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WinCC Unified SIPEC Workshop

Experience the future of Visualization Hands On

SIMATIC WinCC Unified
Hands On: Goals

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What we are going to accomplish today:

1. Introduction to WinCC Unified
2. Screen Layout with Picture Windows
3. Screen Navigation
4. Screen Engineering
5. Alarming
6. Logging
7. Faceplates

Other topics

8. Openness in WinCC Unified
9. Technological Hierarchy (Object Orientated)
10. User Administration
11. Recipes
12. Reporting

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WinCC Unified SIPEC Workshop
Basic Information

Agenda

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1 **Overview**

2 Licensing

3 Preconditions

4 Unified Tools

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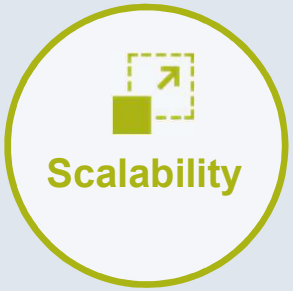
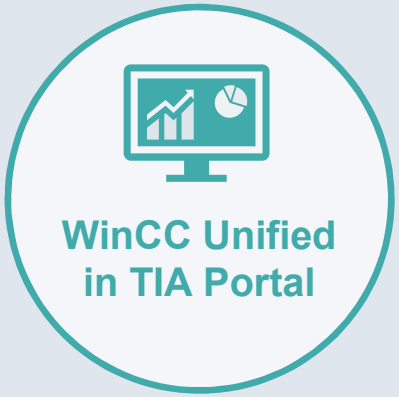
We meet these requirements with the new WinCC Unified system!

- Native Web Technology, HTML5, SVG, JavaScript
- Device independent
- Object oriented – HMI



- One Engineering
- Unified Comfort Panels
- WinCC Unified PC
- Collaboration



- On Premise
- Unified @Cloud
- Unified @Edge
- MindSphere Apps

- Basis for Digitalization
- Plant Intelligence
- Integration Platform for everything north of the PLC
- Openness

SIMATIC WinCC Unified Configuration - PC Systems

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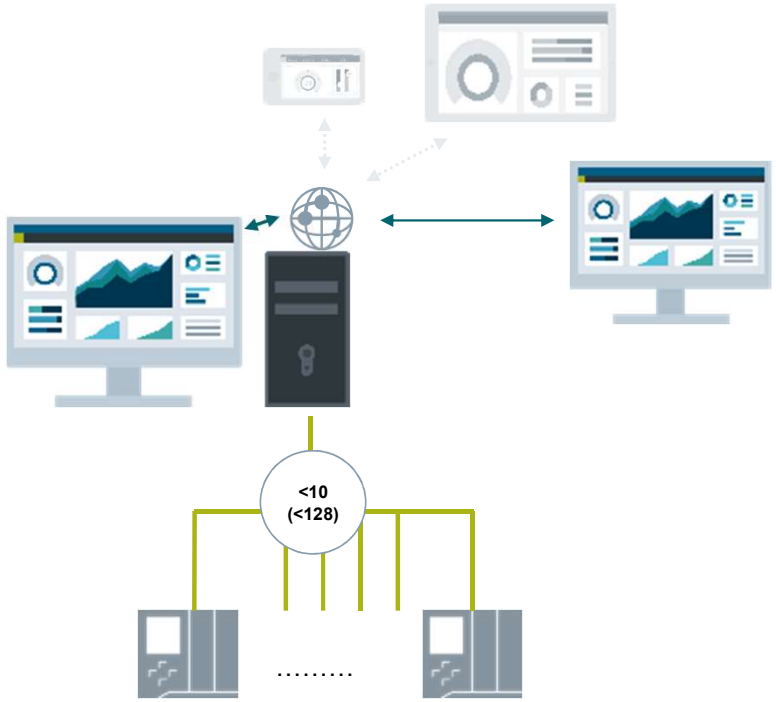

Grow from small to large applications

What is included:

- **Openness** (Engineering, Runtime, Custom web controls) and **Scripting**
- **2 Clients included**
  one for local HMI plus one for remote access
- **S7 connections** (up to 10)
- OPC UA DA Server & Client
- 3rd Party Drivers
- **Reporting** (manual)
- **Object oriented Technological Hierarchy**

Expandable via options

- S7 connections up to 128
- Logging concept (w/o, file-based, databased)
- Logging tags (file-based up to 5000, databased no limit)
- Additional Concurrent Clients (up to 150)

Configuration - PC Systems
WinCC Unified PC Runtime - options

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… scalable from operator panel to control center

… expandable to fit every application

… on premise data backbone

… with proven engineering in the TIA Portal

Agenda

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SIMATIC WinCC Unified Engineering Packages

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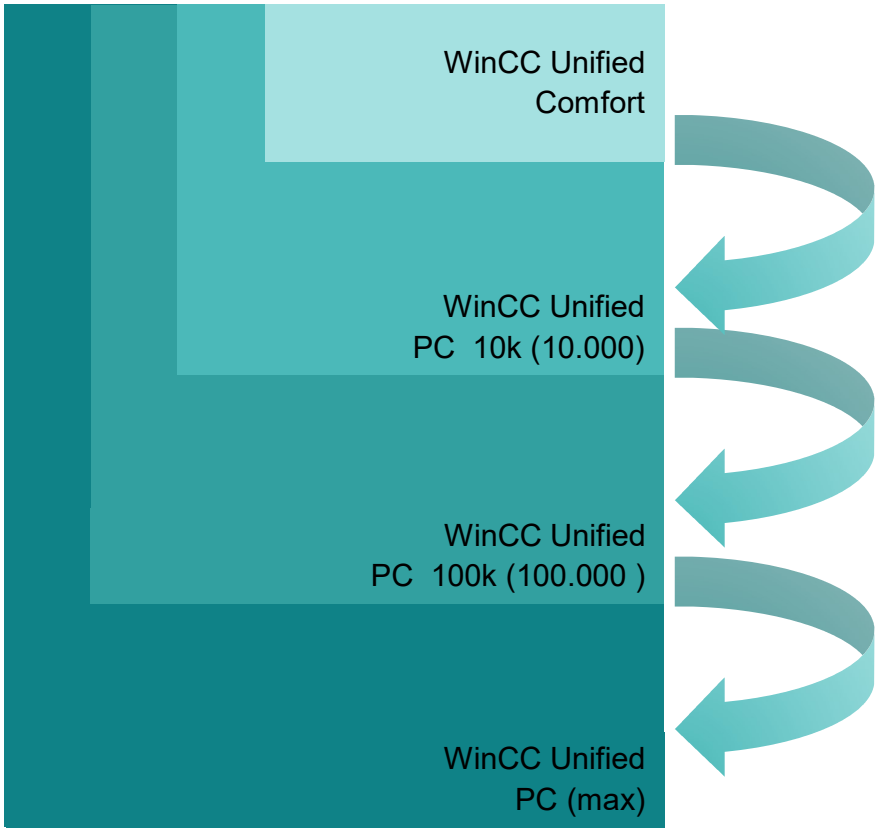

Engineered in the TIA Portal

SIMATIC WinCC Unified
License Compatibility Engineering - Existing customers

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WinCC (TIA Portal) V16					WinCC Unified (TIA Portal) V16	
Engineering System valid for…	Comfort Panels	WinCC RT Adv.	WinCC RT Prof.		Unified Comfort Panels	Unified PC Runtime
WinCC Prof. (max)	✓	✓	✓ (max.)	→	✓	✓ **(100k)**
WinCC Prof. (4k)	✓	✓	✓ (4k)	→	✓	✓ (10k)
WinCC Prof.(512)	✓	✓	✓ (512)	→	✓	✓ (10k)
WinCC Advanced	✓	✓	✗	→	✓	✓ (10k)
WinCC Comfort	✓	✗	✗	→	✓	✗

Existing customers with WinCC (TIA Portal):

The license of WinCC (TIA Portal) is also valid for engineering using WinCC Unified (TIA Portal).

SIMATIC WinCC Unified
License Compatibility Engineering - New Customers

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WinCC Unified (TIA Portal) V16				WinCC (TIA Portal) V16		
Engineering System valid for..	Unified Comfort Panels	Unified PC Runtime		Comfort Panels	WinCC RT Advanced	WinCC RT Professional
PC (max.)	✓	✓ (max.)	→	✓	✓	✓ (max.)
PC (100k)	✓	✓ (100k)	→	✓	✓	✓ (max.)
PC (10k)	✓	✓ (10k)	→	✓	✓	✗
Comfort	✓	✗	→	✓	✗	✗

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1 Overview

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4 Unified Tools

SIMATIC WinCC Unified Preconditions

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Operating System (PC-systems)	Configuration	Remark
Windows 10 Pro	• Windows 10 Pro Version 1809 • Windows 10 Pro Version 1903	Windows 10 64-Bit
Windows 10 Enterprise	• Windows 10 Enterprise Version 1809 • Windows 10 Enterprise Version 1903	
Windows 10 IoT Enterprise LTSB (Test for IPC)	• Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB • Windows 10 IoT Enterprise 2019 LTSC	
• Windows Server 2012 R2 StdE • Windows Server 2016 Standard • Windows Server 2019 Standard	Full Installation	64-Bit

SIMATIC WinCC Unified
Preconditions

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Operating System (Client)	Recommended Browser
Microsoft Windows	• **Google Chrome** (Test focus) • Mozilla Firefox, • Microsoft Edge
Android	• **Google Chrome** (Test focus) • Firefox • Edge
iOS, Mac	• **Safari** (Test focus) • Google Chrome • Firefox • Edge



SIMATIC WinCC Unified– Connectivity
To automation systems

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Unified Comfort Panel ✓ PC ✓

Native 3rd Party | S7-1200/1500 ✓ | S7-300/400 ✓

SIMOTION[2] | S7-1500 Software Controller | PLCSIM/PLCSIM Advanced

Native 3rd Party[1] communication via Channel Support Package
e.g., Modbus TCP, Allen-Bradley EtherNet/IP, …

OPC UA today

1 In preparation **2** only tag communication via OPC UA DA

Perfect integration of SIMATIC PLCs
(TIA Portal)

High number of connections
for PC systems, up to 128 PLCs
(>10 with extra Softnet-IE license)

Increased number of connections
for Panel systems, up to 16 PLCs

SIMATIC WinCC Unified– Clients
Flexible web-based, remote Monitoring and Operation

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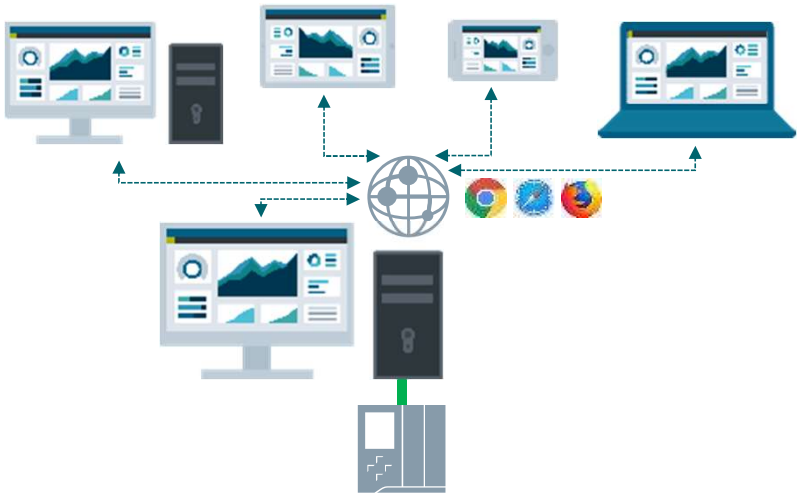
Unified Comfort Panel | PC ✓



WinCC Unified includes two Clients: One for local visualization **plus ONE Client for remote operation, which is included in every WinCC Unified PC Runtime system.**

"Zero Installation" Clients, based on native web technology, independent of platform and browser

Flexible, maintenance free 24/7 remote access due to pooled license (concurrent access)

Secure remote access using Web standards (https with SSL)

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WinCC Unified Device Handling

Agenda

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1 **Device Handling**

2 Screen Navigation

SIMATIC WinCC Unified
Add Device

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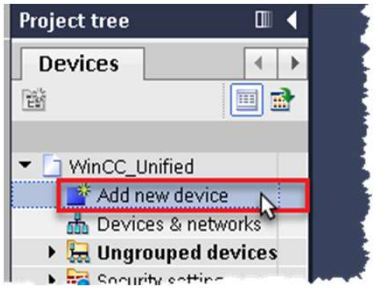

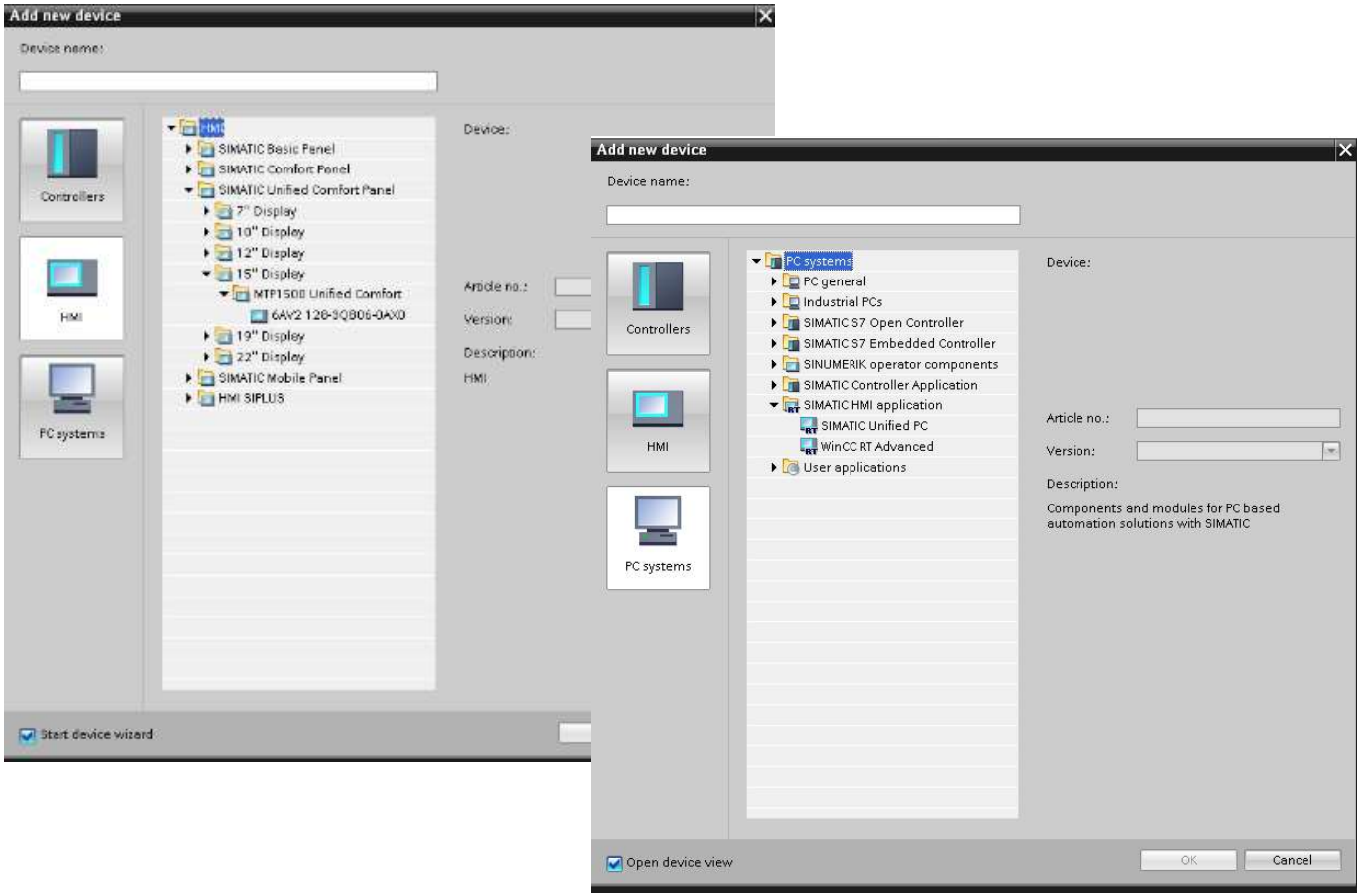

SIMATIC WinCC Unified
Screen Engineering

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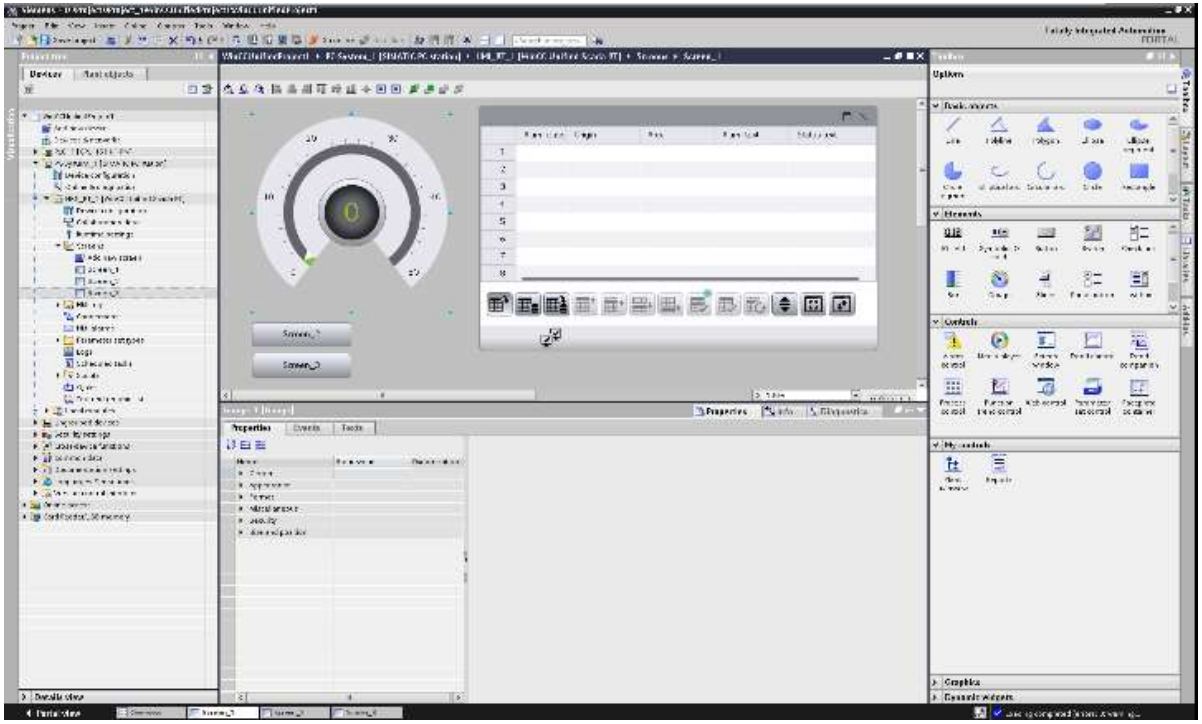
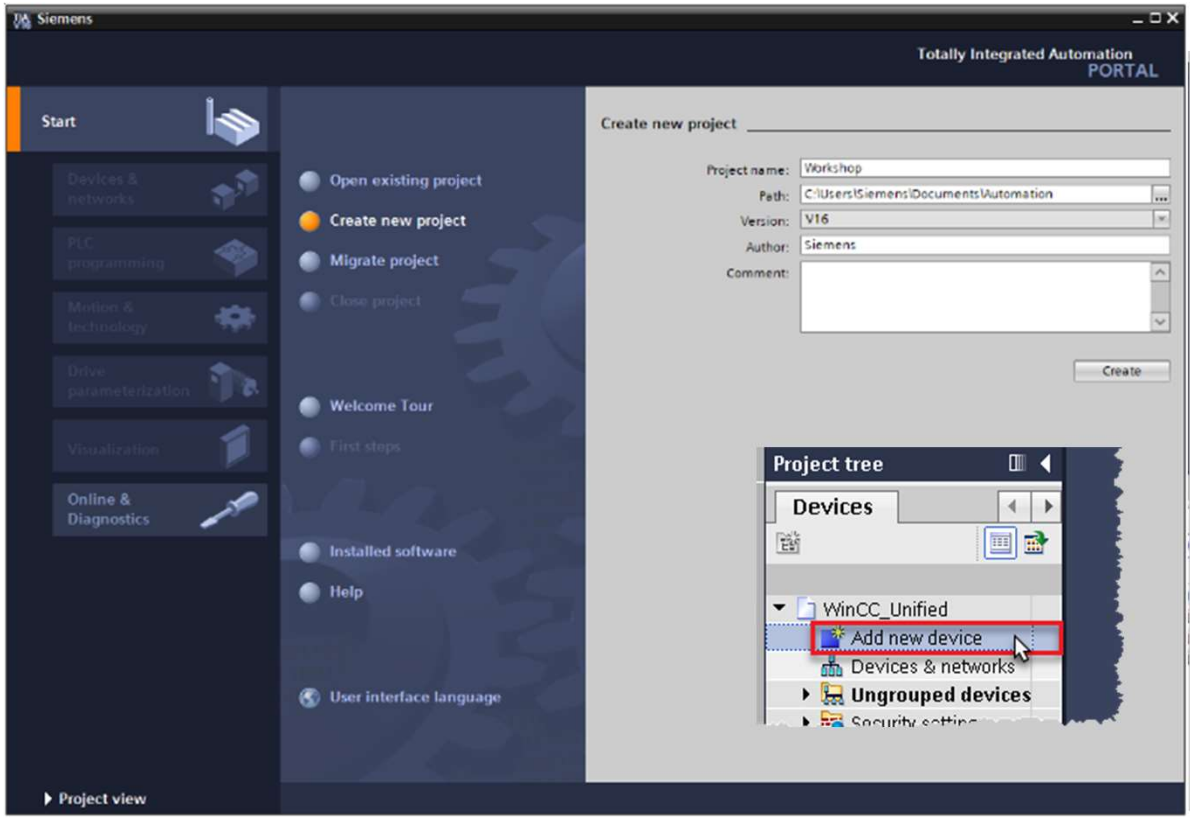
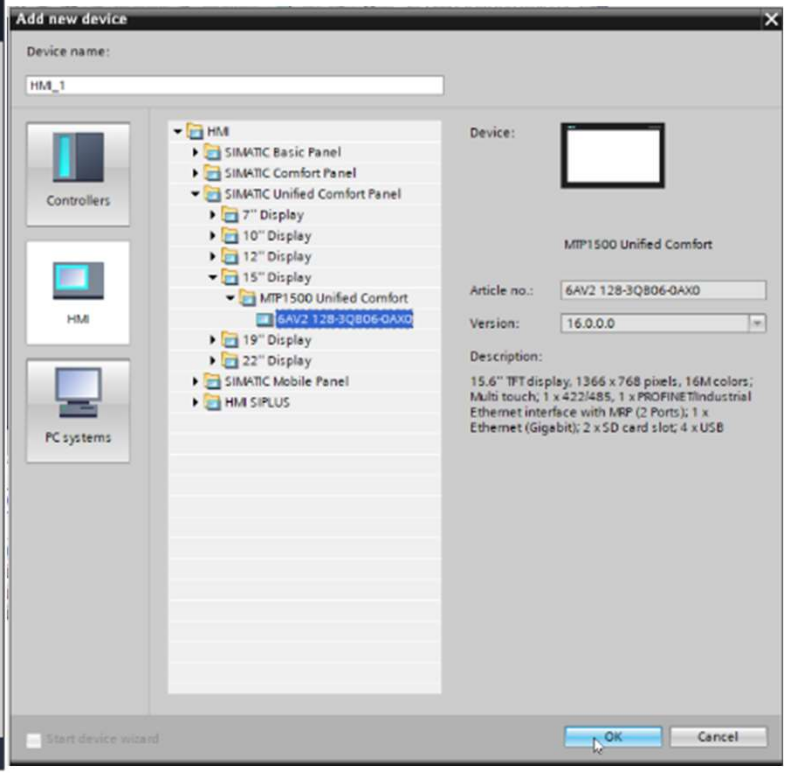


The screen editor of WinCC Unified fits inside the TIA portal suite!

SIMATIC WinCC Unified
Create a new project and Add Device





SIMATIC WinCC Unified
Hands On: Project Creation & Runtime Start

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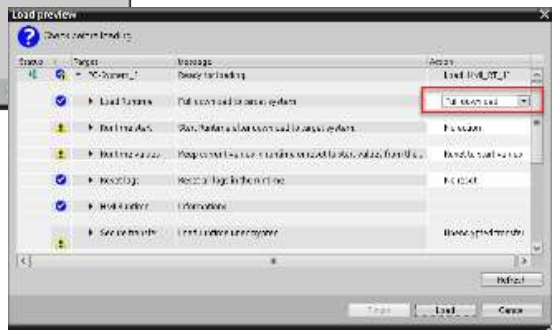
HANDS ON in 10 min



1. Add a Unified Panel to your TIA Project
2. Create a Start screen called ‘Main_screen’
3. Add some elements
4. Compile and simulate your project
5. Open a browser and connect to the Unified Runtime

SIMATIC WinCC Unified
Add Screen and Elements

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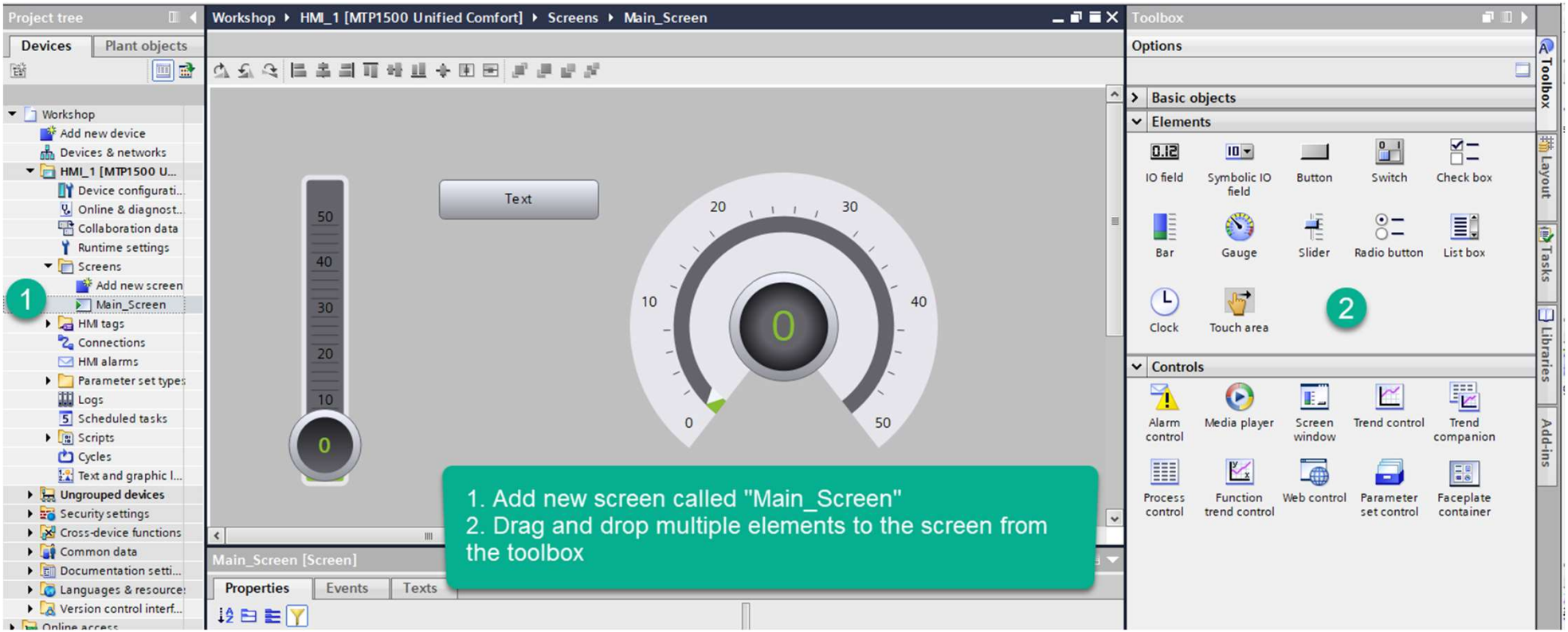

SIMATIC WinCC Unified
Runtime Settings

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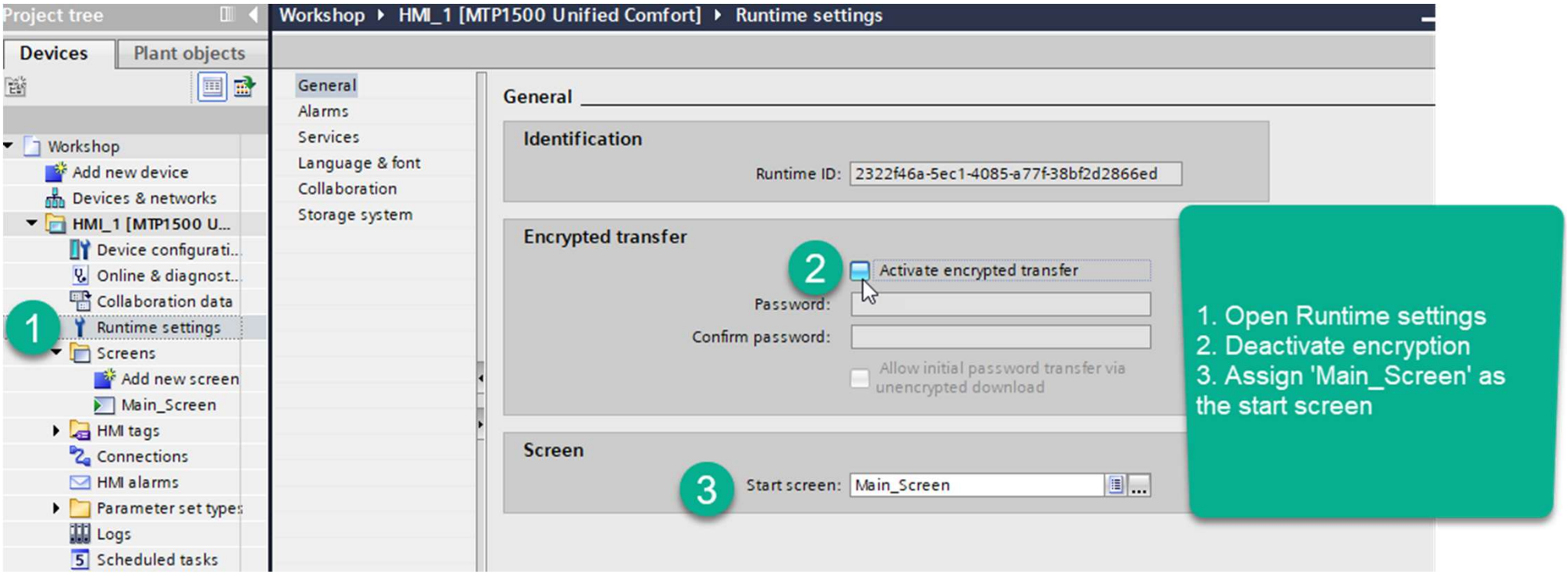

SIMATIC WinCC Unified
Download to Simulator and test screen

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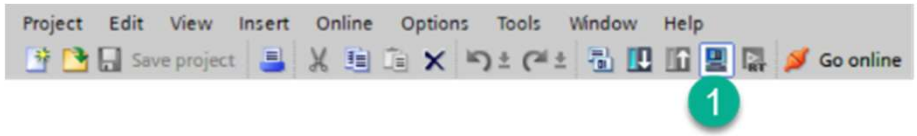

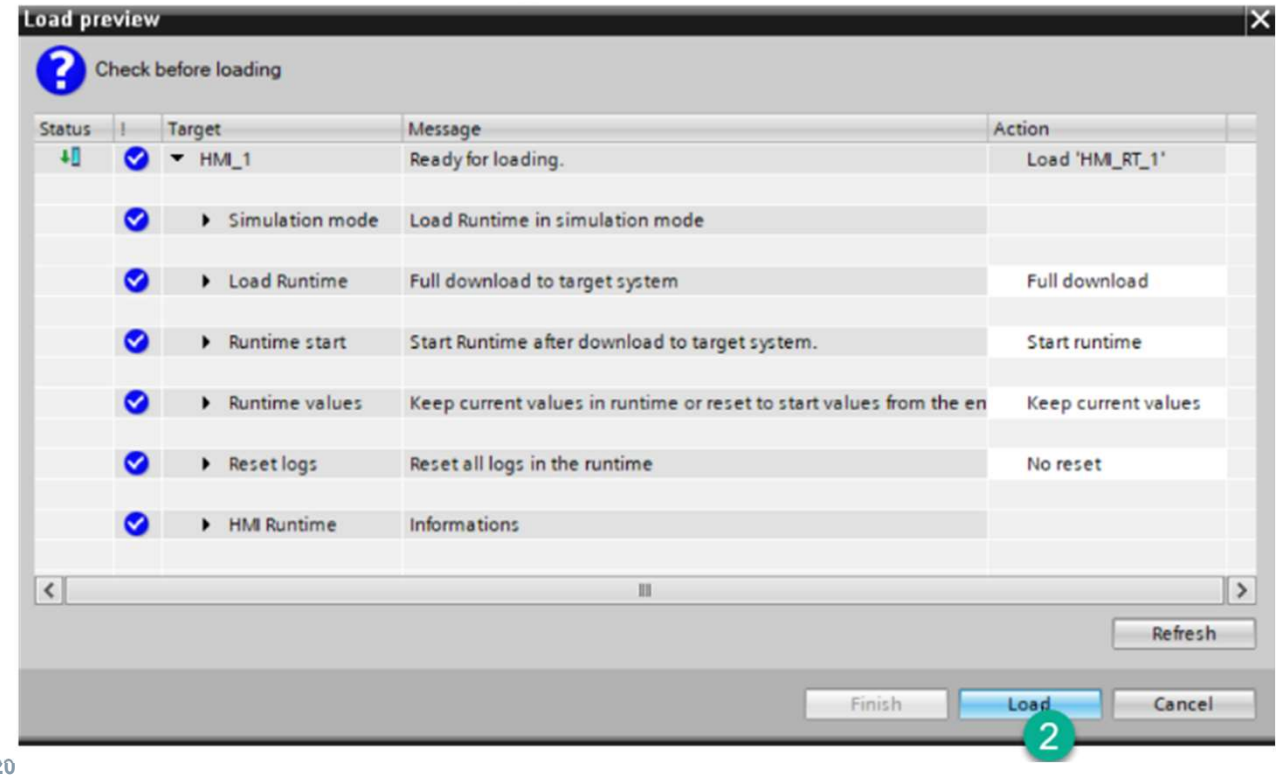

SIMATIC WinCC Unified
Open Browser and Launch Runtime

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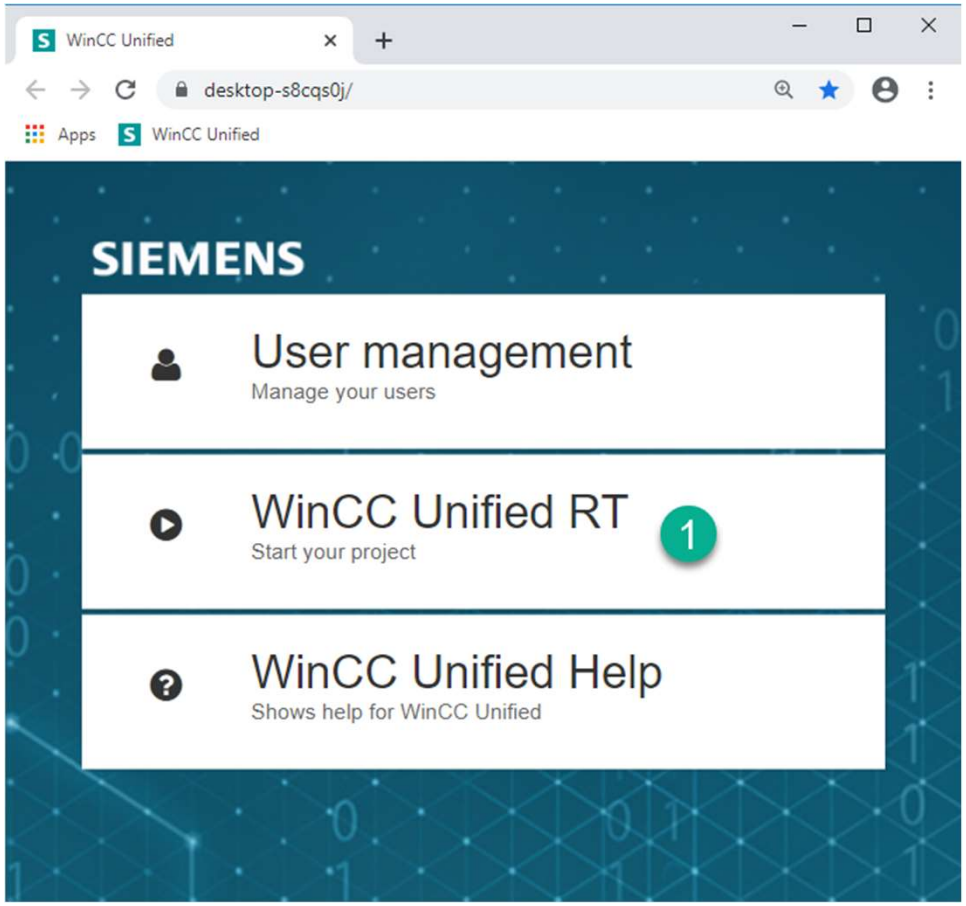

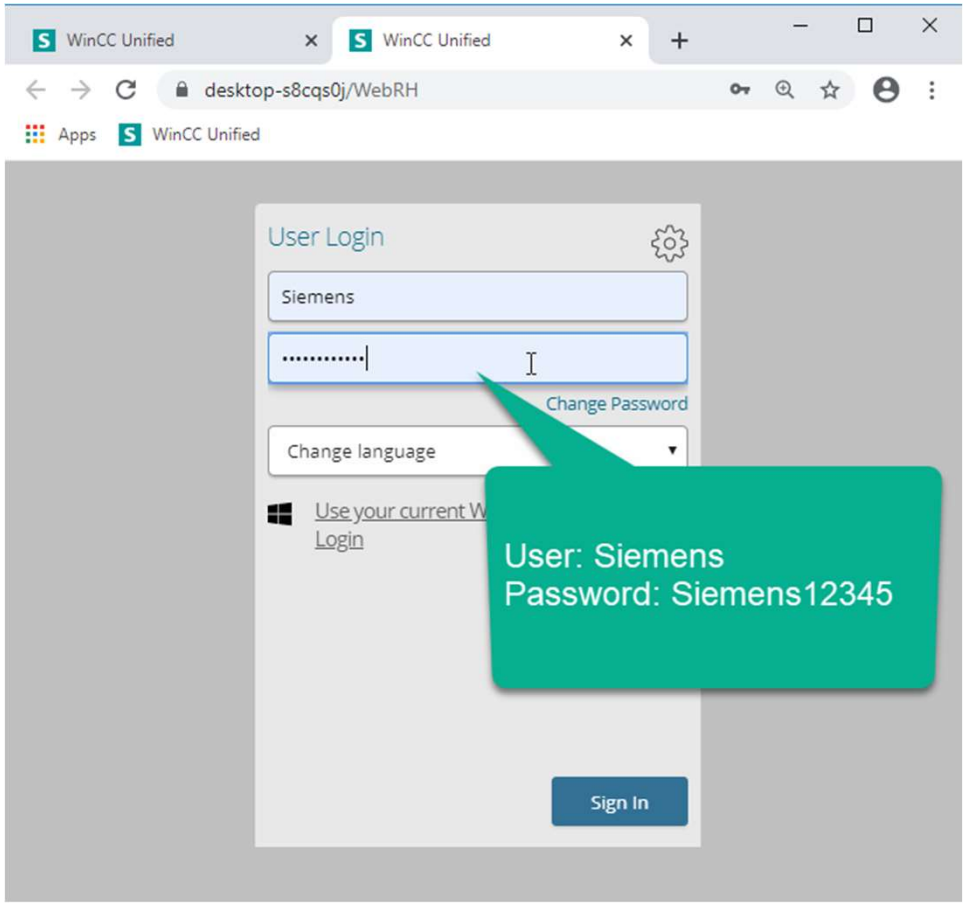

SIMATIC WinCC Unified
Success!!

