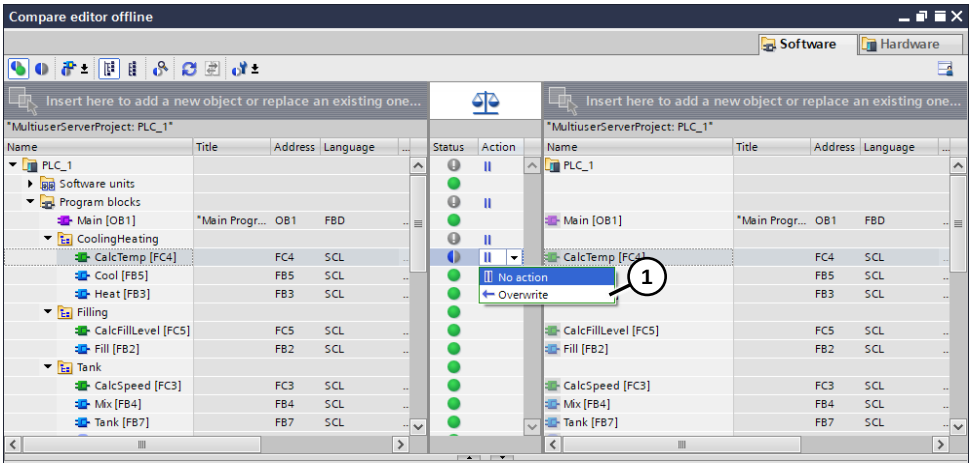
For example, to display differences in a module in detail, you can compare your local session with the server project offline in the TIA Portal.

To perform an offline/offline comparison, proceed as follows:

1. Open the server project view (see 2.5.1).
2. Select the PLC in the server project.
3. Right-click to open the context menu.
4. Select "Compare > Offline/Offline".

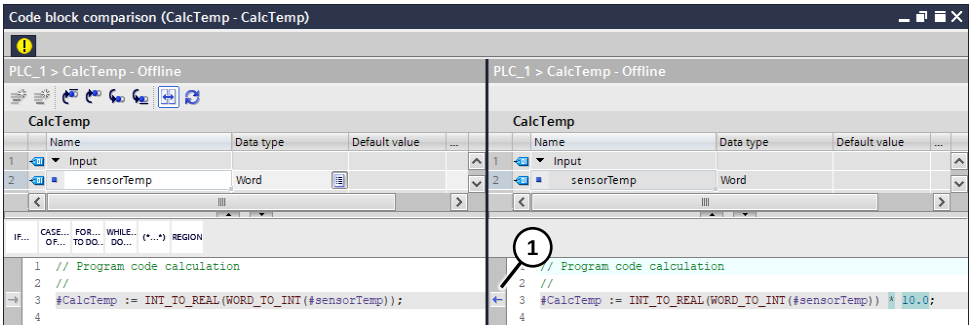
   → The compare editor will open and the PLC will appear in the left pane.
5. Drag the PLC from your local session to the drop area on the right. →. An automatic comparison is performed and the differences will be displayed. With the action "Overwrite" (1) you can transfer the block from the local session into the server project. However, this causes a conflict (red flag) in the local session.

   Figure 4-7



6. Double-click on the block and both blocks will open next to each other. Here you can use the arrow (1) to copy individual sections to the left into the block of the server project. This will also cause a conflict (red flag) in the local session.

   Figure 4-8



5 Appendix

5.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

support.industry.siemens.com

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts. Please send queries to Technical Support via Web form:

siemens.com/SupportRequest

SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

siemens.com/sitrain

Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android:

support.industry.siemens.com/cs/ww/en/sc/2067

5.2 Industry Mall

The Siemens Industry Mall is the platform on which the entire siemens Industry product portfolio is accessible. From the selection of products to the order and the delivery tracking, the Industry Mall enables the complete purchasing processing – directly and independently of time and location:
mall.industry.siemens.com

5.3 Links and literature

Table 5-1

No.	Subject
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the article https://support.industry.siemens.com/cs/ww/en/view/109740141
\3\	SIMATIC STEP 7 Basic/Professional V17 and SIMATIC WinCC V17 system manual https://support.industry.siemens.com/cs/ww/en/view/109798671
\4\	FAQ: Startdrive in TIA Portal V17 with Option Multiuser Engineering https://support.industry.siemens.com/cs/ww/en/view/109755940
\5\	FAQ: In TIA Portal V14 why can you not establish a connection to the Multiuser server? https://support.industry.siemens.com/cs/ww/en/view/109741420

5.4 Change documentation

Table 5-2

Version	Date	Modification
V1.1	02/2017	First version
V1.2	08/2017	Information about Multiuser license added
V1.3	06/2018	Update to TIA Portal Multiuser Engineering V15
V1.4	06/2019	Update to TIA Portal Multiuser Engineering V15.1
V1.5	09/2021	Update to TIA Portal Multiuser Engineering V17
V1.6	02/2023	Name harmonization