

Introduction to Programmable Logic Controllers Ex11_alarms

DTU 31343

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Task 1

To create the alarm conditions, the program shown in Figure 1 was used. In this manner, by using the GEN function block, the signal would alternate accordingly when the alarm is induced, such that the functionality based on an alternating signal could be checked.

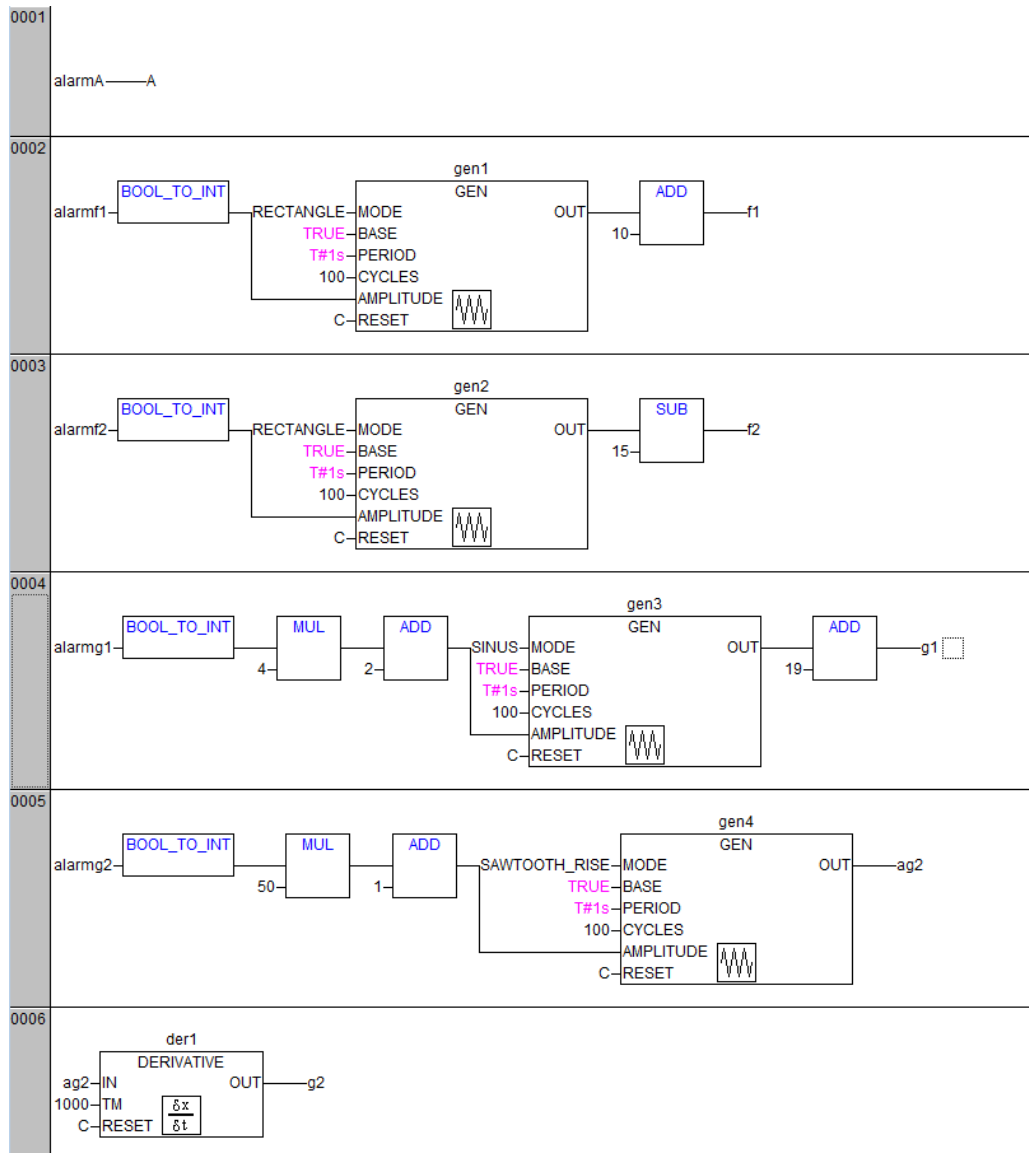


Figure 1: Program creating alarm conditions based on button input.

The alarm conditions were then set given to the desired conditions, where:

- A, was a digital alarm set to DIG=0
- f1, was a conditional alarm set to HI
- f1, was a conditional alarm set to LO
- g1, was based on two alarms set to DEV+ and DEV-
- g2, was a conditional alarm set to HI

Logging capabilities were added and an example is saved onto the file *alarmx0.alm*. A line in this file looked as follows:

```
1623856875;55275106;16-06-2021;03:21:15;INT0;PLC_PRG.f1;HI;10;;;
11.00;newclass;0;Alarm f1;
```

Which has the following meaning:

```
unix timestamp in seconds;nanosecond within the second;date;time;INT0;variable;
type of alarm;threshold of the alarm;;;value causing the alarm;
class of the alarm;priority of alarm;message displayed for alarm;
```

The resulting visualisation that provided the required functionality is shown in Figure 2.

