akYtec

Sample Project:
Modifiable Week Clock

PR200 Programmable Relays

- This is an example project to set a modifiable clock to turn on and turn off any device depending on the hour of the day and the day of the week. This program uses the macros "Clock_Mod", "Day_Week" and "Set value selector" (please refer to the Akytec online macro database). This document describes what devices are used for this program and also how the program structures and its functions work.

1. Devices and signal types

This project uses the PR200 display to receive input data and to show the output status. The output Q1 is activated as well and can be used to start a relay for example. There is no other equipment connected to the PR200.
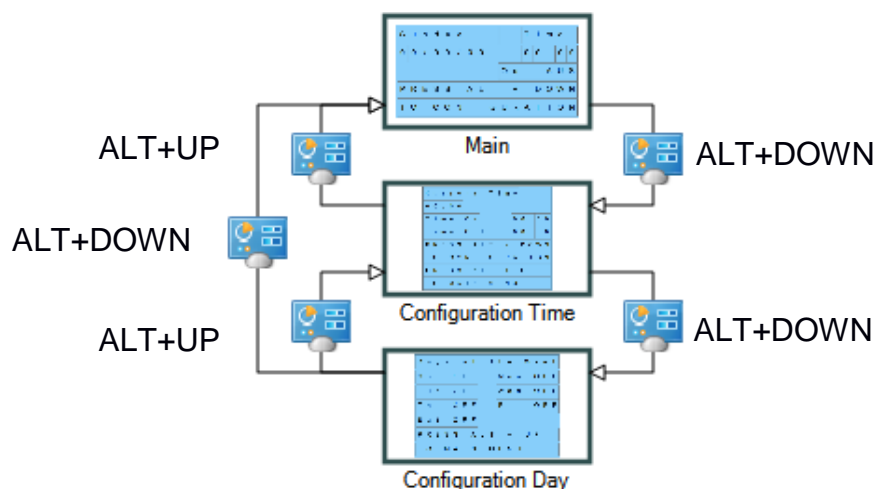
1.1. Device configuration

No configuration is needed on the PR200 hardware.

2. The program

2.1. Functions and structure of the program

2.1.1. Display

There are three displays in this program.

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Display main:

This display shows the current day, current date and the current time as well as the output "Out", that indicates the output Q1's status.

To access the display "configuration time", press the key combination ALT + DOWN.

Sunday		Time
00 / 00 / 00		00 : 00
	Out	AUS
PRESS ALT + DOWN		
TO CONFIGURATION		

Display configuration time:

On this screen the time to active (Time ON) and to deactivate (Time OFF) the output Q1 can be set.

To access the display "configuration day", press the key combination ALT + DOWN.

To return to the main display, press the key combination ALT + UP.

Current Time	
00 : 00	
Time ON	00 : 00
Time OFF	00 : 00
PRESS ALT + DOWN	
TO CONFIGURATION	
PRESS ALT + UP	
TO MAIN MENU	

Display configuration day:

The days, when the output Q1 should be active (ON), can be set on this screen. If a day is selected as OFF, the output won't be activated on this day.

To access the main display, press the key combination ALT + DOWN.

To return to the display "configuration time", press the key combination ALT + UP.

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D a y s	o f	t h e	W e e k
S u n	O F F	M o n	O F F
T u e	O F F	W e d	O F F
T h u	O F F	F r i	O F F
S a t	O F F		
P R E S S	A L T	+	U P
T O	M A I N	M E N U	

2.1.2. Program

The program uses two Macro to calculate the activation time, depending on the hour of the day (Clock_Mod) and the day of the week (Day_Week).

To set the macro Clock_Mod, it is important to synchronize the PR200's real time clock to have an accurate date and time.

To access this menu, use the path Device->Device Configuration.
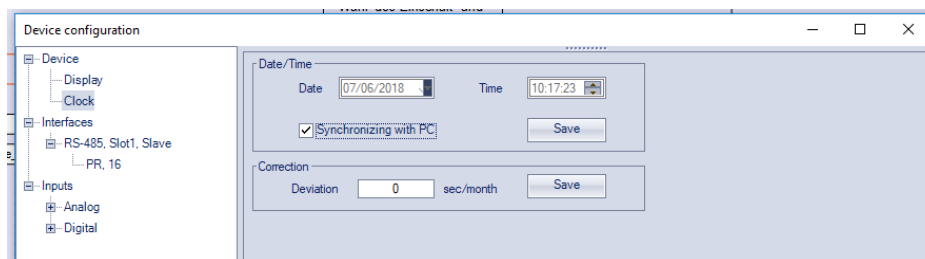
The inputs "Hour RTC" and "Minute RTC" are connected to the service variable "Hours" and "Minutes" to get the current time.

