HMI Template Suite (WinCC Unified)

SIMATIC WinCC Unified V17
SIMATIC HMI Unified Comfort Panels

https://support.industry.siemens.com/cs/ww/en/view/91174767

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Table of contents

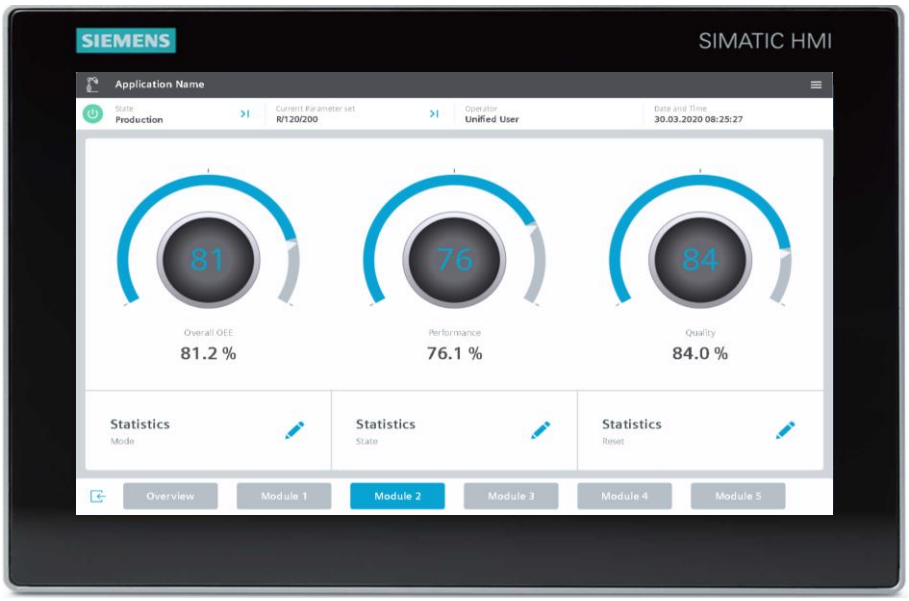
1 Introduction

1.1 Overview

Systems and machines are becoming more and more complex and, therefore, the demands on the system operators are increasing. For this reason, designing an intuitive and graphically appealing user interface as a link between human and machine is becoming increasingly more important.

The HMI Template Suite offers you templates and ideas to make the configuration of your HMI operator panel clear and modern.

Figure 1-1 Visualization with the "HMI Template Suite"



Layout and design are designed for smooth operation, transparency, and scalability. In this way, you can simplify the operation of your machine and reduce operator errors.

1.2 Principle of operation

The basis of the "HMI Template Suite" is a fully configured operator device or, as of WinCC Unified V17, a web application in the memory of the SIMATIC S7-1500 (SIMATIC WinCC Unified "View of Things", or "VoT" for short). You can find detailed information about "VoT" via the following link: \5\.

The fully configured operator device contains basic navigation and control functions. On this basis, you can easily build and extend your project in a modular manner using additional HMI objects from the library.

The "HMI Template Wizard" helps you create your new operator panel by selecting the contents and then having the Wizard integrate them into your project via Openness. The basis for the configuration of the Wizard is, in turn, the "HMI Template Suite (WinCC Unified)" library.

This gives you a uniform "look & feel" with a consistent operating concept, in addition to saving time during configuration.

1.3 Operating Philosophy

There is a philosophy behind every operating concept. This operating philosophy covers points such as the following:

- How is the operator notified of the current state of the machine?
- How is the operator shown when or where an operator action is necessary?
- How are the implications of an operator action made clear to the operator?

Humans are not able to register as much information as they would like to at one time. For this reason, it is necessary to present solid information in such a way as to allow the operator to register all the information quickly and intuitively. An easy-to-follow HMI plays a major role in this regard.

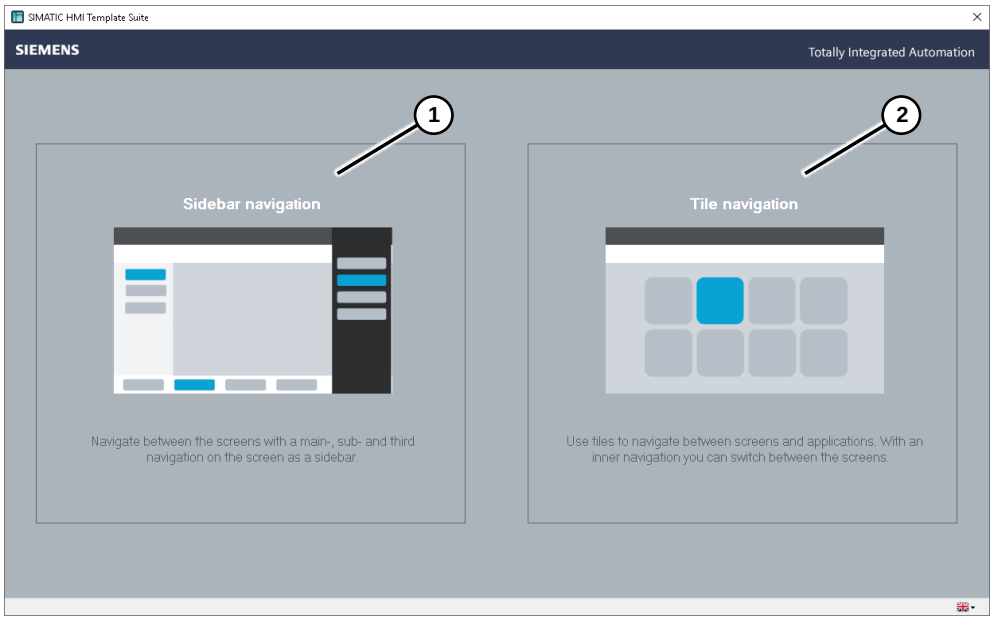
Note

You can find additional information on the operator philosophy in the free HMI Design Masterclass:

https://new.siemens.com/global/en/products/automation/simatic-hmi/design-masterclass.html

1.4 Screen Navigation

Figure 1-2



As of version V2.0, the Wizard offers two types of navigation.

1. Sidebar navigation (navigation elements arranged to the side)
2. Tile navigation

1.4.1 Sidebar navigation

"Sidebar navigation" is always useful where several subordinate navigation levels are required.

Of course, less complex system and machine areas can also be configured here.

1.4.2 Tile navigation

"Tile navigation" is ideal when connected machinery or plant areas are operated from one operator panel.

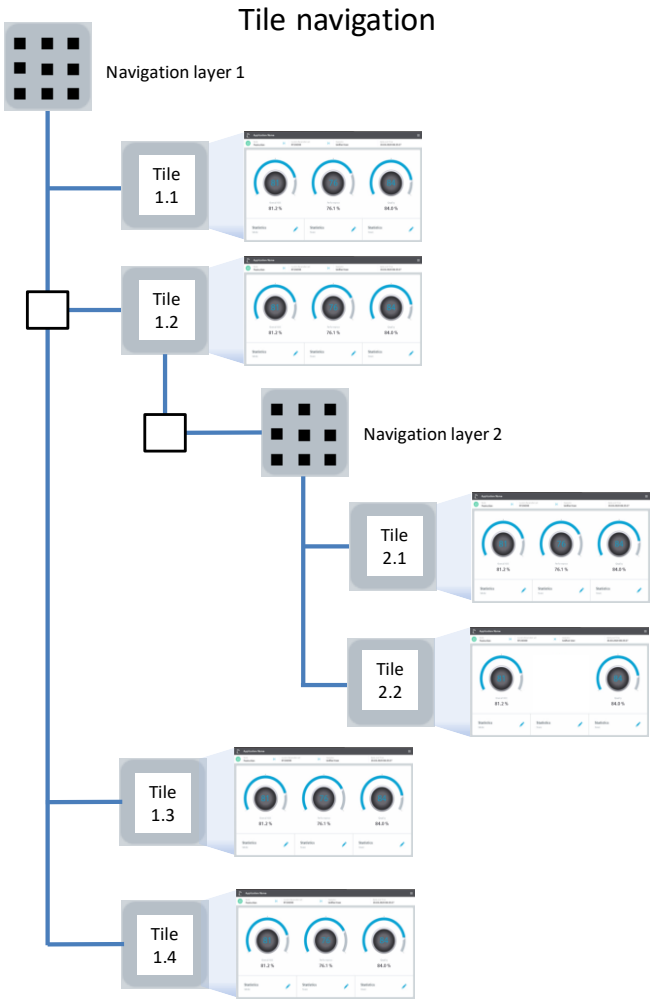
The navigation can be likened to the Table of Contents in a Word document in which a main heading contains sub-chapters.

Here, the "Tile" named "Tile 1.1" is analogous to the first "navigation level" which pulls up the associated plant screen.

The "Tile" named "Tile 2.1" is analogous to the second "navigation level" which pulls up its own associated plant screen.

The following graphic is provided to illustrate the principle of operation.

Figure 1-3



A detailed description of how to configure a "tile navigation" can be found in chapter 2.2.2 Tile navigation.

1.5 Components used

This application example was created with these hardware and software components:

Table 1-1

Components	Quantity	Item number	Note
SIMATIC HMI MTP700 Unified Comfort	1	6AV2128-3GB06-0AX0	Alternatively, you can use operator panels in sizes from 7 to 22 inches.
SIMATIC WinCC Unified V17 (Engineering)	1	6AV2151-0XB01-7AA5	Engineering in the TIA Portal.
SIMATIC WinCC Unified PC RT V17	1	6AV2154-2GB01-7AA0	

This application example consists of the following components:

Table 1-2

Components	File name	Note
Documentation	91174767_HMITemplateSuiteUnified_V20_DOC_en.pdf	
Library	91174767_HMI_Template_Suite_Unified_Lib_V17.zip	
Wizard	91174767_HMITemplateSuiteWizard_V2.0.1_Setup.zip	"Exe file"

1.6 Color concept

For optimal usability and ergonomics, a simple color concept is used for this project. The accent color is used to highlight objects such as the title bar or active buttons and tabs. Shades of gray are used to distinguish the navigation bars and the status bar from the contents of the main screen.

Table 1-3

Color	RGB color code	Function

2 HMI Template Wizard

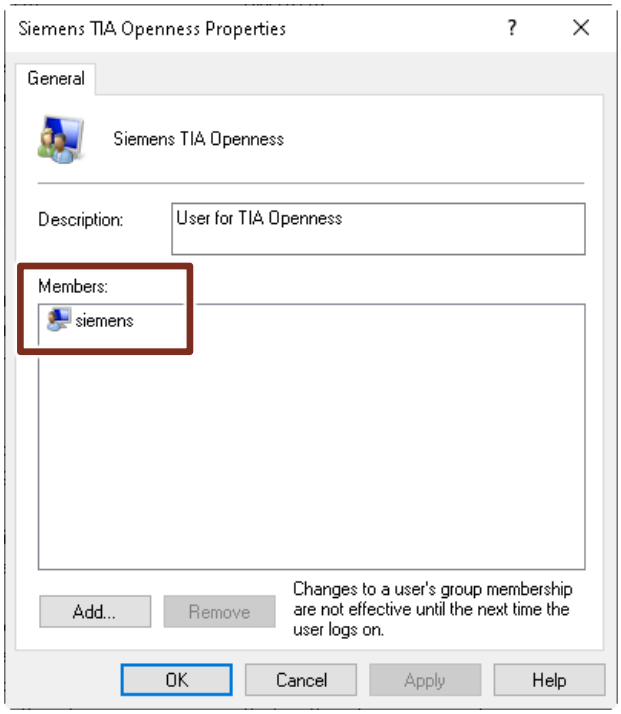
The HMI Template Wizard helps you create the configuration for your Unified operator panel even faster.

2.1 Installing HMI Template Wizard

2.1.1 Requirements

1. The Template Suite Wizard accesses the selected contents of the library via the TIA Portal Openness interface and integrates them into your project. It is therefore necessary that the user with which you are logged in to the Engineering PC is a member of the Windows user group "Siemens TIA Openness".

   Figure 2-1

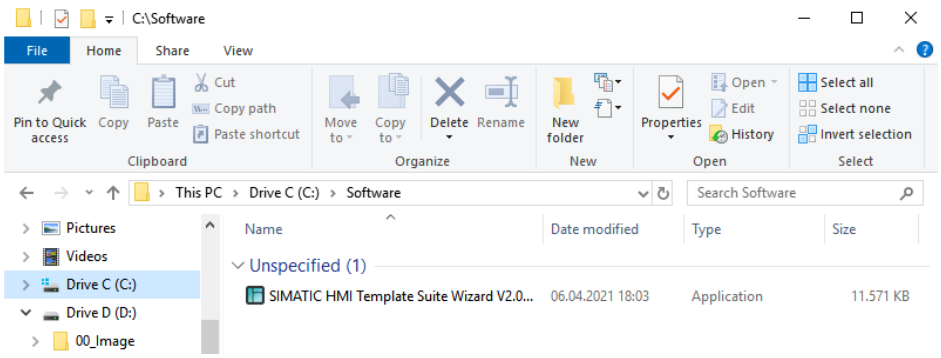


2. WinCC Unified V17 (or higher) is installed on the PC.
3. A user must be created in WinCC Unified.

2.1.2 Installation

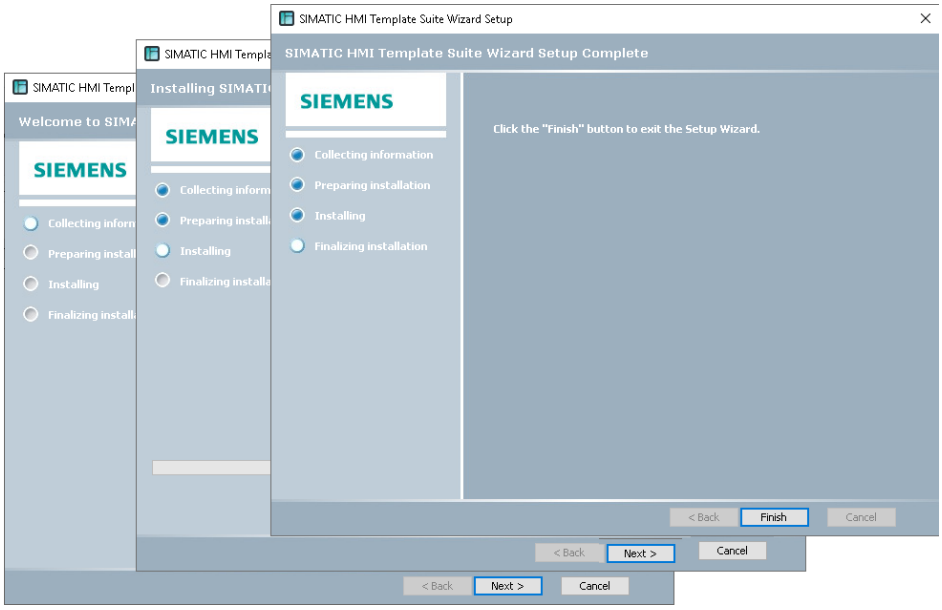
1. Download the file "SIMATIC HMI Template Suite Wizard V2.0.0 Setup.zip" from this application example and unzip it.
2. Start the installation by double clicking the file "SIMATIC HMI Template Suite Wizard V2.0.0 Setup.exe".

   Figure 2-2



3. Follow the setup instructions and perform all installation steps.

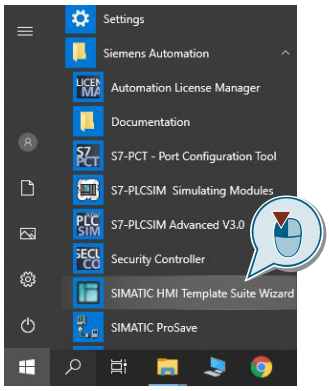
   Figure 2-3



2.2 Operating the HMI Template Wizard

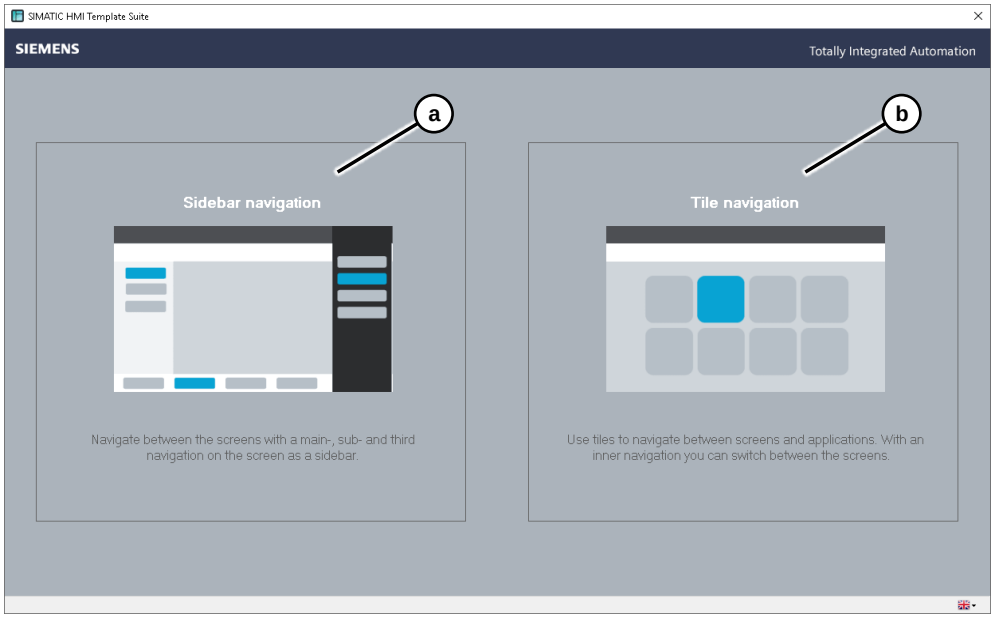
1. Start the "SIMATIC HMI Template Suite Wizard" via the Windows start menu in the folder "Siemens Automation".

   Figure 2-4



2. Select the navigation type
   You can choose between two types of navigation.
   a. Sidebar navigation.
   b. Tile navigation.

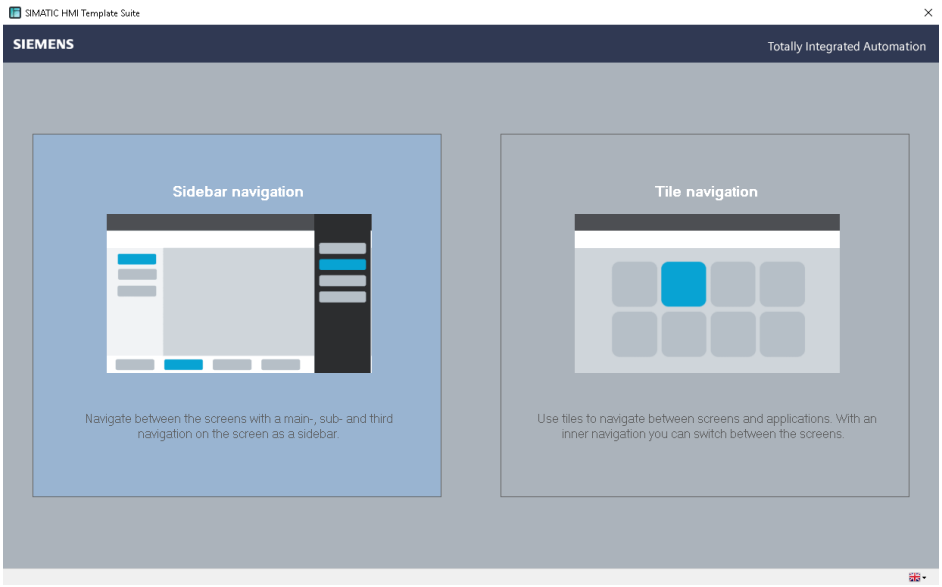
Figure 2-5



2.2.1 Sidebar navigation

1. In the first step, select the navigation type.
   In this case, "Sidebar navigation". Double-click the blue surface to start the Wizard.