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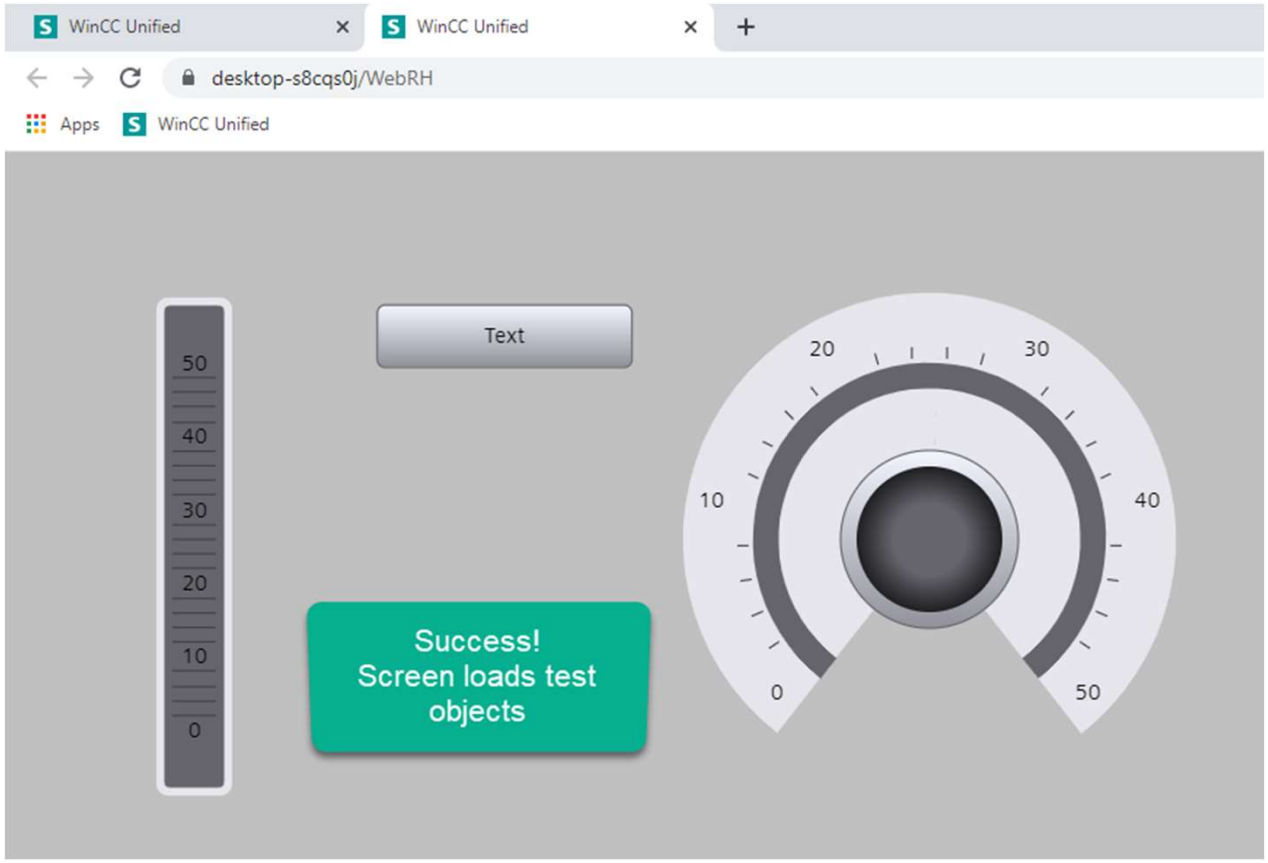

Agenda

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1 Device Handling

2 **Screen Navigation**

SIMATIC WinCC Unified
Screen Navigation - Description

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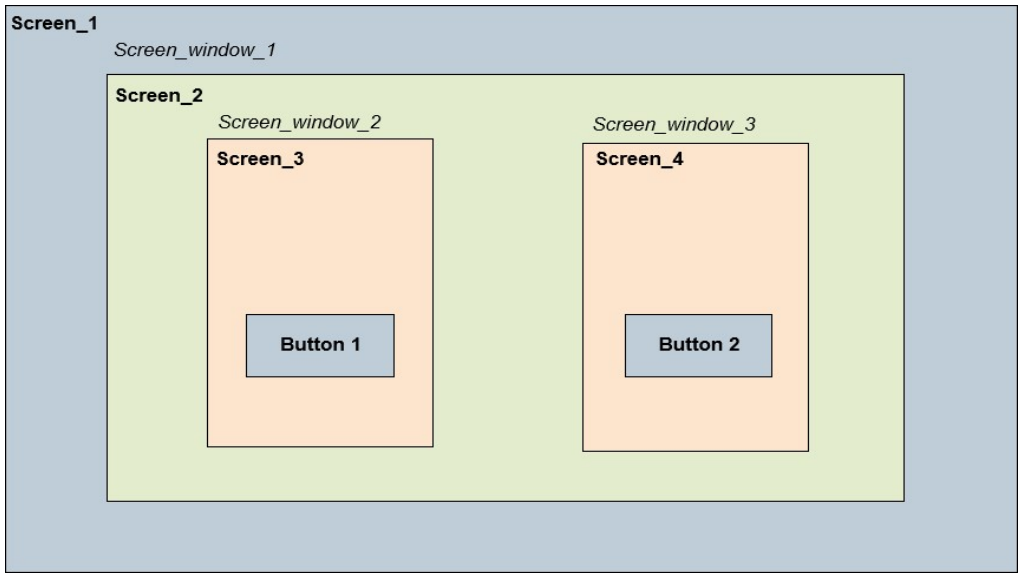

- To create the screen layout screen windows are used in WinCC Unified
- This applies also to the Unified Comfort Panels
- Depending on the application, it may happen that several screen windows are nested.
- The **FindItem()** method can be used to reference the objects within the screen windows and to change their properties dynamically.
- Method of the following objects: **UI** and **Screen**.
- Syntax: **Object.FindItem(ScreenItemPath);**
- Parameter: **ScreenItemPath** [String].

Working with clear object names, instead of default object names is highly recommended!

SIMATIC WinCC Unified
Screen Navigation - Description

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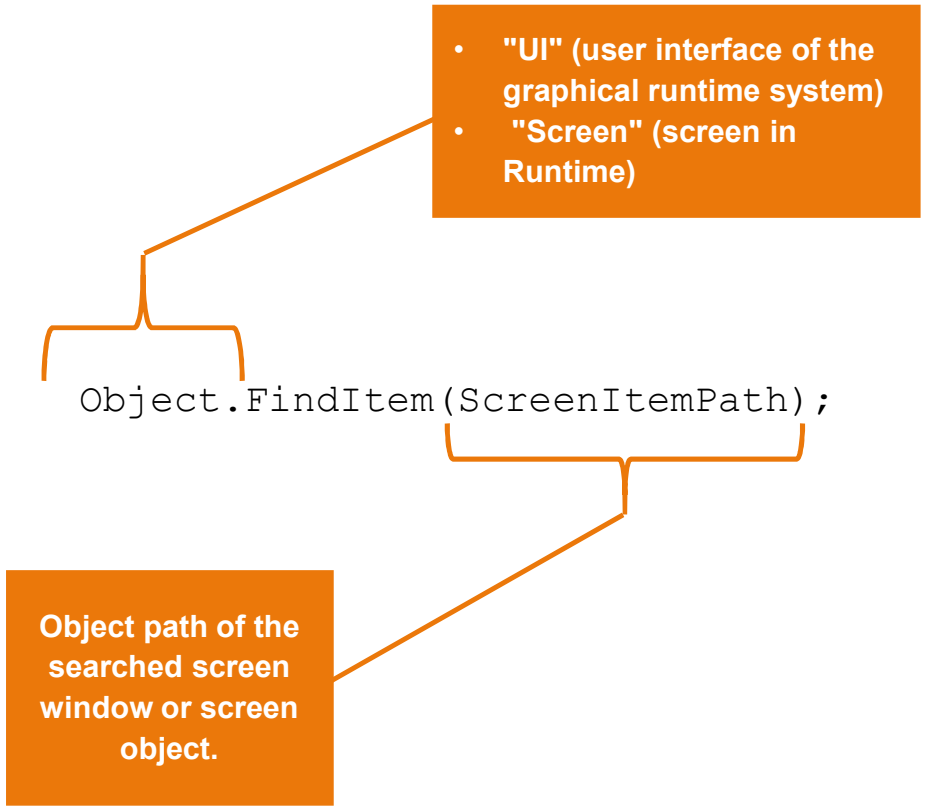

- The object path consists of the names of the screen windows (Screen Windows) and screen objects (Screen Items).
- The names are connected via a slash ("/") according to the hierarchical positioning.

SIMATIC WinCC Unified
Screen Navigation - Description

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relativ

Prefix	Description
".."	References the higher level screen window (parent) in the context of the current screen window.
"."	References the own screen window (self).
""	A screen object of the current screen window is referenced without prefix.

absolut

Prefix	Description
"/"	References a screen window on the highest level, whose name must follow.
"~"	References the screen window on the highest level in the own screen hierarchy.

- Relative and absolute objects paths are distinguished by the prefix of the object path.
- The **relative object path** is specified starting from the screen where the script is called.
- The **absolute object path** is specified starting from the "RootScreenWindow".

SIMATIC WinCC Unified
Screen Navigation – Example 1 - Adjacent screen windows

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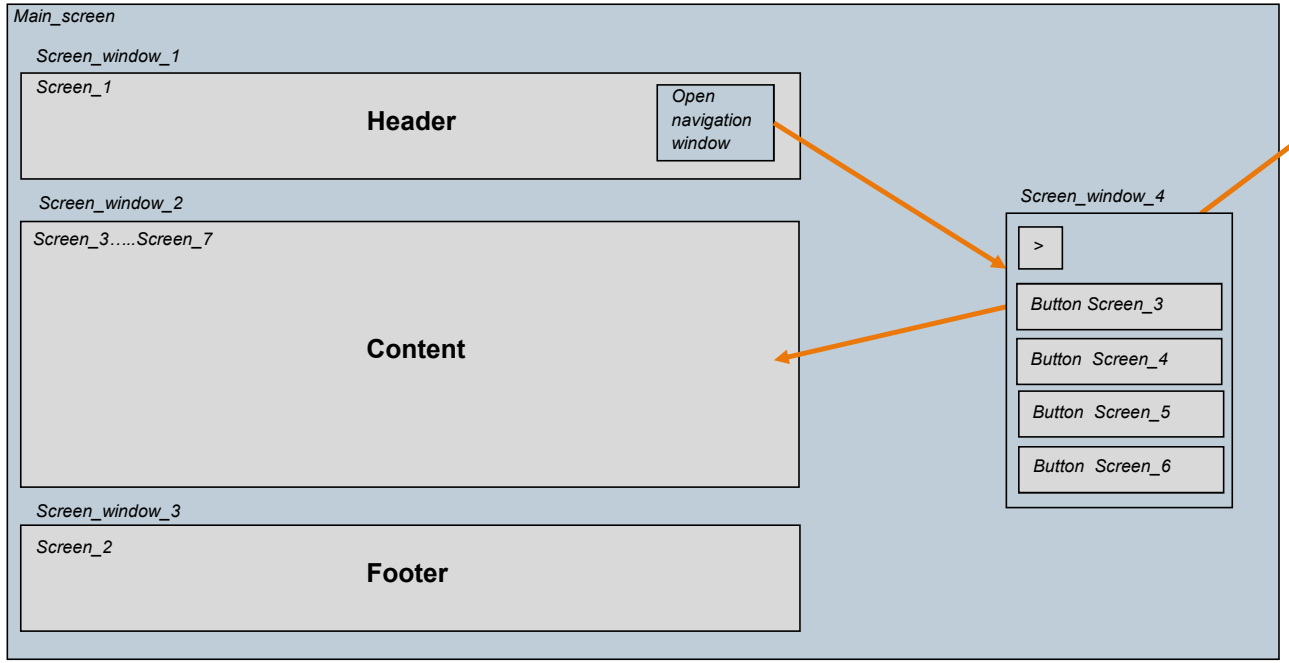

The navigation window is a good example of the FindItem() Method functionality.

SIMATIC WinCC Unified
Screen Navigation

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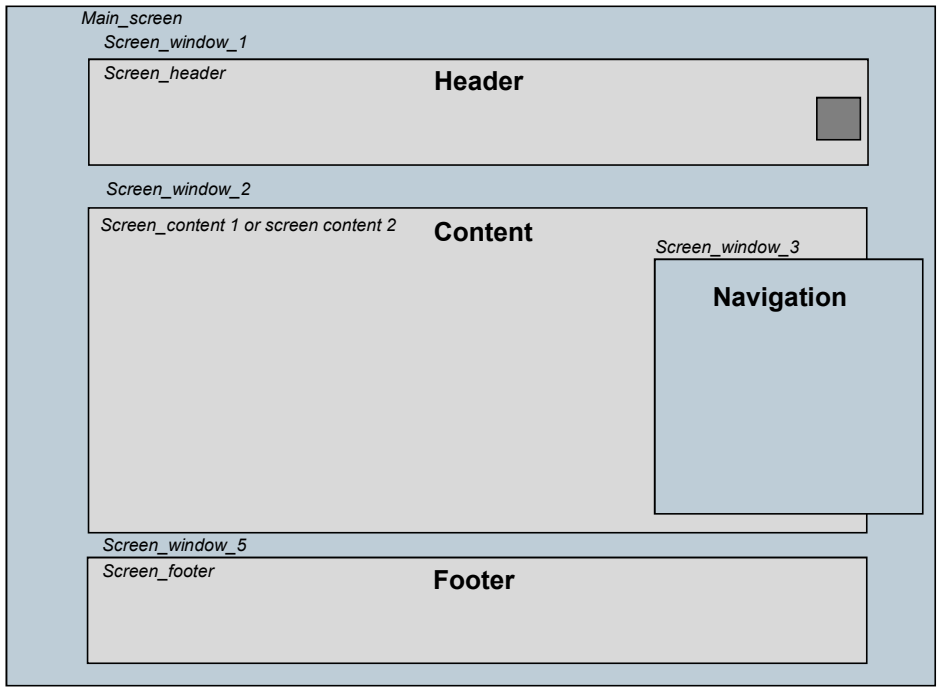
L I V E D E M O



Create a Navigation

Working with Screen windows

SIMATIC WinCC Unified
Hands On: Screen Windows & Screens

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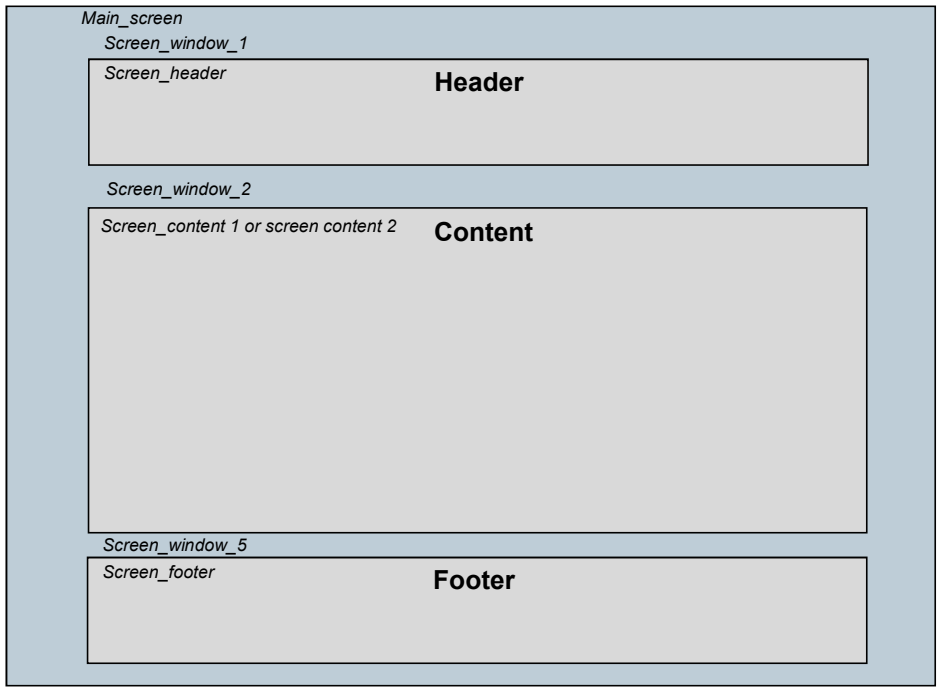
HANDS ON in 15 min



Create the following screens:

1. Main screen 1366*768 (default)
2. Header 1366*120
3. Footer 1366*70
4. Overview 1366*578

1. On the main screen add 3 screen windows: as show on the left picture and define the screen for each screen window.
2. Define clear names for the screen windows

SIMATIC WinCC Unified
Add Screen Groups and Screens

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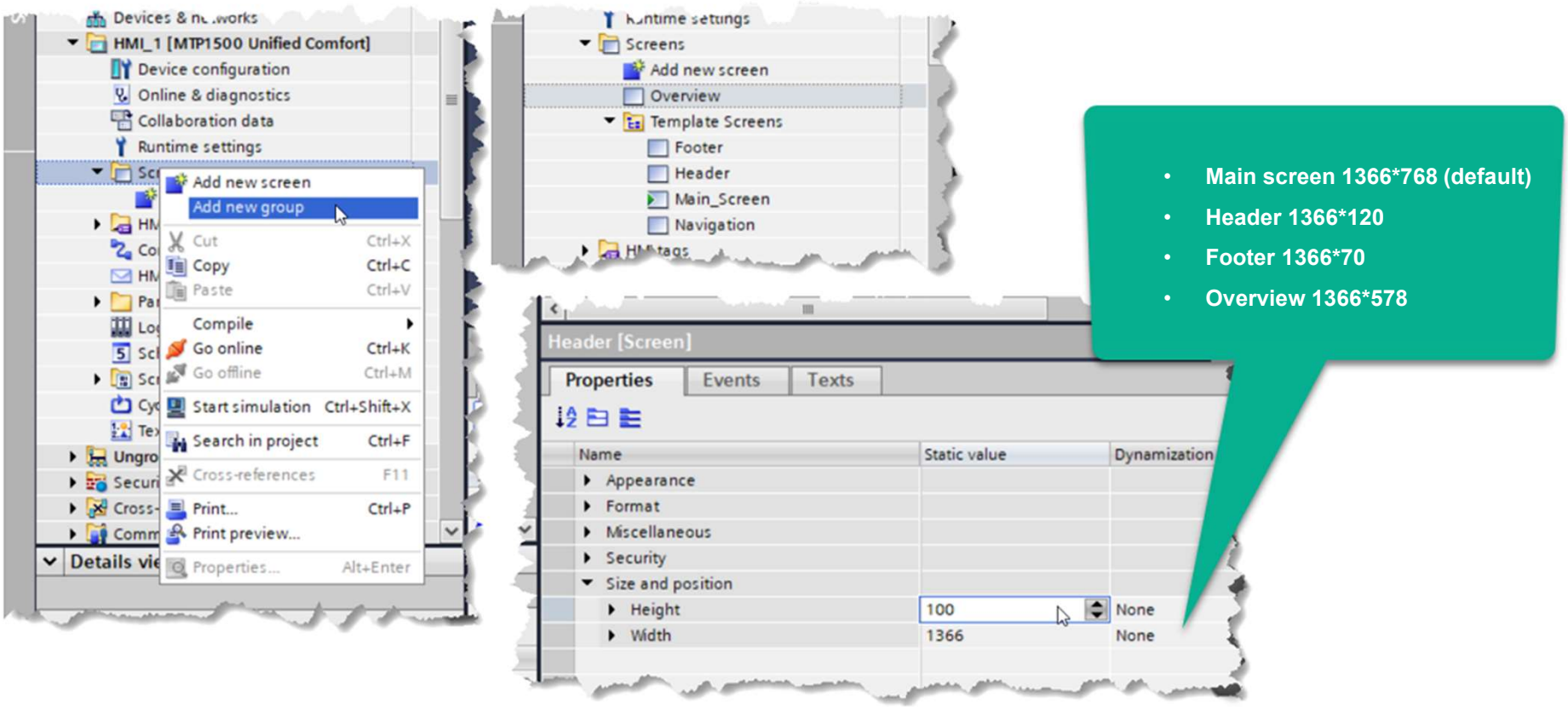

SIMATIC WinCC Unified
Add Text label on each screen

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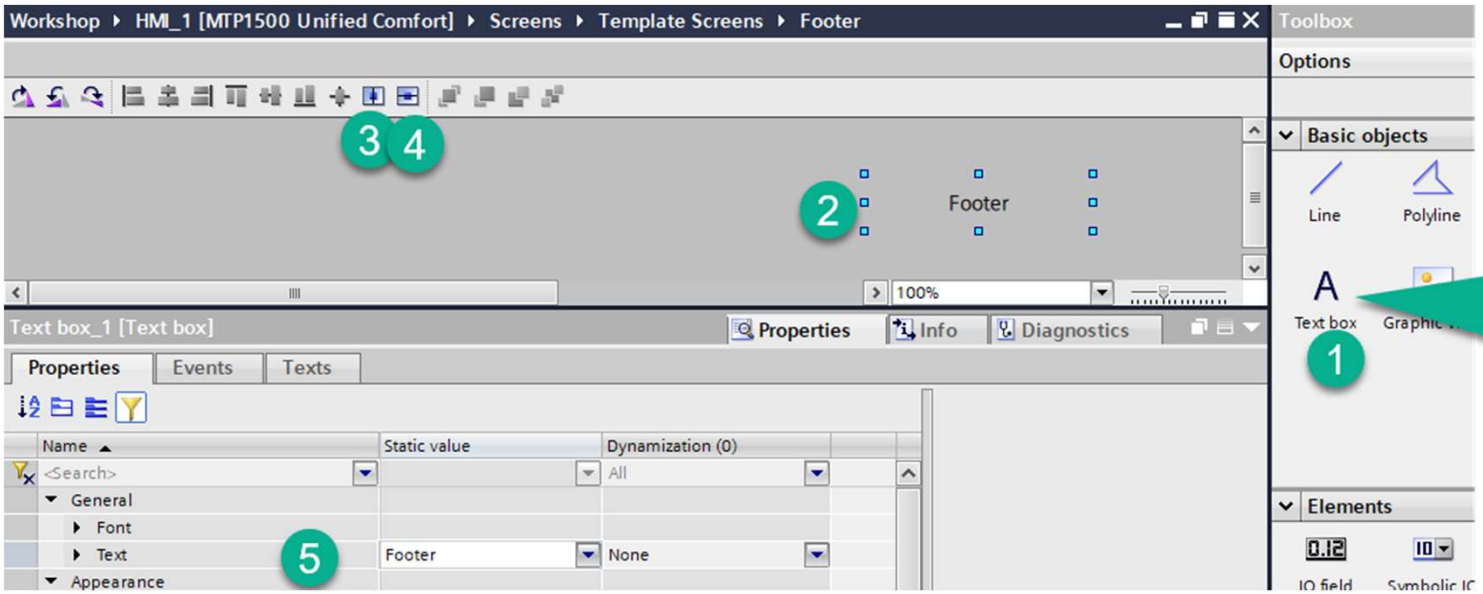

Add a Text box to each screen created to help indicate which screen is being displayed during runtime.
1. Footer
2. Header
3. Overview

NOTE: Center object on screen with the tools #3 and #4

SIMATIC WinCC Unified
Add Tags for Navigation

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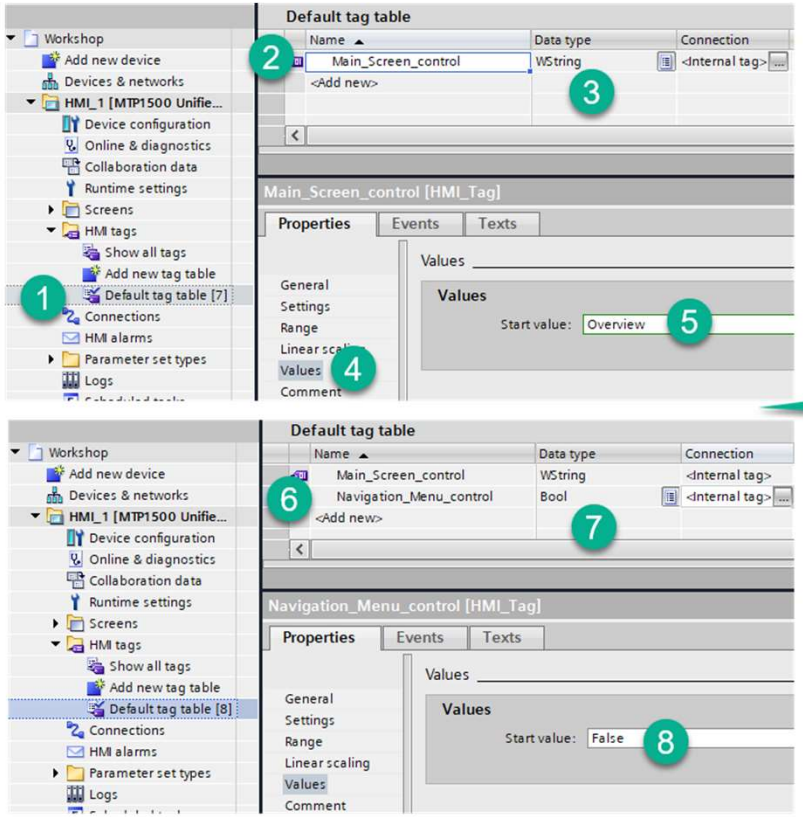

Open the Default tag table and add two tags.
First one of String Data type and start value of 'Overview'
Second one of Bool Data type and start value of 'False

SIMATIC WinCC Unified
Add Screen Windows

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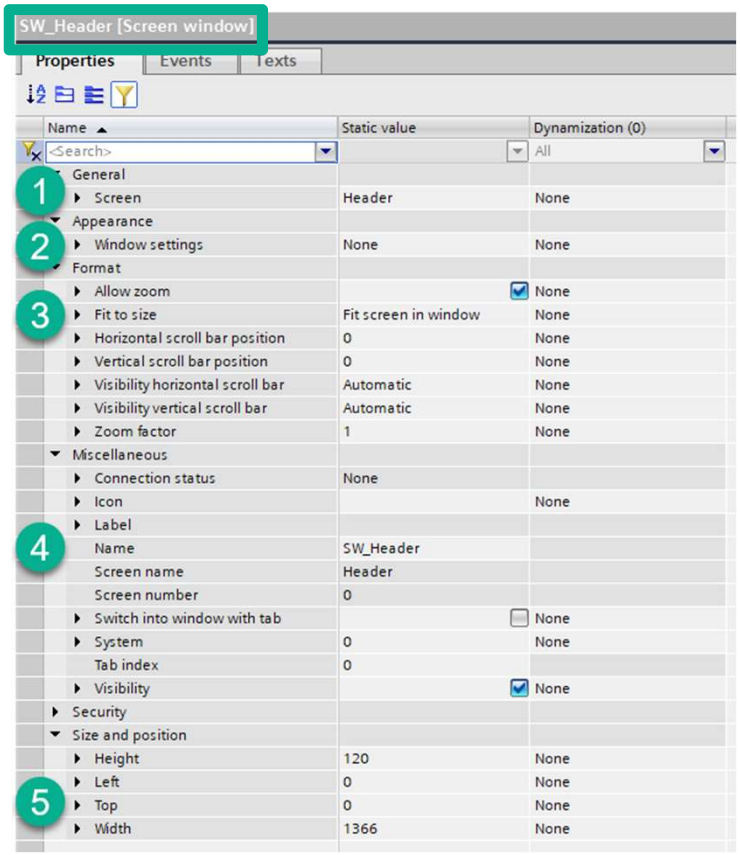

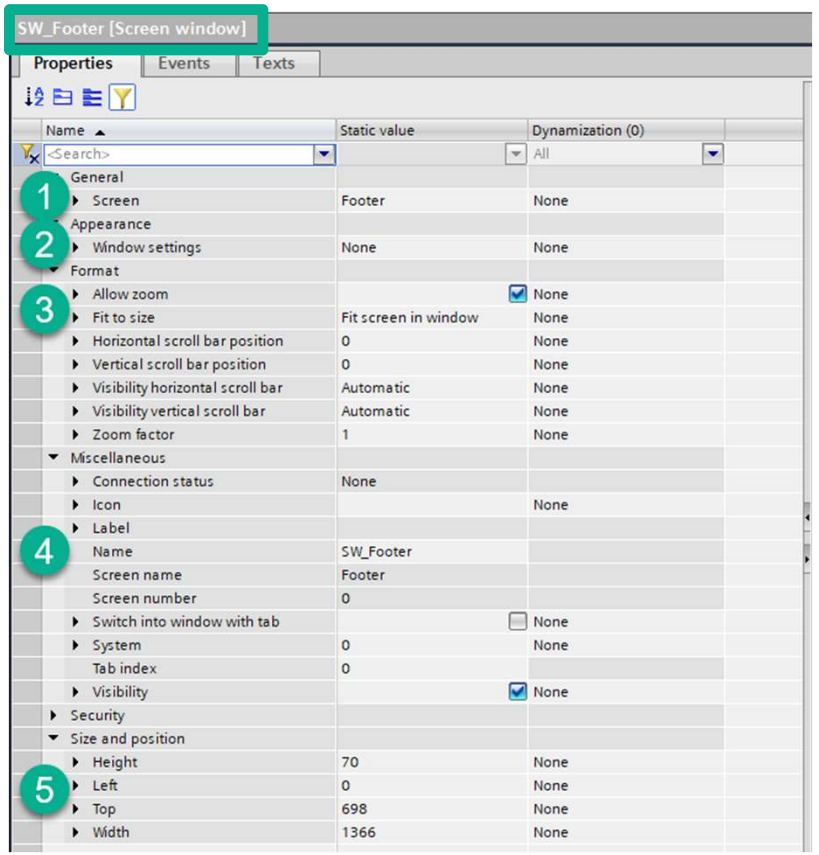

SIMATIC WinCC Unified
Add Screen Windows continued

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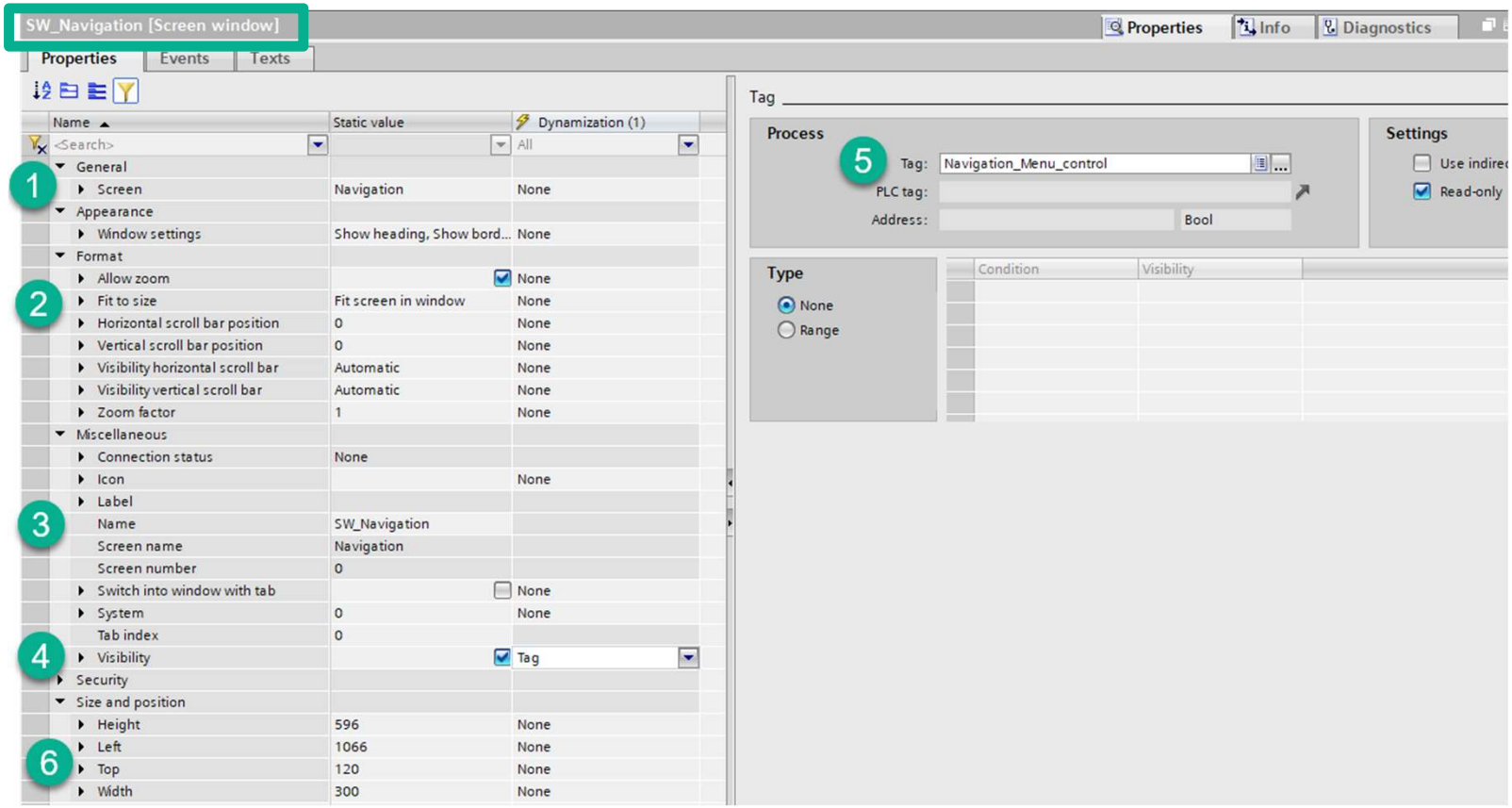

SIMATIC WinCC Unified
Add Screen Windows continued

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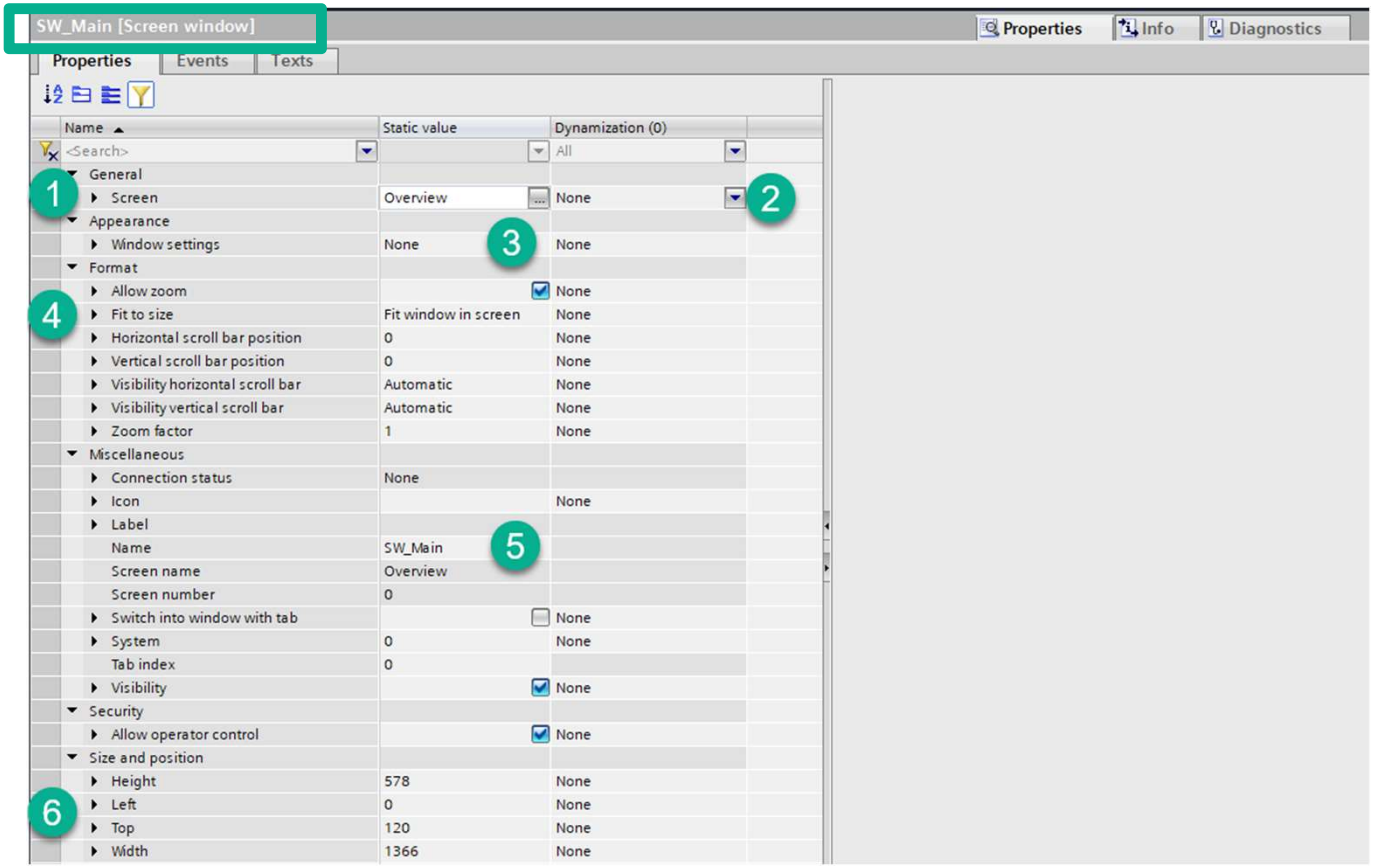

SIMATIC WinCC Unified
Main Screen window layout

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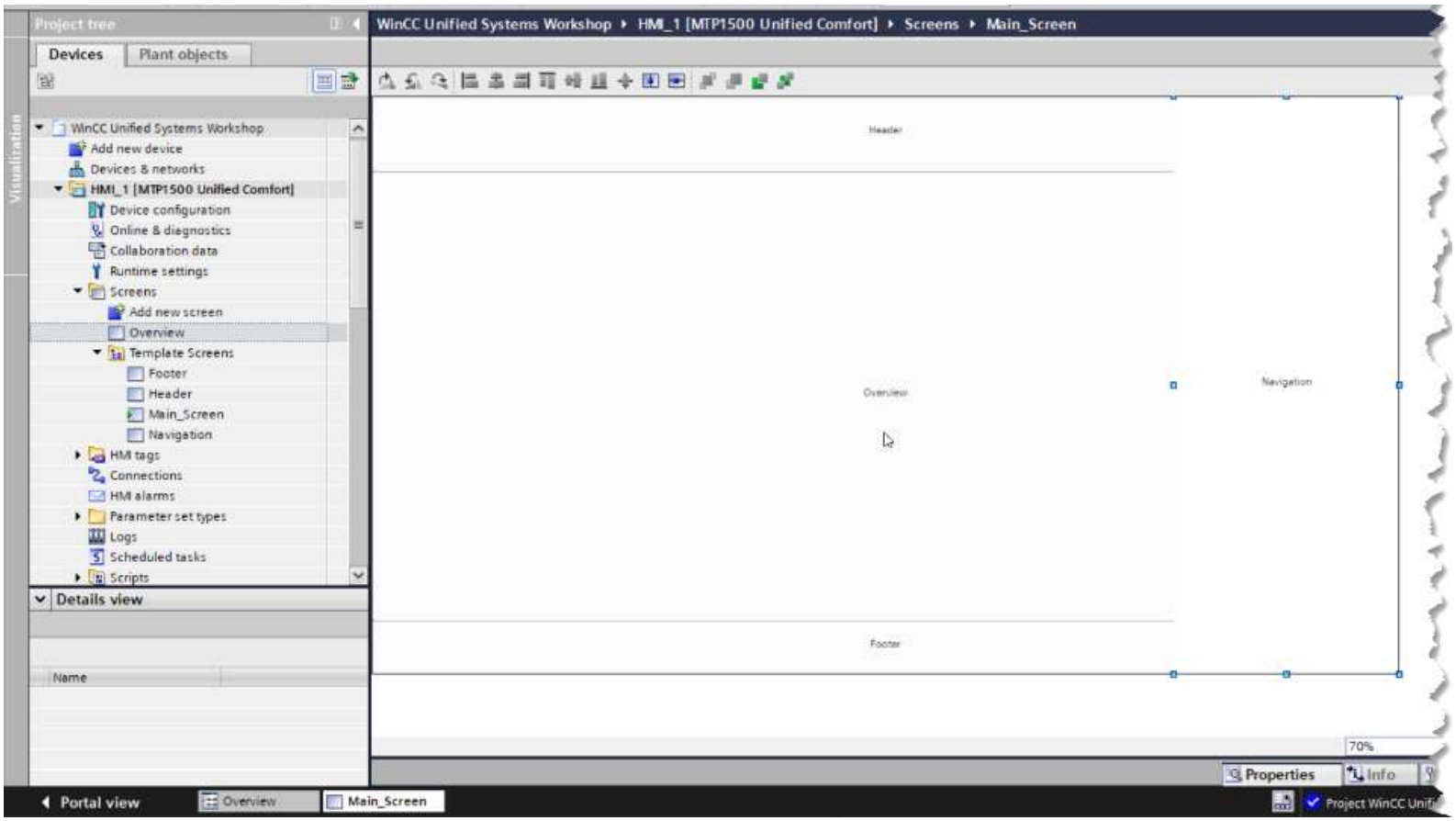

SIMATIC WinCC Unified
Save/Compile and test

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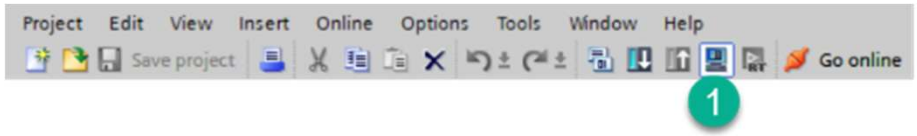

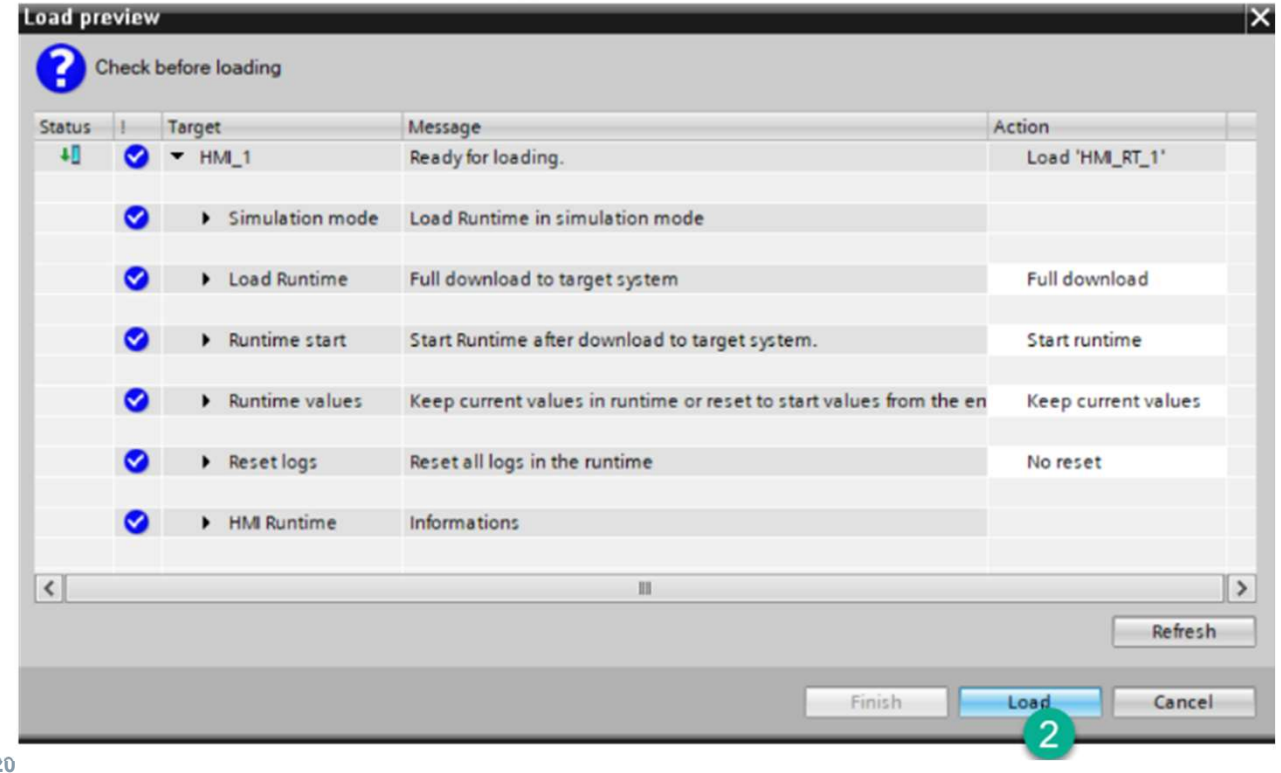

SIMATIC WinCC Unified
Save/Compile and test

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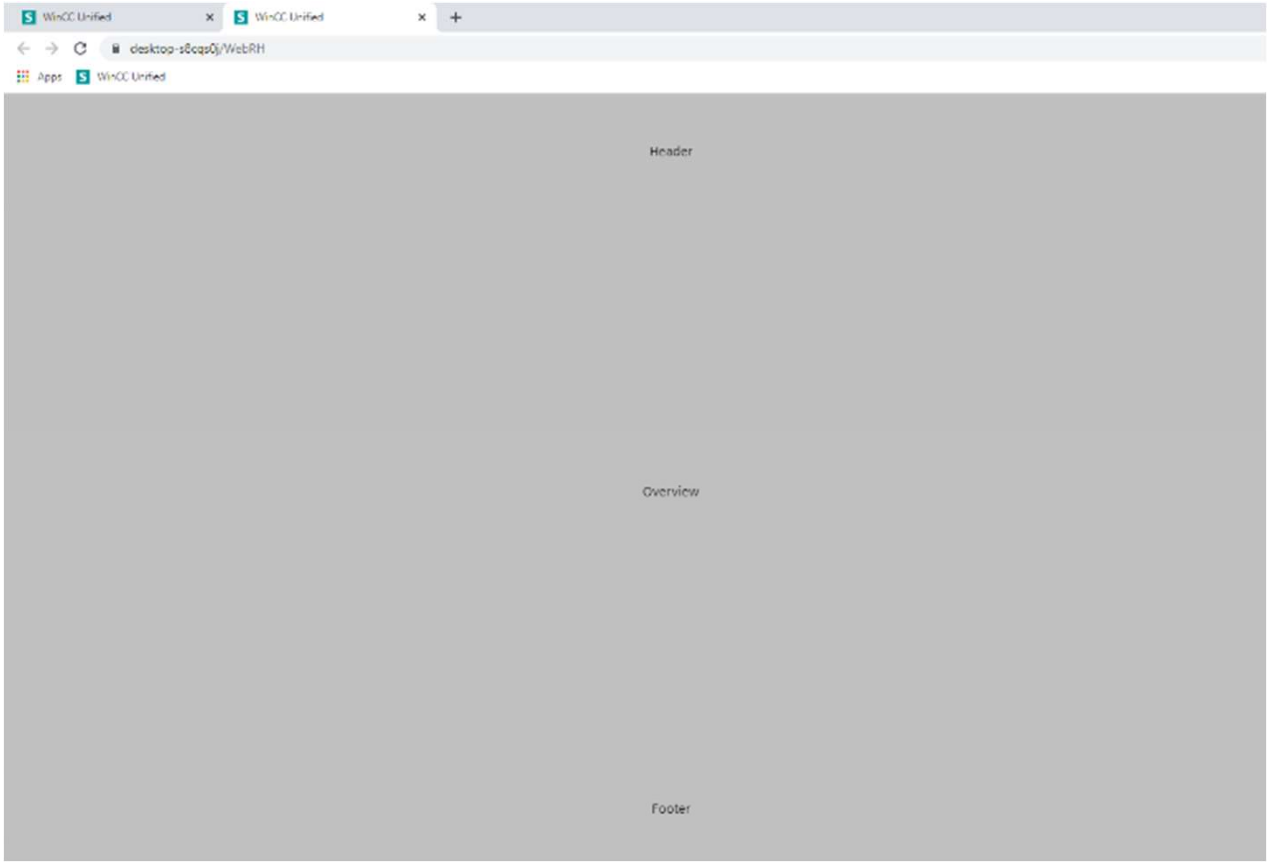

