SIEMENS

SIMATIC HMI

WinCC V8.0
SIMATIC HMI WinCC V8.0 Getting Started

Getting Started

Printout of the Online Help

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Table of contents

Welcome

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Welcome to WinCC Getting Started.

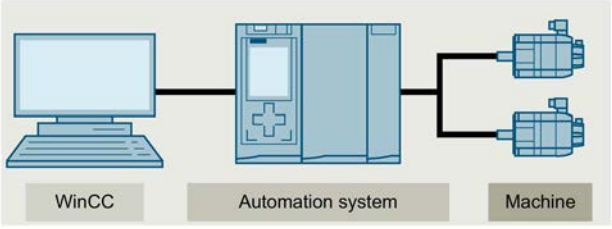
Getting Started provides a quick and targeted introduction to WinCC V8.

SIMATIC HMI WinCC

WinCC is a powerful HMI system for use under Microsoft Windows or Microsoft Windows Server.

HMI stands for "Human Machine Interface", i.e. the interface between the person and the machine.

WinCC enables operator control and monitoring of processes running in a machine or plant. The communication between WinCC and the machine takes place via an automation system.



Getting started

You will need approx. four hours to work through all subjects of this documentation and to learn the basics of WinCC configuration.

The pictorial representation of the individual configuration steps help you to orient yourself quickly in the editors.

Example project "Quick_Start"

The creation of a sample project is described in Getting Started.
You will control a water treatment system with this project.

To do so, you will "configure" different objects that are necessary to operate and monitor the system, such as:

- Pictures to depict and operate the processes on the control device.
- Tags to transfer data between the operating device and the installation
- Archive to store the process data
- Messages to indicate the operating states of the plant on the HMI device

This Getting Started guides you through the following steps:

- Creating a project
  You create a project in WinCC Explorer that serves as the basis for configuring an operator interface.
- Configuring the communication
  You configure connections and tags in the "Tag Management" editor to establish communication between the AS and HMI device.
- Configuring process pictures
  You configure process pictures in the "Graphics Designer" editor that you use to display, operate and monitor processes.
- Configuring faceplate types and structure types
  You configure reusable templates for process pictures and structured tag groups.
- Archiving and displaying values
  You configure archives and define archiving cycles in the "Tag Logging" editor in order to archive process values.
- Configuring messages
  You configure discrete and analog alarms in the "Alarm Logging" editor in order to monitor machine or plant processes.

Installation of WinCC

WinCC Setup contains a detailed installation guide.

WinCC Setup includes all the programs you need to perform the configuration steps.

WinCC know-how and training

You can find more information about WinCC on the Internet:

- SIMATIC WinCC V7 in the Online Support
  (https://support.industry.siemens.com/cs/ww/en/view/93906404):

  All important information about WinCC at a glance.
- Training:
  - SITRAIN course: WinCC V7 (basic course/system course)
    (https://support.industry.siemens.com/cs/ww/en/view/109758633)
  - SITRAIN advanced course: WinCC V7 and WinCC options
    (https://support.industry.siemens.com/cs/ww/en/view/109758660)
- Compatibility tool for automation and drive technology:
  (https://support.industry.siemens.com/kompatool/index.html?lang=en):

  The tool informs you about the compatibility of Siemens products.
  Other products are also covered, for example, operating system versions.

See also

Creating a project (Page 15)
Configure communication (Page 19)
Configuring the Process Screens (Page 43)
Configuring faceplate types and tag structures (Page 103)
Archiving and displaying values (Page 139)
Configuring messages (Page 173)

Icons

2

Introduction

This section provides information for the icons that are used in Getting Started.

Used icons

The following icons are used to represent the individual steps of the instructions pictorially:

Icon	Meaning
	A click with the left mouse button
	A click with the right mouse button
	A double-click with the left mouse button
	Entering text via the keyboard
	Press and hold the left mouse button (drag-and-drop)
	Dragging with the left mouse button pressed (drag-and-drop)
	Release the left mouse button after dragging (drag-and-drop)
	Numbering of the individual action steps

Working with WinCC

3

Introduction

WinCC is a modular system:

- You use WinCC to visualize the process and configure a graphical user interface.
- You use the user interface for operator control and monitoring of the process.

Functions of WinCC

- You visualize the process with WinCC.

  For this purpose, the process is visualized graphically on the screen.

  The display is updated as soon as a state in the process changes.
- You control the process with WinCC.

  For example, you can specify a setpoint or open a valve from the user interface.
- You monitor the process with WinCC.

  An alarm is automatically triggered when critical process states occur.

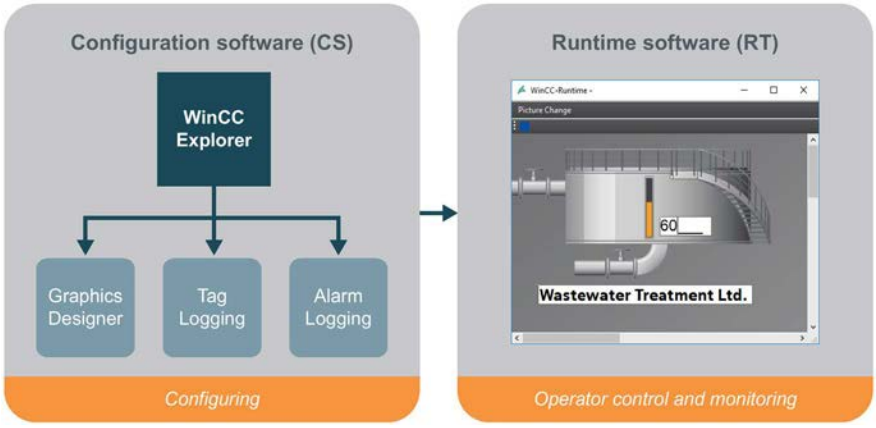
  If, for example, a pre-defined value is exceeded, a message appears on the screen.
- You archive the process with WinCC.

  WinCC allows you to digitally archive messages and process values or output them as a PDF.

  You thereby document the process history and have access to past production data.

Components of WinCC

The basic components are the Configuration software (CS) and Runtime software (RT)



WinCC Configuration Software (CS)

WinCC Explorer forms the core of the Configuration software.

The overall project structure is displayed and the project is managed in WinCC Explorer.

You can open various editors from WinCC Explorer.
Each editor belongs to a subsystem of WinCC.

The most important subsystems of WinCC are:

Subsystem	Editor	Function
Graphics system	Graphics Designer	Configuring pictures
Alarm logging	Alarm Logging	Configuring messages
Archive system	Tag Logging	Archiving data
Report system	Report Designer	Creating layouts
User administration	User Administrator	Administering users and user rights
Communication	Tag Management	Configuring communication

WinCC Runtime Software (RT)

WinCC Runtime runs the project in process mode. The project is then in Runtime.

WinCC Runtime enables operator control and monitoring of the processes.

The Runtime system has, in particular, the following tasks:

- Reading the configuration data stored in the CS database
- Displaying process pictures on the screen
- Communication with the automation system
- Archiving current Runtime data, e.g. process values and alarm events
- Controlling the process, e.g. through setpoint specification or switching on and off

Creating a project

4

Introduction

This section describes how you create a project in WinCC Explorer.

The project is the basis for the configuration of a user interface in WinCC. Within the project you will create and edit all objects that you will need to operate and observe the processes.

Principle

You create the project in WinCC Explorer.

WinCC Explorer is the configuration system of WinCC.
You use WinCC Explorer to manage your projects.

4.1 Creating the "Quick_Start" project

Introduction

The following steps will show you how to start WinCC and create the "Quick_Start" project.

You will create the "Quick_Start" project as a "Single-user project".

A "Single-user project" only runs on one PC. Other computers cannot access this project.

The project runs on a computer that serves as the server for data processing and as an operator station.

Starting WinCC Explorer

When you start WinCC for the first time, the "WinCC Explorer" will open.
In this dialog, you will select a project type or open an existing project.

The next time WinCC is started, the last project worked on will be opened.

If the project was active at the time WinCC was exited, it is reopened in activated state.

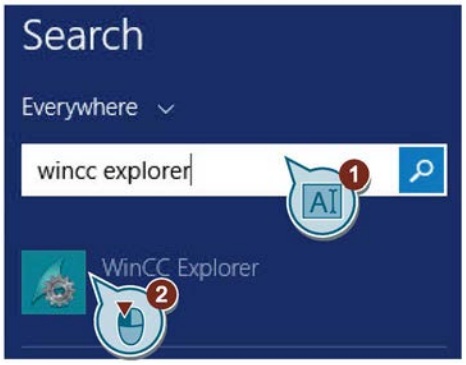
Requirement

- The "Standard" variant of WinCC has been installed at a minimum.

Procedure

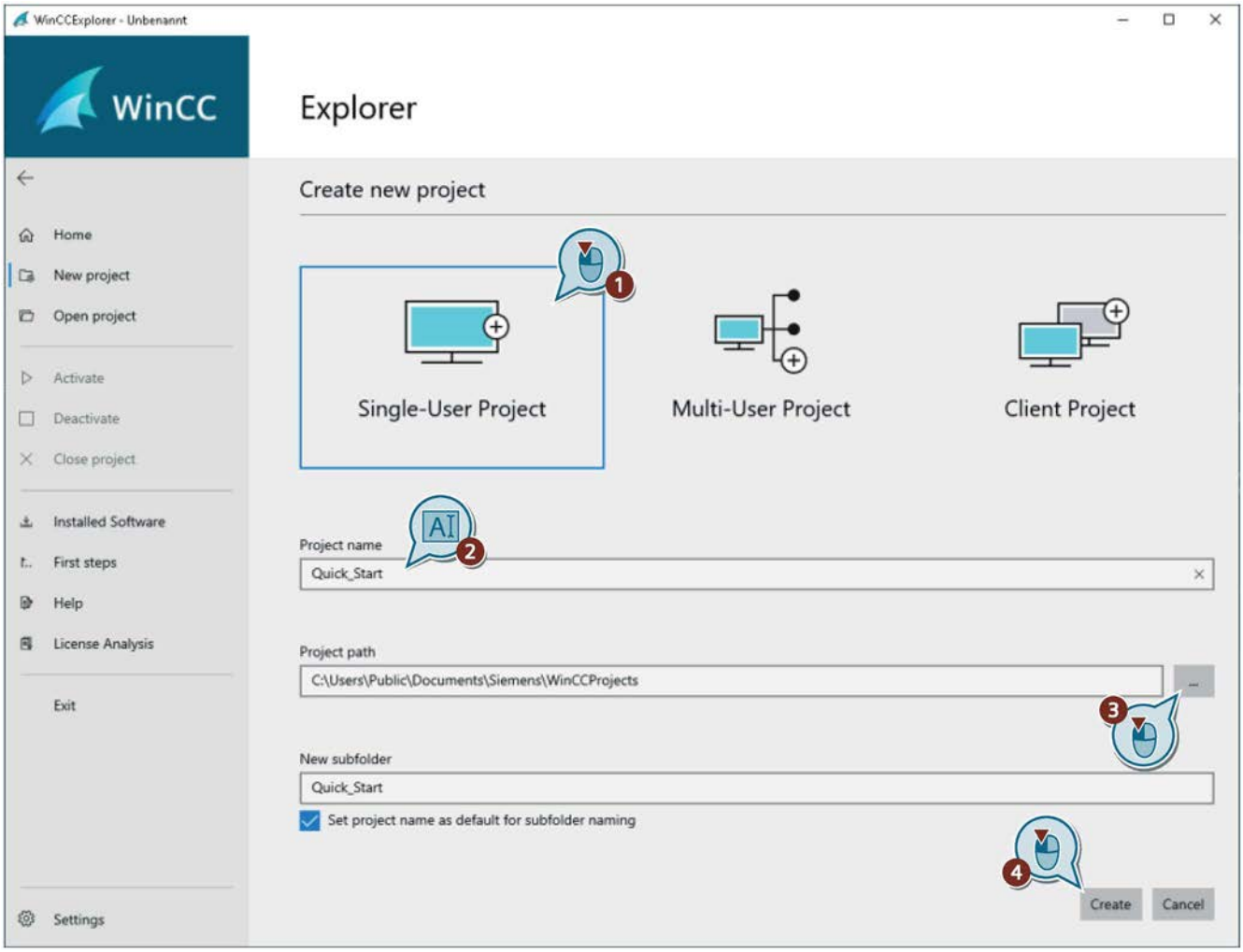
1. Start WinCC.

   If required, open the input window using <Windows+R>.



2. In the Welcome screen, select "Single-User Project" and enter the project information.

   Accept the default settings in the "New subfolder" and "Project path" fields or choose a different path on your PC.



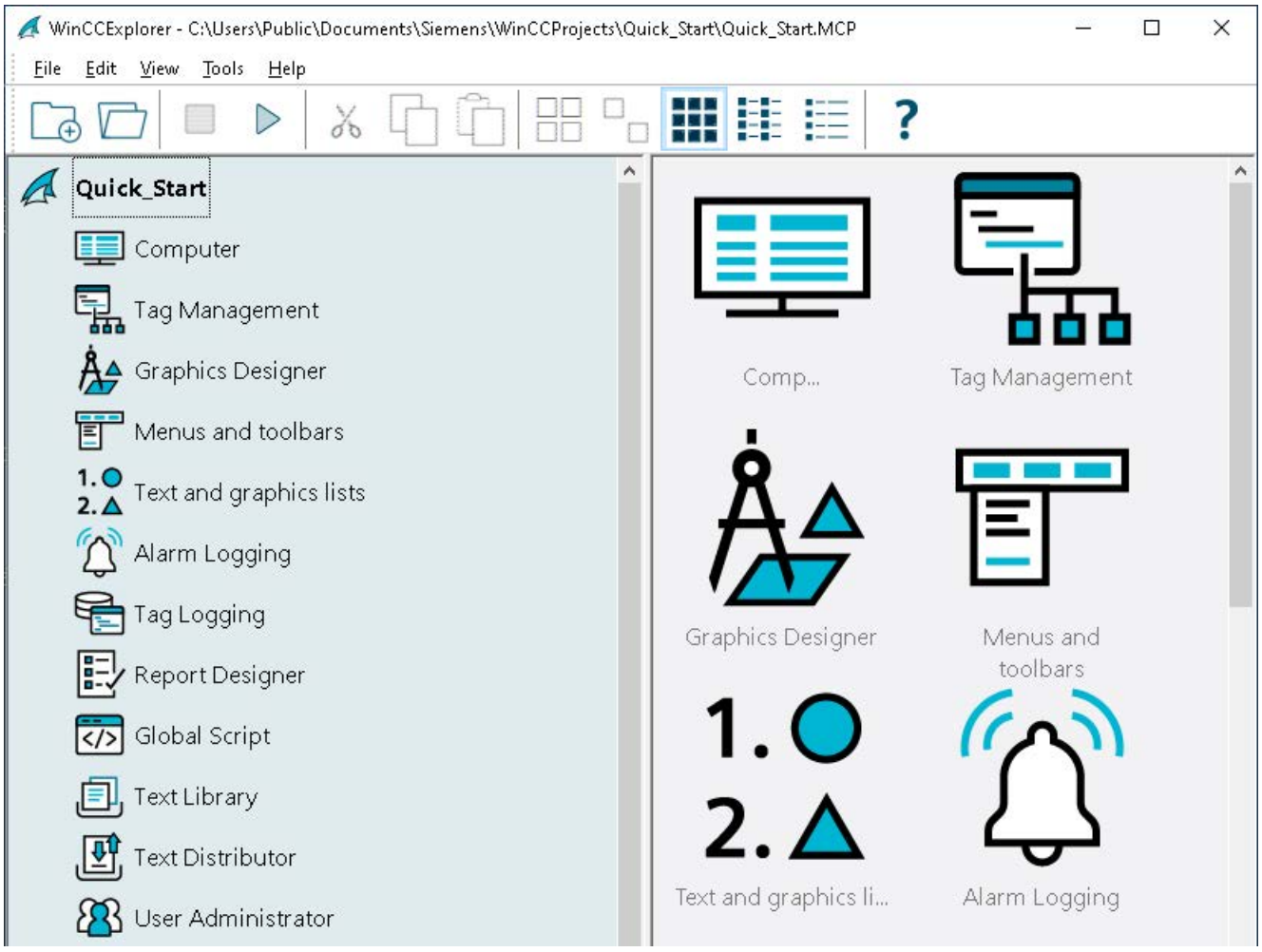
Result

You have created the "Quick_Start" project.

The project is opened in the WinCC Explorer.

The project structure with the required editors is displayed in the left pane of WinCC Explorer.

When an editor is selected in the left pane, the right pane shows the elements that belong to that editor.



Configuring communication

5

Introduction

This section contains information on configuring the communication between WinCC and the automation system.

This section shows you how to create and scale tags.

Principle

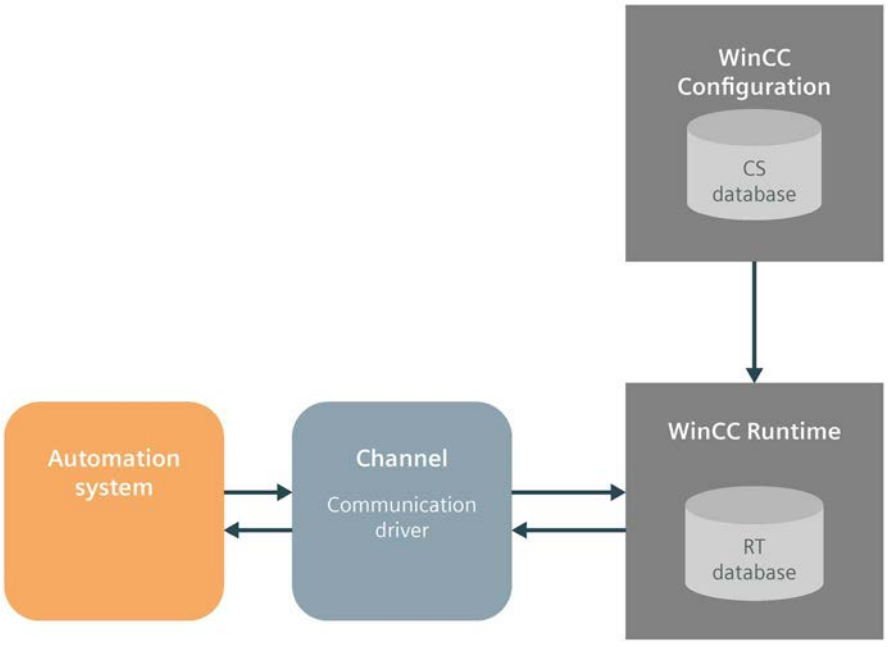
You configure the communication using the "WinCC Configuration Studio".

You will need at least the following components to configure the communication:

- One channel with channel units
- One connection
- One process tag

In practice, you will achieve access to the current process values of the automation system by the configured communication.

Communication in the WinCC system



Configuring in the "Quick_Start" project

You do not need an automation system for the "Quick_Start" project.

In this project, all values are transported within WinCC using internal tags.

The configuring of the communication between WinCC and the automation system and the linear scaling of process tags are exercises for gaining practical experience.

5.1 Channels and connections in WinCC

Introduction

Through channels and connections, you specify how the automation system is connected to WinCC.

The channels

The channels are specialized communication drivers.

Channels enable process tags with process values to be supplied from the automation system, and vice versa.

WinCC provides a variety of channels for connection of different automation systems.

The channel units

The channels have different channel units for the different communication networks.

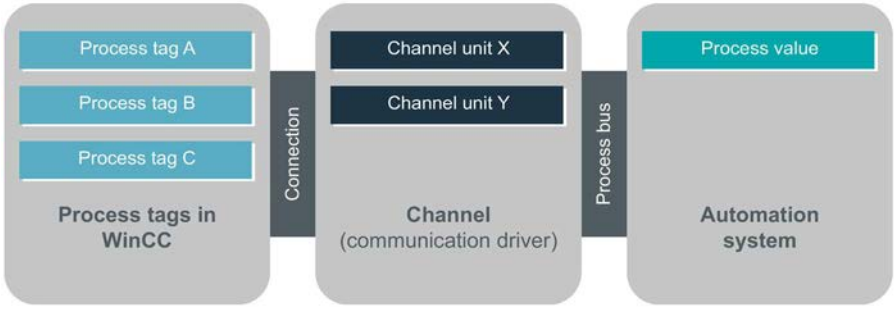
This channel unit is then used to access to a certain type of automation system.

A channel unit forms the interface to exactly one underlying hardware driver and therefore to exactly one communications processor in the PC.

The connections

You configure connections to the various automation systems under the channel units.

Each connection describes the interface to an individual, defined automation system. The data exchange takes place in Runtime via the connections.



5.2 Tags in WinCC

Introduction

The tags in WinCC represent either external values or internal values.
The internal values are calculated or simulated within WinCC.
The external values are read, for example, from the automation system.

WinCC manages the communication connections and tags in the Tag Management.

Use the "Tag Management" editor in "WinCC Configuration Studio" for configuration and management.

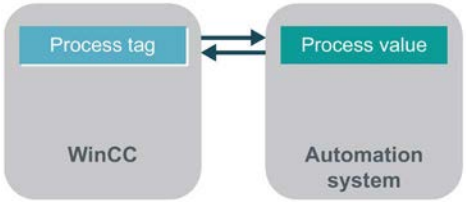
Process tags

External tags serve as the link for the data exchange between WinCC and the automation system.

Each external tag in WinCC corresponds to a certain process value in the memory of one of the connected automation systems.
External tags are therefore referred to as process tags.

In Runtime, the process values of the process tags are determined and entered by WinCC.

In WinCC, you can also determine the values for the process tags.
These values are transferred to the automation system via the stipulated channel.
The automation system controls the process accordingly.



Internal tags

You use internal tags in WinCC to transport values within WinCC without a process link.

Tag groups

The tag groups are components of the "Tag management" editor.

Tag groups are used to organize tags in a clear structure.

Structure tags

Structure tags are equivalent to a template you can use to create multiple tag groups having the same properties in each case.

The created structure assists you in the repeated visualization of comparably structured plant components.

For this you define a structure type with specific elements and properties.
The structure type is linked with as many structure tag as desired, each of which receives the same elements and properties.

In this way you avoid having to configure identical applications multiple times.

In practice, such structures are often imported from the PLC or third-party applications. You then use the structures in WinCC without having to separately configure the tags.

5.3 Adding a channel

Introduction

The following steps will show you how to create a channel in WinCC.

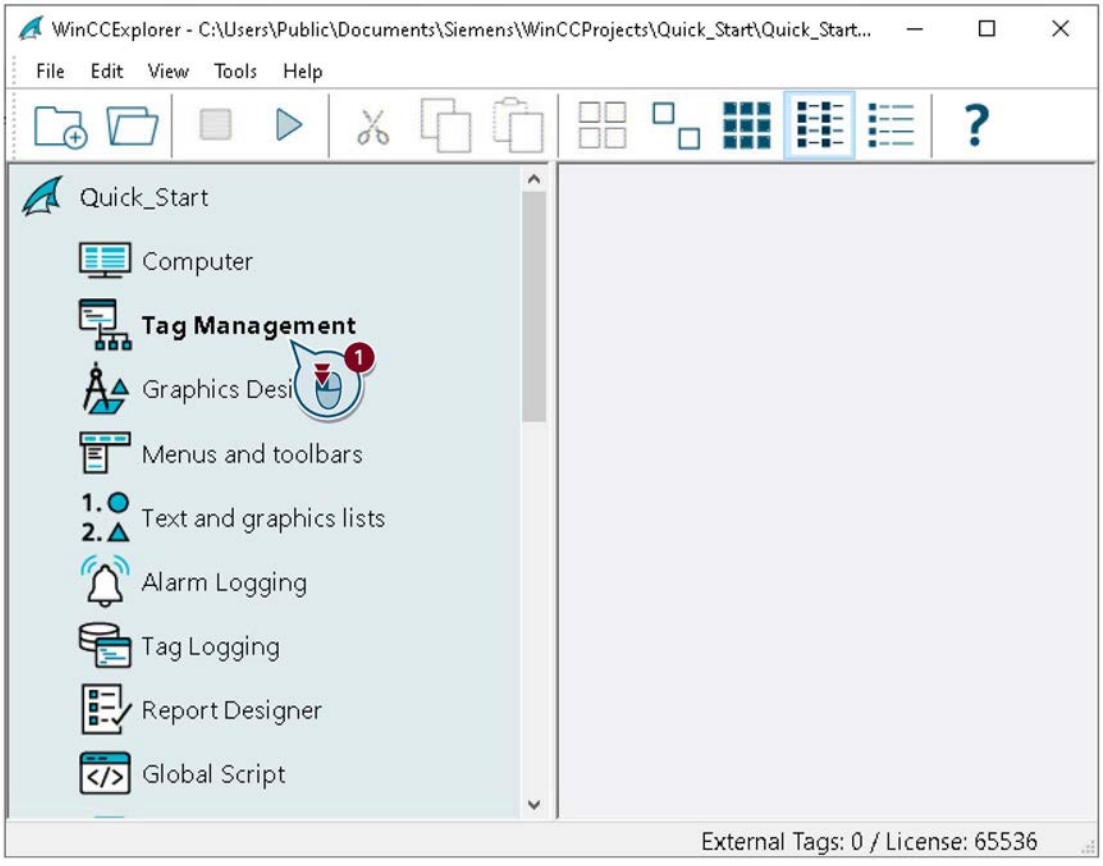
WinCC communicates with the automation system via this channel.
This also supplies process values to the process tags in WinCC.

Requirement

- The "Quick_Start" project is open.

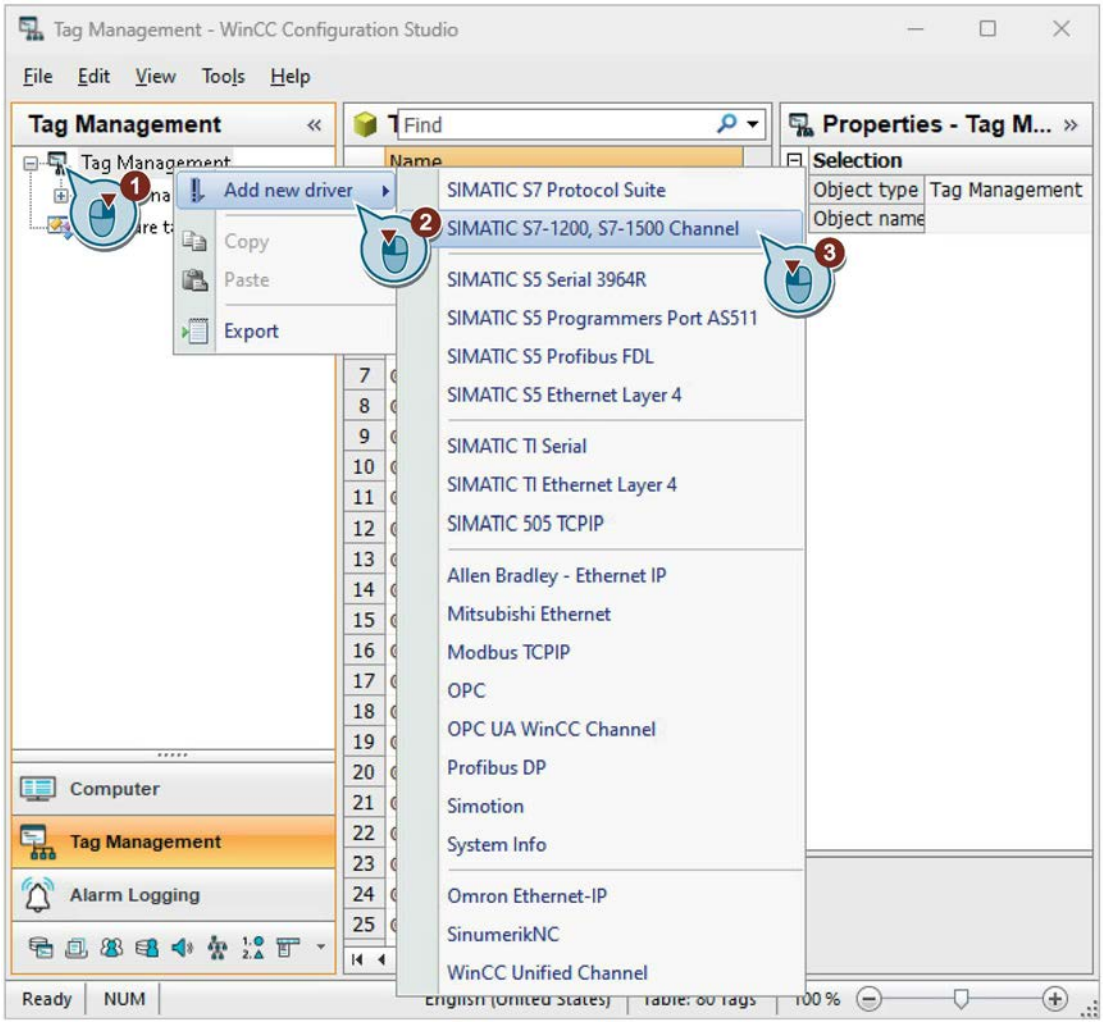
Procedure

1. Open the "Tag Management" editor.



The "Tag Management" editor opens in the WinCC Configuration Studio.

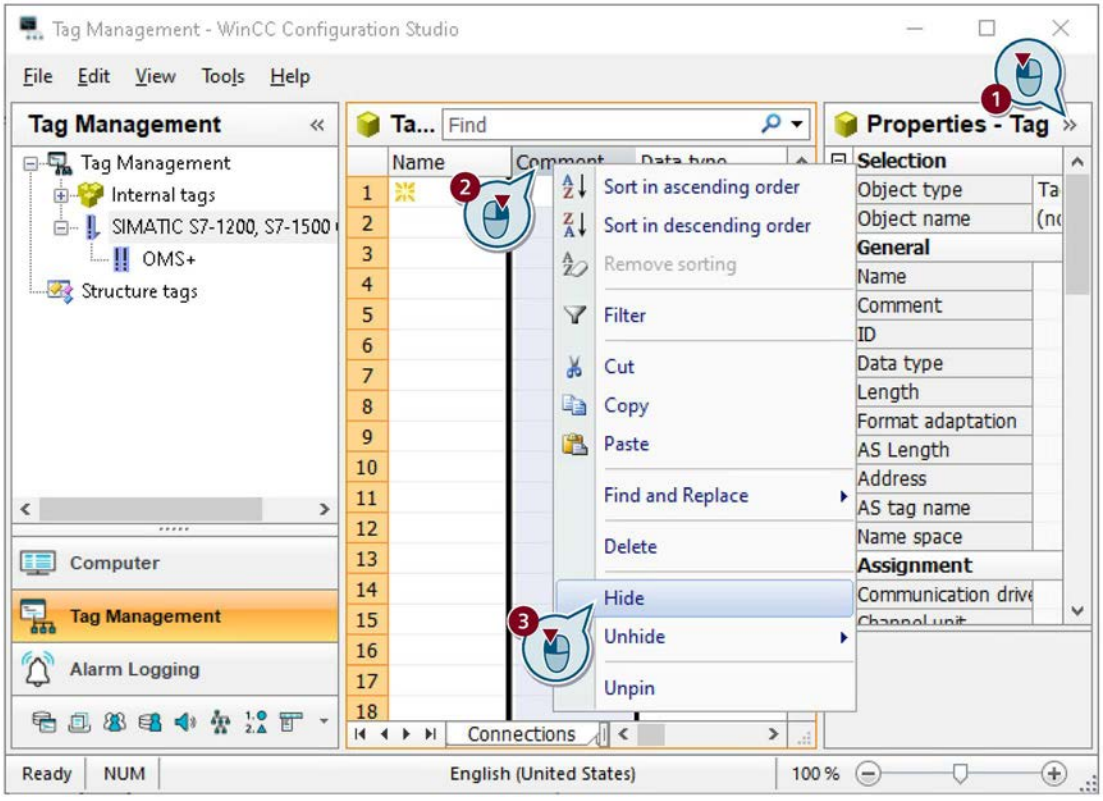
2. Insert the "SIMATIC S7-1200, S7-1500 Channel".



3. To enlarge the data area, reduce the size of the "Properties" window using the » button.

   To show the "Properties" window again, click on the « button.

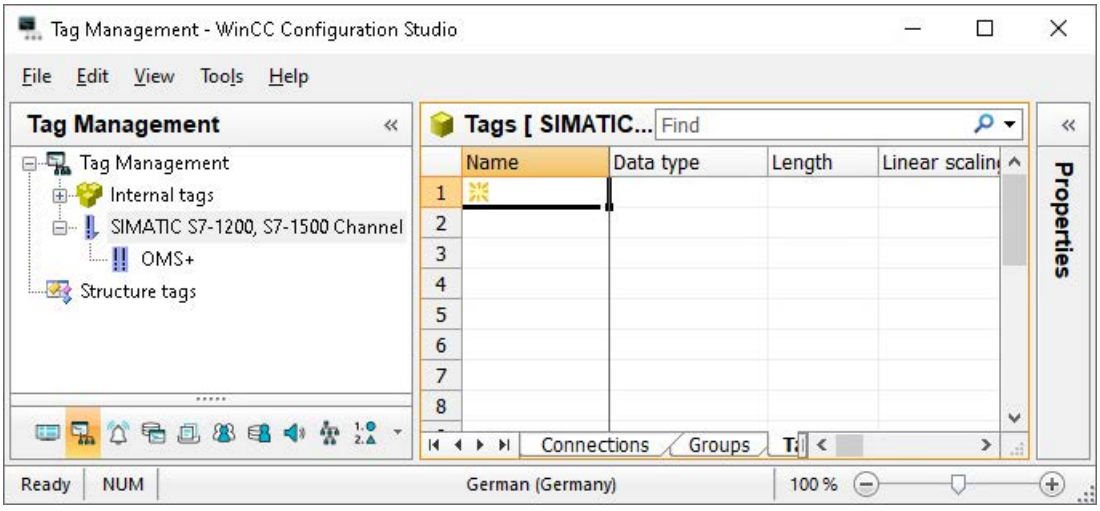
4. You can hide and show columns in the data area in the editors of the WinCC Configuration Studio.



Result

"SIMATIC S7-1200, S7-1500 Channel" is displayed in Tag Management.

The channel unit "OMS+" is displayed below the channel.



Next steps

You create a connection to the automation system below the channel unit "OMS+".

5.4 Creating a connection

Introduction

The following steps will show you how to create a connection to the automation system under the channel unit "OMS+".

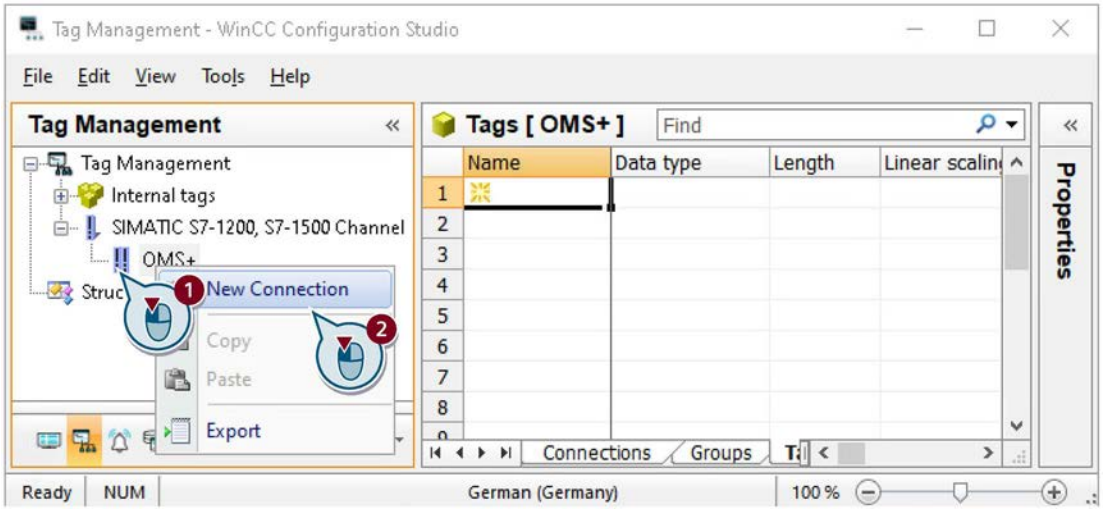
The data exchange will take place via this connection in Runtime.

Requirement

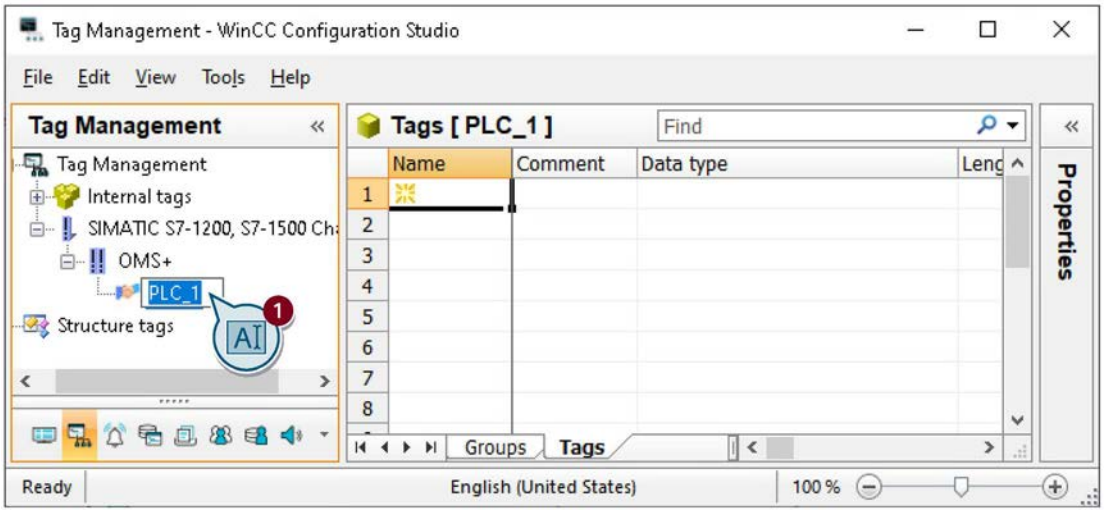
- "SIMATIC S7-1200, S7-1500 Channel" has been added to Tag Management.

Procedure

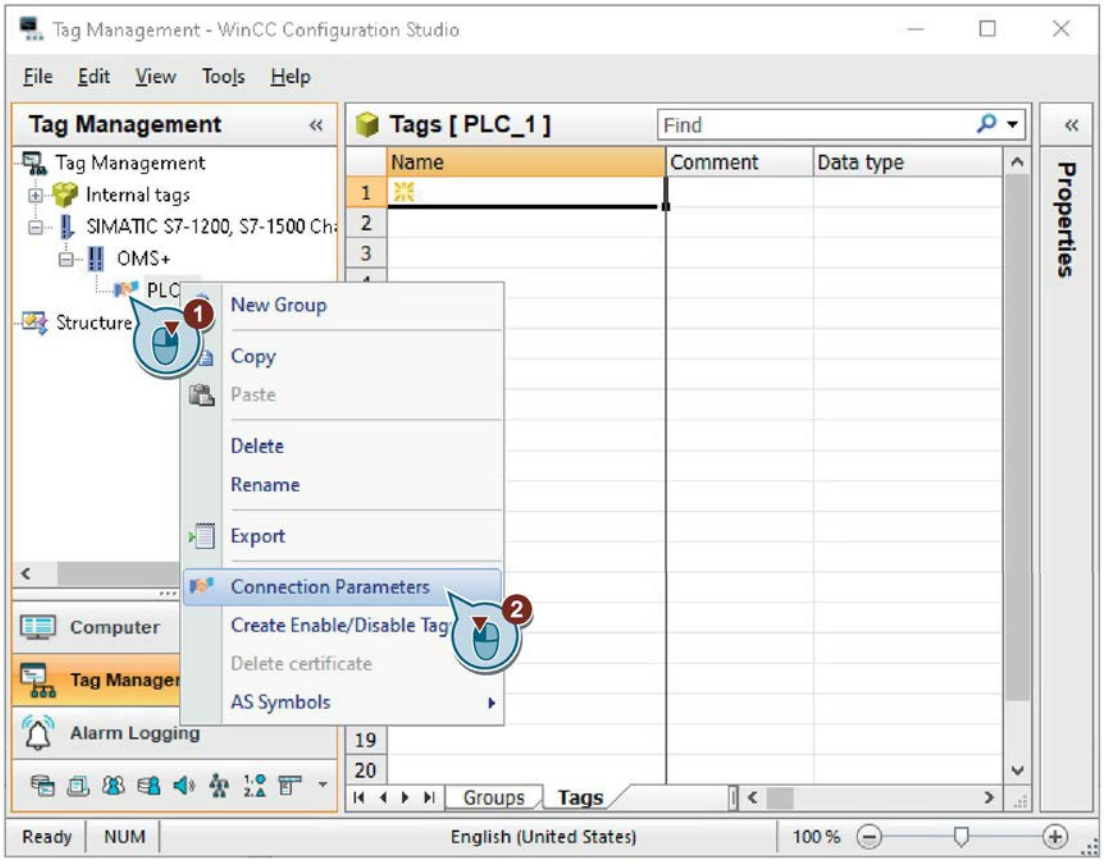
1. Create a new connection under channel unit "OMS+".



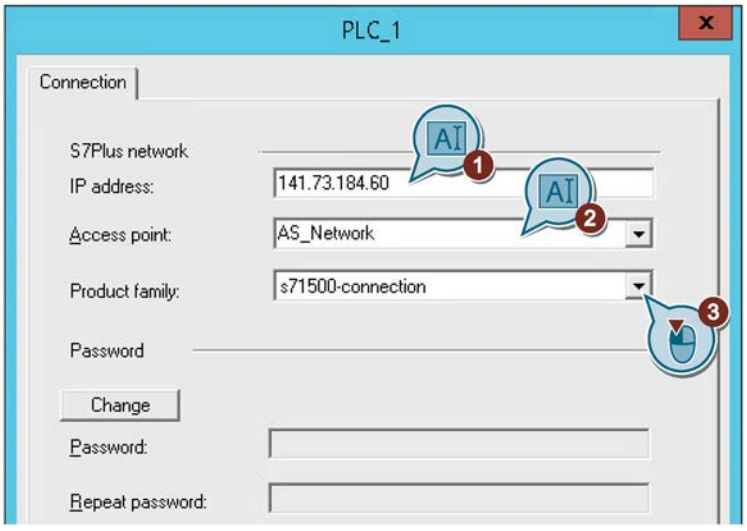
2. Enter "PLC_1" as the connection name.



3. Open the "Connection Parameters" dialog to configure the connection.



4. Enter the connection parameters.

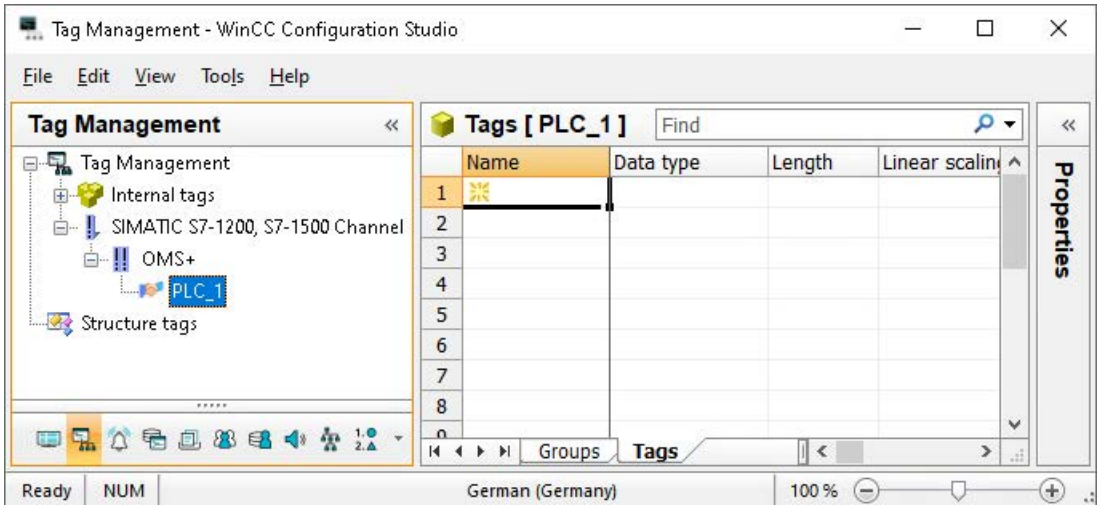


5. Close the dialog with "OK".

Result

You have established the "PLC_1" connection to the automation system.

The connection is displayed in Tag Management.



Next steps

You create a tag group and a tag below the "PLC_1" connection.

5.5 Creating process tags in a tag group

Introduction

The following steps show you how to create a process tag in a tag group, and how to determine its properties.

The tag groups are components of the "Tag management" editor.
You can sort and clearly display the structured tags using these components.

You specify the following properties for the process tag:

- Name
- Data type

  The data type determines the data format in WinCC.

  The data type of a tag in WinCC can differ from the data type used in the automation system.
- Address

  Via the addressing, you assign a certain data range in the automation system to a process tag.

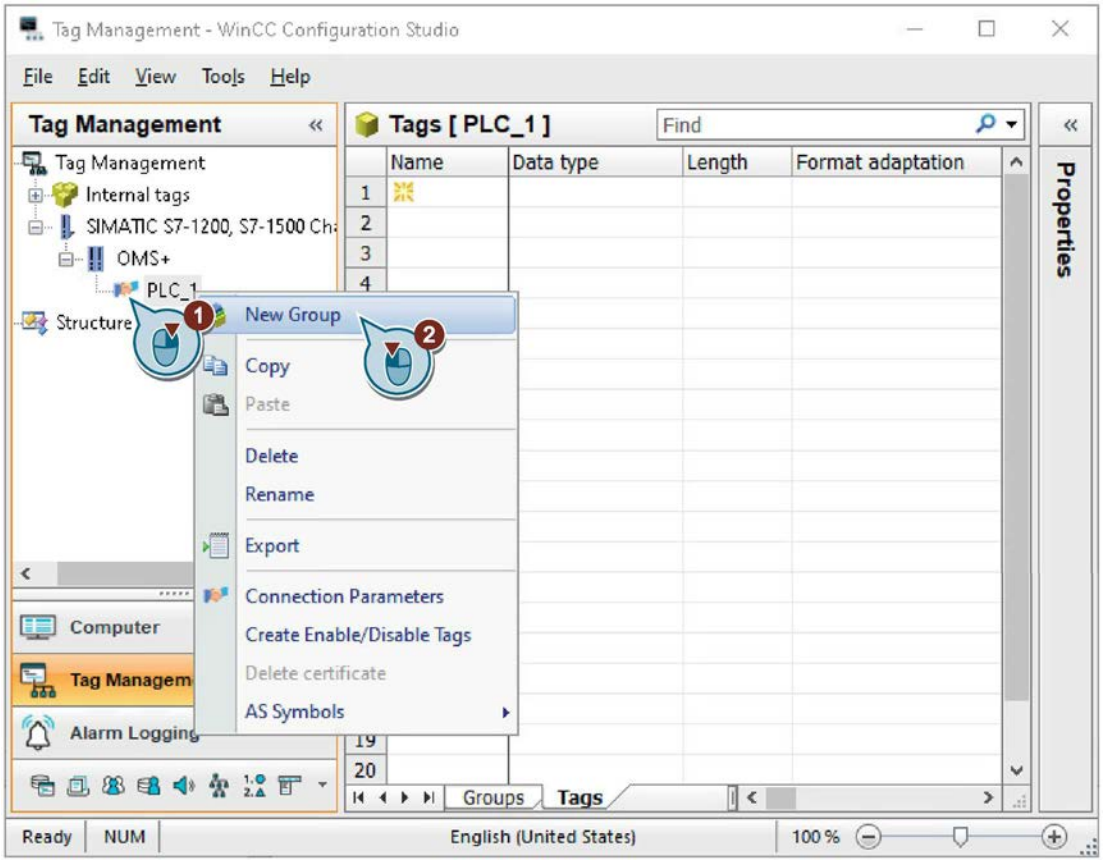
  The addressing type depends on the type of communication partner.

Requirement

- The "PLC_1" connection is created in Tag Management.

Procedure

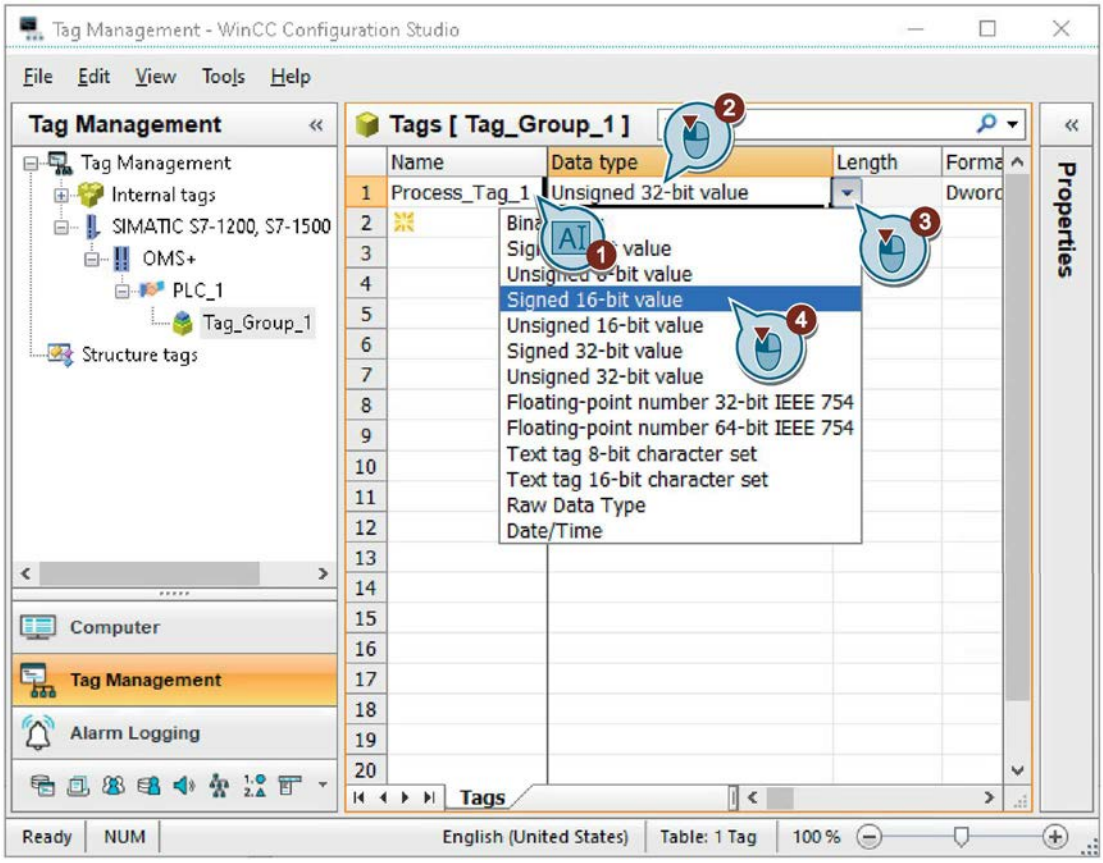
1. Create a tag group.



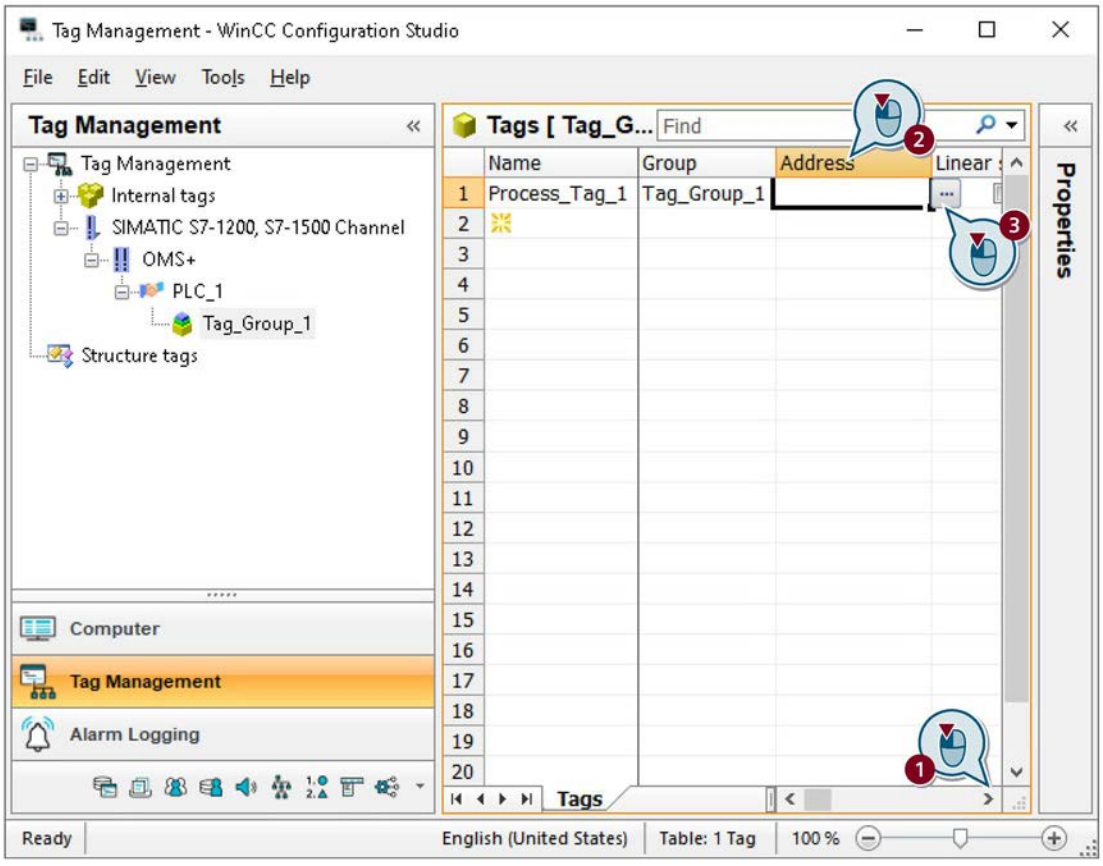
2. Enter "Tag_Group_1" as tag group name.
3. To create a process tag below the tag group, enter "Process_Tag_1" as the process tag name in the topmost available field of the "Name" column.

   The "Process_Tag_1" process tag has been created.

4. Select data type "Signed 16-bit value".

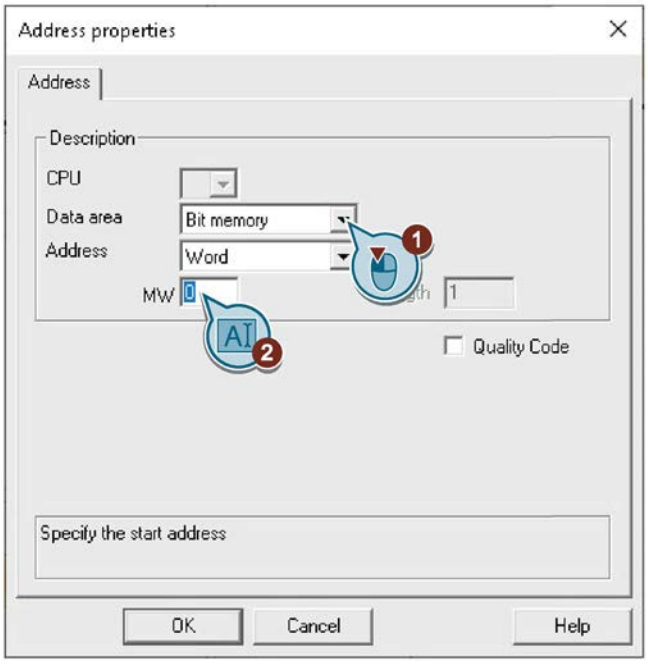


5. Click "..." in the "Address" column to specify the properties of the tag addressing.



The "Address properties" dialog box opens.

6. Enter the information for the address description.



7. Close the dialog with "OK".

Result

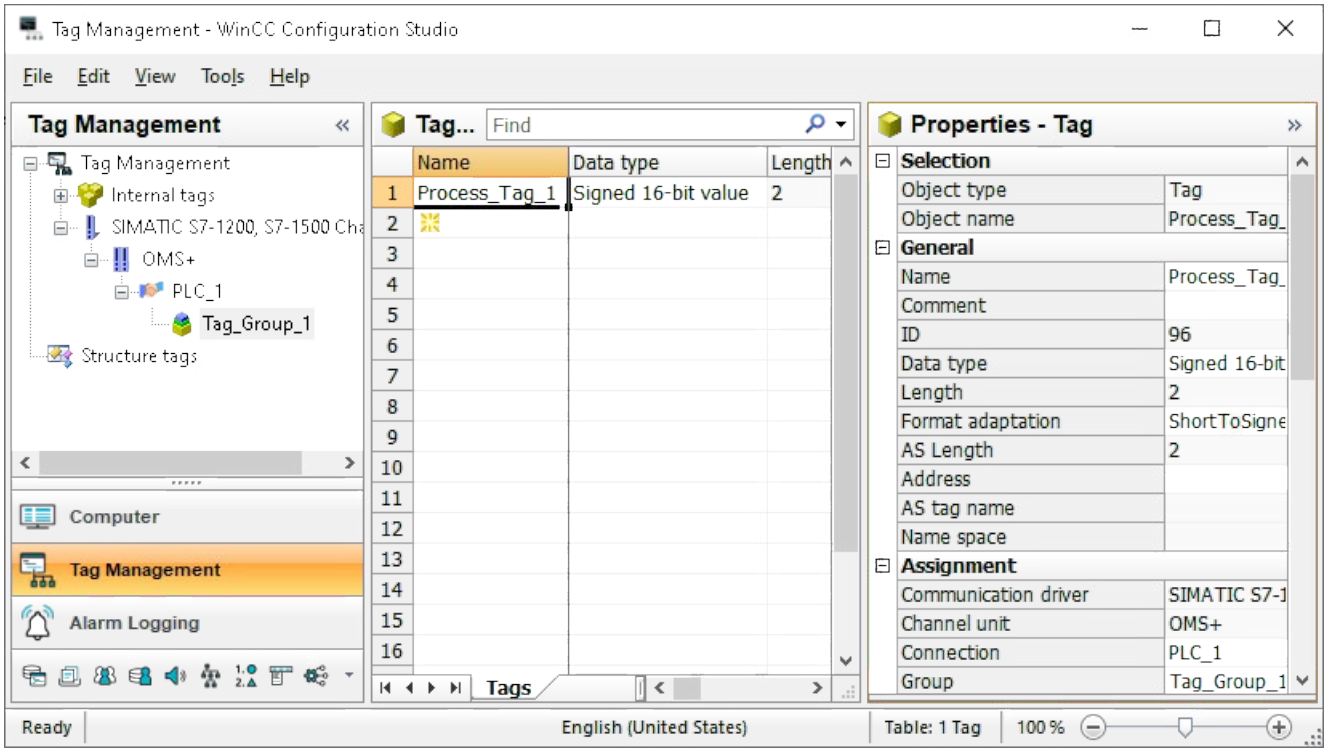
You have created the process tag "Process_Tag_1".

The process tag is displayed in the table area of the "Tag Management" editor.

The "Properties - Tag" area displays all properties of the selected tag.

The type conversion can convert the data format of an automation system into a WinCC format.

The process tag was the last component needed to create the communication between WinCC and the automation system.



Next steps

You define the properties of the linear scaling for scaling process values in WinCC.

5.6 Scaling process tags in WinCC

Introduction

The following steps will show you how to scale process tags in WinCC.

Using linear scaling, you map the value range of a process value linearly onto a defined value range of a process tag in WinCC. The process value itself is not modified.

You will specify the following properties for the linear scaling:

- Set the value range of the process value in the "AS value range" columns.
- Set the value range of the process tag in WinCC in the "OS value range" columns.

Linear scaling is only available for process tags. You cannot scale internal tags.

Example:

A temperature sensor measures resistance in a system and returns the value in the unit "Ohm". Specific resistance values correspond to specific temperatures.

You can use the linear scaling function for automatic conversion of the resistance values to the temperature scale. This ensures that the measured resistance is immediately displayed as temperature in the project.

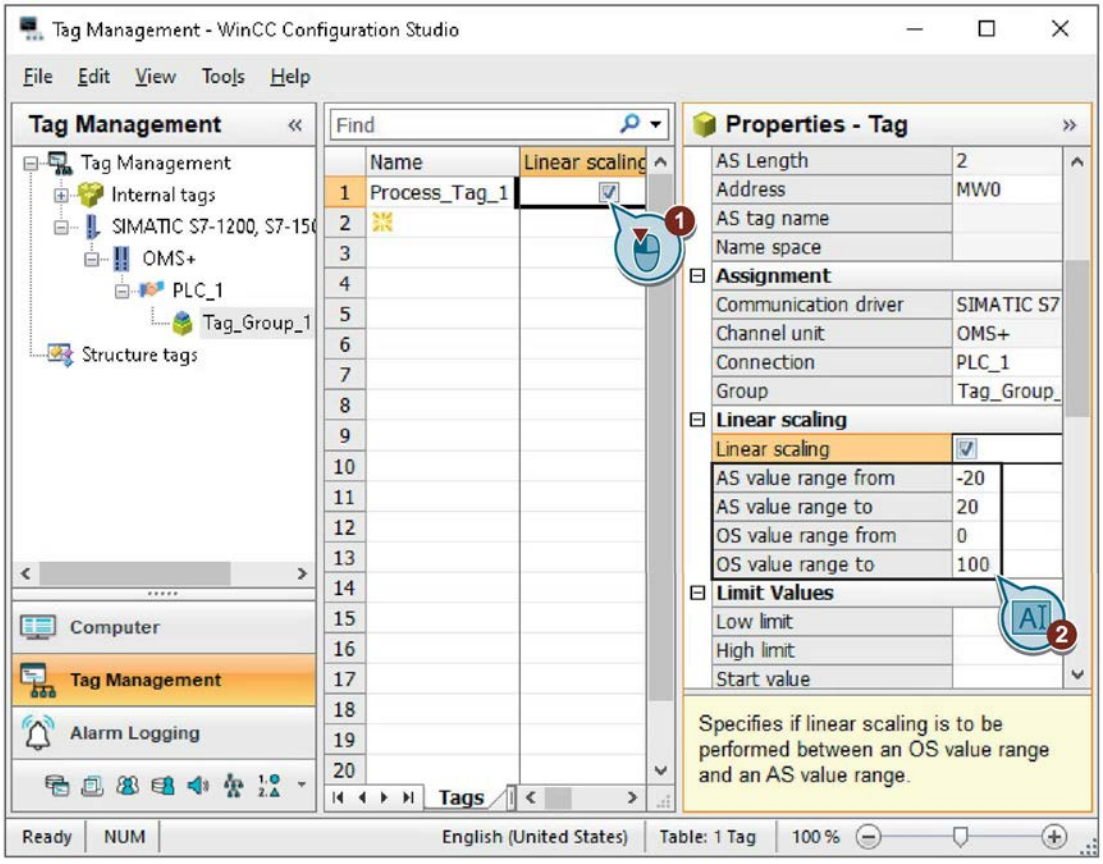
In Tag Management, the resistance value corresponds to the settings in the "AS value range" columns. The temperature corresponds to the settings in the "OS value range" columns.

Requirement

- The "Process_Tag_1" process tag has been created in Tag Management.

Procedure

1. Activate linear scaling and define the value range for the process and the tag.



Result

You have activated linear scaling for the "Process_Tag_1" process tag.

The value ranges for the process and the tag are set.
The value range of the process value [-20...20] is displayed as value range of the process tag [0...100].