   Figure 2-6

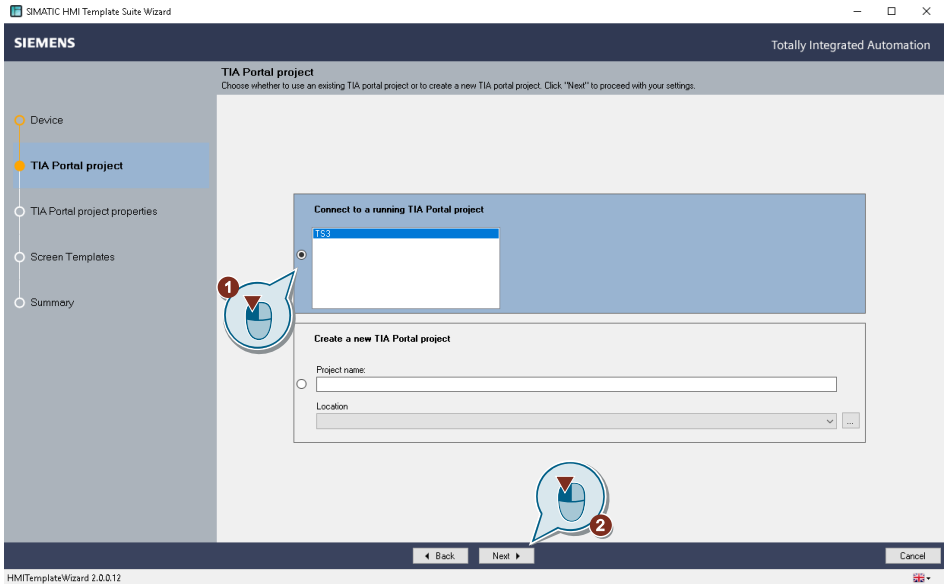


2. Select device
   - Select which device (Unified Comfort Panel or PC station with WinCC Unified Runtime) you want to create (1).
   - Then use the drop-down list to select the desired resolution (2).
   - Click "Next" button (3).

   Figure 2-7

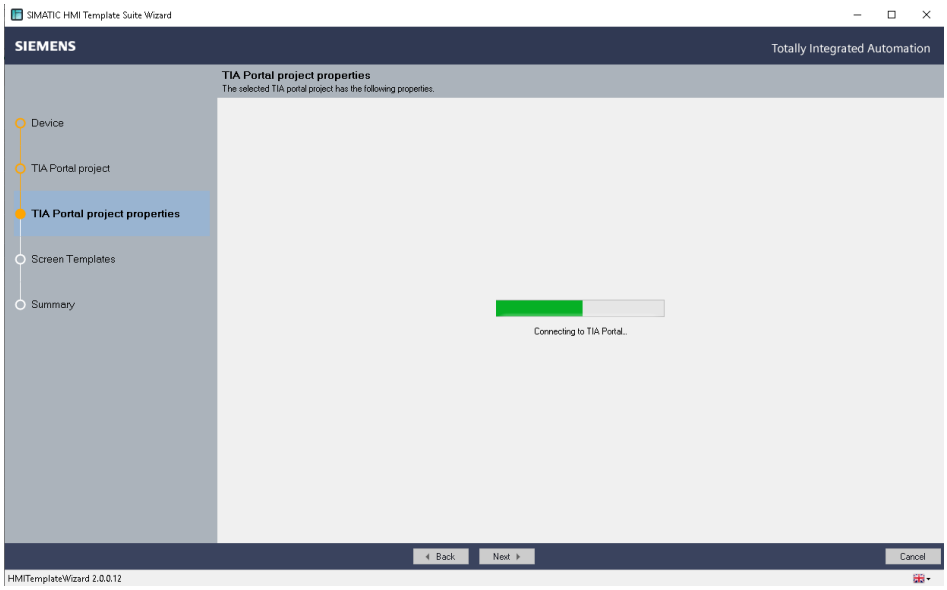
3. Select a TIA project
   - In the next step, choose whether you want to modify an existing TIA project (1) or create a new project.
     To extend an existing project, the project must already be open.
     If you create a new project, you must also specify the "Project name" and "Location".
   - Click "Next" button (2).

Figure 2-8



4. Various functions now run automatically in the background, such as establishing a connection to the TIA Portal project, etc.

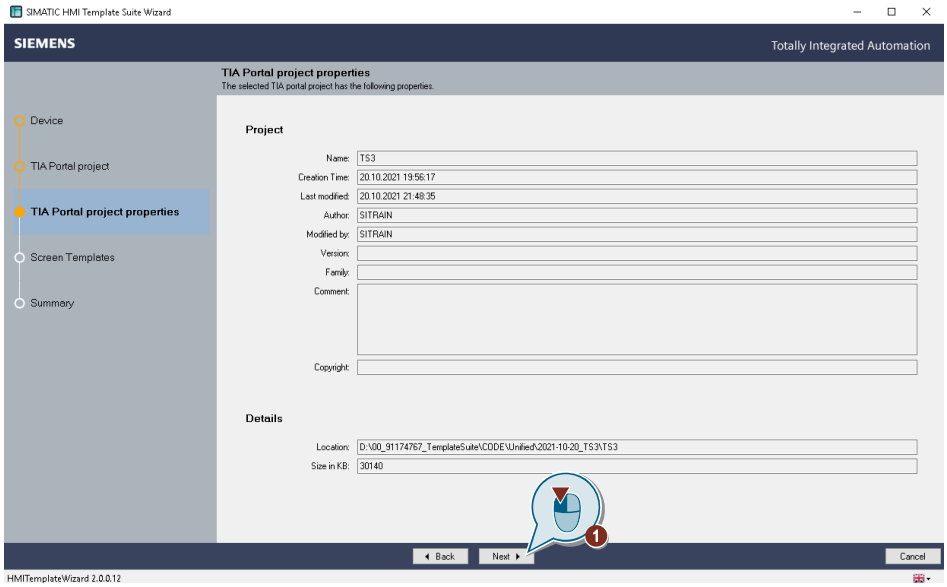
Figure 2-9



After completion, the following screen appears automatically.

5. The properties of the project are displayed as read-only. Click "Next" to go to the screen selection.

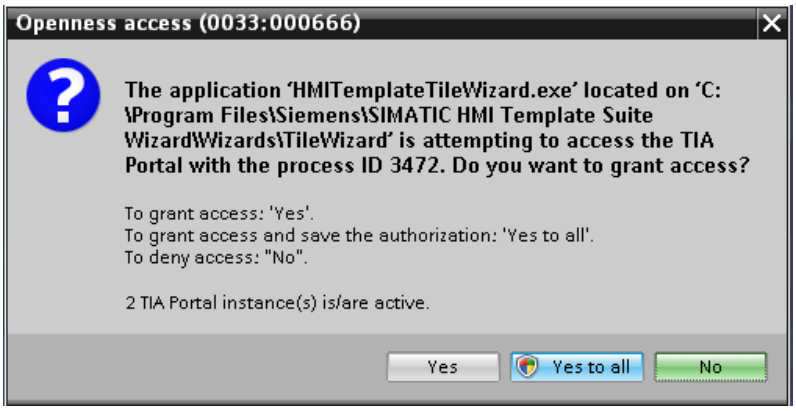
Figure 2-10



Openness access message

While the Wizard performs some functions automatically in the background, the following message appears when you use the Wizard for the first time. Depending on the configuration, this message may be partially obscured by the "Wizard screen", meaning you may not see the message, and an error message may appear (see Figure 2-12).

Figure 2-11



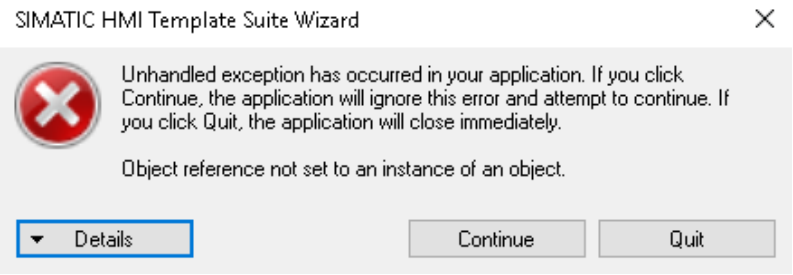
Otherwise, confirm the message by clicking "Yes to all".

Error message

If the "Openness access" message (see Figure 2-11) is not confirmed in time, the following message appears. In this case, click "Quit".

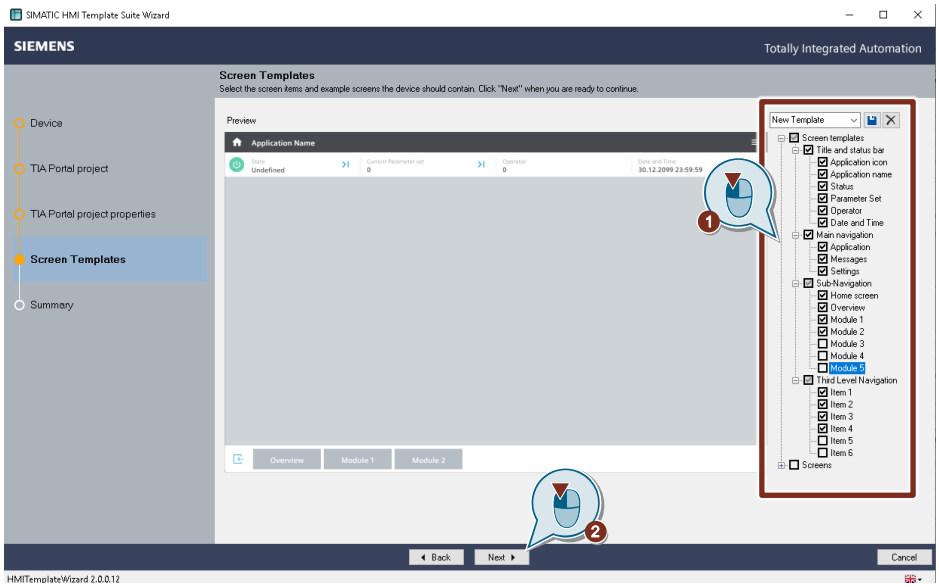
The Wizard is canceled. Start the Wizard a second time.

Figure 2-12



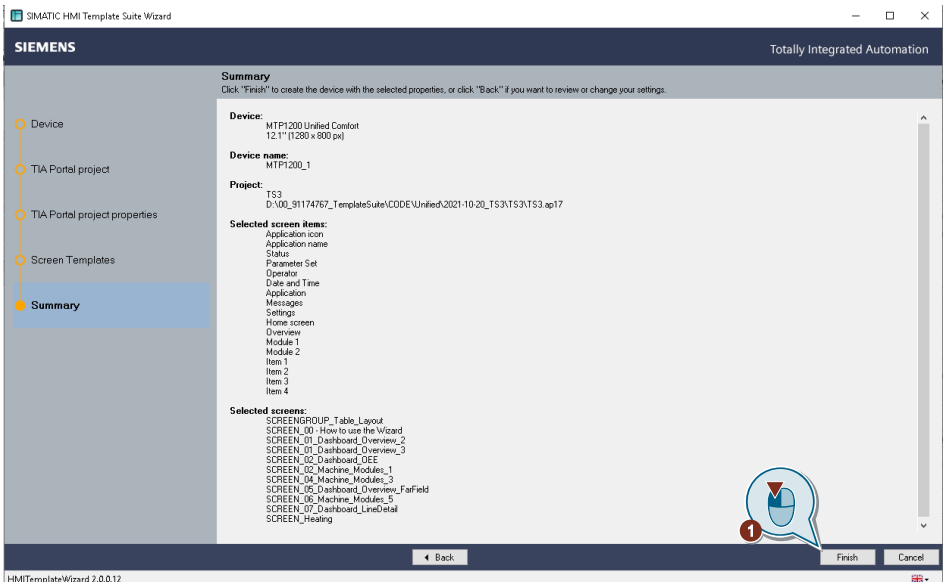
6. Select screens for navigation and for system operation.
   Check or uncheck the checkboxes of the objects you want to use in your project (1).
   When clicking the name of a grouping or an element, it will be highlighted in the preview.
   When you have finished selecting the screens, click "Next" (2).

   Figure 2-13



7. In the last step, all chosen settings are displayed again in summary. Click "Finish" (1) to complete the Wizard and apply the changes to your project.

Figure 2-14

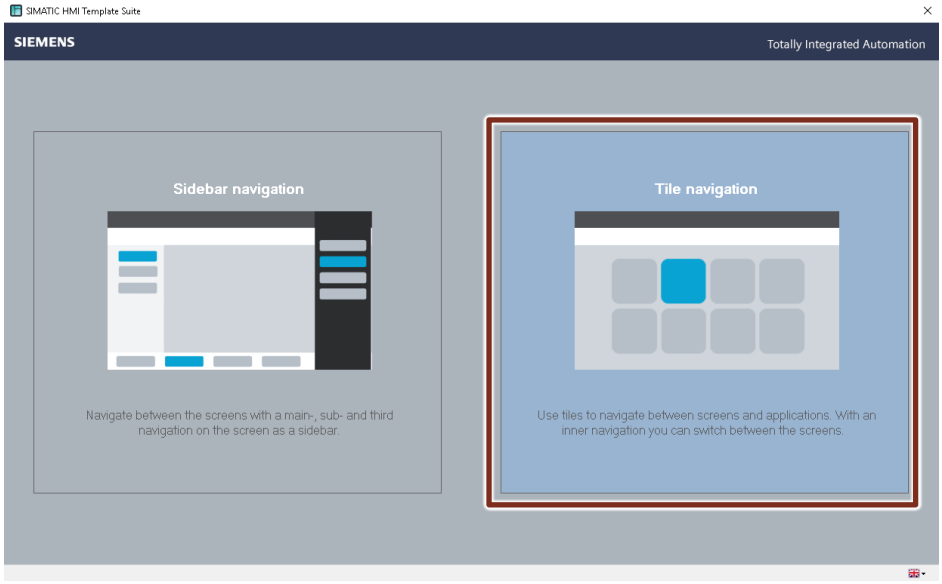


2.2.2 Tile navigation

General settings

1. After starting the Wizard, first select the navigation type, in this case "Tile navigation". Double-click the blue button (interface with red border) to start the Wizard.

   Figure 2-15

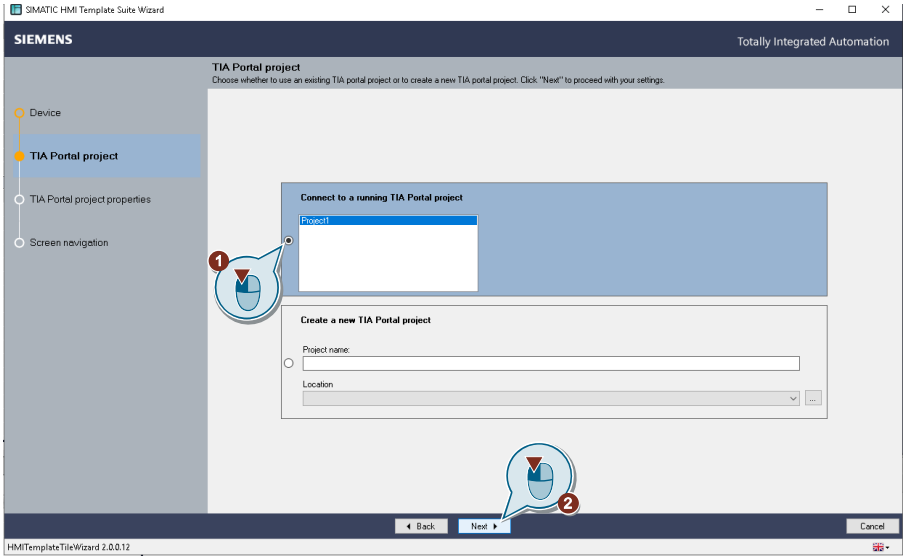


2. Select device
   - Select which device (Unified Comfort Panel or PC station with WinCC Unified Runtime) you want to create (1).
   - Use the drop-down list to select the desired resolution (2).
   - Click the "Next" button (3).

   Figure 2-16

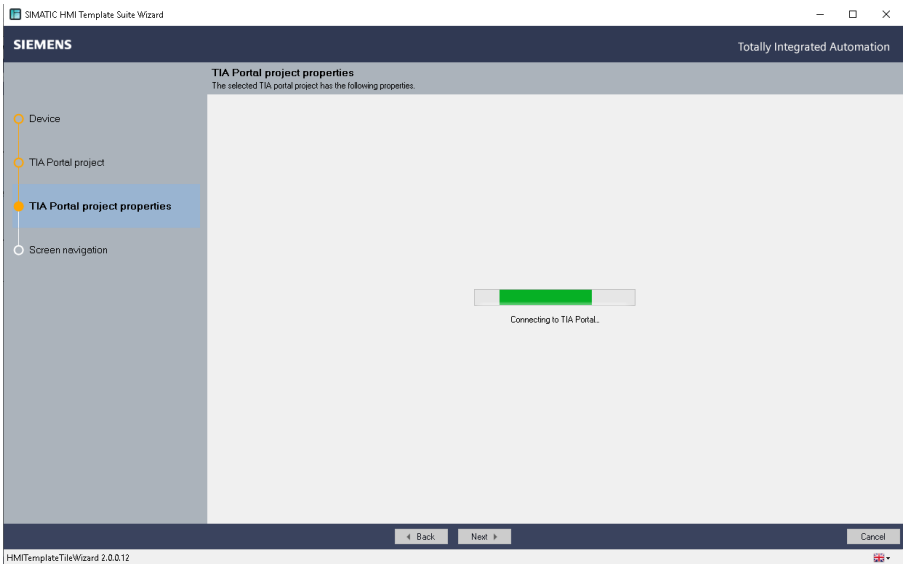
3. Select a TIA project
   - Choose whether you want to modify an existing TIA project (1) or create a new project.
     To extend an existing project, the project must already be open.
     If you create a new project, you must also specify the "Project name" and "Location".
   - Click the "Next" button (2).

Figure 2-17



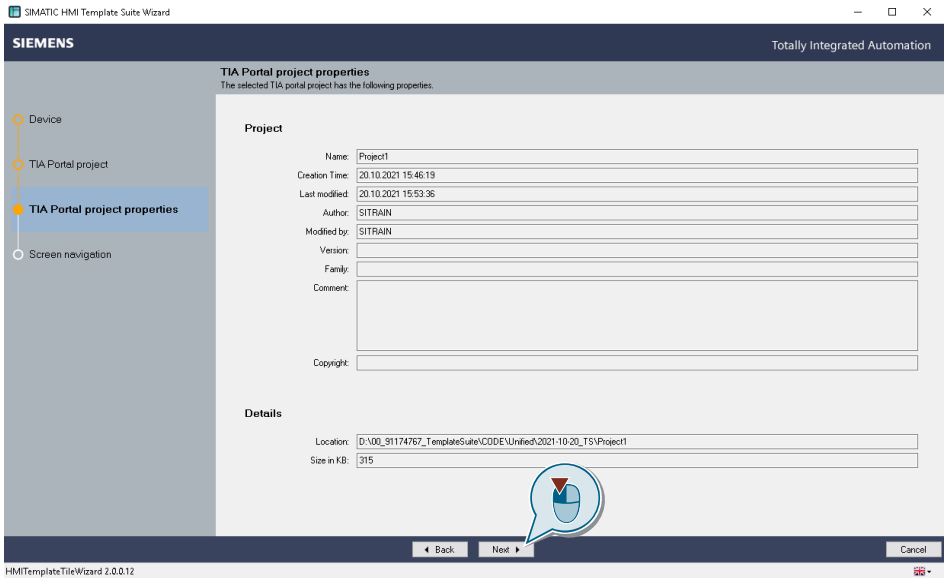
4. Various functions now run automatically in the background, such as establishing a connection to the TIA Portal project, etc. This can cause a brief waiting time and is necessary for transmitting the screen navigation that will be programmed below.

Figure 2-18



After completion, the following screen appears automatically.

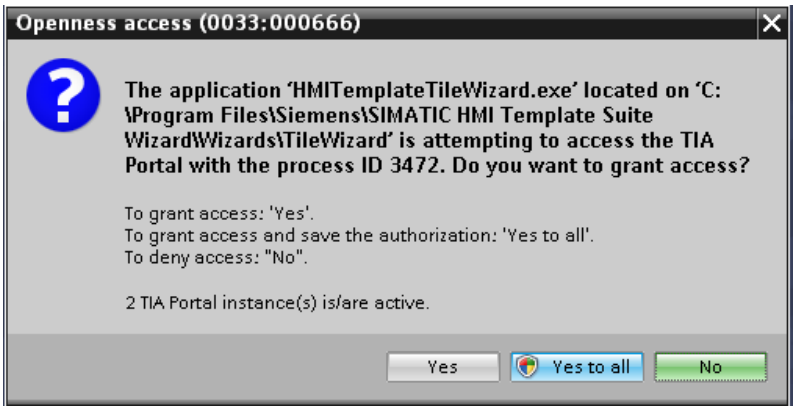
5. The properties of the project are displayed as read-only. Click "Next" to go to the screen selection screen.



Openness access message

While the Wizard performs some functions automatically in the background, the following message appears when you use the Wizard for the first time. Depending on the configuration, this message may be partially obscured by the "Wizard screen", meaning you may not see the message, and an error message may appear (see Figure 2-20).

