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Creating a Standard Recipe View and Recipe Screen

WinCC Runtime Advanced V14 and Comfort Panels

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1 Task

1.1 Overview

Introduction

Recipes summarize related data like machine configurations or production data. These data can then, for example, be transferred from the operator panel to the controller in one step to switch the production to another product variant. Vice versa, it is also possible to transfer the configuration data you entered directly at the machine to the operator panel and save them in the recipe.

Automation task

The application shows a simplified filling process using recipe management and clarifies the following topics:

- How to use the standard recipe view
- Using self-made displays to configure recipes

1.2 Requirements

There are two possibilities to display and edit recipes and the involved recipe data records on the operator panel during runtime in WinCC Advanced:

- "Recipe view"
- Recipe screen

Topics not covered by this application

This application does not include a description of

- the engineering tools
  SIMATIC STEP 7 (TIA Portal) or SIMATIC WinCC (TIA Portal)
- the used operator panels.

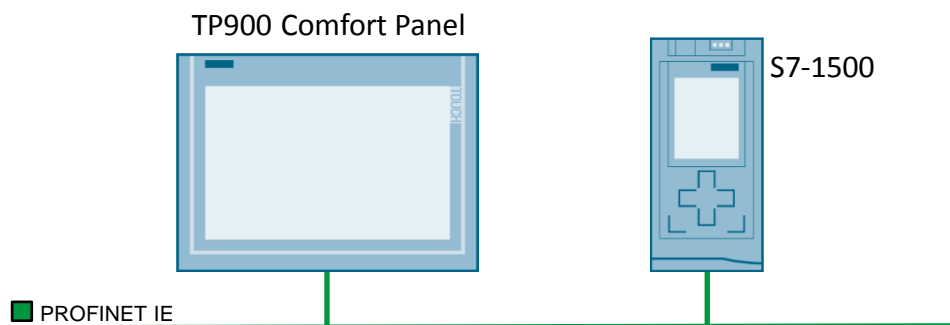Basic knowledge of these topics is assumed.

2 Solution

2.1 Overview

The following section describes the automation task using the application example.

The following diagram gives a schematic overview of the hardware configuration

Figure 2-1

PROFINET IE

Setup

The included configuration considers a plant with one production line which is operated with a SIMATIC HMI panel.

- SIMATIC HMI TP900 Comfort

- SIMATIC S7-1500

All nodes are connected to one another via PROFINET.

Description of the core functionality

The difference between a standard recipe view and a recipe screen is considered in detail using two application examples. The two examples show how the settings impact the properties of the used recipe tags at the operator panel and at the controller.

2.2 Application example 1: "AdvancedRecipe"

The application example "AdvancedRecipe" shows how to create and configure a standard recipe view in simple steps. The following aspects are considered:

- Creating a recipe data block

- Creating a new recipe, recipe elements and recipe data records

- Configuring a recipe view

Figure 2-2
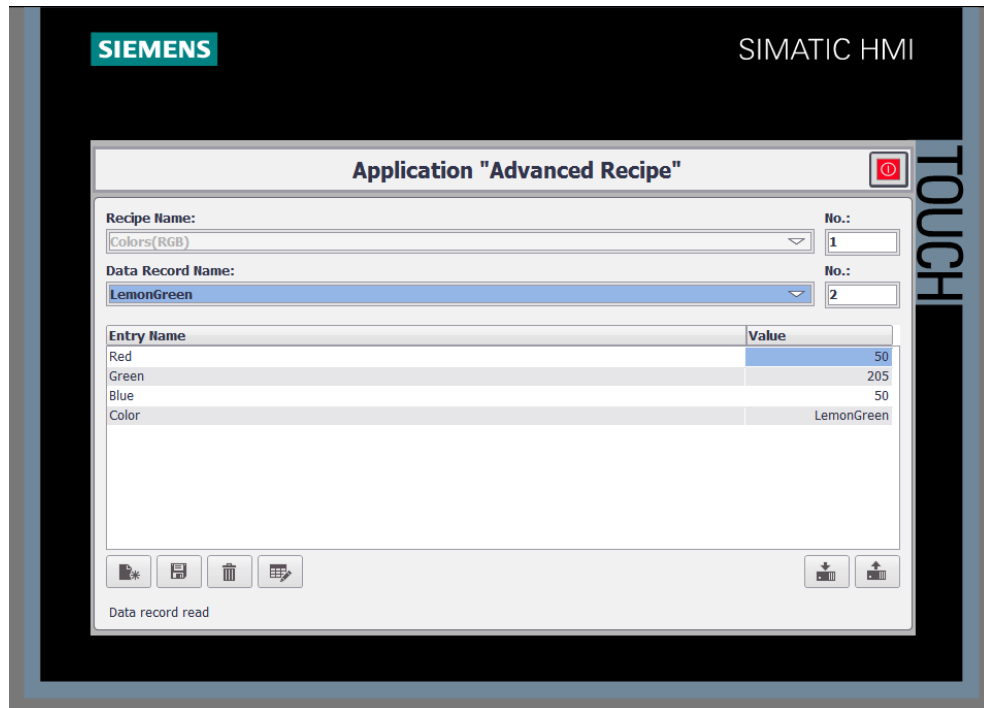
Topics not covered by this application

This application does not contain any descriptions on the following issues:

- Network connection
- Hardware configuration

Assumed knowledge

Basic knowledge of

- S7-1500
- STEP7 (TIA Portal)
- WinCC Advanced V13
- SIMATIC HMI panels

is assumed.

2.3 Application example 2: "RecipeScreen"

The application example "RecipeScreen" describes how to configure an RGB ink mixing system for mixing and filling a previously programmed ink recipe using a self-made recipe screen.

The ink recipe consists of the three RGB colors (red, green and blue).

The filling procedure is carried out as follows:

- Selecting the ink mixture with the recipe function on the HMI panel.
- Filling the selected ink mixture and transporting it with a conveyor belt.

The core of this application example is how to use a recipe screen regarding following topics:

- Creating RGB recipe, recipe elements and recipe data records

2.4 Hardware and software components

- Creating HMI tag and connecting with the PLC tags
- Integrating the RGB recipe in the HMI screen of the ink mixing system

Figure 2-3
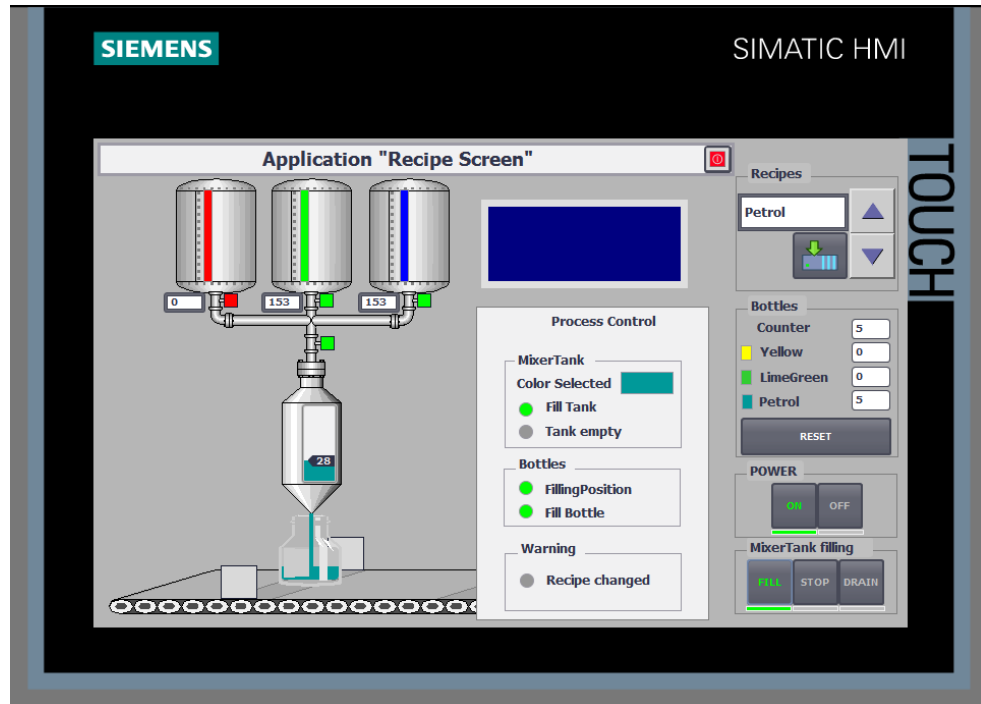
Topics not covered by this application

This application does not include a description of:

- Network connection and hardware configuration
- S7 programs

Assumed knowledge

Basic knowledge of

- S7-1500
- STEP7 (TIA Portal)
- WinCC Advanced V13
- SIMATIC HMI panels

is assumed.

2.4 Hardware and software components

2.4.1 Validity

This application is valid for

- STEP7 (TIA Portal) V14
- S7-1500 V1.7
- WinCC V14

2.4 Hardware and software components

2.4.2 Components used

This application was set up with the following components:

Hardware components

Table 2-1

Component	Qty	Article number
SIMATIC HMI TP900 COMFORT	1	6AV2124-0JC01-0AX0
CPU 1515-2 PN	1	6ES7515-2AM00-0AB0

Software components

Table 2-2

Component	Qty	Article number
SIMATIC WinCC Advanced V14	1	6AV2102-0AA03-0AA5
SIMATIC STEP 7 V14 Professional	1	6ES7822-1..03-..

Example files and projects

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

Table 2-3

Component	Note
109739999_CODE_Application_AdvancedRecipe.zip	This zip file contains a preconfigured WinCC Advanced project required for Application example No. 1.
109739999_CODE_Application_RecipeScreen.zip	This zip file contains the STEP 7 and WinCC Advanced project required for Application example No. 2.
109739999_Umgang_mit_Rezepturen_v13_e.pdf	This document.

3 Basics

3.1 Recipe structure

Figure 3-1
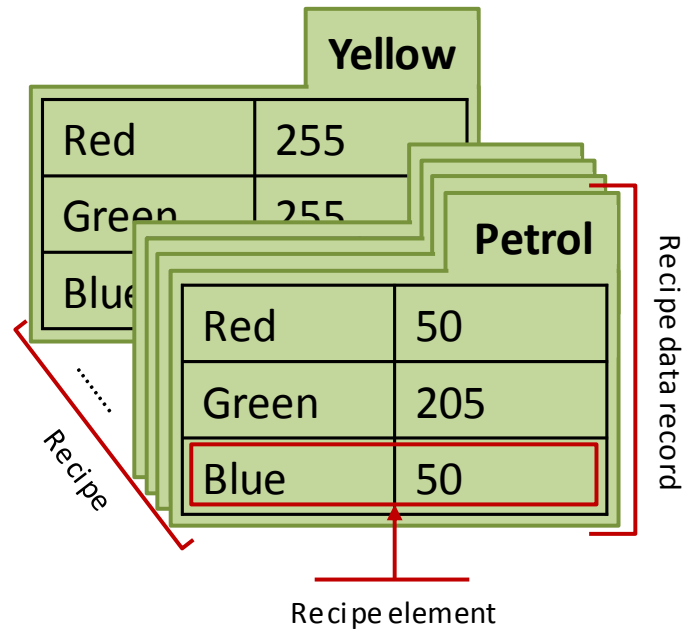
Recipes

Recipes summarize related production data, e.g. mixture ratios.

A recipe contains several recipe data records with a predefined data structure, e.g. for an ink mixing system (RGB colors).

Recipe data records

The structure of each register in figure 3-1 is identical and represents one recipe data record in which the mixture ratios, e.g. for producing a specific mixed color (yellow, orange, petrol, ...) are saved.

