Two pumps with runtime control

Project for PR200-24.2

Project overview

The example describes a project for alternate operation of two pumps with count of the operating time and the number of starts. The project contains 3 data processing blocks and 3 screens.

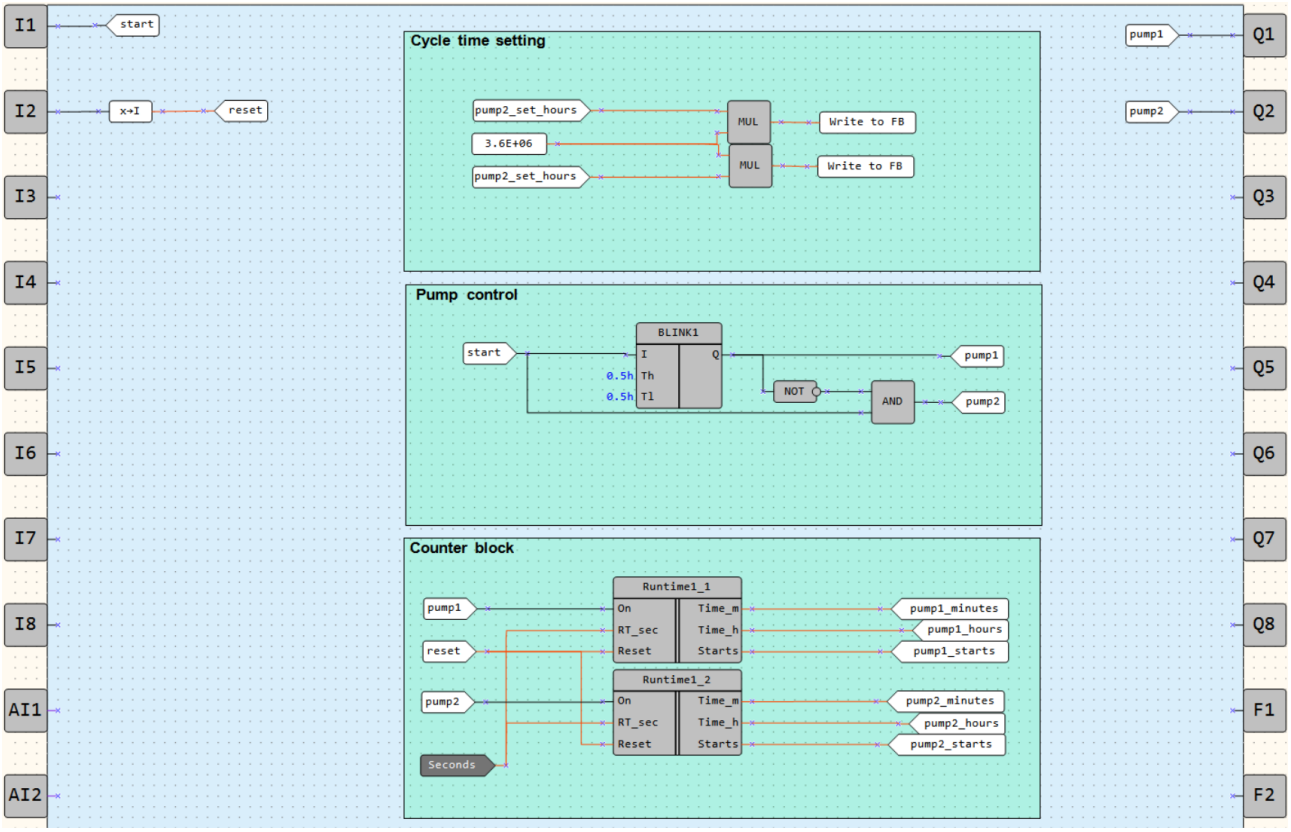

Fig. 1. Program workspace

Data processing blocks:

- Cycle time setting
- Pump control
- Counter block

Screens:

- *Pump control*
- *Counter block*
- *Cycle time setting*

Table 1. Device inputs/outputs

Name	Type	Description
I1	BOOL	Input (NO contact, latching) / Enable start
I2	BOOL	Input (NO contact, latching) / Reset counters
Q1	BOOL	Output / Pump 1
Q2	BOOL	Output / Pump 2

Table 2. Project variables

Name	Type	Description
pump1	BOOL	Pump 1 start
pump2	BOOL	Pump 2 start
pump1_hours	INT	Pump 1 / operating hours
pump2_hours	INT	Pump 2 / operating hours
pump1_minutes	INT	Pump 1 / operating minutes
pump2_minutes	INT	Pump 2 / operating minutes
pump1_starts	INT	Pump 1 / number of starts
pump2_starts	INT	Pump 2 / number of starts
reset	INT	Reset counters
start	BOOL	Enable start
pump1_set_hours	INT	Pump 1 / set cycle hours
pump2_set_hours	INT	Pump 2 / set cycle hours

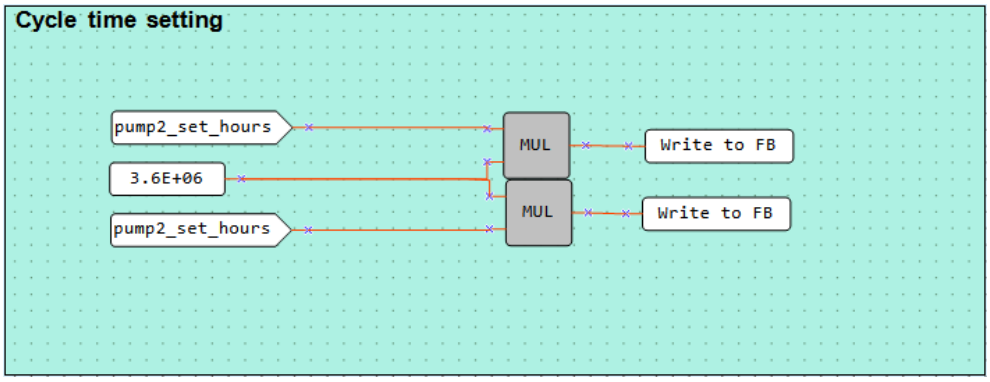

Fig. 2. Cycle time setting

The cycle run time for each pump is set in the block *Cycle time setting* (Fig. 2). It is entered in hours via the screen using the function buttons on the device. The time is then converted to milliseconds to be applied to a *BLINK* FB via *WriteToFB* blocks (Fig. 3).

The algorithm is activated if the signal on the input *I1* is *TRUE*. The pumps are switched on alternately over the *BLINK* FB (Fig. 3).

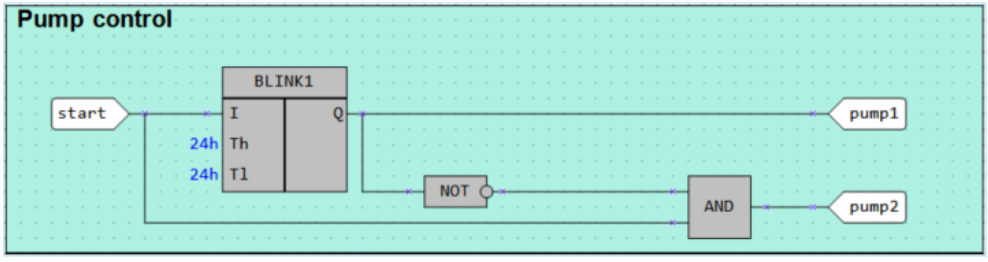

Fig. 3. Pump control

In the *Counter block* (Fig. 4), the operating time and the number of starts for each pump are counted using two macros *Runtime1_*. The macro returns the total operating time in hours and minutes and the number of starts. The output is displayed on the screen *Counter block*. All the counters can be reset by closing the *I2* input (Fig. 1).

