Decentralized Operation of WinCC with SIMATIC Industrial Thin Clients

WinCC V7.3 SE, Industrial Thin Client

https://support.industry.siemens.com/cs/wwde/28309119
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1 Task

1.1 Introduction

Thin Clients have several advantages for the operation and monitoring of systems and production machines. In combination with a SCADA system they can reduce costs and increase the system availability.

The present document describes the possibility of setting up an infrastructure by using the control panels type SIMATIC Industrial Thin Client and the SCADA system SIMATIC WinCC V7.3.

You will learn about the required hardware and software components and how to configure and set up these components. Afterwards, you will start a small example project.

You will be able to use the solutions presented here for the planning, configuration and commissioning of your own individual production plant, where you use SIMATIC Industrial Thin Clients and SIMATIC WinCC V7.3.

1.2 Problem description

To ensure a simple introduction into the topic the following figures describe the essential elements of a general automation solution.

Figure 1-1

Requirements of the automation solution

- It must be possible to operate the production plant from various locations (operator stations).
- The operator stations are sometimes exposed to rough environmental conditions, therefore the devices need to be robust.
- The operator stations all access the same central data management.
2 Solution

2.1 Overview

Main topics of this application
This document covers the following topics:
- Which hardware and software components are needed for a functioning solution?
- What licenses are needed?
- How do the various components work together?
- How must the individual components be configured and parameterized?

2.2 Setup

Schematic layout
Figure 2-1
2 Solution
2.2 Setup

Function

- A WinCC server assumes the central data management of the production plant. The connection of the process values from the controller (CPU) and their graphic processing for displaying them at the operator station are done here.
- The data provided by the WinCC server is supplied by the remote desktop session host within the individual remote desktop sessions and is thus made accessible for several terminal clients.
- The Industrial Thin Clients have the task of visualization, and enable the operation of the production plant.
- A switch connects all the Ethernet nodes with each other.

Advantages

The structure of this layout offers the following advantages:

- Investment security through:
  - the use of standardized interfaces and components
- Saving costs when SIMATIC Industrial Thin Clients are used as WinCC clients instead of classical PCs, due to
  - the use of low-cost hardware
  - the fact that no additional software licenses for the clients are needed.
- Additional costs saved in engineering and maintenance, due to the fact that
  - no user software needs to be installed on the Thin Clients
  - no additional configuration of the clients is needed
  - simple expansion options for additional operator stations
  - devices can be easily replaced
- Machine-level operating and monitoring is possible because of
  - the use of robust components for industrial use

Delimitation

The solution described here refers to WinCC V7.3. For WinCC Professional V13 a comparable application example does not exist.

On the internet page of this application example both alternatives are available.
https://support.industry.siemens.com/cs/ww/en/28309119

Assumed knowledge

For the implementation of the solution described in this document, basic knowledge in the following topics is assumed:

- Basics of automation hierarchy (field level \( \rightarrow \) SCADA)
- Automation technology
- Microsoft Windows operating systems
- Ethernet network with TCP/IPv4
2.3 Hardware and software components

Validity

This application is valid for
• SIMATIC Industrial Thin Clients
• SIMATIC S7-1500 CPUs
• Windows Server 2012 R2
• WinCC V7.3

Components used

The application was created with the following components:

Software components

Table 2-1

<table>
<thead>
<tr>
<th>Component</th>
<th>Qty</th>
<th>Article number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Server 2012 R2</td>
<td>1</td>
<td>Microsoft</td>
<td></td>
</tr>
<tr>
<td>WinCC V7.3 SE</td>
<td>1</td>
<td>6AV63.1-....7-3...</td>
<td></td>
</tr>
<tr>
<td>WinCC WebNavigator V7.3</td>
<td>1</td>
<td>6AV6371-1DH07-3AX0</td>
<td>License for 3 clients</td>
</tr>
<tr>
<td>3 clients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal Server CAL (user)</td>
<td>3</td>
<td>Microsoft</td>
<td>License for 3 clients</td>
</tr>
<tr>
<td>CAL</td>
<td>1</td>
<td>Microsoft</td>
<td></td>
</tr>
</tbody>
</table>

Hardware components

Table 2-2

<table>
<thead>
<tr>
<th>Component</th>
<th>Qty</th>
<th>Article number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial PC SIMATIC IPC647D</td>
<td>2</td>
<td>6AG4112-2-....-....</td>
<td>This IPC is used as an example, other IPCs can also be used when meeting the SW requirements.</td>
</tr>
<tr>
<td>POWER SUPPLY PS307 24 V/5 A</td>
<td>1</td>
<td>6ES7307-1EA01-0AA0</td>
<td>If more devices are connected, it can become necessary to connect a stronger power supply, e.g. with 10 A (order number: 6ES7307-1KA02-0AA0)</td>
</tr>
<tr>
<td>SCALANCE X208</td>
<td>1</td>
<td>6GK5208-0BA10-2AA3</td>
<td>Connects up to 8 Ethernet nodes.</td>
</tr>
<tr>
<td>SIMATIC ITC1200</td>
<td>1</td>
<td>6AV6646-1AA22-0AX0</td>
<td></td>
</tr>
<tr>
<td>CPU 1516-3 PN/DP</td>
<td>1</td>
<td>6ES7516-3AN00-0AB0</td>
<td></td>
</tr>
<tr>
<td>SIMATIC S7 MEMORY CARD, 24 MB</td>
<td>1</td>
<td>6ES7954-8LF01-0AA0</td>
<td></td>
</tr>
</tbody>
</table>
2 Solution

2.3 Hardware and software components

Example files and projects

The following list includes all files and projects that are used in this example.