Recipe elements

Figure 3-1 shows that each register contains identical fields (red, green, blue). Each field represents a recipe element. This means that only the value of the individual recipe elements is different.

Example:

All mixed inks in the recipe "RGB colors" contain the following components or elements

- Red

- Green and

- Blue

and only the value of the individual element is different.

3.1 Recipe structure

E.g.:

Table3-1

		"Color" recipe data records		
		Yellow	Lemon green	Petrol
Recipe elements	Red	255	50	0
	Green	255	205	153
	Blue	0	50	153
Recipe "RGB colors"				

Note	For further information, please refer to the "WinCC Advanced V14" system manual under Definition and applications.

3.2 Recipe view and recipe screen

Recipes on the operator panel can be displayed or edited with a recipe view or a recipe screen.

Note	For further information, please refer to the "WinCC Advanced V14" system manual, chapter "Display of recipes"

3.2.1 Recipe view

The recipe view is a screen object that you configure in the "Screen" editor and use in runtime to display and edit recipe data records.

Figure 3-2

The recipe view shows recipe data records in table format. The finished screen object allows you to quickly create a recipe management and save time. The style and design can be adapted to a certain degree.

Note	For further information, please refer to the "WinCC Advanced V14" system manual, chapter Description of the advanced recipe view"

3.2.2 Recipe screen

A recipe screen is a custom recipe input screen within the HMI operator panel which is configured using I/O fields and other screen objects in the "Screens" editor. In this example, it is a process image of the ink mixing system. It enables in particular:

- Entering configuration data in the context of, e.g., a graphic representation of the machine.

3.2 Recipe view and recipe screen

- Distributing the I/O fields for a recipe over several recipe screens.
- Configuring custom operating functions for the recipe screens in the process images. (→ Custom recipe screen)

Custom recipe screen

Custom screens enable you to tailor your recipe management to the system. Several examples are shown below.

- Different appearance of the recipe management depending on the logged in user.
    - Hiding/showing objects

User A   User B
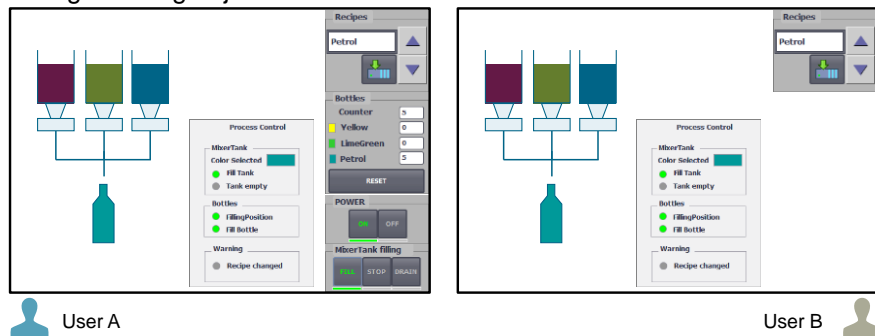
    - Different object positions

User A   User B
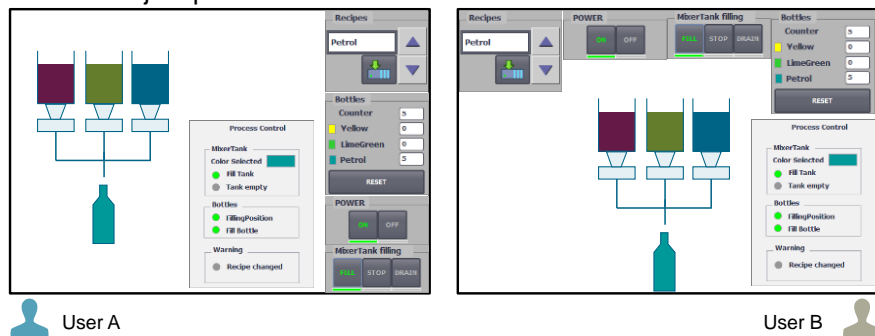
    - Different appearance of objects (colors)

User A   User B
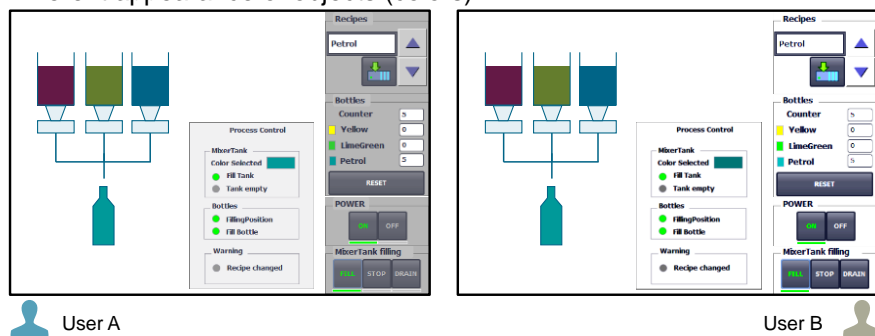
3.2 Recipe view and recipe screen

- Locking buttons with passwords
  (Only complete objects can be locked in standard recipe views. A recipe screen enables you to lock individual elements in the recipe management.)
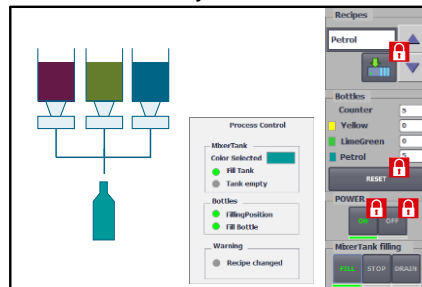
- Configuring additional button functions.
  (E.g. setting a status, adding a script or adding a counter for the number of times a recipe function has been used.
  The buttons in standard recipe views are assigned only one function. A recipe screen enables you to add several functions.)
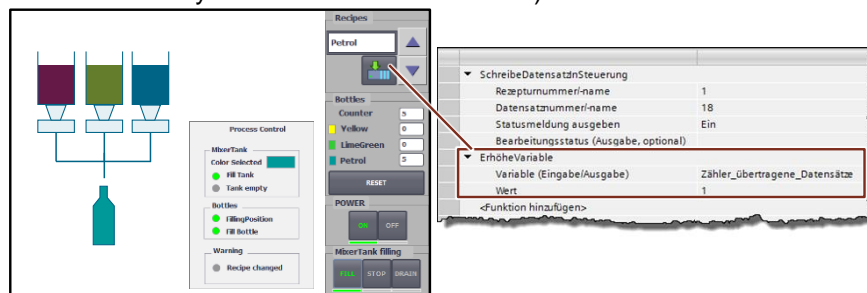
| Note | For further information, please refer to the "WinCC Advanced V14" system manual, chapter Basics on the recipe screen" |

4 Application example 1: Standard recipe view

4.1 Overview

The following figure shows the configuration steps for a standard recipe view:

Figure 4-1
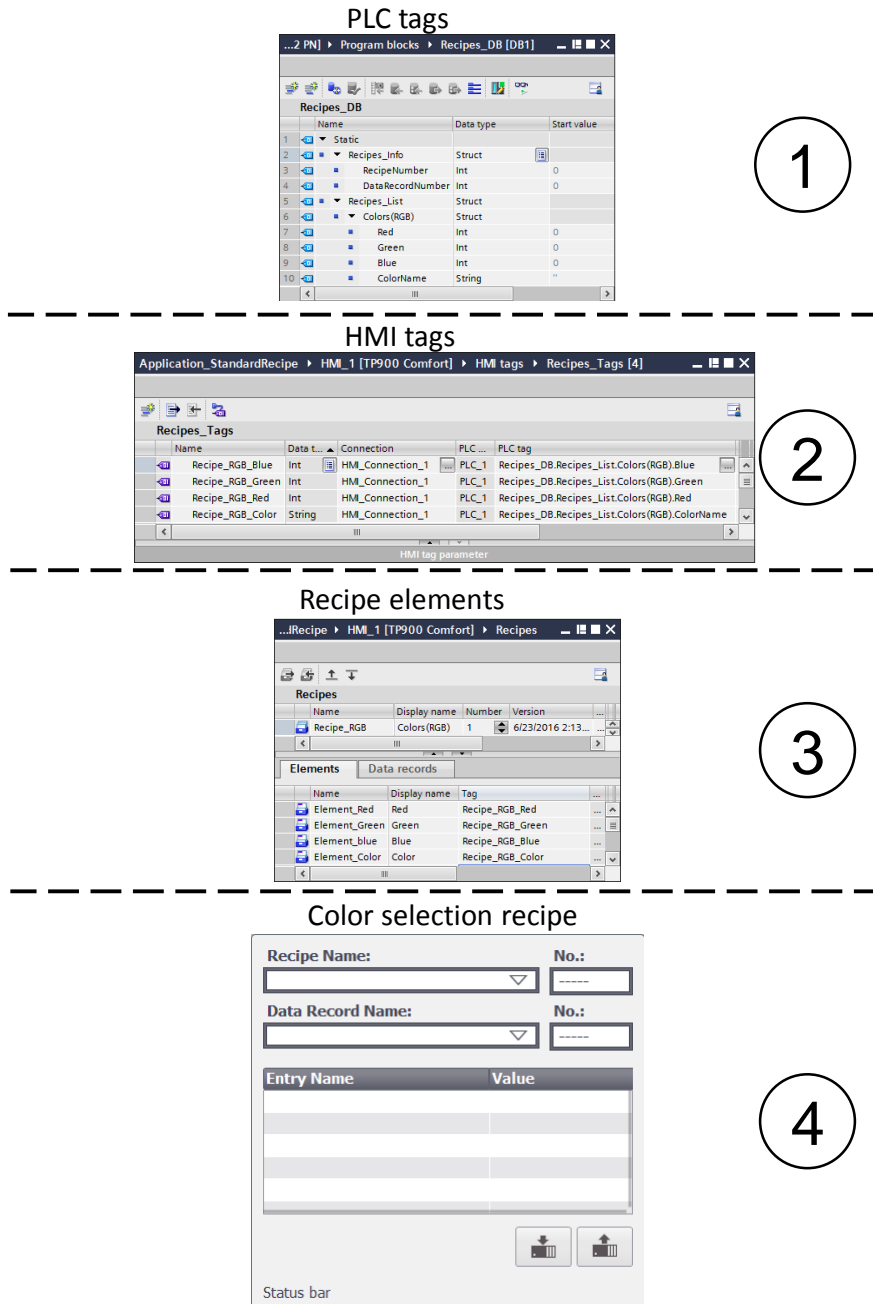
4.2 Configuration and settings

This chapter describes details on the configuration of a standard recipe view.

Note	At this point, it is assumed that the necessary software has already been installed on your computer and that you are already familiar with handling the software.

4.2.1 Opening the example project

Table 4-4

No.	Description
1.	Download the project "109739999_CODE_Application_AdvancedRecipe.zip" for this documentation and unzip it.
2.	Open the contained project "Application_AdvancedRecipe.zap13" with STEP 7 (TIA Portal V13).

Note	For further information, please refer to the "WinCC Advanced V14" system manual, chapter Retrieving compressed project"

4.2.2 Creating network

Note	It is assumed that a connection between the S7 controller and the operator panel has been established.

The "WinCC Advanced V14" system manual provides further basics on the following topics:

- Creating a new connection
- PROFINET parameters for the HMI connection
- Creating an integrated HMI connection

4.3 Creating the program in STEP 7

Before the recipe management can be created in WinCC Advanced, a recipe data block for the S7-1500 must be created in STEP 7.

