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# SIMATIC HMI and OPC UA Part 6: WinCC RT Professional Server, Comfort Panel Client

WinCC Professional V14, Comfort Panel,  
WinCC Runtime Professional

<https://support.industry.siemens.com/cs/ww/en/view/63481236>

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# 1 Task

## Introduction

The application example describes the configuration steps for creating a secure OPC UA connection (UA Security)<sup>1</sup> between a SIMATIC Comfort Panel and WinCC Runtime Professional (PC station).

## Overview of the automation task

A production plant consists of several plant areas. In each plant area, an HMI operator panel is used to control a machine.

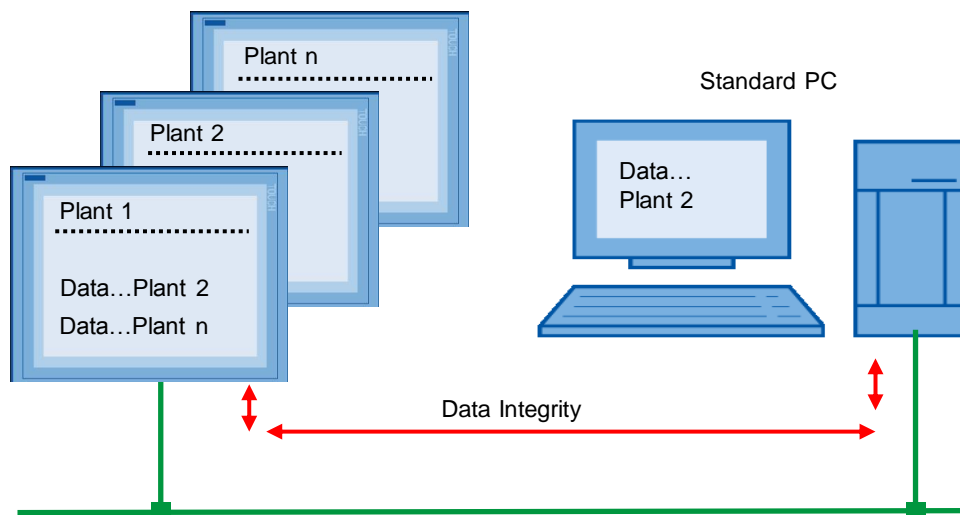
A control center is used to additionally monitor the plant areas and output the information using a PC station.

Cross-plant information is output using the HMI operator panels. To this end, the HMI operator panels directly access the tags of the PC station.

Communication between the HMI operator panels and the PC station is encrypted for security reasons.

The following figure provides an overview of the automation task.

Figure 1-1



<sup>1</sup> UA Security consists of authentication and authorization, encryption and data integrity via signatures.

## 2 Solution

### Overview

SIMATIC Comfort Panels are used to control the plant areas. A PC station with WinCC Runtime Professional installed on it is used as a control center.

- The Comfort Panels are parameterized as an OPC UA client.
- The PC station is parameterized as an OPC UA server.
- All devices communicate via an OPC UA connection. Data integrity through encryption and digital signatures is supported by the OPC UA communication interface.

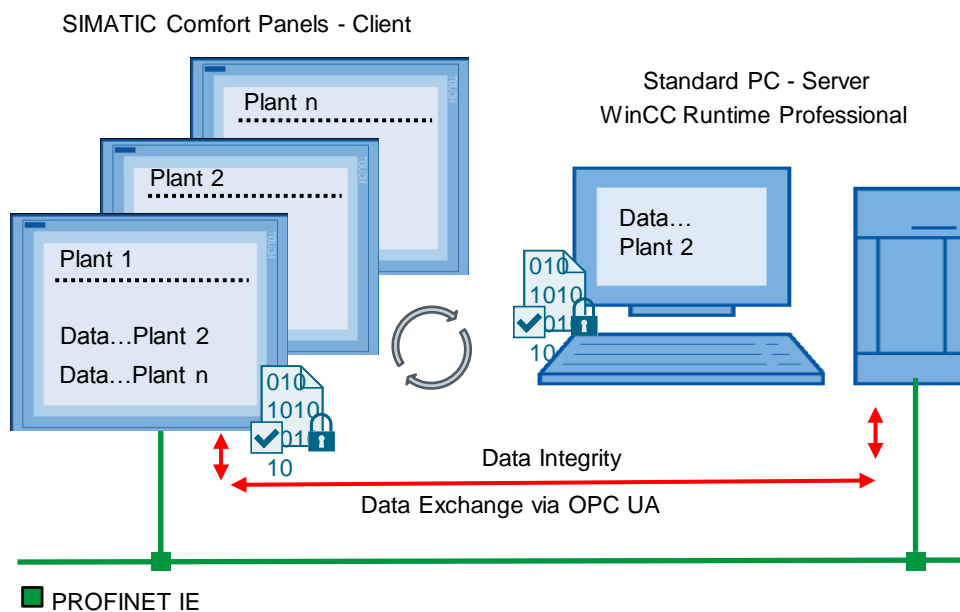
### Note

When the application example uses the term 'PC station', this always refers to the "WinCC Runtime Professional" installation.

### Diagrammatic representation

The diagrammatic representation below shows the most important components of the solution:

Figure 2-1



### Configuration

All nodes are integrated into a PROFINET network. The nodes communicate with each other via the OPC UA interface.

The following devices are used as hardware:

- SIMATIC HMI TP900 Comfort
- Standard PC with WinCC Runtime Professional V14

## 2.1 Hardware and software components

### 2.1.1 Validity

The application example is valid for:

- WinCC Runtime Professional V14 or higher.
- All Comfort Panels.

### 2.1.2 Components used

The application example was created with the following components:

#### Hardware components

Table 2-1

| Component                 | No. | Article number     | Note     |
|---------------------------|-----|--------------------|----------|
| SIMATIC HMI TP900 COMFORT | 1   | 6AV2124-0JC01-0AX0 | -        |
| Standard PC               | 1   | -                  | -        |
| CPU 1516-3 PN/DP          | 1   | 6AG1516-3AN00-7AB0 | Optional |

#### Software components

Table 2-2

| Component                              | No. | Article number     | Note |
|--|-----|--------------------|------|
| SIMATIC WinCC Professional V14         | 1   | 6AV2103-0HA04-0AA5 | -    |
| SIMATIC WinCC Runtime Professional V14 | 1   | 6AV2103-0HA04-0AA5 | -    |

#### Sample files and projects

The following table contains the names of the sample files that are used in this application example.

Table 2-3

| Component   | Note   |
|---|--|
| 63481236_Part6_CODE_RT Professional Server und Panel Client.zip | Contains the WinCC Professional V14 project. |
| 63481236_Part6_RT Professional Server und Panel Client_en.pdf   | This document.                               |

## 3 Configuration and Project Engineering

### General

A WinCC (TIA Portal) configuration is used as a basis for this application example. The configuration includes

- a PC station with WinCC Runtime Professional.
- a TP900 Comfort Panel.
- a CPU 1516-3 PN/DP.

