Toolbox for HMI projects

SIMATIC WinCC Professional V15.1
SIMATIC STEP 7 Professional V15.1

https://support.industry.siemens.com/cs/ww/en/view/106226404

Siemens Industry Online Support

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1 Introduction

The HMI toolbox of Siemens Industry Online Support provides many useful tools that can clearly make every day work easier.

The different tools are available in global libraries and can thus be easily integrated in your visualization. This saves you valuable development time that you would have to invest in the development of your own tools.

The HMI toolbox comprises tools for six different subject areas.

- "Time functions"
- "Transfer data"
- "Mathematical functions"
- "Simplified operation"
- "Increase clarity"
- "Simplified engineering"

A separate section is available in this document for each subject area. A library with all tools and an example project that shows the application of the tools is available.

Application example
"Example project for WinCC Runtime Professional V15.1":

- Engineering: STEP 7 Professional / WinCC Professional V15.1
- HMI operator panel: PC station with WinCC RT Professional
- Controller: SIMATIC CPU S7-1516F-3 PN/DP.

Note

For some tools a PLC is required in combination.

You should therefore note the hardware and software requirements at the beginning of each section.

Depending on the size of the HMI operator panel, it may be necessary to adapt the screens.

2 Time functions

2.1 Time-of-day alarm / Alarm

2.1.1 Solution

Description

You can use the time-of-day alarm / alarm to be reminded of a specific event in Runtime at a specific time (time-of-day) via a screen.

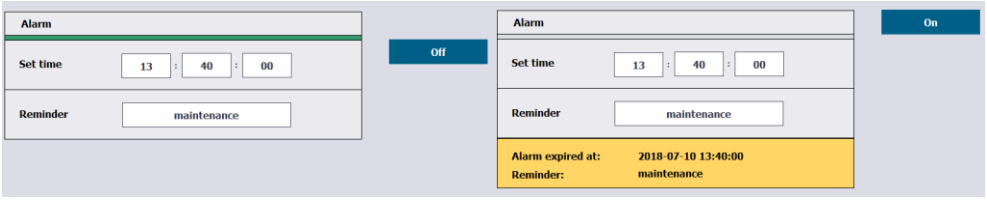
The time must be set in the format (hh:mm:ss) by means of three I/O fields directly in the screen. Use the switch to activate the time-of-day alarm / alarm.

The PLC compares the current time with the time of the time-of-day alarm / alarm and triggers an alarm when the set time has been reached.

In the status bar you can see when the alarm has expired. Press the status bar to acknowledge the alarm.

If you trigger a screen change before the alarm is triggered, the alarm is still maintained.

Figure 2-1



2.1.2 Hardware and software components

This application example is valid for:

- SIMATIC WinCC Professional and STEP 7 Professional V15.1
- SIMATIC WinCC RT Professional V15.1
- SIMATIC S7-1200/S7-1500

2.1.3 Data types and function blocks used

FC "LGF_DTLtoString"

The function block "LGF_DTLtoString" has been applied from the "Library with general functions (LGF) for STEP 7 (TIA Portal) and S7-1200 / S7-1500" library. This block converts date components of the data type DTL to a character string of the String format.

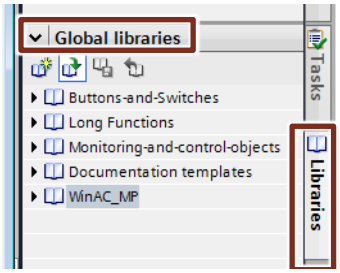
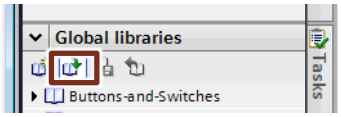
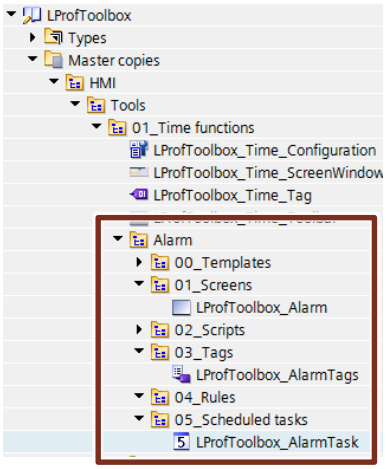
More information on this function block is available under the associated entry ID 109479728.

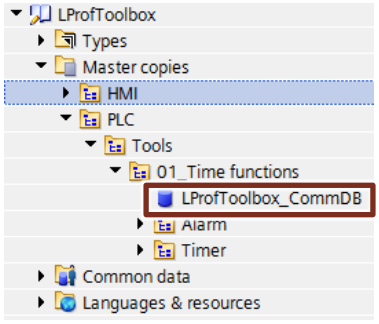
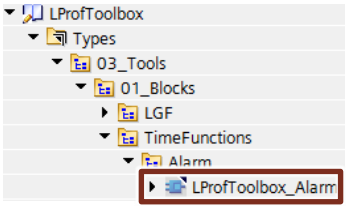
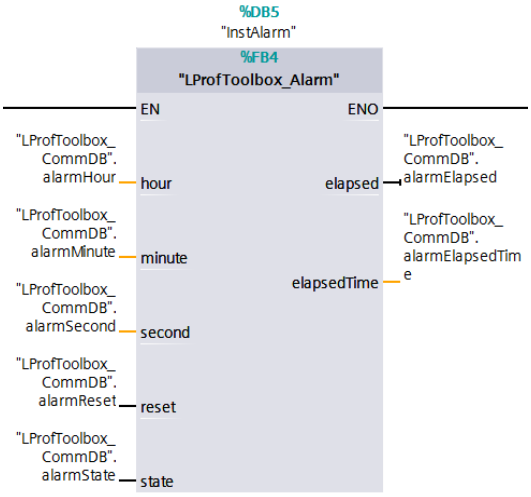
FB "LProfToolbox_Alarm"

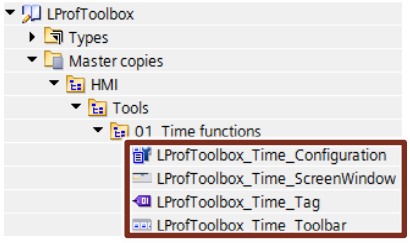
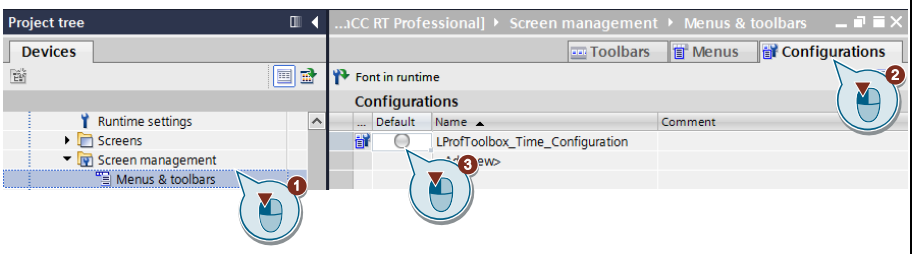
The function block "LProfToolbox_Alarm" compares the entered alarm time with the system time. If both match, the function block sets an "elapsed" alarm status and returns the current system time "elapsedTime".

2.1.4 Project Planning

Table 2-1

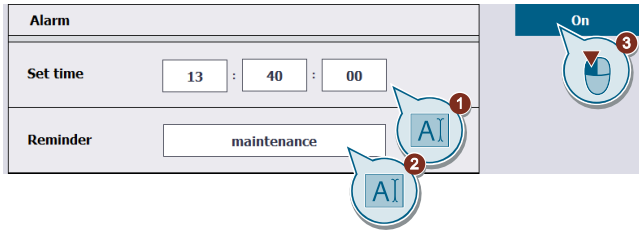
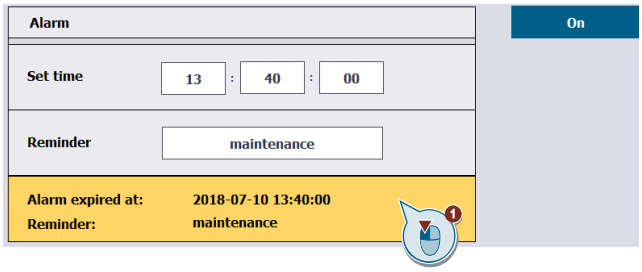
No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration. To do this, open the "Global libraries" pane in the "Libraries" task card. 
3.	Click on the second icon from the left to open a "Global Library". 
4.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
5.	Open the folder "Master copies > HMI > Tools > 01_Time functions > Alarm" of the library. Drag the elements to the corresponding folder of the HMI operator panel.  **Note** Depending on the size of the HMI operator panel, it may be necessary to adapt the screens. If your HMI connection to the PLC is not called "HMI_Connection_1", update your HMI connection in the tag table. You must also synchronize the HMI tags again with the PLC tags.

No.	Action
6.	Drag the data block "LProfToolbox_CommDB" to the "Program blocks" folder of your PLC.  All tags that are required for the time-of-day alarm have the prefix "alarm". Delete all other tags from the data block "LProfToolbox_CommDB".
7.	Open the "Types" folder of the library and drag the function block "LProfToolbox_Alarm" to the program blocks folder of your PLC.  **Note** The block "LGF_DTLtoString" is created automatically in the project. You only need the function block "LGF_DTLtoString" if it has not been integrated into your project yet.
8.	Call the function block "LProfToolbox_Alarm" in your user program and interconnect the inputs and outputs with the respective tags of the communication DB. **Block from library** 

No.	Action
9.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_Time_Screenwindow - Configuration "LProfToolbox_Time_Configuration" - Tag "LProfToolbox_Time_Tag". Alternatively, configure your own screen window by calling the screen window "Alarm". Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_Time_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.
10	Deselect the default configuration under "Menus & toolbar →Configurations". 

2.1.5 Operation

Table 2-2

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click on the "Time functions" button in the navigation bar at the bottom.  Open the pop-up screen with the "Alarm" button. 
5.	Enter the time when the alarm is to appear. Enable the alarm with the "On" switch. 
6.	Click the "Alarm expired at" button to acknowledge the alarm. 

2.2 Calendar

2.2.1 Solution

Description

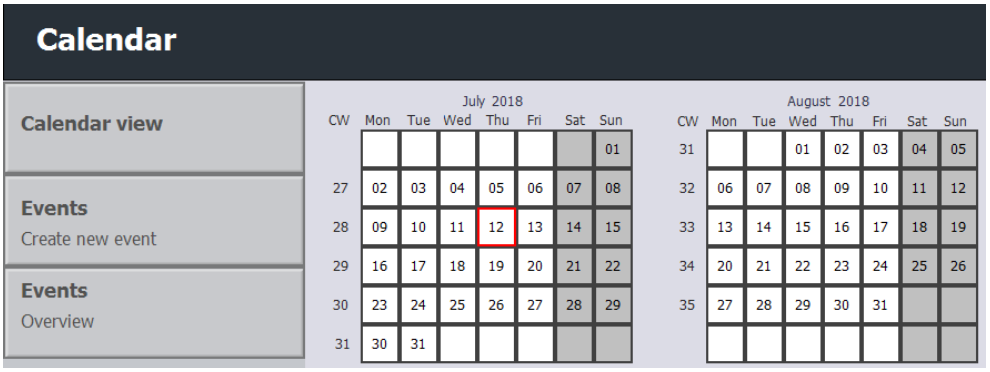
The calendar provides an overview of individual days of the current and the next month. The current day is highlighted in red.

You can enter up to 30 appointments in the calendar with the "Events" button. The calendar will remind you of any pending events that are scheduled.

The events are saved in the file system of the operator panel for this purpose.

This tool does not depend on a PLC. The calculations are performed by the HMI operator panel.

Figure 2-2



2.2.2 Hardware and software components

This application example is valid for:

- SIMATIC WinCC Professional V15.1
- SIMATIC WinCC RT Professional V15.1

2.2.3 VBS scripts used

The individual functions of the calendar are solved with the help of multiple scripts. You may be able to use these scripts for other areas of application.

LProfToolbox_CalendarEvent

The "LProfToolbox_CalenderEvent" script is used for event management. The events are stored in the "events.txt" file with the associated time stamp and reminder text. The script handles the following tasks:

- Initialize the event entries
- Create and save a new event
- Delete an existing event
- Transfer the parameters to the associated HMI tags.

LProfToolbox_GenerateCalendar

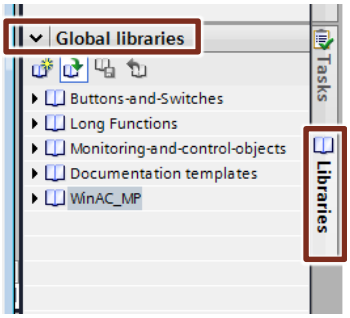
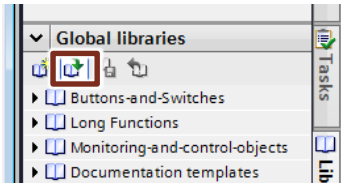
The "LProfToolbox_GenerateCalendar" script generates the calendar overview with the current month and next month based on the current date.

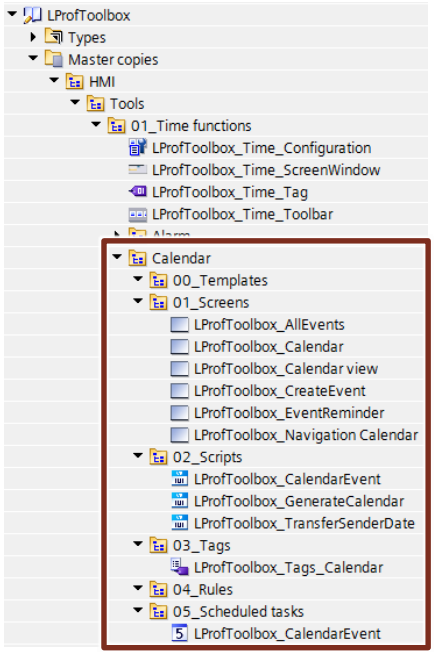
LProfToolbox_TransferSenderDate

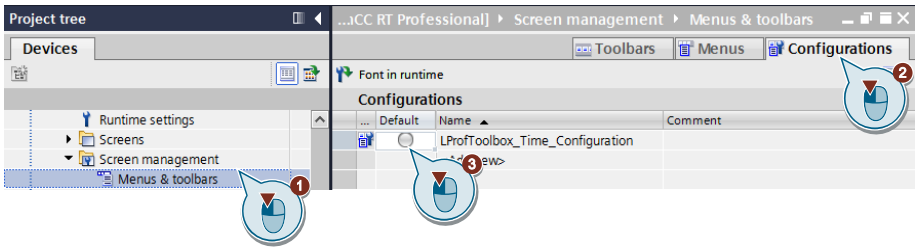
The "LProfToolbox_TransferSenderDate" script reads the date of the selected day in the calendar and transfers the date to the input screen for a new event.

2.2.4 Project Planning

Table 2-3

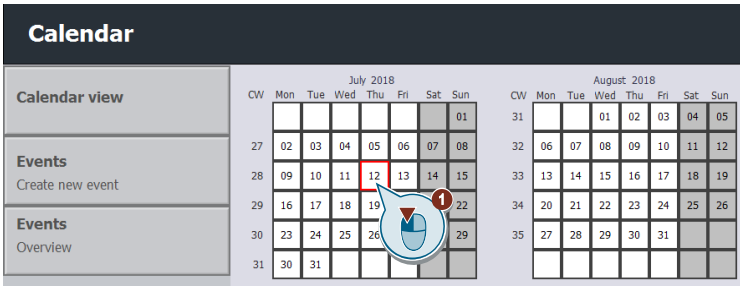
No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration. Open the "Global libraries" pane in the "Libraries" task card. 
3.	Click on the second icon from the left to open a "Global Library". 
4.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.

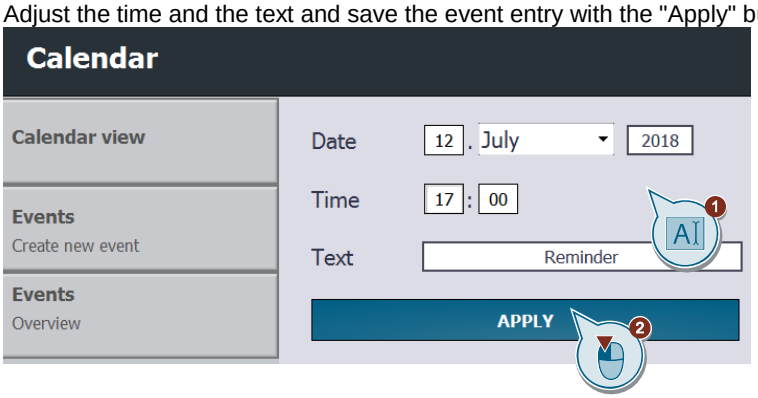
No.	Action
5.	Open the folder "Master copies > HMI > Tools > 01_Time functions > Calendar" of the library. Drag the elements to the corresponding folders of the operator panel.  **Note** Depending on the size of the HMI operator panel, it may be necessary to adapt the screens. If your HMI connection to the PLC is not called "HMI_Connection_1", update your HMI connection in the tag table. You must also synchronize the HMI tags again with the PLC tags.
6.	Call the scripts "LProfToolbox_GenerateCalender" and "LProfToolbox_Calendar Event" at the "Loaded" event of your start screen so that the events are loaded.
7.	**Optional:** When you adapt the size of the calendar, enter the changed height or width of a calendar day I/O field as start value for the tags "calendarFieldHeight" and "calendarFieldWidth" in the "LProfToolbox_Tags_Calendar" tag table. The position of the selection frame is calculated based on these tags.
8.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_Time_ScreenWindow" - Configuration "LProfToolbox_Time_Configuration" - Tag "LProfToolbar_Time_Tag". Alternatively, configure your own screen window by calling the screen "LProfToolbox_Calendar". Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case. **Note:** The toolbar "LProfToolbox_Time_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.

No.	Action
9.	Deselect the default configuration under "Menus & toolbar →Configurations". 

2.2.5 Operation

Table 2-4

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click on the "Time functions" button.  Click on the "Calendar" button. 
5.	To add an event, click on a day. The "Add reminder" dialog opens with the selected date. 

No.	Action
6.	Adjust the time and the text and save the event entry with the "Apply" button.  **Note** Confirm the entry with "Enter" in the I/O field. Note that you can only enter events in the future.
7.	Click on the "Events" button in the "Calendar" screen. You will see an overview of upcoming events. These are automatically sorted in ascending order.  **Note** Use the buttons on the right to delete an event. To change an event, click in the corresponding I/O field and enter the changed time or text.

2.3 Stopwatch

2.3.1 Solution

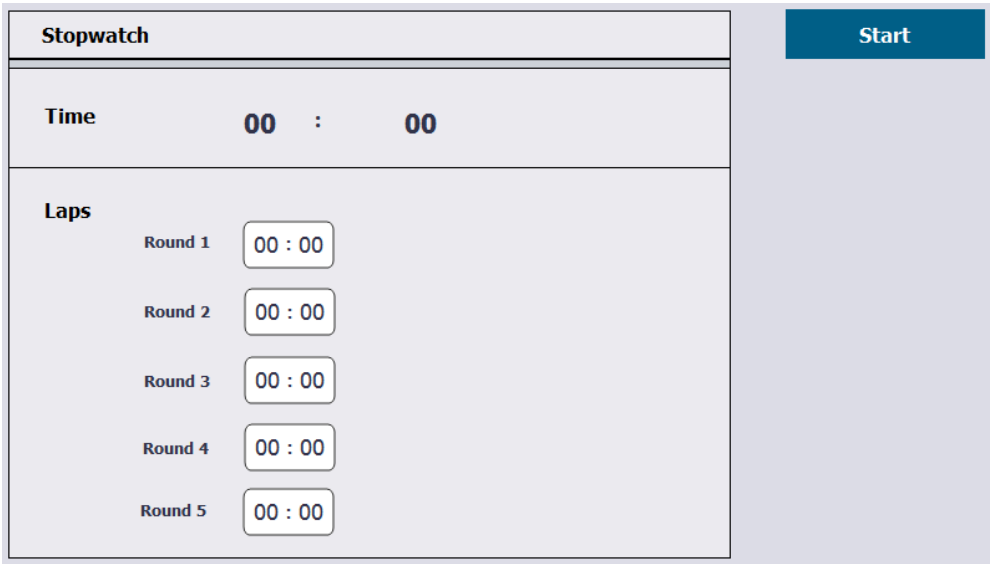
Description

You can monitor and record the duration of production steps in your plant with the stopwatch.

The stopwatch is started with the "START" button and stopped with the "STOP" button. The PLC calculates the lap time.

The stopwatch can save up to 5 lap times and display them on your HMI operator panel. The lap time is recorded with the "Lap" button. The stopwatch stops once the five lap times have been recorded. You can reset the stop and lap times with the "RESET" button.

Figure 2-3



2.3.2 Hardware and software components

This application example is valid for:

- SIMATIC WinCC Professional and STEP 7 Professional V15.1
- SIMATIC WinCC RT Professional V15.1
- SIMATIC S7-1500

2.3.3 Data types and function blocks used

Data type "LProfToolbox_Time_typeRoundStopwatch"

The data type "LProfToolbox_Time_typeRoundStopwatch" defines the stop / lap times as data format "Time" as well as the associated number of minutes and seconds.

Table 2-5: Parameters of typeRound

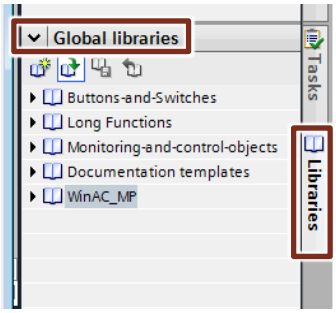
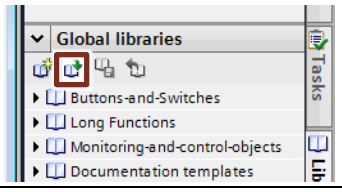
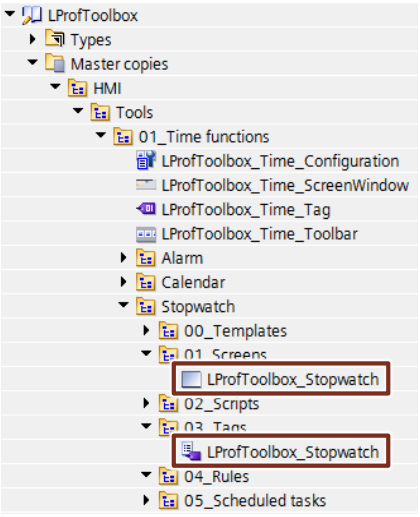
Name	Data type	Comment
time	Time	Total time
min	Int	Number of minutes
sec	Int	Number of seconds

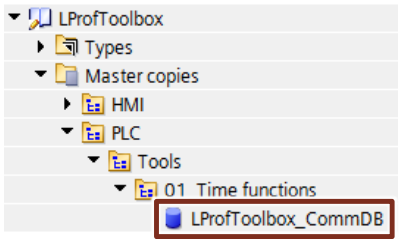
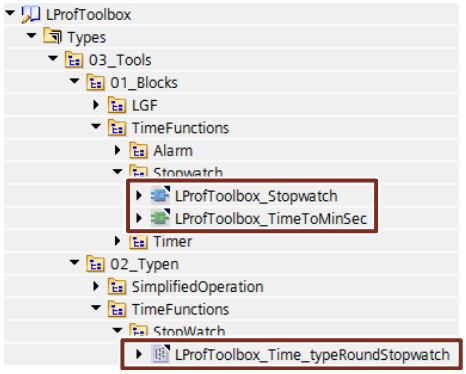
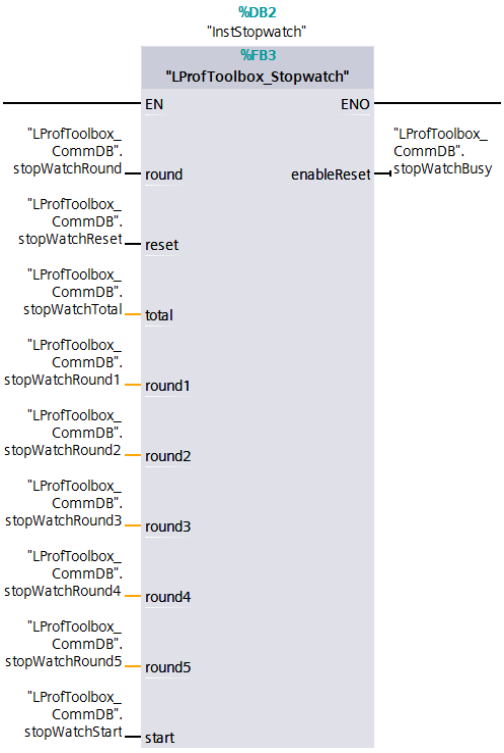
FB "LProfToolbox_Stopwatch"

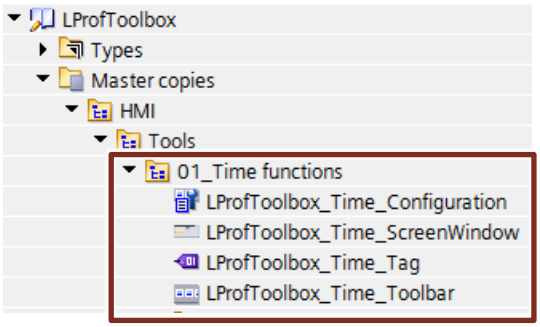
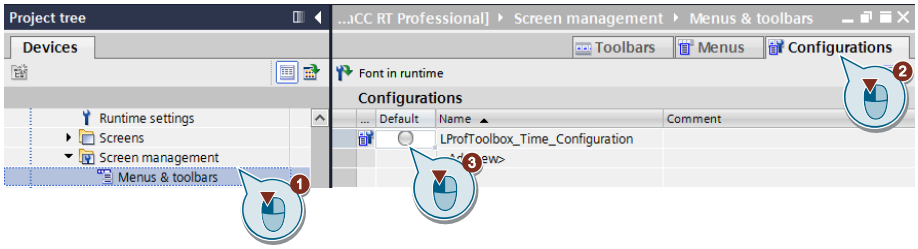
The function block "LProfToolbox_Stopwatch" starts an internal timer that calculates the stop time "total" as well as the individual lap times ("round1" – "round5").