4.3.1 Recipe data block [DB1]

In the navigation pane, select "PLC_1>Program blocks", double-click on "Add new block" and proceed as follows:

Creating a data block

Table 4-1

No.	Procedure
1.	In the "Add new block" window, click on the "Data block" button. (1)
2.	Enter a meaningful name in the "Name" field, e.g. "Recipes_DB". (2)
3.	Then click "OK". (3)

4.3 Creating the program in STEP 7

No.	Procedure
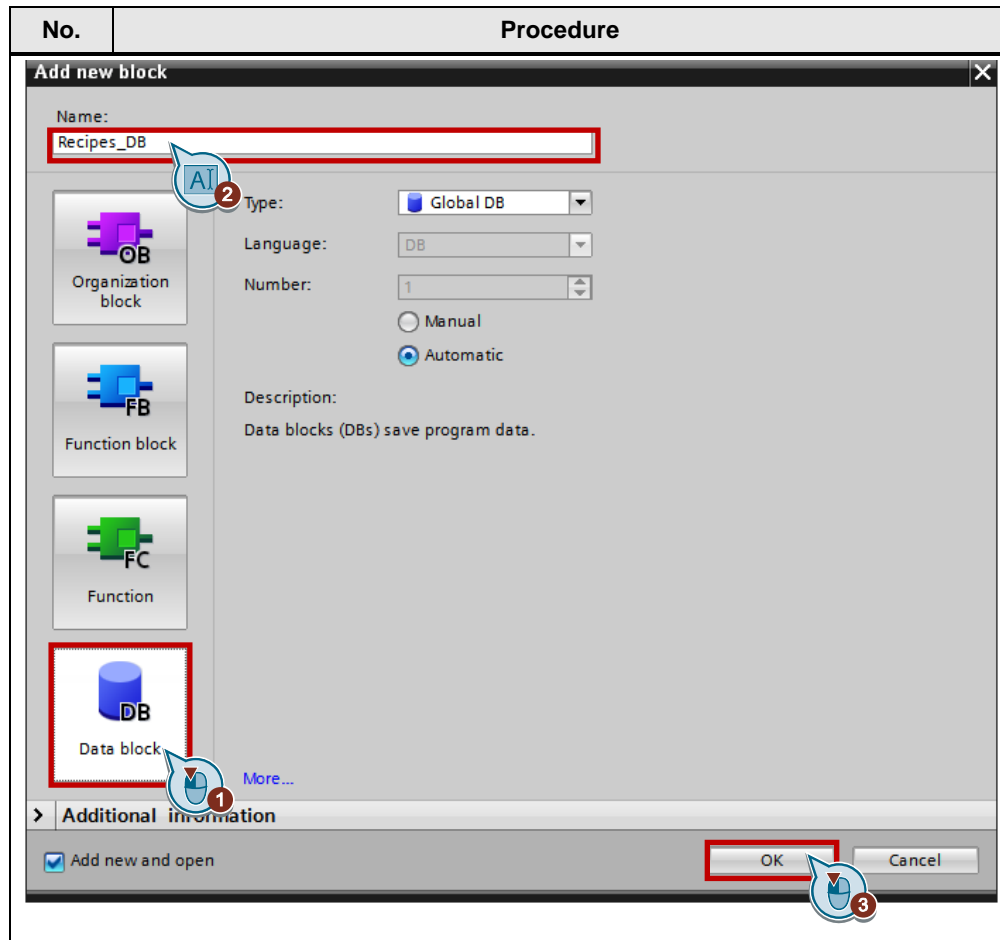
Configuring a data block

The recipe tags are declared under the following data structure in the data block window "Recipes_DB":

- Recipes-Info: contains the "RecipeNumber" and "DataRecordNumber" tags.
- Recipes-List: contains the recipes and the recipe element tags.
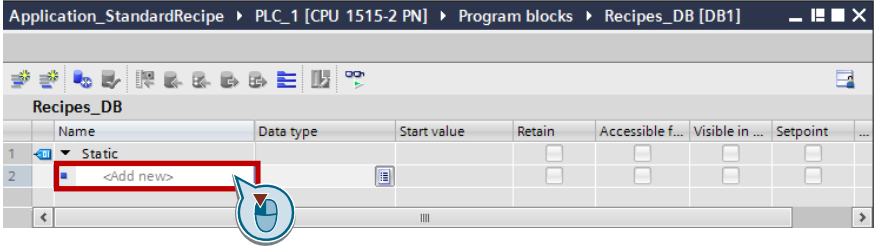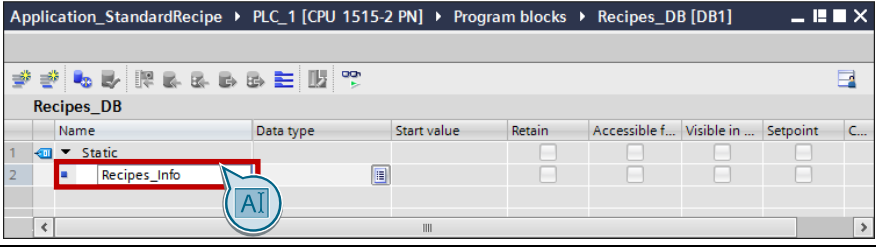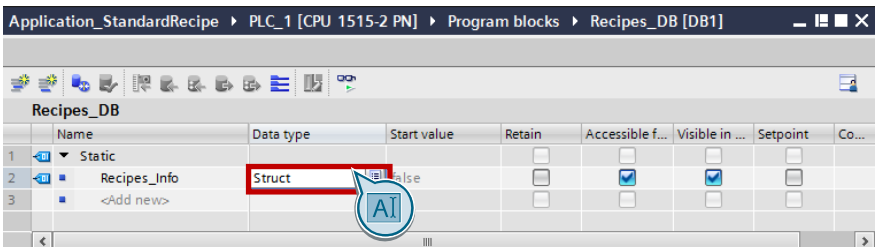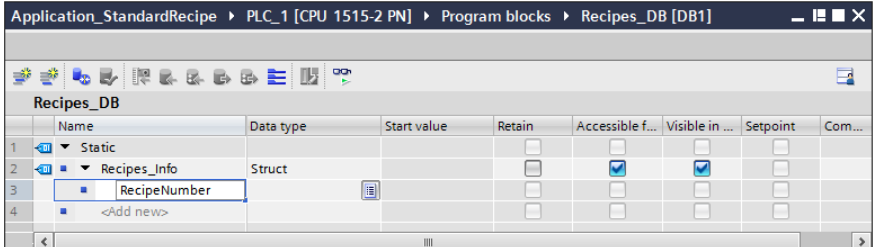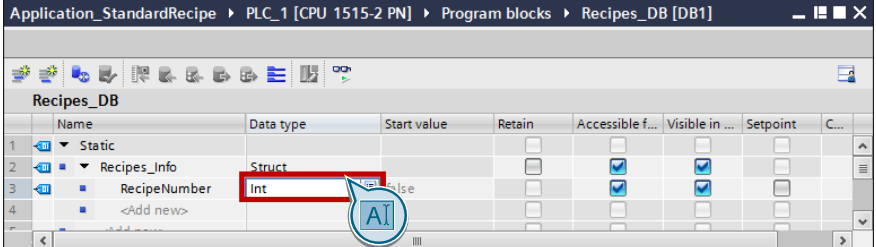
4.3 Creating the program in STEP 7

Data structure: Recipes-Info

Table 4-2

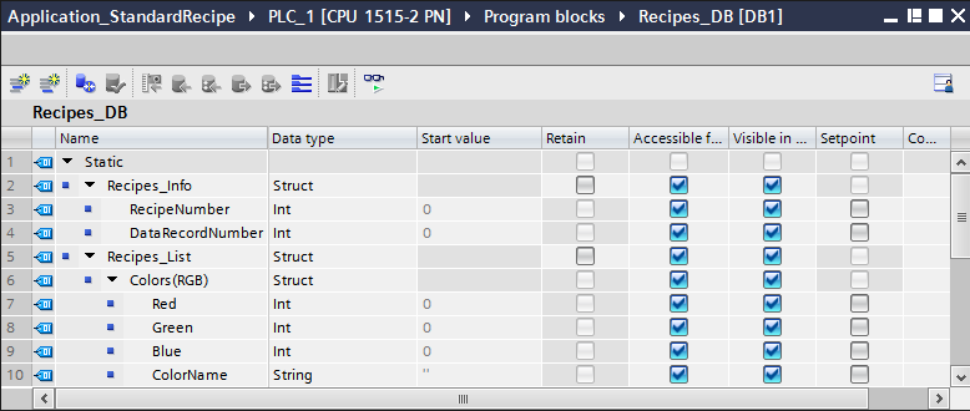| No.	Procedure
1.	Under "Static", click on "Add new"
2.	Enter "Recipes_Info" as a name and then press "Enter".
3.	From the "Data type" drop-down list, select the data type "Struct" and then press "Enter".
4.	Under "Recipes-Info", click on "<Add new>" and enter "RecipeNumber" as a name in the input field, then press "Enter".
5.	From the "Data type" drop-down list, select the data type "Int" and then press "Enter".
6.	Repeat steps 4 and 5 for the tag "DataRecordNumber" with "Int" data type.

4.3 Creating the program in STEP 7

No.	Procedure

Data structure: Recipes-List

Table 4-3

No.	Procedure
1.	Under "Static", click on "Add new"
2.	Enter "Recipes_List" as a name and then press "Enter".
3.	From the "Data type" drop-down list, select the data type "Struct" and then press "Enter".

4.3 Creating the program in STEP 7

No.	Procedure
4.	Under "Recipes-List", click on "<Add new>" and enter "Colors(RGB)" as a structure name in the input field, then press "Enter".
5.	From the "Data type" drop-down list, select the data type "Struct" and then press "Enter".
6.	Under "Colors(RGB)", click on "<Add new>" and enter "Red" as a tag name in the input field, then press "Enter".
7.	From the "Data type" drop-down list, select the data type "Int" and then press "Enter".
8.	Repeat steps 6 and 7 for the following tag: • Green(Int), • Blue(Int) and • ColorName(String)

No.	Procedure
The figure shows how the completed recipe data block table looks after preparation: 	

4.3.2 Compiling the project

The following table shows how to compile the project:

Table 4-4

No.	Procedure
1.	Select the CPU "PLC_1[CPU1515_2 PN]" from the navigation pane.
2.	Open the context menu with the right mouse button and select the command "Hardware and software (only changes)".

Note	For further information, please refer to the "WinCC Advanced V14" system manual, chapter Basic information on compiling blocks"

The project has been compiled and is ready for loading.

4.3.3 Loading the project into the CPU

The following table shows how to load the project into the CPU:

Table 4-5

No.	Procedure
1.	Select the CPU "PLC_1[CPU1515_2 PN]" from the navigation pane.
2.	Open the context menu with the right mouse button and select the command "Download to device>Hardware and software (only changes)".
3.	In the "Extended download to device" window, select the interface and the subnet connection from the "PG/PC interface type" drop-down list.
4.	Select the CPU in the "Compatible devices in the subnet" section and then click on "Load".
5.	Confirm the two "Assign IP address" dialogs with "Yes" and "OK".
6.	In the "Load preview" dialog, select the alternative entry for all entries in the drop-down list set to "No action" and confirm open options.

No.	Procedure
7.	Click on "Load".
8.	Confirm the "Start all" option and click "Finish".
9.	The project has been loaded to the CPU.

Note	For further information, please refer to the "WinCC Advanced V14" system manual, chapter Introduction on downloading blocks"

4.4 Configuring HMI visualization

After having crated the PLC tag structure for the "Colors"RGB" recipe in chapter 4.3, the next step is to create the HMI tags and connect them to the PLC tags. This enables the recipe elements to be created in chapter 4.4.2 to access the tags in the controller.

