Pressure Controlling System

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Learn-In-Depth

System Requirements :
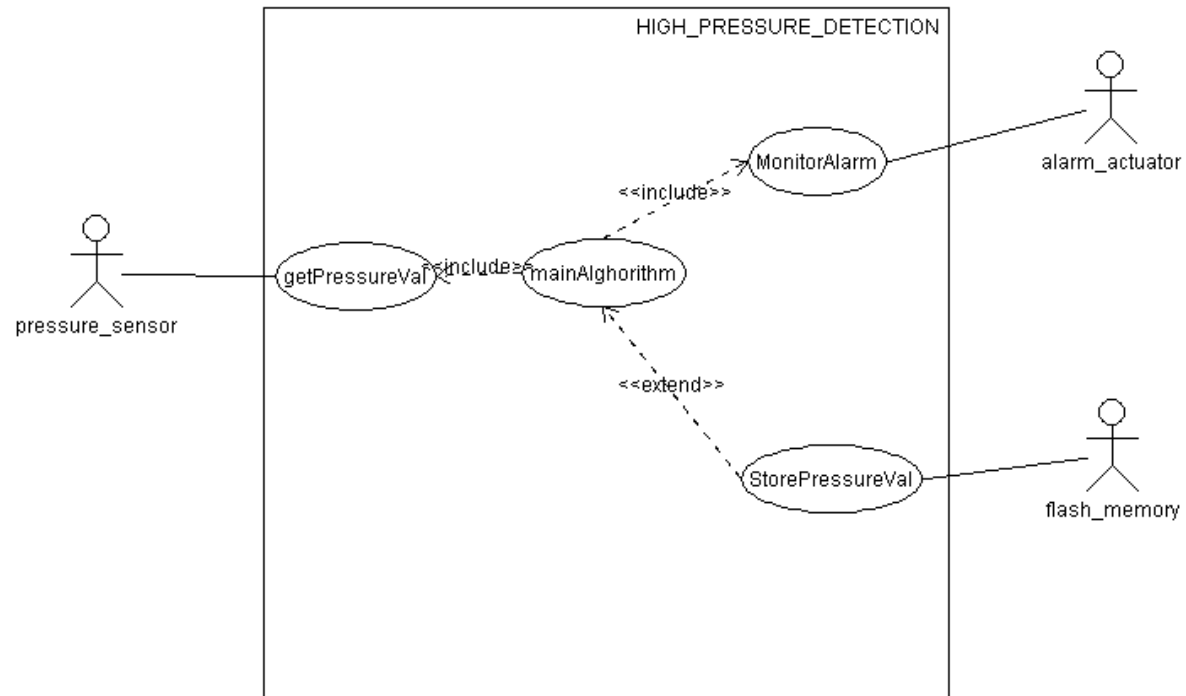

<<Requirement>>
HIGH_PRESSURE_DETECTION

ID=0
Text="the system shall protect the crew against high pressure"
Kind="Functional"
Risk="Low"
Reference elements=""

<<Requirement>>
HIGH_PRESSURE_DETECTION

ID=1
...
Kind="Functional"
Risk="Low"
Reference elements=""

<<Requirement>>
crew_warning

ID=2
Text="Requirement description:
Double-click to edit"
Kind=""
Risk=""
Reference elements=""

<<Requirement>>
store_pressure

ID=3
...
Kind="Other"
Risk="Low"
Reference elements=""

<<refine>>

<<refine>>

<<deriveReqt>>

<<Requirement>>
pressure_threshold

ID=4
...
Kind="Functional"
Risk="Low"
Reference elements=""

<<Requirement>>
inform_by_led

ID=6
...
Kind="Functional"
Risk="Low"
Reference elements=""

<<Requirement>>
save_in_flash_memory

ID=7
...
Kind="Functional"
Risk="Low"
Reference elements=""

<<refine>>

<<Requirement>>
pressure_sensor

ID=5
...
Kind="Functional"
Risk="Low"
Reference elements=""

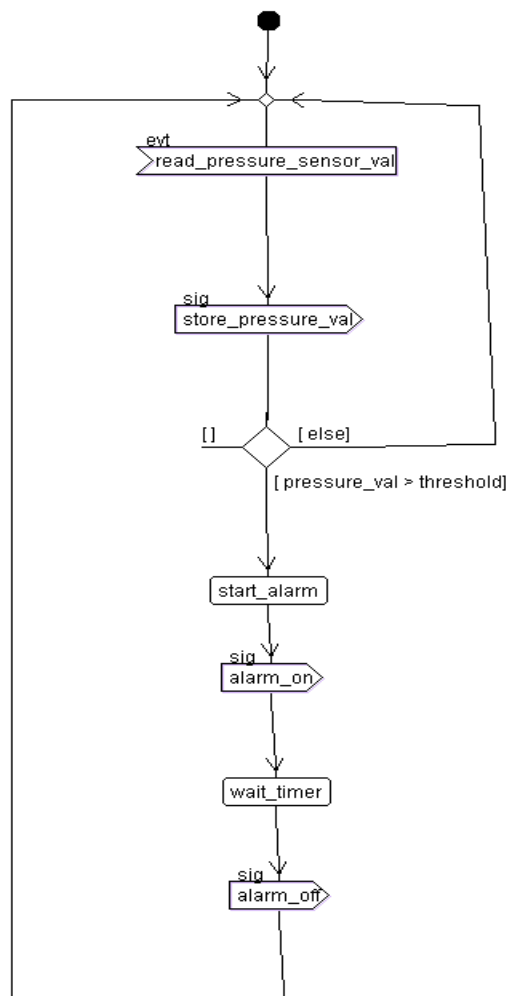## System hardware partitioning :