The variables "Hour_On", "Hour_Off", "Minute_On" and "Minute_Off" are obtain using the display "configuration time".
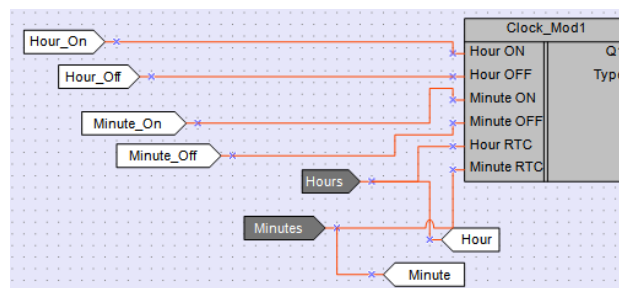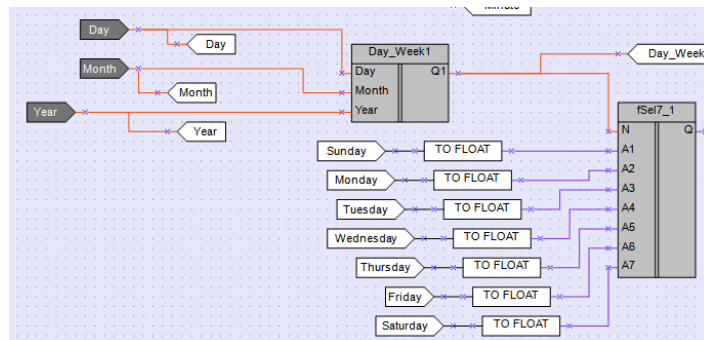
To set the days of operation, the macro Day_Week is used to calculate and set the current day according to the following table:

| Q1 Value	Day of the Week
0	Sunday
1	Monday
2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday

The service variables "Day", "Month" and "Year" are used to calculate the current day.

A 7 Position selector is used to activate the output in case the current day is selected (please refer to our online database).

To show the current time in 00:00 format, a circuit is included in the program and the output is included over the second position of the current minute and hour in the main display
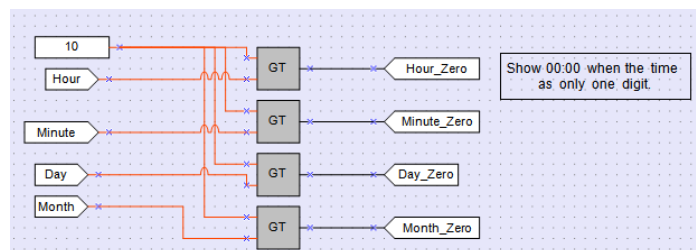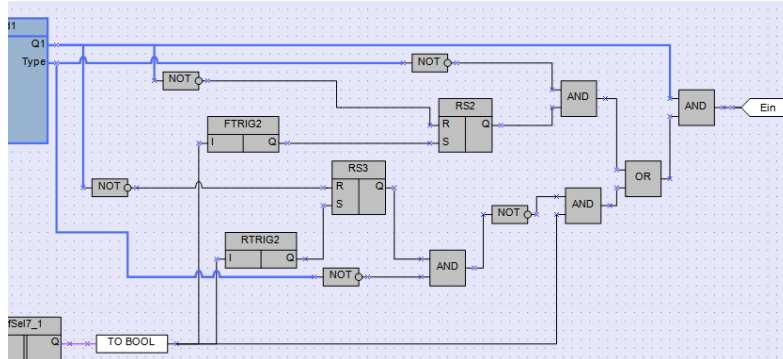

