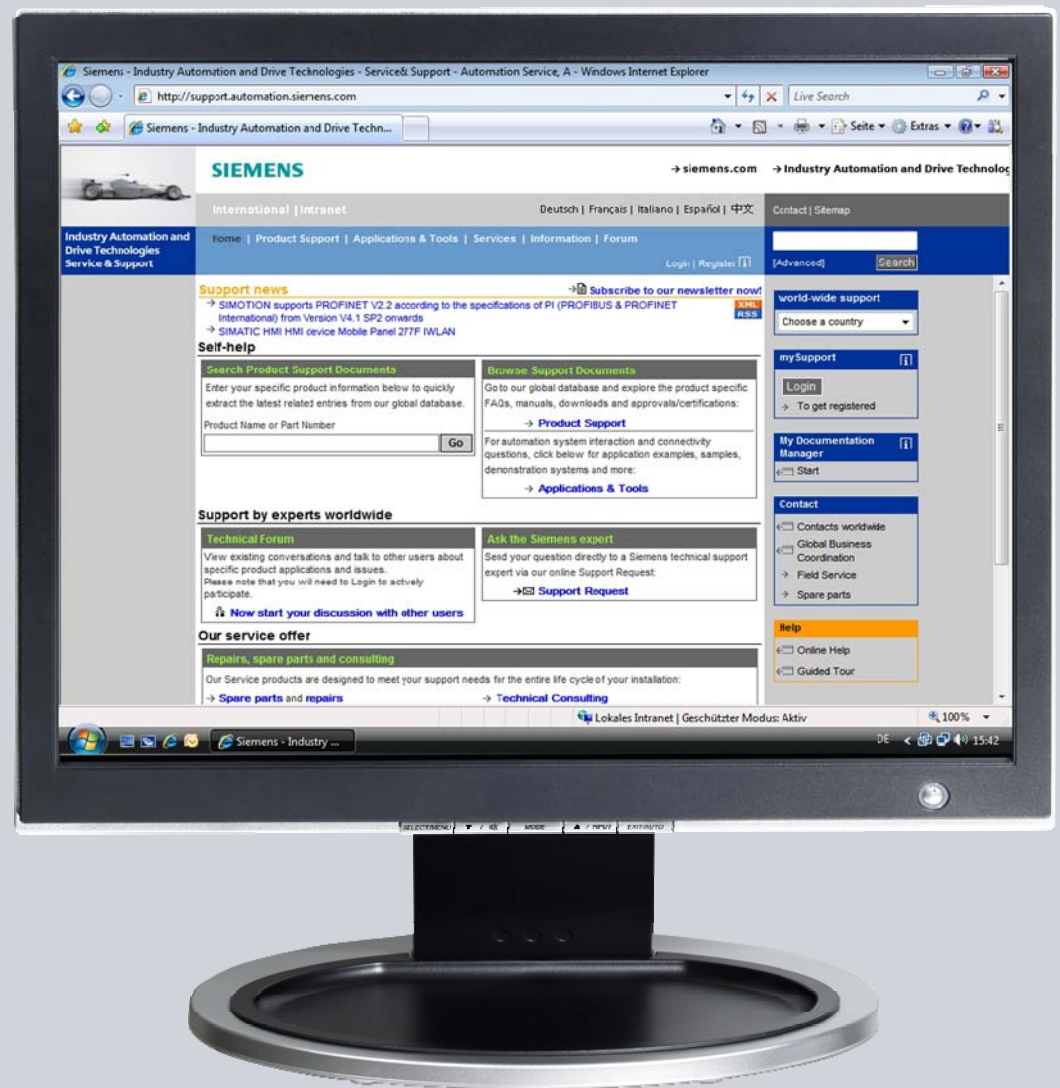# How do you create a weekly timer with WinCC flexible?

WinCC flexible 2008 SP2

FAQ · October 2011

Service & Support

Answers for industry.

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Caution

The functions and solutions described in this article confine themselves predominantly to the realization of the automation task. Furthermore, please take into account that corresponding protective measures have to be taken in the context of Industrial Security when connecting your equipment to other parts of the plant, the enterprise network or the Internet. Further information can be found in Entry ID: !50203404!.

http://support.automation.siemens.com/WW/view/de/50203404

Question

How do you create a time switch with WinCC flexible?

Answer

Follow the instructions and notes listed in this document for a detailed answer to the above question.

Contents

1 Introduction

Aim of the entry

The aim of this entry is to demonstrate one way you can create a weekly timer with WinCC flexible without using additional program blocks from the PLC.

Which operator panels are supported?

The instructions below apply for all operator panels that support scripts.
An overview of the functions of the various operator panels is available in Entry ID 40227286.

In this application we have used an MP 277 Touch.

