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SIMATIC PCS 7
Minimal Configurations

SIMATIC PCS 7 V9.0

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Foreword

Aim of this document

Typical PCS 7 systems have at least one ES (Engineering Station) on the PC side, one or more possibly redundant servers and several OS clients (Operator Stations). In addition to the maximum availability of process control and data acquisition, there is also the possibility of integrating program adjustments or expansions in the foreground, quickly and without affecting the current process.

In contrast, small systems or stand-alone units often require very little maintenance after commissioning. To achieve high efficiency, there exists the requirement to get along with as few PC stations as possible. It therefore makes sense to utilize the rarely used ES as an OS in process mode.

This document is intended to help you in choosing a suitable PC set-up for small systems. It compares various minimal configurations (up to a maximum of three PCs) in terms of their functionality. Since the corresponding PCS 7 configuration is not the main focus of the system documentation, here you can also find the necessary activities for installation in the form of detailed step instructions.

Core contents

The main focus is on the following:

- Configuration comparison regarding functionality
- Activities for configuration, activation, and maintenance of different configurations

Table of Contents

1 Overview of Minimal Configurations

There are various possible options when utilizing the engineering station in process mode as an operator station or multiple operator stations with as few PCs as possible. The following versions were selected according to their feasibility and usefulness in the context of PCS 7.

The configurations shown here also include descriptions of solutions with configurations that do not differ significantly from each other.

In general, particular functionality criteria must be considered when using the engineering PC as an OS, because the OS project must be closed when performing certain activities. This will also be discussed in more detail below.

1.1 ES/OS Single Station

The smallest of all configurations only needs one PC station.

Process mode/functionality

Since version 6.1 of PCS 7, it has also been possible to compile the OS project when runtime is activated (change compilation). This means that the operator and archiving functions are present permanently.

Note You can find a description of this configuration and a how-to guide in chapter 3 "ES/OS Single Station".

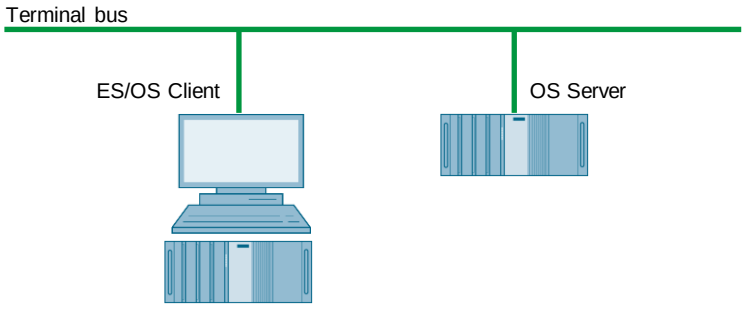
Alternatives/variations

The complete SIMATIC PCS 7 BOX package is also a good alternative. It combines the AS, the OS, and the ES in one compact PC system. As an option, a PROFIBUS or PROFINET interface is integrated in the same way to link to distributed process peripherals.

Note The ES/OS Single Station can also be extended with the functionality of the PCS 7 OS Web Server. You can find a guide to doing this in chapter 7 "Expansion with the PCS 7 OS Web Option".

1.2 ES/OS Client and OS Server

With an additional PC station as an OS server, the ES can be used as an OS client. This accesses the data of the OS server in process mode and visualizes it.



Process mode/functionality

In PCS 7, the OS server can be used for operator functions when no more than four OS clients are connected. In this example, if the server malfunctions, the complete OS functionality fails. Besides this, the OS client must be terminated to make OS project changes at a later stage. However, the OS server keeps on working permanently at compiling/loading of changes.

Note You can find a description of this configuration and a how-to guide in chapter 4 "ES/OS Client and OS Server".

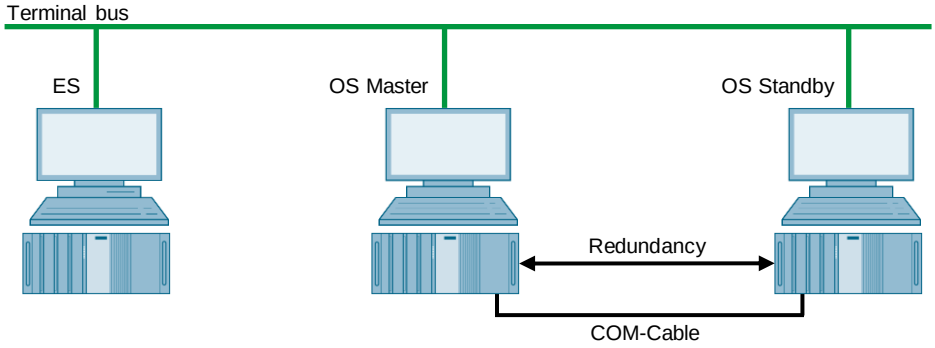
Alternatives/variations

One of the advantages of this configuration is the option of connecting additional clients to the OS server on a relatively simple and inexpensive basis.

1.3 ES, OS Master and OS Standby

You need three PC stations for PCS 7-compliant implementation of OS redundancy.

In this case, the ES only carries out engineering tasks and, while doing this, is only used for testing OS functions.



Process mode/functionality

Since the ES is not involved in process mode, the operator functions of the two OS Single Stations are permanently available. The OS remains active even during complete loading of project changes. Redundancy ensures mutual synchronization both when online and after the failure of one of the two partners.

The COM connection (RS 232 connecting cable) is for optimization of internal server-to-server communication.

Since PCS 7 V7.0, it has been possible, as an alternative to the COM connection, to use a separate Ethernet connection (a free on-board or additional network adapter) for the redundancy connection.

Note You can find a description of this configuration and a how-to guide 5 "ES, OS Master and OS Standby".

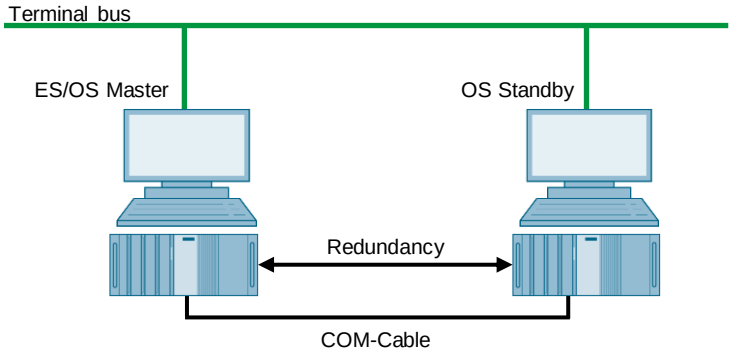
Alternatives/variations

In the case of the low-maintenance systems that this document focuses on, you can often do without a permanently available if it is possible to rent a temporary ES for configuration, commissioning, and project changes.

In this example, it is only conceivable to extend the system using additional OS clients if a server operating system is installed on the OSes.

1.4 ES/OS Master and OS Standby

In this configuration with two redundant OS Single Stations, one of the stations is also used as a simultaneous ES, which obviates the need for a separate third station.



Process mode/functionality

In this example, both PC stations work in process mode as redundant OS single stations that balance each other both in operation and after the failure of one of the two partners. This is also relevant for later OS project changes, which require the Master OS to be exited. In this case, the Standby OS takes over the master role. It keeps on working permanently while compiling/loading changes and updates the redundancy partner after it returns.

The COM connection (RS 232 connecting cable) is used to optimize internal communication between the two OS Single Stations.

Since PCS 7 V7.0, it has been possible, as an alternative to the COM connection, to use a separate Ethernet connection (a free on-board or additional network adapter) for the redundancy connection. For complete loading, you must deactivate OS Runtime and the OS projects on both stations and close them. For this period, no OS functionality is available.

Note

This configuration does not offer all of the PCS 7 functionality, since redundancy is set up using WinCC resources.

In chapter 6 "ES/OS Master and OS Standby“, you can find corresponding limitations in process operation and differences in system behavior together with a description of configuration and a how-to guide.

Alternatives/variations

For PCS 7-compliant implementation of OS redundancy, we recommend using three PC stations. With the changes to the license concept from PCS 7 V8.0 onward, you will need the same number of license packages. The implementation of redundancy with two PC stations is associated with some limitations (see chapter 6.1 "Configuration description") and, compared to PCS 7-compliant implementation with a separate ES and two redundant OS Single Stations (see chapter 1.3 "ES, OS Master and OS Standby“), only saves you one computer (hardware and Windows license).

Note The ES/OS Single Station can also be extended with the functionality of the PCS 7 OS Web Server. You can find a guide to doing this in chapter 7 "Expansion with the PCS 7 OS Web Option".

2 General/optional system settings

The system settings that are relevant to configuration are presented below.

2.1 Bus connection of the PC stations

Plant bus

In the ES and in each server, a network card is used in "Configured mode" for the plant bus. On this network card, only the ISO protocol is enabled for Windows. If a CP1623 is present, it is used for accessing the plant bus. Parameterization is carried out in SIMATIC NetPro and in the HW Config.

Terminal bus

Except for configuration with only one ES/OS Single Station, all of the other PC stations are additionally linked to the terminal bus. When doing this, the necessary second network card of the ES and the server is set here to "PG mode". This card is not configured in SIMATIC NetPro and in the HW Config. PCS7 finds this network access via the computer name or the specified path for the target machine that must be entered in the object properties of the PC station. For this network card, only the TCP/IP protocol (not ISO) is activated in Windows.

Client PC stations are generally fitted with only one network card that is used to connect to the terminal bus. For this network card, only the TCP/IP protocol (not ISO) is activated in Windows.

2.2 Autostarting WinCC

This document contains the step-by-step instructions for opening the OS project on the OS servers and clients for runtime activation in the WinCC Explorer.

This should be usually avoided in the system, since there are generally no configuration licenses (RC licenses) on the OSes. If WinCC Explorer is open for longer than two hours while doing this, WinCC switches to Demo mode and you must close it completely (including runtime) and reopen it for further configuration steps.

To activate runtime automatically when the computer starts without having to open WinCC Explorer, you can configure an automatic start for the project.

In conjunction with SIMATIC NET 2005 Edition (WinCC V6.0 SP3 and above), you should configure the "AutoStartRT" WinCC tool on the "Set configuration console PC station" to configure the WinCC automatic start. You can find more information in the following FAQs:

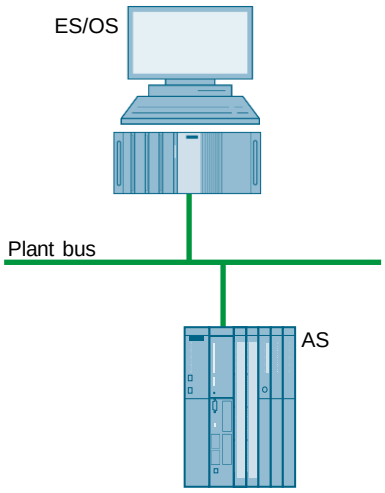
https://support.industry.siemens.com/cs/ww/en/view/23061262

3 ES/OS Single Station

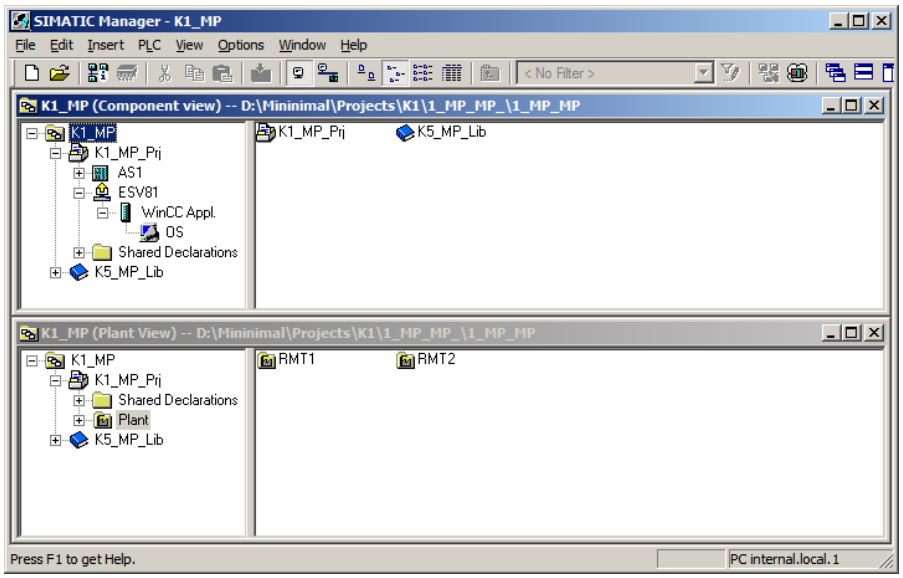
3.1 Configuration description

The Single Station is the smallest possible configuration. The same PC is used for both ES and OS functionality.

Hardware configuration



PCS 7 configuration



3.2 Required hardware and software licensing

Hardware

The following hardware is recommended for this configuration and can be ordered via the Siemens mall. Your selected operating system and the appropriate scope of the SIMATIC PCS 7 system software are preinstalled on the PC station.

Station	Product designation	Operating system	Plant bus transition
1 x ES/OS	SIMATIC PCS 7 ES/OS IPC847D BCE	Windows 7	RJ45 network card
	SIMATIC PCS 7 ES/OS IPC847D IE	Windows 7	CP1623

Software licensing

The following section lists the software/license package that are necessary for this configuration selection.

In the selected configuration as a Single Station, the number of POs is limited to a maximum of 2000.

Component	Software/licence packages
ES/OS	• SIMATIC PCS 7 ES Single Station (incl. 250 AS/OS Runtime POs) • SIMATIC PCS 7 AS runtime license • SIMATIC PCS 7 OS runtime license

3.3 Step-by-step configuration

Note The following instructions have been drawn up based on Windows 7 and PCS 7 V9.0. A CP1623 is used as an example of the plant bus transition. Time synchronization is activated.

3.3.1 ES configuration

Creating the multiproject

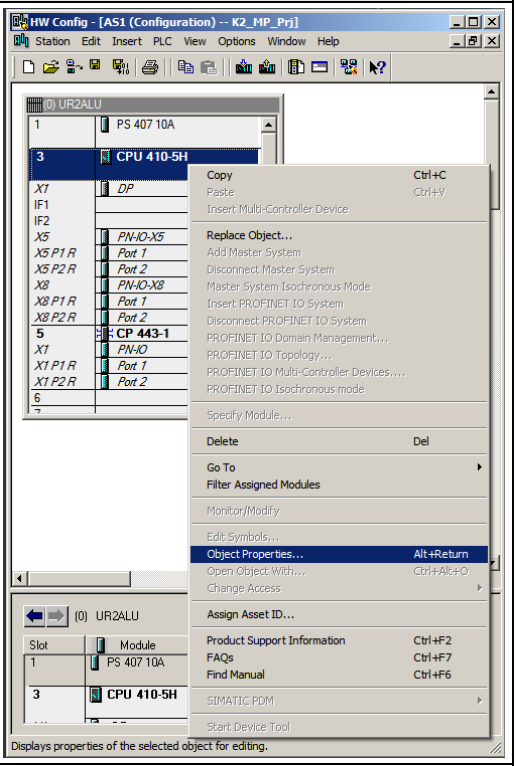
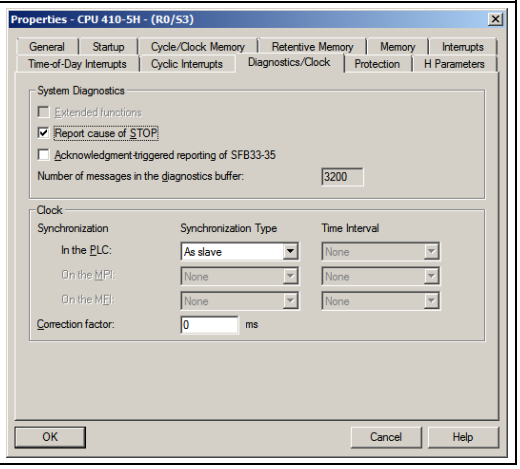
As the basis for the instructions below, the station must be physically networked as shown in the illustration in chapter 3.1. Apart from this, you must create a multiproject on the ES in which the hardware and software of the AS are already configured.

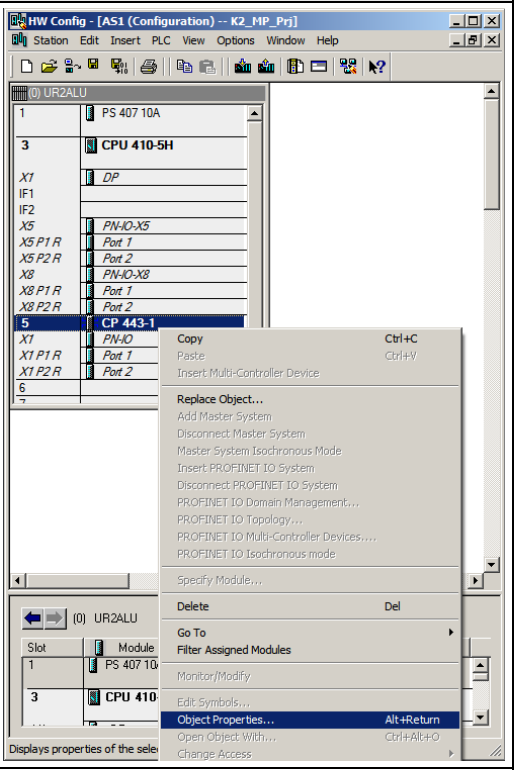
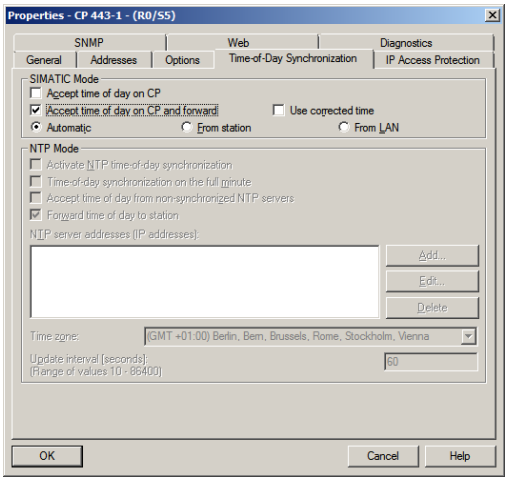
AS settings

This example describes a way in which the OS server specifies the master time.

Note More time synchronization options are described in detail in the following manuals:

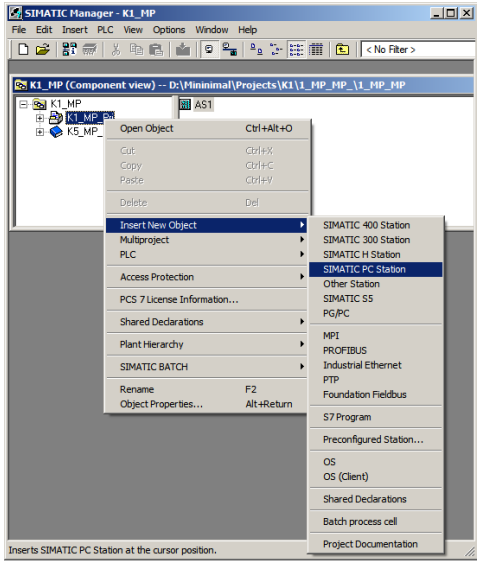
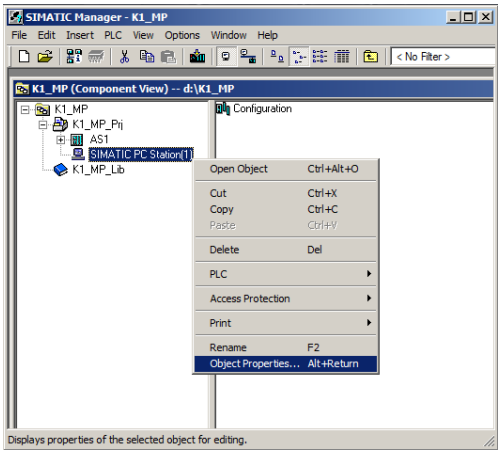
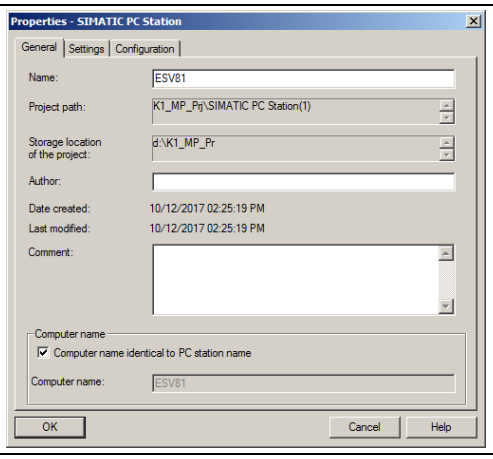
- "SIMATIC PCS 7 Operator Station (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746516
- "SIMATIC Process Control System PCS 7 Time Synchronization (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746544

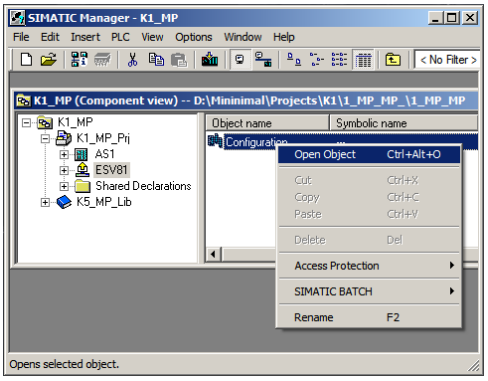
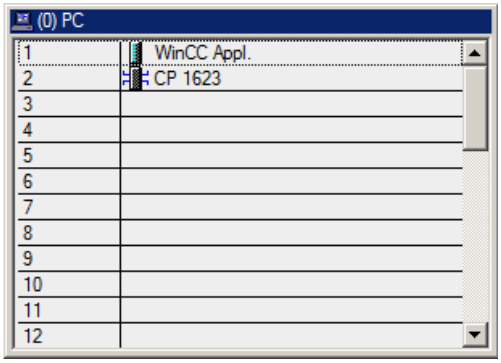
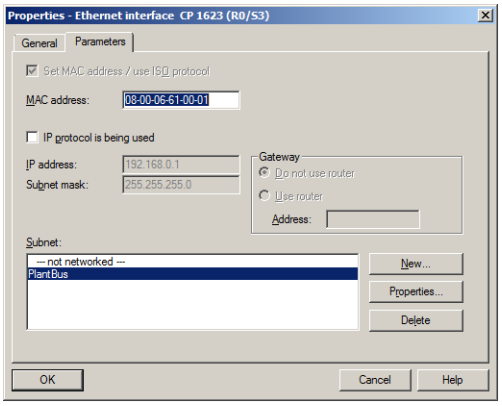
Step	Activity	Screenshot
1.	Open the HW Config for the AS. Highlight the CPU and choose "Object properties..." in the shortcut menu.	
2.	Switch to the "Diagnostics/Clock" tab. In the "Clock" section, set "As slave" for the AS under “Synchronization Type”. Click on the "OK" button to confirm your selection.	

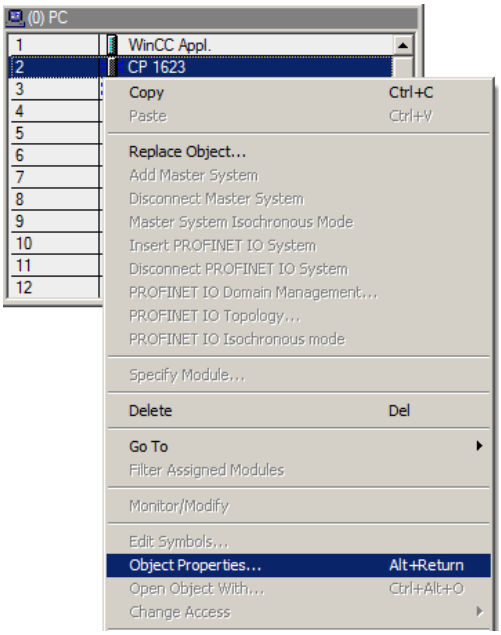
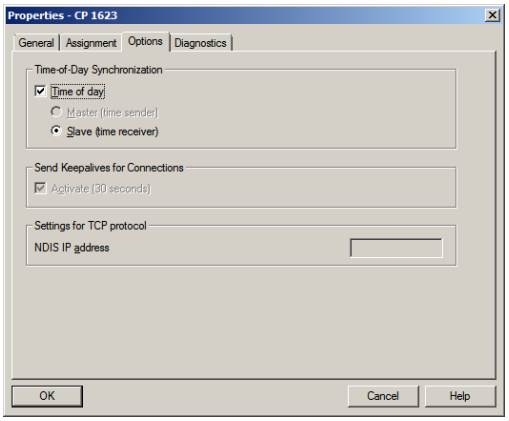
Step	Activity	Screenshot
3.	Open the shortcut menu of the CP and select "Object properties…".	
4.	Switch to the "Time synchronization" tab. Select the "Accept time of day on CP and forward" check box. Click on the "OK" button to confirm the setting.	
5.	Save the configuration and compile it using: "Station > Save and Compile…". Close the HW Config.	

Creating a PC station

The PC station is created in the PCS 7 project that represents both the ES and the OS.

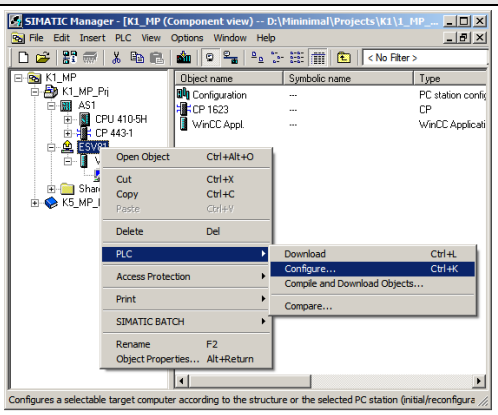
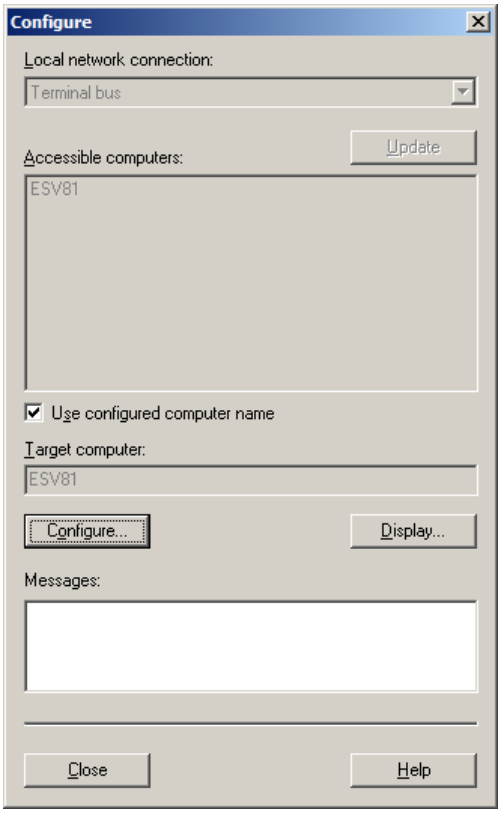
Step	Activity	Screenshot
1.	In component view, open the shortcut menu of the project and use "Insert New Object > SIMATIC PC station" to add a new PC station.	
2.	Use the shortcut menu to open the object properties of the PC station.	
3.	Change the name of the ES PC station to match the name of the local computer on the network. Select the “Computer name identical to PC station name” checkbox.	

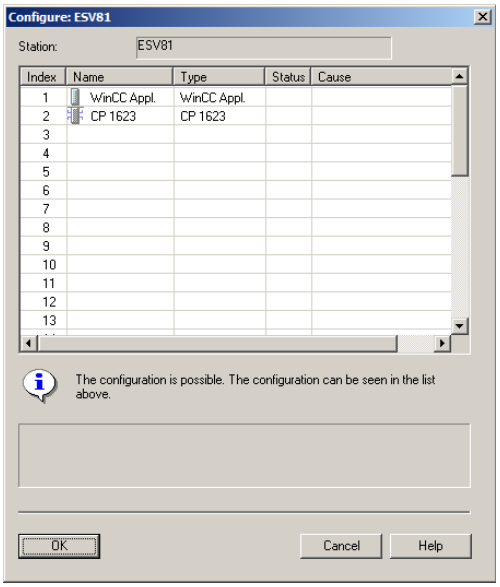
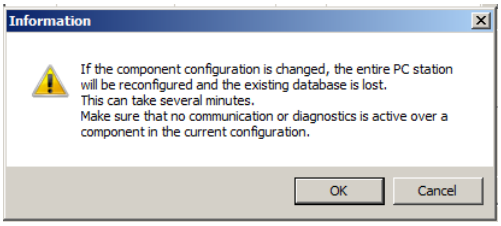
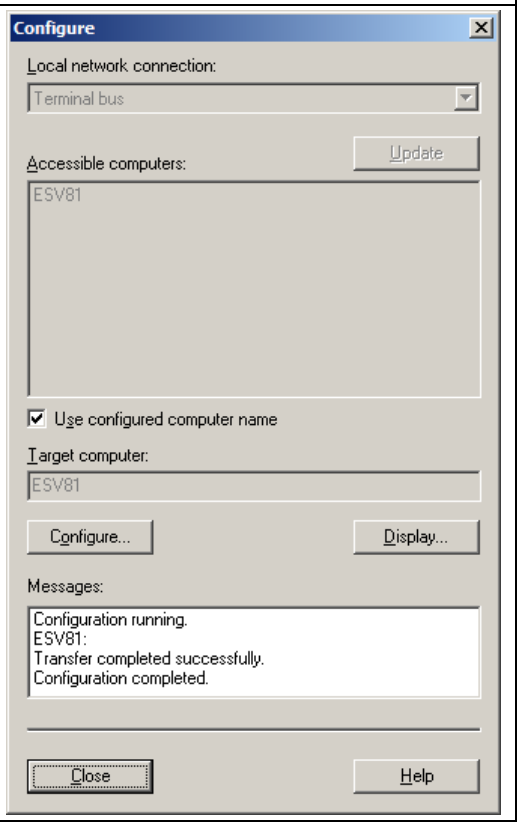
Step	Activity	Screenshot
4.	Open the HW Config of the PC station via the shortcut menu.	
5.	Insert a "WinCC application" and a network card of type "CP1623" from the object catalog (View > Catalog).	
6.	Under "Subnet", choose the plant bus or create it by clicking on the "New…" button. Assign the corresponding MAC address to the CP1623. Deselect the "IP protocol is being used" checkbox. Click on the "OK" button to confirm your settings.	

Step	Activity	Screenshot
7.	Open the shortcut menu of the CP1623 and select "Object properties…".	
8.	Switch to the “Options" tab and select the "Time of day” checkbox. Click on the "OK" button to confirm your selection.	
9.	Use the "Station > Save and compile..." menu item to save the configuration and compile it. Close the HW Config.	

Configuring the PC station

The "Configure PC station" function transfers project configurations to one or more target stations.

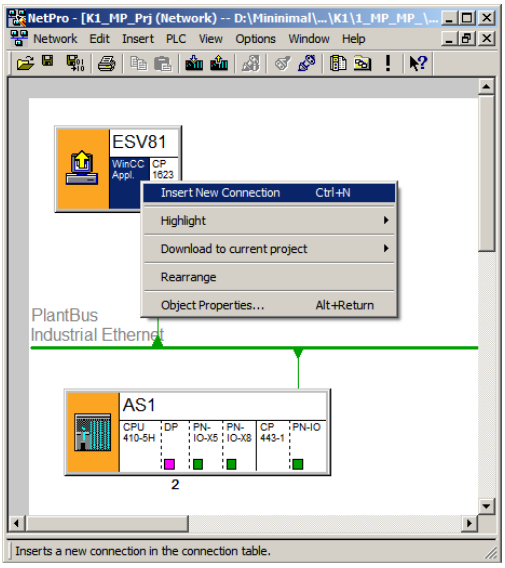
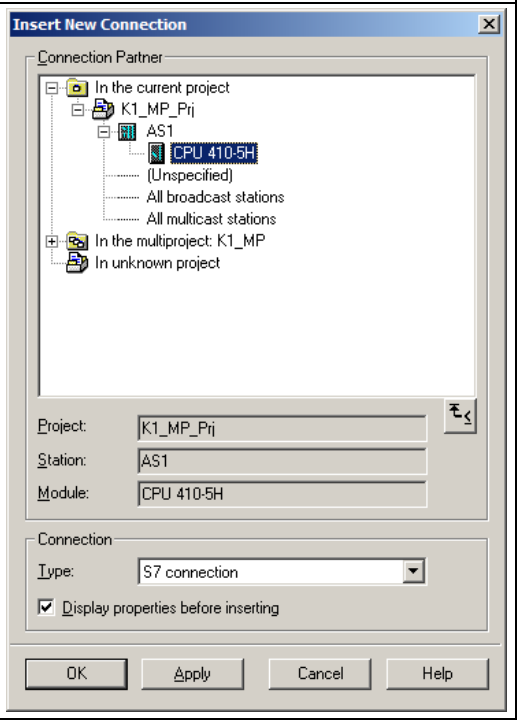
Step	Activity	Screenshot
1.	Configure the Station Configuration Editor of the ES. To do this, highlight the PC station of the ES and then choose "PLC > Configure…" in the shortcut menu.	
2.	Under "Accessible computers:" choose the PC that you want to configure. **NOTE** If you chose the option "PC name identical to PC station name" for the PC station in the "Object properties", the system displays directly in the component configurator the target PC to be configured. Using the "Display..." button, you can display the current configuration of the PC station. Click on the "Configure…" button.	

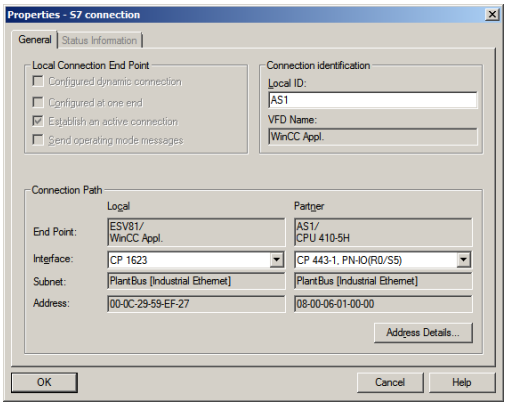
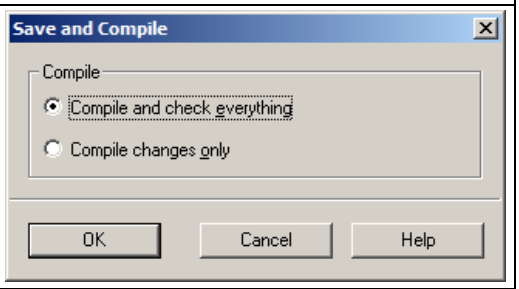
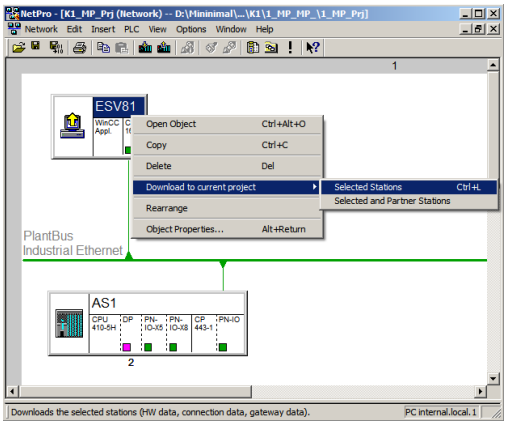
Step	Activity	Screenshot
3.	In the window that appears, you can see how the PC station is configured. Click on the "OK" button to confirm this.	
4.	Click on the "OK" button to confirm the information dialog.	
5.	In the bottom window, you then see the message: "Transfer completed successfully." Close the configuration dialog.	