Based on this hardware configuration, the following sections describe all the settings that are required for data exchange via the OPC UA interface.

### STEP 7 configuration

The application example includes a SIMATIC S7-1516 3PN/DP.

The controller is optional and shows that all HMI tags (with and without a PLC connection) can be accessed via the OPC UA interface.

This example does not provide a detailed description of how to create an S7-1500 connection.

### Comfort Panel

The starting point is an existing WinCC (TIA Portal) project with a SIMATIC TP900 Comfort Panel.

### PC station

The starting point is an existing WinCC (TIA Portal) project with a WinCC Runtime Professional station.

### Note

When the application example uses the term 'PC station', this always refers to the "WinCC Runtime Professional configuration" settings.

### IP addresses

Define the IP addresses for the individual hardware components. The following table shows the IP addresses used in the sample project:

Table 3-1

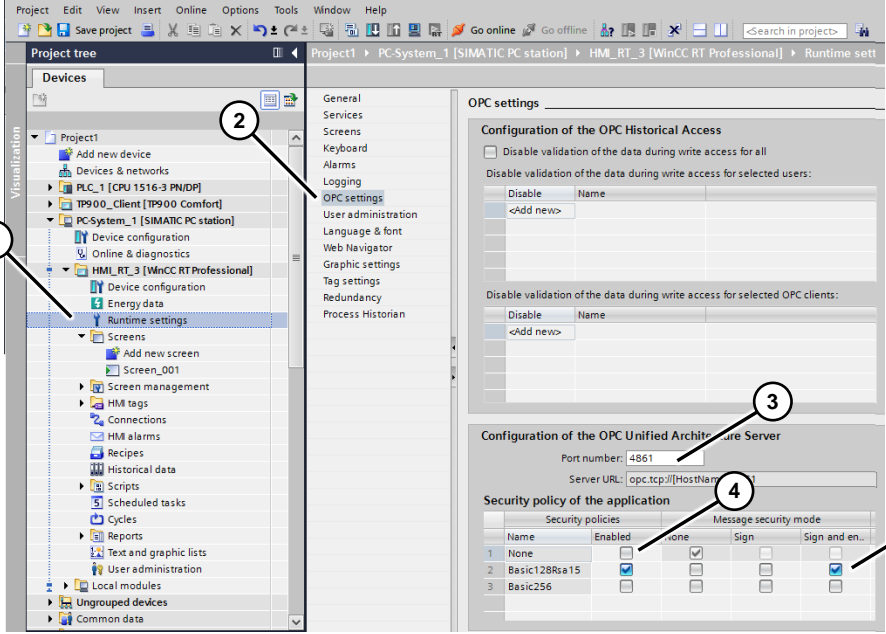
| Hardware                                | IP address    | Subnet      |
|---|---------------|-------------|
| SIMATIC HMI TP900 Comfort Panel         | 172.16.34.210 | 255.255.0.0 |
| WinCC Runtime Professional (PC station) | 172.16.34.5   | 255.255.0.0 |
| CPU 1516-3PN/DP                         | 172.16.34.34  | 255.255.0.0 |

### 3.1 PC station configuration – server

#### 3.1.1 OPC UA configuration

Table 3-2

| No. | Action   |
|-----|--|
| 1.  | <p><b>OPC settings</b></p> <ul style="list-style-type: none"> <li>In the project tree, select the PC station and open "Runtime settings" (1).</li> <li>In "Runtime settings", open the "OPC settings" menu. (2)</li> </ul> <p><b>"Configuration of the OPC Unified Architecture Server" section</b></p> <ul style="list-style-type: none"> <li>Port number: Specify a value between 1024 and 49151. The application example uses the default address, "4861", (3).</li> <li>"Security policy of the application" table                     <ul style="list-style-type: none"> <li>"Security policies" table row                             <ul style="list-style-type: none"> <li>In "None" and "Basic256", uncheck "Enabled" (4).</li> </ul> </li> <li>"Message security mode" table row                             <ul style="list-style-type: none"> <li>In "Basic128Rsa15", check "Sign and encrypt" (5).</li> </ul> </li> </ul> </li> </ul> |





### 3.1.2 Creating tags

Table 3-3

| No.              | Action  |                  |           |                  |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |
|------------------|---|------------------|-----------|------------------|----------|---------|-----------|-----|----------------|--|-------------|-----------|-----|----------------|--|-------------|-----------|-----|----------------|--|-------------|-----------|-----|----------------|--|-------------|-----------|-----|----------------|--|-------------|------------------|-----|------------------|-------|------------------|------------------|-----|------------------|-------|------------------|------------------|-----|------------------|-------|------------------|
| 1.               | <p>Insert all required tags. You can use internal HMI tags and tags with a PLC connection.</p> <p>Five internal tags and three tags with a PLC connection were created for the application example.</p> <p>The application example does not provide a detailed description of how to create a tag.</p> <table border="1"> <caption>Tag table_1</caption> <thead> <tr> <th>Name</th> <th>Data type</th> <th>Connection</th> <th>PLC name</th> <th>PLC tag</th> </tr> </thead> <tbody> <tr> <td>HMI_Tag_1</td> <td>Int</td> <td>&lt;Internal tag&gt;</td> <td></td> <td>&lt;Undefined&gt;</td> </tr> <tr> <td>HMI_Tag_2</td> <td>Int</td> <td>&lt;Internal tag&gt;</td> <td></td> <td>&lt;Undefined&gt;</td> </tr> <tr> <td>HMI_Tag_3</td> <td>Int</td> <td>&lt;Internal tag&gt;</td> <td></td> <td>&lt;Undefined&gt;</td> </tr> <tr> <td>HMI_Tag_4</td> <td>Int</td> <td>&lt;Internal tag&gt;</td> <td></td> <td>&lt;Undefined&gt;</td> </tr> <tr> <td>HMI_Tag_5</td> <td>Int</td> <td>&lt;Internal tag&gt;</td> <td></td> <td>&lt;Undefined&gt;</td> </tr> <tr> <td>dataBlock_1_tag1</td> <td>Int</td> <td>HMI_Connection_1</td> <td>PLC_1</td> <td>dataBlock_1.tag1</td> </tr> <tr> <td>dataBlock_1_tag2</td> <td>Int</td> <td>HMI_Connection_1</td> <td>PLC_1</td> <td>dataBlock_1.tag2</td> </tr> <tr> <td>dataBlock_1_tag3</td> <td>Int</td> <td>HMI_Connection_1</td> <td>PLC_1</td> <td>dataBlock_1.tag3</td> </tr> </tbody> </table> | Name             | Data type | Connection       | PLC name | PLC tag | HMI_Tag_1 | Int | <Internal tag> |  | <Undefined> | HMI_Tag_2 | Int | <Internal tag> |  | <Undefined> | HMI_Tag_3 | Int | <Internal tag> |  | <Undefined> | HMI_Tag_4 | Int | <Internal tag> |  | <Undefined> | HMI_Tag_5 | Int | <Internal tag> |  | <Undefined> | dataBlock_1_tag1 | Int | HMI_Connection_1 | PLC_1 | dataBlock_1.tag1 | dataBlock_1_tag2 | Int | HMI_Connection_1 | PLC_1 | dataBlock_1.tag2 | dataBlock_1_tag3 | Int | HMI_Connection_1 | PLC_1 | dataBlock_1.tag3 |
| Name             | Data type   | Connection       | PLC name  | PLC tag          |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |
| HMI_Tag_1        | Int   | <Internal tag>   |           | <Undefined>      |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |
| HMI_Tag_2        | Int   | <Internal tag>   |           | <Undefined>      |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |
| HMI_Tag_3        | Int   | <Internal tag>   |           | <Undefined>      |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |
| HMI_Tag_4        | Int   | <Internal tag>   |           | <Undefined>      |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |
| HMI_Tag_5        | Int   | <Internal tag>   |           | <Undefined>      |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |
| dataBlock_1_tag1 | Int   | HMI_Connection_1 | PLC_1     | dataBlock_1.tag1 |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |
| dataBlock_1_tag2 | Int   | HMI_Connection_1 | PLC_1     | dataBlock_1.tag2 |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |
| dataBlock_1_tag3 | Int   | HMI_Connection_1 | PLC_1     | dataBlock_1.tag3 |          |         |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |           |     |                |  |             |                  |     |                  |       |                  |                  |     |                  |       |                  |                  |     |                  |       |                  |