Table 2-2

<table>
<thead>
<tr>
<th>Component</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>28309119_Thin_Client_Doku_V7.3_de.pdf</td>
<td>This document.</td>
</tr>
<tr>
<td>28309119_Thin_Client_Code_V7.3.zip</td>
<td>This zip file contains the WinCC project.</td>
</tr>
</tbody>
</table>
3 Basics

3.1 Client and server

In the client & server concept, a server provides information and service, which is requested by one or more clients. The server passively waits for the requests, which are actively made by the client. The client and the server communicate in a network.

Figure 3-1

3.2 Industrial Thin Client

The idea of Thin Clients is that the clients only need little power from the data-processing hardware. They are optimized for data input and output. Powerful and expensive hardware components for processing data are not necessary. The data is processed and the programs are run on a central server so that cost-optimized hardware can be used for the clients.

Figure 3-2
3 Basics

3.3 Remote desktop session host (terminal server)

The considerably lower requirements for the data-processing hardware as compared to the server are the reason for the name “Thin Client”.

Since the hardware is less complex, it is also less susceptible to errors as compared with the standard PC solutions. SIMATIC Industrial Thin Clients have been especially optimized for the use in a rough industrial environment and do not contain rotating parts, for example.

An additional advantage of Thin Clients is that installation, maintenance and software updates have to be performed only once on the server. No additional installations or updates of the software and licenses are necessary in the Thin Clients themselves.

3.3 Remote desktop session host (terminal server)

A remote desktop session host offers several remote desktop clients the possibility of joint access to applications provided by the remote desktop session host.

Each remote desktop client receives its own workspace on the remote desktop session host for executing the desired application. This workspace is referred to as remote desktop session.

In a remote desktop session, the available resources can be used by the applications executed there. This includes the main memory and the CPU of the remote desktop session host.

The operator entries by mouse, keyboard or touchscreen, etc. from the remote desktop client are transmitted to the remote desktop session host.

The application is run and the data processed completely on the remote desktop session host.

For the output of the visual data, the screen contents of the remote desktop session are transmitted back to the remote desktop client.

The remote desktop session host and the remote desktop client communicate via the TCP/IP and RDP protocols.

Figure 3-3
3.4 Multi-instance capability of applications

The capability of an application to be carried out several times simultaneously on a computer system is called multi-instance capability.

This feature of the application is a basic prerequisite for its use in the remote desktop session host.

Each client of the remote desktop session host uses its own instance of the application.

The following figure shows an application capable of multi-instances taking the example of a text processing program.

Figure 3-4
4 Mode of Operation

4.1 General overview

Figure 4-1

On the WinCC server (1), the operator control and monitoring system SIMATIC WinCC V7.3 runs.

Since no RDP connections are admitted for operating the WinCC V7.3 project from the Industrial Thin Clients (2) to the WinCC server, the option package SIMATIC WinCC WebNavigator (3) is used here. It consists of a server and a client component.

The WebNavigator server provides the WinCC Runtime project as a website via the Internet Information Service (IIS). It can be called from the WebNavigator client via the http/https protocol.

The WebNavigator client is installed on a separate computer, the remote desktop session host (4). There, the program can be simultaneously executed in several remote desktop sessions (5) thus enabling multiple access to the WinCC project.

From each Industrial Thin Client, a Remote Desktop Protocol (RDP) connection to the remote desktop session host is created to initiate a session on the remote desktop session host. In each of these sessions, an instance of the WebNavigator Client is carried out.

Additional connections can be set up from the Industrial Thin Clients, for example for a direct diagnostics of the CPU.

Note

Please find further information on the possibilities of a remote access to WinCC stations online at the following address:
4 Mode of Operation

4.2 WinCC Server functionality

4.2 WinCC Server functionality

On the WinCC server the WinCC Runtime project runs in the WinCC runtime environment.

The following table lists the users, which are used in the later configuration of the user management of the WinCC server in this application.

Table 4-1

<table>
<thead>
<tr>
<th>User name</th>
<th>Password</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>WinCC remote1</td>
<td>remote1</td>
<td>ITC 1</td>
</tr>
<tr>
<td>WinCC remote2</td>
<td>remote2</td>
<td>ITC 2</td>
</tr>
</tbody>
</table>

The users you work with in the WinCC server during plant operation need to be maintained in the Windows user management and in parallel also in the user management of the WinCC Runtime project.

Please keep this in mind, especially when you change the password, as it must be changed in the user management of the operating system and also in the user management of the WinCC project.

4.3 Remote desktop session host functionality

A client receives its own remote desktop session by logging a remote desktop client on at the remote desktop session host via RDP.

The users used in this application example, for example for logging on to the remote desktop session host, are listed in the following table.