Next steps

You create an internal tag.

5.7 Creating internal tags

Introduction

The following steps will show you how to create an internal tag in a tag group, and how to determine its properties.

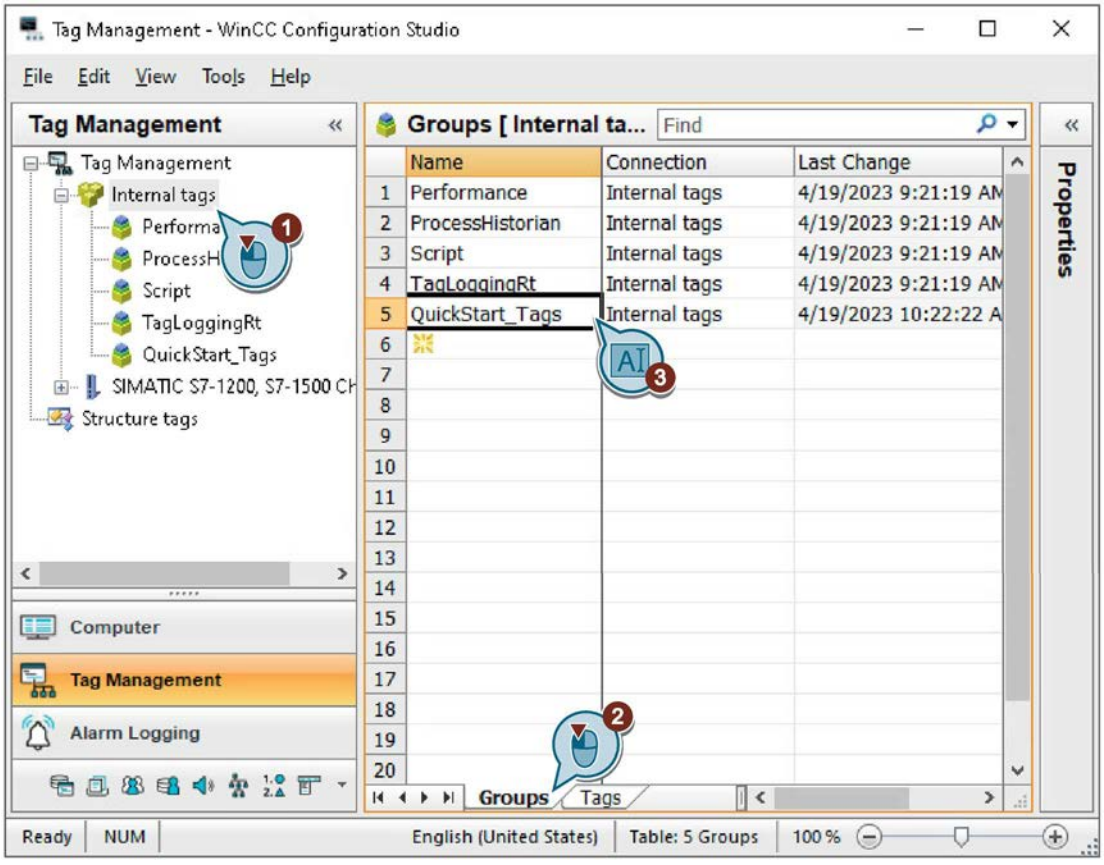
The internal tag is used to transfer values within WinCC.

Requirement

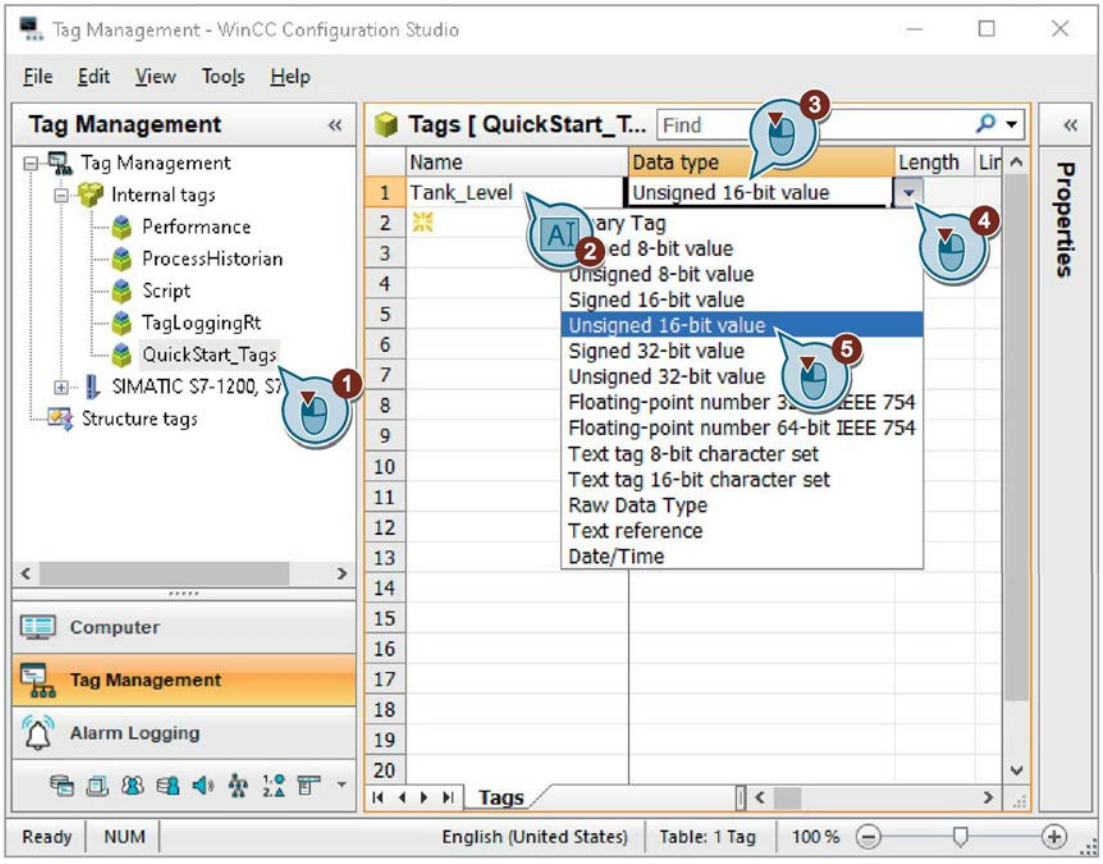
- The "Quick_Start" project is open.

Procedure

1. Select the "Internal tags" entry in Tag Management.
2. Create the "QuickStart_Tags" tag group in the "Groups" tab.



3. Enter "Tank_Level" as name of the internal tag to create an internal tag in the tag group.
4. Select data type "Unsigned 16-bit value".

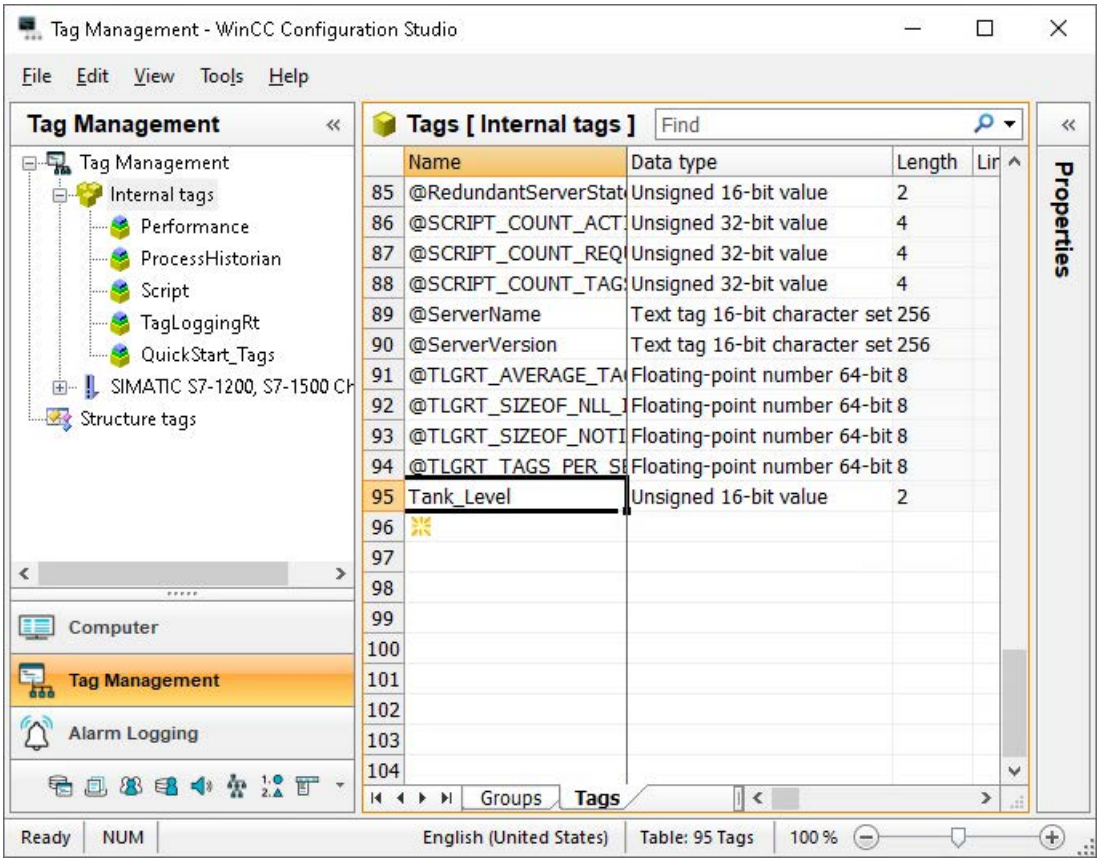


Result

You have created the internal tag "Tank_Level" and defined its data type in the "QuickStart_Tags" tag group.

The internal tag "Tank_Level" is displayed in Tag Management.

Tags whose name starts with "@" are system tags. You can use system tags in your project but you cannot change them.



Configuring the process screens

6

Introduction

This section provides information about the graphics system and a description of how to configure process pictures.

The process pictures are main elements of a project. They represent a process and allow the operation and observation of this process.

Principle

You can use the "Graphics Designer" editor to configure the process pictures.
This editor is the configuration component of the graphics system in WinCC.

Each process picture consists of one or more objects:

- Static objects remain unchanged in Runtime.
- Dynamic objects change in accordance with the individual process values.

  A bar is an example of a dynamic object.
  The length of the bar depends on the current temperature value.
- Controllable objects allow you to have an active influence on the process.

  These objects include buttons, sliders, or I/O fields used for entering certain process parameters (input/output field).

A project often comprises several process pictures.
Each process picture shows a different process step or displays special process data.

Configuring in the "Quick_Start" project

In this section, you create a process picture "START.Pdl" that represents a water treatment system. The creation of a second process picture "SAMPLE.Pdl" is foreseen as an exercise.

WinCC provides you with all the objects you need to configure the process pictures.

In the second step, you dynamize the process picture "START.Pdl" using the internal tag "Tank_Level" that you created beforehand. This results in a graphic representation of the level in a water tank as a function of the tag value.

6.1 The graphics system

Introduction

The graphics system is a subsystem of WinCC.
This subsystem is used to configure process pictures.

The graphics system handles the following tasks:

- It displays static and operator-controllable objects, such as texts, graphics or buttons
- It updates dynamic objects, e.g. modifies the length of a bar graph in relation to a process value
- It reacts to operator input, e.g. clicking a button or entering a text into a text box

The Components of the Graphics System

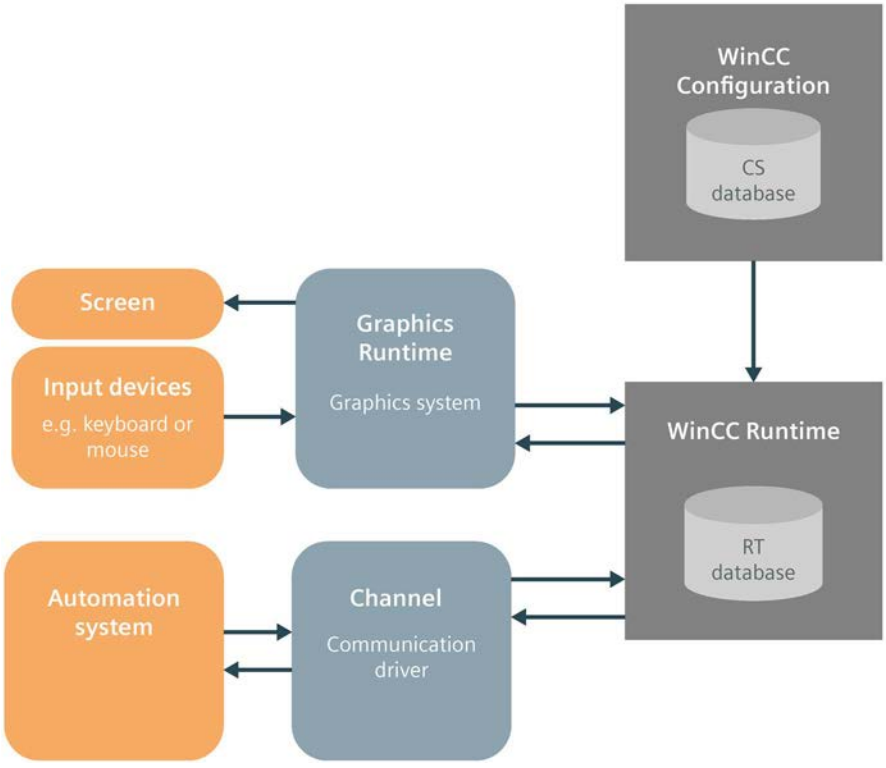
The graphics system is made up of a configuration component and a Runtime component:

- The "Graphics Designer" editor is the configuration component of the graphics system.

  You create the process pictures for your project in this editor.
- Graphics Runtime is the Runtime component of the graphics system.

  Graphics Runtime displays the pictures in Runtime and administers all inputs and outputs.

Graphics system in the WinCC system



6.2 Creating process screens

Introduction

The following steps show you how to create and rename process pictures in the WinCC Explorer.

New, empty process pictures can be created using either the "Graphics Designer" editor or the WinCC Explorer:

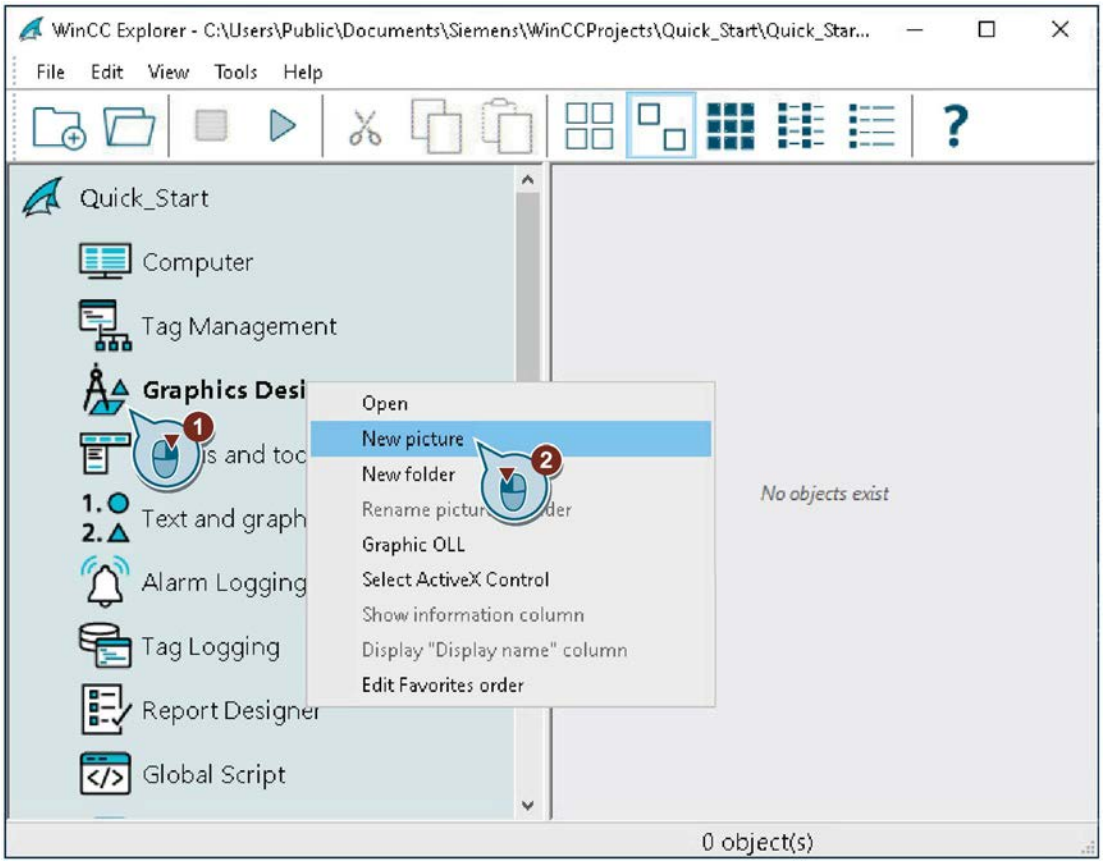
- If you wish to edit a process picture immediately, create it using the "Graphics Designer" editor.
- If you wish to create all required process pictures before you process them, we recommend that you use the WinCC Explorer.

Requirement

- The "Quick_Start" project is open.

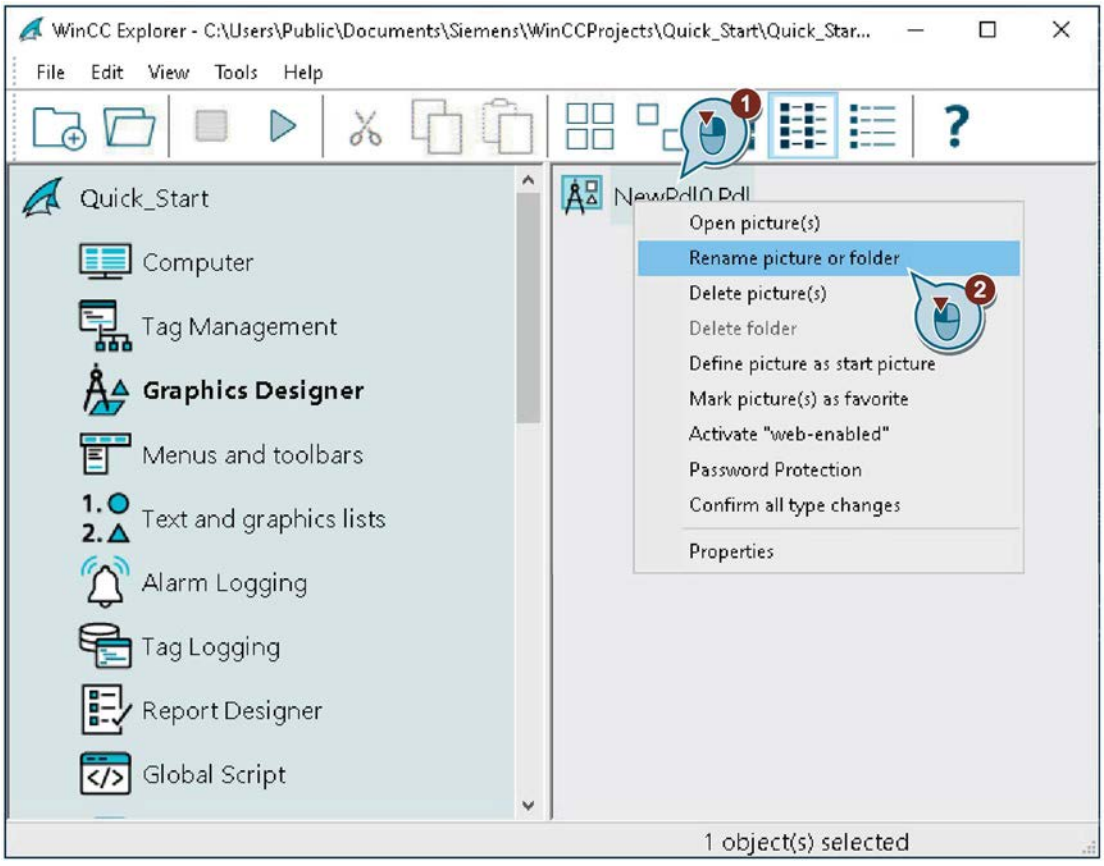
Procedure

1. Create a new process picture.



The process picture is displayed in the right pane of WinCC Explorer.

2. Rename the process picture you created to "Start.Pdl".



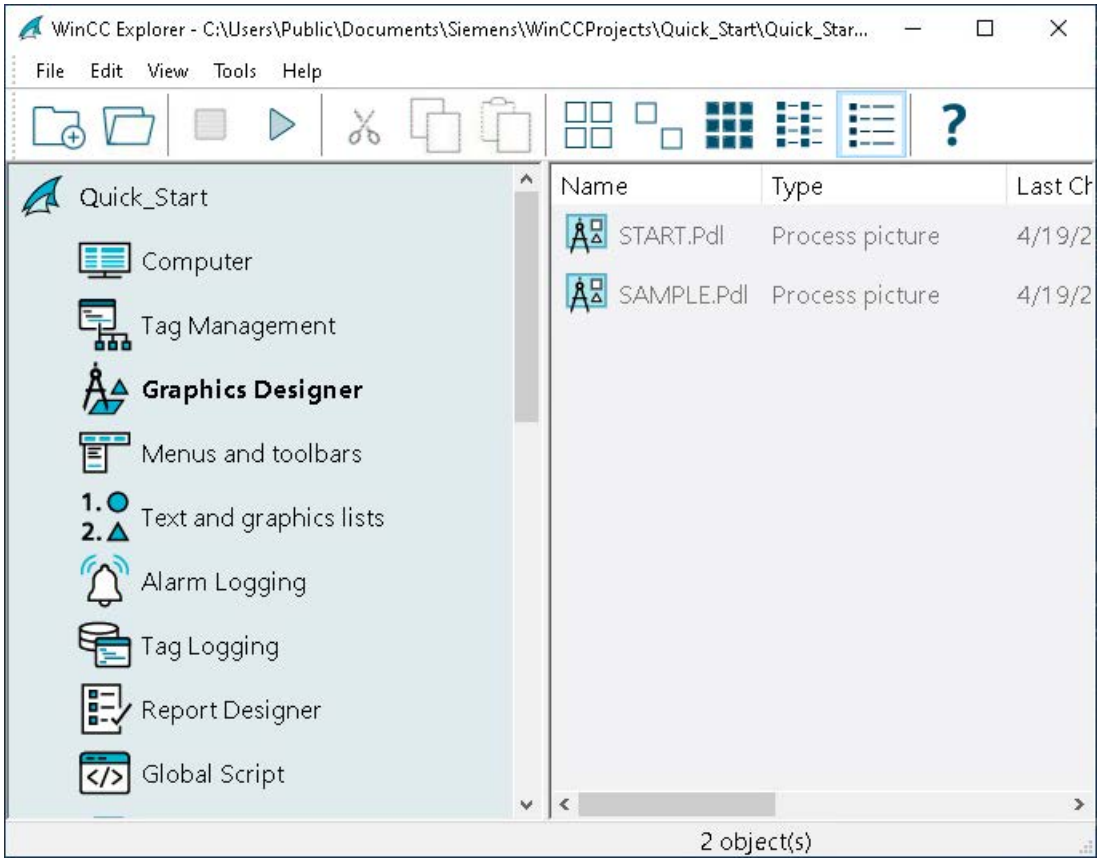
The "Start.Pdl" process picture is displayed in the right pane of the WinCC Explorer.

3. Create a second process picture similar to steps 1 and 2 and name it "SAMPLE.Pdl".

Result

You have created the process pictures "START.Pdl" and "SAMPLE.Pdl".

These are displayed in the right pane of WinCC Explorer.



Next steps

You create a pictorial representation of a water treatment system by inserting several objects in the "START.Pdl" process picture.

6.3 Editing process screens

Introduction

This section offers a description how to edit process pictures using the "Graphics Designer" editor.

At the end of the section, you have the opportunity to deepen what you have learned by editing the "SAMPLE.Pdl" picture on your own.

Principle

You can use the "Graphics Designer" editor to configure the process pictures. The structure of this editor is similar to a drawing program and it is also operated in a similar manner.

The "Graphics Designer" editor provides objects and tools to configure process pictures. For the "Quick_Start" project you use mainly the object palette and the library of the editor "Graphics Designer".

The object palette contains different types of objects that are frequently required for configuring process pictures.

You insert the objects of the object palette into the process pictures using drag-and-drop. Alternatively, select the object and click once with the left mouse button on the work surface of the process picture.

The object palette contains the following types of objects to configure pictures:

- Standard objects: e.g. line, polygon, ellipse, circle, rectangle, static text
- Smart objects: e.g. application window, picture window, OLE object, I/O field, bars, status display
- Windows objects: e.g. button, check box, option group, slider object
- Tube objects: e.g. polygon tube, T-piece, double T-piece, tube bend
- Controls: The most important ActiveX controls can be found in the "Controls" tab. You can integrate additional controls using the control object.

You can create your pictures efficiently using the library. The library contains graphic objects, which you can insert into your pictures using drag-and-drop.

You can import graphics of external graphic programs in the "Graphics Designer" editor.

6.3.1 Inserting graphic objects from the library

Introduction

The following steps show you how to insert graphic objects from the SVG library into the "START.Pdl" process picture.

The SVG library is a component of the "Graphics Designer" editor.

This component is a versatile tool to store and manage graphic objects.
The library is split up into two areas:

- Global Library

  The "Global SVG library" area is structured in a directory tree.

  It offers a variety of pre-made graphic objects, such as machine and system parts, measuring devices, operator controls and buildings.

- Project Library

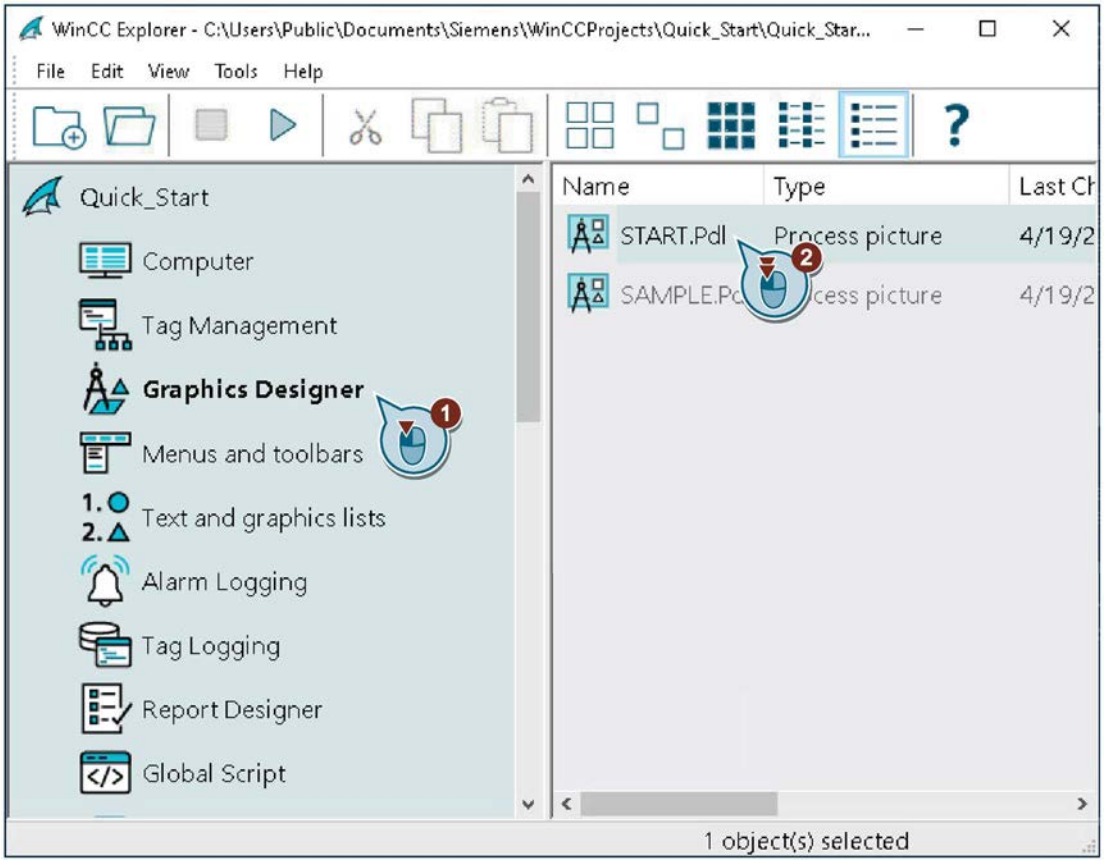
  In the "Project SVG library" area, you can store custom projects.

You will only need the graphic objects of the area "Global SVG Library" for the "Quick_Start" project.

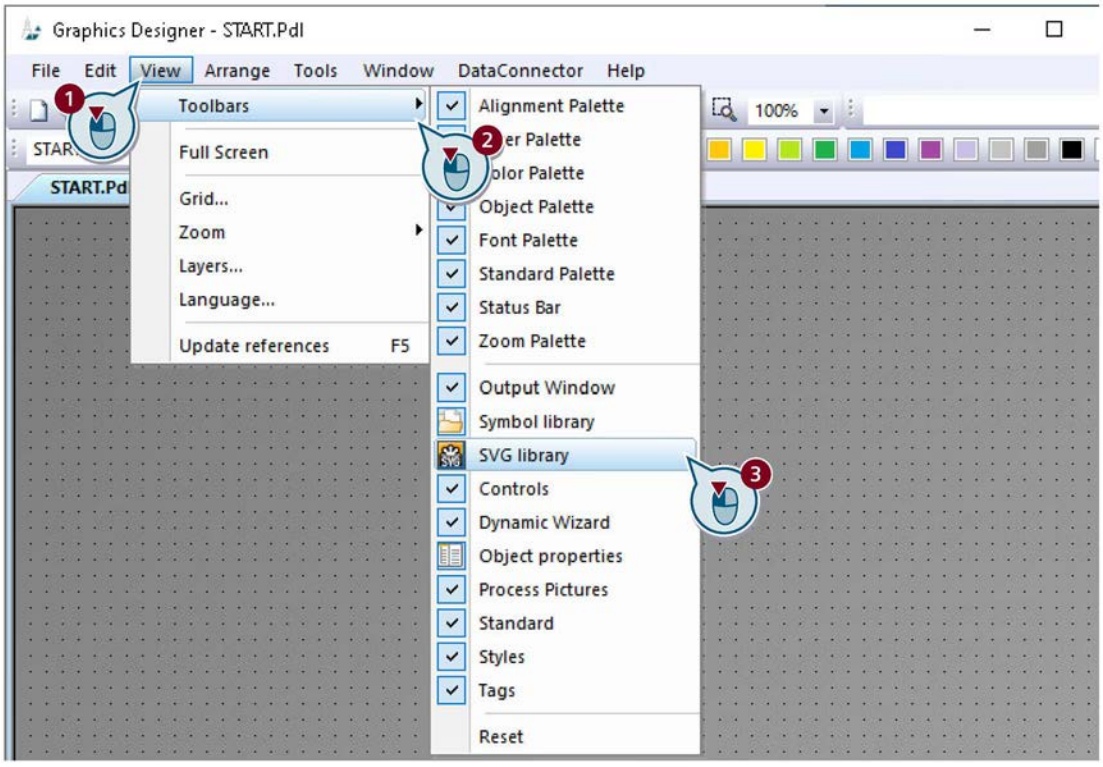
You use these objects to represent a water treatment system in the "START.Pdl" process picture.

Procedure

1. Open the "START.Pdl" process picture in the "Graphics Designer" editor.

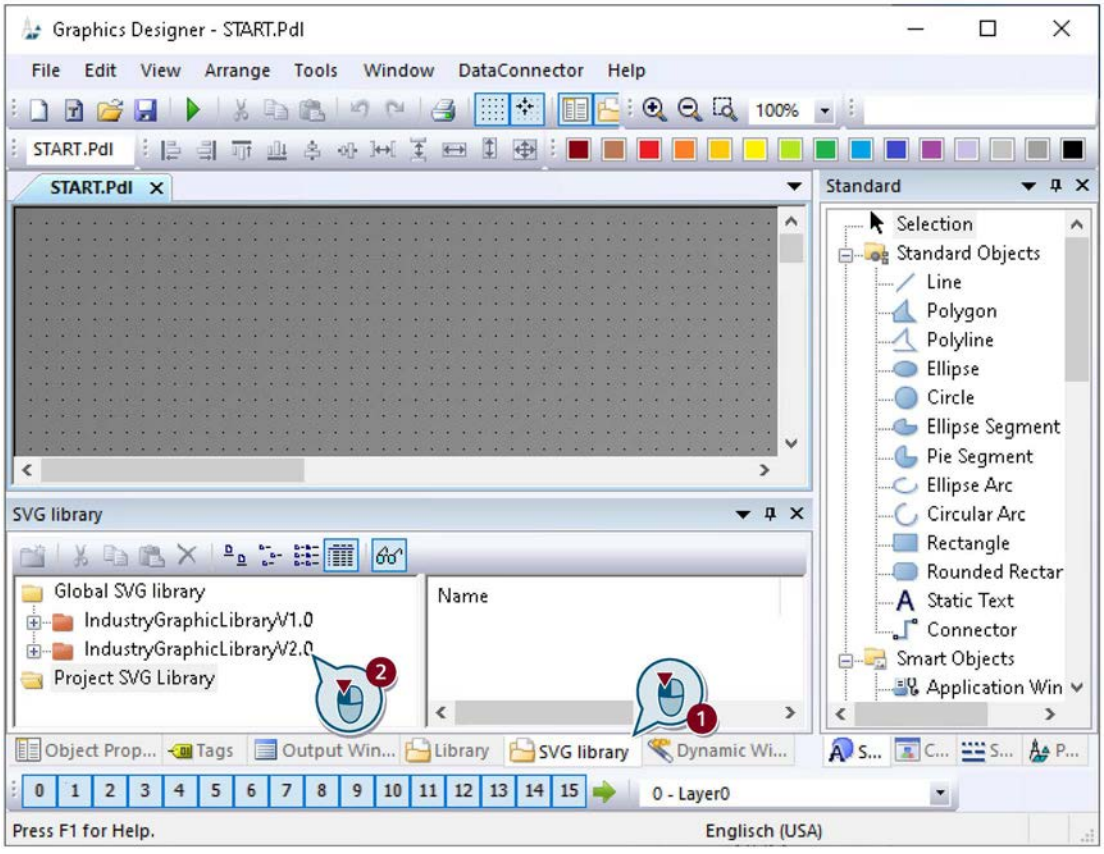


2. If the "SVG Library" window is not displayed, enable the view.



The "SVG Library" window opens.

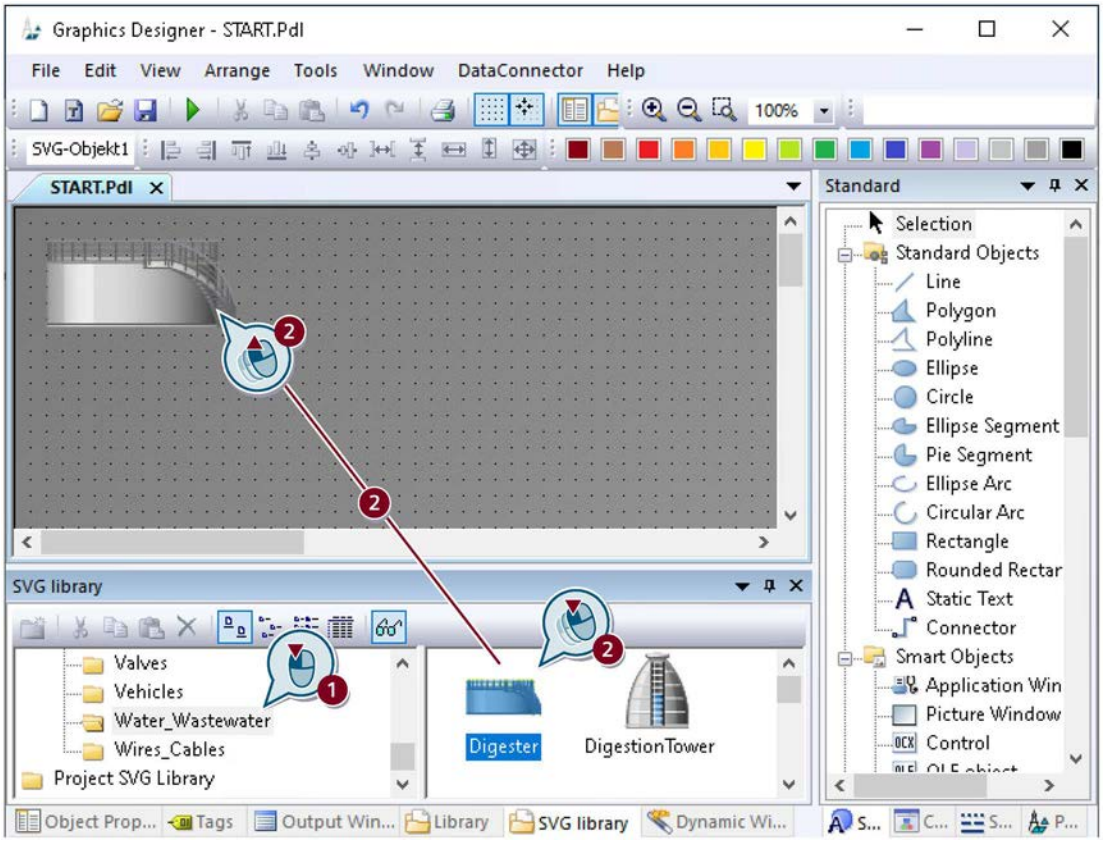
3. Select the global SVG library "IndustryGraphicLibraryV2.0" in the "SVG Library" window.



Use the button in the toolbar of the library to obtain a preview of the available objects.

You can resize the displayed symbols using the and buttons.

4. Insert the "Digester" object from the "Water_Wastewater" folder.

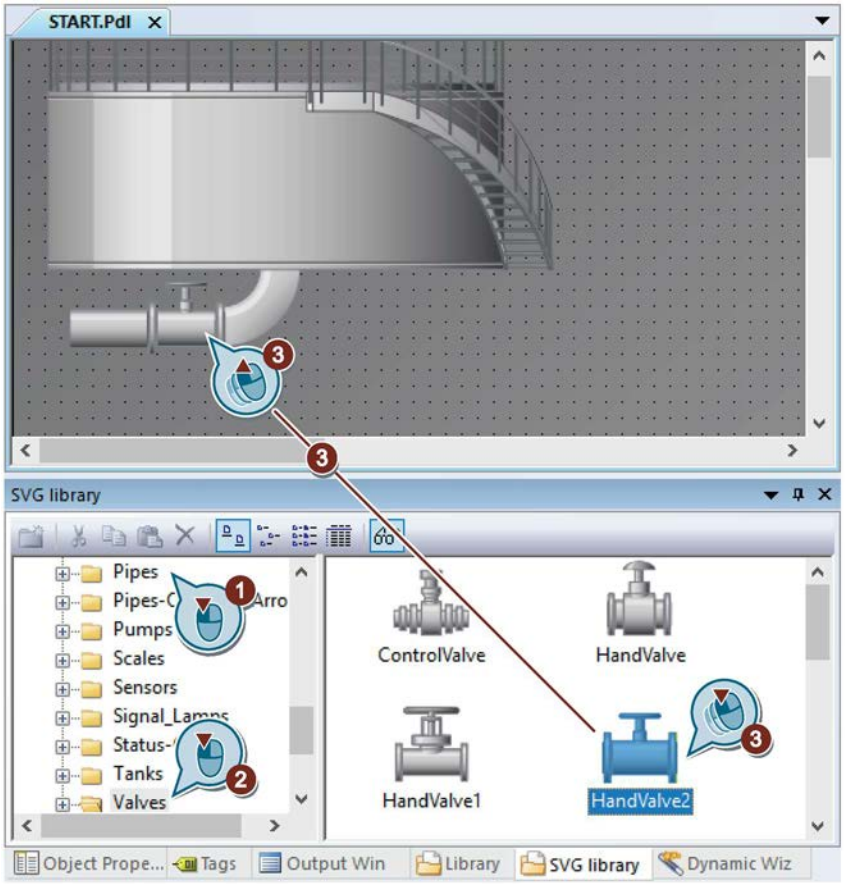


The picture of the bioconverter appears on the work surface.

Zoom in on the picture by clicking and dragging one of the displayed points with the mouse.

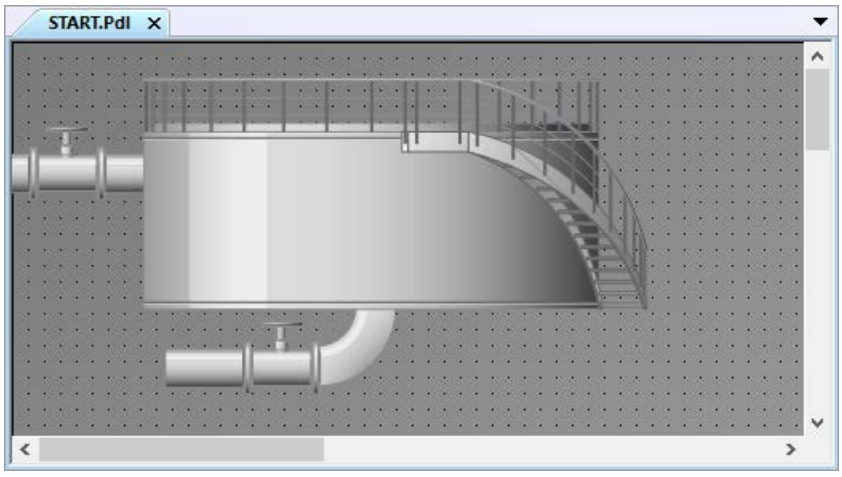
5. Add representations of other objects, e.g. pipelines and a valve.

   Use the mouse or the cursor keys to move the pictures of objects on the process picture.



Result

You have now depicted the water treatment system.



Next steps

You label the represented process by inserting the "Static text" object into the process picture.

6.3.2 Inserting a "Static text" graphic object

Introduction

The following steps will show you how to insert and edit the "Static text" object.

The object "Static text" is a text field that remains unchanged in Runtime.

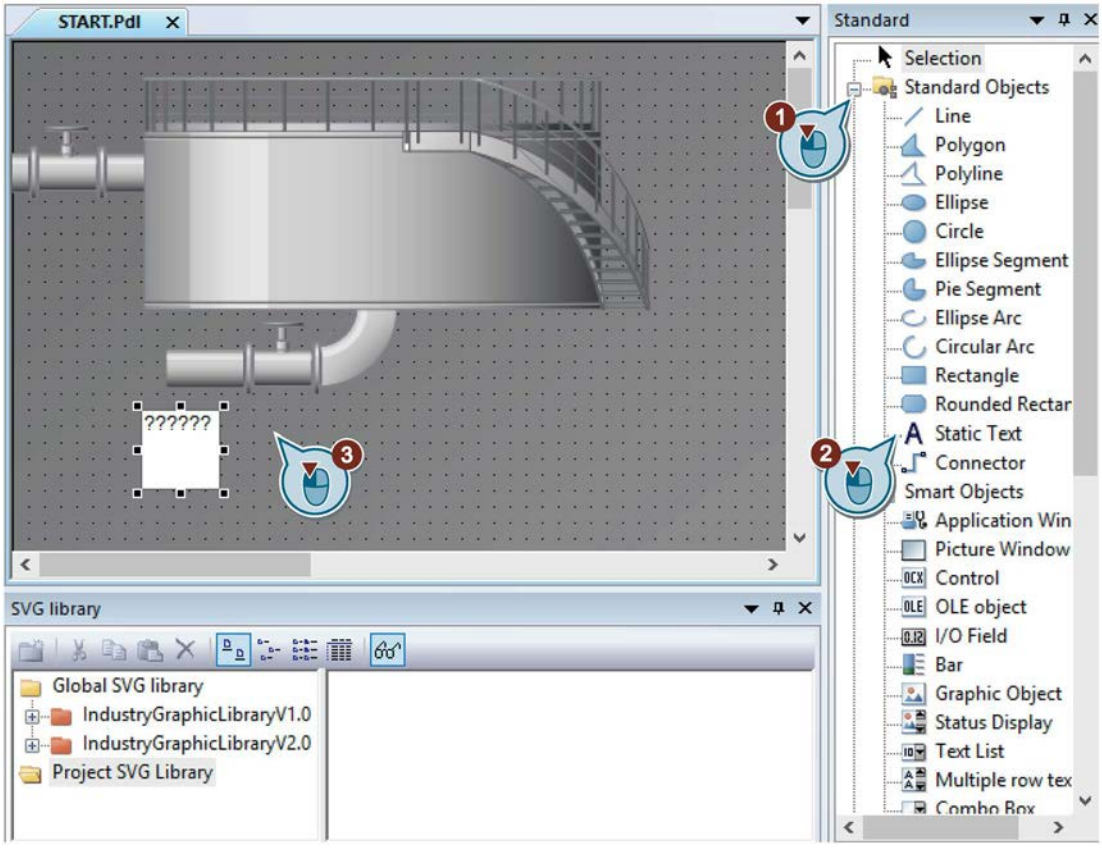
In the "Quick_Start" project you need the static text for labeling the displayed processes. If you create multiple pictures, clear labeling of the represented processes is important.

Requirement

- The "START.Pdl" process picture is open in the "Graphics Designer" editor.

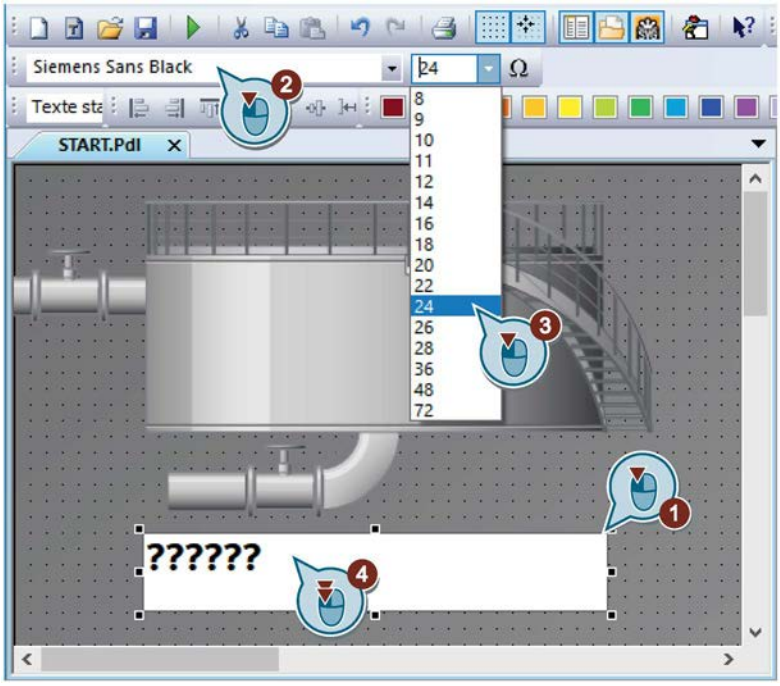
Procedure

1. To insert the "Static Text" object, click on the object in the "Standard" window and then on the process picture.



The text field is displayed on the process picture.

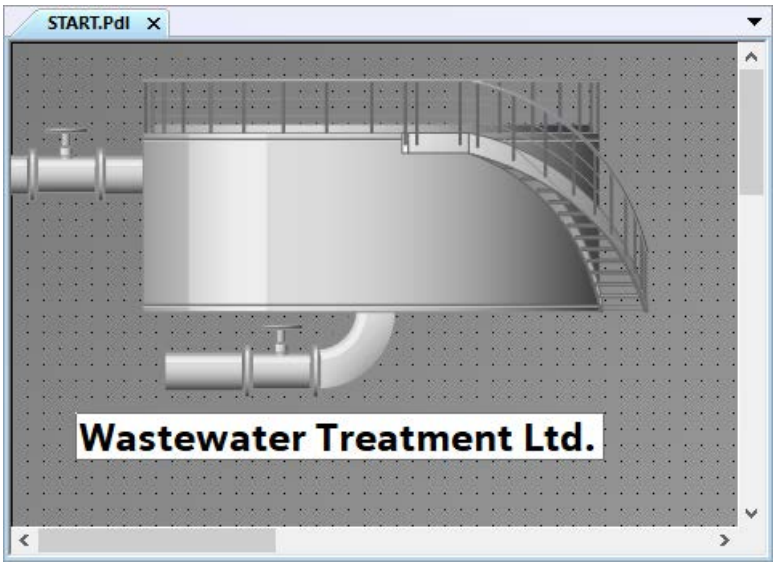
2. Drag the text box using the mouse and set the font type and size.



3. Double-click inside the text field and enter the title, e.g. "Wastewater Treatment Ltd", using the keyboard.
4. Resize the text box to fit the text.
5. Save the "START.Pdl" process picture using the button in the toolbar.
6. Close the "START.Pdl" process picture.

Result

You have added a static text field and labeled the displayed process.



Next steps

- For more practice in creating and editing process pictures, you have the option of creating an additional process picture "SAMPLE.Pdl".
- You dynamize the plant in the "START.Pdl" process picture by inserting an input field and connecting it to the graphic of the bioconverter using the internal tag.

6.3.3 Editing the "SAMPLE.Pdl" process picture

Introduction

In the following steps, you edit the "SAMPLE.Pdl" process picture.

While editing, you display a process using the graphic objects in the library.

Displaying the process is a free exercise. You do not need this step for the "Quick_Start" project.

Requirement

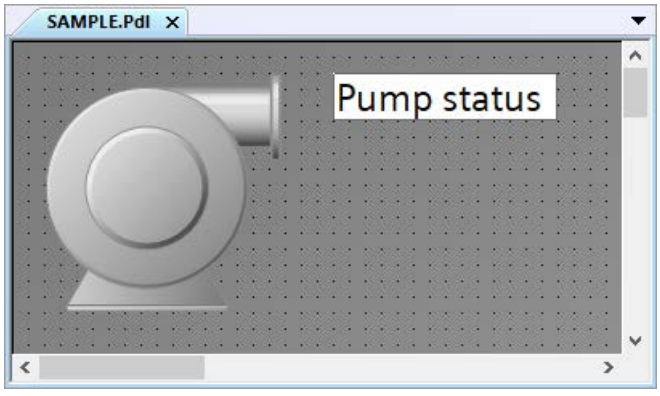
- The "SAMPLE.Pdl" process picture has been created.
- The "Graphics Designer" editor is open.

Procedure

1. Open the "SAMPLE.Pdl" process picture using the button in the toolbar of the "Graphics Designer" editor.
2. Use the graphic objects of the library, for example, to represent a pump with status display.
3. Save the "SAMPLE.Pdl" process picture using the button in the toolbar.
4. Close the "SAMPLE.Pdl" process picture.

Result

You have edited the "SAMPLE.Pdl" process picture.



See also

Inserting graphic objects from the library (Page 50)

6.4 Dynamizing process screens

Introduction

This section describes how to dynamize process pictures.

Principle

You dynamize the "START.Pdl" process picture in the "Quick_Start" project through a direct tag connection.

Tag connection

With a direct tag connection, you connect a tag to a dynamic object of the process picture.

If the tag takes on a value in Runtime, this value is transferred directly to the dynamic object. The dynamic display of the object changes in Runtime according to the tag value.

In practice, the dynamic object of a process picture is connected to a process tag.
If there is a connection between WinCC and the automation system, the automation system supplies the process tag with values.
The dynamic object indicates the change of process values in Runtime.

In the "Graphics Designer" editor you can also configure objects that transfer values to the automation system. The automation system uses the transferred values to control the process.

Dynamization using an internal tag

You do not need an automation system for the "Quick_Start" project. In this project, you connect the internal tag "Tank_Level" to the graphic image of the bioconverter.

To specify values for the internal tag, you configure an I/O field. The I/O field is an input and output field that is used to display and change the tag values.

If you enter a value in the I/O field in Runtime, this value is received by the internal tag "Tank_Level". The internal tag transfers the entered value to the graphic object that depicts the bioconverter. The fill level indicator changes according to the tag value.

Activating WinCC Runtime

WinCC Runtime is started when a project is activated.

WinCC Runtime executes a project in process mode. The project is then in Runtime.

You perform operator control and monitoring of the processes in Runtime.
You specify the Runtime properties in WinCC Explorer.

6.4.1 Dynamizing the fill level indicator

Introduction

The following steps will show you how to dynamize the fill level indicator of the bioconverter.

The dynamization of the fill level indicator involves the following steps:

- Connecting the graphic picture of the bioconverter with the internal tag "Tank_Level"

  The connection to the internal tag "Tank_Level" allows the transfer of tag values to the graphic object that depicts the bioconverter. The fill level indicator changes according to the tag values in Runtime.

  A link between a tag and an object is indicated in the "Object Properties" window by means of the icon and by bold font.

- Specifying the update cycle

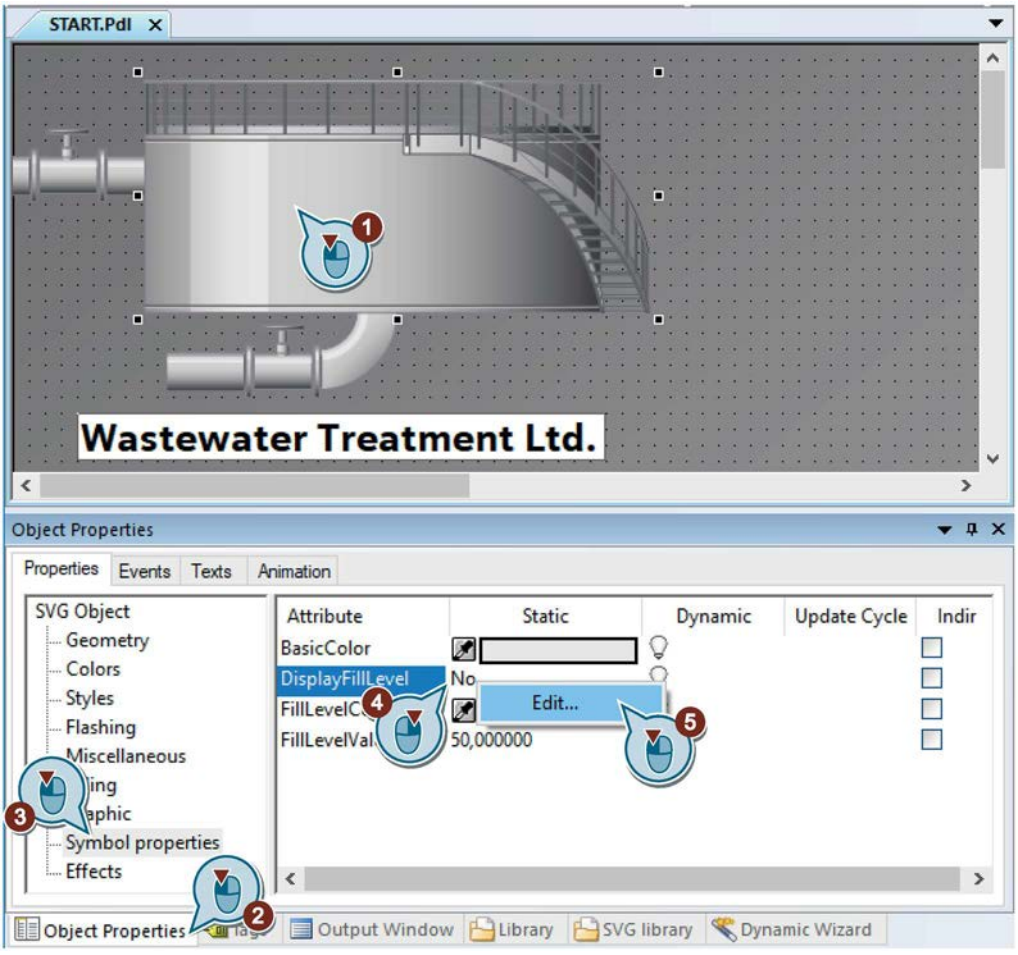
  The update cycle determines the time interval at which the fill level indicator is updated.

Requirement

- The "START.Pdl" process picture has been created.
- The internal tag "Tank_Level" has been created.
- The SVG object "Digester" has been inserted in the "START.Pdl" process picture as a graphic depiction of the bioconverter.

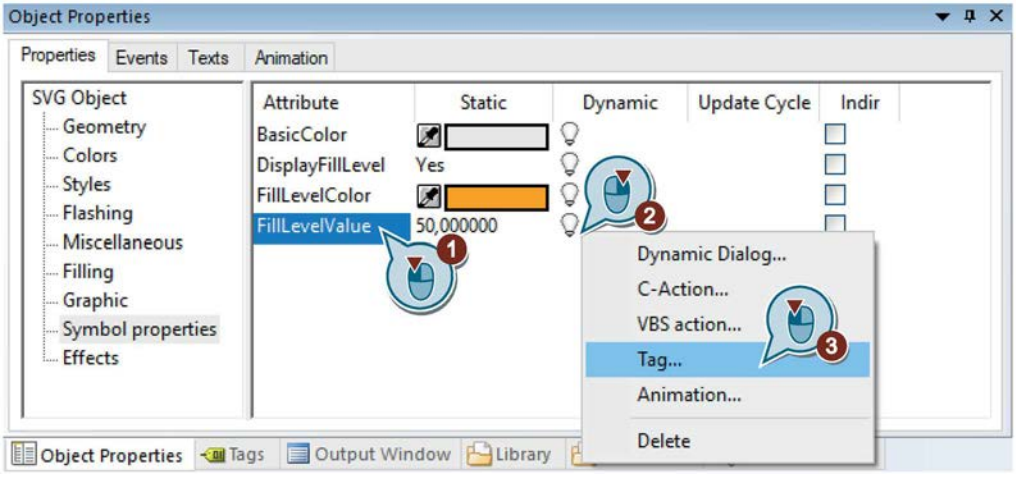
Procedure

1. Open the "START.Pdl" process picture and click on the "Digester" object.
2. Open the "Symbol properties" group in the "Object Properties" window and change the "DisplayFillLevel" attribute from "No" to "Yes".



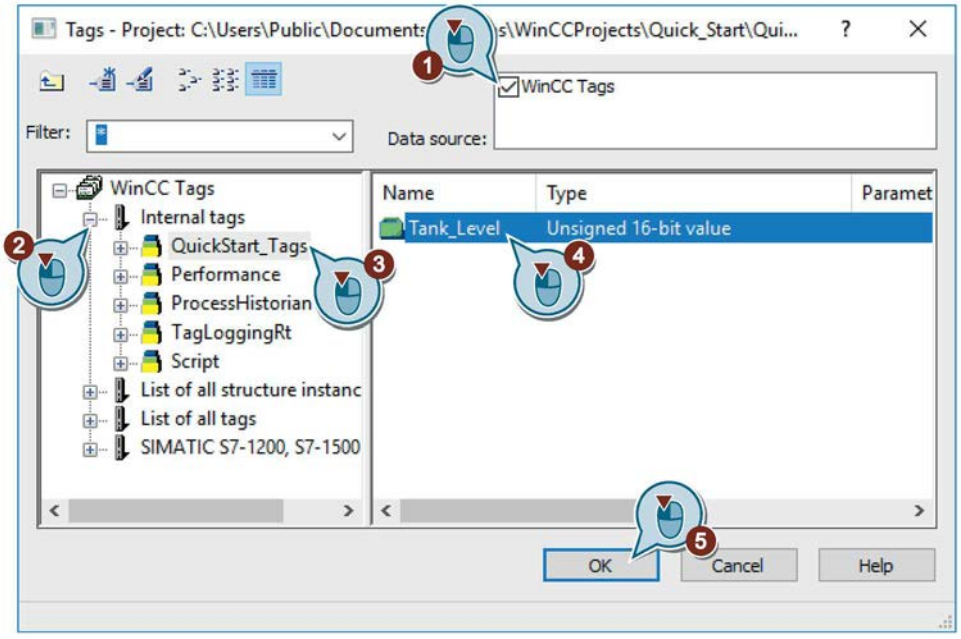
A bar graph is displayed as fill level indicator in the "Digester" SVG object.

3. Open the "Tag" dialog to link the "FillLevelValue" attribute with a tag.



4. Select the internal tag "Tank_Level".

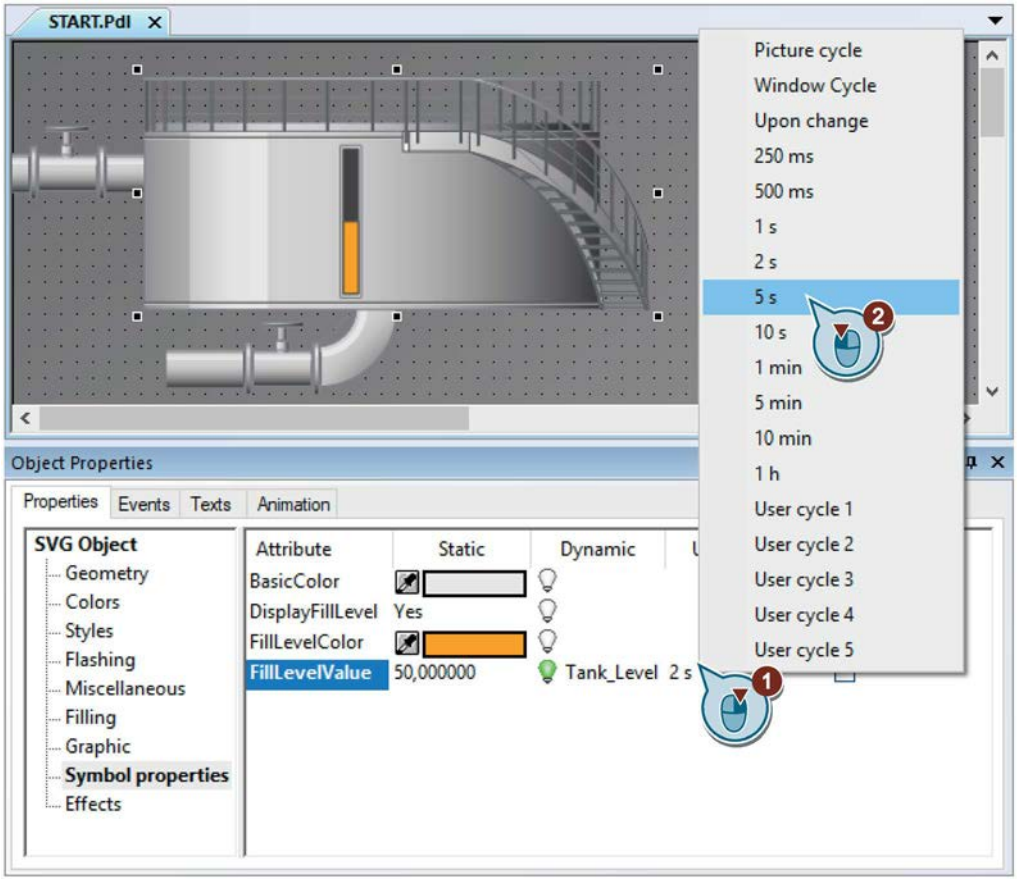
   If needed, select the "WinCC Tags" option in the "Data source" area.



   The transparent light bulb in the "FillLevelValue" line will turn green.

   The "Symbol properties" property and the "FillLevelValue" attribute are displayed in bold.

5. Set the value of the fill level update cycle to "5s".



Result

You have connected the internal tag "Tank_Level" to the graphic picture of a bioconverter. This connection allows the transfer of tag values to the graphic object.

Next steps

You insert an I/O field in the "START.Pdl" process picture for input and output of values.