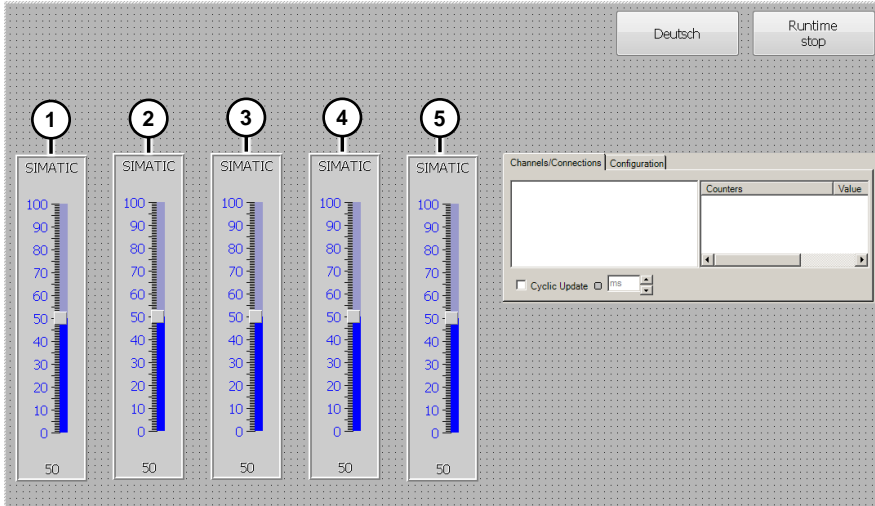
### 3.1.3 Creating the connection

Table 3-4

| No. | Action  |
|-----|---|
| 1.  | <p>In the "Connections" menu, <b>no</b> OPC UA communication settings need to be made for the PC station.</p> <p>The required communication settings are made when configuring the "client" (see Chapter <a href="#">3.2.1 "Creating the OPC UA connection"</a>).</p> |

3.1.4 Plant screen

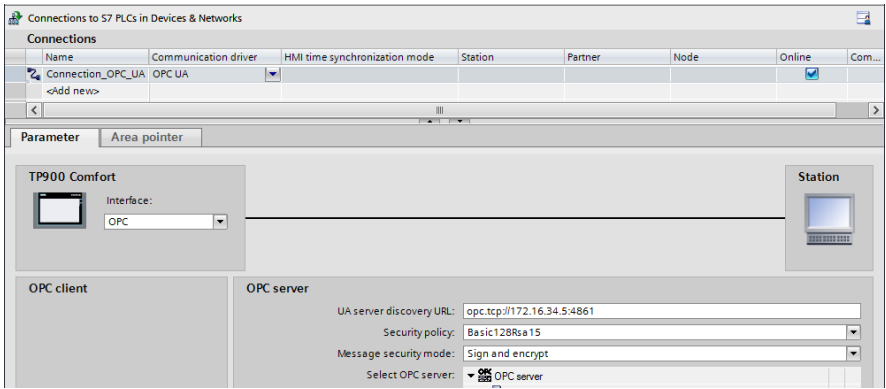
Table 3-5

| No. | Action  |
|-----|---|
| 1.  | <p>This screen provides five sliders to test data exchange between the PC station and the TP900 Comfort Panel. The sliders allow you to simulate "process values". The first three sliders each use an internal tag. Sliders 4 and 5 each use a tag with a PLC connection.</p>  <p>The screenshot shows a control panel interface with five vertical sliders, each labeled 'SIMATIC' and numbered 1 through 5. Each slider has a scale from 0 to 100 and a blue bar indicating the current value. Below each slider, the number '50' is displayed. To the right of the sliders, there are two buttons: 'Deutsch' and 'Runtime stop'. Below these buttons is a 'Channels/Connections Configuration' dialog box. The dialog box has a 'Counters' table with two columns: 'Counters' and 'Value'. The table is currently empty. Below the table, there is a checkbox for 'Cyclic Update' and a dropdown menu set to 'ms'.</p> |