Figure 2-19



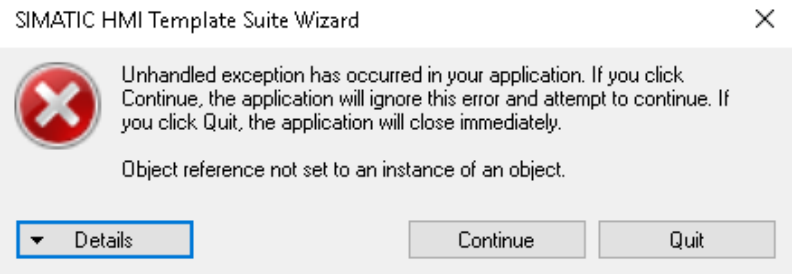
Otherwise, confirm the message by clicking "Yes to all".

Error message

If the "Openness access" message (see Figure 2-19) is not confirmed in time (the specific time is defined through the TIA Openness API), the following message appears. In this case, click "Quit".

The Wizard is canceled and the message will prompt you at the next start.

Figure 2-20

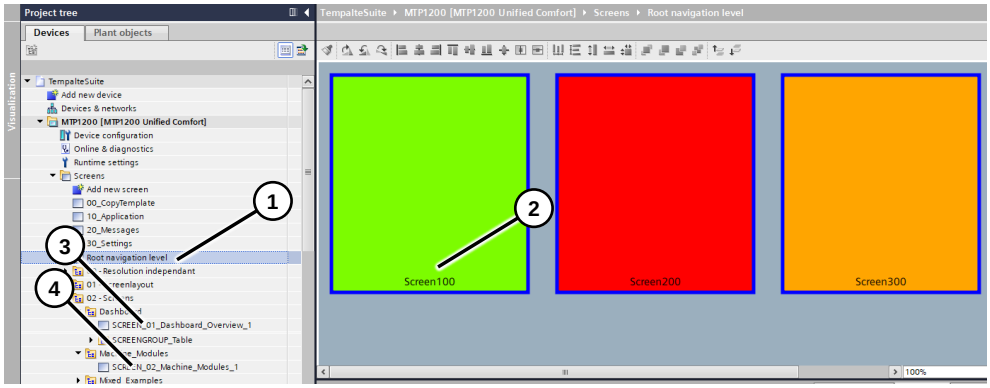


Create a screen layout

The small excerpt in the Figure below shows how the "Tile navigation" created with the Wizard will later appear in the finished HMI project. More details on this can be found at the end of this chapter.

Figure 2-21

(1) Root navigation level
(2) Tile text: Screen100 (alternative: name of screen that appears.
(3) Screen from the Template Suite
(4) Screen from the Template Suite



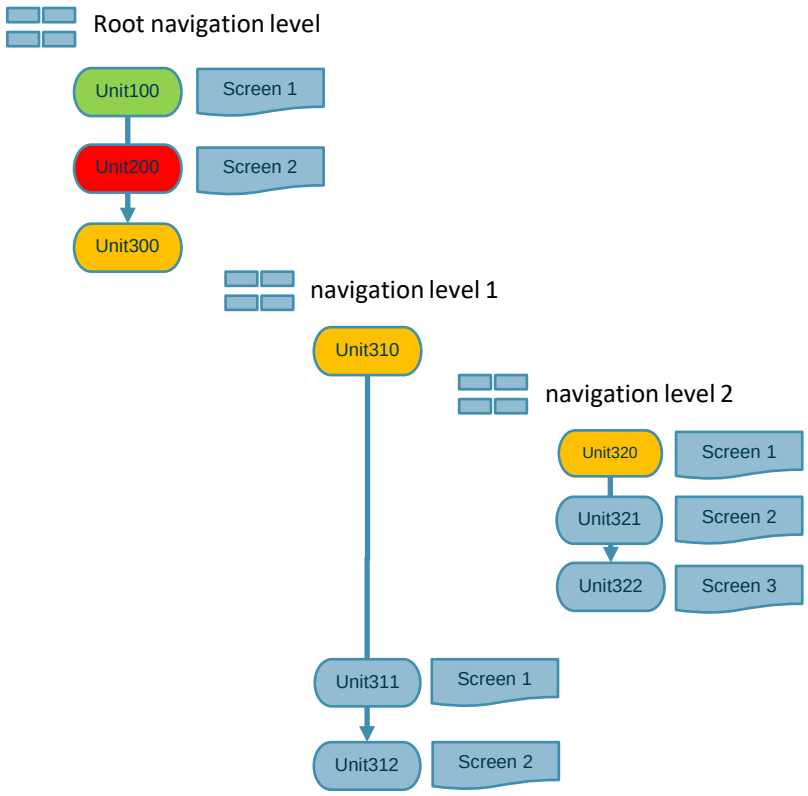
Create first navigation level

Note

Before starting to create the individual navigation levels and their page calls with the "tiles", you should create an overview of the plant structure and its naming conventions. This will help you keep track of the configuration steps below.

Example of a plant structure:

Figure 2-22



Unit100 = Plant unit 1

Unit200 = Plant unit 2

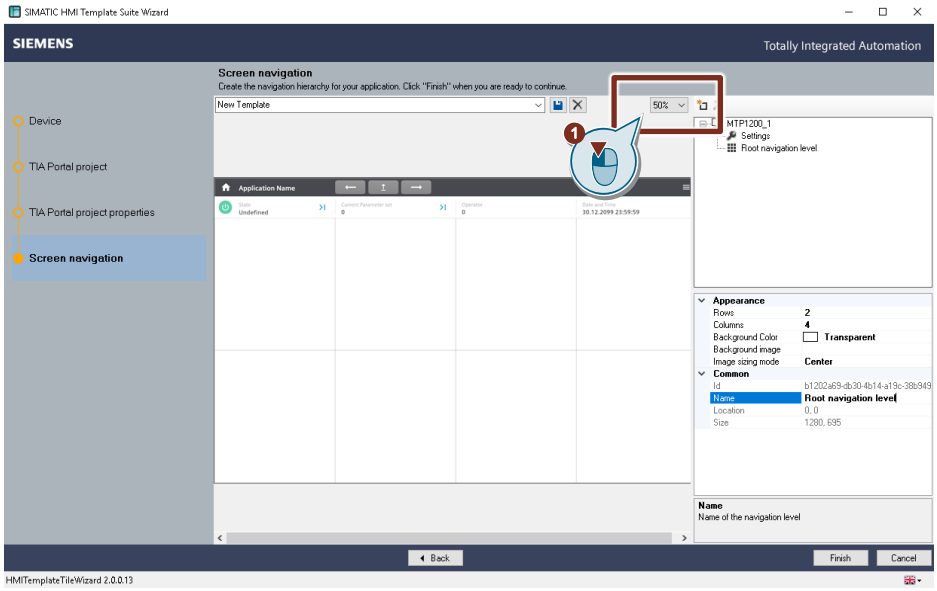
Unit300 = Plant unit 3

Unit310 = Plant unit 3, section 1…

Unit320 = Plant unit 3, section 2…

Assign tiles

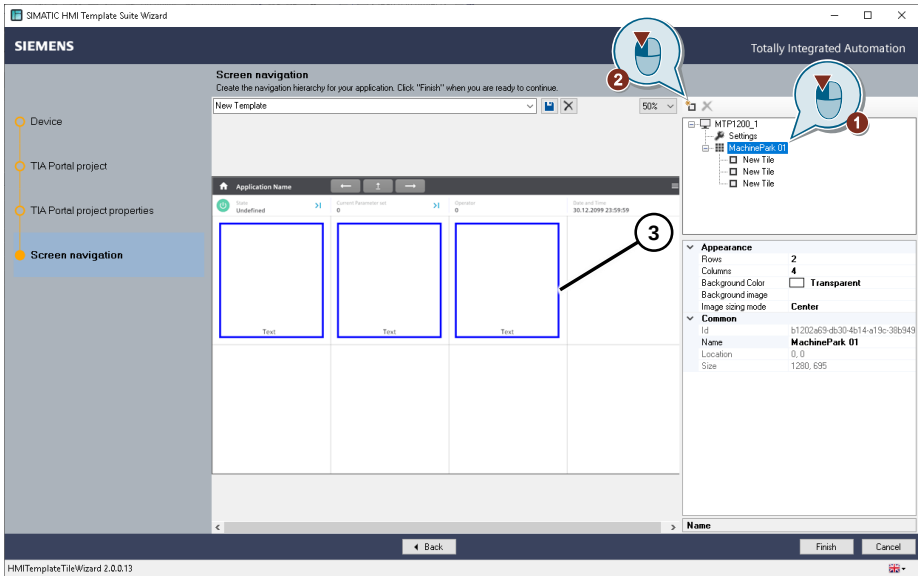
1. In the generated HMI project, the tiles are used to access the assigned Template Suite screens.
   Zoom out of the view using the drop-down menu (1) for a more manageable view.
   Figure 2-23



First navigation level

1. Select the "Root navigation level" (1).
2. Create a new tile by clicking the tile icon (2). Repeat this step to create additional tiles.
   Tiles you have inserted will each appear as a blue rectangle (3).

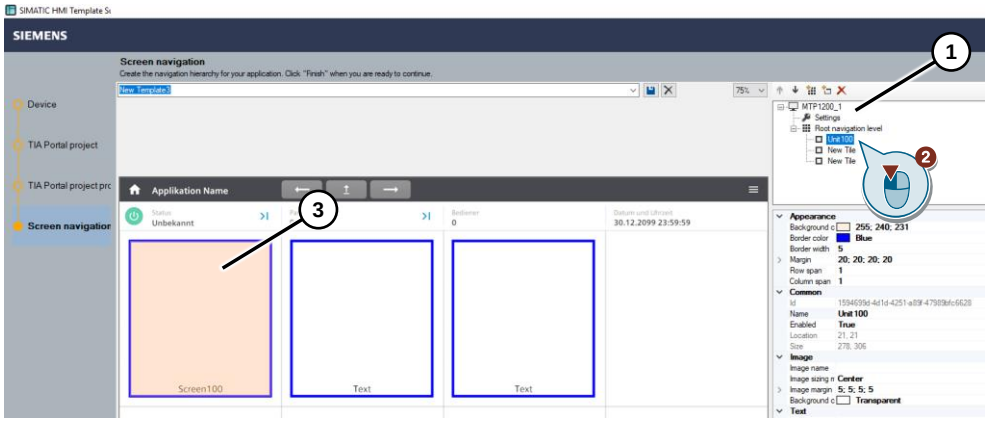
   Figure 2-24



Edit tile properties

1. Select the tile you created (2) in the Overview window (1).
   The selected tile can be recognized by the color change (3).

Figure 2-25



Note

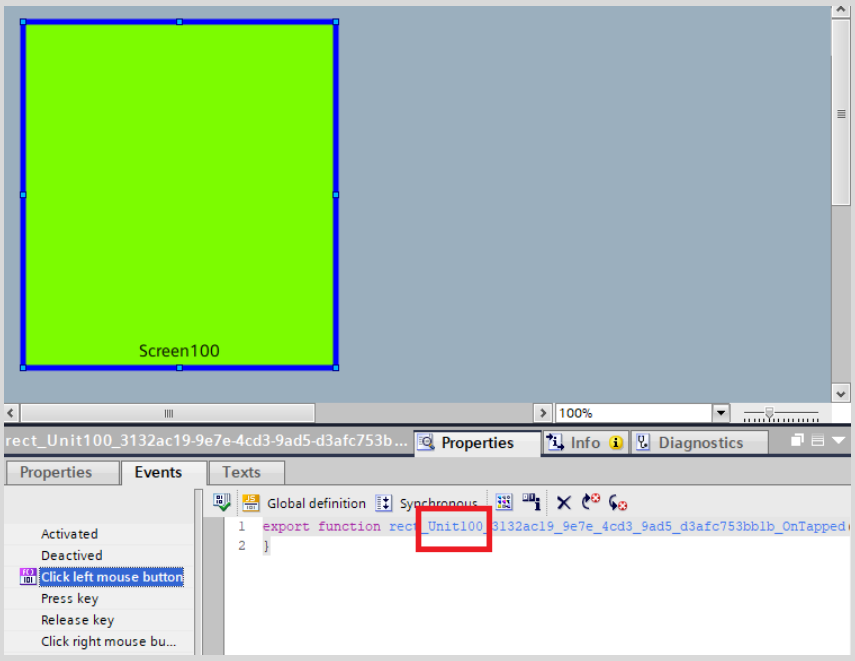
Various tile properties are described below.

If your project is in multiple languages, try to use English names for the "**Name**" property where possible.

This name will later be used for the screen navigation. Do **not** change them later on.

In the example, the name "Unit100" was used for the tile.

In the "**Text**" property, enter the name of the screen that this tile will pull up, for example. The text you enter will appear at the bottom edge of the tile. It serves as a tooltip about the function of the tile, for example to change to the screen indicated. This text can be changed later on in the generated HMI project.

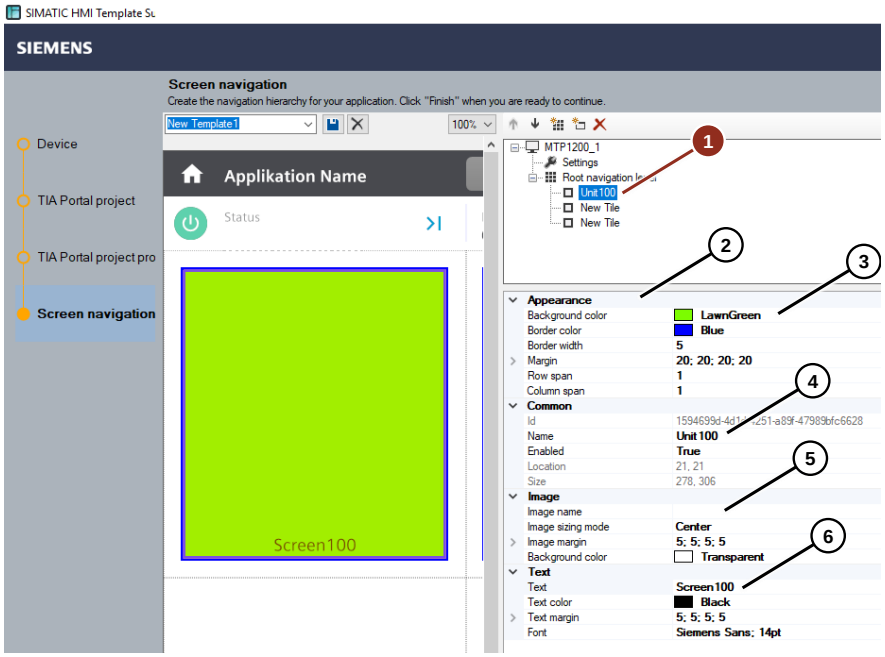


2. The properties of the tile (2) appear under the selected tile (1). You can change various settings here. Some of the settings are described in greater detail below.

   (3) You can give the tile a background color. This lets you color-code plant areas, for example.
   (4) Give the tile a unique name under the "**Name**" section. The name will be used for the screen navigation.
   (5) Here you can select a graphic from a preset list and have it displayed on the foreground of the tile.
   (6) Give the tile a name with the "**Text**" section. This text appears at the bottom of the tile. It helps subsequent navigation in individual sections of the runtime editor.

3. Change the settings for the other tiles.

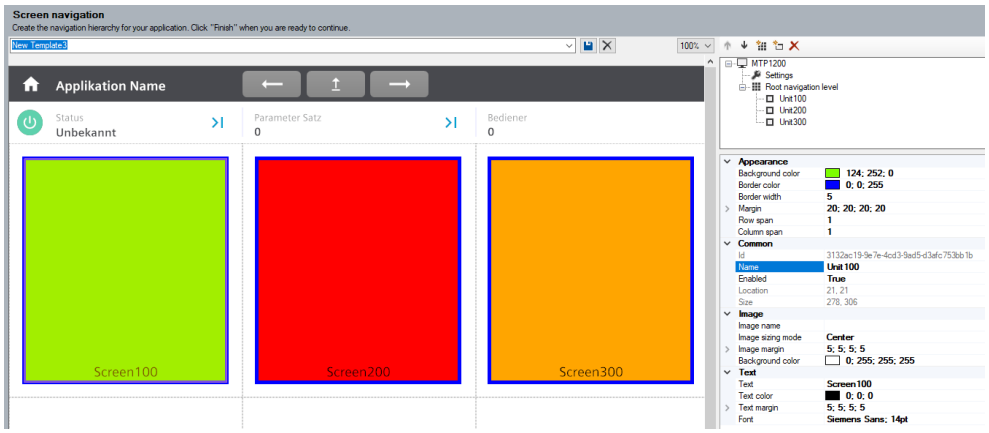
Figure 2-26



Here you can see the appearance of the first three tiles. The tiles do not have any function yet.

See also Figure 2-32 for more information.

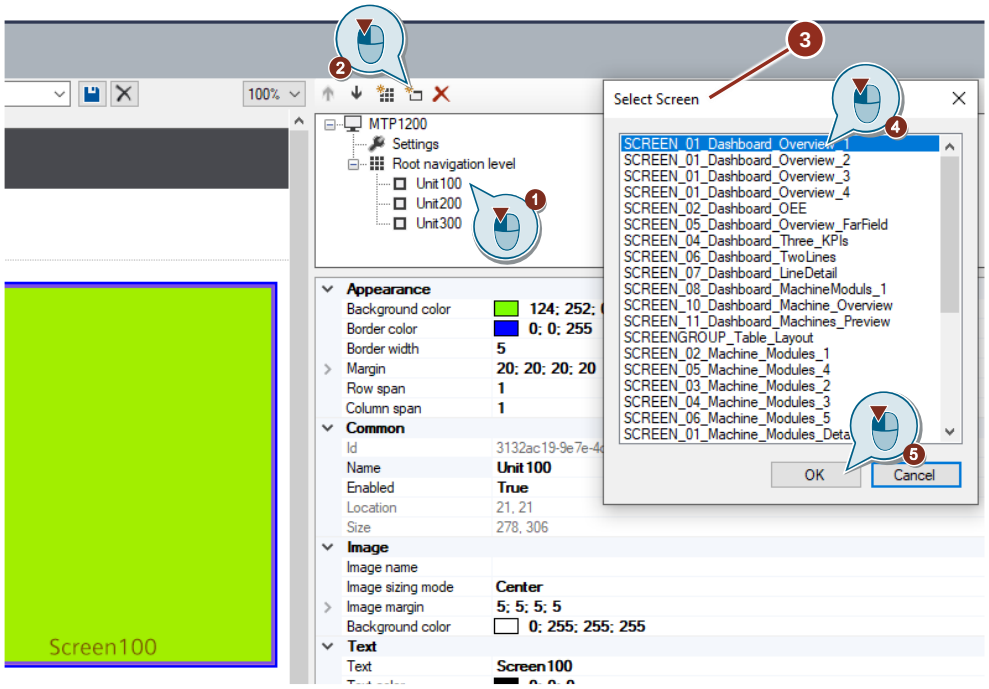
Figure 2-27



Optional: Assign a tile an image from the Template Suite collection

1. Select a tile. In this example: the tile "Unit100" (1).
2. Click the "library" icon (2) in the header.
   A window will open where you can select images from the "Template Suite library" (3).
3. Select an image from the library collection (4) and confirm the selection with "Ok" (5).

Figure 2-28

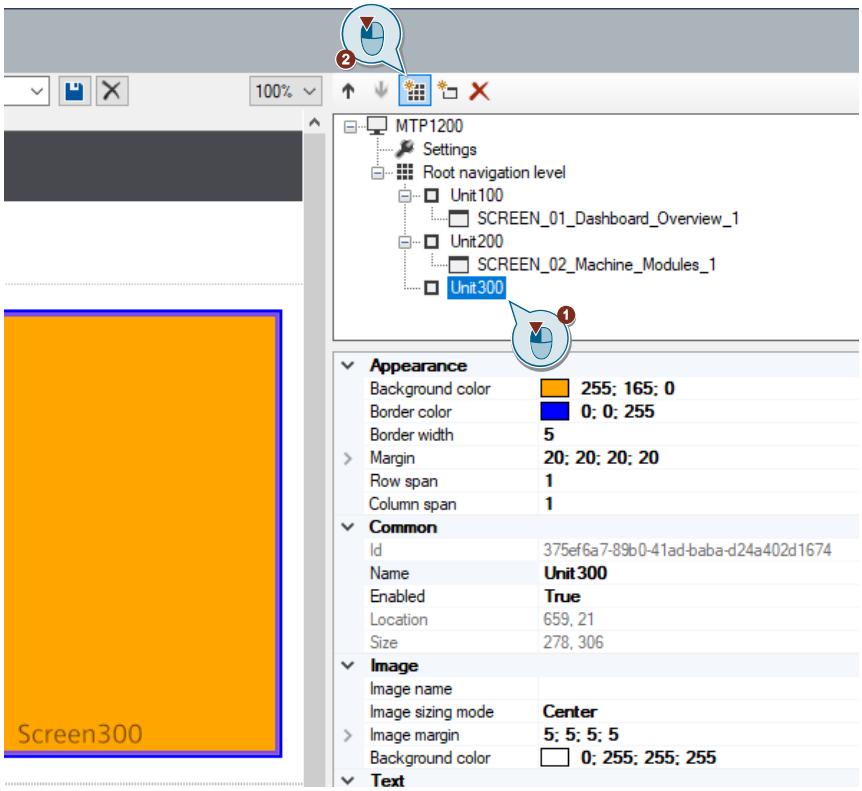


Repeat these steps if you wish to assign other tiles images from the library collection.