Table 4-2

<table>
<thead>
<tr>
<th>User name</th>
<th>Password</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>remote1</td>
<td>remote1</td>
<td>ITC 1</td>
</tr>
<tr>
<td>remote2</td>
<td>remote2</td>
<td>ITC 2</td>
</tr>
</tbody>
</table>
5 Installation and Configuration

5.1 Hardware

Overview

The following picture gives an overview of the hardware structure of the application:
Figure 5-1

Note

Please follow the setup instructions of the components used above.
Please refer to the introduction into the SIMATIC S7-1500 controller family at the following address:
5 Installation and Configuration
5.1 Hardware

WARNING
The connection line of the power supply must not be connected to the mains during wiring.

Installation procedure
Table 5-1

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Install the hardware of both SIMATIC Rack PCs. Do not switch on the PCs yet.</td>
</tr>
<tr>
<td>2.</td>
<td>Connect the 24V of the power supply to the SCALANCE X208.</td>
</tr>
<tr>
<td>3.</td>
<td>Connect the SIMATIC Industrial Thin Client to the potential equalization.</td>
</tr>
<tr>
<td>4.</td>
<td>Connect the 24V of the power supply to the SIMATIC Industrial Thin Client.</td>
</tr>
<tr>
<td>5.</td>
<td>Open the front cover of the CPU and insert the SIMATIC memory card into the provided slot.</td>
</tr>
</tbody>
</table>
### 5 Installation and Configuration
### 5.1 Hardware

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Connect the 24V output voltage of the power supply PS307 24V/5 A to the 24V input voltage of the CPU 1516-3 PN/DP.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>
| 7.  | Connect the SCALANCE switch at one free Ethernet port to the following Ethernet nodes:  
  - SIMATIC Industrial Thin Client  
  - SIMATIC Industrial Thin Client  
  - SIMATIC Rack PC  
  - CPU 1516  
  - Programming unit |
| 8.  | Connect the plug of the power supply PS307 24V/5 A to the mains. |
| 9.  | Switch on the PS307 24V/5 A power supply. |
| 10. | Switch on the PCs. |
5.2 Software

The following installation order must be followed for operating the Industrial Thin Client at the server.

1. Assigning IP address/server name
2. Installing Internet Information Service (IIS)
3. Installation WinCC V7.3 and WebNavigator
4. Installing remote desktop services
5. Installing WebNavigator Client
6. Creating Windows user accounts
7. WebNavigator configuration
8. Configuring the Thin Client

The following steps describe the installation of additional software components in detail.

Starting points are two preinstalled operating systems Microsoft Windows Server 2012 R2 operating systems.

Note

Please find a list of operating systems suitable for the use of WinCC with the WebNavigator Server option online in the system manual of WinCC Professional V7.3 in the chapter “Software and Hardware Requirements” at the following address:


Further information about WinCC is available online in the system manual of WinCC V7.3 at the following address:


5.2.1 Assign IP address

The following chapter describes assigning the IP addresses in the network and explains how to assign the IP addresses of the servers.

Note

The IP addresses are only examples and can be replaced by your own IP addresses.

The following table contains an overview of the network devices and their respective IP addresses.

<table>
<thead>
<tr>
<th>No.</th>
<th>Device</th>
<th>IP address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>WinCC Server (server 1)</td>
<td>172.16.51.1</td>
</tr>
<tr>
<td>2.</td>
<td>Remote desktop session host (server 2)</td>
<td>172.16.51.2</td>
</tr>
<tr>
<td>3.</td>
<td>Industrial Thin Client 1</td>
<td>172.16.51.10</td>
</tr>
<tr>
<td>4.</td>
<td>Industrial Thin Client 2</td>
<td>172.16.51.11</td>
</tr>
<tr>
<td>5.</td>
<td>CPU</td>
<td>172.16.51.20</td>
</tr>
<tr>
<td>6.</td>
<td>SCALANCE</td>
<td>172.16.51.30</td>
</tr>
</tbody>
</table>
5 Installation and Configuration

5.2 Software

Setting the IP address of the server

Table 5-2

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open the “Control Panel” of the WinCC server (server 1).</td>
</tr>
<tr>
<td>2.</td>
<td>Open the “Network and Internet”.</td>
</tr>
<tr>
<td>3.</td>
<td>Open “Network and Sharing Center”.</td>
</tr>
</tbody>
</table>
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Select the LAN connection.</td>
</tr>
</tbody>
</table>

![Image of Network and Sharing Center]

- Control Panel Home
- Change adapter settings
- Change advanced sharing settings

Access type: No Internet access
Connections: Ethernet0

Set up a new connection or network
Set up a broadband, dial-up, or VPN connection; or set up a router or access point.

Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.

See also
- Internet Options
- Windows Firewall

| 5.  | Open the “Properties” of the LAN connection. |

![Image of Ethernet0 Status]

- IPv4 Connectivity: No Internet access
- IPv6 Connectivity: No Internet access
- Media State: Enabled
- Duration: 00:00:00
- Speed: 1.0 Gbps

Activity
- Sent: 1.391
- Received: 7.010

Properties, Disable, Diagnose
5.2 Software


7. Configure the IP address of the server. Use the IP address from Table 5-2.

8. Confirm the set IP address by clicking on the "OK" button and then close the dialog.

9. Repeat steps 1-8 for the remote desktop session host (server 2). Configure the IP address of the server. Use the IP address from Table 5-2.
5.2 Software

5.2.2 Set server name

The following steps show how to configure the server name.