2.3.4 Project Planning

Table 2-6

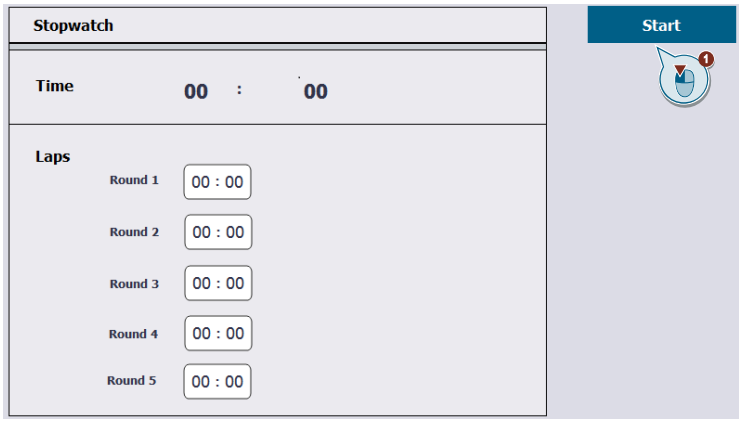
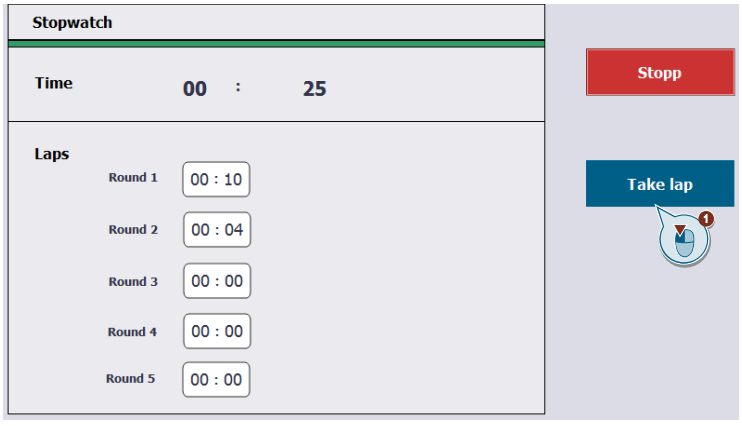
No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration. Open the "Global libraries" pane in the "Libraries" task card. 
3.	Click on the second icon from the left to open a "Global Library". 
4.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
5.	Open the folder "Master copies > HMI > Tools > 01_Time functions > Stopwatch" of the library. Drag the elements to the corresponding folder of the HMI operator panel.  **Note** If your HMI connection to the PLC is not called "HMI_Connection_1", update your HMI connection in the tag table. Depending on the size of the HMI operator panel, it may be necessary to adapt the screens. You must also synchronize the HMI tags again with the PLC tags.

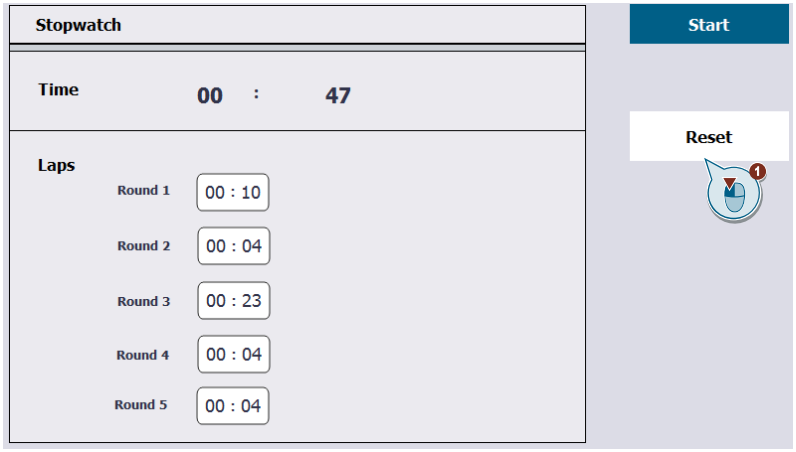
No.	Action
6.	Drag the data block "LProfToolbox_CommDB" to the "Program blocks" folder of your PLC.  Delete all other tags you do not need from the data block.
7.	Open the folder "Types > 03_Tools > 01_Blocks > TimeFunctions > Stopwatch" of the library. Drag the function block "LProfToolbox_Stopwatch" to the "Program blocks" folder of your PLC. 
8.	Call the function block "LProfToolbox_Stopwatch" in your user program and interconnect the inputs and outputs with the respective tags of the communication DB. 

No.	Action
9.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_Time_Screenwindow" - Configuration "LProfToolbox_Time_Configuration" - Tag "LProfToolbox_Time_Tag". Alternatively, configure your own screen window by calling the screen window "Stopwatch". Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_Time_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.
10.	Deselect the default configuration under "Menus & toolbar →Configurations". 

2.3.5 Operation

Table 2-7

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click on the "Time functions" button.  Open the stopwatch with the "Stopwatch" button. 
5.	Start the stopwatch with the "Start" button. 
6.	Use the "Round" button to take a current lap time and start a new lap. Use the "Stop" button to pause/cancel the stopwatch.  **Note** When all lap times are full and you start the stopwatch again, the lap time of lap 5 is overwritten the next time you click on the "Round" button.

No.	Action
7.	Use the "Reset" button to reset the values of the stop and lap times. 

2.4 Timer

2.4.1 Solution

Description

You use the timer to have the system remind you of an event after a defined runtime has elapsed.

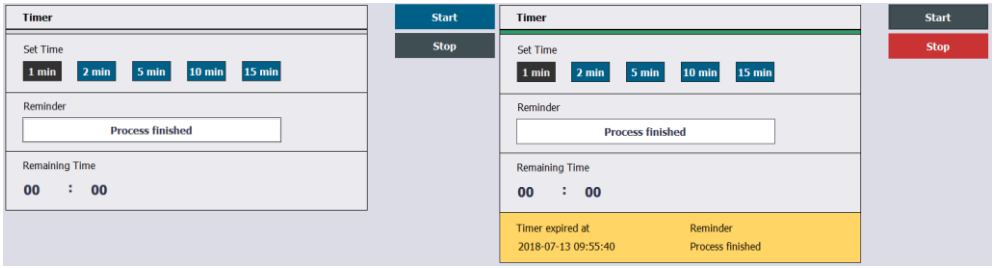
By default, the timer offers five runtimes (1 min, 2 min, 5 min, 10 min, 15 min). You set the runtime by pressing the associated button.

The PLC starts a timer with the specified runtime and triggers an alarm when this time has expired.

In the status bar you can see when the timer has expired. Press the status bar to reset the timer.

When you trigger a screen change before the timer is triggered, the timer still remains active.

Figure 2-4



2.4.2 Hardware and software components

The application example is valid for:

- STEP 7 Professional V15.1
- SIMATIC WinCC Professional and STEP 7 Professional V15.1
- SIMATIC WinCC RT Professional V15.1
- SIMATIC S7-1500

2.4.3 Function blocks used

FC "LGF_DTLtoString"

The function block "LGF_DTLtoString" has been applied from the "Library with general functions (LGF) for STEP 7 (TIA Portal) and S7-1200 / S7-1500" library. This block converts a character string of the format "String" with date components into the data type DTL.

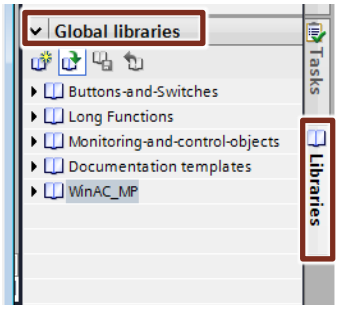
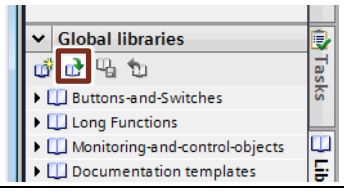
More information on this function block is available at the following link: https://support.industry.siemens.com/cs/ww/en/view/109479728.

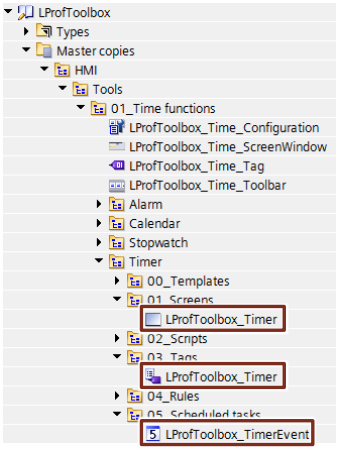
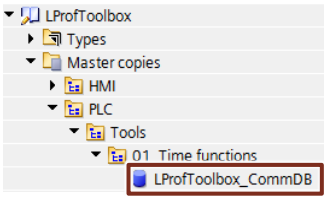
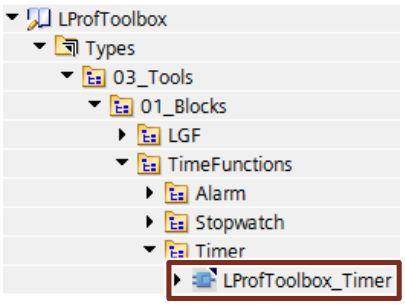
FB "LProfToolbox_Timer"

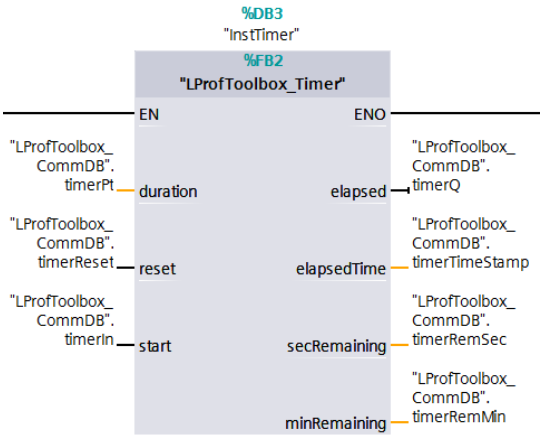
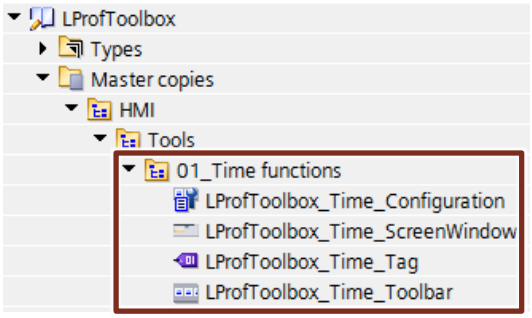
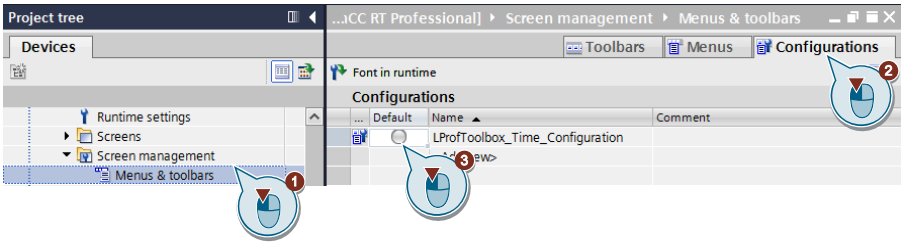
The function block "LProfToolbox_Timer" starts a timer with the runtime "duration". When this runtime has expired, the function block sets an alarm status "elapsed" and returns the current system time "elapsedTime".

2.4.4 Project Planning

Table 2-8

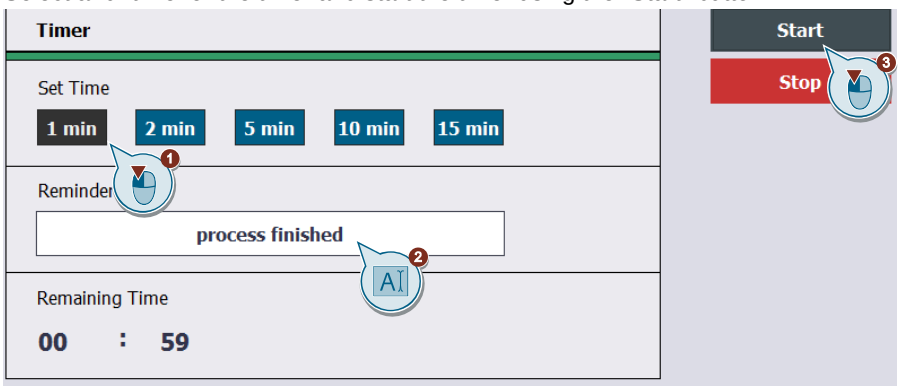
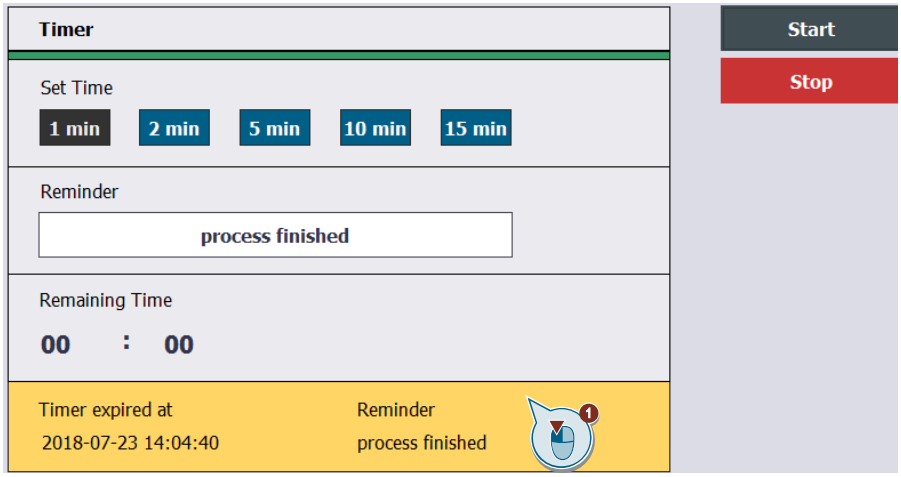
No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration. To do this, open the "Global libraries" pane in the "Libraries" task card. 
3.	Click on the second icon from the left to open a "Global Library". 
4.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.

No.	Action
5.	Open the folder "Master copies > HMI > Tools > 01_Time functions > Timer" of the library. Drag the elements to the corresponding folder of the HMI operator panel.  **Note** If your HMI connection to the PLC is not called "HMI_Connection_1", update your HMI connection in the tag table. Depending on the size of the HMI operator panel, it may be necessary to adapt the screens. You must also synchronize the HMI tags again with the PLC tags.
6.	Drag the data block "LProfToolbox_CommDB" to the "Program blocks" folder of your PLC.  Delete the tags that are not needed for the timer from the data block "LProfToolbox_CommDB".
7.	Open the "Types" folder of the library and drag the function block "LProfToolbox_Timer" to the program blocks folder of your PLC.  **Note** You only need the function block "LGF_DTLtoString" if it has not been integrated into your project yet.

No.	Action
8.	Call the function block "LProfToolbox_Timer" in your user program and interconnect the inputs and outputs with the respective tags of the communication DB. 
9.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_Time_ScreenWindow" - Configuration "LProfToolbox_Time_Configuration" - Tag "LProfToolbox_Time_Tag". Alternatively, configure your own screen window by calling the screen window "Timer". Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_Time_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.
10.	Deselect the default configuration under "Menus & toolbar →Configurations". 

2.4.5 Operation

Table 2-9

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click on the "Time functions" button.  Open the timer with the "Timer" button. 
5.	Select a runtime for the timer and start the timer using the "Start" button.  Use the "Stop" button to pause the timer during runtime.
6.	Click on the "Timer expired at: …" button to acknowledge the timer. 

3 Data transfer

3.1 Barcode

3.1.1 Solution

Note The application example was tested with the font "Code 39" from Logitogo in version 1.00. The functionality cannot be guaranteed for other font versions.

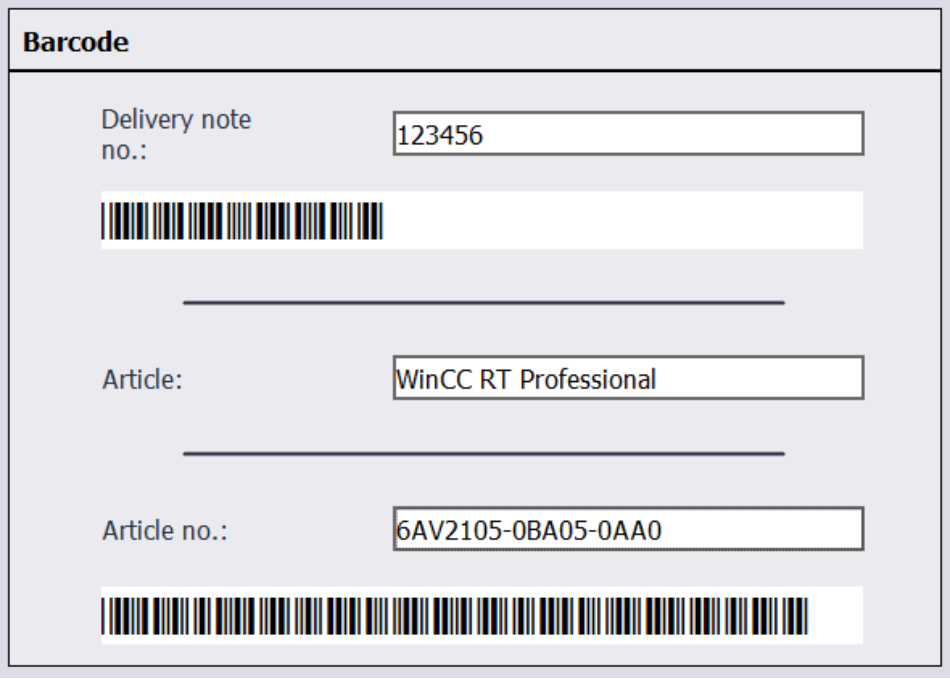
Description

To show a barcode in Professional, you must install a corresponding font.

You can find numerous providers of these fonts on the Internet. The "Code-39-Logitogo Version V1.0 (with width check)" font was used for the application example. You can find additional information on this in the document list under /5/.

A screen with multiple text boxes is used to enter data for a delivery note. For illustration purposes, the barcodes of the previously entered texts are displayed.

Figure 3-1



The barcode is created by direct input using a "TrueType font". Depending on the respective barcode type, a start and stop character is expected, for example, "*" for the Code39 used in the example.

For detailed information on the design of the different barcode fonts, please refer to the appropriate font documentation.

3.1.2 Hardware and software components

The application example is valid for

- SIMATIC WinCC Professional V15.1
- SIMATIC WinCC RT Professional V15.1

3.1.3 VBS scripts used

The script "AddStartStopSign" adds a "*" as start and stop character to the entered string tags and saves this string in the HMI tag for the barcode.

3.1.4 Installing the barcode font under Windows 10

There are three options to install the font under Windows 7 .

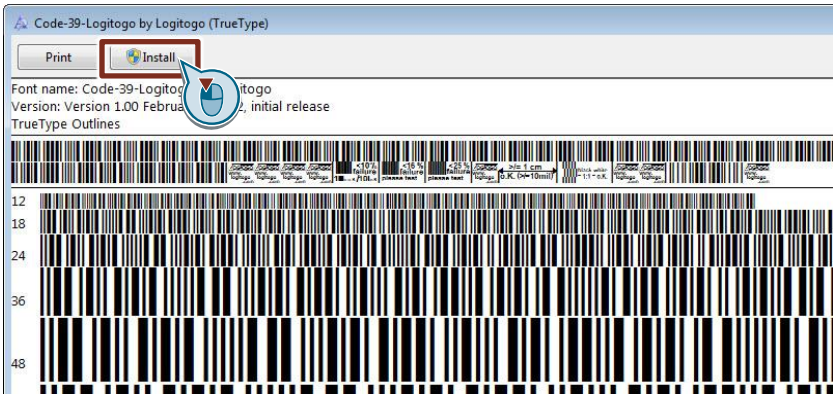
Note

Close all instances of the TIA Portal prior to the installation.

If an instance of the TIA Portal was open during the installation of the font, close the TIA Portal and then restart it.

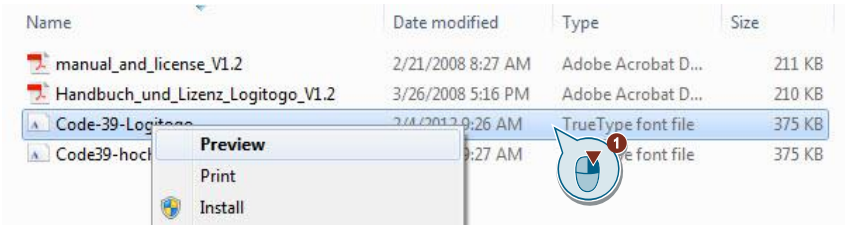
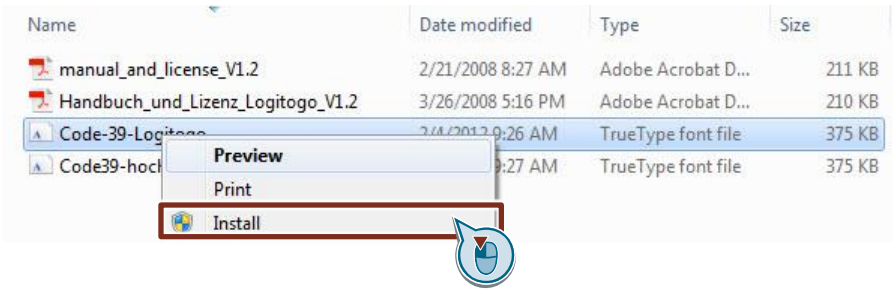
Option 1

Table 3-1

No.	Action
1.	Open the file with the barcode font by double clicking it. The font preview opens.
2.	Click "Install".  **Note** You need to have the required administrator rights to do this.
3.	Complete the installation.

Option 2

Table 3-2

No.	Action
1.	Right-click the barcode font file. The shortcut menu opens. 
2.	Click "Install".  **Note** You need to have the required administrator rights to do this.
3.	Complete the installation.

Option 3

Table 3-3

No.	Action
1.	Select the file for the barcode font and copy the file using the key combination <Ctrl> + <C>.
2.	Open the "Fonts" folder in the Control Panel.
3.	Add the "SiemensTIAPortalIcons.ttf" file with the key combination <Ctrl> + <V>.

3.1.5 Integrating a font into your project

When you configure a PC station with SIMATIC WinCC Professional, you do not have to integrate the font. You only have to install the font on the operating system. All installed fonts of the Windows operating system are available for the configuration.

3.1.6 Using a font

Setting the font, font style and font size

You have to manually customize the font, as well as associated font style and font size for basic objects and elements.