Optional: Assign a navigation level to a tile

1. Select a tile. In this example: the tile "Unit300" (1).
2. Click the "navigation levels" icon (2) in the header.
   Clicking the "navigation level" icon creates a new "level" where you can add more "tiles".
3. Assign a name to the level you just created under the properties of the new level.

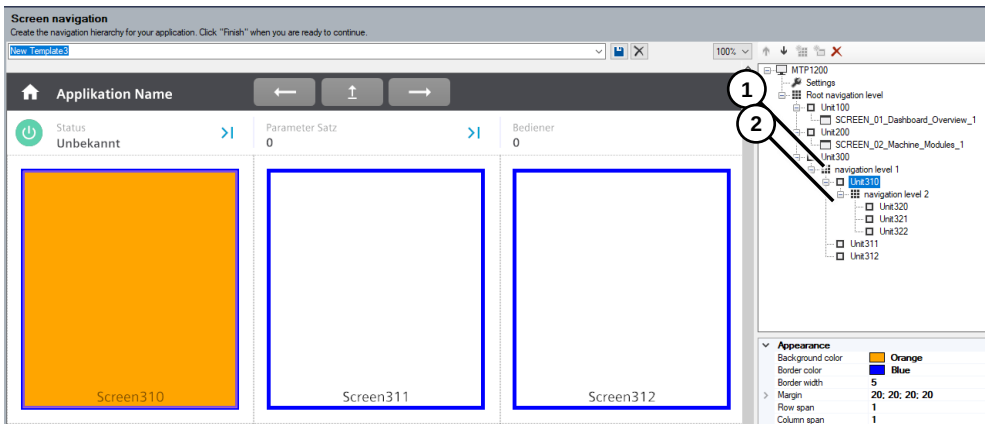
Figure 2-29



The Figure below shows two levels that were added (1) / (2).

The view corresponds to the plant structure created earlier (see Figure 2-22).

Figure 2-30



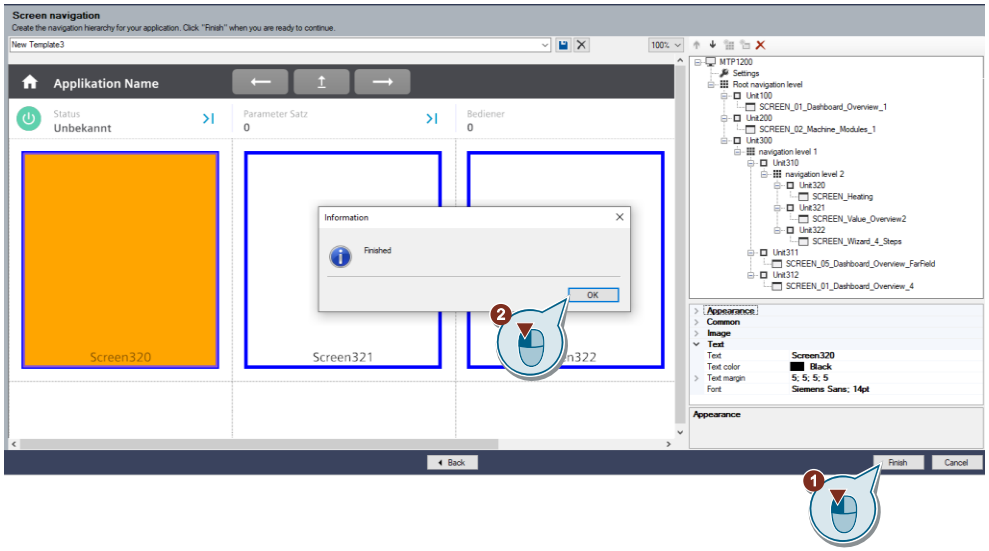
Finish the "Tile navigation" Wizard

In the example, the tiles in the newly-created levels still need to be assigned the corresponding template screens from the Template Suite library.

Once you have completed all steps, click the "Finish" button (1). The project will be compiled.

Finally, confirm the process by clicking "OK" (2).

Figure 2-31



2.2.3 Tile navigation view during engineering

This chapter describes the arrangement of the screens after the Wizard has implemented your configuration and imported it into the existing/new project.

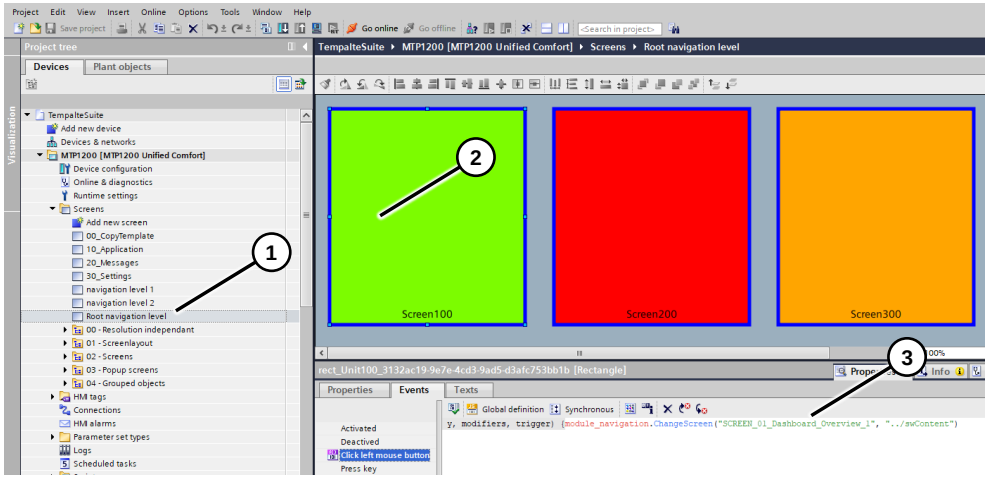
The screens you created with the Wizard will be listed in the project tree under the "Screens" folder.

Root navigation level

The configured "navigation levels" are all in the main screens folder.

The "Root navigation level" screen item (1) contains the three "tiles" that you created earlier in Figure 2-27.

Figure 2-32



Select one tile (button) (2).

You can check which page this would call up by looking in "Properties > Events > Click left mouse button" (3).

Template Suite screens

The screens used in the "Tile navigation" Wizard can be found in the project tree under "Screens > 02-Screens".

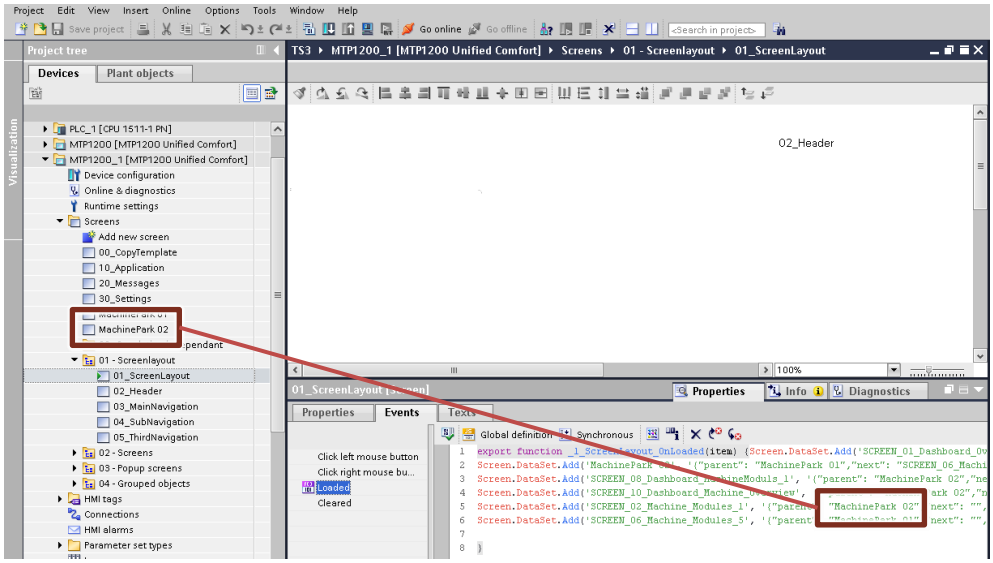
Changing screen navigation names after the fact

When the project was created with the "Tile navigation" Wizard, a "Screen navigation name" was assigned under the "**Name**" parameter in the tile properties. This name is not intended to be changed later on (see Figure 2-26). If this is nevertheless necessary, proceed as follows.

CAUTION	**Before making any changes, make a backup copy of the current configuration.** **By renaming the screens manually, there is a possibility that the "link" of the automatically generated screens will be lost if the renaming is done incorrectly.**

1. In the project tree, open the screen "Screens > 01_ScreenLayout > 01_ScreenLayout".
2. The names of the navigation levels are stored under "Properties > Events". Now modify these manually.

Figure 2-33

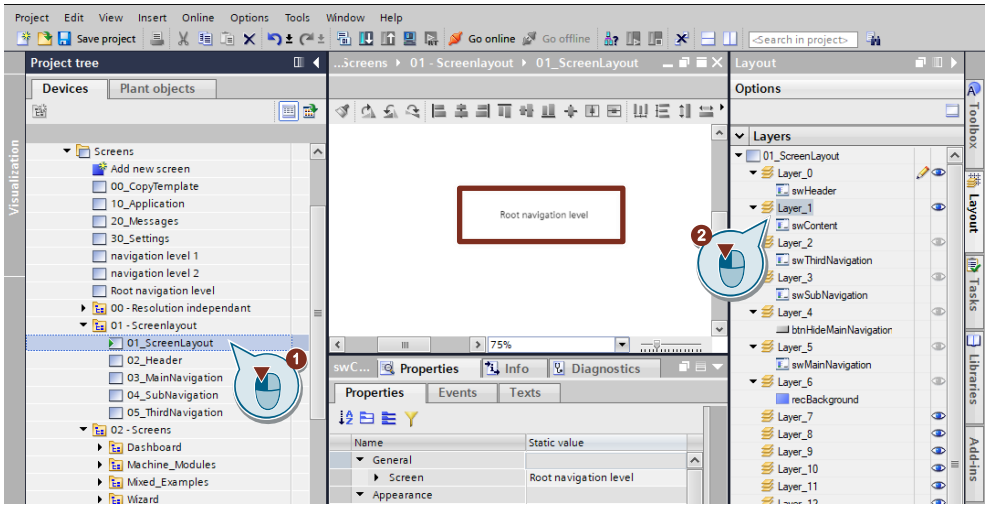


2.2.4 Launch "Tile navigation" with a button

Default setting

If you are using the HMI configuration generated by the "Tile navigation" wizard, then the screen "01_Screenlayout" will be selected as the start screen (click 1). Here, the content is displayed in a screen window "swContent" (click 2) by the screen "Root navigation level".

Figure 2-34



The following screen appears after starting the runtime.

By default you find the links here that you defined in the Template Wizard. If you wish to create more links to Template Suite screens or your own screens, you can add them as described in the next step.

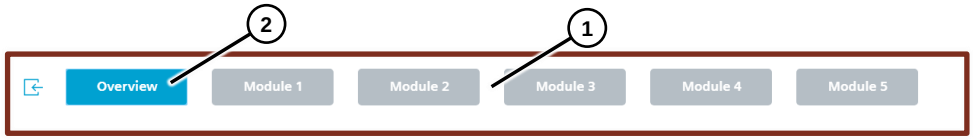
Figure 2-35

Link to more screens

The HMI project generated by the "Tile navigation" Wizard already contains various navigation templates.

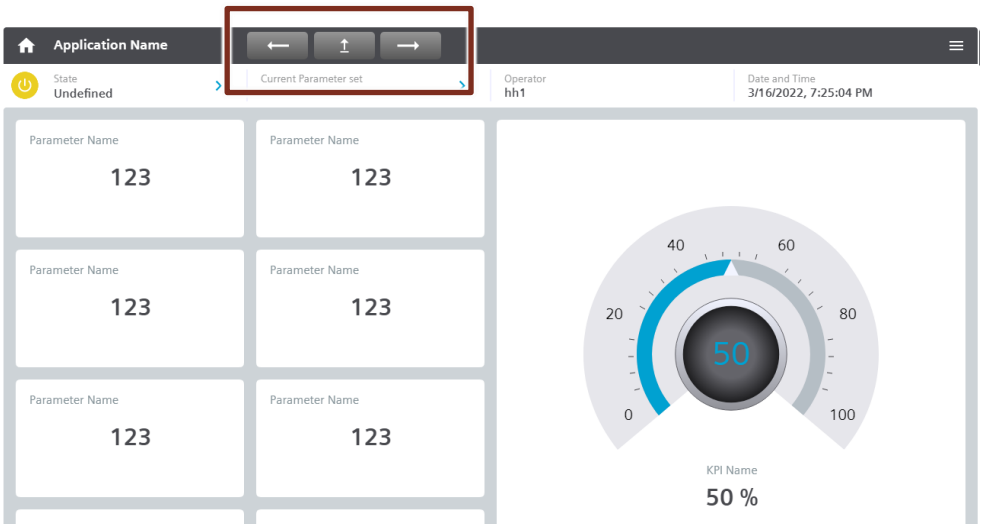
The existing "sub-navigation" (1) will be used to call up the following screen (previously the "Start screen", see Figure 2-40) via the "Overview" button (2). In this way it is possible to access additional screens with the existing "Module x" buttons.

Figure 2-36



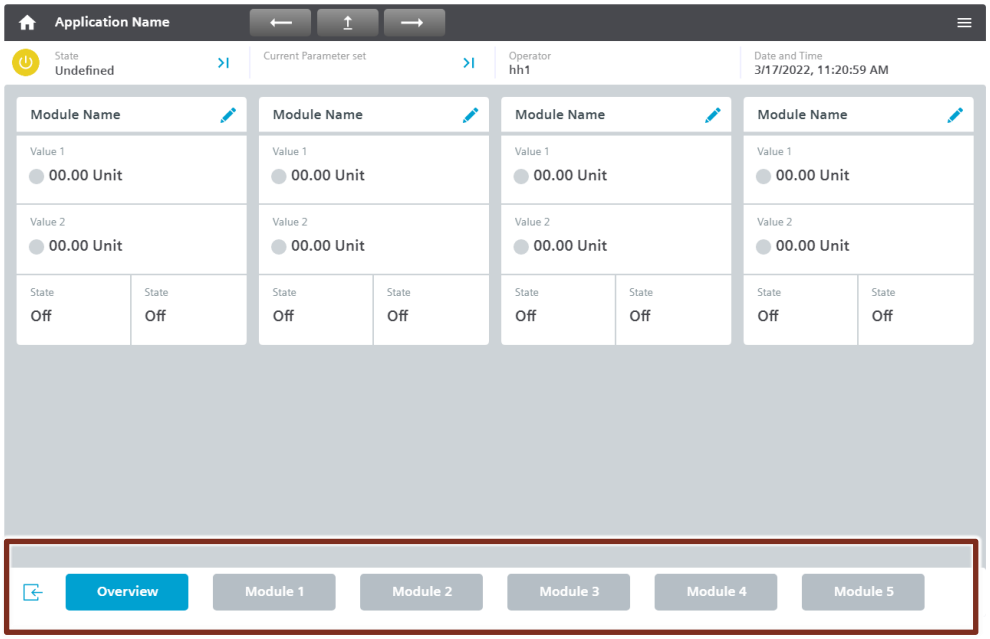
Navigation within the "Tile navigation" is done with the "navigation elements" in the title bar. The "sub-navigation" is hidden for this (it can also be shown if needed).

Figure 2-37



The Figure below shows a screen from the Template Suite with the "sub-navigation" visible.

Figure 2-38



Configuration

1. Modify/check "01_ScreenLayout" screen.
   a. Open the screen "01_ScreenLayout" ("project tree > screens > 01-Screenlayout").

   b. Select the screen window "swContent". Under "Properties > Properties > General > Screen", select the screen "10_Application" (you can also use a screen of your choice). In this case, the screen "10_Application" serves as the start screen.

   c. Select the screen window "swSubNavigation". Make sure the "Operability" and "Visibility" are enabled in the object properties. Also make sure that the "Height" under "Size and position" is specified as "64" (if using an MTP1200 Comfort).

2. Call up the screen "04_SubNavigation".
   a. Open the "04_SubNavigation" screen ("project tree > screens > 01-Screenlayout").

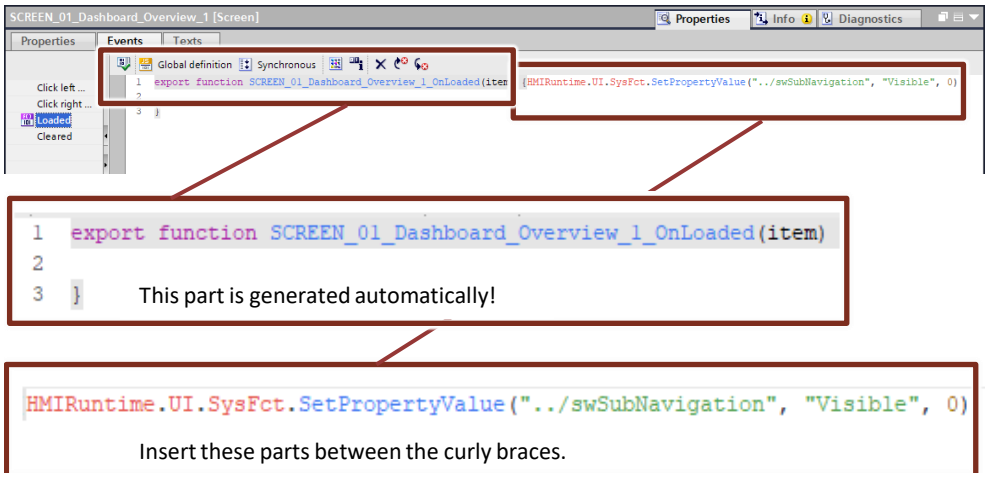
   b. Select the "Overview" button and open "Properties > Events > Click left mouse button".

   c. Add the function "ChangeScreen".
   Screen name: Root navigation level
   Screen window path: ../swContent ("String" must be set as the type here)

3. In all screens where the "sub-navigation" needs to be hidden, you must put the following script under the screen properties ("Properties > Events > Loaded"): {HMIRuntime.UI.SysFct.SetPropertyValue("../swSubNavigation", "Visible", 0)

   The "0" means that the sub-navigation will be hidden. If the sub-navigation needs to remain visible, change the "0" to "1".

Figure 2-39



2.3 Structure of the Library

With the "HMI Template Suite" library, you can easily create a custom project using preconfigured graphics and control elements.

WinCC Unified operator panels

The template is available for WinCC Unified operator panels with the following resolutions:

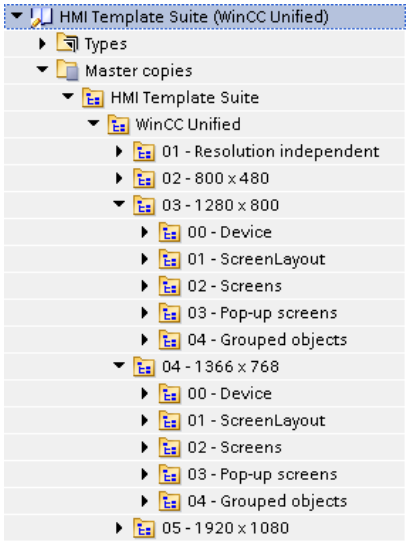
- 800x480 pixels (MTP700)
- 1280x800 pixels (MTP1000 and MTP1200)
- 1366x768 pixels (MTP1500)
- 1920x1080 pixels (MTP1900 and MTP2200)

Move the various HMI objects into you operator panel using the drag-and-drop feature.