SIMATIC WinCC Unified
Hands On: Screen Navigation via navigation window (SlideIn)

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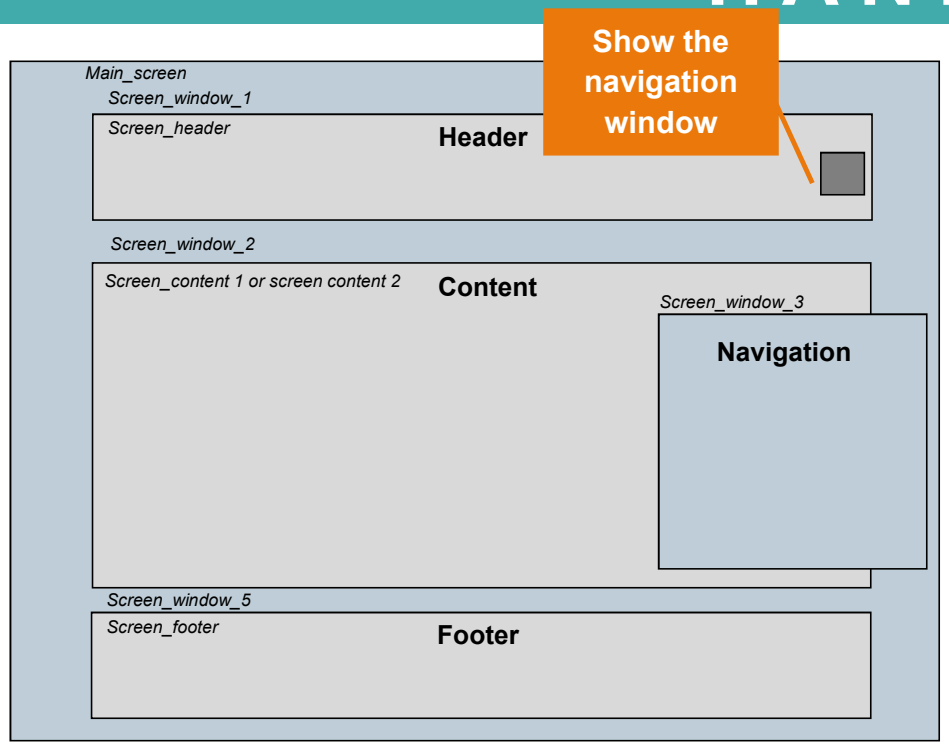
HANDS ON in 15 min



1. Add a new screen window for Navigation on the Main screen
2. On the screen “Header” place a new button to make the navigation screen visible

```
Screen.FindItem("../Screen_window_4").Visible = 1;
```

3. Add a new screen “Navigation” 300*596
4. Connect the screen “Navigation” to the screen window “Navigation”

SIMATIC WinCC Unified
Hands On: Screen Navigation via navigation window

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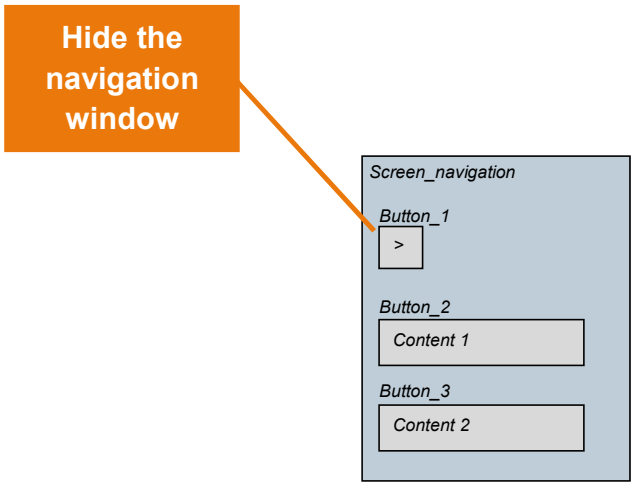
HANDS ON in 15 min



1. Place in the buttons for screen navigation
2. Use the button 1 to hide the navigation
3. Use the Additional Buttons for the “content change”
4. Save, compile and start simulation
5. Check the main screen if its works

SIMATIC WinCC Unified
Navigation control

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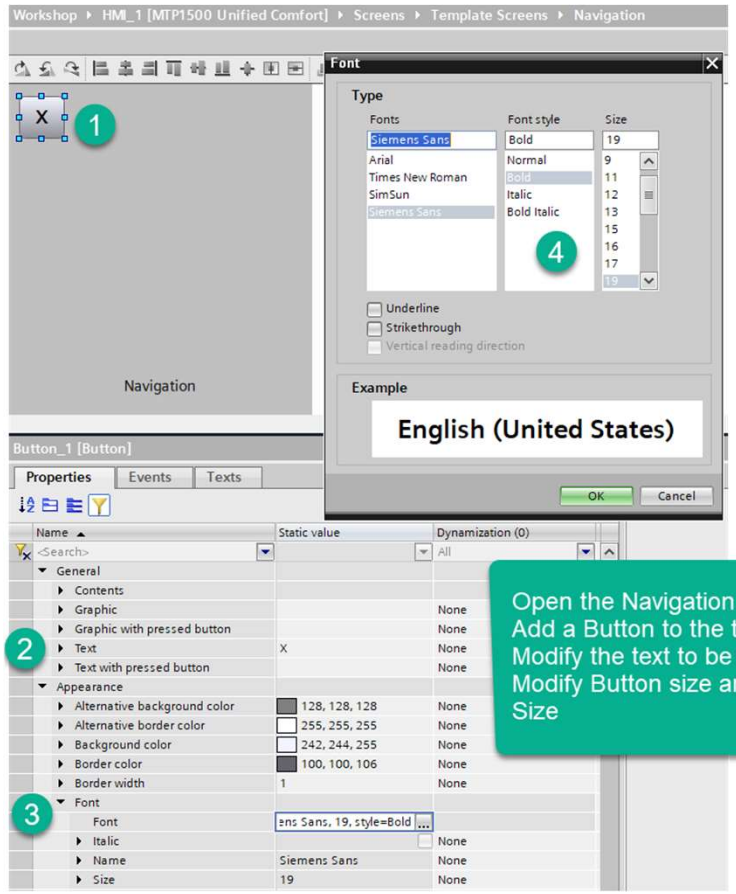
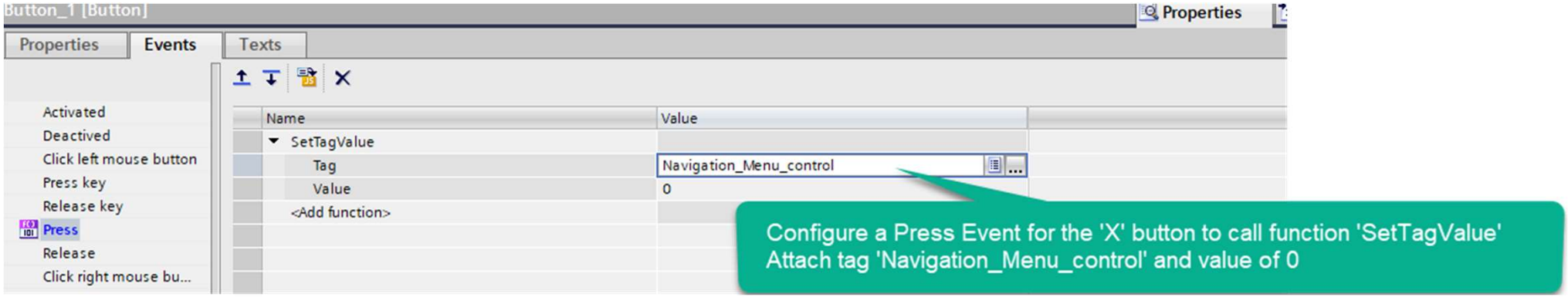


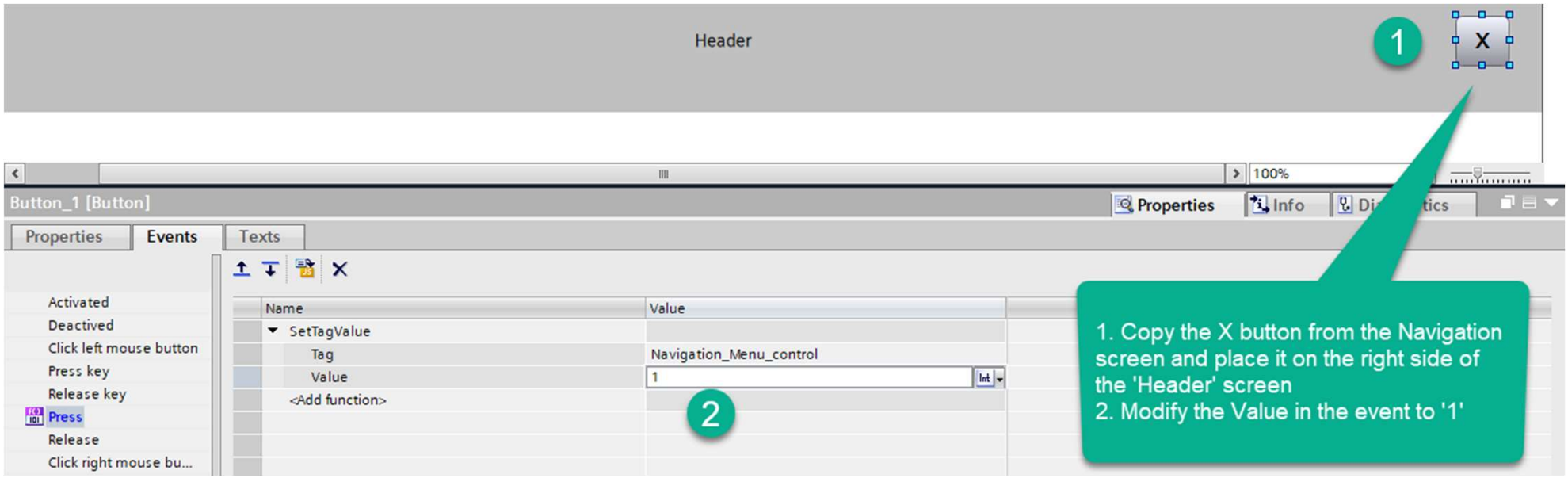
SIMATIC WinCC Unified
Navigation close event

SIEMENS
Ingenuity for life



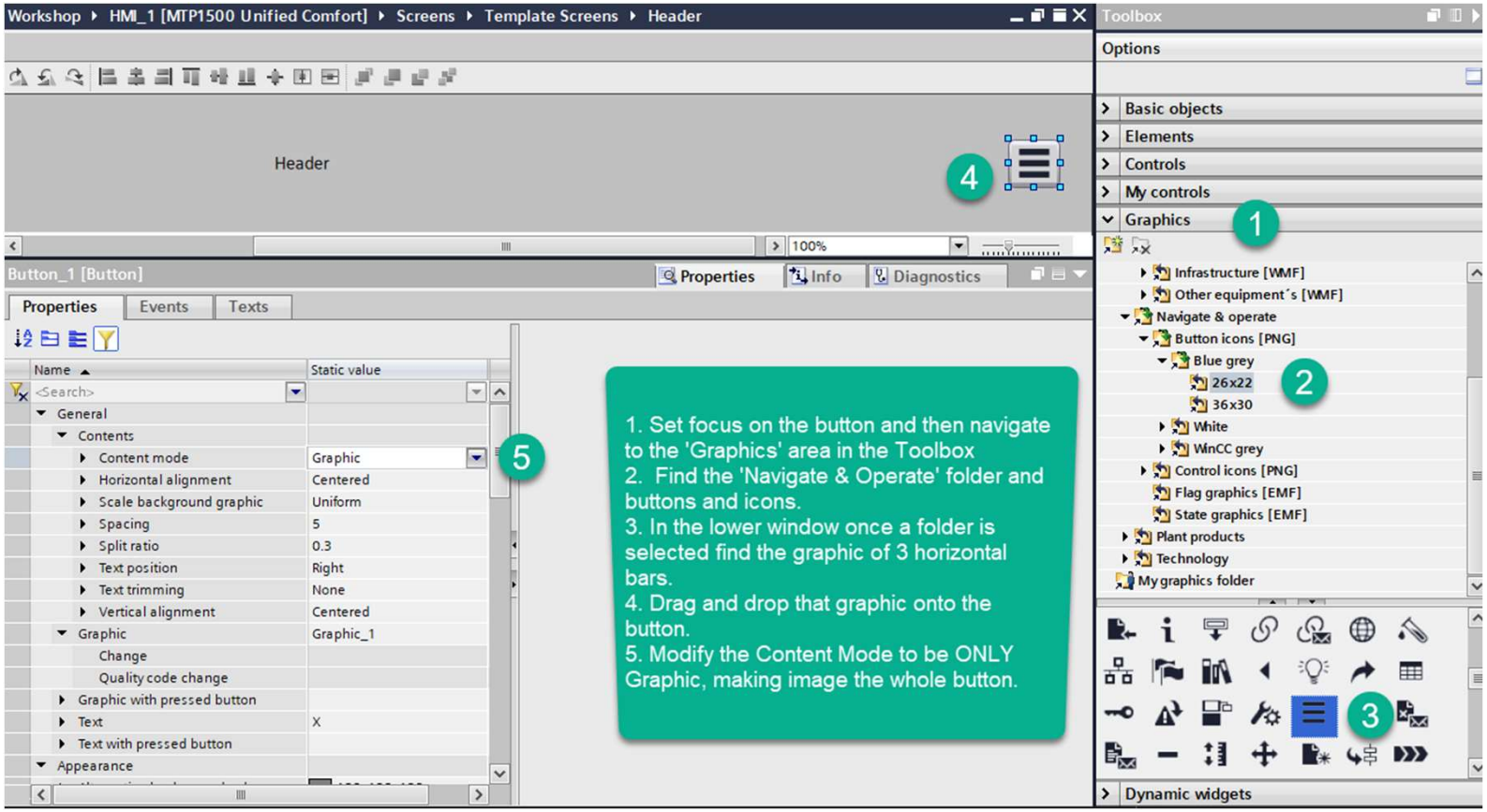
SIMATIC WinCC Unified
Navigation open

SIEMENS
Ingenuity for life



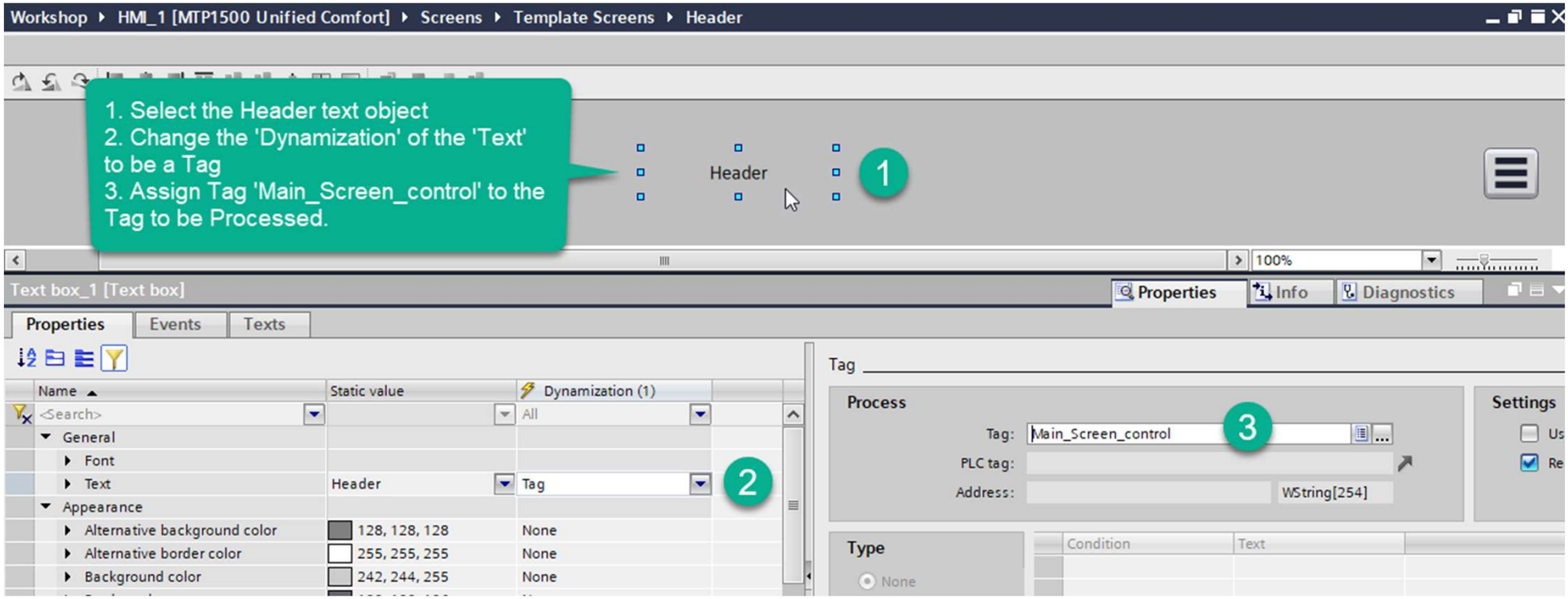
SIMATIC WinCC Unified
Navigation open continued

SIEMENS
Ingenuity for life



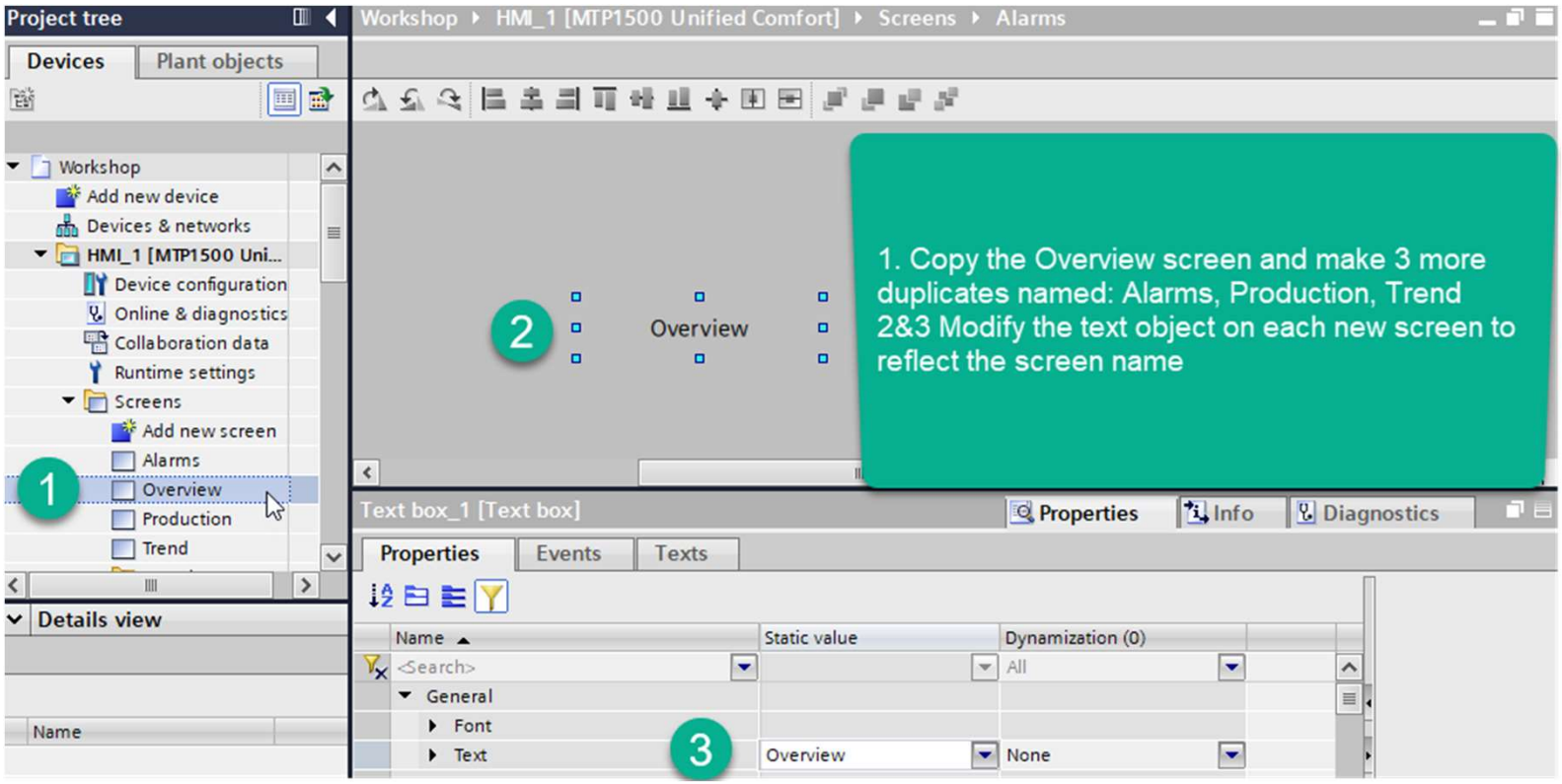
SIMATIC WinCC Unified
Dynamization of Screen Name to Text box

SIEMENS
Ingenuity for life



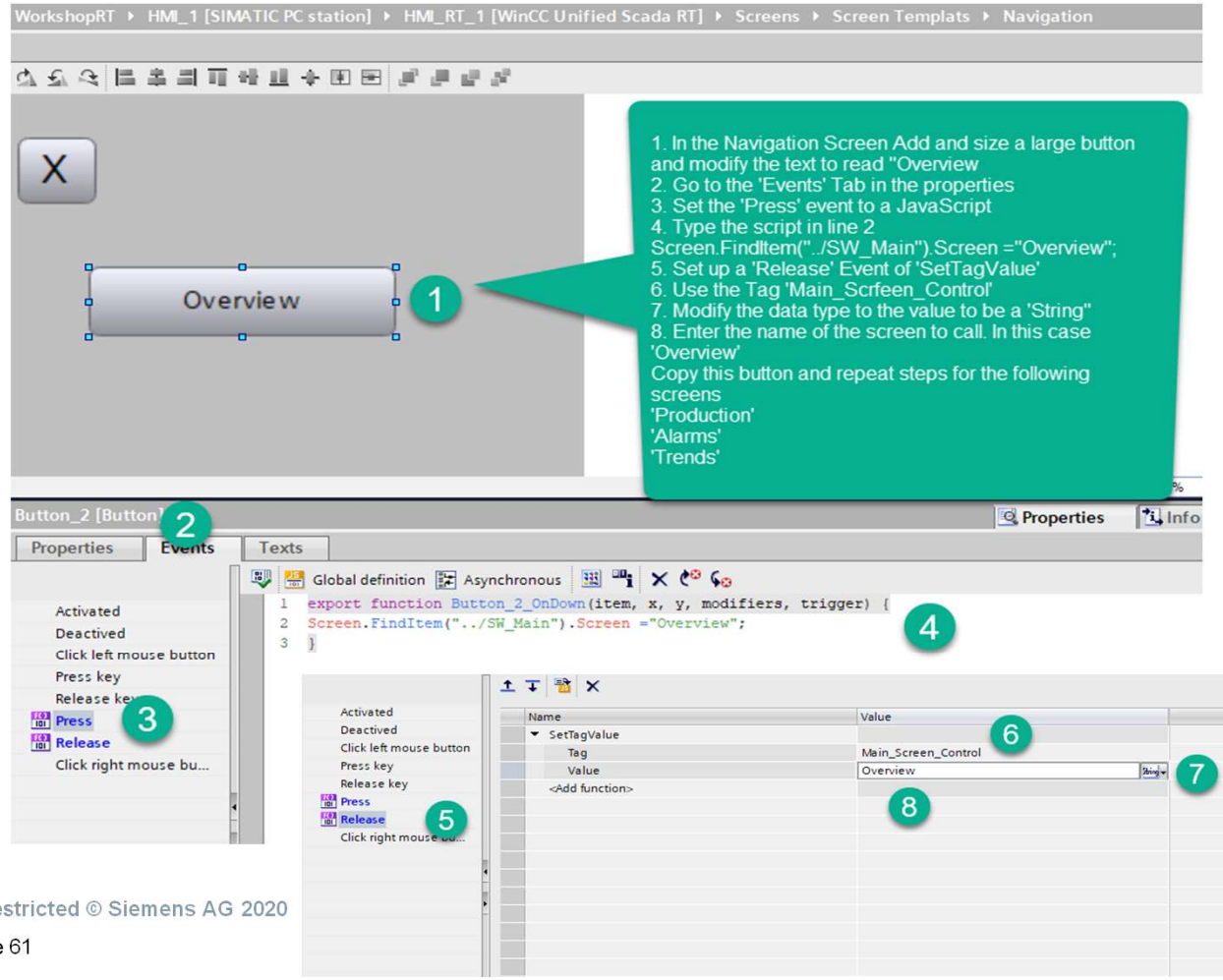
SIMATIC WinCC Unified
Duplicate screens

SIEMENS
Ingenuity for life



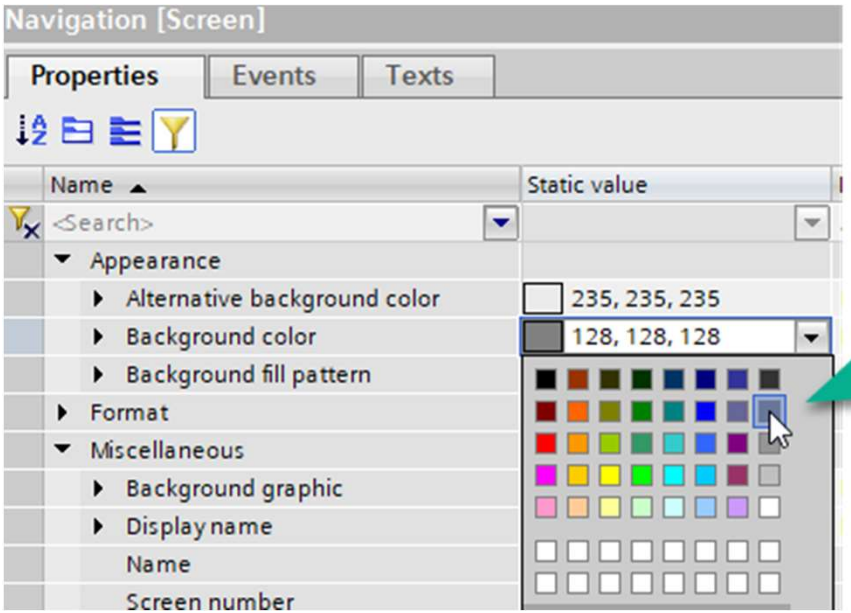
SIMATIC WinCC Unified
Add Navigation buttons to the screen

SIEMENS
Ingenuity for life

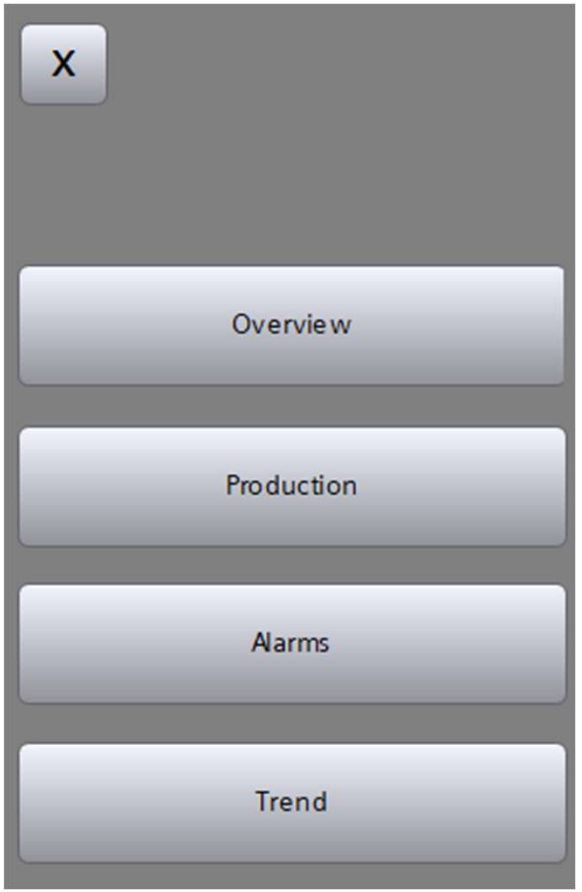


SIMATIC WinCC Unified
Navigation Screen background color

SIEMENS
Ingenuity for life

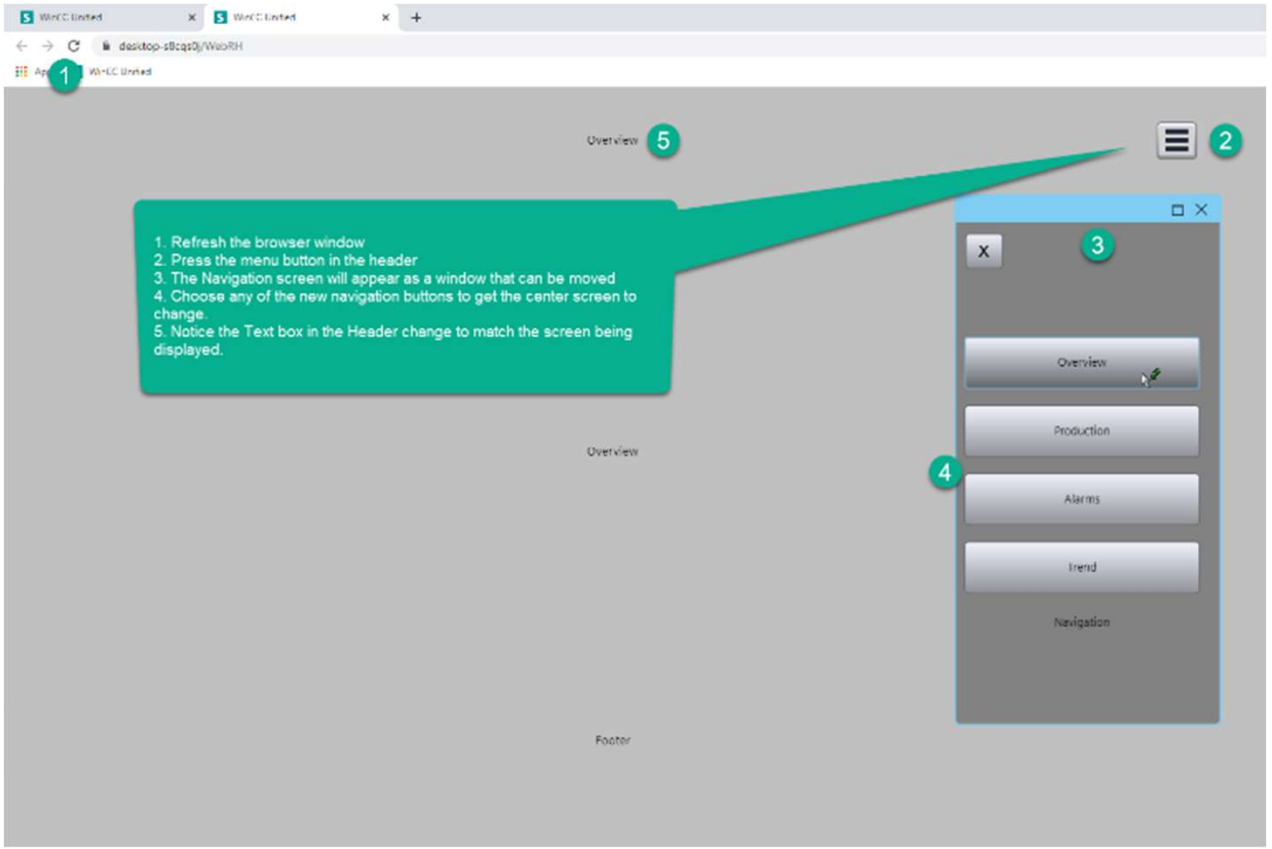


Modify the Background color of the Navigation screen to be a darker shade of Gray to help set the window apart from the rest of the screen



SIMATIC WinCC Unified
Save/Compile and test

SIEMENS
Ingenuity for life



SIEMENS
Ingenuity for life

WinCC Unified SIPEC Workshop Communication

Agenda

SIEMENS
Ingenuity for life

1 **Communication**

2 OPC Communication

SIMATIC WinCC Unified
To automation systems

SIEMENS
Ingenuity for life

Unified Comfort Panel ✓ PC ✓

Native 3rd Party | S7-1200/1500 ✓ | S7-300/400 ✓

SIMOTION[2] | S7-1500 Software Controller | PLCSIM/PLCSIM Advanced

Native 3rd Party[1] communication via Channel Support Package
e.g., Modbus TCP, Allen-Bradley EtherNet/IP, …

\Download from Service and Support website

Perfect integration of SIMATIC PLCs (TIA Portal)

High number of connections for PC systems, up to 128 PLCs (>10 with extra Softnet-IE license)

Increased number of connections for Panel systems, up to 16 PLCs

1 In preparation **2** only tag communication via OPC UA DA

Agenda

SIEMENS
Ingenuity for life

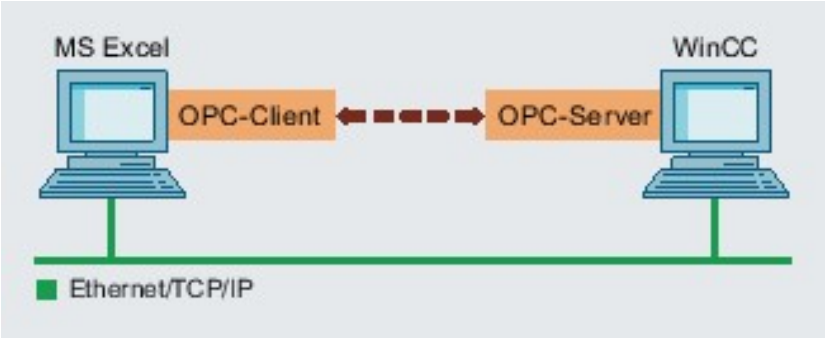
1 Communication

2 **OPC Communication**

SIMATIC WinCC Unified
OPC UA Connection

SIEMENS
Ingenuity for life

Unified Comfort Panel | PC ✓



OPC UA (Unified Architecture)

- You use OPC interface to link the devices and applications from various manufacturers in a standardized manner
- WinCC Unified can be configured as OPC UA server and as OPC UA client*. The OPC server provides process values from the WinCC data management for one or more OPC clients.

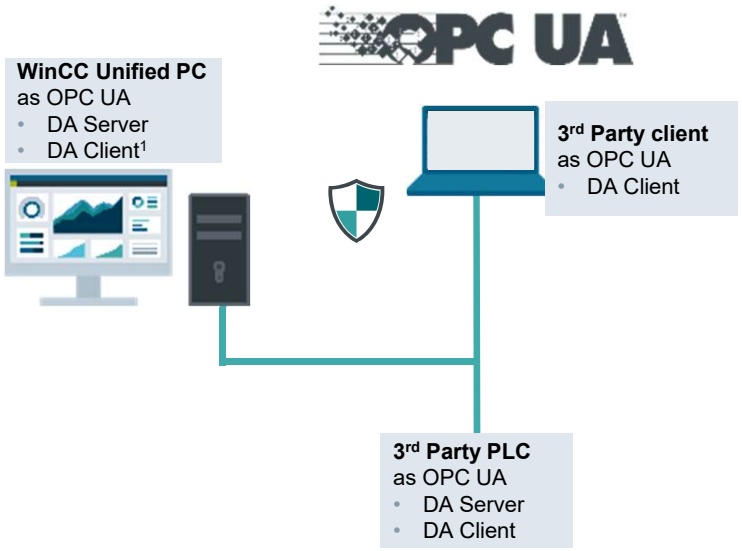
OPC UA is a platform-independent technology.

* Only PCs can be an OPC client for a remote OPC server.

SIMATIC WinCC Unified
Using standard interface OPC UA Server

SIEMENS
Ingenuity for life

Unified Comfort Panel | **PC** ✓



Using communication standard OPC UA for OT/IT and automation connectivity

Standard connectivity via OPC UA (DA Server & DA Client[1])

OT/IT connectivity via OPC UA to forward data to 3rd party applications

Automation connectivity via OPC UA to integrated 3rd party PLCs

1 In V16 only local OPC UA server can be connected as OPC UA client

SIEMENS
Ingenuity for life

WinCC Unified Screen Engineering

Agenda

SIEMENS
Ingenuity for life

1 **Screen Engineering**

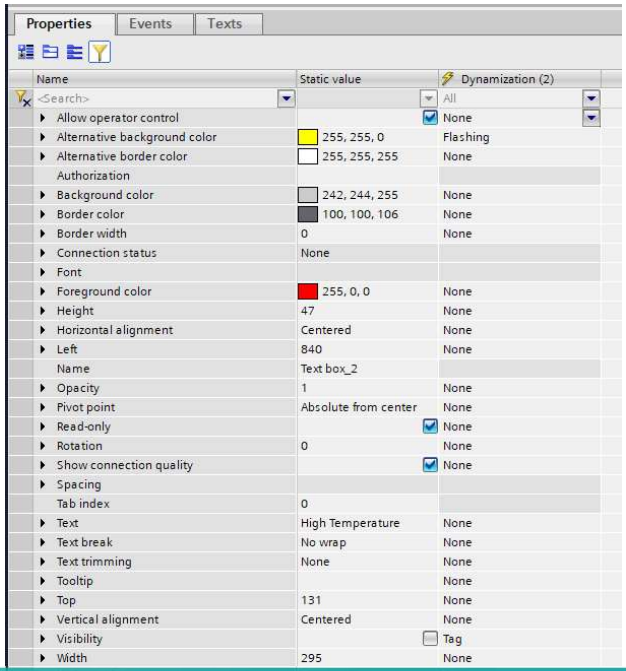
2 Basic Screen Objects

3 Dynamic SVG

4 Animations

SIMATIC WinCC Unified
Screen Engineering – Properties

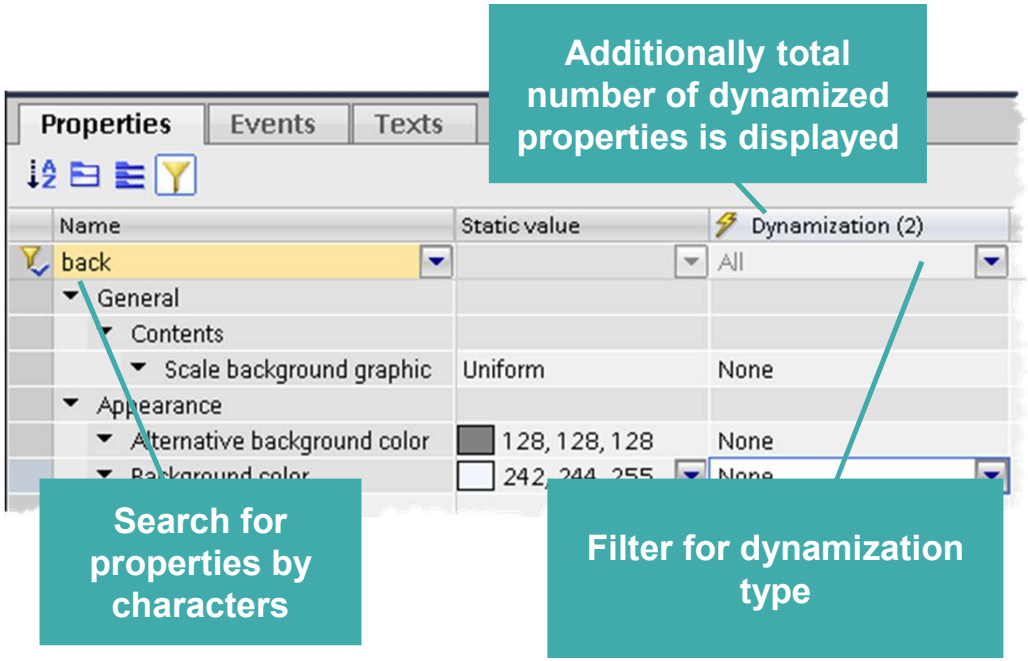
SIEMENS
Ingenuity for life



It is possible to view and to edit the properties of an object using the property list in the Inspector window.