Configuring and loading AS-OS communication

In the following section, the connection is configured using NetPro and loaded in the stations.

Note In the case of a granular station configuration, you must merge the subnets of the individual sub-projects first.

Step	Activity	Screenshot
1.	Open NetPro. Highlight the WinCC application of the ES and open the shortcut menu. Choose "Insert New Connection".	
2.	In the "Connection Partner" window, select the CPU of AS. Make sure that an “S7 connection" is selected under “Connection”. Click on the "OK" button to confirm your selection.	

Step	Activity	Screenshot
3.	On the “General" tab under "Connection identification”, change the “Local ID:" to a descriptive name like AS1, for example. Click on the "OK" button to confirm your entry.	
4.	Save and compile by means of: “Network > Save and Compile…". Select "Compile and check everything". Click on the "OK" button to confirm your selection.	
5.	Highlight the ES and download the connection via the shortcut menu: "Download to current project > Selected Stations". Download the AS in the same way. Then, close NetPro.	

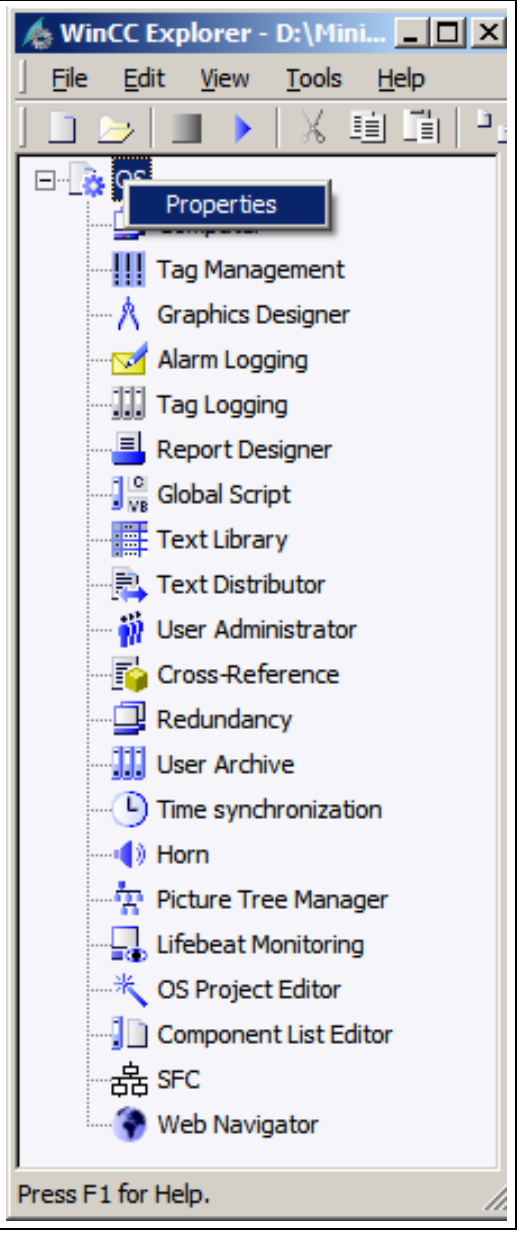
Compiling and loading the user program

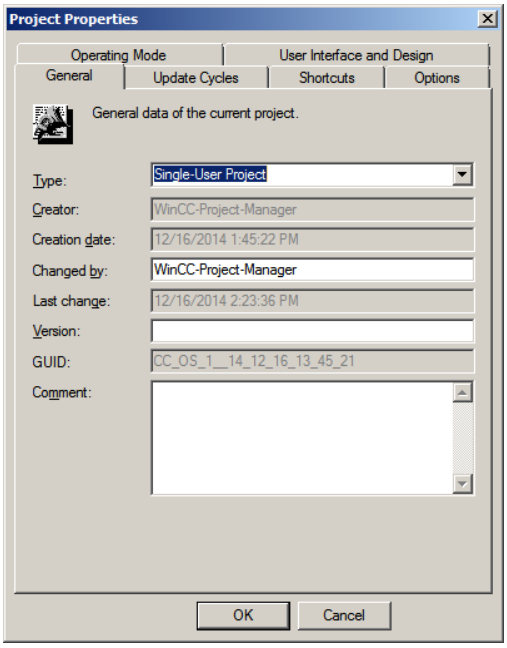
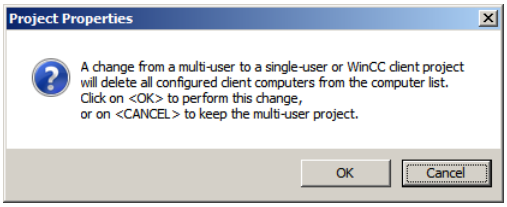
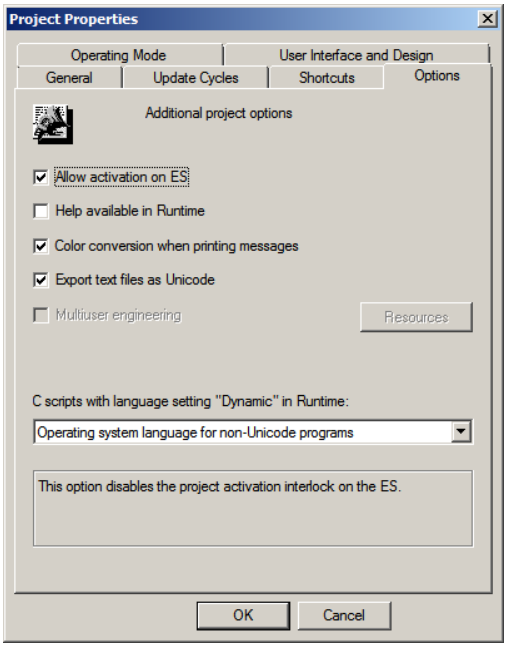
Compile the S7 program and download it to the AS.

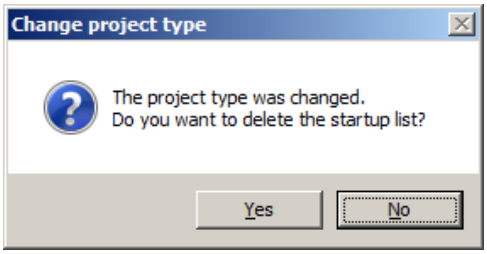
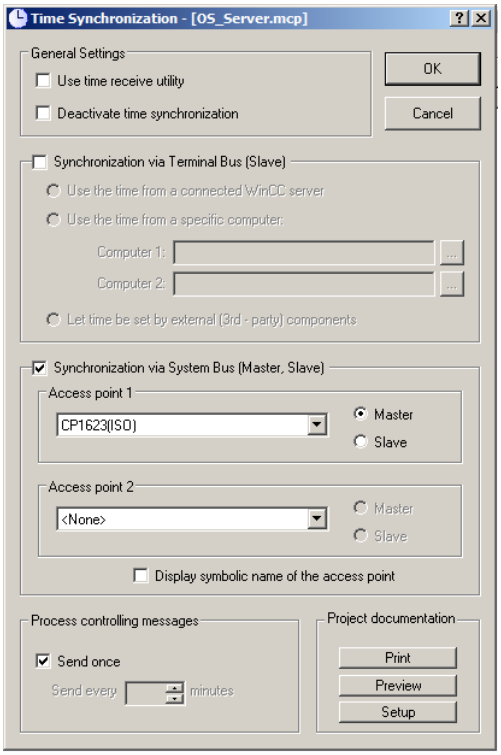
Compiling the OS project

Compile the OS project in SIMATIC Manager.

3.3.2 OS configuration

Step	Activity	Screenshot
1.	Open the OS project. In the open WinCC Explorer, highlight the OS project and choose “Properties” in the shortcut menu.	

Step	Activity	Screenshot
2.	On the “General” tab under “Type:”, choose "Single-user project". Click on the "OK” button to confirm your selection and the message that the system then displays.	 
3.	On the "Options" tab, select the "Allow activation on the ES" option. **NOTE** When using PCS 7 V9.0 and above, the "Allow activation on the ES" option is automatically selected and grayed out if you have not configured a “Path to the target OS computer”.	

Step	Activity	Screenshot
4.	Click on the "No" button to prevent the startup list being deleted.	
5.	Open the "Time Synchronization" editor. Select the "Synchronization via System Bus (Master, Slave)" checkbox. Under "Access point 1", choose "CP1623(ISO)" and select the "Master" radio button. Click on the "OK" button to confirm your selection.	
6.	Close WinCC Explorer. **NOTE** The changes do not take effect until you have closed and reopened WinCC Explorer.	

3.3.3 Activating runtime

After the OS project has been closed, open it again and activate runtime.

3.3.4 Particularities when loading OS project changes

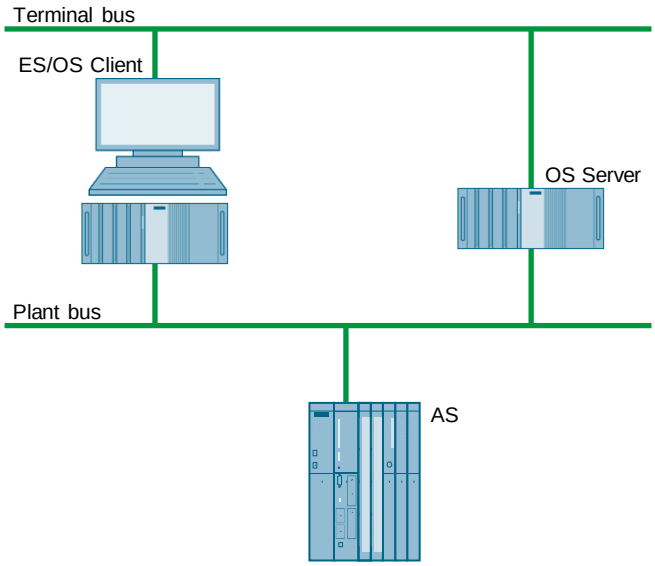
If the OS and ES are operated on a single PC, you do not need to carry out a loading operation because all the required data is already available. In this case, you only need to run the "Compile OS" function.

In a similar way to the "Download changes" function, you can run the "Compile changes" function in the Single Station without exiting process mode in the OS.

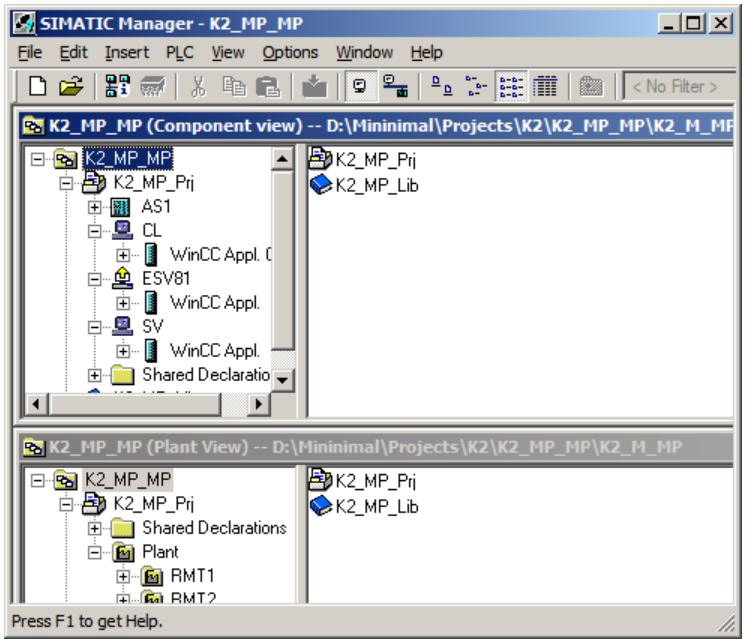
4 ES/OS Client and OS Server

4.1 Configuration description

In a server-client structure with only two computers, the ES is used as an OS client at the same time. Three PCs should be provided in this configuration.



PCS 7 configuration



4.2 Required hardware and software licensing

Hardware

For this configuration, we recommend using the hardware below which you can order via the Siemens mall. This ensures that the appropriate number of selected operating systems and SIMATIC PCS 7 system software packages are pre-installed on the PC stations.

Station	Product designation	Operating system	Plant bus transition
1 x ES/OS Client	SIMATIC PCS 7 ES/OS IPC847D BCE	Windows 7	RJ45 Network card
	SIMATIC PCS 7 ES/OS IPC847D IE	Windows 7	CP 1623
1 x OS Server	SIMATIC PCS 7 ES/OS IPC847D BCE	Windows Server 2012 R2	RJ45 Network card
	SIMATIC PCS 7 ES/OS IPC847D IE	Windows Server 2012 R2	CP 1623

Software licensing

The following section lists the software/license packages that you need for the selected configuration.

Depending on the project size, an OS server can provide up to 12,000 POs with the corresponding software package. In addition to engineering software, OS client software must also be installed on the ES.

Component	Software/licence packages
ES/OS client	• SIMATIC PCS 7 AS/OS Engineering Software (PO unlimited) • SIMATIC PCS 7 AS Runtime License • SIMATIC PCS 7 OS Software Client
OS Server	• SIMATIC PCS 7 OS Software Server • SIMATIC PCS 7 OS Runtime License

4.3 Step-by-step configuration

Note

The following instructions have been drawn up based on Windows 7 and PCS 7 V9.0.

CP1623 are used as an example of the plant bus transition. Time synchronization is activated.

The PC stations used in the test setup are called:

- ES/OS client: ESV81
- OS server: SV

4.3.1 Preparatory activities

Create a project folder on the OS server and share it. This allows the OS data configured on the engineering station to be transferred to the OS server.

4.3.2 ES configuration

Creating the multiproject

As the basis for the following instructions, all of the PC stations must be physically networked as shown in the illustration on page 28. Apart from this, you must create a multiproject on the ES in which the hardware and software of the AS are already configured.

Then, you start with the following CPU and CP settings.

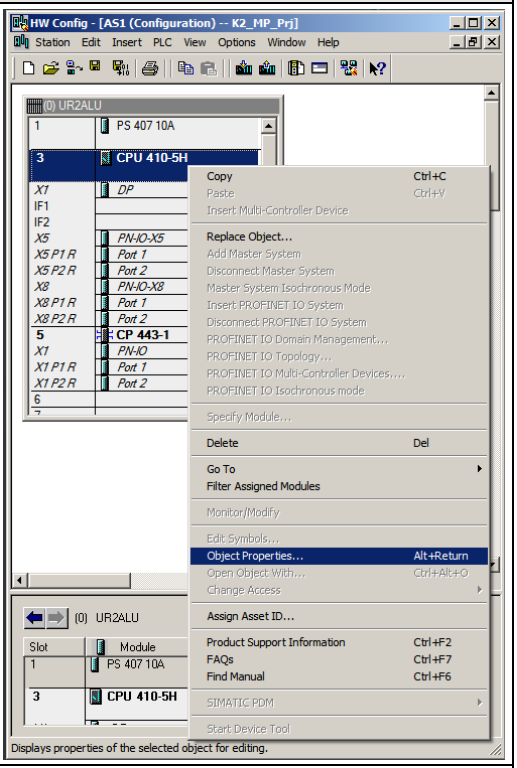
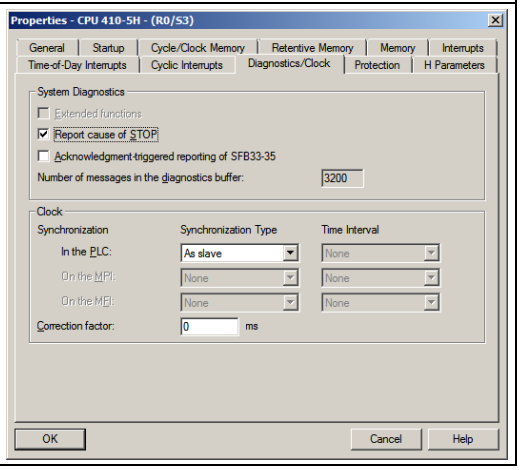
AS settings

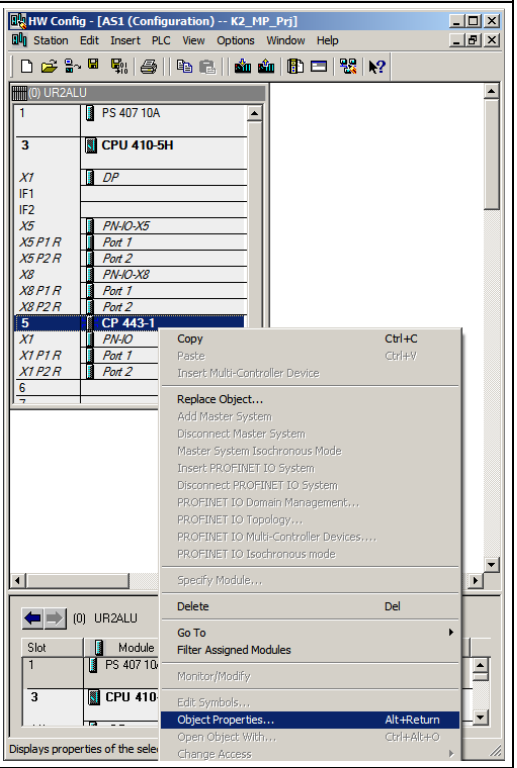
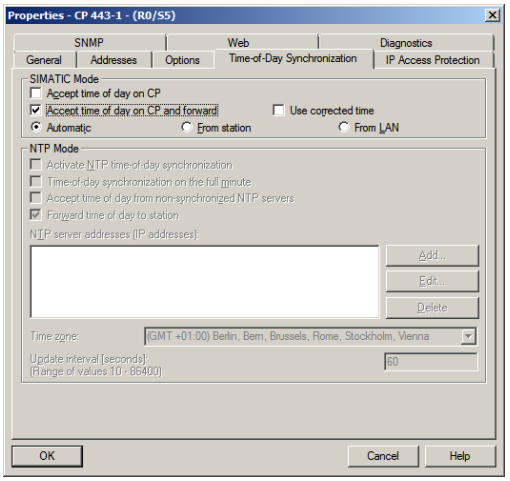
This example describes a way in which the OS server specifies the master time.

Note

More time synchronization options are described in detail in the following manuals:

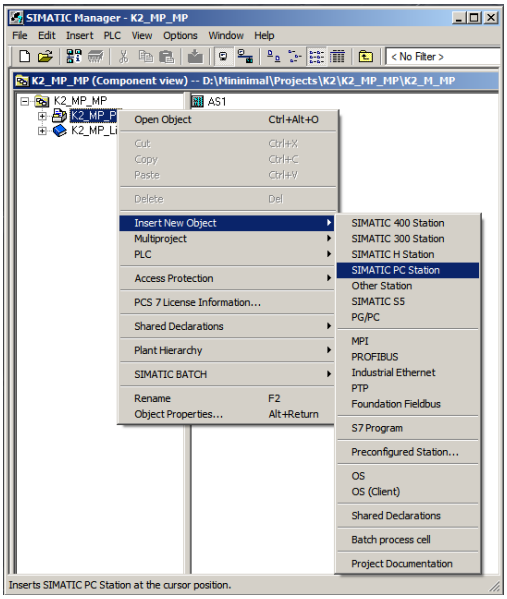
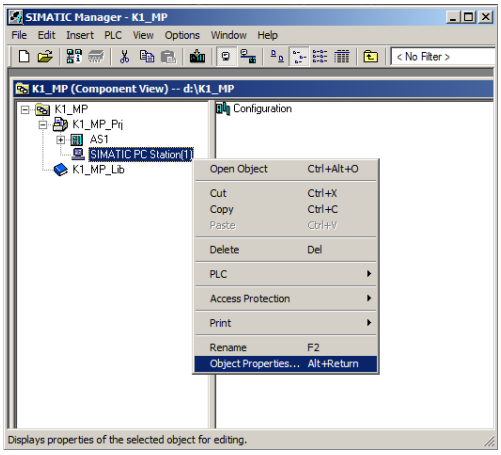
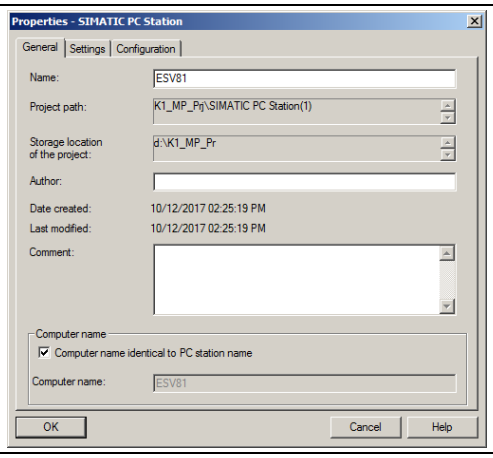
- "SIMATIC PCS 7 Operator Station (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746516
- "SIMATIC Process Control System PCS 7 Time Synchronization (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746544

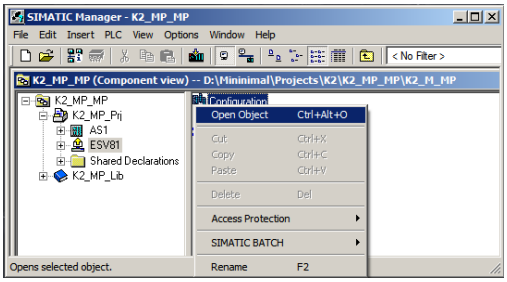
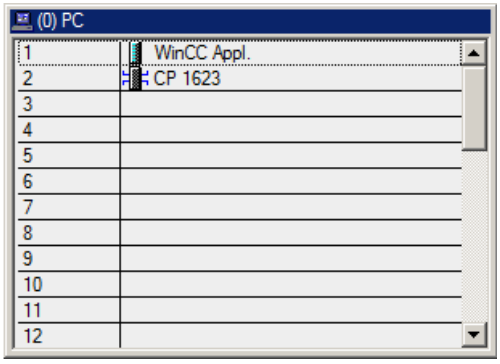
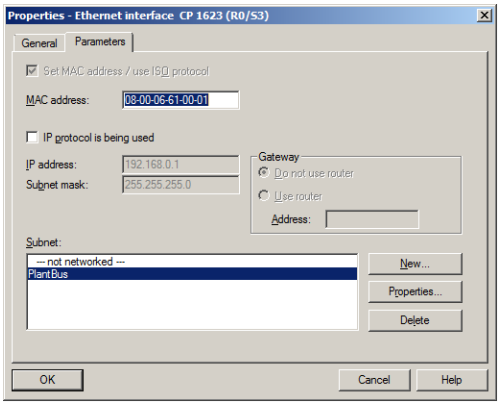
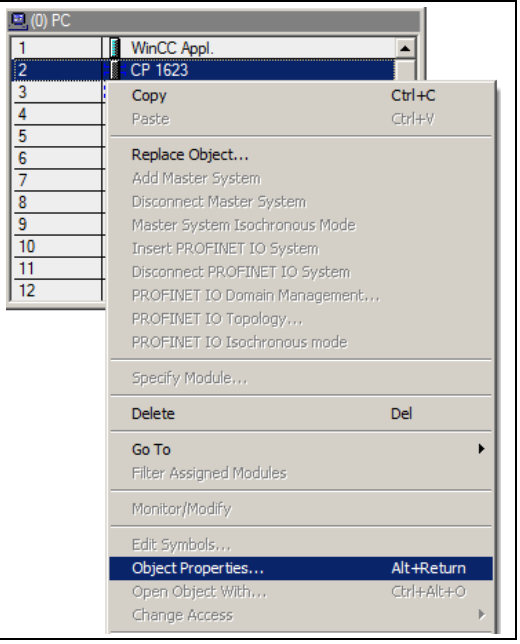
Step	Activity	Screenshot
1.	Open the HW Config for the AS. Highlight the CPU and choose "Object properties..." in the shortcut menu.	
2.	Switch to the "Diagnostics/Clock" tab. In the "Clock" section, set "As slave" for the AS under “Synchronization Type”. Click on the "OK" button to confirm your selection.	

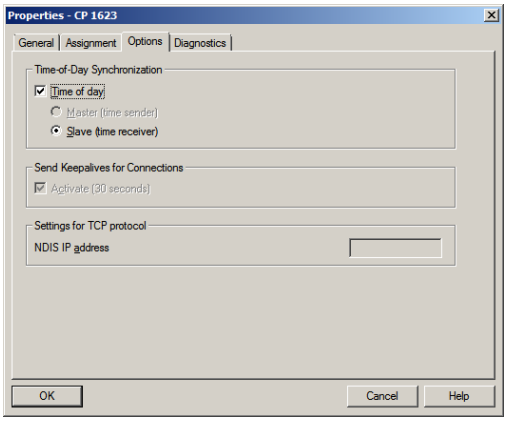
Step	Activity	Screenshot
3.	Open the shortcut menu of the CP and select "Object properties…".	
4.	Switch to the "Time synchronization" tab. Select the "Accept time of day on CP and forward" check box. Click on the "OK" button to confirm the setting.	
5.	Save the configuration and compile it using: "Station > Save and Compile…". Close the HW Config.	

Setting up the ES PC station

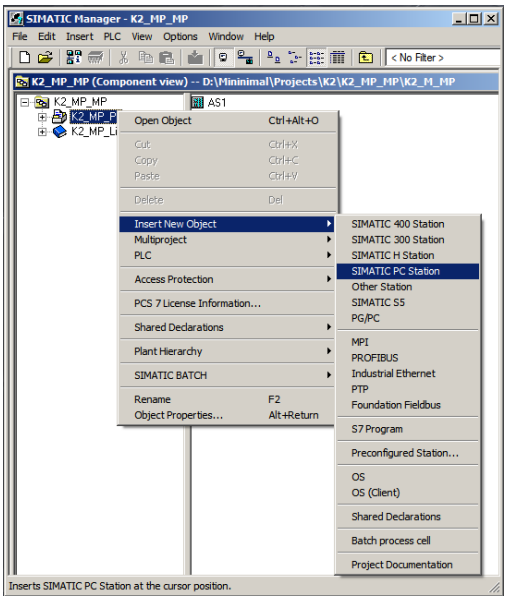
To be able to test the OS project on the ES, create a PC station for the ES using the WinCC application.

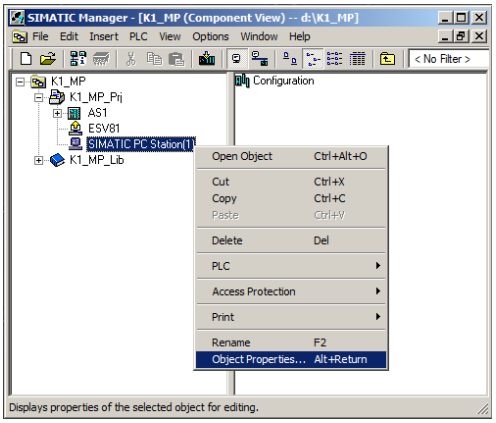
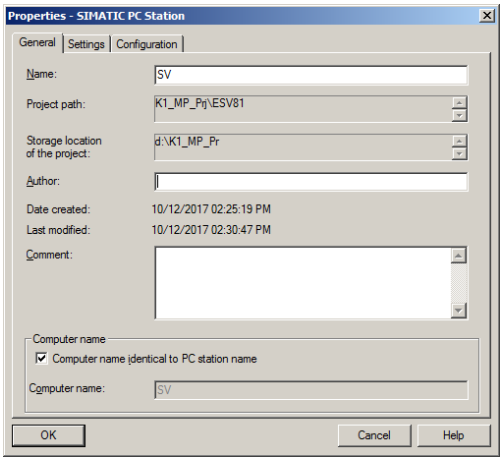
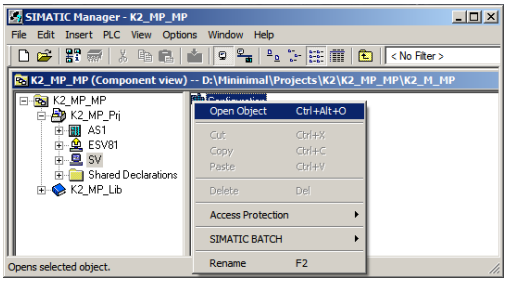
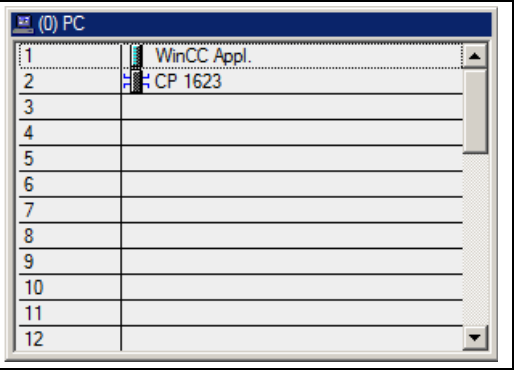
Step	Activity	Screenshot
1.	In component view, open the shortcut menu of the project and use "Insert New Object > SIMATIC PC station" to add a new PC station.	
2.	Use the shortcut menu to open the object properties of the PC station.	
3.	Change the name of the ES PC station to match the name of the local computer on the network. Select the “Computer name identical to PC station name” checkbox.	

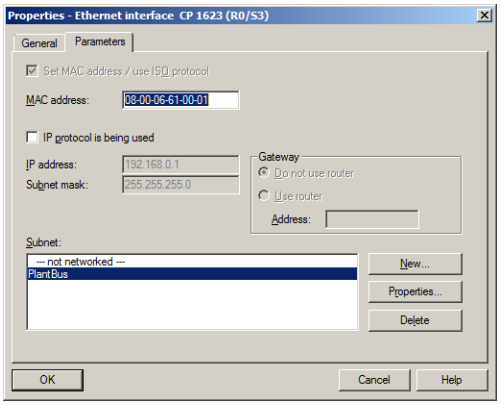
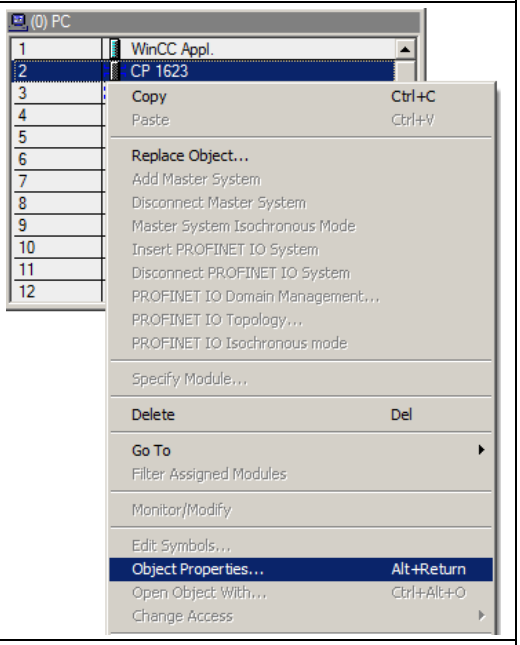
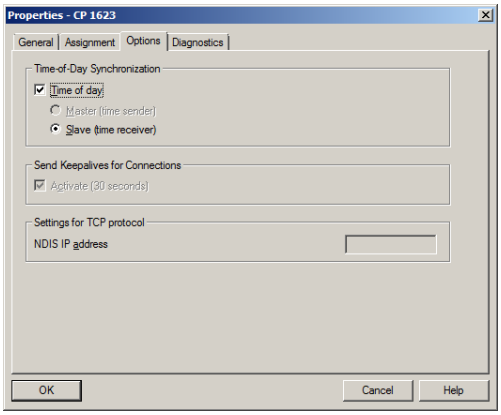
Step	Activity	Screenshot
4.	Open the HW Config of the PC station via the shortcut menu.	
5.	Insert a "WinCC application" (and a network card) of type “CP1623” from the object catalog (View > Catalog).	
6.	Under “Subnet”, choose the plant bus or create it by clicking on the “New…" button. Assign the corresponding MAC address to the CP1623. Deselect the "IP protocol is being used" checkbox. Click on the “OK” button to confirm your settings.	
7.	Open the shortcut menu of the CP1623 and select "Object properties…".	

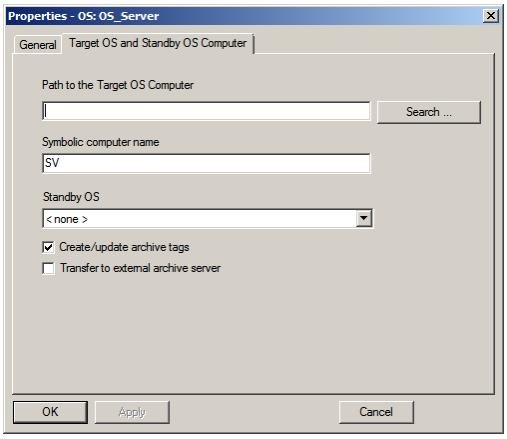
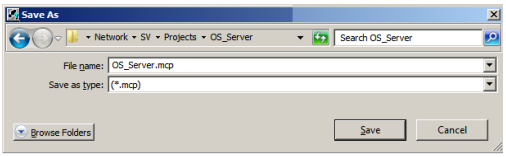
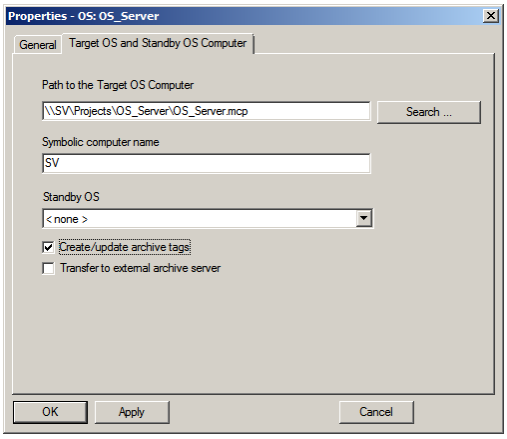
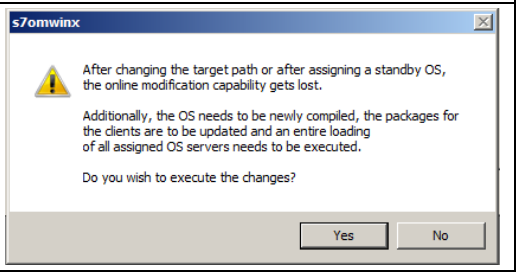
Step	Activity	Screenshot
8. Optionally	Switch to the “Options" tab and select the "Time of day” checkbox. Click on the "OK" button to confirm your selection **NOTE** You do not need to activate Time of day of the CP 1623 for an ES/OS client combination, since time synchronization of the OS client is configured via the terminal bus.	
9.	Save and compile using the "Station > Save and compile…" menu item. Close the HW Config.	
10. Optionally	In SIMATIC Manager, delete the OS application of the ES PC station, since it is not needed in our example.	