The following table shows how the tags are assigned to each other:

Table 4-6

PLC tag	HMI tag	Recipe element
Recipes_DB.Recipes_List.Colors(RGB).Red	Recipe_RGB_Red	Element_Red
Recipes_DB.Recipes_List.Colors(RGB).Green	Recipe_RGB_Green	Element_Green
Recipes_DB.Recipes_List.Colors(RGB).Blue	Recipe_RGB_Blue	Element_Blue
Recipes_DB.Recipes_List.Colors(RGB).Color	Recipe_RGB_Color	Element_Color
Recipes_DB.Recipes_Info.RecipeNumber	RecipeNumber	-
Recipes_DB.Recipes_Info.DataRecordNumber	DataRecordNumber	-

4.4.1 HMI tag table

HMI tag tables contain the definitions of the HMI tags for the devices. With the HMI tags connected with the controller, you can access the addresses of the controller.
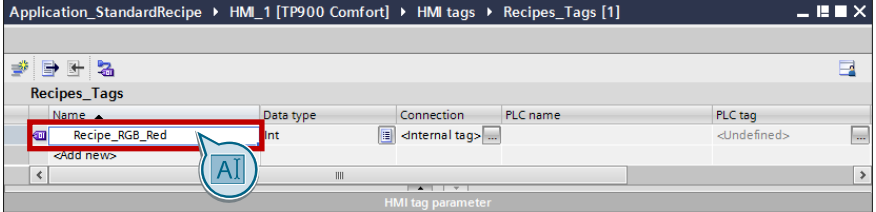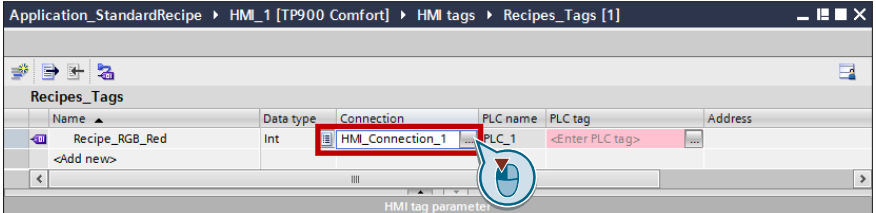
Note	For further information, please refer to the "WinCC Advanced V14" system manual, chapter Creating external tags"

The following table shows how to create HMI tags and how to connect them with the controller via the respective PLC tags:
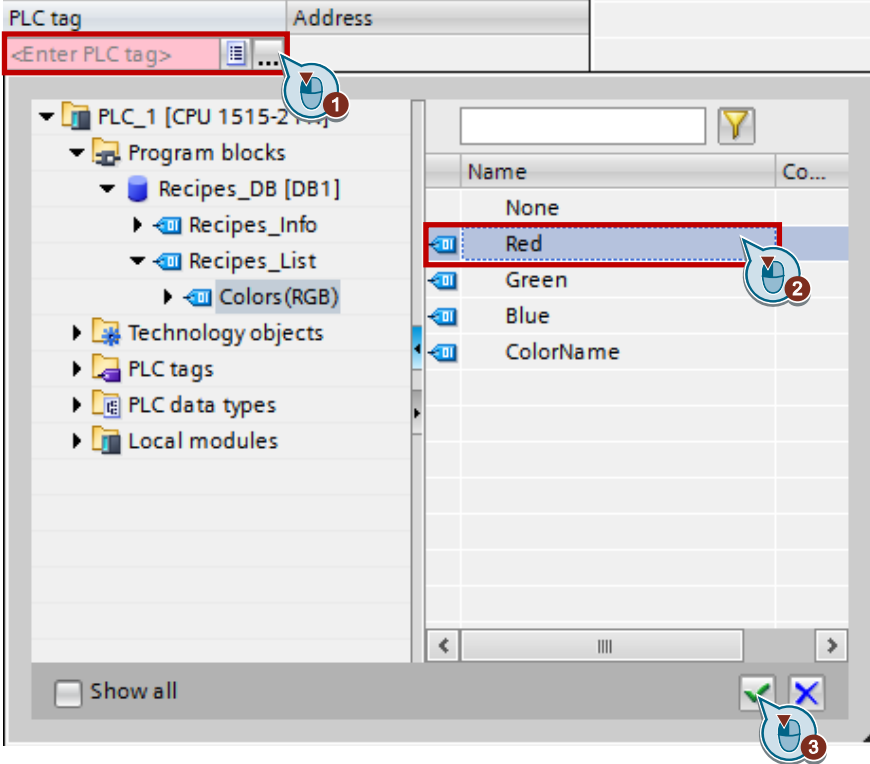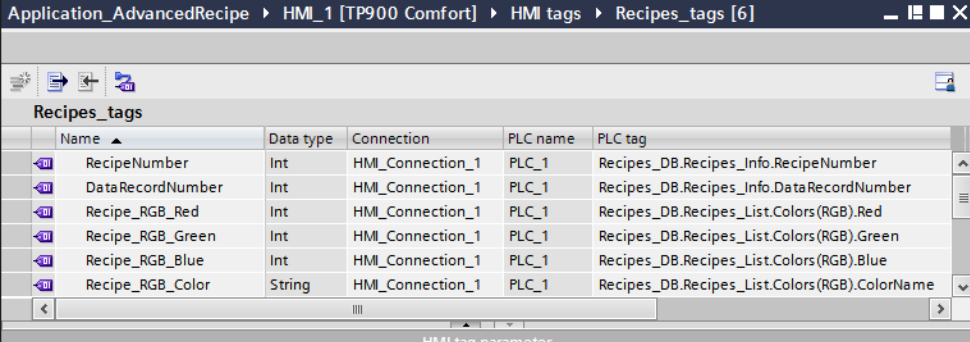
4.4 Configuring HMI visualization

Table 4-7

No.	Procedure
1.	Under the operator panel "HMI_1", open the folder "HMI tags" folder and create a new tag table by double-clicking on "Add new tag table". The tag table opens up.
2.	Rename the tag table to "Recipes_Tags".
3.	Double-click the tag table to "Recipes_Tags" to open it.
4.	In the "Name" column in the table, double-click on "<Add new>" to create a new tag.
5.	Enter a tag name in the "Name" column, e.g. "Recipe_RGB_Red".
6.	In the "Connection" column, click on the [...] button and select the connection to the desired controller.

4.4 Configuring HMI visualization

No.	Procedure
7.	In the "PLC tag" column, click on the [...] button and select the respective PLC tag, e.g. "Recipes_DB[DB1]>Recipes_List>Colors(RGB)>Red"
8.	Repeat the steps 4-7 for the remaining HMI tags: • Recipe_RGB_Green • Recipe_RGB_Blue • Recipe_RGB_Color • RecipeNumber • RecipeRecordNumber **Note:** Please note, that the PLC tags for the HMI tags (RecipeNumber and RecipeRecordNumber) can be found under "Recipes_DB[DB1]>Recipes_Info>…".

4.4.2 Recipe editor

The following tables show how to

- create a new recipe
- assign recipe elements to the newly created recipe and
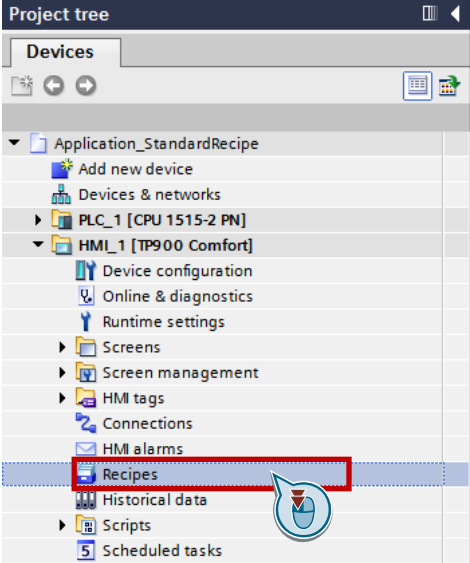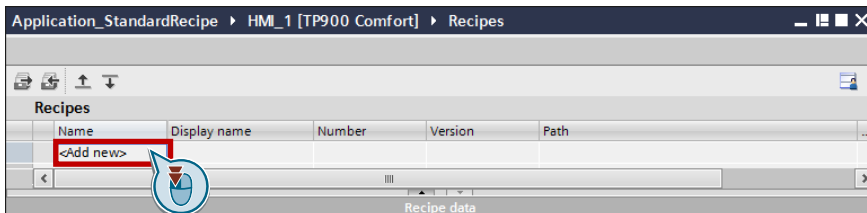- set the respective values in a recipe data record

Note	For further information, please refer to the "WinCC Advanced V14" system manual, chapter Creating a new recipe"

Creating a new recipe

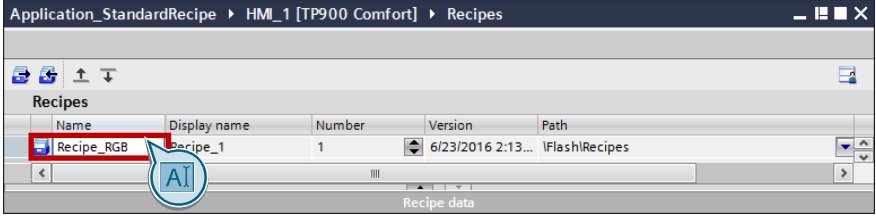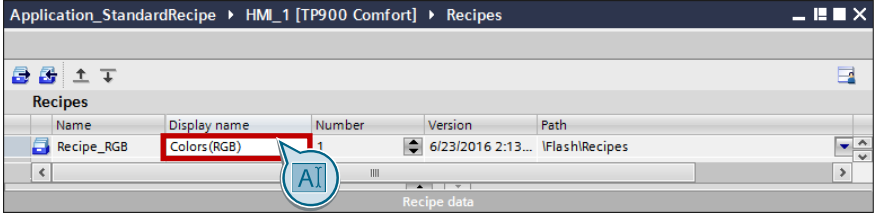The following table shows how to create a new recipe with the name "Recipe_RGB":

Table 4-8

No.	Procedure

1.	Under the folder "HMI_1[TP900 Comfort]", click on the "Recipe" editor.
	
	Project tree
	Devices
	▼ Application_StandardRecipe
	  Add new device
	  Devices & networks
	  ▶ PLC_1 [CPU 1515-2 PN]
	  ▼ HMI_1 [TP900 Comfort]
	    Device configuration
	    Online & diagnostics
	    Runtime settings
	    ▶ Screens
	    ▶ Screen management
	    ▶ HMI tags
	    Connections
	    HMI alarms
	    Recipes
	    Historical data
	    ▶ Scripts
	    Scheduled tasks

2.	In the "Recipes" tab in the work area, double-click on "<Add new>" in the first row of the table to create a new recipe. Application_StandardRecipe ▶ HMI_1 [TP900 Comfort] ▶ Recipes Recipes Name | Display name | Number | Version | Path <Add new> Recipe data

4.4 Configuring HMI visualization

No.	Procedure
3.	For a better overview, assign a meaningful name in the "Name" column, e.g. "Recipe_RGB".
4.	Enter a meaningful name in the "Display name" field, which will be displayed in the recipe view, e.g. "Colors(RGB)".