SIMATIC WinCC Unified
Screen Engineering – Properties

SIEMENS
Ingenuity for life



The property list can be sorted as follows:

- Display of properties in alphabetical order
- Display of the properties grouped in categories
- Search Filter:
  - Search for all properties by characters
  - Overview of used dynamizations
  - Filter of different dynamizations

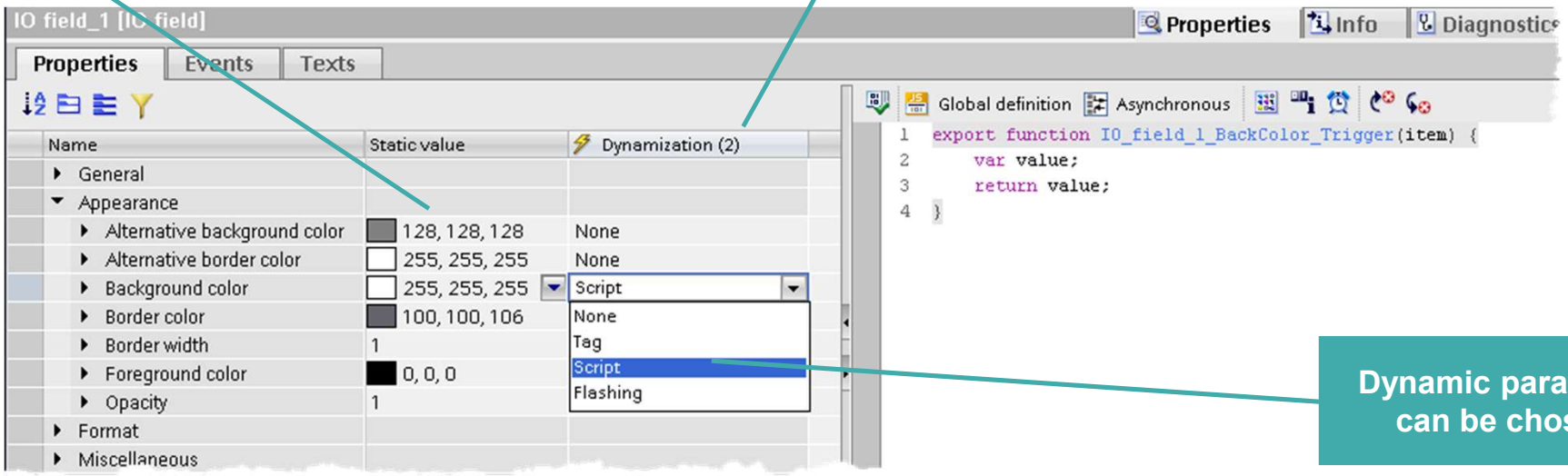
Tip: most important properties of an object can always be found in the "General" category (list needs to be sorted by category)

SIMATIC WinCC Unified
Screen Engineering – Properties

SIEMENS
Ingenuity for life

Column for static values

Column for dynamization



Dynamic parameter can be chosen

Almost all object properties can be dynamized. Tags, Scripts and depending on the property other objects (resource list for example) can be used for dynamization.

Agenda

SIEMENS
Ingenuity for life

1 Screen Engineering

2 **Basic Screen Objects**

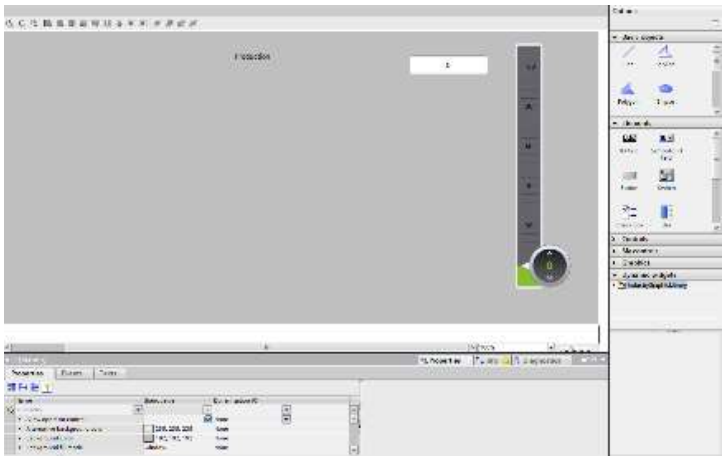
3 Dynamic SVG

4 Animations

SIMATIC WinCC Unified Alarming

SIEMENS
Ingenuity for life

LIVE DEMO

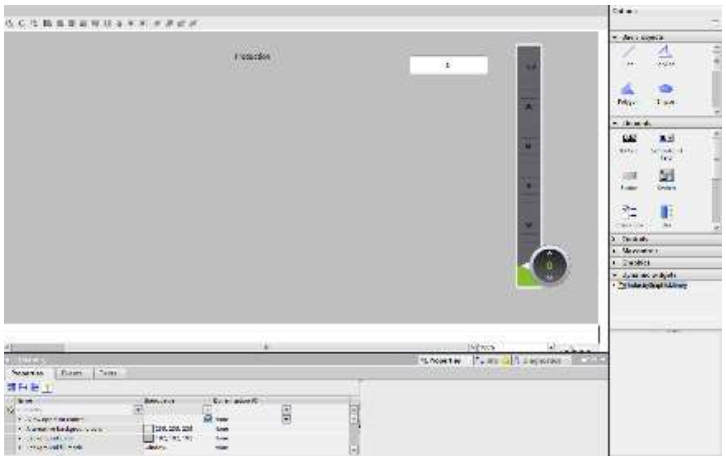


- Show HMI Toolbox and different areas
- Drag and drop objects on screen
- Configure objects
- Create tags and assign to objects

SIMATIC WinCC Unified
Hands On: Properties

SIEMENS
Ingenuity for life

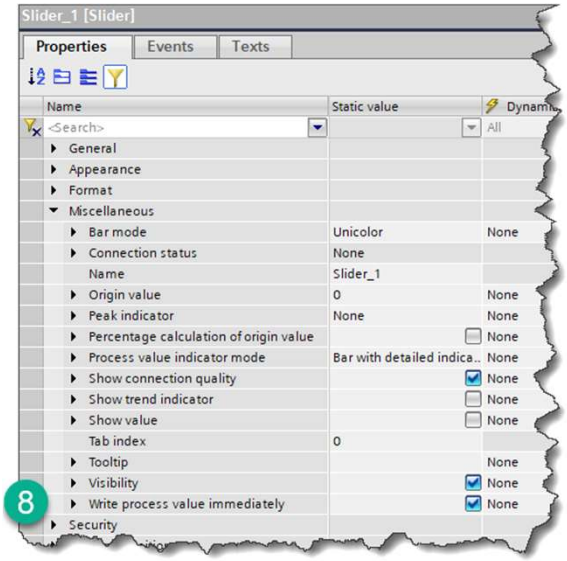
HANDS ON in 10 min

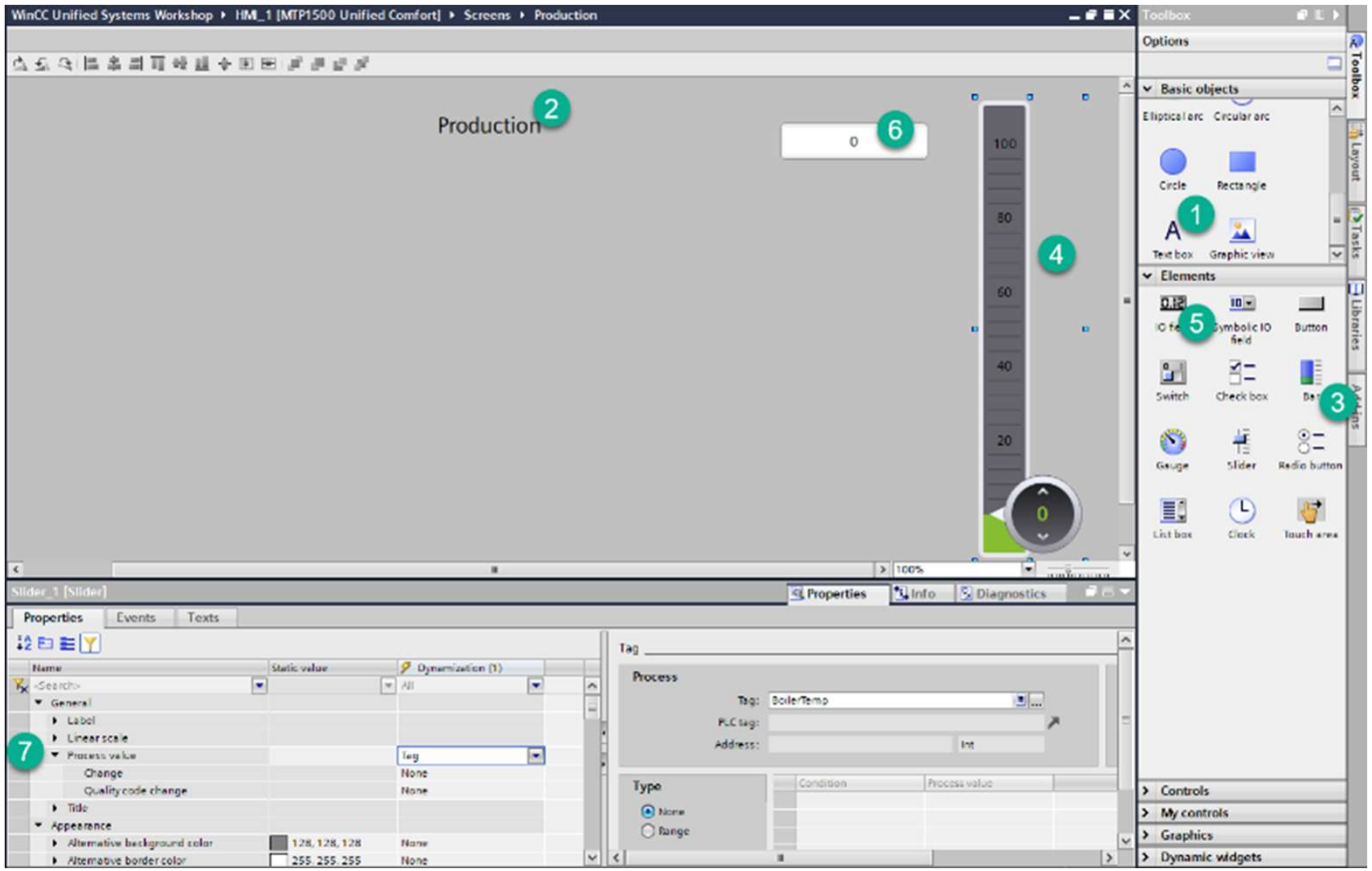


1. Create Production Screen (1366*578)
2. On Production Screen insert
    1. Slider
    2. I/O field
3. Set lower and upper limits of slider to 0, 100
4. Create Tag (BoilerTemp - internal tag)and attach to both Slider and IO field
5. Save and test

SIMATIC WinCC Unified
Hands On: Properties

SIEMENS
Ingenuity for life

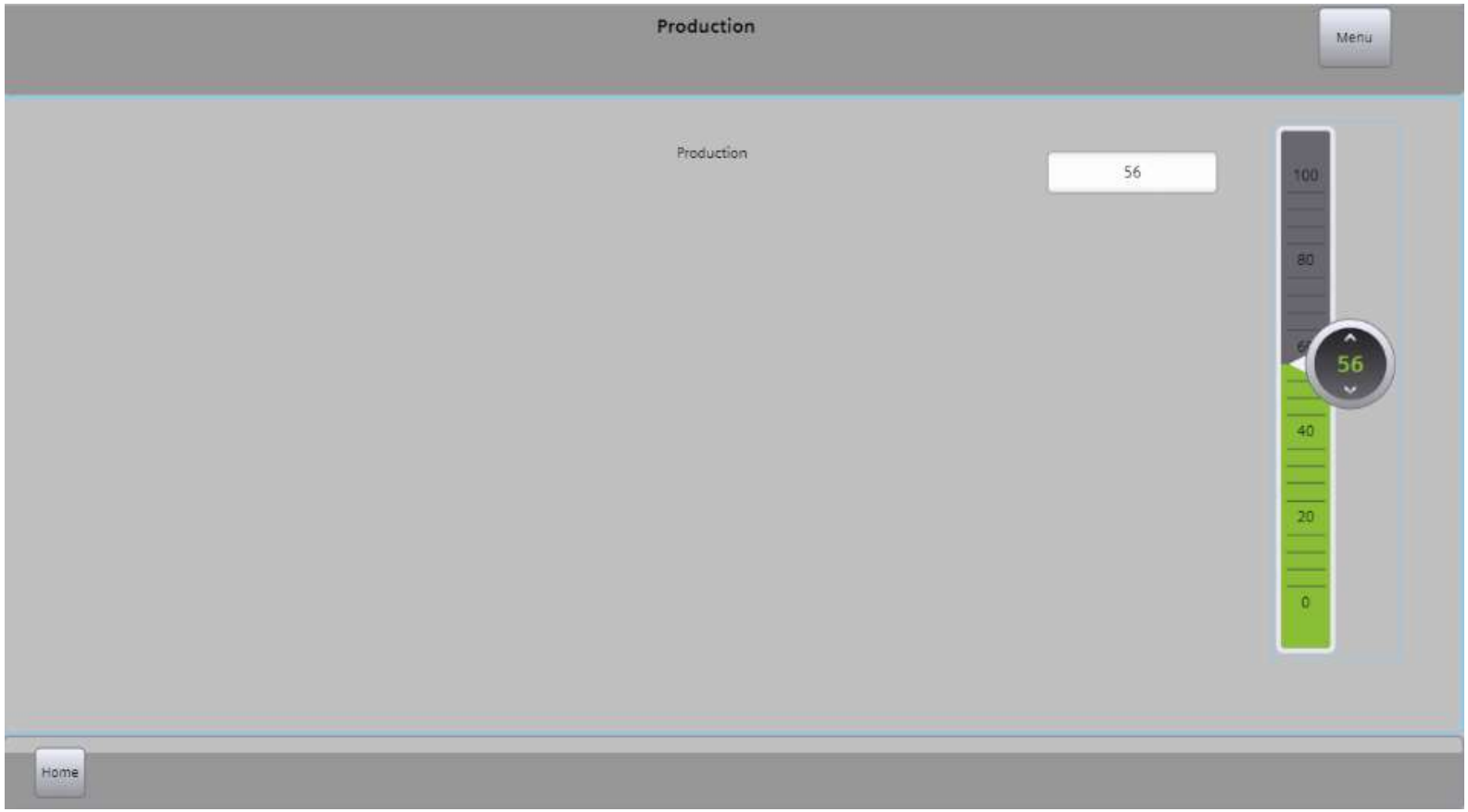




Note: Select Write process value immediately

SIMATIC WinCC Unified
Hands On: Properties

SIEMENS
Ingenuity for life



Agenda

SIEMENS
Ingenuity for life

1 Screen Engineering

2 Basic Screen Objects

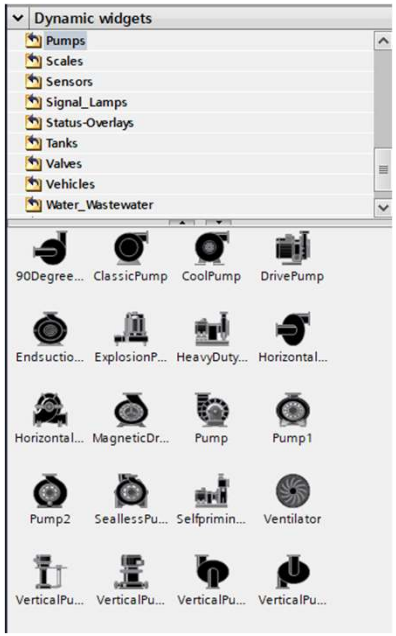
3 **Dynamic SVG**

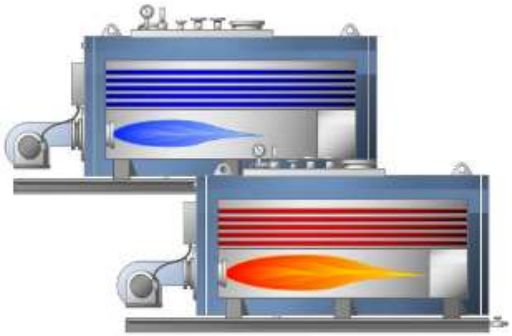
4 Animations

SIMATIC WinCC Unified
Scalable Vector Graphic (SVG)

SIEMENS
Ingenuity for life

Unified Comfort Panel ✓ PC ✓





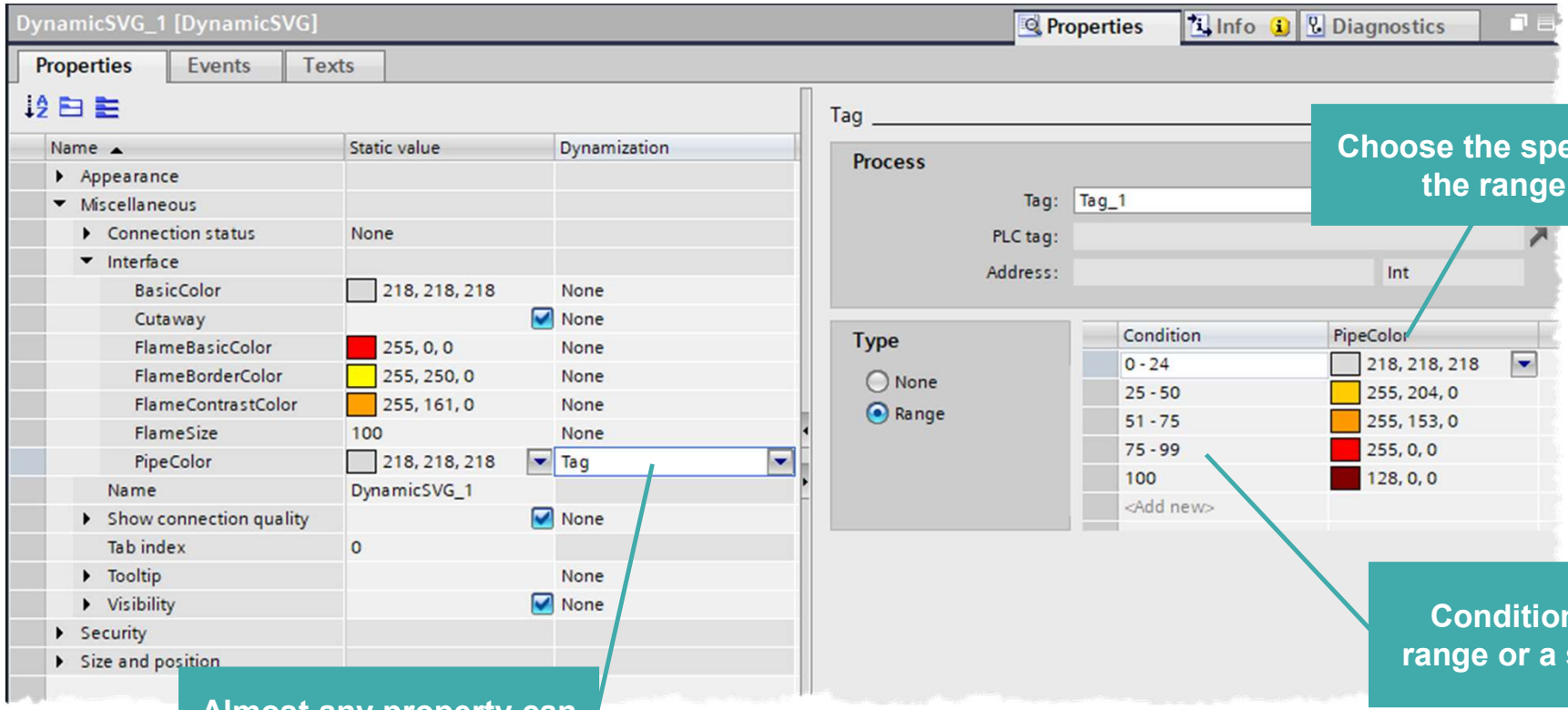
Scalable Vector Graphics (SVG)
for all resolutions without loss of quality

- **Animate (dynamic) SVG files**
  according to the process state

- **Ready to use industry library**
  with static and dynamic SVGs

SIMATIC WinCC Unified
Dynamizations

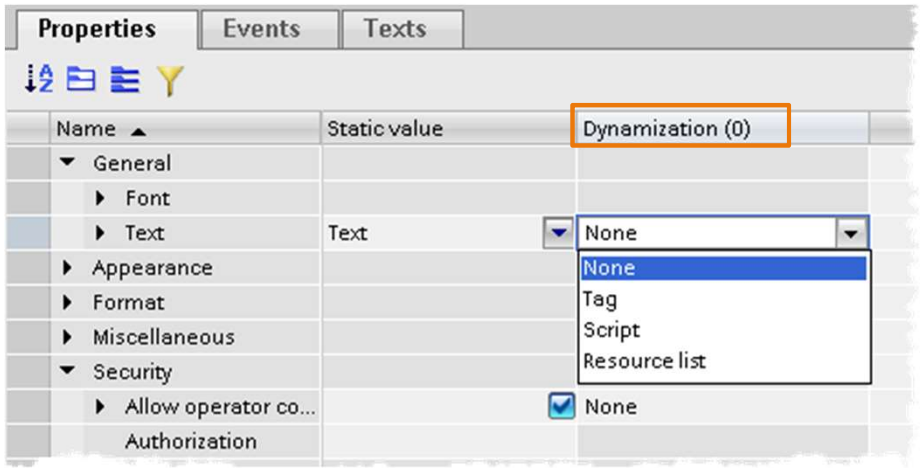
SIEMENS
Ingenuity for life



SIMATIC WinCC Unified
Dynamization

SIEMENS
Ingenuity for life

Dynamization types depend on the selected object



Dynamization types:

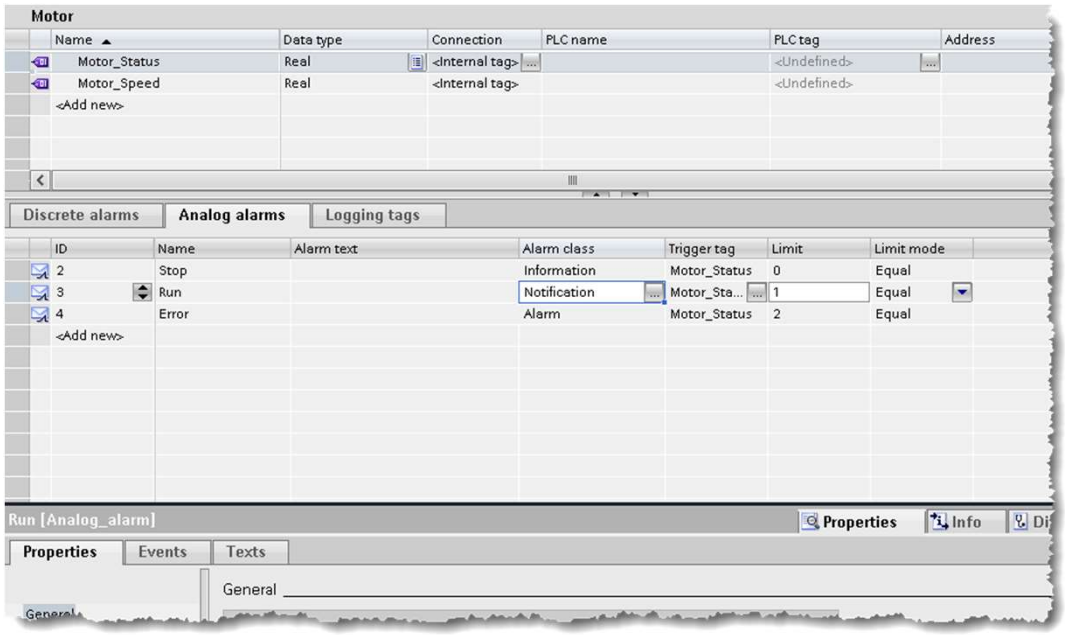
- Tag – Defines the property value depending on the tag value
- Script – Defines the property value depending on the return value
- Resource list – Defines the property value depending on an entry from a text/graphic list
- Flashing – Defines that the property flashes in configurable colors

Dynamics are used to change the properties of screen objects and screens in runtime depending on another value.

SIMATIC WinCC Unified Alarming

SIEMENS
Ingenuity for life

L I V E D E M O

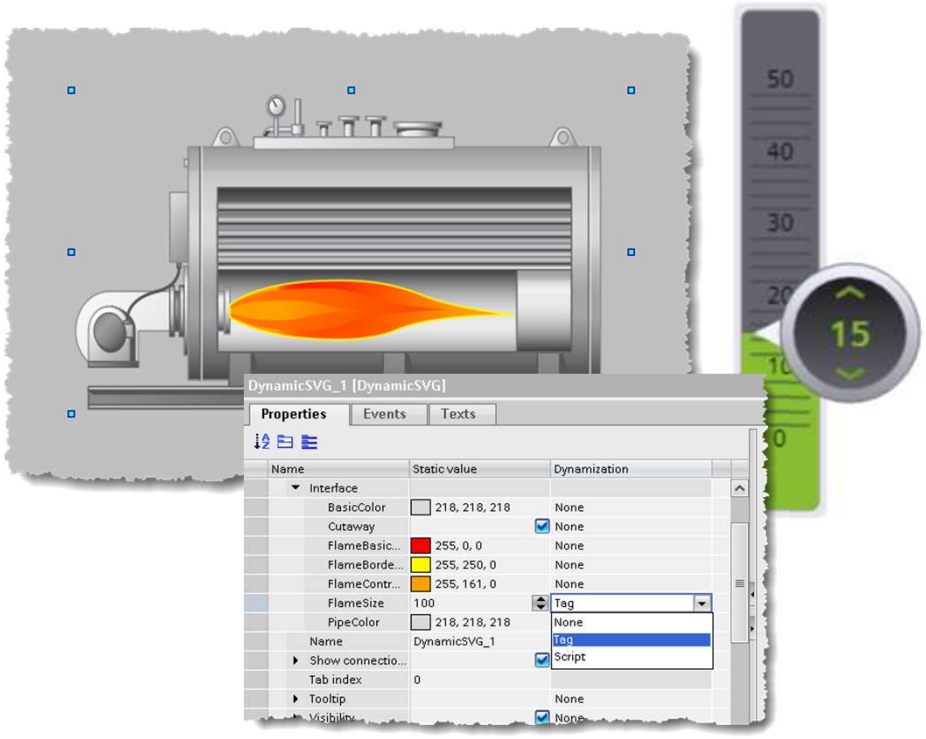


- Add SVG Graphics
- Edit Graphics Properties
- Assign to tags to visualize changes
- Simulate

SIMATIC WinCC Unified
Hands On: SVG‘s

SIEMENS
Ingenuity for life

HANDS ON in 20 min



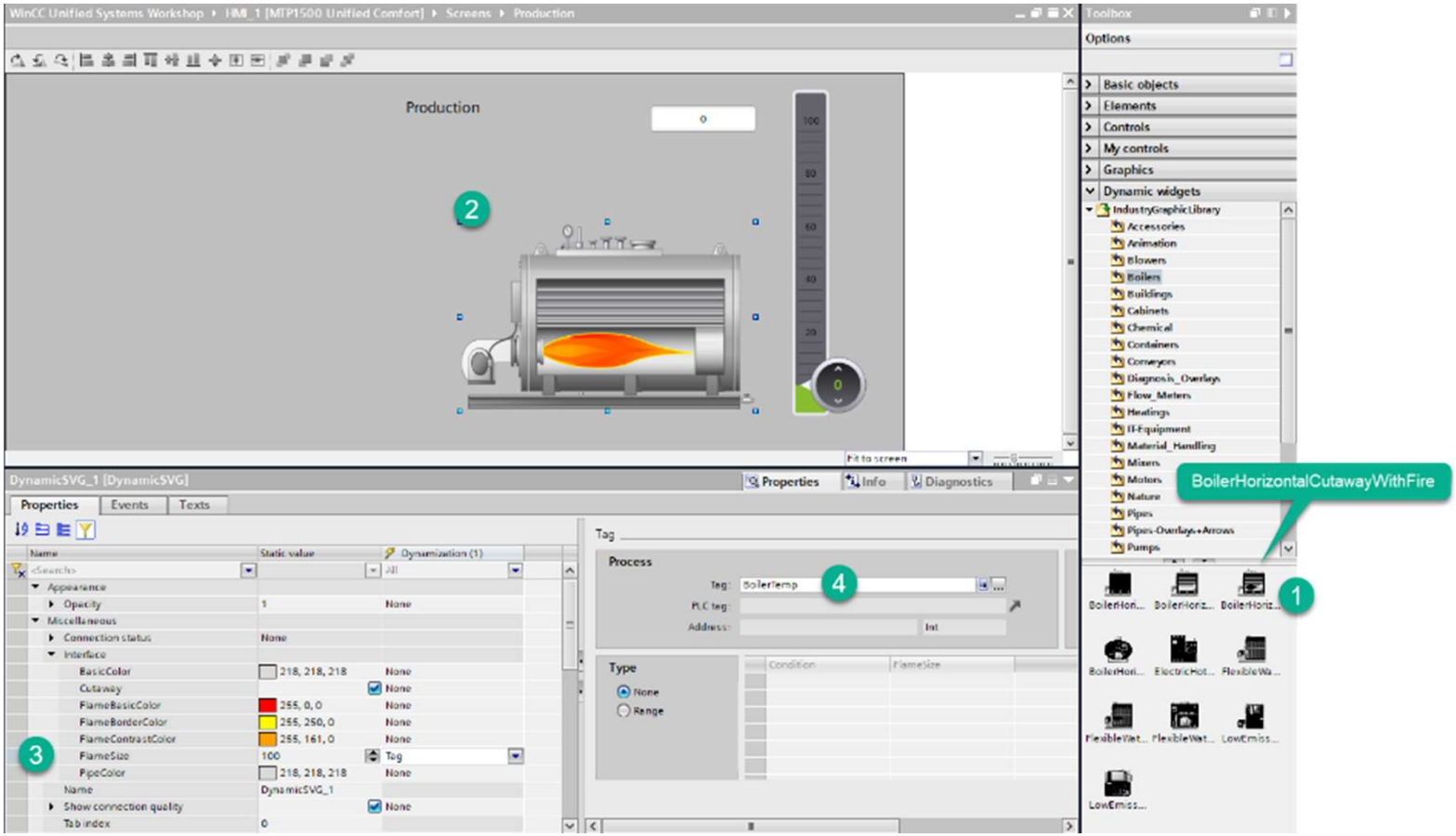
1. Add the SVG Boiler with flame to a screen

   “BoilerHorizontalCutawaywithFire”
2. Open the interface in the properties of the SVG
3. Connect the Slider Tag to the flame size of the boiler
4. Download the Runtime
5. Change the size of the flame during the Runtime

Additional: Try also some other SVG’s to see the differences in the interface!

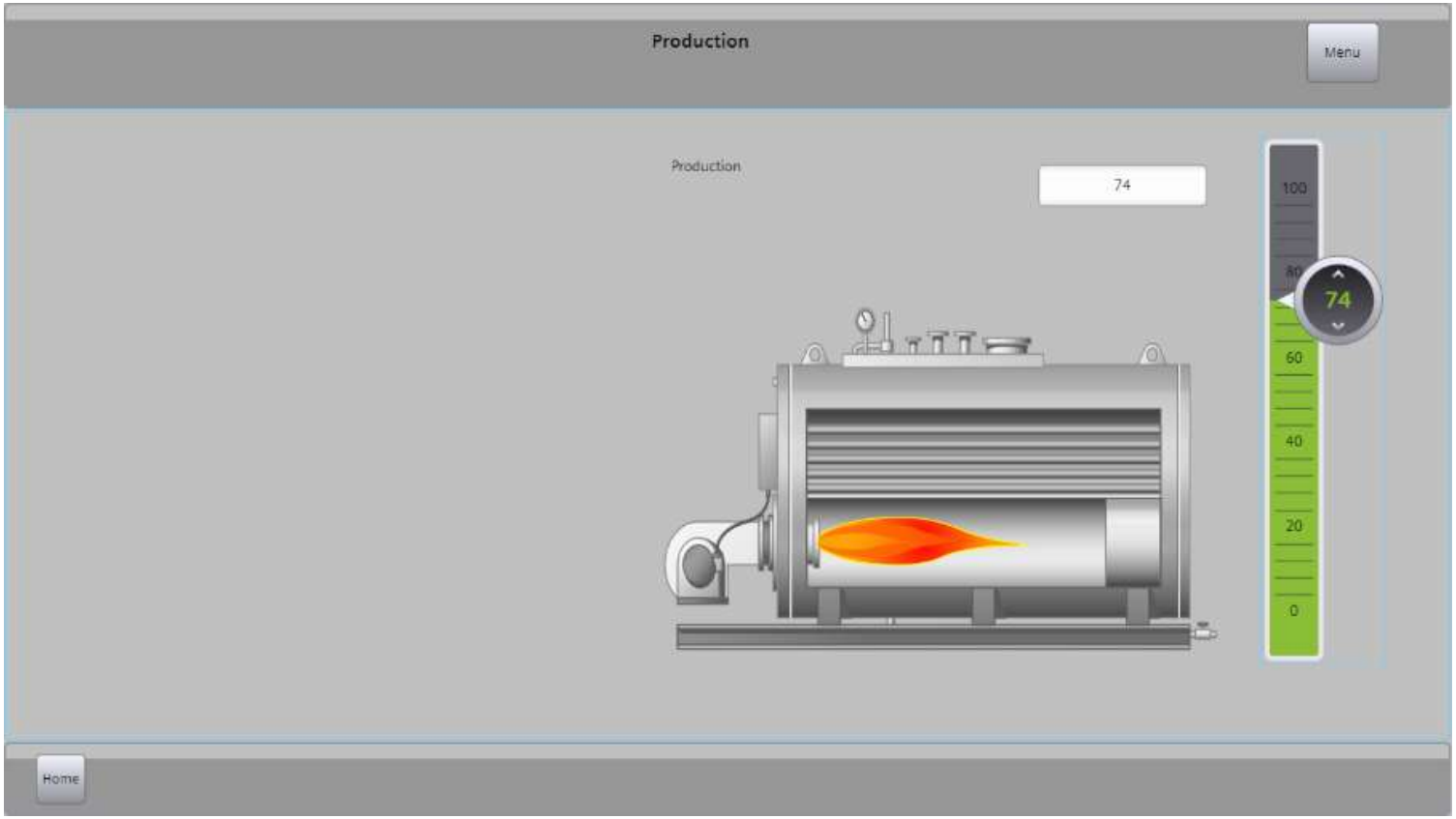
SIMATIC WinCC Unified
Hands On: SVG‘s

SIEMENS
Ingenuity for life



SIMATIC WinCC Unified
Hands On: SVG‘s

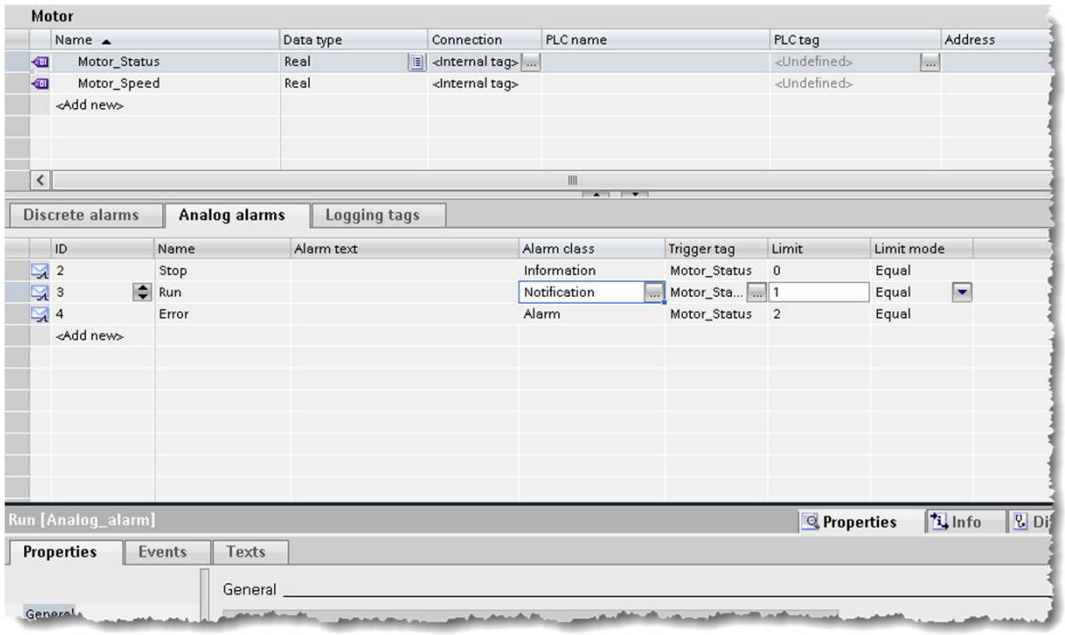
SIEMENS
Ingenuity for life



SIMATIC WinCC Unified Alarming

SIEMENS
Ingenuity for life

LIVE DEMO

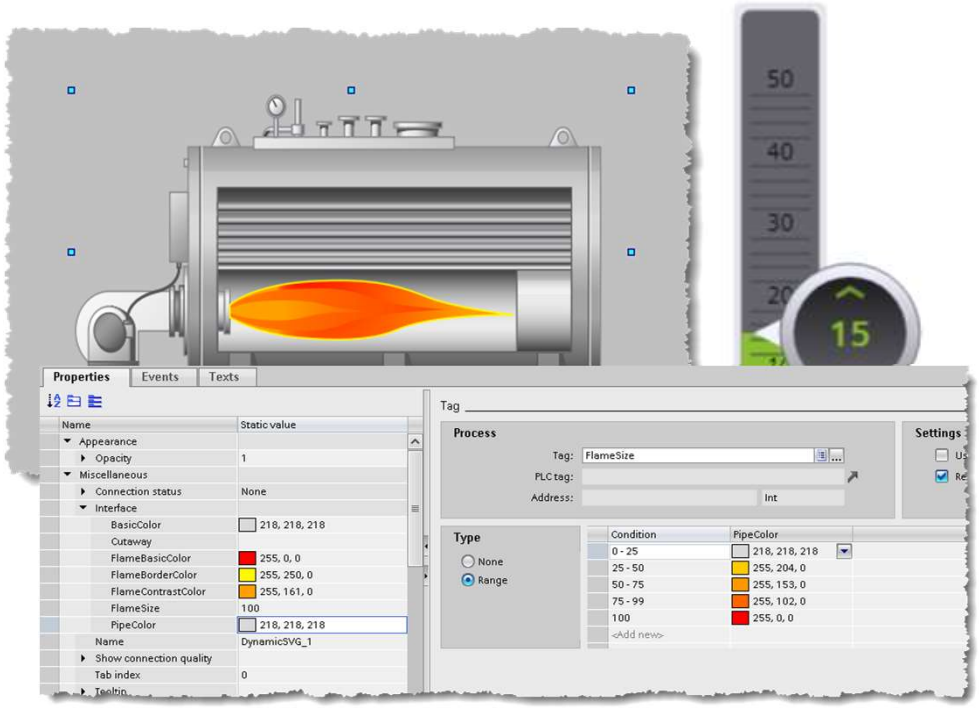


- Edit SVG Properties (more)
- Flame size
- Simulate

SIMATIC WinCC Unified
Hands On: SVG‘s

SIEMENS
Ingenuity for life

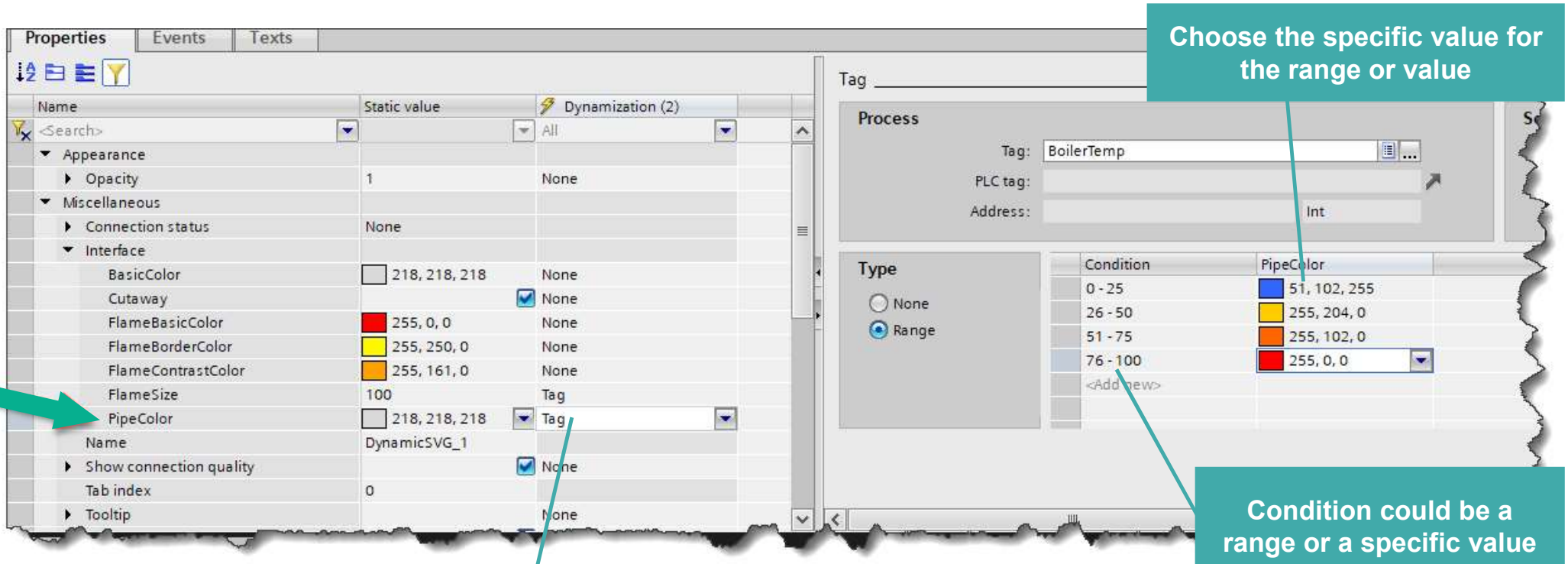
ADDITIONAL HANDS ON in 15 min



1. Add the same tag you added to the flame size also to pipe color
2. Activate dynamization type “Range”
3. Create different colors depending on the value
4. Do this with ranges or static values
5. Download the Runtime and test
6. Change pipe color during the Runtime

SIMATIC WinCC Unified
Hands On: SVG's

SIEMENS
Ingenuity for life



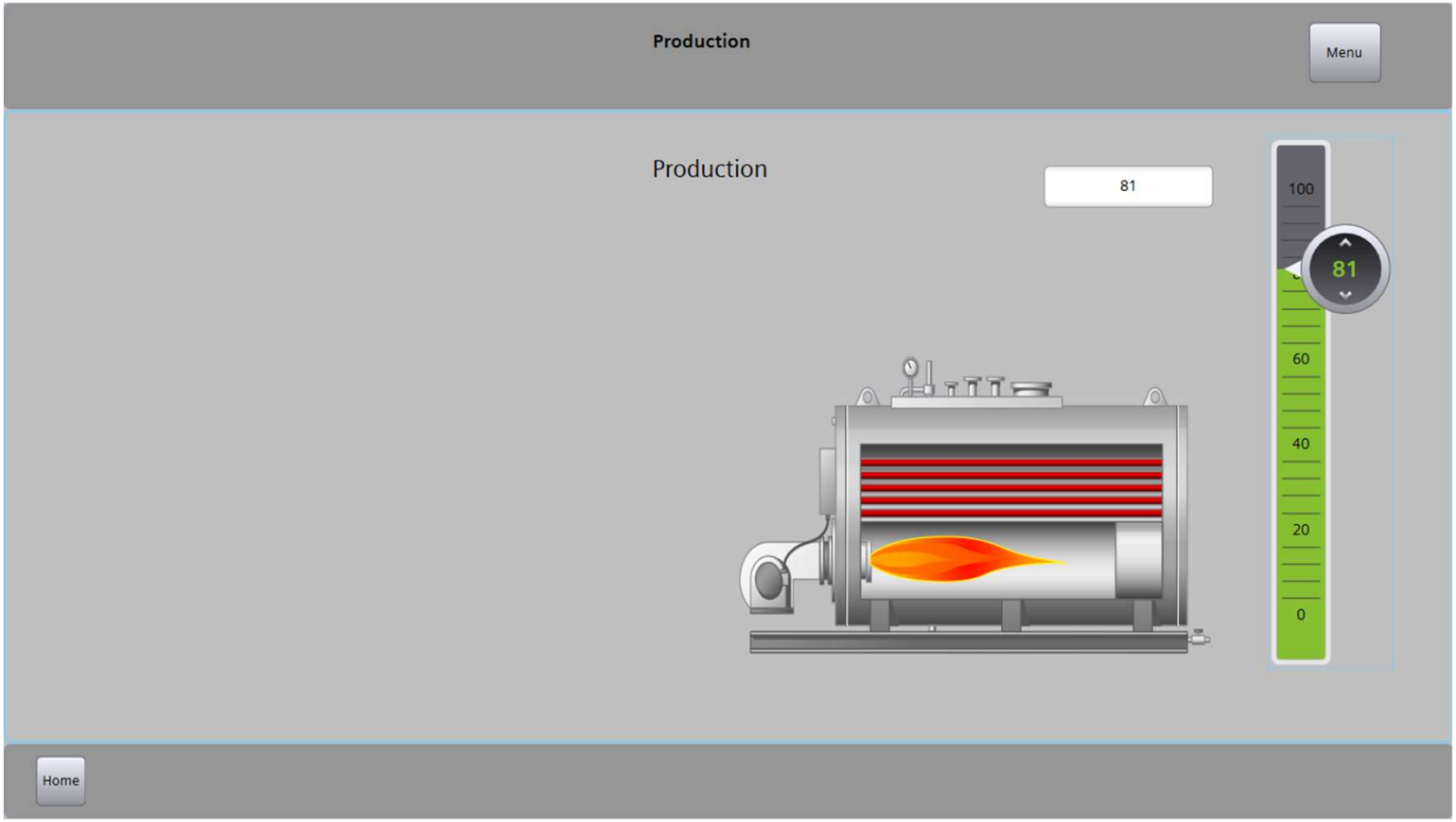
Choose the specific value for the range or value

Condition could be a range or a specific value

Almost any property can be dynamized

SIMATIC WinCC Unified
Hands On: SVG's

SIEMENS
Ingenuity for life



Agenda

SIEMENS
Ingenuity for life

1 Screen Engineering

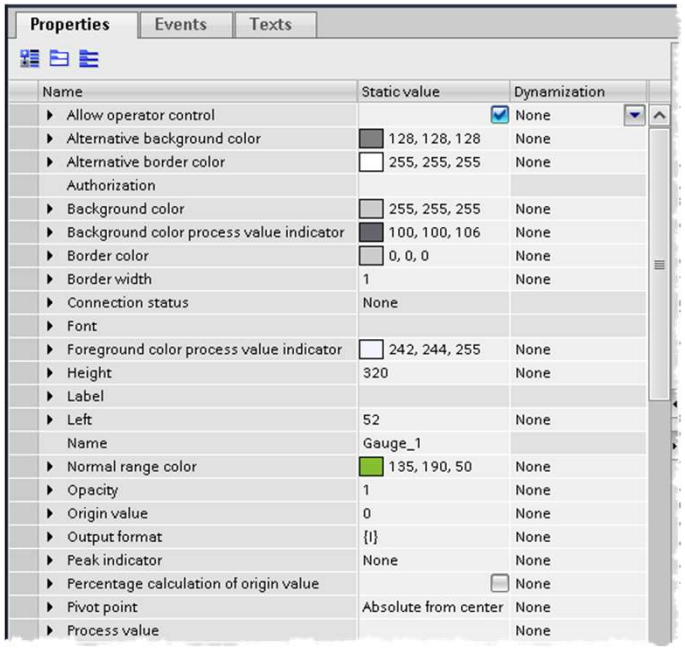
2 Basic Screen Objects

3 Dynamic SVG

4 **Animations**

SIMATIC WinCC Unified
Screen Engineering – Properties

SIEMENS
Ingenuity for life

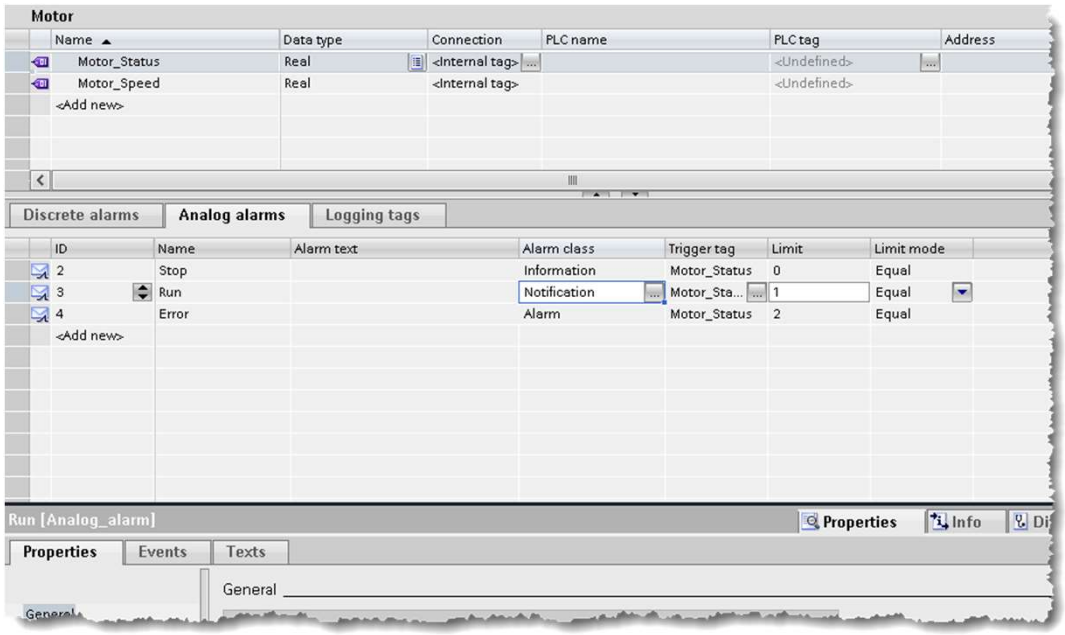


It is possible to view and to edit the properties of an object using the property list in the Inspector window.