Setting up the OS server PC station

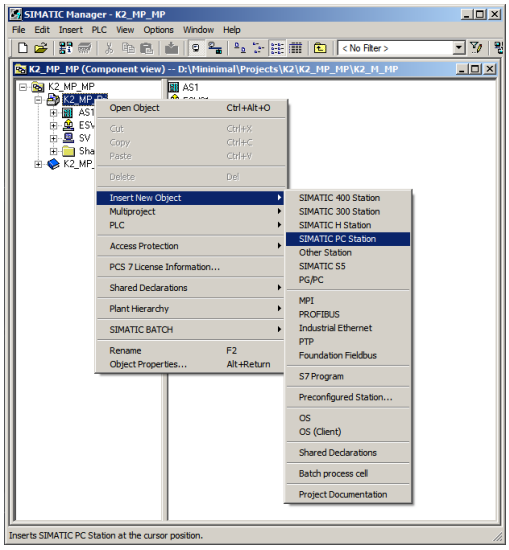
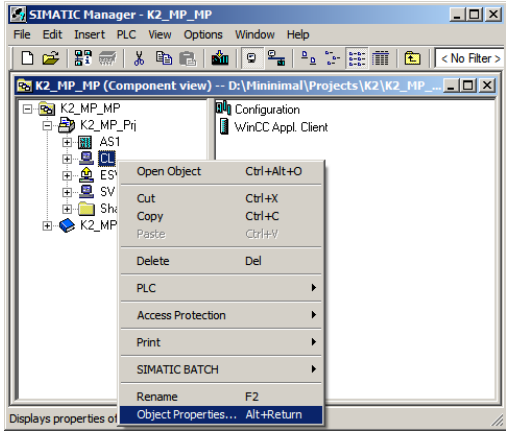
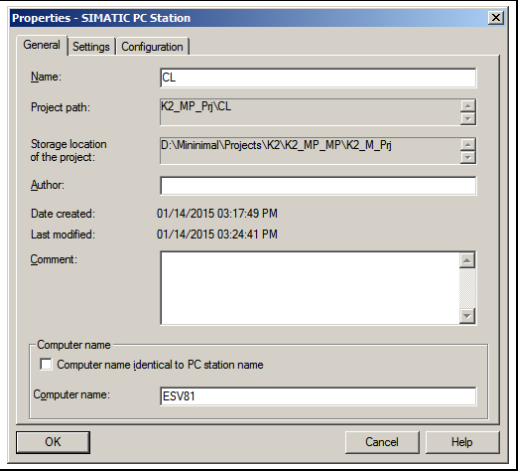
Step	Activity	Screenshot
1.	In component view, open the shortcut menu of the project and use "Insert New Object > SIMATIC PC station" to add a new PC station.	

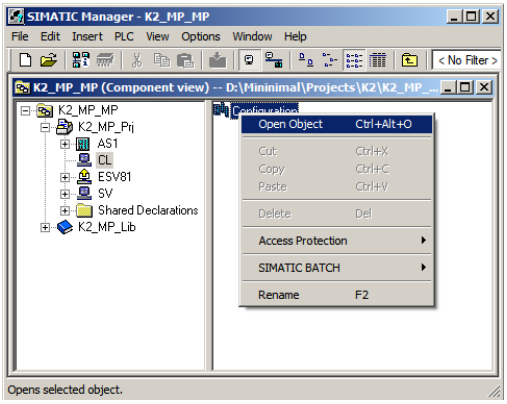
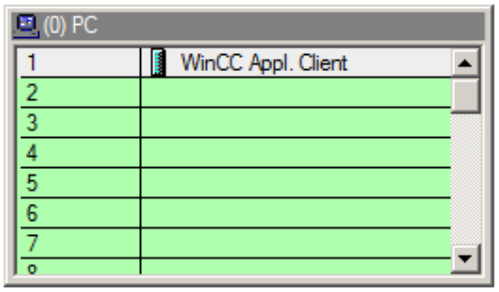
Step	Activity	Screenshot
2.	Use the shortcut menu to open the object properties of the PC station.	
3.	Change the name of the OS server PC station to match the name of the computer on the network. Select the “Computer name identical to PC station name” checkbox.	
4.	Open the HW Config of the PC station via the shortcut menu.	
5.	From the object catalog ("View > Catalog"), insert a "WinCC application" and a network card of type "CP1623".	

Step	Activity	Screenshot
6.	Under “Subnet”, choose the plant bus or create it by clicking on the “New…" button. Assign the corresponding MAC address to the CP1623. Deselect the "IP protocol is being used” checkbox. Click on the “OK” button to confirm your settings.	
7.	Open the shortcut menu of the CP1623 and select "Object properties…".	
8.	Switch to the “Options" tab and select the "Time of day” checkbox. Click on the "OK" button to confirm the setting.	
9.	Save and compile using the "Station > Save and compile…" menu item. Close the HW Config.	

Step	Activity	Screenshot
10.	In SIMATIC Manager, open the properties dialog of the OS server's OS project. Switch to the "Target OS and Standby OS Computer" tab. Under "Standby OS", choose <none>. Then, click on the "Search..." button.	
11.	Use the drop-down list to navigate to the shared project folder of the OS server (see 4.3.1 Preparatory activities). Click on the "Save" button.	
12.	In the input field, check the "Path to the Target OS Computer". Clear the “Transfer to external archive server” checkbox if you are not using a Process Historian. Click on the "OK" button to confirm this.	
13.	Click on the “Yes” button to confirm the information dialog.	

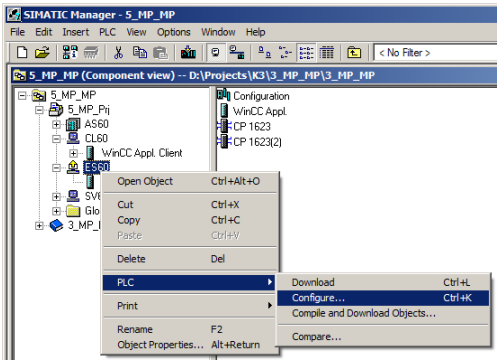
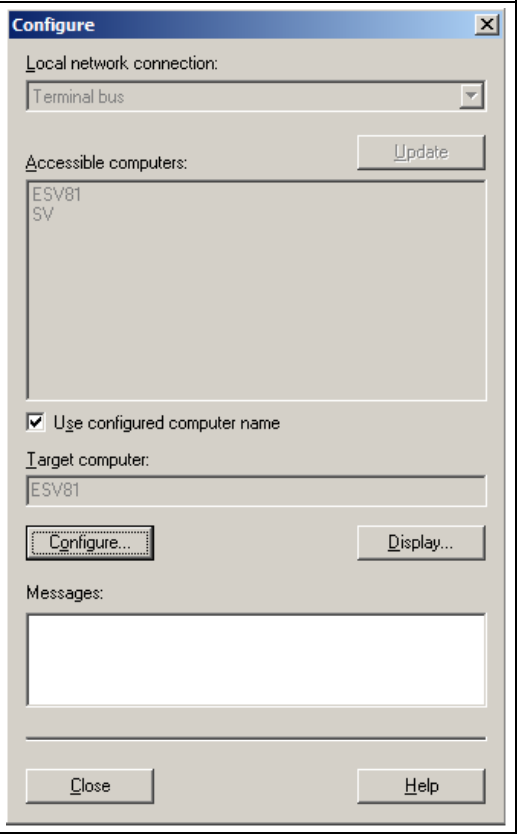
Setting up the Client PC station

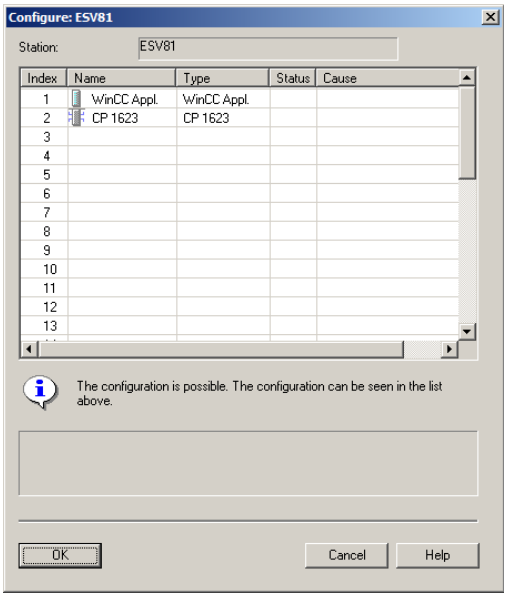
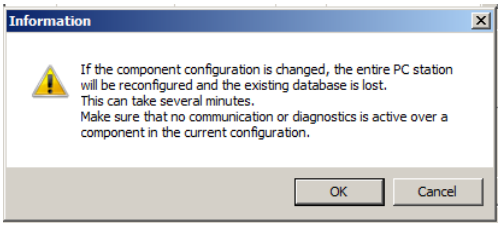
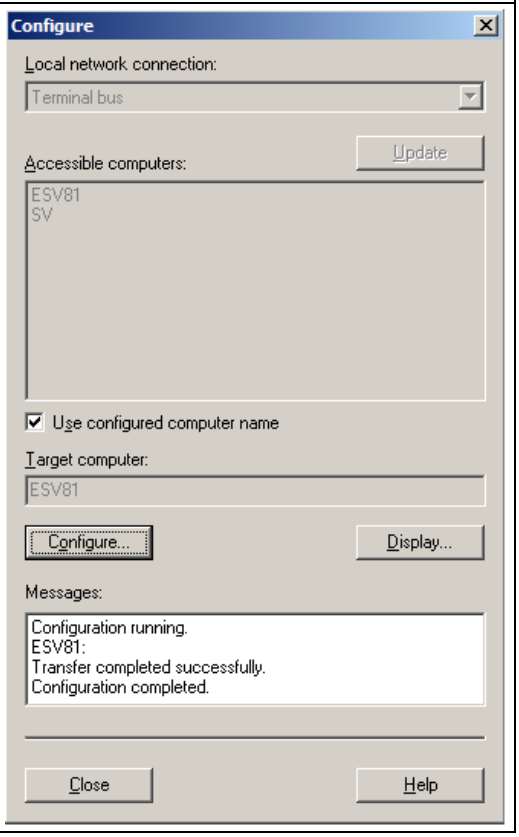
Step	Activity	Screenshot
1.	In component view, open the shortcut menu of the project and use "Insert New Object > SIMATIC PC station" to add a new PC station.	
2.	Use the shortcut menu to open the object properties of the PC station.	
3.	Enter a freely selectable name under "Name". Under "PC name:" enter the name of the PC on which you intend to operate the client. In the present configuration, this is the ES PC. Click on the "OK" button to confirm your entry.	

Step	Activity	Screenshot
4.	Open the HW Config of the OS client's PC station.	
5.	From the object catalog (View > Catalog) insert a WinCC application client.	
6.	Save and compile using menu command: "Station > Save and Compile…". Close the HW Config.	

Configuring all of the relevant PC stations

The "Configure PC station" transfers project configurations to one or more target stations. First of all, configure the local Station Configuration Editor of the ES and then the OS connected to the plant bus.

Step	Activity	Screenshot
1.	Configure the Station Configuration Editor of the ES. To do this, open the shortcut menu of the ES and choose “PLC > Configure…".	
2.	Under "Accessible computers:” choose the PC that you want to configure. **NOTE** If you chose the option "PC name identical to PC station name" for the PC station in the “Object properties”, the system displays directly in the component configurator the target PC to be configured. Using the “Display..." button, you can show the current configuration of the PC station. Click on the “Configure…” button.	

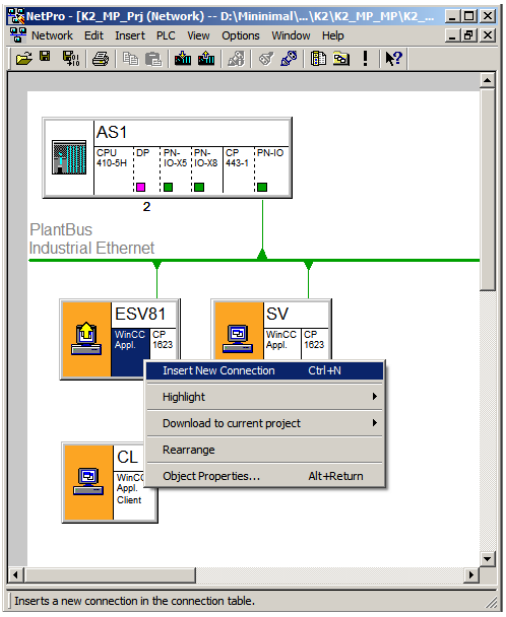
Step	Activity	Screenshot
3.	In the window that appears, you can see how the PC station is configured. Click on the "OK" button to confirm this setting.	
4.	Click on the "OK" button to confirm the information dialog.	
5.	In the bottom window, you then see the message: "Transfer completed successfully." Close the configuration dialog.	

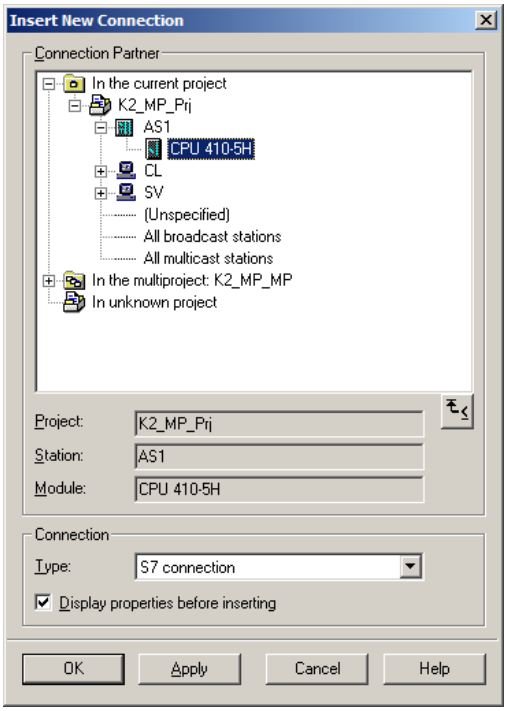
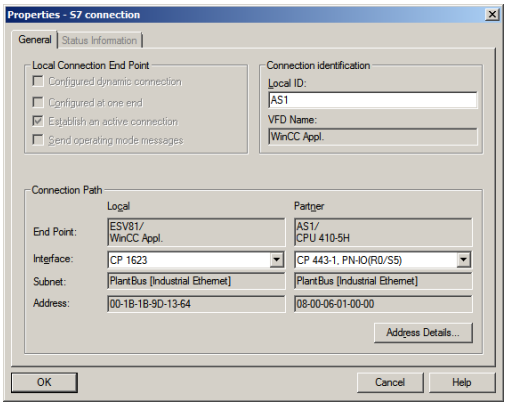
Step	Activity	Screenshot
6.	Configure the Station Configuration Editor of the OS server as shown in steps 1 to 5.	

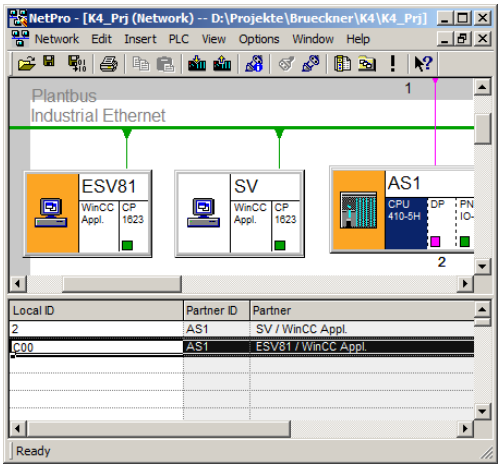
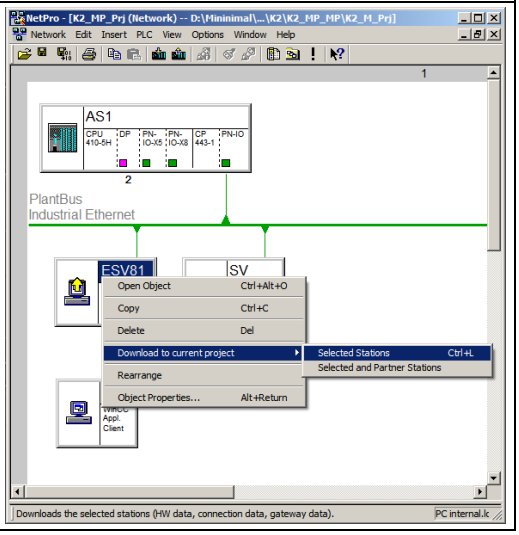
Configuring and loading AS-OS communication

In the following section, the connections between the PC stations and the AS are configured in NetPro and loaded in the individual stations.

Note In the case of a granular station configuration, you must merge the subnets of the individual sub-projects first.

Step	Activity	Screenshot
1.	Open NetPro. Highlight the WinCC application of the ES and open the shortcut menu. Choose "Insert New Connection".	

Step	Activity	Screenshot
2.	In the "Connection Partner" window, select the CPU of the AS. Make sure that an “S7 connection" is selected under “Connection”. Click on the "OK" button to confirm your selection.	
3.	On the “General" tab under "Connection identification”, change the “Local ID:" to a descriptive name like AS1, for example. Click on the "OK" button to confirm your entries.	
4.	Repeat steps 1 to 3 to connect the OS server to the AS. When doing this, it is important that the connections of the ES and the OS server to the AS have the **same name.**	

Step	Activity	Screenshot
5. Optionally	In the connection table of the AS, change the local ID for the connection to the ES to a value of greater than 0xc00. **Note** A connection ID of greater than 0xc00 prevents the AS from generating messages in later operation due to starting or stopping of OS simulation on the ES.	
6.	Use the ""Network > Save and Compile..." menu item to save the configuration and compile it. Select the "Compile and check everything" option button and click on the "OK" button to confirm your selection.	
7.	Select the ES and download the connections via the shortcut menu: "Download to current project > Selected Stations". Download the OS server and the AS in the same way. Then, close NetPro.	

Compiling and loading the user program

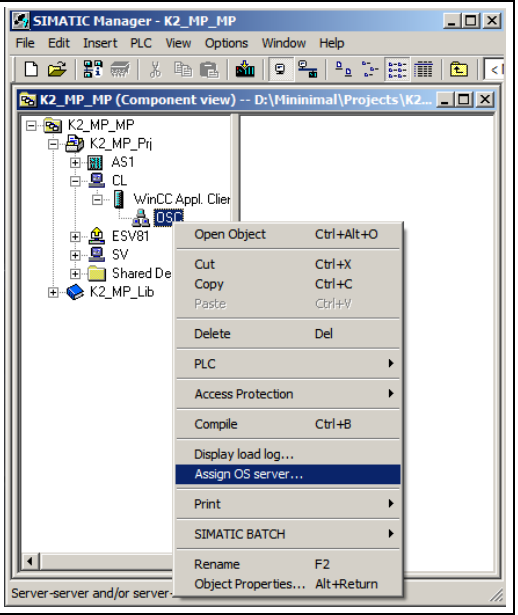
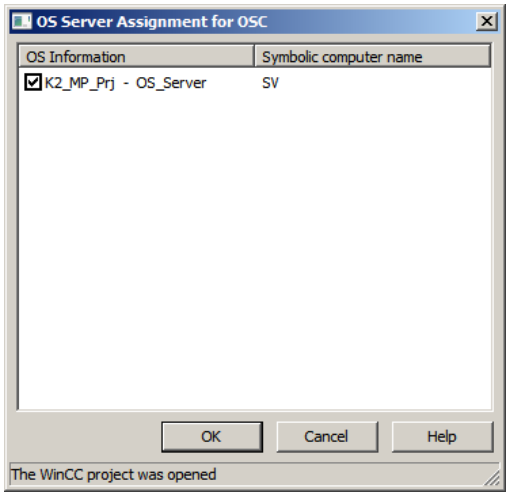
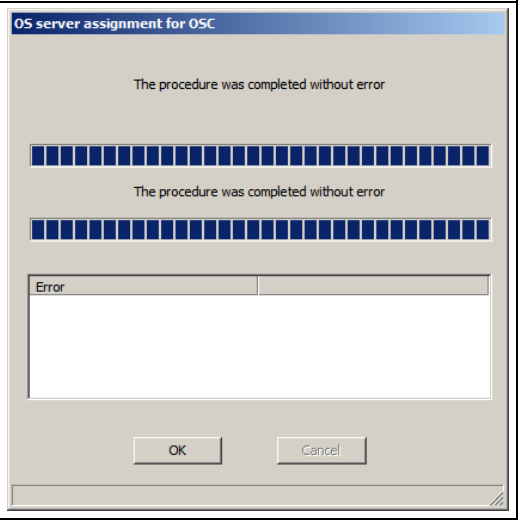
Compile the S7 program and download it to the AS.

Compiling the OS server project

Compile the OS server project in SIMATIC Manager with selected "Generate server data" checkbox.

Make sure that you make the correct OS assignment to the server in plant view.

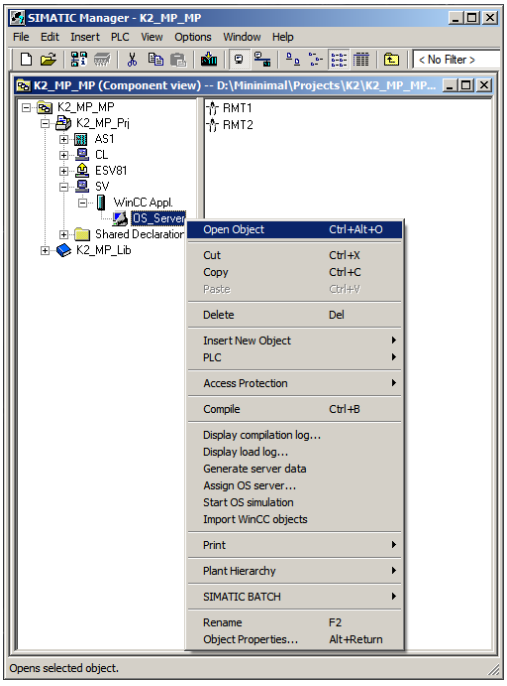
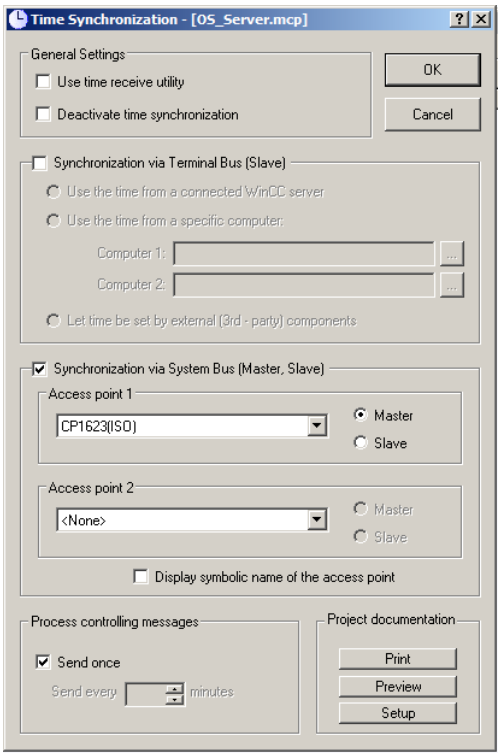
Assigning the server package

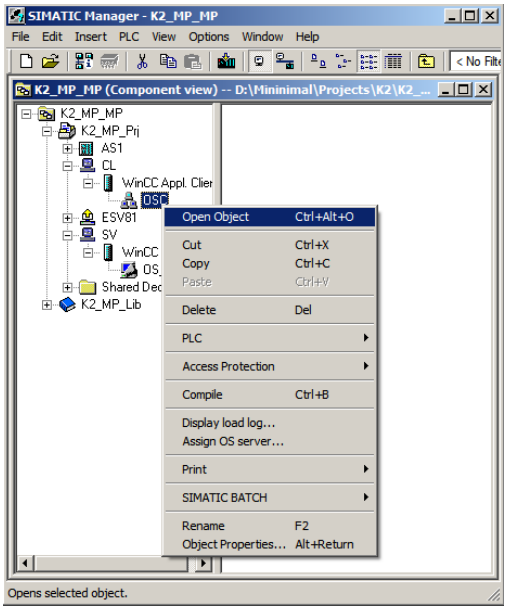
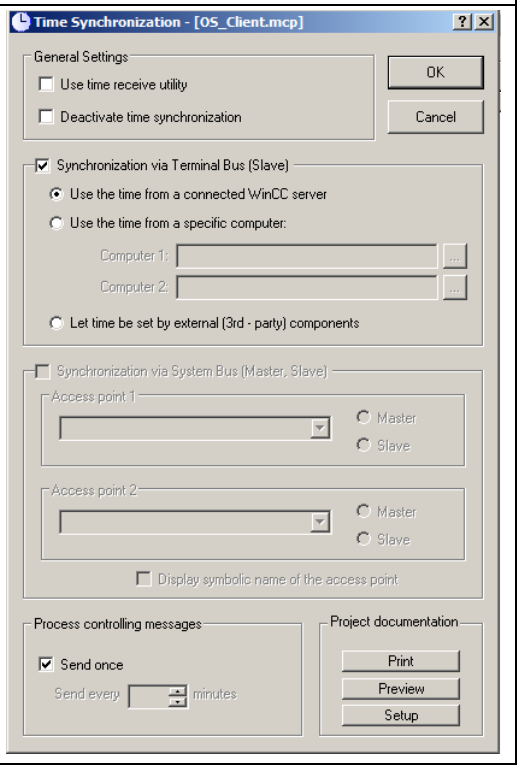
Step	Activity	Screenshot
1.	Highlight the OS application of the OS client and choose "Assign OS server..." in the shortcut menu.	
2.	Select the corresponding OS project and click on the "OK" button to confirm your selection.	
3.	Click on the "OK" button to confirm that the package was loaded successfully.	

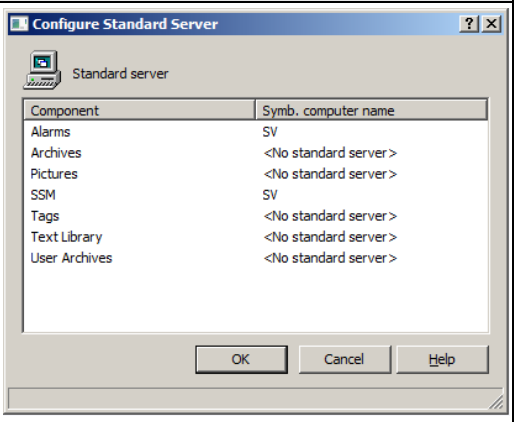
4.3.3 OS configuration

Activating time synchronization

On the ES, the necessary settings are activated in the OS projects of the OS server and the OS client.

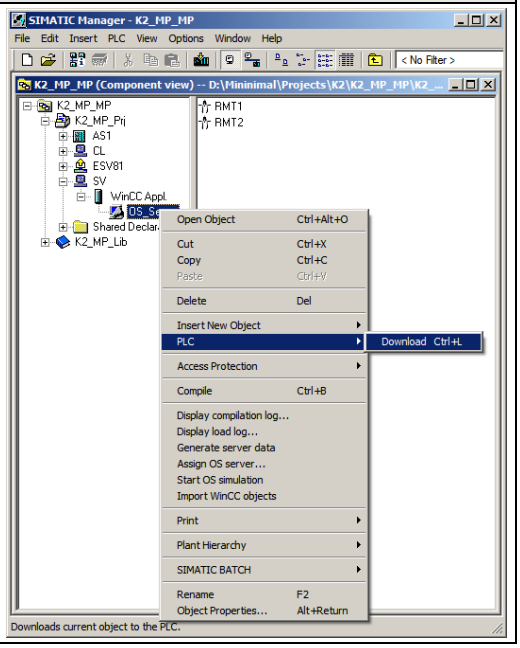
Step	Activity	Screenshot
1.	Open the OS server project.	
2.	Open the "Time Synchronization" editor from the shortcut menu. Select the "Synchronization via System Bus (Master, Slave)" checkbox. Under "Access point 1", choose "CP1623(ISO)" and select the "Master" radio button. Click on the "OK" button to confirm your selection. **NOTE** If you configure station time synchronization on a different computer, the access points are not known, which means that they are not available in the drop-down list. To choose the access point regardless, select the "Display symbolic name of the access point" checkbox and then choose the appropriate access point.	
3.	Close the OS server project.	

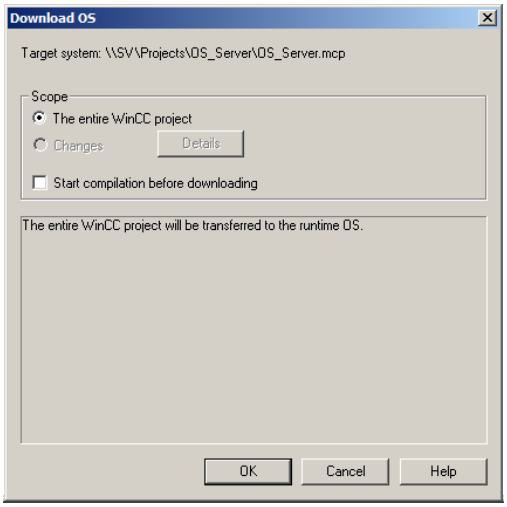
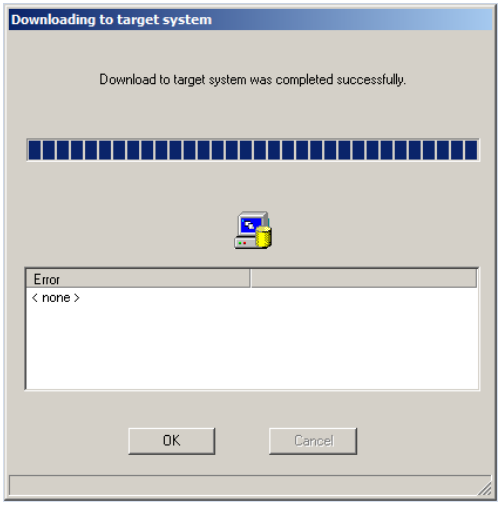
Step	Activity	Screenshot
4.	Open the OS client project.	
5.	Open the "Time Synchronization" editor from the shortcut menu. Select the "Synchronization via Terminal Bus (Slave)" checkbox and choose "Use the time from a connected WinCC server". Click on the "OK" button to confirm your selection.	

Step	Activity	Screenshot
6.	Select the "Server Data" editor in the WinCC Explorer, and then select the "Standard Server..." command from the shortcut menu. Select the standard server for the components "Alarms" and "SSM" (Split Screen Manager) Click on the "OK" button to confirm your selection.	
7.	Close the OS client project.	

Downloading the OS project to the OS server

After time synchronization is configured on the ES side, download the OS project to the OS server.

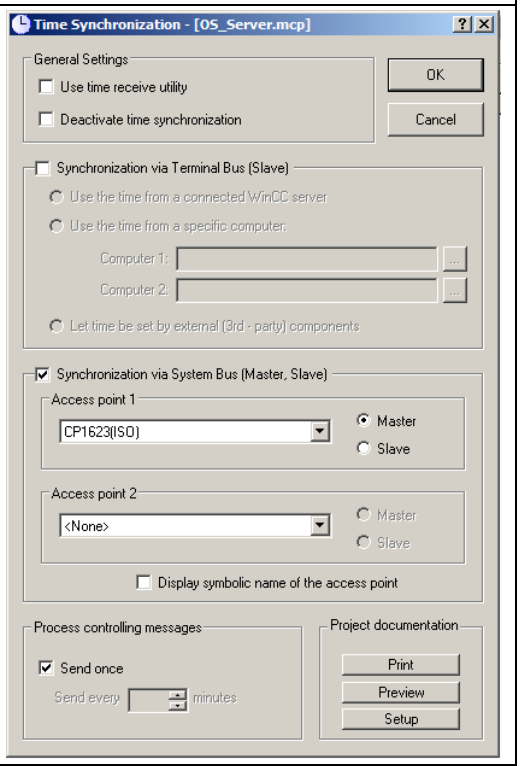
Step	Activity	Screenshot
1.	In SIMATIC Manager, highlight the OS project of the OS server and select the "PLC > Download" context menu.	

Step	Activity	Screenshot
2.	For the first OS project download, an entire download is required. Click on the "OK" button to start downloading.	
3.	After successful downloading, the OS project is located in the specified folder on the OS server. Click on the "OK" button to confirm the message that is issued.	

OS configuration on the OS server

After the first download, check the step instructions below for time synchronization and correct them if necessary.

Note Normally, all configuration work is carried out on the ES to ensure consistent data management. This means that no WinCC engineering licenses are needed on the OSes. However, each time WinCC Explorer is opened, a license-free time window of two hours is available for WinCC configuration work.

Step	Activity	Screenshot
1.	Open the OS project on the OS server.	
2.	Open the "Time Synchronization" editor from the shortcut menu. Check or select the "Synchronization via System Bus (Master, Slave)" checkbox. Check or select "CP1623(ISO)" and the "Master" option button under "Access point 1". Click on the “OK” button to confirm your settings.	

4.3.4 Activating runtime

Open the OS project on the OS server and activate runtime.

Then, switch to the ES computer and open the OS client project. Activate runtime there too.

4.3.5 Particularities when loading OS project changes

Loading changes

Before you can carry out OS compiling and downloading to the ES, OS client runtime must be deactivated and the OS project closed.

Complete download

Before you can carry out OS compiling and downloading from the ES, OS client runtime and the OS server must be deactivated and the respective OS projects must be closed.