Brief description of the configuration

There are three switching procedures (time intervals) available for each day of the week.
(For example, one for the "early shift", one for the "afternoon shift" and one for the "late shift").

You set the switch-on and switch-off times by way of a "date/time field" (you enter only the time).

Once the specified switch-on time is reached, an output signal is set. This output signal can be transferred to a PLC, to switch on a pump, for example.
Once the specified "switch-off time" is reached, the output signal is reset.

Configuration test

You can also test the attached configuration with the WinCC flexible Runtime (the Runtime software must be installed on the configuration computer).

2 Automation Solution

2.1 How Does Configuration Work?

The specified switch-on and switch-off times are monitored by means of a script. The scheduler executes the script every minute.

The script has an output parameter which can be used to trigger an output to switch a pump on and off, for example.

The operating mode, the "enabling/disabling" of the separate time intervals and the triggering of the output to control a pump, for example, is also executed by means of the script.

The following figure shows the Runtime picture configured.

Figure 2-1
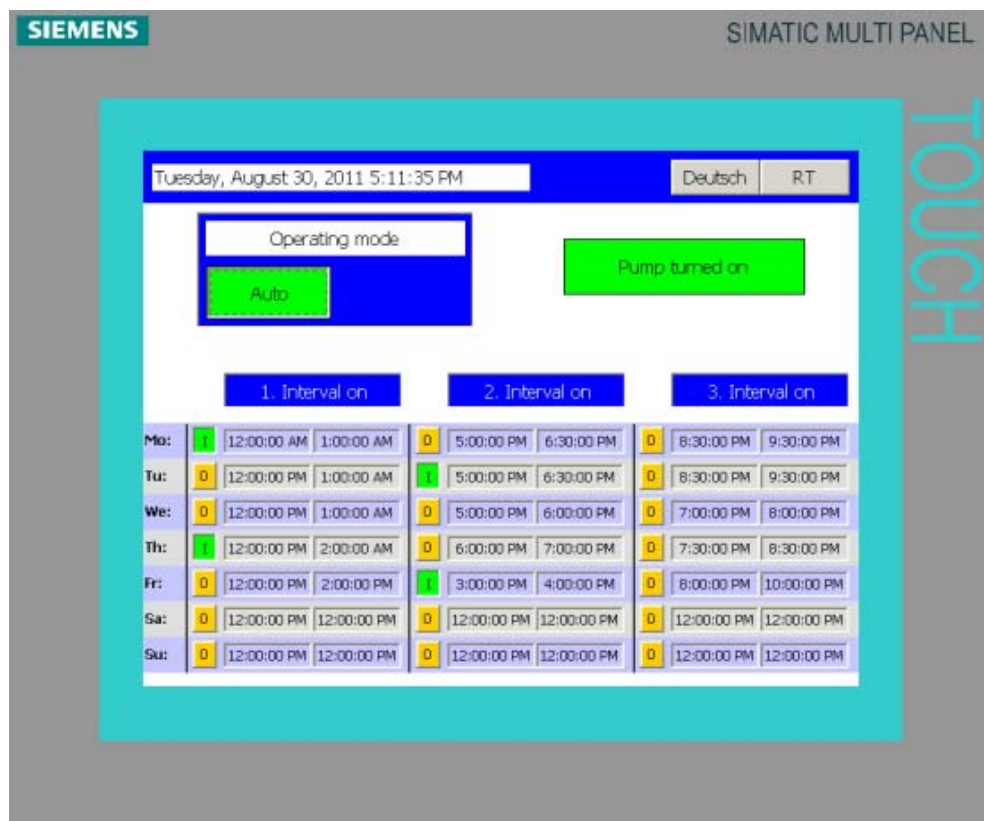
The separate functions are described below.

2.2 Overview

The figure below gives an overview of the separate "functional sequences".