SIMATIC WinCC Unified Alarming

SIEMENS
Ingenuity for life

LIVE DEMO

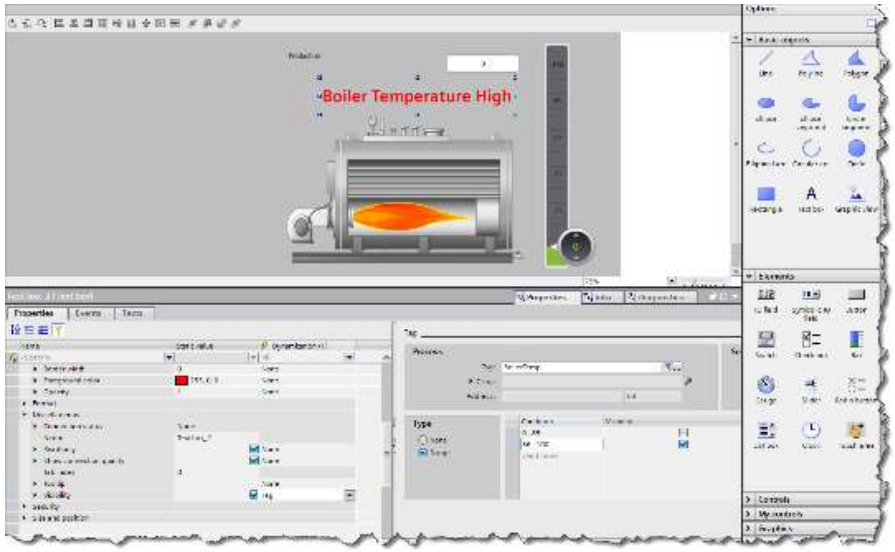


- Add test field
- Animate field
- Simulate

SIMATIC WinCC Unified
Hands On: Animations

SIEMENS
Ingenuity for life

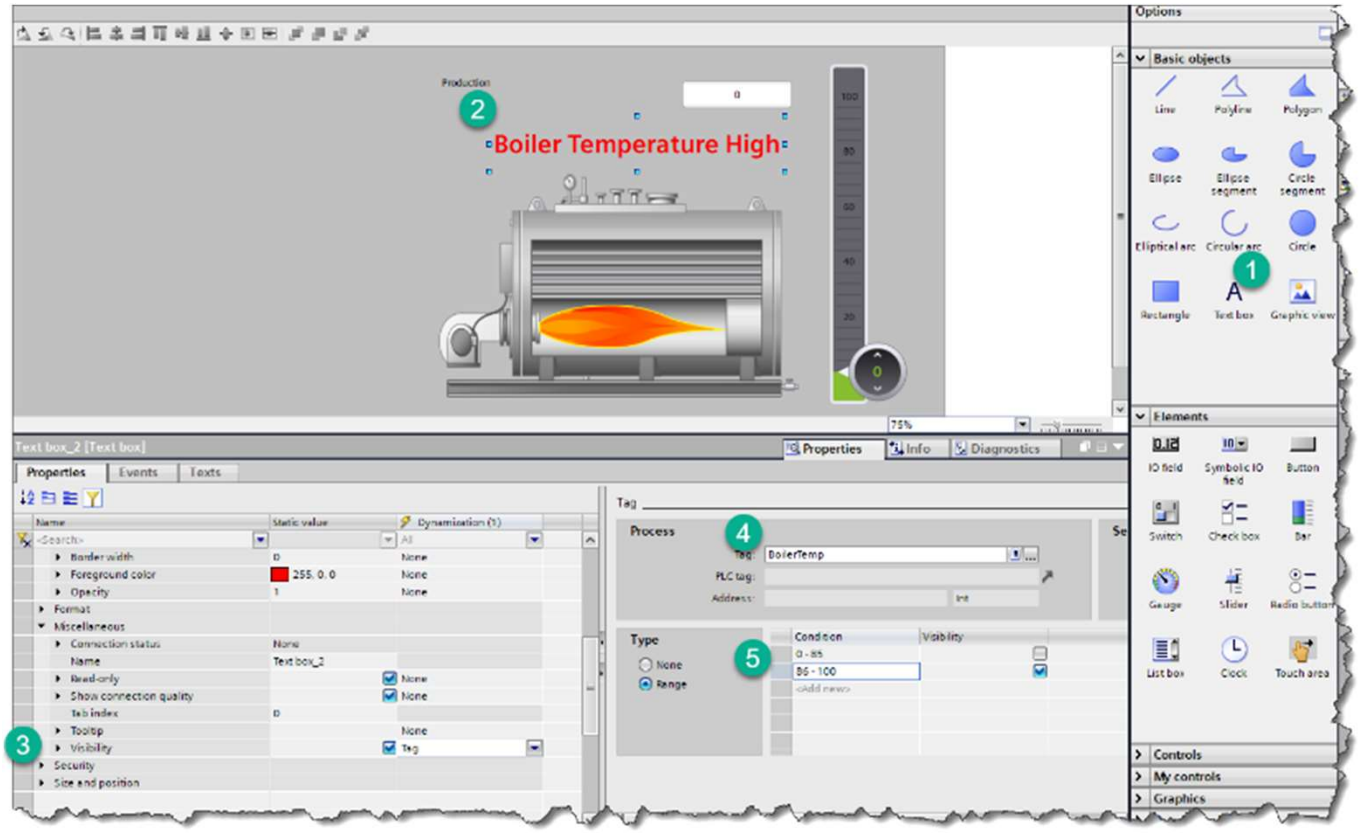
HANDS ON in 15 min



1. Add a Text Field
2. Adjust font and color
3. Set text field only to show based on tag value
4. Download the Runtime
5. Test

SIMATIC WinCC Unified
Hands On: Animations

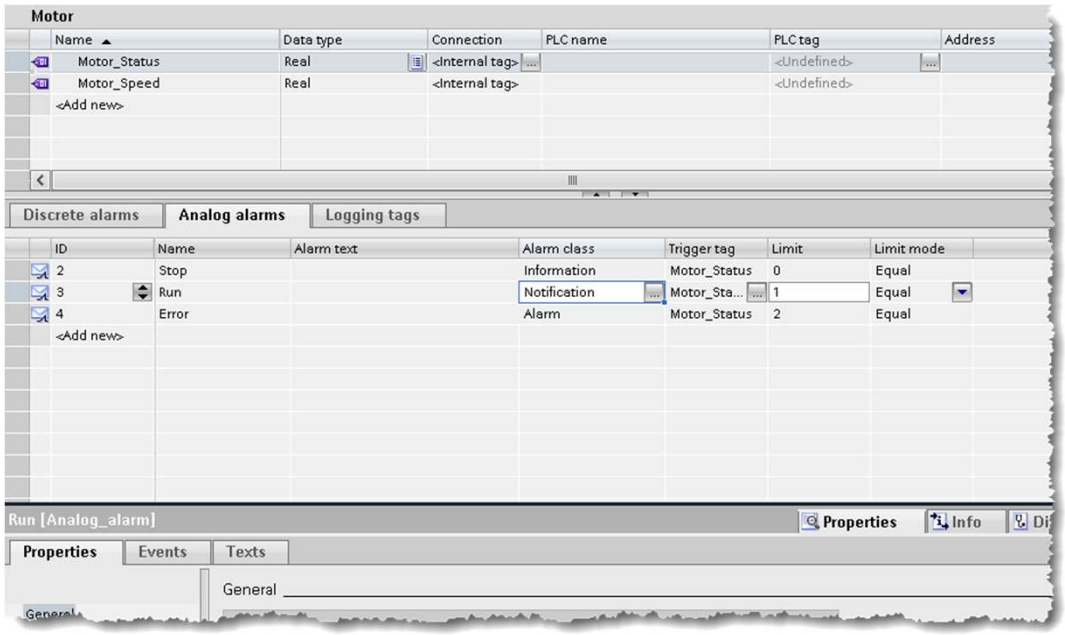
SIEMENS
Ingenuity for life



SIMATIC WinCC Unified Alarming

SIEMENS
Ingenuity for life

LIVE DEMO

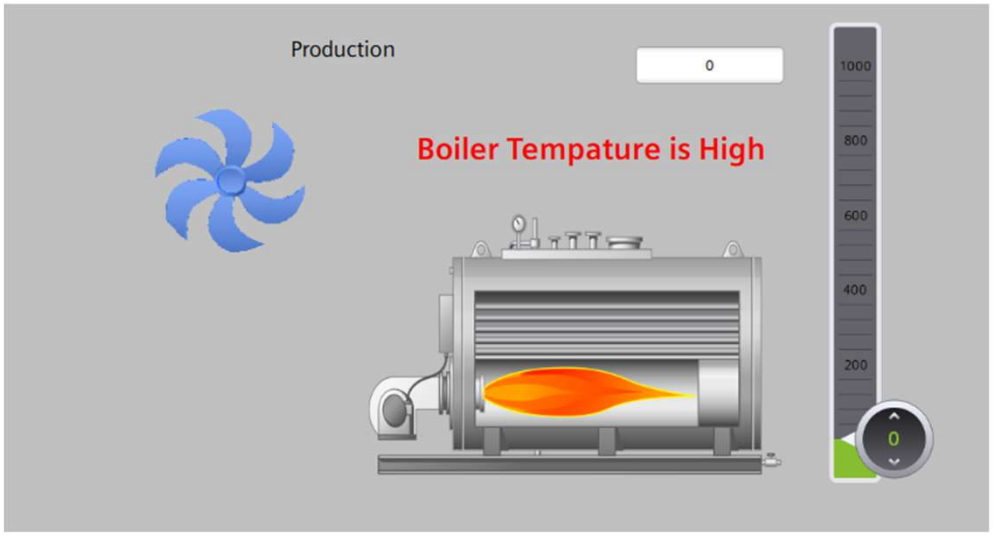


- Add graphic
- Show rotation animation
- Simulate

SIMATIC WinCC Unified
Hands On: Rotation

SIEMENS
Ingenuity for life

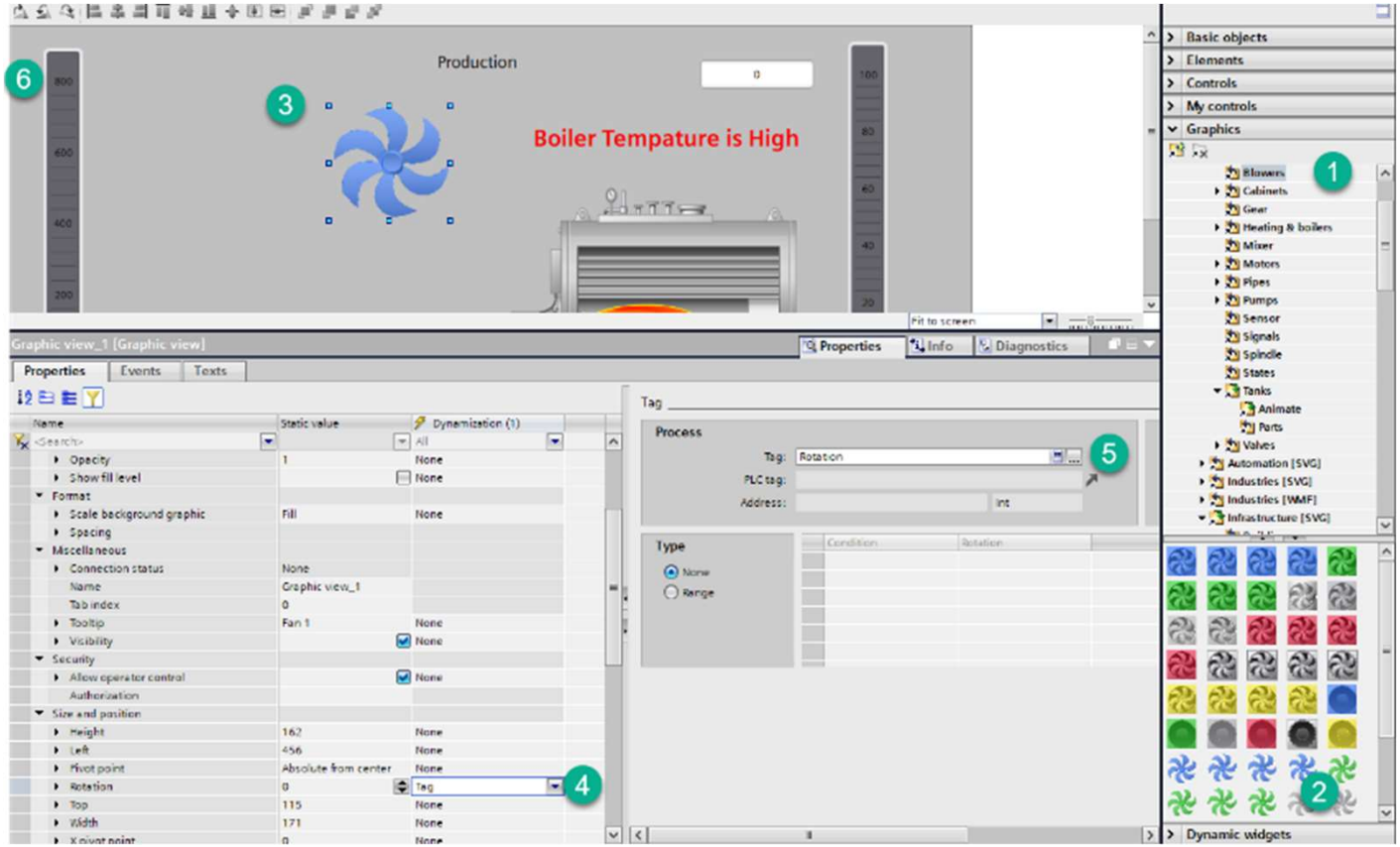
HANDS ON in 15 min



1. Add some basic objects on a screen
2. Create a tag for the rotation and connect it to a slider control
3. Use the tag to configure the rotation of objects
4. Download the runtime
5. Rotate the objects

SIMATIC WinCC Unified
Hands On: Properties

SIEMENS
Ingenuity for life



SIMATIC WinCC Unified
Hands On: Properties

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Ingenuity for life

WinCC Unified Alarming

www.usa.siemens.com/wincc-unified

Agenda

SIEMENS
Ingenuity for life

1 **General Information**

2 TIA Settings

3 Alarm Classes

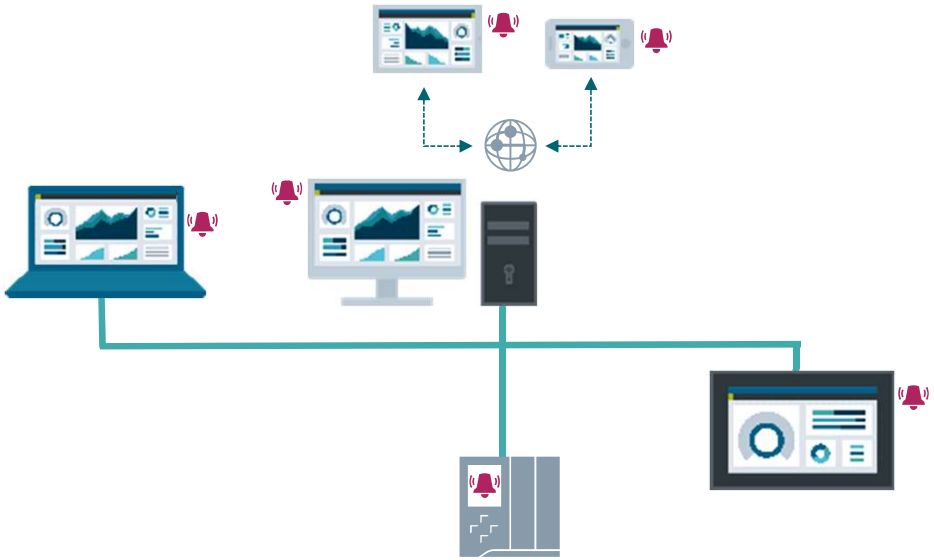
4 Alarm Logging

5 Alarm Control settings

SIMATIC WinCC Unified Alarming

SIEMENS
Ingenuity for life

Unified Comfort Panel ✓ PC ✓



Immediate notification of process states, warnings or critical alarms for quick reactions and shorter downtimes.

Maximum process transparency due to a **configurable alarm system** based on IEC 62682

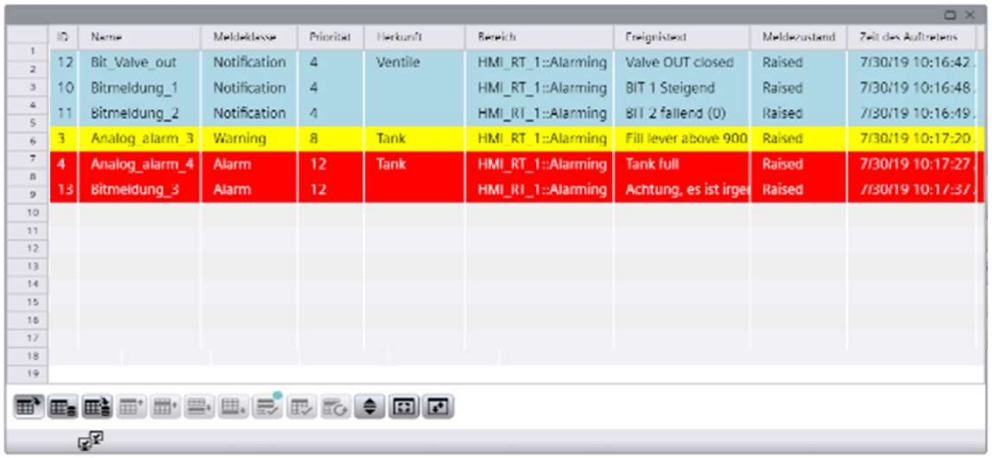
Availability of **S7-1500 PLC- and HMI alarms**

Alarm control for efficient handling e.g., filter, sort, acknowledge, manually or via scripting

SIMATIC WinCC Unified Alarm Control

SIEMENS
Ingenuity for life

Unified Comfort Panel ✓ **PC** ✓



Know what's happening at your facility depending on your personal demand (operator, supervisor, maintenance, …). Multilingual alarm view to support commissioning phase and international operators.

Free configurable alarm view
e.g., column order, toolbar buttons

Select alarms according to production unit or user demand e.g., plant unit in technological hierarchy, maintenance

Alarm control user interface for e.g., select time-range, sort, filter, print, hide and lock, acknowledgement

Agenda

SIEMENS
Ingenuity for life

1 General Information

2 **TIA Settings**

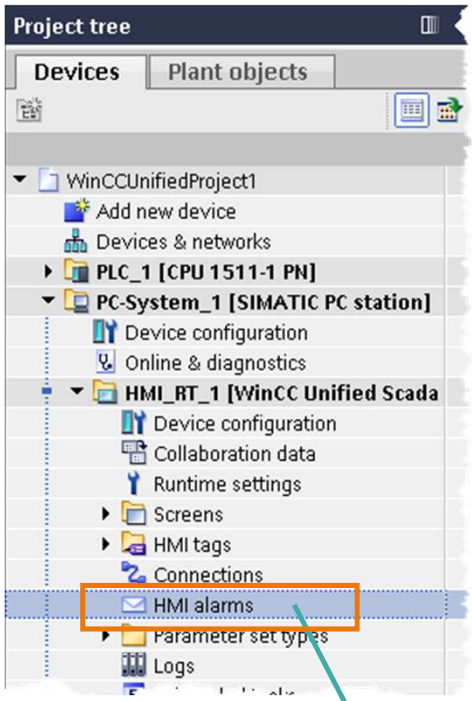
3 Alarm Classes

4 Alarm Logging

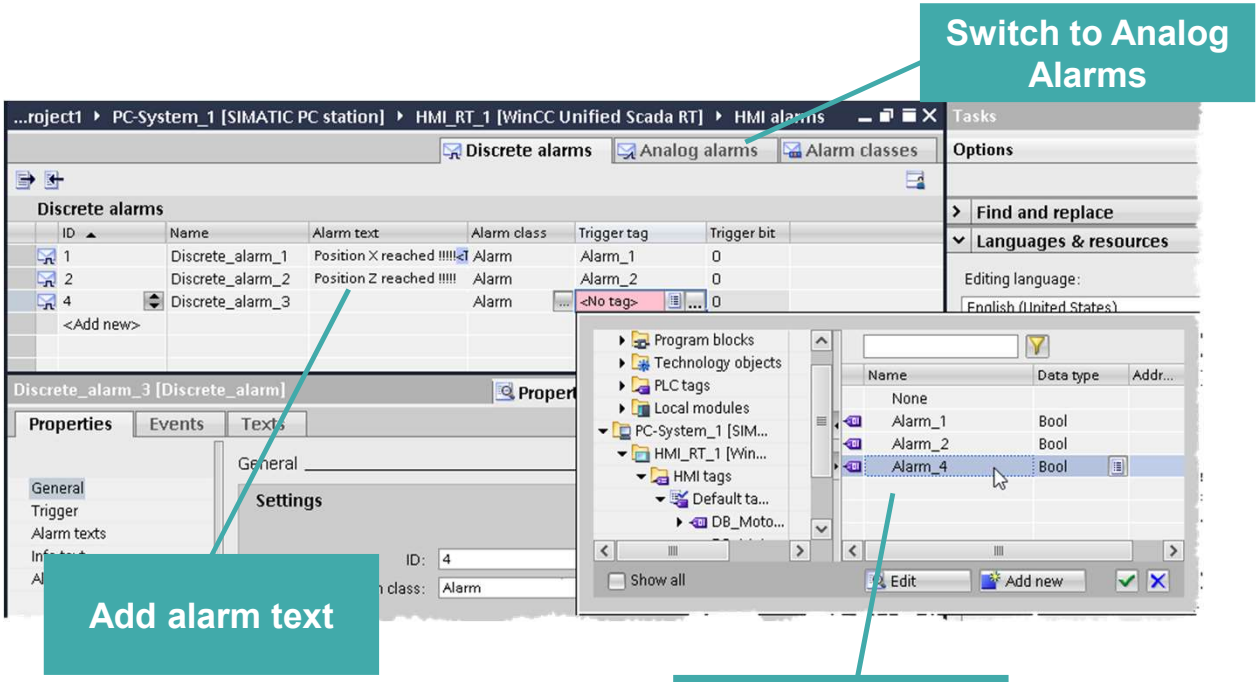
5 Alarm Control settings

SIMATIC WinCC Unified HMI Alarms

SIEMENS
Ingenuity for life



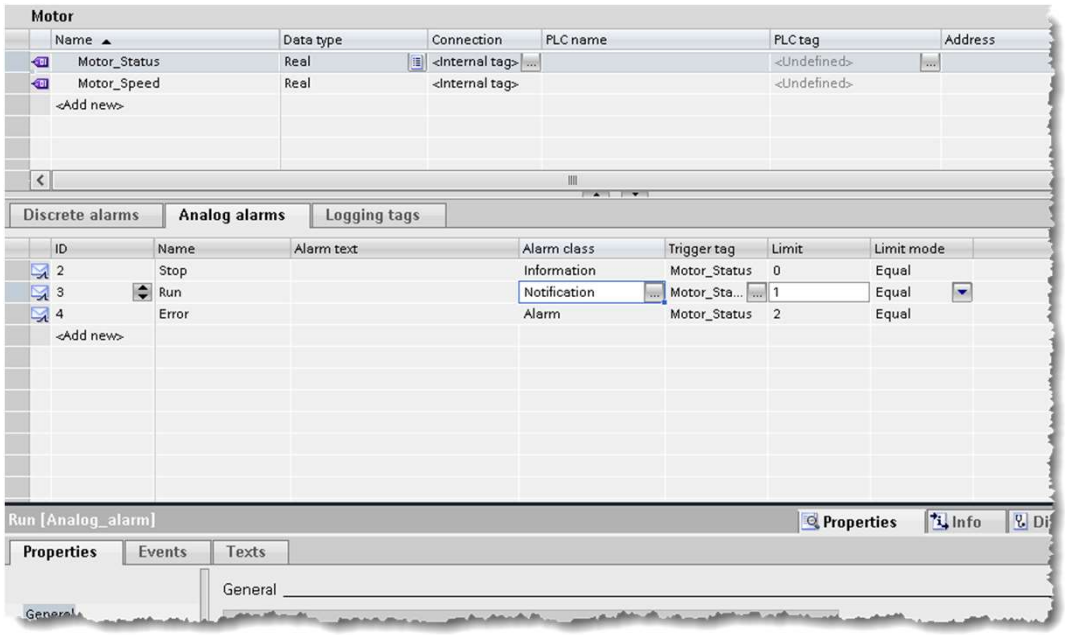
Location in the project tree



SIMATIC WinCC Unified Alarming

SIEMENS
Ingenuity for life

L I V E D E M O

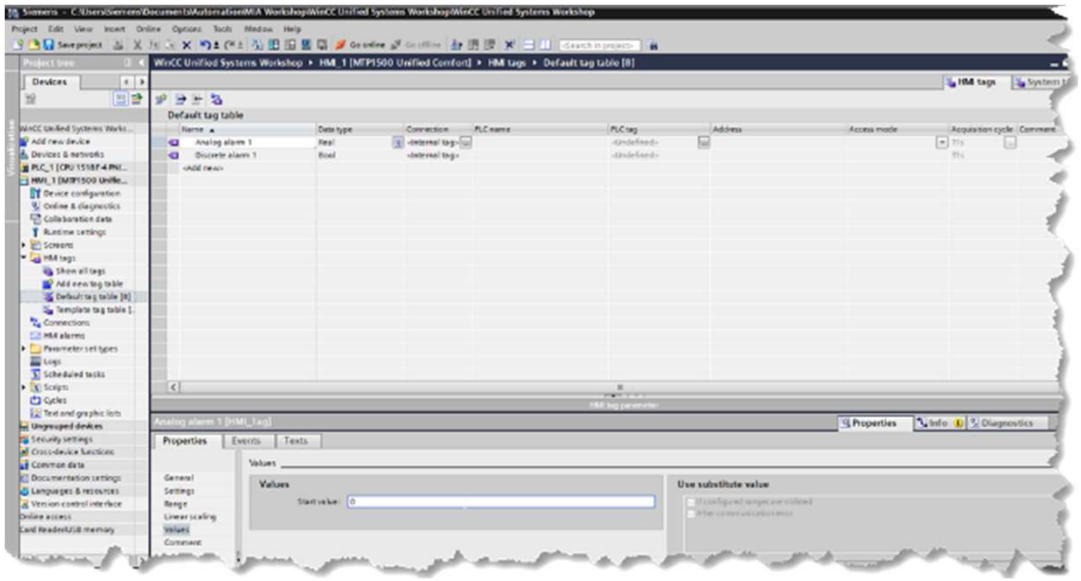


- Configure the TIA settings
- Create and trigger discrete and analog alarms

SIMATIC WinCC Unified
Hands On: Analog and Discrete Alarms

SIEMENS
Ingenuity for life

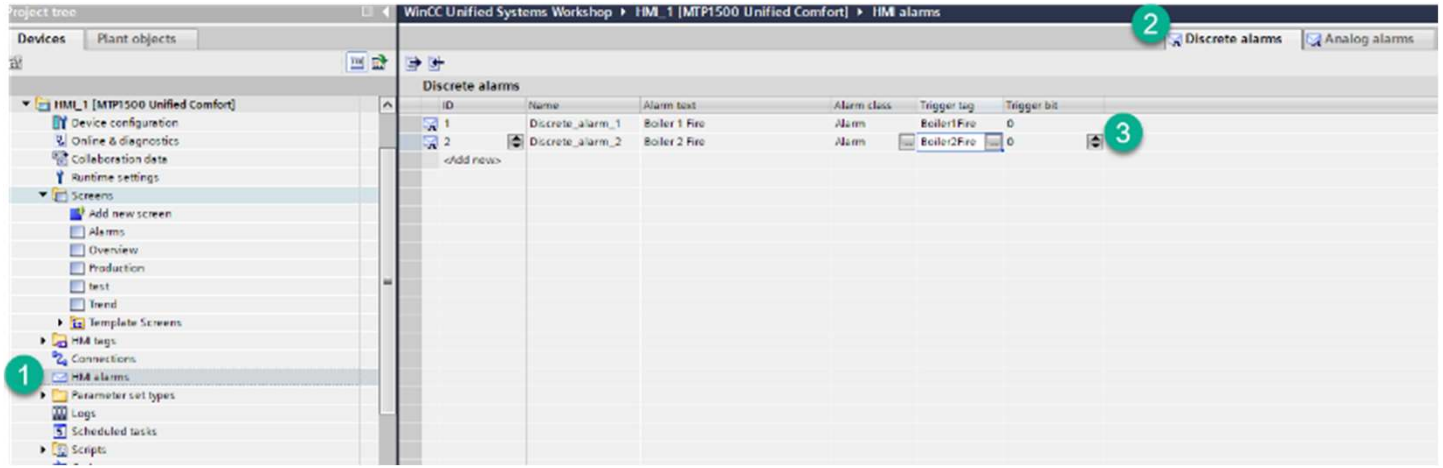
HANDS ON in 15 min

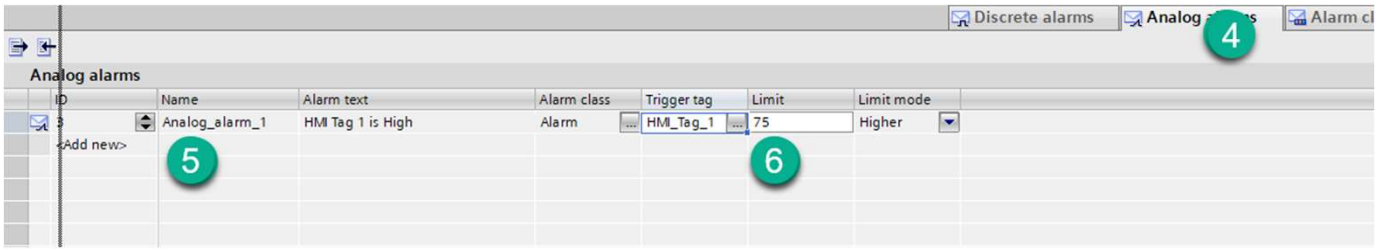


1. Configure an analog and discrete alarm tag
2. Place a switch or an I/O field on the screen and connect it to the variable to force them
3. Add an alarm Control to a screen
4. Download the Runtime
5. Trigger the alarm

SIMATIC WinCC Unified Alarms

SIEMENS
Ingenuity for life

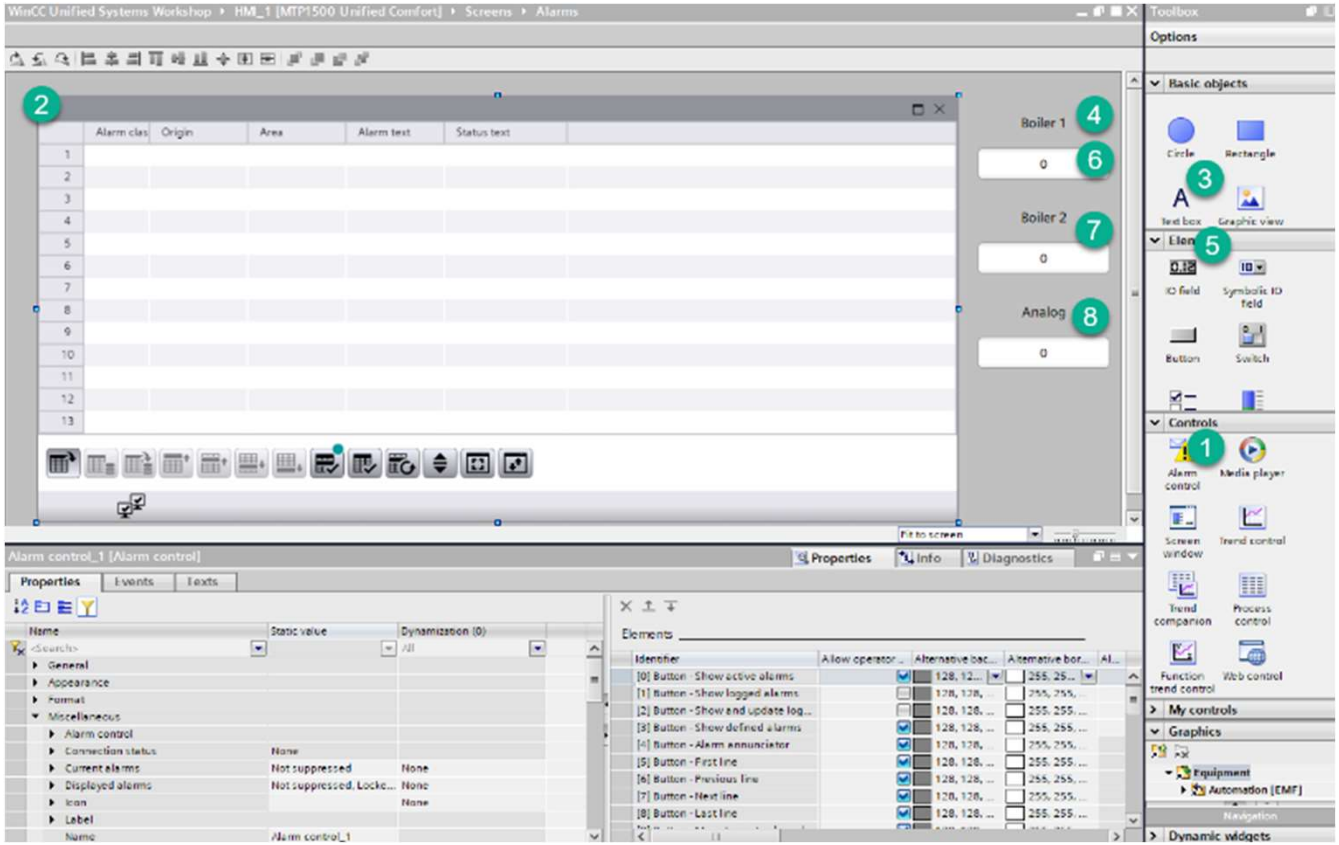




1. Open HMI Alarms
2. Select Discrete alarms
3. Create 2 alarms and associated tags
   - 1 tag as bit
   - 1 tag as byte
4. Open Analog alarms
5. Create one alarm using tag HMI_Tag_1
6. Set an upper limit

SIMATIC WinCC Unified
Alarms

SIEMENS
Ingenuity for life



1. Select Alarm Control
2. Drag to Screen and size

3.-8.