Reset	Alarm A	Alarm f1	Alarm f2	Alarm g1	Alarm g2
	Date	Time	Value	Message	Priority
0	16-06-2021	03:19:55	1	Alarm A	0
1	16-06-2021	03:20:00	25.00	Alarm g1	0
2	16-06-2021	03:19:57	1.00	Alarm g2	0

Figure 2: Visualisation of the alarm table based on the given conditions.

Task 2

Alarms were added to Ex8_serial as shown in Figure 3.

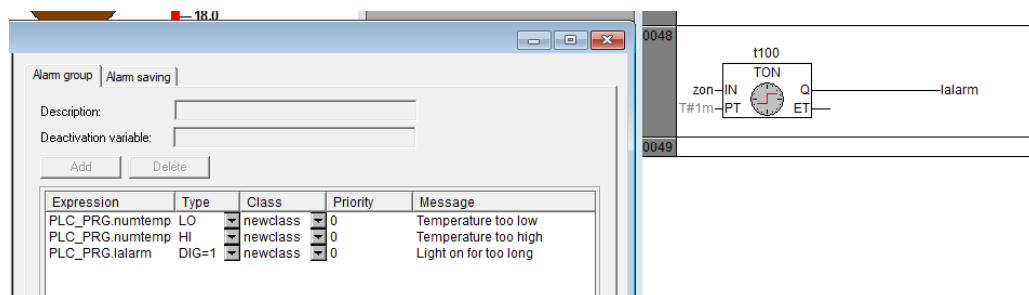


Figure 3: Added alarm functionality and program allowing the tracking of the light on duration.

The alarm would activate when temperatures increased above 23 °C, or below 19 °C. The alarm caused when the temperature was below the threshold is shown in Figure 4.

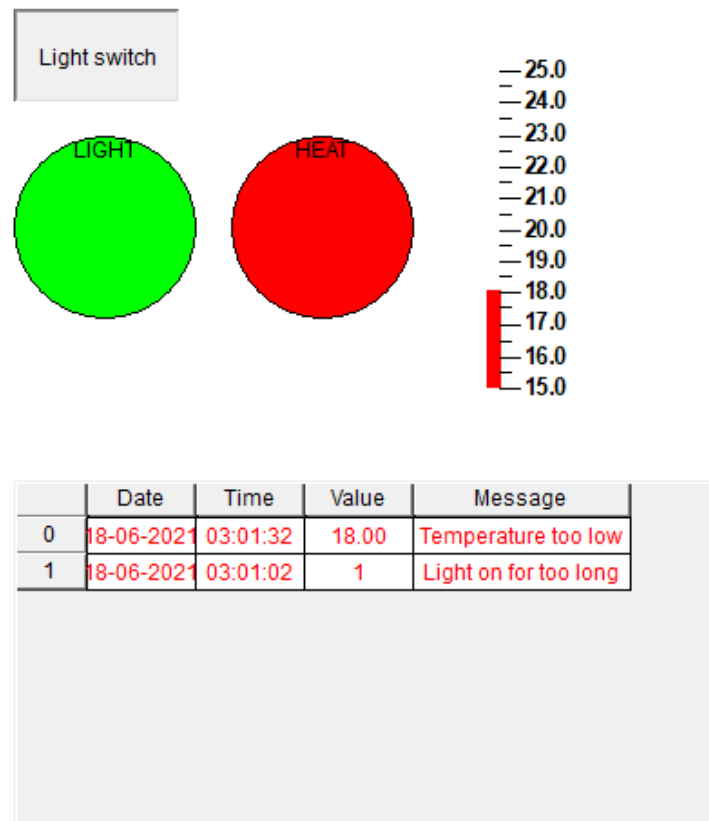


Figure 4: Visualisation of the arduino functionality, with the alarm being shown due to the low temperature.

Additionally, the alarms would get logged into a file, an example is shown in the file *arduinoalarm0.alm*. A line in this file looked as follows:

```
1624028521;54121081;18-06-2021;03:02:01;INT0;PLC_PRG.numtemp;L0;19;;;
17.00;newclass;0;Temperature too low;
```

Which has the following meaning:

```
unix timestamp in seconds;nanosecond within the second;date;time;INT0;variable;
type of alarm;threshold of the alarm;;;value causing the alarm;
class of the alarm;priority of alarm;message displayed for alarm;
```