## 3.2 TP900 Comfort Panel configuration – client

### 3.2.1 Creating the OPC UA connection

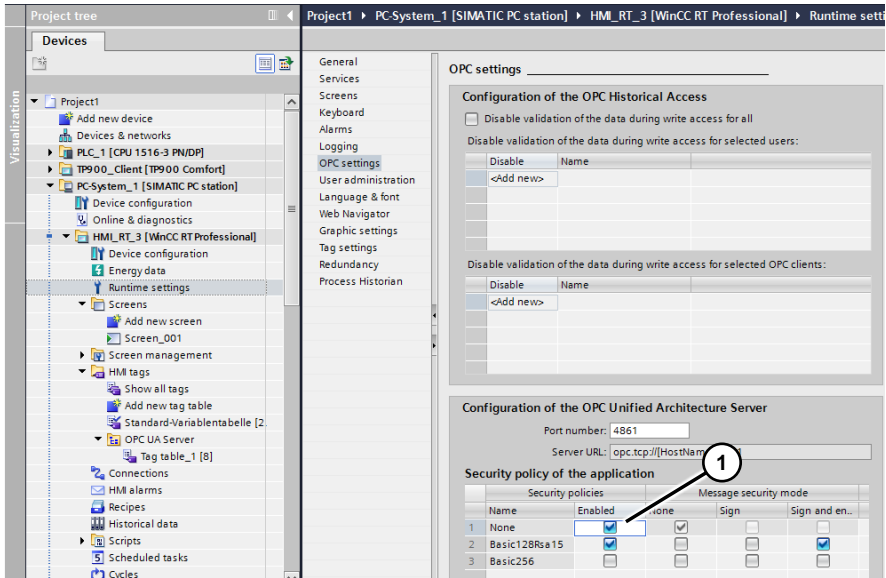
Table 3-6

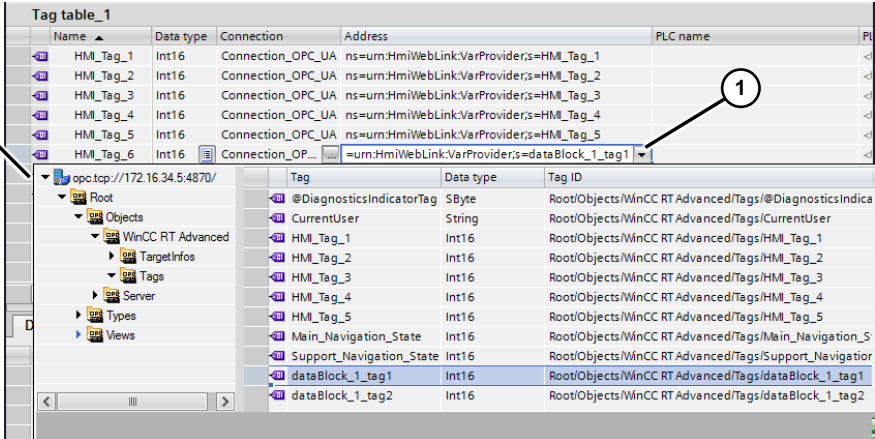
| No. | Action  |
|-----|---|
| 1.  | <p><b>Creating the OPC UA connection</b></p> <ul style="list-style-type: none"> <li>• In the project tree, open the "Connections" folder.</li> <li>• Create a new connection.</li> <li>• In "Communication driver", select "OPC UA".</li> </ul> <p style="margin-left: 20px;">- "OPC server"<br/>(Specify the server's IP address. In this case: the PC station's IP address)</p> <p style="margin-left: 20px;">UA server discovery URL:   opc.tcp://172.16.34.05:4861<br/>Security policy:               Basic128Rsa15<br/>Message security mode:       Sign and encrypt.</p> <p><b>Note:</b><br/>The "security policy" used must match the "security policy" selected in the WinCC Runtime Professional (server) configuration (see Chapter <a href="#">3.1.1 "OPC UA configuration"</a>).</p>  |

### 3.2.2 Online browsing to the PC station tags

From the TP900 Comfort Panel's tag editor, you can browse (online) to the tags of the PC station (server). To do this, the PC station runtime must be started first.

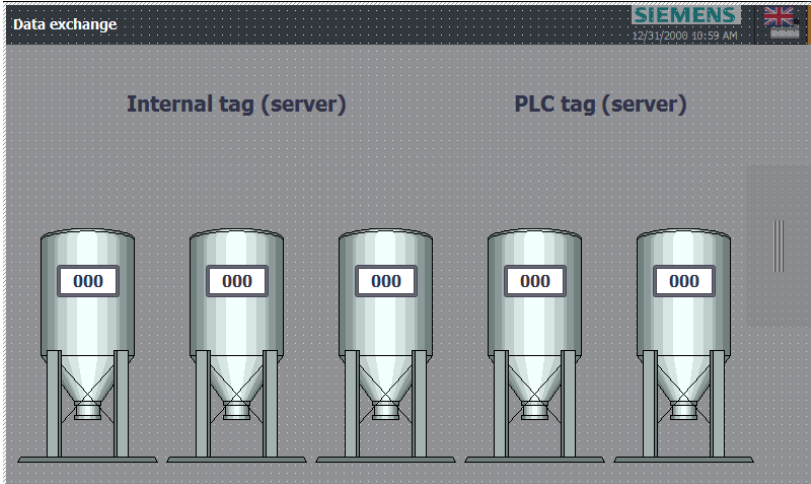
Table 3-7

| No.             | Action  |                          |                          |                                     |      |                |        |                                     |                          |                          |                          |                 |                                     |                          |                          |                                     |            |                          |                          |                          |                          |
|-----------------|---|--------------------------|--------------------------|-------------------------------------|------|----------------|--------|-------------------------------------|--------------------------|--------------------------|--------------------------|-----------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1.              | <p><b>Preparations in the PC station configuration</b></p> <p>In order to browse to the PC station tags online, edit the "security policies" in the PC station configuration.</p> <ul style="list-style-type: none"> <li>• In the project tree, open the OPC settings for the PC station. "Project tree &gt; Runtime settings &gt; OPC settings".</li> <li>• For the period during which you browse to the TP900 Comfort Panel tags, check the "None" check box (1).</li> <li>• Then start the PC station runtime.</li> </ul>   |                          |                          |                                     |      |                |        |                                     |                          |                          |                          |                 |                                     |                          |                          |                                     |            |                          |                          |                          |                          |
|                 |  <p>The screenshot shows the SIMATIC Manager interface. On the left is the 'Project tree' with the path: Project1 &gt; PC-System_1 [SIMATIC PC station] &gt; HMI_RT_3 [WinCC RT Professional] &gt; Runtime settings. On the right, the 'OPC settings' window is open, showing 'Configuration of the OPC Unified Architecture Server'. The 'Security policy of the application' table is as follows:</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Enabled</th> <th>None</th> <th>Sign</th> <th>Sign and en...</th> </tr> </thead> <tbody> <tr> <td>1 None</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>2 Basic128Rsa15</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>3 Basic256</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <p>A circled '1' points to the 'None' checkbox in the first row of the table.</p> | Name                     | Enabled                  | None                                | Sign | Sign and en... | 1 None | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2 Basic128Rsa15 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 3 Basic256 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Name            | Enabled   | None                     | Sign                     | Sign and en...                      |      |                |        |                                     |                          |                          |                          |                 |                                     |                          |                          |                                     |            |                          |                          |                          |                          |
| 1 None          | <input checked="" type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |      |                |        |                                     |                          |                          |                          |                 |                                     |                          |                          |                                     |            |                          |                          |                          |                          |
| 2 Basic128Rsa15 | <input checked="" type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |      |                |        |                                     |                          |                          |                          |                 |                                     |                          |                          |                                     |            |                          |                          |                          |                          |
| 3 Basic256      | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |      |                |        |                                     |                          |                          |                          |                 |                                     |                          |                          |                                     |            |                          |                          |                          |                          |