6.4.2 Inserting and dynamizing an I/O field (graphics system - process pictures)

Introduction

The following steps show you how to insert and dynamize an I/O field.

The I/O field is an input/output field that is used to display and change tag values.

The dynamization of the I/O field involves the following steps:

- Connecting the I/O field with the internal tag "Tank_Level"

  You will connect the I/O field with the internal tag "Tank_Level" in the "Quick_Start" project. This establishes an indirect connection between the I/O field and the graphic of the bioconverter.

  If you enter a value in the I/O field in Runtime, this value is taken on by the internal tag "Tank_Level".
  The tag transfers the value to the graphic object that depicts the bioconverter.
  The fill level indicator of the bioconverter changes in Runtime according to the tag value.

- Defining update

  With the update you will define at which time intervals the display in the I/O field will be updated.

- Defining attributes "Low Limit Value" and "High Limit Value"

  With the attributes "Low Limit Value" and "High Limit Value" you can limit the input into the I/O field to a certain value range. Values outside the configured value range are declined by the system and are not displayed.

Requirement

- The "START.Pdl" process picture is open in the "Graphics Designer" editor.
- The internal tag "Tank_Level" has been created.

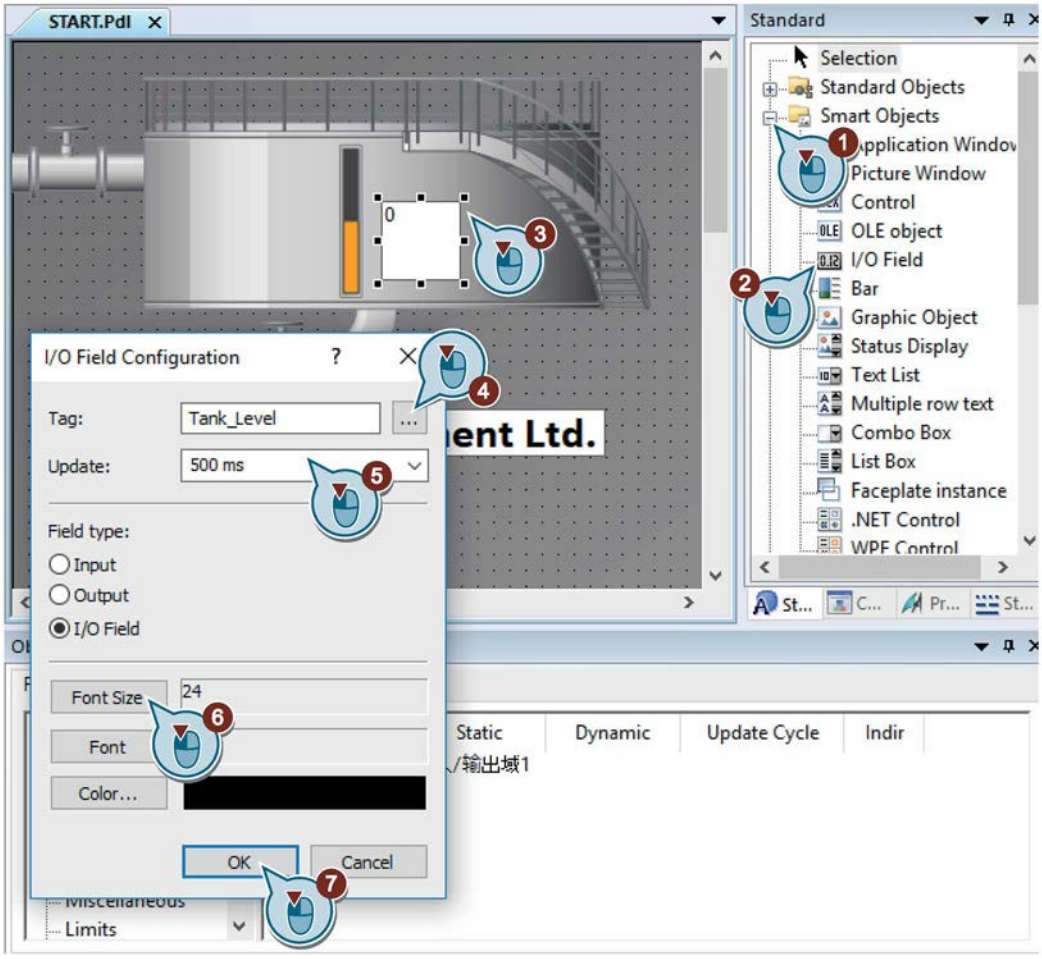
Procedure

1. To insert the "I/O Field" smart object, click on the object in the "Standard" window and then on the process picture.

   The I/O field appears on the work surface. The "I/O Field Configuration" dialog opens.

2. Link the "Tank_Level" tag with the new I/O field.

   Select 500 ms as update cycle and 24 as font size.

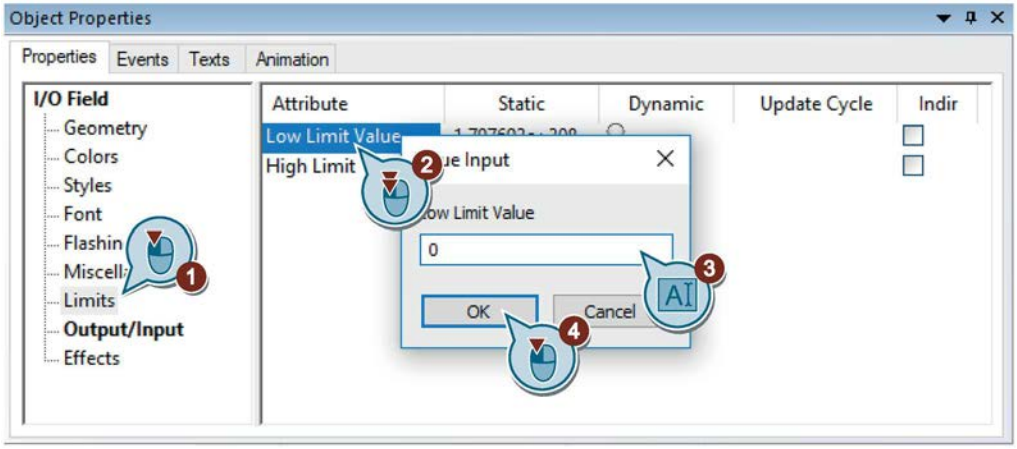


   Select the "Configuration Dialog" entry in the shortcut menu of the I/O field to reopen the "I/O Field Configuration" dialog.

   The "Output/Input" property is displayed in bold font in the "Object Properties" window. Here, you can see that the internal tag "Tank_Level" is connected to the I/O field.

   You can create the connection to a tag in the "I/O-Field Configuration" dialog as well as in the "Object Properties" window.

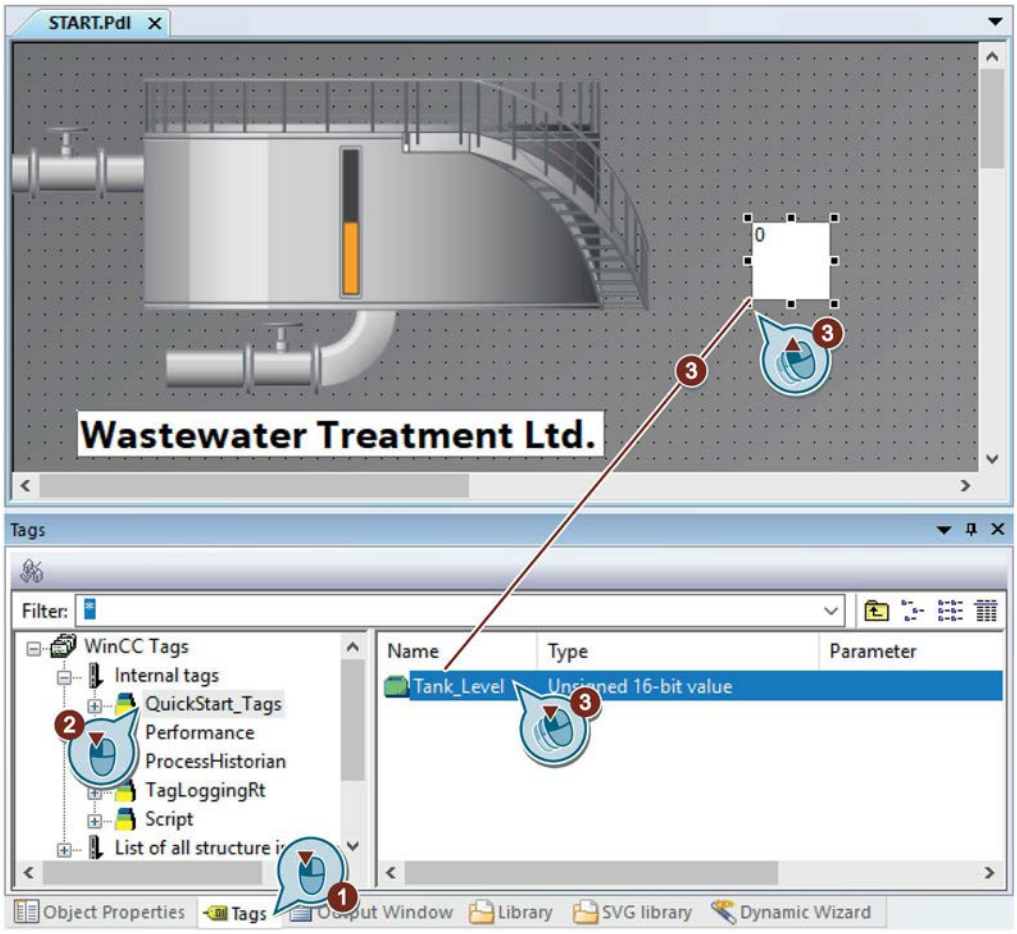
3. Open the "Limits" group in the "Object Properties" window and set the "Low Limit Value" to 0.



4. Similar to step 3, set 100 as a "High Limit Value".
5. Save the "START.Pdl" process picture.
6. Close the "Graphics Designer" editor.

Alternative procedure

1. Select the "Tank_Level" tag in the "Tags" window of the "QuickStart_Tags" tag group.
2. Drag-and-drop the tag into the process picture.



An I/O field is created for the selected tag.
The I/O field is connected with the "Tank_Level" tag.

3. Select "Configuration Dialog" from the shortcut menu of the I/O field to open the "I/O field configuration" dialog.
4. Select 500 ms as update cycle and 24 as font size.
5. To move the I/O field to the desired position, use the mouse or the arrow keys on the keyboard (cursor keys).

   Continue with step 3 of the above procedure.

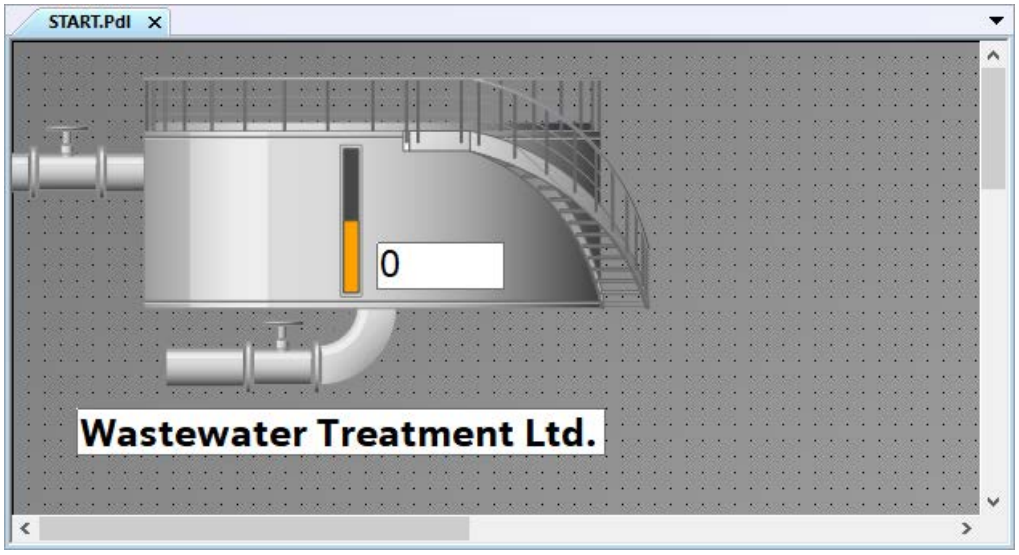
Result

You have inserted an I/O field and connected it with the internal tag "Tank_Level".

If you enter a value in the I/O field in Runtime, this value is transferred to the graphic picture of the bioconverter via the internal tag. The fill level indicator changes according to the entered value.

With the attributes "Low Limit Value" and "High Limit Value" you have defined a value range for the I/O field.

If you enter the value "0" in the I/O field in Runtime, an empty bioconverter is displayed.
If you enter the value "100" in the I/O field in Runtime, a full bioconverter is displayed.
Values outside the value range are declined by the system.



Next steps

- You create a user-defined menu to allow you to change between configured pictures in Runtime.
- You define the properties of WinCC Runtime and activate the "Quick_Start" project to view the dynamization of the "START.Pdl" process picture.

6.5 Creating user-defined menus and toolbars

Introduction

In this section, you will find a description of how to create customized menus and toolbars for a picture change.

Principle

In the "Menus and Toolbars" editor you can configure customized menus and toolbars.

The customized menus and toolbars are saved in a configuration file, which you assign to the project in the "Computer" editor in WinCC.

You connect menu items and symbols with Global Script procedures.

Further configuration possibilities:

- Assigning authorizations

  The logged-in operator must have the required authorization in order for the correspondingly configured elements to be displayed.

- Hiding or deactivating menu commands and symbols

  Create 2 configuration files with a different scope of functionality.

  Application example: On a user change in runtime, the current configuration file is replaced by the 2nd file.

6.5.1 Creating procedures for customized menus and toolbars

Introduction

The following steps will show you how to create procedures in a module in Global Script.

You will need two procedures in order to make the customized menus and toolbars functional:

- ActivatePicture(ByVal PictureName):

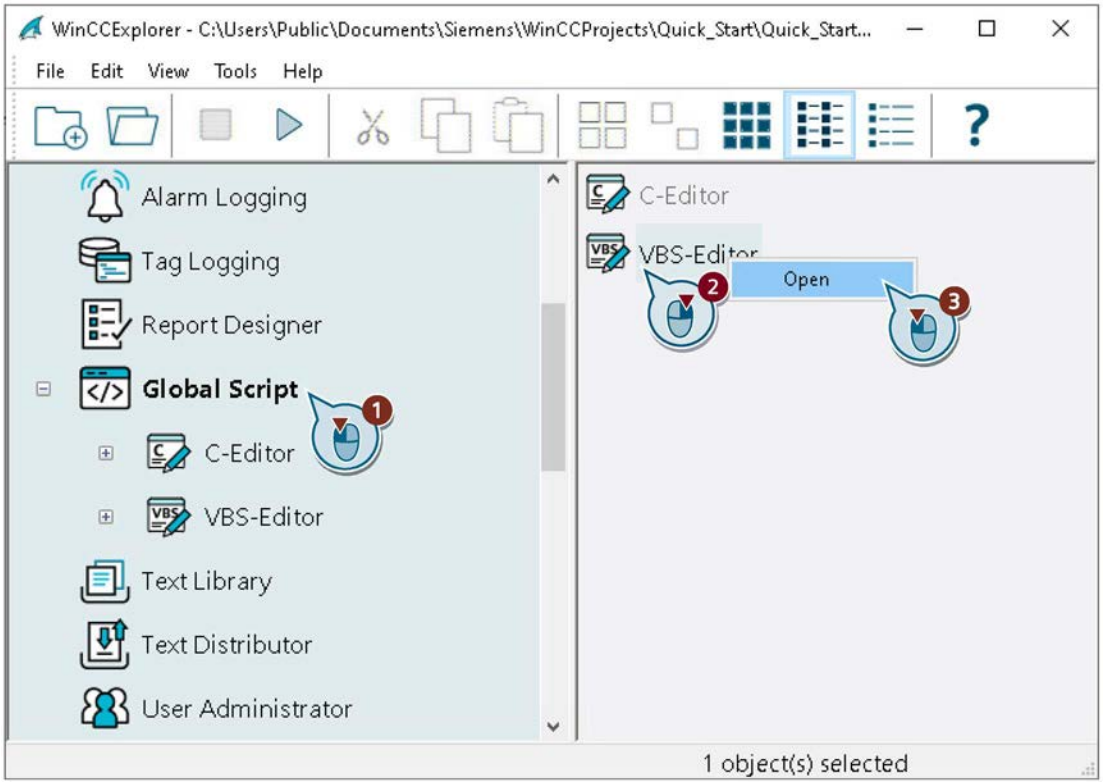
  Executes a picture change to the picture that is transferred with the "PictureName" parameter.

- StopRuntime(ByVal Item):

  Exits Runtime.

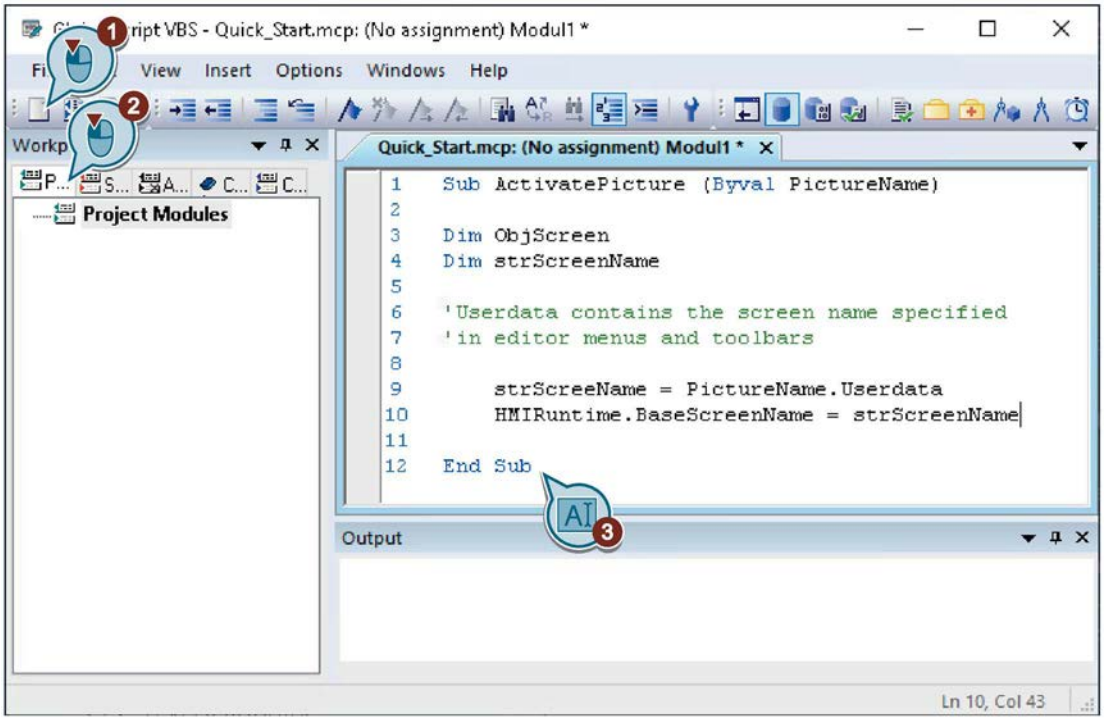
Procedure

1. Open the VBS-Editor.



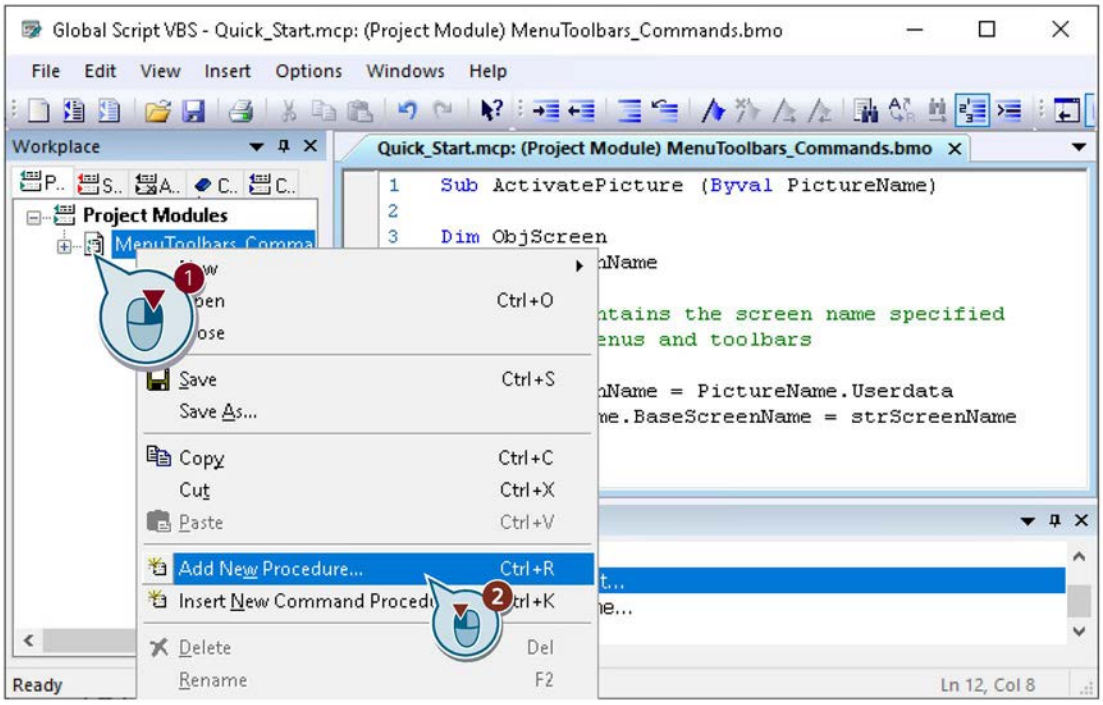
2. Select the "Project module" tab and write the following procedure code.

```
Sub ActivatePicture (Byval PictureName)

Dim objScreen
Dim strScreenName

'Userdata contains the screen name specified in editor menus and
toolbars

strScreenName = PictureName.Userdata
HMIRuntime.BaseScreenName = strScreenName

End Sub
```

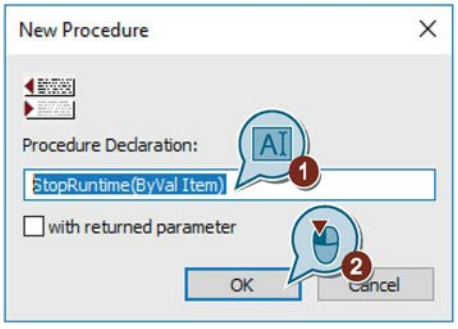


3. Save the module as file "MenuToolbars_Commands.bmo" using "File > Save".

4. Insert a new procedure.

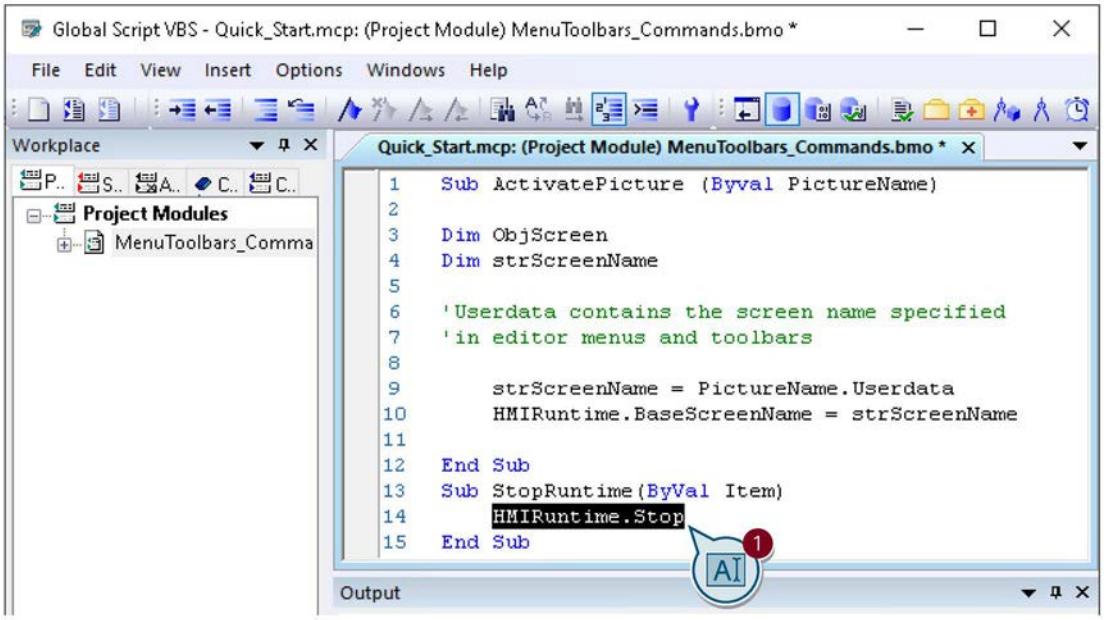


5. Enter the name "StopRuntime(ByVal Item)".



6. Write the following procedure code.

```
Sub ActivatePicture (Byval PictureName)

Dim objScreen
Dim strScreenName

'Userdata contains the screen name specified in editor menus and
toolbars

strScreenName = PictureName.Userdata
HMIRuntime.BaseScreenName = strScreenName

End Sub
Sub StopRuntime (ByVal Item)
 HMIRuntime.Stop
End Sub
```



7. Save the module.
8. Close the VBS-Editor.

Result

You have created the procedures "ActivatePicture(ByVal PictureName)" and "StopRuntime(ByVal Item)".

Next steps

- You create a customized menu that executes the picture change to the "START.Pdl" and "SAMPLE.Pdl" pictures.
- You will use a customized toolbar to exit Runtime.

6.5.2 Creating a customized menu for screen changes

Introduction

The following steps show you how to create the customized menu "Picture Change" with two menu items, "Start" and "Sample".

You will link the menu entries "Start" and "Sample" with the procedure "ActivatePicture(ByVal PictureName)".

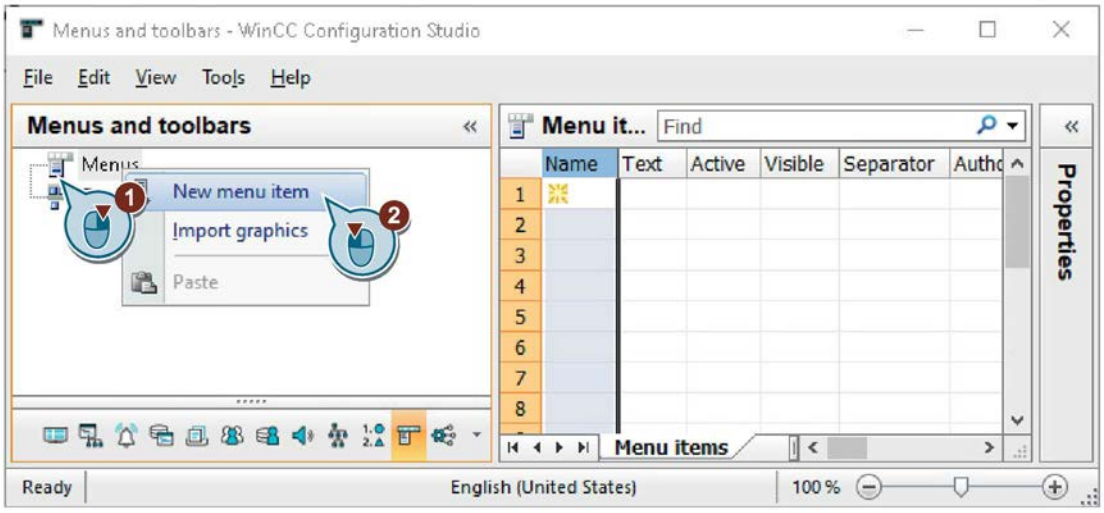
Enter the name of the process picture that you wish to change to in the "User data" box.

Requirement

- The procedure "ActivatePicture(ByVal PictureName)" has been created.

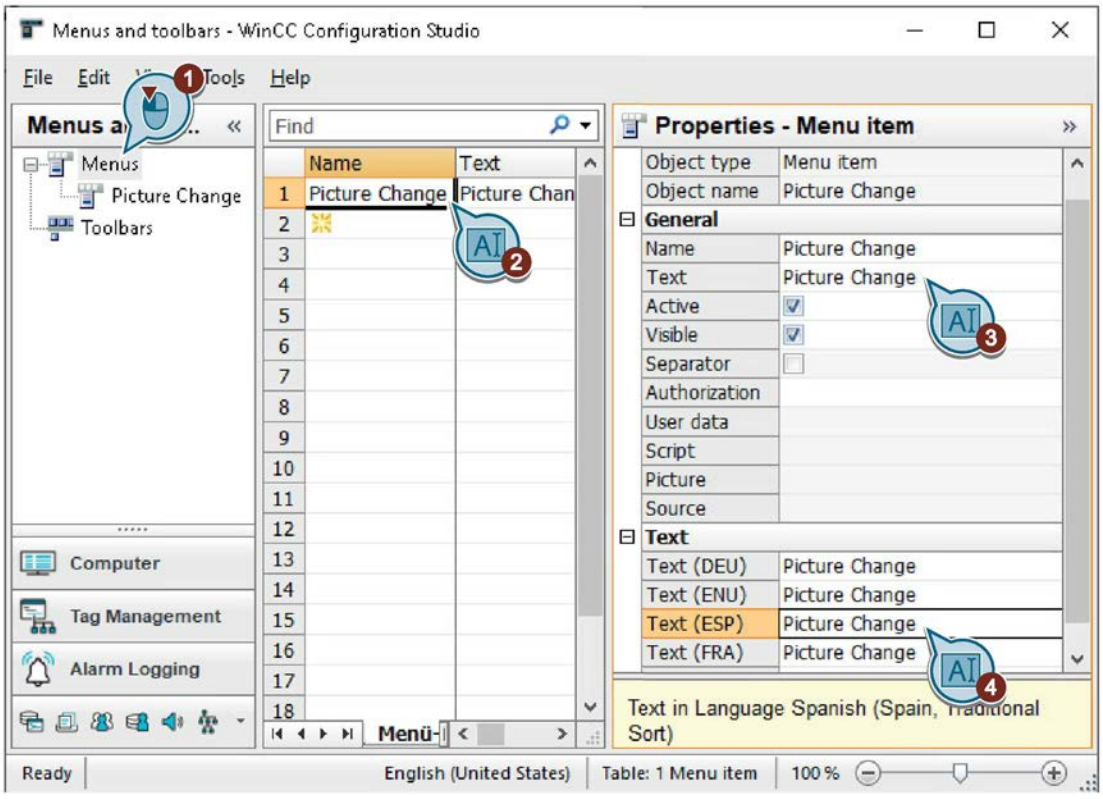
Procedure

1. Open the "Menus and toolbars" editor.
2. Create a new menu item.

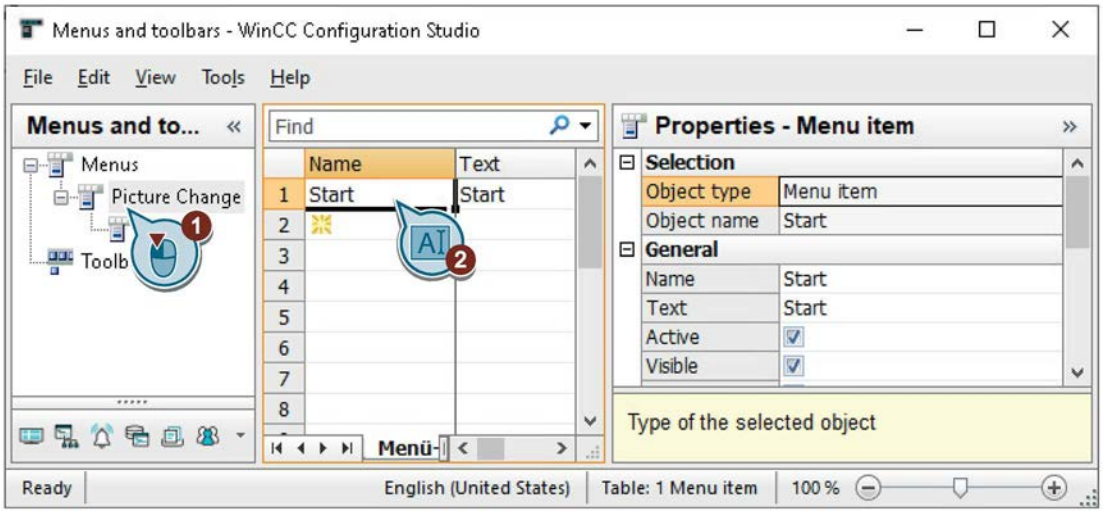


3. Give the menu item the name "Picture Change".

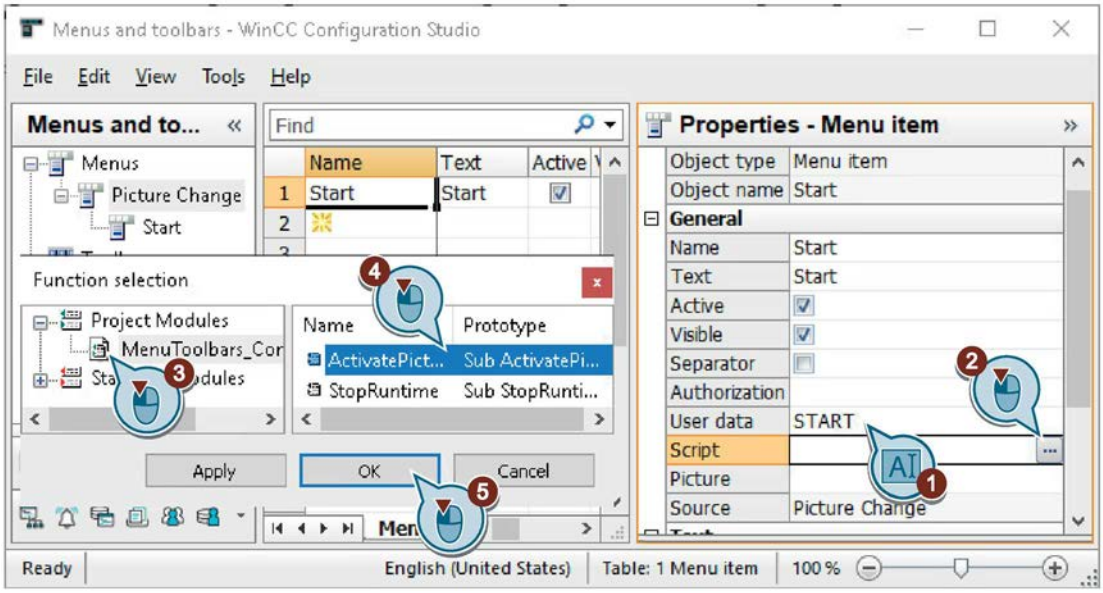
   In the "Properties" window, you can enter the name for other Runtime languages in the "Text" area.



4. Create the "Start" menu command.



5. Configure the menu item "Start" so that it executes a picture change to the "START.Pdl" picture.

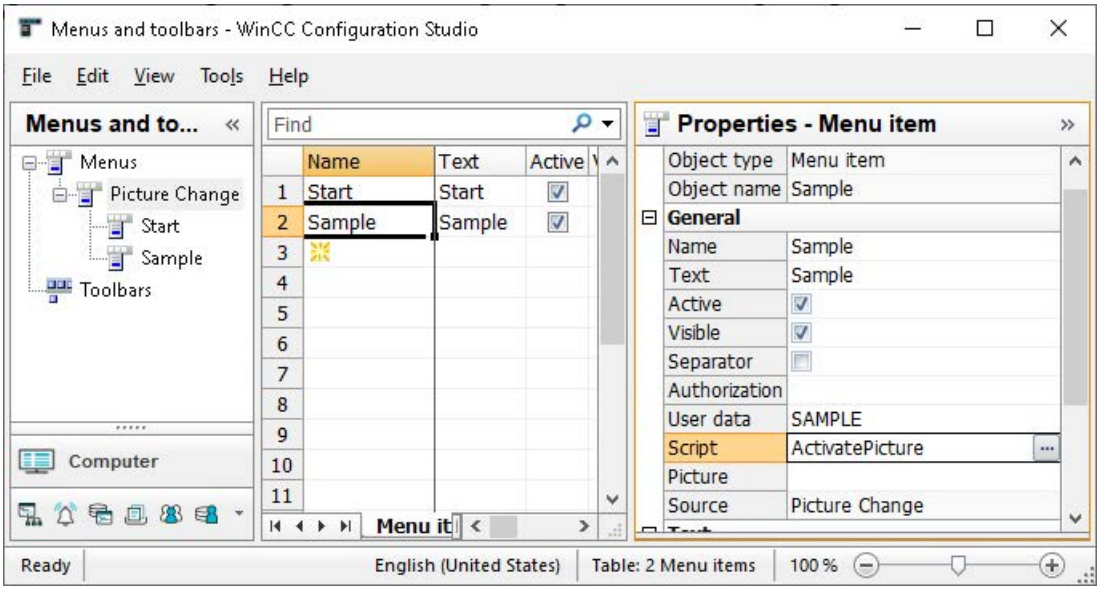


6. Use the same procedure to create the menu item "Sample" that executes a picture change to the "SAMPLE.Pdl" picture.
7. Save the configuration under the name "ActivatePicture" using "File > Save".

Result

You have created the "Picture Change" menu with two menu commands.

You use the menu items in Runtime to change to the "START.Pdl" and "SAMPLE.Pdl" process pictures.



6.5.3 Creating a customized toolbar to exit Runtime

Introduction

The following steps show you how to create a customized toolbar with an icon to exit Runtime.

Graphic files for symbols

Copy a graphic file to be displayed as a symbol to the following folder:

- <Project folder>\GraMT\mtimages

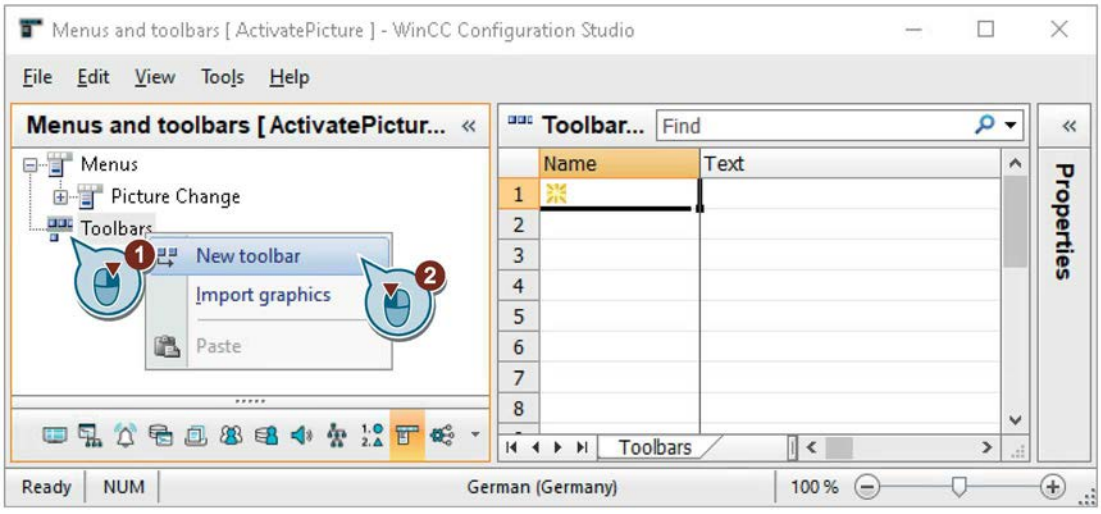
You use a graphic, e.g. in BMP, PNG, JPG or GIF format, as a symbol.

Requirement

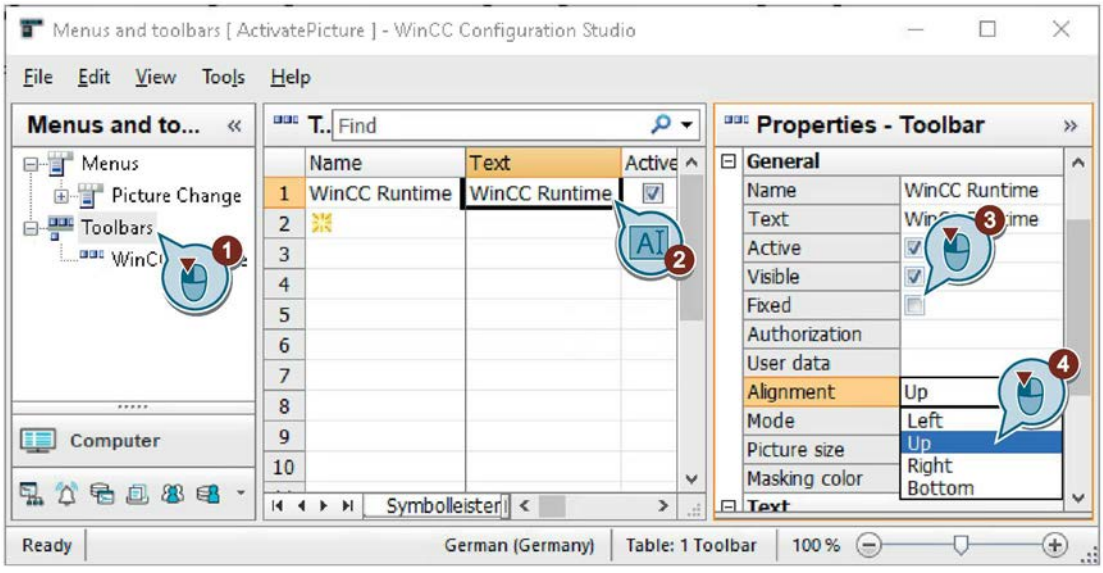
- The "ActivatePicture" configuration is open in the "Menus and toolbars" editor.
- The "StopRuntime(ByVal Item)" procedure has been created.
- A graphics file has been copied to the WinCC project folder as the symbol for "Exit Runtime", e.g.:
  - C:\Users\Public\Documents\Siemens\WinCCProjects\Quick_Start\GraMT\mtimages

Procedure

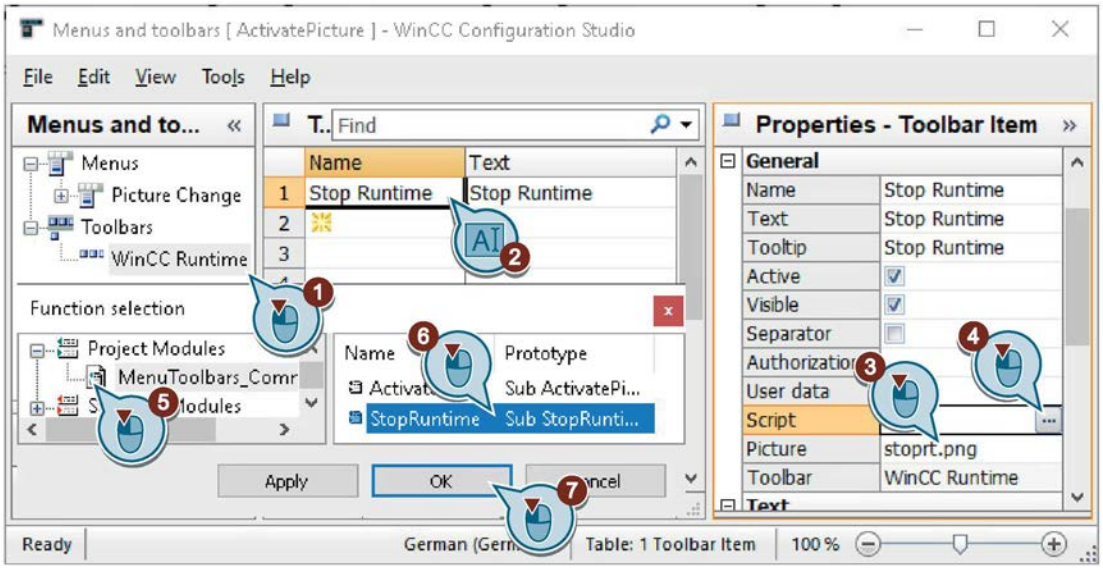
1. Create a new toolbar and enter "WinCC Runtime" as name.



2. Configure the toolbar so that it is displayed by default at the upper edge of the picture, while allowing users to change the position.



3. Create a "Stop Runtime" element and configure an icon that is used to stop Runtime.
   The graphic "stoprt.png" is used as the icon in this example.



4. Save the "ActivatePicture" configuration.
5. Close the "Menus and toolbars" editor.

Result

You have created the toolbar with an icon to exit Runtime and saved the configuration.

Next steps

To display the menu bar and toolbar in Runtime, select the configuration file when specifying the Runtime properties.

In Runtime, the user-defined menus and toolbars are then displayed in each process picture.

If you generate additional process pictures in the course of the Getting Started, you can extend the menu configuration to include the additional pictures using the steps shown.

6.6 Executing a project in Runtime

6.6.1 Defining Runtime properties (graphics system - process pictures)

Introduction

The following steps will show you how to define the properties for WinCC Runtime.

You configure the properties of WinCC Runtime in the "Computer" editor of the WinCC Configuration Studio.

You set up WinCC Runtime so that Graphics Runtime is executed when the project is activated.

Select the "START.Pdl" process picture as the start screen for the Runtime window.

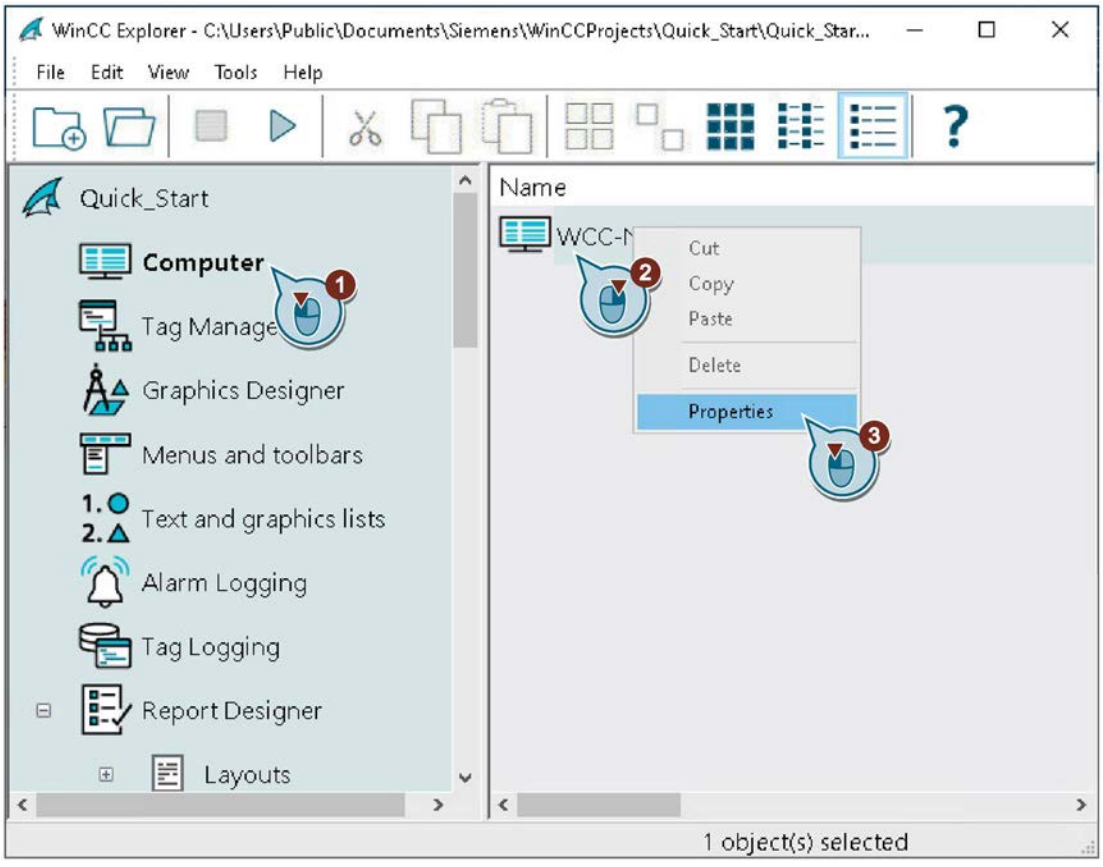
Load the created configuration file to display the user-defined menu and the toolbar in the process pictures.

Requirement

- The "Quick_Start" project is open.

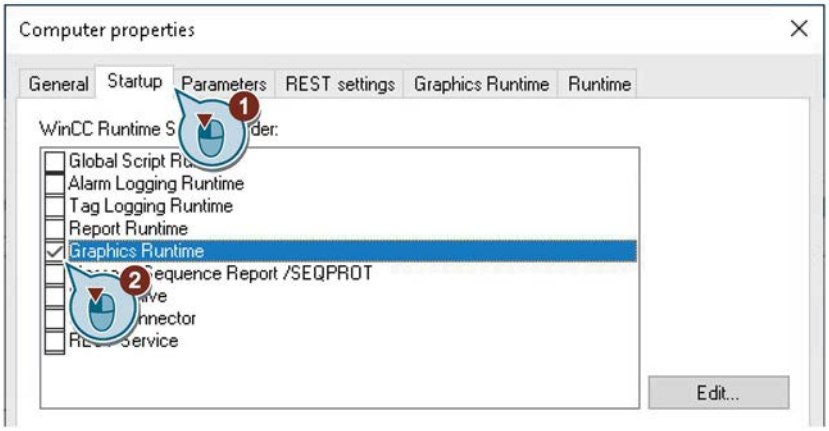
Procedure

1. Select the computer name under "Computer" and the "Properties" entry in the shortcut menu.

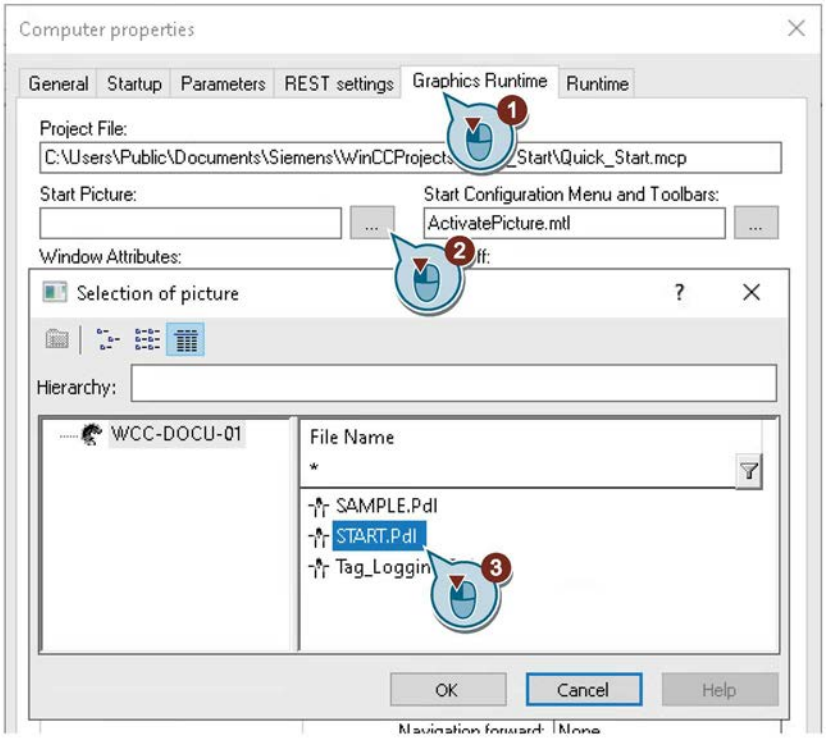


   The "Computer" editor opens.

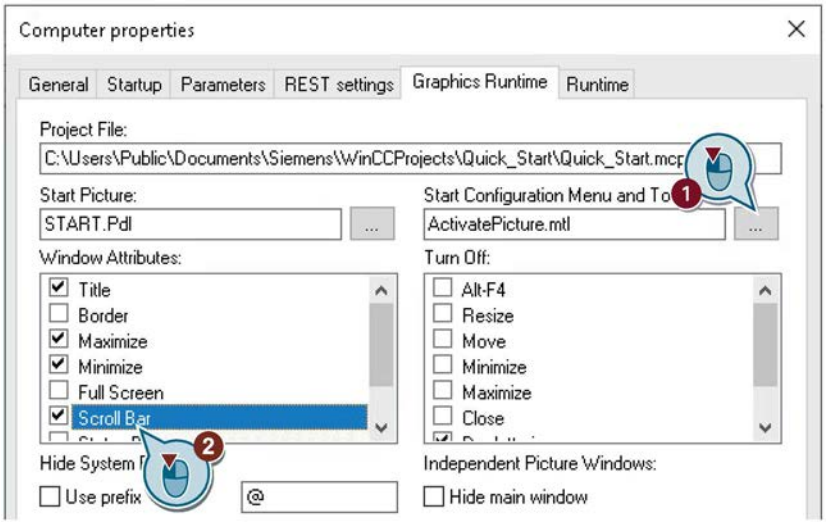
2. Select the "Graphics Runtime" application on the "Startup" tab.



3. On the "Graphics Runtime" tab, define the "START.Pdl" process picture as the start picture.



4. Select the configuration file for the menu and toolbars "ActivatePicture.mtl".
5. Activate the "Title", "Maximize", "Minimize", and "Scroll Bar" window attributes.



Result

You have defined the WinCC Runtime properties.

When the "Quick_Start" project is activated, the "Graphics Runtime" component runs. The "START.Pdl" process picture is displayed as the start picture.

The customized menus and toolbars are displayed in every process picture to navigate and exit Runtime.

You use the window attributes to determine the additional functions of the Runtime window.

Next steps

You activate the "Quick_Start" project.

6.6.2 Activating the project (graphics system - process pictures)

Introduction

The following steps show you how to activate the "Quick_Start" project and how to operate the dynamic process picture "START.Pdl" in runtime.

When activating the project, WinCC Runtime is started. WinCC Runtime runs the project in process mode.

In Runtime you will operate the configured I/O field and observe the changes in the fill level indicator.

Requirement

- The Runtime properties are defined.

Procedure

1. Activate the "Quick_Start" project using the toolbar button in WinCC Explorer.

   The Runtime window will open after a short loading time.
   The "START.Pdl" process picture is displayed.

2. Enter values between 0 and 100 in the I/O field and confirm your entry with <Return>.

   Observe the changes in the fill level indicator.

3. To switch to the "SAMPLE.Pdl" process picture, click on the "Sample" entry in the "Picture Change" menu.

4. To return to the "START.Pdl" process picture, click on the "Start" entry in the "Picture Change" menu.
5. Click the configured toolbar button to exit Runtime.

   Alternatively, stop Runtime using the button in the WinCC Explorer toolbar.

Result

You have activated the "Quick_Start" project and thus started WinCC Runtime.
The dynamic process picture "START.Pdl" is displayed in the runtime window.

If you enter a value in the I/O field, this value is transferred to the graphic picture of the bioconverter via the internal tag "Tank_Level".
This will allow you to monitor the fill level indicator of the bioconverter.

Next steps

You test the "Quick_Start" project and use the "Tag simulation" editor to simulate the internal tag "Tank_Level".

See also

Creating a customized toolbar to exit Runtime (Page 80)

6.6.3 Testing the project (graphics system - process pictures)

Introduction

The following steps show you how to test the "Quick_Start" project by means of the WinCC TAG Simulator.

The WinCC TAG Simulator allows testing of a project, which is still in the development stage. During testing you will check how the project acts when connected to an automation system.

In the "Quick_Start" project, you simulate the values of the internal tags "Tank_Level" with the WinCC TAG Simulator. You configure the simulation in the "Tags Simulation" editor in the WinCC Configuration Studio.

The WinCC TAG Simulator assigns different values to the internal tag "Tank_Level". As the internal tag is connected to the graphic depiction of the bioconverter, the fill level indicator of the bioconverter will change according to the tag values.

Requirement

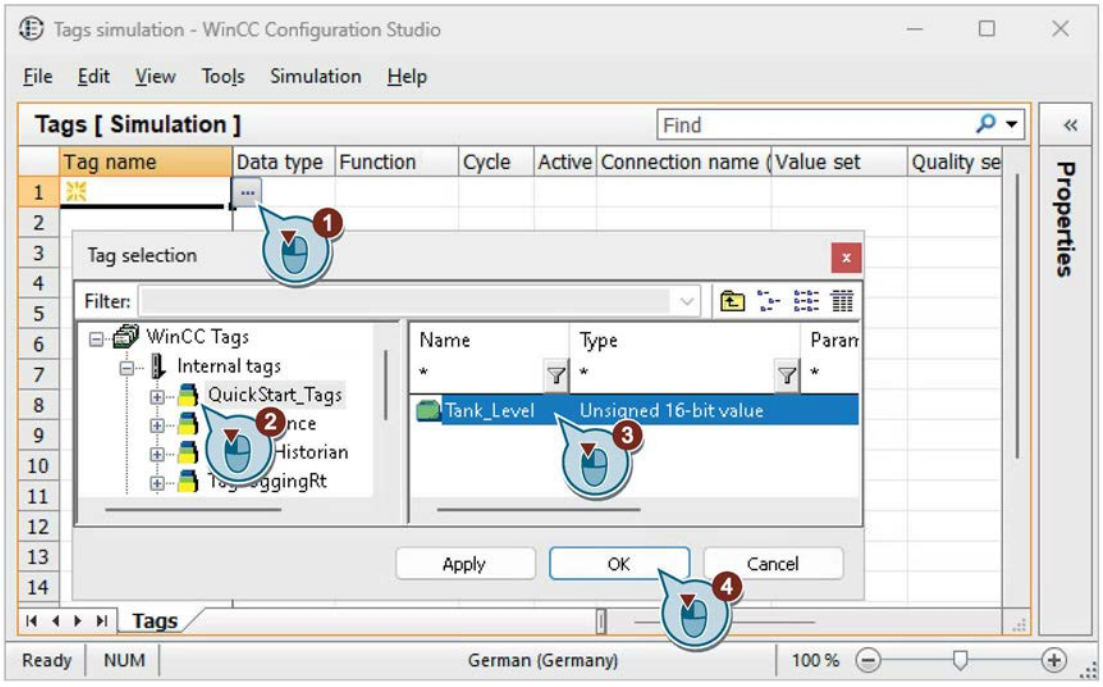
- The Runtime properties are defined.

Procedure

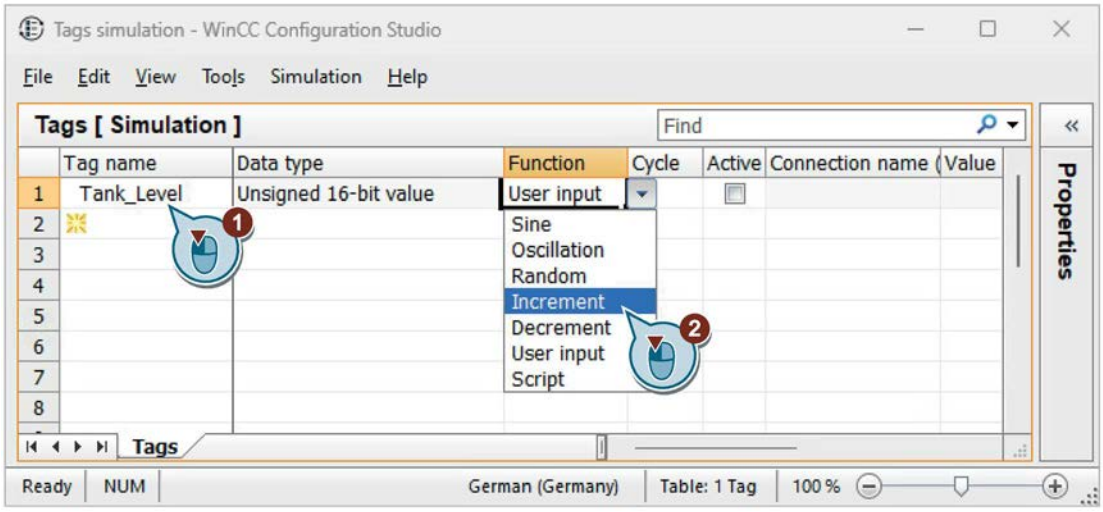
1. Start the "Tags Simulation" editor.

   The "Tags Simulation" editor opens.

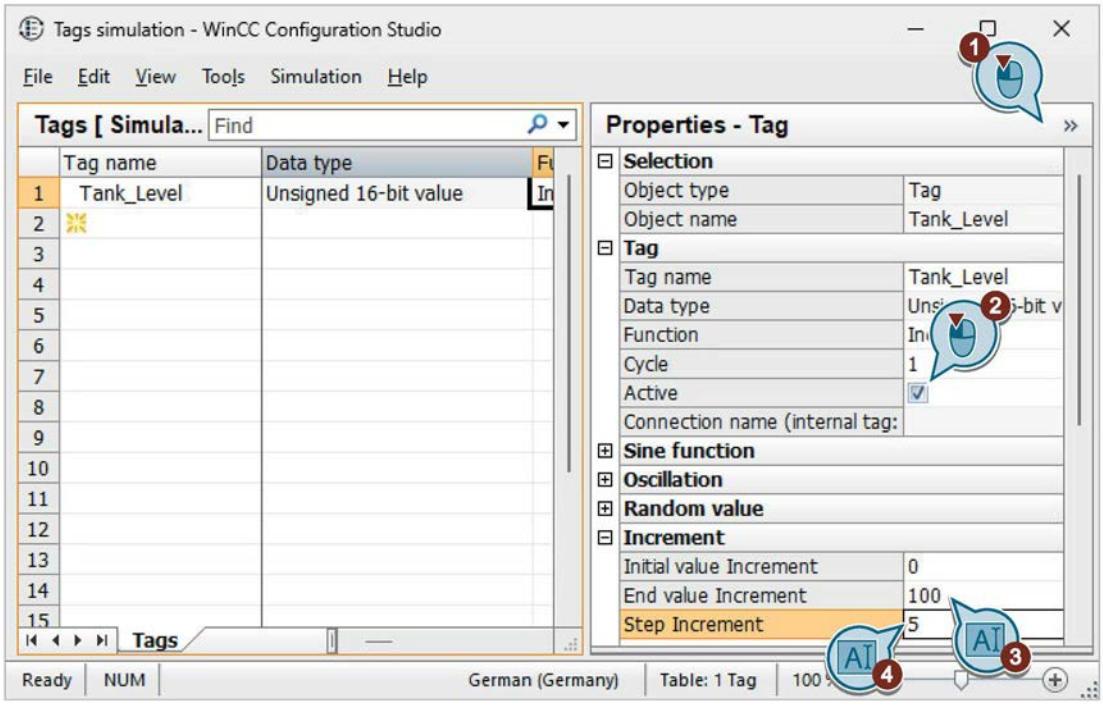
2. Open the tag selection dialog and select the internal tag "Tank_Level" from the tag group "QuickStart_Tags".