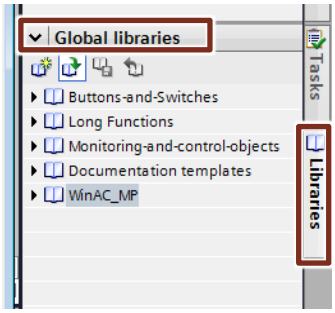
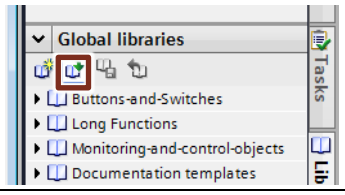
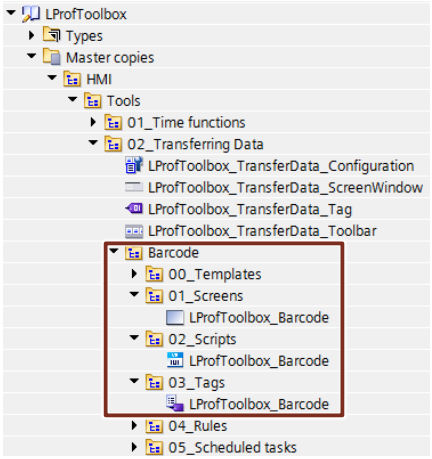
Table 3-4

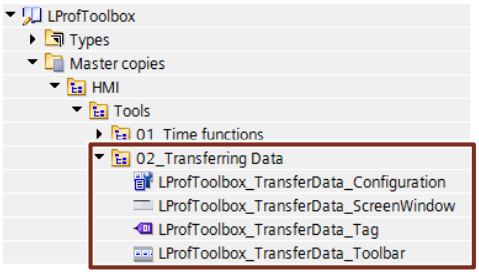
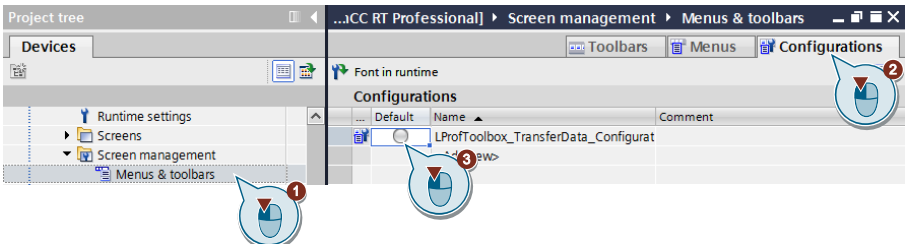
No.	Action
1.	Select a basic object.
2.	Click on "Properties > Text format".
3.	In "Format > Font", click the "…" button.
4.	Select the barcode font and set "Font style" and "Size" as desired.
5.	Click on "OK".

3.1.7 Project Planning

Note The correct installation of the barcode font on your panel/your PC station, as well as the integration into your WinCC project is a prerequisite for the configuration.

Table 3-5

No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration.
3.	Open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a "Global Library". 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
6.	Open the folder "Master copies > HMI > Tools > 02_Transferring Data > Barcode" of the library. Drag the elements to the corresponding folders of the operator panel. 
7.	Open the "LProfToolbox_Barcode" screen. Check whether the installed barcode font is set for the two code output fields under "Properties > Text format".
8.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_TransferData_ScreenWindow" - Configuration "LProfToolbar_TransferData_Configuration" - Tag "LProfToolbar_TransferData_Tag".

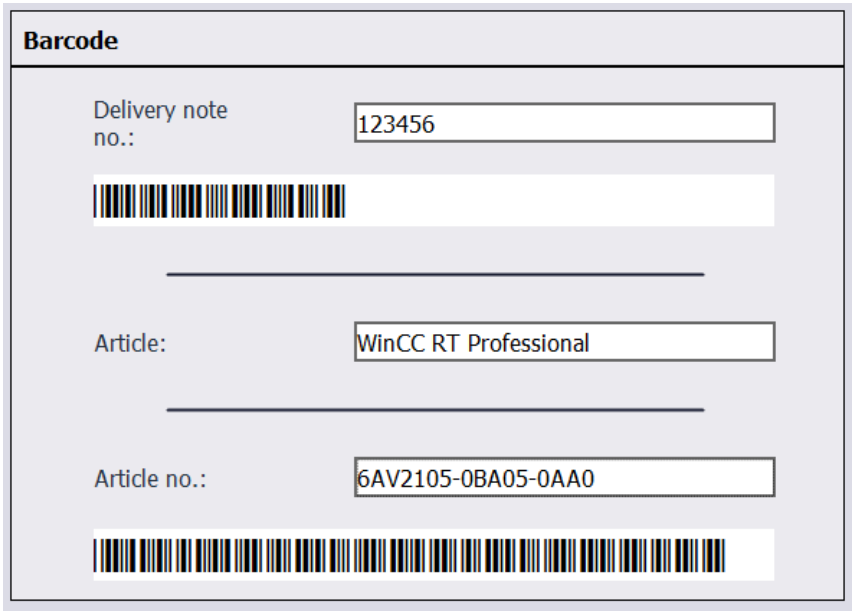
No.	Action
	Alternatively, configure your own screen window by calling the "Barcode" screen. Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbar_TransferData_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.
9.	Deselect the default configuration under "Menus & toolbar →Configurations". 

Note

Add the event "SetTag" at the "Value change" event of the tag to be encoded. Under "Tag" select the tag through which the barcode is to be displayed, and under "Value" set the tag to be encoded.

3.1.8 Operation

Table 3-6

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file. **Note:** A barcode font must be installed for operation of the example project.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click the "Data transfer" button.  Open the File Explorer with the "Barcode" button. 
5.	Enter the delivery note number, the article name and the article number using the input fields. The delivery note number and the article number are automatically displayed as barcode. 

3.2 QR Codes

3.2.1 Solution

Description

It is often useful to transfer information from operator panels or controllers to a cell phone or tablet PC.

An option should be used without having to integrate the cell phone or tablet PC into the automation network.

The PC station generates a QR code from the information to be transferred. The QR code can be read and interpreted by the cell phone or tablet PC.

Figure 3-2

3.2.2 Hardware and software components

The application example is valid for:

- SIMATIC WinCC RT Professional V15.1

3.2.3 Basics

Structure of the QR code used

Table 3-7

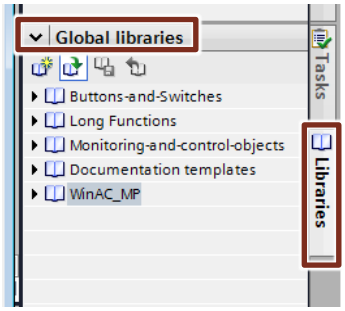
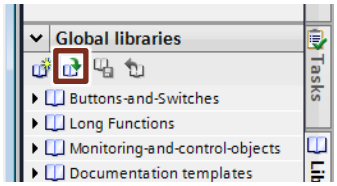
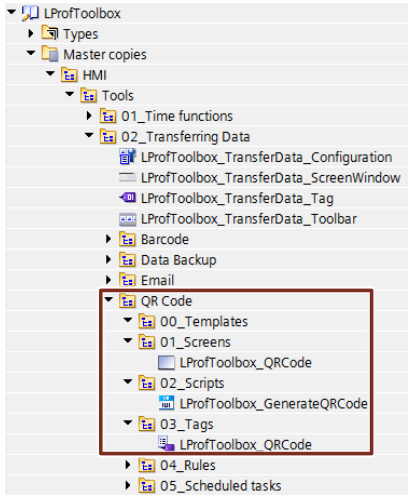
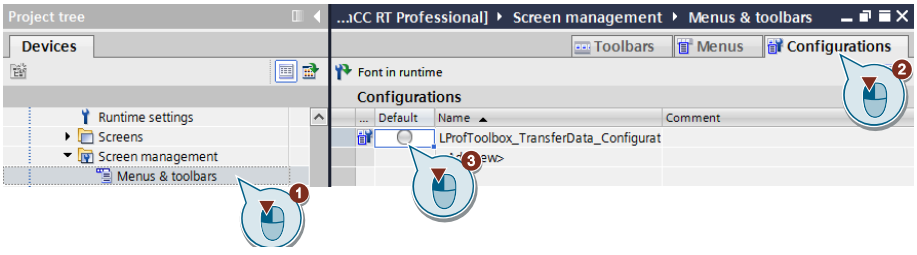
QR code (marked with color)	Meaning
	**Encoding type** This QR code uses eight bit per character. This makes it possible to represent most ASCII characters. The encoding type is "0100" in binary format. The property cannot be changed.
	Length Specifies the number of characters used in the QR code. This code always contains 17 characters. (If fewer characters are used, the script will add the missing characters.)
	Data blocks The data blocks contain the encoded information. Based on the ASCII table, each character is converted into a byte and encoded in these blocks.
	Error blocks The error blocks contain the error number of the "Reed-Solomon" algorithm \4\.
	Formatting The formatting blocks contain information on the QR code structure. This application uses a simple structure. (Error level: L Mask pattern: i%2 = 0 Meaning: The black blocks change the value depending whether the number is even or odd.)

Basic functionality of the script

The script calculates the binary code of the tags to be displayed using the default settings or the settings you have made.
In addition, other information (information on error correction) is converted according to the "Reed-Solomon" algorithm. The result of the script is displayed using the "visibility" property of the individual elements (squares) of the QR code.

3.2.4 Project Planning

Table 3-8

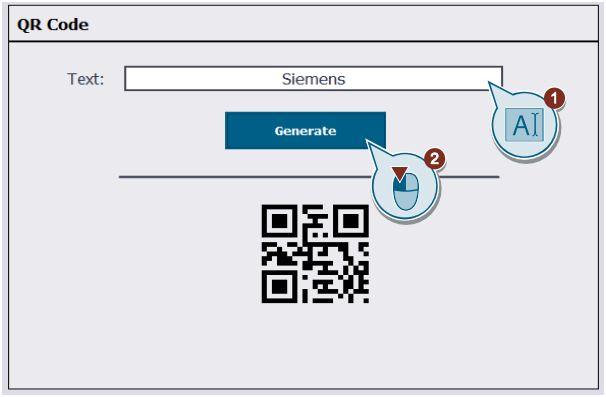
No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration.
3.	To do this, open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a global library. 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
6.	Open the folder "Master copies > HMI > Tools > 02_Transferring Data > QRCode" of the library. Drag the elements to the operator panel. 
7.	Deselect the default configuration under "Menus & toolbar →Configurations". 
8.	Open the VBS script "LProfToolbox_GenerateQRCode".

No.	Action

9.	In line 36 of the script, check the name of the screen on which you have used the QR code and adapt it, if necessary.
	`36 SCREEN_NAME = "LProfToolbox_QRCode"`
	
	In line 56 of the script, check the name of the tag that you want to convert into the QR code and adapt it, if necessary.
	`56 ENCODE_STRING = SmartTags("textoutput")`

3.2.5 Operation

Table 3-9

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click the "Data transfer" button. 
5.	Open the QR code screen with the "QR Code" button. 
6.	Enter a random text into the I/O field. The text is limited to 17 characters.  Click "Generate" to convert the text into a QR code.

3.3 Emails

3.3.1 Solution

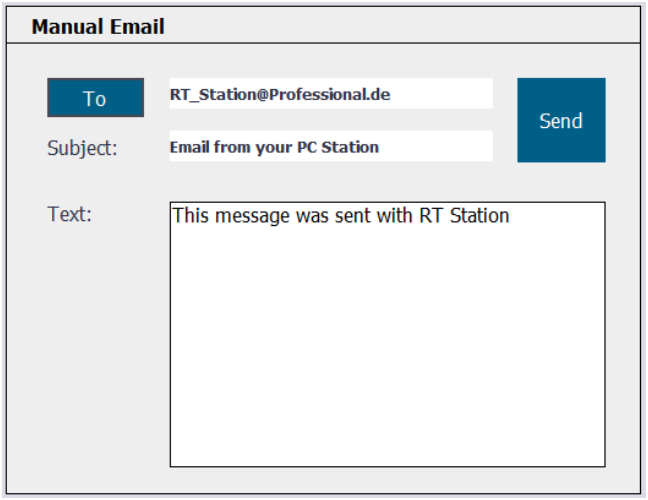
Description

As not all machines of a plant are permanently monitored by staff, it is often not possible to promptly react to pending alarms on the operator panel.

An email notification is to offer help here.

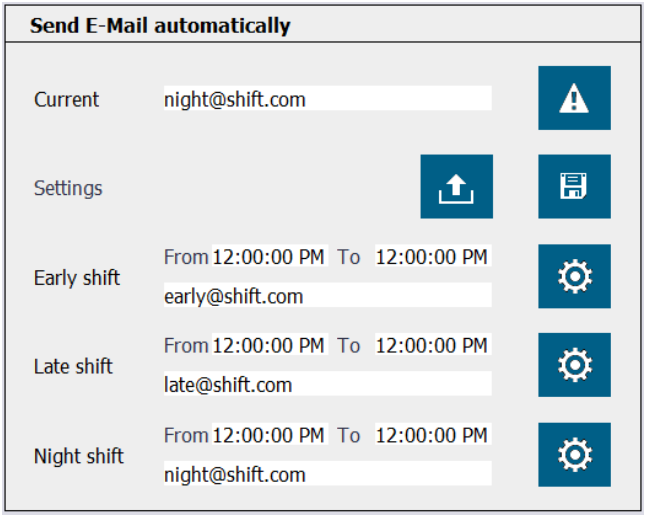
Using the application example, you can send emails automatically when specific alarms occur as well as manually from the IPC.

Figure 3-3



A three-shift system is also available for automatic sending of emails so that the employee in charge is automatically notified.

Figure 3-4



Known email addresses are backed up by a text file in the file system of the operator panel so that they are sill available after a restart.

3.3.2 Hardware and software components

This application example is valid for:

- SIMATIC WinCC Professional V15.1
- SIMATIC WinCC RT Professional V15.1

3.3.3 SMTP server settings

Connection to the SMTP server

The SMTP server (Simple Mail Transfer Protocol), or email server, is a server that sends emails. POP3 servers or IMAP servers are used for receiving an email.

You can find the corresponding settings in the "LProfToolbox_Email_SMTP_Settings" screen.

Figure 3-5

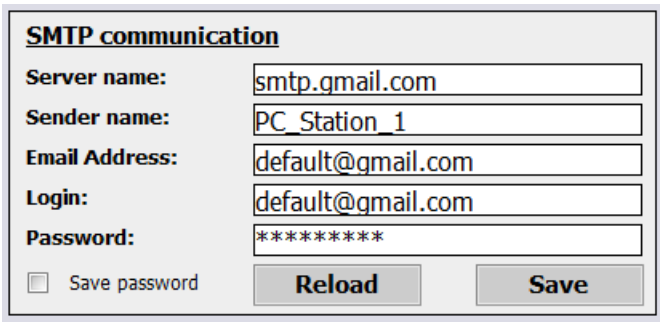


Table 3-10

Field	Explanation
Server name	SMTP server of the email service provider or your own email server. Please note that the SMTP server can only be specified as a computer name or fully qualified domain name (FQDN) or as an IP address.
Port	SMTP server port used for sending email.
Sender name	This plain text name is entered as the sender of the email and can be defined as required; for example, "Hall1", "Panel123", etc.
Email address	Email sender address of your emails
Log in	Use the login data you defined when you created the email account.
Password	Use the password you defined when you created the email account.

The information relates to the email sender. You can use any provider for the recipient address(es).

3.3.4 Activation of encrypted message transmission using SSL

Most SSL servers use port 587 for SSL transmission. If sending emails with this port fails, consult your email service provider for the correct settings.

Verifying the correct port for sending email

If you are not sure whether your provider supports SSL or communicates via port 587, perform the following steps on a PC connected to the Internet via the same subnet as your operator panel:

Table 3-11

No.	Action
1.	Open the Windows Command Prompt.
2.	Enter the command line "telnet [SMTP server name] 587". (Replace "[SMTP server name]" with the actual server name.) **Note** The "Telnet" tool is not enabled by default on all Windows installations. If the command is not known to your command prompt, use "Control Panel > Programs and Features > Turn Windows features on or off" to enable Telnet in Windows 10. On other Windows versions, the path may differ slightly.
3.	If a message appears that a connection cannot be established, port 587 of your server is blocked. In this case, change the port to the value specified by your email service provider or use a different email service provider.

Note If your provider does not support SSL yet, port 25 is used by default for sending emails. Please note that your emails are transmitted unencrypted in this case.

3.3.5 Settings on the HMI operator panel

The IPC must be configured for connection to the Internet.

Make sure that the network access for IPCs is not restricted by domain policies or firewalls. (If necessary, contact your domain administrator.)

3.3.6 Option: Forwarding emails as SMS text messages

General

Various mobile network operators offer a service that assigns an email address to a cell phone number of their network. Emails sent to this address are then converted to SMS text messages and forwarded to the mobile device in this format. This allows you to receive emails on a cell phone or smartphone without having an email client installed.

Note The maximum length of an SMS text message is 160 characters as always. Longer emails are normally truncated by the provider.

Enabling and disabling notification by SMS text message

For an email to be converted into an SMS text message, the appropriate service must be signed up for with the mobile network operator. Using the example of T-Mobile, the following sections describe how to do this.

- **Enabling reception of email with a provider:**
  Send an SMS text message with the text "**OPEN**" to the T-Mobile speed dial number **8000**. This opens your T-Mobile number for email reception.
  And the email address assigned to your cell phone is:
  T-Mobile phone number (incl. area code)@t-mobile-sms.de
  e.g. 017100000000@t-mobile-sms.de.
- **Disabling email reception:**
  If you no longer want to receive emails, send an SMS text message with the text "**CLOSE**" to the T-Mobile speed dial number **8000**.

The above steps may be different for other mobile network operators.

Changes on the HMI operator panel are not necessary.

Other mobile network operators

The following table lists a selection of providers offering SMS notification services. This list does not claim to be complete.

Table 3-12 lists:

- The keywords for the activation/deactivation message of the notification service,
- the speed dial number to which the activation/deactivation message has to be sent,
- the email address from which the received messages are forwarded as SMS text messages (replace the “[No]” with the appropriate cell phone number).
- the individual providers’ websites

Table 3-12

	Vodafone	O_2
Start/end of service	OPEN / CLOSE	+START / STOP
Speed dial	3400	6245
Email address	[No]@vodafone-sms.de	[No]@o2online.de
Website	http://www.vodafone.de	http://www.o2online.de

For more detailed information, please contact the respective provider and obtain information on the "Enable cell phone for receiving email from the Internet" function.

3.3.7 Principle of operation of the project

Automatic assignment of the email recipient

An email is automatically sent in case of a specific alarm. The address of the recipient is determined by a shift schedule in this case.

The active email address is changed daily at the set times by means of the Scheduler.

As an alternative to the individual alarm, you can also define an alarm class for sending emails. If an alarm of this alarm class occurs, an alarm is sent to the respective recipient. In this case, you will not need to activate the "Send email" function multiple times.

Description of the script "LProfToolbox_ReadCurrentValues"

This script is used to restore the last settings saved of the shift schedule. The script reads all values of the "Email_shifts.txt" file and writes them to the associated tags.

Description of the script "LProfToolbox_SendEmailVB"

This script is used for sending an email manually. The script reads the entered recipient address as well as subject and text and sends the email via SMTP service.

Description of the script "LProfToolbox_StartUp"

This script is executed once by the first call of the start screen. It is used for saving and reading the email addresses for the shift schedule and the start times of the shifts. To do so, the "Email_shifts.txt" file is created the very first time the script is called.

Plus the start values for the shift times and shift addresses are created.

Description of the script "LProfToolbox_WriteCurrentValues"

This script is used to save the complete setting of the shift schedule. The script writes the current value of all email addresses and shift schedule times to the "Email_shifts.txt" file.

Description of the script "LProfToolbox_TransferAddressFromDirectory"

This script changes the email address of the selected shift time. It replaces the email address of the shift time by the one selected from the recipe.

The emails are saved in a recipe as data records. You can expand the recipe by any number (max. 5000) of new emails.

Note

Storage path of the "Email_shifts.txt" file in Windows operating systems:

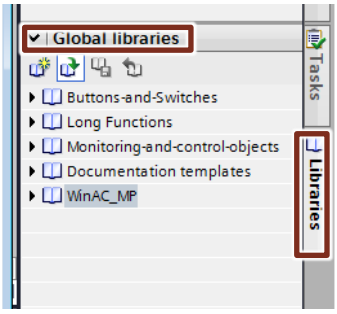
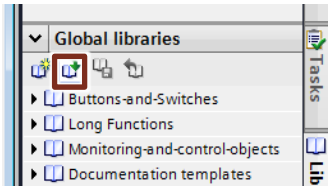
Windows path: C:\Tools\Email_shifts.txt

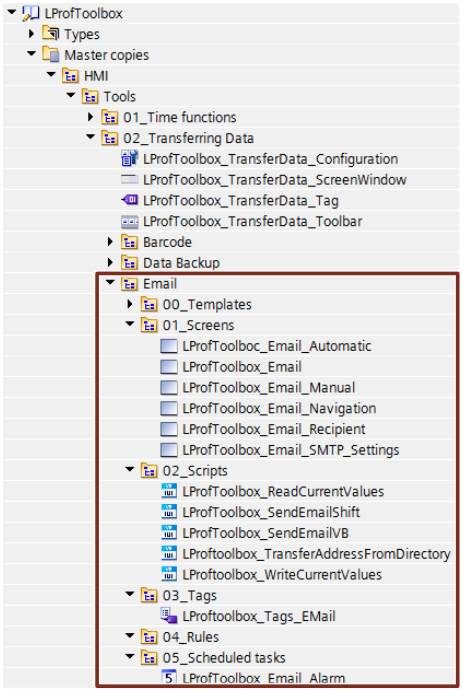
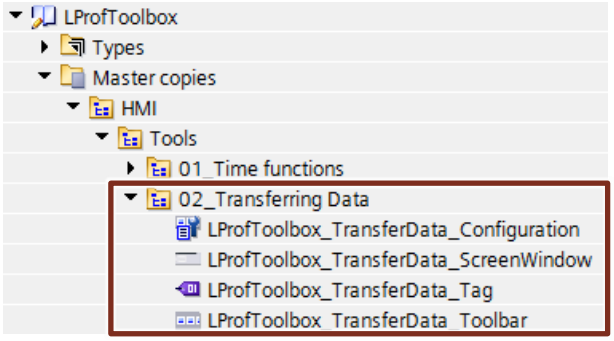
The same is the case for the recipe that saves the email addresses as data records.

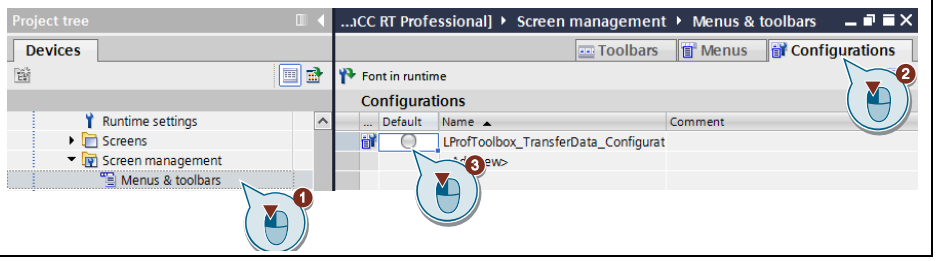
- Windows path: C:\Tools\Recipes

3.3.8 Project Planning

Table 3-13

No.	Action
1.	Use the faceplate "SMTP_Settings" for the SMTP settings during runtime. Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration.
3.	Open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a "Global Library". 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.

No.	Action
6.	Open the folder "Master copies > HMI > Tools > 02_Transferring Data > Email" of the library. Drag the corresponding elements to the associated folders of your HMI operator panel. 
7.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_TransferData_ScreenWindow" - Configuration "LProfToolbox_TransferData_Configuration" - Tag "LProfToolbar_TransferData_Tag". Alternatively, configure your own screen window by calling the "Email" screen. Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_TransferData _Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.

No.	Action
8.	Deselect the default configuration under "Menus & toolbar →Configurations". 

3.3.9 Operation

Note

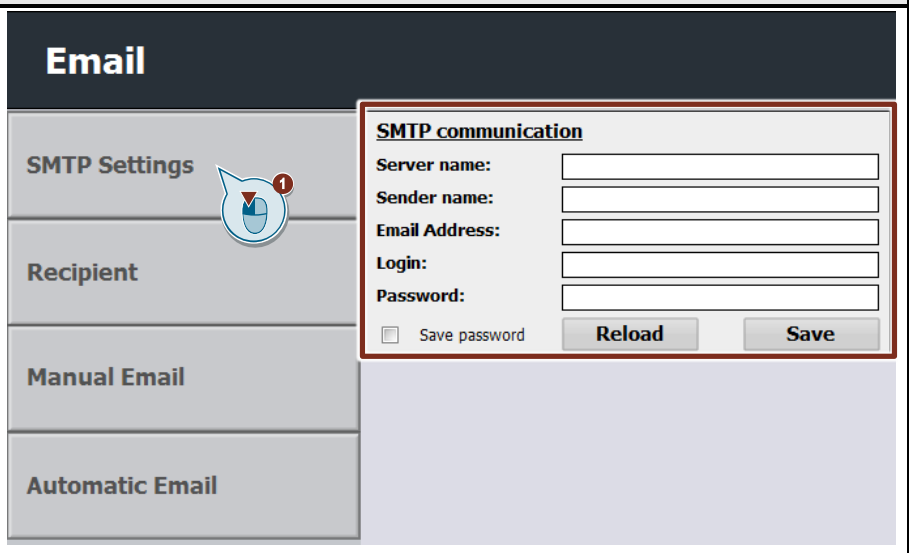
The SMTP server for sending emails has not been set up in the example project yet. You can only test the operation of the user interface.

If you want to test the full functionality, you still need to adapt the SMTP server settings.

Table 3-14

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click the "Data transfer" button.  Open the email window with the "Email" button.  Enter the SMTP settings of your email provider.