Figure 2-2
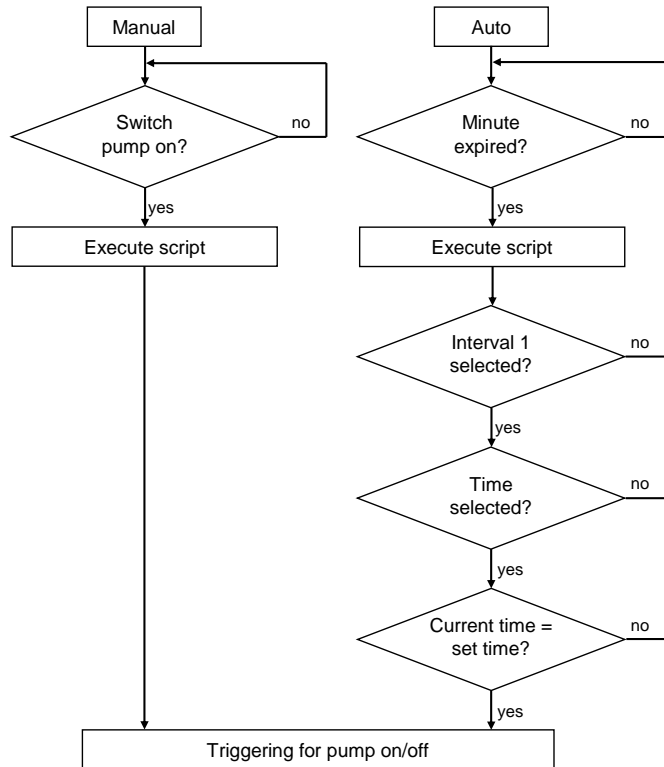
Description

Manual:
You use a button to call the script in manual mode. This script then controls the "pump".

Auto:
The scheduler executes the script every minute.

If the conditions below are fulfilled, then the output for controlling the pump is set:

- "1. Interval" is selected, for example

- The button next to the time field has the status "1"

- The specified time is equal to the current time

3 Configuration

This chapter describes the configuration steps to be taken to readjust the configuration.

Please refer to the attached project for details.
It is useful to open the attached configuration for better understanding.
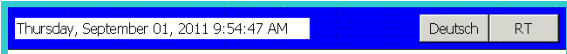
Notes	All the settings already described have been made in the attached configuration.

3.1 Configured Picture

A picture is configured in the attached configuration. The functions configured in the picture are described below.