3. Select the simulation type "Increment".

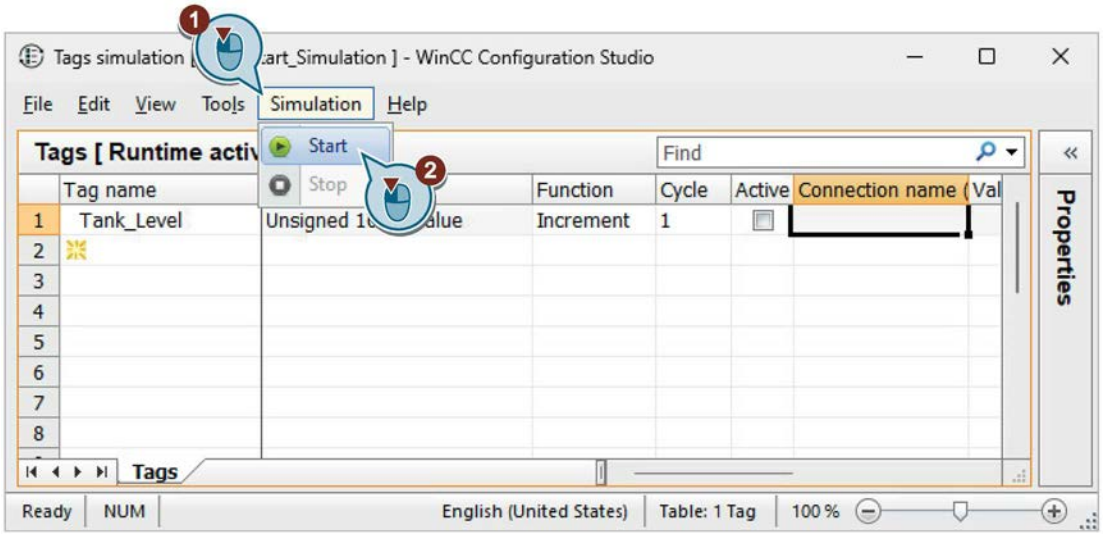


4. Open the "Properties" window and define the properties of the simulation type.



5. Save the simulation as "QuickStart_Simulation".
6. Activate WinCC Runtime in the WinCC Explorer using the button.

7. Start the simulation in the "Tags Simulation" editor.

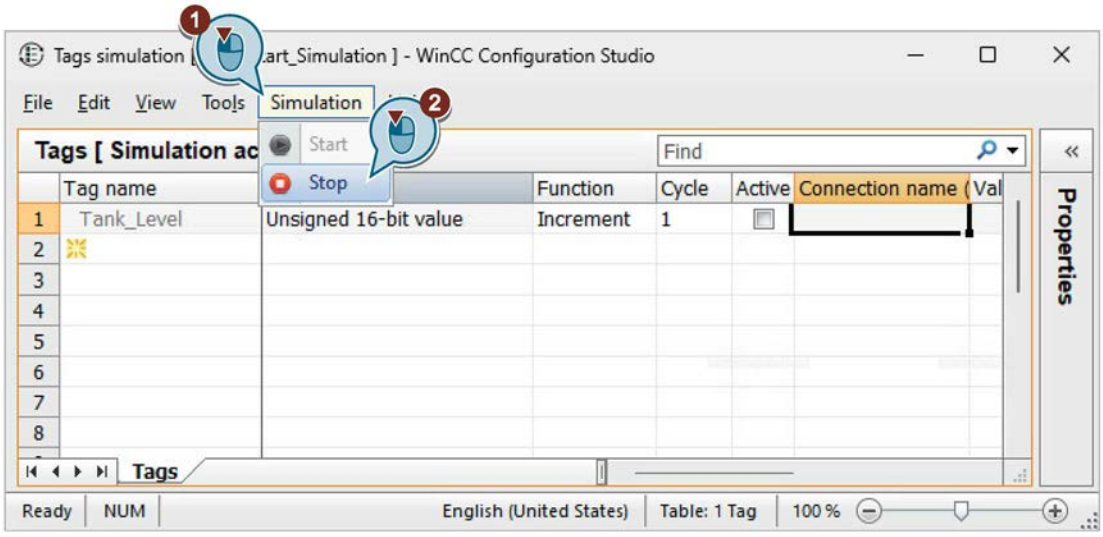


8. Position the "Tags Simulation" editor and the Runtime window in such a way that you can monitor both.

   Observe how the different simulation values affect the fill level indicator.

   The configured update cycles cause different display delays.

9. Exit the simulation and WinCC Runtime.



Result

You have tested "Quick_Start" project by means of the WinCC TAG Simulator.

The test shows the behavior of the project when it is supplied with process values.

6.6.4 Using Runtime system dialogs

Introduction

The Runtime system dialogs can be used to perform actions that are frequently required in Runtime. You do not need to configure the actions in the pictures.

Possible actions include:

- Close Runtime system dialogs
- Display start picture
- Display previous picture
- Display next picture
- Display favorite picture
- Select language

The following steps show you how to activate the Runtime system dialogs.

The example demonstrates the change between two pictures.

Requirement

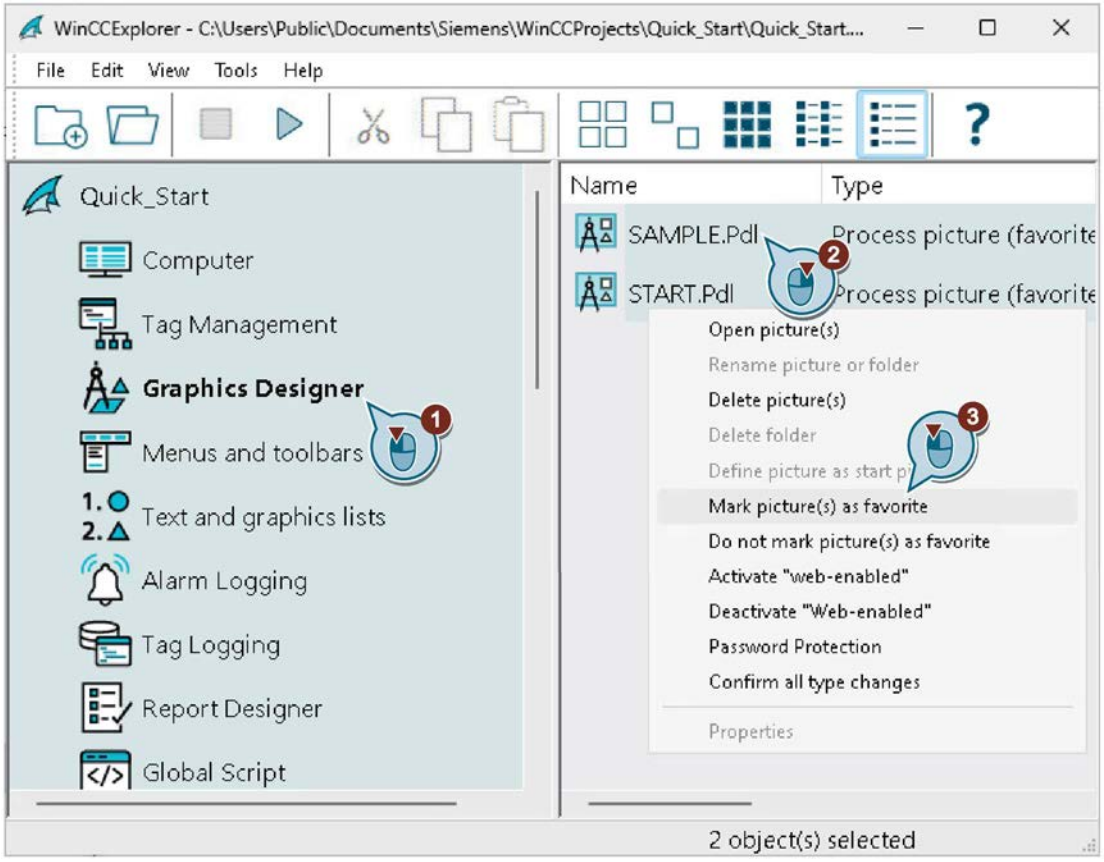
- The "START.Pdl" and "SAMPLE.Pdl" process pictures have been created.
- The "START.Pdl" process picture has been defined as the start picture.

Procedure

1. In WinCC Explorer, select the "START.Pdl" and "SAMPLE.Pdl" process pictures.

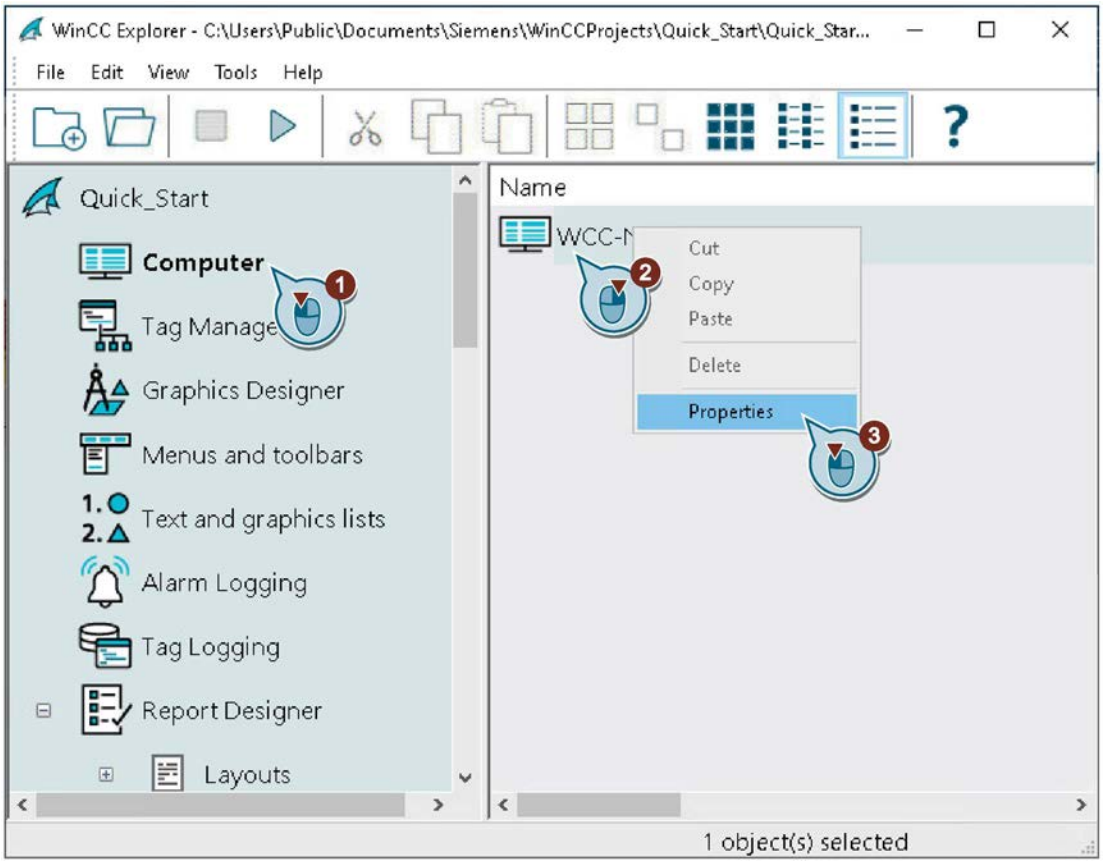
   To select both pictures, press the <Ctrl> button when clicking.

2. Mark the process pictures as favorites.



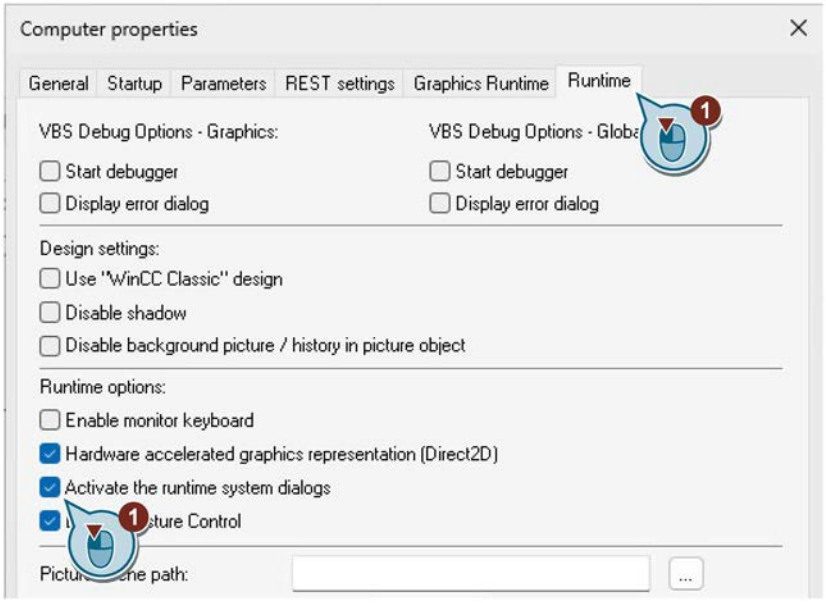
The "START.Pdl" and "SAMPLE.Pdl" process pictures are displayed as favorites in the right pane of WinCC Explorer.

3. Open the properties of the computer via the shortcut menu in the navigation area of the "Computer" editor.

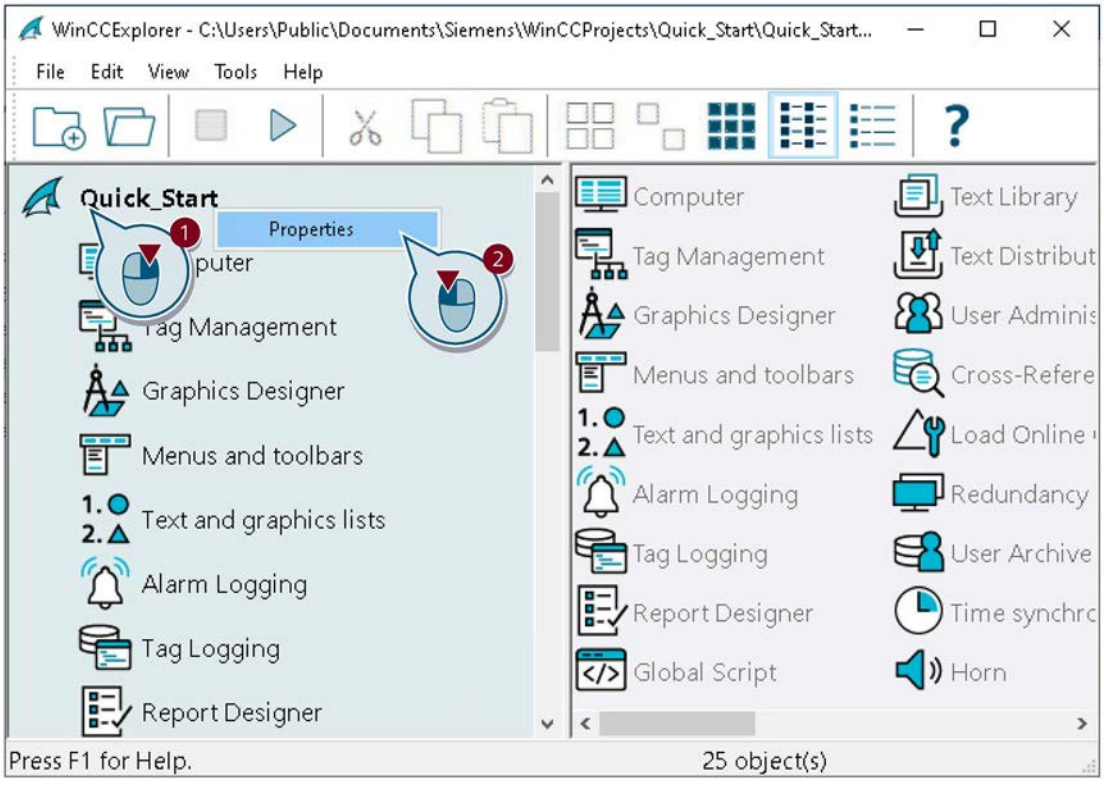


The "Computer" editor opens.

4. In the "Runtime options" area of the "Runtime" tab, activate the "Activate the runtime system dialogs" option.

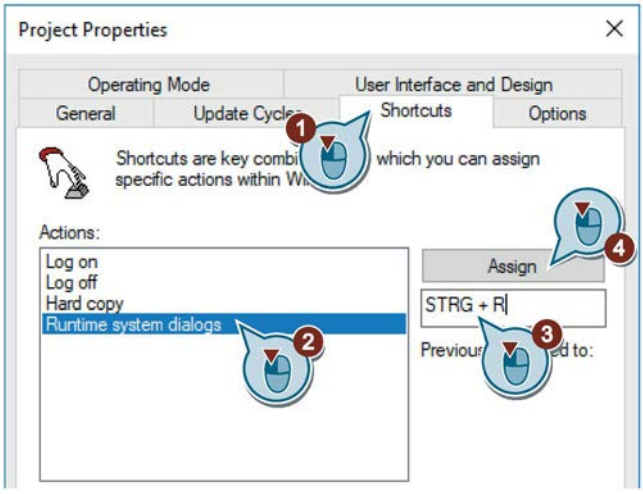


5. Open the project properties via the shortcut menu of the "Quick_Start" project.



The project properties open.

6. On the "Shortcuts" tab, assign a keyboard shortcut, such as <Ctrl+R>, to the "Runtime system dialogs" action.

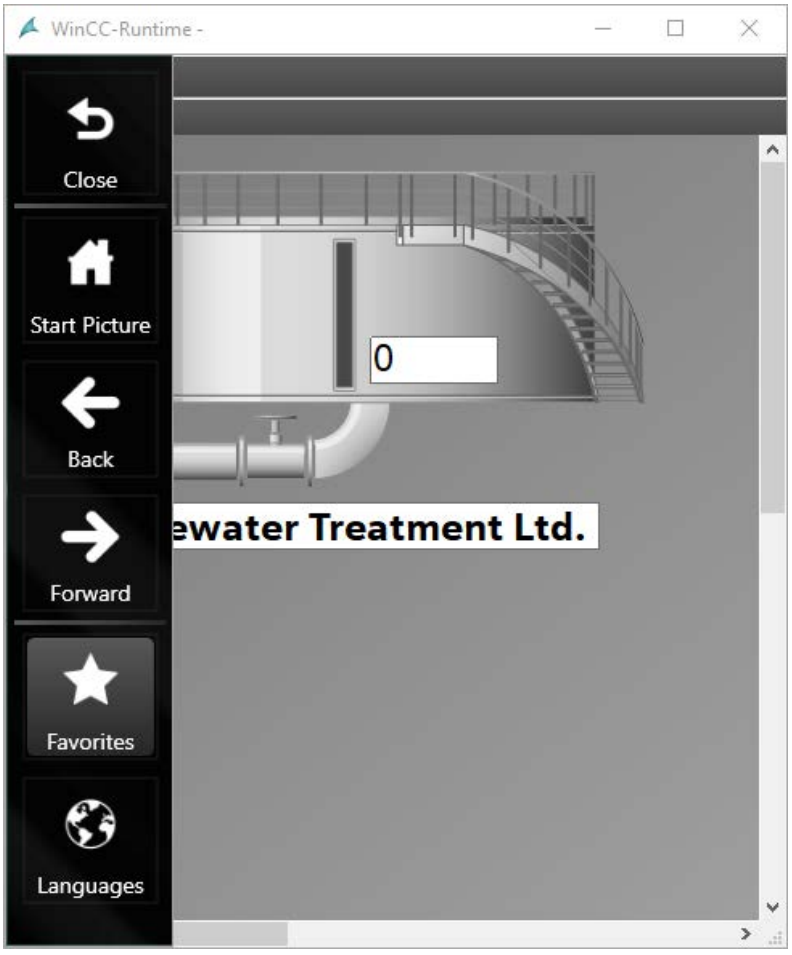


7. Activate the "Quick_Start" project.

   The Runtime window will open after a short loading time.
   The "START.Pdl" process picture is displayed.

8. Start the Runtime system dialog with the assigned keyboard shortcut, e.g. <Ctrl+R>.

   The Runtime window opens and displays the system menu.



9. Click "Favorites" and the "SAMPLE" process picture.

The Runtime system dialog is hidden and the "SAMPLE.Pdl" process picture is displayed.

Result

You have activated and tested the Runtime system dialogs.

You can use the system dialogs to navigate between the created process pictures and change the language of WinCC Runtime.

Configuring faceplate types and tag structures 7

7.1 Configuring faceplate types

Introduction

This section provides information on how to use faceplate types and structure tags to configure reusable customized templates for process pictures.

Faceplate types and structure tags assist you in configuring objects and tags for multiple use.

The faceplate types are created as individual files. The management of these files in WinCC corresponds to the handling of process pictures.

Principle

Faceplate types

You configure faceplate types in the "Graphics Designer" editor in exactly the same way as process pictures. You place static, dynamic and operable objects and connect them to tags. This produces a template that you can use as a faceplate instance in process pictures as often as desired. This type-instance model reduces configuring effort significantly.

In the case of multiple use, you link comparable individual tag groups by linking the faceplate type with a structure type.

Tag Management: Structure types

Structure types are templates for the scheme of a specific compilation of tags.
The structure type is assigned to different structure tags.
As a result, these structure tags always consist of the same elements as the structure type but as standalone structure instances.

If a structure type has been linked with a faceplate type, you place the faceplate instances by dragging the structure instances into the process picture using drag-and-drop.

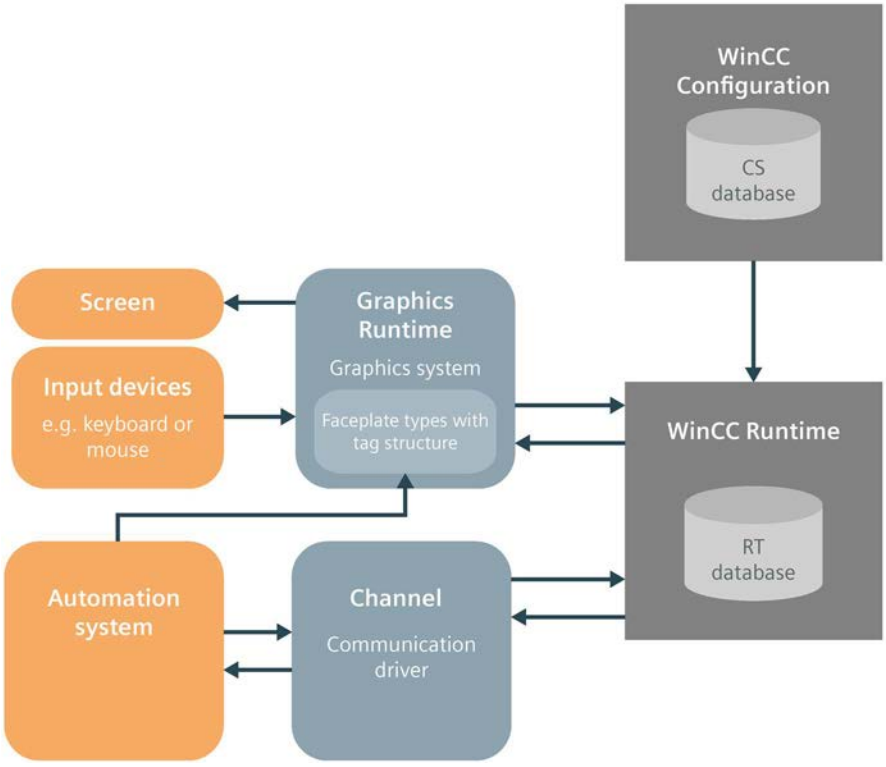
In practice, structure types and the associated instances are imported from a PLC or third-party application and do not have to be manually configured individually.

To export data records from a TIA Portal project, use the "SIEMENS SIMATIC SCADA Export" tool.

You can find the tool for download as well as more information on the Industry Online Support page:

- Industry Online Support: Download "SIMATIC SCADA Export for TIA Portal" (ID 109748955) (https://support.industry.siemens.com/cs/ww/en/view/109748955)
- Industry Online Support: "SIMATIC SCADA Export" documentation (ID 101908495) (https://support.industry.siemens.com/cs/ww/en/view/101908495)

Faceplate types and tag structures in the WinCC system



Configuring in the "Quick_Start" project

The "START.Pdl" process picture contains two valves, which apart from their graphical representation have played no role up to now.

The project will now be expanded to display a popup screen when each valve is clicked. The popup screen shows additional information, such as temperature and flow rate. You use faceplate types and structure types to avoid having to create the associated tags and the popup screen multiple times.

In this section you create the following:

- One structure type and two structure tags
- One faceplate type that is linked with the structure type
- One popup picture that is linked with the faceplate type

You use the created faceplate type as faceplate instances in your process picture.

To demonstrate the added value of faceplate types, you add a color visualization of the valve state to the project.

7.2 Creating structure tags

7.2.1 Creating a structure type

Introduction

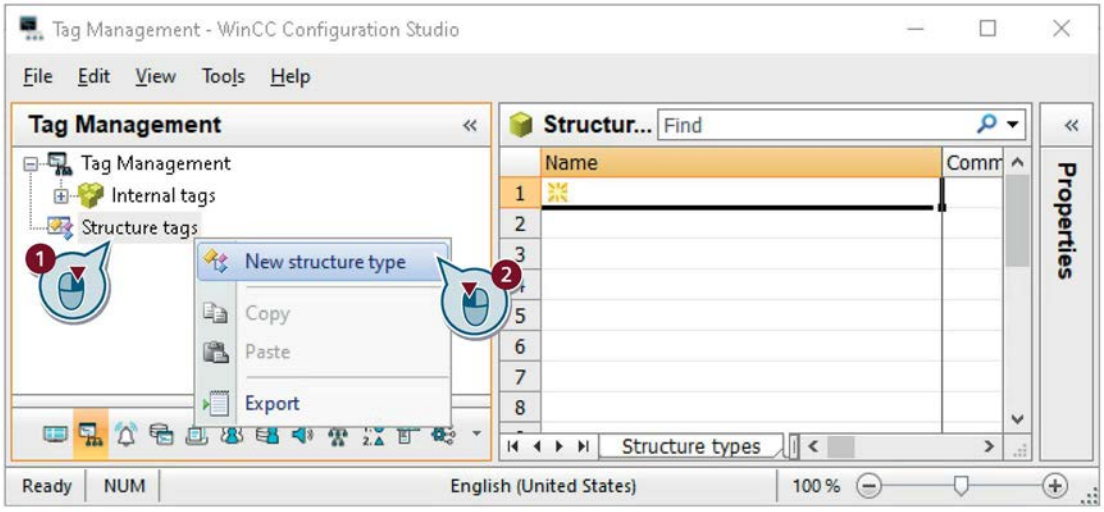
The following steps show how to create a structure type and the associated structure type elements.

Requirement

- The "Quick_Start" project is open.

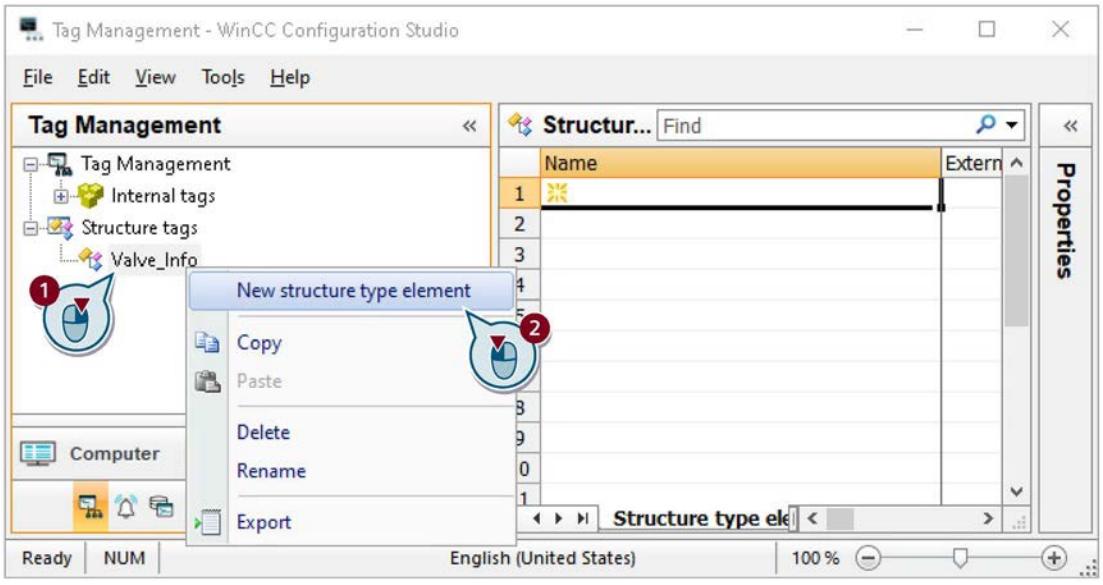
Procedure

1. Create a new structure type under the "Structure tags" entry in the Tag Management.

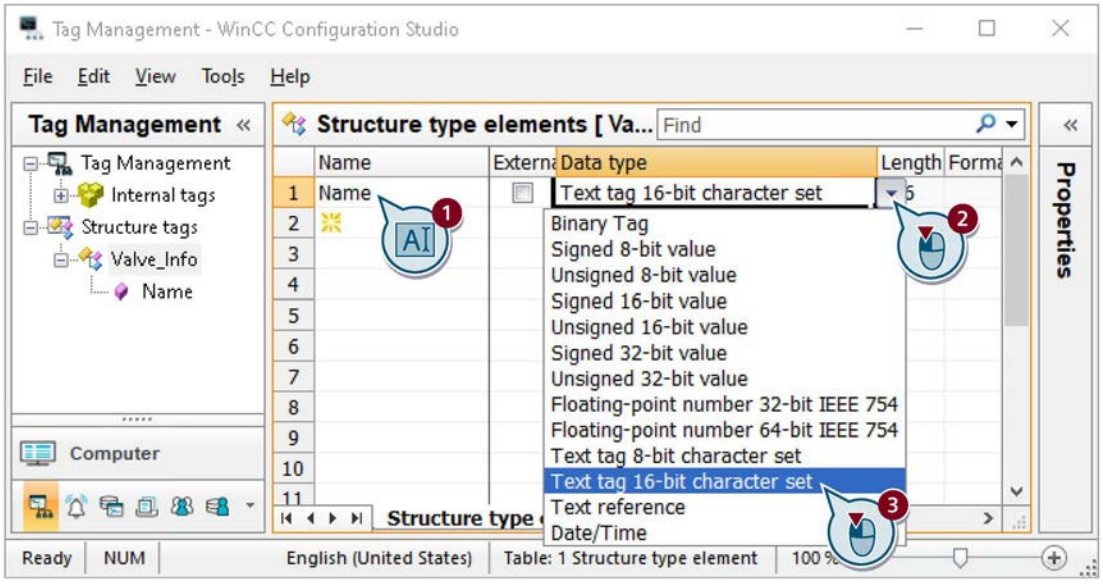


2. Enter "Valve_Info" as the name of the structure type.

3. Create a structure type element for the "Valve_Info" structure type.



4. Enter "Name" as the name and select the data type "Text tag 16-bit character set".



5. Create additional structure type elements with the following properties via the shortcut menu:

Name	Data type
Status	Binary tag
Temperature	Floating-point number 64-bit IEEE 754
Pressure	Floating-point number 64-bit IEEE 754
Flow	Floating-point number 64-bit IEEE 754

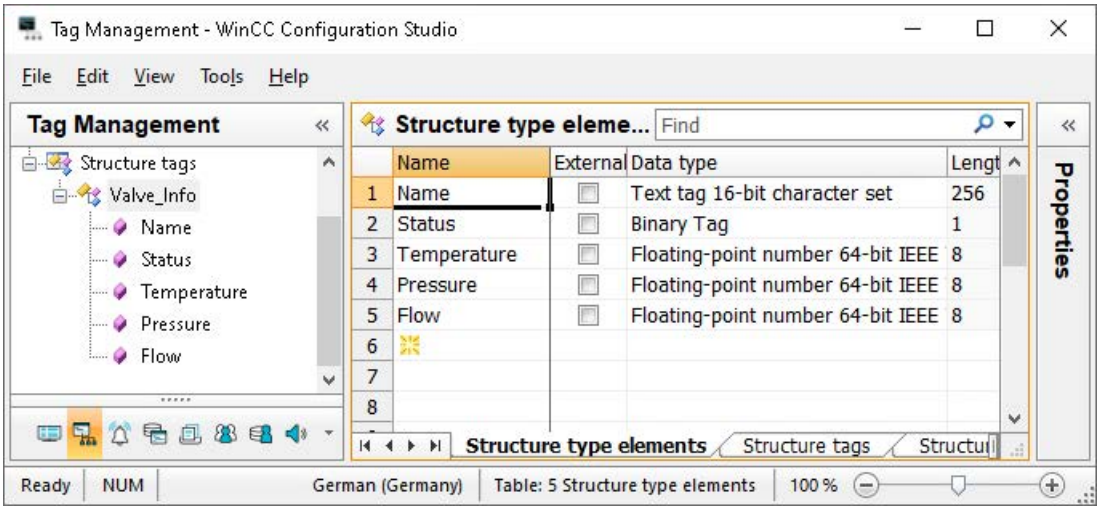
Alternatively, click in the next available field and enter the name of the structure type element directly.

To create multiple structure type elements with a single action, click inside the field named "Name" and drag the lower right corner of the field downward with the mouse. Similar to the autofill function in Microsoft Excel, the column entries of the row are applied in the rows underneath.

Result

You have created the "Valve_Info" structure type and defined five structure type elements.

The "Valve_Info" structure type is displayed below "Structure tags" in the Tag Management.



Next steps

You create structure tags based on the defined structure type.

7.2.2 Creating structure tags

Introduction

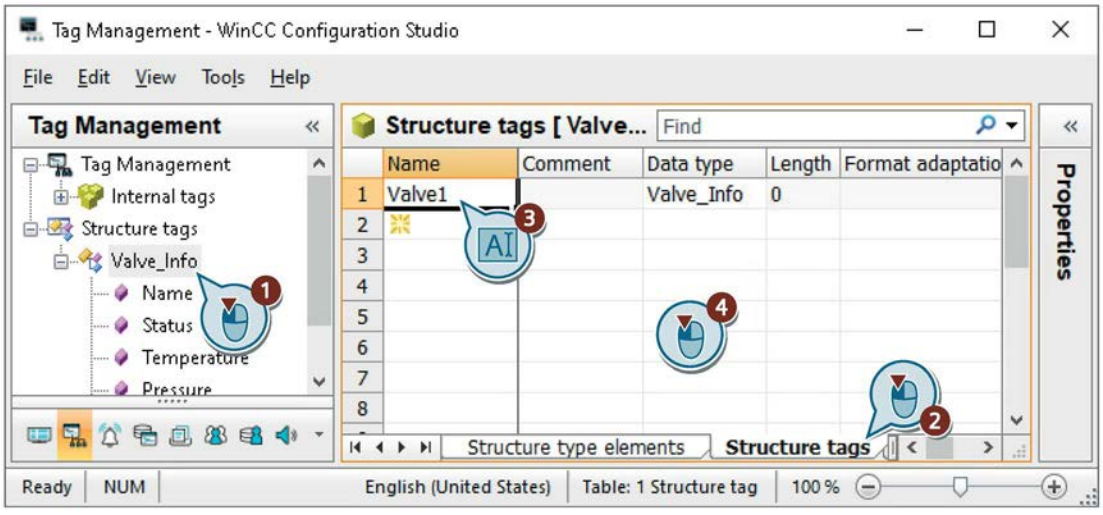
The following steps show you how to create structure tags that use the previously created structure type as data type.

Requirement

- The "Valve_Info" structure type has been created and defined.

Procedure

1. Create the structure tag "Valve1" for the "Valve_Info" structure type on the "Structure tags" tab.



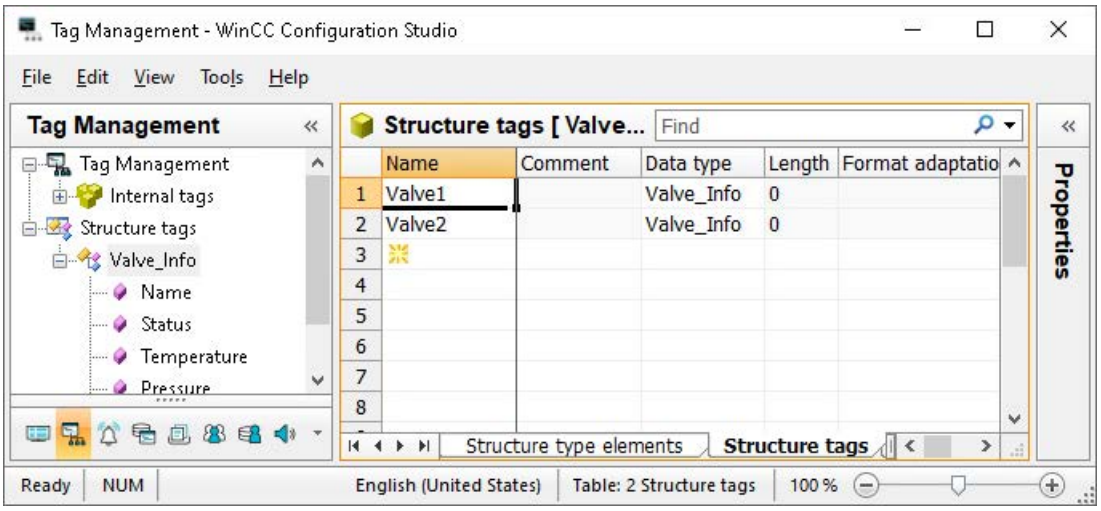
2. Click in any available field.

   Since you have only created one structure data type up to now, "Valve_Info" is automatically entered in the "Data type" column.

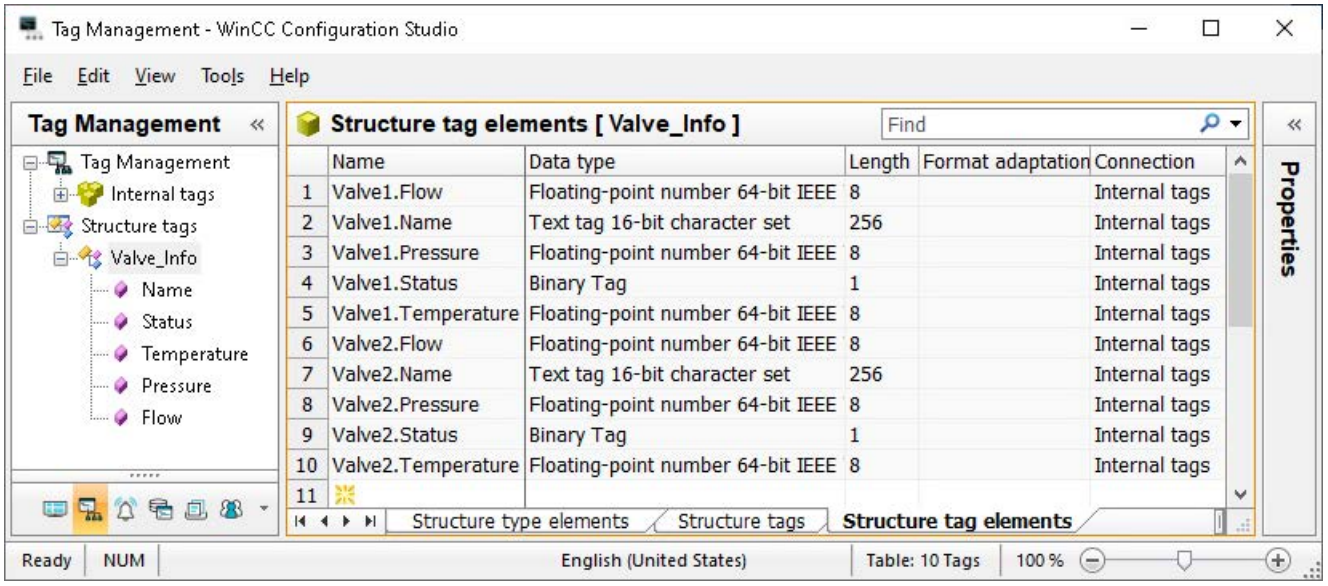
3. Create another structure tag named "Valve2".

Result

You have created two structure tags based on the "Valve_Info" structure type.



The associated structure tag elements are created automatically as instances of the tags.



7.3 Configuring a popup screen

7.3.1 Creating a popup screen and adapting its size

Introduction

The following steps show you how to create a popup screen that opens when the faceplate instance is clicked.

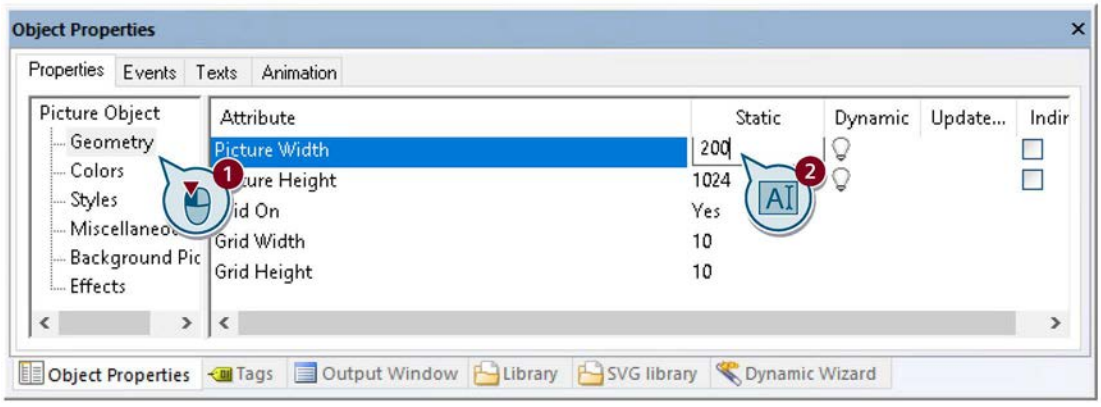
You adapt the size of the process picture to prevent the popup screen from concealing the contents underneath.

Requirement

- A process screen "POPUP.Pdl" has been created.
  Follow the procedure described under: Creating process screens (Page 45)

Procedure

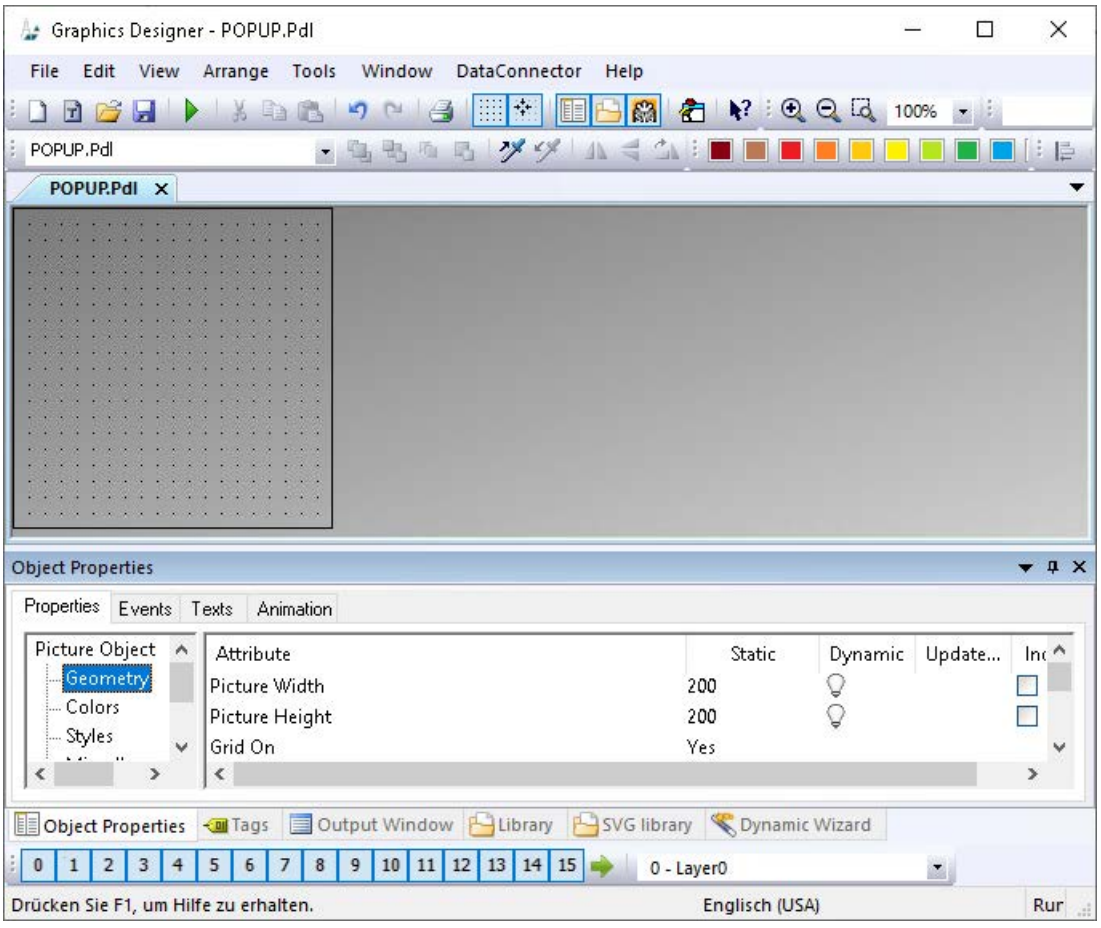
1. Open the "POPUP.Pdl" process picture in the "Graphics Designer" editor.
2. Open the "Geometry" group in the "Object Properties" window and set "Picture Width" to the value "200".



3. Analogous to step 2, set "Picture Height" to the value "200".

Result

You have changed the dimensions of the process picture to 200 x 200 pixels.



Next steps

You place all the needed objects in the "POPUP.Pdl" process picture.

7.3.2 Placing objects in the popup screen

Introduction

The following steps show you how to insert the needed objects into the popup screen.

You use static text as the label and I/O fields for outputting the process values.

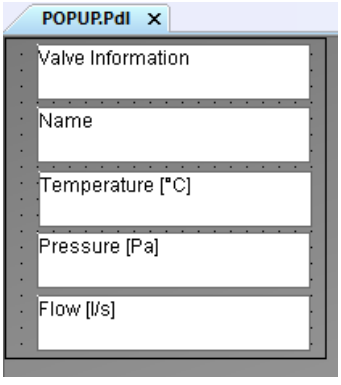
Requirement

- The "POPUP.Pdl" process picture is open.

Procedure

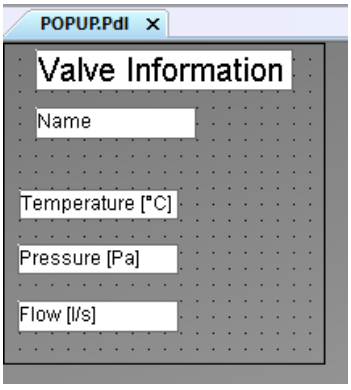
1. Insert five objects of "Static Text" type.

   Follow the procedure described under: Editing Process Screens (Page 49)
2. Enter the following texts:
   - Valve Information
   - Name
   - Temperature [°C]
   - Pressure [Pa]
   - Flow [l/s]

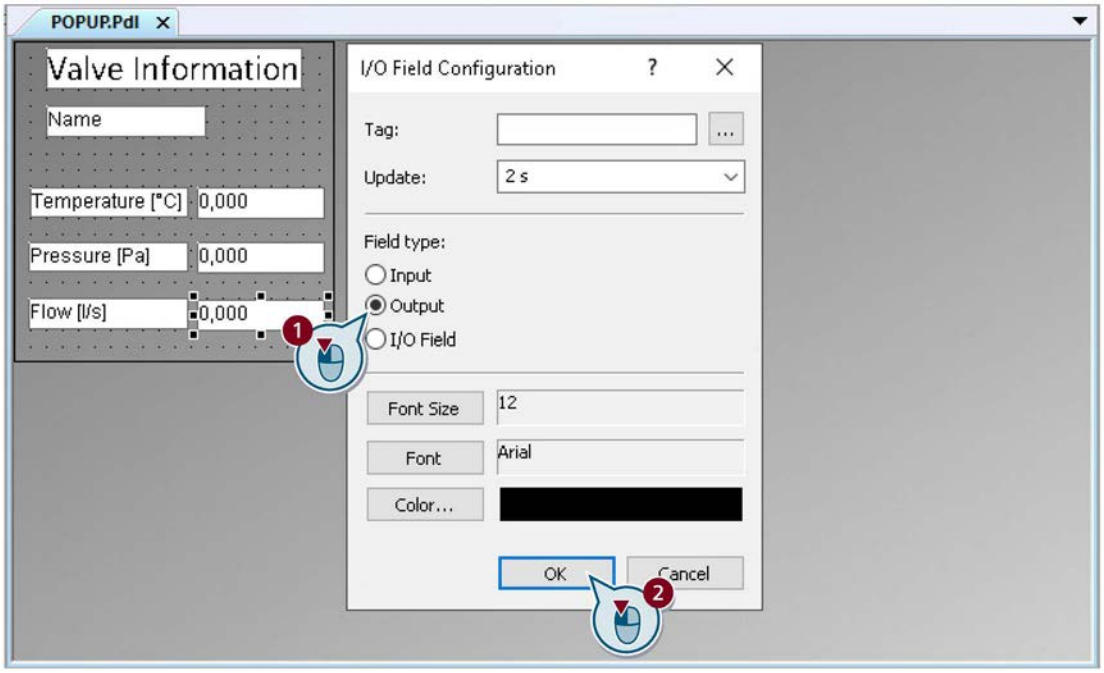


3. Define the font size in the text boxes.

4. Adapt the size and position of the text boxes.

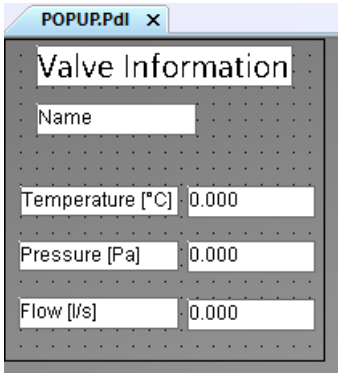


5. Insert three objects of "I/O field" type and select "Output" as the field type in each case. Leave the "Tag" field empty.



Result

You have inserted all the needed objects in the popup screen.



Next steps

You dynamize the inserted objects.

7.3.3 Dynamizing objects in the popup screen

Introduction

The following steps show you how to dynamize the objects of the popup screen.

If you follow the same procedure you used to dynamize the level indicator, the same tag is output in all instances.
In this case, all popup screens of the valves have the same content.

To display different values for the different valves, you link a structure type element instead of a specific tag.
For this, you use the notation ".Temperature" as the tag name.

You dynamize the objects in two steps:

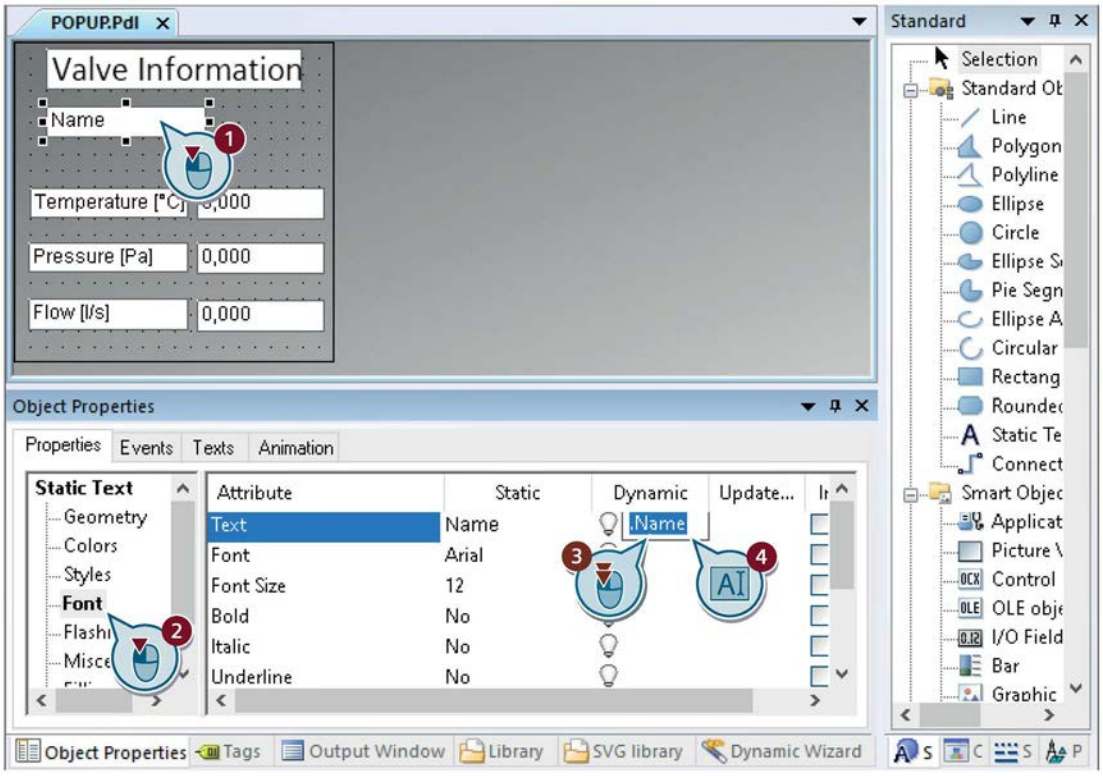
- Dynamization of the object property "Text" of the static text "Name":
  Dynamic display of the name of the respective valve
- Dynamization of the object property "Output value" of the I/O fields:
  Dynamic display of the respective process values of the valves

Requirement

- The "POPUP.Pdl" process picture is open.

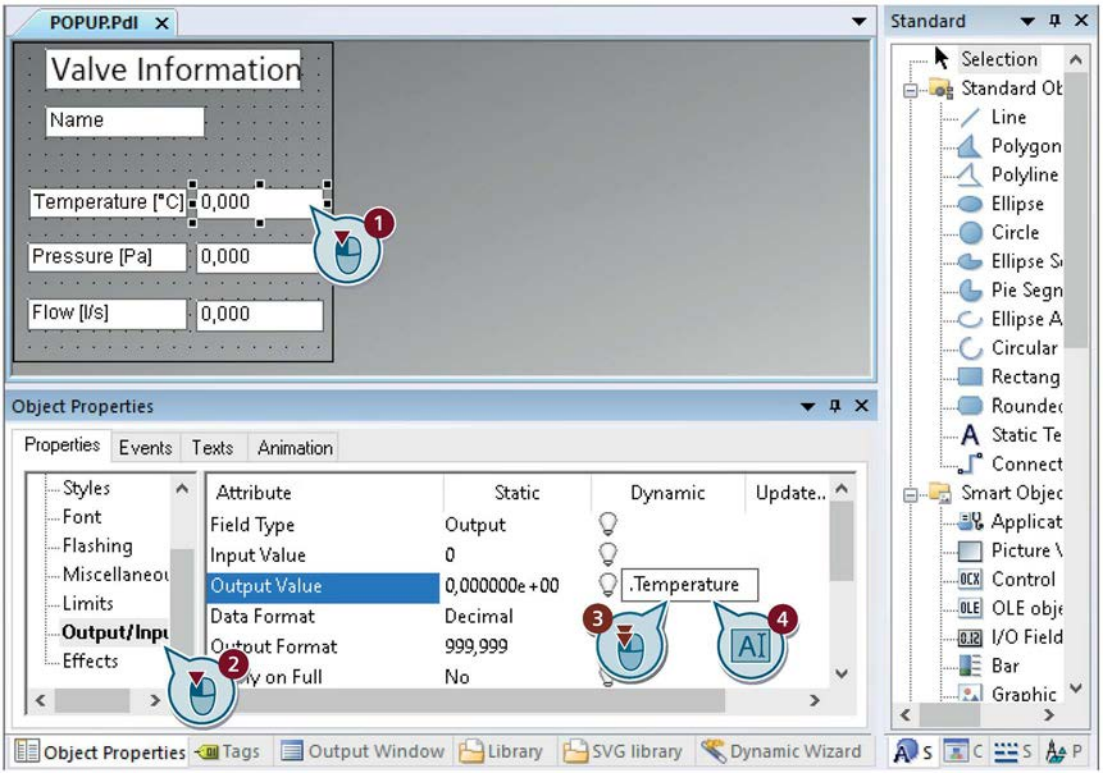
Procedure

1. For the "Static text" object with the "Name" label, dynamize the object property "Text" with the structure tag element ".Name".



The light bulb turns green. The text has been dynamized.

2. For the "I/O field" object next to the "Temperature [°C]" label, dynamize the object property "Output value" with the structure tag element ".Temperature".



The light bulb turns green. The output value has been dynamized.

3. Repeat step 2 for the other two I/O fields:

   Use the following structure tag elements for the dynamization:

   – ".Pressure"
   – ".Flow"

Result

You have dynamized all objects of the popup screen.

7.4 Configuring a faceplate type

7.4.1 Creating a faceplate type and placing objects

Introduction

The following steps show you how to create a faceplate type and place the needed objects.

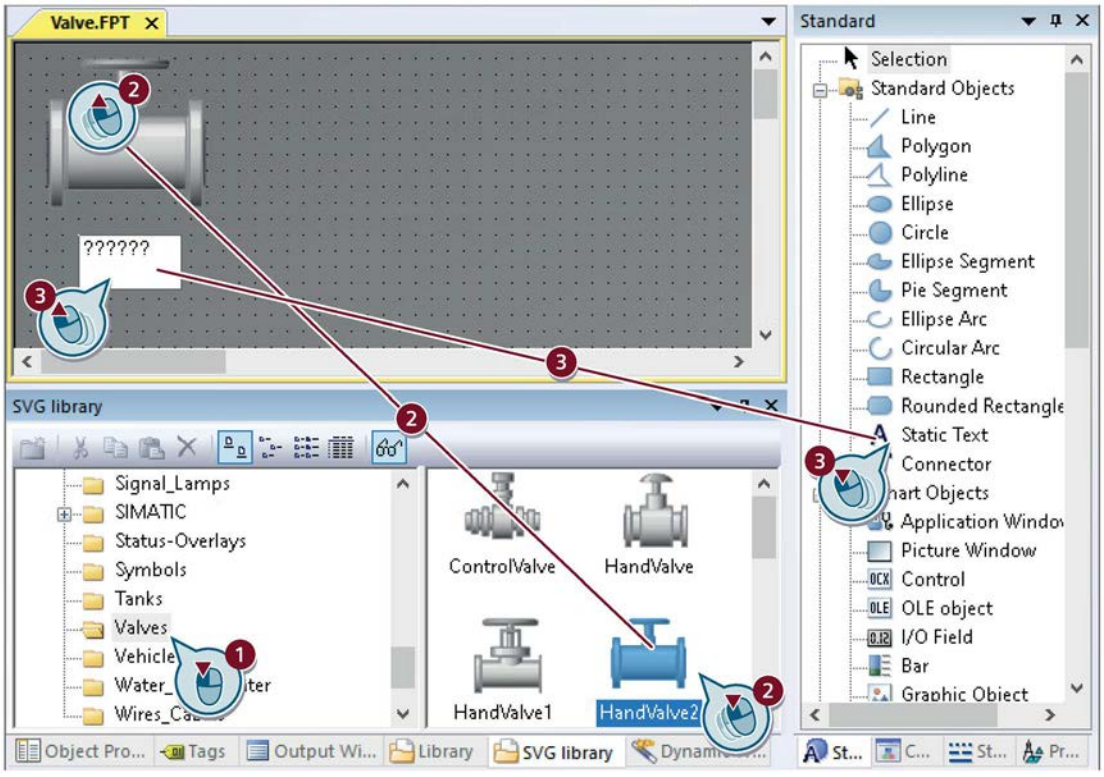
Requirement

- The "Graphics Designer" editor is open.

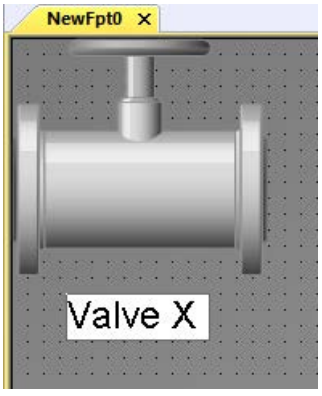
Procedure

1. Select the "New faceplate type" entry in the "File" menu.
   A new picture with *.FPT format opens.
2. Select the "Save" entry in the "File" menu.
3. Name the faceplate type "Valve.Fpt".
   Confirm with "Save".
   The "Valve.Fpt" faceplate type has been created in the "GraCS" project folder.
4. Select the global SVG library "IndustryGraphicLibraryV2.0" in the "SVG library" window.
5. Insert the "HandValve2" object from the "Valves" folder.

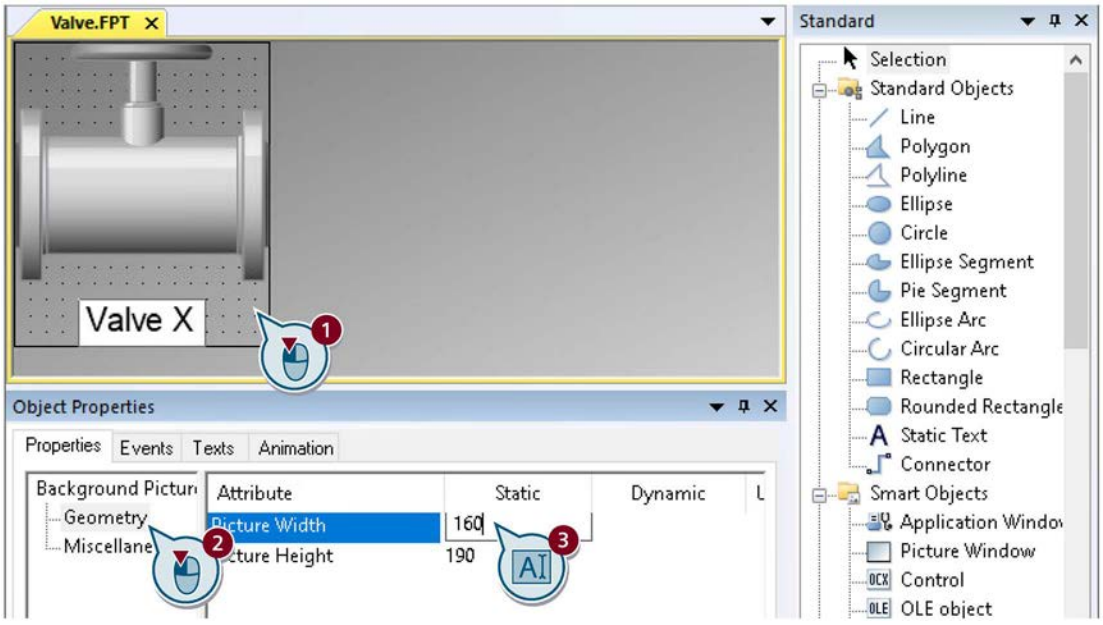
6. Insert an object of "Static Text" type and enter the text "Valve X" as the label.



7. Adapt the position of the objects.



8. Click in the background so that no object is selected.
   The object properties of the process picture are displayed.
9. Set "Picture Width" to the value "160" and "Picture Height" to the value "190".



Result

You have created the "Valve" faceplate type and placed all the needed objects.

Next steps

You link the "Valve_Info" structure type with the "Valve" faceplate type.

7.4.2 Linking a structure type with a faceplate type

Introduction

The following steps show you how to configure the faceplate type.

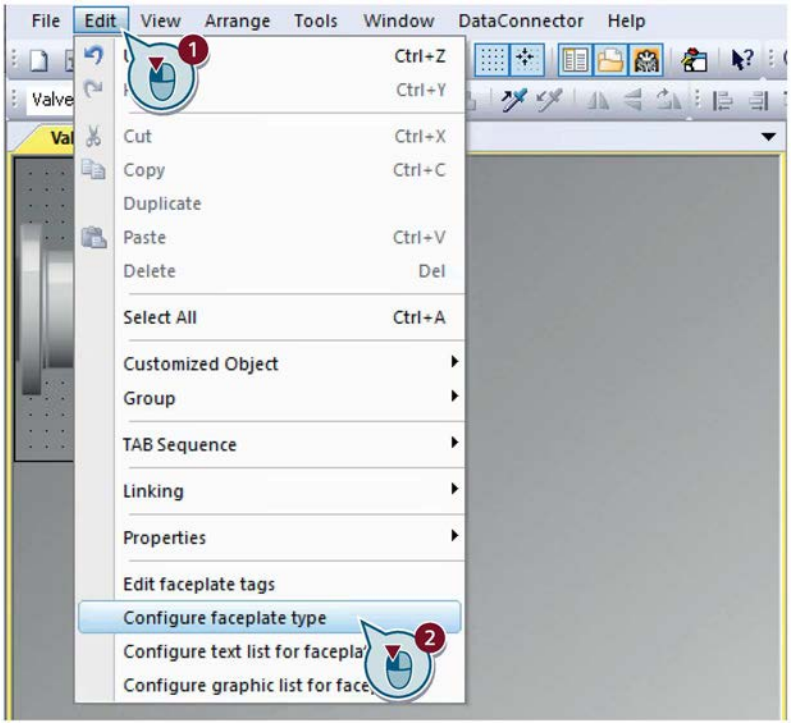
You link the faceplate type with the created structure tags and configure the popup screen.