Stm32f103c6 (cortex-m3)

System Analysis :
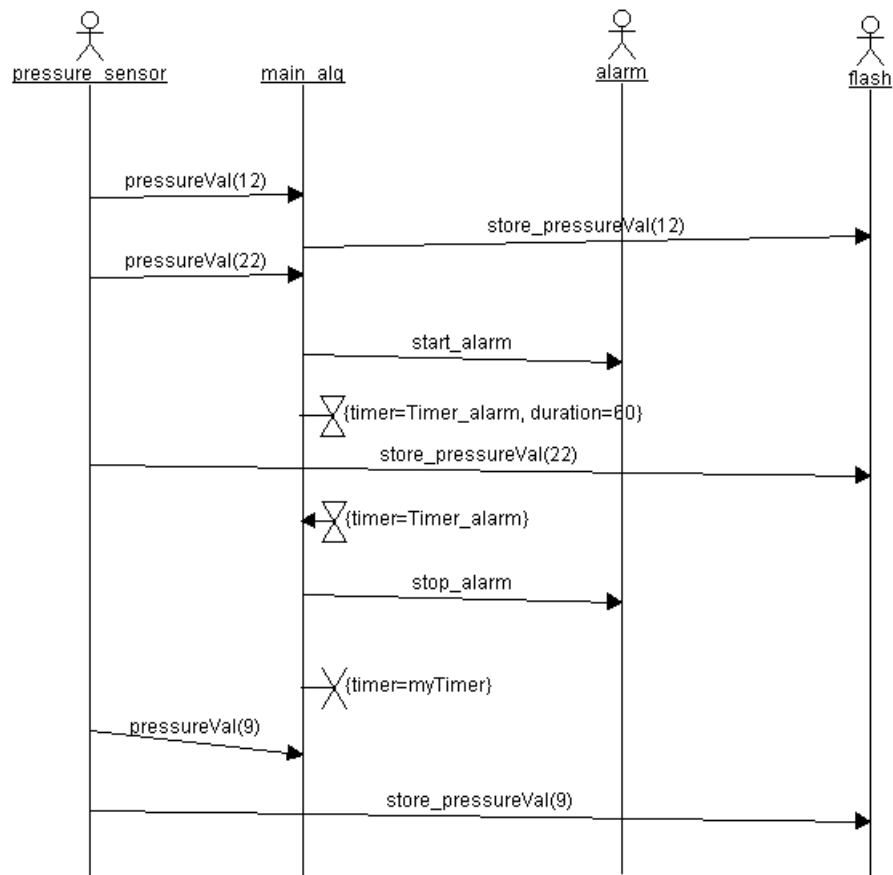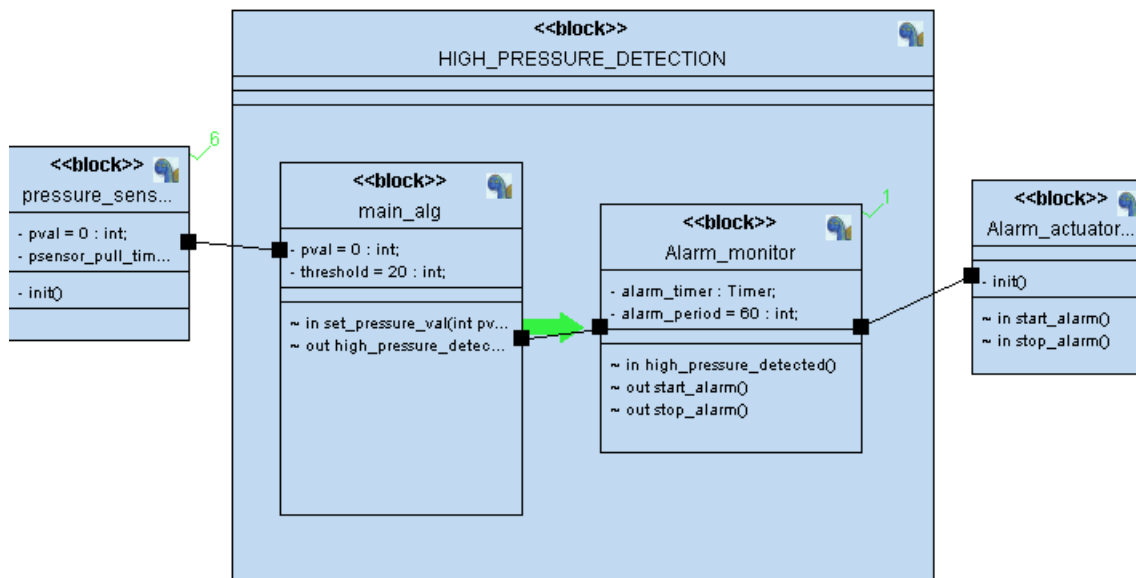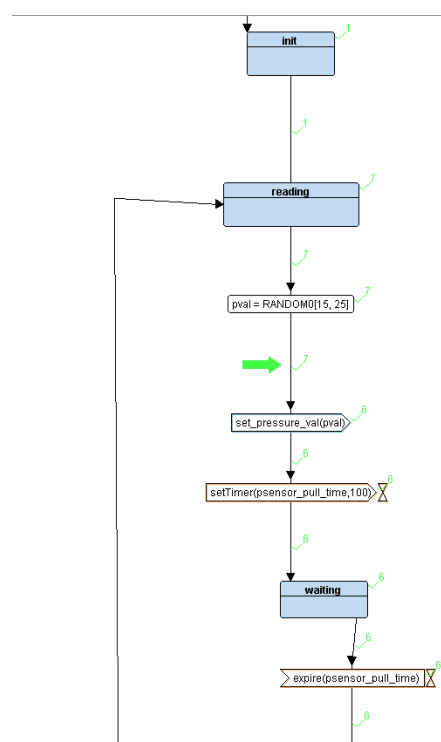
- use case study