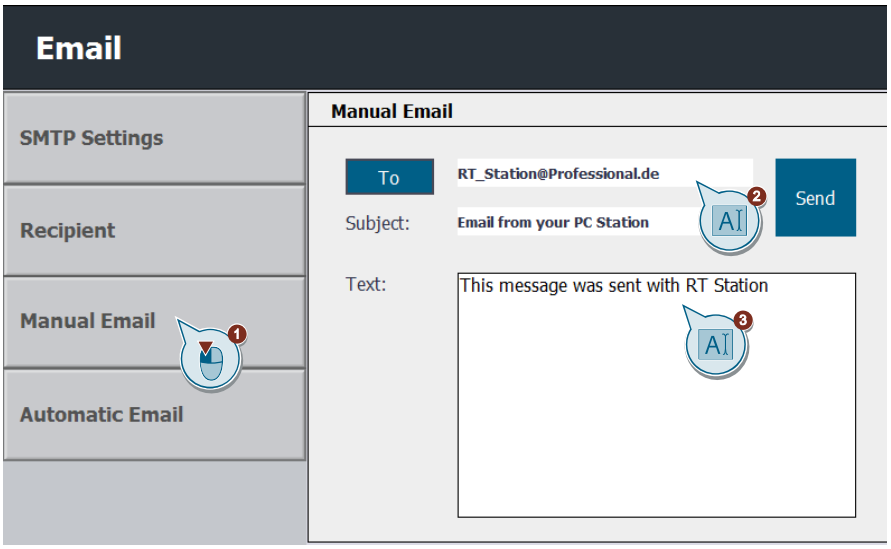
No.	Action



Choose whether you want to send an automatic email (via an alarm) or a manual email.

Sending emails manually

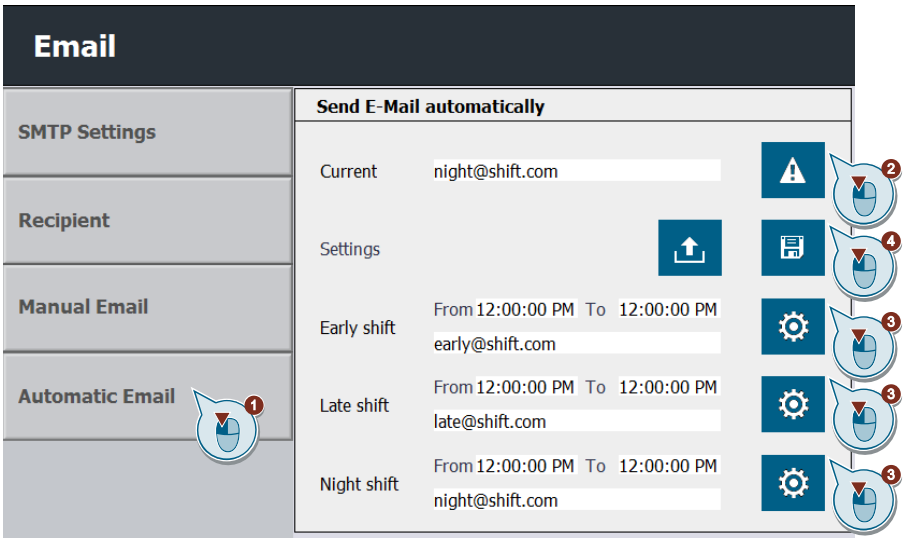
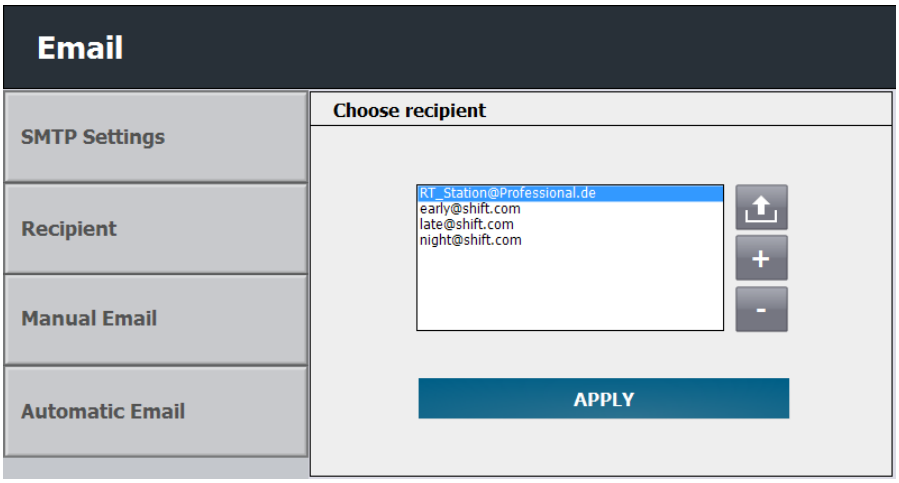
Enter the recipient address, the subject and the body in the appropriate fields. Click on "To" to open the address book (see step 7). You can send the email with the "Send" button.



Sending emails automatically

Click the button (2) to activate the alarm that sends the automatic email.

Use the IO fields to specify different email addresses for the respective shift. You

No.	Action
	can use the buttons (3) to select addresses from the address book (see step "Maintenance of the address book"). You specify the times of the respective shift with the "From" and "To" I/O fields. Use the buttons (4) to save and download the settings for shift times and shift addresses.  **Maintenance of the address book**  Management of the address book has been solved with a faceplate. To add a new email address, click the "+" button. Select an email address and press the "-" button to delete an email address. The addresses are automatically saved in the file system. Click the "Load" button to load the addresses. Click the "Apply" button when you have selected the desired email address.

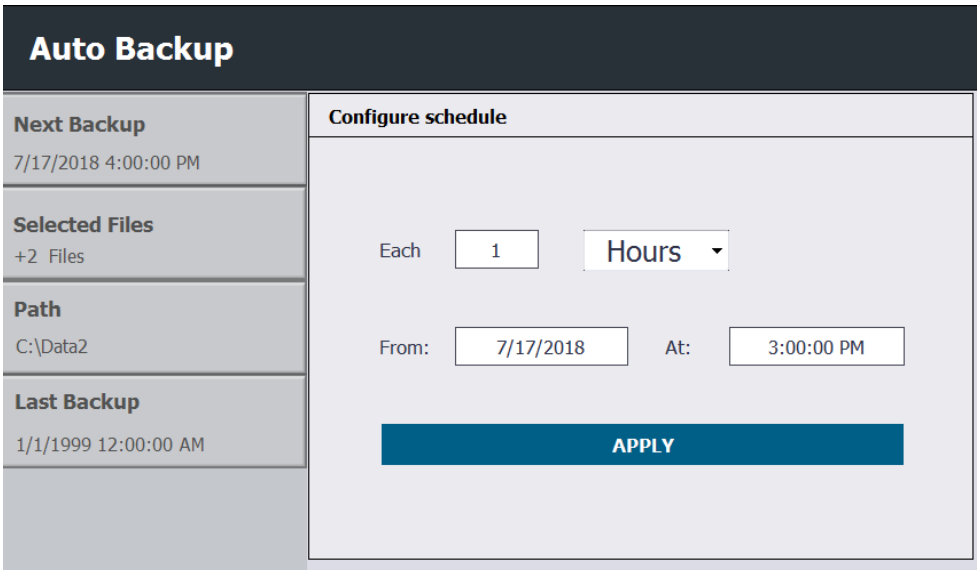
3.4 Automatic backup of files

3.4.1 Solution

Description

With the aid of automatic backup, your files (e.g., archives) are backed up to any location (e.g., a USB flash drive, network folder, etc.) at configurable intervals.

Figure 3-6



3.4.2 Hardware and software components

This application example is valid for:

- SIMATIC WinCC Professional V15.1
- SIMATIC WinCC RT Professional V15.1

3.4.3 VBS scripts used

LProfToolbox_calculateNextExecution

The "LProfToolbox_calculateNextExecution" script calculates the time for the next automatic backup, based on the set time interval.

LProfToolbox_CopyFiles

The "LProfToolbox_CopyFiles" script copies the files selected together with date and time stamp to the file path selected.

LProfToolbox_FileSelectCopyFiles

The "LProfToolbox_FileSelectCopyFiles" script writes the paths of the files to the copied into the associated HMI tags.

LProfToolbox_InitializeTime

The "LProfToolbox_InitializeTime" script reads the current time and writes it as default value for the backup time.

LProfToolbox_previousFolder

The "LProfToolbox_previousFolder" script opens the higher-level folder of the currently selected folder.

LProfToolbox_ReadFilesOfFolder

The "LProfToolbox_ReadFilesOfFolder" script reads the files from the specified path and shows them as a table.

LProfToolbox_Search

The "LProfToolbox_Search" script searches for the specified file/folder in the current path.

LProfToolbox_ShowFile

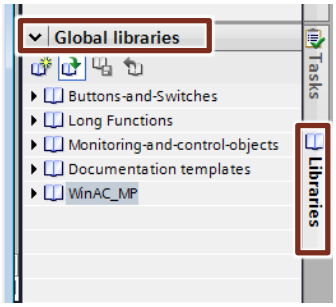
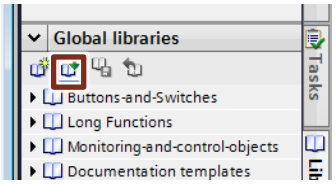
The "LProfToolbox_ShowFile" script opens the selected folder / file.

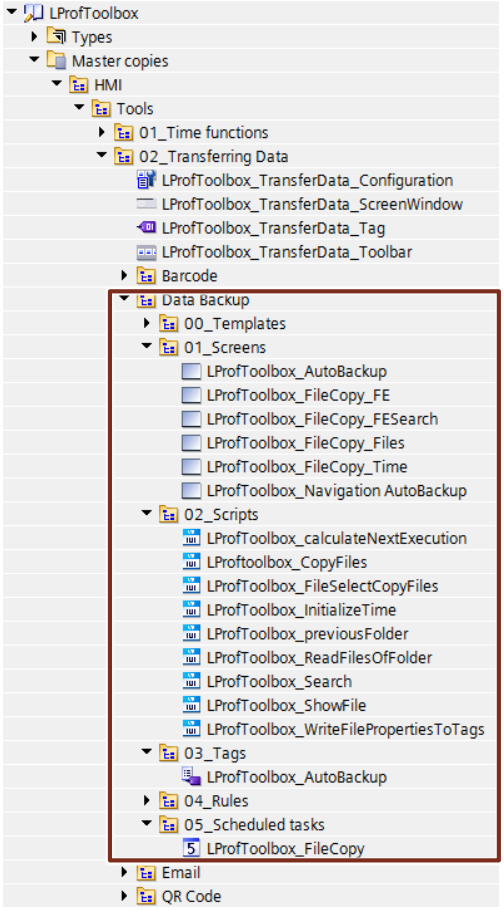
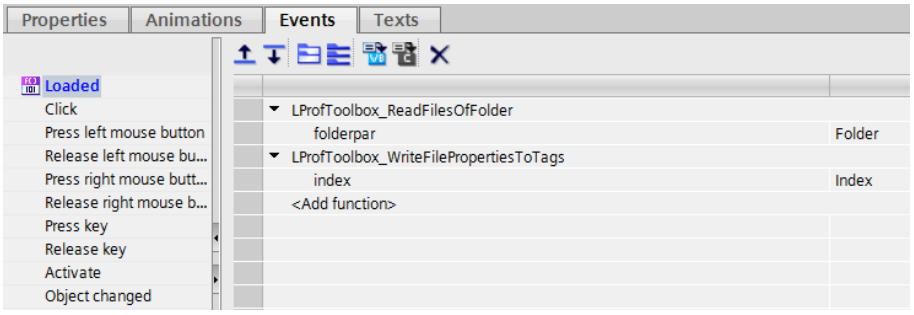
LProfToolbox_WriteFilePropertiesToTags

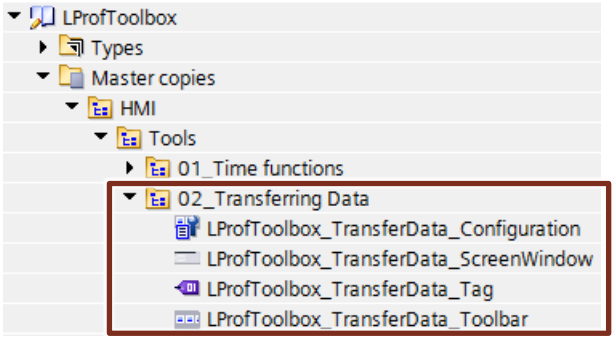
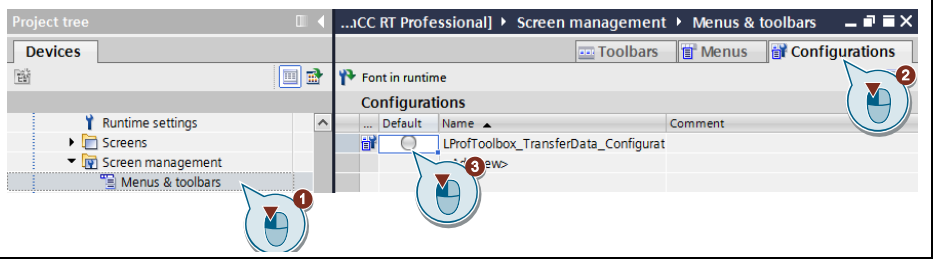
The "LProfToolbox_WriteFilePropertiesToTags" script writes the properties of the selected folder / file to the associated HMI tags.

3.4.4 Project Planning

Table 3-15

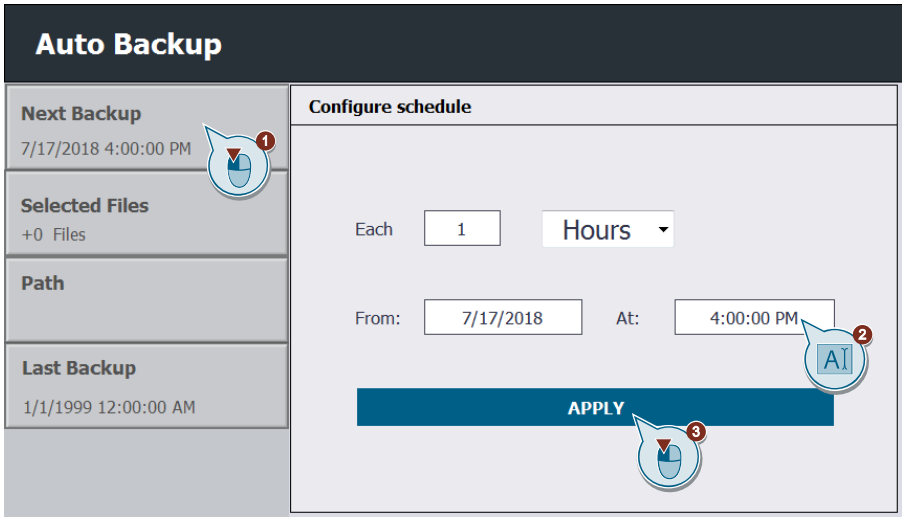
No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration.
3.	Open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a "Global Library". 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.

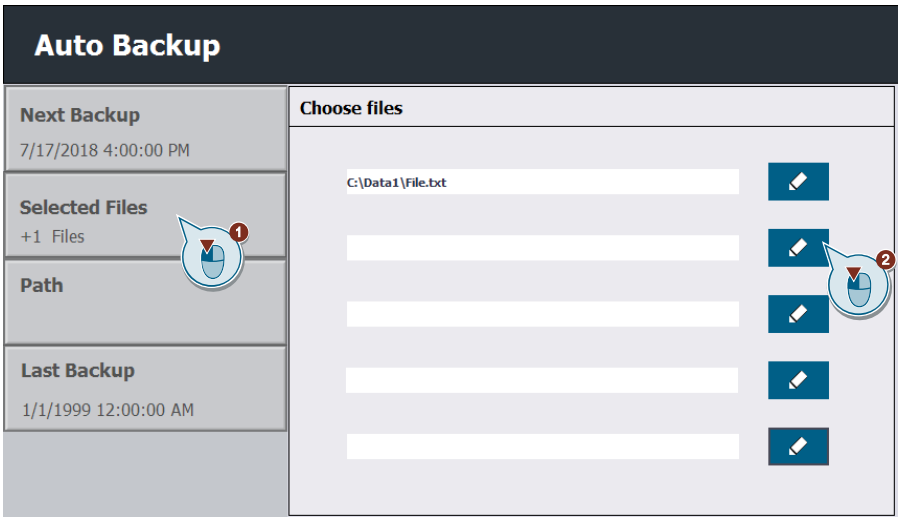
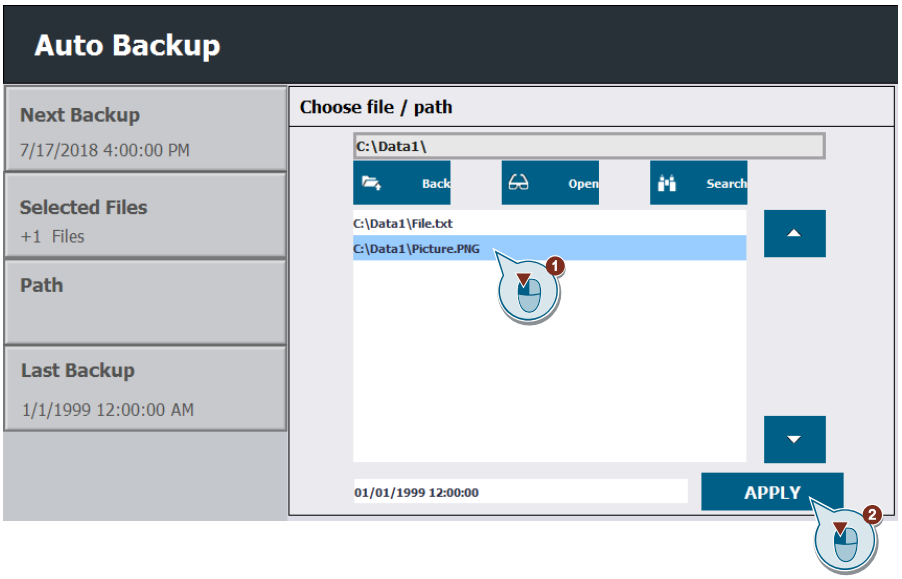
No.	Action
6.	Open the folder "Master copies > HMI > Tools > 02_Transferring Data > FileCopy" of the library. Drag the elements to the corresponding folders of the operator panel. 
7.	Open your start screen.
8.	Add the script "LProfToolbox_ReadFilesOfFolder" under "Properties > Events > Loaded". For the "folderpar" parameter, select the "Folder" HMI tag. Alternatively, you can enter your own path that starts the File Explorer. Add the script "LProfToolbox_WriteFilePropertiesToTags" and select the HMI tag "Index" as "index". 

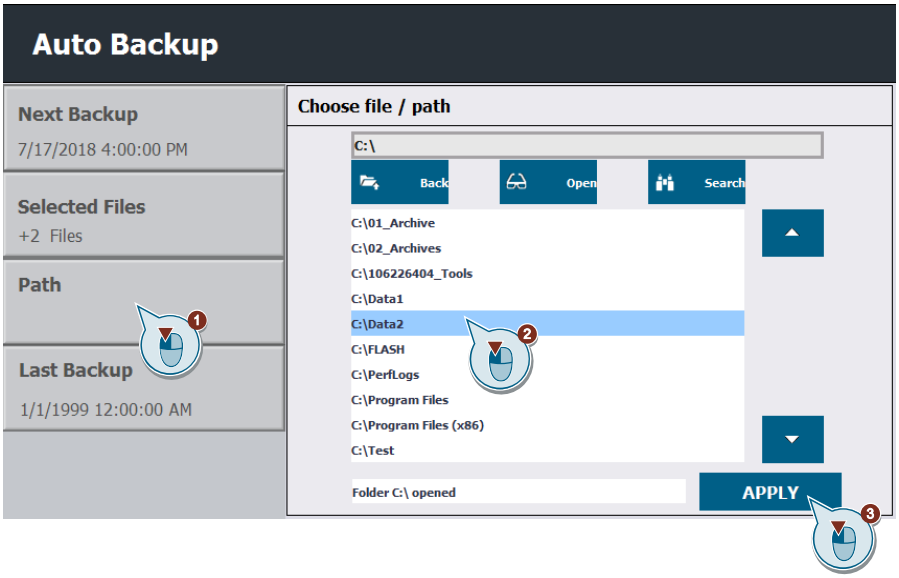
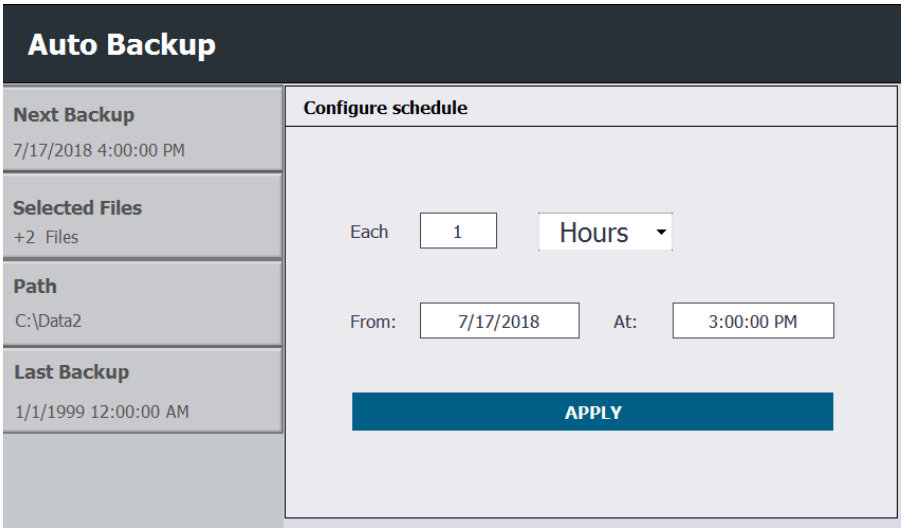
No.	Action
9.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_TransferData_ScreenWindow" - Configuration "LProfToolbox_TransferData_Configuration" - Tag "LProfToolbox_TransferData_Tag". Alternatively, configure your own screen window by calling the "LProftoolbox_AutoBackup" screen. Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_TransferData_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.
10.	Deselect the default configuration under "Menus & toolbar →Configurations". 

3.4.5 Operation

Table 3-16

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click the "Data transfer" button.  Open the screen with the "File copy" button. 
5.	Click on the "Next Backup" button and set up the backup interval for the selected files.  Click "Apply" to confirm your entries.

No.	Action
6.	Click the button with the pen symbol. 
7.	Open the file path with the "Open" button. Select the file you want to back up. Confirm the selection with "Apply".  For a detailed description of the File Explorer, refer to the section 6.2. To remove an already selected file from the list again, select the I/O field and delete the input.

No.	Action
8.	Click on the "Path" button to select the file path for the backup. You can also enter the path directly via the I/O field. 
9.	The files are copied to the specified folder at the set time. The original file name is preceded by the current date and the current time.
10.	The times for "Last Backup" and "Next Backup" are automatically updated depending on the backup interval. 

4 Mathematical functions

4.1 Unit converter

4.1.1 Solution

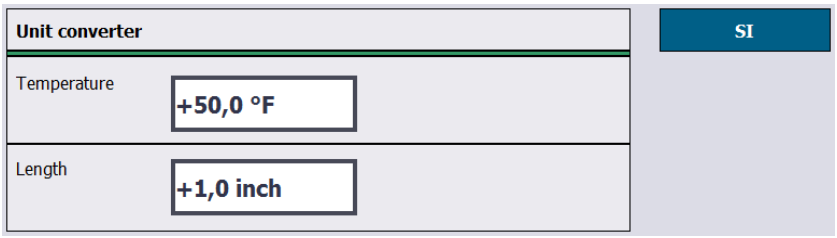
Description

The unit converter is used to quickly and easily switch between different unit systems when displaying process data. While the data can be displayed and entered in different systems, the user program in the CPU will not be affected by the switchover between the unit systems. Instead, all HMI data is to be automatically converted to the CPU's system of units.

The example project contains two faceplates for unit conversion between imperial and SI system:

- **Length**: Millimeters (mm) ⇔ inches (in)
- **Temperature**: °Celsius (°C) ⇔ °Fahrenheit (°F).