Requirement

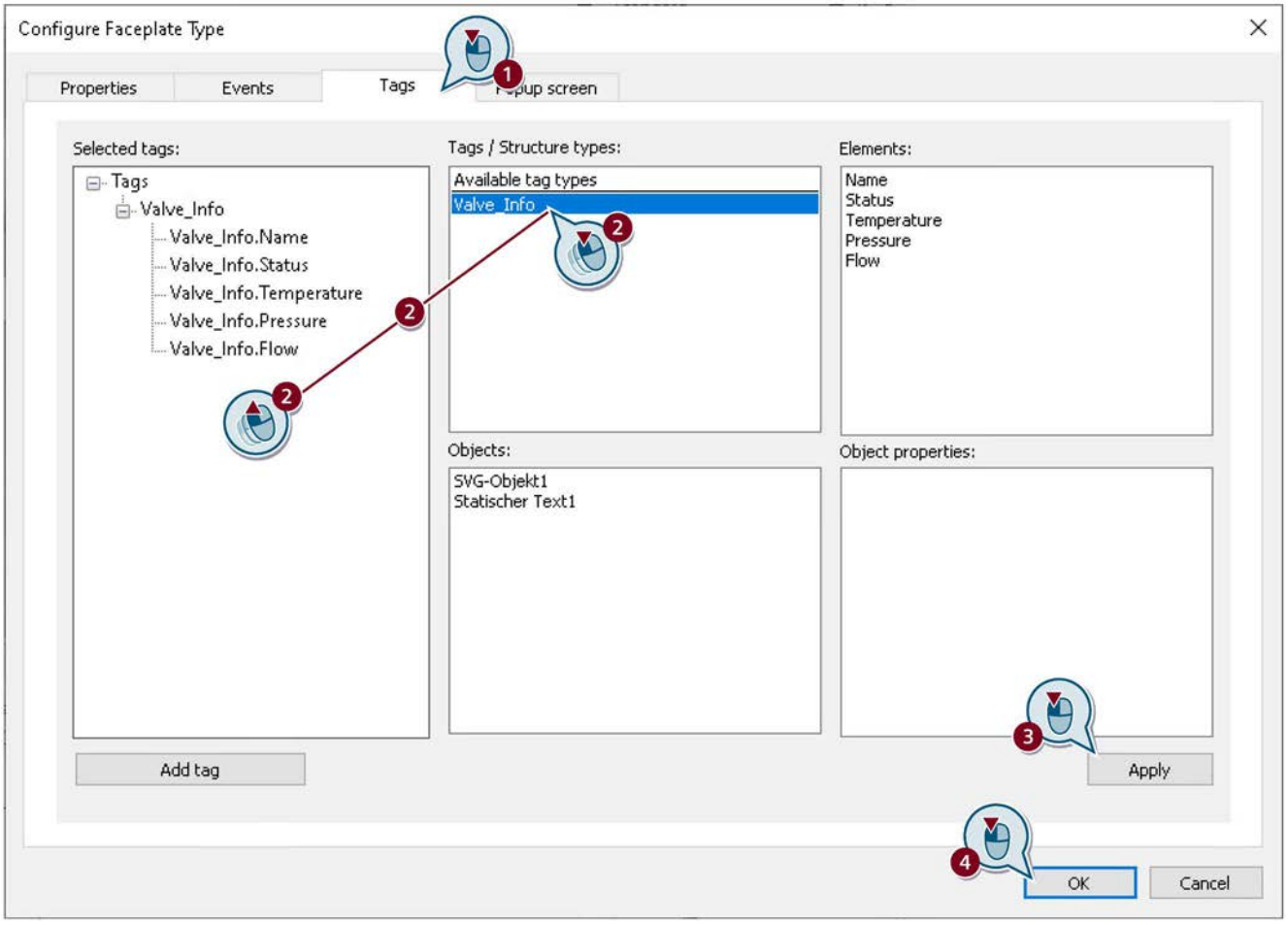
- The "Valve.Fpt" faceplate type is open.

Procedure

1. To define the properties of the faceplate type, open the configuration dialog.



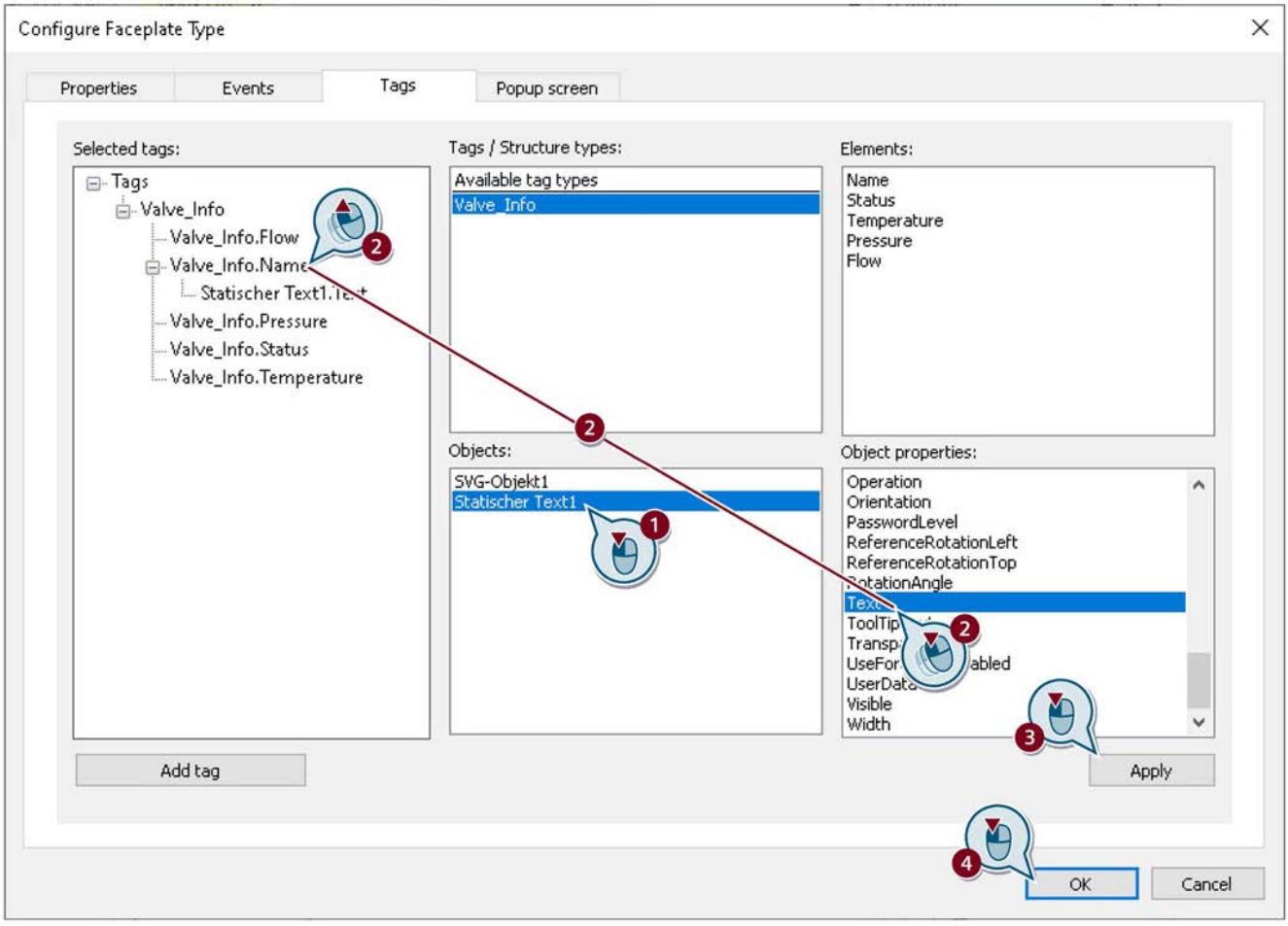
2. On the "Tags" tab, configure the "Valve_Info" structure type as the selected tag.



The structure type has been defined as the interface tag.

You use the interface tags for dynamizing the faceplate type.

3. Link the "Text" object property with the "Valve_Info.Name" tag.



4. To save the settings, click "Apply" and confirm with "Yes".

Result

You have defined the created structure type as the interface tag and dynamized the text by assigning a tag.

Next steps

You configure the "POPUP.Pdl" process picture as a popup screen.

7.4.3 Configuring a popup screen

Introduction

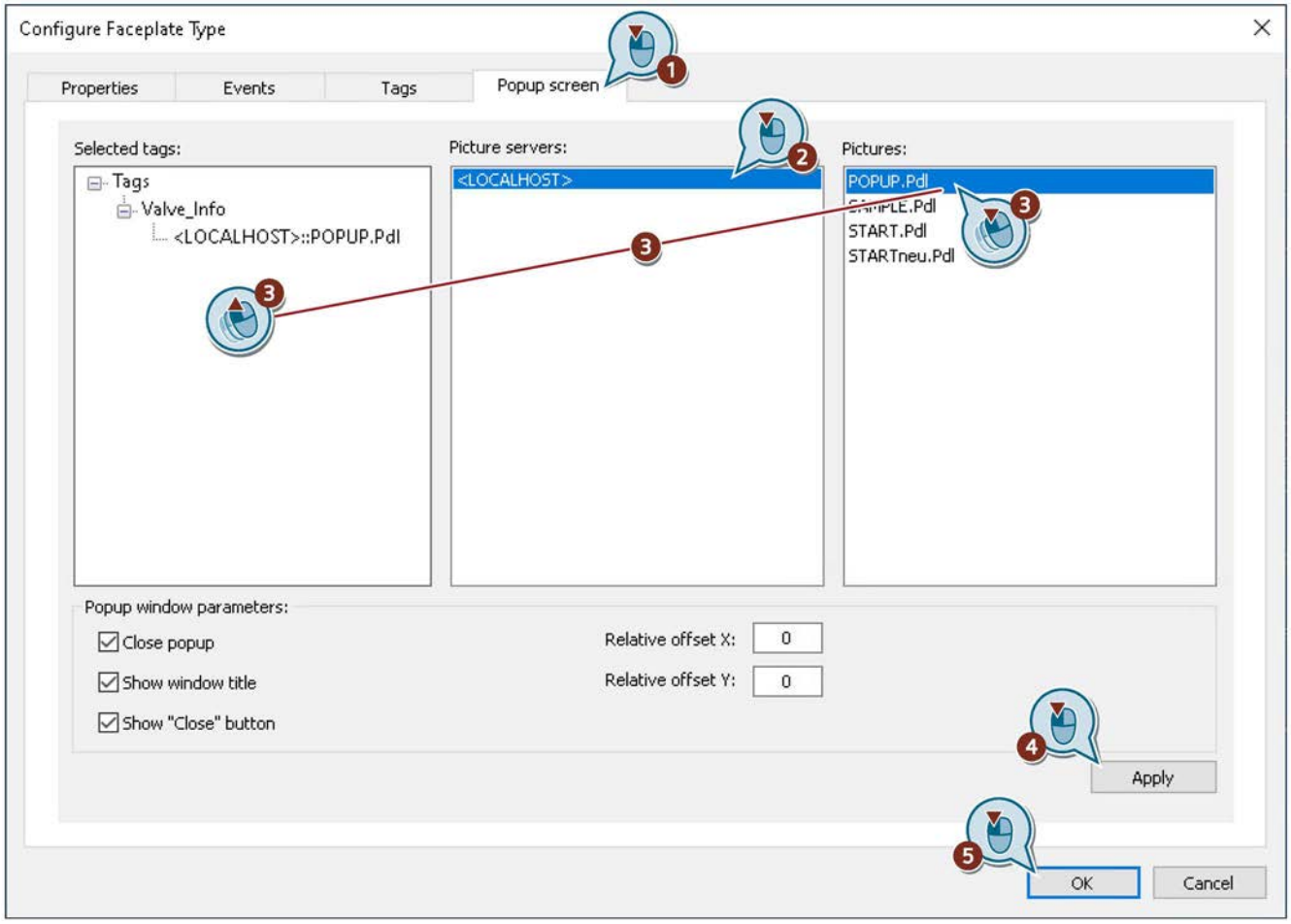
The following steps show you how to configure the popup screen in the faceplate type.

Requirement

- The "Valve.Fpt" faceplate type is open.

Procedure

1. Open the configuration dialog by selecting the "Configure faceplate type" entry in the "Edit" menu.
2. Configure the "POPUP.Pdl" process picture as a popup screen on the "Popup screen" tab.



3. To save the settings, click "Apply" and confirm with "Yes".

   The picture has been configured as a popup screen.

Result

You have configured the "POPUP.Pdl" picture as a popup screen.
The picture is opened in Runtime when the faceplate instance is clicked.

The associated script is created automatically.

7.5 Creating a faceplate instance

Introduction

The following steps show you how to insert a faceplate instance into a process picture.

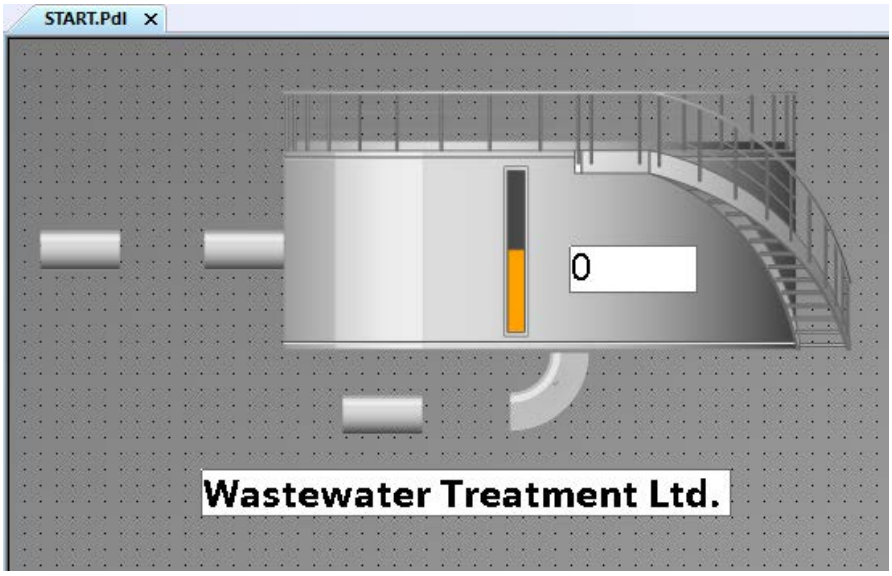
For this you drag the structure tags into the process picture using drag-and-drop.

Requirement

- The "Graphics Designer" editor is open.
- The "START.Pdl" process picture is open.

Procedure

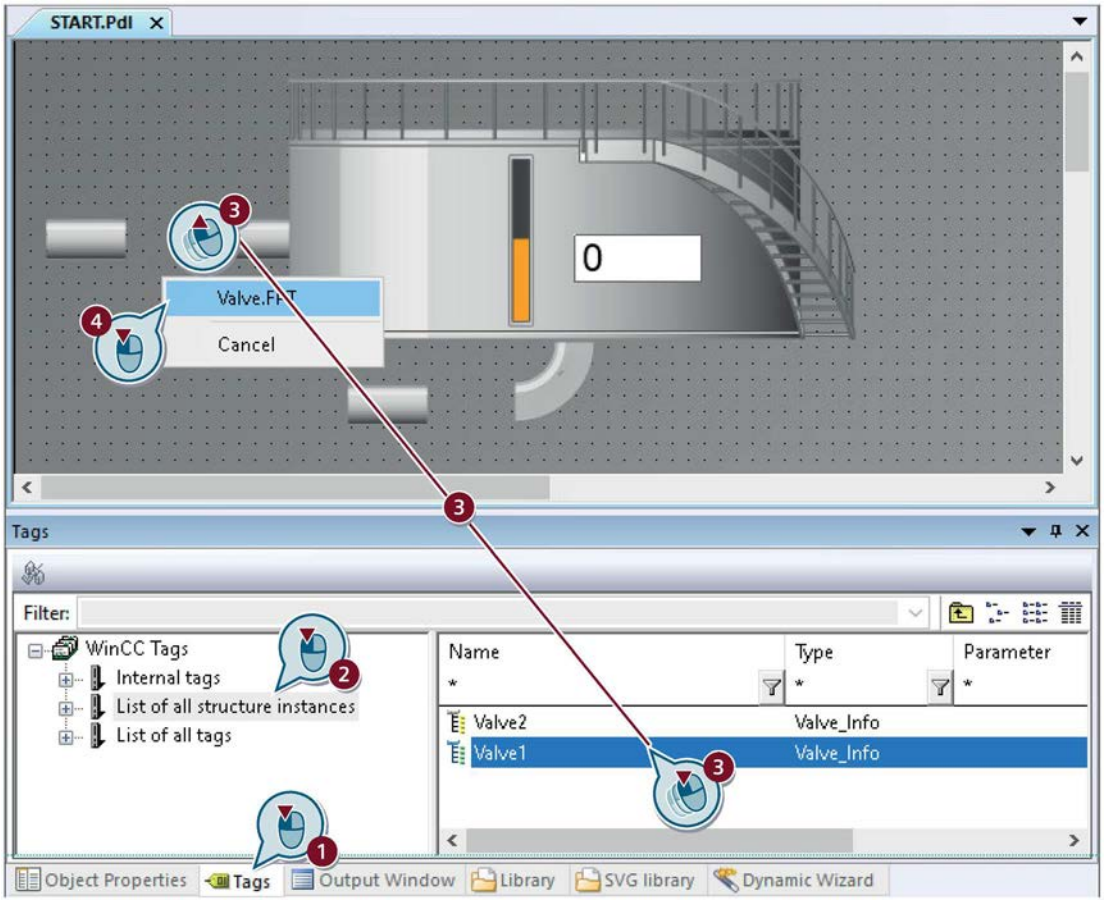
1. Right-click on each of the two SVG objects "HandValve2" in the process picture and select "Delete".
   The two SVG objects are deleted.



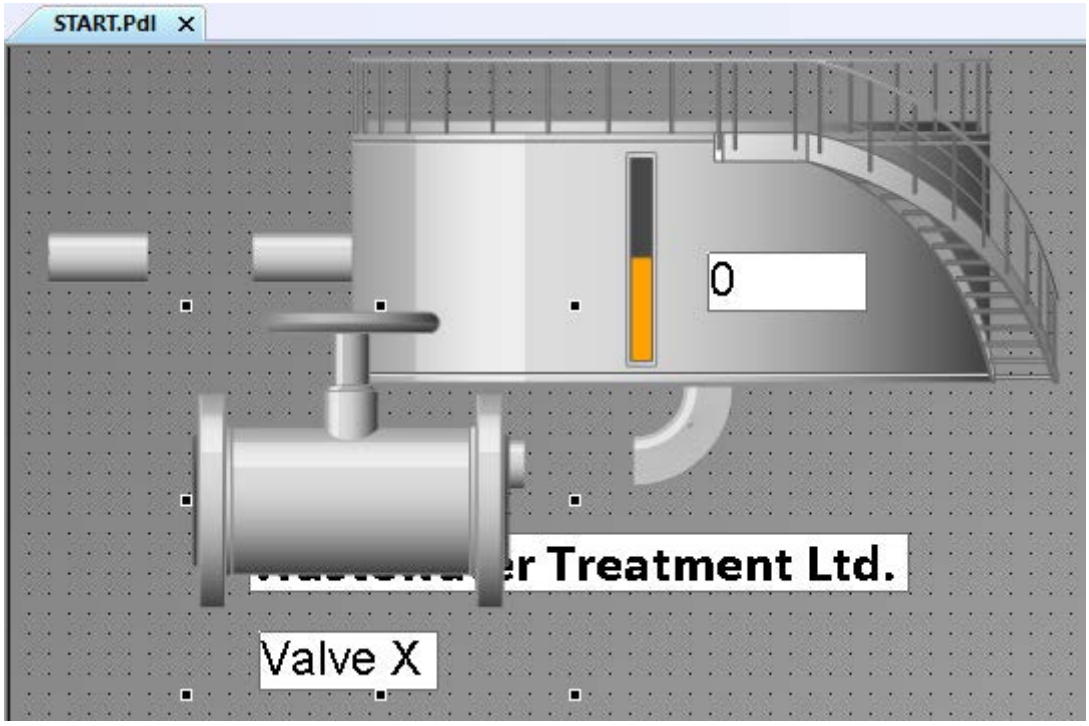
2. Have the list of all structure instances displayed in the "Tags" selection window.

   If the "Tags" window is not displayed, enable the "Tags" entry in the "View" menu under "Toolbars".

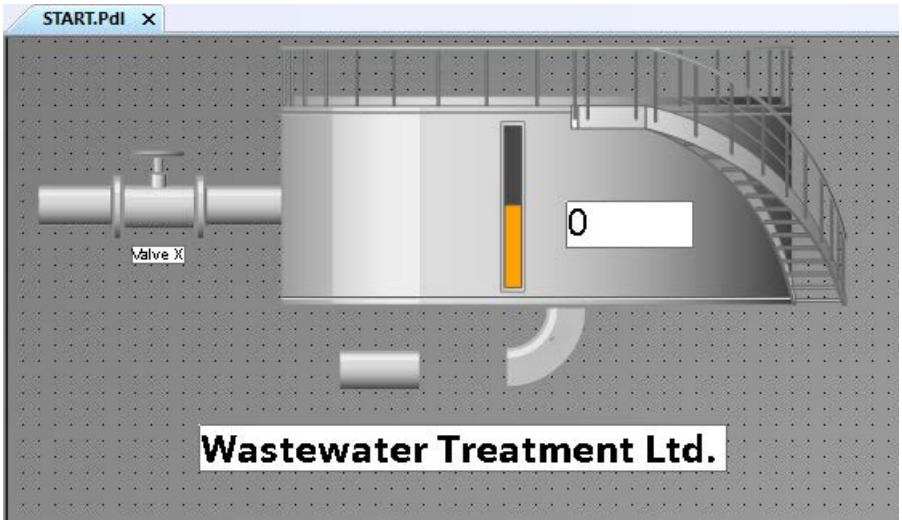
3. Drag the "Valve1" structure instance into the process picture using drag-and-drop.
   Select the "Valve.Fpt" faceplate type.



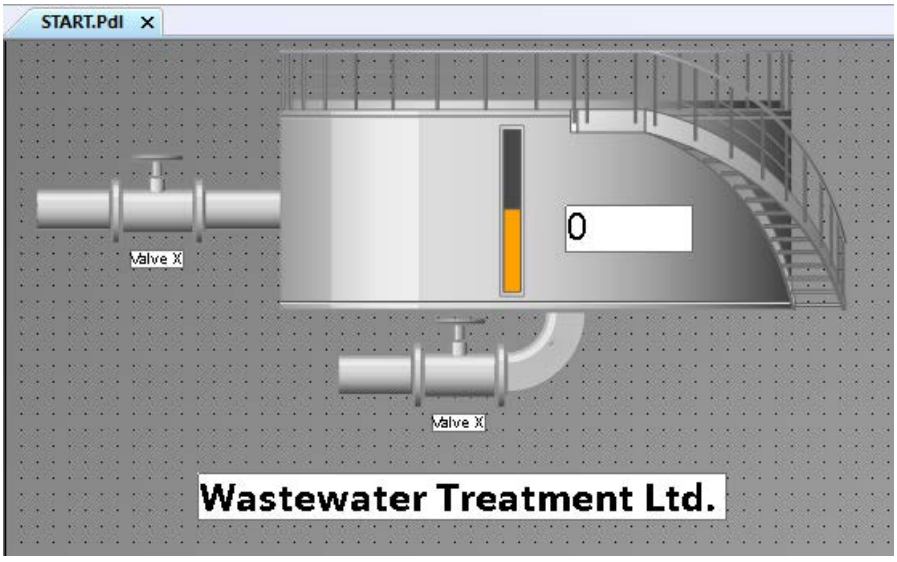
The faceplate instance has been placed in the process picture and dynamized with the structure tags of the "Valve1" structure instance.



4. Adapt the position and size of the faceplate instance.



5. Repeat steps 3-4 for the "Valve2" structure instance.



Result

You have inserted the structure instances and, as a result, created two faceplate instances in the process picture.

7.6 Changing the faceplate type

Introduction

This section provides information on how to implement changes with little configuring effort by using faceplate types.

Principle

The major advantage of using faceplate types is the easy, time-saving implementation of changes.

If you change the faceplate type, the changes are applied to all instances.
This eliminates the need for time-consuming changes to individual objects.

Configuring in the "Quick_Start" project

The "Valve.Fpt" faceplate type is to additionally represent the valve status using color.

You animate the basic color of the valve using a tag.

Because you configure the animation in the faceplate type, the change is applied to both valves in the process picture.

7.6.1 Animating an object property

Introduction

The following steps show you how to animate an object property.

You link the desired property with a tag. The object property changes in Runtime as a function of the tag value.

Requirement

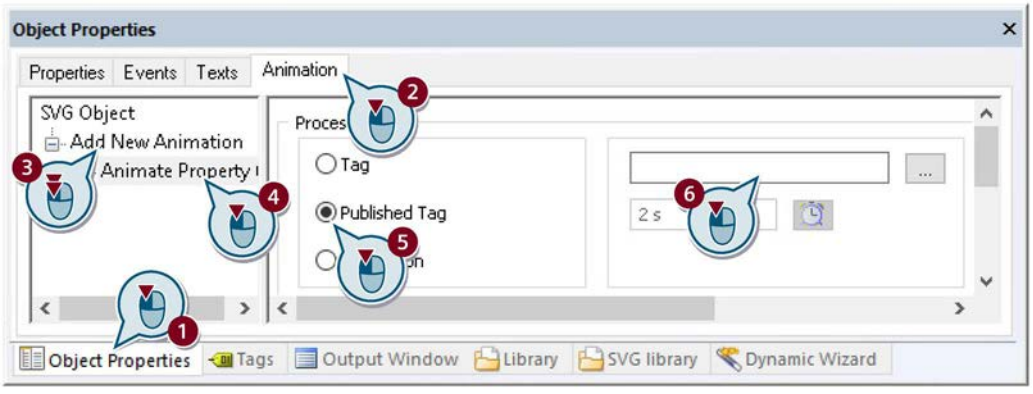
- The "Valve.Fpt" faceplate type is open.

Procedure

1. Click on the valve object from the SVG library in the faceplate type.

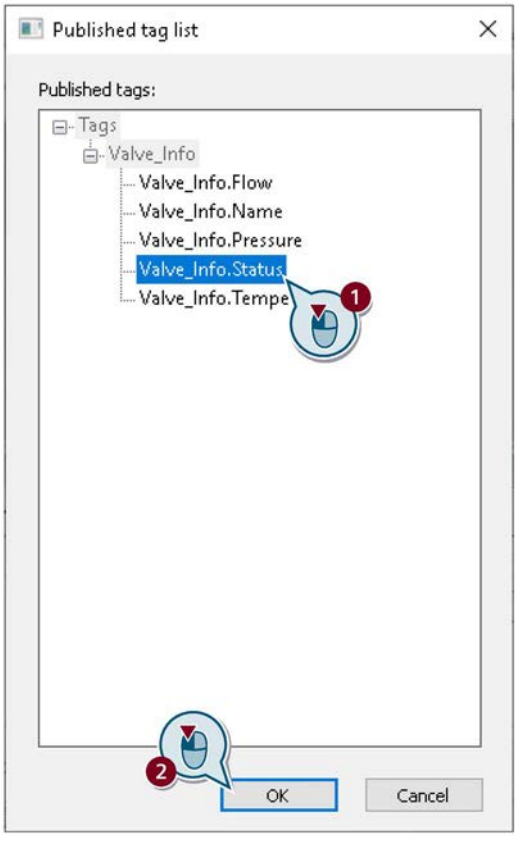
   The SVG object is selected and is displayed in the "Object Properties" selection window.

2. Create a new animation that uses a published interface tag.

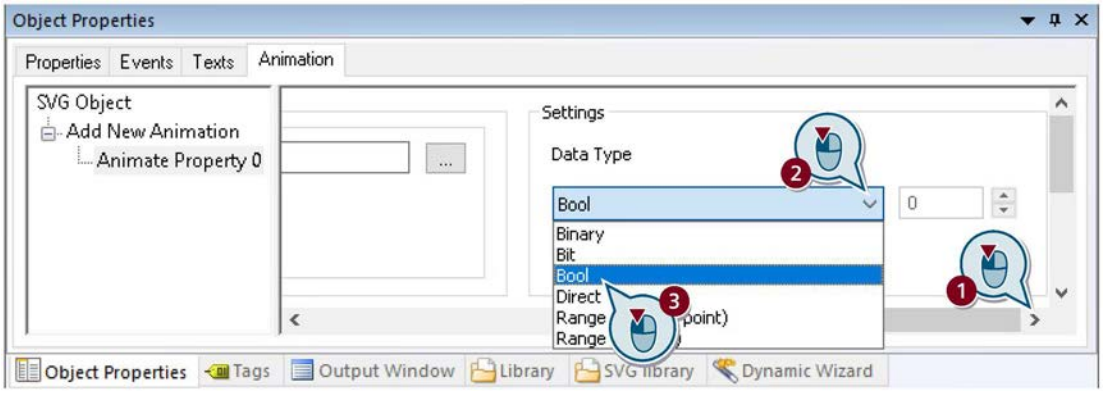


3. Open the tag selection using "...".

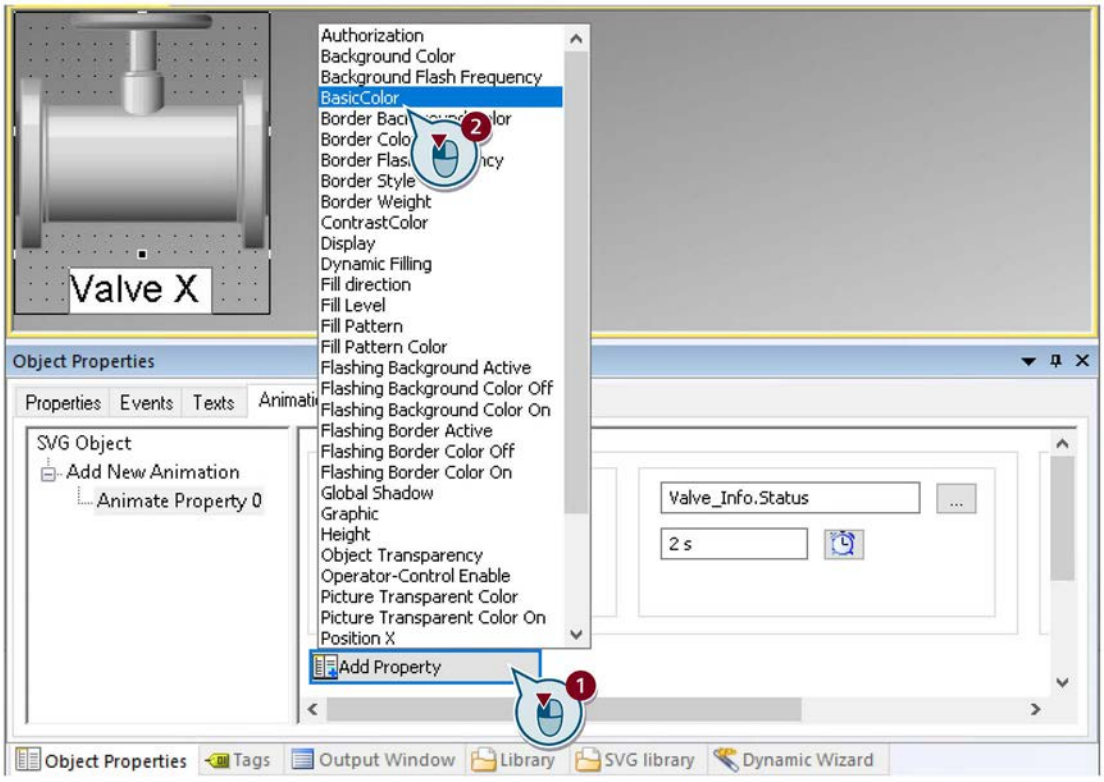
4. Select the interface tag "Valve_Info.Status" and confirm with "OK".
   The animation is controlled by the structure type element ".Status" of the "Valve_Info" structure type.



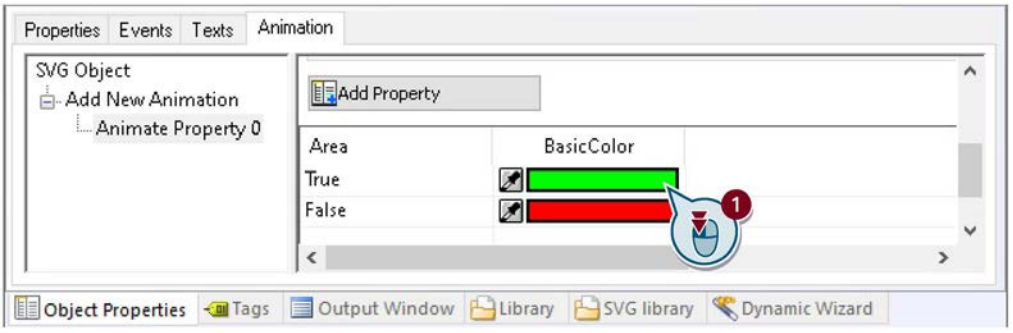
5. Select the "Bool" data type.



6. Add the "BasicColor" property.



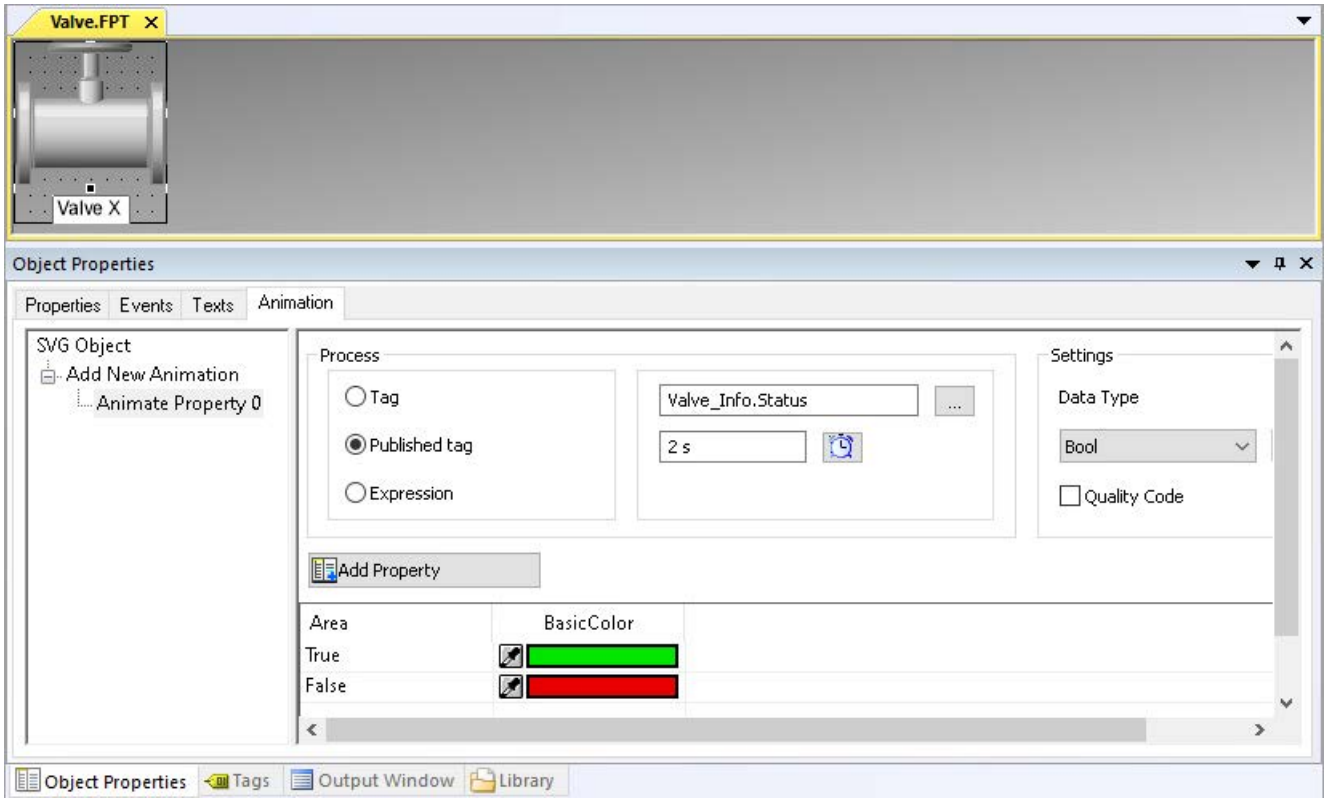
7. Select the color green for "True" and red for "False".



8. Save the process picture.

Result

You have animated the SVG object with the "Valve_Info.Status" interface tag.
The valve is represented in Runtime in green or red depending on the valve status.



7.7 Testing the project (graphics system - faceplate types)

Introduction

The following steps show you how to test the expanded "Quick_Start" project using the WinCC TAG Simulator.

In the expanded "Quick_Start" project, you simulate the values of the structure tags with the WinCC TAG Simulator.

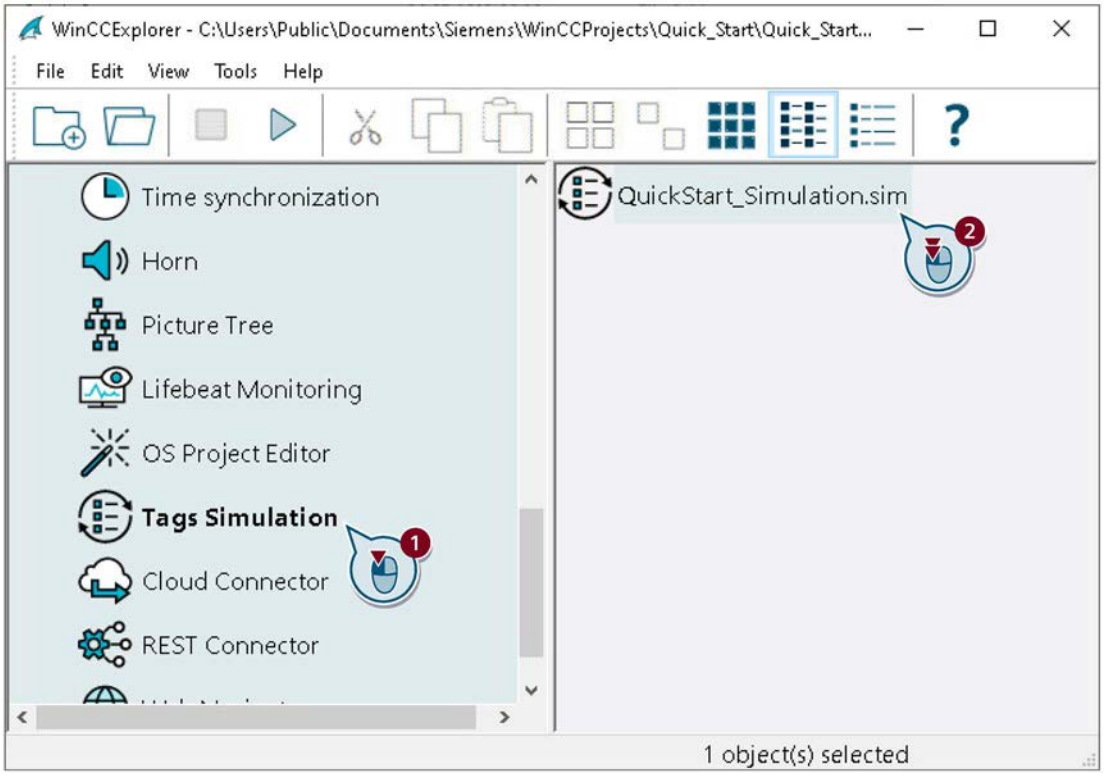
The WinCC TAG Simulator assigns various values to the structure tag elements.
The structure tag elements have been connected to the I/O fields in the popup screen and the representation of the valves. The values in the I/O fields and the valve representation vary in Runtime according to the tag values.

Requirement

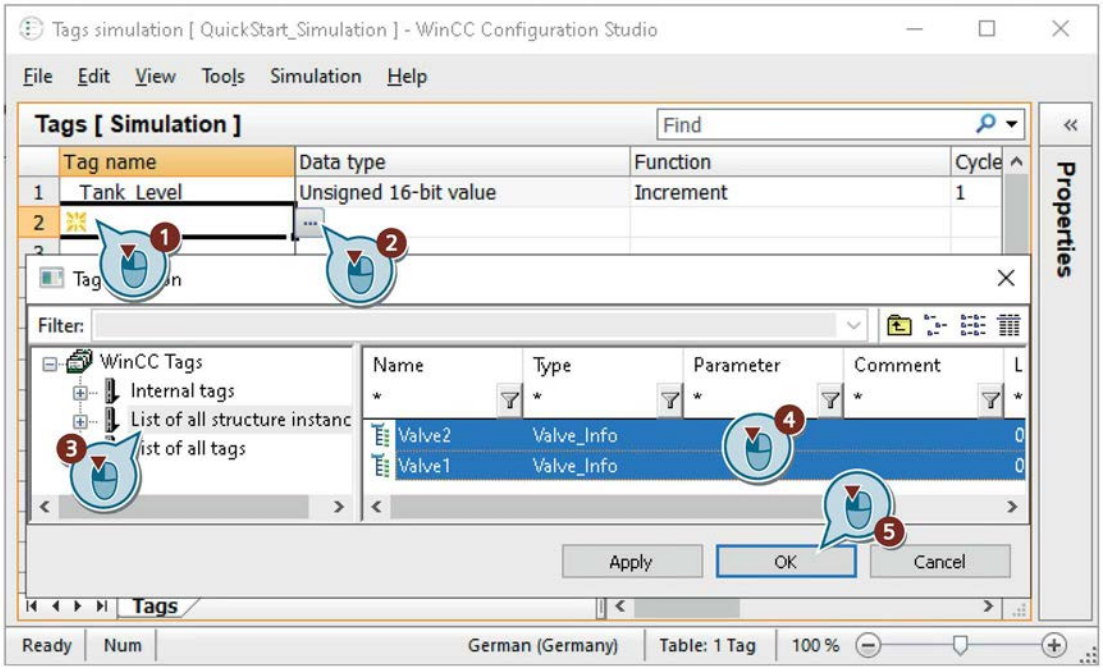
- The Runtime properties have been defined.
  Follow the procedure described under:
  Defining Runtime properties (graphics system - process pictures) (Page 83)

Procedure

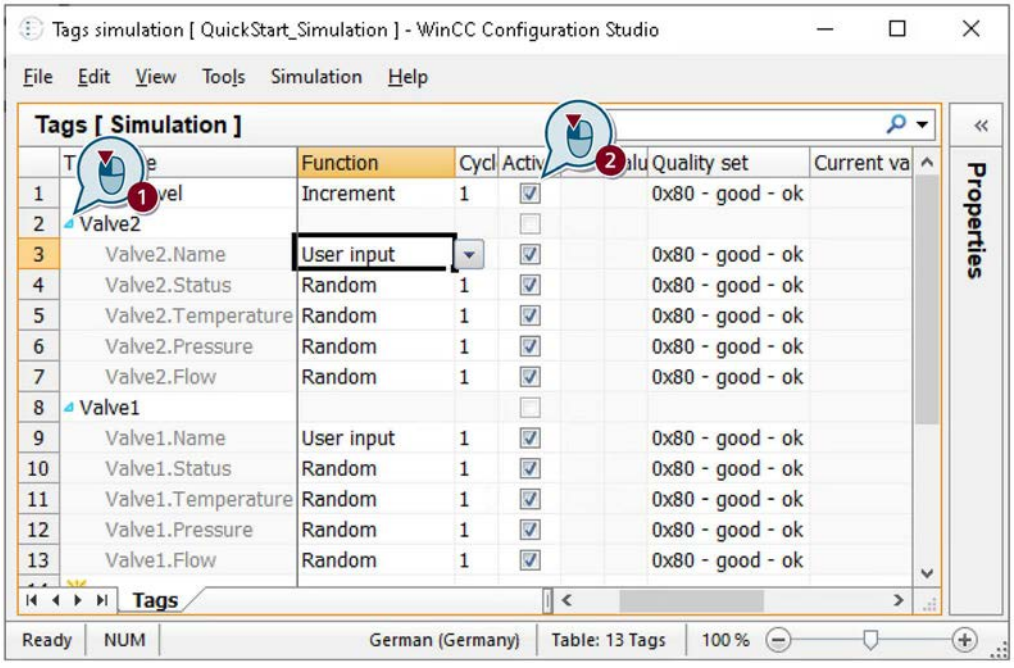
1. Open the "QuickStart_Simulation.sim" configuration in the "Tags Simulation" editor.



2. Open the tag selection dialog and select the "Valve1" and "Valve2" tags from the list of structure instances.



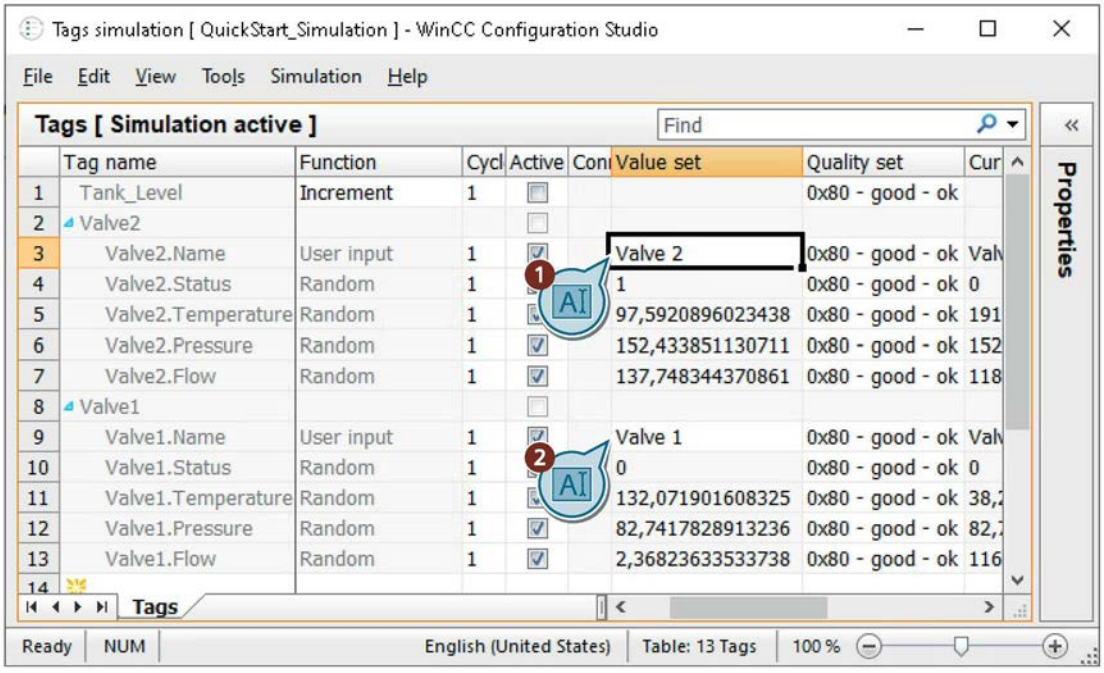
3. Expand the structure tag elements using the ▷ button.
4. Activate all tags in the "Active" column.



5. Define the following properties for the tags:

Tag name	Function	Cycle	Quality set
Tank_Level	Increment	1	0x80 - good - ok
Valve2.Name	User input	1	0x80 - good - ok
Valve2.Status	Random	1	0x80 - good - ok
Valve2.Temperature	Random	1	0x80 - good - ok
Valve2.Pressure	Random	1	0x80 - good - ok
Valve2.Flow	Random	1	0x80 - good - ok
Valve1.Name	User input	1	0x80 - good - ok
Valve1.Status	Random	1	0x80 - good - ok
Valve1.Temperature	Random	1	0x80 - good - ok
Valve1.Pressure	Random	1	0x80 - good - ok
Valve1.Flow	Random	1	0x80 - good - ok

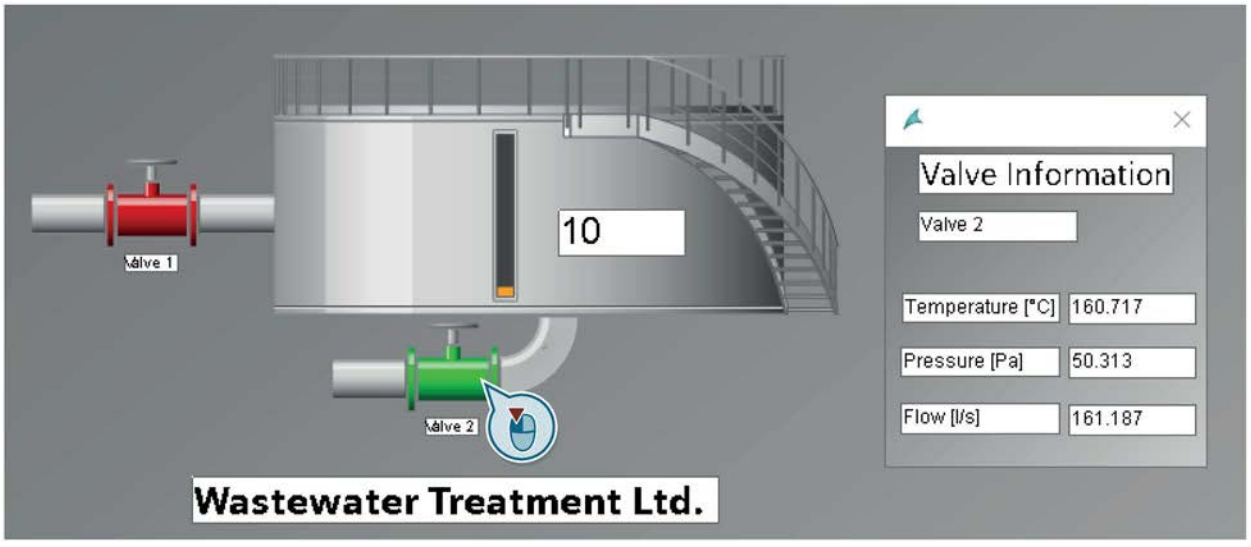
6. Save the configuration.
7. Activate WinCC Runtime in the WinCC Explorer using the button.
8. Start the simulation in the "Tags Simulation" editor.
9. To display the names of the valves, enter the name as the current tag value for the structure tag elements "Valve1.Name" and "Valve2.Name".



10. Position the "Tags Simulation" editor and the Runtime window in such a way that you can monitor both.

    Open the popup screen by clicking on one of the two valves and observe how the various simulation values affect the display.

    Observe how the color of the valves changes as a function of the value of the "Valve(x).Status" tag.



11. Exit the simulation and WinCC Runtime.

Result

You have tested the expanded "Quick_Start" project using the WinCC TAG Simulator.

The test shows the behavior of the project when it is supplied with process values.

Archiving and displaying values

8

8.1 Archiving and displaying values

Introduction

This section provides information about the archive system and a description of how to save values in a process value archive.

Principle

With the help of the process value archives you display the development of the process values over time, for example, as a diagram or as a table. In practice, such temporal displays are very important as they allow problems to be recognized very early on.

Having access to individual historic process values is another use of the process value archives. This application can, for example, help to determine how high certain values were at a time when production problems were experienced.

Configuring in the "Quick_Start" project

You do not need process values for the "Quick_Start" project.

In this project, you use the internal tag "Tank_Level".
You will simulate the values of these tags by means of the WinCC TAG Simulator.
The simulated tag values are saved in a process value archive.

The sequence of the saved values will be entered into a process picture as a trend diagram and as a table. For this you will use the controls in the "Controls" selection window of the "Graphics Designer" editor.

You observe the changes in the simulation values in the configured controls in Runtime.

8.2 The archive system

Introduction

The archive system is a subsystem of WinCC. This subsystem is used to archive process values and messages.

Components of the Archiving System

The Archive System for process values is made up of a configuration component and a Runtime component:

- The configuration component of the archiving system is the "Tag Logging" editor.

  In this editor, you can carry out the following tasks (among others):

  – Defining acquisition and archiving cycles
  – Configuring process value archives and compressed archives
  – Defining process values to be archived

- Tag Logging Runtime is the Runtime component of the archiving system.

  Tag Logging Runtime has the following tasks:

  – Writing process values into the process value archive
  – Reading archived process values from the process value archive

Archiving

Process values are stored either in the archive database on the hard disk of the computer or in the main memory of Tag Logging Runtime.

The archived process values can be compressed to reduce the data volume.

Archiving Times

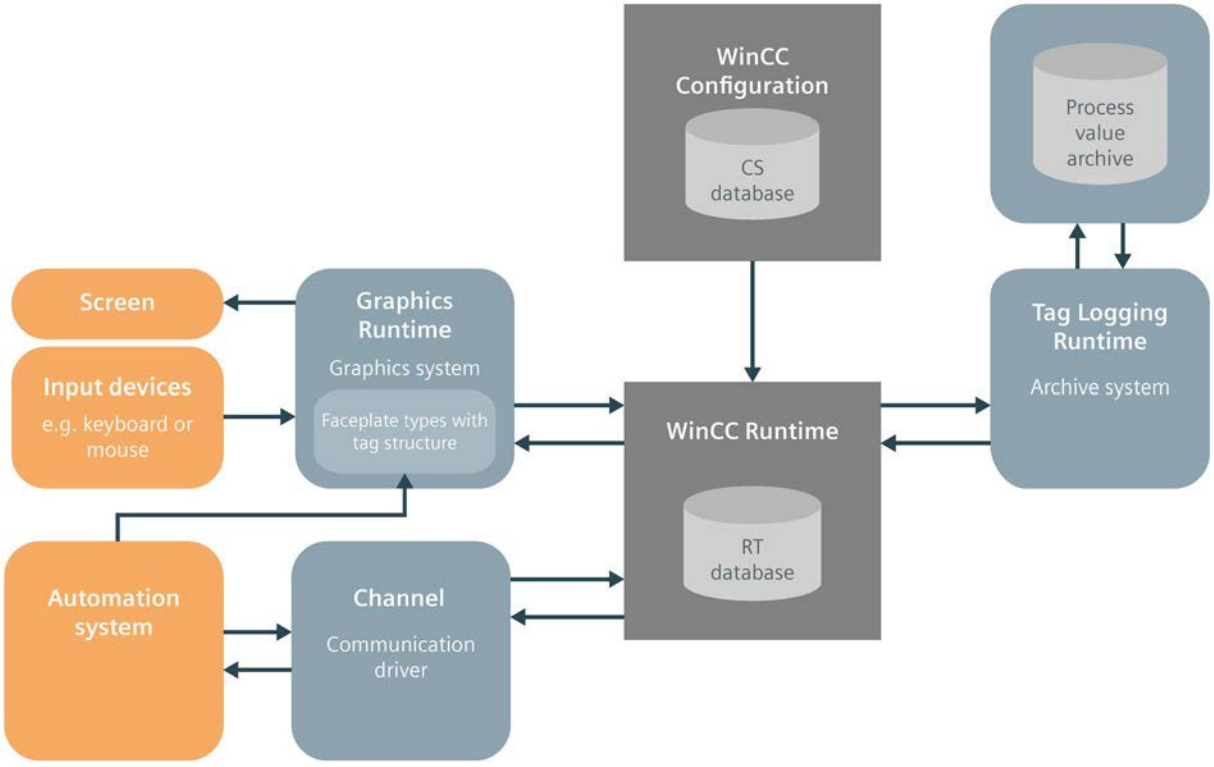
You control the archiving times via the archiving cycle and events.

You can archive the process values, for example, at constant intervals or only when the process value changes by a defined amount or percentage.

Licensing

In the WinCC Basic System, it is possible to configure up to 512 logging tags without additional licensing.

Archiving in the WinCC system



8.3 Starting Tag Logging

Introduction

The following steps show how to start the editor "Tag Logging".

In the editor "Tag Logging" you will configure a process value archive as well as the times for the acquisition and archiving cycles.

Requirement

- The "Quick_Start" project is open.

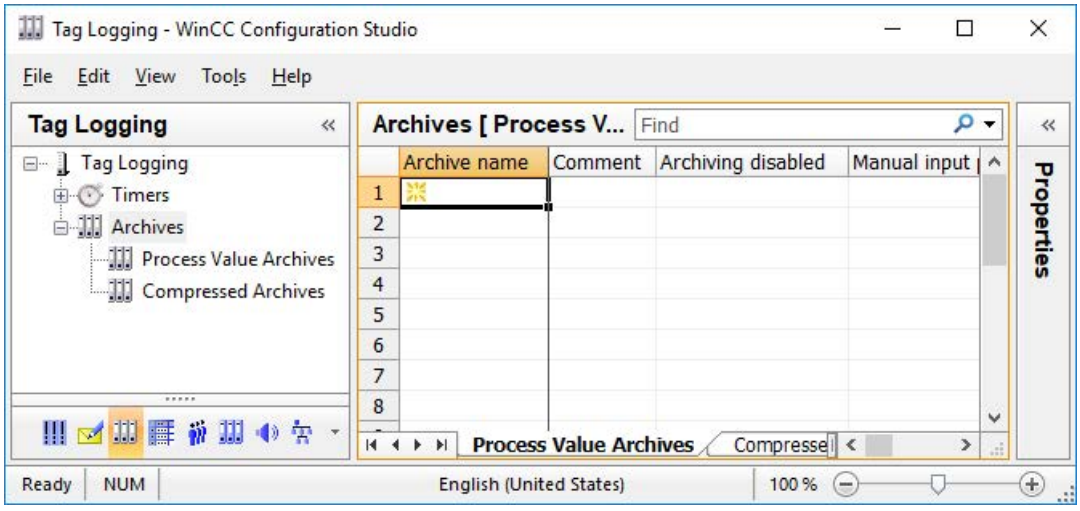
Procedure

1. Start the "Tag Logging" editor.

   The "Tag Logging" editor opens.

Result

You have opened the "Tag Logging" editor.



Next steps

- In the "Tag Logging" editor, you configure the time for the acquisition and archiving cycles.
- Using the configured time, you define the time interval at which the tag values are acquired and archived.
- You create a process value archive.

8.4 Configuring timers

Introduction

In the "Quick_Start" project, you will configure a new time for the acquisition and archiving cycles.

By this time, you will determine the time interval, in which the tag values are captured and archived.

Acquisition cycle

The acquisition cycle determines the interval at which the process value of a process tag is read.

The acquisition cycle starts as soon as WinCC Runtime is activated.

Archiving cycle

Archiving cycles are time intervals in which a process value is stored in the archive database.

- The archiving cycle is always an integer multiple of the configured acquisition cycle.
- The archiving cycle starts either when WinCC Runtime is activated or at a point in time defined by the user.

  The indication of a starting point allows the delayed archiving of the values and the distribution of the archiving load.

  The system may cause a delay between acquisition and archiving up to the length of one acquisition cycle.

The "Tag Logging" editor will offer you different standard times.

You are not permitted to change these times. If the standard times do not suffice, configure new times.

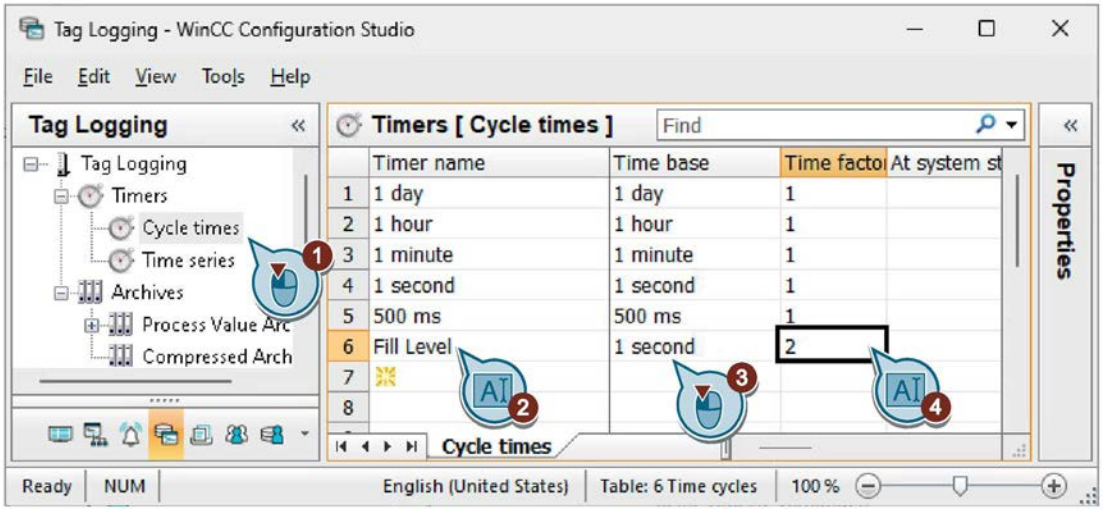
When configuring the times, you will define a time basis and a time factor.
The product of the time basis and time factor determines the time distance between two archivings.
For example, if you define "1 second" as the time base and "5" as the time factor, the process values are archived every 5 seconds.

Requirement

- "Tag Logging" editor is open.

Procedure

1. Create the new cycle time "Fill_Level".
2. To create a new timer, click the top empty cell and enter a name in the "Timer name" column of the table pane.



Result

You have configured the new time "Fill_Level" for the acquisition and archiving cycles.

The configured time allows the acquisition and archiving of tag values every 2 seconds.

Next steps

You create a process value archive to archive the values of the internal tags.

8.5 Creating the process value archive

Introduction

The following steps will show you how to create a process value archive for the "Quick_Start" project.
The values of the internal tag "Tank_Level" are saved in this archive.

Archives are created in the "Tag Logging" editor.

When creating process value archives, you will also define the tags whose values are archived.

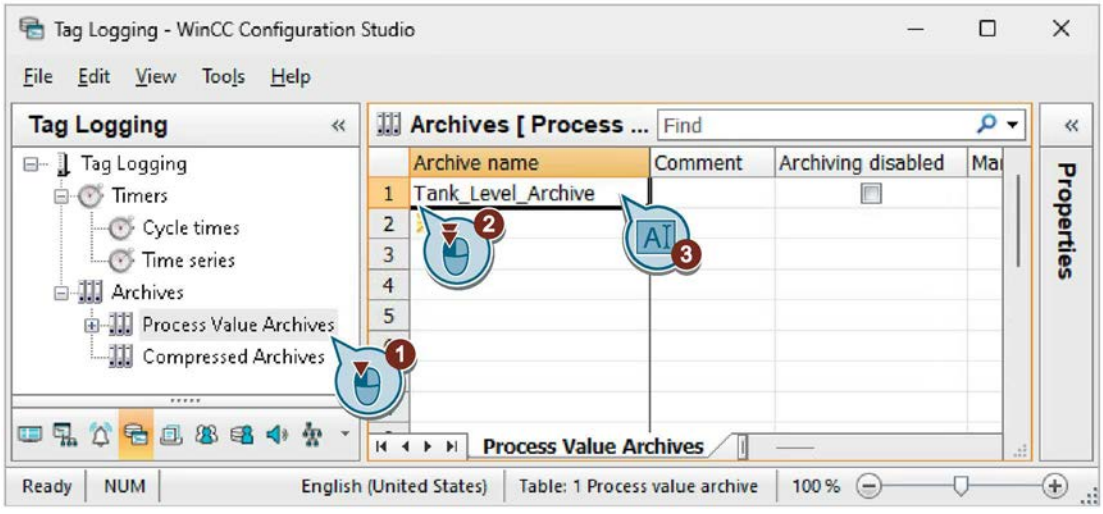
Once the tag has been defined, Tag Logging creates an archive tag in the process value archive.
The values to be archived are saved in the archive tags.