| No.                      | Action  |  |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
|--------------------------|---|--|--|------------|---------|----------|-----------|-------|-------------------|---|--|-----------|-------|-------------------|---|--|-----------|-------|-------------------|---|--|-----------|-------|-------------------|---|--|-----------|-------|-------------------|---|--|-----------|-------|------------------|--|--|-----|-----------|--------|--------------------------|-------|--|-------------|--------|---|-----------|-------|---|-----------|-------|---|-----------|-------|---|-----------|-------|---|-----------|-------|---|-----------------------|-------|---|--------------------------|-------|---|------------------|-------|--|------------------|-------|--|
| 2.                       | <p><b>Adding tags</b></p> <p>Condition:<br/>The PC station runtime has started.</p> <ul style="list-style-type: none"> <li>Open the TP900 Comfort Panel's tag editor.</li> <li>Insert a new tag and in the "Address" column, open the drop-down list (1). A dialog opens (2).</li> <li>In the dialog, click the arrow next to the "server object".</li> <li>Navigate to the "Root &gt; WinCC RT Professional &gt; Tags" folder. The folder displays the PC station's tags.</li> </ul> <p><b>Note:</b><br/>The path may differ depending on the project.</p> <ul style="list-style-type: none"> <li>Double-clicking a single tag applies the tag to the TP900 Comfort Panel configuration.</li> </ul>  <p>The screenshot shows the 'Tag table_1' editor. The top table lists tags with columns: Name, Data type, Connection, Address, and PLC name. Below it is a tree view of the project structure. A circled '1' points to the address dropdown menu in the table, and a circled '2' points to the tree view.</p> <table border="1" data-bbox="486 768 1364 929"> <thead> <tr> <th>Name</th> <th>Data type</th> <th>Connection</th> <th>Address</th> <th>PLC name</th> </tr> </thead> <tbody> <tr> <td>HMI_Tag_1</td> <td>Int16</td> <td>Connection_OPC_UA</td> <td>ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_1</td> <td></td> </tr> <tr> <td>HMI_Tag_2</td> <td>Int16</td> <td>Connection_OPC_UA</td> <td>ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_2</td> <td></td> </tr> <tr> <td>HMI_Tag_3</td> <td>Int16</td> <td>Connection_OPC_UA</td> <td>ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_3</td> <td></td> </tr> <tr> <td>HMI_Tag_4</td> <td>Int16</td> <td>Connection_OPC_UA</td> <td>ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_4</td> <td></td> </tr> <tr> <td>HMI_Tag_5</td> <td>Int16</td> <td>Connection_OPC_UA</td> <td>ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_5</td> <td></td> </tr> <tr> <td>HMI_Tag_6</td> <td>Int16</td> <td>Connection_OP...</td> <td>ns=urn:HmiWebLink:VarProvider;s=dataBlock_1_tag1</td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="486 929 1364 1205"> <thead> <tr> <th>Tag</th> <th>Data type</th> <th>Tag ID</th> </tr> </thead> <tbody> <tr> <td>@DiagnosticsIndicatorTag</td> <td>SByte</td> <td>Root/Objects/WinCC RT Advanced/Tags/@DiagnosticsIndica</td> </tr> <tr> <td>CurrentUser</td> <td>String</td> <td>Root/Objects/WinCC RT Advanced/Tags/CurrentUser</td> </tr> <tr> <td>HMI_Tag_1</td> <td>Int16</td> <td>Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_1</td> </tr> <tr> <td>HMI_Tag_2</td> <td>Int16</td> <td>Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_2</td> </tr> <tr> <td>HMI_Tag_3</td> <td>Int16</td> <td>Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_3</td> </tr> <tr> <td>HMI_Tag_4</td> <td>Int16</td> <td>Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_4</td> </tr> <tr> <td>HMI_Tag_5</td> <td>Int16</td> <td>Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_5</td> </tr> <tr> <td>Main_Navigation_State</td> <td>Int16</td> <td>Root/Objects/WinCC RT Advanced/Tags/Main_Navigation_S</td> </tr> <tr> <td>Support_Navigation_State</td> <td>Int16</td> <td>Root/Objects/WinCC RT Advanced/Tags/Support_Navigatio</td> </tr> <tr> <td>dataBlock_1_tag1</td> <td>Int16</td> <td>Root/Objects/WinCC RT Advanced/Tags/dataBlock_1_tag1</td> </tr> <tr> <td>dataBlock_1_tag2</td> <td>Int16</td> <td>Root/Objects/WinCC RT Advanced/Tags/dataBlock_1_tag2</td> </tr> </tbody> </table> | Name   | Data type  | Connection | Address | PLC name | HMI_Tag_1 | Int16 | Connection_OPC_UA | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_1 |  | HMI_Tag_2 | Int16 | Connection_OPC_UA | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_2 |  | HMI_Tag_3 | Int16 | Connection_OPC_UA | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_3 |  | HMI_Tag_4 | Int16 | Connection_OPC_UA | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_4 |  | HMI_Tag_5 | Int16 | Connection_OPC_UA | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_5 |  | HMI_Tag_6 | Int16 | Connection_OP... | ns=urn:HmiWebLink:VarProvider;s=dataBlock_1_tag1 |  | Tag | Data type | Tag ID | @DiagnosticsIndicatorTag | SByte | Root/Objects/WinCC RT Advanced/Tags/@DiagnosticsIndica | CurrentUser | String | Root/Objects/WinCC RT Advanced/Tags/CurrentUser | HMI_Tag_1 | Int16 | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_1 | HMI_Tag_2 | Int16 | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_2 | HMI_Tag_3 | Int16 | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_3 | HMI_Tag_4 | Int16 | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_4 | HMI_Tag_5 | Int16 | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_5 | Main_Navigation_State | Int16 | Root/Objects/WinCC RT Advanced/Tags/Main_Navigation_S | Support_Navigation_State | Int16 | Root/Objects/WinCC RT Advanced/Tags/Support_Navigatio | dataBlock_1_tag1 | Int16 | Root/Objects/WinCC RT Advanced/Tags/dataBlock_1_tag1 | dataBlock_1_tag2 | Int16 | Root/Objects/WinCC RT Advanced/Tags/dataBlock_1_tag2 |
| Name                     | Data type   | Connection   | Address  | PLC name   |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_1                | Int16   | Connection_OPC_UA                                      | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_1        |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_2                | Int16   | Connection_OPC_UA                                      | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_2        |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_3                | Int16   | Connection_OPC_UA                                      | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_3        |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_4                | Int16   | Connection_OPC_UA                                      | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_4        |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_5                | Int16   | Connection_OPC_UA                                      | ns=urn:HmiWebLink:VarProvider;s=HMI_Tag_5        |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_6                | Int16   | Connection_OP...                                       | ns=urn:HmiWebLink:VarProvider;s=dataBlock_1_tag1 |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| Tag                      | Data type   | Tag ID   |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| @DiagnosticsIndicatorTag | SByte   | Root/Objects/WinCC RT Advanced/Tags/@DiagnosticsIndica |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| CurrentUser              | String  | Root/Objects/WinCC RT Advanced/Tags/CurrentUser        |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_1                | Int16   | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_1          |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_2                | Int16   | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_2          |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_3                | Int16   | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_3          |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_4                | Int16   | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_4          |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| HMI_Tag_5                | Int16   | Root/Objects/WinCC RT Advanced/Tags/HMI_Tag_5          |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| Main_Navigation_State    | Int16   | Root/Objects/WinCC RT Advanced/Tags/Main_Navigation_S  |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| Support_Navigation_State | Int16   | Root/Objects/WinCC RT Advanced/Tags/Support_Navigatio  |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| dataBlock_1_tag1         | Int16   | Root/Objects/WinCC RT Advanced/Tags/dataBlock_1_tag1   |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| dataBlock_1_tag2         | Int16   | Root/Objects/WinCC RT Advanced/Tags/dataBlock_1_tag2   |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| 3.                       | To add more tags, repeat the step from table section 2.   |  |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |
| 4.                       | <p><b>Enabling "security policies" in the PC station</b></p> <ul style="list-style-type: none"> <li>In the PC station connection project tree, open the OPC settings. "Project tree &gt; Runtime settings &gt; OPC settings".</li> <li>Uncheck the "None" check box.</li> </ul> <p>Transfer or start the PC station runtime.</p>  |  |  |            |         |          |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                   |   |  |           |       |                  |  |  |     |           |        |                          |       |  |             |        |   |           |       |   |           |       |   |           |       |   |           |       |   |           |       |   |                       |       |   |                          |       |   |                  |       |  |                  |       |  |