Permanent window
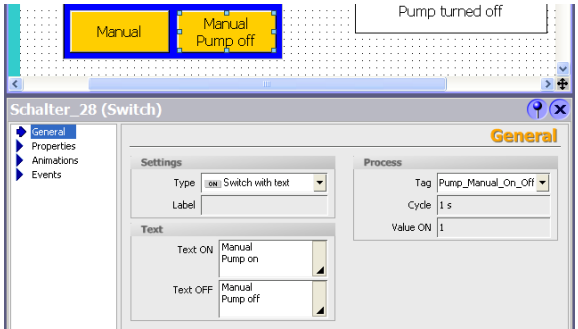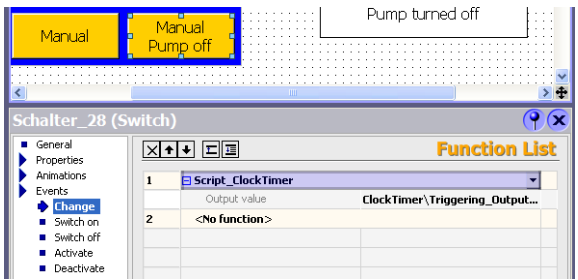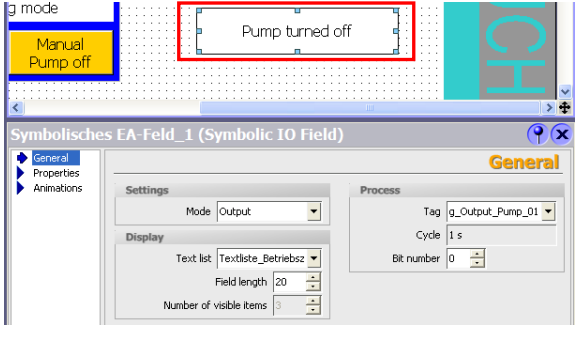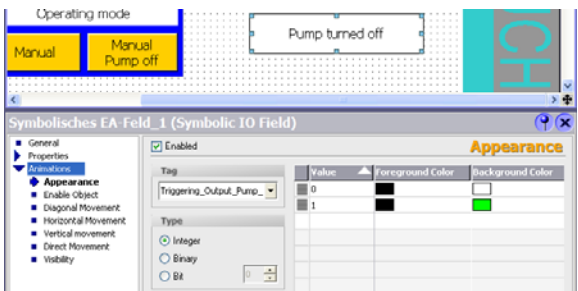
Table 3-1
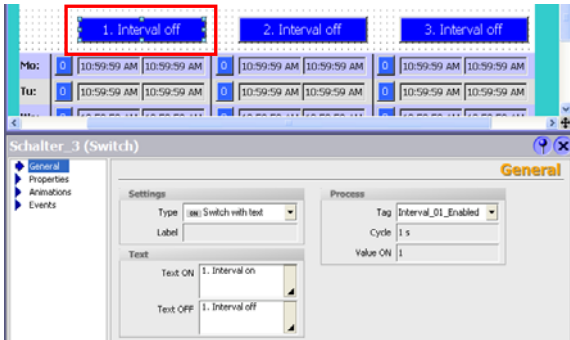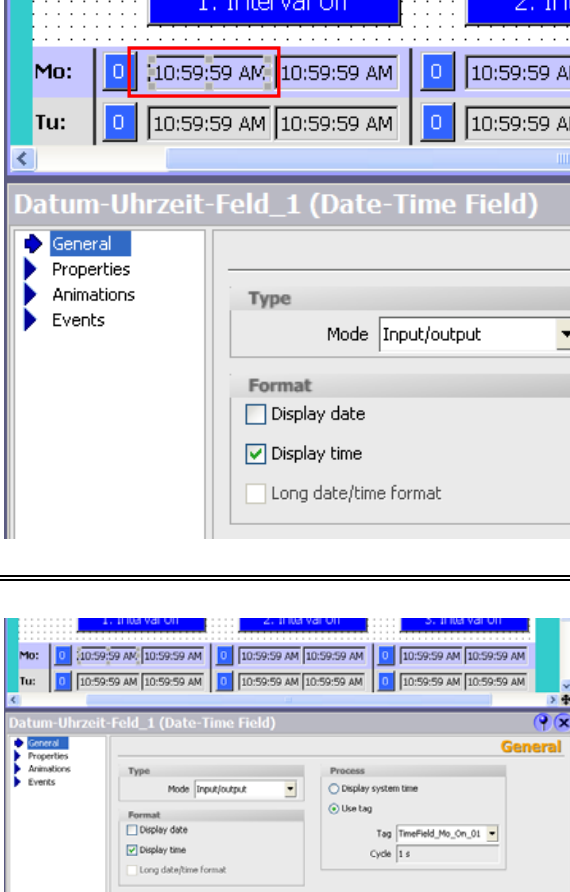
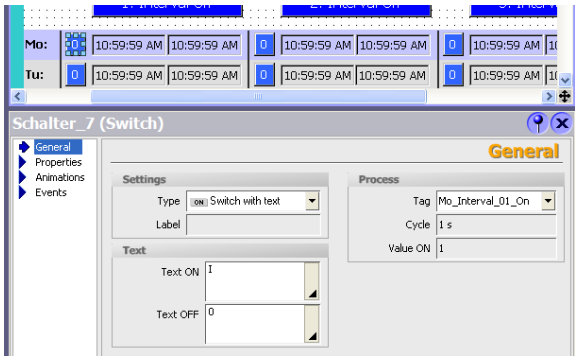| No.	Description	Picture
1.	**Permanent window** Two buttons are configured in the permanent window. These buttons are for ... • Changing the language of the user interface (German/English) • Ending Runtime Furthermore, the current system time is output by means of a date/time field.	Thursday, September 01, 2011 9:54:47 AM Deutsch RT
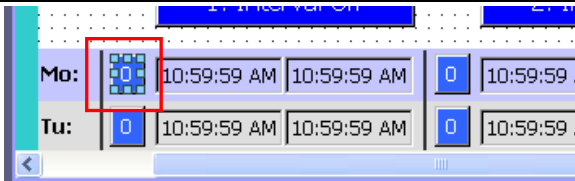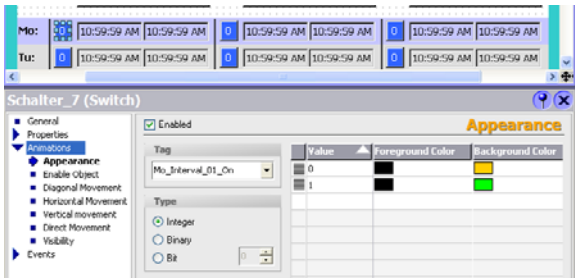
Picture 01 (Screen 01)