Requirement

- The "Tank_Level" tag is configured in tag management.

Procedure

1. In the "Tag Logging" editor navigation area, select the "Process Value Archives" folder.
2. Click in the top empty line in the "Archive name" column of the table area, and enter the name "Tank_Level_Archive".

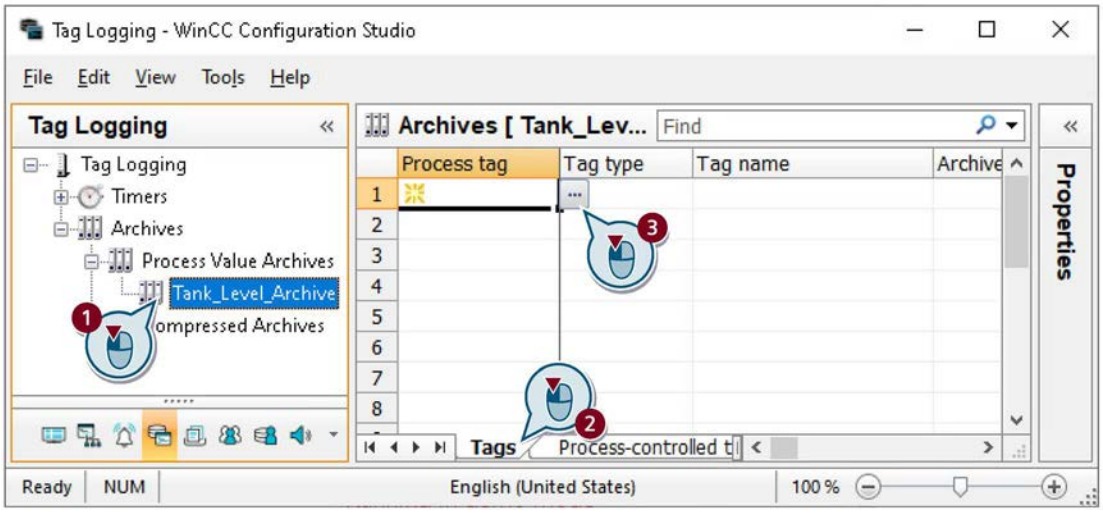


3. Select the folder of the archive in the navigation area.

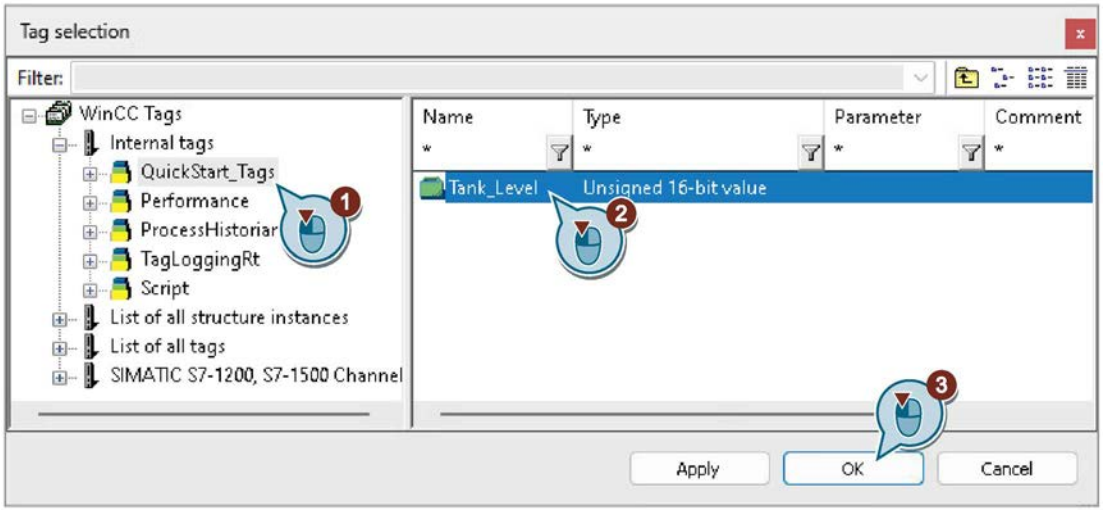
   Select the "Tags" tab in the table area.

4. Click in the top empty line in the "Process tag" column of the table and then on the "..." button.

   The dialog for selecting a tag opens.



5. Select the internal tag "Tank_Level" in the "QuickStart_Tags" tag group.



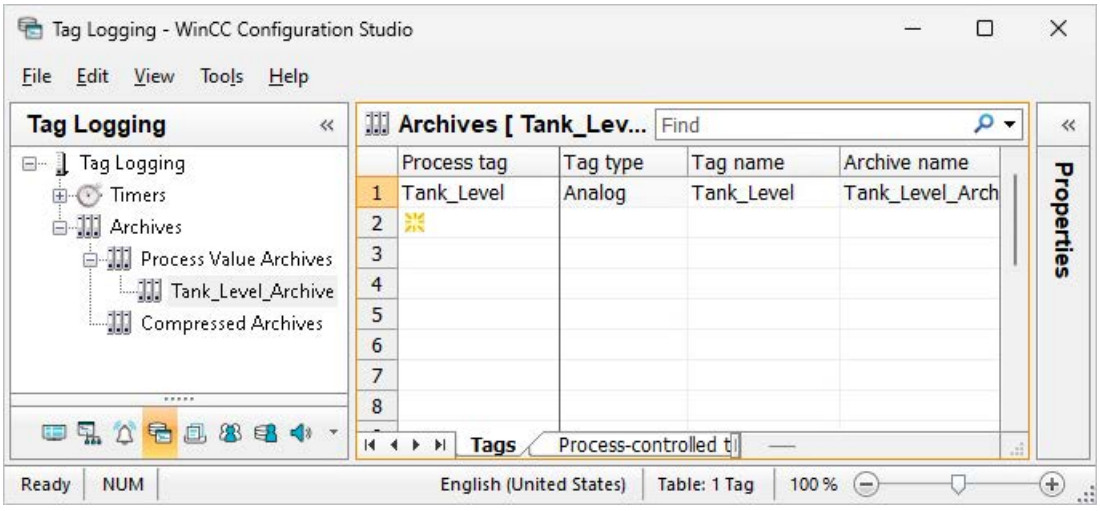
6. Close the dialog with "OK".

   The archive tag has been created. It adopts the name of the internal tag.

Result

You have created the "Tank_Level_Archive" process value archive.

The values of the internal tag "Tank_Level" are written to this process value archive.



Next steps

You edit the created process value archive.

8.6 Editing the process value archive

Introduction

The following steps will show you how to edit the process value archive "Tank_Level_Archive".

The editing of the process value archive is carried out with the following steps:

- Renaming archive tag
- Assigning the configured time "Fill_Level" to the acquisition and archiving cycle
- Defining the saving location for the process value archive
- Defining the size of the process value archive

You select the main memory in the "Quick_Start" project as your saving location for the process value archive. The main memory provides the process value archives only in Runtime.

You can define the size of the process value archive by the number of data sets saved in the process value archive.

Requirement

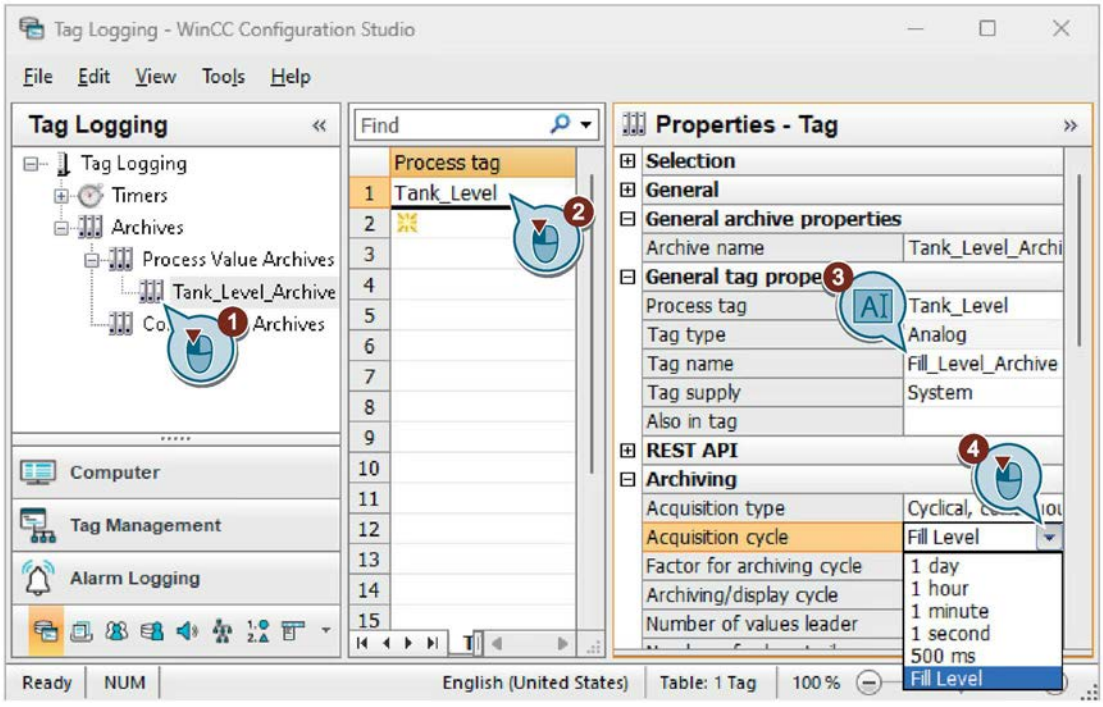
- You have created the process value archive "Tank_Level_Archive".

Procedure

1. Click in the table area in the line with the configured archive tag and open the "Properties" window via the « button.

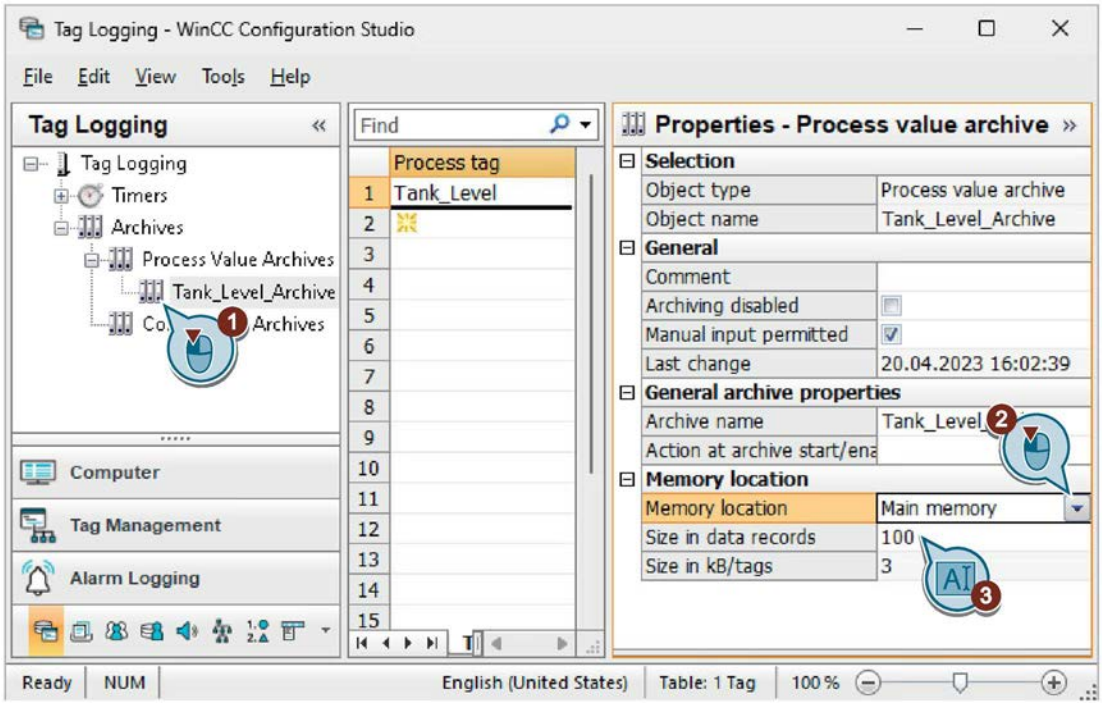
   If necessary, enlarge the properties area.

2. Enter "Fill_Level_Archive" as archive tag name.
3. Assign the configured time "Fill_Level" to the acquisition and archiving cycle.



4. Click in the navigation area on the created process value archive "Tank_Level_Archive".

5. Define the memory location and the size of the process value archive "Tank_Level_Archive".



6. Close the "Tag Logging" editor.

Result

You have edited the process value archive.

The values of the internal tag "Tank_Level" are acquired every two seconds and are saved in the archive tag "Fill_Level_Archive".

The tag values are archived in the main memory and are only available in Runtime.

Next steps

You configure a trend window in the "Graphics Designer" editor to output the saved values as a trend in Runtime.

8.7 Configuring a process screen (archive system)

Introduction

This section offers a description how to configure a process picture, which displays the output values from the process value archive.

Principle

You configure the process picture in the "Graphics Designer" editor.

For this, you use the following objects:

- WinCC OnlineTrendControl

  The "WinCC OnlineTrendControl" object is used to create a trend window.

  In the trend window, the values from the process value archive are output as a trend.

- WinCC OnlineTableControl

  The "WinCC OnlineTableControl" object is used to create a table window.

  In the table window, the values from the process value archive are output as a table.

Each output takes place in Runtime.

8.7.1 Configuring a trend window

Introduction

The following steps will show you how to configure a trend window.

You will configure the trend window in the "Graphics Designer" editor.

For this, you will create a new process picture.
Insert the object "WinCC OnlineTrendControl" into the process picture.

In the "Quick_Start" project you will connect this object with the archive tag "Fill_Level_Archive".

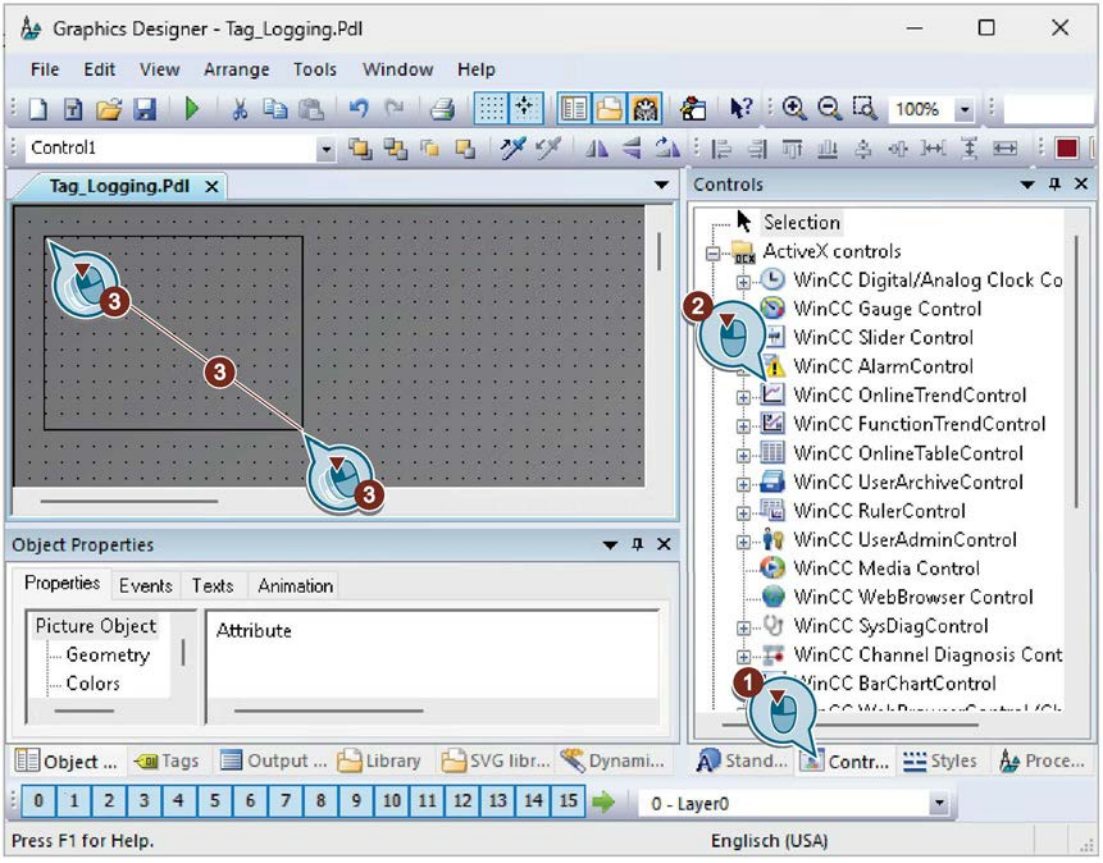
Hence, the values saved in the archive tag in Runtime are output as a trend.

Requirement

- You have created the process value archive "Tank_Level_Archive".

Procedure

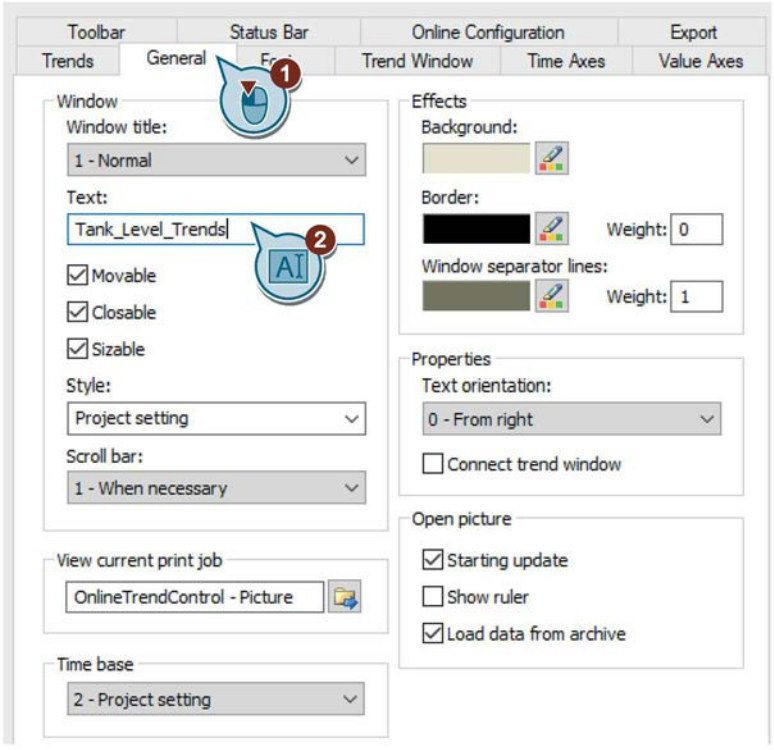
1. Create a new process picture named "Tag_Logging.Pdl" and open it in the "Graphics Designer" editor.
2. Insert the "WinCC OnlineTrendControl" object from the "Controls" window into the "Tag_Logging.Pdl" process picture.



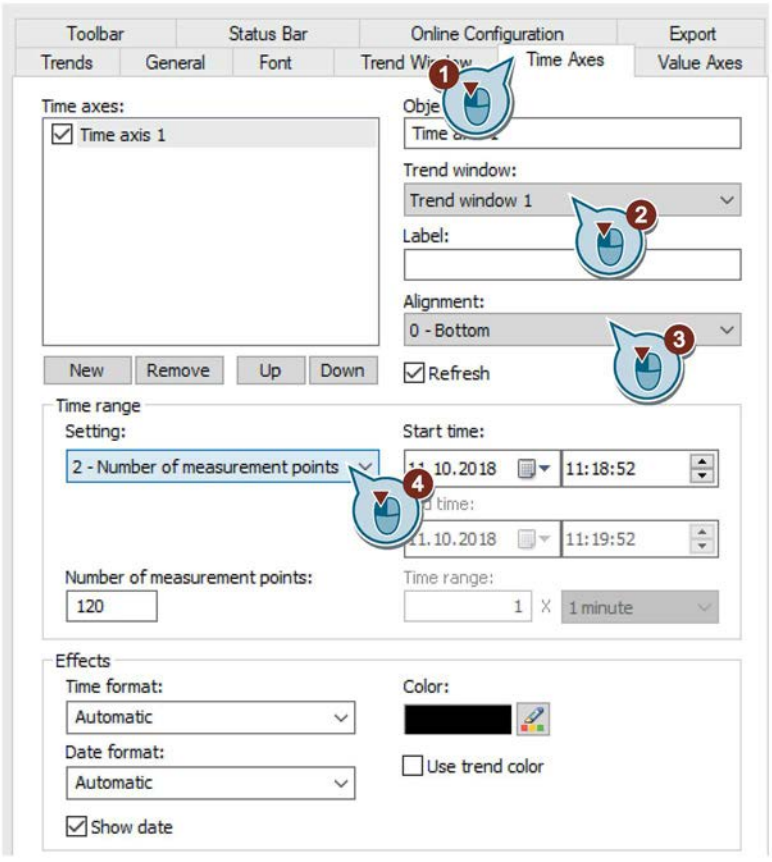
The trend window will appear on the work surface in the "Graphics Designer" editor.

The "Properties of WinCC OnlineTrendControl" dialog opens.

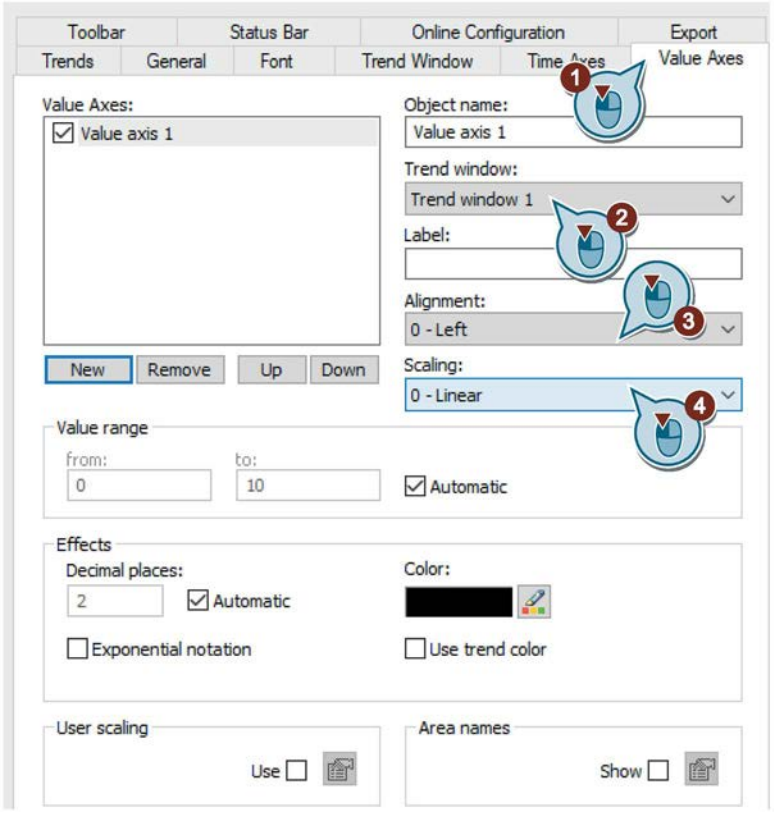
3. Enter "Tank_Level_Trends" as title for the trend window and apply the default settings.



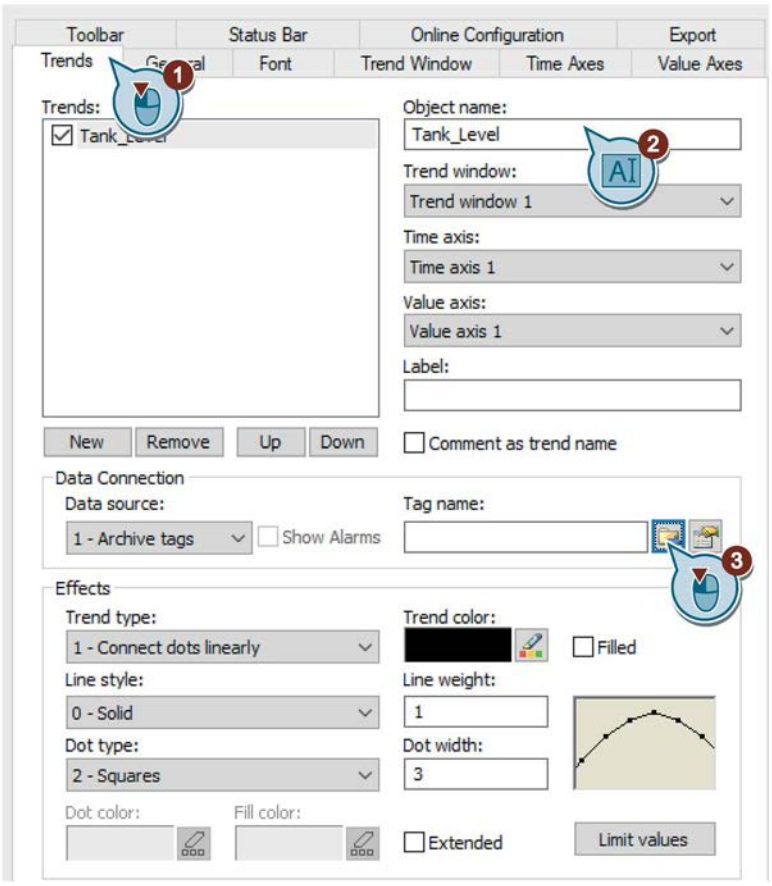
4. Define the settings for the time axes.



5. Define the settings for the value axes.



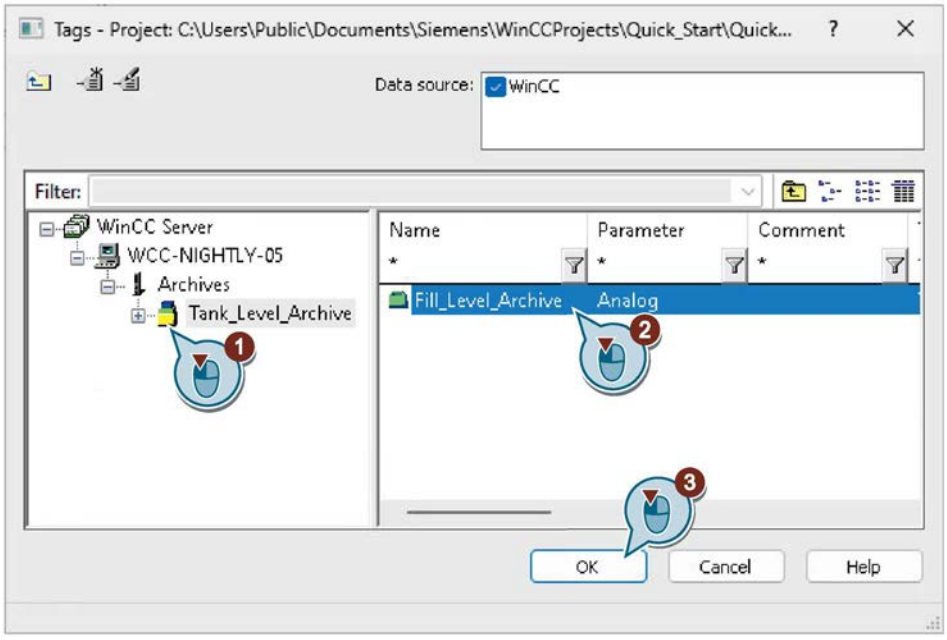
6. Enter the trend name "Tank_Level" and then click .



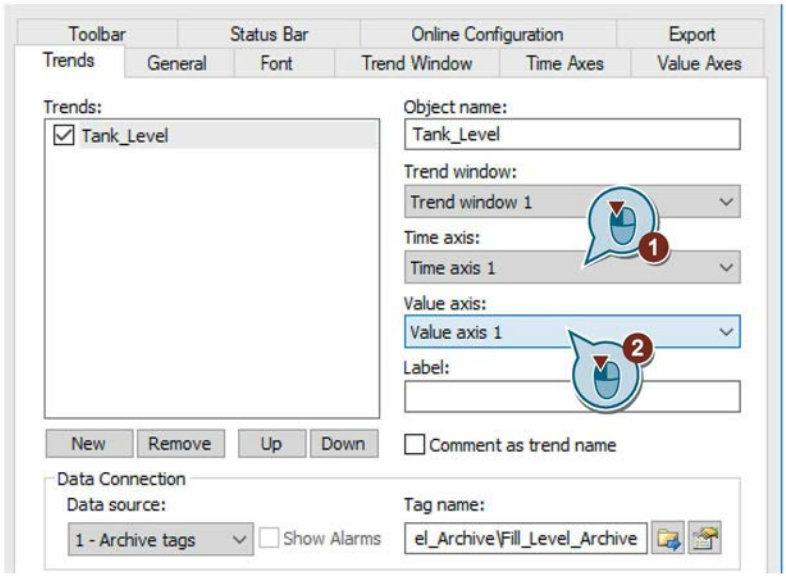
The dialog for selecting tags opens.

7. Select the "Fill_Level_Archive" archive tag in the "Tags" dialog.

   To display the tags, you may need to select the "WinCC Tags" option in the "Data source" area.



8. Select a time axis and a value axis.



9. Click "OK" to close the dialog box and to apply the settings.
10. Save the "Tag_Logging.Pdl" process picture.

Alternative procedure

1. Select the line with the archive tags "Fill_Level_Archive" in the table pane of the "Tag Logging" editor.

   Move the mouse to the edge of the selection rectangle.

   The cursor changes from a "+" to a cross.

2. Keep the left mouse button pressed while you drag the tag selection to an empty area of the picture in the Graphics Designer.

3. Release the mouse button in the picture.

   A WinCC OnlineTrendControl is created.

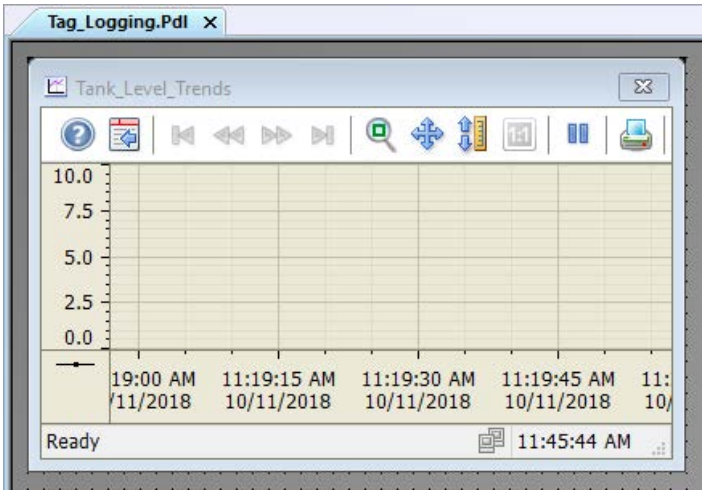
   The created Control contains a trend with the data connection of the selected archive tag "Fill_Level_Archive".

4. Continue with steps 3 to 5 and 8, as described in the above procedure.

Result

You have configured the trend window "Tank_Level_Trends".

In Runtime, this window outputs the values that are saved in the "Fill_Level_Archive" archive tag as a trend.



Next steps

You configure a table window in the "Graphics Designer" editor to output the values stored in the logging tag as a table in Runtime.

8.7.2 Configuring a table window

Introduction

The following steps will show you how to configure a table window.

You will configure the table window in the editor "Graphics Designer". You use the "Tag_Logging.Pdl" process picture for this.

You insert the object "WinCC OnlineTableControl" into the process picture.

In the "Quick_Start" project you will connect this object with the archive tag "Fill_Level_Archive".

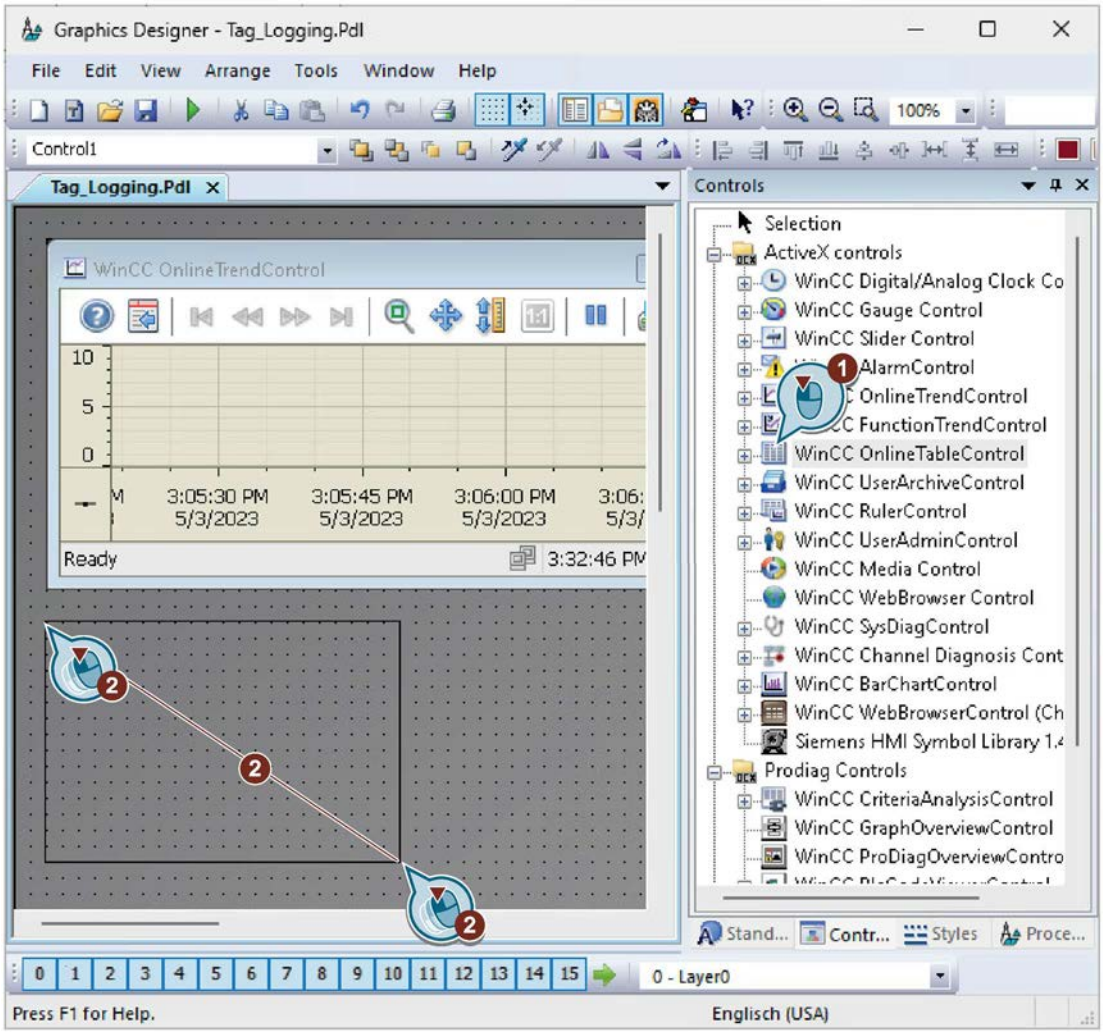
Hence, the values saved in the archive tag in Runtime are output as a table.

Requirement

- You have created the process value archive "Tank_Level_Archive".
- The "Tag_Logging.Pdl" process picture is open.

Procedure

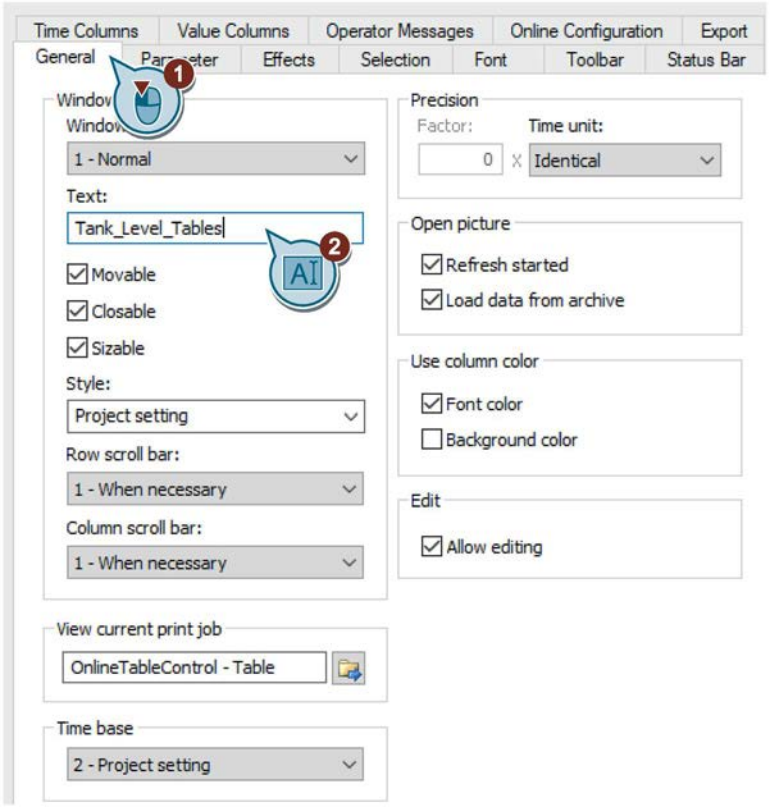
1. Insert the "WinCC OnlineTableControl" object into the "Tag_Logging.Pdl" process picture.



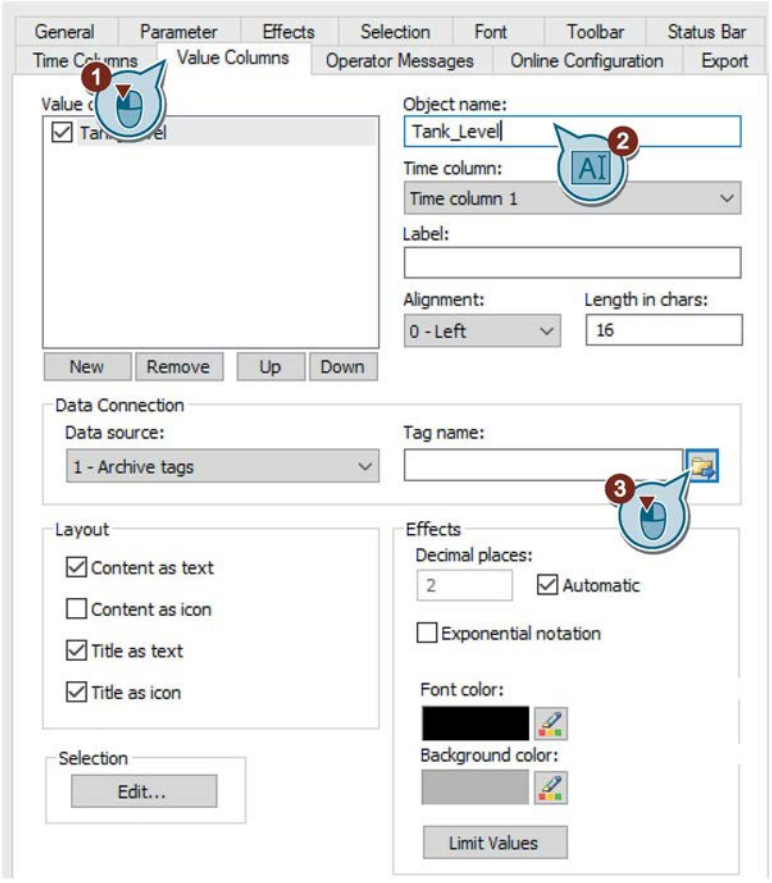
The table window will appear on the work surface in the "Graphics Designer" editor.

The "Properties of WinCC OnlineTableControl" dialog opens.

2. Enter the name "Tank_Level_Tables" for the table window.



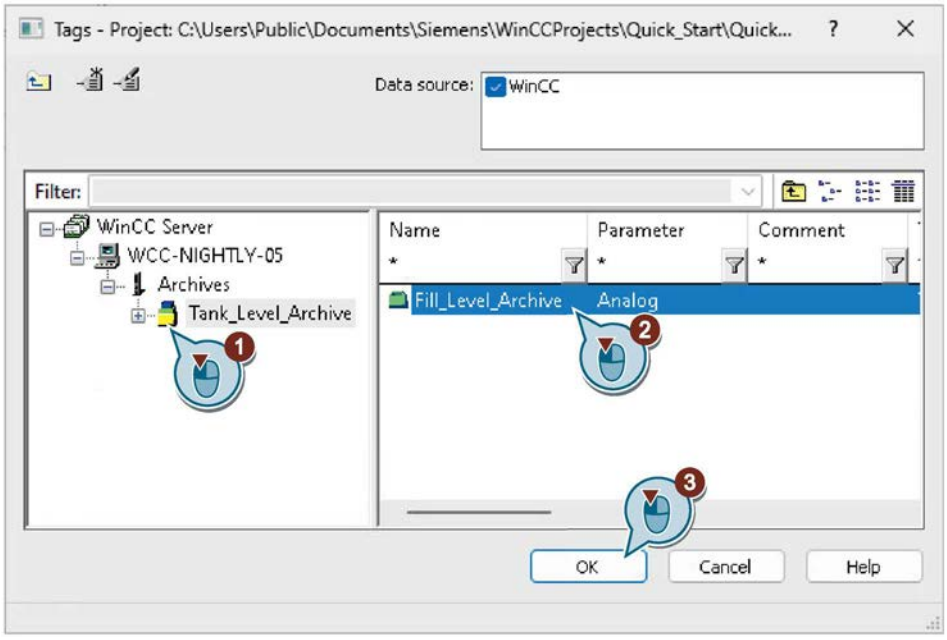
3. Enter the name "Tank_Level" for the value column and then click .



The dialog for archive tag selection opens.

4. Select the "Fill_Level_Archive" archive tag in the "Tags" dialog.

   To display the tags, you may need to select the "WinCC Tags" option in the "Data source" area.

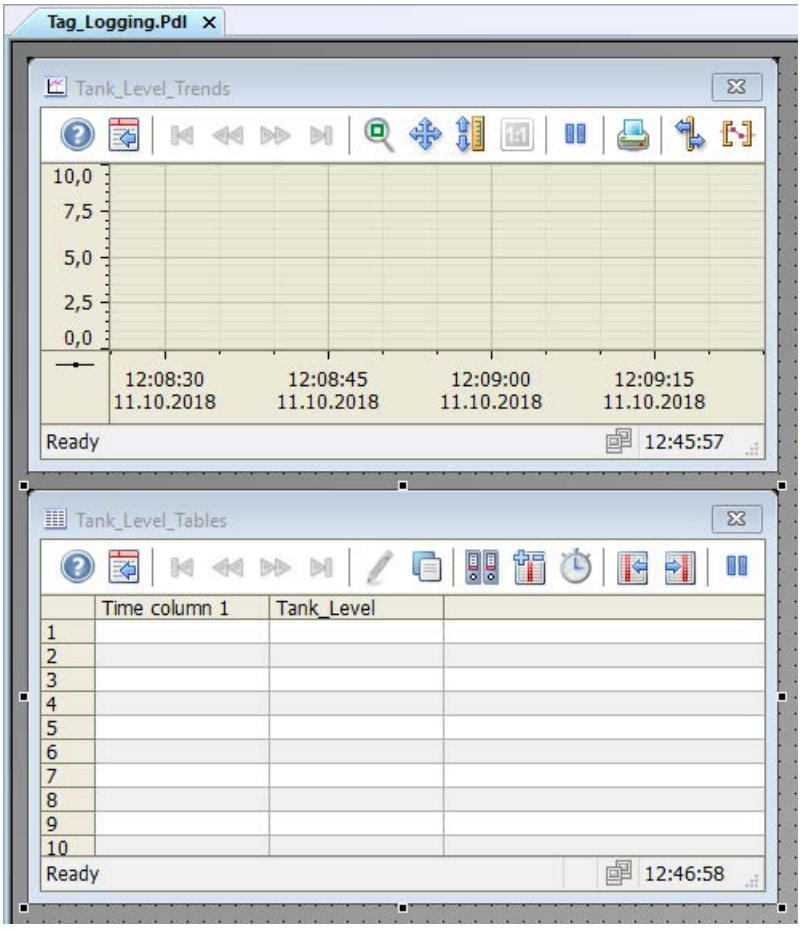


5. Click "OK" to close the "Properties of WinCC OnlineTableControl" dialog.
6. Save the "Tag_Logging.Pdl" process picture.
7. Close the Graphics Designer.

Result

You have configured the table window "Tank_Level_Tables".

In Runtime, this window outputs the values, which are saved in the "Fill_Level_Archive" archive tag as a table.



Next steps

- You add the "Tag_Logging.Pdl" page to the user-defined menu.
- You define the properties of WinCC Runtime.

8.8 Customizing the user-defined menu (archive system)

Introduction

The following steps show you how to add the "Tag Logging" menu item to the customized "Picture Change" menu.

You will link the menu entry "Tag Logging" with the procedure "ActivatePicture(ByVal PictureName)".

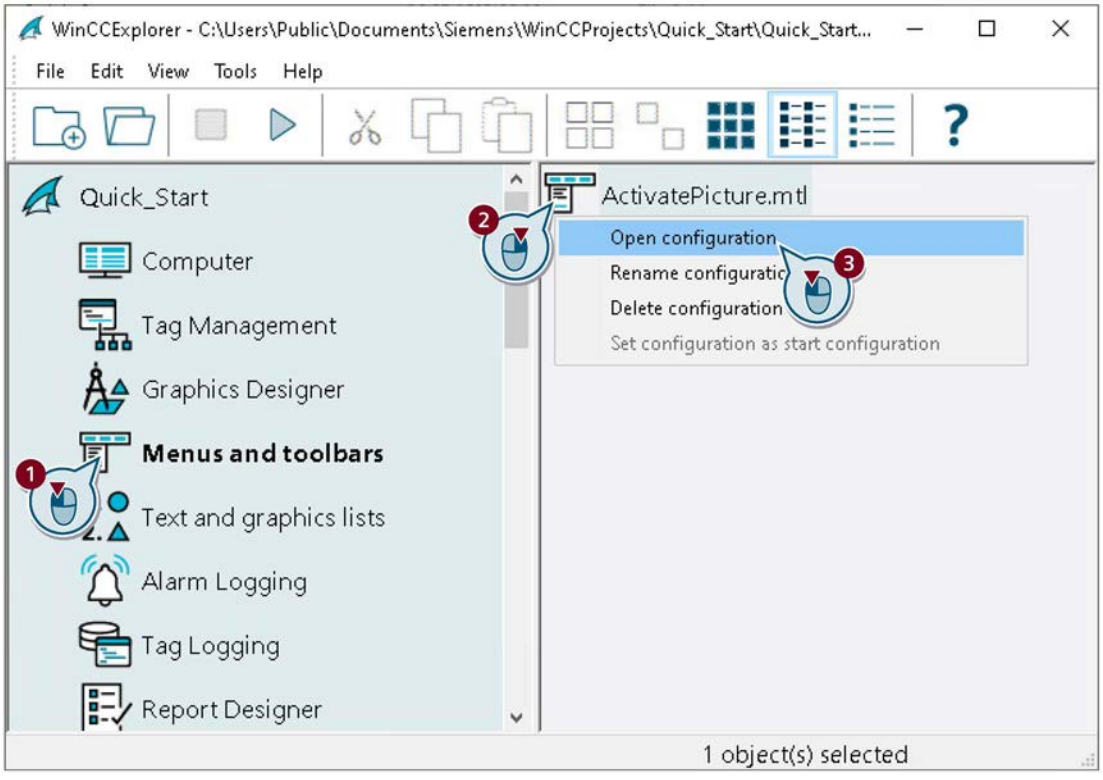
Enter the name of the process picture that you wish to change to in the field "User data".

Requirement

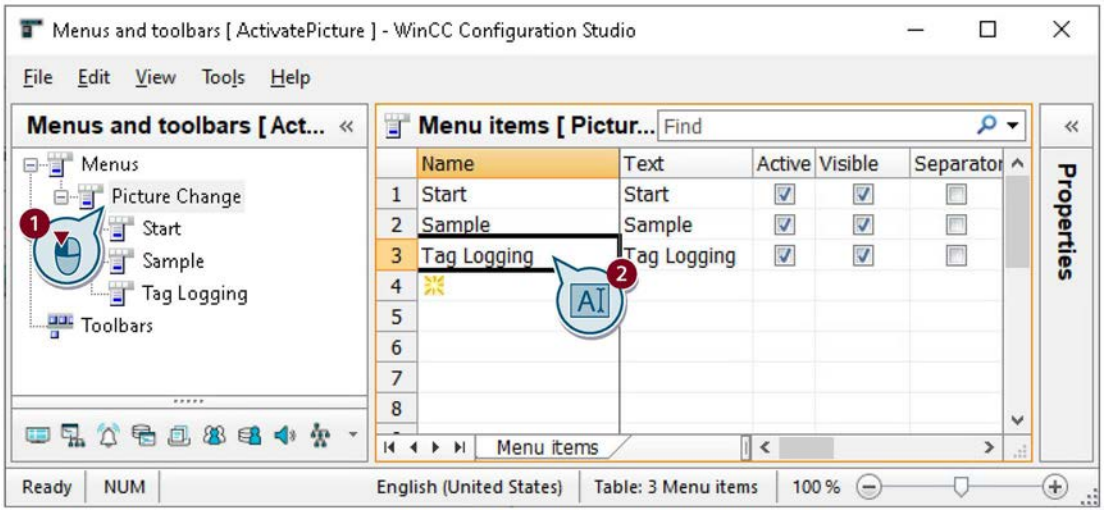
- The procedure "ActivatePicture(ByVal PictureName)" has been created.
- The user-defined "Picture Change" menu has been created for the "START.Pdl" and "SAMPLE.Pdl" process pictures.

Procedure

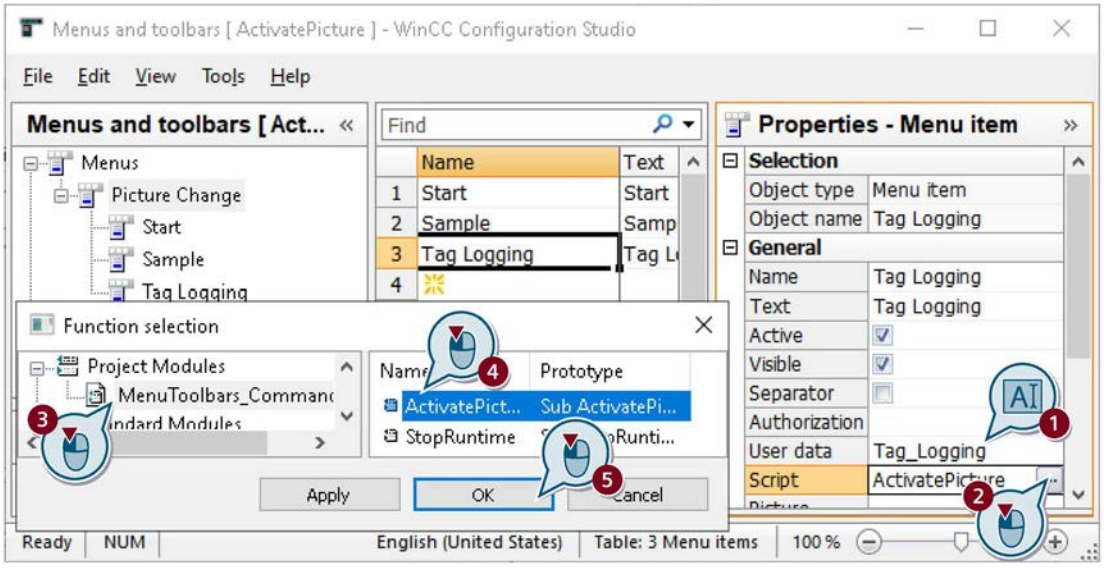
1. Open the saved configuration "ActivatePicture.mtl" in the "Menus and toolbars" editor.



2. Create the "Tag Logging" menu command.



3. Configure the "Tag Logging" menu item so that it executes a picture change to the "Tag_Logging.Pdl" picture.



4. Save the changes in the "Menus and toolbars" editor.
5. Close the "Menus and toolbars" editor.

Result

You have added the "Tag Logging" menu item to the "Picture Change" menu.

You switch to the "START.Pdl", "SAMPLE.Pdl" and "Tag_Logging.Pdl" process pictures in runtime with the menu items.

8.9 Defining Runtime properties (archive system)

Introduction

The following steps will show you how to define the properties for WinCC Runtime.

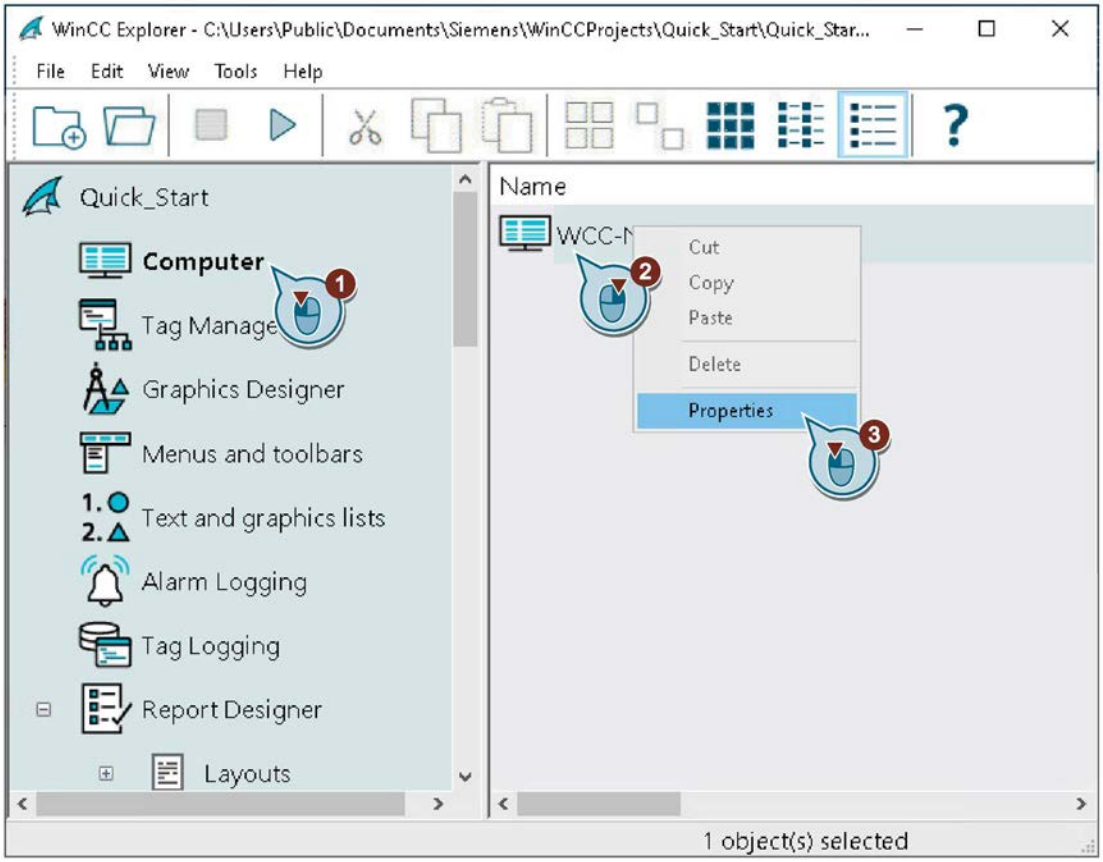
In this section, you will set up WinCC Runtime so that Tag Logging Runtime is executed when the project is activated.
You select the "Tag_Logging.Pdl" process picture as the start picture for the runtime window.

Requirement

- The "Tag_Logging.Pdl" process picture has been created.

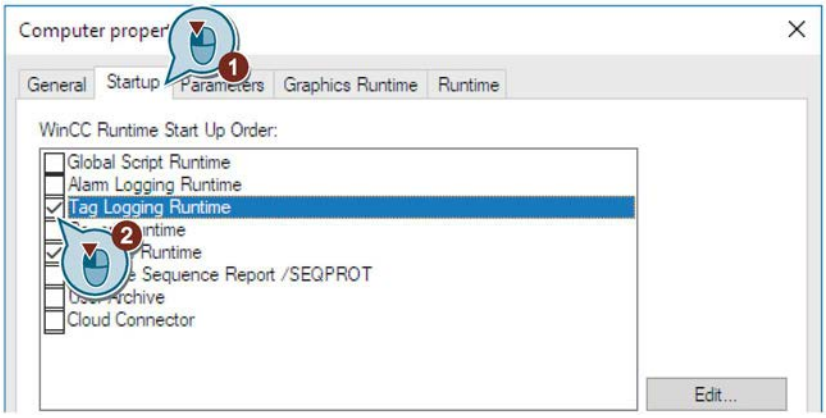
Procedure

1. Open the properties of the computer via the shortcut menu in the navigation area of the "Computer" editor.

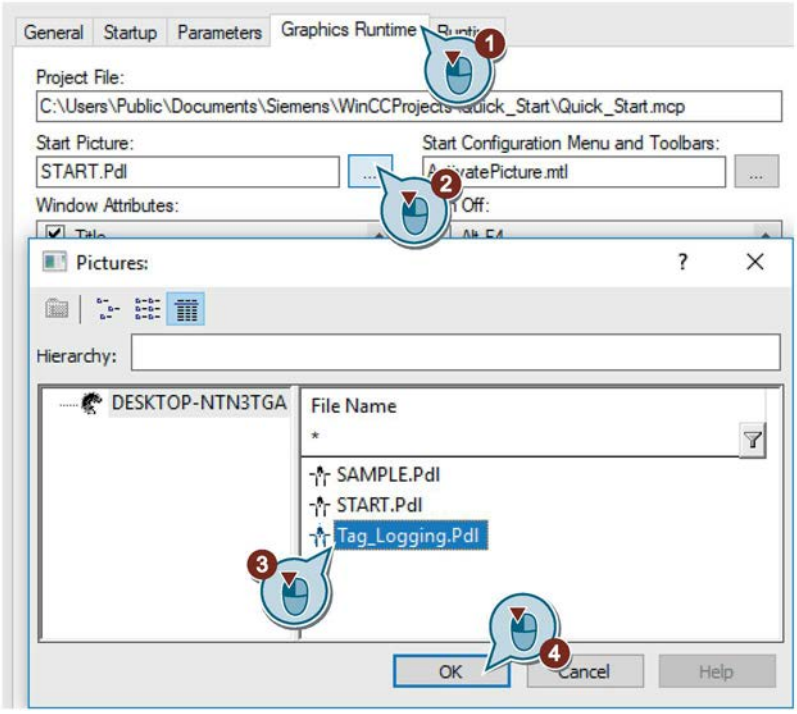


The properties of the computer open.

2. Select the "Tag Logging Runtime" application on the "Startup" tab.



3. Define the "Tag_Logging.Pdl" process picture as the start picture on the "Graphics Runtime" tab.



Result

You have defined the WinCC Runtime properties. When the "Quick_Start" project is activated, Tag Logging Runtime is executed and the "Tag_Logging.Pdl" process picture is displayed.

Next steps

You activate and test the "Quick_Start" project.

8.10 Activating and testing the project (archive system)

Introduction

The following steps will show you how to activate and test configurations in the "Quick_Start" project.

The WinCC TAG Simulator assigns values to the internal tag "Tank_Level" in Runtime.

These values are acquired every two seconds in the "Quick_Start" project and saved in the archive tag "Fill_Level_Archive".

Tag Logging Runtime reads the archives values and transfers them to the trend window and the table window. The values are output as a trend and as a table.

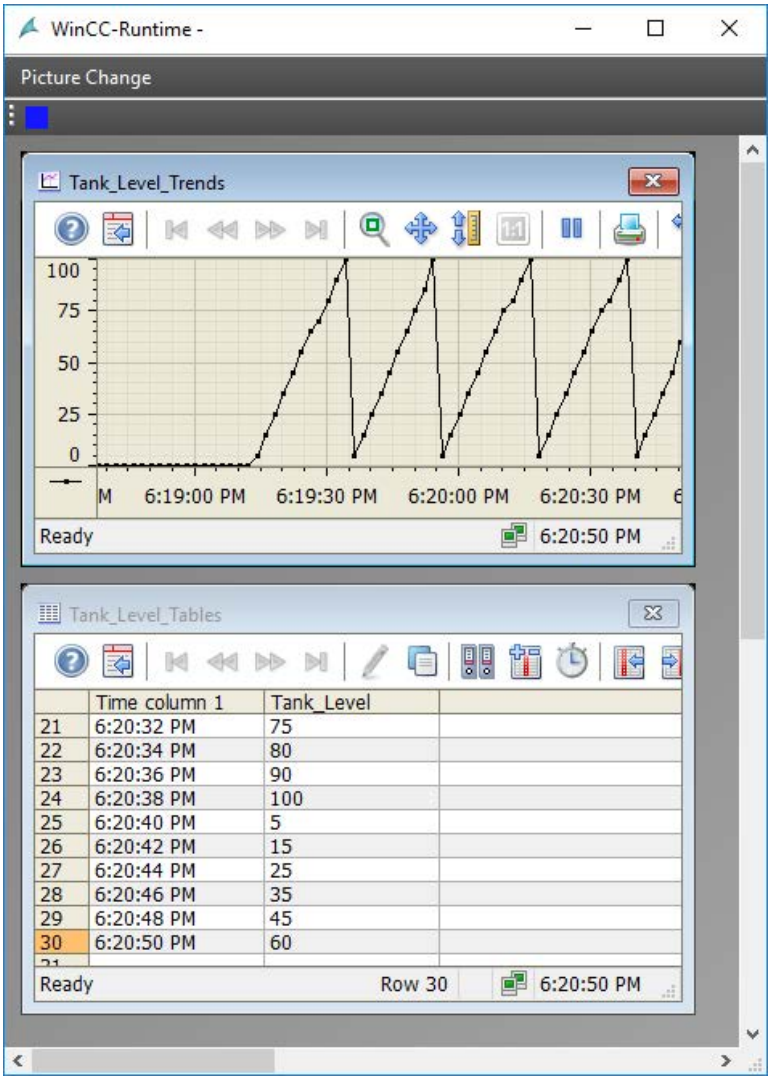
Requirement

- The Runtime properties are defined.

Procedure

1. Open the "QuickStart_Simulation.sim" configuration in the "Tags Simulation" editor.
2. Activate WinCC Runtime in the WinCC Explorer using the button.
3. Start the simulation in the "Tags Simulation" editor using "Simulation > Start".

4. Observe the output of the simulation values in the "Tag_Logging.Pdl" process picture.



5. Stop the simulation in the "Tags Simulation" editor using "Simulation > Stop".
6. Exit WinCC Runtime using the ☐ button in the toolbar.

Result

You have activated the "Quick_Start" project and simulated the values of the internal tags "Tank_Level".

The value sequence is displayed in the configured trend and table windows.