Figure 4-1



4.1.2 Hardware and software components

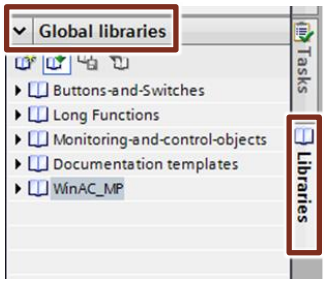
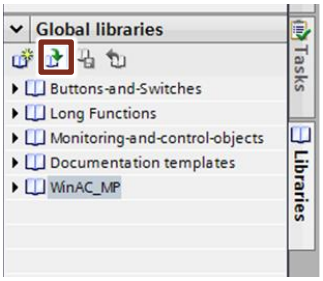
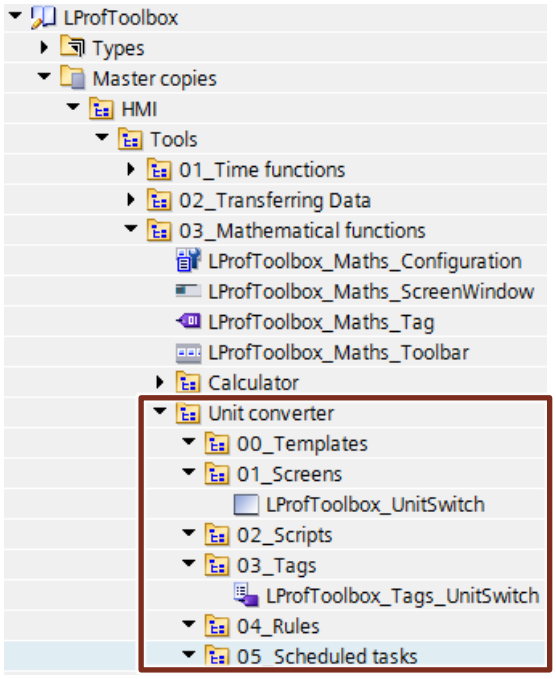
This application example is valid for:

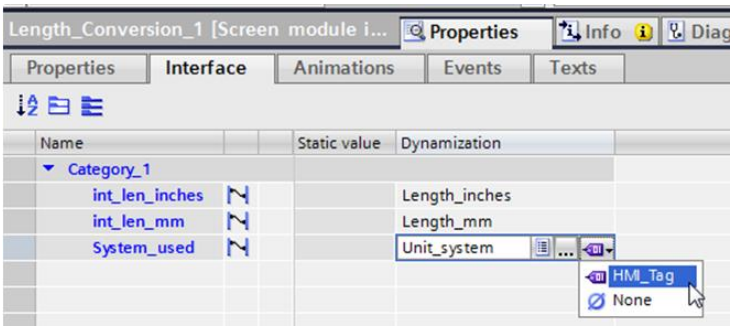
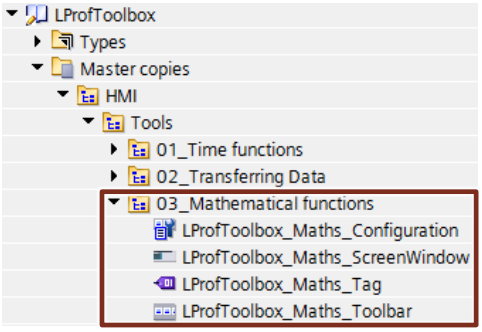
- WinCC (TIA Portal) V15.1 or higher
- WinCC Runtime Professional

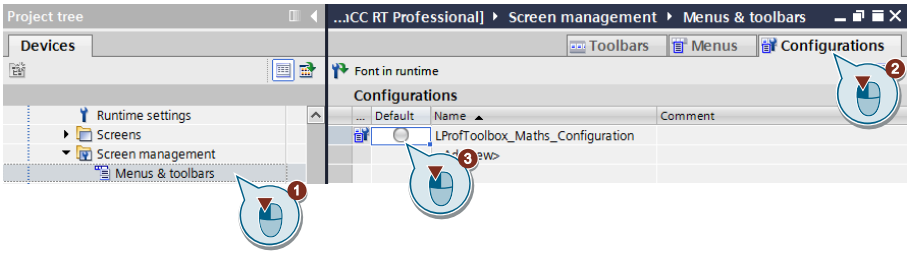
The application example was created with WinCC Professional V15.1.

4.1.3 Project Planning

Table 4-1

No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC (TIA Portal) configuration. Open the "Global libraries" pane with the "Libraries" task card. 
3.	Click on the second icon from the left to open a global library. 
4.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
5.	Open the folder "Master copies > HMI > Tools > 03_Mathematical functions > Unit converter" of the library. Drag the elements to the corresponding folders of the operator panel. 

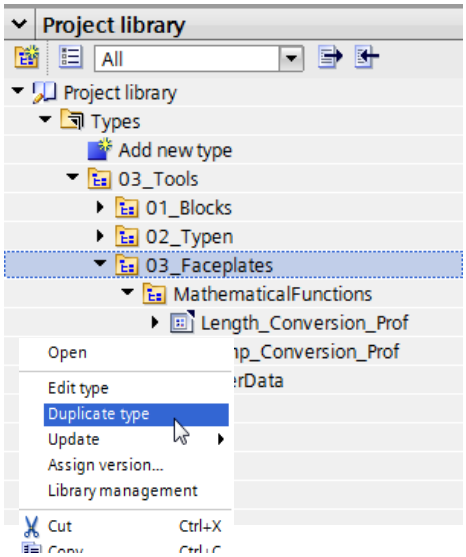
No.	Action
6.	Open the LProfToolbox_unitSwitch screen. Open the "Properties > Interface" tab of the "Length_Conversion" faceplate. The faceplate has three parameters: • Int_len_inches (data type: Real) Process value in inches (inches) • Int_len_mm (data type: Real) Process value in millimeters • System_used (data type: Bool) Specification of the unit system 0: Metric unit system 1: Imperial unit system. 
7.	The faceplate "Temp_Conversion" has parameters for temperature conversion.
8.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_Maths_ScreenWindow" - Configuration "LProfToolbox_Maths_Configuration" - Tag "LProfToolbox_Maths_Tag". Alternatively, configure your own screen window by calling the "LProftoolbox_UnitSwitch" screen. Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_Maths_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.

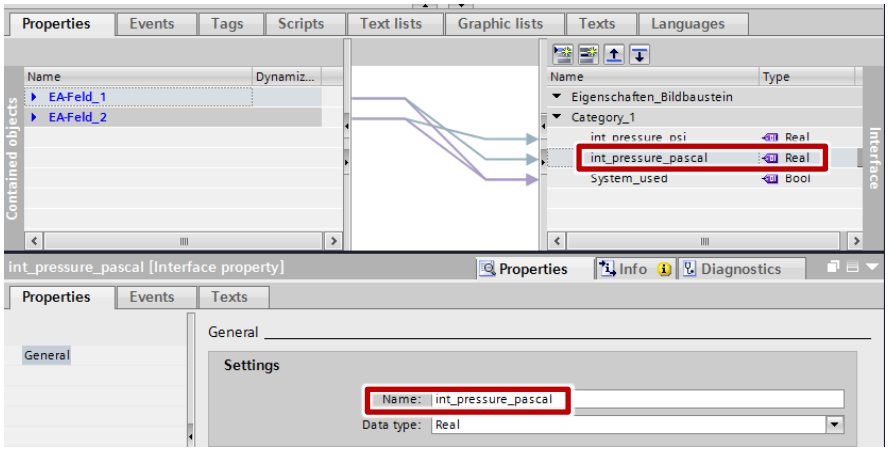
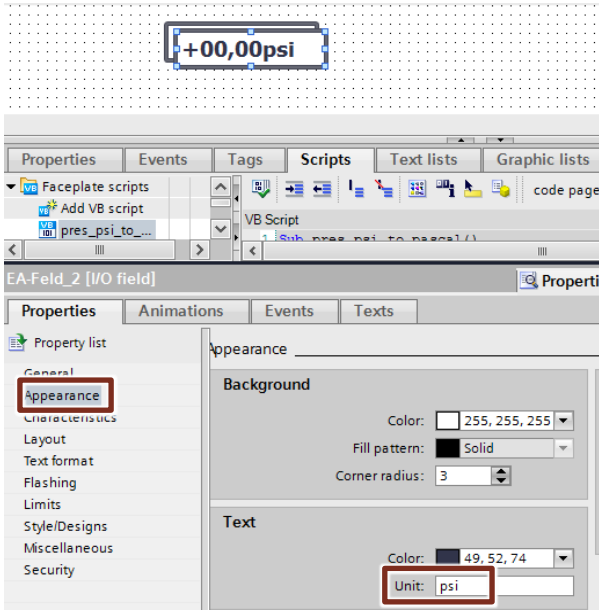
No.	Action
9.	Deselect the default configuration under "Menus & toolbar →Configurations". 

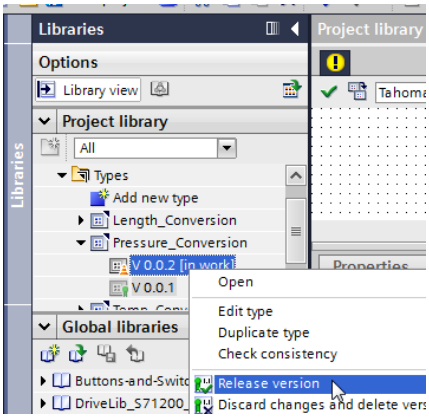
Note The use of two HMI tags (Length_inches and Length_mm) is for demonstration purposes only. In practice, only one tag is used in the process.

Configuring additional unit conversion

Table 4-2

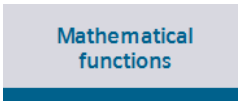
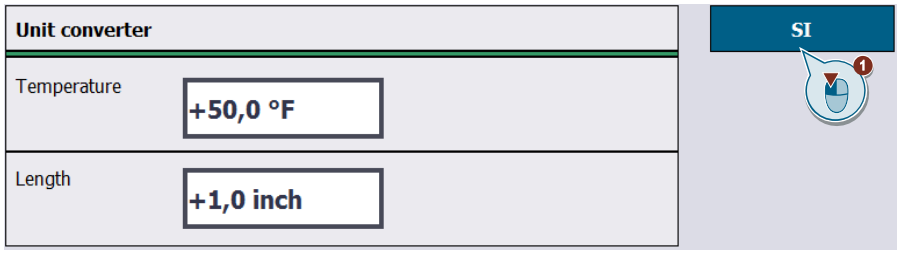
No.	Action
1.	In the "Project library" pane open the shortcut menu of the faceplate "Length_Conversion_Prof" and select the command "Duplicate type".  Assign a meaningful name to the type, for example, "Pressure_Conversion". If necessary, adjust the version and enter a comment.
2.	Open the shortcut menu of the "Pressure_Conversion" faceplate and select "Edit type".
3.	Select the "Properties" tab in the configuration area of the faceplate and open the view of the interface parameters in the right screen area with the black arrow.

No.	Action
4.	In the Inspector window under the "Properties" tab, adjust the names of the parameters of *both* I/O fields in the "Properties" tab. 
5.	Select an I/O field and enter the conversion formula for the unit system under "Properties > Events > Object changed". Repeat this step for the second I/O field.
6.	Double-click one of the I/O fields. Specify the unit of the value under "Properties > Appearance > Unit". 
7.	Repeat step 6 for the second IO field and position the IO fields on top of each other again.

No.	Action
8.	Open the shortcut menu of the faceplate and select "Release version". 

4.1.4 Operation

Table 4-3

No.	Action
1.	Open the example project "106226404_ExampleProject_Professional" that you can download on the download page of this entry.
2.	Download the configuration to your operator panel.
3.	Click on the "Mathematical functions" button.  Select the "Unit converter" button. 
4.	Enter the values in the two I/O fields. Change the unit for the switch. 

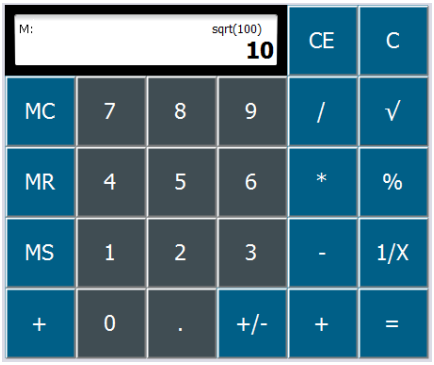
4.2 Calculator

4.2.1 Solution

Description

Visualization devices are often located directly in the production plant. The operator not only monitors the production process but also controls the availability of materials. To do so, individual process variables may frequently have to be calculated. The HMI calculator offers the standard arithmetic functions, such as "+" and "-" for this purpose.

Figure 4-2



4.2.2 Hardware and software components

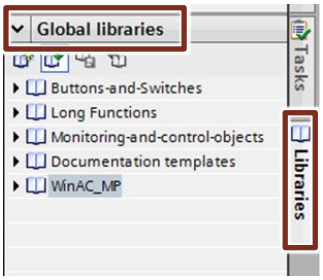
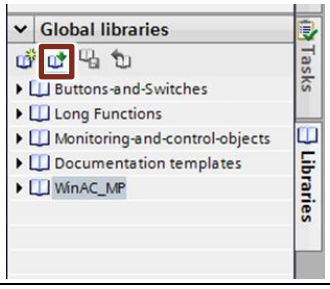
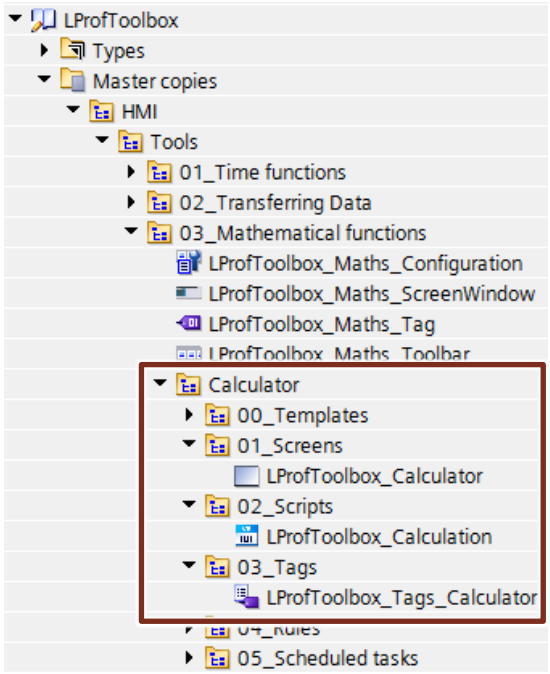
This application example is valid for:

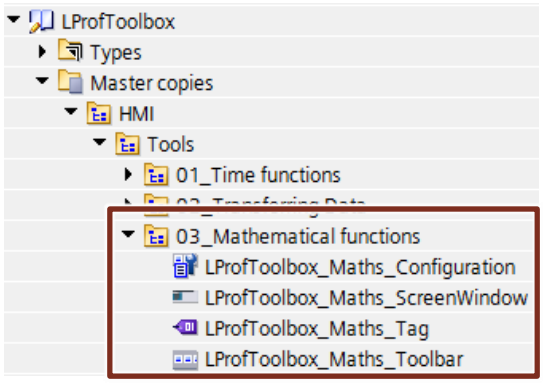
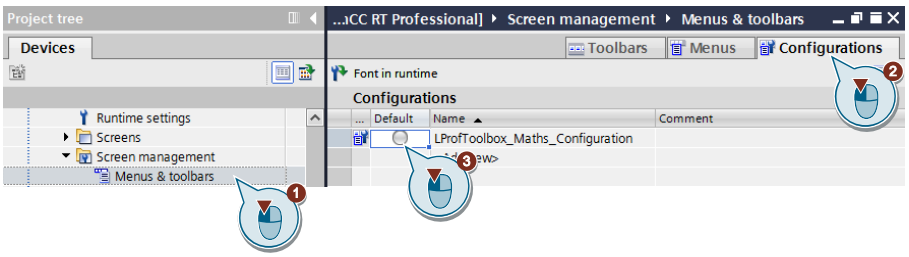
- WinCC (TIA Portal) V15.1 or higher
- WinCC Runtime Professional:

The application example was created with WinCC V15.1.

4.2.3 Project Planning

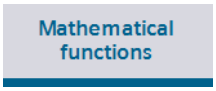
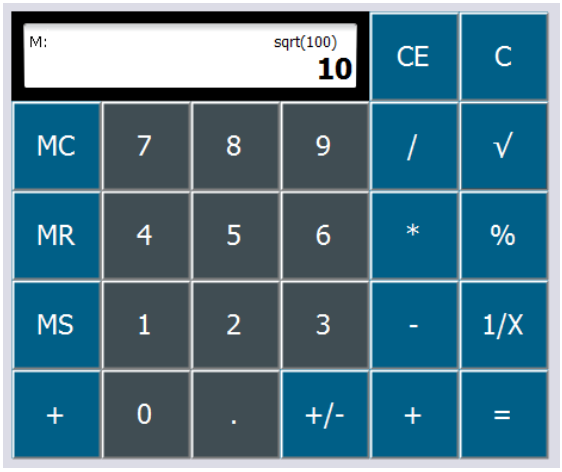
Table 4-4

No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC (TIA Portal) configuration. Open the "Global libraries" pane with the "Libraries" task card. 
3.	Click on the second icon from the left to open a global library. 
4.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
5.	Open the folder "Master copies > HMI > Tools > 03_Mathematical functions > Calculator" of the library. Drag the elements to the corresponding folders of the operator panel. 

No.	Action
6.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_Maths_ScreenWindow - Configuration "LProfToolbox_Maths_Configuration" - Tag "LProfToolbox_Maths_Tag". Alternatively, configure your own screen window by calling the "LProfToolbox_Calculator" screen. Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_Maths_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.
7.	Deselect the default configuration under "Menus & toolbar →Configurations". 

4.2.4 Operation

Table 4-5

No.	Action
1.	Open the example project "106226404_ExampleProject_Professional" that you can download on the download page of this entry.
2.	Download the configuration to your operator panel.
3.	Click on the "Mathematical functions" button. Open the calculator with the "Calculator" button.  Select the "Calculator" button. 
4.	You operate the calculator as you would any standard calculator. 

5 Simplified operation

5.1 Segmented control

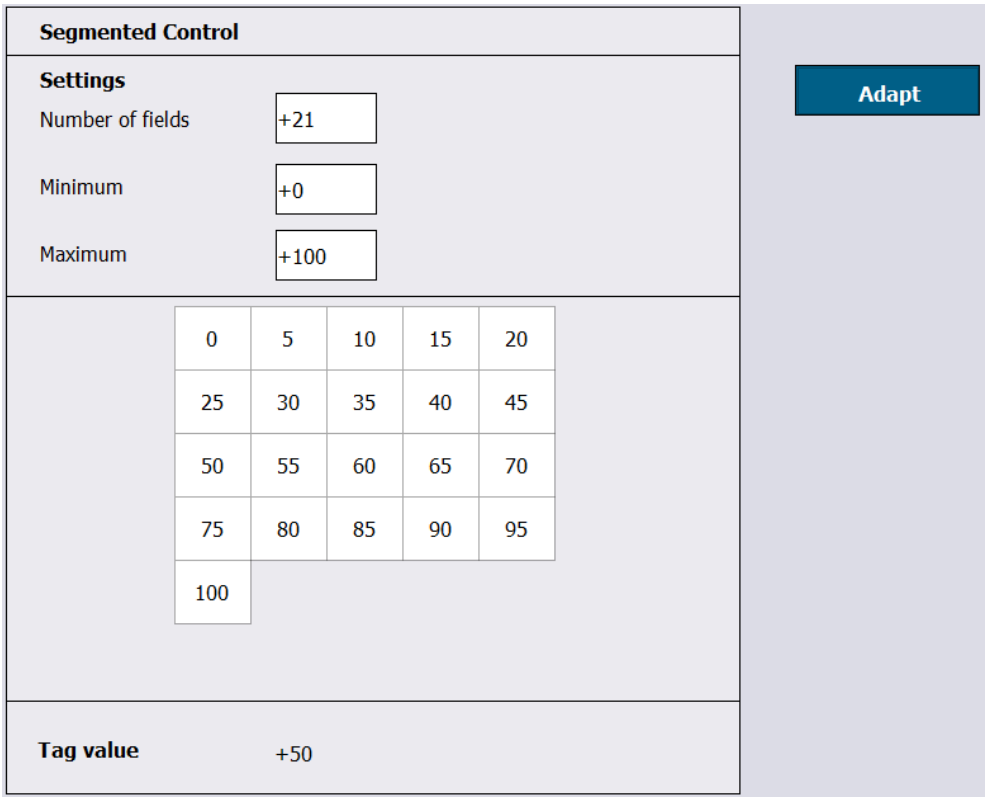
5.1.1 Solution

Description

A segmented control helps you to clearly and quickly define values. This allows you to specify potential values beforehand and avoid operating errors.

Variable specification of a value in equidistant steps between a minimum and a maximum value (can be set during runtime). The display can be changed via the interface of the block.

Figure 5-1



A screen window is available for SIMATIC WinCC RT Professional. You can use this screen window to specify the number of steps (maximum of 30) as well as the minimum and maximum value.

The values and the labeling of the buttons is calculated in equidistant steps.

The connection takes place by means of a user-defined data type. You use the tag prefix of the screen window to specify which tag is to be controlled.

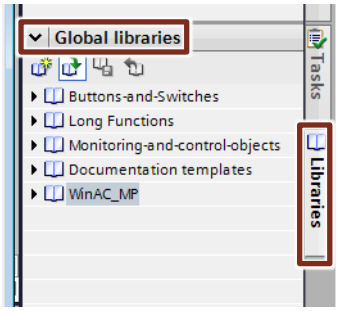
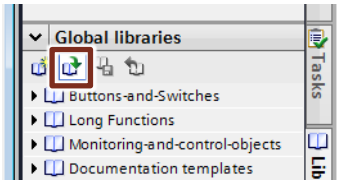
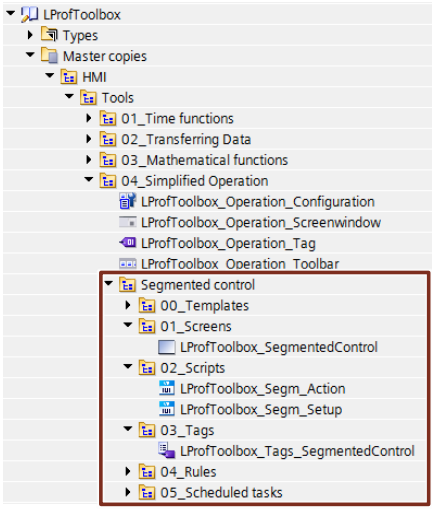
5.1.2 Hardware and software components

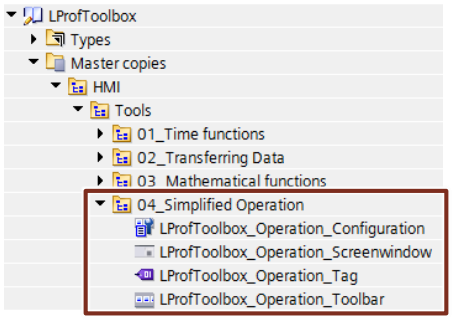
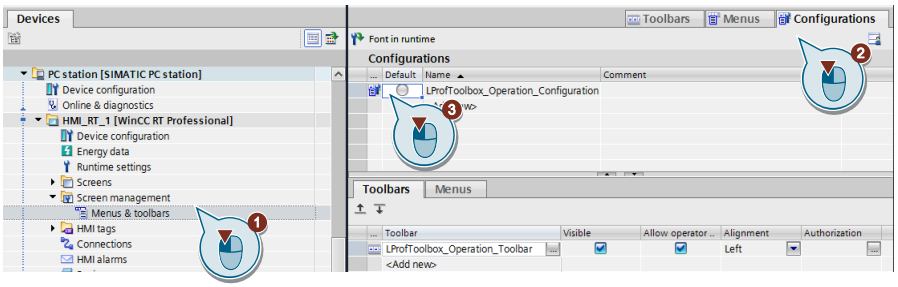
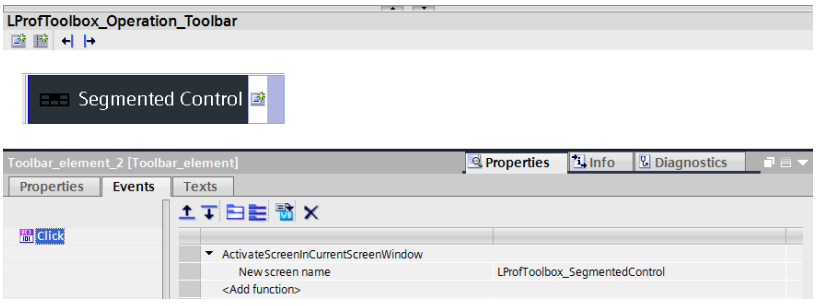
This application example is valid for:

- SIMATIC WinCC Professional V15.1
- WinCC RT Professional V15.1

5.1.3 Project Planning

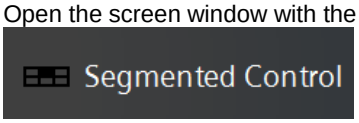
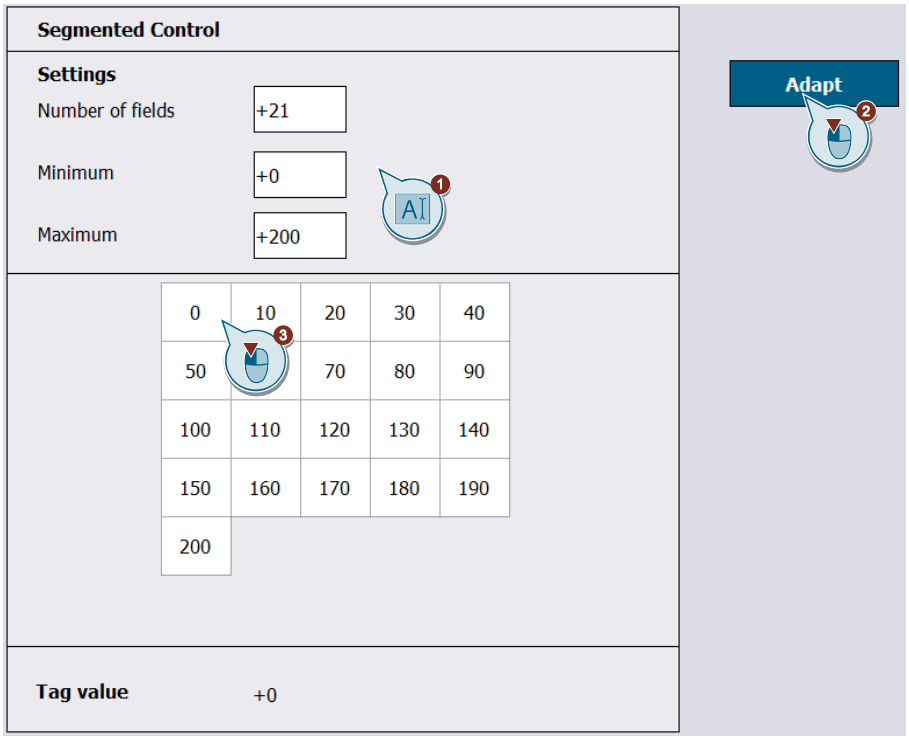
Table 5-1

No.	Action
1.	Download the library "106226404_LProfToolbox.zip". Unzip the file.
2.	Open your WinCC configuration.
3.	Open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a "Global Library". 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
6.	Open the folder "Master copies > HMI > Tools > 04_Simplified Operation > SegmentedControl" of the library. 
7.	Drag the elements to the corresponding folder of the HMI operator panel.