Table 5-3

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open the “Control Panel”.</td>
</tr>
<tr>
<td>2.</td>
<td>Open “System and Security”.</td>
</tr>
<tr>
<td>3.</td>
<td>Open “System”.</td>
</tr>
</tbody>
</table>
5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Open “Change settings”.</td>
</tr>
</tbody>
</table>

[Image of the Control Panel settings showing the System properties with the option to change the computer name]

| 5.  | Click on “Change...” to rename the computer. |

[Image of the System Properties window with the option to change the computer name]
## 5.2 Software

### 6. Assign the computer name.

![Computer Name/Domain Changes](image)

You can change the name and the membership of this computer. Changes might affect access to network resources.

<table>
<thead>
<tr>
<th>Computer name:</th>
<th>Server2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full computer name:</td>
<td>Server2</td>
</tr>
<tr>
<td>Member of:</td>
<td>Workgroup: WORKGROUP</td>
</tr>
</tbody>
</table>

### 7. Repeat steps 1 to 6 for the remote desktop session host (server 2).

![Computer Name/Domain Changes](image)

You can change the name and the membership of this computer. Changes might affect access to network resources.

<table>
<thead>
<tr>
<th>Computer name:</th>
<th>Server2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full computer name:</td>
<td>Server2</td>
</tr>
<tr>
<td>Member of:</td>
<td>Workgroup: WORKGROUP</td>
</tr>
</tbody>
</table>
5.2.3 Installation Internet Information Services (IIS)

The following steps show how to install Internet Information Services (IIS) on the server.

Table 5-4

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open the Server Manager of the WinCC server (server 1).</td>
</tr>
<tr>
<td>2.</td>
<td>In the “Server Manager” in “Manage” you click on “Add Roles and Features”.</td>
</tr>
<tr>
<td>3.</td>
<td>Select “Role-based or feature-based installation” as the installation type</td>
</tr>
</tbody>
</table>

Roles and Features (Services) must be started manually when you restart the computer.

Select installation type

Before You Begin

Installation Type

Server Selection

Server Roles

Features

Description

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

- Role-based or feature-based installation
  Configure a single server by adding roles, role services, and features.

- Remote Desktop Services installation
  Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.
5.2 Software

4. Select your server on which you wish to install the Internet Information Services.

   ![Add Roles and Features Wizard]

   Server Pool:
   
   Name | IP Address | Operating System
   ---- | ---------- | -------------------
   Server1 | 172.16.54.1 | Microsoft Windows Server 2012 R2 Standard

   1 computer(s) found
   This page shows servers that are running Windows Server 2012, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

5. Select the “Web server (IIS)” entry under “Server Roles”.

   ![Add Roles and Features Wizard]

   Web Server (IIS) provides a reliable, manageable, and scalable Web application infrastructure.
5.2 Software

6. Select “Message Queuing Server” in “Features”.

7. Complete and close the selection by clicking on the “Next” button.
5 Installation and Configuration

5.2 Software

8. In “Role Services” you select the following role services for installation.

WWW services > Common HTTP features
- standard document
- static content

World Wide Web Services > Security:
- Request Filtering
- Basic Authentication
- Windows Authentication

World Wide Web Services > Application Development Features:
- .NET Extensibility 3.5 and 4.5
- ASP
- ASP.NET 3.5 and 4.5
- ISAPI Extensions
- ISAPI Filters

Web Management Tools:
- IIS Management Service
- IIS Management Console
- IIS Management Scripts and Tools
- IIS Metabase and IIS 6 Configuration Compatibility
- IIS 6 WMI Compatibility

Close the selection by clicking on the “Next” button.
## 5 Installation and Configuration

### 5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>Install the selected role services and close the wizard.</td>
</tr>
</tbody>
</table>

In case your computer can not download the necessary files from Windows, specify the alternate path to the installation CD of Windows Server 2012.
5 Installation and Configuration

5.2 Software

5.2.4 Installation WinCC V7.3 and WebNavigator

The following steps show how to install WinCC V7.3 and WebNavigator on the WinCC server (server 1).

Table 5-5

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Start the WinCC V7.3 software by double-clicking on the “Setup” application of from the installation medium.</td>
</tr>
<tr>
<td>2.</td>
<td>Choose a setup language.</td>
</tr>
</tbody>
</table>

![Setup Window](image)

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### 5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Terminate all Windows programs. Click on the “Next” button.</td>
</tr>
</tbody>
</table>

#### Setup

**Welcome to the installation of HMI Edition.**
**Version: V7.3**

It is strongly recommended that you exit all Windows programs before running the Setup program.

Click Cancel to quit Setup and then close any programs you have running.
Click Next to continue with the Setup program.

**WARNING:** This program is protected by copyright law and international treaties.

Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Back</td>
<td>Next</td>
<td>Cancel</td>
</tr>
</tbody>
</table>

#### Setup

**Product Notice**
Product notes display.

The product notes contain important information on installing and using this product.

We recommend you read these notes before installing.