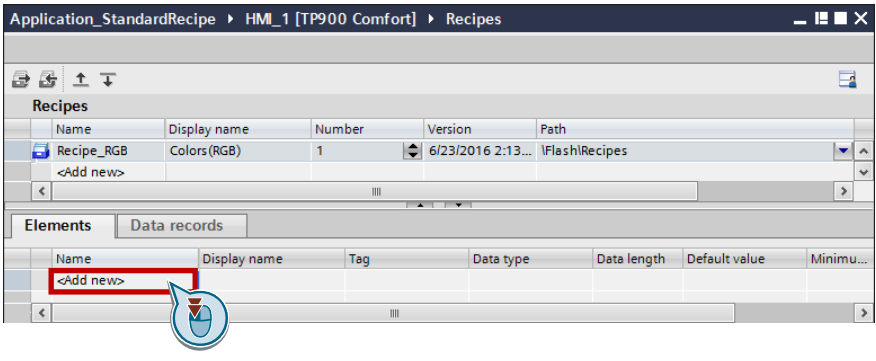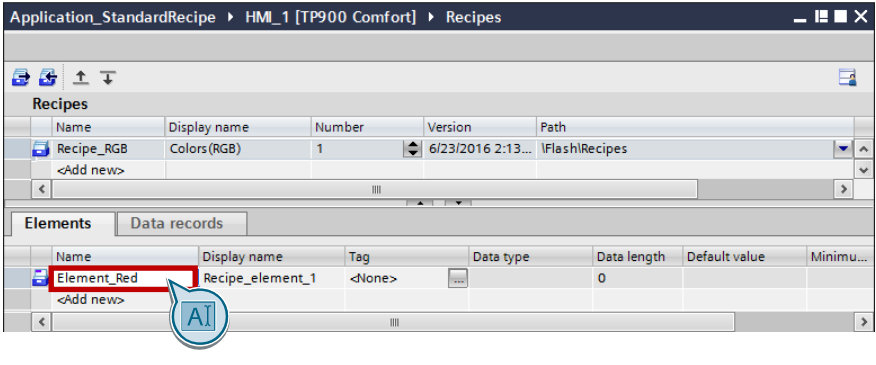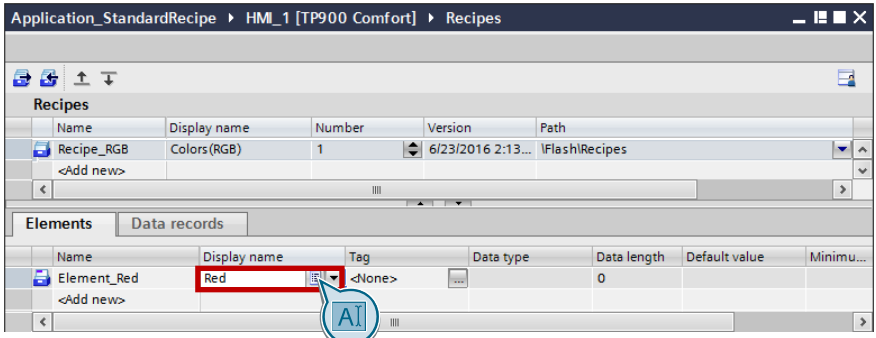| Note	For information on the "Synchronization" configuration, refer to the WinCC Advanced V14 system manual under "Configuration of recipes"
	For further information on the "Synchronization of recipes", refer to the application example "Automatic synchronization of recipes on several panels".

Creating recipe elements

The following table shows how to assign recipe elements (red, green, blue) to the previously created recipe "Recipe_RGB".

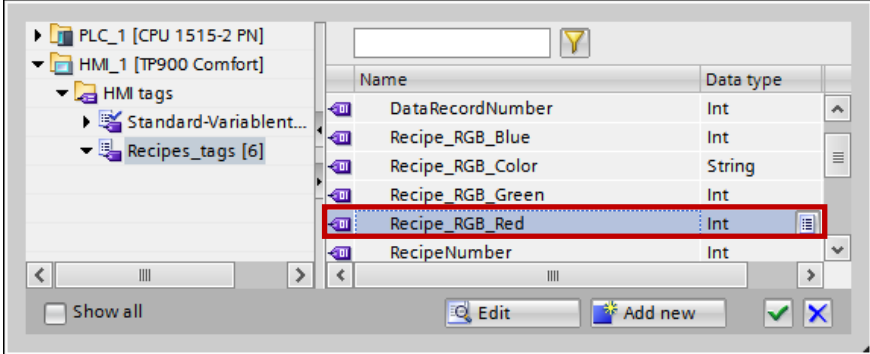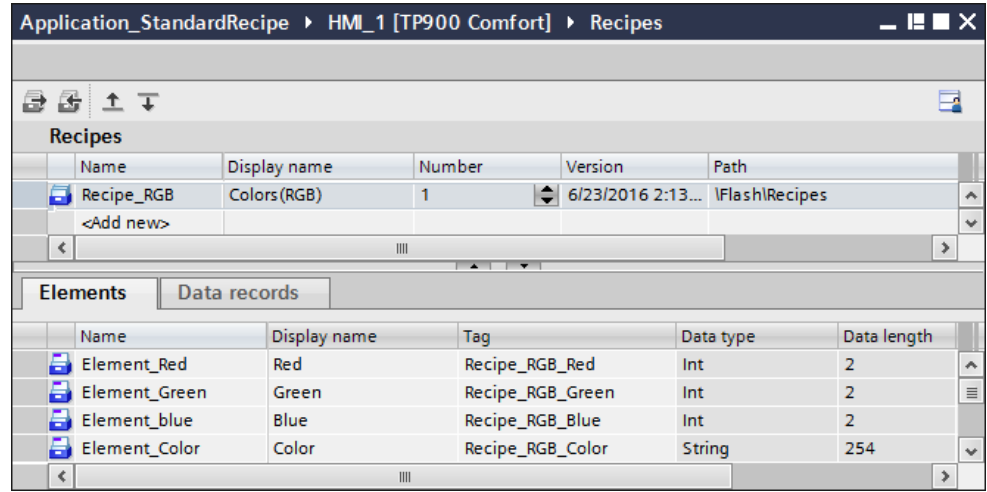First, select the recipe in the "Recipe" tab and the proceed as follows:

4.4 Configuring HMI visualization

Table 4-9

No.	Procedure
1.	In the "Elements" tab in the work area, double-click on "<Add new>" to create a new recipe element.
2.	For a unique identification of the recipe element, double-click on the "Name" column in the "Recipe element_1" field and enter a meaningful name for the recipe element, e.g. "Element_Red".
3.	Double-click on the "Display name" column in the "Recipe element_1" field and enter a meaningful name for the recipe element, e.g. "Red". **Note** This display name will be displayed in the recipe view.

4.4 Configuring HMI visualization

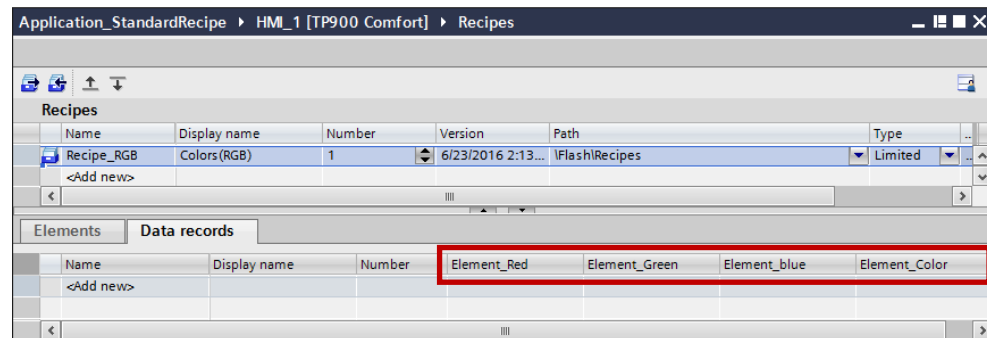| No.	Procedure
4.	In the "Tag" column, click on the [...] button and select the HMI tag previously created in chapter 4.3.1, e.g. "Recipe_RGB_Red" **Note** This tag serves for saving the value of the recipe element stored in a recipe data record in runtime.
5.	Repeat the steps 1-4 for the following recipe elements: • Name: "Element_Green", display name: "Green", HMI tag: "Recipe_RGB_Green" • Name: "Element_Blue", display name: "Blue", HMI tag: "Recipe_RGB_Blue" • Name: "Element_Color", display name: "Color", HMI tag: "Recipe_RGB_Color"

Creating recipe data records

After having created the recipe elements, they are displayed in the "Data records" tab. The values of the recipe elements are determined for each recipe data record.

4.4 Configuring HMI visualization

Figure 4-2
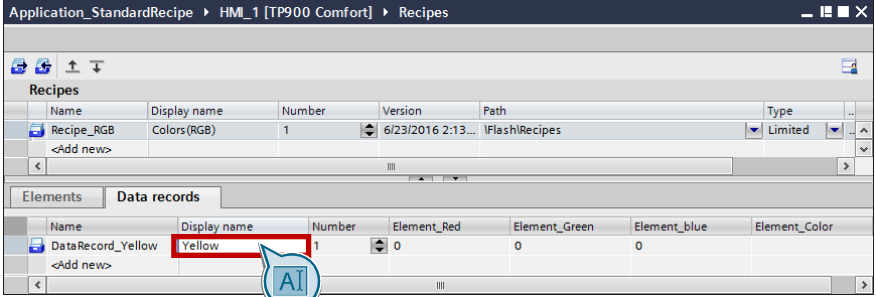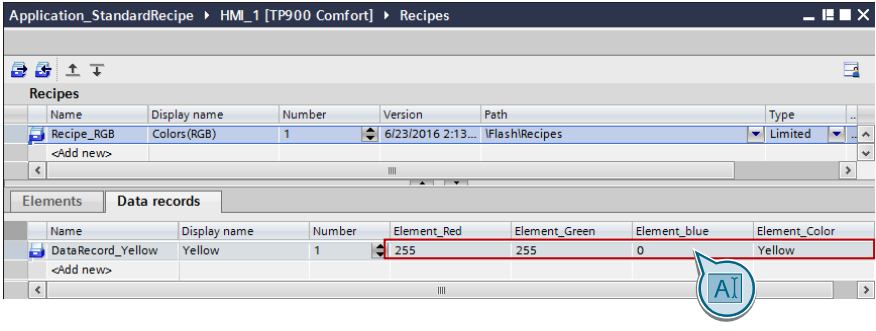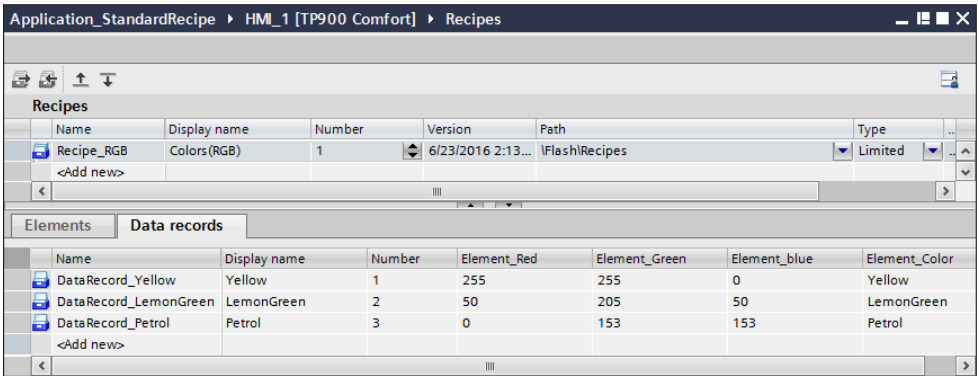

The following table shows how to create the recipe data records (yellow, lemon green, petrol) and how to set the values for the recipe elements:

Table 4-10

No.	Procedure
6.	In the "Recipes" tab in the work area, double-click on "<Add new>" in the first row of the table to create a new recipe data record.
7.	For a unique identification of the recipe element, double-click on the "Name" column in the "Recipe data record_1" field and enter a meaningful name for the recipe element, e.g. "DataRecord_Yellow".

