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3 Introduction

This project is a simple prototype of high-pressure protection system in airplane cabin.

4 Case study

4.1 Assumptions:

- Physical installation of components will not be designed.
- Sensors, controller, and actuator maintenance will not be considered.
- The controller will never face power cut off.
- Sensors and actuators will never fail.
- The system will read pressure value from external sensor (sensor driver will not be modeled).

4.2 Versioning:

- Version one: will simulate the logic using proteus simulation. Simulating alarm as a LED, and sensor is a set of switches to change pressure values without storing any data in flash memory.
- Version two: full version which will be burned into the controller.

This report covering only version one.

5 Method

This system will be implemented using V-model SDLC.

6 Requirements:

This section shows high level view of the whole system using UML diagrams.

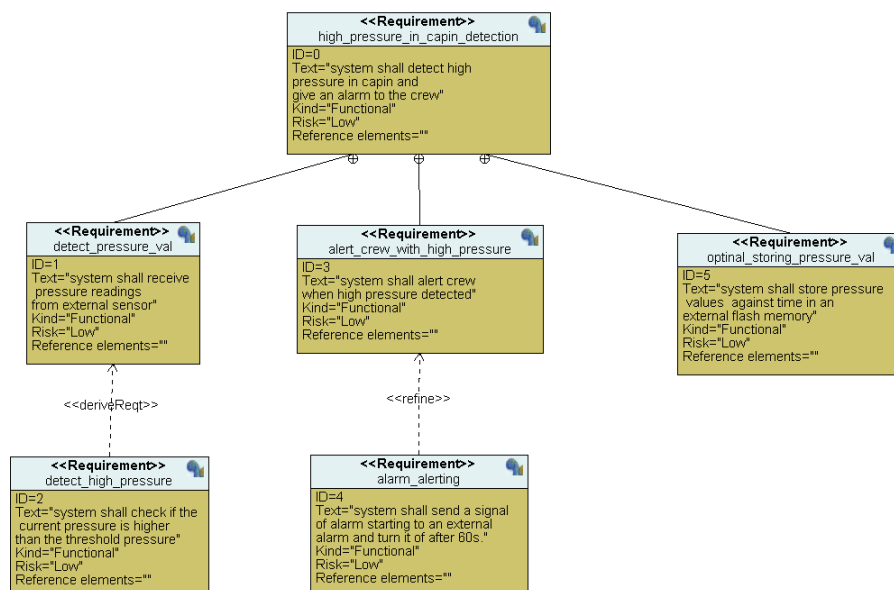


Figure 6.1 Requirements UML diagram

7 System analysis

This section gives deeper understanding if system and how it works using UML diagrams.