You will find the notes in the directory:
D:\Install_and_Release-Notes\English\InstallNotesInfoSystem.chm

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Back</td>
<td>Next</td>
<td>Cancel</td>
</tr>
</tbody>
</table>
## 5 Installation and Configuration

### 5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Accept the license agreement as well as the security information.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="License agreement" /></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Setup" /></td>
</tr>
<tr>
<td>6.</td>
<td>Select the Setup type “Install”.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Setup type" /></td>
</tr>
</tbody>
</table>
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Select the languages you wish to install for WinCC V7.3.</td>
</tr>
</tbody>
</table>

**Product languages**

Please select the language you want to install.

- German
- Korean
- English
- Taiwanese
- French
- Spanish
- Italian
- Japanese
- Chinese

<table>
<thead>
<tr>
<th>Back</th>
<th>Next &gt;</th>
<th>Cancel</th>
</tr>
</thead>
</table>

| 8.   | Choose “Package installation” |

**Installation type**

Select the installation type which corresponds best to your experience.

- Package installation
  - Install program package

- User-defined installation
  - The user-defined installation allows you to select the products to be installed.

Target directory:

C:\Program Files (x86)\...
5.2 Software

9. Select the packages “WinCC Installation” and “WebNavigator Server”.

10. Click on the “Next” button.
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Read the terms of the license agreements and the security information and confirm.</td>
</tr>
</tbody>
</table>

**License agreements**

Please read the following license agreement carefully.

4. Third Party Commercial License Conditions
4.1) Microsoft SQL Server 2008 R2 Standard Edition

**END-USER LICENSE AGREEMENT**

These license terms are an agreement between the licensor of the software application or suite of applications with which you acquired the Microsoft software ("Licensor") and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft updates, supplements, and Internet-based services for this software, unless other terms accompany those items. If so, those terms apply. Microsoft.

- [ ] I accept the conditions of this license agreement

12. Accept the changes made to the system settings. Click on the “Next” button.

**System settings**

The following system settings will be changed on this computer:

- The following registry settings and rights will be set
- The following firewall settings will be modified
- Allow incoming ICMP Echo (ping)
- Allow file and printer sharing
- Network access ranges: Subnet
- OPC UA Discovery
- TCP port 4440 Open
- Network access range: All computers
- Automation License Manager Service
- Network access ranges: Subnet
- WinCC

- [ ] I accept the changes to the system settings
5 Installation and Configuration

5.2 Software

13. Click on Install. WinCC V7.3 and WebNavigator are then installed.

![Setup window showing installation of WinCC V7.3, WebNavigator, SQL Server 2008 R2, and Automation License Manager V5.3 (64-bit) with estimated installation time of 0:39 (Hrs min).]
5.2.5 Installing of the remote desktop services

The following steps describe the installation of the remote desktop session host (terminal server).

**Note**

Install the remote desktop services on your computer before installing WinCC WebNavigator Client. Otherwise, the WinCC WebNavigator Client may not run correctly in a multi-user environment.

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open the Server Manager.</td>
</tr>
<tr>
<td>2.</td>
<td>In the “Server Manager” in “Manage” you click on “Add Roles and Features”.</td>
</tr>
</tbody>
</table>

Roles and Features (Services) must be started manually when you restart the computer.
5.2 Software

3. Select "Role-based or feature-based installation" as the installation type.

Select your server on which you wish to install the Remote desktop services.
## 5 Installation and Configuration

### 5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Select the role “Remote Desktop Services”.</td>
</tr>
</tbody>
</table>

![Select server roles](image1)

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>The .NET Framework 4.5 is then installed as well.</td>
</tr>
</tbody>
</table>

![Select features](image2)
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
</table>
| 7.  | Select the following role services:  
- Remote Desktop Connection Broker  
- Remote Desktop WebAccess  
- Remote Desktop Session Host |

8. Click the "Install" button.
## 5 Installation and Configuration

### 5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>Open the “Control Panel”.</td>
</tr>
<tr>
<td>10.</td>
<td>Open “System and Security”.</td>
</tr>
<tr>
<td>11.</td>
<td>Open “Allow remote access”.</td>
</tr>
</tbody>
</table>

![Control Panel](image1.png)

![System and Security](image2.png)
5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>Select “Allow remote connection to this computer” so clients can connect to the server.</td>
</tr>
</tbody>
</table>

![System Properties](image)

**Note**

Microsoft permits the provisional setup of a remote desktop session host without installing a license server for the duration of 120 days. Then the installation of a license server is required, on which Client Access Licenses (CAL) are required.


Windows Server 2012 CALs are available in two versions:

- **User CAL**: A user can access the server software from any device by means of a user CAL.
- **Device CAL**: Any user can access the server software from the licensed device by means of a device CAL.
5.2.6 Installing Web Navigator Client

The following steps describe the installation of the Web Navigator Client on the remote desktop session host (server 2).

Table 5-7

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Start the WinCC V7.3 software by double-clicking on the “Setup” application of from the installation medium.</td>
</tr>
<tr>
<td>2.</td>
<td>Choose a setup language.</td>
</tr>
</tbody>
</table>
3. Terminate all Windows programs. Click on the "Next" button.

4. Read the Product Notice. Click on the "Next" button.
5. Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Accept the license agreement as well as the security information.</td>
</tr>
</tbody>
</table>

**Setup**

License agreements
Please read through the following license agreement carefully, including the security information it contains.