When the hour or minute has just one digit (from 0 to 9), a zero will be displayed on the second position.
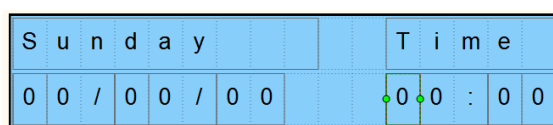
At last, this part of the program is needed for a proper two-days operation mode.
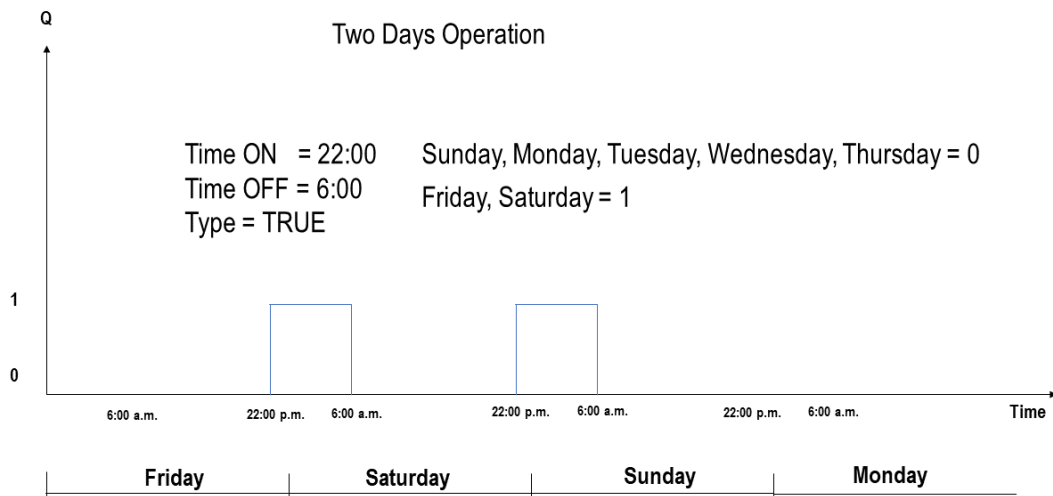

In case of a two-days operation, the Switch-on occurs one day and the switch-off occurs the following day. For example: Time On at 22:00 and Time Off at 06:00. Then it is necessary to explain the proper configuration.

In this example, it will be considered a weekend operation, that starts on Fridays and Saturdays at 10:00 p.m. and finish on Saturdays and Sundays at 6:00 a.m. respectively. In this case, the configuration on the macro Day_Week is shown in the following table:

Q1 Value	Day of the Week	BOOL Value
0	Sunday	0
1	Monday	0
2	Tuesday	0
3	Wednesday	0
4	Thursday	0
5	Friday	1
6	Saturday	1

In this way, the program will not set the output Q1 on Friday from 0:00 to 6:00 or on Sunday from 22:00 to 23:59 in spite of being both conditions active (Q1 from Clock_Week and Q from Fsel_1).

Two Days Operation

Time ON = 22:00   Sunday, Monday, Tuesday, Wednesday, Thursday = 0
Time OFF = 6:00   Friday, Saturday = 1
Type = TRUE

2.1. Variable table

The following picture list all the variables used in the program.

Local variables

Name	Data type	Persistence	Default value	Use in project	Comment
Day	INT	☑	0	Yes	
Month	INT	☑	0	Yes	
Year	INT	☑	0	Yes	
Ein	BOOL	☑	0	Yes	
Day_Week	INT	☐	0	Yes	
Hour_On	INT	☑	0	Yes	
Hour_Off	INT	☑	0	Yes	
Minute_On	INT	☑	0	Yes	
Minute_Off	INT	☑	0	Yes	
Hour	INT	☑	0	Yes	
Minute	INT	☑	0	Yes	
Sunday	BOOL	☑	0	Yes	
Monday	BOOL	☑	0	Yes	
Tuesday	BOOL	☑	0	Yes	
Wednesday	BOOL	☑	0	Yes	
Thursday	BOOL	☑	0	Yes	
Friday	BOOL	☑	0	Yes	
Saturday	BOOL	☑	0	Yes	
Hour_Zero	BOOL	☐	0	Yes	
Minute_Zero	BOOL	☐	0	Yes	
Day_Zero	BOOL	☐	0	Yes	
Month_Zero	BOOL	☐	0	Yes	

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