5 ES, OS Master and OS Standby

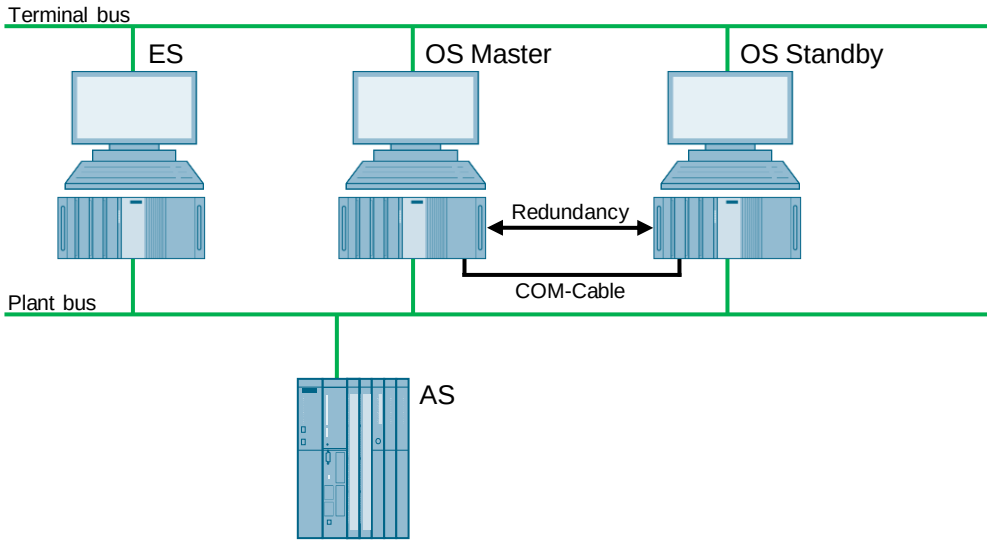
5.1 Configuration description

During process mode, the pair of Single Stations runs completely in-parallel and independently from each other. If one of the Single Stations fails, an equivalent, redundant OS Single Station is always available. The Single Stations monitor each other during runtime and synchronize the project archives as needed.

For synchronization, the OS Single Stations are connected via a redundant cable. You can use a network cable on an additional network adapter or a null modem cable on the COM port as the redundant cable. In the configuration below, a COM cable is used.

Configuration is carried out via the ES.

Hardware configuration

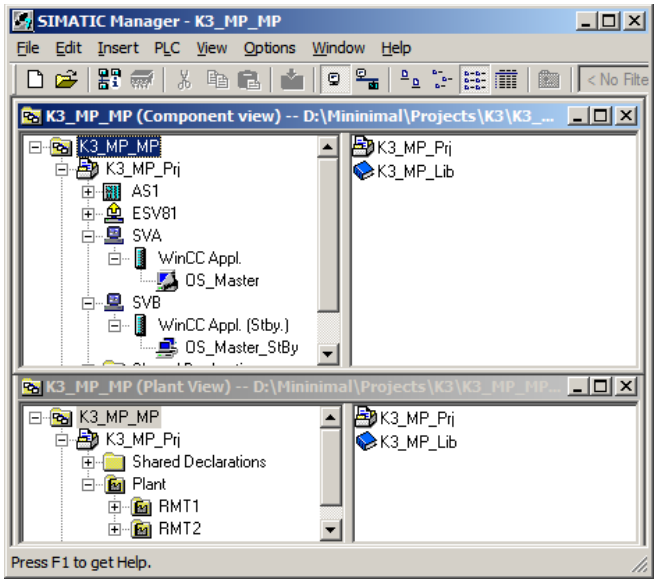


Note

You need server packages for the function of the MS clients. If the OS/MS server is set up as a Single Station, the MS client cannot be used on the ES.
The jump keys in the asset faceplate for hardware configuration and for PDM function as follows:

- Up to PDM V8.1: On ES only
- PDM V8.2 and higher: On ES and OS clients
- PDM V9.0 and higher: On ES and OS clients, and web clients

PCS 7 configuration



5.2 Required hardware and software licensing

Hardware

For this configuration, we recommend using the hardware below which you can order via the Siemens mall. This means that the appropriate number of selected operating systems and SIMATIC PCS 7 system software packages are pre-installed on the PC stations.

Station	Product designation	Operating system	Plant bus transition
1 x ES	SIMATIC PCS 7 ES/OS IPC847D BCE	Windows 7	RJ45 Network card
	SIMATIC PCS 7 ES/OS IPC847D IE	Windows 7	CP 1623
2 x OS Single Station	SIMATIC PCS 7 ES/OS IPC847D BCE	Windows 7	RJ45 Network card
	SIMATIC PCS 7 ES/OS IPC847D IE	Windows 7	CP 1623

Software licensing

The following section lists the software/license packages that you need for the selected configuration.

Component	Software/license packages
ES	• SIMATIC PCS 7 AS/OS Engineering Software (PO unlimited) • SIMATIC PCS 7 AS Runtime License
OS Single Station Redundant	• SIMATIC PCS 7 OS Software Single Station Redundancy (Single License for 2 installations) • 2 x SIMATIC PCS 7 OS Runtime License (max. of 8,500 POs)

5.3 Step-by-step configuration

Note

The following instructions have been drawn up based on Windows 7 and PCS 7 V9.0.

CP1623 are used as an example of the plant bus transition. Time synchronization is activated.

The PC stations used in the test setup are called:

- ES: ESV81
- OS server: SVA
- OS server standby: SVB

5.3.1 Preparatory activities

Create a project folder on the OS master and the OS standby and share it. This makes it possible to transfer the OS data that is configured on the engineering station to the OS master and the OS standby.

5.3.2 ES configuration

Creating the multiproject

As the basis for the instructions below, all of the PC stations must be physically networked as shown in the illustration in chapter 5.1. Apart from this, you must create a multiproject on the ES in which the hardware and software of the AS are already configured.

Then, you start with the following CPU and CP settings.

AS settings

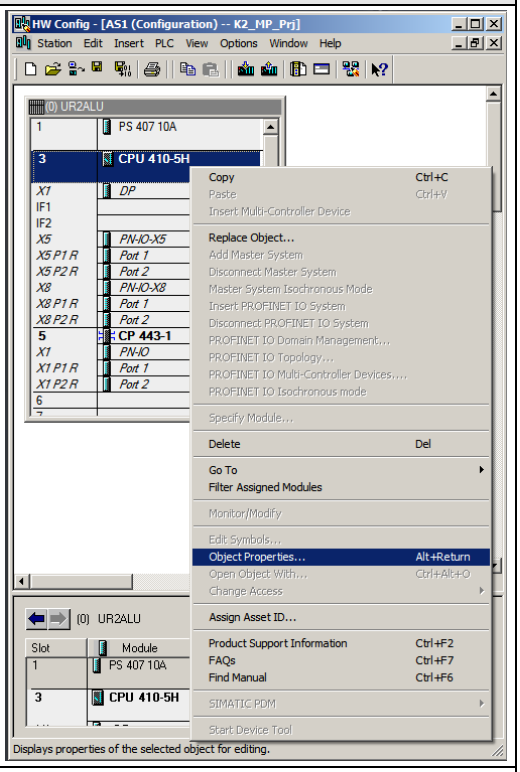
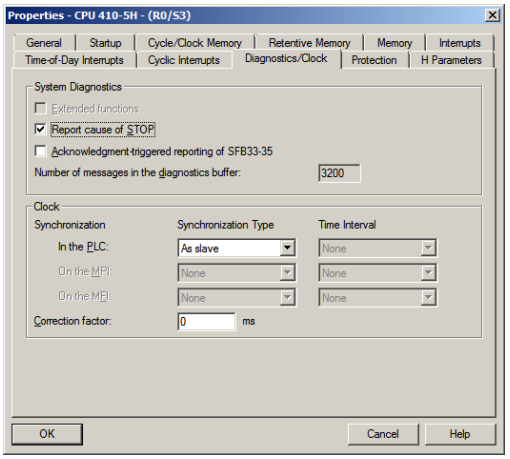
The analyzability of the process data requires that all of the components of the process control system work with an identical clock time to be able to assign messages in the correct time sequence.

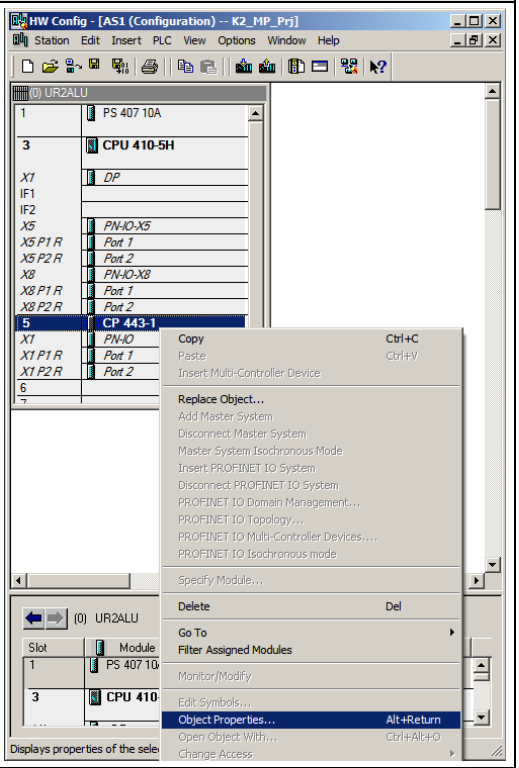
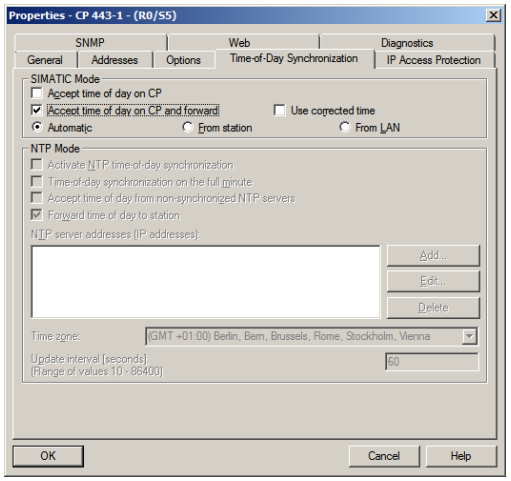
The following section describes a way in which the redundant OS Single Stations specify the master time.

Note

More time synchronization options are described in detail in the following manuals:

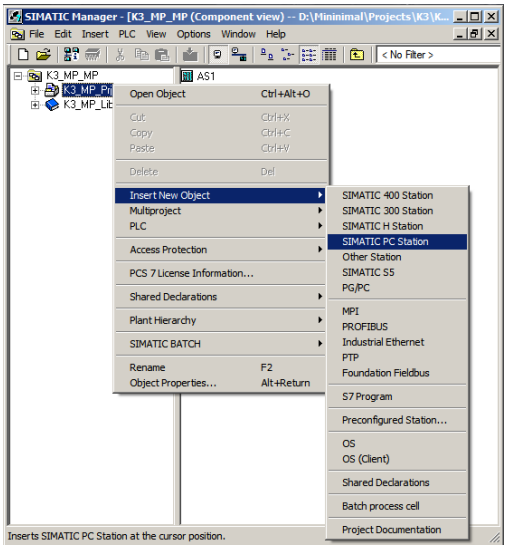
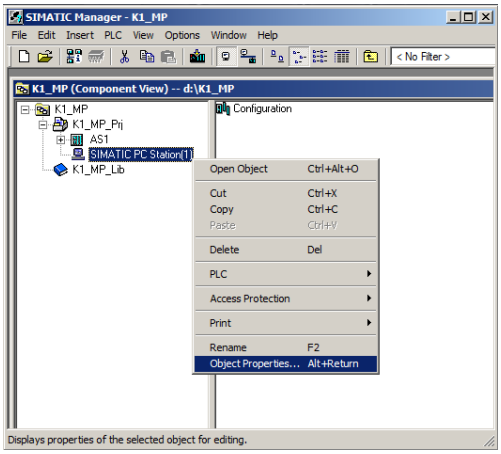
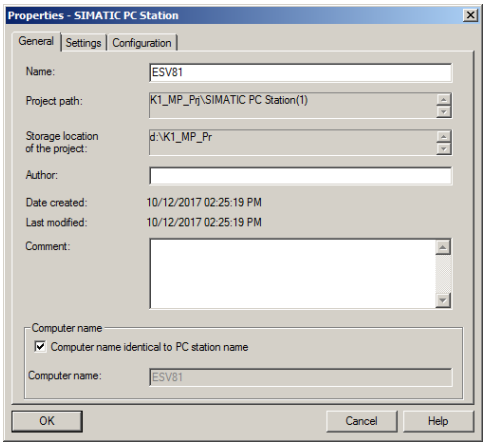
- "SIMATIC PCS 7 Operator Station (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746516
- "SIMATIC Process Control System PCS 7 Time Synchronization (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746544

Step	Activity	Screenshot
1.	Open the HW Config for the AS. Highlight the CPU and choose "Object properties..." in the shortcut menu.	
2.	Switch to the "Diagnostics/Clock" tab. In the "Clock" section, set "Synchronization Type - As slave" for the AS. Click on the "OK" button to confirm your selection.	

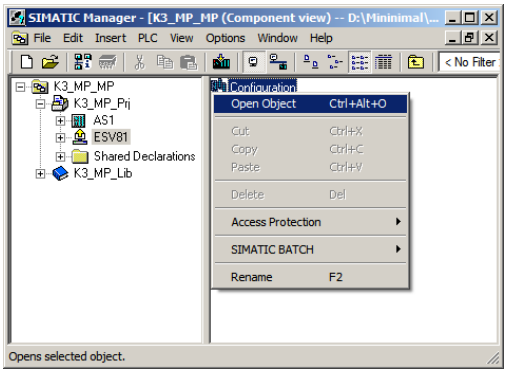
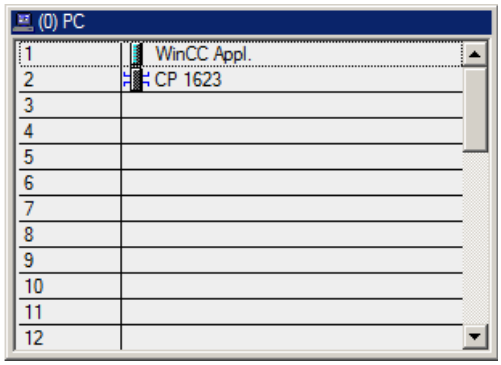
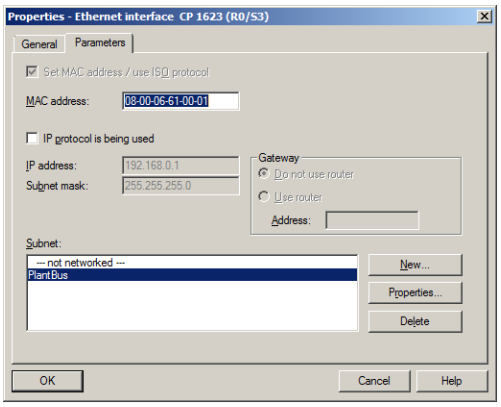
Step	Activity	Screenshot
3.	Open the shortcut menu of the CP and select "Object properties…".	
4.	Switch to the "Time synchronization" tab. Select the "Accept time of day on CP and forward" check box. Click on the "OK" button to confirm the setting.	
5.	Save the configuration and compile it using: "Station > Save and Compile…". Close the HW Config.	

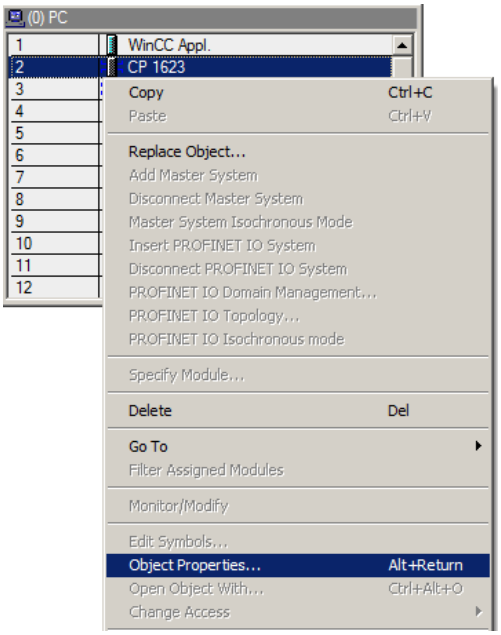
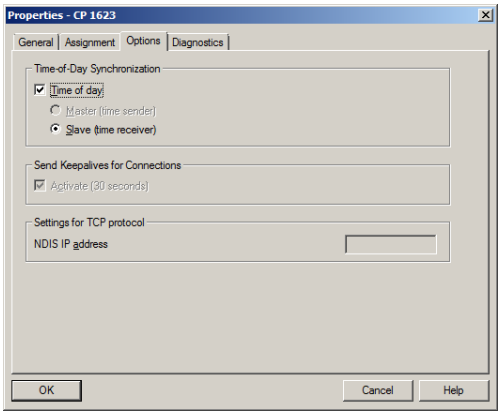
Setting up the ES PC station

A PC station is created for the ES using the WinCC application to allow testing of the OS project on the ES.

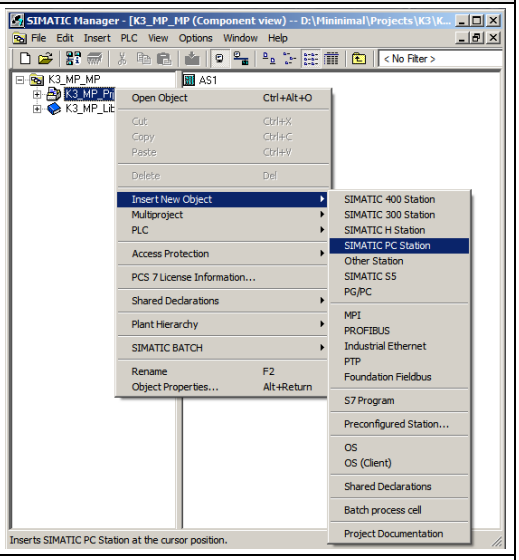
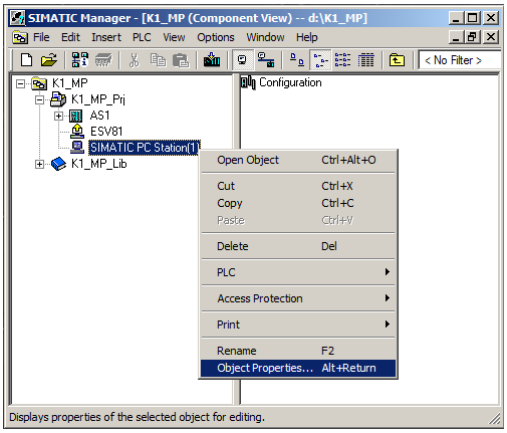
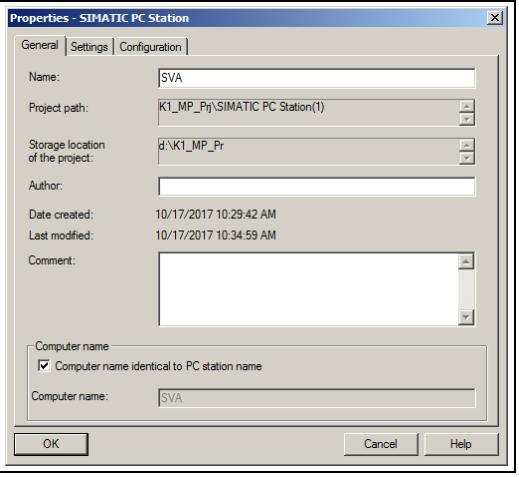
Step	Activity	Screenshot
1.	In component view, open the shortcut menu of the project and use "Insert New Object > SIMATIC PC station" to add a new PC station.	
2.	Use the shortcut menu to open the object properties of the PC station.	
3.	Change the name of the ES PC station to match the name of the local computer on the network. Select the “Computer name identical to PC station name” checkbox.	

5.3 Step-by-step configuration

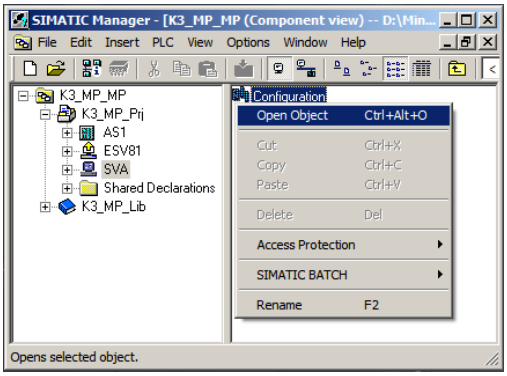
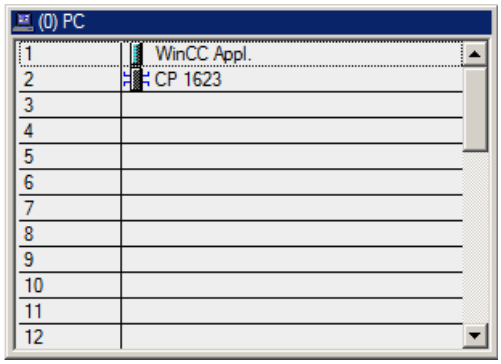
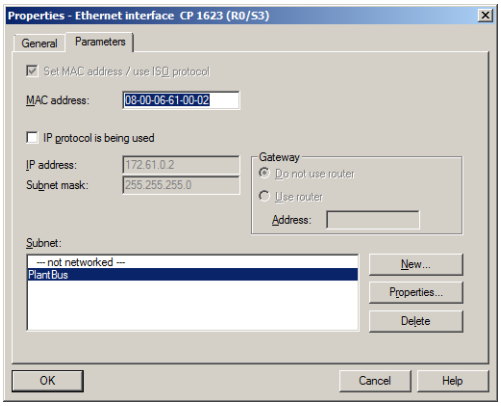
Step	Activity	Screenshot
4.	Open the HW Config of the ES PC station via the shortcut menu.	
5.	Insert a "WinCC application" and a network card of type "CP1623" from the object catalog (View > Catalog).	
6.	Under “Subnet”, choose the plant bus or create it by clicking on the “New…" button. Assign the corresponding MAC address to the CP1623. Deselect the "IP protocol is being used” checkbox. Click on the “OK” button to confirm your settings.	

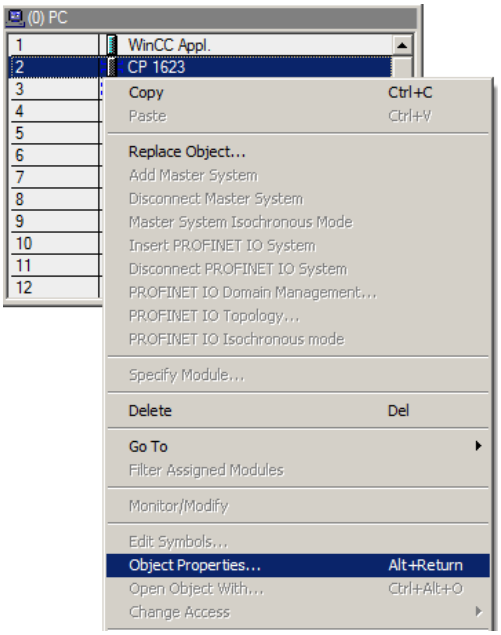
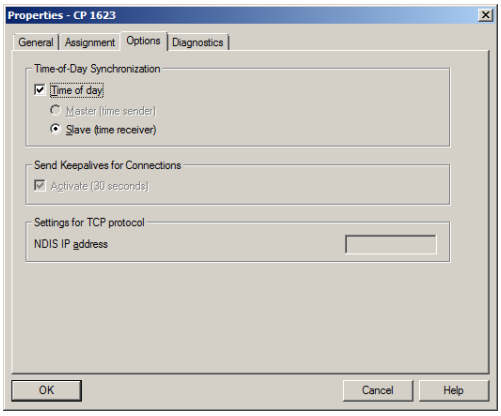
Step	Activity	Screenshot
7.	Open the shortcut menu of the CP1623 and select "Object properties…".	
8.	Switch to the “Options" tab and select the "Time of day” checkbox. Click on the "OK" button to confirm your selection.	
9.	Save and compile using menu command: "Station > Save and Compile…". Close the HW Config.	
10. Optionally	Delete the OS of the Engineering Station in SIMATIC Manager as it is not needed in our example.	

Setting up the Master OS PC station

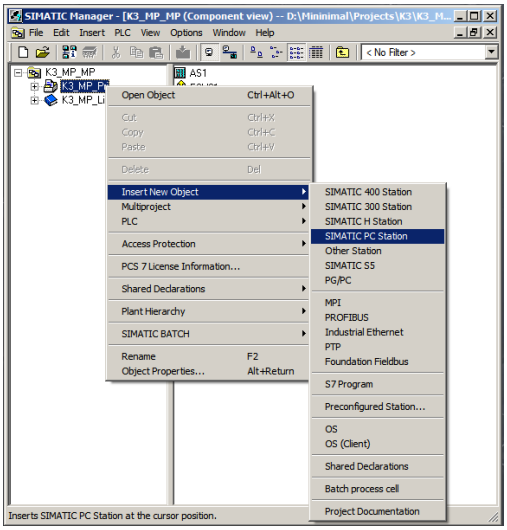
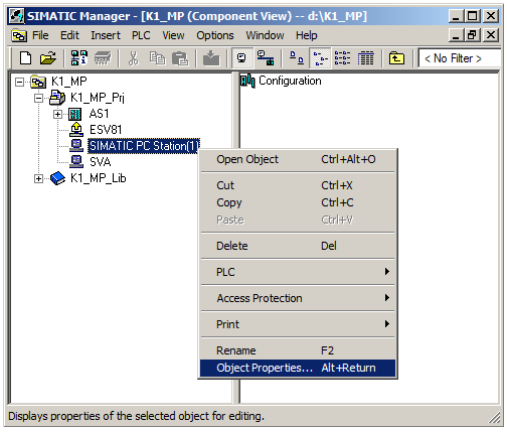
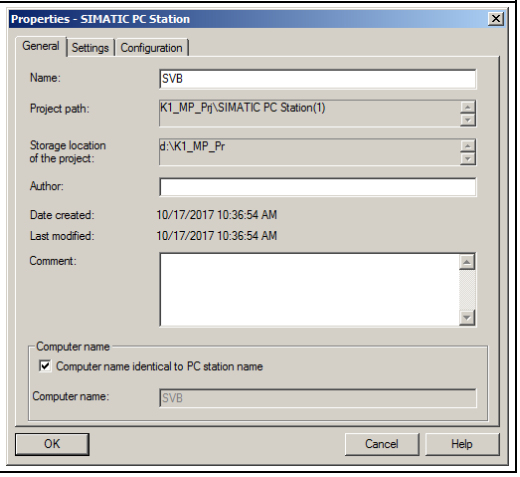
Step	Activity	Screenshot
1.	In component view, open the shortcut menu of the project and use "Insert New Object > SIMATIC PC station" to add a new PC station.	
2.	Use the shortcut menu to open the object properties of the PC station.	
3.	Change the name of the OS master PC station to match the name of the computer on the network. Select the “Computer name identical to PC station name” checkbox.	

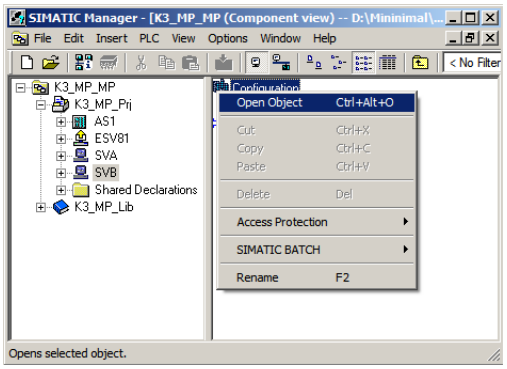
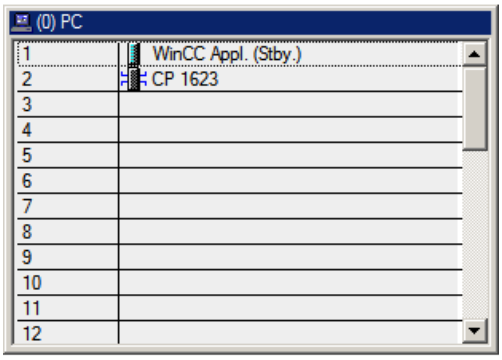
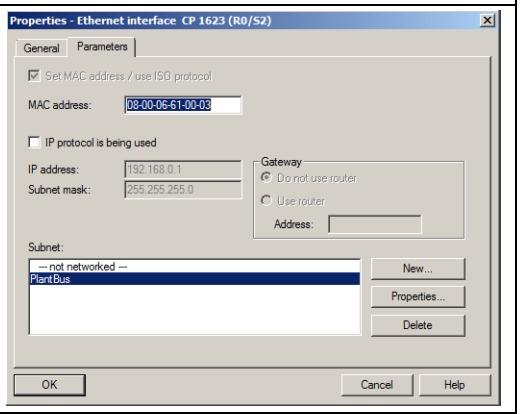
5.3 Step-by-step configuration

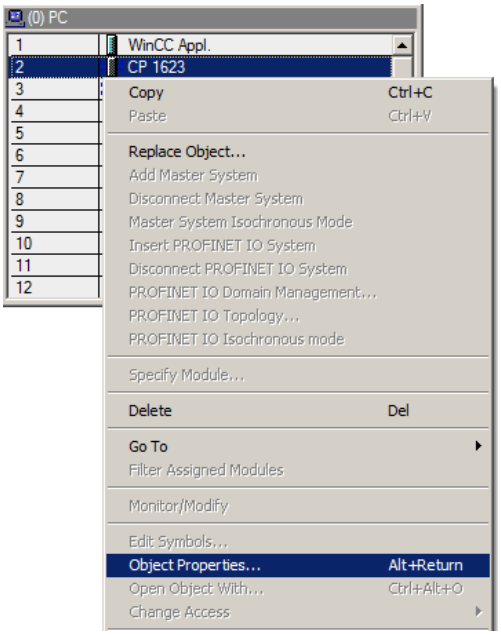
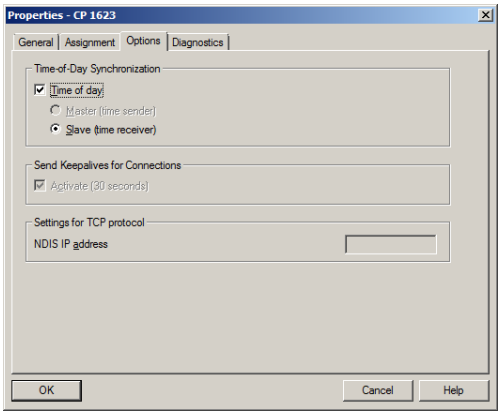
Step	Activity	Screenshot
4.	Open the HW Config of the OS master PC station via the shortcut menu.	
5.	Insert a "WinCC application" and a network card of type "CP1623" from the object catalog (View > Catalog).	
6.	Under “Subnet”, choose the plant bus or create it by clicking on the “New…" button. Assign the corresponding MAC address to the CP1623. Deselect the "IP protocol is being used” checkbox. Click on the “OK” button to confirm your settings.	

Step	Activity	Screenshot
7.	Open the shortcut menu of the CP1623 and select "Object properties…".	
8.	Switch to the “Options" tab and select the "Time of day” checkbox. Click on the "OK" button to confirm your selection.	
9.	Save and compile using menu command: "Station > Save and Compile…". Close the HW Config.	

Setting up the OS standby PC station

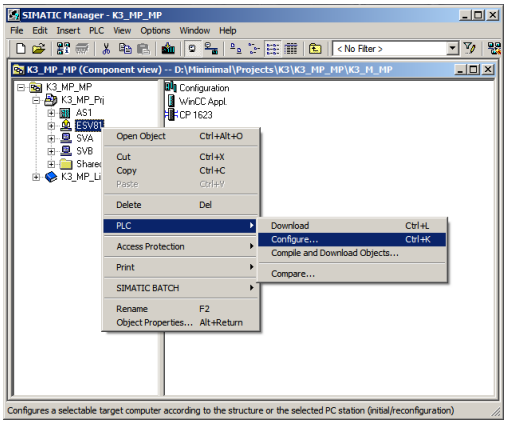
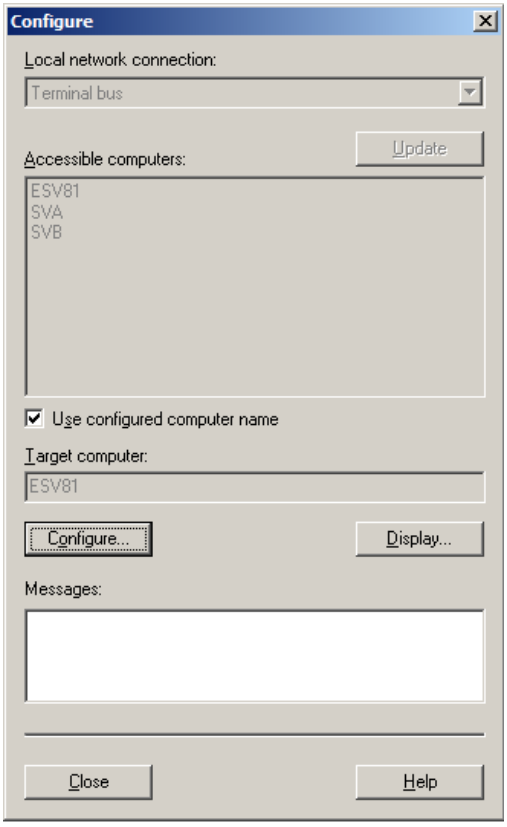
Step	Activity	Screenshot
1.	In component view, open the shortcut menu of the project and use "Insert New Object > SIMATIC PC station" to add a new PC station.	
2.	Use the shortcut menu to open the object properties of the PC station.	
3.	Change the name of the OS standby PC station to match the name of the computer on the network. Select the “Computer name identical to PC station name” checkbox.	