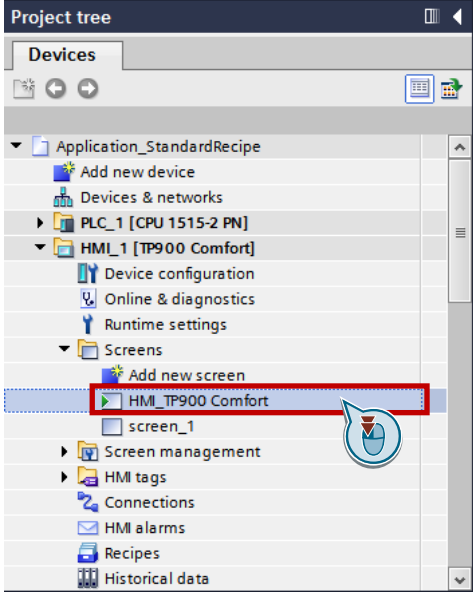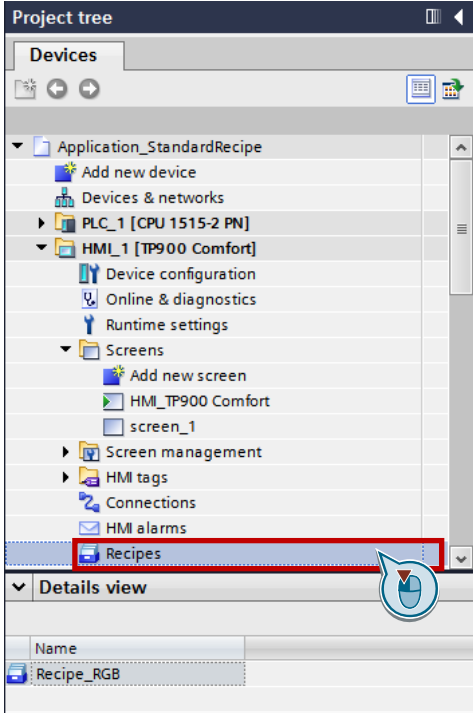| No.	Procedure
8.	Double-click on the "Display name" column in the "Recipe data record_1" field and enter a meaningful name for the recipe element, e.g. "Yellow". **Note** This display name will be displayed in the recipe view under "Data record name".
9.	Enter the respective value (255, 255, 0, Yellow) for each recipe element (Element_Red, Element_Green, Element_Blue, Element_Color).
10.	Repeat the steps 1-4 for the remaining recipe data records • Name: DataRecord_LemonGreen, display name: LemonGreen, (50, 205, 50, LemonGreen) • Name: DataRecord_Petrol, display name: Petrol, (0, 153, 153, Petrol)

4.4.3 Configuring a standard recipe view

The standard recipe view is a preconfigured display and operating object used for managing recipe data records.
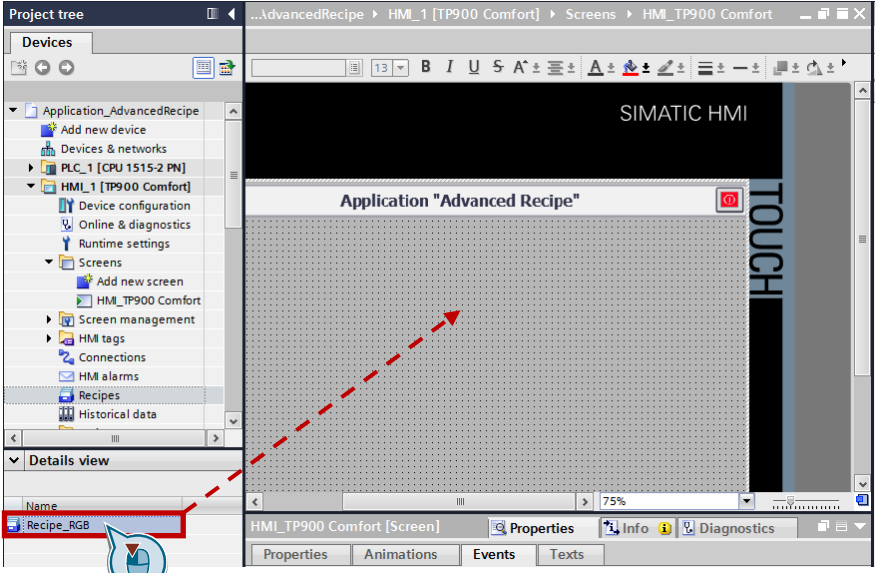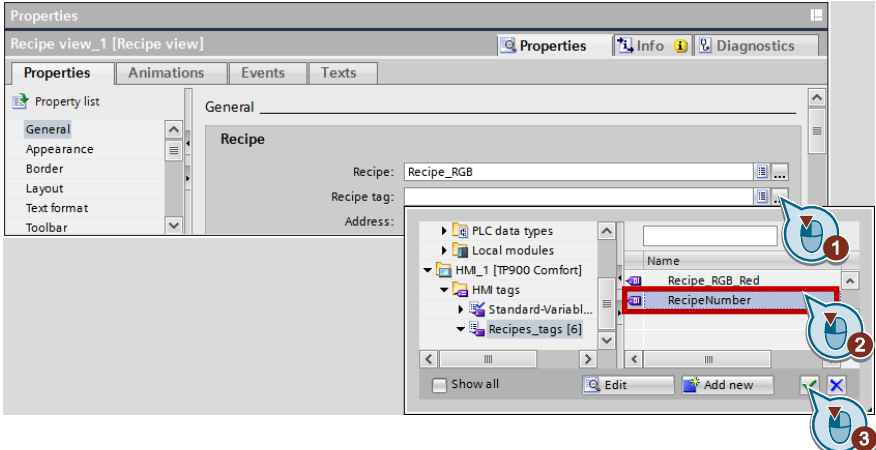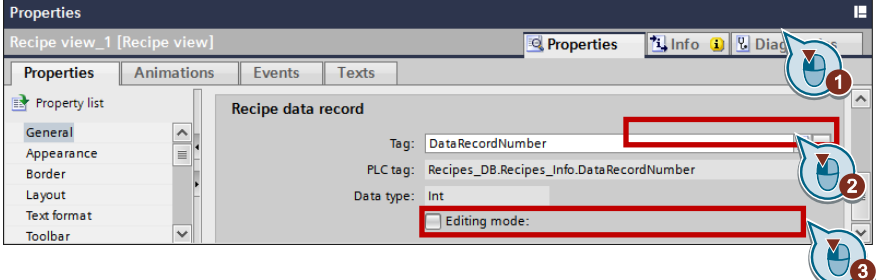
4.4 Configuring HMI visualization

Table -411

No.	Procedure
1.	Open the "Screens" folder in the navigation pane.
2.	Double-click on "HMI_TP900 Comfort"
3.	In the navigation pane, click on the "Recipe" editor

4.4 Configuring HMI visualization

No.	Procedure
4.	Drag and drop the displayed recipe "Recipe_RGB" from the "Detailed view" section to the screen.
5.	In the "Properties>General>Recipe" tab, click on [...] button for the "Recipe tag" and select the "RecipeNumber" HMI tag under: "HMI_1>HMI_tags>Recipes_tags>RecipeNumber".
6.	In the "Recipe data record" section, click on [...] button for the "Tag" input field and select the "DataRecordNumber" tag under: "HMI_1>HMI_tags>Recipes_tags>DataRecordNumber".
7.	If you deactivate the option box "Editing mode", you will not be able to create, rename, edit or delete recipe data in runtime.

4.4 Configuring HMI visualization

No.	Procedure
8.	Click the "Save" button to accept the changes.

| Note	For further information on configuration, please refer to the "WinCC Advanced V14" system manual, chapter "Configuration options of the advanced recipe view (V13 or higher)"

5 Application example 2: Recipe screen

5.1 Overview

Instead of the standard recipe view, this "RecipeScreen" application example uses a custom recipe screen to operate the system.

5.2 Function description of the application example

Figure 5-1
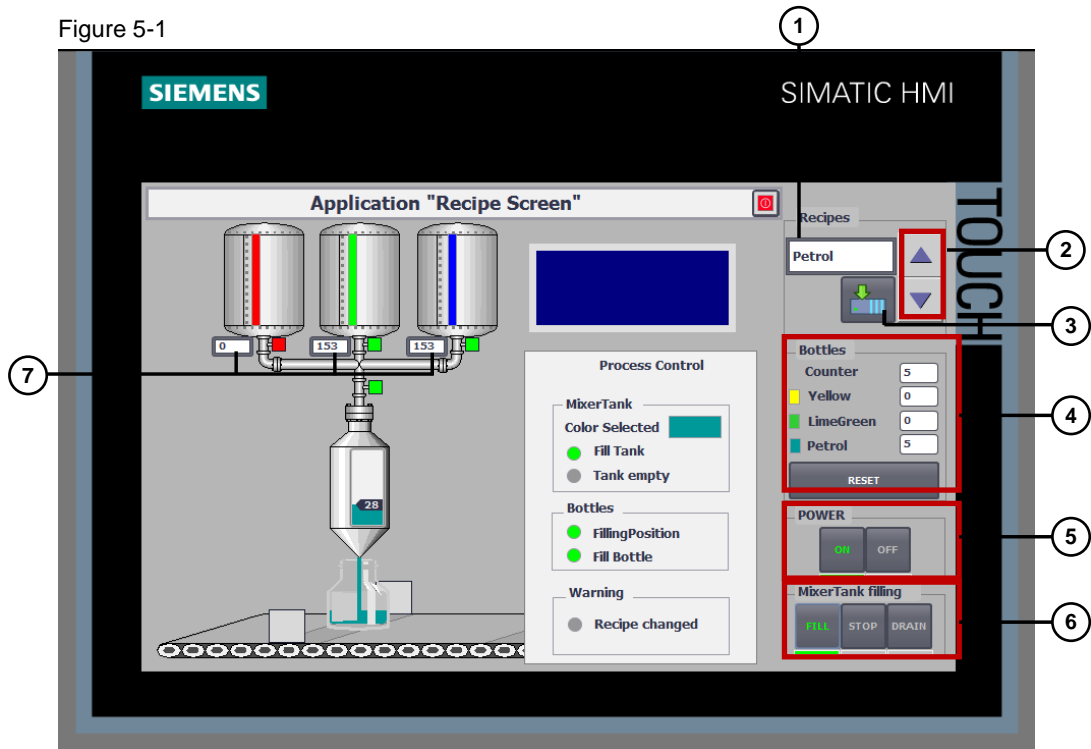
The following functions have been configured:

Table 5-1

No.	Description
1.	A "RecipeList" text list has been configured containing the desired mixed color names "Yellow, LimeGreen and Petrol".
2.	You can use the buttons to scroll up and down the text list. When pressing the "scroll buttons", a script is called up assigning the relevant data record number to the "RecipeList" text list.
3.	When pressing the button, the selected data record is transferred to the PLC.
4.	The number of produced bottles in total and the individual numbers for each color are displayed.
5.	The entire system can be switched on and off using the buttons
6.	The mixing tank can be controlled (fill, stop, discharge) with the respective buttons.
7.	All recipe tags from the configured recipe are not configured using a "table", but directly in the system screen. A graphical representation with the system screen provides an overview of the system.

5.3 Program structure of the S7-1500 project

The following table lists and explains the key S7 blocks.