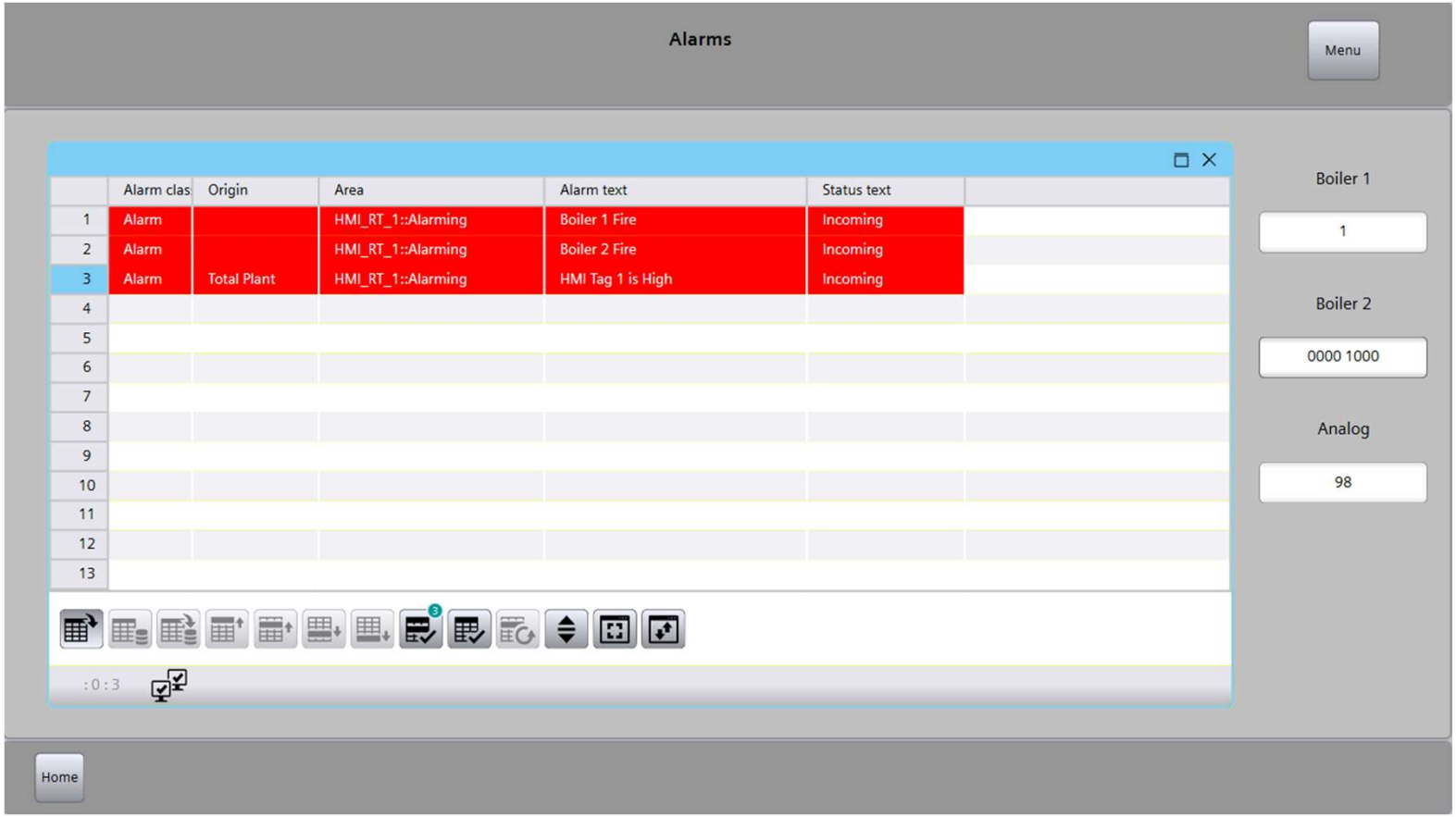
Add IO and \Text fields to simulate alarm tags

Assign same tags that you created in the alarms

Download and Test

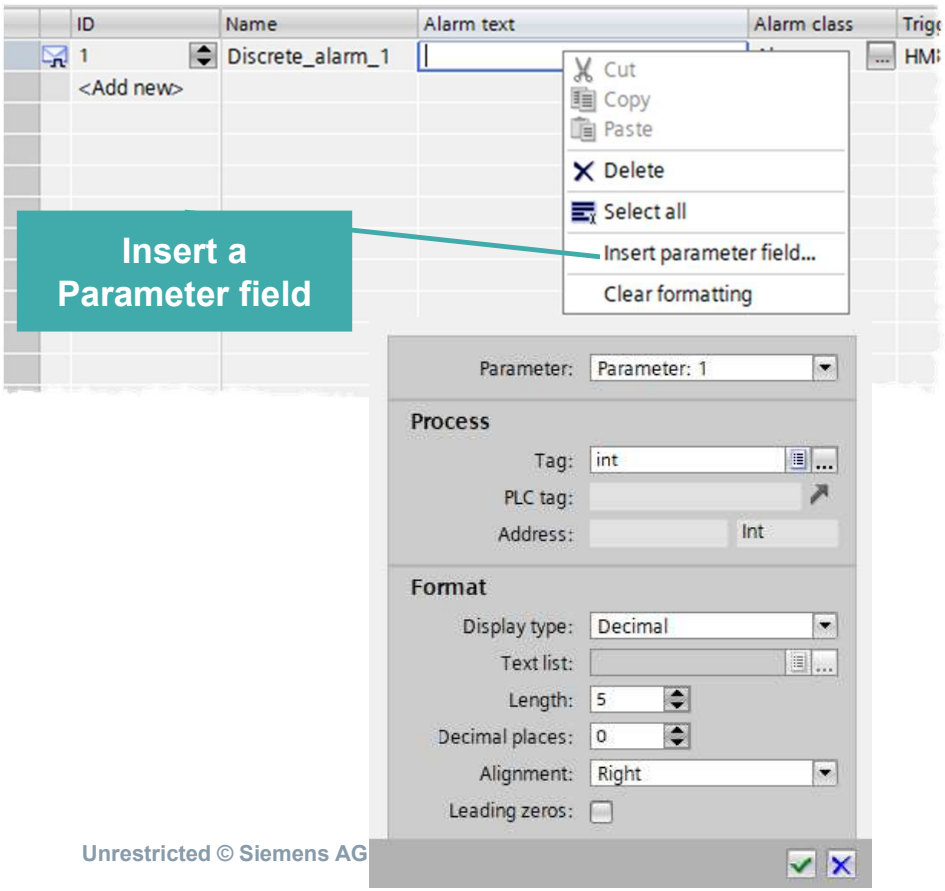
SIMATIC WinCC Unified
Alarms

SIEMENS
Ingenuity for life



SIMATIC WinCC Unified AlarmTexts

SIEMENS
Ingenuity for life



- For an alarm text up to ten parameters can be defied and included in the text
- If required, output fields for displaying alarm parameters in each alarm text can be inserted.
- Each alarm text contains up to 512 characters.

SIMATIC WinCC Unified
Alarm parameter

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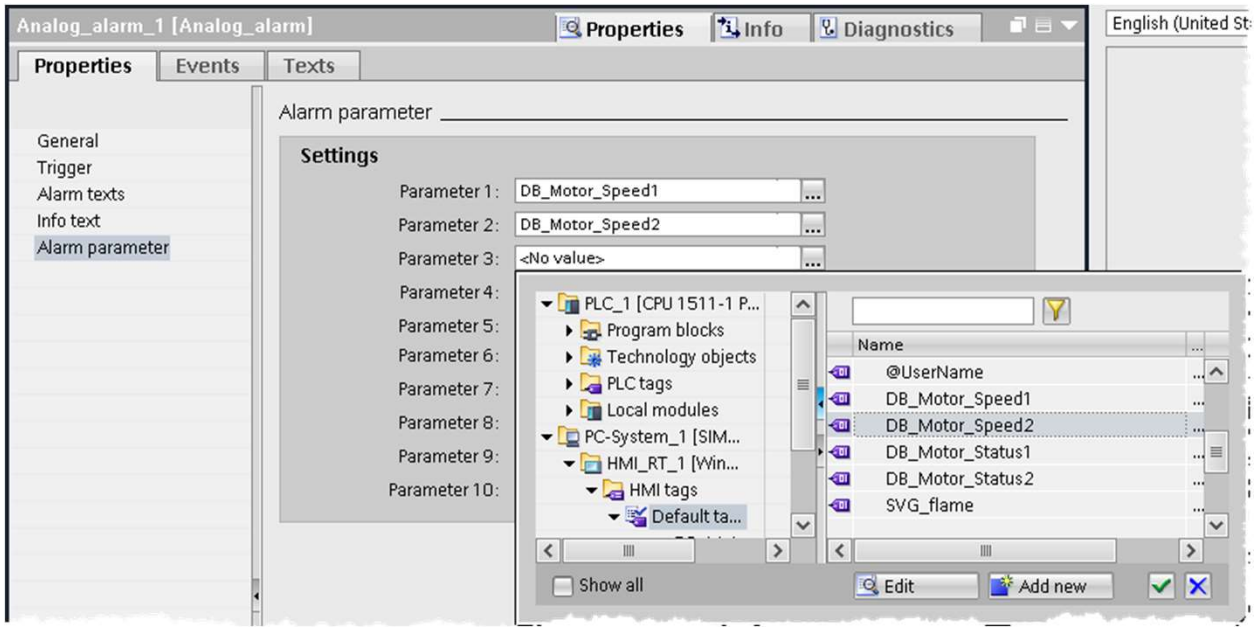
Ingenuity for life

Up to 10 different alarm parameters can be used



Alarm parameters are used to output process values in the alarm text (valid for discrete and analog alarms !).

SIMATIC WinCC Unified
Alarm parameter

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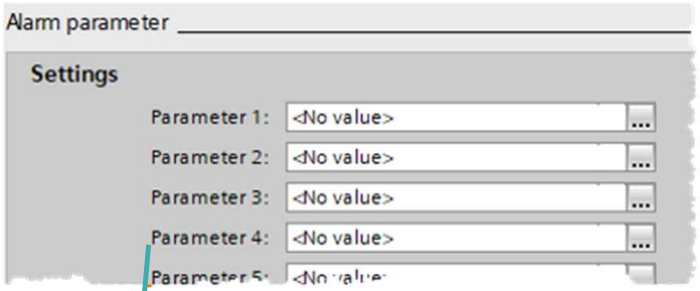
Ingenuity for life



@<No. of alarm parameter> % <format specification>@

Format specification	Type
i	Signed decimal Integer
u	Unsigned decimal Integer
f	Floating
s	String

For accompanying values in the alarm text, it requires a placeholder with a special notation

Example:

- **@2%2.3f@** → Parameter 2 with 2 digits before decimal sign and 3 decimal places → e.g. 44,378
- **@4%i@** → Parameter 4 signed Integer → e.g. -25416

SIMATIC WinCC Unified
System parameters

SIEMENS
Ingenuity for life

Format specification	System Meldeparameter
S1	HostName
S2	UserName
S3	Value
S4	Quality Code
S5	ValueLimit
S6	Absolute deadband
S7	Connection-ID (PLC alarms)

Assign additional system defined parameters to the alarm text

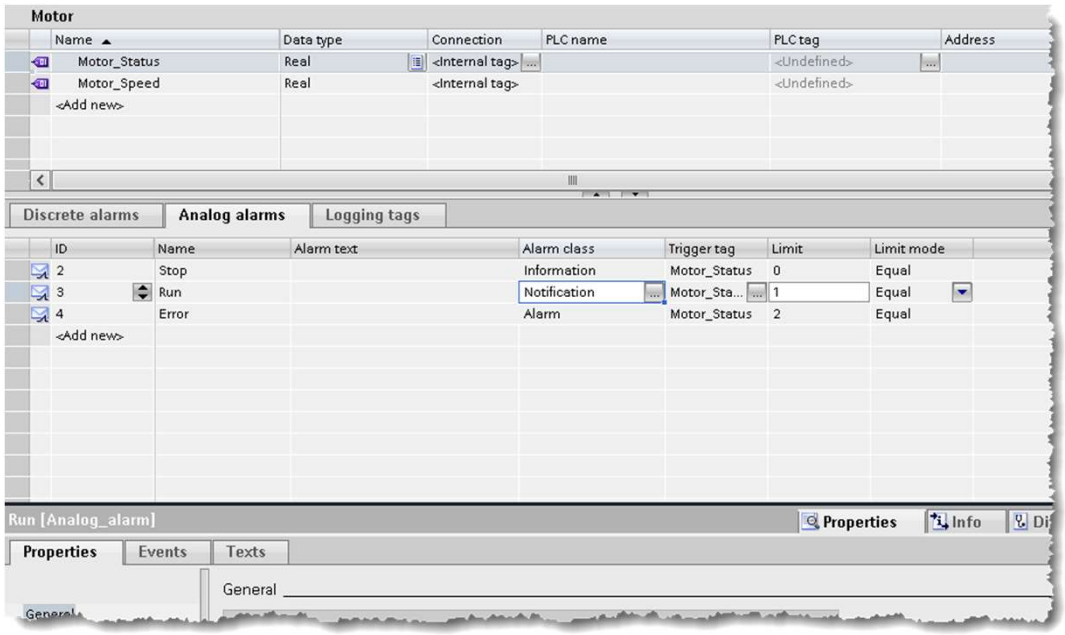
Example:

- **@S1%S@** → Computer name as String
- **@S3%I@** → Current value of trigger tag when the alarm was raised

SIMATIC WinCC Unified Alarming

SIEMENS
Ingenuity for life

L I V E D E M O



- Add Parameters to Alarms

SIMATIC WinCC Unified
Hands On: Analog and Discrete Alarms

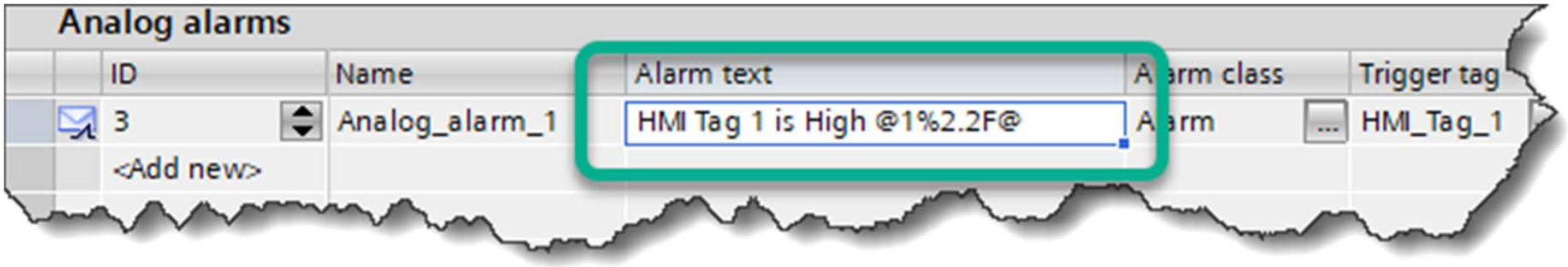
SIEMENS
Ingenuity for life

HANDS ON in 15 min

1. Add the tag value to the Analog Alarm Message

SIMATIC WinCC Unified
Alarms

SIEMENS
Ingenuity for life



Alarm text calls out Parameter and defines format.

Agenda

SIEMENS
Ingenuity for life

1 General Information

2 TIA Settings

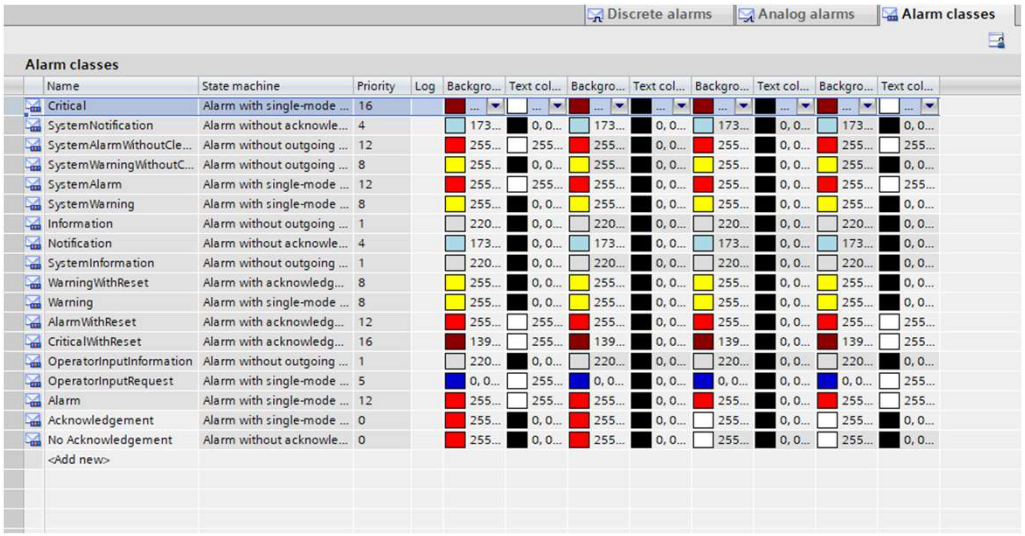
3 **Alarm Classes**

4 Alarm Logging

5 Alarm Control settings

SIMATIC WinCC Unified
Alarm classes based on IEC 62682

SIEMENS
Ingenuity for life



Predefined set of alarm classes
based on IEC 62682

Configurable colors
(background and text)

Add custom-specific alarm classes

SIMATIC WinCC Unified
Add your own alarm class

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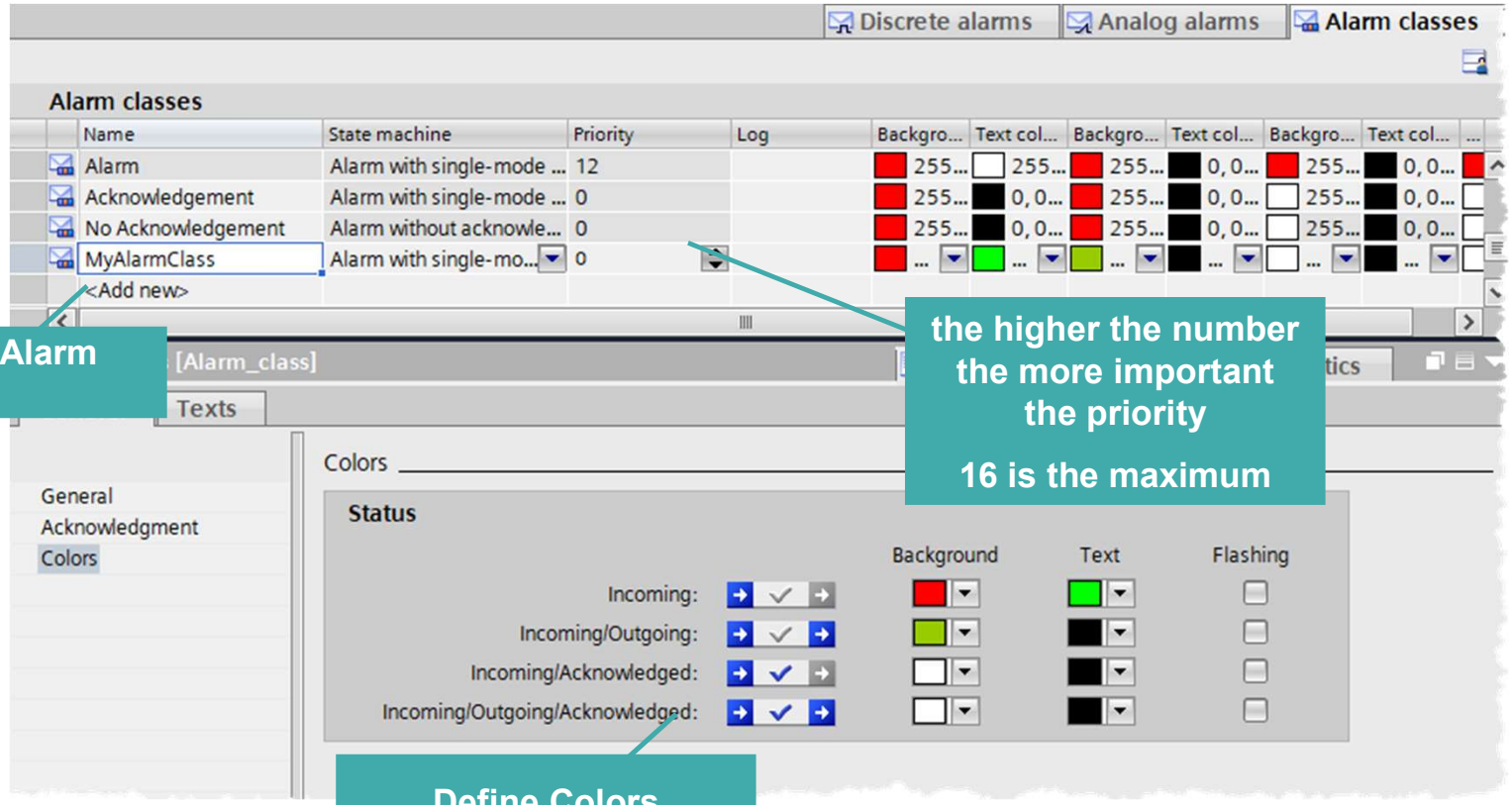
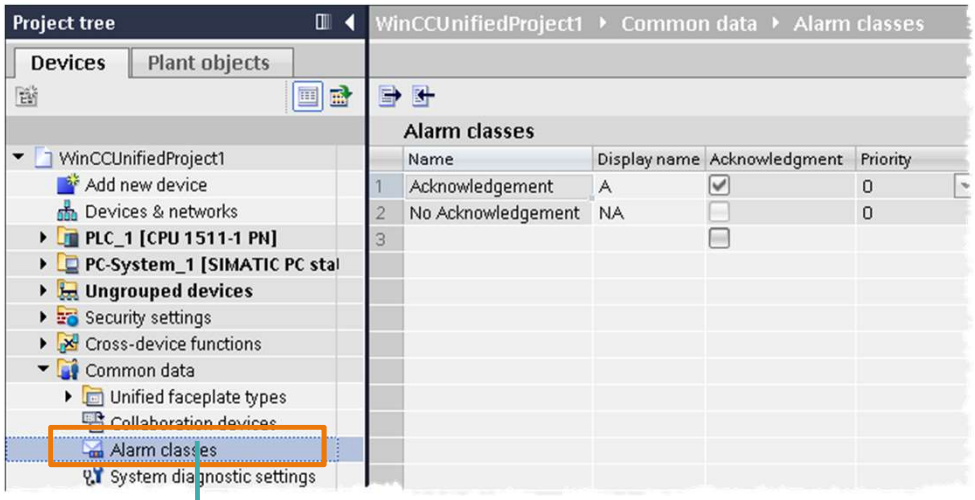
Ingenuity for life



SIMATIC WinCC Unified
Common alarm classes

SIEMENS
Ingenuity for life



Location: "Common data" in the project tree

Common alarm classes:

- Common alarm classes are used for controller alarms and the alarms of an HMI device.
- If required, an additional common alarm class can be created.
- Common alarm classes are divided into predefined and user-defined common alarm classes.
- The predefined common alarm classes are "Acknowledgement" (for alarms with acknowledgment) and "No Acknowledgement" (for alarms without acknowledgment).

SIMATIC WinCC Unified
Trigger Events by Alarms conditions

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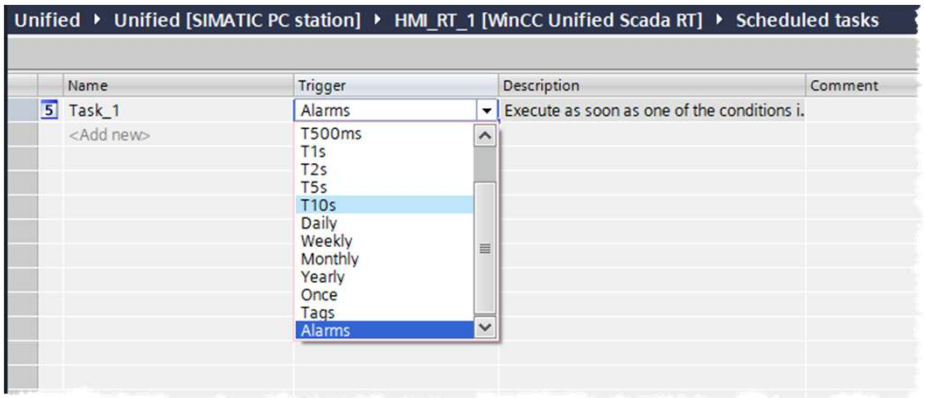
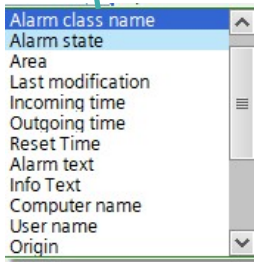
Ingenuity for life

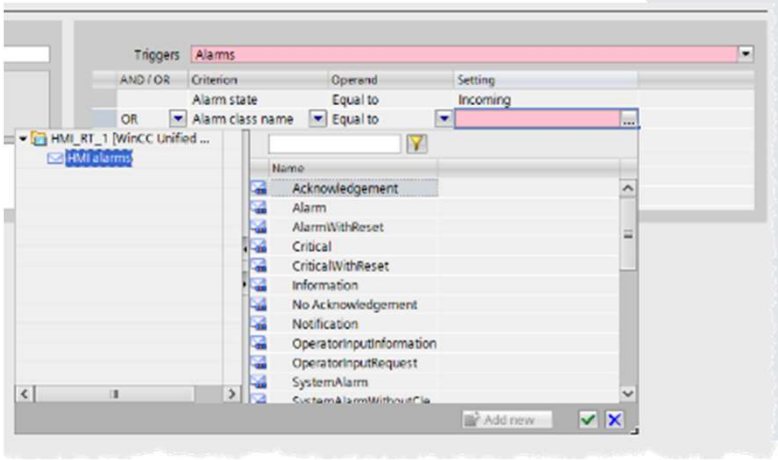


Alarms in Scheduled tasks

- In the scheduler your can combine alarm criteria to trigger a event
- You can combine different alarm criteria with: AND or OR

Criteria





Agenda

SIEMENS
Ingenuity for life

1 General Information

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3 Alarm Classes

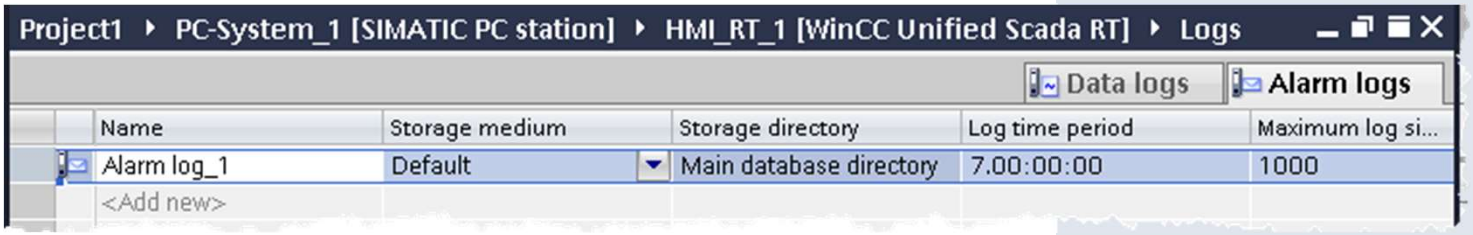
4 **Alarm Logging**

5 Alarm Control settings

SIMATIC WinCC Unified
Alarm Logs

SIEMENS
Ingenuity for life

- Each alarm event is logged, e.g., the transition of the alarm from "incoming" to "acknowledged" status.

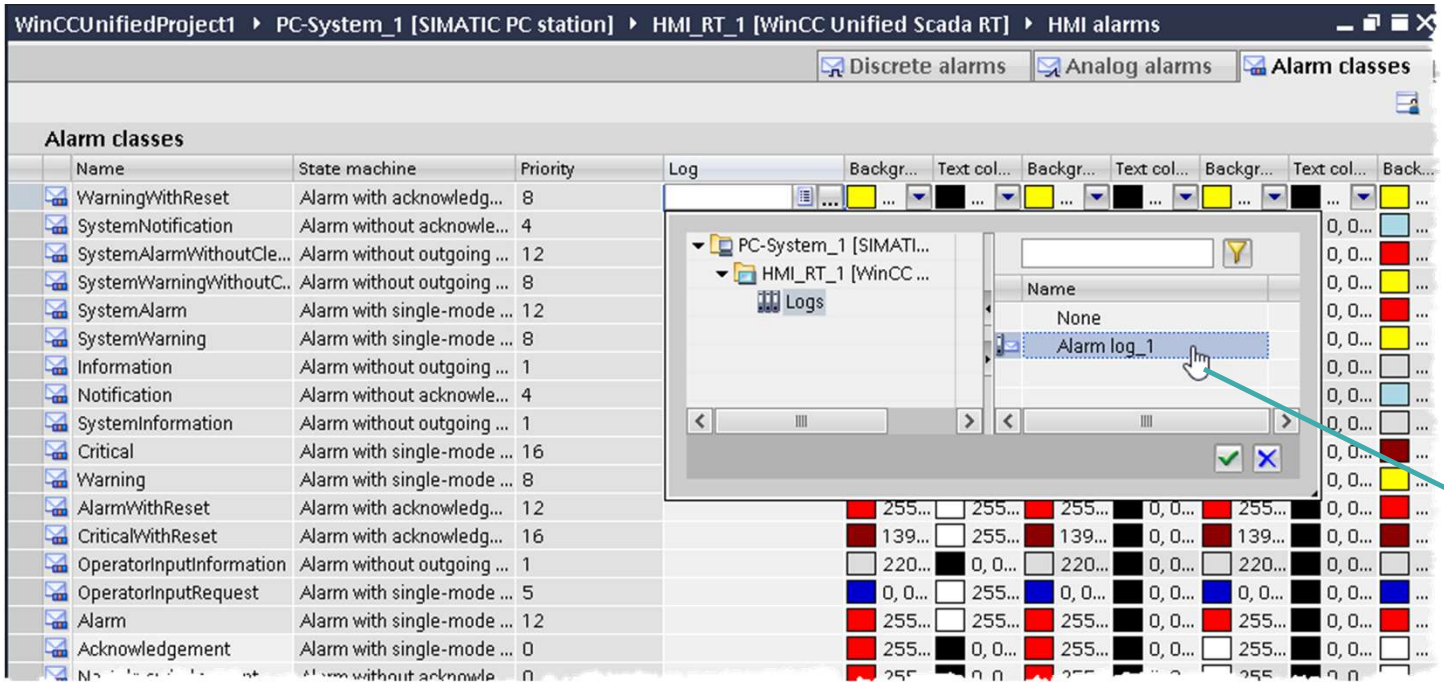


- The time stamp of a logged alarm is always specified in standard UTC format (Universal Time Coordinated).

An alarm log is used to log alarms that occur in the monitored process.

SIMATIC WinCC Unified
Alarm Logging

SIEMENS
Ingenuity for life



Select alarm log

Alarms can't be logged separate. It is only possible to add a complete Alarm class to the archive

Agenda

SIEMENS
Ingenuity for life

1 General Information

2 TIA Settings

3 Alarm Classes

4 Alarm Logging

5 **Alarm Control settings**

SIMATIC WinCC Unified
Alarm Control – Alarm source

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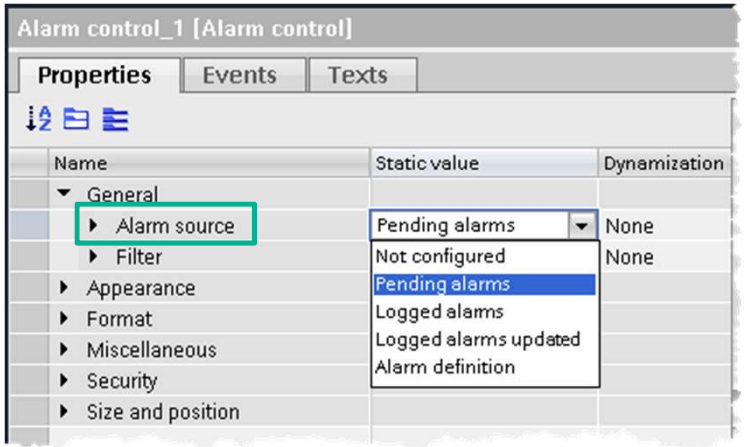
Ingenuity for life



at "Alarm source" you specify which alarms the alarm view displays in runtime by default:

- "Not configured": The alarm view does not show any alarms.
- "Pending alarms": The alarm view shows the currently pending alarms.
- "Logged alarms": The alarm view shows the logged alarms.
- "Logged alarms updated": The alarm view shows the logged alarms that are updated at specified intervals.
- "Alarm definition": The alarm view shows all alarms configured in the engineering system, regardless of whether or not they have occurred.

Hint: settings can also be changed and configured in runtime, but in WinCC Unified V16 the control does not support persistency, so any changes in runtime will be reset again to engineering setting after a screen change

SIMATIC WinCC Unified
Alarm Control – Filter in Engineering

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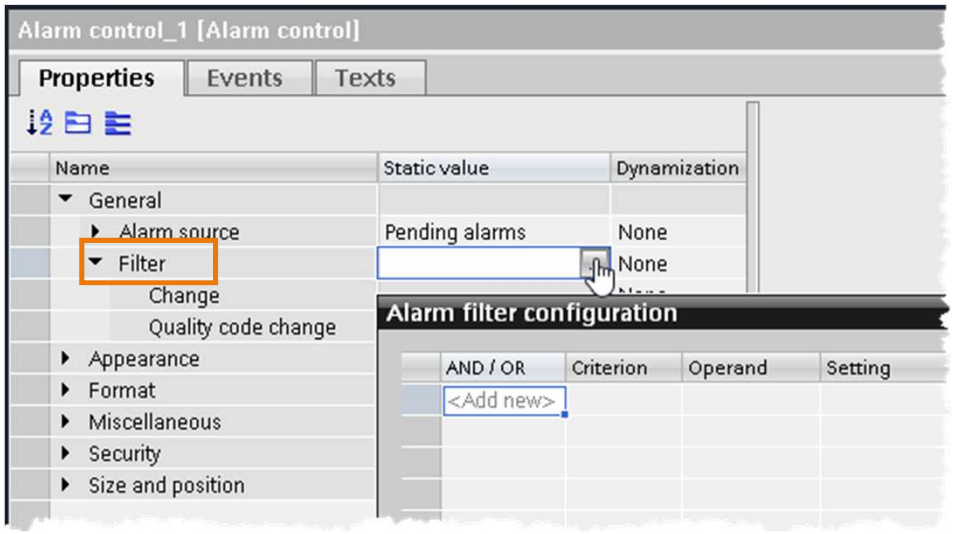
Ingenuity for life

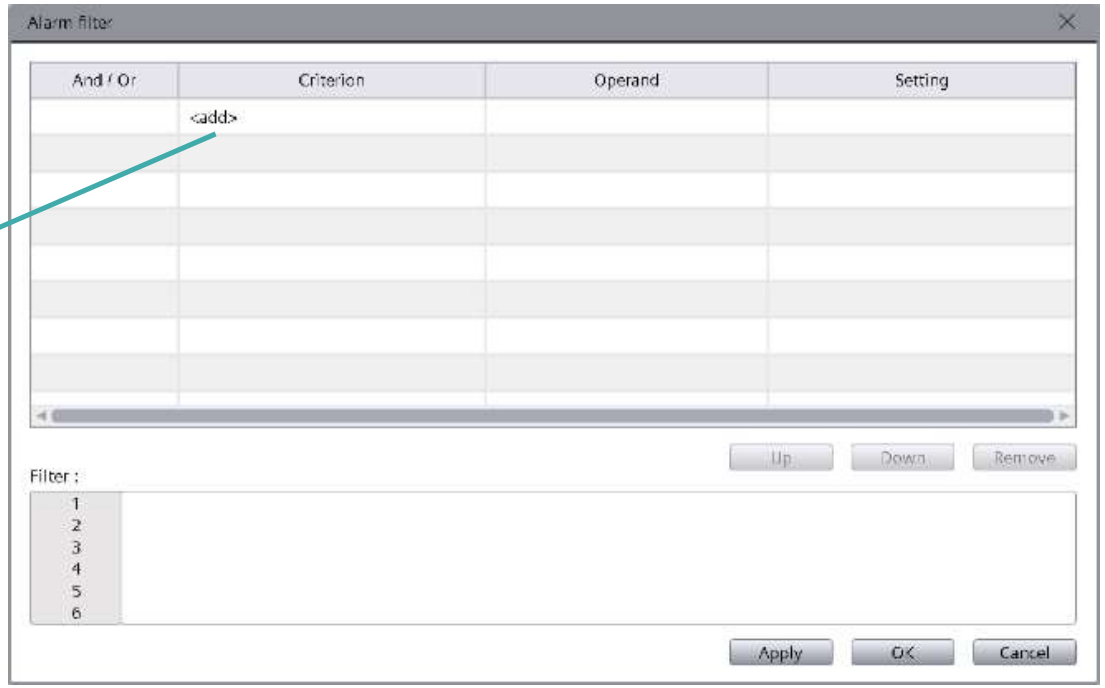


- The display of alarms in the alarm control can be filtered.
- A static value, a tag or a script can be configured for the filter. This functions can be configured in the alarm control in the "Screens" editor and in Runtime.
- The filter can be created by all parameters, such as ID, name, alarm class, priority, etc.

SIMATIC WinCC Unified
Alarm Control – Filter in runtime

SIEMENS
Ingenuity for life

Create a new filter criterion



The filters are not persistence in runtime!

To filter the alarms in Runtime, click 

SIEMENS
Ingenuity for life

WinCC Unified SIPEC Workshop Trending and Logging

Agenda

SIEMENS
Ingenuity for life

1 **General Information**

2 TIA Settings

3 Trendcontrol

SIMATIC WinCC Unified
File-based Logging - Scalable logging concept

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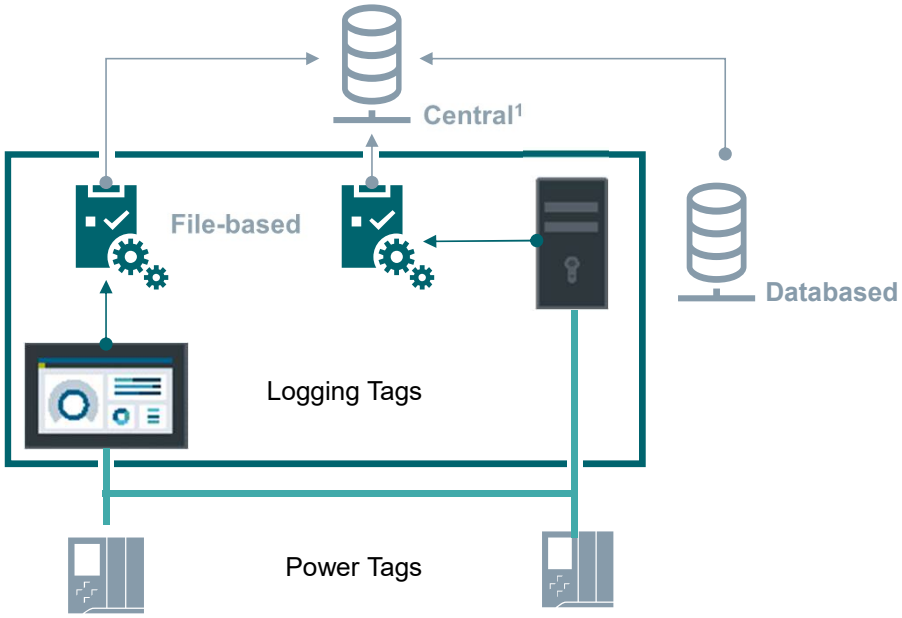
Unified Comfort Panel ✓ PC ✓



Universal logging functionality for machine-level requirements regarding handling of archive data e.g., copy/paste log files

Unmanaged file-based data archive for **small to medium applications** up to 5,000 Logging Tags

Changeover to databased logging (optional) possible due to identical logging structures

Planned

Central logging[1] as overall plant archiving solution (optional)

[1] planned

SIMATIC WinCC Unified – Logging Tags Licensing concept

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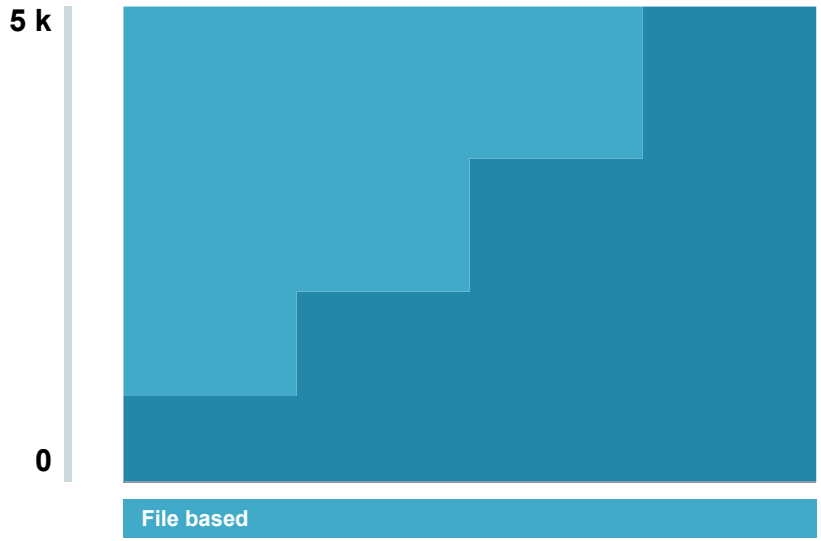
Ingenuity for life

Unified Comfort Panel ✓ PC ✓



Unified comfort panel PC

Unified Comfort Panels

File-based Logging up to 5,000 Logging Tags (included)

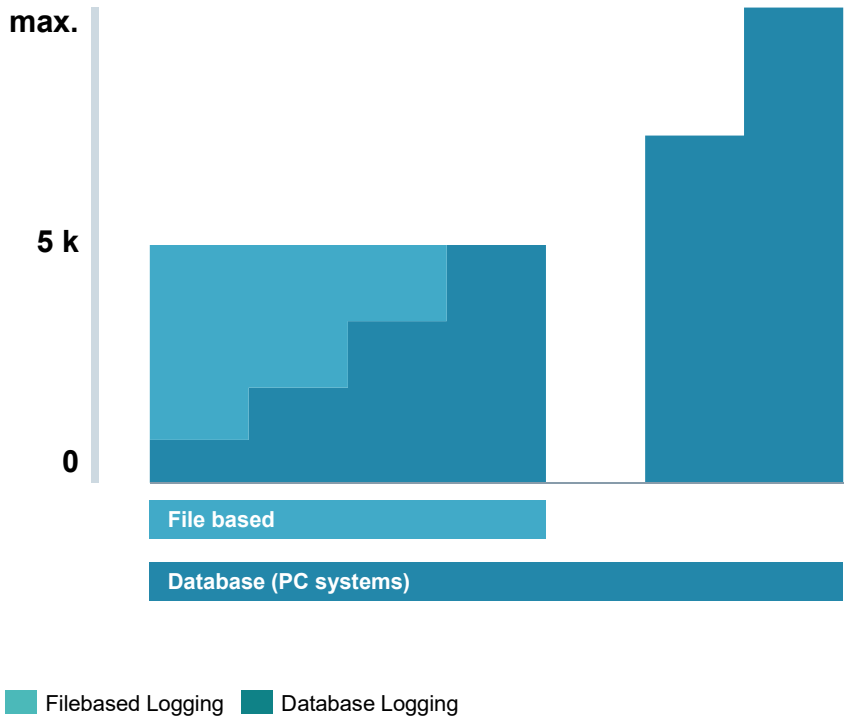
Unified PC Systems

- File-based Logging up to 5,000 Logging Tags
- Licenses for Logging Tags: 100, 500, 1,000, 5,000 (countable)

Possibility to change to Database Logging for growing requirements

SIMATIC WinCC Unified – Logging Tags Licensing concept

SIEMENS
Ingenuity for life



Unified PC Systems

Configure the logging system
according to your requirements

- Database Logging (optional), **scalable up to the maximum number of Power Tags**
- Licenses for Logging Tags:
  100, 500, 1,000, 5,000, 10.000, 30.000
  (countable)

Agenda

SIEMENS
Ingenuity for life

1 General Information

2 **TIA Settings**

3 Trendcontrol

SIMATIC WinCC Unified Logging – Storage system

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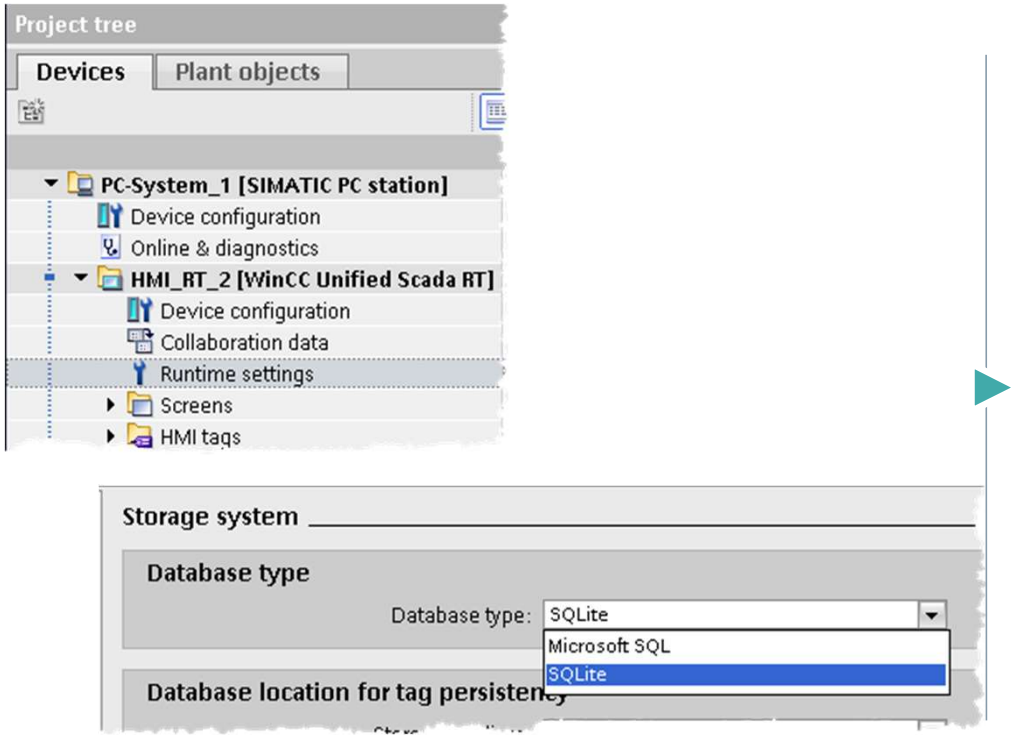
Ingenuity for life

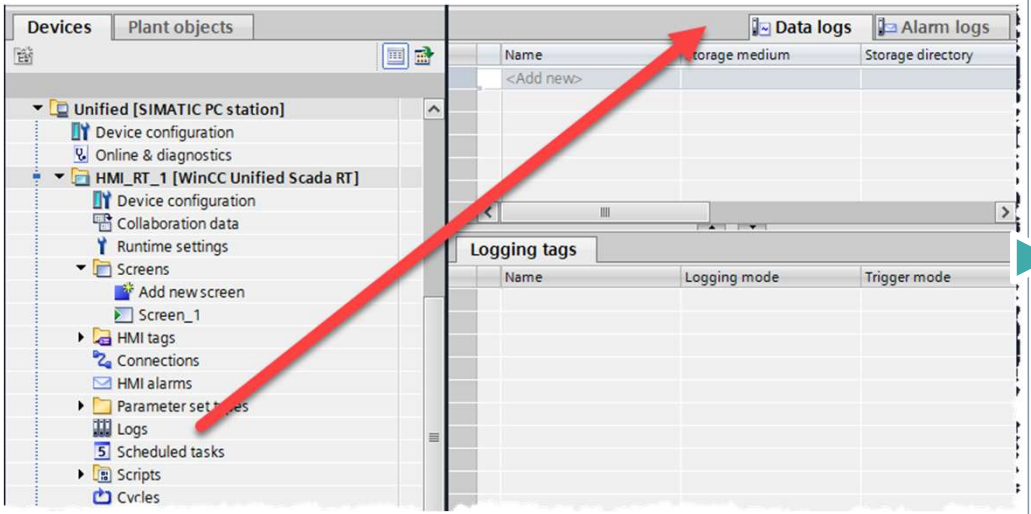


Database supported types:

- File-based logging – SQLite (as default in Unified PC RT systems).
- Database logging – Microsoft SQL (as an option for Unified PC RT Systems). Not available for Unified Comfort Panels.