Note When dragging an operator panel into your project, make sure that you also include the faceplates (see also Section 3.1.1).

Use the preconfigured operator panels that are stored in the library under the different resolutions in the folder "00 – Device".

Figure 2-40



Preparing the HMI operator panel

Visualization offers the perfect basis for your project. The operator panel already contains all of the necessary elements for operation:

- Navigation and title bar
- Display of notifications/alarms
- Settings and diagnostics pages
- HMI templates ("Screen templates") for various navigation levels

Note

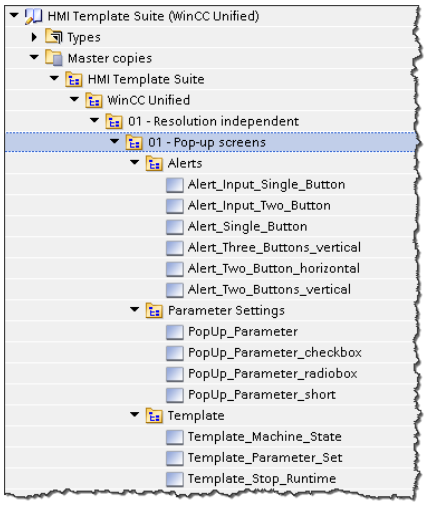
The operator panels are located in the library within the subfolders "00 – Device". They are stored according to resolution.

You can create your visualization on this basis and enhance it using the other objects (i.e., pop-up screens) from the library.

Preconfigured pop-up screens

The pop-up screens are used to display alarms or to change parameters in the machine. You will find the pop-up screens in the subfolder "01 - Resolution independent > 01 - Pop-up screen".

Figure 2-41, Pop-up screens



Note

The preconfigured pop-up screens are screens that are used as pop-ups in WinCC Unified via a screen window.

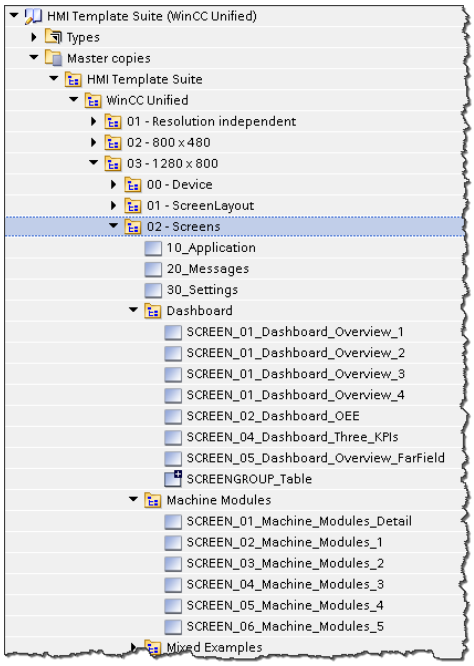
Preconfigured HMI screens

The preconfigured HMI screens allow you to use dashboards, overview screens, or operator wizards.

Note

The HMI screens are stored in the subfolder "02 - Screens" in the respective resolution.

Figure 2-42

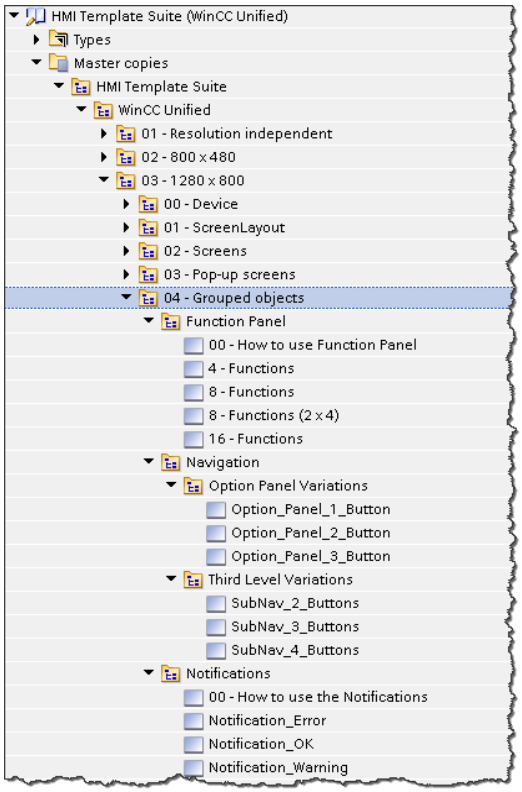


Preconfigured navigation and operator panels

Use the navigation and function buttons for the tasks and functions of the machine. You can use these elements to create different navigation levels.

Note You can find the navigation and operator panels in the "04 – Grouped objects" subfolder.

Figure 2-43, Navigation and control objects



WinCC Unified View Of Things

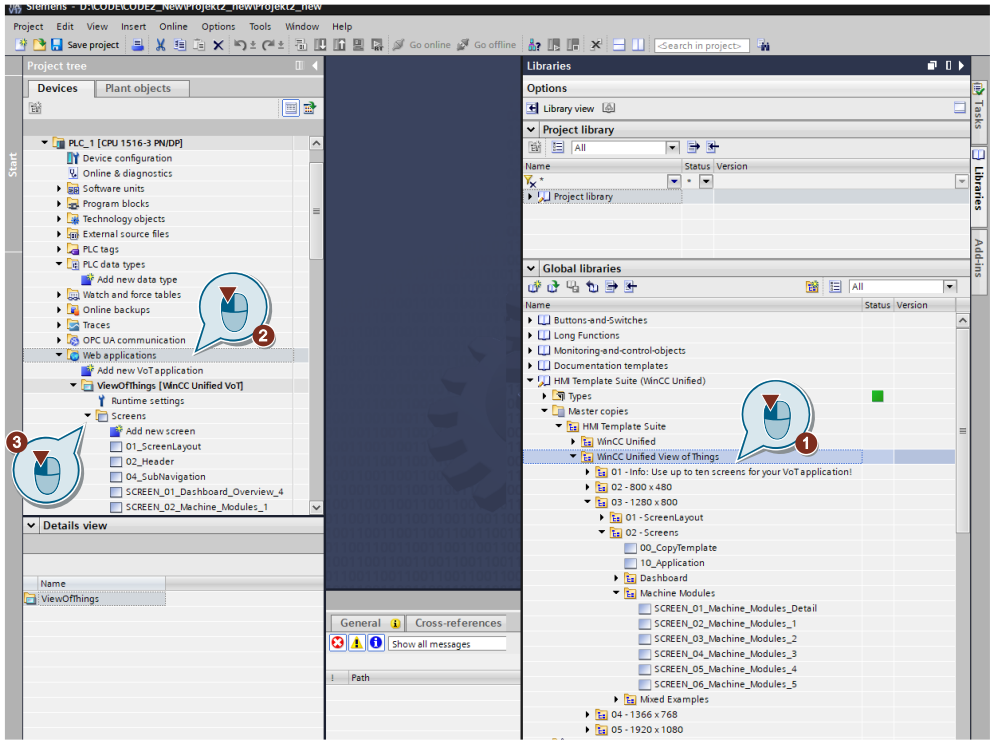
The template is for SIMATIC WinCC Unified "View of Things", or "VoT" for short. SIMATIC WinCC Unified "View of Things" is a web application in the memory of the SIMATIC S7-1500. You can find detailed information about "VoT" via the following link: \5\.

The templates are available in the following resolutions:

- 800x480 pixels
- 1280x800 pixels
- 1366x768 pixels
- 1920x1080 pixels

Move the individual objects from the "WinCC Unified View Of Thing" folder (1) into the "Web Application (2) > Screens (3)" folder of your Controller using drag & drop.

Figure 2-44



Note To stay within the VoT limits, do not configure more than 10 screens.

2.4 Color and design concept

2.4.1 Concept

The entire project is created in flat design. Flat design is a minimalist style that refrains from using three-dimensional effects (shadows or textures). This facilitates configuration and provides clarity for operators, as the focus remains on the content.

For optimal usability and ergonomics, a simple color concept is used for this project.

Colors:

- an accent color
- a complementary color
- various shades of gray for navigation
- light gray for the MainWindow and to operate the system
- Another shade of gray for regular text

The accent color is used to highlight objects such as the title bar or active buttons and tabs.

Shades of gray are used to distinguish the navigation bars and the status bar from the contents of the main screen.

The Main Window background is lighter. The main content stands out due to its placement in the middle of the operator panel and the high-contrast differentiation from the other objects at the edge of the screen.

2.4.2 Colors

For visualization, the following colors are used for HMI objects.

Table 2-1, Main colors

Color	RGB color code	Function
	0, 161, 209	Blue, accent color, Button (active)
	38,39,41	Anthracite, Main Navigation (background)
	72,73,78	Dark gray Title bar (background) Option Panel, background
	181,190,197	Gray, Button (inactive)
	205, 211, 215	Light gray, Main Window background
	240,242,243	Light gray, Third navigation level (background)
	255,255,255	White, Status bar (background), content board (background) SubNavigation (background)

The following colors are defined for status displays:

Table 2-2: Status colors

Color	RGB color code	Function
	234, 206, 33	Warning color 1
	231,121, 16	Warning color 2
	222,56,88	Alarm
	94,209,173	Status OK
	0, 80, 104	Dark blue Complementary color for display elements

The following color is used for ordinary text:

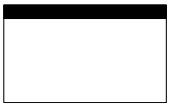
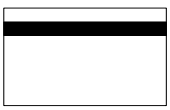
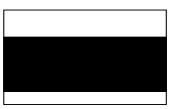
Table 2-3

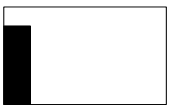
Color	RGB color code	Function
	133, 147, 153	Value descriptions for Contentboards

2.5 Overview of the layout areas

The following names are predefined for the individual objects of the "HMI Template Suite". Table 2-4 lists the elements and their intended use.

Table 2-4: Identification of the navigation levels

No.	Element	Position	Uses
1.	Title bar		Display title, open MainNavigation
2.	Status bar		Displaying important information, e.g., current parameter set, registered user, or status of the machine The display can be adjusted according to the machine
3.	MainWindow (application area)		Display of plant modules, dashboards, machine operation

No.	Element	Position	Uses
4.	MainNavigation		**First navigation level:** Display of the menu and switching between modules, or displaying messages or settings
5.	SubNavigation		**Second navigation level:** Navigation bar at the bottom edge of the screen, within a machine module
6.	Third navigation level		**Third navigation level:** Additional level for better structuring

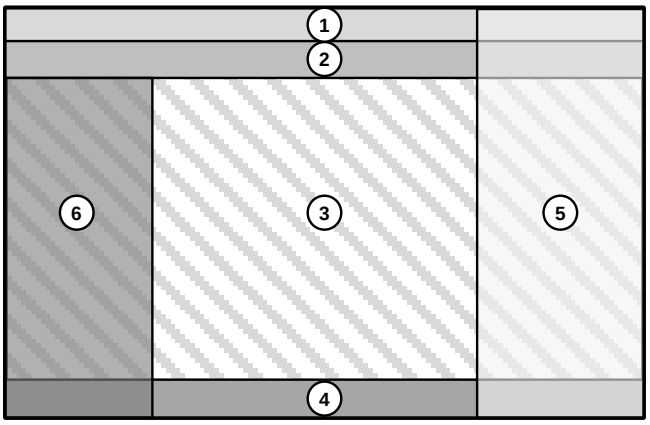
Note A fourth navigation level is possible by using a "Tab" view.
You can find configuration details for this navigation level in Section 2.5.1.

Screen layout with screen window

The Start Screen in WinCC Unified is divided into six screen windows, corresponding with the areas as shown in Table 2-4.

Note If the contents of the Title bar (1) and Status bar (2) remain the same throughout the project, a screen window can also be used for both areas.

Figure 2-45, Start Screen layout with screen windows



The contents displayed in the screen window are configured in the folder "Screens".

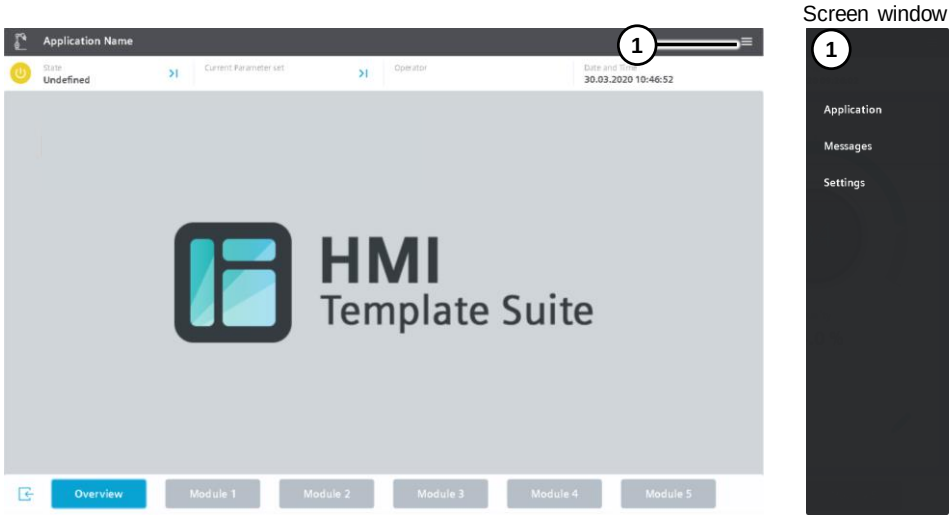
Note In the "01_ScreenLayout" screen, the following elements are located next to the screen windows:

- "btnHideMainNavigation":
  Closes the MainNavigation if it is open and is clicked outside the MainNavigation.
- "RecBackground":
  Semi-transparent rectangle that blocks the entire screen except the image that is called as a pop-up.

2.5.1 Navigation Levels in detail

First navigation level ("MainNavigation")

Figure 2-46: HMI Template Suite, MainNavigation



The first navigation level (MainNavigation) is implemented via a screen window "swMainNavigation" in the "01_ScreenLayout" screen on the right side. The "03_MainNavigation" screen is displayed in the screen window.

The main navigation can be displayed via the ham rger () menu in the Title bar.

Note

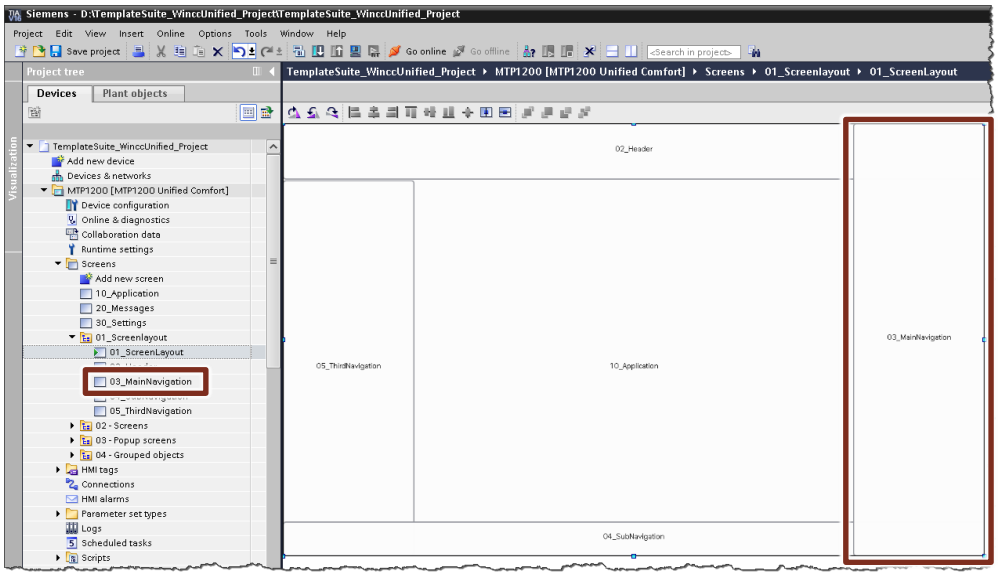
If you want to show or hide levels of navigation and highlight the selected navigation point, please refer to Section 2.5.2.

In the main navigation, you can switch between the configured application and the global message page. In "Settings", you can, for example, change the display language or the brightness of the operator panel.

Configuration

The first menu level is already included in the preconfigured operator panel.

Figure 2-47



Second navigation level

Second navigation level (SubNavigation) is the main navigation of a module. It is located at the bottom edge of the screen and can be displayed using the "ShowSubNavigation" script (see chapter 2.5.2).

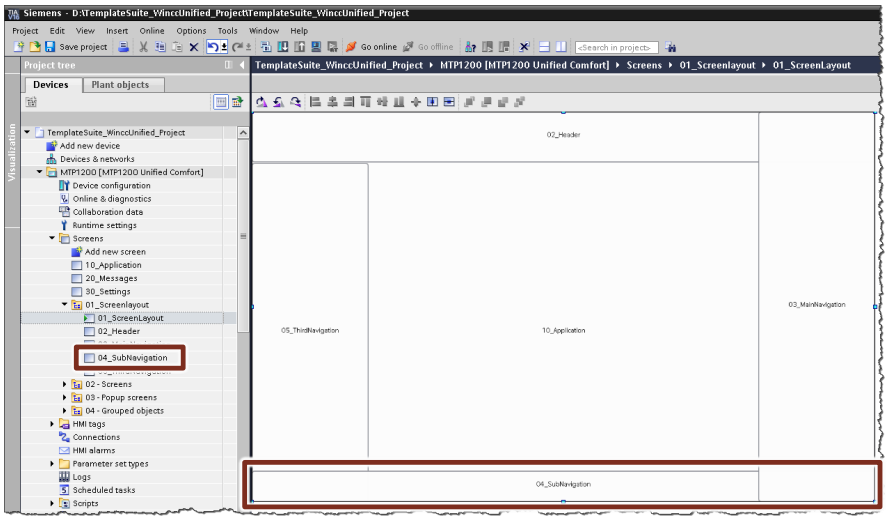
Figure 2-48: HMI Template Suite, second menu level

You can switch between the individual HMI screens of a plant module using the navigation bar (see chapter 4.2).

Configuration

The second navigation level is configured via the "swSubNavigation" screen window in the "01_ScreenLayout" screen. You can configure page calls and adjust the text in the corresponding screen, "04_SubNavigation".

Figure 2-49



Third navigation level (optional)

Third navigation level can be used within a module to give a more detailed structure to the displayed module functionalities.
The navigation bar is implemented as text-based navigation. However, it is possible to switch to icon-based navigation by swapping the image. This saves space for the plant visualization on smaller operator devices.

Figure 2-50: third navigation bar, text-based

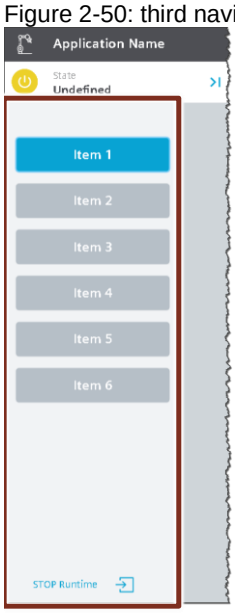
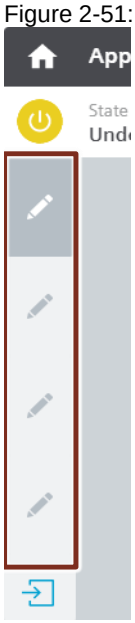


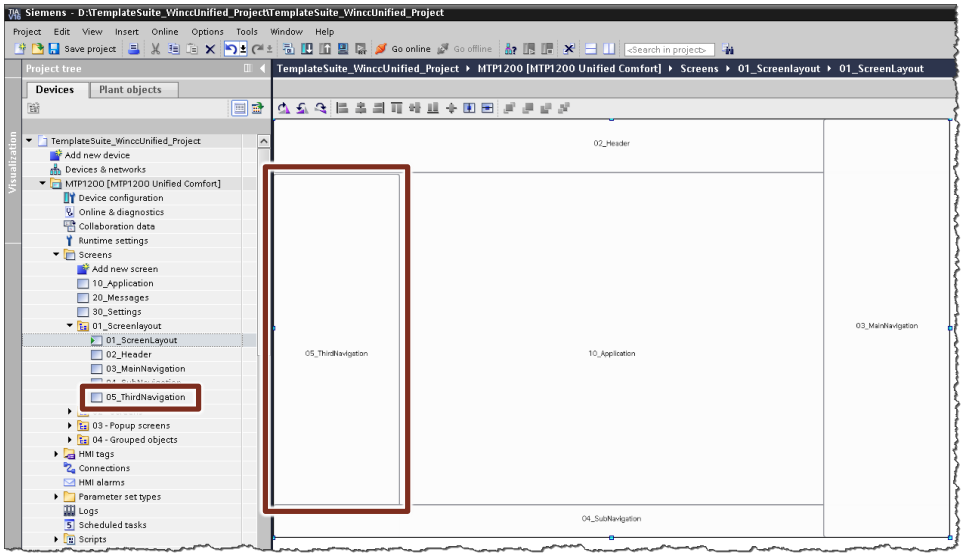
Figure 2-51: third navigation bar as icon variant



Configuration

The third navigation level is also implemented as the "swThirdNavigation" screen window in the "01_ScreenLayout" screen. You can configure the page calls and add button text for the third-level navigation bar in the corresponding screen, "05_ThirdNavigation". If you want to use the icon variant, you must configure the associated "05_ThirdNavigation_Icons" screen and select it in the screen window under the "Screen" property.