No.	Action
8.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_Operation_ScreenWindow" - Configuration "LProfToolbox_Operation_Configuration" - Tag "LProfToolbox_Operation_Tag": Alternatively, configure your own screen window by calling the "SegmentedControl" screen. Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_Operation_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.
9.	Deselect the default configuration under "Menus & toolbar →Configurations". 
10.	Adapt the function "ActivateScreenInScreenWindow" to your configured screen with screen window. 

5.1.4 Operation

Table 5-2

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional" and unzip the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click on the "Simplified operation" button. 
5.	Open the screen window with the "Segmented Control" button. 
6.	In the "Number of fields" I/O field enter the number of fields into which the control is to be subdivided. Enter the limits between which the values must be specified in the "Minimum" and "Maximum" I/O fields. Click "Apply" to apply the settings. Click on a field to specify the tag value. 

6 Enhanced clarity

6.1 Notes

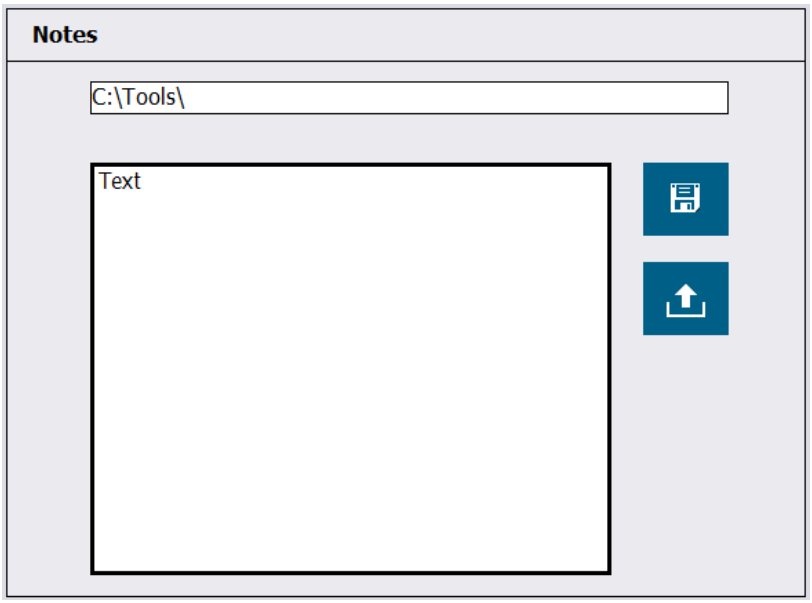
6.1.1 Solution

Description

Notes help the operator of the IPC to process text notes. The tool saves the entered notes in a text file to the memory of the HMI operator panel.

Notes can be written, read, edited and shared with other operators this way.

Figure 6-1



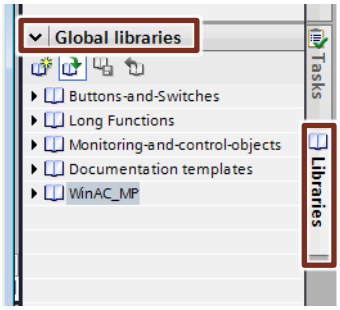
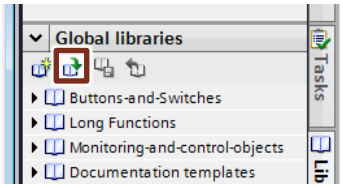
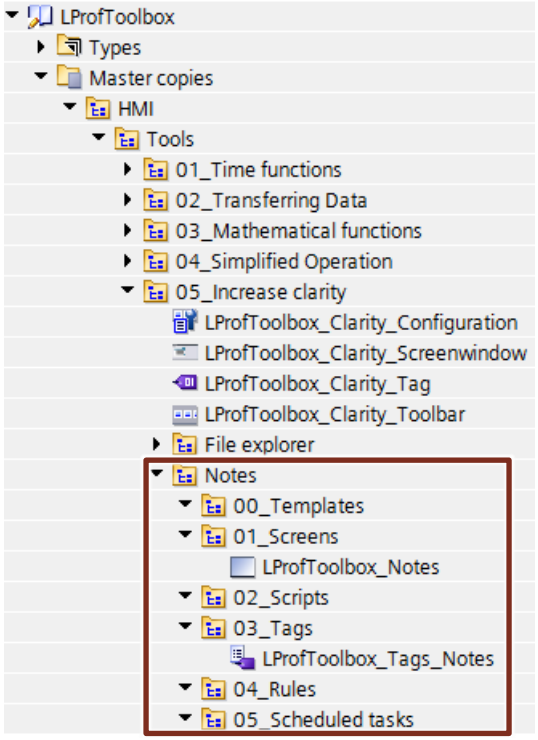
6.1.2 Hardware and software components

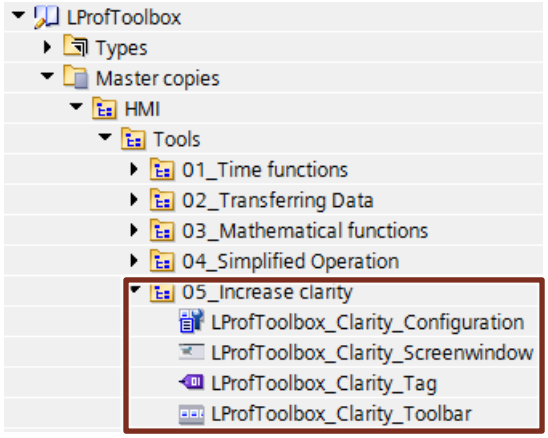
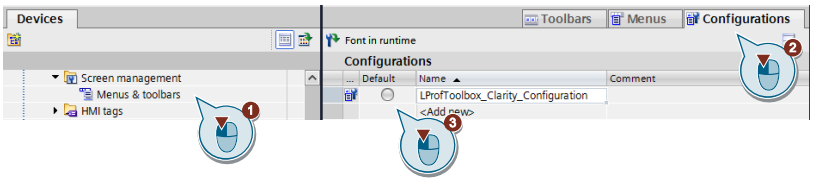
This application example is valid for:

- SIMATIC WinCC Professional V15.1
- SIMATIC WinCC RT Professional V15.1

6.1.3 Project Planning

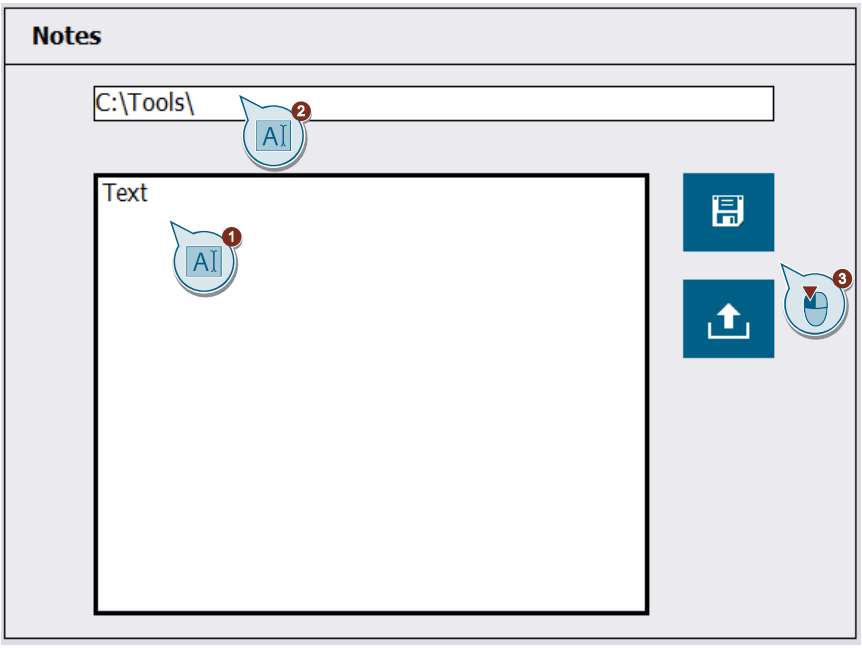
Table 6-1

No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration.
3.	To do this, open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a global library. 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
6.	Open the folder "Master copies > HMI > Tools > 05_Increase clarity > Notes" of the library. 
7.	Drag the elements to the corresponding folder of the HMI operator panel.

No.	Action
8.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_Clarity_Screenwindow" - Configuration "LProfToolbox_Clarity_Configuration" - Tag "LProfToolbox_Clarity_Tag". Alternatively, configure your own screen window by calling the "Notes" screen. Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_Clarity_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.
9.	Deselect the default configuration under "Menus & toolbar →Configurations". 

6.1.4 Operation

Table 6-2

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Click the "Increase clarity" button. 
4.	Open the notes with the "Notes" button. 
5.	Enter your notes using a multi-line text (1). Enter the storage path where you want to save the notes in the I/O field (2).  You can load or save the notes with the "Save" and "Load" buttons (3).

6.2 File Explorer

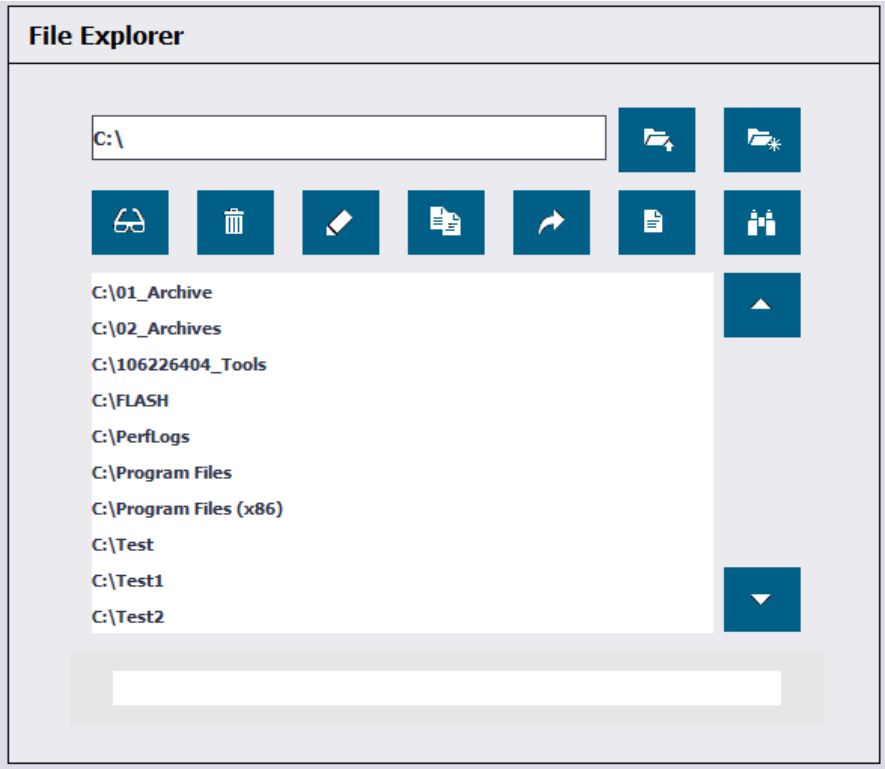
6.2.1 Solution

Description

The default file browser allows you to select any file in the file system of the operator panel and save it in your project as a WinCC tag for further use.

The File Explorer that you can download in this application example enables you to use extended file functions such as "Delete", "Rename" or "Search" of files / folders. The File Explorer is fully integrated into the runtime environment so that the operator does not need to access the operating system.

Figure 6-2



6.2.2 Hardware and software components

This application example is valid for:

- WinCC Professional V15.1
- WinCC RT Professional V15.1

6.2.3 VBS scripts used

LProfToolbox_FileExplorer_CreateFolder

The "LProfToolbox_FileExplorer_Create Folder" script creates a new folder in the file system.

LProfToolbox_FileExplorer_delete

The "LProfToolbox_FileExplorer_Delete" script deletes the selected file/folder from the file system.

LProfToolbox_FileExplorer_move

The "LProfToolbox_FileExplorer_move" script allows copying, cutting and pasting the selected file in the file system. The "sender" transfer parameter defines the mode:

- sender = 1: copy
- sender = 2: paste
- sender = 3: cut

LProfToolbox_FileExplorer_previousFolder

The "LProfToolbox_FileExplorer_previousFolder" script opens the higher-level folder of the currently selected folder.

LProfToolbox_FileExplorer_ReadFilesOfFolder

The "LProfToolbox_FileExplorer_ReadFilesOfFolder" script reads the files from the specified path and shows them as a table.

LProfToolbox_FileExplorer_Rename

The "LProfToolbox_FileExplorer_Rename" script renames the selected file / folder.

LProfToolbox_FileExplorer_Search

The "LProfToolbox_FileExplorer_Search" script searches for the specified file / folder in the current path.

LProfToolbox_FileExplorer_ShowFile

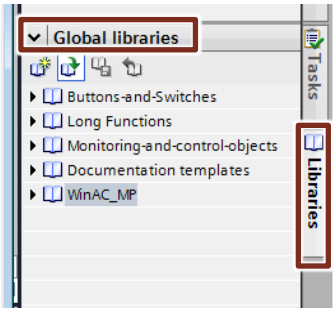
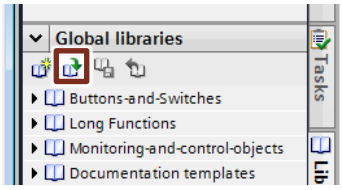
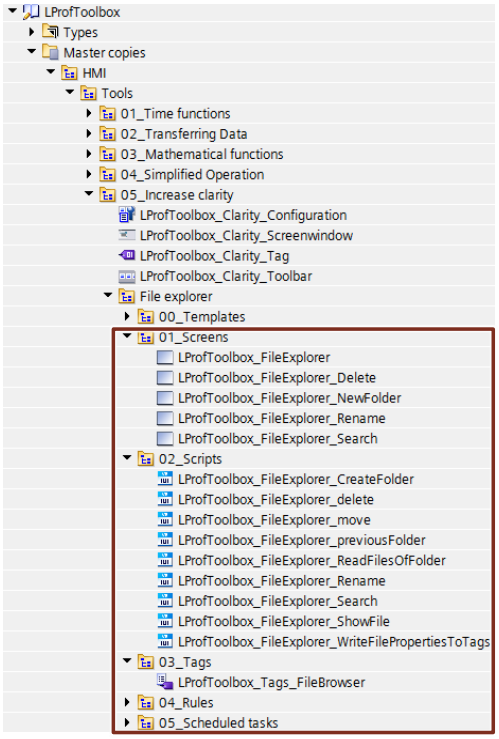
The "LProfToolbox_FileExplorer_ShowFile" script opens the selected folder / file.

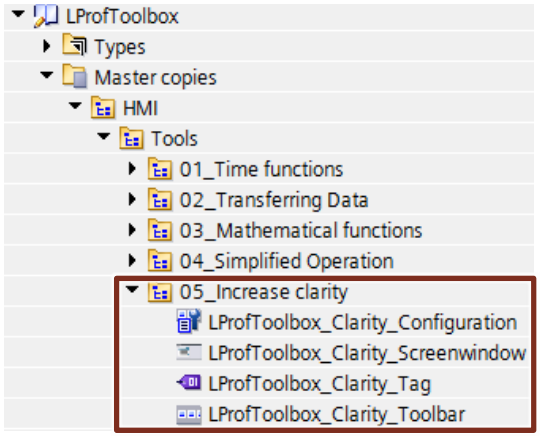
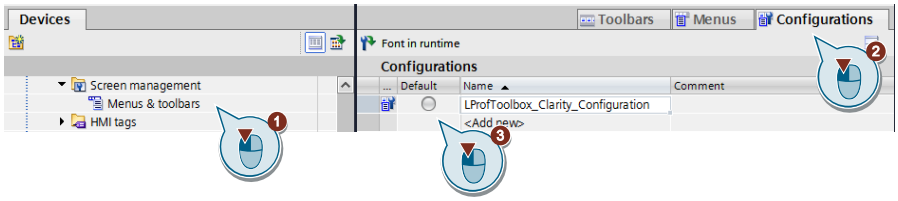
LProfToolbox_FileExplorer_WriteFilePropertiesToTags

The "LProfToolbox_FileExplorer_WriteFilePropertiesToTags" script writes the properties of the selected folder / file to the associated HMI tags.

6.2.4 Project Planning

Table 6-3

No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration.
3.	To do this, open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a global library. 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
6.	Open the folder "Master copies > HMI > Tools > 05_Increase clarity > FileExplorer" of the library. Drag the elements to the operator panel. 
7.	Open your start screen.

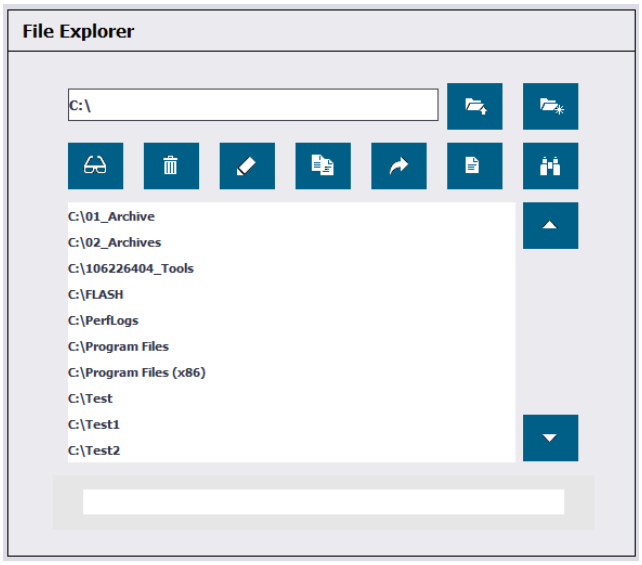
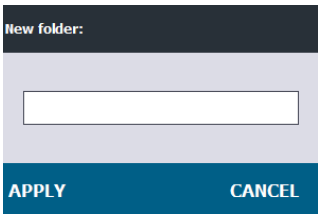
No.	Action
8.	Drag the following objects from the library to your project: - Screen window "LProfToolbox_Clarity_Screenwindow" - Configuration "LProfToolbox_Clarity_Configuration" - Tag "LProfToolbox_Clarity_Tag". Alternatively, configure your own screen window by calling the "LProfToolbox_FileExplorer" screen. Note that additional steps (e.g. adapting the screen window name in scripts) may be necessary in this case.  **Note:** The toolbar "LProfToolbox_Clarity_Toolbar" is automatically transferred with the configuration. Check the toolbar and delete the tools that you are not using from the toolbar.
9.	Deselect the default configuration under "Menus & toolbar →Configurations". 

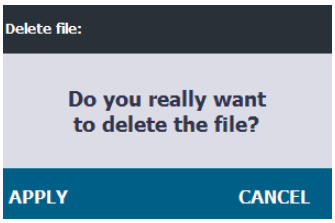
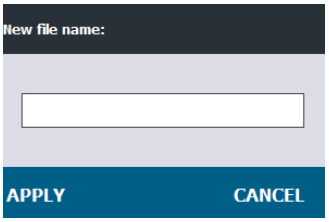
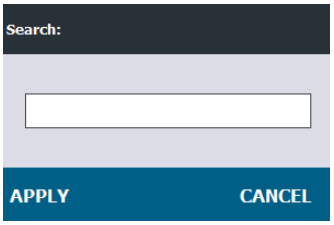
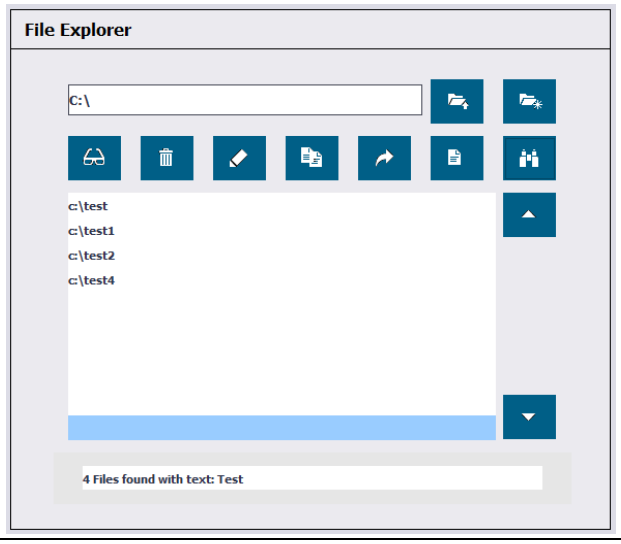
Note

Note that the File Explorer gives the operator access to all files of the operator panel. Therefore, use appropriate operator authorizations to protect the File Explorer.

6.2.5 Operation

Table 6-4

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click the "Increase clarity" button.  Open the File Explorer with the "File Explorer" button. 
5.	The File Explorer opens. The default path setting is "C:\" (Computer – Windows). Select a folder and open it with "Open".  **Note** Due to the space requirements on the operator panel, very long path names will not be displayed (approx. 60 or more characters). If you regularly use longer path names, resize the file browser and the I/O fields to suit your requirements.
6.	Press the "Back" button to open the previous folder.
7.	Press the "New" button to create a new folder in the current directory. Enter the name of the folder and select "Apply". Use "Cancel" to cancel the action without creating a folder. 
8.	Click "Open" to open a folder or a file. **Note** For PC-based systems the possible data formats depend on your installed programs.

No.	Action
9.	Press the "Delete" button to delete the selected element. Only empty folders can be deleted. Confirm the security prompt with "Apply" if you really want to delete the element or cancel the process with "Cancel". 
10.	Click the "Rename" button to rename the selected file. Enter a new name and confirm with "Apply" to apply the name or cancel the process with "Cancel". 
11.	Select Copy or Cut to copy or move a selected element. Navigate to the desired path and select "Paste". Folders cannot be copied / cut.
12.	Click on the "Search" button and enter the character string which is to be searched for. Start the search with "Apply". 
13.	The currently open folder is searched and the results are displayed in the list. 

Note

The bottom part of the window includes a status bar.
Note that some file operations (e.g. delete, search) may take some time. Wait therefore until the status bar confirms successful execution.

6.3 Waiting view

6.3.1 Solution

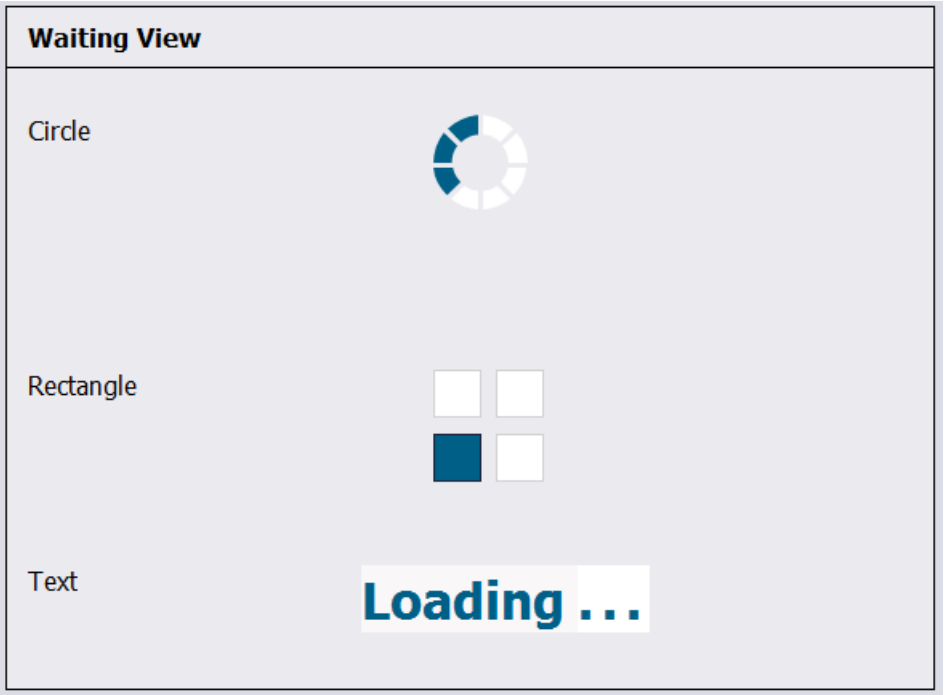
Description

The waiting view allows you to inform the operator when a function (e.g. script execution) still needs time. This also prevents operator errors.