- Please note:
  - This software is protected under German and US-American Copyright Laws and provisions in international treaties. Unauthorized reproduction and distribution of this software or parts of it is liable to prosecution. It will be prosecuted according to criminal as well as civil law and may result in severe punishment and/or damage claims.
  - Please read all license provisions applicable to this software before installing and using this software. You will find them after this note.

If you purchased this software on a CD marked as "Trial Version" or together with another licensed software for you, this software may only be used for test and evaluation purposes according to the provisions of the Trial License stated after this note. A prerequisite for this kind of use is the installation of programs, software libraries, etc., on your computer. Therefore, we recommend to install it either on a standalone computer or on a computer which is not needed in production or for keeping important data because we cannot totally exclude that existing data will be modified or overwritten. Therefore, we will not be liable for any damages resulting from this installation or from ignoring this legal notice and/or for loss of data.

Any other type of usage of this software is only admissible if you have a valid license from us, if you do not have a valid license (which has to be established by submitting a corresponding license agreement).

[Red box: I accept the conditions of the above license agreement as well as the Open Source license agreement.]

[Red box: I confirm that I have read and understood the security information.]

6. Select the Setup type “Install”.

**Setup**

- Select the Setup type that suits your requirements best.

[Red box: Please select the products that you would like to install on your system.]

[Red box: Please select the products that you would like to remove from your system.]

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5 Installation and Configuration

5.2 Software

7. Select the languages you wish to install for WinCC V7.3.

8. Choose “Package installation”
9. Select the "WebNavigator Client" package.

10. Click on the "Next" button.
5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Click on Install. WebNavigatorClient will then be installed.</td>
</tr>
</tbody>
</table>

![Setup window]

- **Ready to install the selection**
- **The wizard is ready to begin the installation**

- **WebNavigator**
  - WebNavigator Client
  - Size: 21 MB

- **Required**: 76 MB
- **Estimated installation time**: 00:03 (HH:mm)

- **Actions**:
  - [Back]
  - [Install]
  - [Cancel]
5.2.7 Creating a Windows user

The following steps describe how to create user accounts in the remote desktop session host (server 2).

Table 5-8

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open the Server Manager.</td>
</tr>
<tr>
<td>3.</td>
<td>Open the “Local Users and Groups” dialog. Right-click on “Users” and select “New Users...”.</td>
</tr>
</tbody>
</table>
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Enter user name and password <strong>Table 4-2.</strong></td>
</tr>
</tbody>
</table>

![New User dialog box]

- User name: remote1
- Password: ********
- Confirm password: ********

- User must change password at next logon
- User cannot change password
- Password never expires
- Account is disabled

![Properties of created user]

5. Open the Properties of the created user “remote1”.

![Computer Management window]

Displays Help for the current selection.
### 5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Open the “Member Of” tab. Click on “Add”.</td>
</tr>
<tr>
<td></td>
<td>![Image of properties window]</td>
</tr>
<tr>
<td></td>
<td>Changes to a user’s group membership are not effective until the next time the user logs on.</td>
</tr>
<tr>
<td>7.</td>
<td>Then click the “Advanced” button.</td>
</tr>
<tr>
<td></td>
<td>![Image of select groups window]</td>
</tr>
</tbody>
</table>
5 Installation and Configuration

5.2 Software

8. Click the “Find Now” button.

9. Select the Remote Desktop Users group. Click on the “OK” button.
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>Click on the “Apply” button to save the changes made.</td>
</tr>
</tbody>
</table>

![Remote Desktop Users Membership](image)
## 5 Installation and Configuration

### 5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Open the “Environment” tab. For starting the WebNavigator Client automatically when you log on, enter the path and the program file name of the WebNavigator Client. For example: C:\Program Files (x86)\Siemens\WinCC\Webnavigator\Client\bin\WinCCViewerRT.exe</td>
</tr>
<tr>
<td>12.</td>
<td>Confirm the changes by clicking on the “OK” button.</td>
</tr>
<tr>
<td>13.</td>
<td>Repeat steps 3 to 12 with different users for the respective number of Industrial Thin Clients which connect to the terminal server via the RDP.</td>
</tr>
</tbody>
</table>
5 Installation and Configuration

5.2 Software

5.2.8 Configuring Web Navigator

Opening the WinCC demo project

The following steps describe how to open the demo project in WinCC.

Table 5-9

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Unzip the file “28309119_Thin_Client_Code.zip” in the WinCC server (server 1).</td>
</tr>
<tr>
<td>2.</td>
<td>Start WinCC Explorer and open the demo project.</td>
</tr>
<tr>
<td>3.</td>
<td>Select “Computer” in the WinCC Explorer. Now right-click the entry shown in the right window and select “Properties”.</td>
</tr>
</tbody>
</table>
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Open the “General” tab. Click on “Use Local Computer Name”.</td>
</tr>
</tbody>
</table>

5. Next you will be notified that WinCC has to be restarted.
5 Installation and Configuration

5.2 Software

Setting the Web Configurator

The following steps describe how to set the Web Configurator in the WinCC server (server 1).