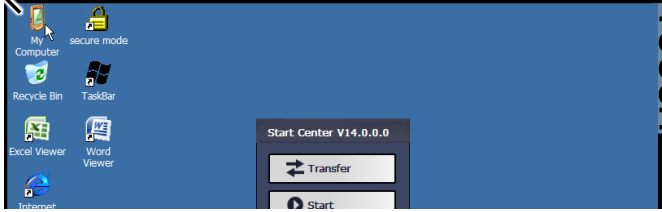
### 3.2.3 TP900 Comfort Panel plant screen

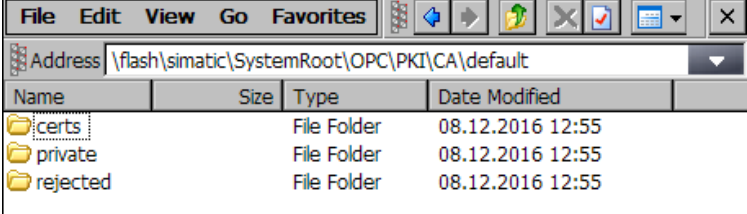
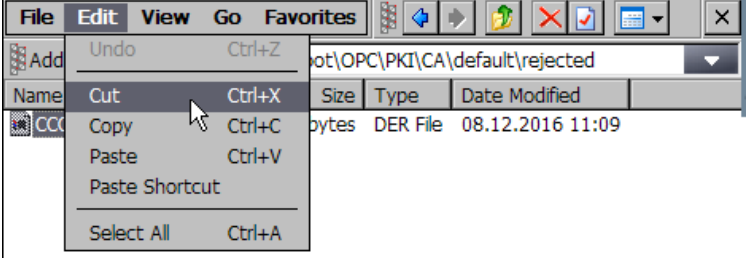
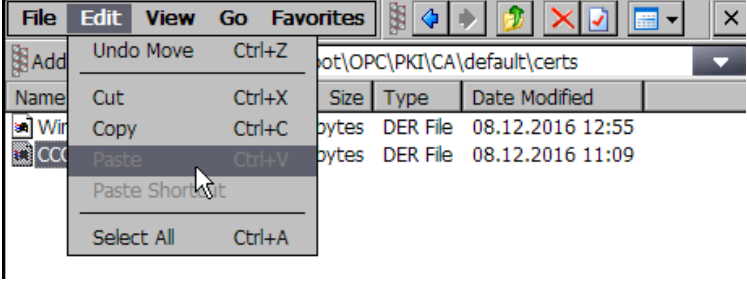
Table 3-8

| No. | Action  |
|-----|---|
| 1.  | <p>For illustration purposes, the plant screen contains five symbolic containers to test data exchange between the TP900 Comfort Panel and the PC station.</p> <p>The tags that are output on this plant screen match the tags from Chapter <a href="#">3.2.2 "Online browsing to the PC station tags"</a>.</p>  |