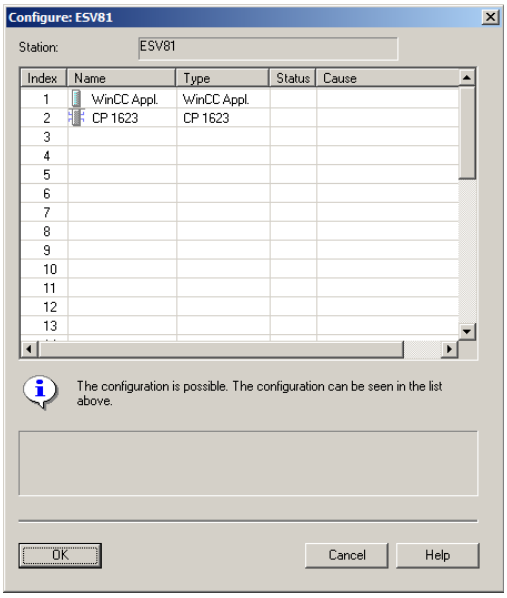
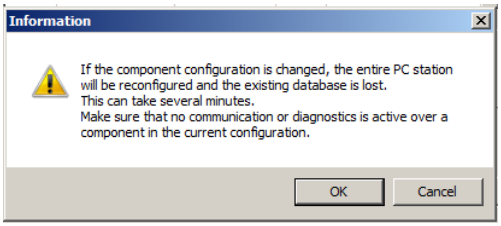
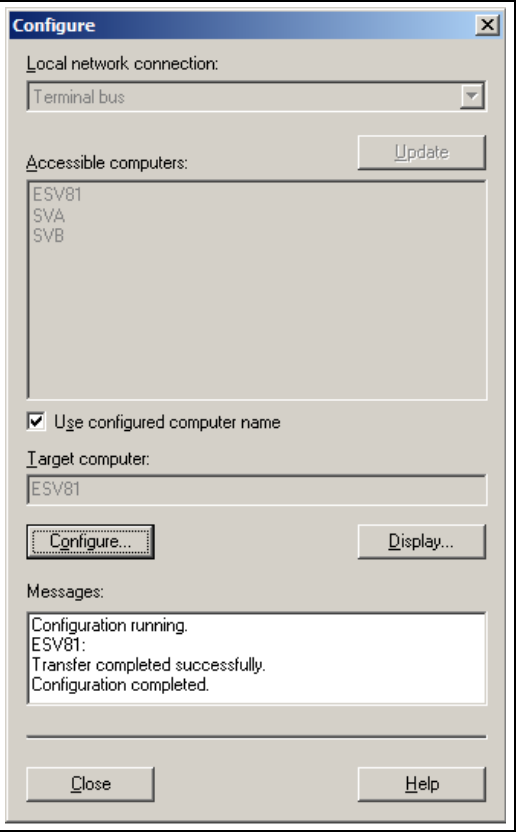
Step	Activity	Screenshot
4.	Open the HW Config of the OS standby PC station via the shortcut menu.	
5.	From the object catalog (View > Catalog), insert a "WinCC application (Stby)" and a network card of type "CP1623".	
6.	Under “Subnet”, choose the plant bus or create it by clicking on the “New…" button. Assign the corresponding MAC address to the CP1623. Deselect the "IP protocol is being used” checkbox. Click on the “OK” button to confirm your settings.	

Step	Activity	Screenshot
7.	Open the shortcut menu of the CP1623 and select "Object properties…".	
8.	Switch to the “Options" tab and select the "Time of day” checkbox. Click on the "OK" button to confirm the setting.	
9.	Save and compile using menu command: "Station > Save and Compile…". Close the HW Config.	

Configuring all of the PC stations

The "Configure PC station" function transfers project configurations to one or more target stations. First, configure the local ES and then all of the operator stations that are connected to the plant bus.

Step	Activity	Screenshot
1.	Configure the Station Configuration Editor of the ES. To do this, select the PC station of the ES and in the shortcut menu choose: "PLC > Configure…".	
2.	Under "Accessible computers:" choose the PC that you want to configure. **NOTE** If you chose the option "PC name identical to PC station name" for the PC station in the "Object properties", the system displays directly in the component configurator the target PC to be configured. Using the "Display..." button, you can show the current configuration of the PC station. Click on the "Configure…" button.	

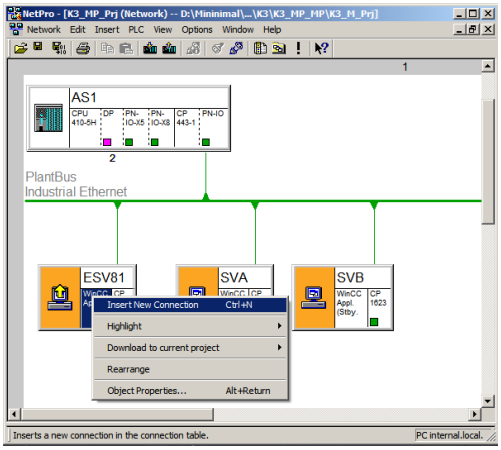
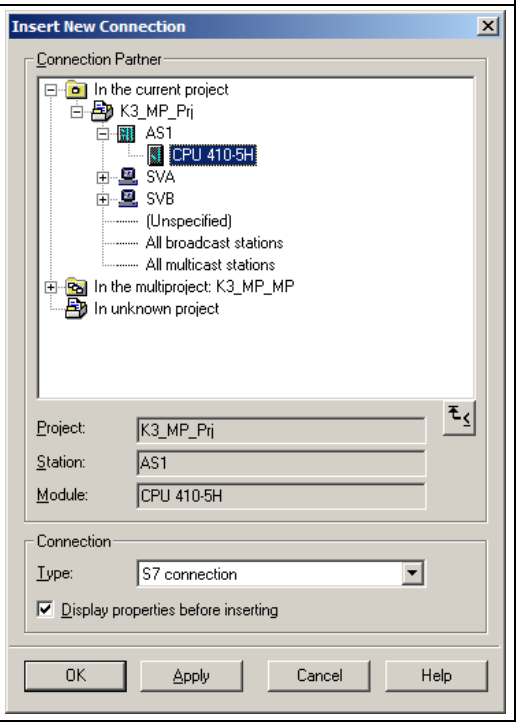
Step	Activity	Screenshot
3.	In the window that appears, you can see how the PC station is configured. Click on the "OK" button to confirm this setting.	
4.	Click on the "OK" button to confirm the information dialog.	
5.	In the bottom window, you then see the message: "Transfer completed successfully." Close the configuration dialog.	

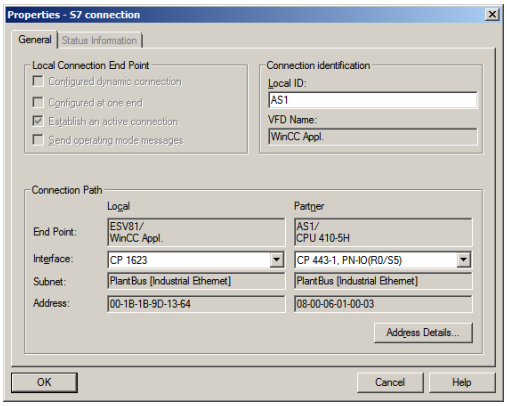
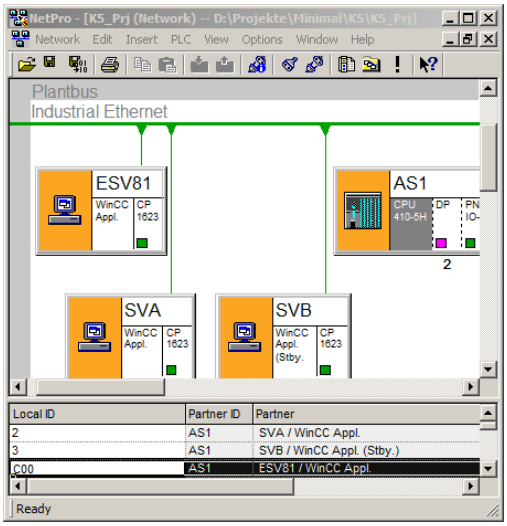
Step	Activity	Screenshot
6.	Configure the Station Configuration Editors of the OS master/standby as shown in steps 1 to 5.	

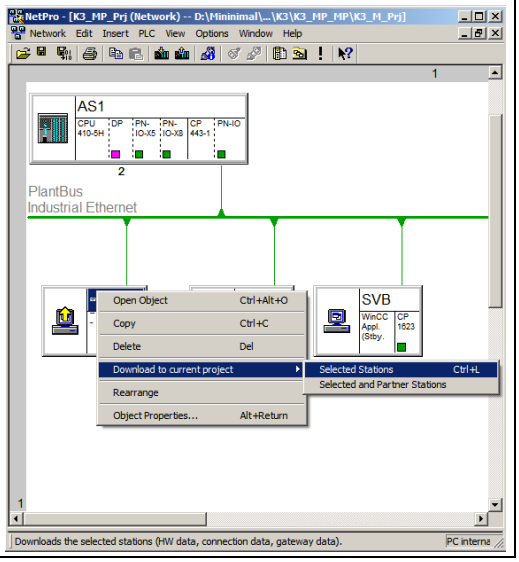
Configuring and loading AS-OS communication

In the following section, the connections between the PC stations and the AS are configured in NetPro and loaded in the individual stations.

Note In the case of a granular station configuration, you must merge the subnets of the individual sub-projects first.

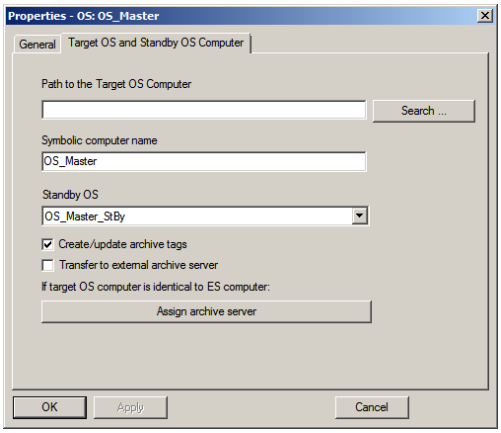
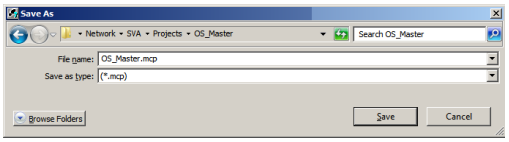
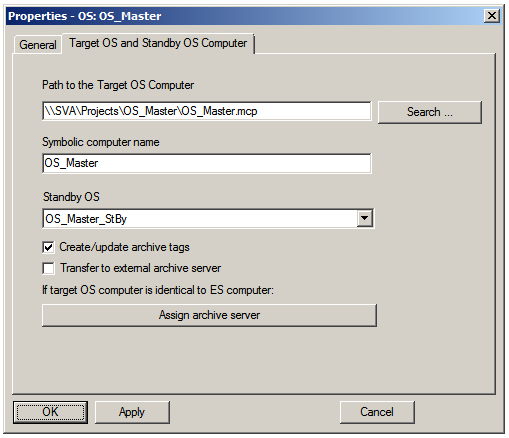
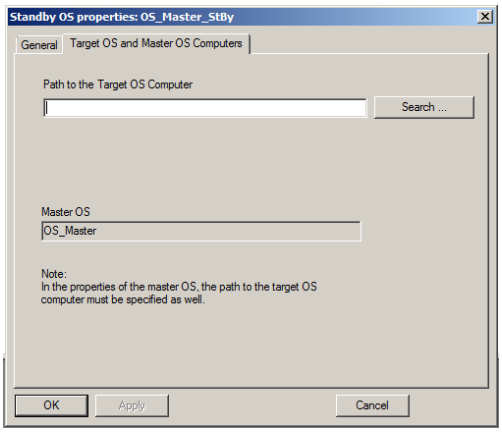
Step	Activity	Screenshot
1.	Open NetPro. Highlight the WinCC application of the ES and open the shortcut menu. Choose "Insert New Connection".	
2.	In the "Connection Partner" window, select the CPU of the AS. Make sure that an “S7 connection" is selected under “Connection”. In this example, a high-availability S7 connection is configured due to the AS configuration. Click on the "OK" button to confirm your selection.	

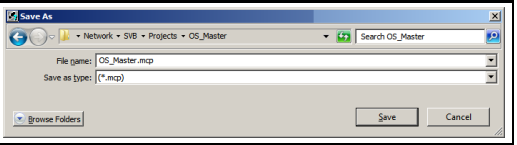
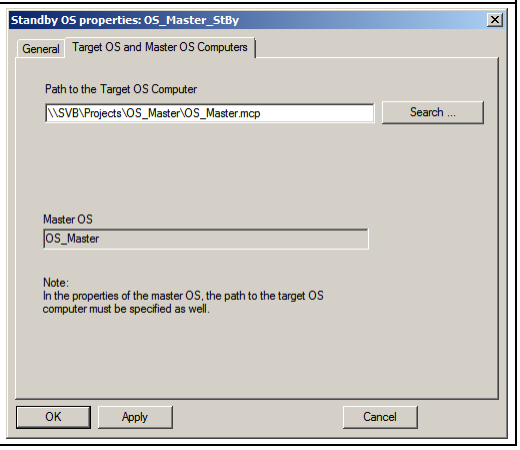
Step	Activity	Screenshot
3.	On the “General" tab under "Connection identification”, change the “Local ID:" to a descriptive name like AS1, for example. Click on the “OK” button to confirm your settings.	
4. Optionally	In the connection table of the AS, change the local ID for the connection to the ES to a value of greater than 0xc00. **Note** A connection ID of greater than 0xc00 prevents the AS from generating messages in later operation due to starting or stopping of OS simulation on the ES.	
5.	Also set the connections of the OS master and OS standby to the AS by repeating steps 1 to 3. When doing this, it is important that the connections of the OS master, OS standby and of the ES to the AS have the same name. After this, use the ""Network > Save and Compile..." menu item to save the configurations and compile them. Select the "Compile and check everything" option button and click on the "OK" button to confirm your selection.	

Step	Activity	Screenshot
6.	Highlight the ES and download the connection use the “PLC > Download to Current Project > Selected Stations" menu item to download the connection. Download the AS, the OS master, and OS standby in the same way. Then, close NetPro.	

Master/Standby settings on the ES

Here, you define the master/standby assignment and set the loading paths.

Step	Activity	Screenshot
1.	In SIMATIC Manager, open the properties dialog of the OS master PC station. Switch to the "Target OS and Standby OS Computer" tab. Select the Standby OS from the drop-down list. Select the "Create/update archive tags" checkbox. Clear the “Transfer to external archive server” checkbox if you are not using a Process Historian. Click on the "Browse" button.	
2.	Use the drop-down list to navigate to the shared project folder of the Master OS (see 5.3.1 Preparatory activities). Click on the "Save" button.	
3.	In the "Path to Target OS Computer” input field, check again the whole project path. Click on the “OK button” to confirm your entry.	
4.	Open the properties dialog of the Standby OS PC station. Switch to the "Target OS and Mater OS Computers" tab. Check whether OS_Master is entered in the "Master OS" field too. Click on the "Search..." button to select the storage path of the OS data.	

Step	Activity	Screenshot
5.	Use the drop-down list to navigate to the shared project folder of the Standby OS (see 5.3.1 Preparatory activities). Click on the "Save" button.	
6.	In the input field, check the "Path to the Target OS Computer". Click on the "OK" button to confirm this. Click on "Yes" to confirm the dialog that is displayed next.	

Compiling and loading the user program

Compile the S7 program and download it to the AS.

Compiling the OS project

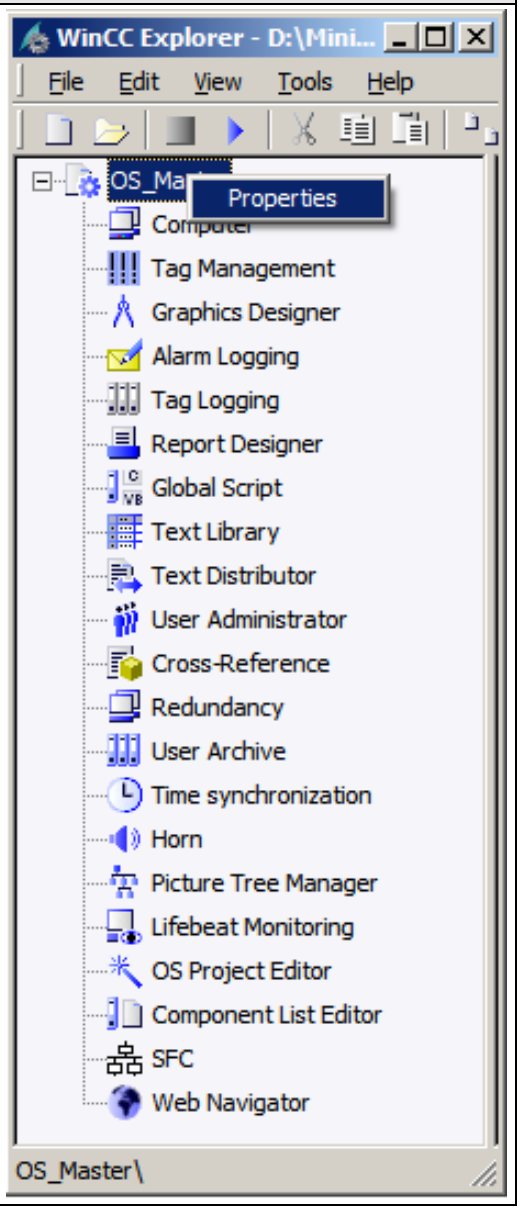
Compile the OS project of the Master OS in SIMATIC Manager.

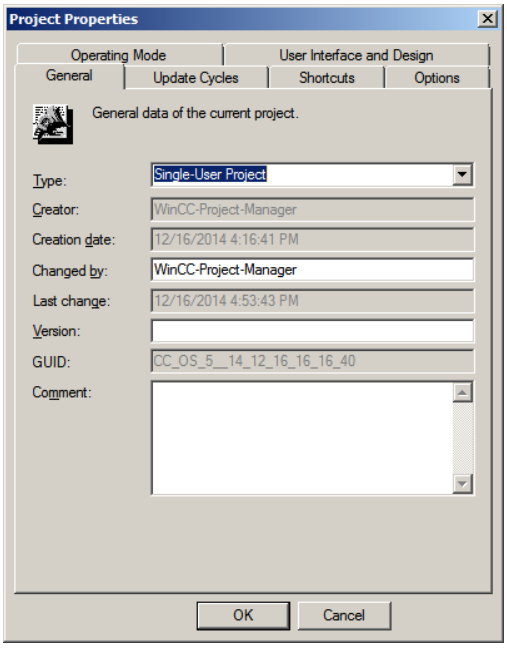
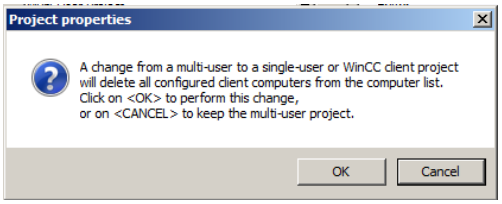
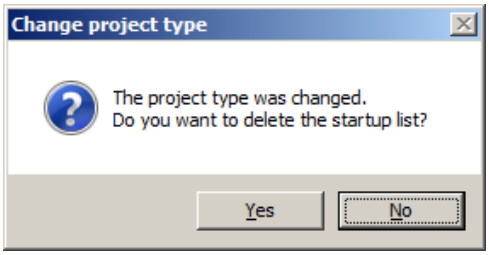
Make sure that you make the correct OS assignment to the server in plant view.

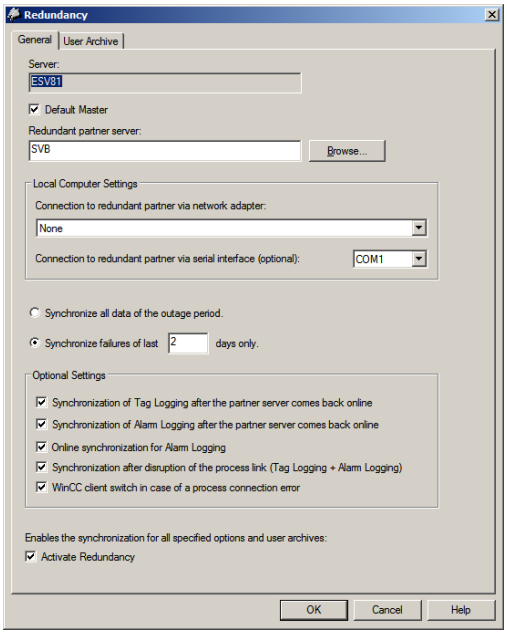
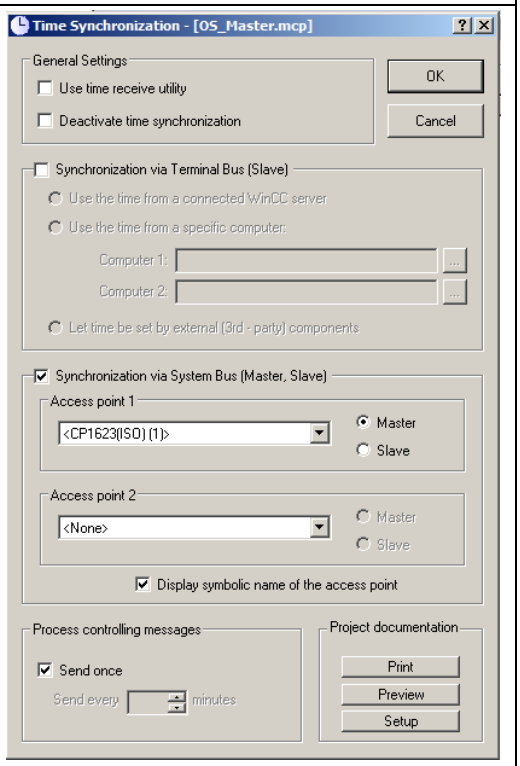
5.3.3 OS configuration

Configuring the OS on the engineering station

On the ES, you switch from a multi-user system to a single-user one and make the settings for redundancy and time synchronization.

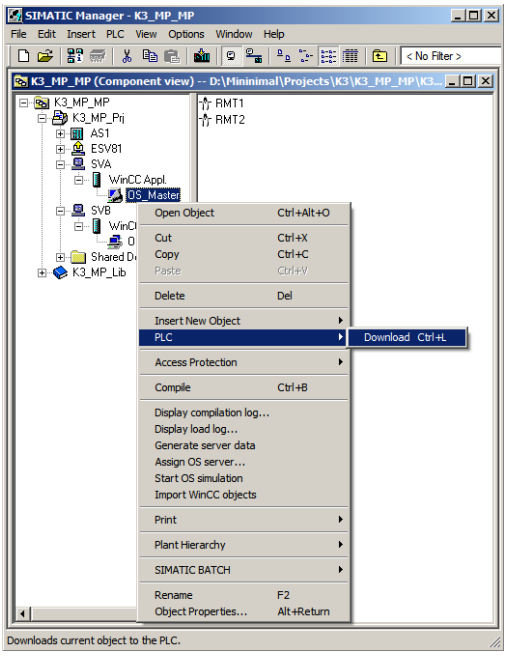
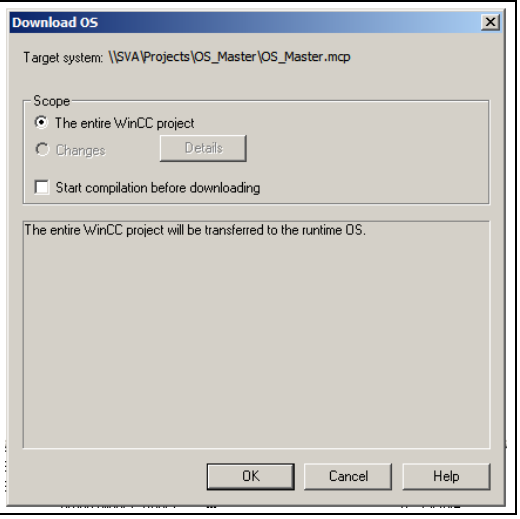
Step	Activity	Screenshot
1.	On the ES, open the OS project of the Master OS. In the open WinCC Explorer, highlight the OS project and choose “Properties” in the shortcut menu.	

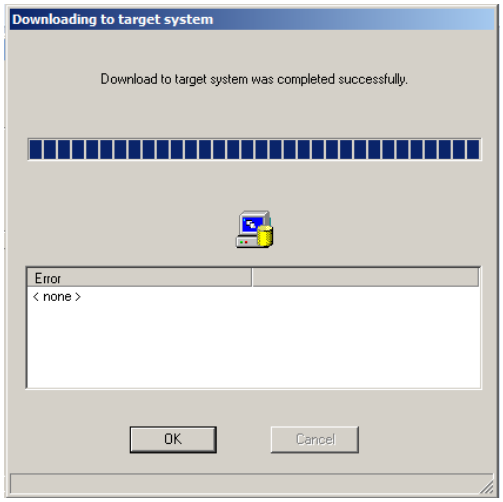
Step	Activity	Screenshot
2.	On the “General” tab under “Type:”, choose "Single-user project". Confirm your input and the displayed message by clicking on the "OK" button. **Note:** You need server packages for the function of the MS clients, i.e. the OS/MS server must not be a single-user project. If the OS/MS server is set up as a single-user project, the MS client cannot be used on the ES.	 
3.	Click on the "No" button to prevent the startup list from being deleted.	

Step	Activity	Screenshot
4.	Open the "Redundancy" editor. Select the "Default Master" checkbox. Enter the Standby OS in the "Redundant partner server" field. Check whether you have selected the desired checkboxes under "Optional Settings". In the drop-down list, select the connection path that is used to connect the Master OS and the Standby OS. Click on the “OK” button to confirm your settings.	
5.	Open the "Time Synchronization" editor. Select the "Synchronization via System Bus (Master, Slave)" checkbox. Under "Access point 1”, choose "CP1623(ISO)" and select the "Master" radio button. Click on the “OK” button to confirm your settings. **NOTE** If you configure station time synchronization on a different computer, the access points are not known, which means that they are not available in the drop-down list. To choose the access point regardless, select the "Display symbolic name of the access point" checkbox and then choose the appropriate access point.	
6.	Close the OS project.	

Downloading the OS project to the OS computer

Once redundancy and time synchronization have been configured on the ES, download the OS project to the Master OS and the Standby OS.

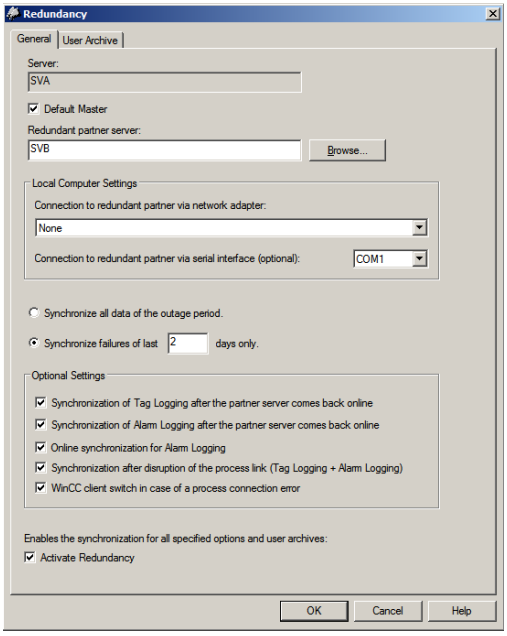
Step	Activity	Screenshot
1.	In SIMATIC Manager, highlight the Master OS and choose “PLC -> Download" in the shortcut menu.	
2.	For the first OS project download, an entire download is required. Click on the "OK" button to start downloading.	

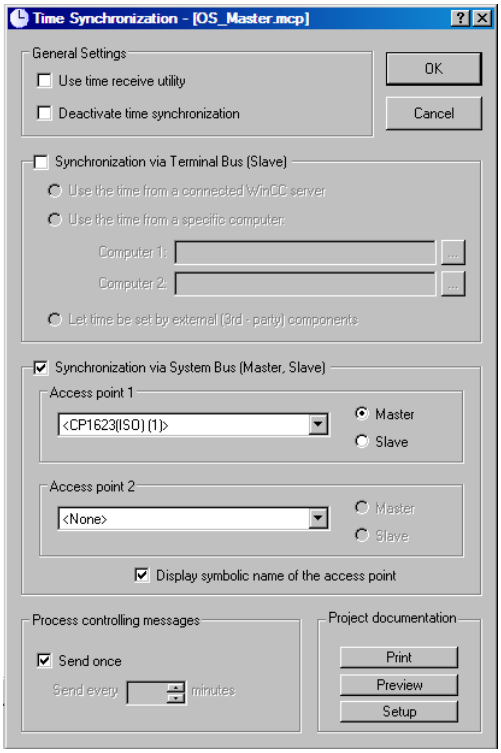
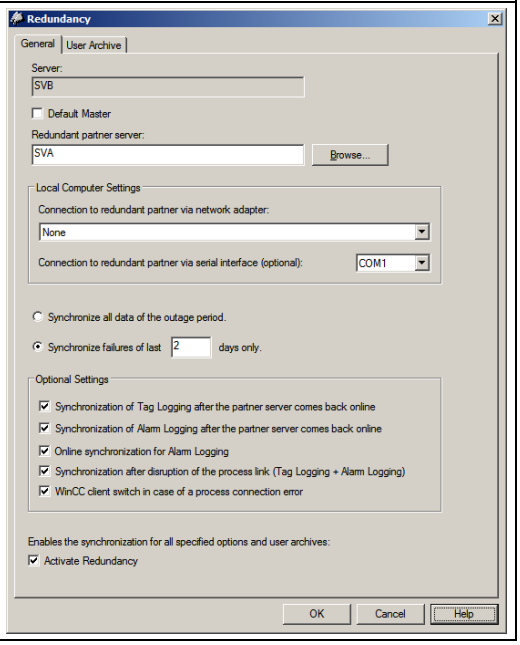
Step	Activity	Screenshot
3.	After successful downloading, the OS project is located in the specified folder on the Master OS. Click on the "OK" button to confirm the message that is issued.	
4.	Repeat steps 1 to 3 to download the OS project to the Standby OS.	

Configuring on the operator station

Generally, we would advise you to check the project settings after the project has been downloaded to the target systems.

Note Normally, all configuration work is carried out on the ES to ensure consistent data management. This means that no WinCC engineering licenses are needed on the OSes. However, each time WinCC Explorer is opened, a license-free time window of two hours is available for WinCC configuration work.

Step	Activity	Screenshot
1.	Open the OS project on the OS project.	
2.	Open the "Redundancy" editor. Check the name of the Master OS in the "Server" field. Select the "Default Master" checkbox. Also, check whether the name of the Standby OS is entered correctly under "Redundant partner server:". Check whether you have selected the desired checkboxes under "Optional Settings". Check whether the connection path that is used to connect the Master OS and the Standby OS is set. Click on the “OK” button to confirm your settings.	

Step	Activity	Screenshot
3.	Open the "Time Synchronization" editor. Check or select the "Synchronization via System Bus (Master, Slave)" checkbox. Under "Access point 1", check or select "CP1623(ISO)" and the "Master" radio button. Click on the “OK” button to confirm your settings.	
4.	If you have made project changes in WinCC Explorer, close the OS project and open it again for the settings to take effect.	
5.	Repeat steps 1 to 4 on the Standby OS with the following modifications for step 2 (redundancy): • The "Default Master" checkbox must be cleared. • Check whether the name of the Master OS is entered correctly under "Redundant partner server:" and change it if necessary.	

5.3.4 Activating runtime

First activate the OS project on the Master OS and then on the Standby OS. Before activating the second runtime, it is advisable to wait until the boot process of the first one has completed.

Online synchronization is active immediately.
By contrast, mutual synchronization of archives starts 10 minutes later.

6 ES/OS Master and OS Standby

6.1 Configuration description

In this configuration with two redundant OS Single Stations, one of the stations is used at the same time as an ES, which obviates the need for a separate third station.

In this connection, you must pay attention to the following two criteria. This is why we generally recommend creating a configuration with a separate ES (see chapter 5 "ES, OS Master and OS Standby"):

Comparatively low savings potential

The savings potential has been reduced since PCS 7 V8.0 because the OS runtime license is no longer included with the ES license. This means that, savings are limited to one computer (hardware and Windows license).

Special considerations when configuring

The configuration differs from that of the PCS 7 Engineering Standard and represents a kind of workaround.

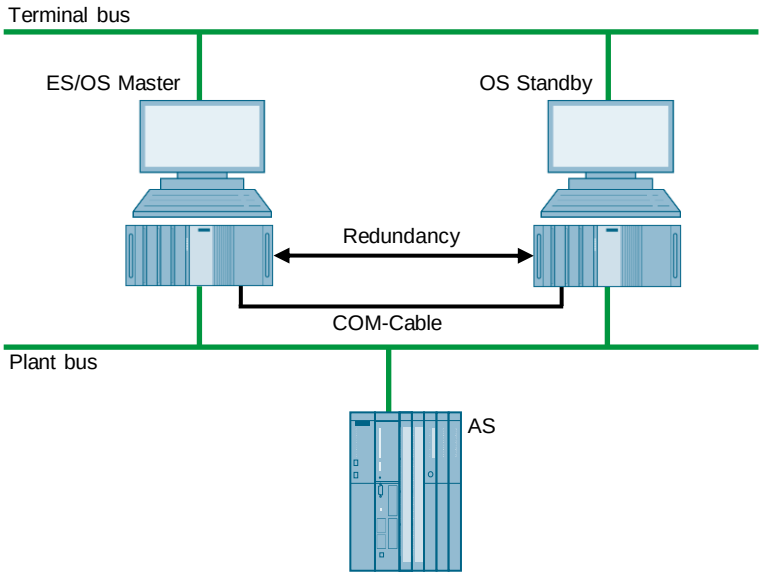
You cannot use the "WinCC Application" and "WinCC Standby Application" PCS 7 standard tools, since it is not possible to download changes during operation. The mechanisms controlling the fact that both systems must be in runtime and that runtime on the ES must be stopped for the download to proceed block one another.

For this reason, we configure only one OS application, open it on both stations, and configure mutual redundancy locally in WinCC in each case. To be able to download to the OS Single Station, runtime on the ES and the OS must be closed first.

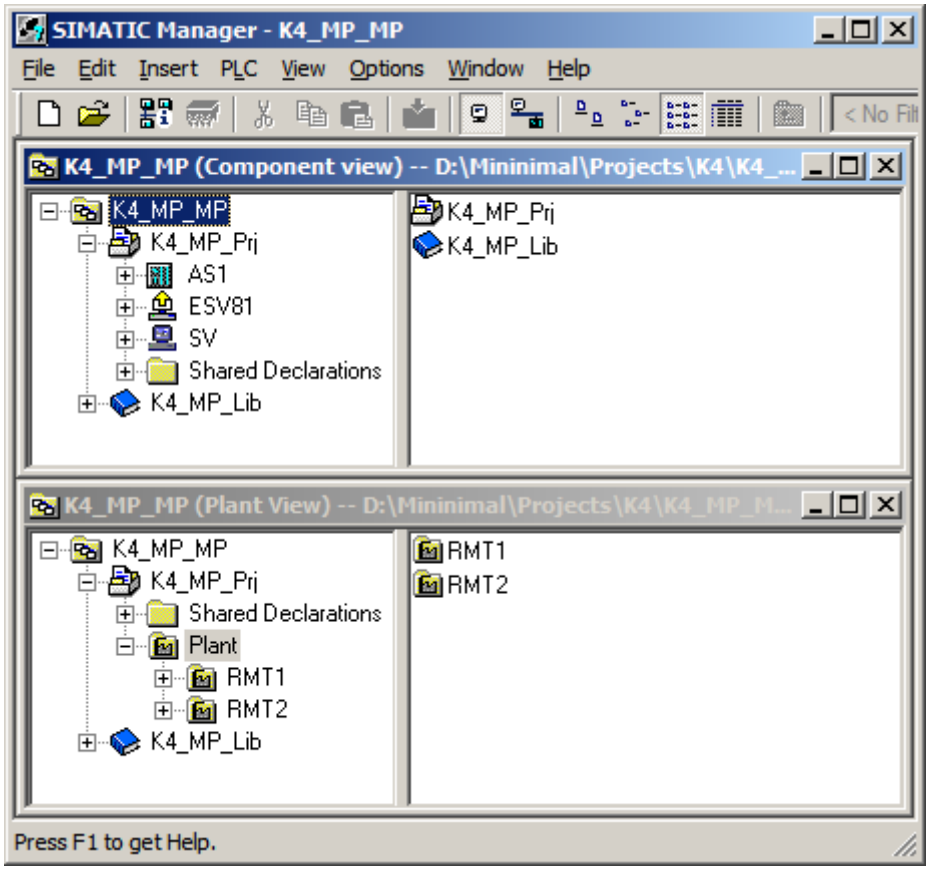
CAUTION	This configuration has been tested with a PCS 7 basic installation including the Web Option. No statement can be made regarding the functionality with additional optional packages.