Table 3-2

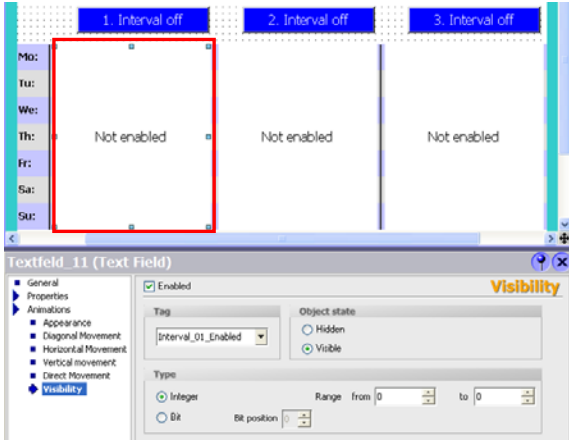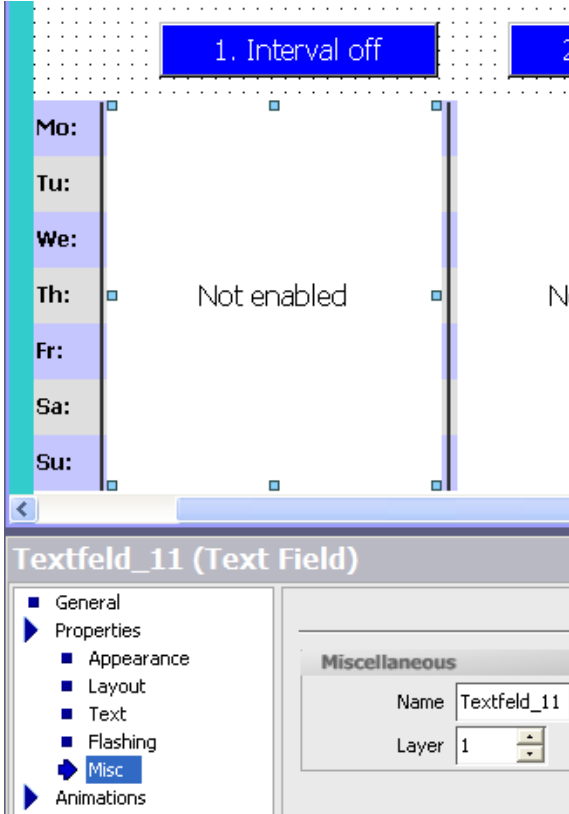| No.	Description	Pictures

1.	**"Manual" button**
	
	This button is for switching between the "Manual" and "Automatic" operating modes.
	The tag used is evaluated in the "Script_ClockTimer" script.
	
	The button executes two functions.
	• "Properties > Events > Change"
	  - The script "Script_ClockTimer" is called here.
	• "Properties > Events > Switch on"
	  - "SetValue"
	  When you operate the "Manual Pump off" button, the value of a tag is set.
	  When you switch from "Auto" to "Manual", this value is reset to "zero".

No.	Description	Pictures
2.	**"Manual Pump off" button** The button is for manually switching the pump on and off. The tag used is evaluated in the "Script_ClockTimer" script. The button executes one function. • "Properties > Events > Change" - The script "Script_ClockTimer" is called here.	
3.	**Symbolic IO field "Pump turned off"** The symbolic IO field "Pump turned off" indicates the current operating mode of the "pump" in a text list. Value "0": Pumped turned off Value "1": Pump turned on In addition, the operating mode is indicated "in color". • "Properties > Animations > Appearance" - The symbolic IO field is displayed in "white" or "green" depending on the "operating mode".	

No.	Description	Pictures
4.	**"1 Interval off" button** You can use this button to completely disable Interval 1. Switch "**on**": Interval 1 is enabled Switch "**off**": Interval 1 is disabled The tag used is evaluated in the script "Script_ClockTimer". The button executes no other function. The **"2. Interval off"** and **"3. Interval off"** buttons are configured in the same way.	
5.	**Date/time field** You specify the "switch-on and switch-off times" by way of the "Date/time field". One "date/time field" is configured for each "day" and "time interval". Each "date/time field" has its own tag. The tags used are evaluated in the script "Script_ClockTimer".	

No.	Description	Pictures
6.	**"0" button** This button is used for enabling/disabling each "switch-on/switch-off time" separately. Each "button" has its own tag. The tag used is evaluated in the script "Script_ClockTimer". Button "**0**": switch-on/switch-off time disabled Button "**1**": switch-on/switch-off time enabled In addition, the switching state is indicated "in color". • "Properties > Animations > Appearance" - The button is displayed in "yellow" or "green" depending on the "switching state".	

No.	Description	Pictures
7.	**Text field "Not enabled"** You can use the "1. Interval" button to select/deselect the associated "time interval" completely. A "text field" is displayed over the "time input fields" to indicate the deselected state to the operator. • "Properties > Animations > Visibility" – With value "0" the text field is visible The "text field" has "Layer 1" so that it does not interfere during the configuration phase. • Properties > Properties > Miscellaneous In this way, you can show/hide "Layer 1" during the configuration phase.	

3.2 Tags

Tags used

Table 3-3

No.	Description	Picture
1.	**"ClockTimer" tag folder** All the tags are grouped in the "**ClockTimer**" subfolder and have no controller connection.	

Notes:

- It is recommended, in particular for the tags that are used for the switch-on/switch-off times, to make a connection to a controller (->Use data block).
  Otherwise, you have to re-enter the switch-on/switch-off times each time you restart the operator panel.

- If you change the names of the tags used for your configuration, than also check the script "Script_ClockTimer".
  You might have to "synchronize" the changed tags here.