Figure 2-52: Third navigation level

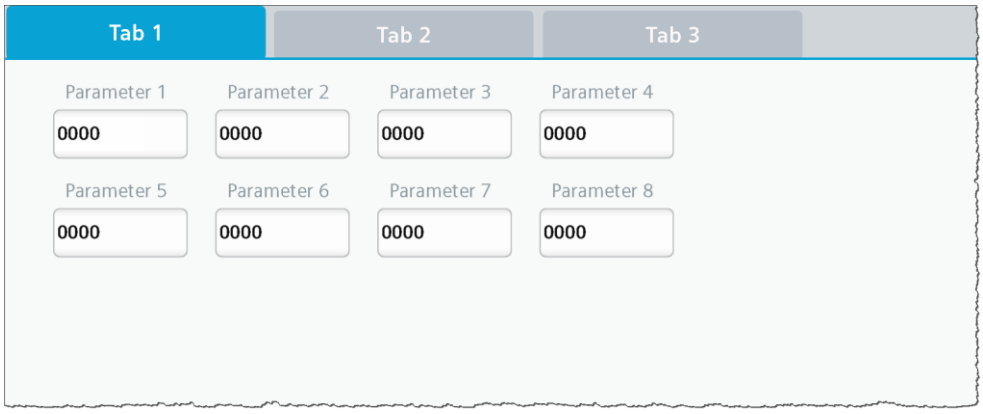


Fourth navigation level (optional)

On an HMI screen, you also have the option of displaying content in a clear and structured manner using the following "Tab" view.

Operators are familiar with tab views as they appear in a number of everyday applications, which makes them intuitive to use.

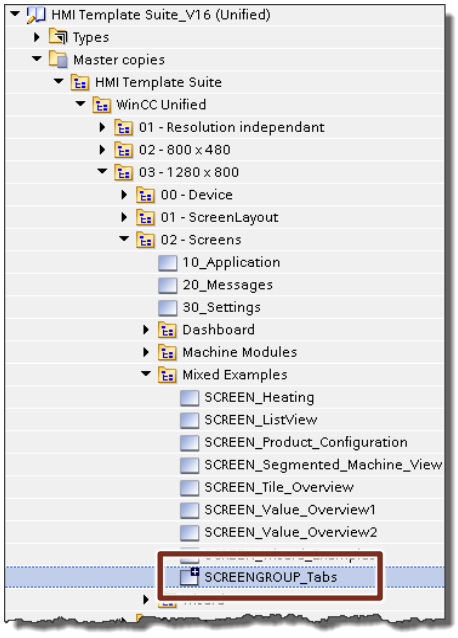
Figure 2-53 Sample visualizations



Configuration:

A "Tab" view is already stored in the "Mixed Examples" folder in the library.
The contents of the tabs are each implemented in a separate screen. The different tabs allow you to set the respective screen in the screen window via a "click" event.

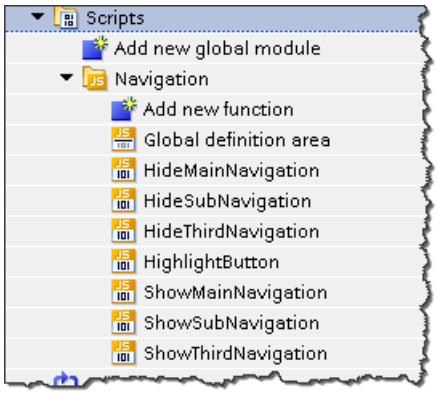
Figure 2-54 HMI screen "Tab view"



2.5.2 Script functions of the navigation levels

Multiple scripts from the global "Navigation" module are used within the navigation levels.

Figure 2-55



Note

To ensure that the scripts are executed correctly, the screen objects within the navigation must be numbered sequentially. The name before the number (e.g., "btnSubNav") can be freely defined, but must remain the same for all elements.

e.g., "btnSubNav1", "btnSubNav2", "btnSubNav3", etc.

"HideMainNavigation" function

This script function hides the first navigation level "MainNavigation".

"HideSubNavigation" function

This script function hides the second navigation level "SubNavigation".

"HideThirdNavigation" function

This script function hides the third navigation level "ThirdNavigation".

"HighlightButton (ButtonName)" function

This script function highlights the screen object in the accent color that was defined in the "ButtonName" parameter.

Note

The main navigation screen objects are named "txtMainNav.." by default. If you change the name of the screen objects within the MainNavigation, you must adapt it in the script function as well.

"HighlightThirdNavIcon (ButtonName)" function

This script function highlights the screen object in the accent color that was defined in the "ButtonName" parameter. The function is an extension of the "HighlightButton" function. Visibility has also been added for the various graphic elements.

Note

The screen objects in the navigation are named "btnThirdNav..", "gfxThirdNavActive.." and "gfxThirdNavNotActive.." by default. If you change the name of the screen objects within ThirdNavigation_Icons, you must adapt it in the script function as well.

"ShowMainNavigation" function

The script function displays the first navigation level "MainNavigation".

"ShowSubNavigation (ButtonNumber)" function

The script function shows the second navigation level "SubNavigation". With the parameter "ButtonNumber", you can specify which screen object of the "SubNavigation" should be set to active.

"ShowThirdNavigation (ButtonNumber)" function

The script function shows the third navigation level "ThirdNavigation". With the parameter "ButtonNumber", you can specify which screen object of the "ThirdNavigation" should be set to active.

Note If the second-level or third navigation level is displayed again after a screen change, the screen object specified with the "ButtonNumber" parameter is set to active.

2.6 Elements of the HMI Template

2.6.1 Title bar

The "Title bar" is located at the top of the screen. It contains a short title that shows the operator of the plant which area of the visualization it deals with. The title should be informative. The first navigation level can be accessed via the menu button on the right side.

Dark gray is used as the background color for the "Title bar".

Figure 2-56, Title bar with access to the first menu level

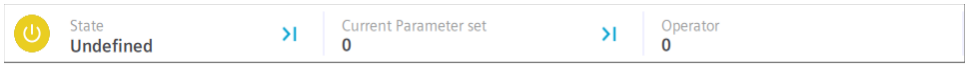
Note Clicking the text of the "Title bar" will take you to the overview screen.

2.6.2 Status bar

The "Status bar" is found directly beneath the "Title bar". The "Status bar" contains dynamic components and displays:

- the state of the different system sections
- the parameter set currently being used
- and the user

Figure 2-57: Status bar



The color of the left icon visualizes the current operating state of the system.

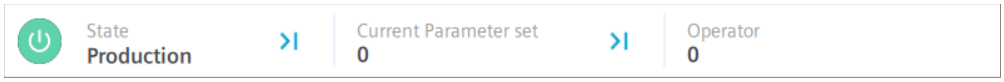
The color white is used for the "Status bar". This makes it stand out from the upper "Title bar" and the lower main window.

Statuses of the Status bar

This section briefly explains the appearance of the different plant states.

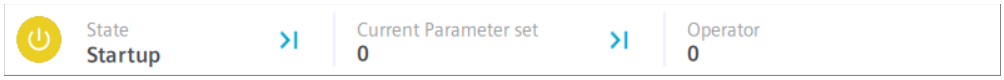
Depending on the condition of each machine (tag: CurrentMachineState), the "Status bar" will change as follows:

Figure 2-58: Normal operating state



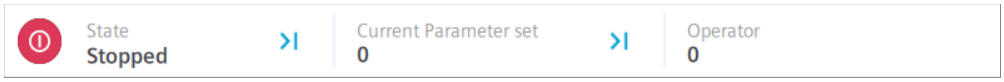
CurrentMachineState = 1

Figure 2-59: Normal operating state, startup



CurrentMachineState = 2-3

Figure 2-60 Error, system stop



CurrentMachineState = 4

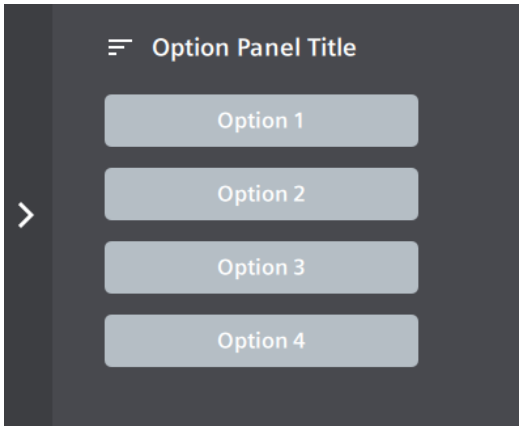
2.6.3 Option Panel

The "Option Panel" can be displayed on the **right side of the screen**.

The following actions can be performed in the Option Panel:

- Functions or actions that have a temporary effect on the machine.
- Global functions that should be accessible from multiple or all HMI screens.

Figure 2-61, Option Panel with 4 buttons

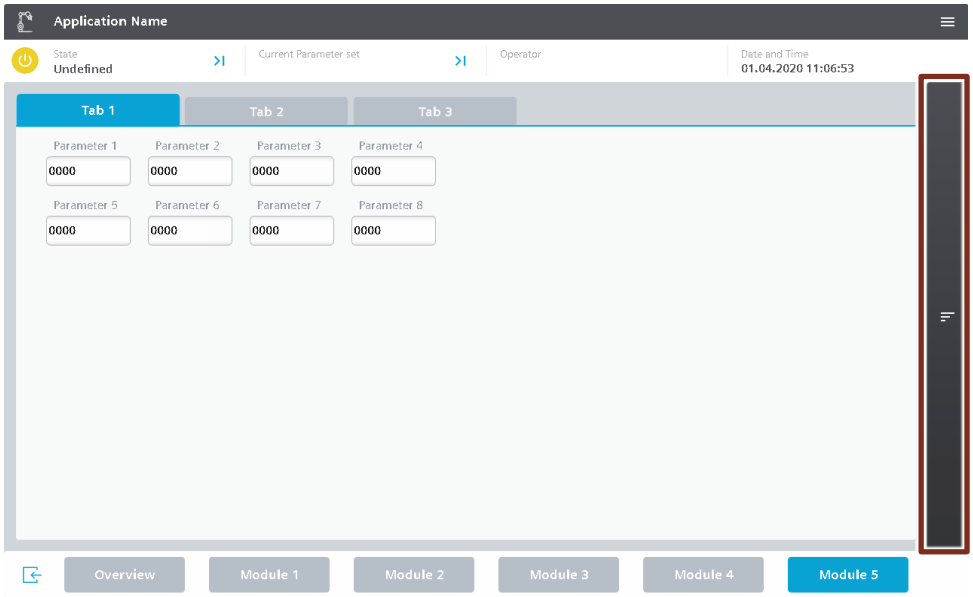


Access the Option Panel on the right side of the screen:

Use the button on the right side of the screen to open the Option Panel (see Figure 2-61).

Since the button is relatively narrow, icons must be used here.

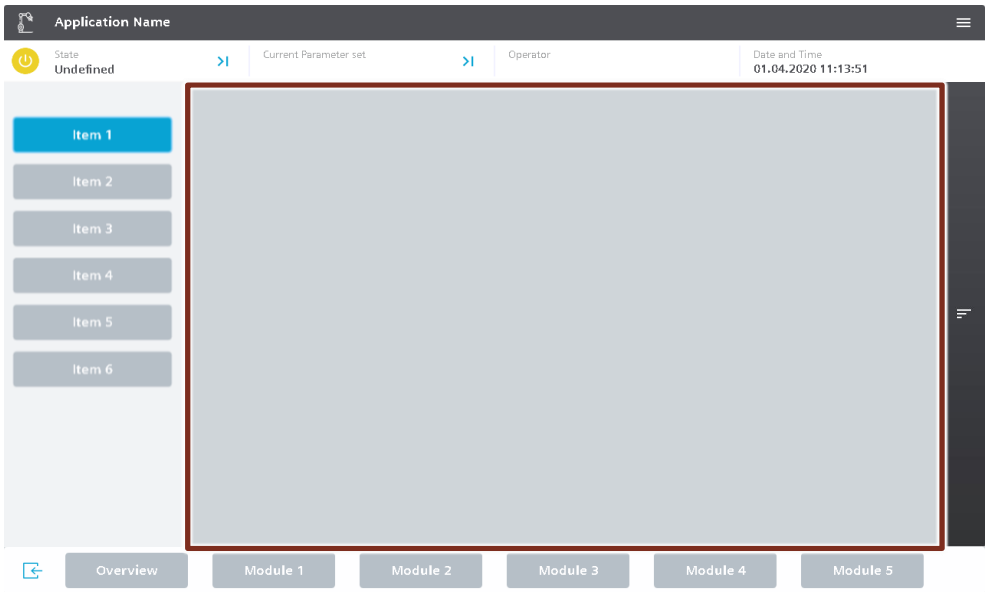
Figure 2-62, The "List view" example screen with the Option Panel on the right



2.6.4 MainWindow

The screen edges of the operator panel are used for navigation or to display global functions. The control area of the plant or the main window is located in the middle of the operator panel.

Figure 2-63, Main window of the visualization



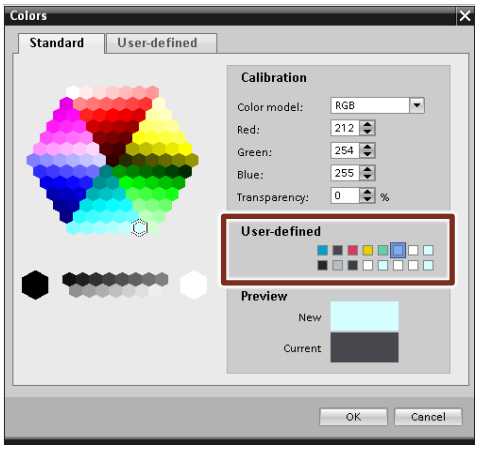
This is the area where the operator's main attention is focused. For this reason, configure the visualization of the machine in the main area of the operator panel. This central area takes up about 70% of the display area. The background color is light gray. The contents of the main display can consist of additional tabs or controls for navigation within the screen.

2.6.5 Buttons and Icons

Colors

Configure a palette of preset colors to achieve a consistent design of your configuration. You can store these as "User-defined". When setting the colors via the quick access, you can select the colors accordingly (see also chapter 2.4.2).

Figure 2-64



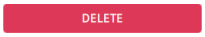
Size

For the HMI Template Suite, a minimum button size of 40x40px has been defined. This ensures that all buttons are of sufficient size to be operated.

Appearance

The uniform design of the buttons is ensured by the use of an operating concept. The following Table lists the objects in your interface and what they mean.

Table 2-5, Overview of the most important buttons in the project

Object name	Appearance	Use/place of use
"Button"		Standard button, for normal operating action e.g., executing a function or opening a pop-up screen
"Cancel_Abort_ Close"		Button to cancel actions or close pop-up screens. → no effect on the machine
"Delete"		Button that triggers a delete action. → critical actions
"Execute_Action"		Button for actions that have an effect on the machine, such as executing script functions or setting machine parameters.
"StatusBar"		Button for opening the pop-up screens of the Status bar, e.g., logon dialog or Recipe view. Button for opening a pop-up screen for controlling the plant module. → Additional content via pop-ups
"SubNavigation_ Inactive"		Navigation button for the "SubNavigation" bar. Display of inactive status (unpressed).
"SubNavigation_ Active"		Navigation button for the "SubNavigation" bar. Display of active status (pressed).
"ScreenTab_ Inactive"		Button for the "Tab bar", unpressed state
"ScreenTab_ Active"		Button for the "Tab bar", pressed state

Note

To configure buttons without a color gradient, text fields were used in the "Template Suite_V17 (Unified)".

With WinCC Unified, the event "Click left mouse button" can also be used to execute "Events" on a "text box". This is done using both mouse and touch operation.

2.6.6 Text and I/O Fields

To ensure a uniform and clean typeface on the operator panels, text and I/O fields can be configured in the "HMI Template Suite" in a standardized way.

This ensures consistency and allows the HMI to be configured more intuitively and quickly.

Size

Present the text in such a way that the operators can recognize them quickly and reliably.

The font size used depends on the distance between the operator and the configured operator panel.

Font

"Siemens Sans" was used as the default font for all text and process values.

Appearance of texts

Table 2-6, Overview of the defined text templates

Style name	Appearance	Use/place of use
Standard		
Standard style	Text	Standard object, unrestricted
"Regular (center)"	Text	Standard object, unrestricted
"Regular (right)"	Text	Standard object, unrestricted
Title bar, Status bar & Pop-ups		
"Headline"	Text	Dark heading, unrestricted
"Headline (Center)"	Text	The middle heading, unrestricted
"SubHeadline"	Text	Heading, only for pop-up screens
"TitleBar"	Text	Font, only for the Title bar
"Navigation"	Text	Font, only for main navigation purposes
"SubNavigation_Active"	Text	Used for active navigation or tab
"SubNavigation_Inactive"	Text	Used for inactive navigation or tab
"StatusBar_Title"	Text	Heading for the Status bar
"StatusBar_Text"	Text	Text, only for the Status bar
Notifications		
"Notification_OK"	Text	Notification at the bottom of the screen, for non-critical information
"Notification_Warning"	Text	Notification at the bottom of the screen, for important information
"Notification_error"	Text	Notification at the bottom of the screen, for critical information

Style name	Appearance	Use/place of use
Miscellaneous		
"OptionPanel_Title"	Text	Heading for the Option Panel
"ContenBoard_Title"	Text	Heading, only for use in HMI faceplates.
"Default"	Text	Display of the stored value or for standard values

Appearance of I/O fields

Entry fields are marked with a white background. If the I/O field does not have a white background or frame, it is not possible to add an entry in the field.
The operator can thus see at a glance whether the field can be edited.

Table 2-7, Overview of the configured I/O fields in the project

Name	Appearance	Use/place of use
"Standard style"	0000 mm	Standard object, unrestricted
"Regular (center)"	0000 mm	Standard object, unrestricted
"Regular (right)"	0000 mm	Standard object, unrestricted
"Regular_Out (left)"	00.00 Unit	Use only to output values
"Regular_Out (center)"	00.00 Unit	Use only to output values
"Regular_Out (right)"	00.00 Unit	Use only to output values
"StatusBar"	00.00 Unit	Used for the Status bar
"ContentBoard_Output"	00.00 Unit	Output and entry field on a "ContentBoard"
"ContentBoard_Output (center)"	00.00 Unit	Output and entry field on a "ContentBoard"
"ContentBoard_ Large_Output"	00.00 Unit	Output and entry field on a "ContentBoard"

2.6.7 Rectangles

Rectangle styles are defined with the main colors (Colors, see chapter 2.4.2).

The rectangles are defined without a border so that they fit with the intended flat design.

Table 2-8: Properties of the configured content board rectangles

Name	Appearance	Use/place of use
"Content board rectangle"	White rectangle, no border, 6 px corner radius	Background for visual grouping of elements; content board border

3 Library elements

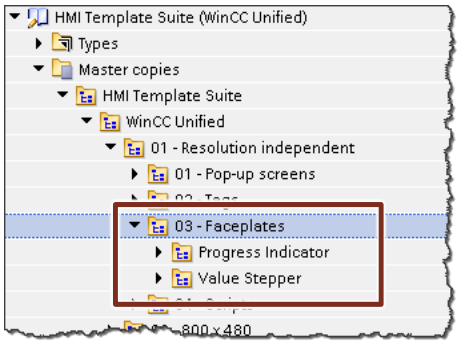
This section explains the additionally available screens and screen objects and their intended use.