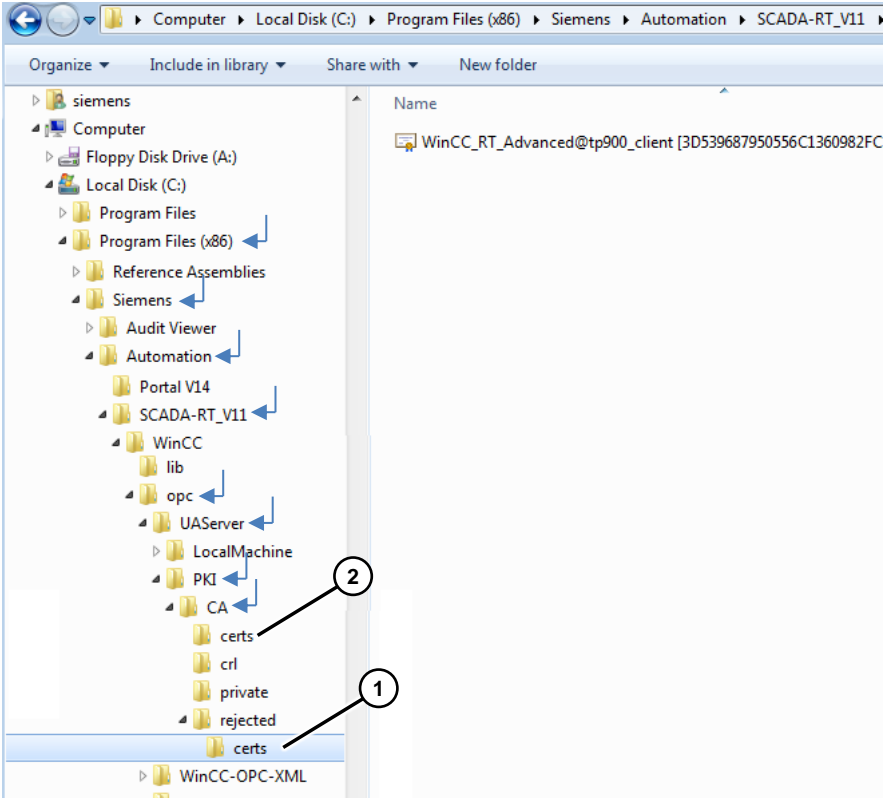
### 3.3 Handling certificates

Table 3-9

| No. | Action  |
|-----|---|
| 1.  | <p><b>General</b></p> <ul style="list-style-type: none"> <li>• Make sure that the PC station is connected to the Comfort Panel.</li> <li>• Make sure that the date and time are synchronized on both devices.</li> </ul> <p><b>Opening the file folder on the Comfort Panel</b><br/>                     The certificates are stored in a special file folder in the Comfort Panel. To go to the file folder, click the "My Computer" icon (1).<br/>                     The following sections describe details about the storage path.</p>  |
| 2.  | <p><b>Starting the PC runtime</b></p> <ul style="list-style-type: none"> <li>• Start the PC station runtime.</li> </ul>   |
| 3.  | <p><b>Starting and stopping the Comfort Panel runtime</b></p> <ul style="list-style-type: none"> <li>• Start the Comfort Panel "runtime".</li> <li>• Wait until the start screen appears on the Comfort Panel.</li> <li>• The PC station transfers its certificate to the Comfort Panel via the existing network connection. In the Comfort Panel, the certificate is saved to the "<b>rejected</b>" file folder.</li> <li>• Stop the Comfort Panel runtime.</li> </ul>   |

| No. | Action   |
|-----|--|
| 4.  | <p><b>Moving the TP900 Comfort Panel (client) certificate</b></p> <p>In the TP900 Comfort Panel, navigate to the following directory:<br/>                     "My Computer\flash\simatic\SystemRoot\OPC\PKI\CA\default"</p>  <ul style="list-style-type: none"> <li>• Open the "rejected" folder and cut (do <b>not</b> copy) the "hexadecimal number..." certificate (Edit &gt; Cut).</li> </ul>  <p>In the same folder tree, open the "certs" folder and paste the certificate you have just cut into this folder.</p>  <ul style="list-style-type: none"> <li>• Moving the certificate is now complete. Close the file system.</li> </ul> |
| 5.  | <p><b>Starting the Comfort Panel runtime</b></p> <ul style="list-style-type: none"> <li>• Start the Comfort Panel "runtime".</li> <li>• Wait until the Comfort Panel's start screen appears.</li> <li>• If you have stopped the PC station runtime, start it.</li> </ul>   |



| No. | Action  |
|-----|---|
| 6.  | <p><b>Moving the PC station (server) certificate</b></p> <ul style="list-style-type: none"> <li>On the PC station, navigate to the "...&gt; CA &gt; <b>rejected</b> &gt; <b>certs</b>" Windows folder (1).<br/> "C:\ProgramFiles (x86) &gt; Siemens &gt; Automation &gt; SCADA-RT_V11 &gt; WinCC &gt; opc &gt; UAServer &gt; PKI &gt; CA &gt; rejected &gt; certs".</li> </ul> <p><b>Note:</b><br/> If the "ProgramFiles (x86)" folder is <b>not</b> displayed, check "Folder Options" on the installation drive (Tools &gt; Folder Options...).<br/> In "Hidden files and folders", check "Show hidden files, folders and drives".</p> <ul style="list-style-type: none"> <li>In the "<b>certs</b>" folder, select the existing certificate and cut the certificate using the system function.</li> <li>In the same folder tree, open the "...&gt; CA &gt; <b>certs</b>" folder and paste the certificate you have just cut into this folder (2).</li> </ul> <p><b>Note:</b><br/> If the "certs" folder contains multiple certificates, use the creation date to find the correct certificate.</p> <p>Moving the certificate is now complete. Close the file system.</p>  |
| 7.  | <p><b>Checking the connection</b></p> <p>If the certificates have been correctly assigned, the Comfort Panel establishes a connection to the PC station.</p>  |

## 4 Installation and Startup

### 4.1 Installation

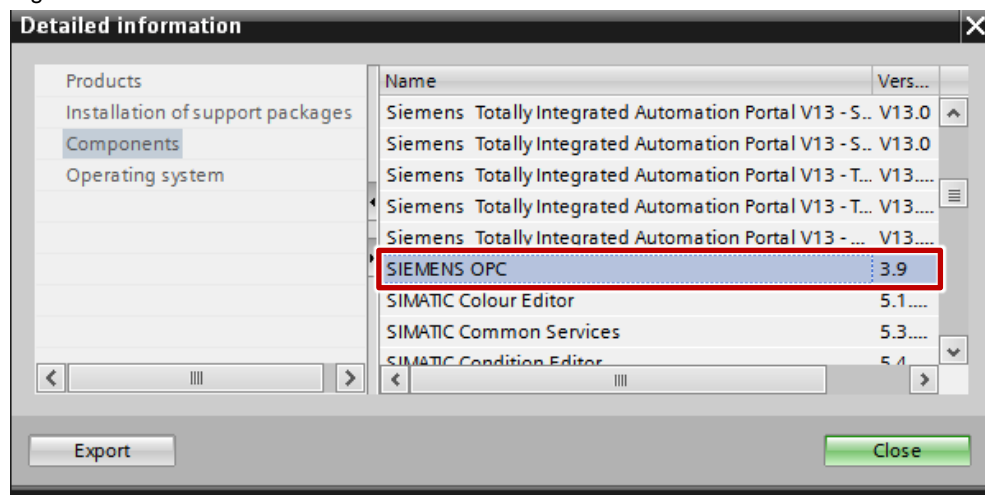
#### Requirement

- The software listed in Chapter [2.1](#) must be installed.
- For communication between the Comfort Panel and the WinCC Runtime Professional station, the "SIEMENS OPC" option must be installed on the PC station.  
Make sure to enable the "SIEMENS OPC" option before installing WinCC Runtime Professional. If necessary, you can install this option at a later time. To do this, insert the installation CD again and follow the instructions.

The online help allows you to check whether the "SIEMENS OPC" option is installed on the PC station: **Help > Installed software... > Detailed information about installed software > Components**".

Online help view when the "SIEMENS OPC" option is installed.

Figure 4-1



### 4.2 Startup of the application example

Table 4-1

| No. | Description   |
|-----|---|
| 1.  | Unzip the supplied application example to a folder and open the configuration.  |
| 2.  | Make sure that all nodes are on and connected to each other.  |
| 3.  | Transfer the configuration to the Comfort Panel and start the WinCC Runtime Professional station runtime.                                 |
| 4.  | For the next steps, see Chapter <a href="#">3.3 "Handling certificates"</a> . When you have copied the certificates, startup is complete. |

# 5 Operation of the Application Example


The application example shows how communication works between a Comfort Panel and a WinCC Runtime Professional station via an OPC UA connection.