Activity diagram :

```
                              ●
                              │
                              ▼
        ┌──────────────────◇◇◇──────────────────┐
        │                    │                    │
        │              evt   │                    │
        │          ▷read_pressure_sensor_val      │
        │                    │                    │
        │                    ▼                    │
        │              sig                        │
        │          store_pressure_val▷            │
        │                    │                    │
        │              [ ]   ◇   [ else]          │
        │                    │                    │
        │          [ pressure_val > threshold]    │
        │                    │                    │
        │                    ▼                    │
        │              ┌────────────┐             │
        │              │ start_alarm│             │
        │              └────────────┘             │
        │               sig  │                    │
        │           ┌──────────────┐              │
        │           │  alarm_on    ▷              │
        │           └──────────────┘              │
        │                    │                    │
        │                    ▼                    │
        │              ┌────────────┐             │
        │              │ wait_timer │             │
        │              └────────────┘             │
        │               sig  │                    │
        │           ┌──────────────┐              │
        │           │  alarm_off   ▷              │
        │           └──────────────┘              │
        │                    │                    │
        └────────────────────┘
```

- Sequence diagram :

pressure_sensor   main_alg   alarm   flash

pressureVal(12)

store_pressureVal(12)

pressureVal(22)

start_alarm

{timer=Timer_alarm, duration=60}

store_pressureVal(22)

{timer=Timer_alarm}

stop_alarm

{timer=myTimer}

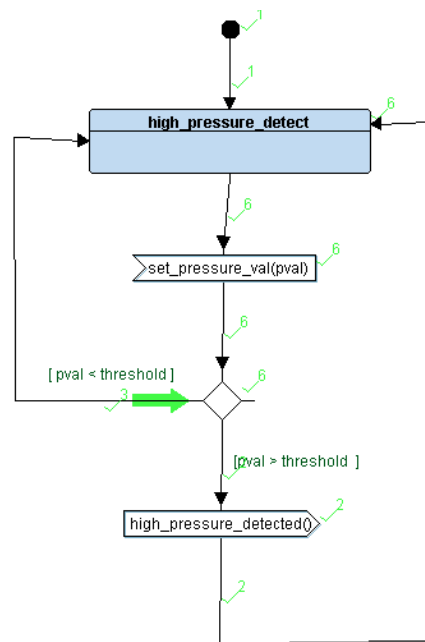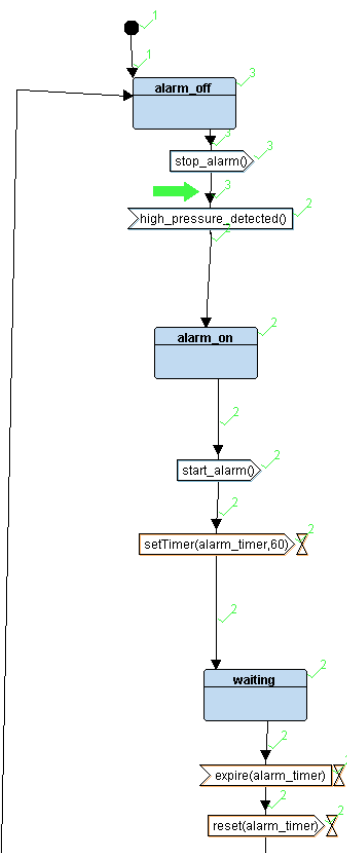pressureVal(9)

store_pressureVal(9)

System design :

- pressure sensor diagram :

- Alghorithm :

- Alarm monitor :

- Alarm actuator :