3.1 Screen objects

3.1.1 Faceplates

You can find the following faceplates in the library under:
"01 - Resolution independent > 03 - Objects":

Figure 3-1, Screen objects in the library



Note

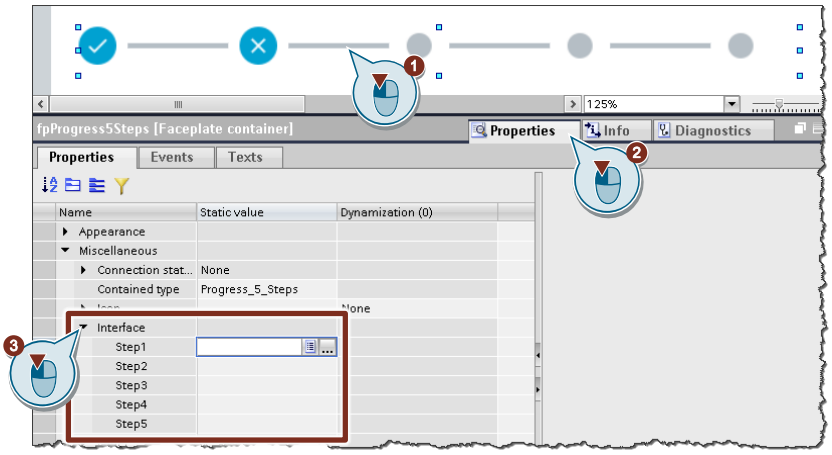
If you drag a device, available in the global library, into your project, then all faceplates that are linked within the device will be automatically created in the project library. You can find the faceplates under "Project library > Types" after they are created.
Additional steps are not required.

You can interconnect the "Faceplates" using the type interface.

1. To do this, select an HMI object in Engineering.
2. In the Inspector window, go to the "Properties" tab
3. Open the "Interface" group in the properties under "Miscellaneous".

A table in the corresponding chapter explains how to interconnect each of the elements.

Figure 3-2, Faceplate interface in engineering



Progress Indicator

Use the "Progress Indicator" to visualize the progress of a process. Each point visualizes one process step. As soon as the step has been completed, it is displayed in blue with a white tick.

Figure 3-3: "Process Indicator"

Table 3-1 Faceplate interface

Interface	Function
"Step1" "Step2" "Step3" …	Connect one HMI tag for each step. Depending on the value of the tag, the display changes as follows: HMI tag = "0" HMI tag = "1" HMI tag = "2"

Value Stepper

The "Value Stepper" is an element with two buttons used to increase or decrease a value. The current value is displayed between the two steppers.

Figure 3-4 "Value Stepper" in Engineering

There are different templates of the "Value Stepper" for "Real" and "Int" values in the library.

Table 3-2 Faceplate interface

Interface	Function
"Value"	Connect to an HMI tag (Int/LReal). If you click the "-" button, the tag value is reduced by the delta value. If you click the "+" button, the tag value is increased by the delta value.
"Delta"	Connect to an HMI tag (Int/LReal). The "Value" tag is incremented or decremented by this value.

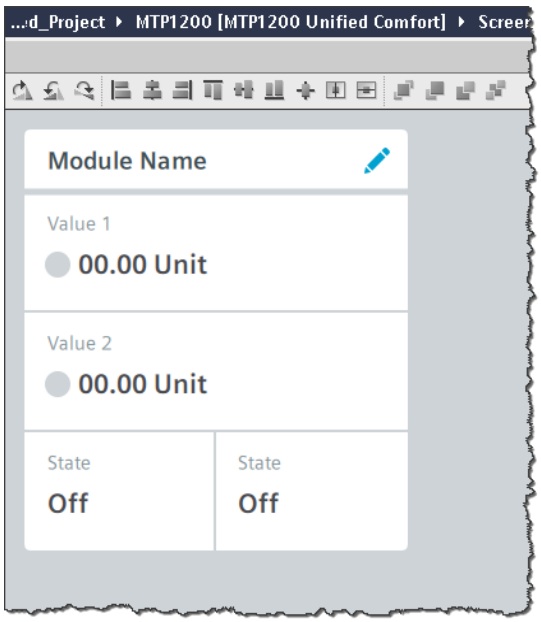
3.1.2 ContentBoard

The "ContentBoard" is a purely visual tool for grouping and structuring HMI elements on a screen.

The "ContentBoard" consists of a white rectangle. This rectangle is placed behind the HMI objects to represent a functional context.

Configuration
Insert a new screen into your image and assign the color white to the rectangle.

Figure 3-5, "ContentBoard" engineering example



Note You can use horizontal and vertical lines within the content board as additional structuring features.

3.1.3 Button with status output

The "Button with status output" is a screen object that combines a button and a status display. Here it is possible to react to various events while showing the value of a tag at the same time, for example.
Locate the element in the "00_CopyTemplate" screen.

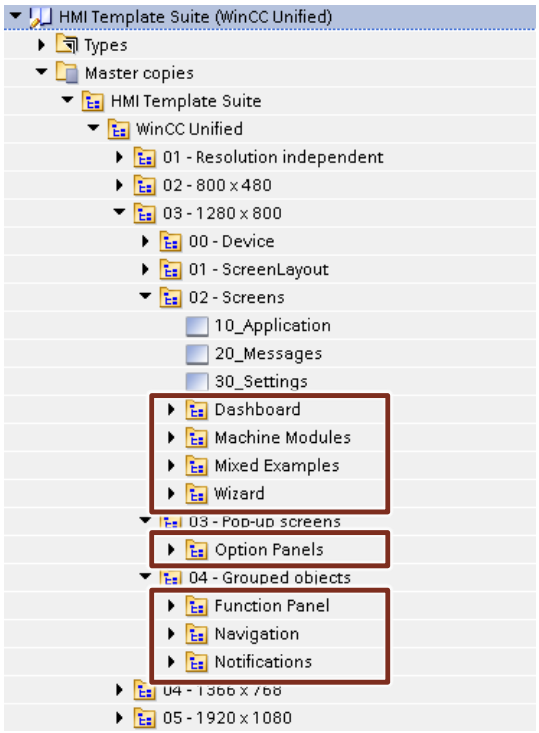
Figure 3-6: Left button with status "0", right with status "1"

3.2 HMI screens

In the library, you can find ready-made HMI screens for various applications. These templates should support you in creating your own HMI operator panel. The following types of templates are at your disposal:

- Dashboards
- Machine overviews
- Wizards
- Function panel
- Notifications
- Additional example screens

Figure 3-7, HMI screen example



Note The screens serve as a template for your visualization. You still have to connect the objects properly so that the objects can display process values.

3.2.1 Dashboards

With a Dashboard, you can display the most important information and analyses such as the "efficiency" or "produced quantity" of the machine. Furthermore, the most important HMI Screens are linked to it.

The Dashboard, therefore, displays the most important information about a machine and links to other HMI screens at a glance.

In the library, different versions are preconfigured for different application scenarios. From the multitude of display formats, you can always put together new Dashboards individually adapted to your machine. In addition to the two variants shown, further variants are available in the library.

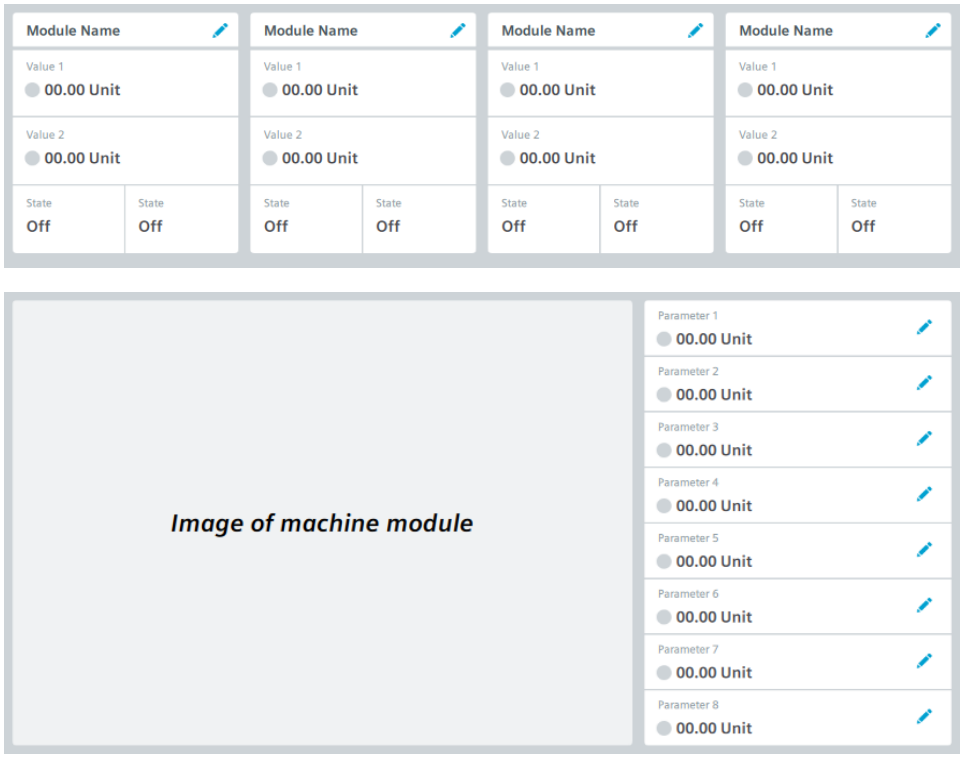
Figure 3-8, Example dashboards

3.2.2 Machine modules

The Machine Modules Overview allows you to keep track of your area of responsibility at all times. The machine module overview pages show the machine states or possible errors for each subarea or module and thus provide a good overview.

One click takes you to the detailed view of a module.
In addition to the two variants shown, further variants are available in the library.

Figure 3-9: Example of machine module overviews



3.2.3 Wizard

Use

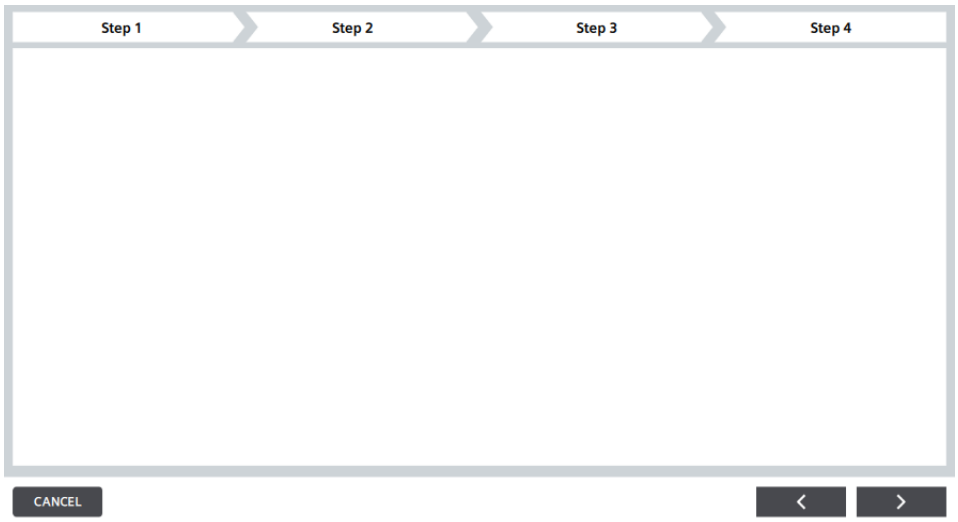
Use a "Wizard" to guide the operator through some steps in a predefined order.

The Wizard should always appear on the entire screen.

This allows the operator to concentrate fully on the current step. Only apply the new settings to the configuration once the operator has completed all steps.

Versions with 3 to 5 steps are available in the Wizard.

Figure 3-10: Example of Wizard with 4 steps



3.2.4 Notifications

Use

Notifications are displayed at the bottom of the screen. If you are in second navigation level, the message overlays the navigation elements (see Fig. 2-14). If you do not use the second navigation level, the notification also appears along the bottom of the screen.

Figure 3-11, Example notification

3.2.5 Function panel

You can use the "Function Panel" to dynamically enable or disable a specific functionality or module of your machine.

By pressing a button, the previous state is inverted (two states). Depending on the status, it should be displayed with a different color.

Different versions are available for different panel sizes and variants with 4, 8, and 16 buttons.

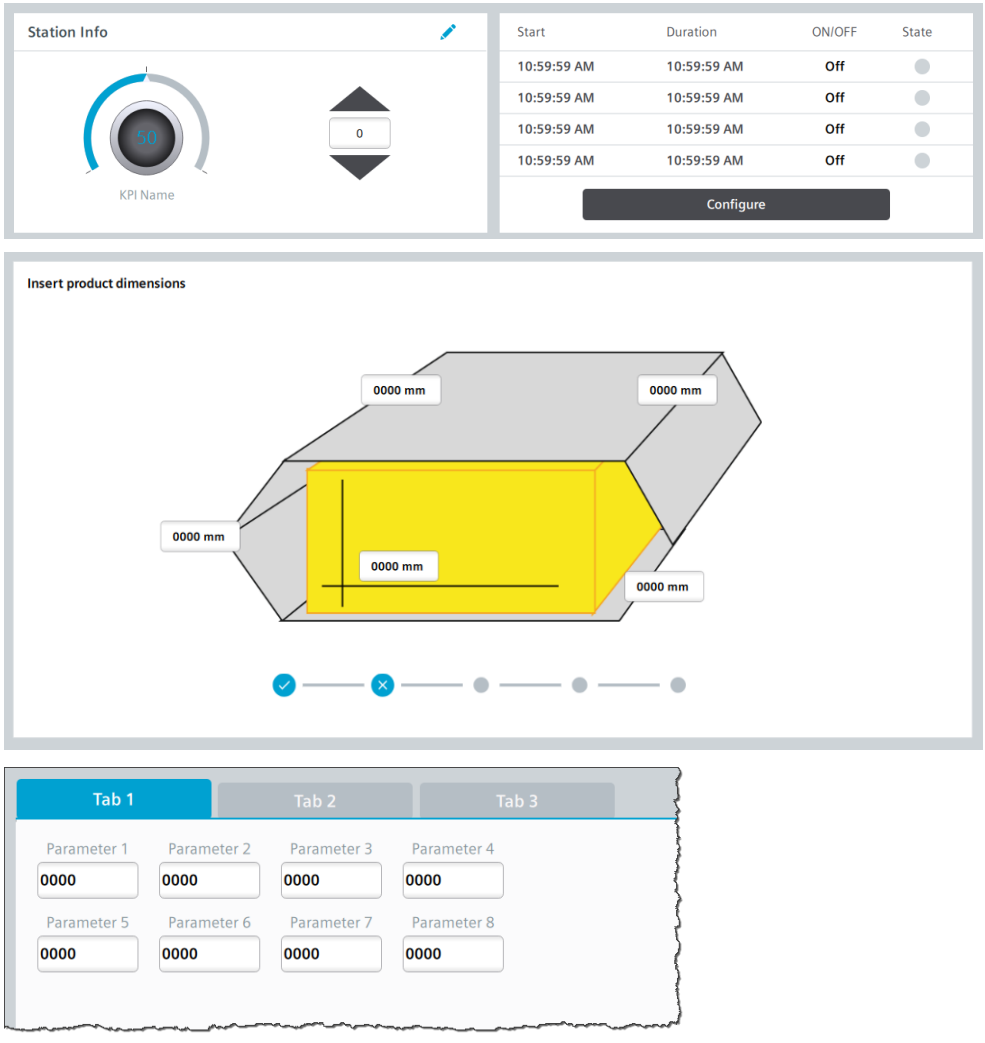
Figure 3-12: Example function panel

3.2.6 Additional example screens ("mixed examples")

Mixed examples are preconfigured in the library in order to demonstrate the visualization concept and inspire ideas for your own implementation.

In addition to the two variants shown, further variants are available in the library.

Figure 3-13: Example visualizations



4 Configuration notes

Requirements

Before you start configuring your HMI operator panel, you must prepare a complete design concept with concrete visualization ideas.

Note

If you need more information and tips on creating a design concept, take a look at the free "HMI Design Masterclass".

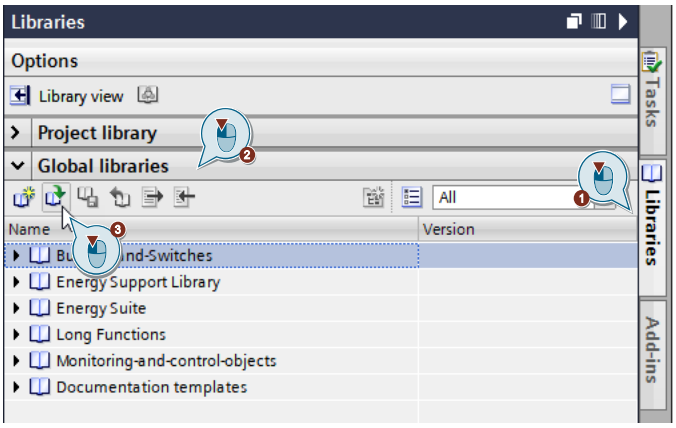
The "HMI Design Masterclass" gives you an introduction to the topic of HMI design in 7 x 10 min video units.

Link to the Masterclass:
https://new.siemens.com/global/en/products/automation/simatic-hmi/design-masterclass.html

Integrating the library

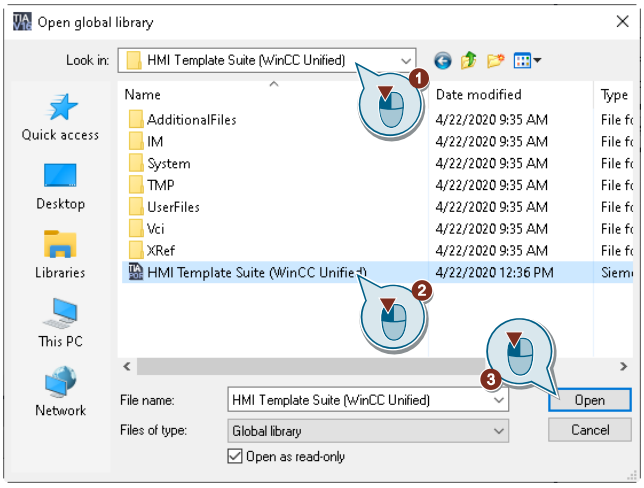
1. Download the library from the article page and unzip it.
   https://support.industry.siemens.com/cs/ww/en/view/91174767
2. Open the library with TIA Portal. Create a new project or open an existing configuration.
3. Open the "Libraries" task card (1).
4. Then open the "Global libraries" palette (2).
5. Click the icon to open a library (3).
   The "Open Global Library" window opens.

Figure 4-1



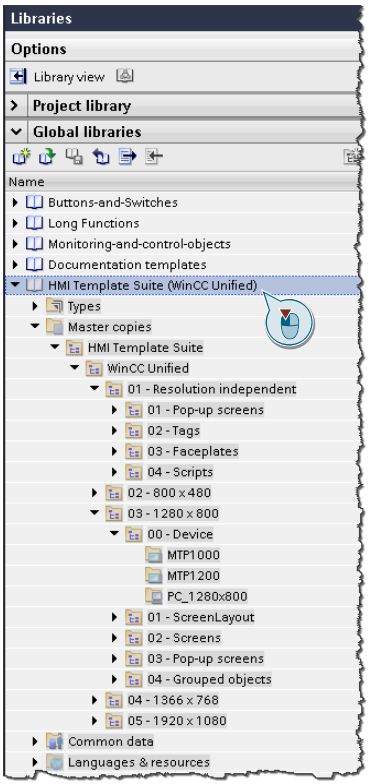
6. Select the library
   - In the window, navigate to the file folder where the library file is located (1).
   - Select the file "HMI Template Suite (WinCC Unified)" (2).
   - Then click "Open" (3).

Figure 4-2



7. View of the open library file (1).
   From here you can navigate to the screen objects or the fully configured HMI operator panels.

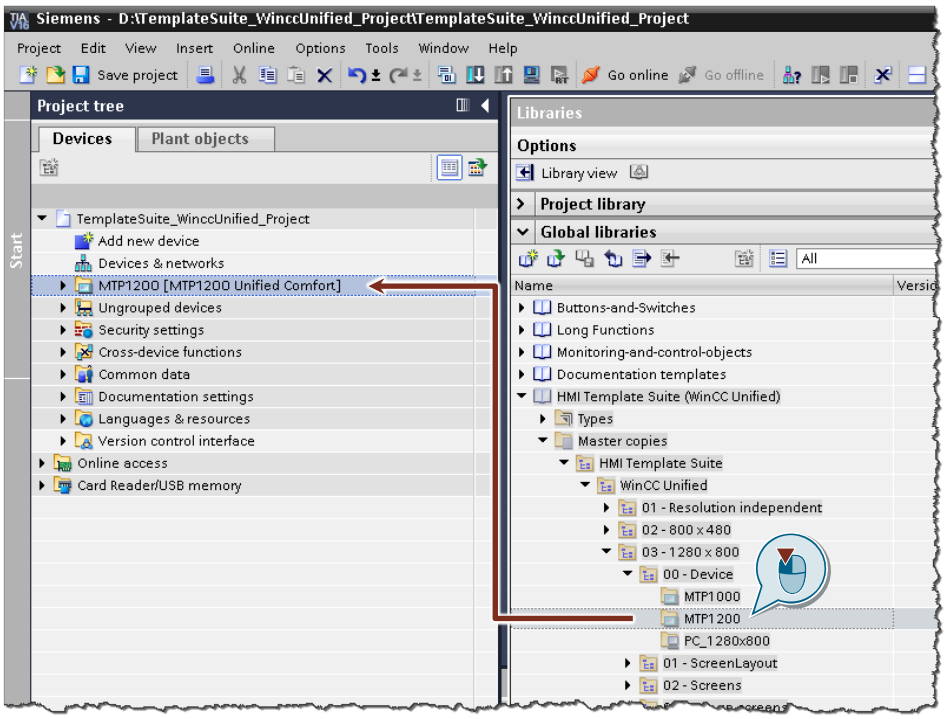
Figure 4-3



8. Once you have selected the appropriate object, move the object to the project tree using the drag-and-drop feature. In this case, the fully configured "MTP1200" is added to the project tree using "Add new device".