3.3 Scheduler

Scheduler

Table 3-4

No.	Description	Picture
1.	The scheduler executes the script "Script_ClockTimer" once every minute. "Project Tree > Device Settings > Scheduler	

3.4   Script

"Script_ClockTimer" script

> The specified switch-on and switch-off times are evaluated by means of this script. The script has comments so that the separate commands can be executed quickly.
>
> Below we described the functions used in detail. Please also refer to the Online Help of WinCC flexible. For this you select the appropriate command and then click the "F1" button.

Table 3-5

No.	Description
1.	**Lines 7 to 14** The internal script tags are declared in lines 7 to 14. These tags can only be used in the script.
2.	**Line 19** TimeNow = **TimeValue (Now)** **TimeNow**: Internal script tag **Now**: This command is for reading out the current date and current system time of the operator panel. **TimeValue**: This command is for reading out only the time from the "**Now**" command. This date is not relevant for this application.
3.	**Line 24** DayOfWeek = **Weekday (Now)** **DayOfWeek**: Internal script tag **Now:** This command is for reading out the current date and current system time of the operator panel. **Weekday**: This command is for reading out current day of the week as integer from the "**Now**" command. (1=Sunday; 2=Monday; 7=Saturday)
4.	**Line 29** This tag is needed to evaluate a specified switch-off time of 0 hours (midnight). The tag is preset with a "time" constant of "0 hours". Midnight = #00:00:00#
5.	**Line 34** Evaluation of the operating mode: • 0 (False) = Manual mode • 1 (True) = Automatic mode
6.	**Lines 38 to 42** Lines 34 to 38 are for the evaluation for triggering the output parameter [*)] in **Manual mode**. [*)] The "Triggering_Output" tag is an output parameter of the script used to trigger the output for a pump, for example.

No.	Description
7.	**Lines 46 to 378** Lines 46 to 378 are for the evaluation for triggering the output parameter in **Automatic mode**.
8.	**Line 49** **Select Case** DayOfWeek The "Select Case" instruction executes several of the instruction groups below depending on the value of the "DayOfWeek" tag. The value of the "DayOfWeek" tag can have a value of 1 to 7 (integers for weekdays). • Case "1" • Case "2" • etc.
9.	The "**Case Instructions**" below all have the same structure. The example described is for lines 52 to 94.

10.	**Lines 52 to 94**
	
	Line 52:
	   – Case "1": This instruction is executed when the content of the "DayOfWeek" tag has the value "1" (1=Sunday).
	Line 54: Beginning of the evaluation for the **first** switch-on/switch-off time in the **1.** Time Interval
	   – **1.** "If query":
	   Evaluation of whether the "**1. Time Interval**" and the button for enabling the **first** switch-on/switch-off time are enabled.
	Line 55:
	   – **2.** "If query":
	   Evaluation of whether **1.** Switch-off time has the value "0 hours".
	Line 56:
	   – Switch-off time "0 hours" => Evaluation of whether **1.** Switch-on time is close to the current time.
	Line 57:
	   – If the **1.** "If query" and the **2.** "If query" are fulfilled, the internal tag "Su_Trigger_**01**" is set to "1" (True), where "Su_" stands for "Sunday".
	Line 59:
	   – "Else" query => **1.** Switch-off time is **less** than "0 hours".
	Line 60:
	   – If the **1.** "If query" and the **3.** "If query" are fulfilled, the internal tag "Su_Trigger_**01**" is set to "1" (True), where "Su_" stands for "Sunday".
	
	Line 66: Beginning of the evaluation for the **second** switch-on/switch-off time in the **1.** Time Interval
	   – **1.** "If query":
	   Evaluation of whether the "**1. Time Interval**" and the button for enabling the **second** switch-on/switch-off time are enabled.
	Line 67:
	   – **2.** "If query":
	   Evaluation of whether **2.** Switch-off time has the value "0 hours".
	Line 68:
	   – Switch-off time "0 hours" => Evaluation of whether **2.** Switch-on time is close to the current time.
	Line 69:
	   – If the **1.** "If query" and the **2.** "If query" are fulfilled, the internal tag "Su_Trigger_**02**" is set