Configuring messages

9

Introduction

This section provides information about the alarm logging and a description of how to configure messages in the "Alarm Logging" editor.

Principle

The alarm logging monitors the processes.

You can configure the following messages in the "Alarm Logging" editor of the alarm system:

- Discrete alarm

  Display status changes in the process.

  The discrete alarms are triggered by the PLC.

- Analog alarm:

  Show limit violations.

  The analog alarms are triggered when the set limits are violated.

Configuring in the "Quick_Start" project

In the "Quick_Start" project, you will configure messages to monitor the supply valve and the fill level of the bioconverter:

- To simulate the statuses of the supply valve, create a new internal tag.

  In the "Alarm Logging" editor you will configure discrete alarms for the different statuses of the supply valve.

  A discrete alarm is triggered when a certain bit is set in the tag value.

- You will simulate the fill level of the bioconverter in the "Quick_Start" project using the values of the internal tag "Tank_Level".

  You will set a lower and high limit for the fill level.

  If the values of the internal tag "Tank_Level" violate a limit, the corresponding analog message is triggered and displayed in Runtime.

9.1 The message system

Introduction

The message system is a subsystem of WinCC which is used to monitor the processes.

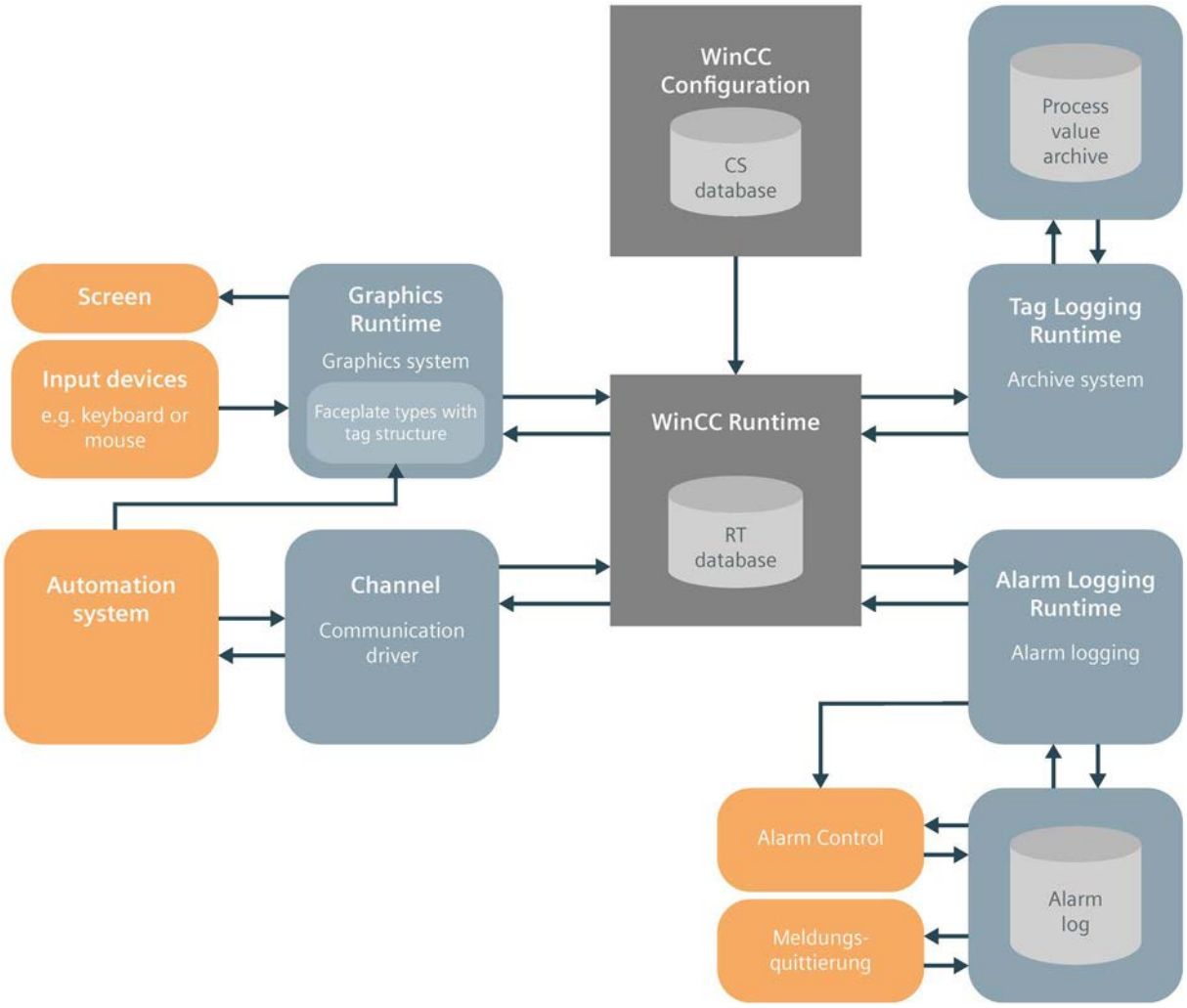
With certain statuses and changes in the process, the message system generates messages and outputs them as tables in Runtime.
The messages help you to identify critical situations early so that downtimes can be avoided.

Components of the message system

The message system is made up of a configuration component and a runtime component.

- The configuration component of the message system is the "Alarm Logging" editor.
  In the "Alarm Logging" editor, you can mainly execute the following tasks:
  - Creating messages
  - Preparing messages
  - Setting limits
  - Displaying message texts and message states
  - Defining acknowledgment properties of the messages
  - Defining archiving properties of the messages
- Alarm Logging Runtime is the runtime component of the message system.
  Alarm Logging Runtime is primarily used to perform the following tasks:
  - Executing the defined monitoring
  - Controlling the message output
  - Managing acknowledgments

Message system and message archive in the WinCC system



9.2 Starting Alarm Logging

Introduction

The following steps show how to start the "Alarm Logging" editor.

In the "Alarm Logging" editor you will configure all bit and analog messages needed for the "Quick_Start" project.

Requirement

- The "Quick_Start" project is open.

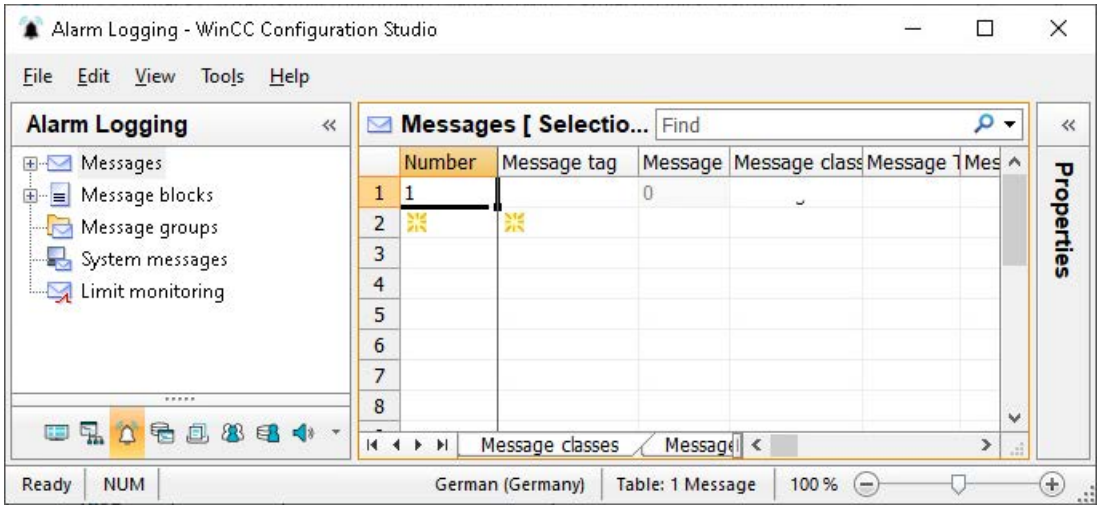
Procedure

1. Launch the "Alarm Logging" editor.

   The "Alarm Logging" editor opens.

Result

You have opened the "Alarm Logging" editor.



Next steps

In the next steps, you define the message blocks and message classes.

9.3 Configuring message blocks

Introduction

The following steps show you how to configure message blocks for the messages in the "Quick_Start" project.

The messages are displayed in a table in Runtime.

Message blocks

Each message is composed of information that is shown in the columns of the table.

These individual pieces of information are referred to as message blocks.
Each message block corresponds to one column in the table.

The message blocks are subdivided into three groups:

- System blocks with system data, for example, date, time, message number and status.

  System blocks are predefined.
- User text blocks with explanatory text, for example, text with information on the location and cause of a fault.

  The texts are freely customizable.
- Process value blocks are used to connect the messages with process values, for example, current fill levels, temperatures or speeds.

You can modify the properties of the message blocks for display in Runtime.

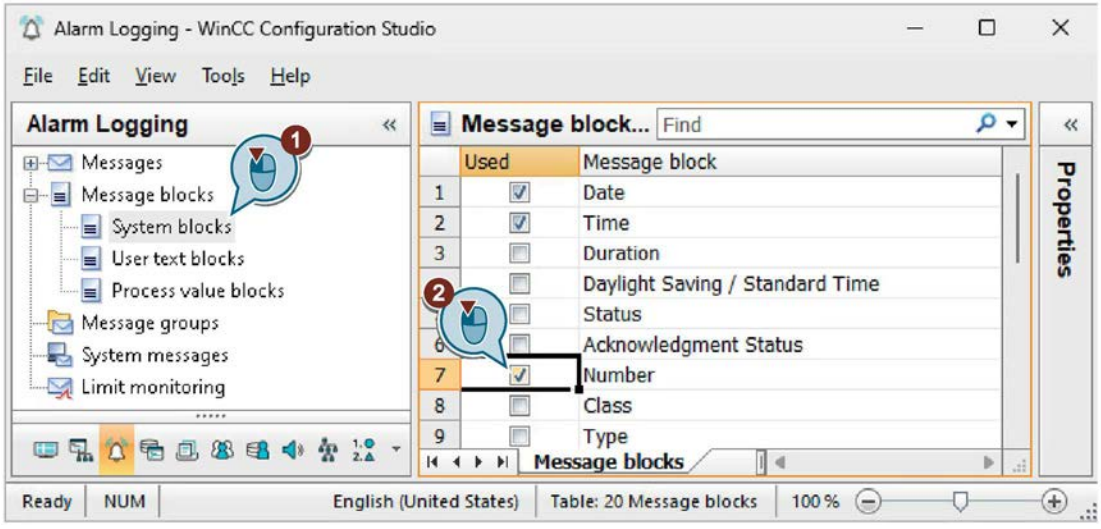
Change the length of the user text blocks used for the "Quick_Start" project.

Requirement

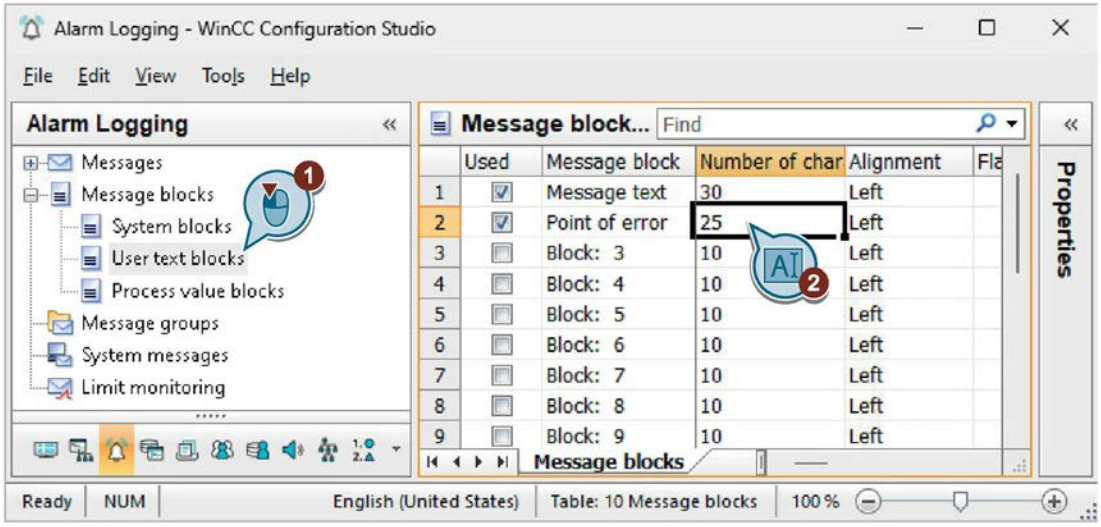
- The "Alarm Logging" editor is open.

Procedure

1. In the navigation area, select the "System blocks" item in the "Message Blocks" folder.
2. Activate the system blocks that are displayed in Runtime:
   - "Date"
   - "Time"
   - "Number"



3. Select the "User text blocks" item in the navigation area and activate the "Message text" and "Point of error" blocks.
4. Change the text length in the "Number of characters" field either in the table area or in the "Properties" window:
   - Message text: 30 characters
   - Point of error: 25 characters



Result

You have defined the message blocks for the messages in the "Quick_Start" project.

Next steps

You configure three discrete alarms to monitor status changes of the inflow valve.

9.4 Configuring bit messages

Introduction

This section provides a description of how to configure discrete alarms in the "Alarm Logging" editor.

Overview

Each discrete alarm corresponds to the following supply valve status at the bioconverter:

- Valve_open (valve open)
- Valve_closed (valve closed)
- Valve_inop (valve failed)

If the status of the supply valve changes, a corresponding discrete alarm will be triggered and displayed in Runtime.

You will create a new internal tag to simulate the various statuses of the supply valve. You will then set this tag as a message tag for the created discrete alarms.

You define the following properties for each discrete alarm:

Message tag	The message tag is linked to the status changes in the process. If a status change takes place in the process, a bit is set in the tag value. Depending on the tag values, a discrete alarm is triggered.
Message bit	The message bit defines which bit triggers a discrete alarm.
Message text	The message text describes the status of the supply valve, for example, "Valve open" in the "Quick_Start" project.
Fault location	The fault location describes the location of the status change.

9.4.1 Creating bit messages

Introduction

The following steps show how to create discrete alarms in the "Alarm Logging" editor.

For the "Quick_Start" project, create three discrete alarms in the message class "Error" and the message type "Alarm".

Requirement

- The "Alarm Logging" editor is open.
- You have created a new internal tag in Tag Management.
  - Name: "Inflow_Valve"
  - Data type: "Unsigned 16-bit value"

  Follow the procedure described under: Creating internal tags (Page 39)

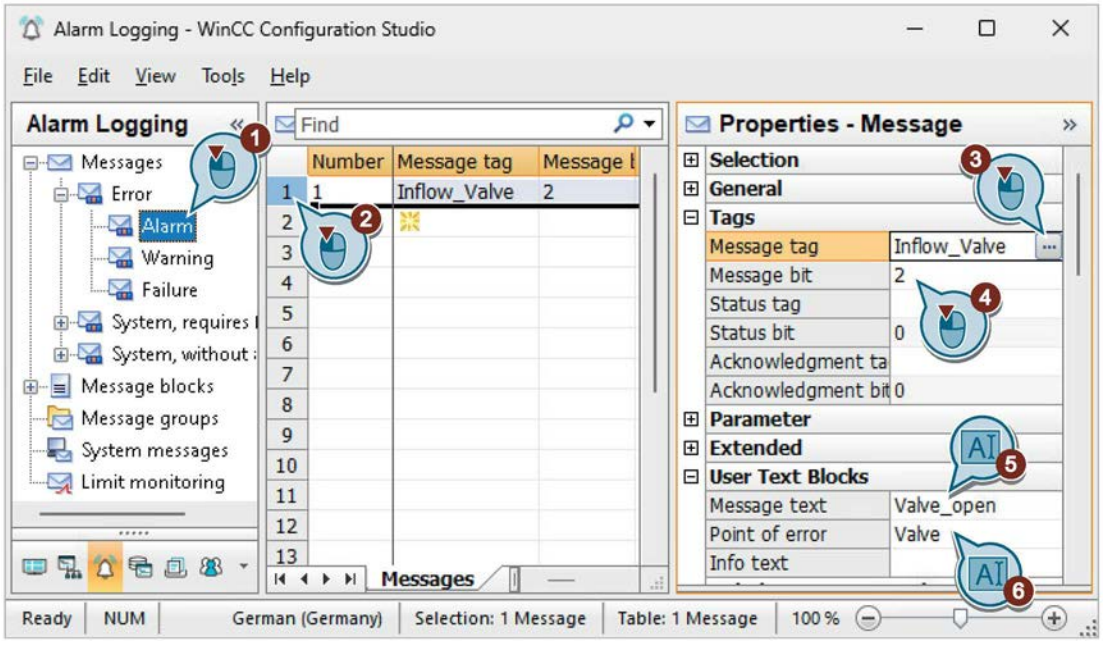
Procedure

1. In the "Messages" folder of the navigation area, select the "Alarm" message type under "Error".

   You can change the displayed language of message class and message type. Select the desired language in the "View > Input language" menu.

   To edit the properties of the messages, open the "Properties" window.

2. In the table area, select the first row and define the following properties:
   - Message tag: "Inflow_Valve"
   - Message bit: 2
   - Message text: "Valve_open"
   - Point of error: "Valve"



3. Create two additional discrete alarms:

   Click in the "Number" column of the next available row in the table area for each.

   Enter a number for the message.

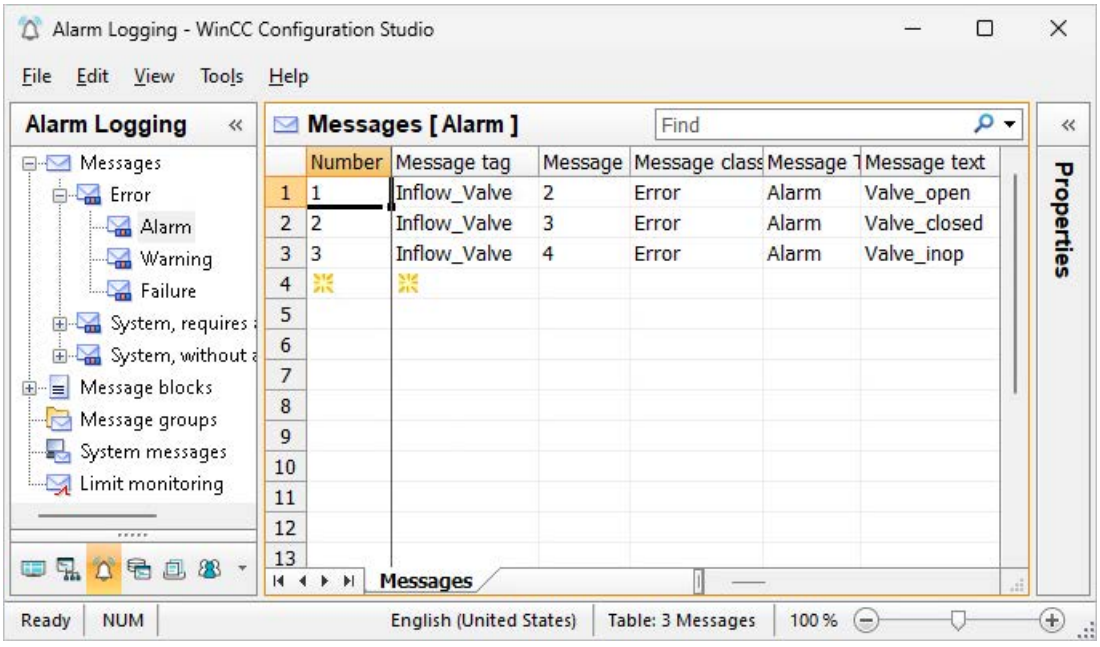
4. In the "Properties - Message" area, define the following properties for the second discrete alarm:
   - Message tag: "Inflow_Valve"
   - Message bit: 3
   - Message text: "Valve_closed"
   - Point of error: "Valve"
5. You define the following properties for the third discrete alarm:
   - Message tag: "Inflow_Valve"
   - Message bit: 4
   - Message text: "Valve_inop"
   - Point of error: "Valve"

Result

You have defined the discrete alarms with the properties for the "Quick_Start" project.

The created discrete alarms are displayed in the table window of the "Alarm Logging" editor.

The output of the discrete alarms in Runtime is controlled with the configuration of the messages. If, for example, the second bit from the right is set in the value of the internal tag "Inflow_Valve", the discrete alarm "Valve_open" is triggered.



Next steps

You configure two analog alarms to monitor the behavior of the internal tag "Tank_Level".

9.5 Configuring analog messages

Introduction

This chapter provides a description of how to configure analog messages in the "Alarm Logging" editor.

Overview

The analog alarms show limit violations in Runtime.

The configuration of the analog messages in the "Quick_Start" project consist of the following steps:

1. Defining the tag to be monitored

   Define the tag to be monitored under "Limit value monitoring" in "Alarm Logging".

2. Setting limits

In the "Quick_Start" project you will monitor the behavior of the internal tag "Tank_Level". The tag values simulate the fill level of the bioconverter.

Define a high and a low limit value for the tag.

The "Alarm Logging" editor generates an analog message for each limit value defined:

- The high limit will define the maximum water volume that is permitted in the bioconverter.

  If the high limit is violated, the bioconverter is overfilled.

  The corresponding analog message is displayed in Runtime.

- The low limit defines the minimum water volume that should be in the bioconverter.

  If the low limit is violated, the fill level of the bioconverter has fallen to a dangerous level.

  The corresponding analog message is displayed in Runtime.

9.5.1 Setting limit values

Introduction

The following steps will show you how to define the limit values for the internal tag "Tank_Level".

Any number of limits can be set for a tag.
The "Alarm Logging" editor will create an analog message for each defined limit value.

In the "Quick_Start" project you will define a upper and low limit value for the internal tag "Tank_Level".

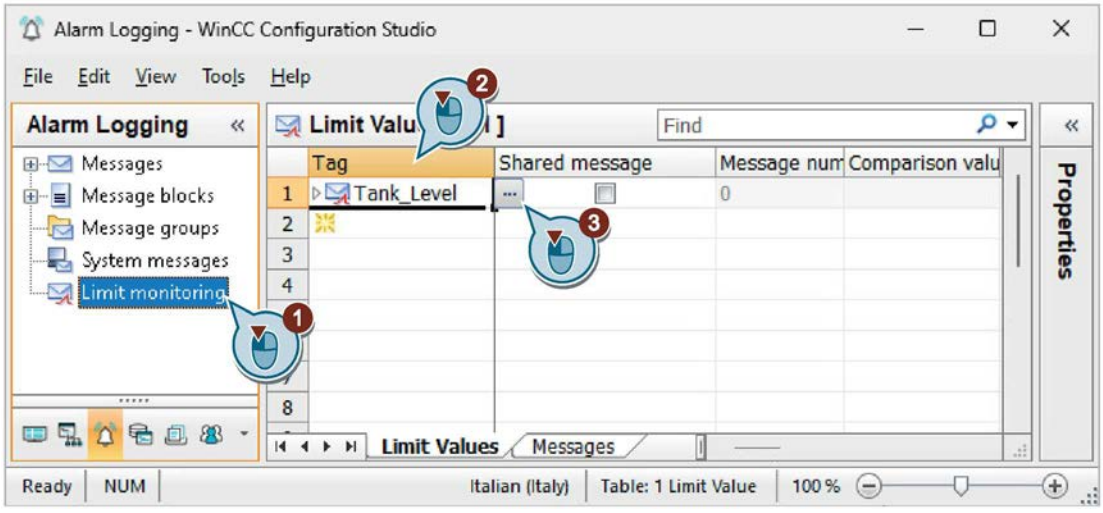
Requirement

- The "Alarm Logging" editor is open.
- The internal tag "Tank_Level" is configured.

Procedure

1. In the navigation area, select the "Limit monitoring" folder.
2. Click in the top empty line of the "Tag" column in the table area.

   Select the internal tag "Tank_Level".

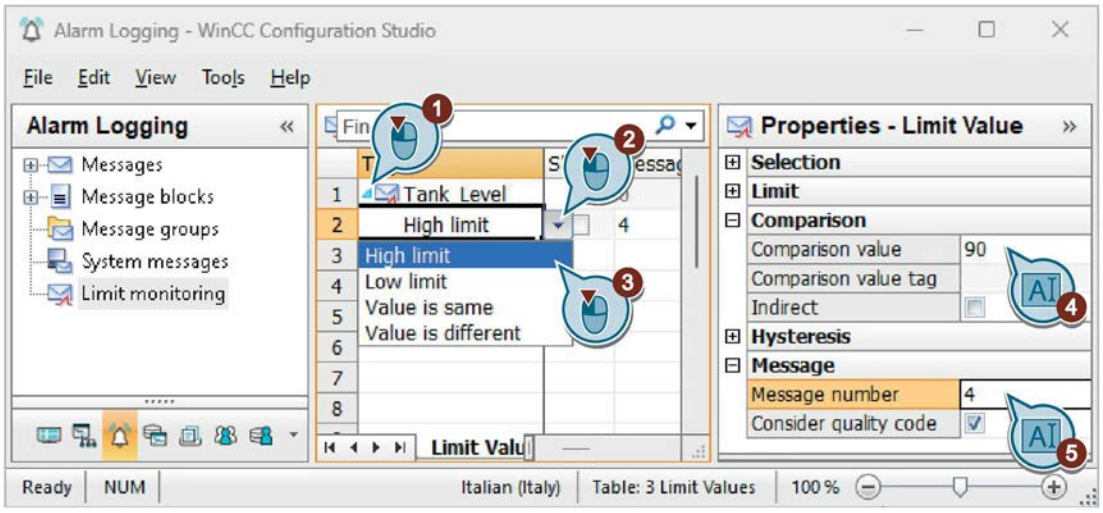


3. To open the entry, click the arrow in front of the tag name.

   Select the "High limit" entry under the tag in the table pane.

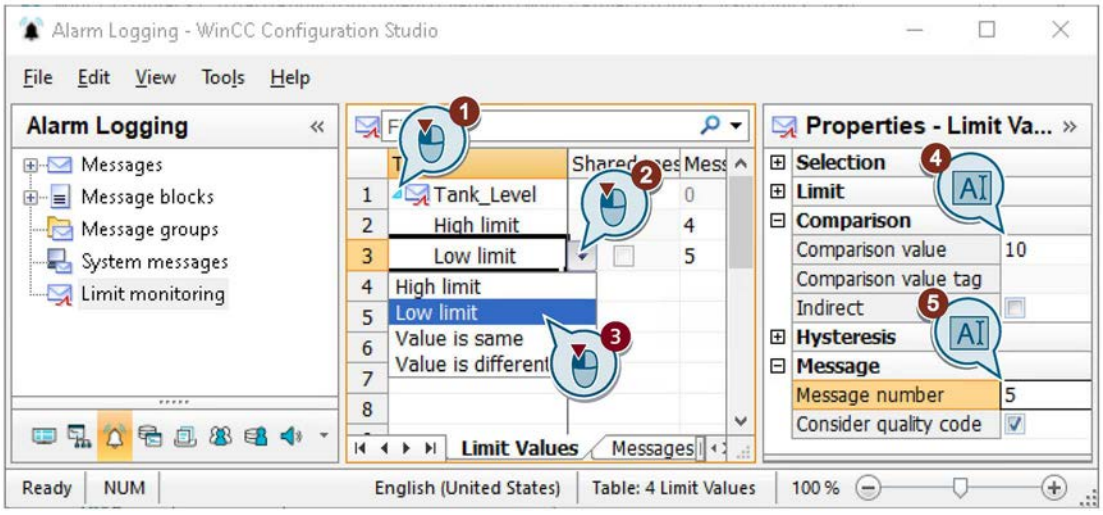
4. Enter the properties for the high limit value in the "Properties - Limit value" area or in the table area.

   Use a new, unused message number, e.g. "4".



5. To enter the data for the second limit, select the "Low limit" entry in the next line under the tag.
6. Enter the properties for the low limit value in the "Properties - Limit value" area or in the table area.

   Use a new, unused message number, e.g. "5".



Result

You have defined the limit values for the internal tag "Tank_Level".

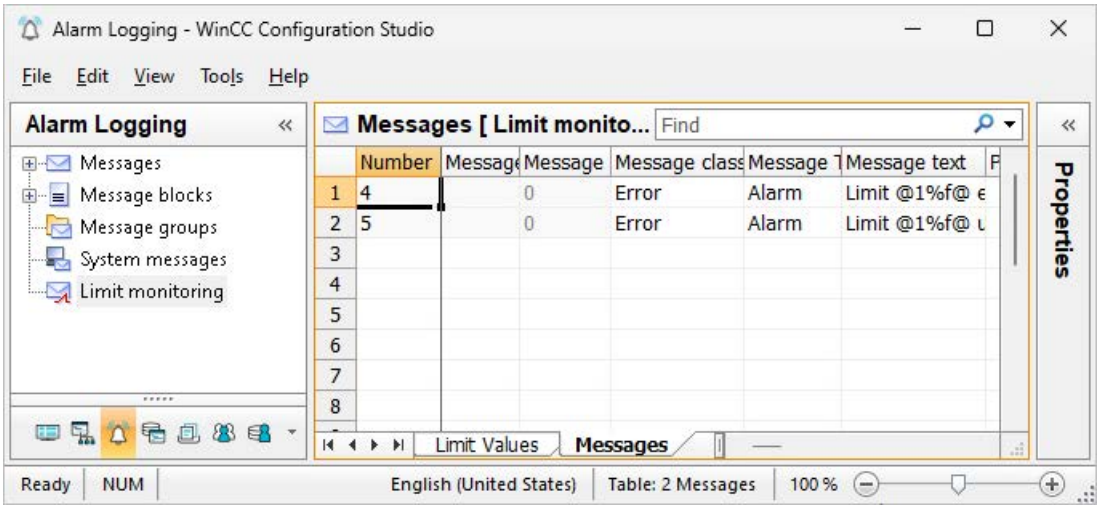
- If the tag value is greater than 90, the analog message "High limit value" is triggered and displayed in Runtime.

  This message indicates that the bioconverter fill level is exceeded.

- If the tag value is less than 10, the analog message "Low limit value" is triggered and displayed in Runtime.

  This message indicates that the fill level is below the permitted level.

Select the "Limit monitoring" entry in the navigation pane and click on the "Messages" tab to obtain an overview of the analog alarms created.



Next steps

You configure the display of limit violations in the WinCC OnlineTrendControl.

9.5.2 Displaying messages in trend windows

Introduction

The following steps show you how to display the messages of the limit monitoring as a tooltip in a WinCC OnlineTrendControl.

You create a trend for the "Tank Level" tag and enable the "Show Alarms" option.

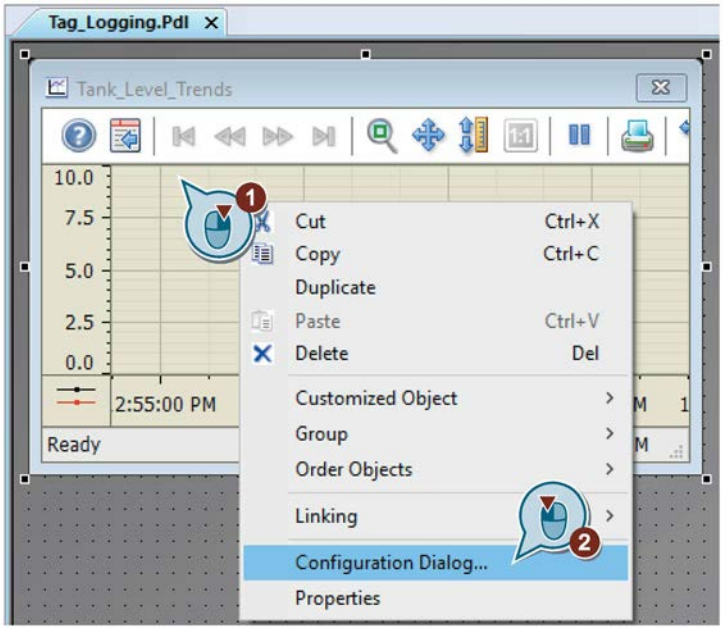
The assigned messages are displayed as symbols and tooltips for trend values with limit violation in Runtime.

Requirement

- The "Tag_Logging.Pdl" picture is open in the Graphics Designer.
- You have configured the limit monitoring in Alarm Logging.
  Follow the procedure described under: Setting limits (Page 185)

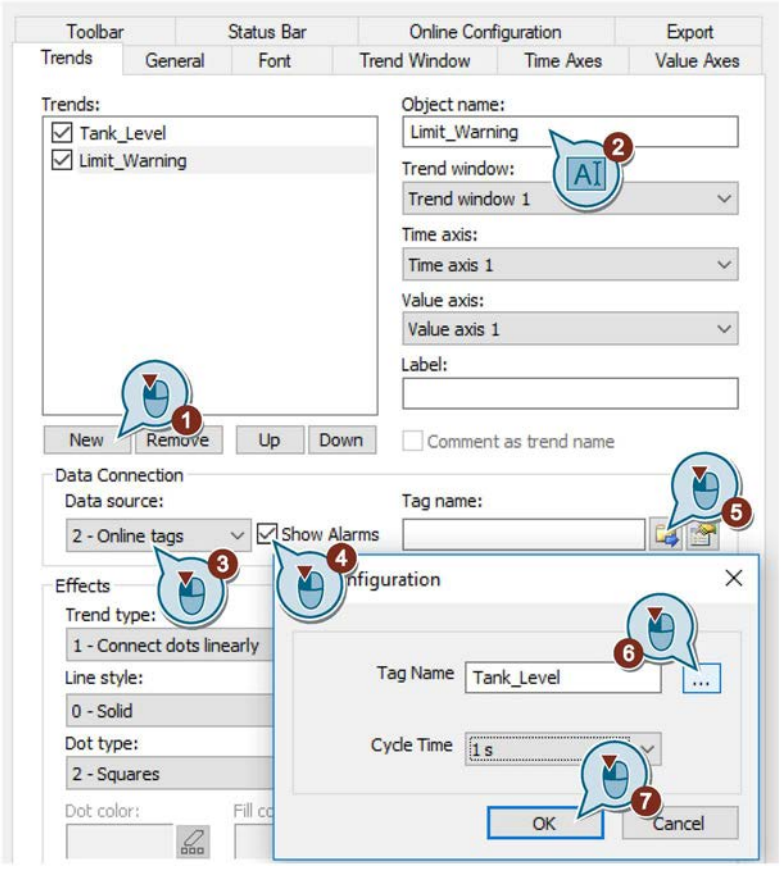
Procedure

1. Select the WinCC OnlineTrendControl "Tank_Level_Trends".
2. Open the "Properties of WinCC Online Trend Control" configuration dialog using the shortcut menu.

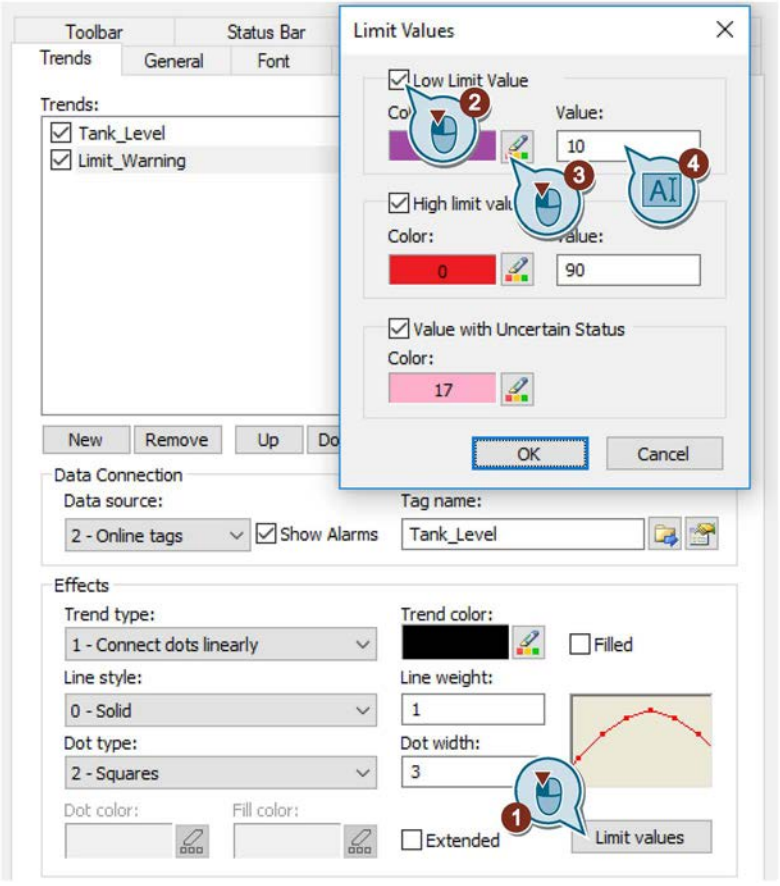


3. Create the "Limit_Warning" trend for internal tag "Tank_Level" and select the "Show Alarms" option.

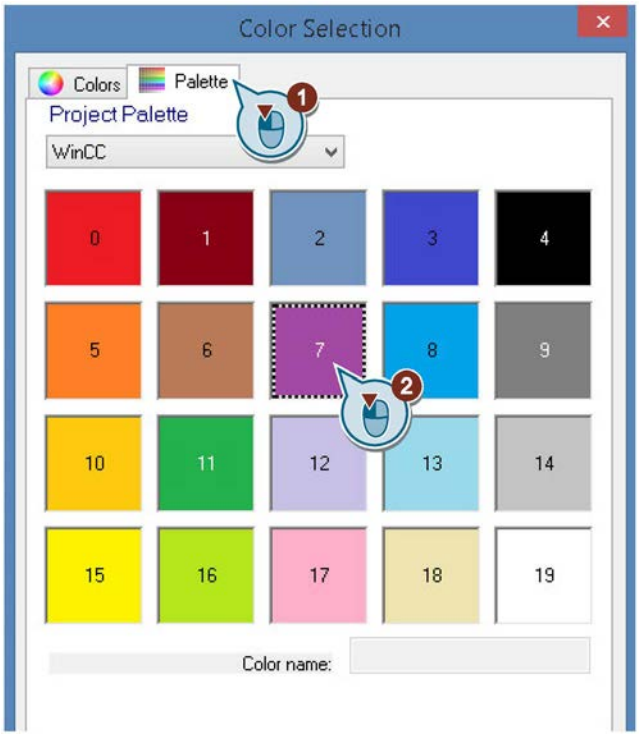
   To display the tags in the tag selection dialog, you may need to select the "WinCC Tags" option in the "Data source" area.



4. Configure a color change of the trend for the low limit.



If you want to apply predefined colors, select the color palette in the "Color Selection" dialog.



5. Configure a color change of the trend for the high limit and for values with uncertain status.

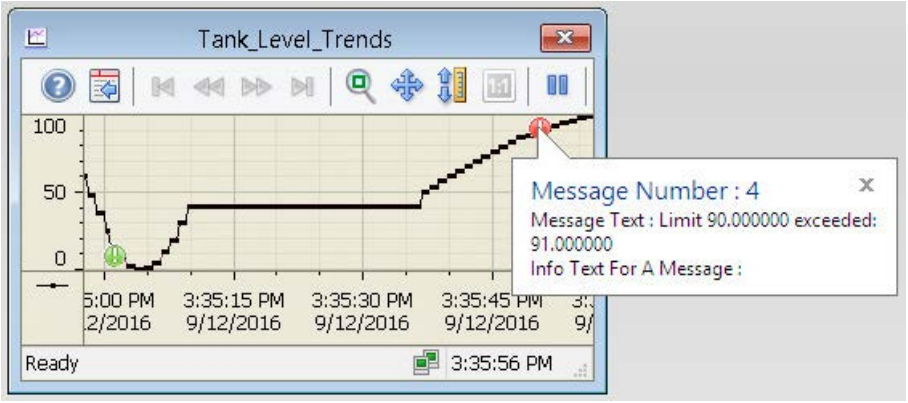
Result

You have configured the "Limit_Warning" trend for internal tag "Tank_Level" and linked it to the limit monitoring.

A limit violation is displayed in Runtime:

- A red symbol indicates that a limit has been violated.
- The tooltip shows the message text of the message.
- The trend changes color.
- When the value is back within the limits, the symbol turns green.

  The message may continue to be displayed.



Next steps

You define the colors for displaying the message statuses in Runtime.

9.6 Defining the color of the message statuses

Introduction

The following steps show you how to define the display colors for the different message statuses.

A distinction is made between three basic types of message status in WinCC:

- A message "came in" as long as the cause for the message exists.
- A message "went out" as soon as the cause for the message no longer exists.
- A message is "acknowledged" when the message is acknowledged by the user.

The current status of each message is displayed in different colors in Runtime.
The display color of the individual message statuses is determined in the "Alarm Logging" Editor.

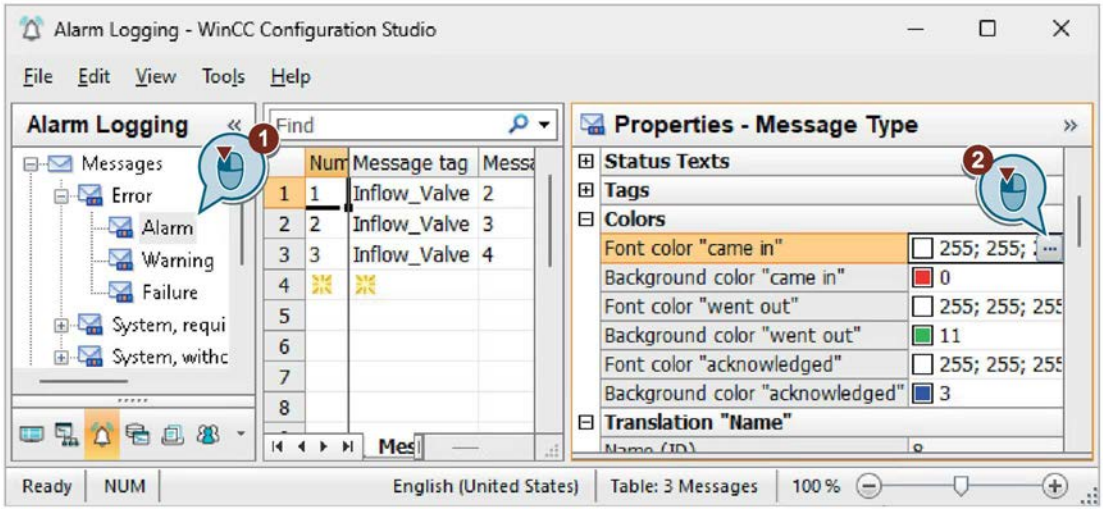
In the "Quick_Start" project, you define the different font colors and background colors for the three basic statuses.
This definition is applicable to the entire message type "Alarm" of the message class "Error".
This applies the settings to all messages in the "Quick_Start" project.

Requirement

- The "Alarm Logging" editor is open.

Procedure

1. Under "Error" in the navigation area, select the folder for the "Alarm" message type.
2. Edit the colors of the message type in the "Properties" area.



3. Define the following properties for the message status "came in":
   - Font color: White
   - Background color: Red
4. Define the following for the message status "went out":
   - Font color: White
   - Background color: Green
5. Define the following for the message status "acknowledged":
   - Font color: White
   - Background color: Blue
6. Close the "Alarm Logging" editor.

Result

You have now defined the display color of the message statuses "came in", "went out" and "acknowledged".

In Runtime, the messages are displayed in the respective colors depending on their status.

Next steps

You configure a process picture in the "Graphics Designer" editor to output the messages in a table in Runtime.

9.7 Configuring a process screen (message system)

Introduction

This section offers a description how to configure a process picture, which displays the output of the messages.

Principle

You configure the process picture in the "Graphics Designer" editor.

For this, you use the following objects:

- WinCC AlarmControl

  The "WinCC AlarmControl" object is used for creating an alarm window. The messages are displayed in a table in the alarm window.

  The output takes place in Runtime.

- Slider object

  You use the slider object in the "Quick_Start" project to transfer analog values to the internal tag "Tank_Level".

  If the transferred values violate a defined limit value, the corresponding analog alarm is triggered.

- I/O field

  You connect the "I/O field" object with the internal tag "Inflow_Valve" in the "Quick_Start" project.

  You enter binary values into the I/O field. These values are assigned to the tag "Inflow_Valve" in Runtime.

  If a certain bit is set in the tag value, the corresponding discrete alarm is triggered.

9.7.1 Configuring an alarm message window

Introduction

The following steps show you how to configure a message window.

You configure the message window in the "Graphics Designer" editor.

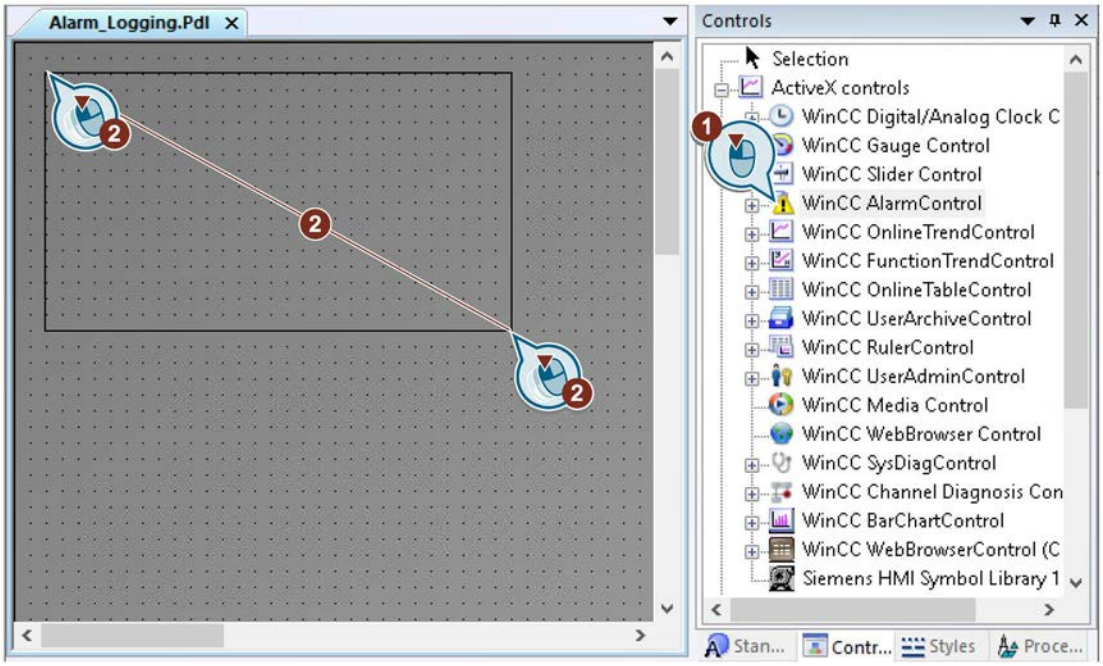
For this, you will create a new process picture. You insert the "WinCC AlarmControl" object in the process picture. This object is pre-configured for the display of the messages.

The properties of the WinCC AlarmControl are used to define which message blocks are to be displayed as columns in the message window.

In Runtime, the messages consist of these message blocks.

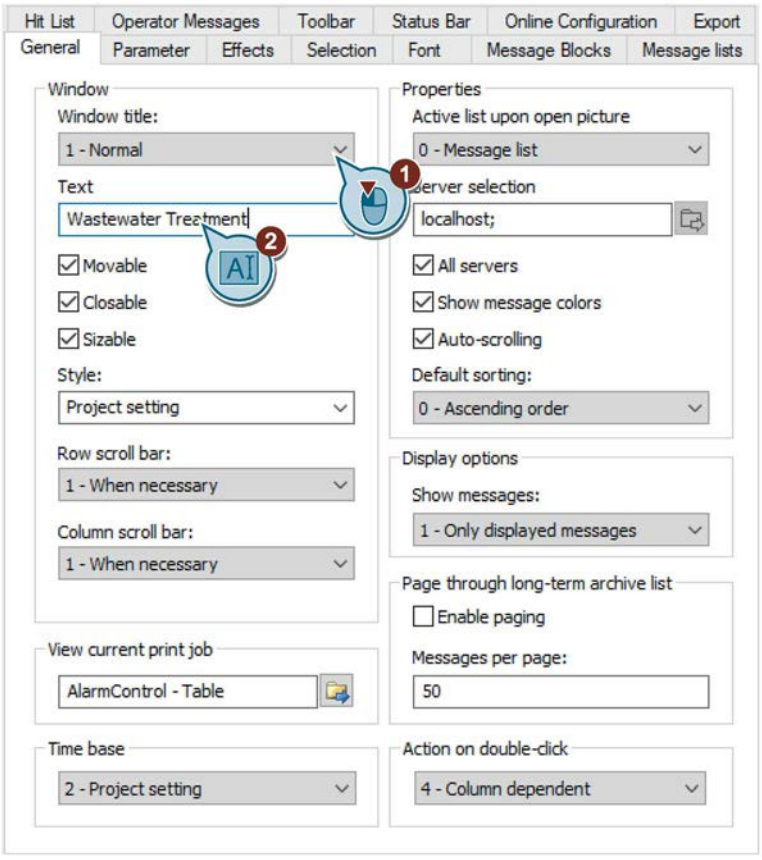
Procedure

1. Create a new process picture named "Alarm_Logging.Pdl" and open it in the "Graphics Designer" editor.
2. Insert the "WinCC AlarmControl" object into the process picture.



The "WinCC AlarmControl Properties" dialog opens.

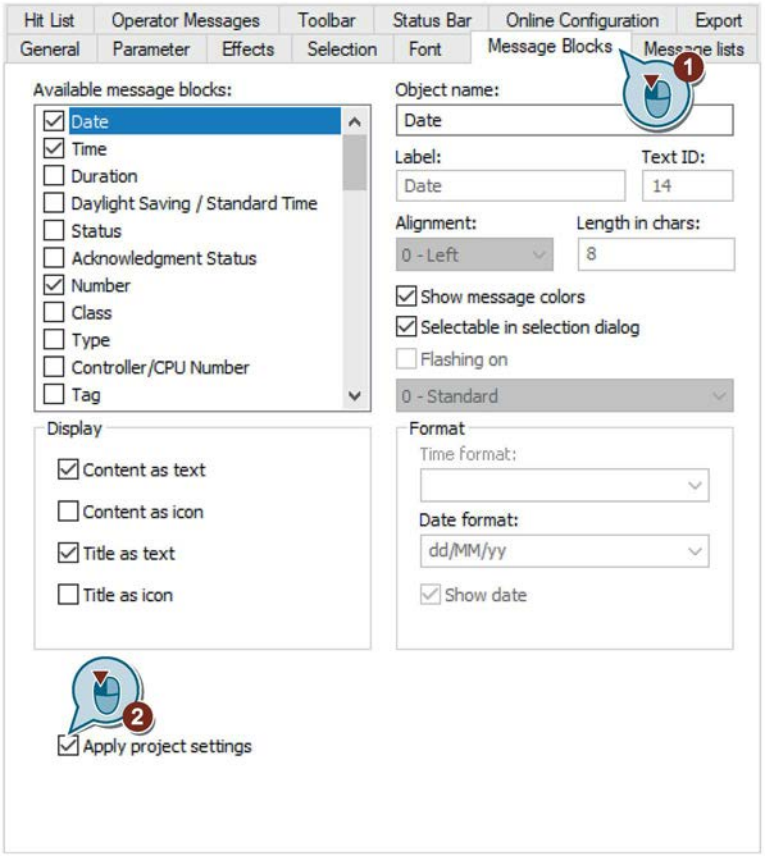
3. Specify the name of the message window.



4. Click on the "Message blocks" tab.

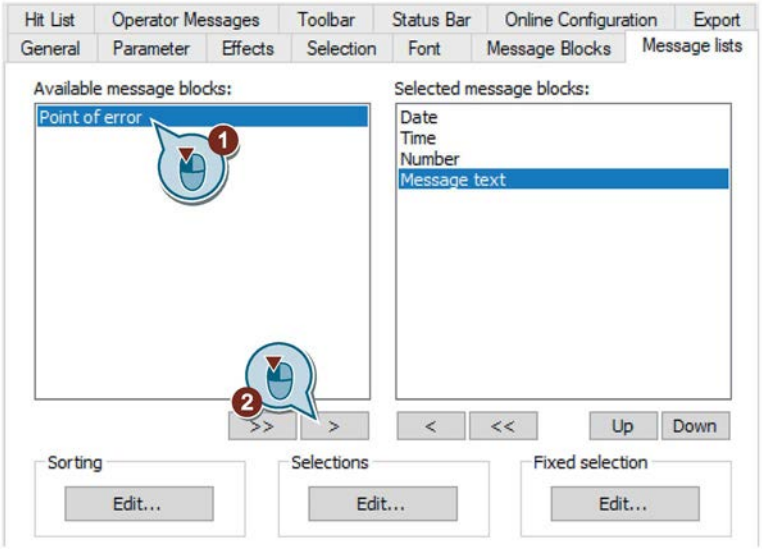
   Make sure that the "Apply project settings" setting is activated.

   This applies the configuration of the message blocks from Alarm Logging.



5. Click on the "Message lists" tab.

   Move the user text blocks "Message text" and "Point of error" to the "Selected message blocks" field.



   The user text blocks "Message text" and "Point of error" are displayed in the message window.

6. Close the dialog with "OK".

   Enlarge the message window if required.

Result

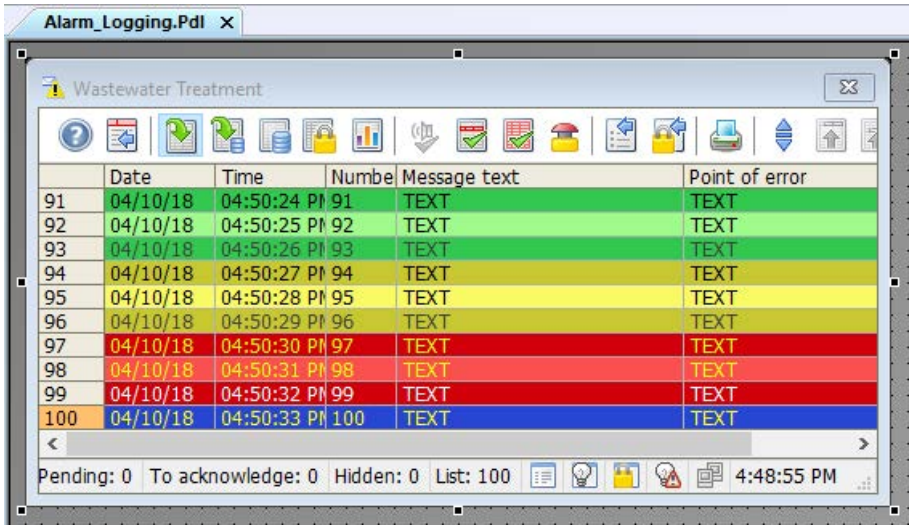
You have configured the "Wastewater Treatment" message window.

The messages you have configured for the "Quick_Start" project are displayed in this window during Runtime.

The triggering of messages depends on the values of the internal tags "Tank_Level" and "Inflow_Valve". The display color of the messages changes according to the message status.

The contents of the messages consist of the following message blocks in the message window:

- System blocks: Date, time and number
- User text blocks: Message text and Point of error



Next steps

You configure a slider object to supply the internal tag "Tank_Level" with analog values.

9.7.2 Inserting and dynamizing a slider object

Introduction

The following steps show you how to insert and dynamize a slider object.

The slider object is used for displaying and changing tag values. The connection of the slider object to a process tag allows the control of the automation system.

You insert the slider object into the "Alarm_Logging.Pdl" process picture in the "Quick_Start" project.

You dynamize the slider object via a connection to the internal tag "Tank_Level".

When you use the slider object in Runtime, the internal tag "Tank_Level" is assigned a value. If the assigned value violates one of the defined limits, the corresponding analog alarm is displayed in the alarm window.

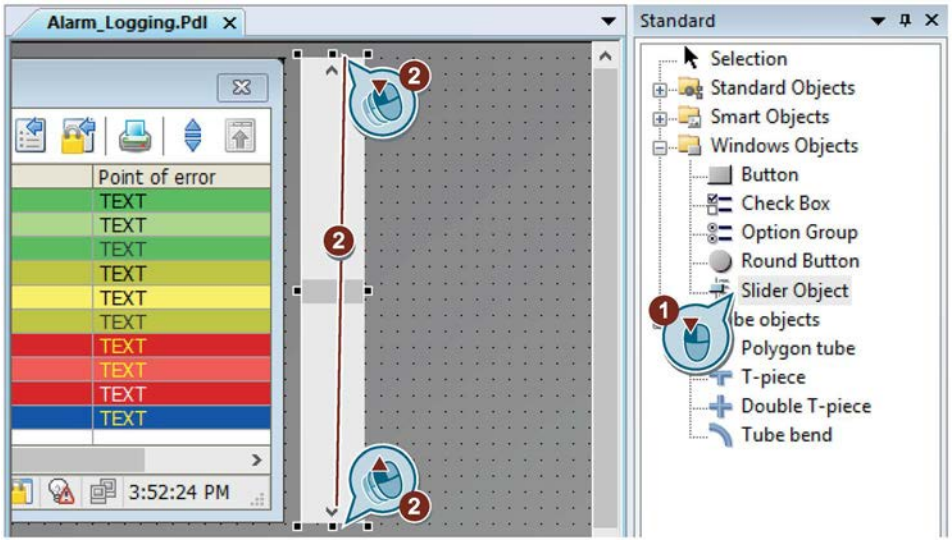
You change the preset properties of the slider object for the "Quick_Start" project: In the "Object Properties" window, you enter a new name for the slider object and define its height.

Requirement

- The "Alarm_Logging.Pdl" process picture is open.
- The internal tag "Tank_Level" has been created.

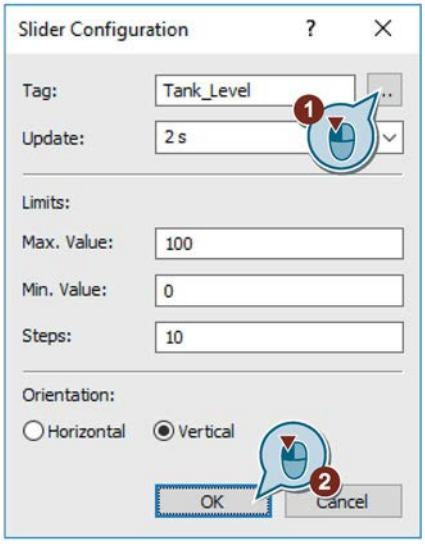
Procedure

1. Insert a slider object into the "Alarm_Logging.Pdl" process picture.



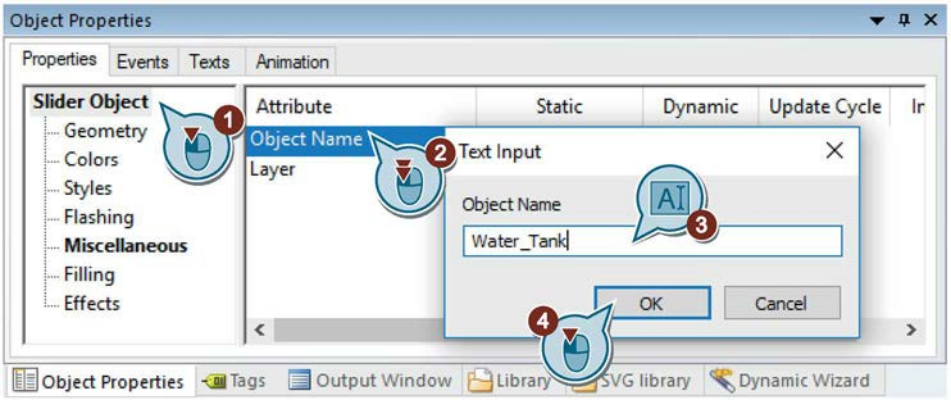
   The "Slider Configuration" dialog opens.

2. Link the slider object to the internal tag "Tank_Level".

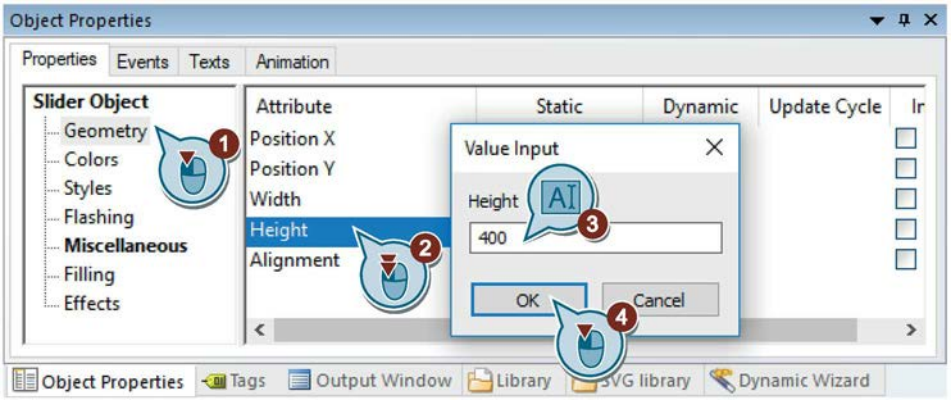


3. Switch to the "Object properties" window.

   Enter "Water_Tank" as name for the slider object.



4. Define "400" as the height of the slider object.



Result

You have inserted the slider object "Water_Tank" and made it dynamic.

The dynamization of the slider object allows the transfer of values to the internal tag "Tank_Level". As limit value monitoring is configured for this tag, the corresponding message is triggered when a set value is violated.

Next steps

You insert a scale to facilitate the setting of values with the slider object.

9.7.3 Inserting a scale

Introduction

The following steps show you how to insert a scale from the library of the "Graphics Designer" editor.

In the "Quick_Start" project, you insert the scale into the "Alarm_Logging.Pdl" process picture.

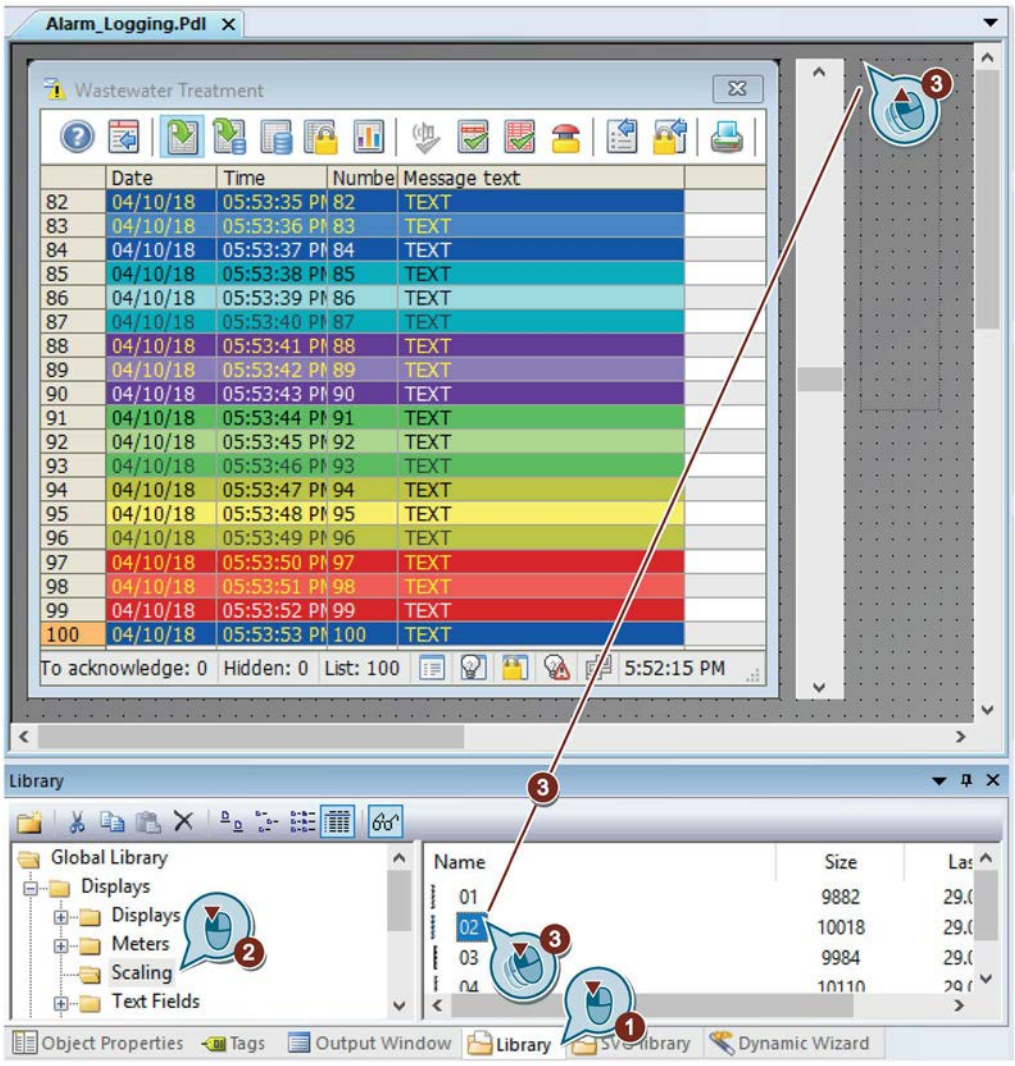
By means of this scale, you display the values that the slider object "Water_Tank" can assume. The lines on the scale correspond to the operating steps of the slider object.