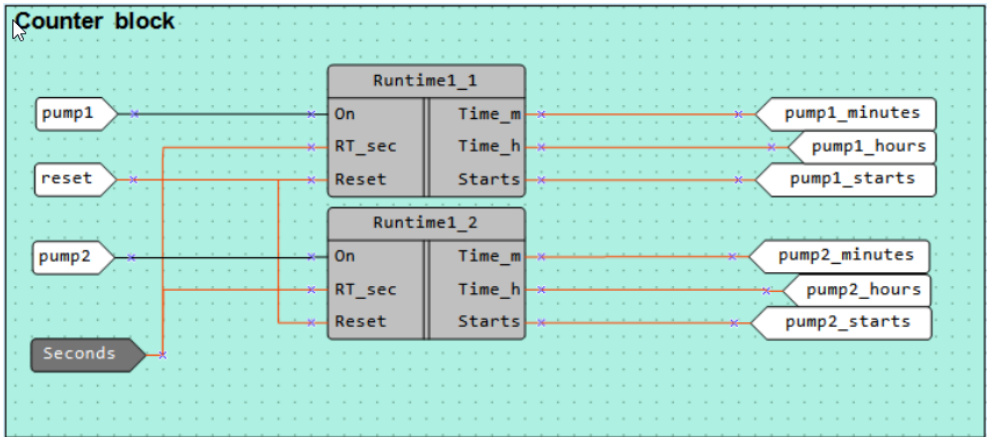

Fig. 4. Counter block

Screens

Table 3. Function buttons

Function buttons	Action
⏬	Scroll down through screen rows
⏫	Scroll up through screen rows
ALT + ⏬	Switch to the screen *Counter block*
ALT + ⏫	Switch to the screen *Cycle time setup*
ESC	Switch to the first screen

Initially, the screen *Pump control* is displayed (Fig. 5). It shows the status of the both pumps (ON/OFF).

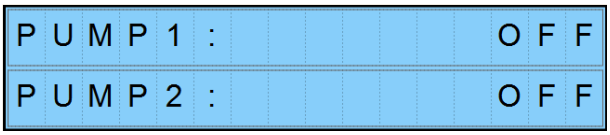

Fig. 5. Screen *Pump control*

The screen *Counter block* (Fig. 6) shows the total operating time of each pump in hours and minutes and its number of starts.

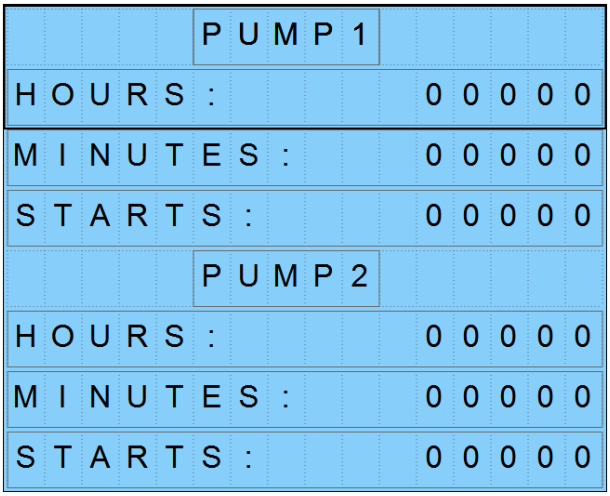

Fig. 6. Screen *Counter block*

The screen *Cycle time setup* is used to set the cycle run time for each pump.

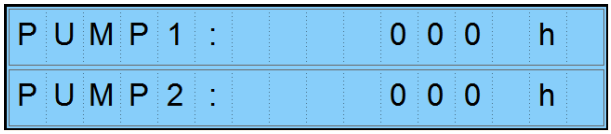

Fig. 7. Screen *Cycle time setup*