Three versions of the waiting view are available:

- Circle - Screen object
- Rectangle - Screen object
- Text - Screen object

Figure 6-3



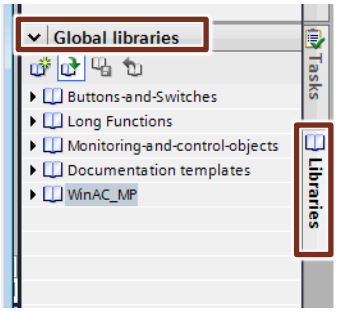
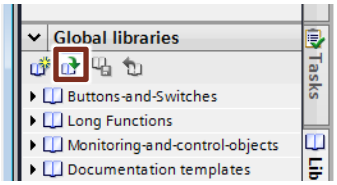
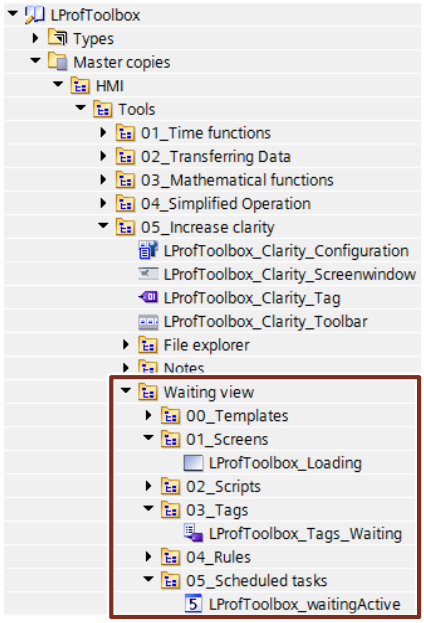
6.3.2 Hardware and software components

This application example is valid for:

- SIMATIC WinCC Professional V15.1
- SIMATIC WinCC RT Professional V15.1

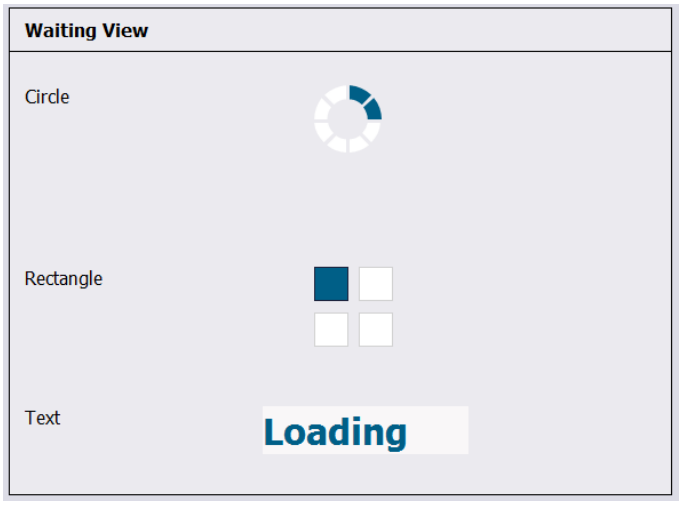
Project Planning

Table 6-5

No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration.
3.	Open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a "Global Library". 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
6.	Open the folder "Master copies > HMI > Tools > 05_Increase clarity > Waiting view" of the library.
7.	Drag the elements to the corresponding folders of the operator panel. 

6.3.3 Operation

Table 6-6

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click the "Increase clarity" button.  Open the screen with the "Wait time preview" button. 
5.	The different waiting views are shown animated. 

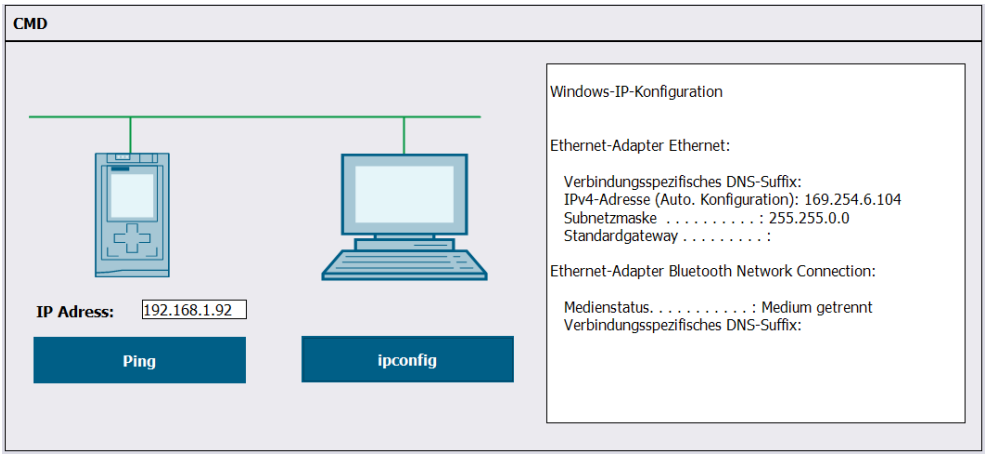
6.4 CMD

6.4.1 Solution

Description

With the help of the command prompt (CMD), the operator can execute CMD commands within the WinCC Runtime.

Figure 6-4



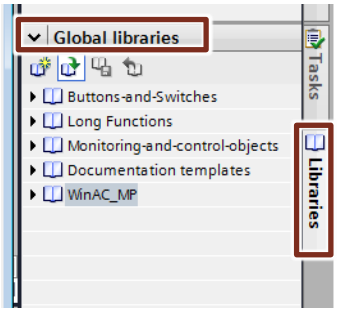
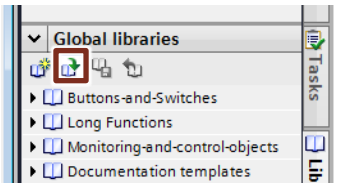
6.4.2 Hardware and software components

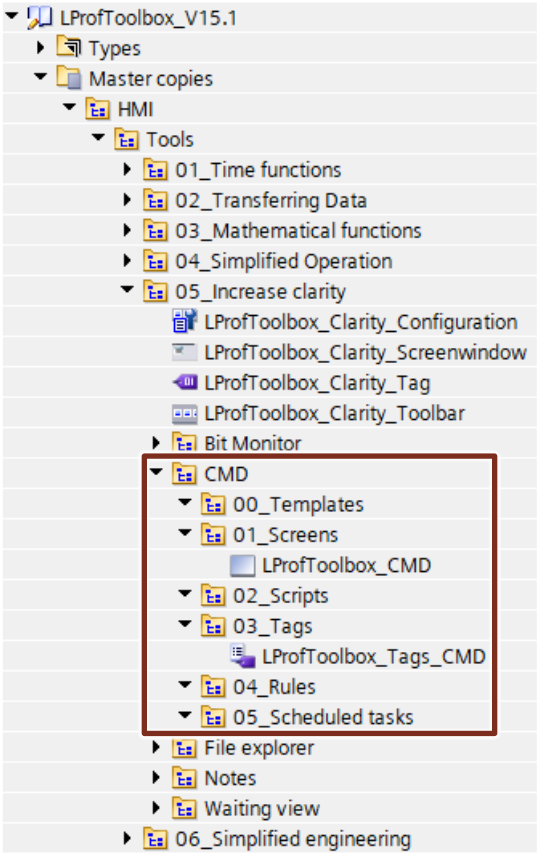
This application example is valid for:

- SIMATIC WinCC Professional V15.1
- SIMATIC WinCC RT Professional V15.1

Project Planning

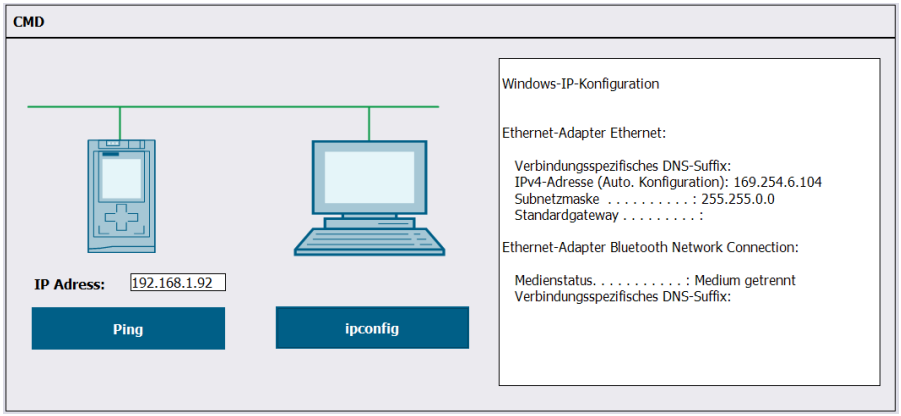
Table 6-7

No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration.
3.	Open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a "Global Library". 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
6.	Open the folder "Master copies > HMI > Tools > 05_Increase clarity > CMD" of the library.

No.	Action
7.	Drag the elements to the corresponding folders of the operator panel. 

6.4.3 Operation

Table 6-8

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click the "Increase clarity" button.  Open the screen with the "CMD" button. 
5.	VB scripts execute 2 different CMD commands "ping" and "ipconfig". 

6.5 Bit monitor

6.5.1 Solution

Description

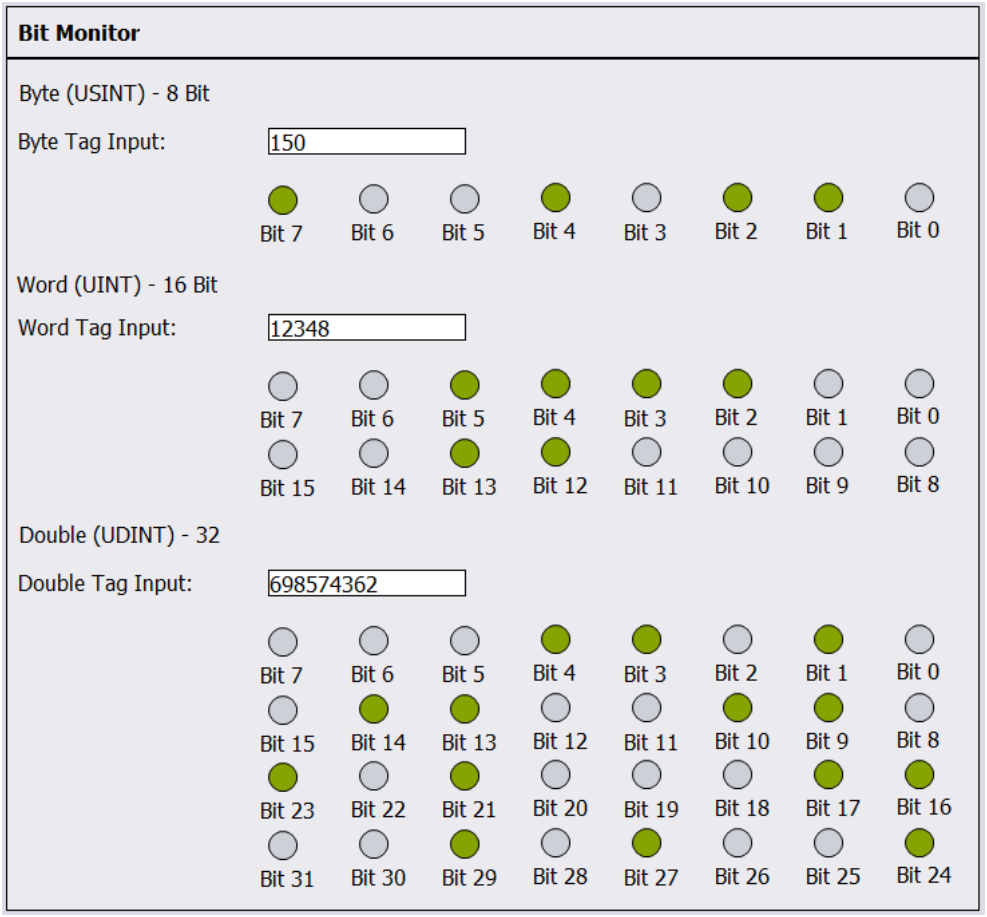
The bit monitor allows you to visualize positive, integer HMI tags (USINT - Byte, UINT - Word, UDINT - Double) bit by bit. This is particularly useful during commissioning and when analyzing error states.

The bit views are available as faceplates for 8-bit (data type: USINT), 16-bit (data type: UINT) and 32-bit tags (data type: UDINT) and can be used independent of one another.

- Variable " InputByte ",
- Variable " InputWord ",
- Variable " InputDouble ",

The animation function masks the individual bits.

Figure 6-5



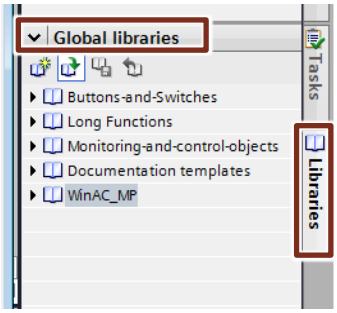
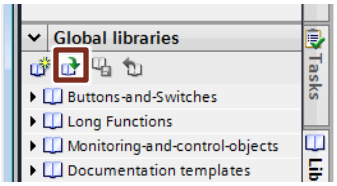
6.5.2 Hardware and software components

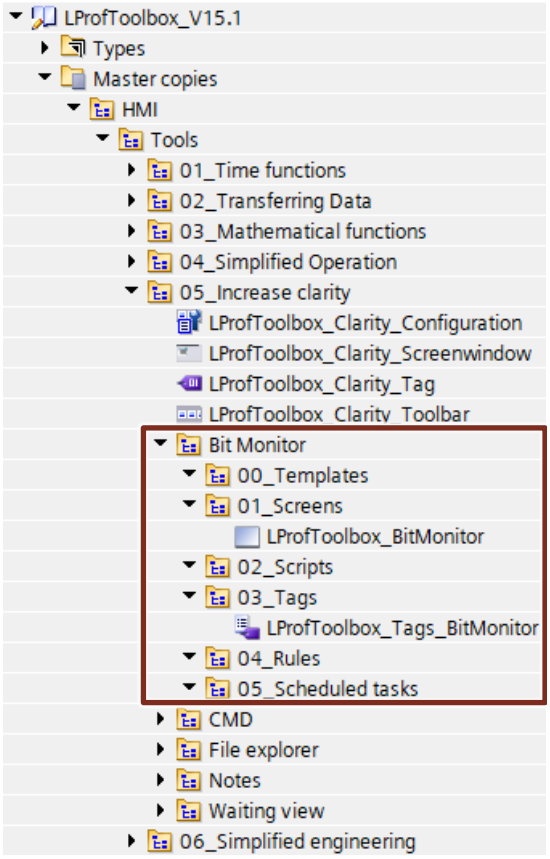
This application example is valid for:

- SIMATIC WinCC Professional V15.1
- SIMATIC WinCC RT Professional V15.1

Project Planning

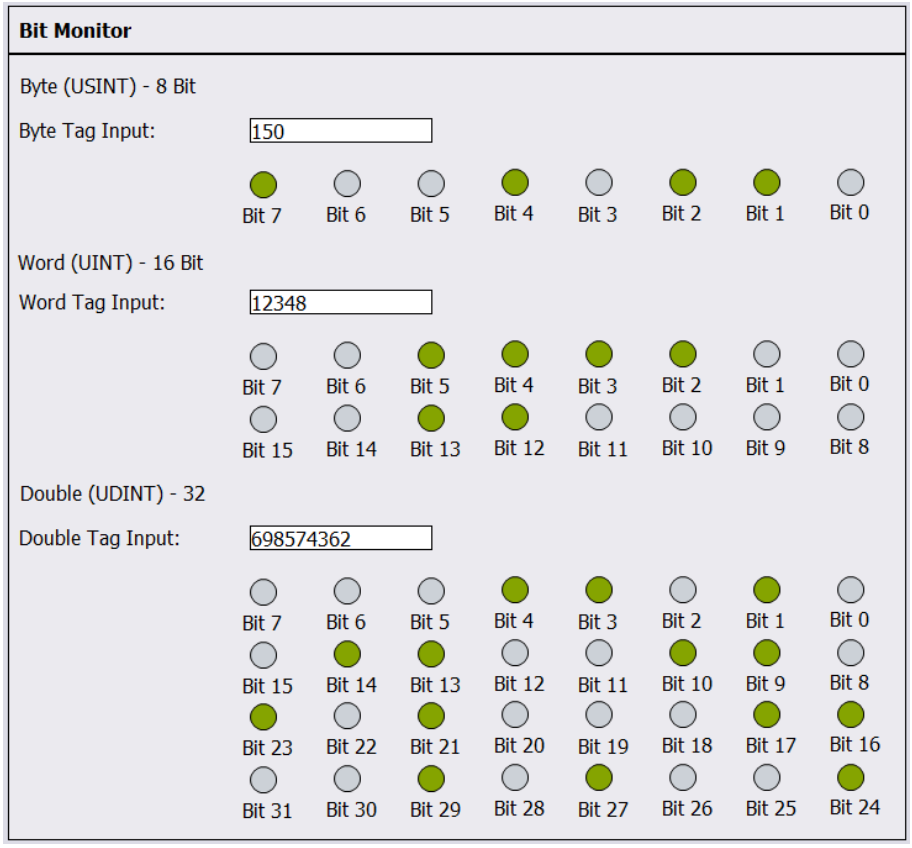
Table 6-9

No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file.
2.	Open your WinCC configuration.
3.	Open the "Global libraries" pane in the "Libraries" task card. 
4.	Click on the second icon from the left to open a "Global Library". 
5.	Select the file "LProfToolbox.al15_1" and open the library with the "Open" button.
6.	Open the folder "Master copies > HMI > Tools > 05_Increase clarity > Bit monitor" of the library.

No.	Action
7.	Drag the elements to the corresponding folders of the operator panel. 

6.5.3 Operation

Table 6-10

No.	Action
1.	Download the example project "106226404_ExampleProject_Professional_zip" and unpack the file.
2.	Open the project with the TIA Portal.
3.	Download the configuration to your PC station or start the simulation.
4.	Click the "Increase clarity" button.  Open the screen with the "BitMonitor" button. 
5.	The different bit monitors for the data types USINT, UINT and UDINT are displayed. 

7 Simplified engineering

7.1 Siemens icon font

7.1.1 Solution

Description

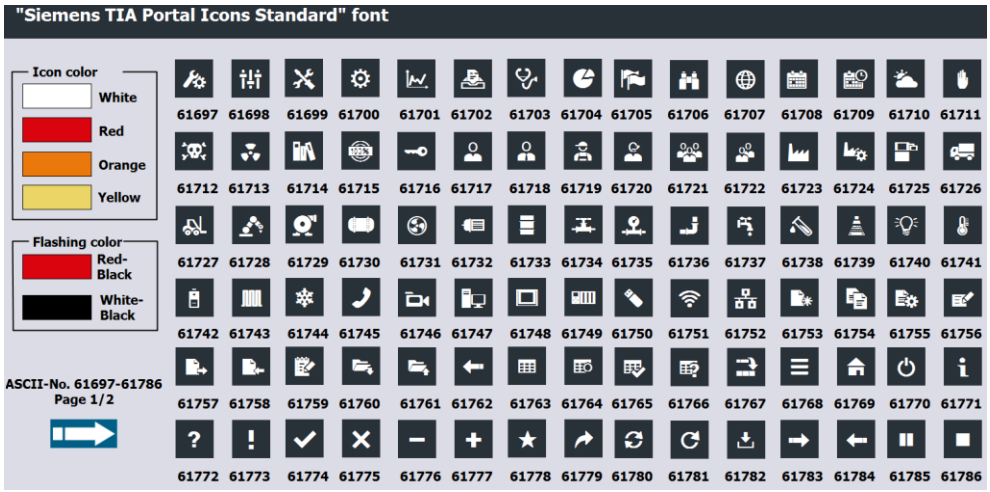
Siemens provides you with a font containing a large selection of icons that you can use as text, for example, for buttons.
In addition to the icons the font also contains a normal character set. This character set corresponds to the character set of the "Siemens Sans" font.

The documentation gives you a clear overview about available icons and shows you how to integrate such icons into your own project.

The file "106226404_SiemensIconFont.zip" contains the "SiemensTIAPortalIcons.ttf" font.

In the example project "106226404_ExampleProject_Professional_zip ", the icons are used as text on the buttons, and a color switching is used as example to show you how you can make use of the diverse dynamic sampling options.

Figure 7-1



Advantages through the use of icons

- **Easy multilingual engineering**
  You can use the icons in any language as they are understood without translation. For other languages, just copy the text list of the language you have already parametrized.
- **Free scaling**
  Characters are freely scalable. Unlike with graphics, you must not pay attention to the size or the resolution of the source material. Free scaling avoids possible built-up of artefacts / blurring effects when zooming in on / zooming out of screens.
- **Automatic transparency**
  Icon characters of the font have a transparent background. You must not pay attention to set the background transparent or color it according to the project color.

7.1.2 Hardware and software components

Validity

This application example is valid for:

- SIMATIC WinCC Professional and RT Professional V15 and higher

7.1.3 Available icons

The "Siemens TIA Portal Icons Standard" font includes a large selection of icons which are shown in the table below.

Note The ASCII characters 61824 to 61857 are supported in WinCC Professional only as of TIA V14 SP1.

Table 7-1

HEX	ASCII	Character	HEX	ASCII	Character	HEX	ASCII	Character
F101	61697		F102	61698		F103	61699	
F104	61700		F105	61701		F106	61702	
F107	61703		F108	61704		F109	61705	
F10A	61706		F10B	61707		F10C	61708	
F10D	61709		F10E	61710		F10F	61711	
F110	61712		F111	61713		F112	61714	
F113	61715		F114	61716		F115	61717	
F116	61718		F117	61719		F118	61720	
F119	61721		F11A	61722		F11B	61723	
F11C	61724		F11D	61725		F11E	61726	
F11F	61727		F120	61728		F121	61729	
F122	61730		F123	61731		F124	61732	
F125	61733		F126	61734		F127	61735	
F128	61736		F129	61737		F12A	61738	
F12B	61739		F12C	61740		F12D	61741	
F12E	61742		F12F	61743		F130	61744	
F131	61745		F132	61746		F133	61747	
F134	61748		F135	61749		F136	61750	
F137	61751		F138	61752		F139	61753	
F13A	61754		F13B	61755		F13C	61756	

HEX	ASCII	Character	HEX	ASCII	Character	HEX	ASCII	Character
F13D	61757		F13E	61758		F13F	61759	
F140	61760		F141	61761		F142	61762	
F143	61763		F144	61764		F145	61765	
F146	61766		F147	61767		F148	61768	
F149	61769		F14A	61770		F14B	61771	
F14C	61772		F14D	61773		F14E	61774	
F14F	61775		F150	61776		F151	61777	
F152	61778		F153	61779		F154	61780	
F155	61781		F156	61782		F157	61783	
F158	61784		F159	61785		F15A	61786	
F15B	61787		F15C	61788		F15D	61789	
F15E	61790		F15F	61791		F160	61792	
F161	61793		F162	61794		F163	61795	
F164	61796		F165	61797		F166	61798	
F167	61799		F168	61800		F169	61801	
F16A	61802		F16B	61803		F16C	61804	
F16D	61805		F16E	61806		F16F	61807	
F170	61808		F171	61809		F172	61810	
F173	61811		F174	61812		F175	61813	
F176	61814		F177	61815		F178	61816	
F179	61817		F17A	61818		F17B	61819	
F17C	61820		F17D	61821		F17E	61822	
F17F	61823		F180	61824		F181	61825	
F182	61826		F183	61827		F184	61828	
F185	61829		F186	61830		F187	61831	
F188	61832		F189	61833		F18A	61834	
F18B	61835		F18C	61836		F18D	61837	
F18E	61838		F18F	61839		F190	61840	
F191	61841		F192	61842		F193	61843	
F194	61844		F195	61845		F196	61846	
F197	61847		F198	61848		F199	61849	
F19A	61850		F19B	61851		F19C	61852	
F19D	61853		F19E	61854		F19F	61855	

HEX	ASCII	Character	HEX	ASCII	Character	HEX	ASCII	Character
F1A0	61856		F1A1	61857				

7.1.4 Installing the font

Installation in Windows 7

There are three options to install the font under Windows 7.