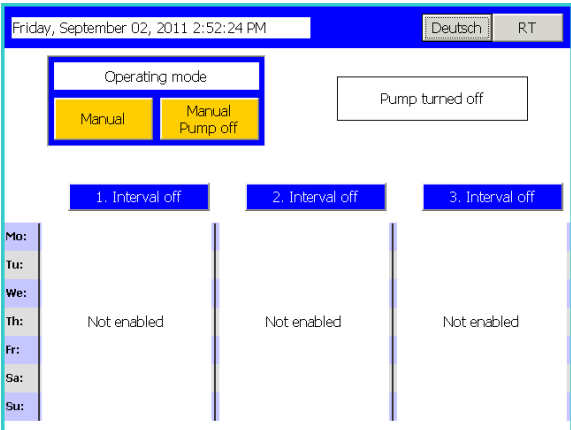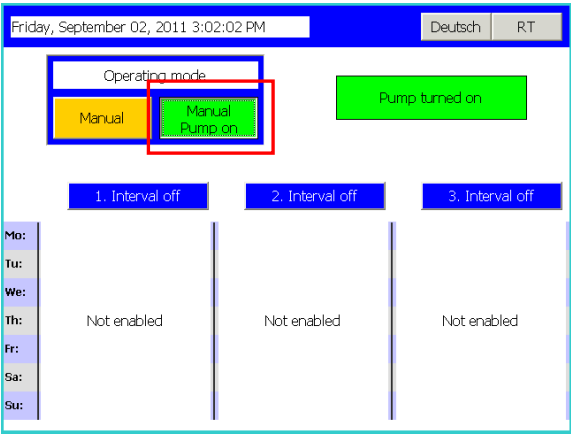| No.	Description

	to "1" (True), where "Su_" stands for "Sunday".
	Line 71:
	  - "Else" query => **2.** Switch-off time is **less** than "0 hours".
	Line 72:
	  - If the **1.** "If query" and the **3.** "If query" are fulfilled, the internal tag "Su_Trigger_**02**" is set to "1" (True), where "Su_" stands for "Sunday".
	
	Line 78: <u>Beginning of the evaluation for the **third** switch-on/switch-off time in the **1.** Time Interval</u>
	  - **1.** "If query":
	Evaluation of whether the "**1. Time Interval**" and the button for enabling the **third** switch-on/switch-off time are enabled.
	Line 79:
	  - **2.** "If query":
	Evaluation of whether **3.** Switch-off time has the value "0 hours".
	Line 80:
	  - Switch-off time "0 hours" => Evaluation of whether **3.** Switch-on time is close to the current time.
	Line 81:
	  - If the **1.** "If query" and the **2.** "If query" are fulfilled, the internal tag "Su_Trigger_**03**" is set to "1" (True), where "Su_" stands for "Sunday".
	Line 83:
	  - "Else" query => **3.** Switch-off time is **less** than "0 hours".
	Line 84:
	  - If the **1.** "If query" and the **3.** "If query" are fulfilled, the internal tag "Su_Trigger_**03**" is set to "1" (True), where "Su_" stands for "Sunday".
	
	Lines 90 to 94:
	  - Evaluation of the three internal tags "Su_Trigger_01" to "Su_Trigger_03".
	If at least on the three tags has the value "True", the output signal for the "Triggering_Output" tag is set (True).

11.	**Line 383** **Script_ClockTimer** = Triggering_Output A "return value" can be output by means of the script. In this case, the content of the "Triggering_Output" tag is output as "return value". When the script is called, for example by a button, a tag can be configured on this "return value". The tag can then be used for triggering an output, for example.

4 How to Use the Example

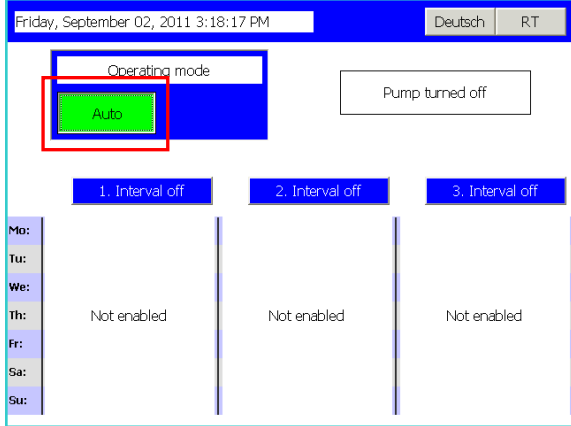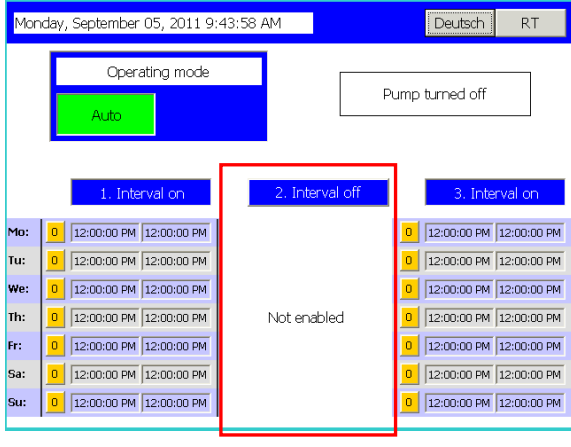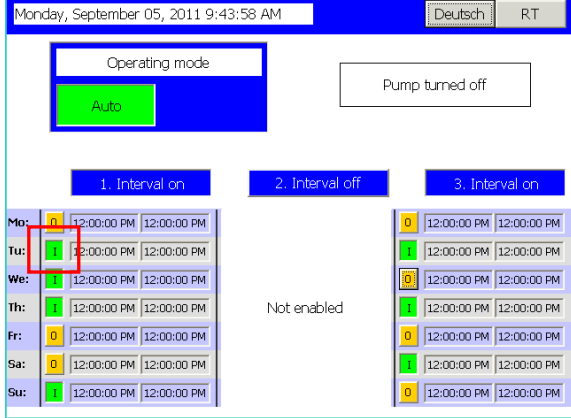This chapter describes how to use the project.