SIMATIC WinCC Unified Logging Overview

SIEMENS
Ingenuity for life



There are two types of log:

- Data logs - used to log process data from an industrial plant
- Alarm logs - used to log alarms that occur in the monitored process

You have the option of archiving tag values and alarms for subsequent analysis

SIMATIC WinCC Unified
Logging – Runtime Setings

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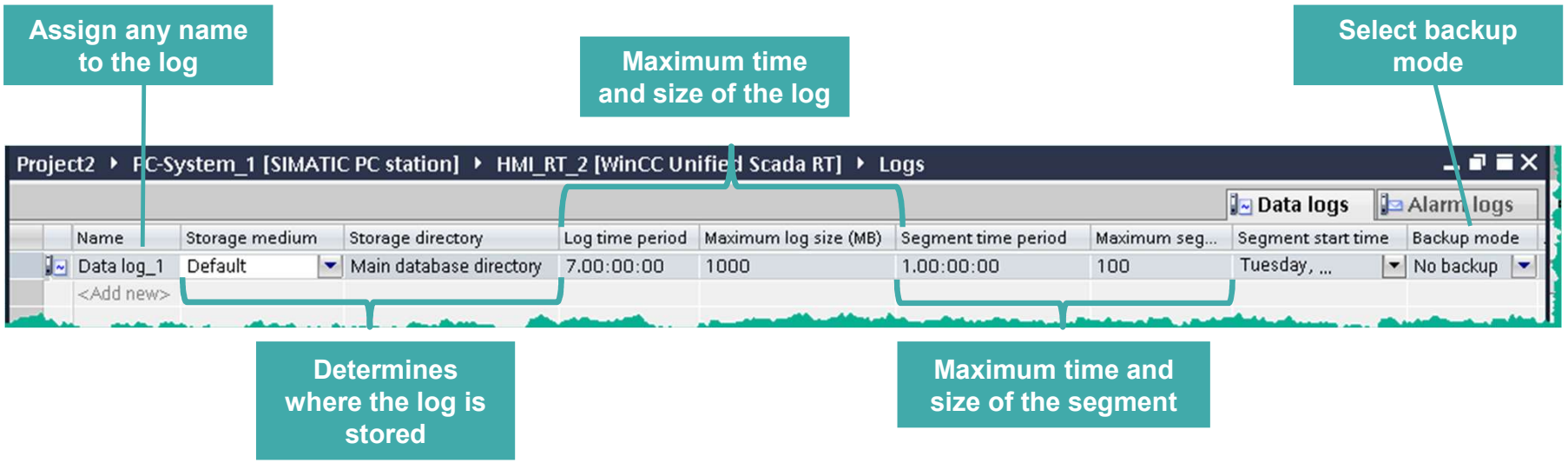
Ingenuity for life

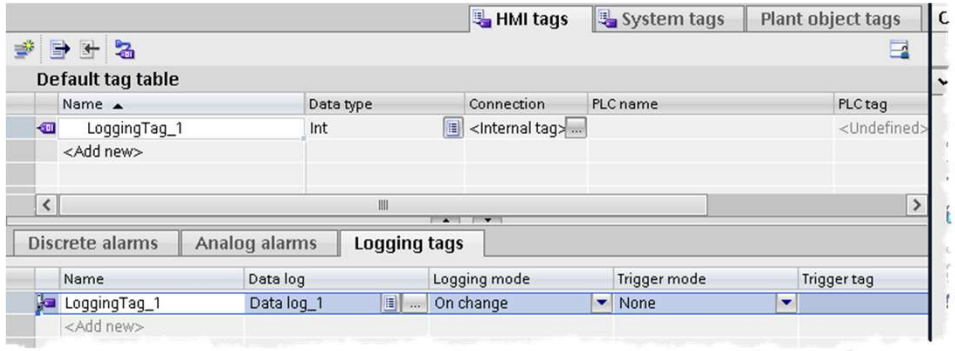


With both types of logs you define the same properties for the log.

SIMATIC WinCC Unified
Logging settings

SIEMENS
Ingenuity for life

L I V E D E M O



SQLite

Microsoft SQL Server

- Which Settings are necessary
- What needs to be considered when archiving

Agenda

SIEMENS
Ingenuity for life

1 General Information

2 TIA Settings

3 **Trendcontrol**

SIMATIC WinCC Unified
Trend Control – Flexible evaluation of process data

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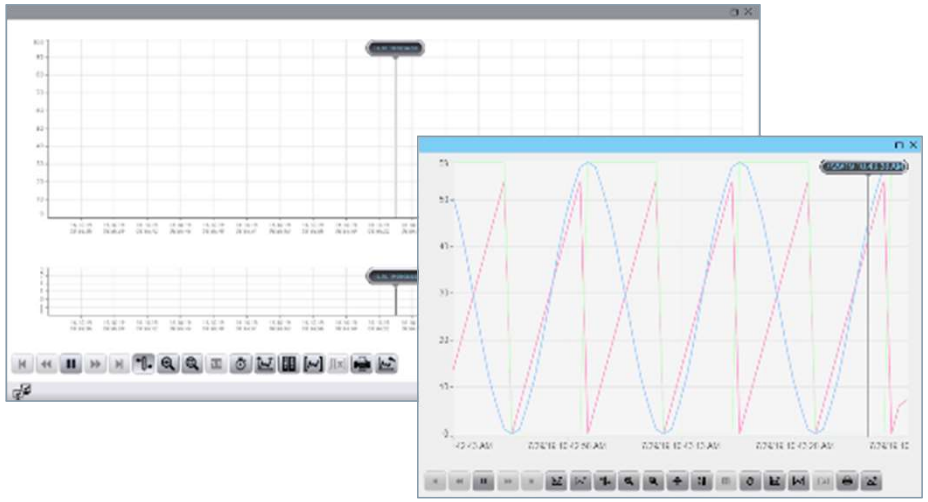
Unified Comfort Panel ✓ PC ✓



Direct evaluation of online and historical data including comparison of different time ranges e.g., shifts

Free configurable trend view of online and/or historical data e.g., multiple trend areas

User defined settings regarding trend appearance e.g., color, line form, single value point, background

Trend user interface e.g., number of trends, ruler, range, print (hardcopy), export

SIMATIC WinCC Unified
Configure Trend Control

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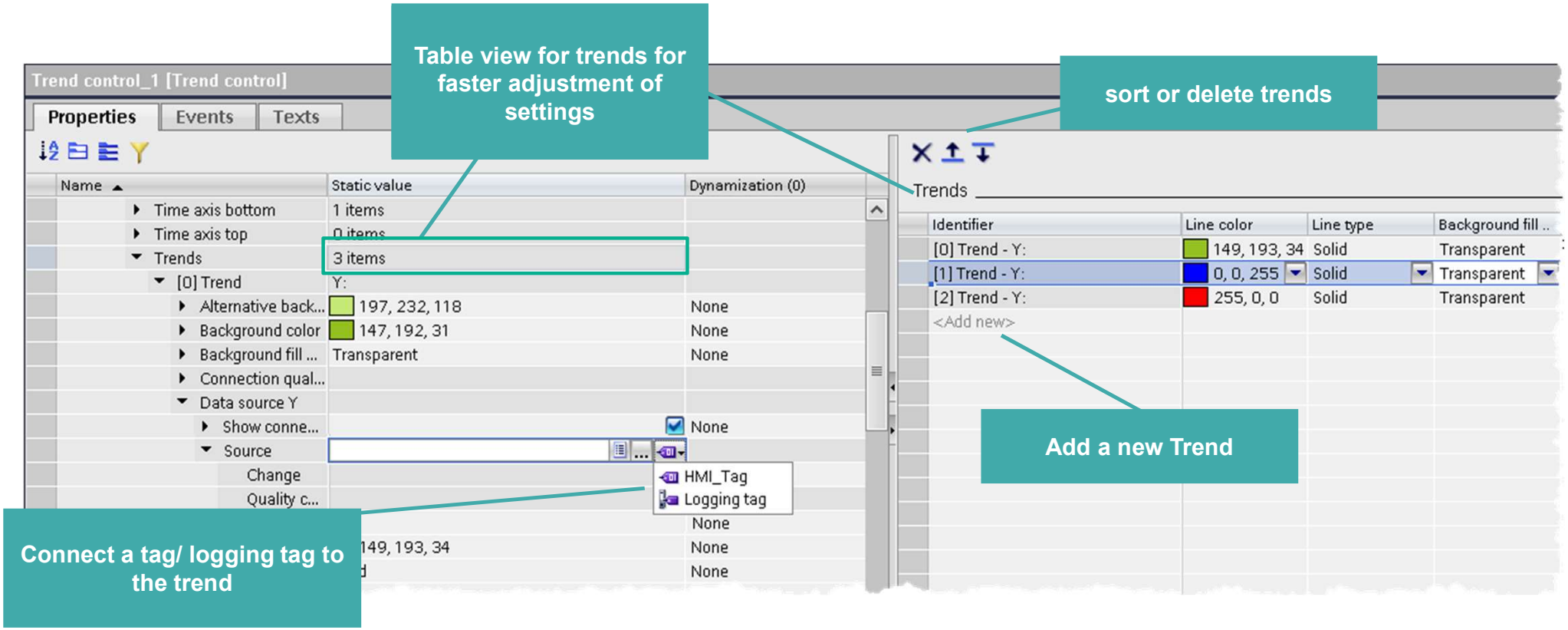
Ingenuity for life



SIMATIC WinCC Unified
Trend Companion – Statistical evaluation of process data

SIEMENS
Ingenuity for life

Unified Comfort Panel | PC

Flexible statistical evaluation of process data depending on your personal demand (operator, supervisor, maintenance, …)

Free configurable statistic view in relation to the selected range of the corresponding trend control

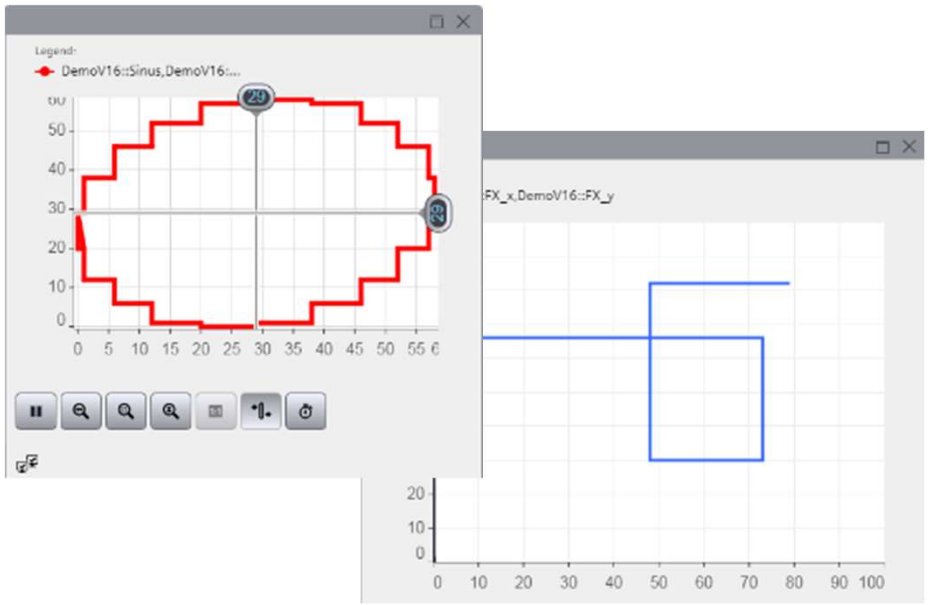
User defined evaluation regarding sum, average, max, min, integral

Trend Companion user interface e.g., print (hardcopy) or the export statistical data

SIMATIC WinCC Unified
Function Trend control f(X)

SIEMENS
Ingenuity for life

Unified Comfort Panel ✓ PC ✓



Function trend control refers to online and historical data.

Analysis of data **without time-based relationship**

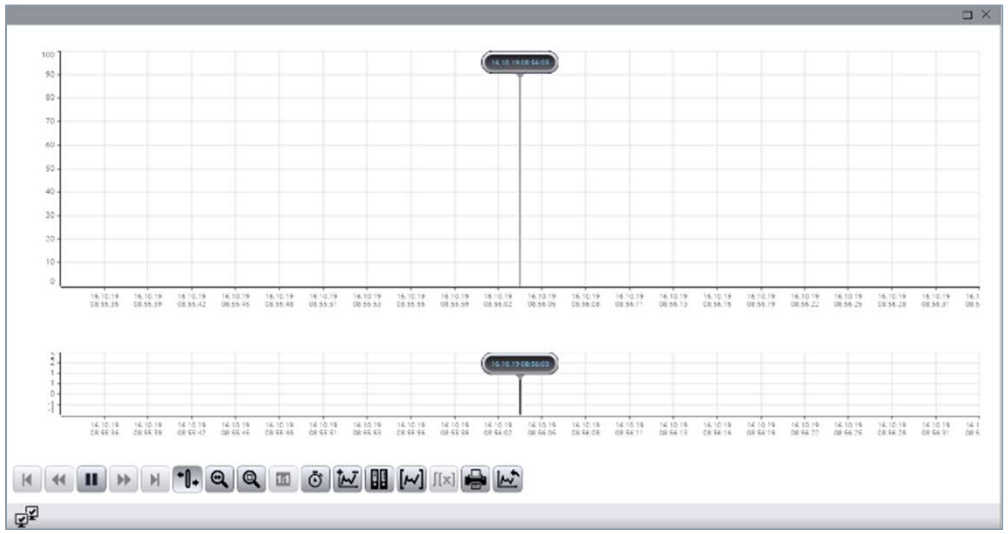
Typical use cases are e.g., batch evaluations (pressure vs. temperature) or quality evaluations (availability vs. performance)

Graphical presentation of **mathematical formulas** e.g., target – performance comparison or reactions at chemical processes

SIMATIC WinCC Unified
Working with the Trend Control

SIEMENS
Ingenuity for life

L I V E D E M O

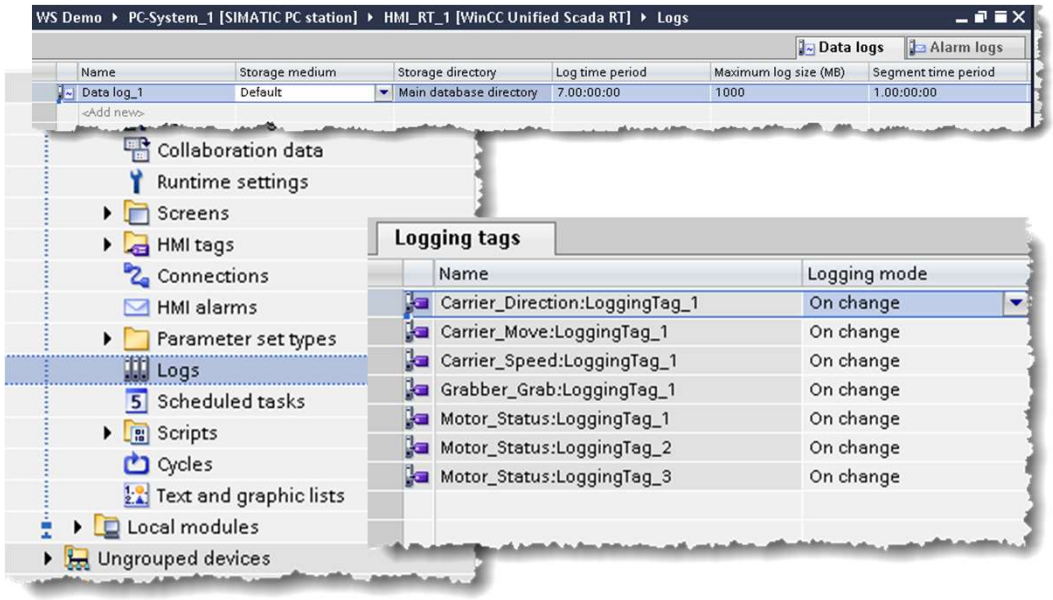


- How does the Trend control work
- Connect tags to it
- Set trend properities
-

SIMATIC WinCC Unified
Hands On: Logging of tags

SIEMENS
Ingenuity for life

HANDS ON in 10 min



1. Create 2 tags
    1. HMI_Tag_1 Int
    2. HMI_Tag_2 Int
2. Create a new data log
3. Define storage path
4. Define logging tags for your tags
5. Download the Runtime

SIMATIC WinCC Unified
Hands On: Trend Control

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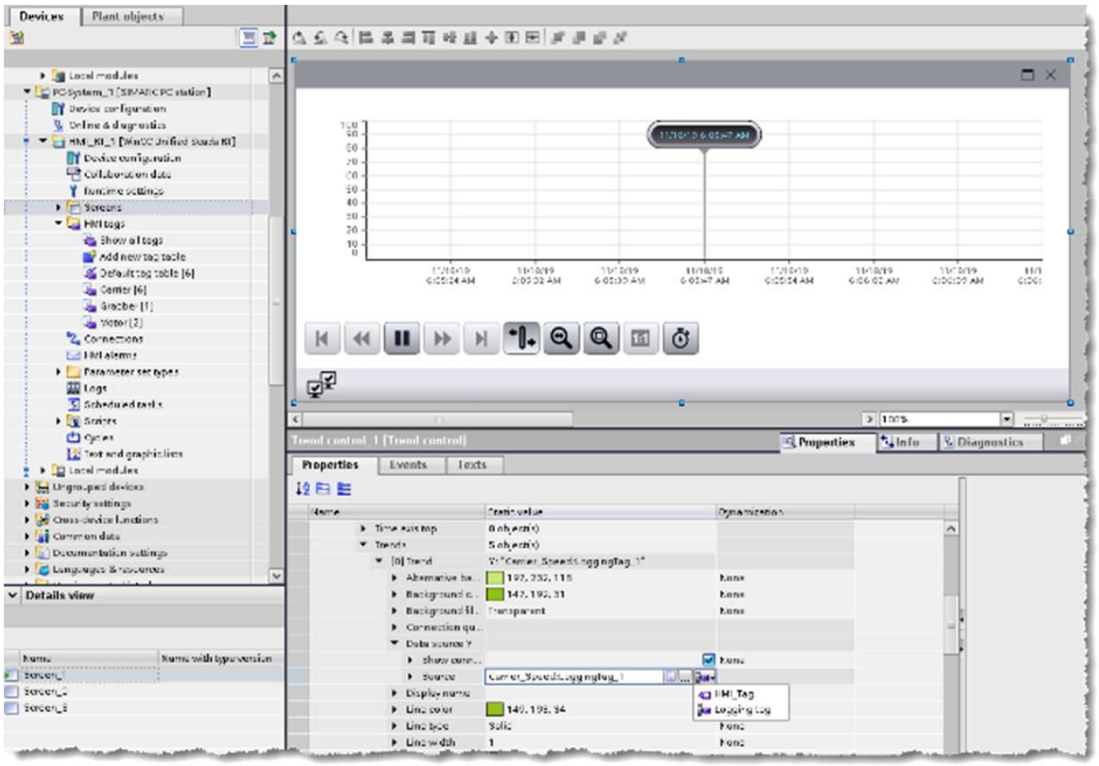
HANDS ON in 20 min



1. On your trend screen, add a trend control to one of your screens
2. Add the logging tags to your trend control
3. Download the Runtime
4. Start Tag Simulation
   Documents\WinCC Unified Tag Simulator
   WinCC Unified Tag Simulator
   File WorkshopSim.sim

SIMATIC WinCC Unified
Hands On: Trend Control

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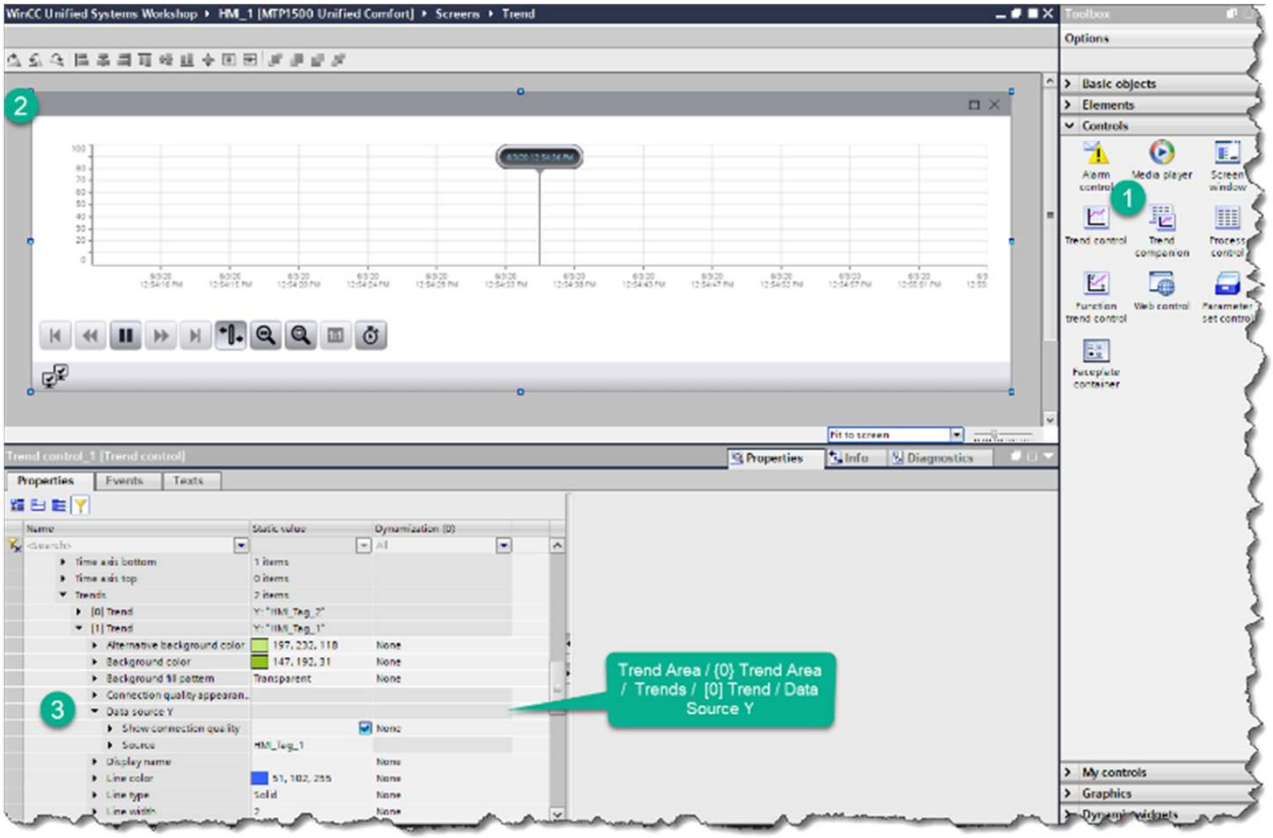

Drag Trend Control to Screen

In Properties configure 2 trends

General / Trend area / Trends / Data Source

Select HIM_Tag_1 and HMI_Tag_2 as your 2 trend tags

Be sure to start the tag simulator

Documents\WinCC Unified Tag Simulator
WinCC Unified Tag Simulator
File WorkshopSim.sim

SIMATIC WinCC Unified
Hands On: Trend Control

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WinCC Unified Faceplates

www.usa.siemens.com/wincc-unified

Agenda

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1 **General Information**

2 Working with Faceplates

SIMATIC WinCC Unified
Unified Faceplates as enclosed graphical objects

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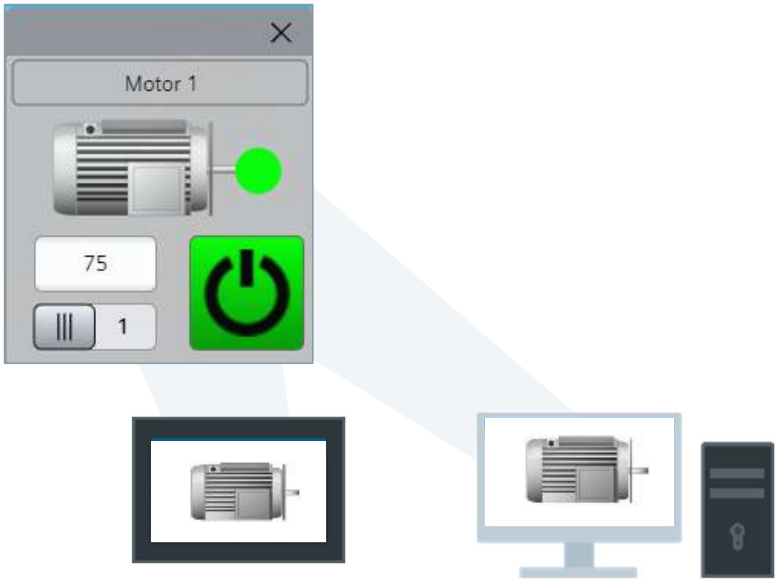
Unified Comfort Panel ✓ PC ✓



Create individual library templates (master copies) with dynamic process connection

Use the same Faceplates
for panel and PC systems using a Faceplate container control

Standardized operation elements for **flexible reuse** in all Unified devices and projects

Efficient operation window (popup)
for assets e.g., motor, pump

SIMATIC WinCC Unified Faceplates – Engineering

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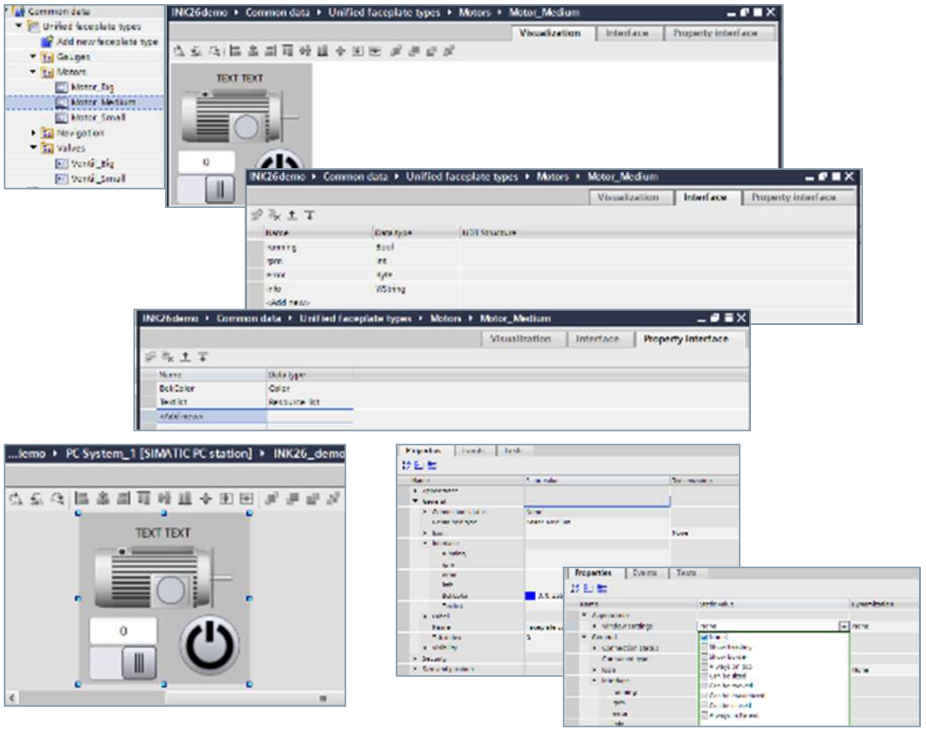

TYPE-INSTANCE-Concept

Define Faceplates (Common data)

- Interfaces – project independent (simple tag types, PLC UDT types)
- Property interface (colors, text resource lists)
- Visualization for object and operation window, engineering like a screen (without advanced controls) including dynamization via Scripting

Use Faceplates in screens

- Drag and Drop
- Assign interface and properties

Agenda

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1 General Information

2 **Working with Faceplates**

SIMATIC WinCC Unified Faceplate Editor

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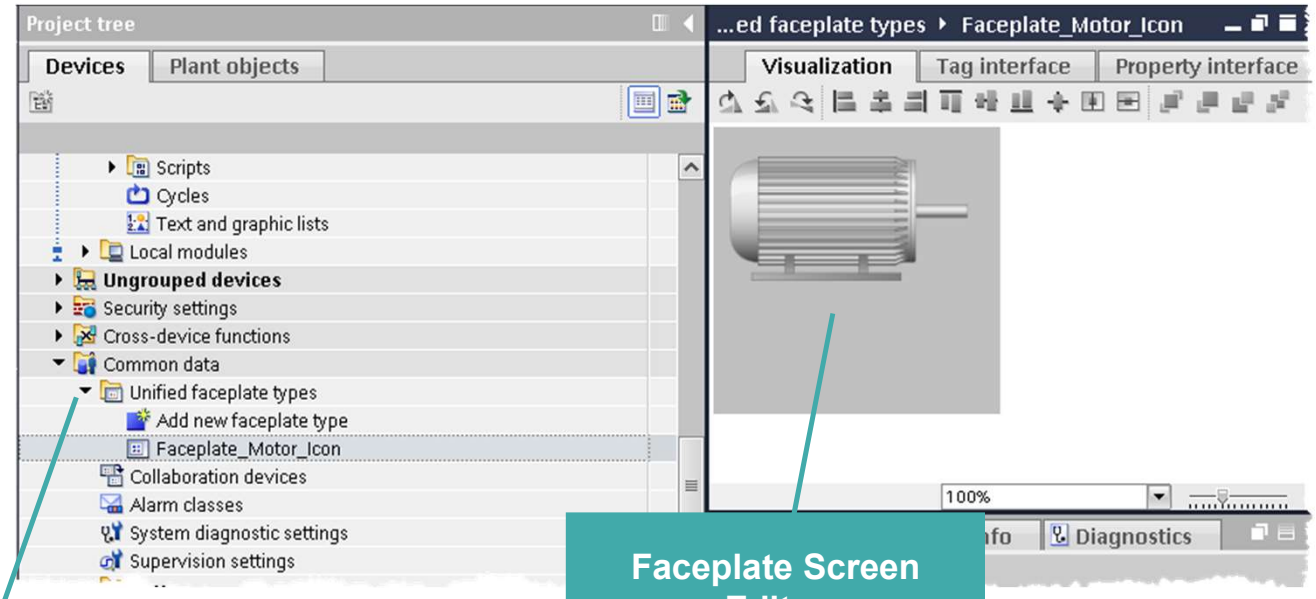

Location: folder „Common data“ in the project tree

Faceplate Screen Editor

Hints:

- Dynamic SVGs are not supported
- Controls are not supported
- System functions work only in the JavaScript context
- Versioning in the library is not supported in V16

SIMATIC WinCC Unified
Faceplate Editor – Tag interface

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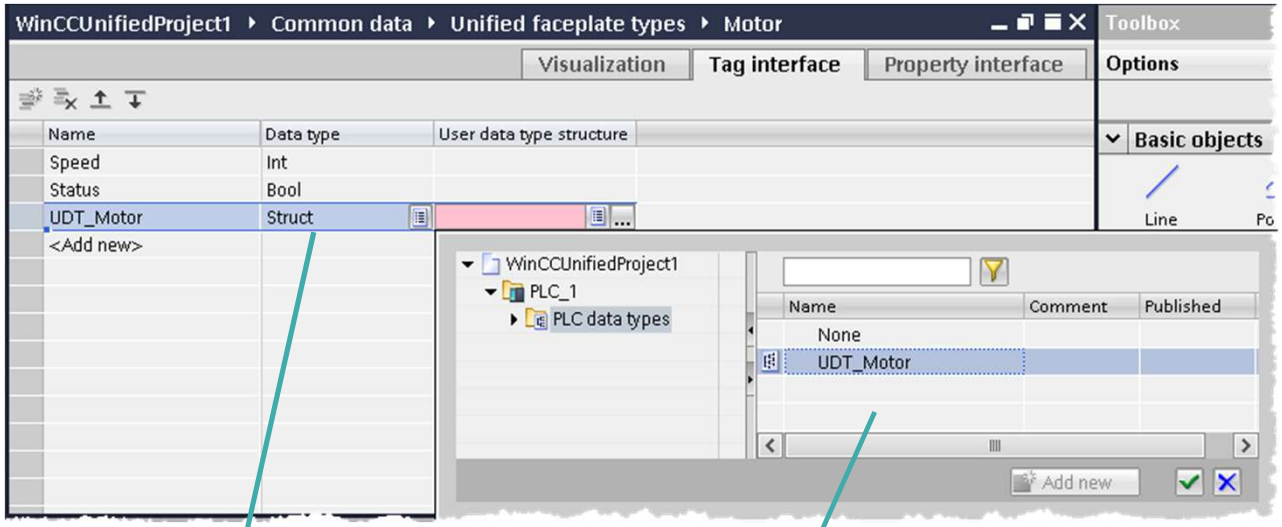

For PLC UDT use the Data Type „Struct“

Selection of the necessary PLC data type

Hints:

- Only tags from the Interface can be connected
- UDT in UDT works
- a UDT containing a Struct does not work!

SIMATIC WinCC Unified
Faceplate Editor – Property interface

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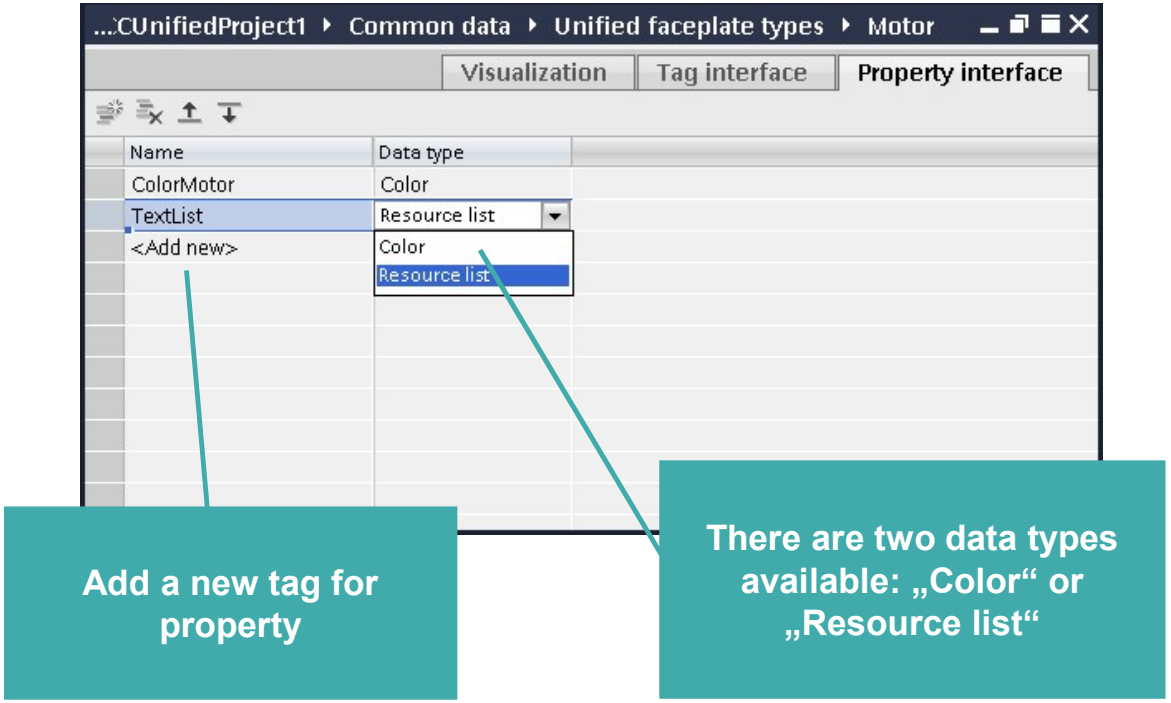

Hints:

- Graphic list does not work in Faceplates
- The Text list works only on the symbolic IO field
- no other properties supported in V16

SIMATIC WinCC Unified
Faceplate Editor – Connection of tags

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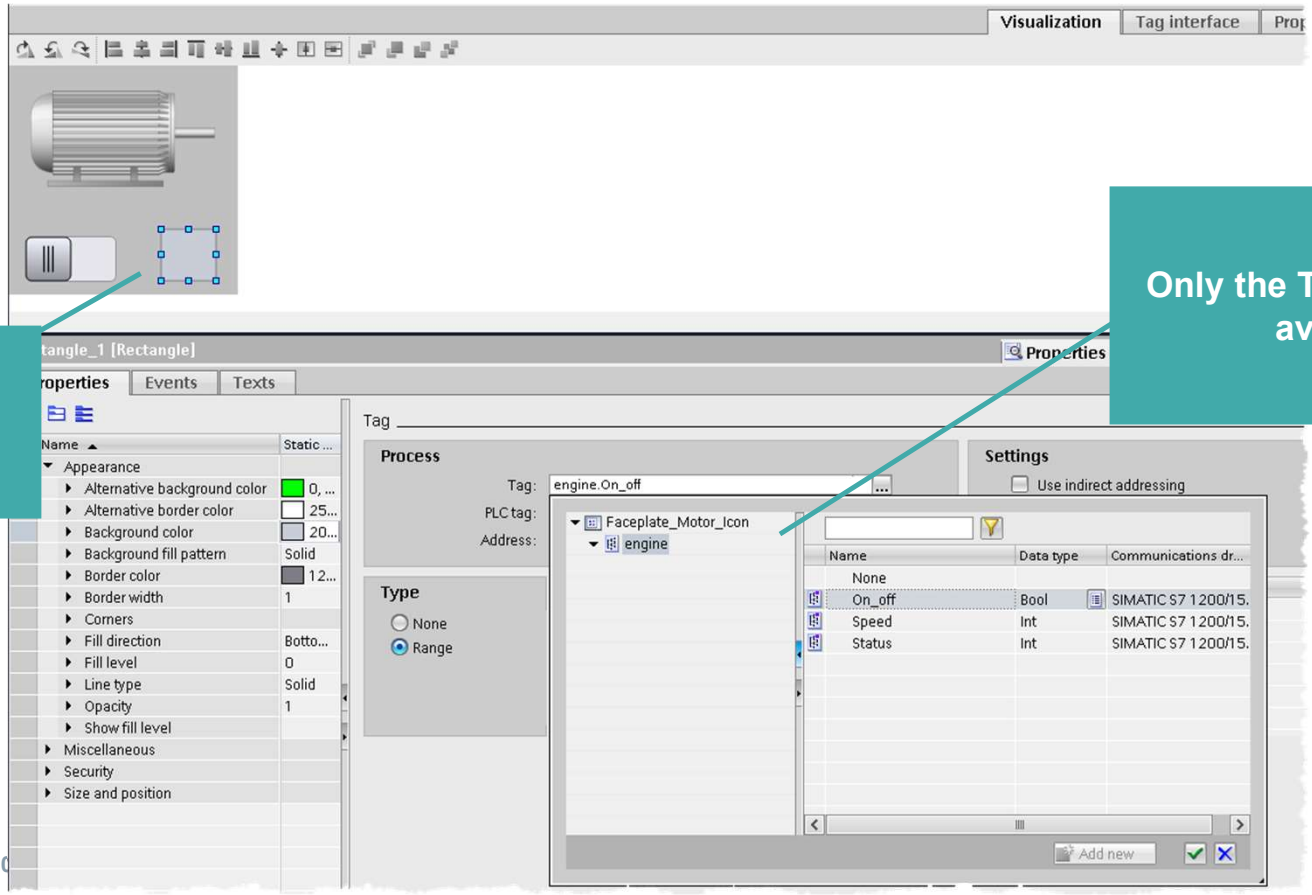
Object in Facplate