Note	The jump keys in the asset faceplates for hardware configuration and for PDM function as follows: - Up to PDM V8.1: On ES only - PDM V8.2 and higher: On ES and Standby OS - PDM V9.0 and higher: On ES and OS clients, and web clients

Hardware configuration



PCS 7 configuration



Limitations/Particularities

Due to the untypical configuration of PCS 7 with only one OS, there are differences in system behavior that must be observed:

- The first activated OS takes on the master role.
- For an entire download to be performed, runtime must be deactivated and the OS project closed on both computers. During this time, operator actions and archiving are not possible.
- To download changes, runtime must be stopped on the ES when compiling the OS. These can then be re-activated to test the modified OS functions. For the downloading process, runtime must be terminated and the OS Project must be closed. As a result, it is not possible to take operator actions on the ES computer during this time.

CAUTION Depending on the changes that are carried out, if runtime remains active during OS compilation, subsequent downloading of changes may not be performed completely and will cause errors. If this happens, only an entire download is possible.

- When runtime is active on the ES computer, the runtime archives are stored in the multiproject path. At archiving, they are included in the ZIP file, which causes an increased demand on memory resources as well as longer archiving times Workaround:
  - Deactivate runtime on the ES computer
  - Reset the archives in the OS project on the ES computer and close the entire PCS 7 project

After archiving and re-activating runtime, the archives are synchronized again. However, it must be noted that more time is needed for synchronization.

6.2 Required hardware and software licensing

Hardware

For this configuration, we recommend using the hardware below which you can order via the Siemens mall. This ensures that the appropriate number of selected operating systems and SIMATIC PCS 7 system software packages are pre-installed on the PC stations.

Station	Product designation	Operating system	Plant bus transition
1 x ES/OS	SIMATIC PCS 7 ES/OS IPC847D BCE	Windows 7	RJ45 Network card
	SIMATIC PCS 7 ES/OS IPC847D IE	Windows 7	CP 1623
1 x OS Single Station	SIMATIC PCS 7 ES/OS IPC847D BCE	Windows 7	RJ45 Network card
	SIMATIC PCS 7 ES/OS IPC847D IE	Windows 7	CP 1623

Software licensing

The following section lists the software/license packages that you need for the selected configuration.

Component	Software/license packages
ES	• SIMATIC PCS 7 AS/OS Engineering Software (Unlimited POs) • SIMATIC PCS 7 AS Runtime License
OS Single Station Redundant	• SIMATIC PCS 7 OS Software Single Station Redundancy (Single License for 2 installations) • 2 x SIMATIC PCS 7 OS Runtime License (max. of 2,000 POs)

6.3 Step-by-step configuration

Note

The following instructions have been drawn up based on Windows 7 and PCS 7 V8.2.

CP1623 are used as an example of the plant bus transition. Time synchronization is activated additionally.

The PC stations used in the test setup are called:

- ES/OS Master: ESV81
- OS Standby: SV

6.3.1 Preparatory activities

Create a project folder on the Standby OS PC station and share it. This makes it possible to transfer the OS data that is configured on the engineering station to the OS master and the OS standby.

6.3.2 ES configuration

Creating the multiproject

As the basis for the instructions below, all of the PC stations must be physically networked as shown in the illustration in chapter 6.1. Apart from this, you must create a multiproject on the ES in which the hardware and software of the AS are already configured.

Start with the following CPU and CP settings.

AS settings for time synchronization

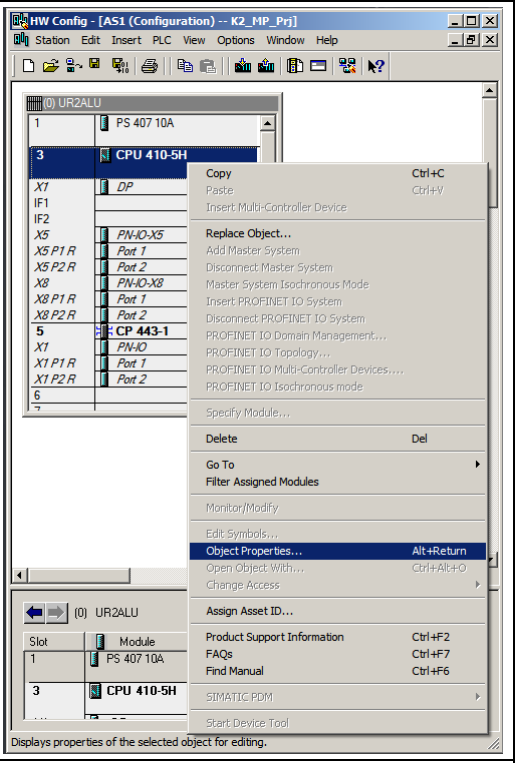
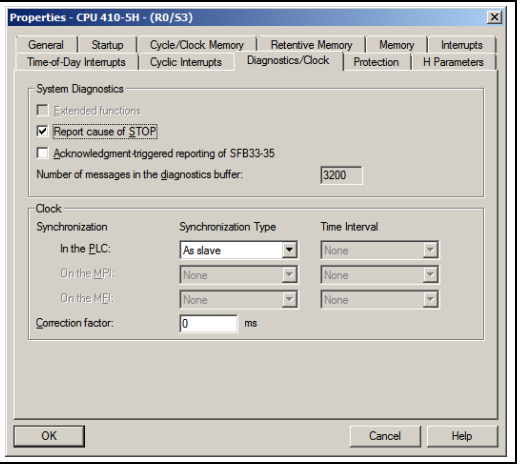
The analyzability of the process data requires that all of the components of the process control system work with an identical clock time to be able to assign messages in the correct time sequence

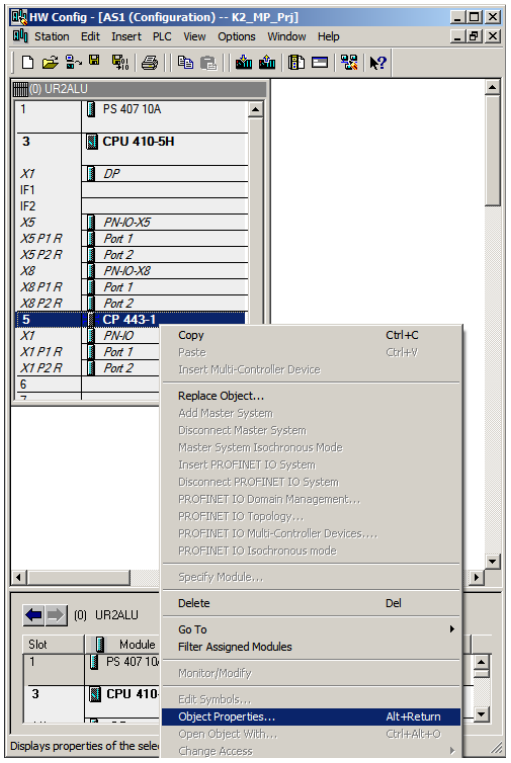
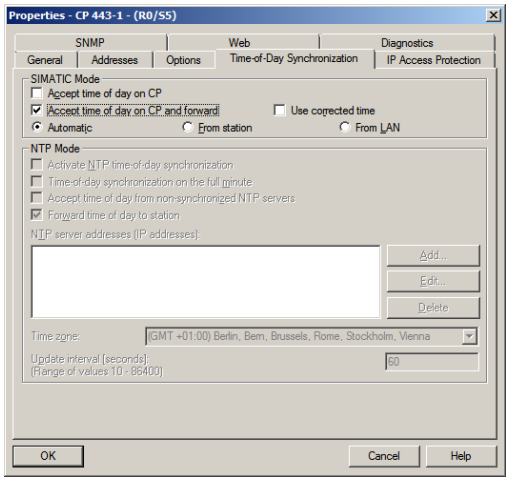
The following section describes a way in which the OS Single Station that is activated first specifies the master time.

Note

More time synchronization options are described in detail in the following manuals:

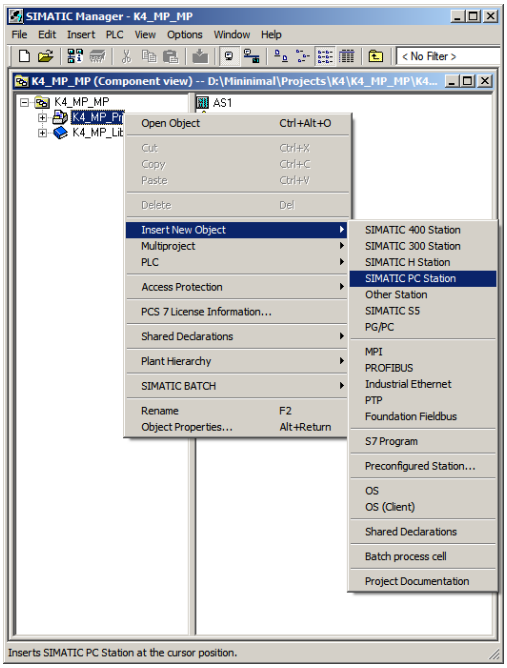
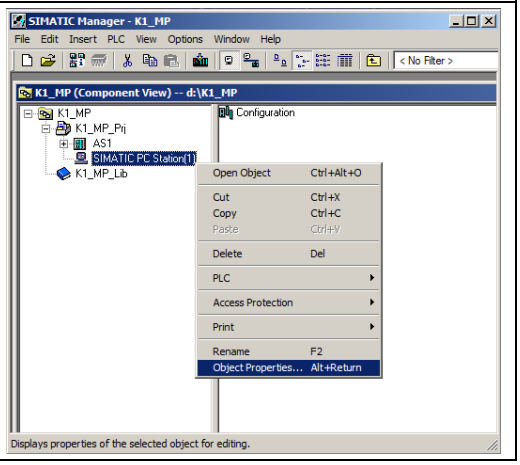
- "SIMATIC PCS 7 Operator Station (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746516
- "SIMATIC Process Control System PCS 7 Time Synchronization (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746544

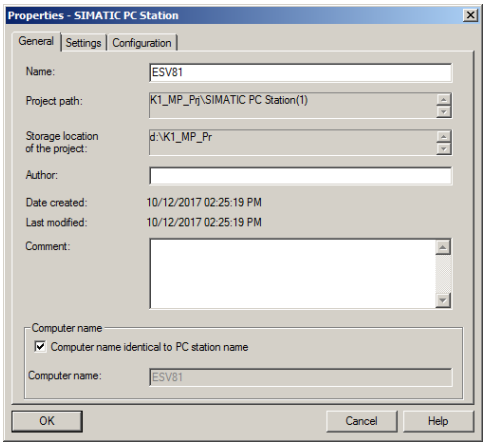
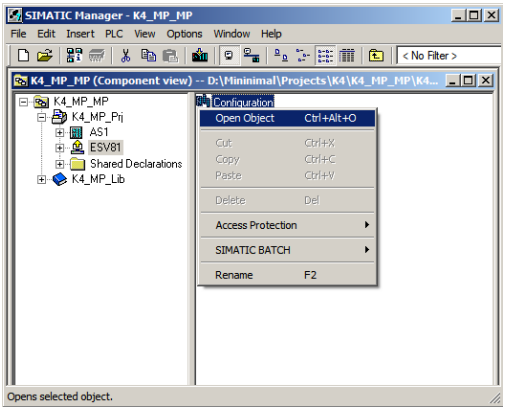
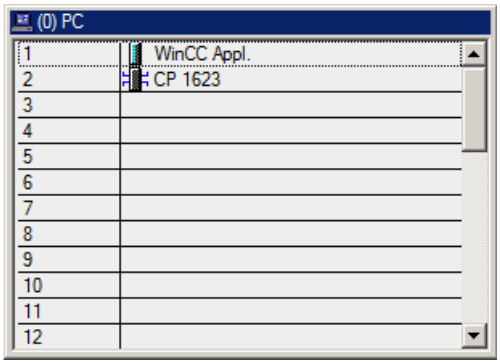
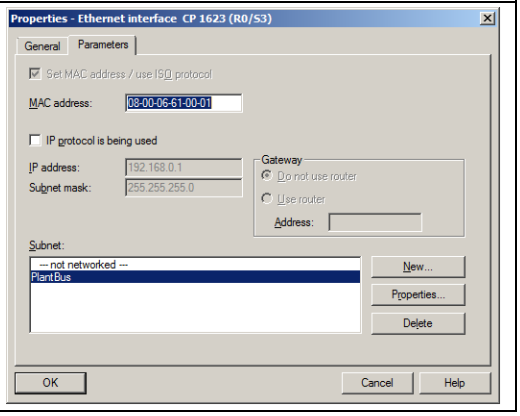
Step	Activity	Screenshot
1.	Open the HW Config for the AS. Highlight the CPU and choose "Object properties..." in the shortcut menu.	
2.	Switch to the "Diagnostics/Clock" tab. In the "Clock" section, set "Synchronization Type - As slave" for the AS. Click on the "OK" button to confirm this setting.	

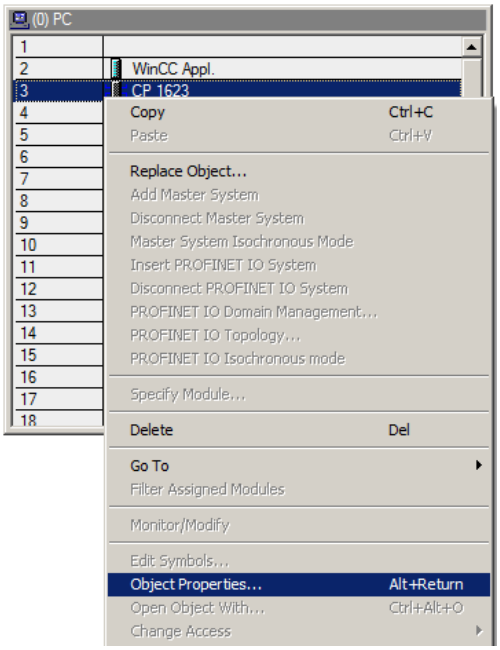
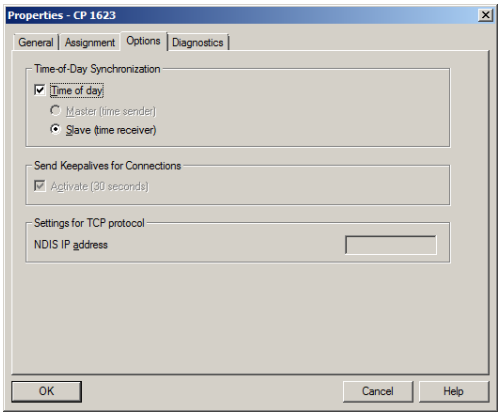
Step	Activity	Screenshot
3.	Open the shortcut menu of the CP and select "Object properties…".	
4.	Switch to the "Time synchronization" tab. Select the "Accept time of day on CP and forward" check box. Click on the "OK" button to confirm your selection.	
5.	Use the "Station > Save and compile..." command to save the configuration. Close the HW Config.	

Setting up the ES PC station

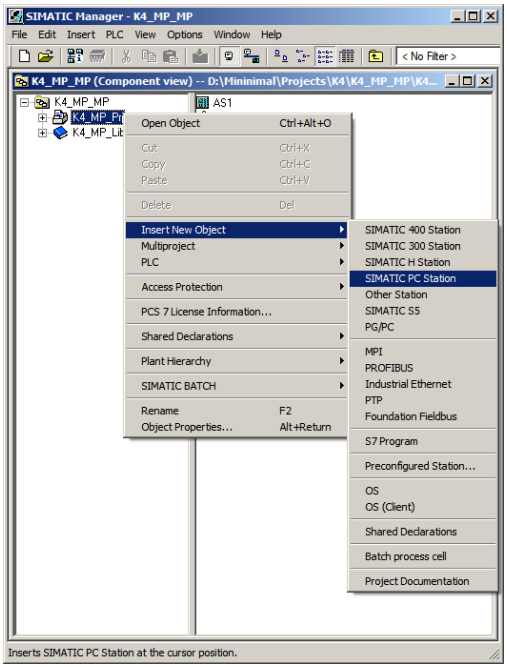
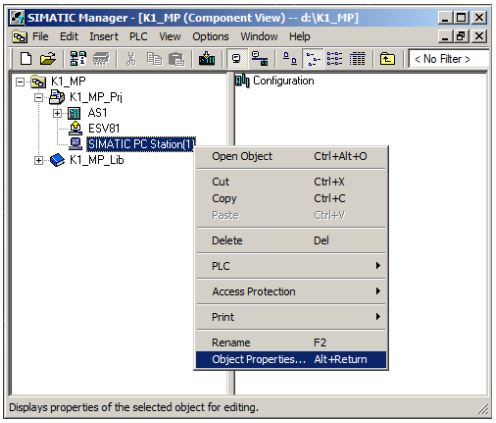
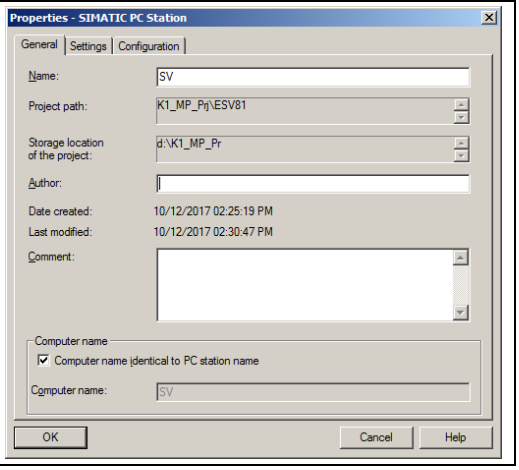
To run the OS project on the ES, a PC station is created for the ES using the WinCC application.

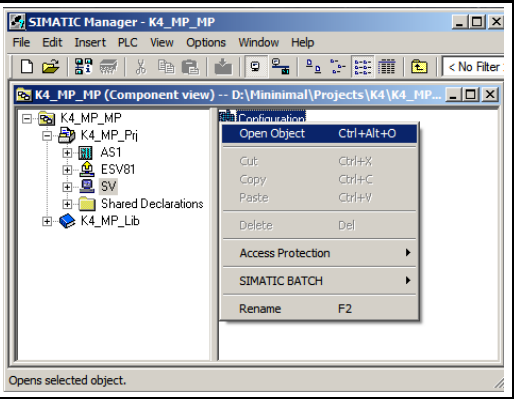
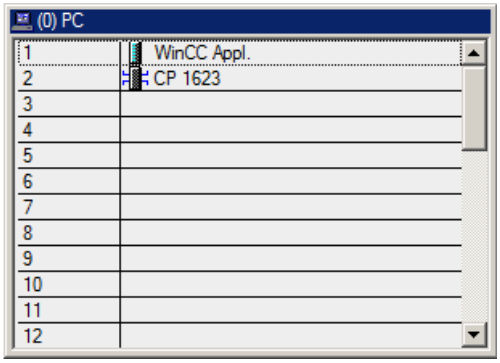
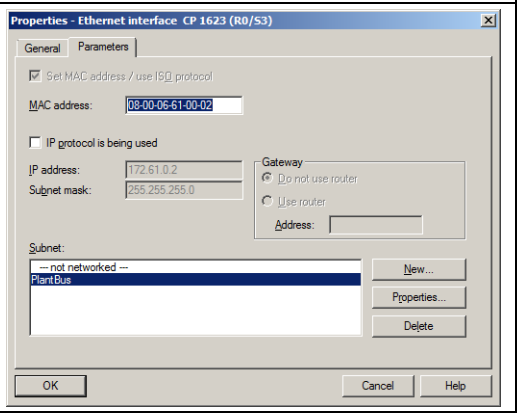
Step	Activity	Screenshot
1.	In component view, open the shortcut menu of the project and use "Insert New Object > SIMATIC PC station" to add a new PC station.	
2.	Use the shortcut menu to open the object properties of the PC station.	

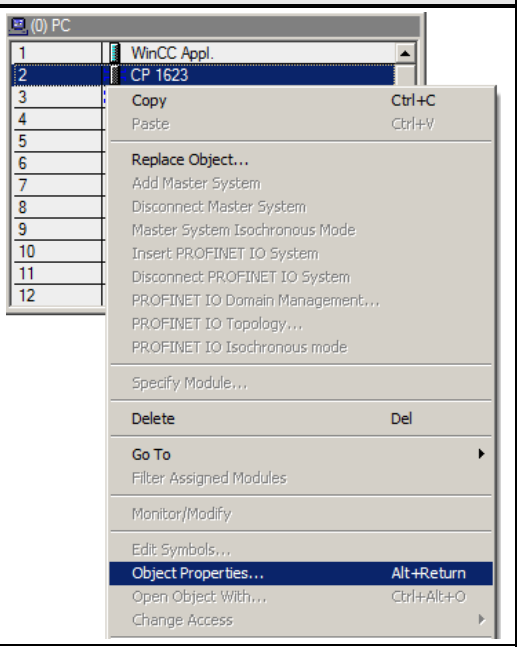
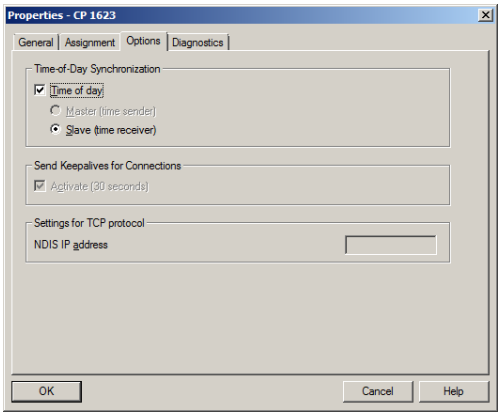
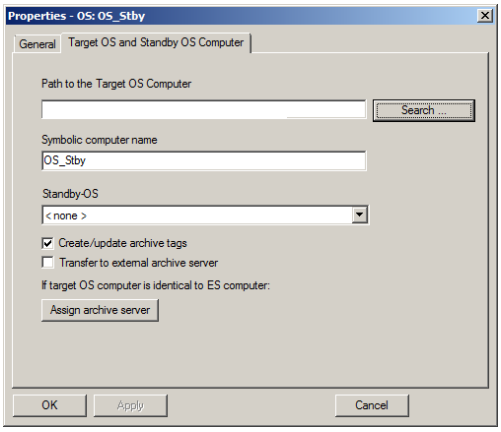
Step	Activity	Screenshot
3.	Change the name of the ES PC station to match the name of the local computer on the network. Select the “Computer name identical to PC station name” checkbox.	
4.	Open the HW Config of the ES PC station via the shortcut menu.	
5.	Insert a "WinCC application” (and a network card) of type “CP1623” from the object catalog (View > Catalog).	
6.	Under “Subnet”, choose the plant bus or create it by clicking on the “New…" button. Assign the corresponding MAC address to the CP1623. Deselect the "IP protocol is being used” checkbox. Click on the “OK” button to confirm your settings.	

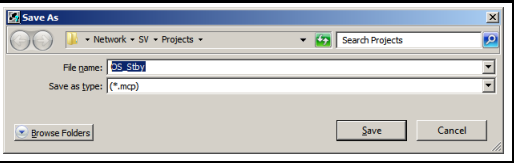
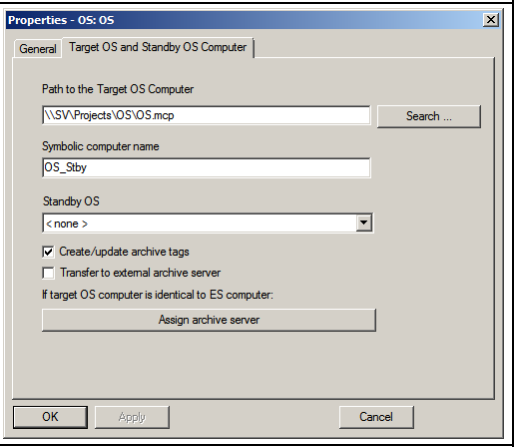
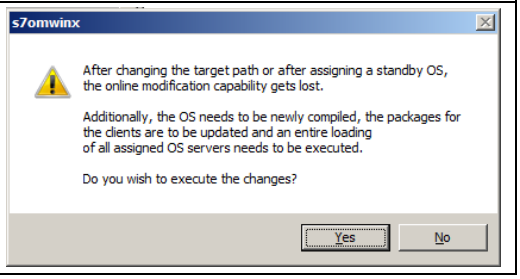
Step	Activity	Screenshot
7.	Open the shortcut menu of the CP1623 and select "Object properties…".	
8.	Switch to the “Options" tab and select the "Time of day” checkbox. Click on the "OK" button to confirm your selection.	
9.	Use the "Station > Save and compile..." menu item to save the configuration and compile it. Close the HW Config.	
10. Optionally	Delete the OS of the PC station of the ES in SIMATIC Manager as it is not needed in our example.	

Setting up the OS standby PC station

Step	Activity	Screenshot
1.	In component view, open the shortcut menu of the project and use "Insert New Object > SIMATIC PC station" to add a new PC station.	
2.	Use the shortcut menu to open the object properties of the PC station.	
3.	Change the name of the OS server PC station to match the name of the computer on the network. Select the “Computer name identical to PC station name” checkbox.	

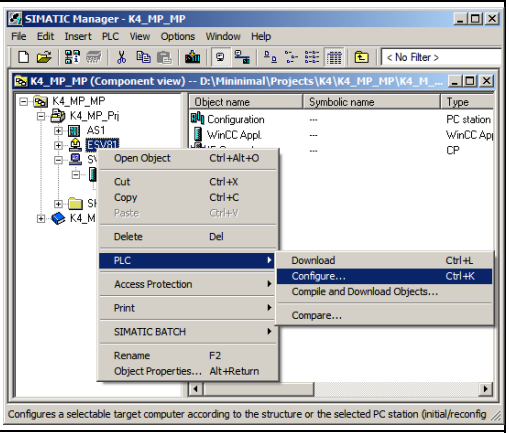
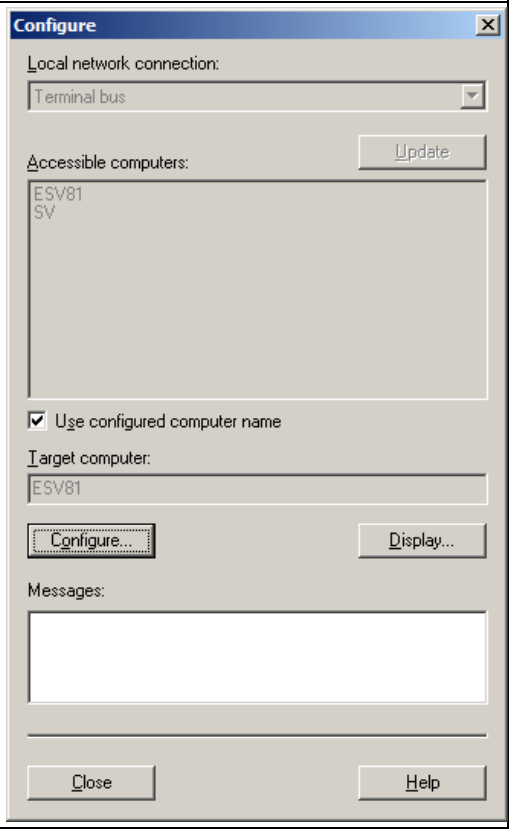
Step	Activity	Screenshot
4.	Open the HW Config of the OS standby PC station via the shortcut menu.	
5.	From the object catalog (View > Catalog) insert a "WinCC application (not a WinCC Application Stby!)" and a network card of type "CP1623".	
6.	Under “Subnet”, choose the plant bus or create it by clicking on the “New…" button. Assign the corresponding MAC address to the CP1623. Deselect the “IP protocol is being used” checkbox. Click on the “OK” button to confirm your settings.	

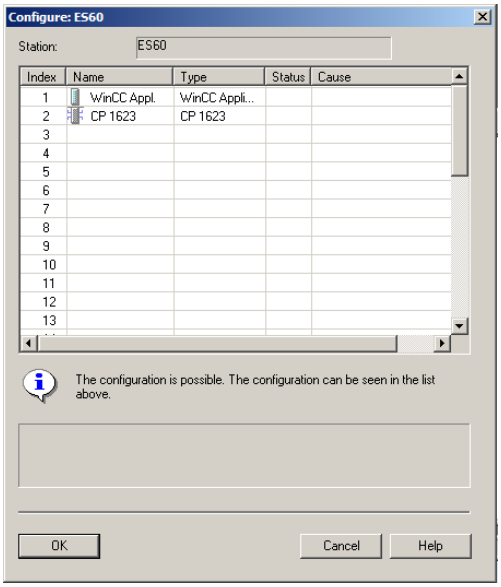
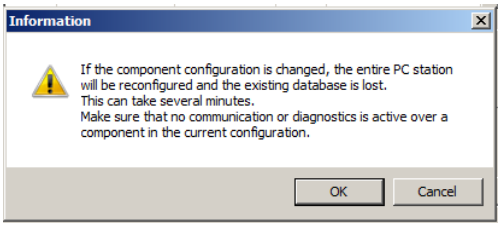
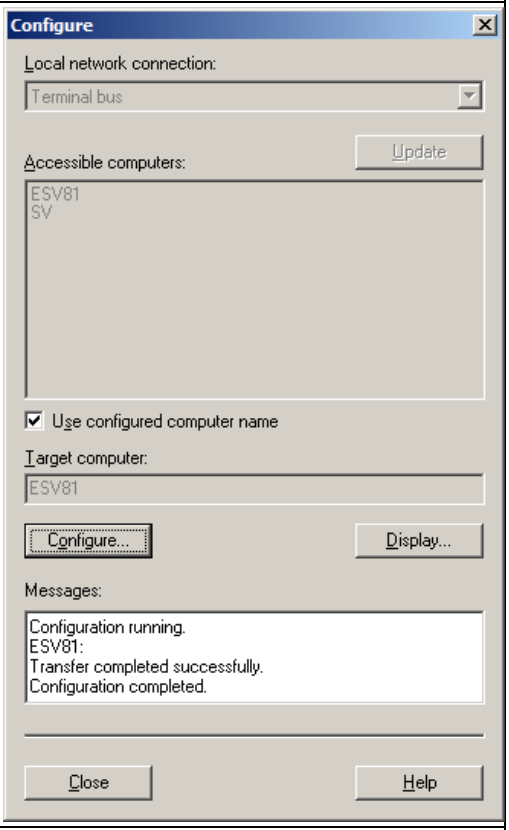
Step	Activity	Screenshot
7.	Open the shortcut menu of the CP1623 and select "Object properties…".	
8.	Switch to the “Options" tab and select the "Time of day” checkbox. Click on the "OK" button to confirm the setting.	
9.	Save and compile using the "Station > Save and compile…" command. Close the HW Config.	
10.	In SIMATIC Manager, open the properties dialog of the Standby OS. Switch to the "Target OS and Standby OS Computer" tab. Select the "Create/update archive tags" checkbox and clear the “Transfer to external archive server” checkbox. Click on the "Search..." button.	

Step	Activity	Screenshot
11.	Use the drop-down list to navigate to the shared project folder of the Standby OS (see 6.3.1 Preparatory activities). Click on the "Save" button.	
12.	In the "Path to Target OS Computer" input field, check again the whole project path. Click on the "OK" button to confirm this.	
13.	Click on the "Yes" button to confirm the information dialog.	

Configuring the PC stations

The "Configure PC station" transfers project configurations to one or more target stations. First configure the local Station Configuration Editor of the ES and then all the other PC stations connected to the plant bus.

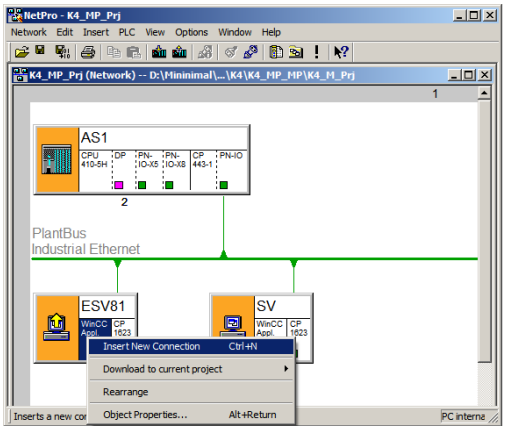
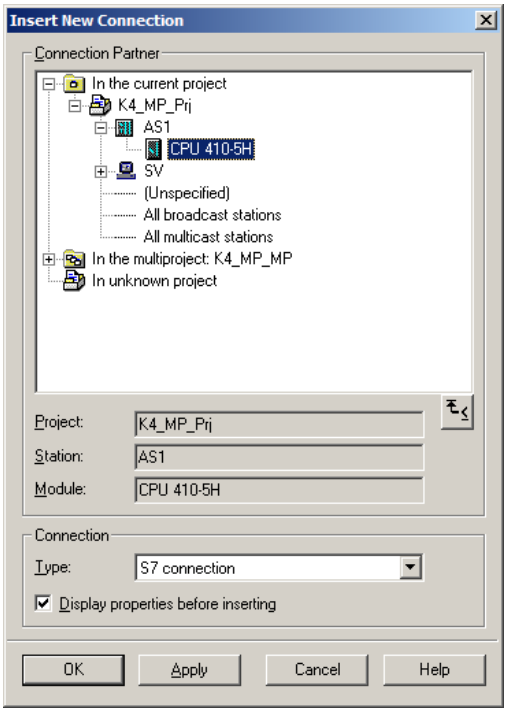
Step	Activity	Screenshot
1.	Execute the Station Configuration Editor of the ES. To do this, select the PC station of the ES and in the shortcut menu choose: "PLC > Configure…".	
2.	Under "Accessible computers:" choose the PC that you want to configure. **Note** If you chose the "PC name identical to PC station name" option for the PC station in the "Object properties", the system displays directly in the component configurator the target PC to be configured. Using the "Display..." button, you can display the current configuration of the PC station. Click on the "Configure…" button.	