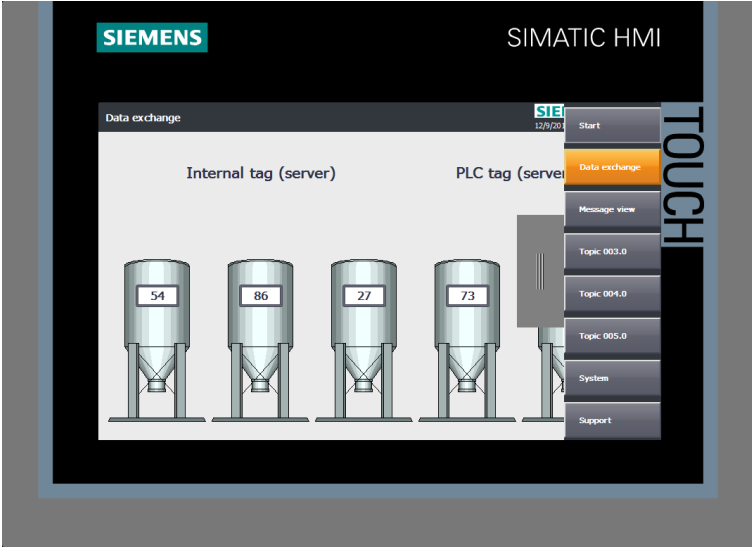
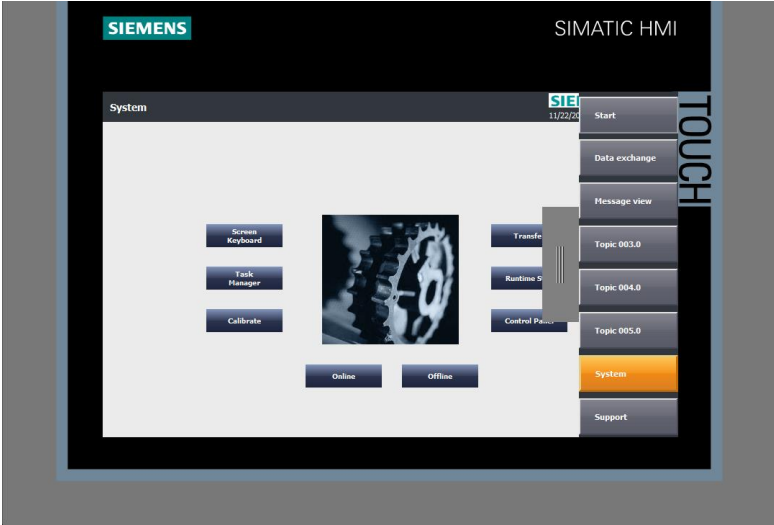
## Overview and description of the Comfort Panel user interface

The following sections provide a brief description of the three most important screens:

- Start screen.
- Data exchange.
- System screen.

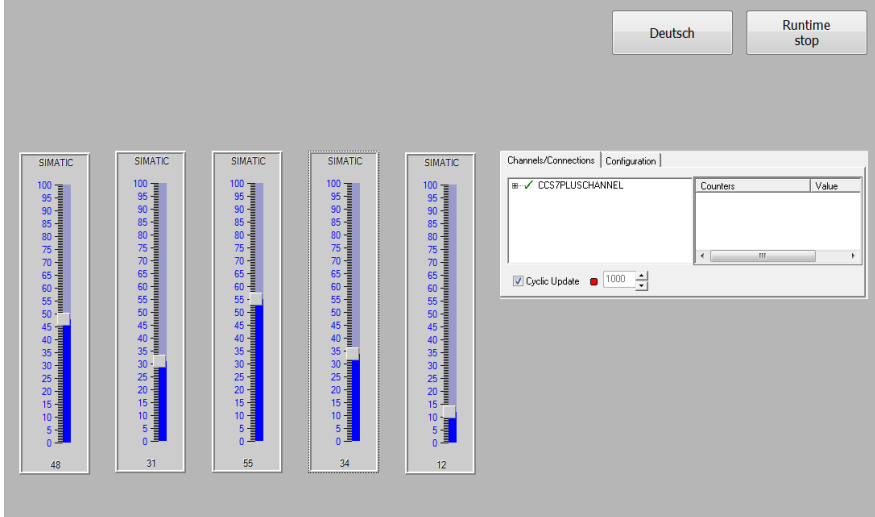
Table 5-1

| No. | Action  |
|-----|---|
| 1.  | <p><b>Start screen</b></p> <ul style="list-style-type: none"> <li>• After starting the Comfort Panel runtime, the following screen opens.</li> <li>• To navigate through the project, open the right-hand "slide-in screen".</li> </ul>  |

| No. | Action  |
|-----|---|
| 2.  | <p><b>Data exchange</b></p> <ul style="list-style-type: none"> <li>Click the "Data exchange" button.<br/>The screen allows you to test communication between the Comfort Panel and the WinCC Runtime Professional station.</li> <li>The simulated process values of the T900 Comfort Panel are read via the OPC UA interface on the TP700 Comfort Panel.</li> </ul>  |
| 3.  | <p><b>System screen</b></p> <ul style="list-style-type: none"> <li>Click the "System" button.<br/>The screen allows you to execute the system functions shown on the screen, for example "Runtime Stop".</li> </ul>   |
| 4.  | <p><b>Other screens</b></p> <p>The "Message view" screen is used to open the message history. The "Support" screen provides you with related online support information.</p>  |

Overview and description of the WinCC Runtime Professional station user interface

Table 5-2

| No. | Action   |
|-----|--|
| 1.  | <p><b>Start screen</b></p> <ul style="list-style-type: none"> <li>Starting the runtime opens the following screen on the PC station. To simulate process values, you can specify values using the sliders.</li> <li>The buttons allow you to open / execute the displayed screens and system functions.</li> </ul>  |

## 6 Appendix

### 6.1 Service and Support

#### Industry Online Support

Do you have any questions or need assistance?

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

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

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

<https://support.industry.siemens.com>

#### Technical Support

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

[www.siemens.com/industry/supportrequest](http://www.siemens.com/industry/supportrequest)

#### Service offer

Our range of services includes, inter alia, the following:

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

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

<https://support.industry.siemens.com/cs/sc>

#### Industry Online Support app

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

<https://support.industry.siemens.com/cs/ww/en/sc/2067>

## 6.2 Related literature

Table 6-1

|     | Topic   |
|-----|---|
| \1\ | Siemens Industry Online Support<br><a href="https://support.industry.siemens.com">https://support.industry.siemens.com</a>            |
| \2\ | <a href="https://support.industry.siemens.com/cs/ww/en/view/63481236">https://support.industry.siemens.com/cs/ww/en/view/63481236</a> |

## 6.3 History

Table 6-2

| Version | Date    | Modifications |
|---------|---------|---------------|
| V1.0    | 04/2017 | First version |