Only the Tag Interface is available



SIMATIC WinCC Unified
Faceplate Editor – working with instances

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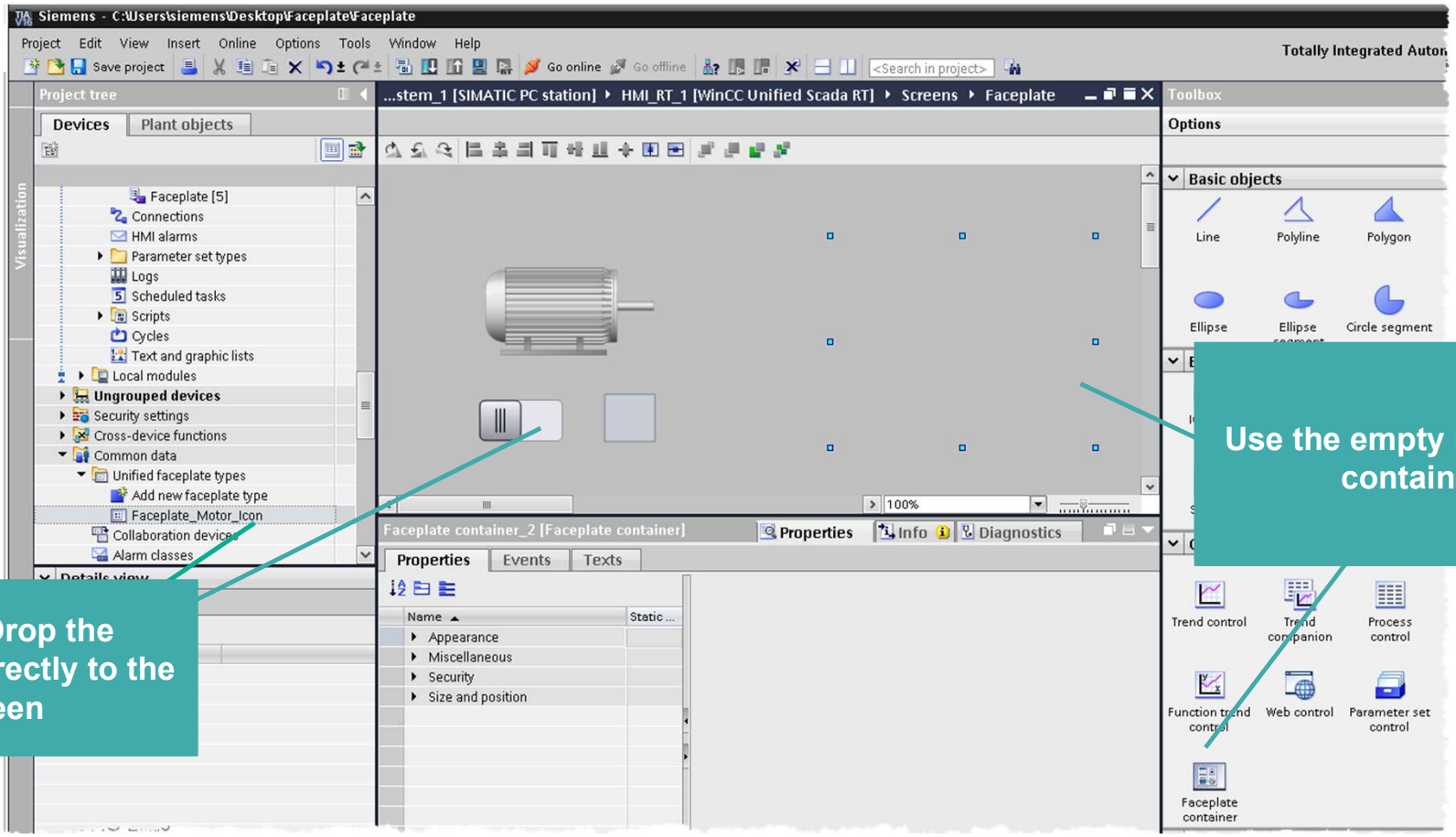

Drag & Drop the Faceplate directly to the Screen

Use the empty Faceplate container

SIMATIC WinCC Unified
Faceplate Editor – connect instances

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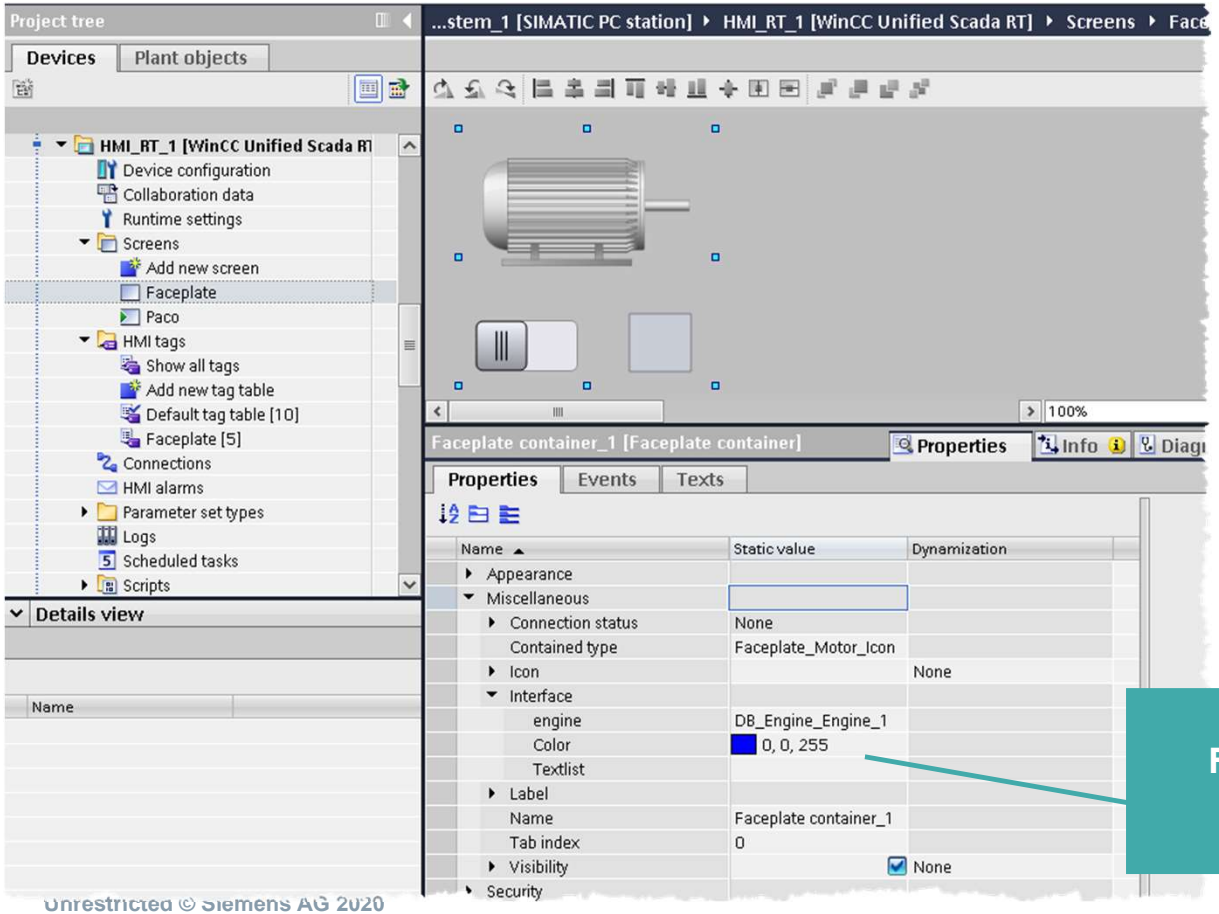
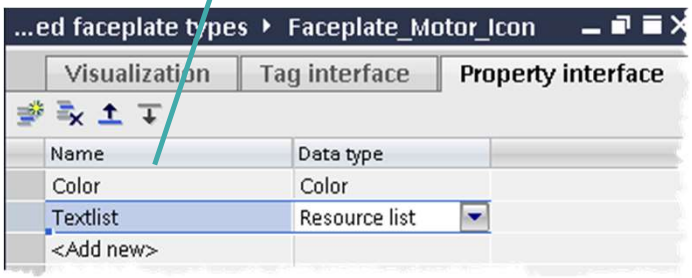


Faceplate type interface



Faceplate instance interface

SIMATIC WinCC Unified
Faceplate

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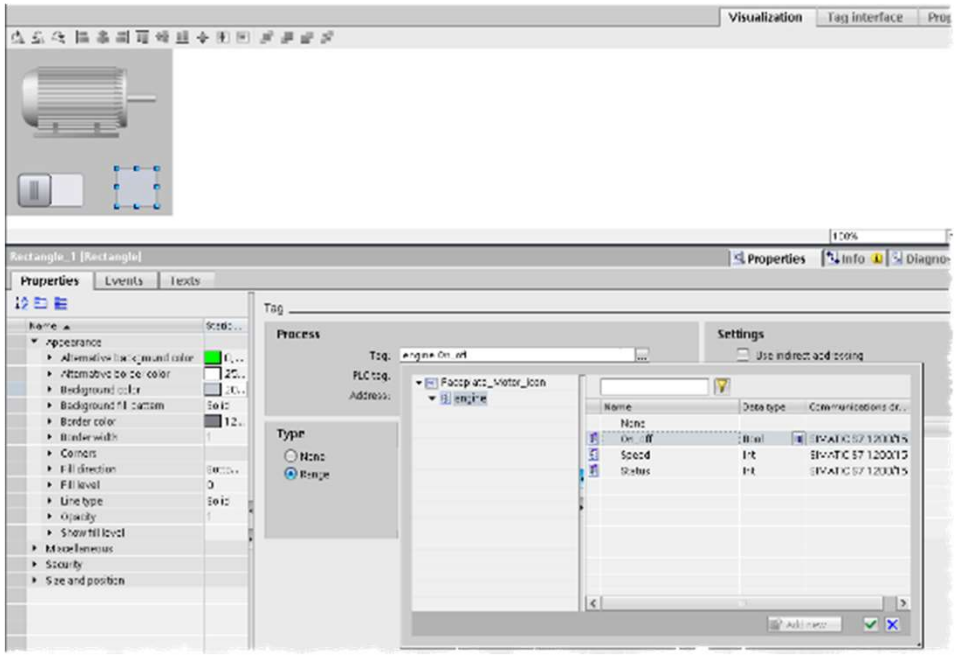
L I V E D E M O



- Create a Faceplate
- Use the tag & property Interface
- Create Instances
- Connect the Instances

SIMATIC WinCC Unified
Hands On: FacePlates

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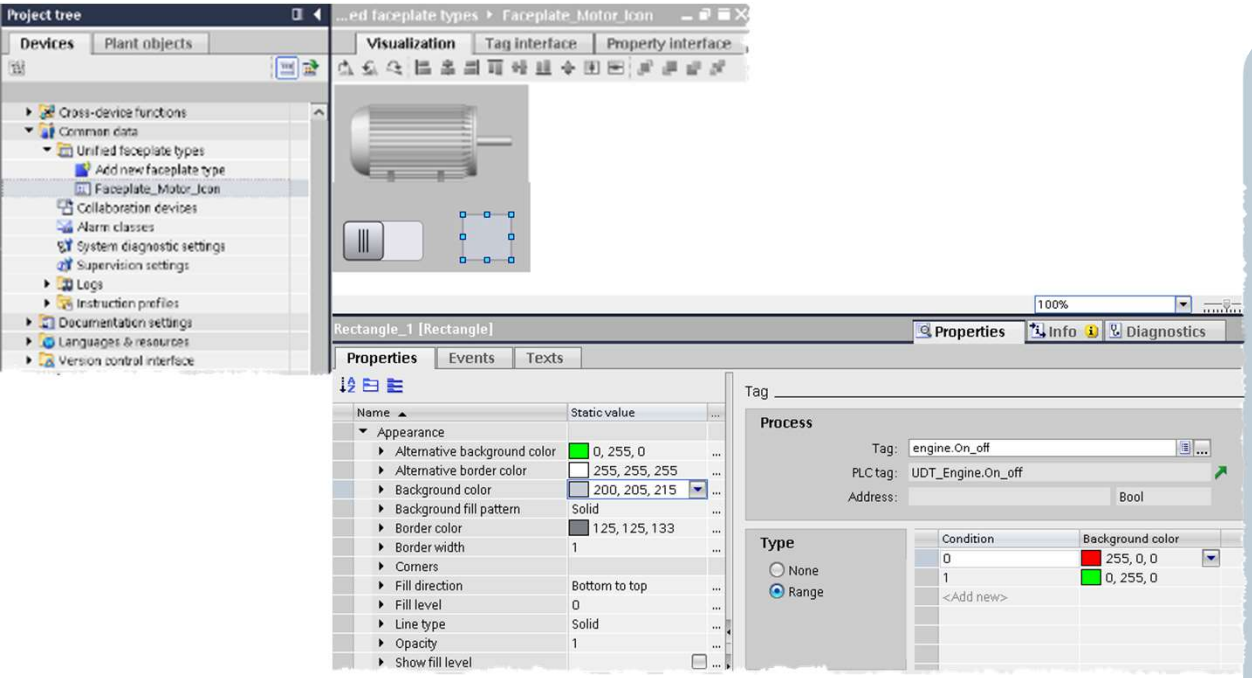
HANDS ON in 20 min



Goal: create a new Faceplate for an engine

1. Open the Faceplate editor and design a Faceplate for an motor
2. define the tag interface (you can also use UDTs from the controller)
3. Connect the switch and the rectangle to a status tag “Bool”
4. Create an instance of the Faceplate on Overview Screen, assign tags and properties
5. Compile & start the RT

SIMATIC WinCC Unified
Hands On: FacePlates

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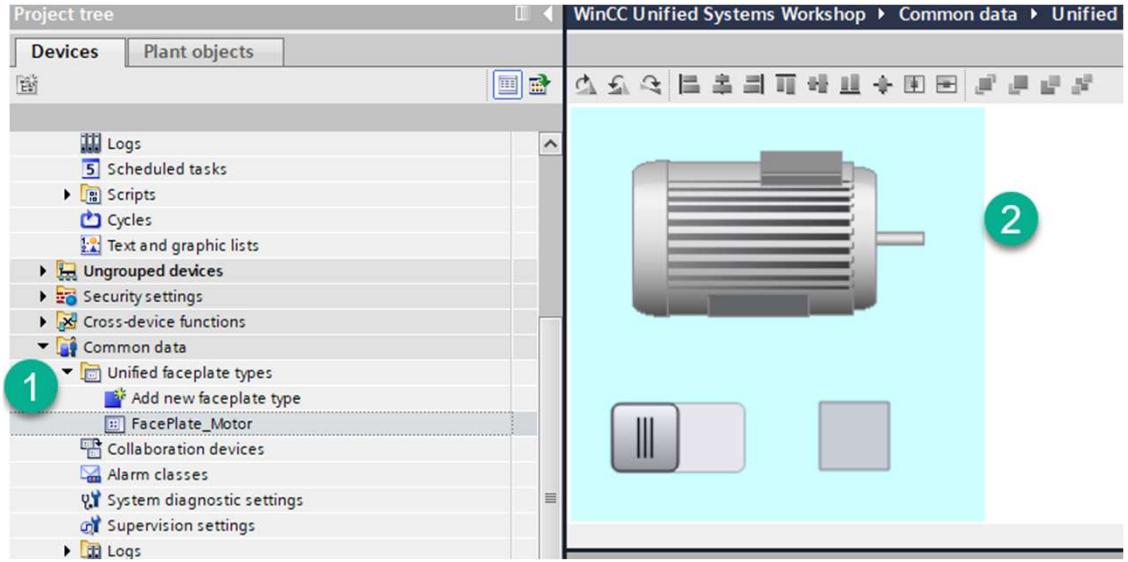

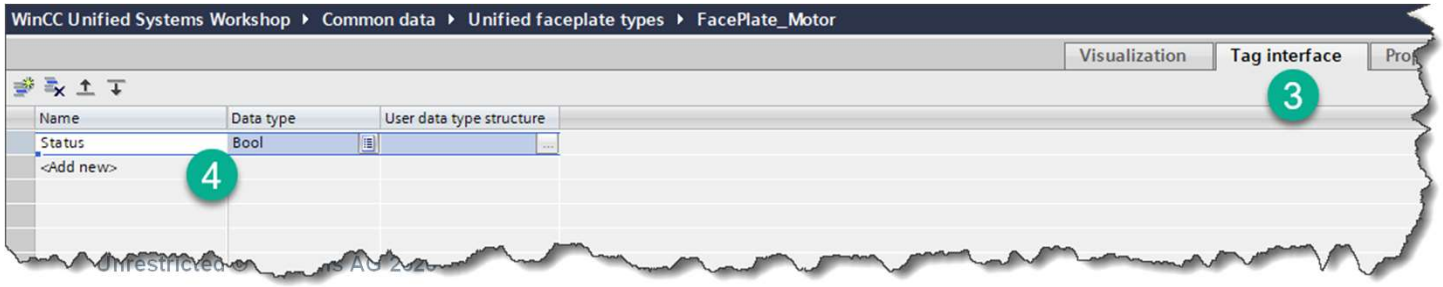

1. Create Faceplate Instance
2. Configure Picture
    1. Size background 250x250
    2. Motor Icon
    3. Switch
    4. Rectangle
3. Go to Tag interface
4. Configure Status tag (bool)

SIMATIC WinCC Unified
Hands On: FacePlates

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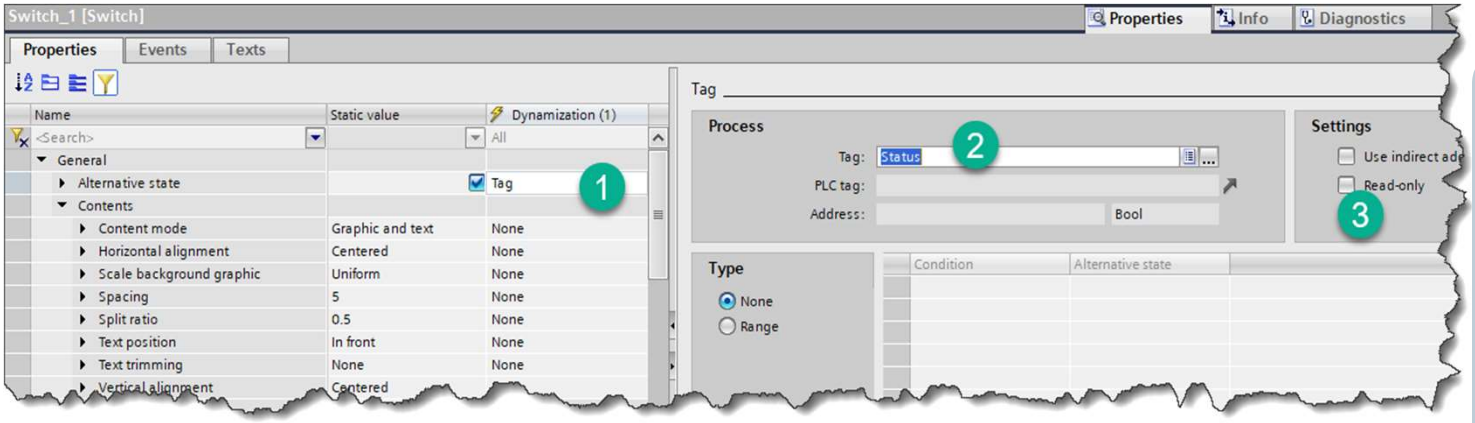

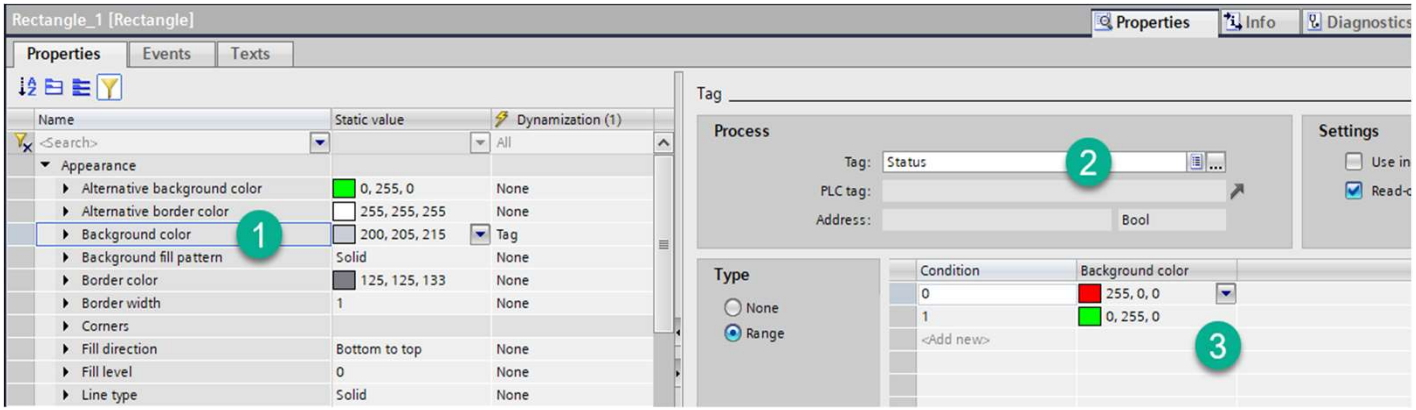

Switch

1. Set Dynamization to Tag
2. Select Status Tag
3. Clear Red-only

Rectangle

1. Set Dynamization for Background to Tag
2. Select Status tag
3. Set colors for state

SIMATIC WinCC Unified
Hands On: FacePlates

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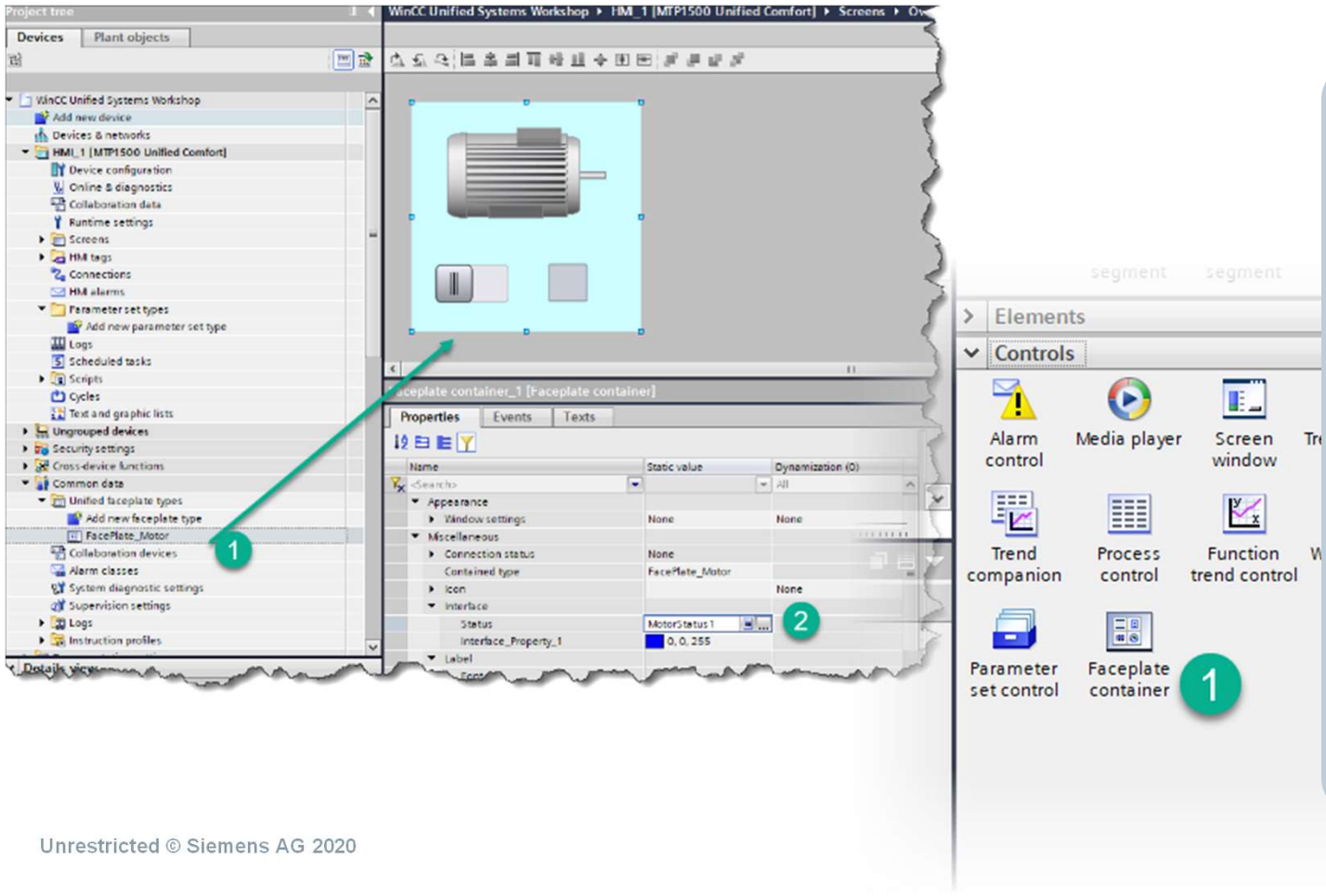

Place faceplate on screen

1. Drag faceplate from tree structure

   Or

   Drag Faceplate Container and define container type

2. Define tags for Interface (you will have an interface for each tag defined)

3. Download and test

SIMATIC WinCC Unified
Hands On: FacePlates

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WinCC Unified SIPEC Workshop Technological Hierarchy

WinCC Unified V16 – Technological Hierarchy
Object oriented plant modelling

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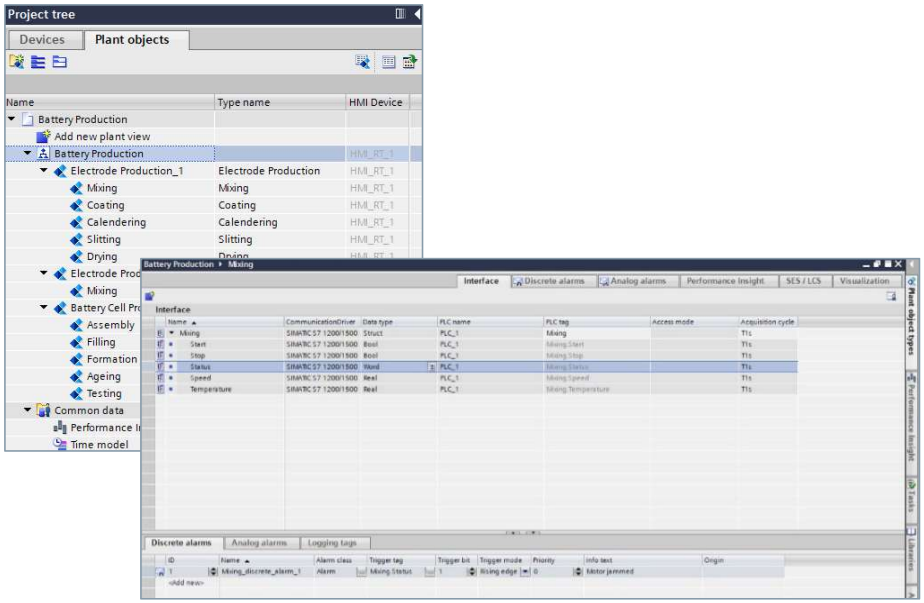

Enable central changeability of all instances due to plant object type instance concept

Reduced effort for engineering and maintenance (e.g., configuration of logging tags, alarms direct at the object)

Reduced avoidable mistakes due to consistent model

Improved overview and maintenance due to plant model and object-oriented engineering

WinCC Unified V16 – Technological Hierarchy
Object oriented plant operation

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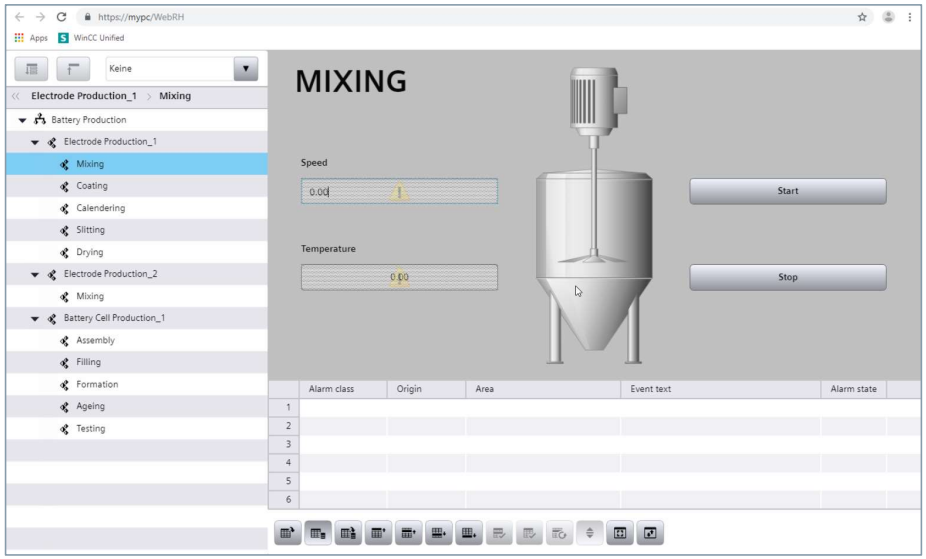

Easy orientation in the plant via technological hierarchy

Create screen navigation in no time with plant overview control

Fast overview the plant status based on hierarchical alarm propagation and filtering

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WinCC Unified SIPEC Workshop Openness

WinCC Unified – Openness Engineering
Shorten Time to Market using automated engineering

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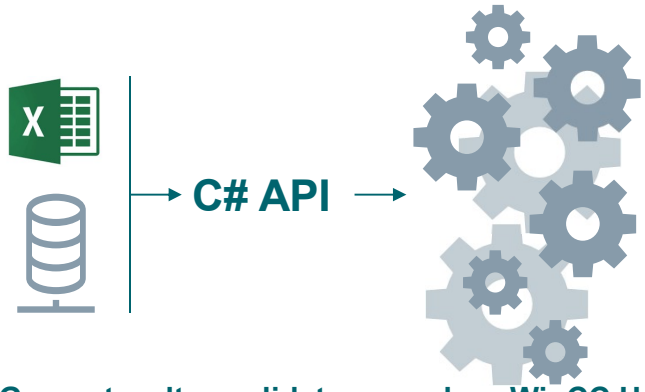

Generate, alter, validate or analyze WinCC Unified Projects

- Tags
- Alarms/Archives
- Screens
- Technological hierarchy of plant objects

Openness (C#) provides full access
to the WinCC Unified object model.

Automated project creation or adaption
of existing projects e.g., for OEMs

Project validation e.g., regarding
compliance to company standards

Project analysis and statistical evaluation
e.g., used tag trigger cycles, search screen
items of certain type, missing translations, …

WinCC Unified – Openness Runtime
Extensive possibilities to expand runtime functionality

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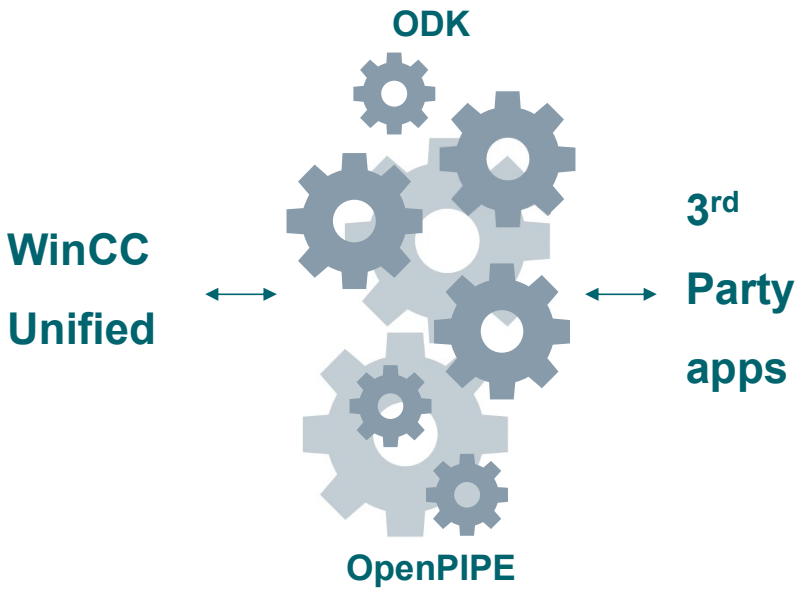

Read/write access via the WinCC Unified object model to runtime data using standard programming languages for customer specific solutions

Create custom solutions based on an extensive C#/C++ runtime object model – **Open Developer Kit (ODK)**

Integrate 3rd party systems based on a lightweight and language independent interface – **OpenPIPE**

ODK vs. OpenPIPE
What are the differences?

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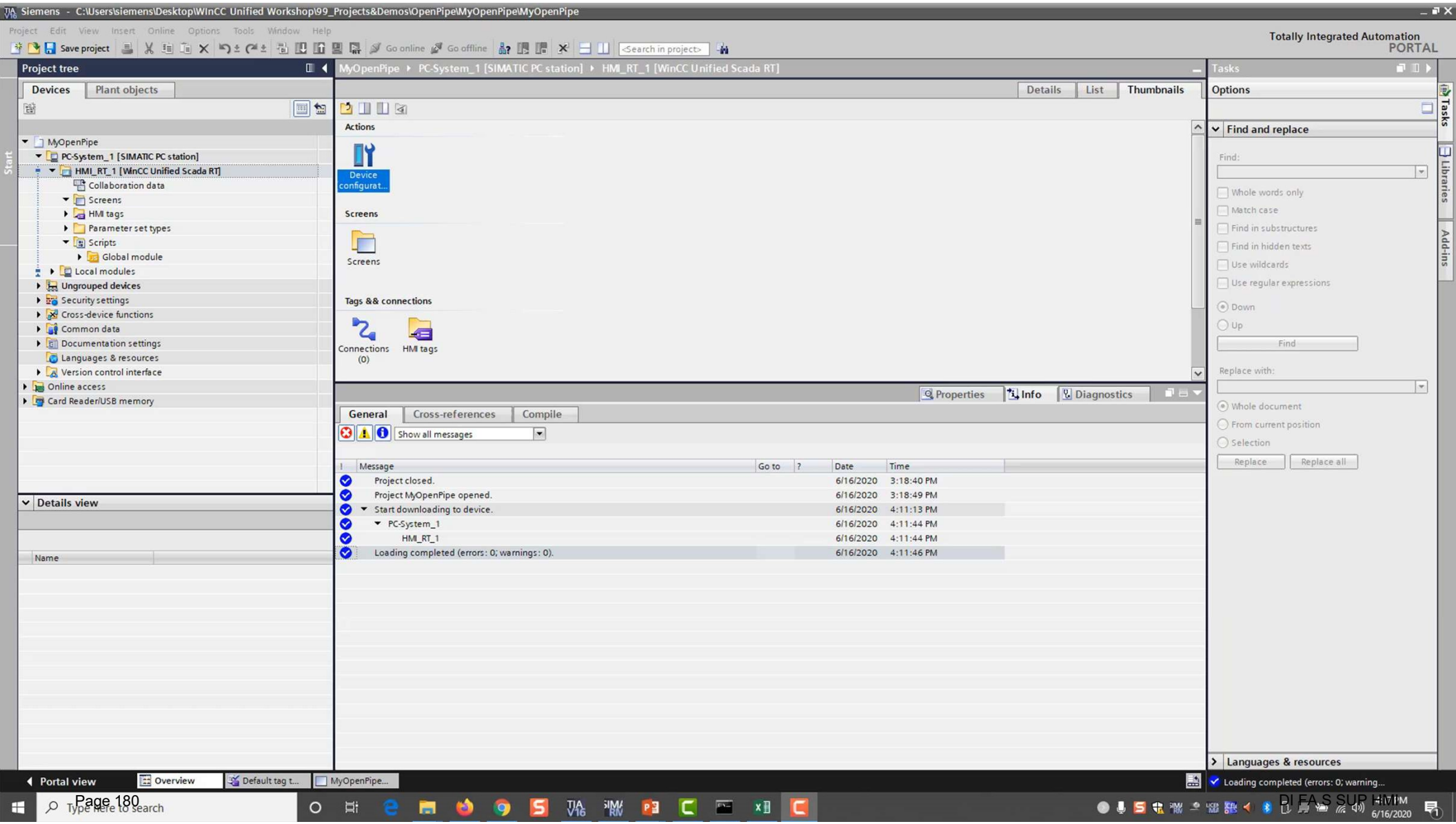
Unified Comfort Panel ✗	PC ✓		Unified Comfort Panel ✓	PC ✓
Open Developer Kit (ODK)			**OpenPIPE**	
Extensive runtime object model		**Type**	**Lightweight interface**	
Large quantities		**Data quantity**	Low to medium	
High		**Data throughput**	Low to medium	
C#/C++		**Programming languages**	**Language independent** e.g.: C#, C++, JavaScript, PowerShell, …	
Online and Logging Tags, Archives, Alarms, Users, Technological Hierarchy plant objects		**Read/Write access to data of WinCC Unified data**	Online Tags, Alarms (read only)	


Siemens - C:\Users\siemens\Desktop\WinCC Unified Workshop\99_Projects&Demos\OpenPipe\MyOpenPipe\MyOpenPipe
Totally Integrated Automation PORTAL
Project tree
Devices
Plant objects
MyOpenPipe
PC-System_1 [SIMATIC PC station]
HMI_RT_1 [WinCC Unified Scada RT]
Collaboration data
Screens
HMI tags
Parameter set types
Scripts
Global module
Local modules
Ungrouped devices
Security settings
Cross-device functions
Common data
Documentation settings
Languages & resources
Version control interface
Online access
Card Reader/USB memory
Details view
Name
MyOpenPipe ▸ PC-System_1 [SIMATIC PC station] ▸ HMI_RT_1 [WinCC Unified Scada RT]
Details
List
Thumbnails
Actions
Device configurat...
Screens
Screens
Tags && connections
Connections (0)
HMI tags
Properties
Info
Diagnostics
General
Cross-references
Compile
Show all messages
! Message Go to ? Date Time
Project closed. 6/16/2020 3:18:40 PM
Project MyOpenPipe opened. 6/16/2020 3:18:49 PM
Start downloading to device. 6/16/2020 4:11:13 PM
PC-System_1 6/16/2020 4:11:44 PM
HMI_RT_1 6/16/2020 4:11:44 PM
Loading completed (errors: 0; warnings: 0). 6/16/2020 4:11:46 PM
Tasks
Options
Find and replace
Find:
Whole words only
Match case
Find in substructures
Find in hidden texts
Use wildcards
Use regular expressions
Down
Up
Find
Replace with:
Whole document
From current position
Selection
Replace
Replace all
Languages & resources
Portal view
Overview
Default tag t...
MyOpenPipe...
Loading completed (errors: 0; warning...
Type here to search
6/16/2020

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WinCC Unified
User Administration

SIMATIC WinCC Unified
Integrated user management and access control

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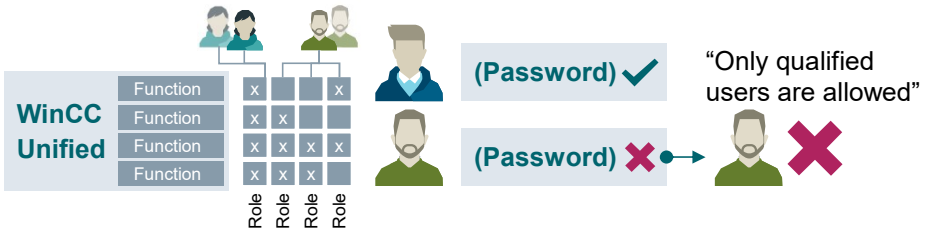

Local user management and access control (UMAC) using pre-defined functional rights and definition of users and password policies during engineering

Protection against unauthorized access
of single objects or entire production units

Define user roles and rights to your demand for privacy and integrity in terms of authentication and authorization

Add, remove users, assign roles
and change passwords during runtime

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WinCC Unified SIPEC Workshop Parameter Control

SIMATIC WinCC Unified
Parameter Control handling and operation of machine or production parameters

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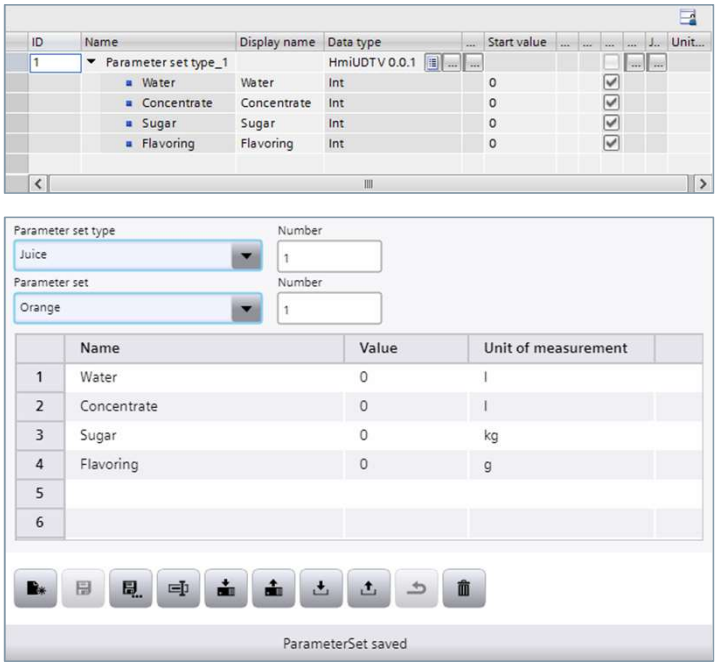

Extend parameters with unit of measurement.

Efficiency due to **reuse of structural definition** of “User Data Types” (PLC/HMI UDT) for parameter sets

Central changeability of parameter set types by using a new version of PLC/HMI UDT from library

Consistent bi-directional PLC/HMI transfer of parameter sets (manually/automatically)

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WinCC Unified SIPEC Workshop Reporting

WinCC Unified – Reporting
Flexible reporting based on Office tools

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Unified Comfort Panel **PC**

Flexible assignment and planning of report execution at runtime. Consistent documentation of production data for all levels of production (product or quality report)

Create **fully customized report templates** with a tool you already know – Microsoft Excel[1]

On Demand Generation – Trigger a report manually whenever you need it

Automated generation – Time-scheduled or event-triggered **reports – fully automatic** (optional)

1 Please note the system requirements

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WinCC Unified SIPEC Workshop Scripting

WinCC Unified – Scripting
Extensive scripting possibilities for Runtime

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Unified Comfort Panel ✓ PC ✓

```
function Button_1_OnTapped(item, x, y, modifiers, trigger) {
  let myDate = new Date(); //create a Date object
  let strTime, strDate, tagVal, strToWrite;
  strDate = myDate.toLocaleDateString(); //get Local date to script internal tag
  strTime = myDate.toLocaleTimeString(); //get Local time to script internal tag
  let tag1 = Tags('AnimationTag');
  let tagValue1 = tag1.Read(); //read the value of tag AnimationTag
  //Build the string to be written into file
  strToWrite = strDate + " " + strTime + ": TagValue = " + tagValue1 + "\r\n";

  //write the entry to the file
  //in case the folder does not exist, an error will occur,
  //if the file does not exist, it will be created
  HMIRuntime.FileSystem.AppendFile('D:\\MyFiles\\textfile.txt', strToWrite, 'utf8').then(
    function() {
      HMIRuntime.Trace('Write file finished successfully');
  })
  .catch(function(){
    HMIRuntime.Trace('Error writing File');
  });
}
```

Efficient scripting for custom solutions with direct access to Unified runtime objects (tags, logging tags, alarms, screen objects, technological hierarchy)

State-of-the-art and well-known programming language **JavaScript** (local and global scripts)

Local scripts for e.g., screen dynamics, events and scheduled tasks. Support of global script functions

Direct access to WinCC Unified JavaScript object model e.g., access to file-system or databases

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Digital Industries
Factory Automation
Visualization

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