Table 5-100

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
</table>

![Web Configurator screenshot](image)

2. Select the “Create a new standard Web site (stand-alone)” option.

![Create new standard Web site](image)
5.2 Software

3. Select "MainControl.asp" as the default web-page.

4. Restart the computer after completing the WinCC Web Configurator.
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>After the restart, open WinCC Explorer again and open the “Web View Publisher”.</td>
</tr>
</tbody>
</table>

6. Click “Next” on the start screen.
### 5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Make sure that the project paths are correct.</td>
</tr>
<tr>
<td></td>
<td><img src="image1.png" alt="WinCC Web Publishing Wizard - Select directories" /></td>
</tr>
<tr>
<td>8.</td>
<td>Select all pictures you wish to see in the WebNavigator client and move them into the right pane.</td>
</tr>
<tr>
<td></td>
<td><img src="image2.png" alt="WinCC Web Publishing Wizard - Select pictures" /></td>
</tr>
</tbody>
</table>
5 Installation and Configuration

5.2 Software

9. Select all functions you wish to operate in the WebNavigator client and move them into the right pane.

![Select functions](image1)

10. Select all referenced graphics you wish to see in the WebNavigator client and move them into the right pane.

![Referenced graphics](image2)
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Click on “Finish” to close the dialog box.</td>
</tr>
</tbody>
</table>

![WinCC Web Publishing Wizard - Finish](image)

**Note**

Using the CMD command “netstat -ano” enables checking whether ports are assigned or connections exist with your server and a remote computer. For existing connections, the address of the peer can be read.

![Windows PowerShell](image)
5 Installation and Configuration

5.2 Software

Creating Web Navigator users

In order to use WebNavigator you have to create users with the corresponding authorization (Server 1). This is described below.

Table -5-11

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open the “User Administrator” in WinCC Explorer.</td>
</tr>
</tbody>
</table>

![Image of User Administrator in WinCC Explorer]

2. Create a new group named “Remote”.

Note: The group name can be changed to suit your project.
3. Select the “Remote” group and activate the authorization for the WebNavigator. Then select the start picture “Start.pd_”.

4. Select the “Remote” group. Select the menu item “New User”.

![WebNavigator configuration](image)

![User Administrator configuration](image)
5 Installation and Configuration

5.2 Software

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
</table>
| 5.  | Enter the username and password below:  
User: “WinCC remote1”  
Password: “remote1” |

![User Administrator - WinCC Configuration Studio](image)

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
</table>
| 6.  | Repeat the steps for the following users:  
“WinCC remote2” (PW:remote2) |
5 Installation and Configuration

5.2 Software

Testing WebNavigator locally at the server (Server 1)

Note: The following requirements must be met:
- WebNavigator is configured correctly.
- WinCC Runtime has been started.

Table 5-12

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Start the Microsoft &quot;Internet Explorer&quot; locally. Enter <a href="http://localhost">http://localhost</a> in the address bar.</td>
</tr>
<tr>
<td>2.</td>
<td>Then a password prompt appears. Assign a user name and the respective password here (see Table 4-1).</td>
</tr>
<tr>
<td>3.</td>
<td>If the user name and the password are correct, the WinCC operator displays are displayed in Microsoft Internet Explorer.</td>
</tr>
</tbody>
</table>

Note: In the Internet Explorer, the server must have been rated as trusted. 
For further information, refer to the following entry ID: 16957049.
Note
In order to be able to use certain controls of extension packages, such as the Performance Monitor, plugins need to be installed.
For further information, refer to the following entry ID: 88195784.

Note
When using a process picture with ActiveX controls in WebNavigator, you need to activate the “Permit ActiveX Controls” checkbox in the “Security” tab in the Internet Options of the Internet Explorer.
For further information, refer to the following entry ID: 102768445.
5.2.9 Industrial Thin Client

**Note**

To delete the set IP address of the device and to **restore the default settings**, keep the reset button pressed for at least 3 seconds after switching on the power supply.

The button is at the back of the device, next to the Ethernet interface. Please use a pointed object such as a paper clip to press the button.
5.2 Software

Setting up the Industrial Thin Client for the first time

The following steps describe how to set up a RDP connection from the Industrial Thin Client to the remote desktop session host.

Table 5-13

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>When you switch on the Industrial Thin Client for the very first time or when you have reset the factory settings at the back of the device, the setup menu will open up. In the first step you enter a unique name for the device such as “itc-1200” and confirm by pressing the “Next &gt;” button.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Setup Menu" /></td>
</tr>
<tr>
<td>2.</td>
<td>In the second step, enter the network configuration of the device. Click on the “Static” button and then enter the IP address from Table 5-2.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Network Configuration" /></td>
</tr>
</tbody>
</table>
5.2 Software

### 3. 
In the third step, create a Remote Desktop Protocol connection. Use the following settings:
- **Connection type:** RDP
- **Connection name:** Terminalserver
- **Server (IP address or Hostname):** ([see IP Terminal server from Table 5-2](#))
- **Port:** 3389
- **User:** ([see user from Table 4-2](#))
- **Password:** ([see password from Table 4-2](#))
- **Show connection (favorites):** *(activated)*

Then click on the “Save & Exit” button.

### 4. 
Open the connection you created from the favorites bar in the Industrial Thin Client. Press on the “Favorites” button and select the connection “Terminalserver”.

---

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When the RDP connection to the remote desktop session host has been built up for the first time, the application "WinCCViewerRT" is started automatically according to the user configuration in chapter 5.2.7 of the remote desktop session host.