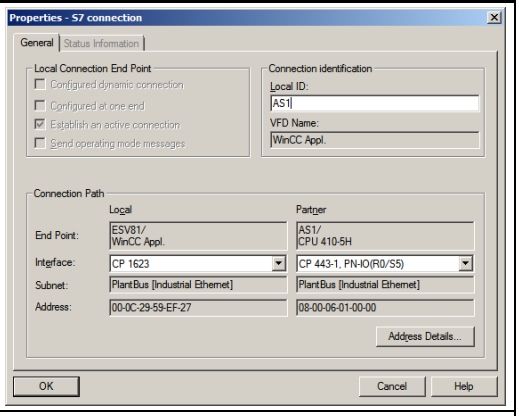
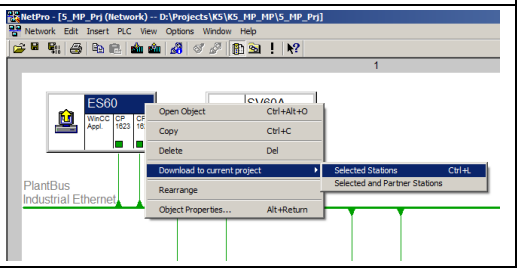
Step	Activity	Screenshot
3.	In the window that appears, you can see how the PC station is configured. Click on the "OK" button to confirm this setting.	
4.	Click on “OK” to confirm the information dialog.	
5.	In the bottom window, you then see the message: "Transfer completed successfully". Close the configuration dialog.	
6.	Configure the Station Configuration Editor of the Standby OS as shown in steps 1 to 5.	

Configuring and loading AS-OS communication

In the following section, the connections between the PC stations and the AS are configured in NetPro and loaded in the individual stations.

Note In the case of a granular station configuration, you must merge the subnets of the individual sub-projects first.

Step	Activity	Screenshot
1.	Open NetPro. Highlight the WinCC application of the ES and open the shortcut menu. Select "Insert New Connection".	
2.	In the "Connection Partner" window, select the CPU of the AS. Make sure that an “S7 connection" is selected under “Connection”.	

Step	Activity	Screenshot
3.	On the “General" tab under "Connection identification”, change the “Local ID:" to a descriptive name like AS1, for example. Click on the “OK” button to confirm your settings.	
4.	Also create a connection between the Standby OS and the AS by repeating steps 1 to 3. When doing this, it is important that the connection has the same name as the connection of the ES to the AS. After this, use the ""Network > Save and Compile..." menu item to save the configuration and compile it. Select the "Compile and check everything" option button and click on the "OK" button to confirm your selection.	
5.	Select the ES and download the connections via the shortcut menu: "Download to current project > Selected Stations". Download the Standby OS and the AS in the same way. Then, close NetPro.	

Compiling and loading the user program

Compile the S7 program and download it to the AS.

Compiling the OS project

Compile the OS project of the Standby OS in SIMATIC Manager.

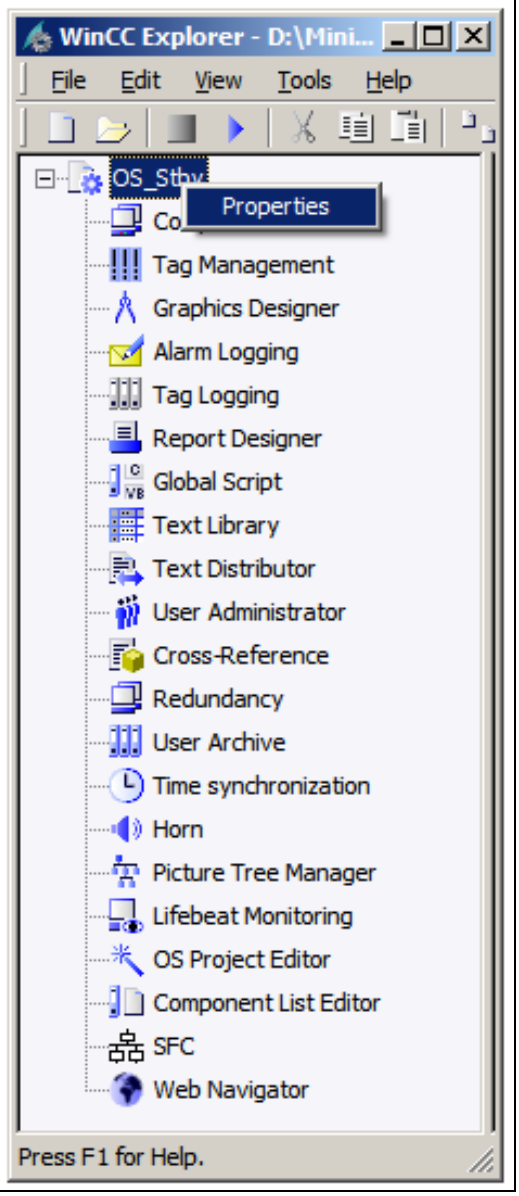
Make sure that you make the correct OS assignment to the server in plant view.

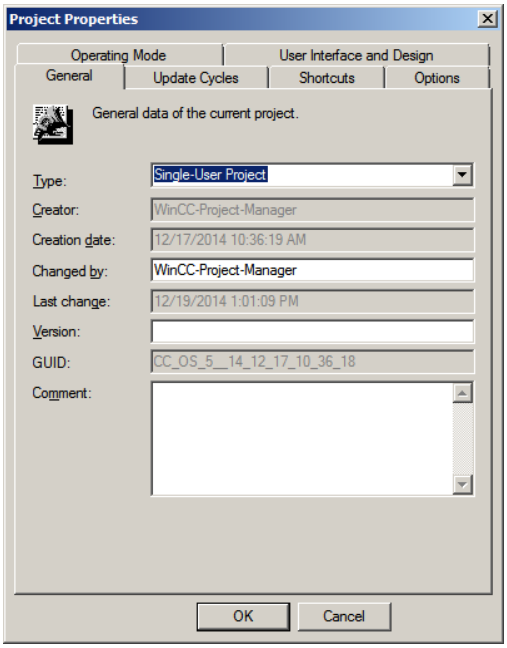
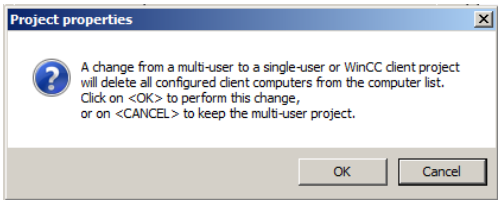
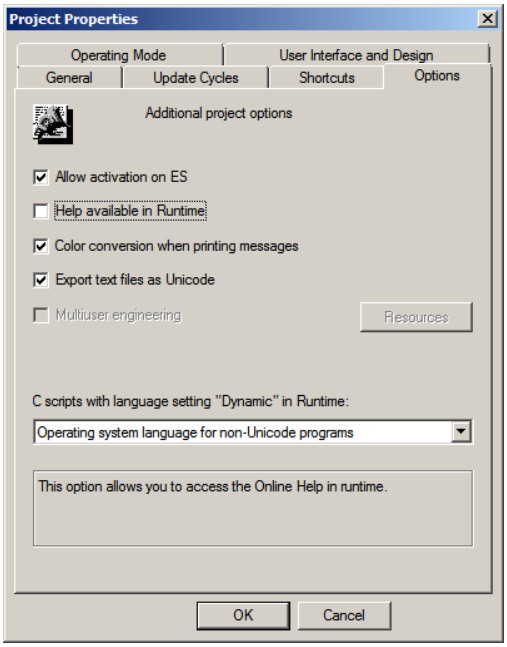
6.3.3 OS configuration

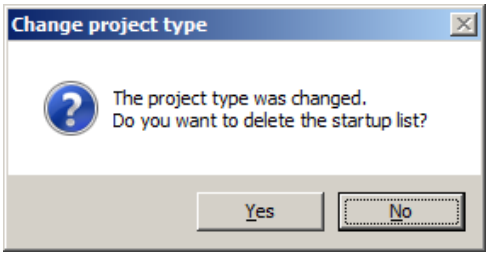
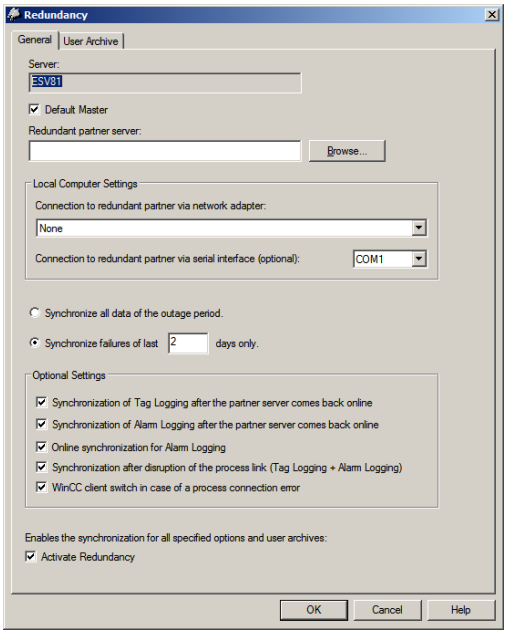
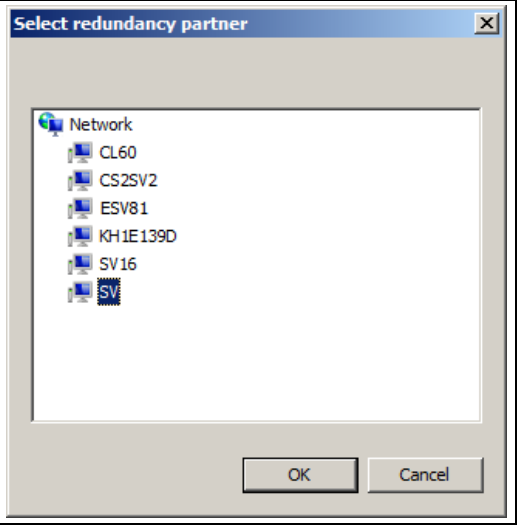
Configuring the OS on the engineering station

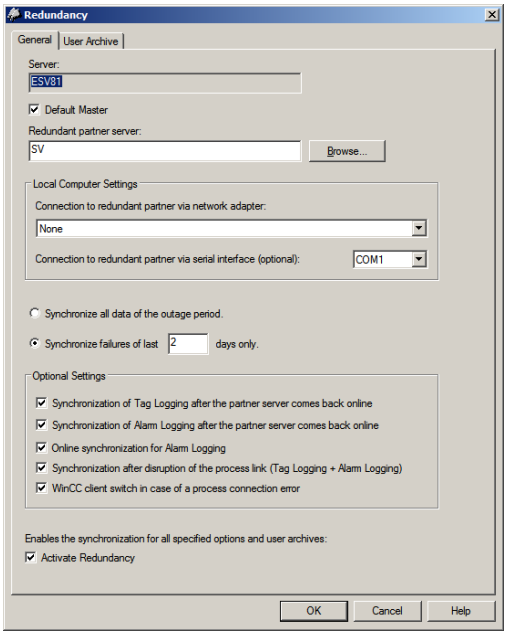
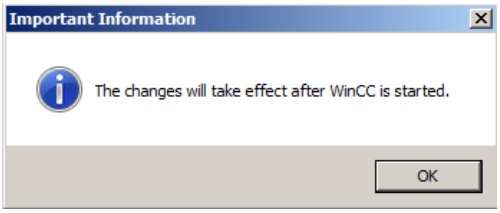
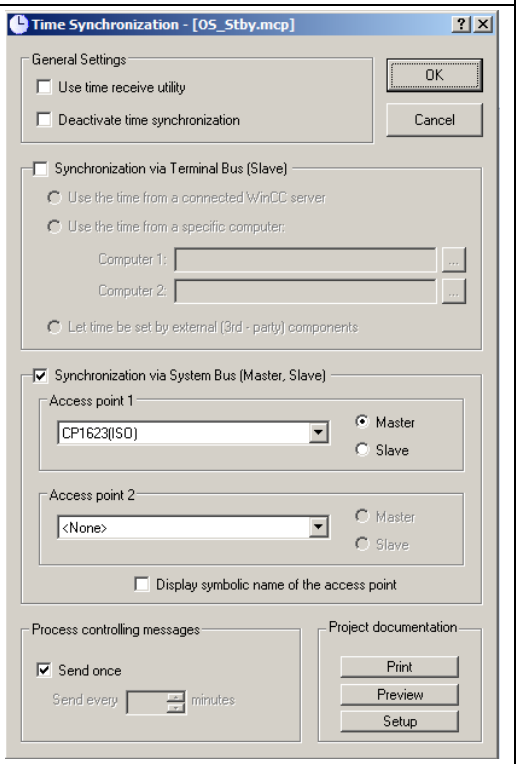
On the ES, you must still switch from a multi-user system to a single-user one and make the settings for redundancy and time synchronization.

Note In this particular configuration, it is necessary to complete the redundancy settings in WinCC Explorer of the Standby OS after the entire download completes.

Step	Activity	Screenshot
1.	Open the OS project of the Standby OS in the ES. In the open WinCC Explorer, highlight the OS project and choose “Properties” in the shortcut menu.	

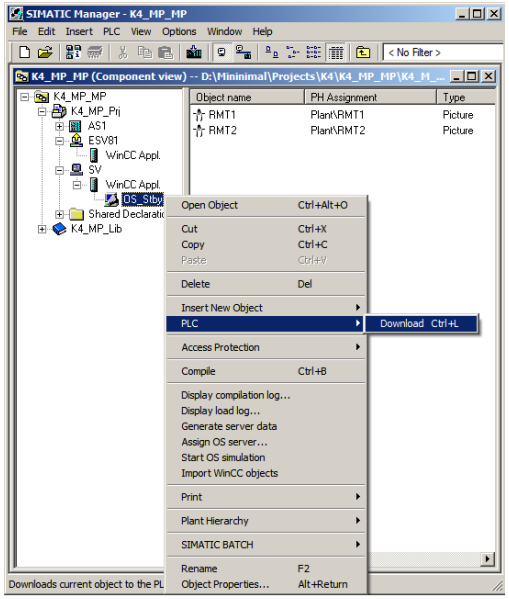
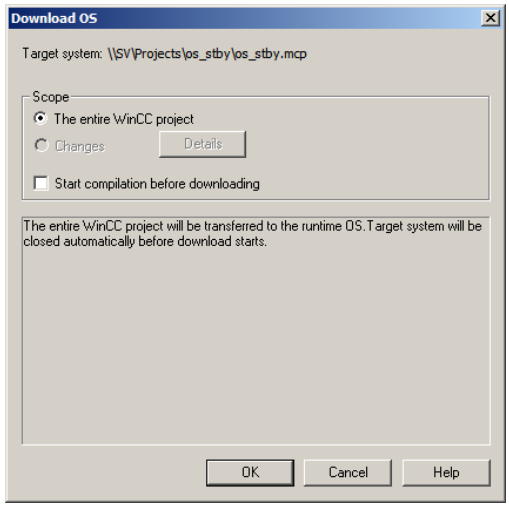
Step	Activity	Screenshot
2.	On the "General" tab under “Type:”, choose "Single-User Project" from the drop-down list.	
	Confirm your settings and the displayed message by clicking on the "OK" button.	
3.	Activate OS project option "Allow activation on ES" from the "Options" tab. This setting allows runtime to be activated in the ES. Then click on the "OK" button.	

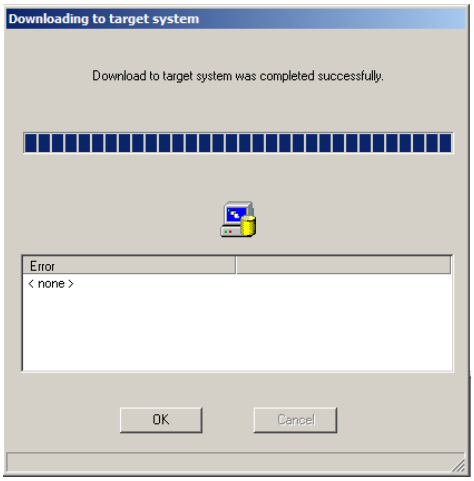
Step	Activity	Screenshot
4.	Click on the "No" button to prevent the startup list from being deleted. Confirm the displayed message by clicking on "OK".	
5.	Open the "Redundancy" editor. Select the "Activate Redundancy" checkbox. Select the "Default Master" checkbox. If necessary, adapt the redundancy properties in "Optional Settings" to meet your requirements. In the drop-down list, select the connection path that is used to connect the Master OS and the Standby OS.	
6.	To complete the redundancy settings for the ES, the partner server must be still selected. To do this, click on the "Search ..." button and select the Standby OS as a redundant partner from the network. Click on the “OK” button to confirm your settings.	

Step	Activity	Screenshot
7.	Double check all of the options before clicking on the "OK" button to confirm the redundancy settings.	
8.	Click on the “OK” button to acknowledge the message.	
9.	Open the "Time Synchronization" editor. Here, select the "Synchronization via System Bus (Master, Slave)" checkbox. Under "Access point 1”, choose "CP1623(ISO)" and select the "Master" radio button. Click on the “OK” button to confirm your settings. **NOTE** If you configure station time synchronization on a different computer, the access points are not known, which means that they are not available in the drop-down list. To choose the access point regardless, select the "Display symbolic name of the access point" checkbox and then choose the appropriate access point.	
10.	Close the OS project.	

Downloading the OS project to the Standby OS

Once redundancy and time synchronization have been configured on the ES and you have closed the OS project again, download the OS project to the Standby OS.

Step	Activity	Screenshot
1.	In SIMATIC Manager, highlight the Standby OS and choose “PLC -> Download" in the shortcut menu.	
2.	For the first OS project download, an entire download is required. Click on the "OK" button to start downloading.	

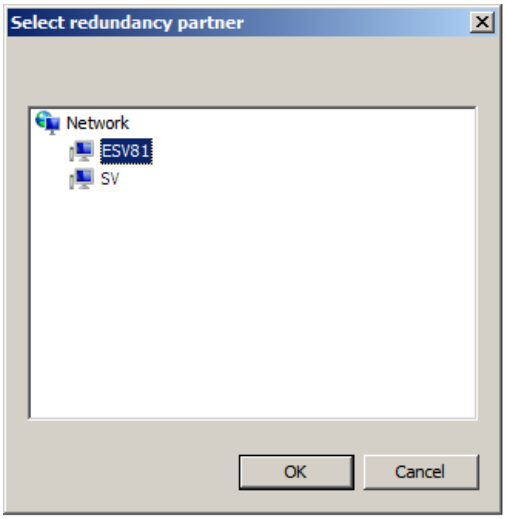
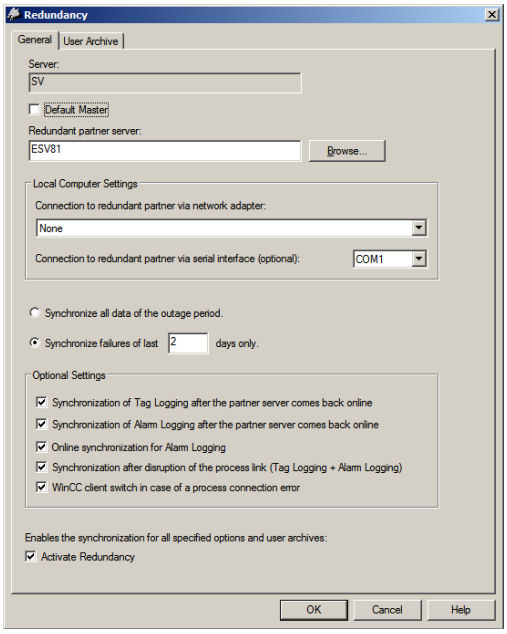
Step	Activity	Screenshot
3.	After successful downloading, the OS project is located in the specified folder on the Standby OS. Click on the "OK" button to confirm the message that is issued.	

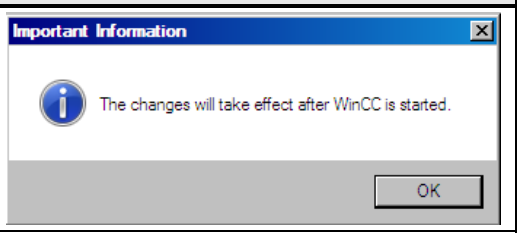
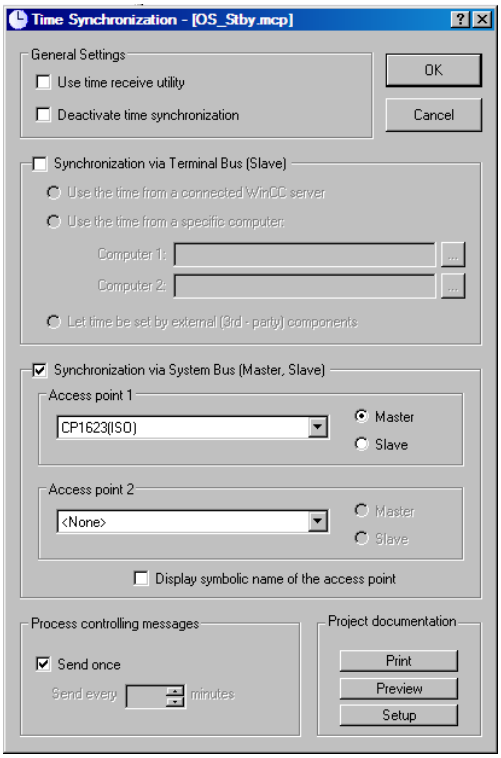
OS configuration on the Standby OS

In this particular configuration, it is necessary to make the redundancy settings after the download completes.

Generally, we would advise you to check the project settings after the project has been downloaded to the target systems.

Note Normally, all configuration work is carried out on the ES to ensure consistent data management. This means that no WinCC engineering licenses are needed on the OSes. However, each time WinCC Explorer is opened, a license-free time window of two hours is available for WinCC configuration work.

Step	Activity	Screenshot
1.	Open the OS project on the Standby OS under the shared project folder.	
2.	Open the "Redundancy" editor from the shortcut menu. Click on the “Search…" button to select the ES computer as the redundant partner.	
3.	Clear the “Default Master” checkbox here. Check whether you have selected the desired checkboxes under "Optional Settings". In the drop-down list, select the connection path that is used to connect the Master OS and the Standby OS. Click on the “OK” button to confirm your settings.	

Step	Activity	Screenshot
4.	Click on the “OK” button to acknowledge the message.	
5.	Open the "Time Synchronization" editor from the shortcut menu. Check or select the "Synchronization via System Bus (Master, Slave)" checkbox. Under "Access point 1”, check or select "CP1623(ISO)" and the "Master" radio button. Always click on the "OK" button to confirm your settings.	
6.	If you have made project changes in WinCC Explorer, close the OS project and open it again for the settings to take effect.	

6.3.4 Activating runtime

First activate the OS project on the ES and then on the Standby OS. Before activating the second runtime, it is advisable to wait until the boot process of the first one has completed.

Online synchronization is active immediately.
Mutual synchronization of archives starts after ten minutes.

6.3.5 Particularities when loading OS project changes

Loading changes

To download changes, runtime must be stopped on the ES when compiling the OS. These can then be re-activated to test the modified OS functions.

CAUTION Depending on the changes that are made, if runtime remains active during OS compilation, the system may not download changes completely, which will cause errors. If this happens, only an entire download is possible.

For the downloading process, runtime must be terminated and the OS Project must be closed. As a result, it is not possible to take operator actions on the ES computer during this time.

Complete download

For a complete download, the following must be always observed:

1. Runtime must be deactivated on both PC stations and the OS project must be closed.
2. Before re-enabling runtime on the Standby OS, you must make the redundancy settings again.
   To do this, repeat the steps in the table on page 107.

7 Expansion with the PCS 7 OS Web Option

Positioning

To control automated processes via the Internet/Intranet, SIMATIC PCS 7 provides operating and monitoring options: what are known as the "Web Options".

This chapter describes configuration of the Web Option on an ES/OS Single Station. The instructions can also be used to expand the following minimal configurations:

- ES/OS Single Station (Chapter 3)
- ES/OS Master and OS Standby (Chapter 6)

Note

To expand the redundant Single Station configuration with the Web Option, the ES/OS station in the following example has been configured as a Web Server. The partner OS could also be used in the same way as a Web Server. The functionality for the Web clients is unchanged.

Redundancy of the operator stations is not available for Web clients. If the OS with the Web Server option is in the STOP status, the Web clients do not have a connection to the process either.

Function

All of the relevant pictures and scripts are stored on the Web Server to make it possible to display or run them via a Web client.

The Web client accesses the system data provided by the Web Server via a TCP/IP connection. The user interface matches the appearance of a standard OS client with an overview, work, and key areas.

Amongst others, the functions below are available via Web:

- Operator control and monitoring functions, which are also used on an OS client
- Message lists that are called on a user-dependent basis, just like on an OS client. Messages can be acknowledged on a user-dependent basis.
- Displaying the picture hierarchy according to the plant hierarchy
- Group display function including the "loop-in-alarm" function
- Enhanced status display

Note

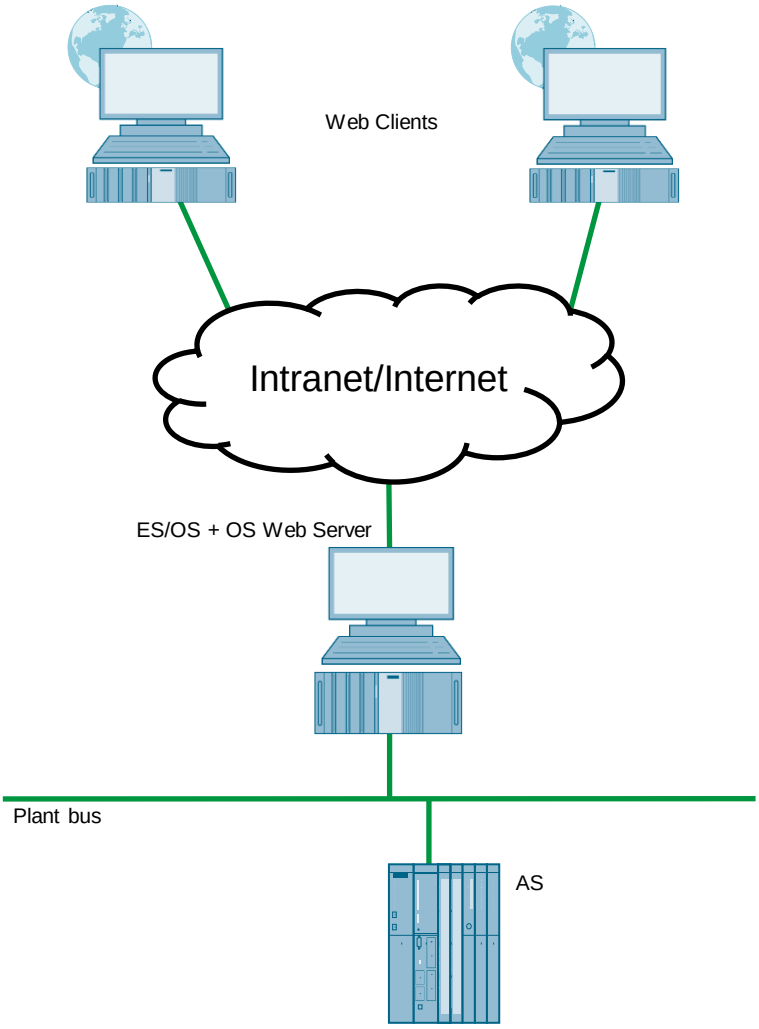
For further information about the PCS 7 Web Options, see the following manual: "SIMATIC PCS 7 Web Option for OS (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746536

7.1 Web configurations

In our example, configuration of the Web Option is an extension to the hardware and software configurations in chapter 3, "ES/OS Single Station" and chapter 6 "Master ES/OS and Standby OS".

ES/OS Single Station with OS Web Server option

To operate and monitor the system process, the OS Web clients use Internet Explorer to get their project data from the Single Station with the OS Web Server option via the Internet/Intranet.



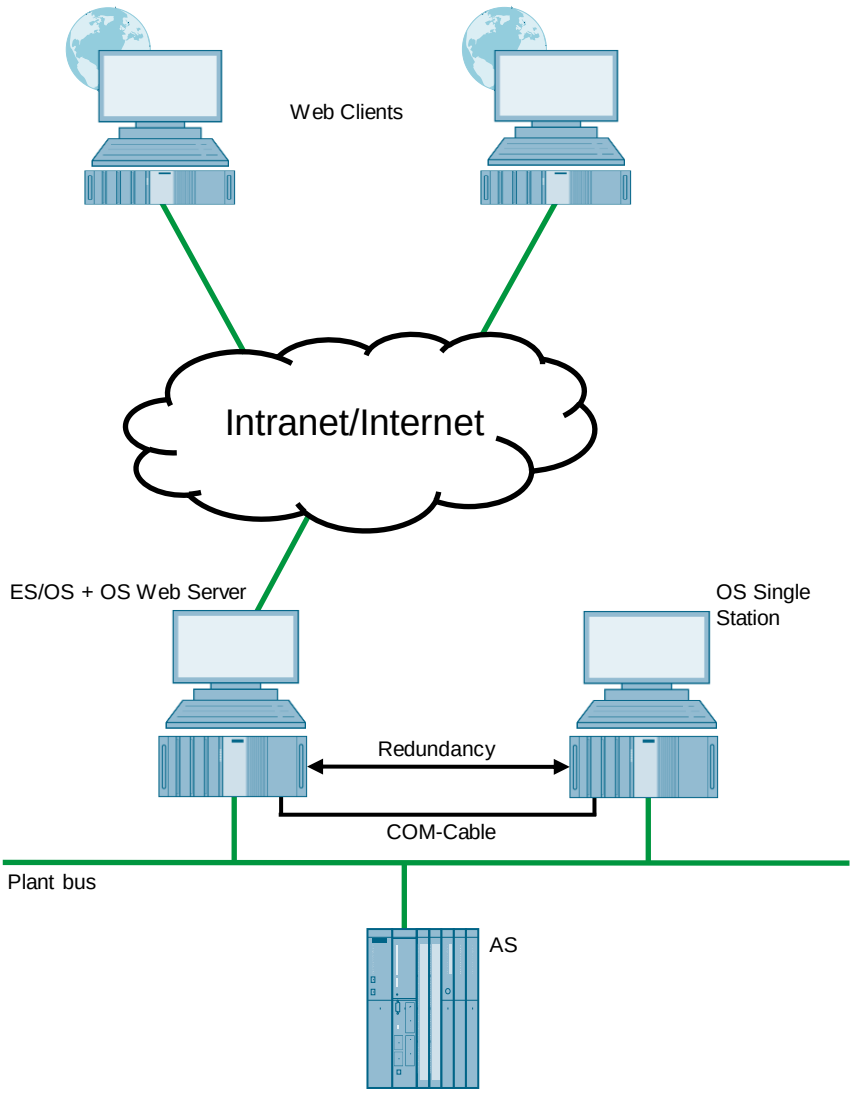
Master ES/OS with OS Web Server option

To operate and monitor the system process, the OS Web clients use Internet Explorer to get their project data from the Single Station with the OS Web Server option via the Internet/Intranet.

In addition, the system process is set up on a redundant basis to offer the greatest possible protection from failure of system operation.

CAUTION

Redundancy of the operator stations is not available for Web clients.
If the OS with the Web Server option is in the STOP status, the Web clients do not have a connection to the process.



7.2 Web-specific hardware and software requirements

Single Station with Web Server option

Property	Requirement
Operating system	• Windows 7 Ultimate/Enterprise SP1 (64 Bit) • Windows 10 Enterprise 2015 LTSB 64-bit • Windows Server 2012 R2 Standard Edition (64-bit) You can find further information in the document entitled "SIMATIC PCS 7 process control system PCS 7 Readme V9.0 (online)" https://support.industry.siemens.com/cs/ww/en/view/109744312
Hardware	• SIMATIC PCS 7 ES/OS IPC847D BCE • SIMATIC PCS 7 ES/OS IPC847D IE You can find information on this topic in the document entitled "SIMATIC PCS 7 process control system PCS 7 Readme V9.0 (online)" https://support.industry.siemens.com/cs/ww/en/view/109744312
Software	• Internet Explorer • Internet Information Services (IIS)
Miscellaneous	Fast access (>= 64 kbps) to the Web Client via Internet/Intranet or a TCP/IP connection

Web Client

Property	Requirement
Operating systems	• Windows 7 Professional SP1 (64-bit) (English only) • Windows 7 Ultimate/Enterprise SP1 (64-bit) • Windows 10 Enterprise 2015 LTSB 64-bit • Windows Server 2012 R2 Standard Edition (64-bit) You can find further information in the document entitled "SIMATIC PCS 7 process control system PCS 7 Readme V9.0 (online)" https://support.industry.siemens.com/cs/ww/en/view/109744312
Minimum hardware requirements	No PDAs, tablet PCs etc.
Software	Internet Explorer
Miscellaneous	Fast access (>= 64 kbit/s) to the Web client via Internet/Intranet or a TCP/IP connection

Note Choose the version of Internet Explorer to match the PCS 7 version. You can find more information by visiting the “Compatibility Tool for Automation and Drive Technology” at:
http://www.siemens.de/kompatool

Software licensing

The following section lists the various additional software/license packages that you need for the selected configuration.

Component	Software/license packages
Single Station with Web Server option	• SIMATIC PCS 7 Web Server Basic • SIMATIC PCS 7 Web Server license (cumulative)

7.3 Maximum number of Web client connections

In one OS Single Station, it is possible to operate a maximum of three Web clients per Web server at the same time.

7.4 Configuring the OS Web Server

Configuration steps on the ES

- Publish pictures using Web View Publisher
- Configure user rights, start screen, and the language of the website in the User Administrator
- Download and compile the Web server

Publishing OS data

The Web Publisher makes it possible to publish pictures and scripts on the OS Web Server, which are intended to run later on the Web clients. In this connection, the following actions are carried out:

- Project data is compressed and saved
- Picture windows are converted to Internet-enabled ActiveX components
- Scripts are converted so that they run on the Web

Requirements

To publish the Web Server data, the following requirements must be met:

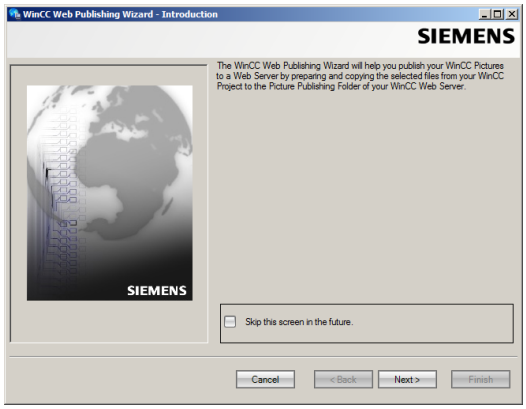
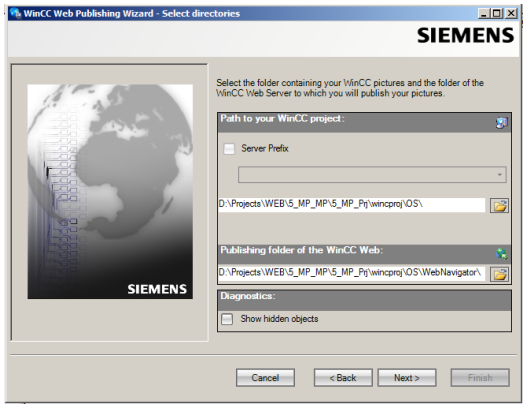
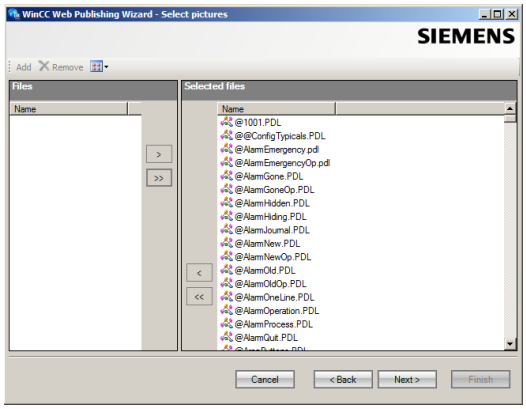
- The hardware and software requirements mentioned in chapter 7.2 have been met.
- The "PCS 7 Web Server" software package have been installed on the ES/OS Single Station.
- The PCS 7 Project is available and fully configured.
- "OS compiling" has been carried out.
- The scripts that are accessed by the Web clients are present.
- Process pictures do not contain double underscores (e.g. yy__xx.pdl).
- Tag names in plain text (quotation marks) within C scripts do not contain any spaces.