Requirement

- The "Alarm_Logging.Pdl" process picture is open.
- The slider object "Water_Tank" has been inserted.

Procedure

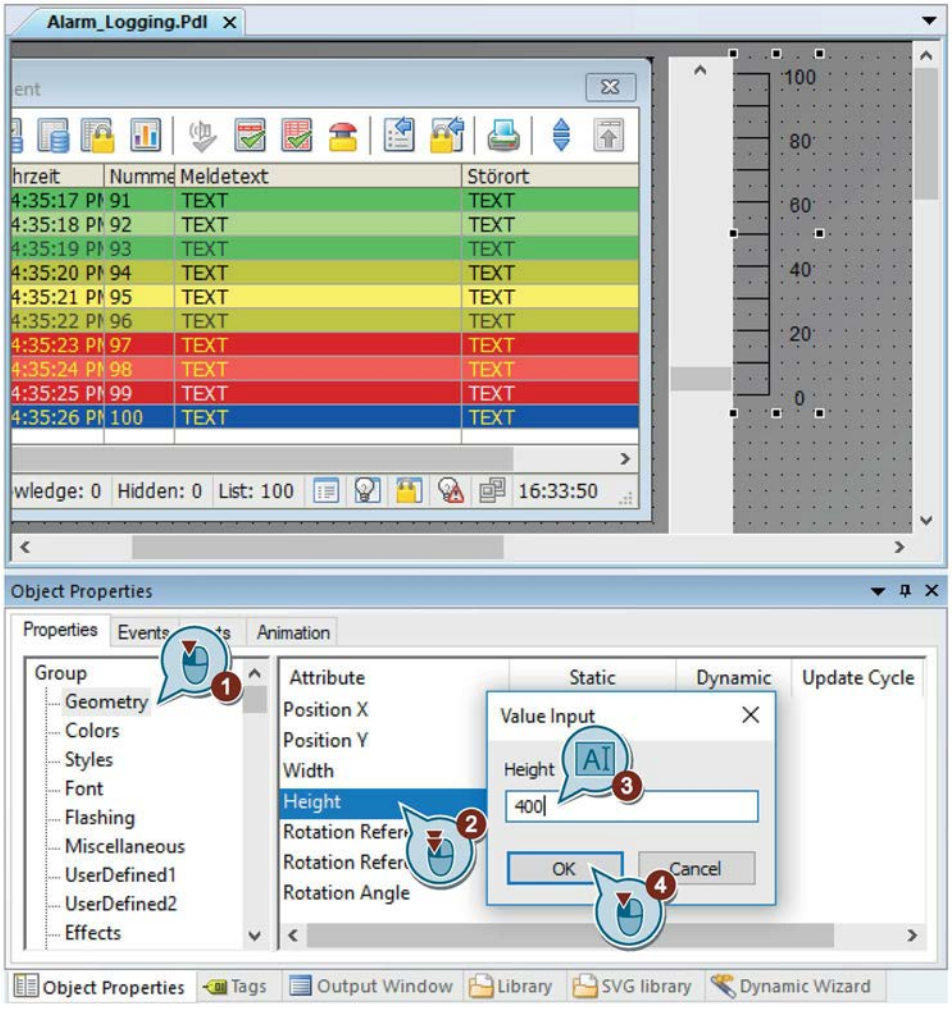
1. Switch to the Global library.
2. Insert scale "02".



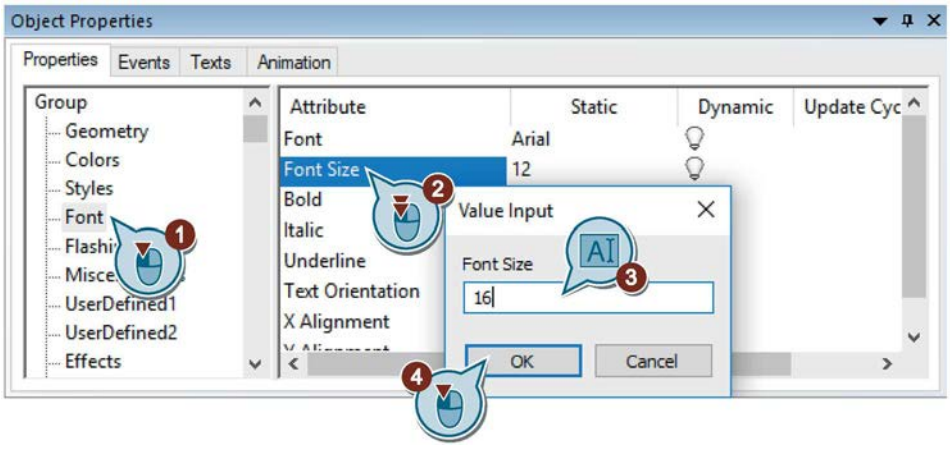
The scale is displayed in the "Alarm_Logging.Pdl" process picture.

3. Switch to "Object properties".

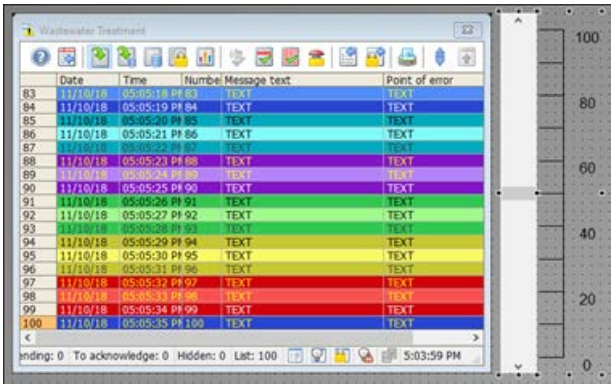
   Define "400" as the height of the scale.



4. Set "16" as the font size for the scale.



5. Align the scale and the slider object to the same horizontal line.



Result

You have inserted a scale into the "Alarm_Logging.Pdl" process picture.

You set the values of the slider object "Water_Tank" in Runtime with this scale.

Next steps

You insert an I/O field to supply the internal tag "Inflow_Valve" with binary values.

9.7.4 Inserting and dynamizing an I/O field (message system)

Introduction

The following steps show you how to insert and dynamize an I/O field.

You insert the I/O field into the "Alarm_Logging.Pdl" process picture in the "Quick_Start" project.

You dynamize the I/O field via a connection to the internal tag "Inflow_Valve".

As statuses are saved in this tag, you define a binary output format of the values for the I/O field.

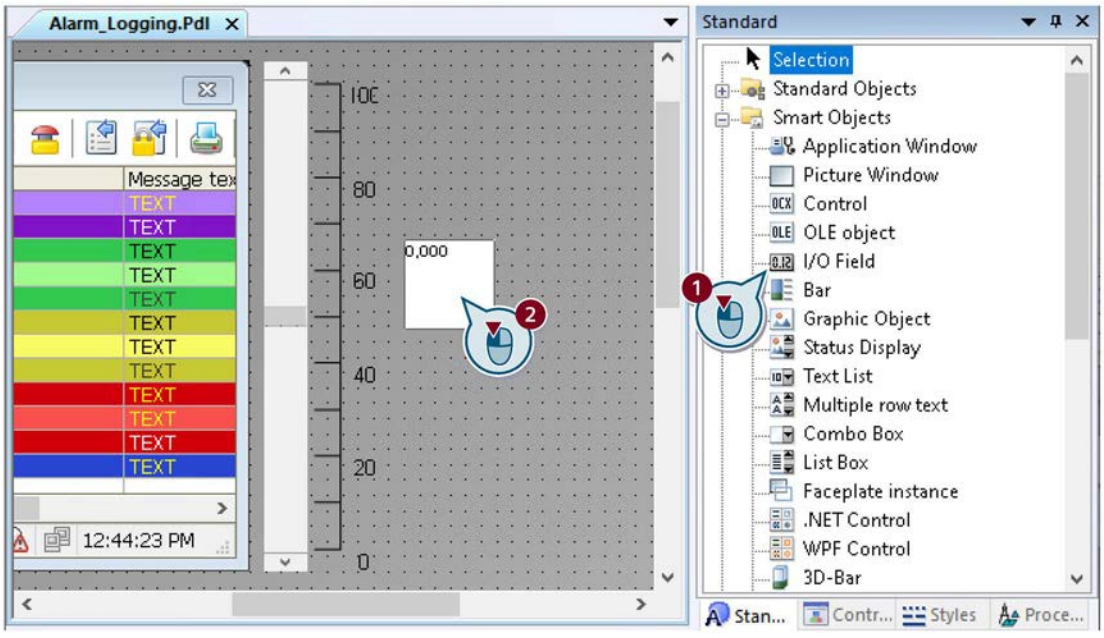
The I/O field is used to transmit binary values to the internal "Inflow_Valve" tag in Runtime.

Requirement

- The "Alarm_Logging.Pdl" process picture is open.
- The internal tag "Inflow_Valve" has been created.

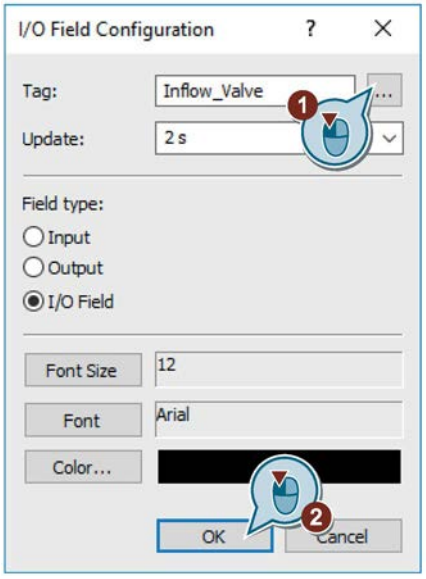
Procedure

1. To insert the "I/O Field" smart object, click on the object in the "Standard" window and then on the process picture.



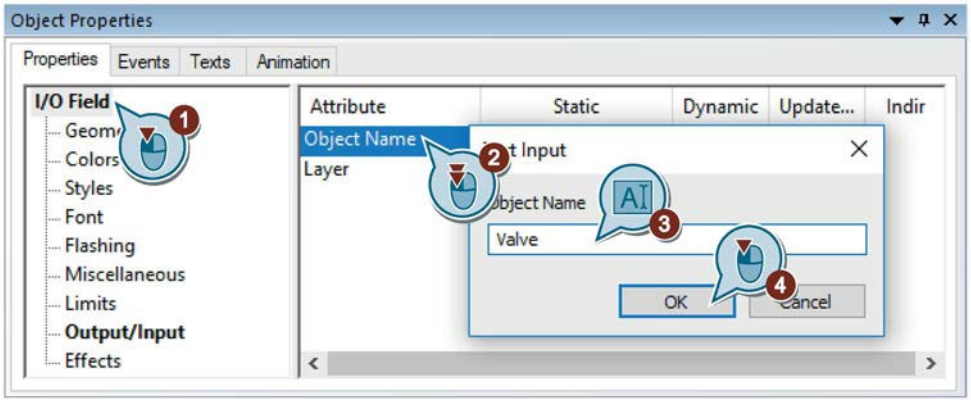
   The "I/O Field Configuration" dialog opens.

2. Link the I/O field with the internal tag "Inflow_Valve".

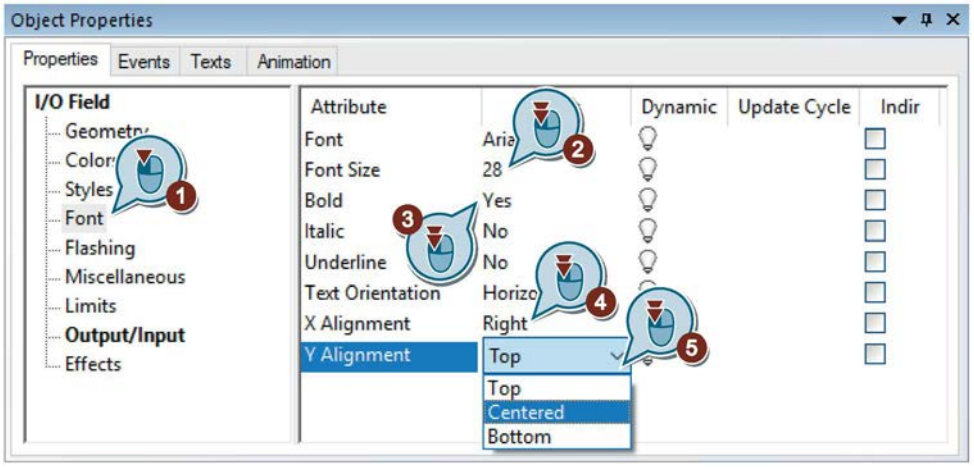


3. Switch to the "Object properties" window.

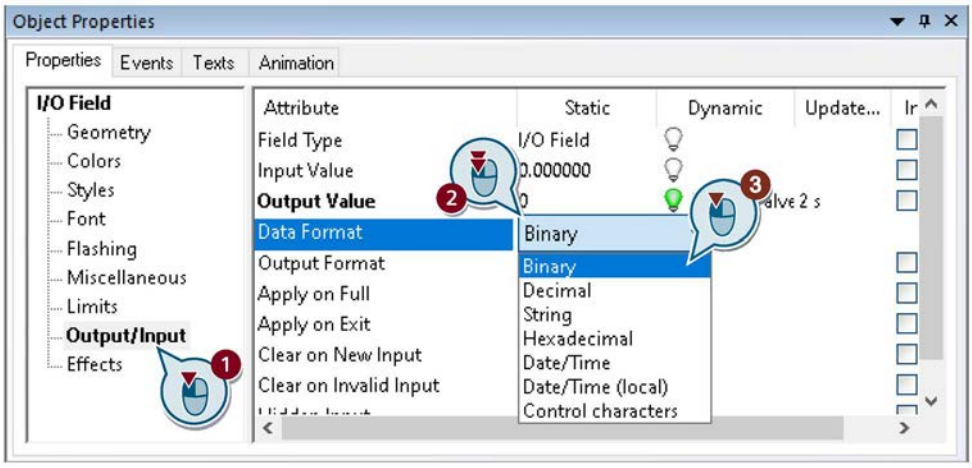
   Enter "Valve" as the name of the I/O field.



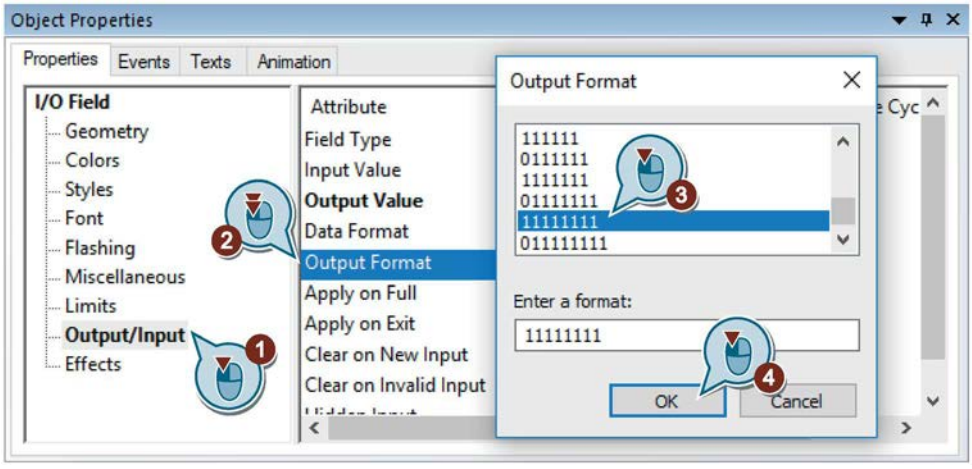
4. Define the following font properties of the I/O field:
   - Font size: 28
   - Bold: Yes
   - X Alignment: right
   - Y Alignment: centered



5. Define "Binary" as the output format of the I/O field.



6. Increase the number of positions from 6 to 8 for the "Output format" property: "11111111".



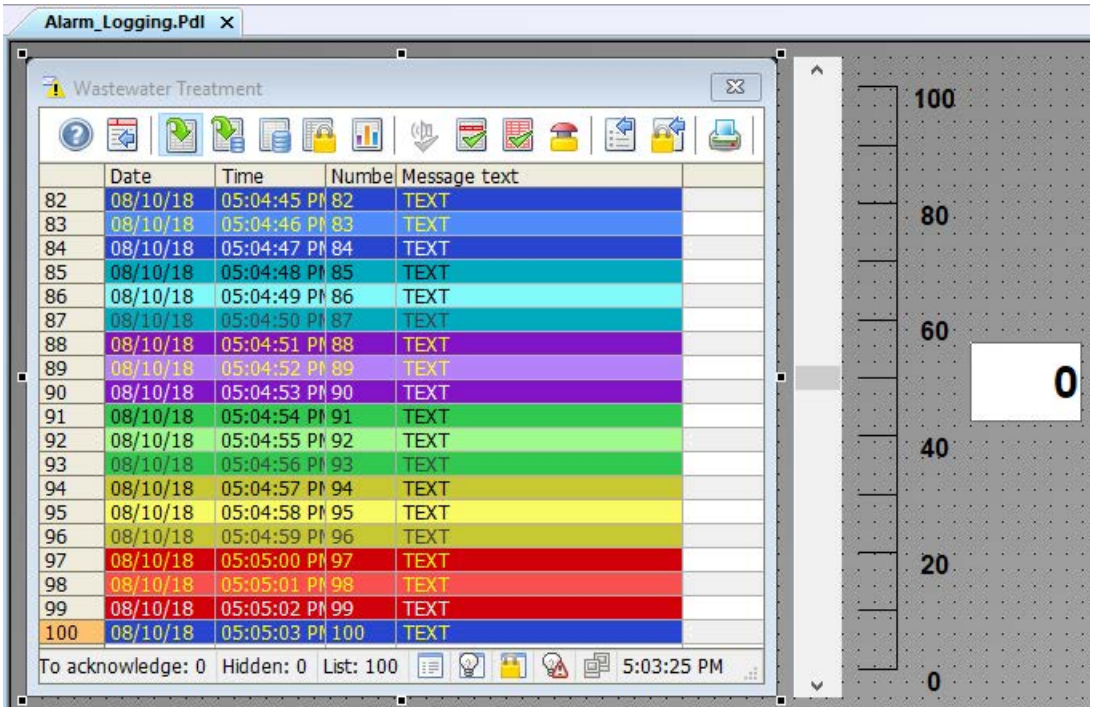
7. Enlarge the I/O field and save the "Alarm_Logging.Pdl" process picture.
8. Close the "Graphics Designer".

Result

You have configured the I/O field "Valve".

Enter binary values in the configured I/O field. These values are transmitted to the internal tag "Inflow_Valve".

If a specific bit is set in the tag value, the corresponding discrete alarm is triggered and displayed in the message window. The discrete alarm "Valve_closed" is triggered, for example, when the second bit is set in the tag value.



Next steps

- You add the "Alarm_Logging.Pdl" page to the user-defined menu.
- You define the properties of WinCC Runtime.

9.8 Customizing the user-defined menu (message system)

Introduction

The following steps show you how to add the "Alarm Logging" menu item to the customized "Picture Change" menu.

You connect the "Alarm Logging" menu entry with the "ActivatePicture(ByVal PictureName)" procedure.

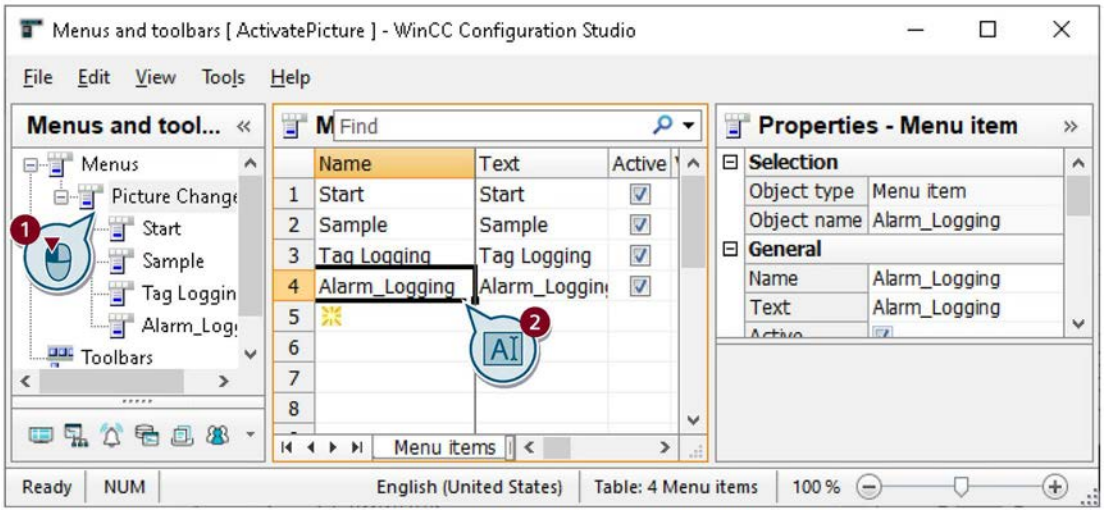
Enter the name of the process picture that you wish to change to in the field "User data".

Requirement

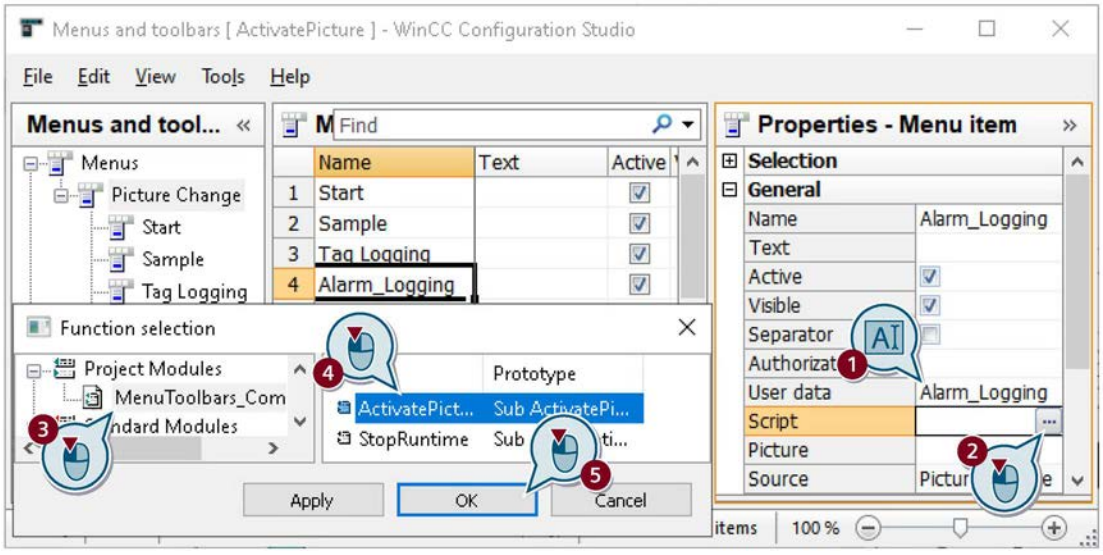
- The procedure "ActivatePicture(ByVal PictureName)" has been created.
- The user-defined "Picture Change" menu has been created for the "START.Pdl", "SAMPLE.Pdl" and "Tag_Logging.Pdl" process pictures.

Procedure

1. Open the saved configuration "ActivatePicture.mtl" in the "Menus and toolbars" editor.
2. Create the "Alarm Logging" menu command.



3. Configure the "Alarm Logging" menu command to change to the "Alarm_Logging.Pdl" picture.



4. Save the changes in the "Menus and toolbars" editor.
5. Close the "Menus and toolbars" editor.

Result

You have added the "Alarm Logging" menu item to the "Picture Change" menu.

You use the menu items in Runtime to switch to the "START.Pdl", "SAMPLE.Pdl", "Tag_Logging.Pdl" and "Alarm_Logging.Pdl" process pictures.

9.9 Defining Runtime properties (message system)

Introduction

The following steps will show you how to define the properties for WinCC Runtime.

In this section, you will set up WinCC Runtime so that Alarm Logging Runtime is executed when the project is activated.

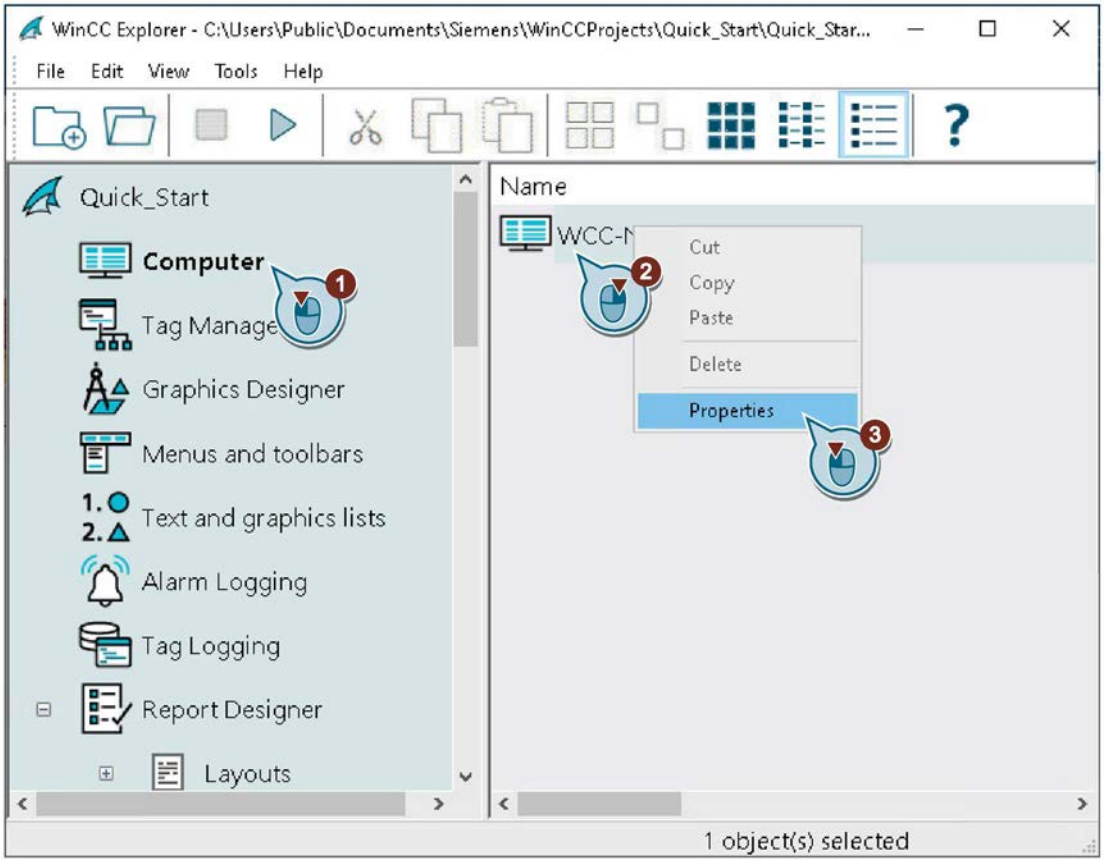
Set the "Alarm_Logging.Pdl" process picture as the start picture for the runtime window.

Requirement

- The "Quick_Start" project is open.
- The "Alarm_Logging.Pdl" process picture has been created.

Procedure

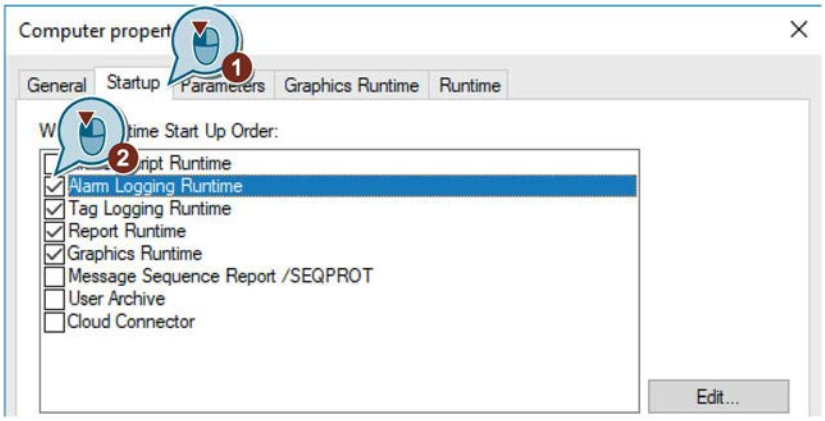
1. Open the "Computer" editor.



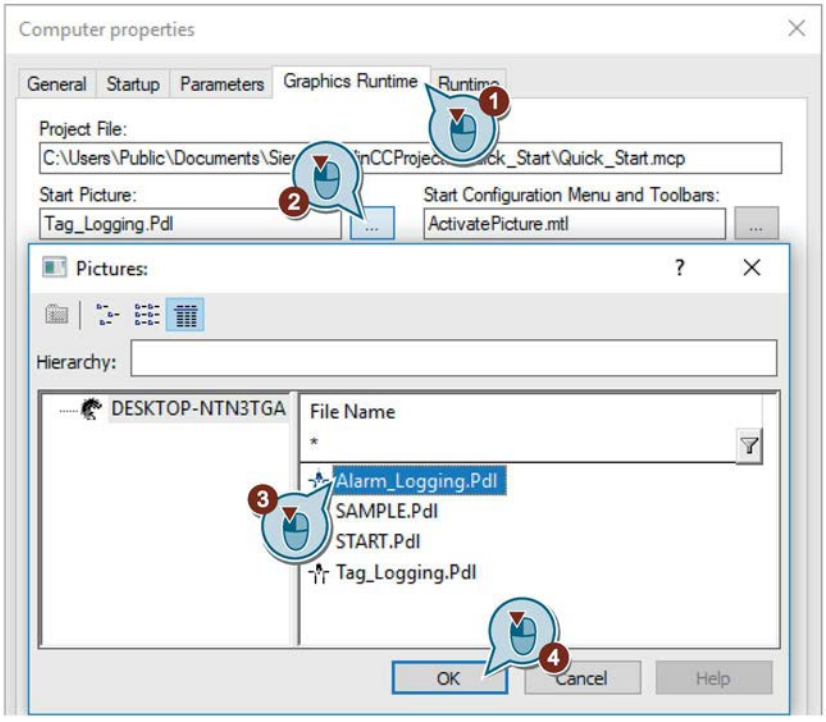
The "Computer" editor opens in the WinCC Configuration Studio.

2. Select the computer name in the navigation area.

   Activate the "Alarm Logging Runtime" application on the "Processes when starting WinCC Runtime" tab.



3. Set the "Alarm_Logging.Pdl" process picture as the start picture for the runtime window under "Graphics" in the "Properties - Computer" area.



Result

You have defined the WinCC Runtime properties.

When the "Quick_Start" project is activated, Tag Logging Runtime is executed and the "Alarm_Logging.Pdl" process picture is displayed.

Next steps

You activate the "Quick_Start" project.

9.10 Activating the project (message system)

Introduction

The following steps show you how to activate the "Quick_Start" project and operate the "Alarm_Logging.Pdl" process picture in Runtime.

When activating the "Quick_Start" project, WinCC Runtime is started.

The "Alarm_Logging.Pdl" process picture is displayed as the start picture.

Message window in Runtime

You operate and observe the message window in Runtime.
Use the message window via the buttons in the toolbar:

The  button allows the display of the message list.
The message list contains the currently pending messages.

The display color of a message in the message window changes depending on the message status.

Requirement

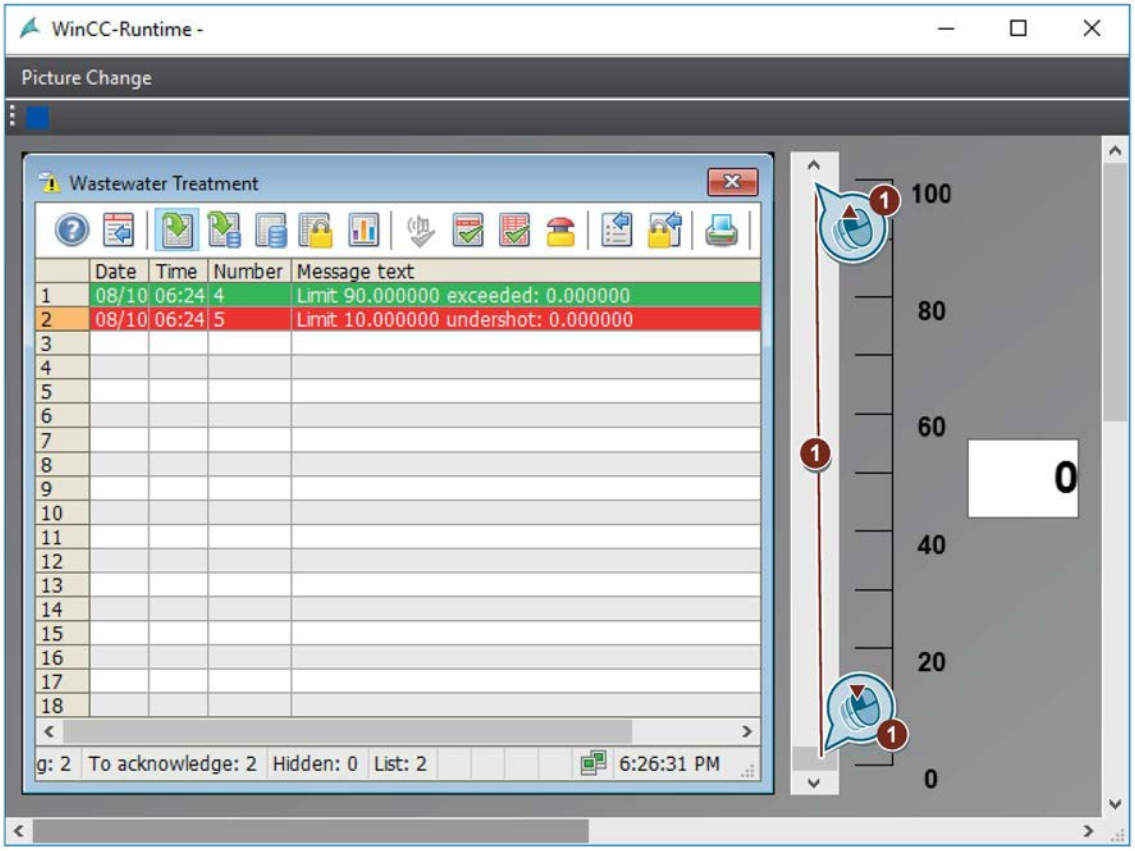
- The "Quick_Start" project is open.
- The Runtime properties are defined.

Procedure

1. Activate the "Quick_Start" project using the toolbar button in WinCC Explorer.

   WinCC Runtime is started.

   The "Alarm_Logging.Pdl" process picture is displayed in the Runtime window.
2. Move the controller of the "Water_Tank" slider object.

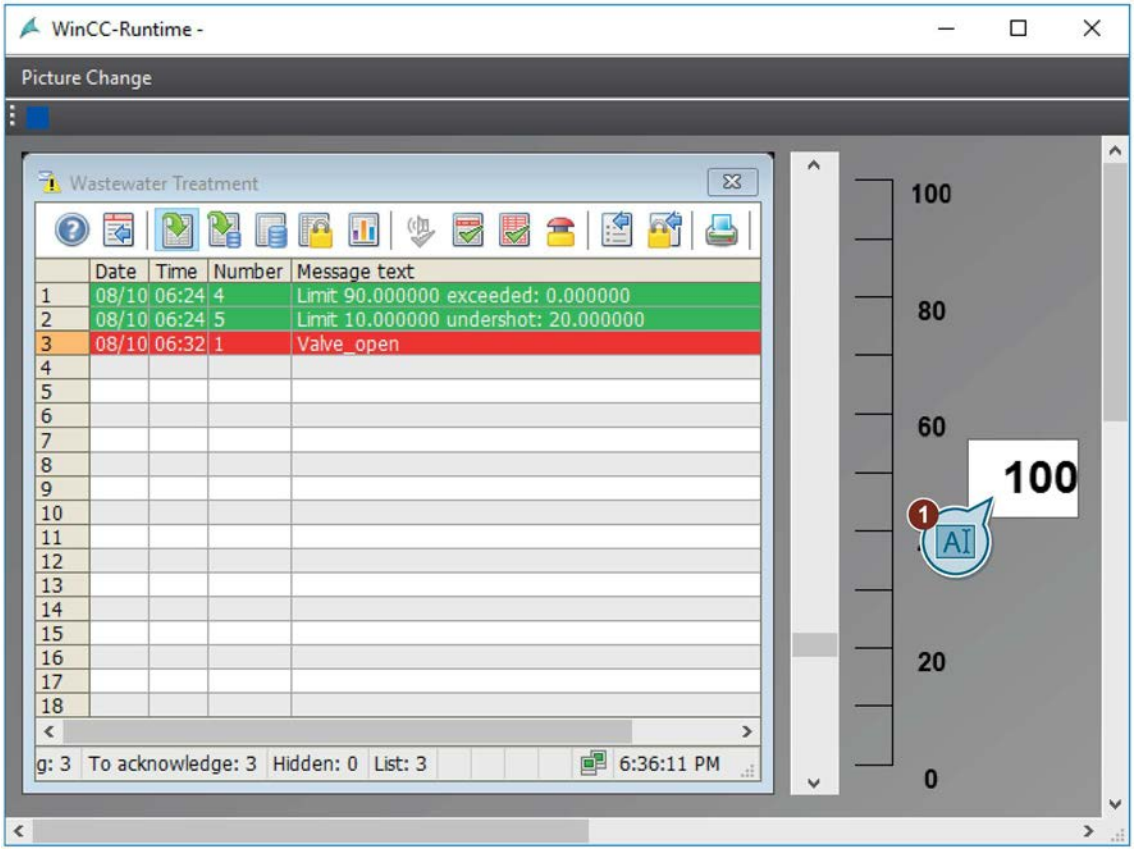


The internal tag "Tank_Level" is assigned a value corresponding to the slider position.

If this value falls below the configured low limit (10), the analog message "Low limit value" is triggered.

If the high limit (90) is violated, the analog message "High limit value" is triggered.

3. Enter the value "100" in the "Valve" I/O field and confirm the entry with <Return>.



The second bit in the tag value is set.

The discrete alarm "Valve_open" is displayed.

4. Enter the value "1000" in the I/O field and confirm the entry with <Return>.

   The third bit in the tag value is set.

   The discrete alarm "Valve_closed" is displayed.

5. Enter the value "10000" in the I/O field and confirm the entry with <Return>.

   The fourth bit in the tag value is set.

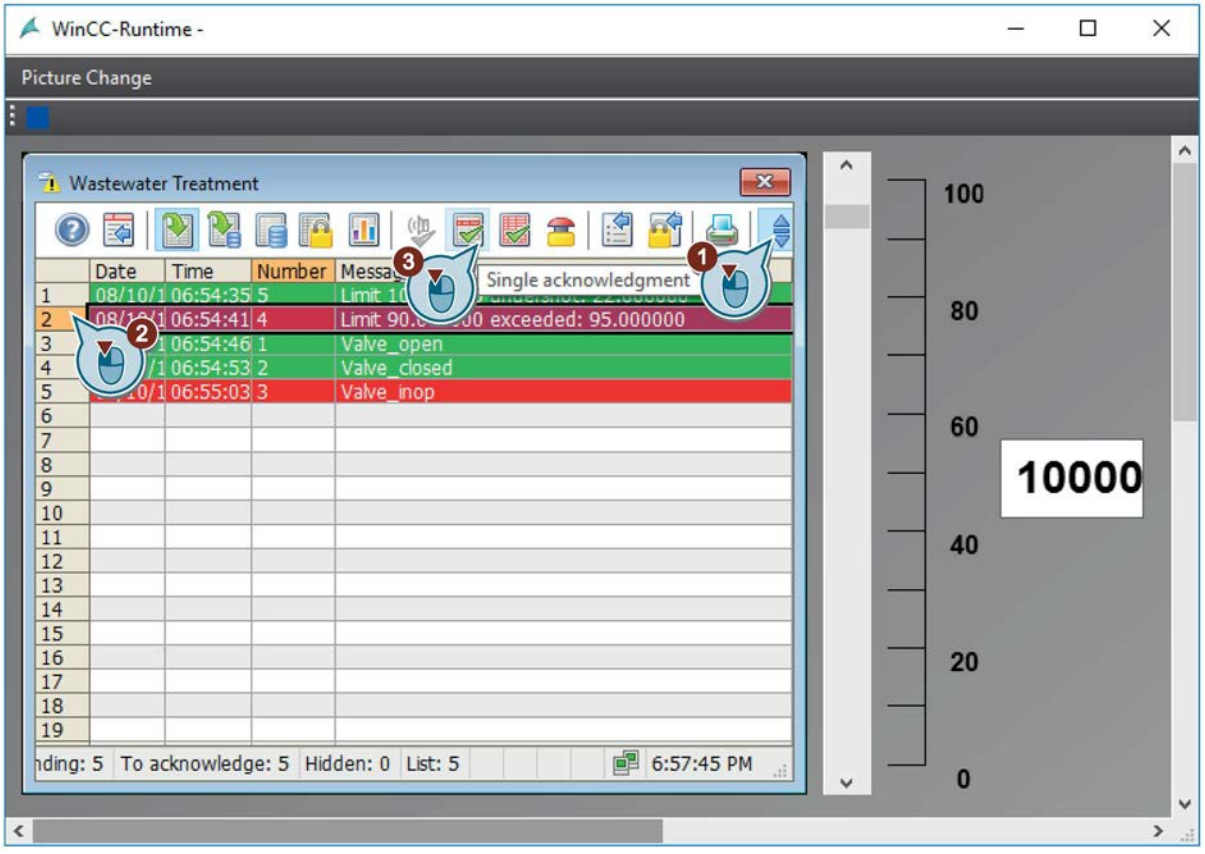
   The discrete alarm "Valve_inop" is displayed.

6. Click the button in the toolbar of the message window to disable the "Autoscroll" function.

   In this way, you can specifically select a message.

7. Select the analog alarm "High limit" and acknowledge the analog alarm.

   The display color of the message status changes.



Result

You have activated the "Quick_Start" project.

The "Alarm_Logging.Pdl" process picture is displayed as the start picture of the project.

The internal tags "Tank_Level" and "Inflow_Valve" are supplied with values by manual input. These tags are monitored by the alarm logging.

Depending on the tag values, the corresponding messages are triggered and displayed in the alarm window.

Next steps

You use the "Tags Simulation" editor to automatically supply the internal tags "Tank_Level" and "Inflow_Valve" with values.

9.11 Testing the project (message system)

Introduction

The following steps show you how to test the "Quick_Start" project by means of the WinCC TAG Simulator.

The WinCC TAG Simulator assigns values to the internal tags "Tank_Level" and "Inflow_Valve" in Runtime.

Since monitoring has been configured for these tags, messages are triggered when the tag value reaches the defined limits.

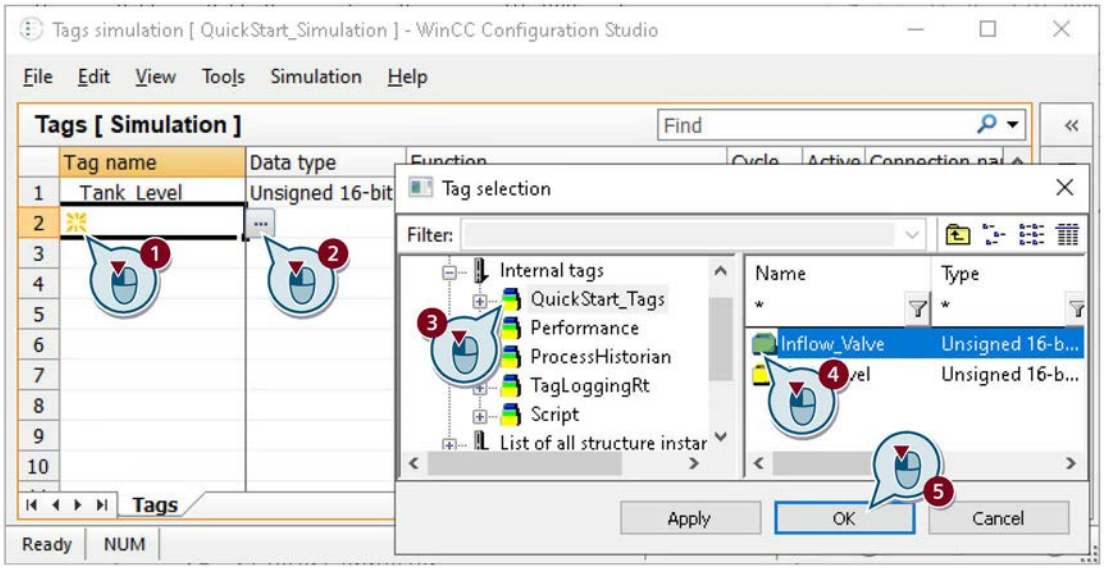
The messages are displayed in the message window.
The message statuses are marked by different display colors.

Requirement

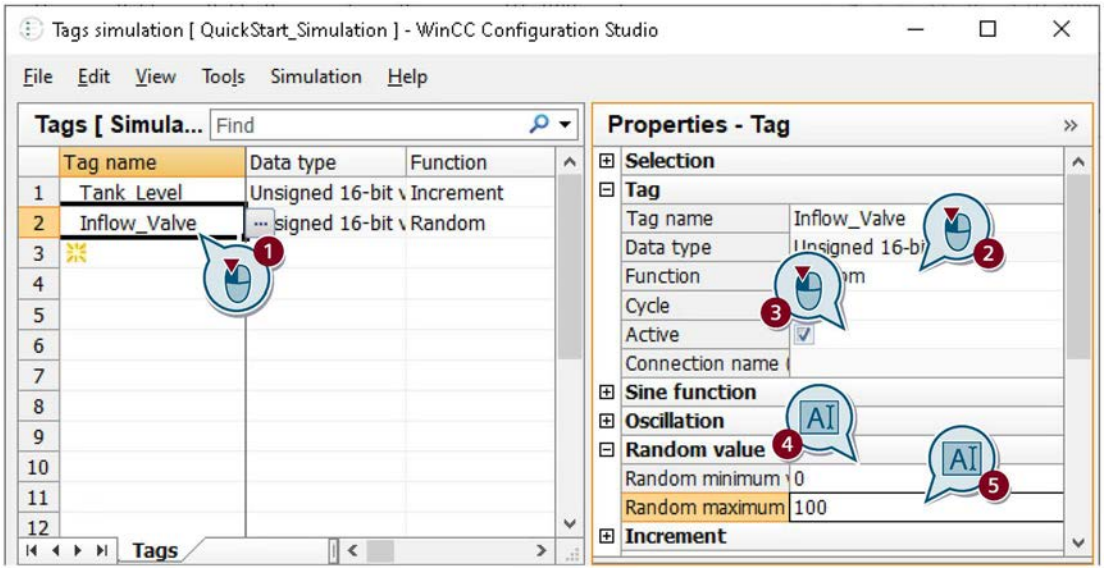
- The Runtime properties are defined.

Procedure

1. Open the "QuickStart_Simulation.sim" configuration in the "Tags Simulation" editor.
2. Open the tag selection dialog and select the internal tag "Inflow_Valve" from the tag group "QuickStart_Tags".



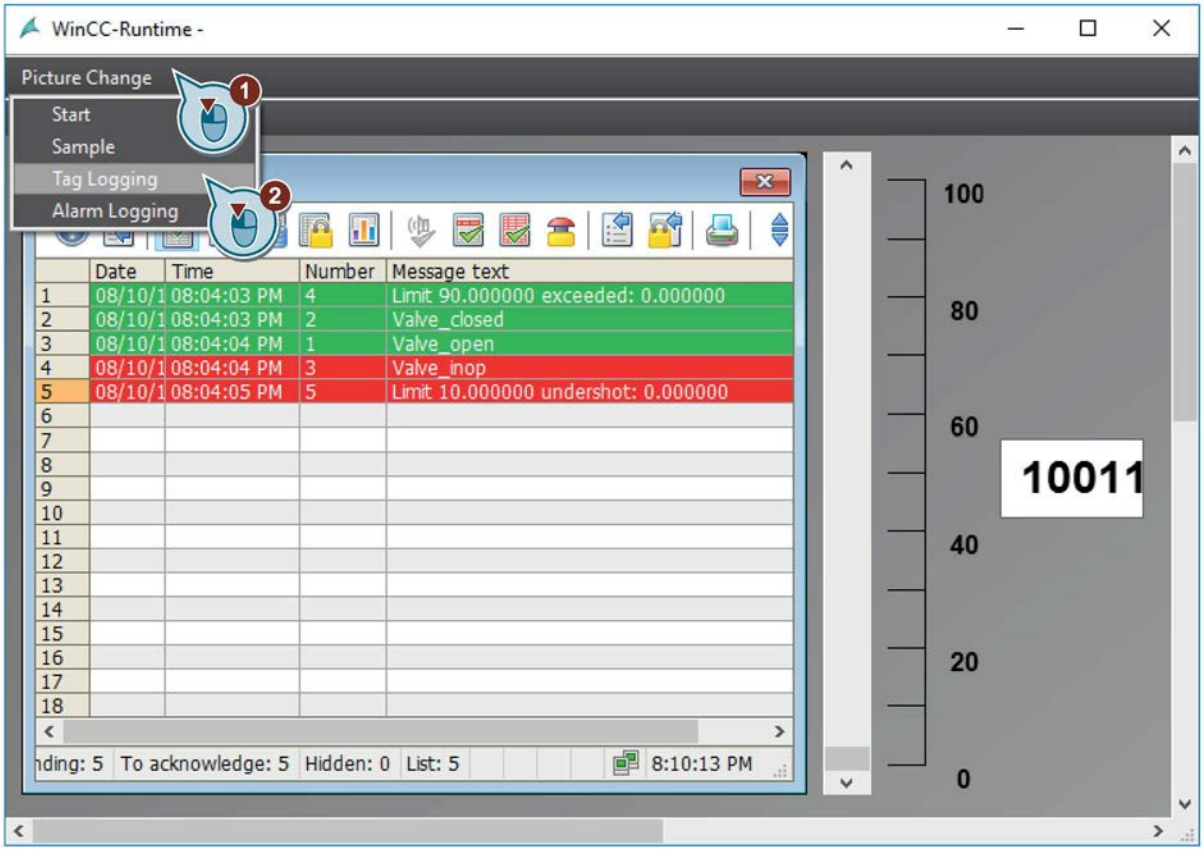
3. Select the simulation type and define the properties of the simulation type.



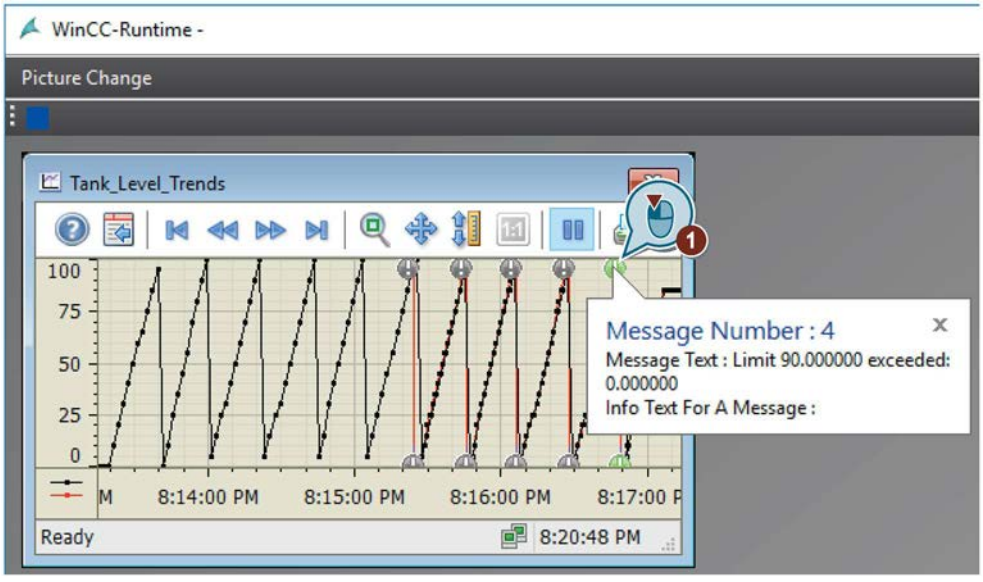
4. Save the configuration using the "File > Save" command in the menu bar.
5. Activate WinCC Runtime in the WinCC Explorer using the button.
6. Start the simulation in the "Tags Simulation" editor using "Simulation > Start".
7. Observe the output of the simulation values in the "Alarm_Logging.Pdl" process picture.

   Observe how the different simulation values affect the message window.

8. Switch to the "Tag_Logging.Pdl" process picture.



9. Observe the extended display in the WinCC OnlineTrendControl.



10. Stop the simulation in the "Tags Simulation" editor using "Simulation > Stop".
11. Exit WinCC Runtime using the ☐ button in the toolbar.

Result

You have tested "Quick_Start" project by means of the WinCC TAG Simulator.

The test shows the behavior of the alarm logging when the monitored tags are continuously supplied with values.

The WinCC OnlineTrendControl displays the second trend for the "Inflow_Valve" tag. Clicking on the exclamation mark displays the triggered messages for this tag in the form of a tooltip.

Glossary

Acquisition cycles

The acquisition cycle determines the interval at which the process value of a process tag is read.

The acquisition cycle starts as soon as WinCC Runtime is activated.

Alarm Logging

The "Alarm_Logging" editor is the configuration component of the alarm logging.

This editor is used to configure messages.

Alarm Logging Runtime

Alarm Logging Runtime is the runtime component of the alarm logging.
Alarm Logging Runtime is primarily used to perform the following tasks:

- Executing the defined monitoring
- Controlling the message output
- Administering acknowledgments

Analog alarm

An analog alarm indicates when a limit has been exceeded or fallen below.

An analog alarm is triggered when a defined limit is exceeded or fallen below.

Animation

In an animation, you combine the dynamization of multiple object properties with a tag or script.

This allows you to assign several property changes to a tag value or value range, e.g. to have an object increase in size and flash simultaneously.

Archive tag

The values to be archived are saved in the archive tags.

Archiving cycles

Archiving cycles are time intervals in which a process value is stored in the archive database.

The archiving cycle is always an integer multiple of the set acquisition cycle.

The archiving cycle starts either when WinCC Runtime is activated or at a point in time defined by the user. The indication of a starting point allows the delayed archiving of the values and the distribution of the archiving load.

Button

The button enables process operation.

A button is used, for example, for acknowledging messages or for navigation in runtime.

Channel

The channels are specialized communication drivers.

They allow the communication between WinCC and the automation system.

Via the channels, the process tags in WinCC are supplied with process values from the automation system.

Channel unit

A channel unit forms the interface to exactly one underlying hardware driver and therefore to exactly one communications processor in the PC.

This channel unit is then used to access to a certain type of automation system.

Configuration Software of WinCC

The configuration software is part of WinCC.

At the heart of the configuration software are WinCC Explorer and WinCC Configuration Studio.

Configuration Studio

"WinCC Configuration Studio" contains most of the editors you need to configure WinCC, such as the "Tag Management", "Alarm Logging" and "Tag Logging" editors.

Connection

A connection describes the interface to an individual, defined automation system.

The data exchange takes place in Runtime via the connections.

The connections are configured under the channel units.

Direct tag connection

With a direct tag connection, you are connecting one tag with a dynamic object of the process picture.

If the tag takes on a value in runtime, this value is transferred directly to the dynamic object. The dynamic display of the object changes in Runtime according to the tag value.

Discrete alarm

The discrete alarms show status changes in the process and are initiated by the PLC.

Display color of the messages

The display color identifies the current status of a message.

The display colors for individual messages are determined in the "Alarm Logging" Editor.

Dynamic objects

Dynamic objects will change in accordance with the individual process values.

A bar is an example of a dynamic object. The length of the bar will depend on the current temperature value.

Faceplate type / Faceplate instance

Faceplate types are special process pictures that you create as reusable templates and use as faceplate instances in the process pictures.

You dynamize the objects in the faceplate types with interface tags or structure tags.

Changes in the faceplate type are automatically applied to all faceplate instances.

The faceplate types are configured in the "Graphics Designer" editor.

Graphics Designer

The "Graphics Designer" editor is a configuration component of the graphics system.

This editor is used to configure process pictures.

Graphics Runtime

Graphics Runtime is the runtime component of the graphics system.

Graphics Runtime displays the pictures in Runtime and manages all inputs and outputs when the project is activated.

I/O field

The I/O field is an input/output field that is used to display and change tag values.

Internal tag

The internal tags do not have a process link and only carry values within WinCC.

Libraries of the "Graphics Designer" editor

The libraries of the "Graphics Designer" editor are a versatile tool to store and manage graphic objects.

In the symbol library, you manage customized objects and controls that you use to create process pictures.

In the SVG library, you manage SVG objects.

The libraries are split into two areas:

- Global Library
- Project Library

Limit monitoring

The limit value monitoring is an add-in to WinCC.

The limit value monitoring allows you to set any number of limit values for a tag. If one of these limit values is violated, a corresponding message will be triggered and displayed in Runtime.

Linear Scaling

When using linear scaling, you can map the value range of a process tag to a certain value range of a process tag in WinCC.

The process value itself is not modified.

Main memory

The main memory of a computer is the memory, in which data objects are saved and from which they can be retrieved at a later time.

The main memory is also called the working memory.

Message bit

With the property "Message bit", you can define when a discrete alarm is triggered.

Message blocks

The content of a message consists of message blocks.

Each message block corresponds to one column in the tabular display in WinCC Alarm Control.

Message classes

A message class contains messages with similar behavior.

The message classes allow a central management of individual messages.

Message report

All messages in the current message list in the message window are documented in the message report.

Message tag

The message tag is linked to the status changes in the process.

If a status change takes place in the process, a bit is set in the tag value. Depending on the tag values, a discrete alarm is triggered.

Operable objects

Controllable objects allow the operator to have an active influence on the process.

These include buttons, slider objects, or I/O fields used for entering certain process parameters (input/output field).

Page layout

In the page layouts you configure the external appearance and data supply for output of a report.

Print job

Print jobs put out project documentation and Runtime documentation.

In the print jobs you configure the output medium, how much is to be printed, the time at which printing is to start, and other output parameters.

Process picture

The process pictures are main elements of a project.

They represent a process and allow the operation and observation of this process.

You can use the "Graphics Designer" editor to configure the process pictures.

Process tag

Process tags form the link for data exchange between WinCC and the automation systems.

Each process tag in WinCC corresponds to a certain process value in the memory of one of the connected automation systems.

Process value archive

The process value archive is an archive where process values from the automation system are stored.

Process Value Blocks

The process value blocks are used to connect the messages with process values, for example, current fill levels, temperatures or speeds.

Process values

The process values are the values supplied by the automation system.

Project

The project is the basis for the configuration of a user interface in WinCC.

Within the project you will create and edit all objects that you will need to operate and observe the processes.

Report Designer

The "Graphics Designer" editor is the configuration component of the reporting system.

This editor is used to configure page and line layouts as well as to configure print jobs.

Report Runtime

Report Runtime is the runtime component of the reporting system.

The report Runtime fetches the data to be documented from the archives or controls, and controls the print output.

Runtime

If this option is activated, the project is in Runtime.

Single-User Project

A "Single-user project" only runs on one PC. Other computers cannot access this project.

The project runs on a computer that serves as the server for data processing and as an operator station.

Slider object

The slider object is used for displaying and changing tag values.

The slider object is made dynamic via the connection to a tag. The connection of the slider object to a process tag allows the control of the automation system.

Start picture

The start picture is the process picture that is displayed when a project is activated in the Runtime window.

Static objects

Static objects remain unchanged in Runtime.

These objects include rectangles, circles, lines or connectors.

Static text

The object "Static text" is a static object that serves for the marking of the displayed processes or content.

Structure tag / Structure type

A structure type denotes a scheme that is used in WinCC to create a specific compilation of tags.

The structure tag is a tag that is linked with a structure type.

With the help of structure types, you create multiple tags as structure tag elements simultaneously in one step. In so doing, you can create internal tags and process tags.

You can also read out tag structures directly from a control system and import them into WinCC Tag Management.

System blocks

The system blocks belong to the message blocks.

They contain system data, for example, date, time, message number and status.

System blocks are predefined.

Tag group

Tag groups are components of Tag Management.

Tag groups are used to organize tags in a clear structure.

Tag Logging

The "Tag Logging" editor is the configuration component of the archive system.

This editor is used to configure archives.

Tag Logging Runtime

Tag Logging Runtime is the runtime component of the Archiving System.
Tag Logging Runtime is primarily used to perform the following tasks:

- Writing process values into the process value archive
- Reading archived process values from the process value archive

Tag Management

Under the component "Tag management", the communication between WinCC and the automation system is configured.

In "Tag management", all tags and channels are created and managed.

Times for the acquisition and archiving cycles

The times for the acquisition and archiving cycles determine the time interval between two archivings.

Update cycle

The updating cycle determines the time interval in which the display is updated in runtime.

User text blocks

The user text blocks belong to the message blocks.

The user text blocks contain explanatory texts, e.g. with information on the location and +cause of an error.

The texts in the user text blocks are freely customizable.

The length of a user text block determines the number of characters that can be entered into this block. The maximum string length is 255 characters.

WinCC AlarmControl

The "WinCC AlarmControl" object is a message window used to display message events.

WinCC Explorer

WinCC Explorer forms the core of the Configuration software of WinCC.

The overall project structure is displayed and the project is managed in WinCC Explorer.

WinCC OnlineTableControl

The "WinCC OnlineTableControl" object is used as a table window to display the process values from a process value archive.

WinCC OnlineTrendControl

The "WinCC OnlineTrendControl" object is used as a trend window to display the process values from a process value archive.

WinCC Runtime

WinCC Runtime runs the project in process mode.

WinCC Runtime enables operator control and monitoring of the processes.

WinCC TAG Simulator

The WinCC TAG Simulator allows testing of a project which is still in the development stage.

Use the "Tag Simulation" editor to configure and activate the simulation.

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