A dialog box for the configuration of the connection from the WinCC WebNavigator client to the WinCC WebNavigator server appears. Enter the address of the WebNavigator server in this dialog box. Use the host name or the IP address of the WinCC server from Table 5-2.

In the example project, the users from Table 4-1 have already been created with their respective passwords. Take a user from the plant operation phase from Table 4-1 for the identification of the WinCC WebNavigator client at the WinCC WebNavigator server.

Note: For further information on setting up WinCCViewerRT, please refer to the following entry ID: 102768445.
6 Operating the Application

6.1 Overview

It is now possible to access the WinCC server and the WinCC Runtime project running on the server via the Industrial Thin Clients.

For diagnostics, the web server of the CPU can also be displayed on the Industrial Thin Clients.

The connections created in chapter 5.2.9 “Industrial Thin Client” are used to access the respective device.

For opening a connection, you simply have to select it in the favorites bar in the Industrial Thin Client.

Note

Please find the operating instructions for Industrial Thin Client at the following address:


6.2 Connecting to the remote desktop session host

When the connection to the remote desktop session host is built up, an instance of the WebNavigator client is started for the logged in user.

This instance connects to the WebNavigator server automatically, enabling the operation of the WinCC Runtime project on the WinCC server of the Industrial Thin Client.

Please find a detailed description of the functionality of the example project online at the following link:

7 Further Notes, Tips & Tricks, etc.

7.1 Expansion options

Remote access to the WinCC server

The remote access on the WinCC server via the RDP is not allowed for active server services such as the WebNavigator server.

As an alternative, the Remote Framebuffer Protocol (RFB) with VNC software is suitable for remote maintenance of the WinCC server.

This protocol is supported by the Industrial Thin Clients and can be used for the access on the WinCC server via the connection created accordingly.

For this purpose, an additional VNC server is installed on the WinCC server. Via the VNC connection it is then possible to operate the WinCC server from the Industrial Thin Clients, for example to carry out maintenance such as starting and stopping runtime.

A video on how to create a VNC connection is available online at the following address: https://support.industry.siemens.com/cs/ww/en/view/63348591.

Sm@rtServer

Another possibility of operating remote devices with Industrial Thin Clients is the Sm@rtServer. Remote access to Comfort Panels is then possible, for example.

For this, the function Sm@rtServer is to be activated on the Comfort Panel. In this way the connection to the Comfort Panel can be created from the Industrial Thin Client.

A video on how to create a Sm@rtServer connection is available online at the following address: https://support.industry.siemens.com/cs/ww/en/view/63445531.

7.2 Alternative configurations

SIMATIC WinCC Runtime Professional V13

In addition to WinCC Runtime V7.3, the solution presented in this application can also be implemented with SIMATIC WinCC Runtime Professional V13.

For this SIMATIC WinCC Runtime Professional V13, the option WebNavigator is also available and can be set in the same way as described here.

The necessary steps can be generally transferred.
Virtualization of the server systems

Virtualization techniques available today allow for the parallel operation of several virtual computer systems on a single hardware platform. Sufficiently powerful computer configurations are needed. Several virtual machines (VM), called guests, are connected to one host device. They use the same resources of the real hardware, i.e. those of the host. In the present solution, two server systems, a WinCC server, and a remote desktop session host are used. All those could be run as guests on a virtual machine on the host computer.

Figure 7-1

Note
Please find more information on virtualization of servers online at the following address:
7.3 Performance data

For a remote access to the WinCC server, the speed of the image build-up and the reaction speed of the Runtime project are very important. This depends on the server hardware used and also on the speed of the network connection and the number of Industrial Thin Clients used at the same time. For estimating the power to be expected, measured data with various connection types for various numbers of clients are available online. Please find the respective measured data at the following address:

8 Links & Literature

Table 1-2

<table>
<thead>
<tr>
<th>Topic</th>
<th>Title</th>
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<tr>
<td>1| Siemens Industry Online Support</td>
<td><a href="https://support.industry.siemens.com">https://support.industry.siemens.com</a></td>
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<td>2| Download page of the entry</td>
<td><a href="https://support.industry.siemens.com/cs/wwde/28309119">https://support.industry.siemens.com/cs/wwde/28309119</a></td>
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<td>5| Industrial Thin Client manual</td>
<td><a href="https://support.industry.siemens.com/cs/ww/en/view/61187980/79267000203">https://support.industry.siemens.com/cs/ww/en/view/61187980/79267000203</a></td>
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9 History

Table 9-1

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<td>V3.0</td>
<td>11/2015</td>
<td>Complete revision: WinCC 6.2 → WinCC 7.3</td>
</tr>
<tr>
<td></td>
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<td>Windows Server 2008 → Windows Server 2012 R2</td>
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<td>V2.0</td>
<td>09/2013</td>
<td>Complete revision: WinCC 6.2 → WinCC Professional V12</td>
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<td></td>
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<td>Thin Client → Industrial Thin Clients</td>
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<tr>
<td>V1.1</td>
<td>05/2008</td>
<td>Installation sequence optimized and notes supplemented</td>
</tr>
<tr>
<td>V1.0</td>
<td>02/2008</td>
<td>First version</td>
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