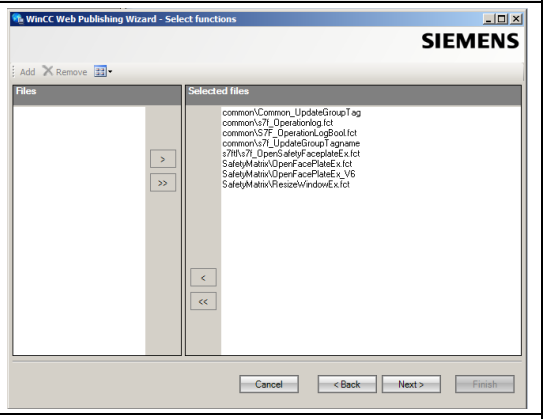
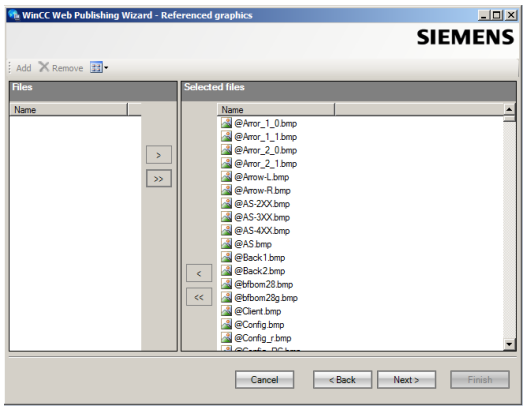
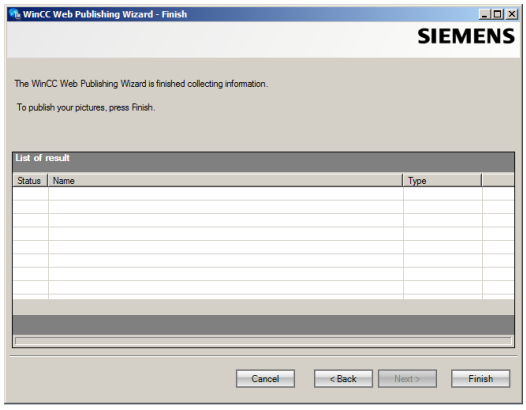
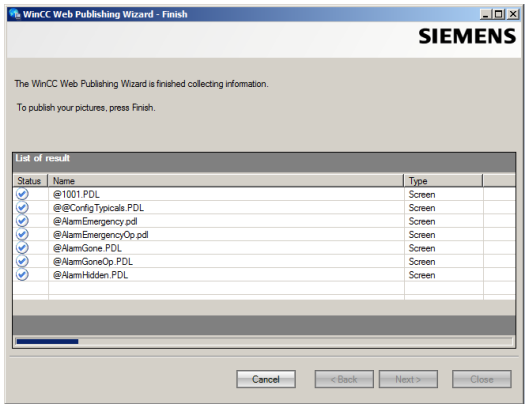
Note

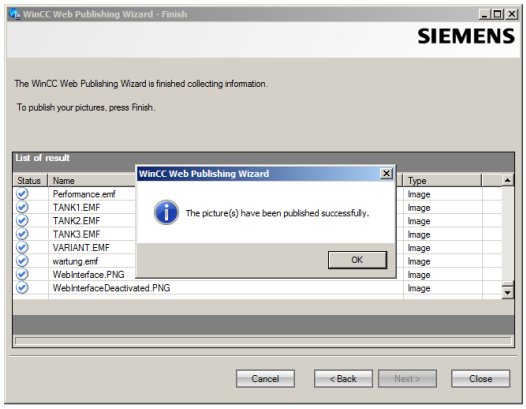
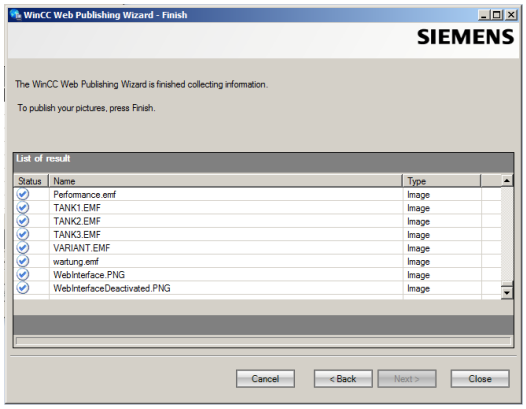
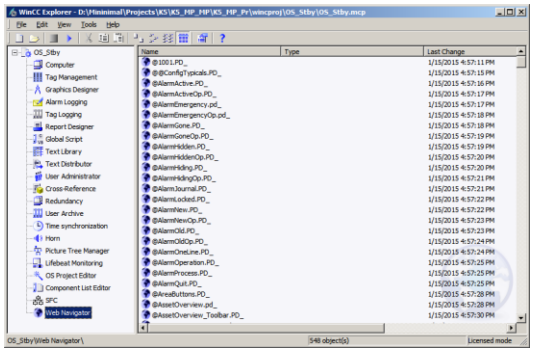
In a Single Station, only one publishing process is needed to publish local data on the Web Server.

For information on the topic of “supported script standard functions”, refer to the “SIMATIC PCS 7 Web Option for OS (V9.0)” manual.
https://support.industry.siemens.com/cs/ww/en/view/109746536
(Chapter 8.1.2 "Web-enabled functions for the Web Option for OS")

7.4.1 Publishing project data

Step	Action	Note
1.	Open the OS project of the OS Web Server in WinCC Explorer. Using the shortcut menu of the "Web Navigator" editor, select the "Web View Publisher" command. The system opens the "WinCC Web Publishing Wizard - Introduction" dialog box. Click on "Continue".	
2.	This opens the "WinCC Web Publishing Wizard – Select files and folders" dialog box. Clear the "Server Prefix" checkbox, since you want to publish local data. Accept the default destination and source paths. If you really want to change the respective path, click on the button behind the grayed entry fields. Navigate to the desired target or source folder. Click on "Continue".	
3.	The system opens the "WinCC Web Publishing Wizard - Select pictures" dialog box. Select all of the pictures that you want to publish. We recommend publishing all of the standard pictures. Use the ">>", "<<", ">", and "<" buttons to select the pictures. Click on "Continue".	

Step	Action	Note
4.	The system opens the "WinCC Web Publishing Wizard - Select functions" dialog box. Select all of the functions that you want to publish. In the pictures, only the scripts are available that you selected during the last publication process. This means that you must select all the necessary functions at every publication process. Use the ">>", "<<", ">", and "<" buttons to select the functions. Click on "Continue".	
5.	The system opens the "WinCC Web Publishing Wizard - Referenced graphics" dialog box. Select all of the graphics that you want to publish. We recommend publishing all of the graphics. Use the ">>", "<<", ">", and "<" buttons to select the graphics. Click on "Continue".	
6.	The system opens the "WinCC Web Publishing Wizard - Finish" dialog box. Click on the "Finish" button.	 

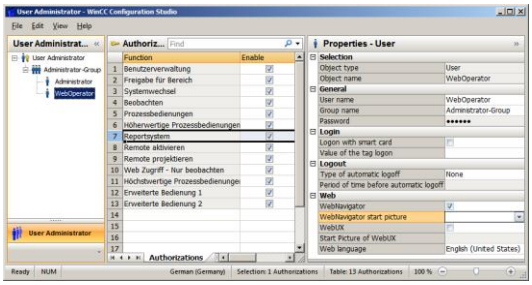
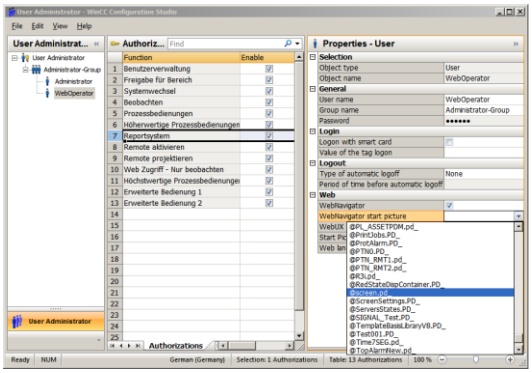
Step	Action	Note
7.	Pictures and functions that contain faulty scripts are identified by a red cross. Double-click on each faulty picture to open the picture in the "PdlPad" editor and to correct it. Once the publishing process is complete, click on the "OK" button to confirm the message.	
8.	The system lists the transferred pictures in the "WinCC Web Publishing Wizard – Finish" dialog box. Click on the "Finish" button.	
9.	The published pictures are displayed in the data window of the Web Navigator.	

7.4.2 Setting up user rights, website start screen, and the language

Restriction of access

You can control the access of the Web client to the OS Web Server by defining user rights. You assign user rights in the “User Administrator” editor. User rights are the same as those of the standard clients.

Settings in the "User Administrator" editor

Step	Action	Note
1.	In the WinCC Explorer of the currently open OS project, open the "User Administrator” editor. Create new users and/or new user groups that you want to assign appropriate permissions to. Also select the "Web Navigator" checkbox for the user(s) or user group(s) and enter the "Start picture" and “Language” of the website in the corresponding input fields.	
2.	Use the "..." button to select the start picture from the published graphics. "…\OS Web Server\<wincc-projectshare-name>\Web Navigator\pictures" Choose the "@screen.pd_" graphic as the start picture. Click on the “Open" button to confirm your selection You can also specify a language for the control and monitoring interface of the Web clients. To do this, you must also click on the corresponding "..." button. Click on the "OK" button to confirm your selection.	
3.	Close the User Administrator Editor.	

7.4.3 Configuring using the Web Configurator

Web Configurator tasks

The Web Configurator enables you to configure and manage the Internet Information Service (IIS) and therefore the website of the OS Web Server. You make the setting on the Web Server after you have downloaded the project to the Web Server. Setup and configuration are necessary to set up an operating station (OS) as an OS Web Server and to make it accessible for the Web clients via the Intranet/Internet.

The Web Configurator allows you to make the necessary firewall settings, if a firewall is activated.

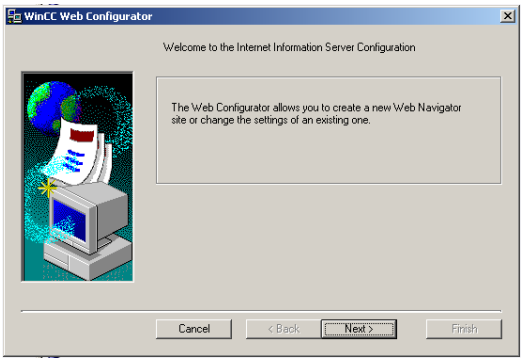
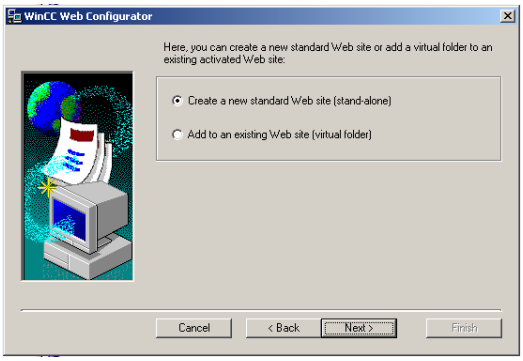
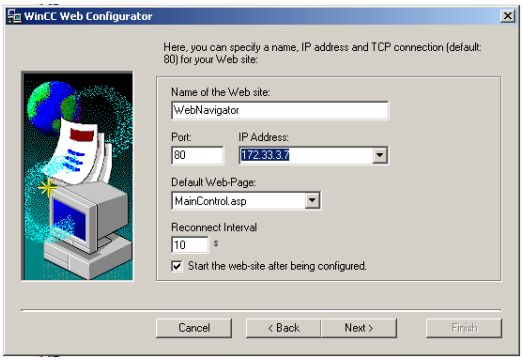
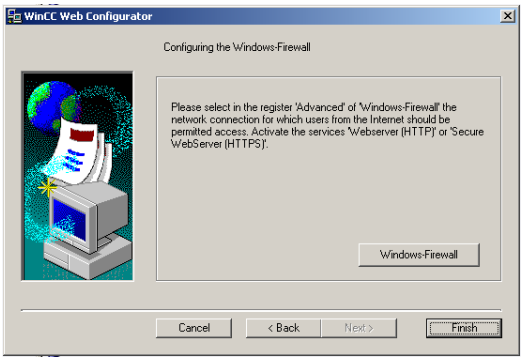
Requirements of the Single Station

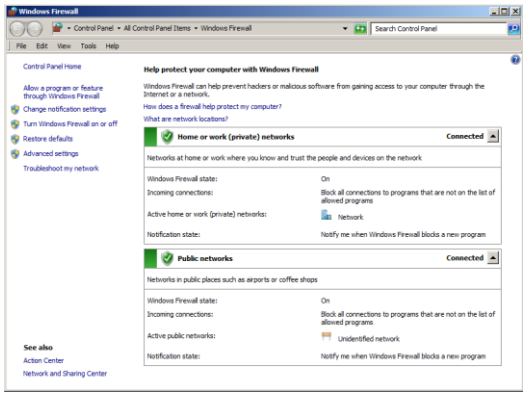
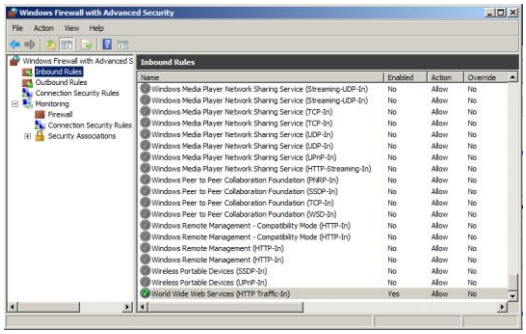
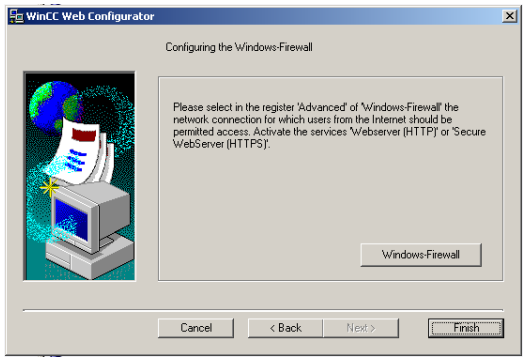
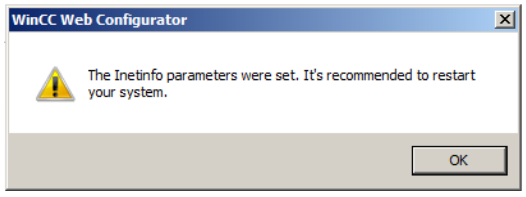
- The PCS 7 Web Server software has been installed on the Single Station
- The OS project has been downloaded to the Single Station
- All settings have been made in the OS
- Pictures, functions, and graphics have been published
- User rights have been assigned

Note

For more information about setting up the standard Web site, refer to the manual entitled "SIMATIC PCS 7 Web Option for OS (V9.0)"
https://support.industry.siemens.com/cs/ww/en/view/109746536
Chapter 9: "Completing the configuration on the Web server"

Settings in the "Web Navigator" editor

Step	Action	Note
1.	Open the OS project in WinCC Explorer on the OS Web Server. Use the shortcut menu of the "Web Navigator" editor to select the "Web Configurator" command. The system opens the "WinCC Web Configurator" dialog box. Click on "Continue".	
2.	In the next window, select "Create a new standard Web site (stand-alone)". Click on "Continue".	
3.	Enter a name for your web site in the "Name of the Web site" text box. Also assign the IP address and connection port of the computer in the "Port" and "IP address" text boxes. Under "Default Web-Page", select "MainControl" from the drop-down list. Enter a time interval in the "Reconnect Interval" text box. Select the "Start the web-site after being configured" checkbox. Click on "Continue". If you have not activated the Windows firewall, continue with step "7".	
4.	Click on the "Windows Firewall" button (the button is only visible if the firewall is activated).	

Step	Action	Note
5.	Click the "Advanced Settings" button in the "Windows Firewall" dialog box.	
6.	Check whether the "World Wide Web Services (HTTP Traffic-In) inbound rule is activated. If this function is deactivated, highlight it and choose the "Enable" command in the shortcut menu.	
7.	Click on the "Finish" button.	
8.	Click on the "OK" button. Then, close WinCC Explorer and restart your computer to apply the settings.	

7.4.4 Downloading and compiling the Web Server

Downloading the Web Server

Since the OS Web Server function is on a Single Station (ES/OS/Web Server), it is not necessary to carry out downloading or change downloading of project data. Due to the "Compile OS", the necessary data is already present locally.

Compile

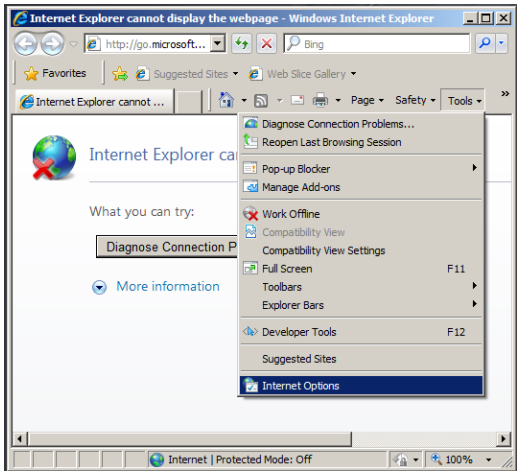
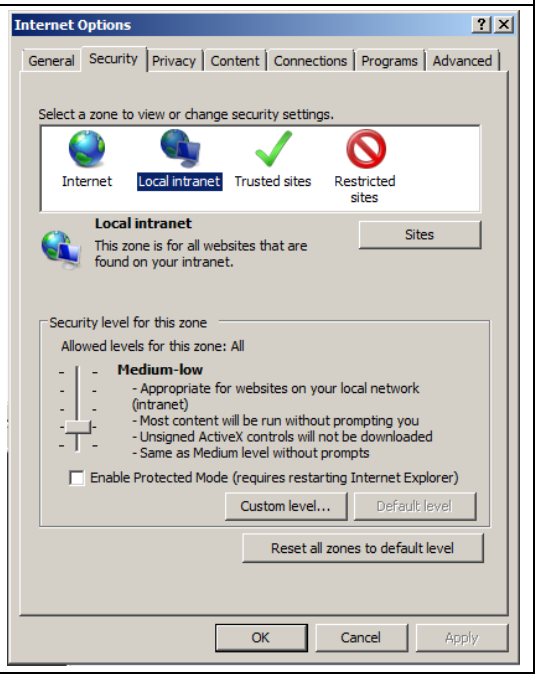
The "Compile Changes" function can be executed in Single Station without having to interrupt the process mode of the Web Server.

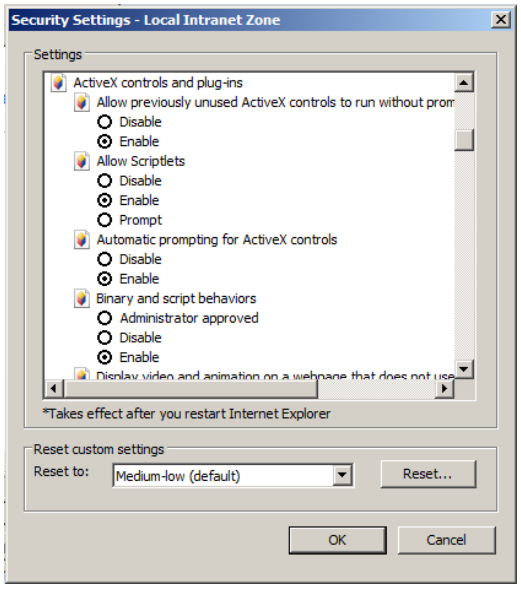
Note For more information about “Configuring the OS Web Server”, refer to the manual entitled "SIMATIC PCS 7 Web Option for OS (V9.0)" https://support.industry.siemens.com/cs/ww/en/view/109746536 (Chapter 8: "Configuring the Web server on an ES")

7.5 Settings on the Web client

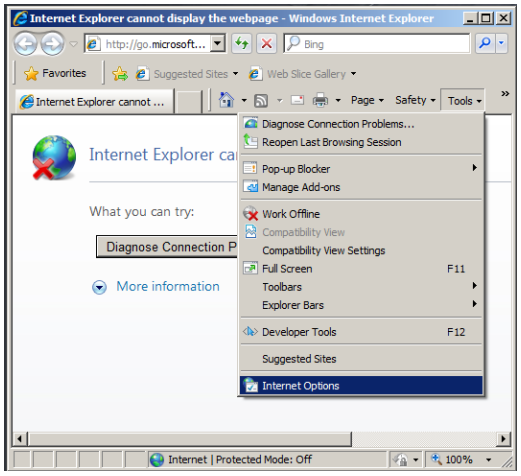
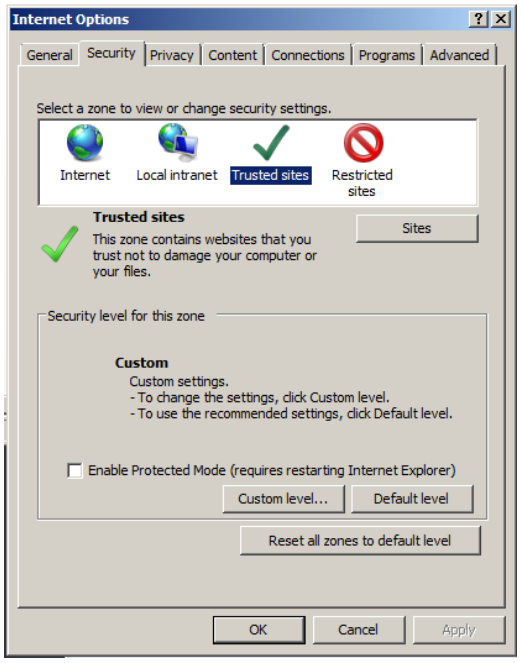
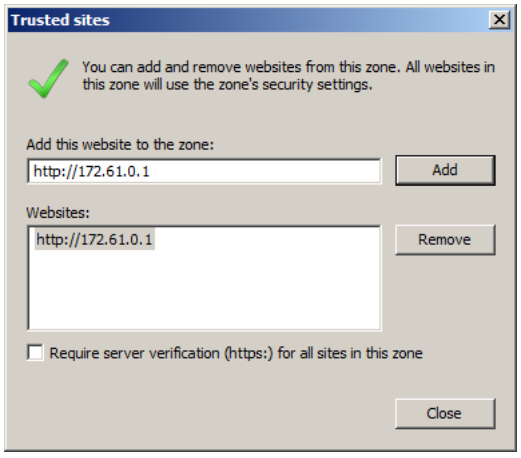
Settings for the "Internet" or "Local Intranet" Web content zone

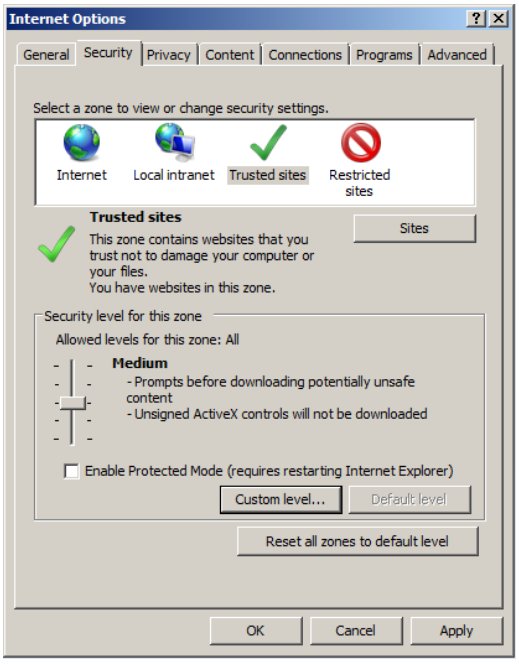
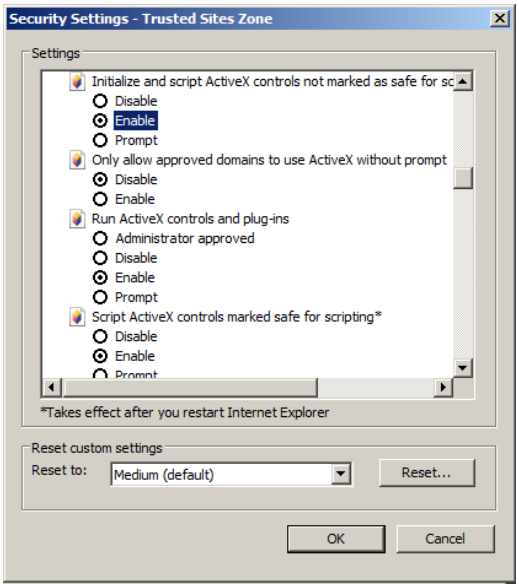
In Internet Explorer, you must make/check the settings for the Web content zone such that you will be able to install the plug-ins for the Web client from the OS Web server later.

Step	Action	Note
1.	Open Internet Explorer. Select the “Tools > Internet Options” menu command.	
2.	Click on the "Security" tab. Highlight the Web content zone in which the Web server is located ("Internet" or "Local intranet"). Click on the "Custom Level" button.	

Step	Action	Note
3.	Select the radio buttons under "Run ActiveX controls that are safe for scripting" and "Download signed ActiveX controls".	
4.	Click on each of the "OK" buttons for the "Security Settings" and "Internet Options" dialog boxes to close them.	

Settings for the "Trusted sites" Web content zone

Step	Action	Note
1.	Open Internet Explorer. Select the “Tools > Internet Options” menu command.	
2.	Click on the "Security" tab. Highlight the "Trusted sites” Web content zone. Click on the "Sites" button to open the dialog box.	
3.	In the text box "Add this website to the zone", enter the address of the OS Web server (7.4.3 Configuring with the Web Configurator > Settings in the "Web Navigator" editor), e.g. *://172.61.0.1 or http://*.microsoft.com Also, clear the "Require server verification (https:) for all sites in this zone” checkbox. Click on the "Add" and "Close" buttons.	

Step	Action	Note
4.	Highlight the “Trusted sites” Web content zone. Click on the "Default level" button and then on the "Custom level" button.	
5.	In the "Security Settings" dialog box, select the radio button under "Initialize and script ActiveX controls not marked as safe for scripting".	
6.	Click on each of the "OK" buttons for the "Security Settings" and "Internet Options" dialog boxes to close them.	

You have now created the conditions that are needed to connect from a Web client to a Web server.

7.6 Installing the Web client plug-ins

Installation methods

During installation of plug-ins for Internet Explorer, you can choose between two installation methods:

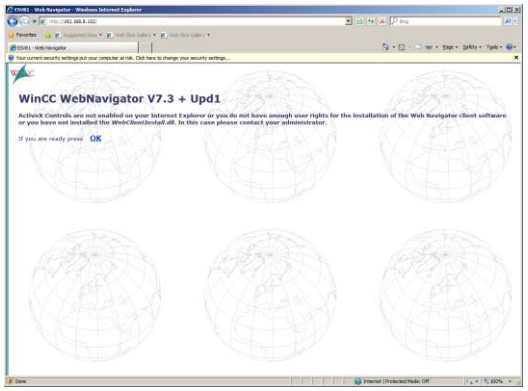
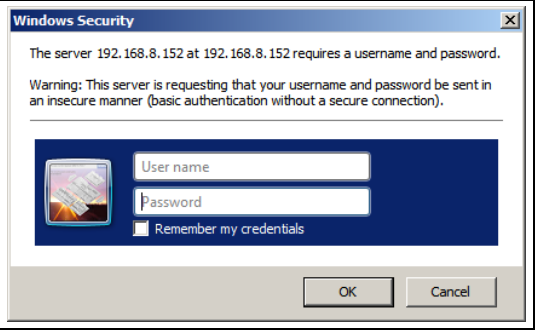
- Remote Installation - Installation via the Intranet/Internet from the Web server
- Local Installation - Installation via the Windows installer package of the Web client

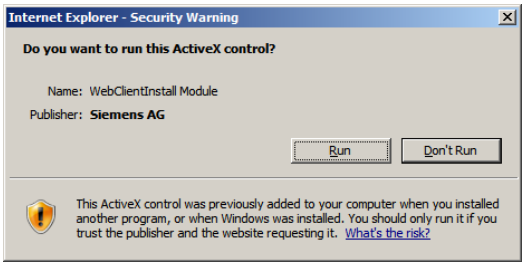
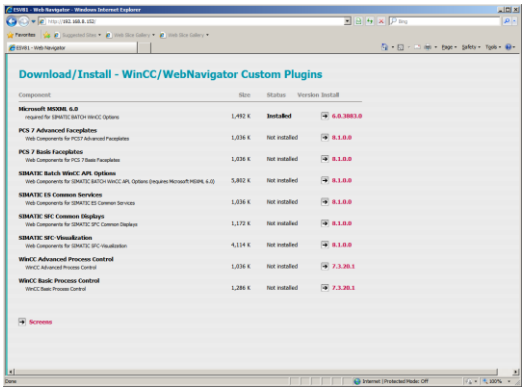
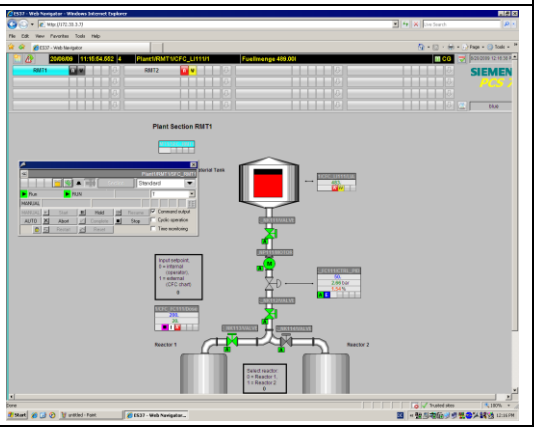
In this application example, we will consider "remote installation".

Requirements

- The OS Web server is in runtime.
- The "PCS 7 Web Client" software package has been installed on the PC.
- The Web client has access to the Web server.
- You know the Web server's address.
- You know the domain name, user name, and password.
- The user permissions apply to the PCS 7 Web Options.
- The logon on the PC has the rights of a primary user.

Installation

Step	Action	Note
1.	Open Internet Explorer. Enter the web server address (http://<server name or IP>) in the "Address" text box.	
2.	In the "Enter Network Password" dialog box, enter the credentials that were set in the "User Administrator" editor on the Web server.	

Step	Action	Note
3.	When you first connect, the "Security Warning" dialog box opens. Proceed by clicking on the "Install" button.	
4.	The system now displays all of the available plug-ins for the Web client in the Internet Explorer window. To install the plug-in, click on the arrow in front of the version number in the "Install" column. The following plug-ins are installed to ensure a minimum of process control: • WinCC Basic Process Control • WinCC Advanced Process Control • PCS 7 Basic Faceplates • PCS 7 Advanced Faceplates During installation, always proceed in the order that is shown.	
5.	Installation of the Web client is complete. Close Internet Explorer and reopen it to register for process control. The process pictures can be called once the Web client has established a connection to the Web server.	

Note For more information about "Installing a Web client", "Process control on the Web client" and "Settings", refer to the manual entitled "SIMATIC PCS 7 Web Option for OS (V9.0)"
https://support.industry.siemens.com/cs/ww/en/view/109746536
(Chapter 10: "Installation and settings for the Web client")

8 History

Version	Date	Change
V1.0	10/2006	First edition V6.1 SP1
V1.1	11/2006	Revised V6.1 SP1
V1.2	05/2009	Revised V6.1 SP1
V2.1	09/2008	First edition V7.0 SP1
V2.2	12/2008	Correction of table 6-2
V2.3	05/2009	Revision V7.0 SP1
V3.0	05/2009	First edition V7.1
V3.1	05/2009	Revision V7.1
V3.2	11/2009	Extension of the document for V7.1 to include the PCS 7 Web Option (tested for PCS 7 V7.1 and V7.0 SP2)
V2.4	12/2010	Note added: The configuration described in chapter 6, "Master ES/OS and Standby OS" only works in PCS 7 V7.0 SP3 if it has WinCC V6.2 SP3 HF8 or higher.
V3.3	09/2011	Note added: The configuration described in chapter 6, "Master ES/OS and Standby OS" only works in PCS 7 V7.1 SP2 and SP3 if it has WinCC V7.0 SP2 HF5 or higher.
V4.0	10/2012	First edition PCS 7 V8.0 Upd1
V4.1	11/2012	Adaptations in the following chapters: • Chapter 7 "Expansion with the PCS 7 OS Web Option" • Chapter 7.1 "Web configurations" • Chapter 7.2 "Web-specific hardware and software requirements" New chapter: • Chapter 7.3 "Maximum number of Web client connections"
V4.2	01/2013	Introduction in chapter 6 "Master ES/OS and Standby OS" has been editorially revised.
V4.3	05/2013	Test and declaration for PCS 7 V8.0 SP1
V4.4	09/2013	License adjustments in chapter 7.1. "Web configurations" in Fig. 7-1 "Web Option in Single Station"
V5.0	02/2015	Test and declaration for PCS 7 V8.1
V6.0	06/2016	Test and declaration for PCS 7 V8.2
V7.0	11/2017	Expansion of time synchronization in chapter 3 "ES/OS Single Station" Test and declaration for PCS 7 V9.0
V7.1	02/2018	Step added (Configuring the standard server) in chapter 5.3.3 "OS configuration" OS Client