You can transfer the attached configuration to an MP 277 Touch or use it to test the WinCC flexible Runtime.

4.1 Operation

Table 4-1

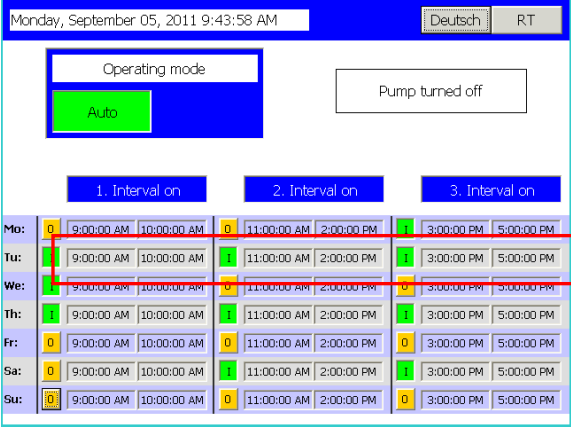| No.	Description	Pictures
1.	**Screen_01** The picture on the right is started by default when Runtime starts. • Manual mode enabled • Intervals 1, 2 and 3 disabled **Note:** The button texts etc. always show the current operating mode.	
2.	**Manual mode, pump on/off** The button with the function • "Manual Pump on" and • "Manual Pump off" is for switching the "pump" on and off. The current operating mode of the pump is displayed in color and output in text form in a symbolic IO field. **Notes:** • The button is only visible when the operating mode is set to "Manual". • If you change from "Manual" mode to "Automatic" mode when the pump is in operation, the pump is switched off.	

No.	Description	Pictures
3.	**Switching between Manual and Automatic mode** The button with the function • "Manual" or • "Auto" is for switching the operating mode between Manual mode and Automatic mode. The current operating mode is indicated in color. • Green = Auto • Yellow = Manual	
4.	**Enabling/disabling time intervals** The button with the function • "x. Interval on" and • "x. Interval off" is for completely disabling the associated time interval. In the disabled state, a text field with the text "Not enabled" is displayed over the switch-on/switch-off times. **Note:** The specified "switch-on/switch-off times" are evaluated only in Automatic mode.	
5.	**Enable/disable switch-on/switch-off time** The button with the function • "0" and • „1" is for separately enabling/disabling the "switch-on/switch-off time". **Note:** The specified "switch-on/switch-off time" is evaluated only in Automatic mode.	

No.	Description	Pictures
6.	**Specifying the switch-on/switch-off time** You can specify three different switch-on/switch-off times for each day in the relevant time fields. In the associated time interval, the "left" time field is the switch-on time and the "right" time field is the switch-off time. You specify only **hours** and **minutes** in the time fields. "Seconds" are not evaluated. **Notes:** • The switch-off time must be greater than the switch-on time. **Exception:** Switch-off time is 0 hours! • Time monitoring is enabled only – in Automatic mode – the "time interval" is enabled – the button next to the time field has the status "**1**"	

4.2   Tips and Tricks

Time-of-day synchronization

Please refer to the entry below for how to synchronize the system time of the HMI operator panel with the system time of the CPU.

http://support.automation.siemens.com/WW/view/de/24104104

The output signal for triggering the pump is not reset

Check the switch-on/switch-off times of each time interval.

If, for example, the specified switch-on time of the "2. Time Interval" is less than the specified switch-off time of the "1. Time Interval", then the time continues running until the switch-off time of 2. Time Interval is reached.

See picture below: Overlapping of the switch-off and switch-on times

Figure 4-1

The output signal for triggering the pump is not switched on

- Check the switch-on/switch-off times of the time interval used.
  - The specified switch-on time must be less than the specified switch-off time.
- Check that you have specified the "correct" time for the relevant day.

The output signal should be present without interruption also on the next day.

The times are specified "by default" for each individual day.

If triggering of the output is to be continued without interruption on the next day, then specify the time below, for example:

Switch-off time Friday: 00:00:00 hours

Switch-on time Saturday: 00:00:00 hours

The "overlapping" of the times ensures that triggering is retained for the output signal.