   Note:
   The operator panels are sorted by resolution in the "00 – Device" folder. All elements (navigation bars, example screens, etc.) of the library are already included in these operator panels.

   Figure 4-4



9. In the next step, copy the faceplate from the library into your project (see chapter 3.1.1).
10. The operator panel is now fully configured. You can test it immediately with the runtime simulation or load it into a real operator panel. For this, adjust the IP address to match your configuration.

Using additional screen objects

Use the other screen objects, as well as the preconfigured HMI screens and assemble your visualization step by step. You can remove unused elements from the operator panel.

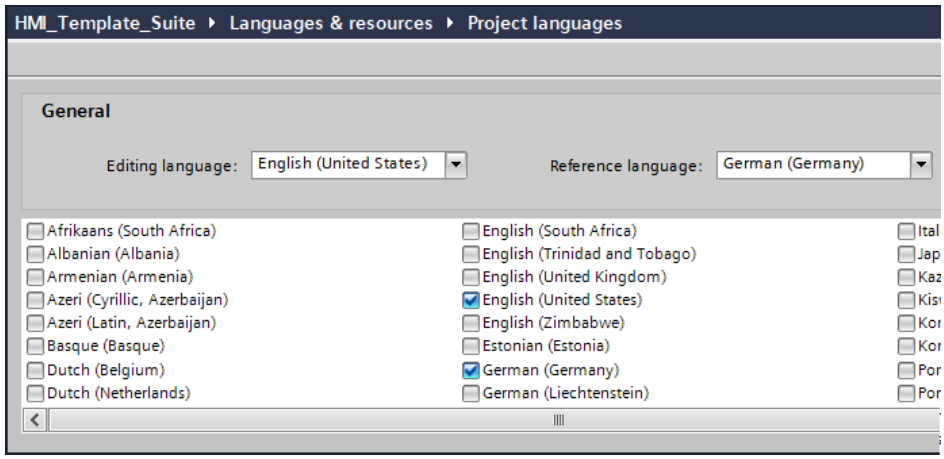
4.1 Set the language

The stored projects and screen objects have been created in the following languages.

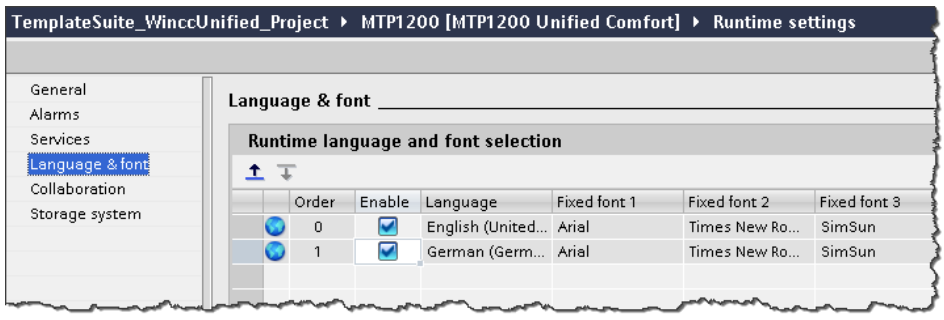
- German (Germany)
- English (United States)

For the project texts to be displayed correctly, the previously mentioned languages must be activated. Check the language settings in your project.

- "Project tree > Languages & resources > Project languages"
  Figure 4-5



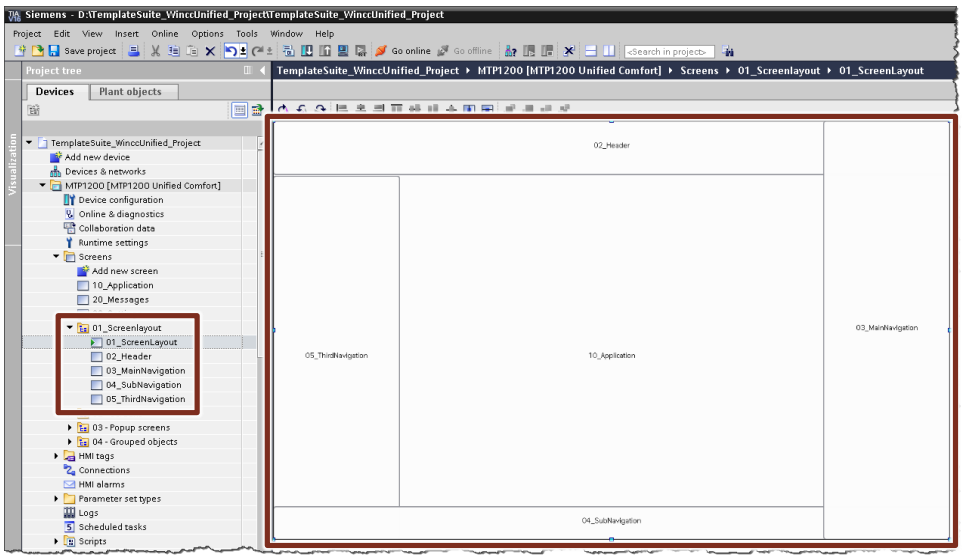
- "Project tree > Configuration > Runtime settings"
  Figure 4-6



4.2 Creating templates with screen windows

A "01_ScreenLayout" screen with several screen window is created in the library (see also Section 2.5). You can create your templates according to the arrangement of the individual screen windows. You can use the screen window object property "Visibility" to define in which screen the faceplate should be visible.

Figure 4-7

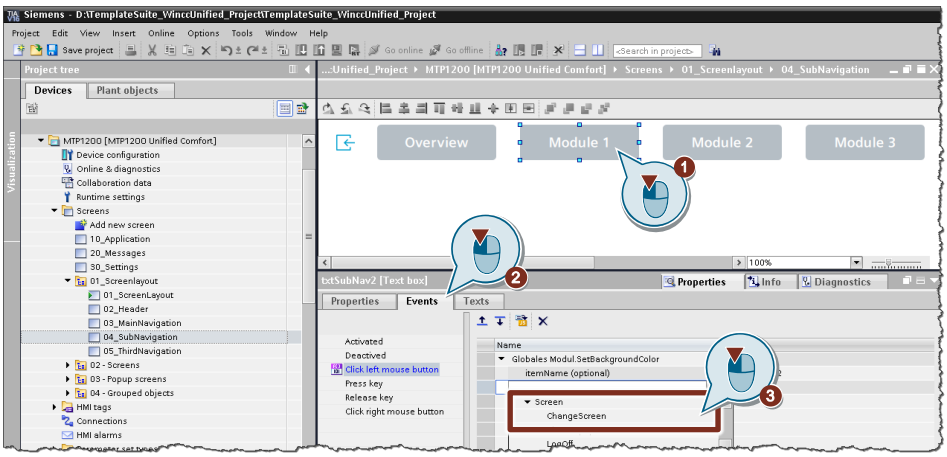


Access screens via navigation levels

The navigation levels can be used, for example, to access screens. To configure these, proceed as follows:

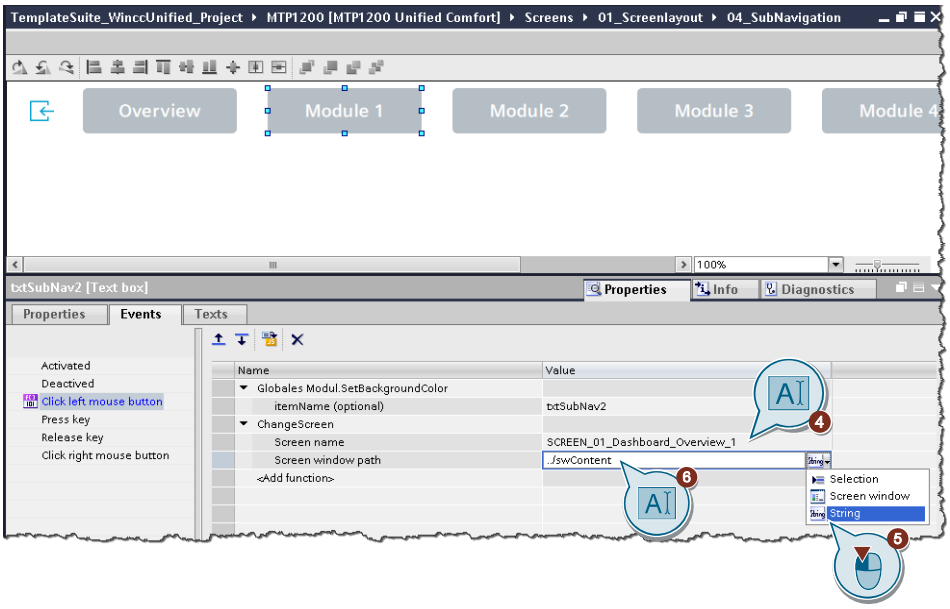
1. Select the screen object that you want to use to switch screens.
2. Open the "Events" of the screen object.
3. Add the "ChangeScreen" system function

Figure 4-8



4. Enter the name of the screen to be displayed in the center screen window.
5. Change the input mode for the screen window path to "String".
6. Enter the path "../swContent" in the field "Screen window path".

Figure 4-9



Note

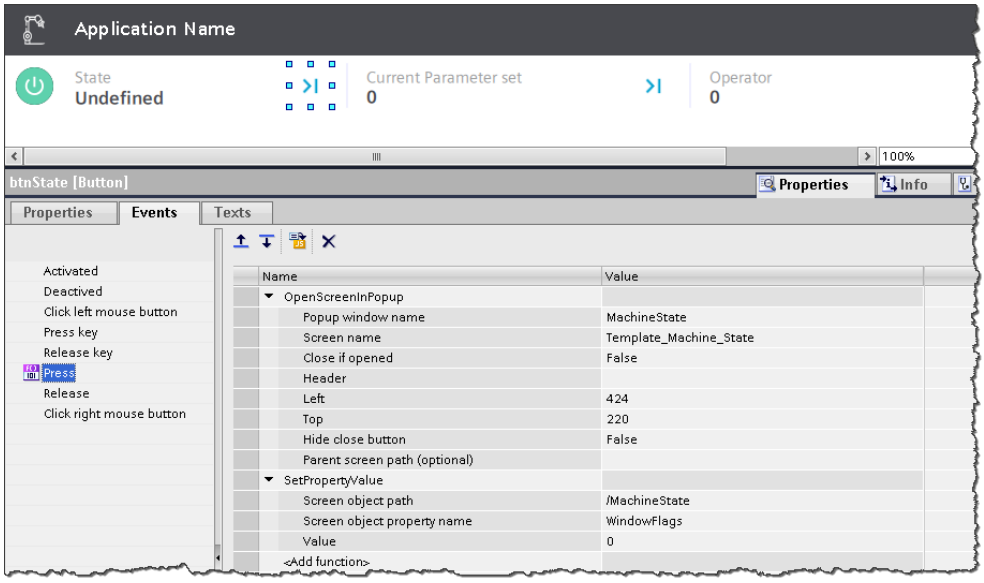
Runtime screen
The button for accessing the currently active screen is always displayed in the accent color.

Highlighting the active screen is done using the script function "HighlightButton" in the Global Module "Navigation".

4.3 Accessing Screens as Pop-Ups

In WinCC Unified, you can access screens as pop-ups. The system function "OpenScreenInPopup" is used for this.

Figure 4-10

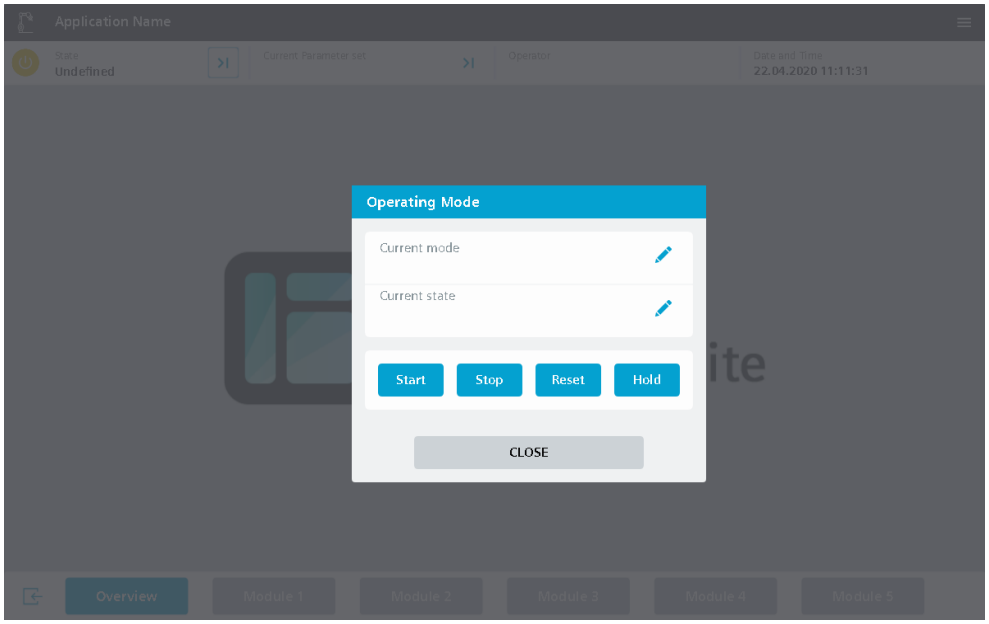


Note By setting the "WindowFlags" property to zero, you hide all faceplate properties (frame, moveable, etc.).

Block background

To focus on the content of the screen (opened as a pop-up), the background is displayed as locked. For this purpose, a semi-transparent rectangle has been configured in the "01_Screenlayout" screen in level 6. The rectangle is turned visible when the screen is displayed.

Figure 4-11



4.4 Example operator actions

This chapter shows the basic operation of the "HMI Template Suite".

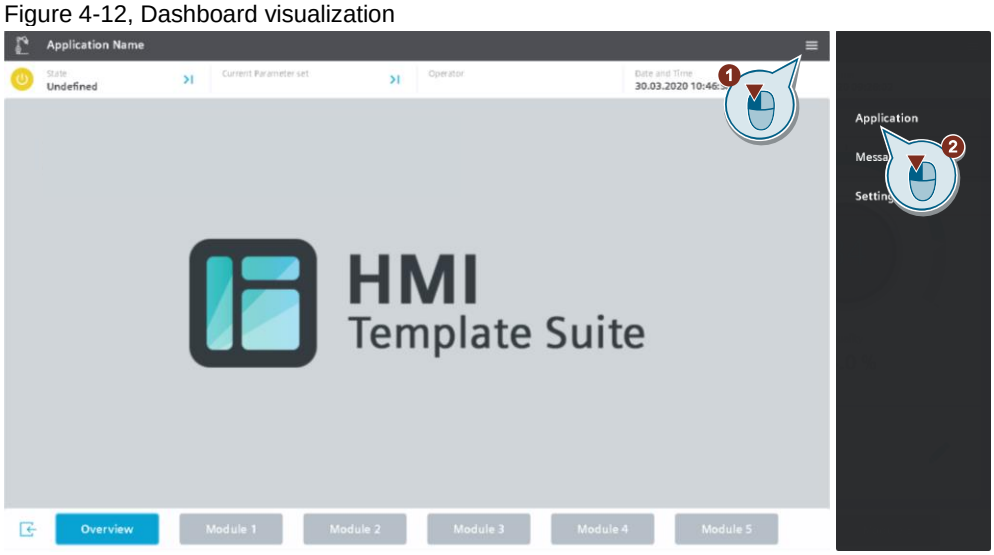
In this application example, the "Application" button is not used to execute any function. Create your own visualization of your system, which you can access with the "Application" button.

An example is shown of what the operation of your machine can look like.

First menu level

1. Click the hamburger menu in the upper right corner (1).
   In this first menu level, you have access to your main visualization, a message and diagnostics window, and a settings page.
2. Click the first "Application" button to start your visualization.

Figure 4-12, Dashboard visualization

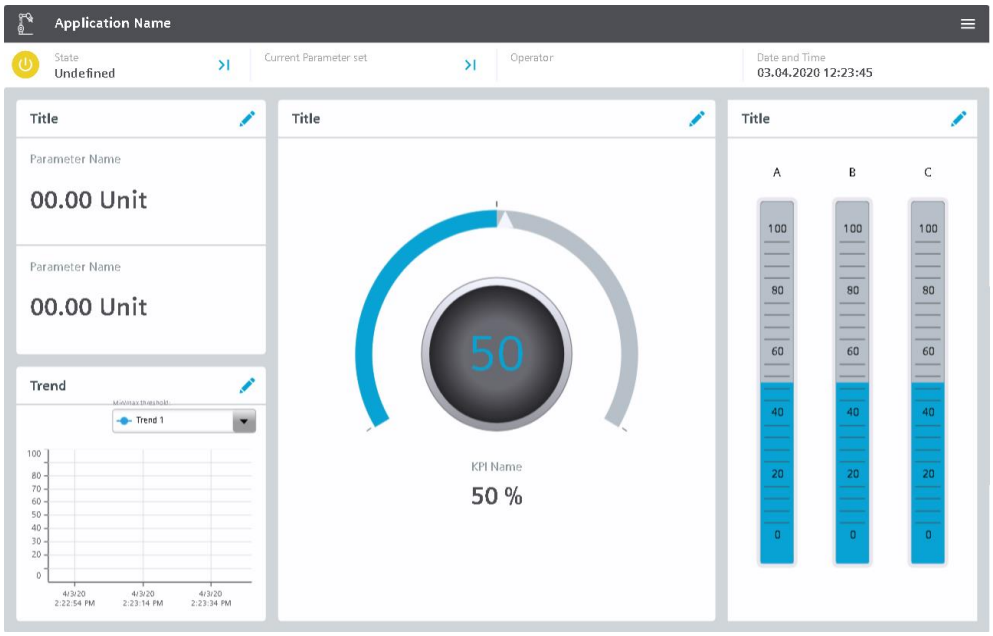


Use dashboards to create an overview

A Dashboard is recommended for the Start Page, e.g., with the screen "SCREEN_01_Dashboard_Overview_3". This screen shows both the current efficiency and that of the last 3 days.

On the left you can see 2 modules. The  button allows you to then jump from the Dashboard to the Module Overview.

Figure 4-13: Dashboard visualization



5 Appendix

5.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

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

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

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

support.industry.siemens.com

Technical Support

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

Please send queries to Technical Support via Web form:

support.industry.siemens.com/cs/my/src

SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

siemens.com/sitrain

Service offer

Our range of services includes the following:

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

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

support.industry.siemens.com/cs/sc

Industry Online Support app

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

support.industry.siemens.com/cs/ww/de/sc/2067

5.2 Industry Mall

The Siemens Industry Mall is the platform on which the entire siemens Industry product portfolio is accessible. From the selection of products to the order and the delivery tracking, the Industry Mall enables the complete purchasing processing – directly and independently of time and location:
mall.industry.siemens.com

5.3 Links and literature

Table 5-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the article page of the application example https://support.industry.siemens.com/cs/ww/en/view/91174767
\3\	Link to the HMI Design Masterclass Video series https://new.siemens.com/global/en/products/automation/simatic-hmi/design-masterclass.html
\4\	Link to the HMI Template Suite page https://new.siemens.com/global/en/products/automation/simatic-hmi/hmi-template-suite.html
\5\	SIMATIC WinCC Unified "View of Things ("VoT") https://support.industry.siemens.com/cs/ww/en/view/109803395

5.4 Change documentation

Table 5-2

Version	Date	Change
V1.0	04/2020	First edition
V2.0	11/2021	Adaptation to V17, Tile navigation
V3.0	12/2021	Added "Unified View Of Things"
V3.1	06/2022	Optimization of the library and documentation as well as new functionalities