Table 5-2

Block	Explanation
OB1	Organization block (called by the operating system) for cyclic program processing.
FB1	Simulation program: This function block is the processing block of the actual application and is called in OB1. It simulates the procedure for the filling and transport.
FB2	Simulation program: This function block checks if the mixing tank is empty when a new recipe data record is selected. This bit is processed further in the program.
FB1001	Serves for the cyclic detection of a positive signal edge.
FC1	Simulates the number of filled bottles in total and the number of individual colors filled.
FC2	Checks general conditions for the following: • Machine status "ON/OFF" • Valve for tank filling • Bottle transport • Valve for bottle filling
DB1	Declaration data block for pulse generation during tank filling; it is called in FB1001.
DB2	Declaration data block for pulse generation during bottle filling; it is called in FB1001.
DB3	Declaration data block for pulse generation during bottle transport; it is called in FB1001.
DB4	Instance DB for the FB1
DB5	Instance DB for the FB2
DB7	This data block serves as counter for the filled bottles and is called in FC1.
DB8	This data block serves as counter for the filled bottles with "Yellow" and is called in FC1.
DB9	This data block serves as counter for the filled bottles with "LemonGreen" and is called in FC1.
DB10	This data block serves as counter for the filled bottles with "Petrol" and is called in FC1.
Color_UDT	This data type is a user-created data type and consists of the following structure: • ID: contains the data record number. • Color: contains the color name. • Red: contains the proportion of red for the selected color. • Green: contains the proportion of green for the selected color. • Blue: contains the proportion of blue for the selected color.

5.4 Configuring HMI visualization

This application example already contains the PLC tags, the HMI tags and the recipe elements.

5.4.1 HMI tag table

The following table shows the HMI tags required for this application:

Table 5-3

PLC tag	HMI tag	Recipe element
recipes_process_DB.color_recipe.red	recipe_red	red
recipes_process_DB.color_recipe.green	recipe_green	green
recipes_process_DB.color_recipe.blue	recipe_blue	blue
recipes_process_DB.color_recipe.color	recipe_color	color
recipes_process_DB.color_recipe.ID	recipe_ID_No	ID_No

The following figures shows how the tags are assigned to each other:

Recipes HMI tags

Figure 5-2

Text list HMI tags

Figure 5-3

5.4.2 Recipe editor

The following figures show the recipes, recipe elements and recipe data records configured in the recipe editor:

Recipe

Figure 5-4

Recipe elements

Figure 5-5

Recipe data records

Figure 5-6

5.4.3 Configuring a text list

The following "RecipeList" text list was configured to integrate a recipe in a recipe screen with the same texts as used in the "Color" recipe under the "Data record" parameter.
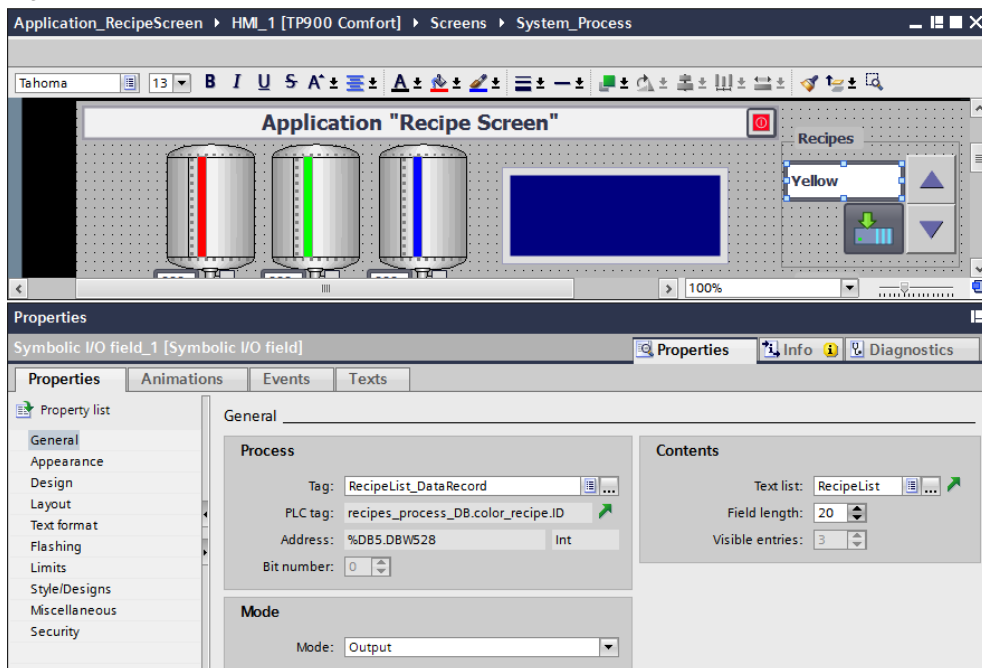
Figure 5-7
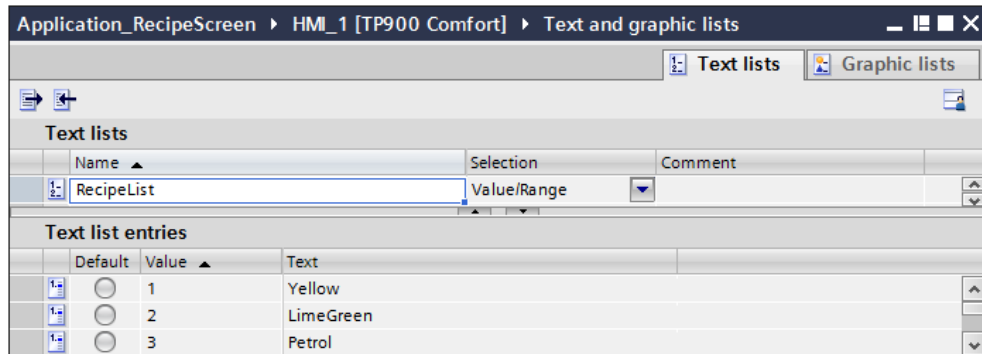
5.4.4 Configuring a recipe screen

The following tables show how to integrate a recipe in a recipe screen:

Integrating text lists

The texts contained in the text list are displayed in the recipe screen using an I/O field. The figure below shows the configuration of the I/O field:

Figure 5-8

Integrating scroll buttons

The buttons on the side can be used to "scroll" up and down the "RecipeList" text list. When pressing the "scroll buttons", a script is called up assigning the relevant data record number to the "RecipeList" text list.

The following figures shows how the two scroll buttons have been configured:
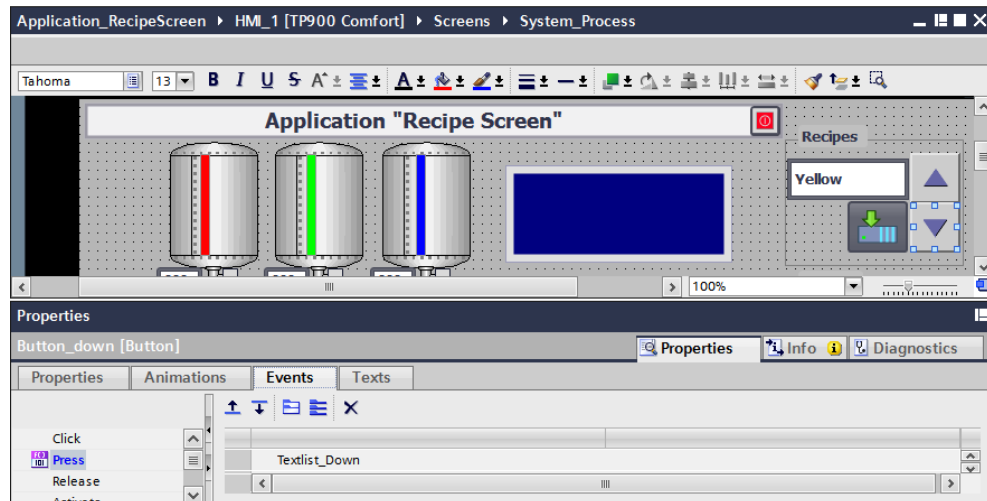
5.4 Configuring HMI visualization
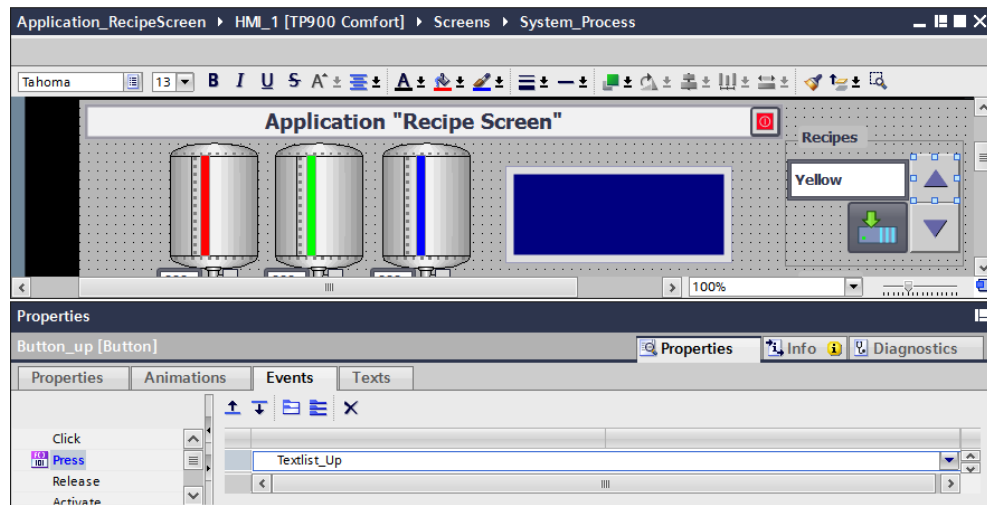
Figure 5-9

Figure 5-10

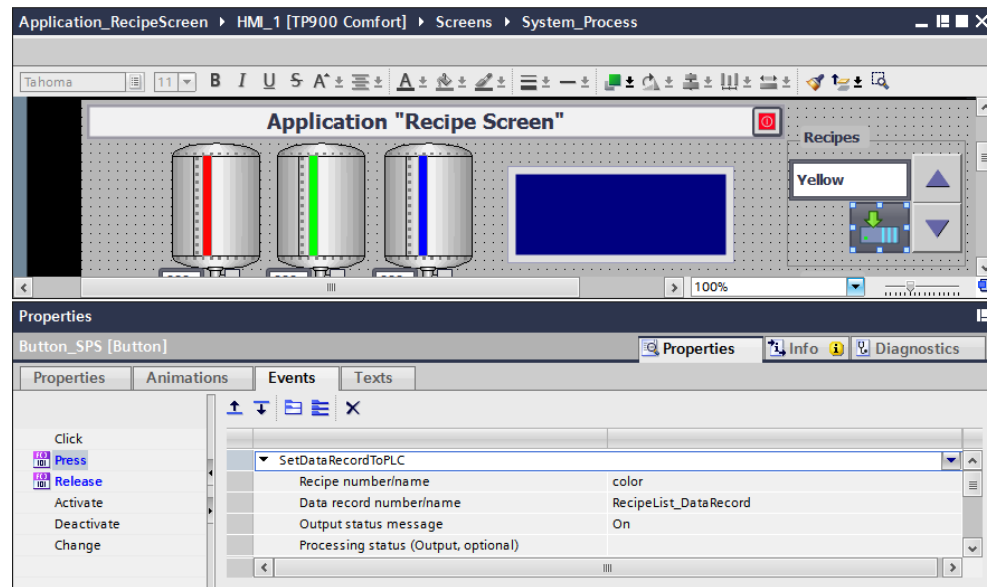**Sending data to the PLC**

The following figures shows how the "Send data record to PLC" button has been configured:

5.4 Configuring HMI visualization

Figure 5-11

6 Installation and commissioning

Note	At this point, it is assumed that the necessary software has already been installed on your computer and that you are already familiar with handling the software.