Unzip the "106226404_SiemensIconFont.zip" file into a folder of your choice for installation. The "SiemensTIAPortalIcons.ttf" file contains the "Siemens TIA Portal Icons Standard" font.

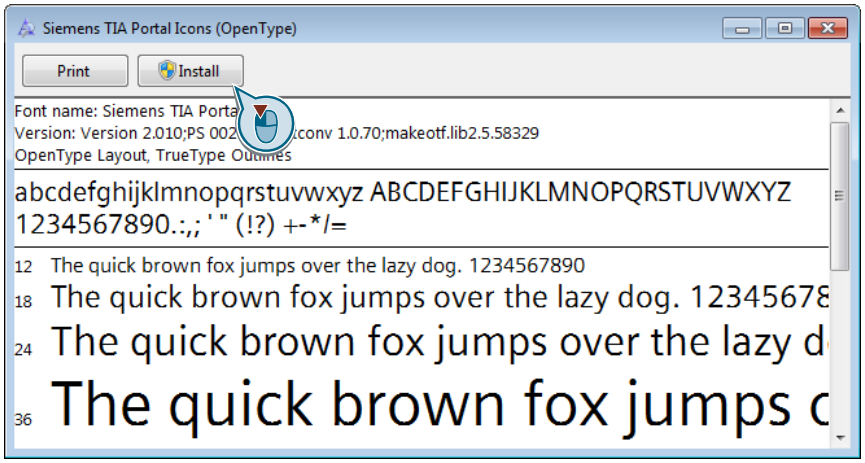
Note

Close all instances of the TIA Portal prior to the installation.

If an instance of the TIA Portal was open during the installation of the font, close the TIA Portal and then restart it.

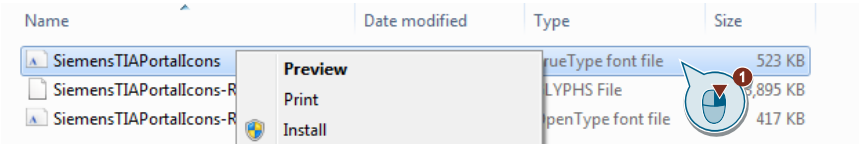
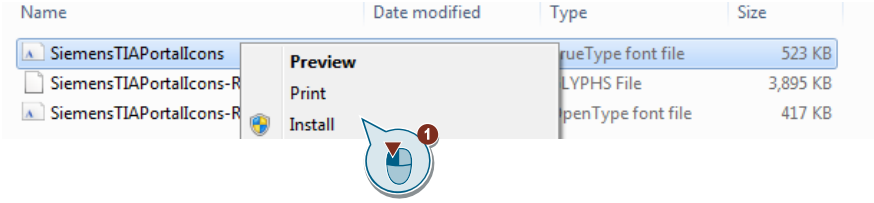
Option 1

Table 7-2

No.	Action
1.	Double-click the "SiemensTIAPortalIcons.ttf" file to open it. The font preview opens.
2.	Click "Install".  **Note** You need to have the required administrator rights to do this.
3.	Complete the installation.

Option 2

Table 7-3

No.	Action
1.	Right-click the "SiemensTIAPortalIcons.ttf" file. The shortcut menu opens. 
2.	Click "Install".  **Note** You need to have the required administrator rights to do this.
3.	Complete the installation.

Option 3

Table 7-4

No.	Action
1.	Select the file "SiemensTIAPortalIcons.ttf" and copy the file using the key combination <Ctrl> + <C>.
2.	Open the "Fonts" folder in the Control Panel.
3.	Add the "SiemensTIAPortalIcons.ttf" file with the key combination <Ctrl> + <V>.

Integrating the font into your project

Note When you configure a PC station with SIMATIC WinCC Professional, you do not have to integrate the font. You only have to install the font. All installed fonts of the Windows operating system are available for the configuration.

7.1.5 Using the font

Setting the font, font style and font size

You have to manually customize the font, as well as associated font style and font size for basic objects and elements.

Table 7-5

No.	Action
1.	Select the basic object or element in which the symbol is to be displayed.
2.	Click on "Properties > Text format".
3.	In "Format > Font", click the "…" button.
4.	Select the "Siemens TIA Portal Icons" font and make the desired settings for "Font style" and "Size".
5.	Click on "OK".

Text input of the icon

Table 7-6

No.	Action
1.	Select the basic object or element in which the symbol is to be displayed.
2.	Click on "Properties > General". **Note** Make sure that "Text" or "Graphics and text" is selected as mode under "Buttons".
3.	Click in the input box for the text input.
4.	Press and hold the <Alt> key and enter the "ASCII" character code of the icon. **Note:** You can find the description in Chapter 7.1.3.
5.	Release the <Alt> key.
6.	Press "Enter" or click an area outside of the "General" window. The icon appears as text of the object. The icon is not displayed in the input area of the "General" window. A square indicates that the input was successful. **Note** An input error has occurred or an incorrect "ASCII" code was entered if no text, a question mark or an unexpected icon appears in the input field. → Solution: Erase the text and repeat the input.

Note

The sequence of the steps "Setting of font, font style and font size" and "Text input of the icon" can be changed, but the sequence specified here is recommended. The font can also be used when entering text in text lists.

You can write several icons one after the other just like text characters. Simply repeat the input.

A combination of symbol and text is also possible. The font size depends on the default text format of the basic object or element.

Positioning the icons

Under "Properties > Text format > Alignment" you can set the general horizontal and vertical alignment of the font.

Follow the description below to more accurately position the icon on the basic object or element.

Table 7-7

No.	Action
1.	Select the basic object or element with the icon.
2.	Click on "Properties > Layout".
3.	Enter the desired margins under "Text margins".

Multilingual configuration of icons

Table 7-8

No.	Action
1.	Open the "Languages & resources > Project texts" folder in the project tree.
2.	Scroll down; the symbols and special characters are at the end of the list and can be identified by the square character (in standard sorting).
3.	Select all icons. Select the first entry and scroll down to the last entry. Keep the <Shift> key pressed and select the last entry.
4.	Copy the selected area. Scroll to the first icon entry.
5.	Next to the first icon entry, click the cell of another configured language. Paste the copied area.
6.	Repeat the last item for each configured language.

Transferring the font style and other objects

Within a screen, you can assign the same font style to several objects all at once.

Table 7-9

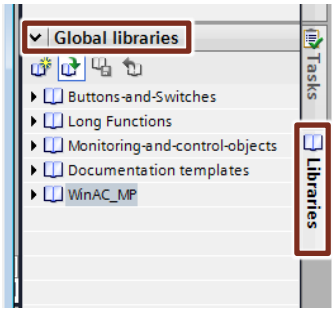
No.	Action
1.	Draw a frame around the desired objects or click a single object. To interconnect several selections, press and hold the <Shift> key and draw additional frames or select additional single objects.
2.	To remove an object from the selection, keep holding down the <Shift> key and click the object you wish to remove from the selection.
3.	Release the <Shift> key and click "Properties". Assign the font and the font style as described in the chapter "Setting the font, font style and font size". If the desired target objects are not in the same screen, you can copy the set font style and paste it into the desired object.
4.	In the "Text format" window, right-click the font and select "Copy" (or select the entry and use the shortcut <Ctrl>+<C>).
5.	Select the desired object and select the available font in the "Text format" window.
6.	Right-click the selected area and select "Paste" (or use the shortcut <Ctrl>+<V>).

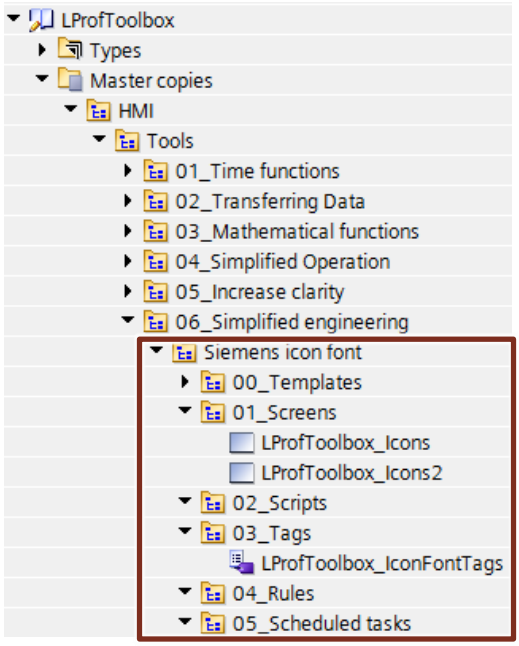
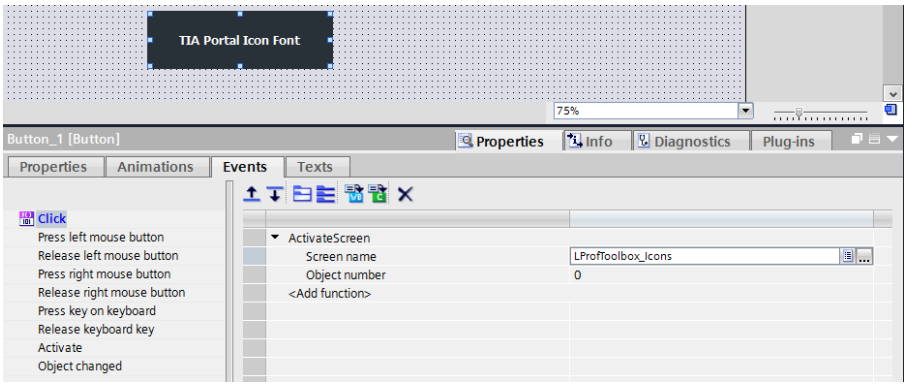
You can also copy an object for which you have already set the font and the style. The properties are retained in the process.

7.1.6 Project Planning

Note The library for the project was created with TIA Portal V15 and can therefore only be opened with a version V15 or higher.

Table 7-10

No.	Action
1.	Download the library "106226404_LProfToolbox.zip" and unzip the file to the project directory of the global libraries.
2.	Open your WinCC configuration.
3.	Open the "Global libraries" pane in the "Libraries" task card and click on the second icon from the left to open a global library. 
4.	Select the file "LProfToolbox.al15" and open the library with the "Open" button.

No.	Action
5.	Under "Master copies" drag and drop the screens and tag tables to the associated folders of your configuration. 
6.	Create a new button and create the click event "Activate Screen" and connect the HMI screen "LProfToolbox_Icons". 

7.1.7 Operation

Table 7-11

No.	Action
1.	Download the file "106226404_ExampleProject_Professional_zip" and unpack the files into a directory of your choice. **Note:** The font must be installed for operation of the example project.
2.	Open the project.
3.	Compile the HMI operator panel and then start the simulation.
4.	Click on the "Simplified engineering" button in the navigation bar at the bottom. 
5.	Open the screen with the "Wait time preview" button. 
6.	Click on one of the colors in the "Icon color" area. The icon color of the icons changes to the selected color.
7.	Click on one of the color gradients in the "Flash color" area. The icon and background color switches between the selected colors at continuous intervals.
8.	Press the buttons with the arrows to change between the individual icons.  

7.2 Rotation tool

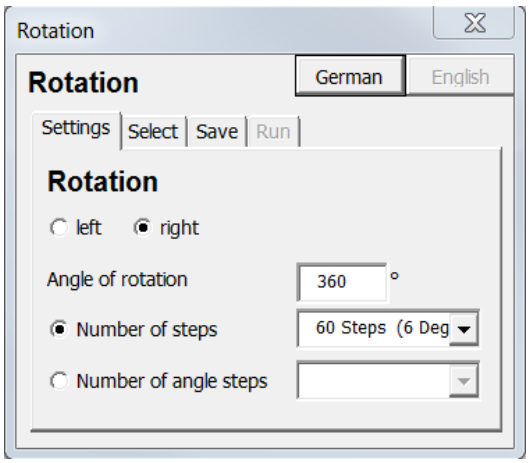
7.2.1 Solution

Description

In addition to color, motion is a good medium to simply and clearly illustrate the status of a machine, for example. It can, for example, be used to illustrate pumps, fans, motors, mixers, or gears.

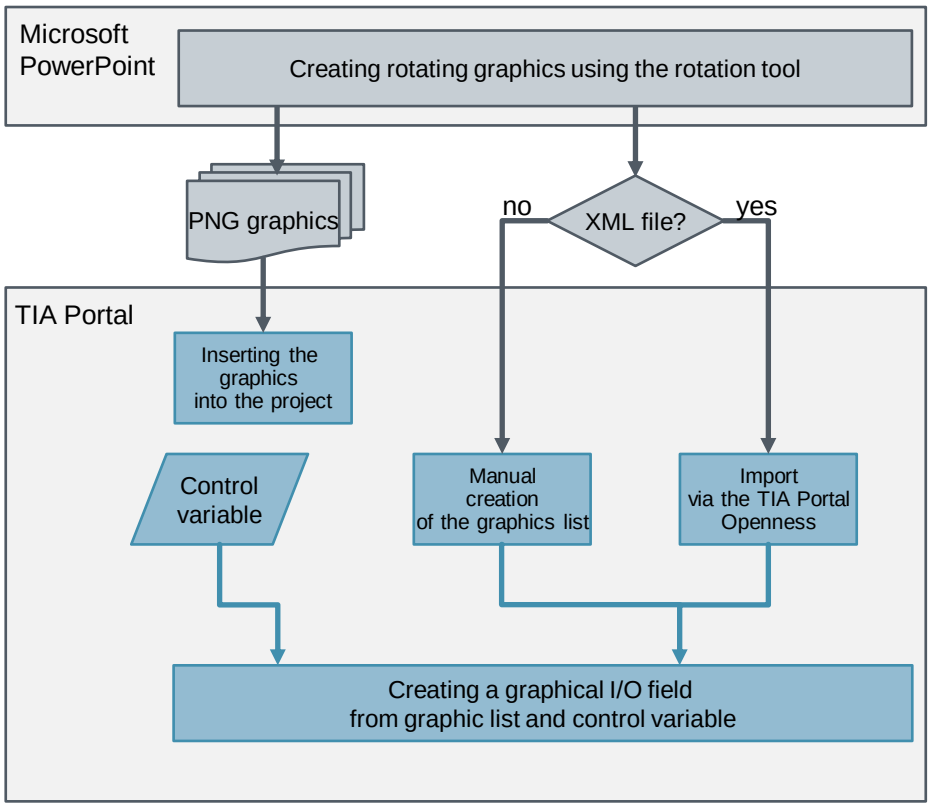
The "Rotation Tool" is a Microsoft PowerPoint Add-In that you can use to automatically rotate and save screens in different status conditions as a png file. Optionally, you can directly create an xml file which you can import as a graphics list directly into the HMI project using TIA Portal Openness.

Figure 7-2



The gauge controls for Basic Panels that you can also download on the download page of this entry were also created using the Rotation Tool.

Figure 7-3



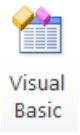
7.2.2 Hardware and software components

This application example is valid for:

- Microsoft PowerPoint 2010
- WinCC (TIA Portal) V15.1 or higher
- Optional: TIA Portal Openness.

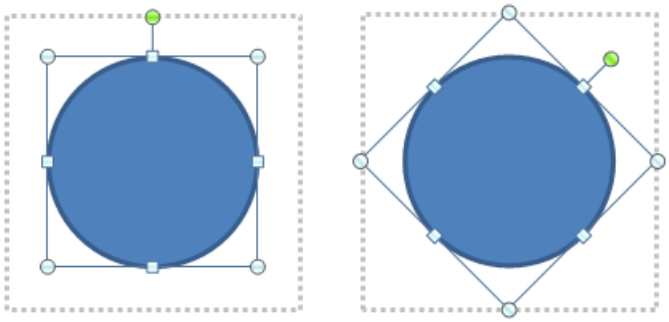
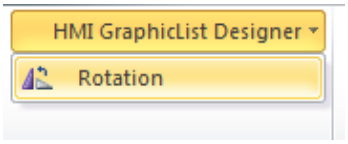
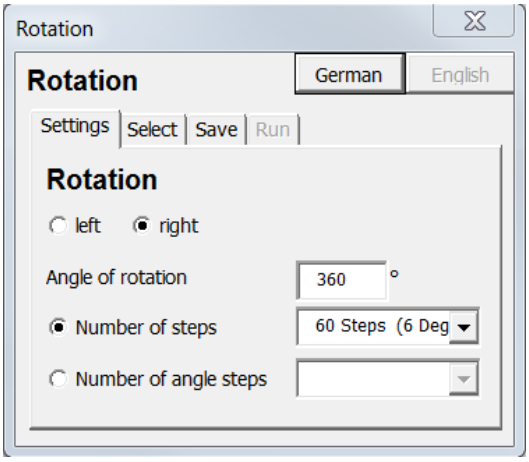
7.2.3 Installation

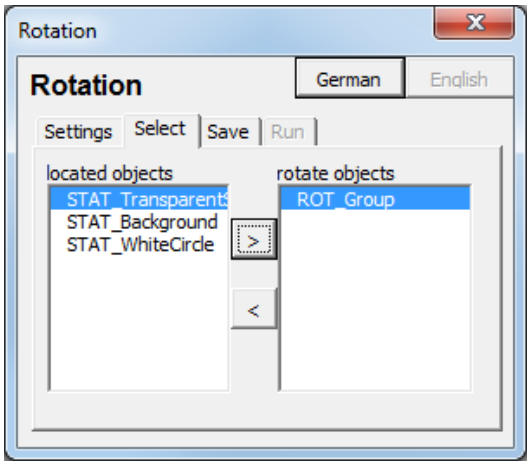
Table 7-12

No.	Action
1.	Download the file "HmiEng.zip" and unzip the folder.
2.	Open Microsoft PowerPoint. Click on "Developer". If the "Developer" tab is not displayed, you must first make it visible. (See Microsoft Office Support entry)
3.	Click on "Visual Basic". 
4.	Under "Options > References", enable the references "Visual Basic For Applications", "Microsoft PowerPoint Object Library" and "Microsoft Forms Object Library".
5.	Click on "Add-ins". 
6.	Click "Add new...".
7.	Select the "HMI_GraphicList_Designer.ppa" file in the unzipped folder and confirm your selection with "Open".
8.	Confirm the security prompt with "Enable macros".
9.	Close the "Add-ins" window.

7.2.4 Operation

Table 7-13

No.	Action
1.	Create a new PowerPoint presentation with a slide. Add the desired screen elements.
2.	Add a rectangle as background to the slide. Select "Shape Fill > No Fill" and "Shape Outline > No Outline". Make sure that the selected rectangle is big enough to completely house the rotating objects in any position. As a result, all screens are saved in the same size. Note that circles, too, have a rectangular frame in PowerPoint so that they are displayed wider during rotating. 
3.	Click on "Add-Ins > HMI GraphicList Designer > Rotation" to start the tool. 
4.	In the "Settings" window select the direction of rotation and the angle of rotation. Select the intermediate steps of the rotation or number of steps or size of the angle of an intermediate step using the selection list. 

No.	Action
5.	In the "Select" window, select the objects you wish to rotate and click the ">" arrow. 
6.	In the "Run" window check if a graphics list shall be created as an XML file for import with TIA Portal Openness.
7.	Open your TIA Portal project. In the project tree, open "Languages & Resources > Graphics library". Drag and drop the screens from the Explorer to the graphics library.
8.	**Import via TIA Portal Openness** Download the "TiaPortalOpennessDemo" demo application in the entry. If you do not yet use TIA Portal Openness, download the documentation and install TIA Portal Openness as described. Link the application with the project and import the graphics list as described in the documentation.
9.	**Manual import** Create a new graphics list in your operator panel. Insert the screens from the graphics library into the graphics list and adapt the values.
10.	Create a new screen in your operator panel. Add a graphic I/O field.
11.	Under "Properties > Properties > General > Contents > Graphics list:", connect the related graphics list.
12.	Specify the associated process tag under "Process > Tag:".

7.2.5 Tips and tricks

Determining the start position

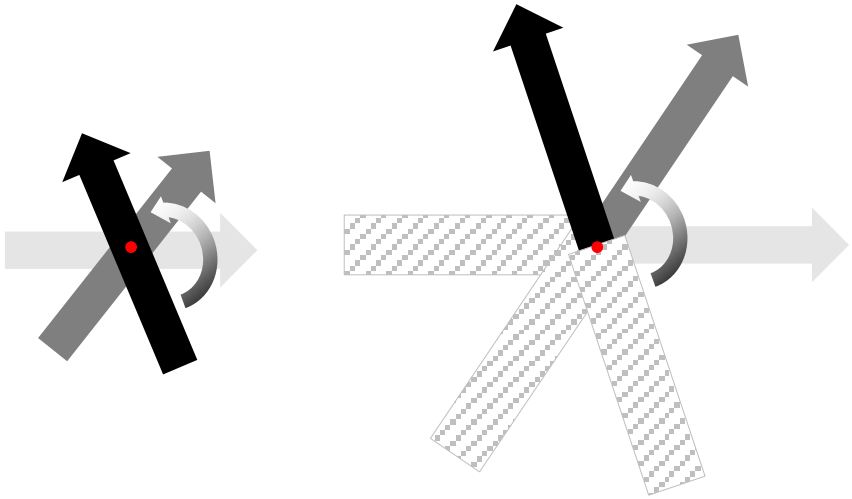
The Rotation Tool changes the "Rotation" property of a screen object.
Before the first screen is created, the "Rotation" value of any rotating element is set to 0°.

If a rotating element is to start at an angle other than 0°, right-click the element in the desired start position and click "Save as graphic...". Save the element in PNG format. Then insert the element as a graphic into the PowerPoint screen again.

Setting the rotation axis

The elements selected in the tool rotate through their center point. To choose another rotation axis, it is useful to group the desired element with a hidden element and then select the entire group for rotation.

Figure 7-4



7.2.6 Continuous rotation

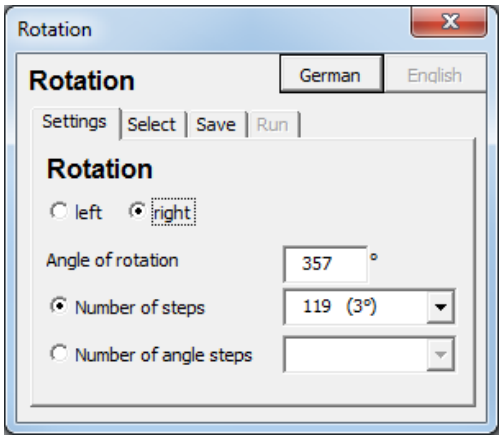
The tool creates in a first step a screen at a 0° rotation (initial state).

A rotation of 360° corresponds to 0°. For a graphic intended to continuously rotate through its own axis you should consider that the last intermediate step must be dropped to prevent two identical screens from following one another.

One way to achieve this is by skipping the graphics list element 0 or 100 when triggering via the control tag (e.g. "startValue" =1).

Alternatively, subtract the angle size of an intermediate step from the overall rotation angle to be able to select a step number reduced by 1 in the Rotation Tool.

Figure 7-5



7.2.7 Creating the control tag

If you intend not to display a real rotation of one of the objects contained in your process with the rotating object but simulate the rotation, you must create the control tag manually.

To do so you can use, for example, the "SimulateTag" system function at the "Loaded" event of the screen. In this case the object will always rotate when the screen is displayed.

If you want to also start and stop the rotation, you can use the STEP 7 function "LGF_SawTooth".

8 Appendix

8.1 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:
https://support.industry.siemens.com

Technical Support

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

SITRAIN – Training for Industry

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:
www.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:
https://support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for Apple iOS, Android and Windows Phone:
https://support.industry.siemens.com/cs/ww/en/sc/2067

8.2 Links and literature

Table 8-1

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/106226404
\3\	Application example "Library with general functions (LGF) for STEP 7 (TIA Portal) and S7-1200 / S7-1500" https://support.industry.siemens.com/cs/ww/en/view/109479728
\4\	Link to Wikipedia entry on the topic "Reed Solomon" http://en.wikipedia.org/wiki/Reed%E2%80%93Solomon_error_correction
\5\	Link to homepage of the barcode font type provider "Logitogo" http://www.logitogo.com/html/barcode39_erstellen.html
\6\	Microsoft Office Support entry "Show the Developer tab" https://support.office.com/en-us/article/show-the-developer-tab-e1192344-5e56-4d45-931b-e5fd9bea2d45?ui=en-US&rs=en-US&ad=US
\7\	TIA Portal Openness: Introduction and Demo Application https://support.industry.siemens.com/cs/ww/en/view/108716692
\8\	WinCC Advanced V13.0 SP1 Manual section "SimulateTag" https://support.industry.siemens.com/cs/ww/en/view/109091876/56856939915

8.3 Change documentation

Table 8-2

Version	Date	Change
V1.0	02/2016	First version
V2.0	06/2017	Revised version
V3.0	07/2018	Revised version Update tools
V4.0	09/2018	• Functional and design revision of all tools • Shared documentation for all tools WinCC Runtime Professional V15 • Release for V15
V5.0	02/2019	Revised version Update tools