Installing the application software

The following table shows how to transfer the S7 configuration to the S7 controller and how to transfer the WinCC Advanced configuration to your operator panel:

Table 6-1

No.	Action
1.	Download the project "109739999_CODE_Application_RecipeScreen.zip" for this documentation and unzip it.
2.	Open the contained project "Application_RecipeScreen.zap13" with STEP 7 (TIA Portal V13).
3.	Select the CPU "PLC_1" in the project tree and click on the "Download to Device" button for download into the CPU. When downloading, the hardware configuration as well as the blocks (software) are transferred.
4.	The "Load preview" window shows whether all of the download conditions are met. Click the "Load" button.
5.	The "Load results" window shows you a summary of the load process. Activate the "Start all" check box and click on the "Finish" button.
6.	Select the operator panel "HMI_1" in the project tree and click on the "Download to Device" button for download into the CPU. When downloading, the hardware configuration as well as the blocks (software) are transferred.
7.	The "Load preview" window shows whether all of the download conditions are met. Click the "Load" button.
8.	The "Load results" window shows you a summary of the load process. Activate the "Start all" check box and click on the "Finish" button.

7 Operating the application

It is assumed that you have transferred the Sz configuration and the WinCC Advanced configuration to the relevant hardware as described in chapter "Installation and commissioning" and that a connection between the S7 controller and the operator panel has been established.

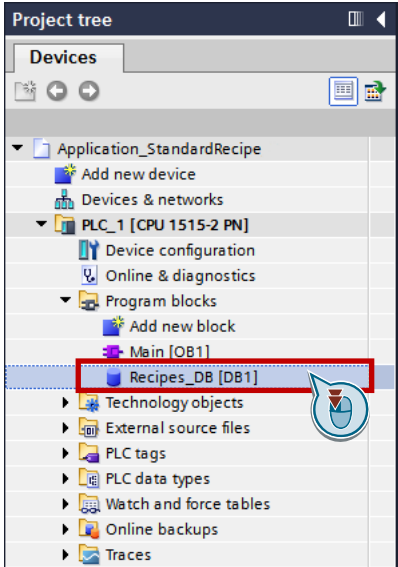| Note | For testing the example configuration, you can, whenever necessary, also use the PLC simulation integrated in WinCC (TIA Portal). |

7.1 Application example 1: Standard recipe view

The enclosed example configuration helps you get an impression of how a standard recipe view can be used.

| Note | It is assumed that you have carried out the configuration steps from chapter 4. |

Monitoring a tag in the PLC

For an improved display of the data transfer to the PLC, proceed as follows:
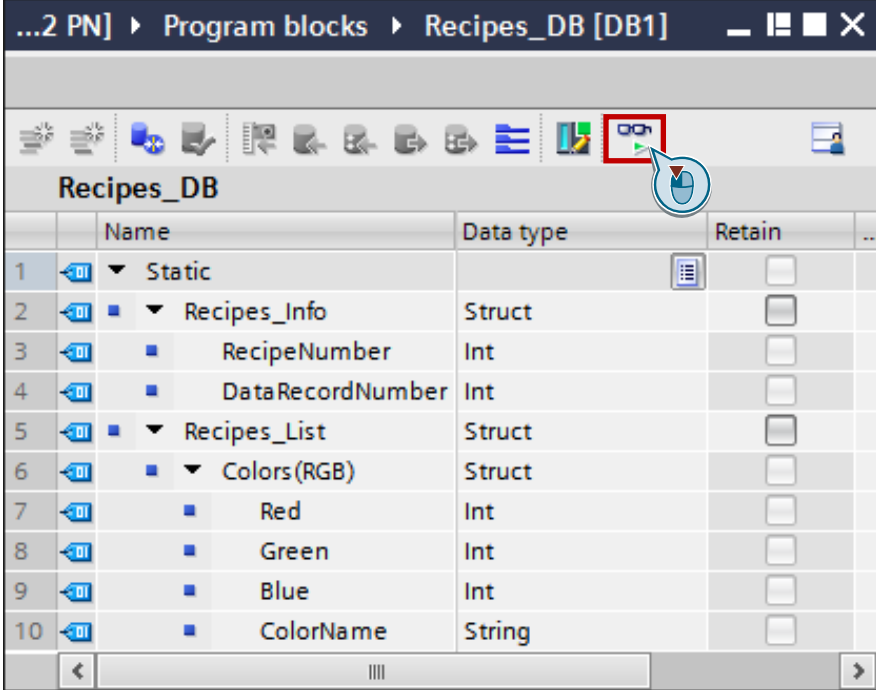
Table 7-1

No.	Description
1.	In the navigation pane, select "PLC_1>Program blocks" and the "Recipes_DB [DB1]" data block.

7.1 Application example 1: Standard recipe view

| 2.	To monitor the tag, click on the "⚏" symbol in the configuration area. (2)

7.1 Application example 1: Standard recipe view

Operating standard recipe views

The following table shows how to operate the application in runtime from the operator panel or from the simulation integrated in WinCC (TIA Portal):
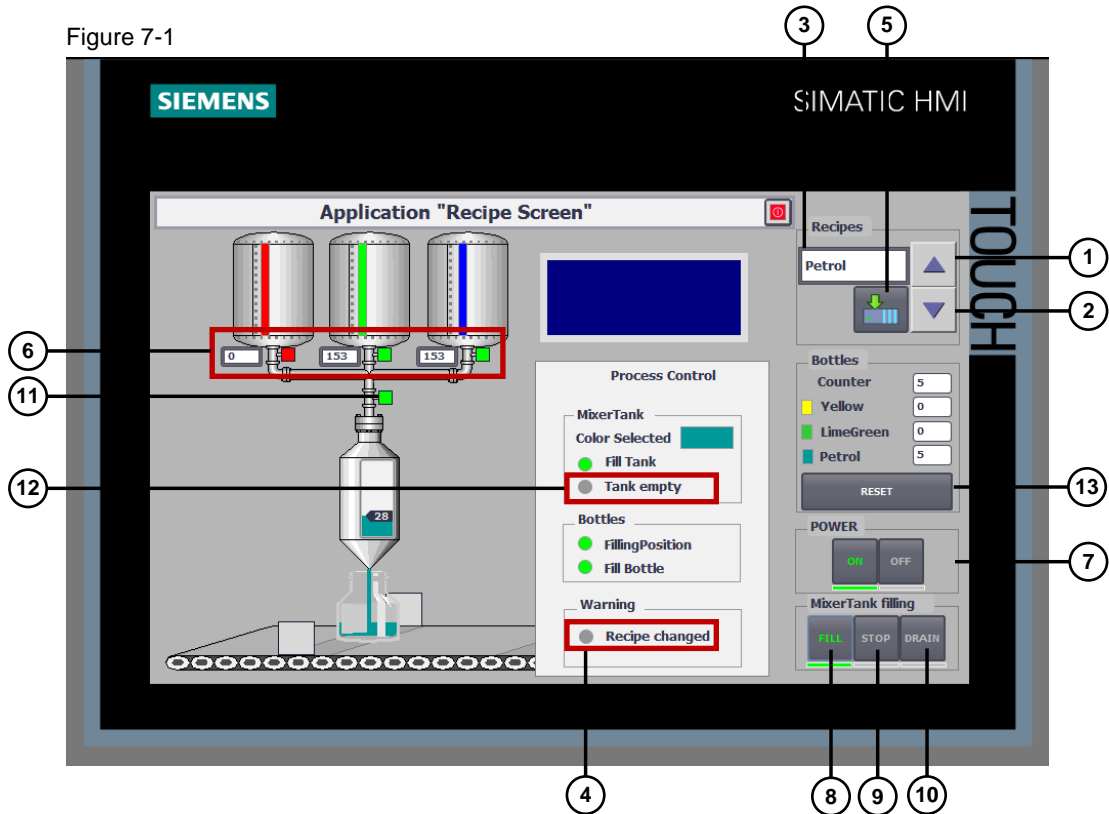
Table 7-2

No.	Description
1.	Select the desired color from the drop-down list under "Data record name". (1)
2.	Click on the " ![ ] " button to transfer the data of the desired color to the PLC. (2)
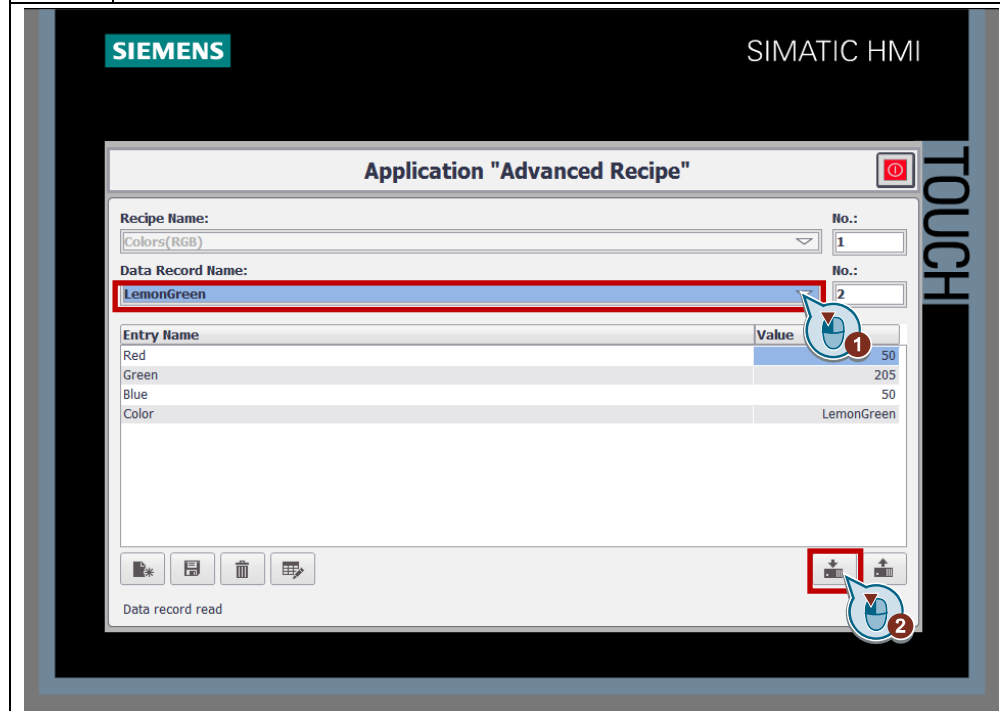
7.2 Application example 2: Recipe screen

The key functions have already been described in the previous chapters.

Figure 7-1

7.2.1 Selecting an RGB color

Table 7-3

No.	Action
1.	Click the " ▲ " (1) or " ▼ " (2) button to select an RGB color.
2.	The selected RGB color is displayed in the output field (3).
3.	Click on the " ↓|||| " (5) button to transfer the data of the desired color to the PLC.
4.	The new data record parameters of the selected RGB color are displayed in the output fields (6).

7.2.2 Operating the mixing tank

Table 7-4

No.	Action
1.	After having selected a new RGB color and having transferred the data to the PKC, click on the " FILL " (8) button to fill the mixing tank with the selected color.
2.	If the mixing tank is not empty, the selected RGB color is only accepted, if the mixing tank has been discharged. This is done if first the " STOP "(9) button and the the " DRAIN " (10) button is clicked.

7.2.3 Operating the conveyor belt

Table 7-5

No.	Action
1.	Click the " ON " or " OFF " button to start or stop the conveyor belt. (7)

7.2.4 Counter reset

Click on the " RESET " button to reset the counter.

8 Links & Literature

Table 8-1

	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Reference to the entry https://support.industry.siemens.com/cs/ww/en/view/109739999
\3\	"WinCC Advanced V14" system manual https://support.industry.siemens.com/cs/ww/en/view/109091876/69349905035

9 History

Table 9-1

Version	Date	Modifications
V1.0	08/2016	First version