7.1 Use case diagram:

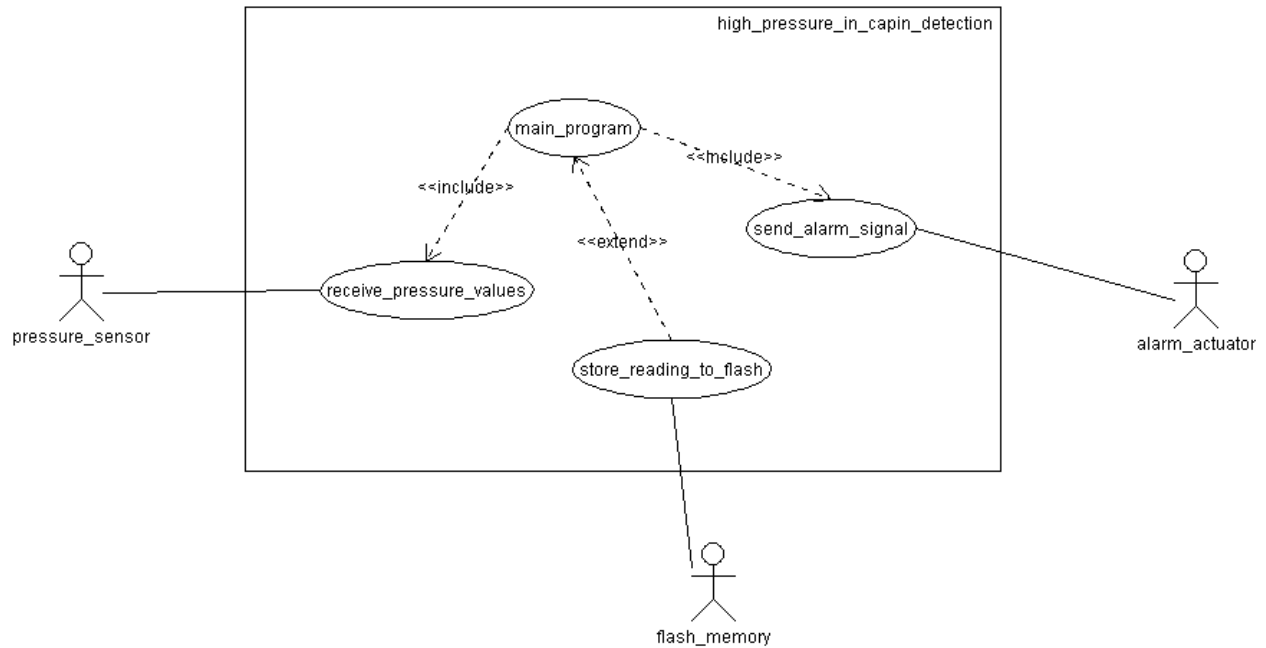


Figure 7.1 use case diagram

7.2 Activity diagram:

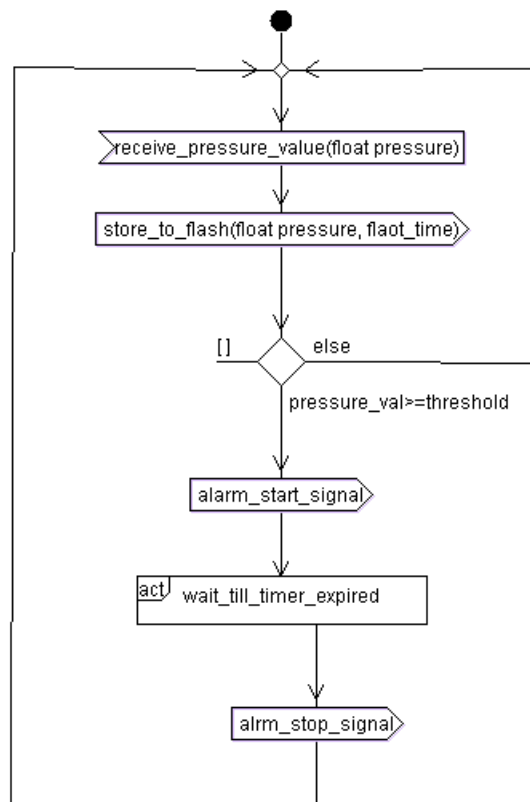


Figure 7.2 activity diagram

7.3 Sequence diagram:

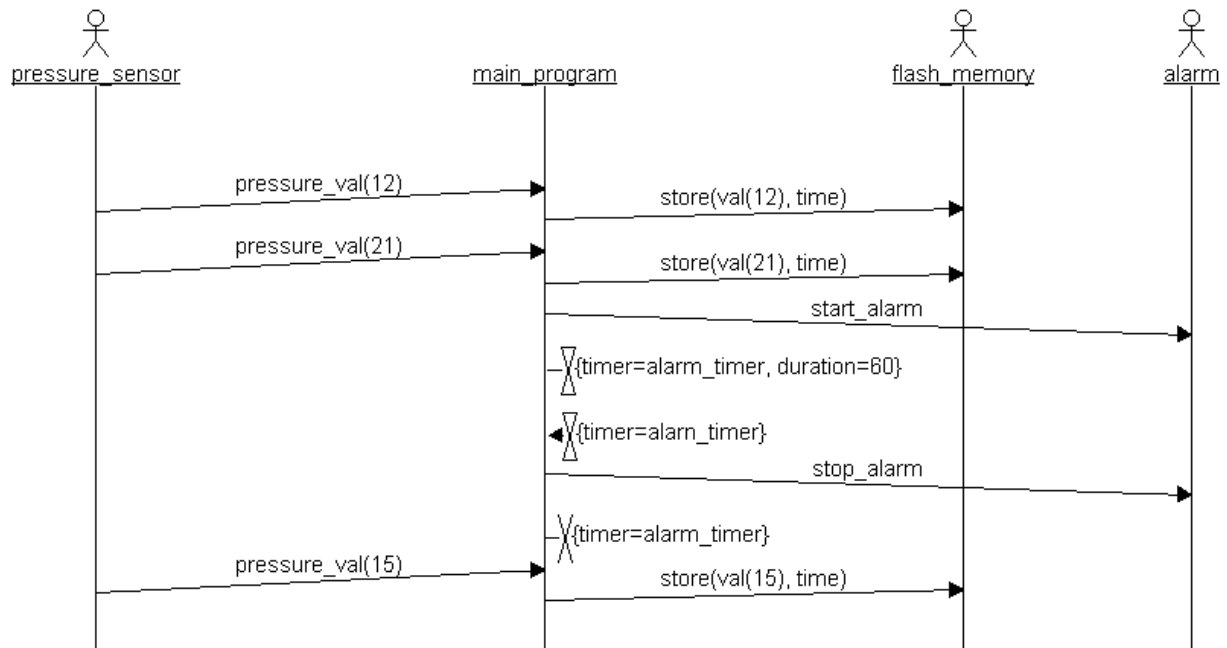


Figure 7.3 sequence diagram

8 System design

8.1 System block diagram:

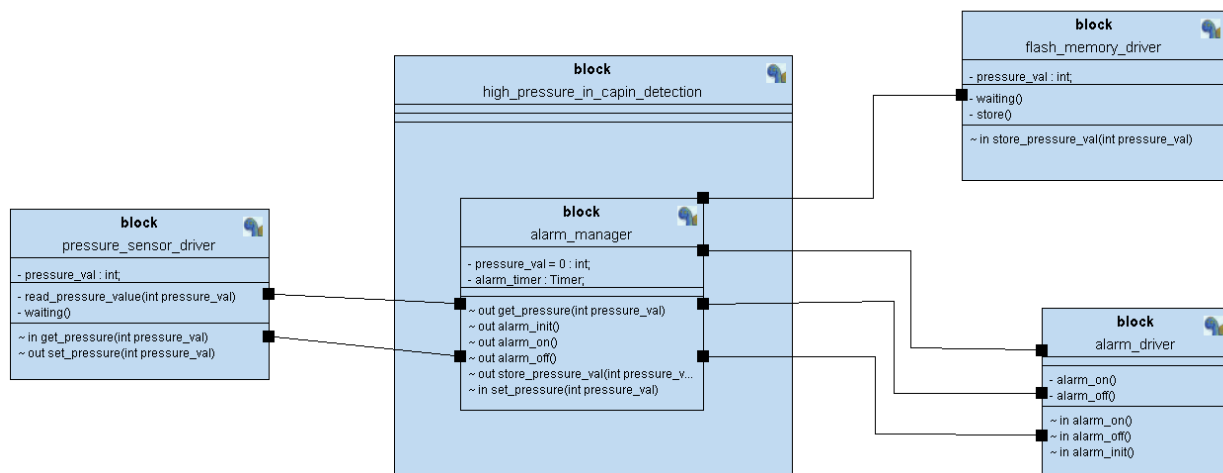


Figure 8.1 block diagram

8.2 Alarm manager (main algorithm) implementing logic:

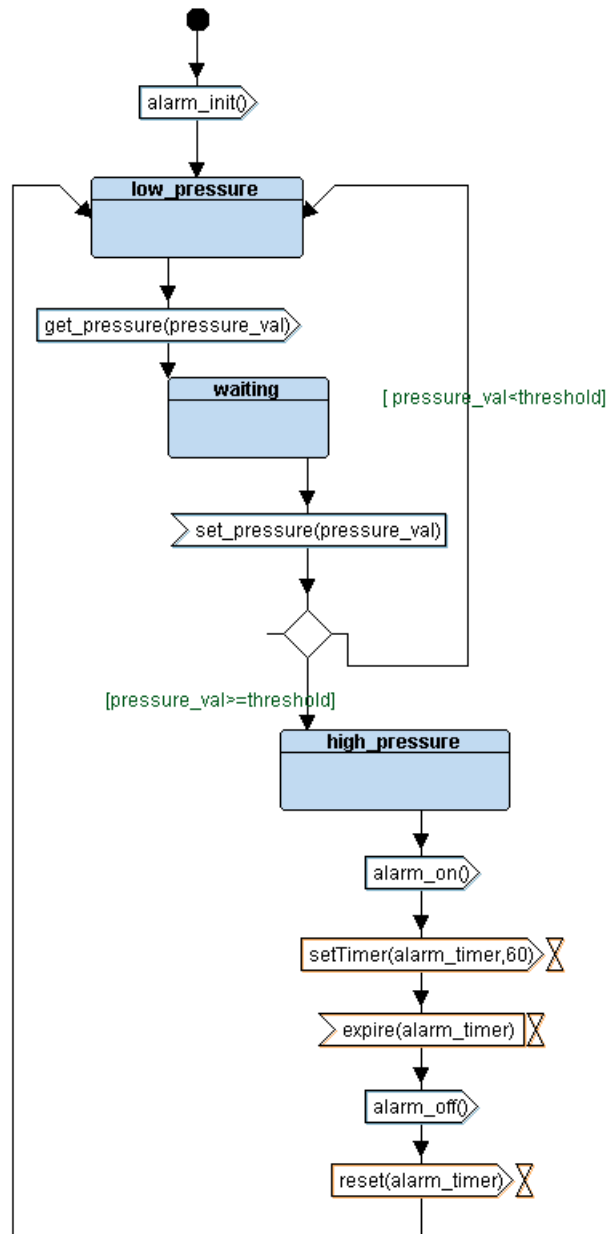


Figure 8.2 alarm manger implementing logic

8.3 Alarm driver implementing logic:

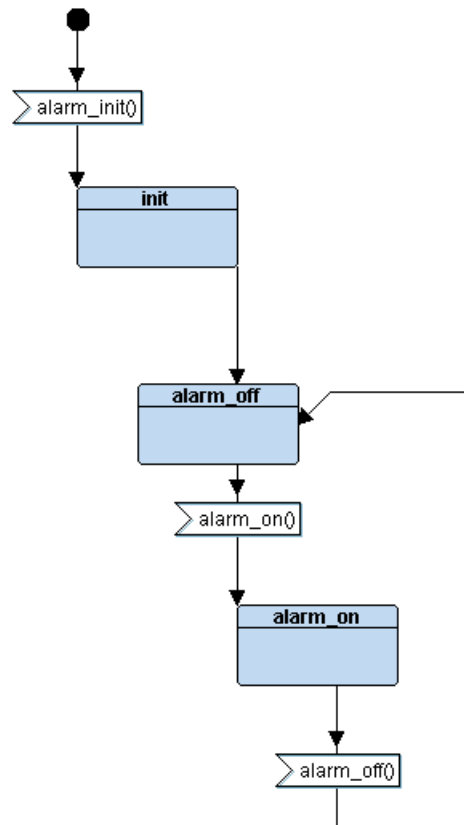


Figure 8.3 alarm driver implementing logic

8.4 Virtual pressure sensor driver

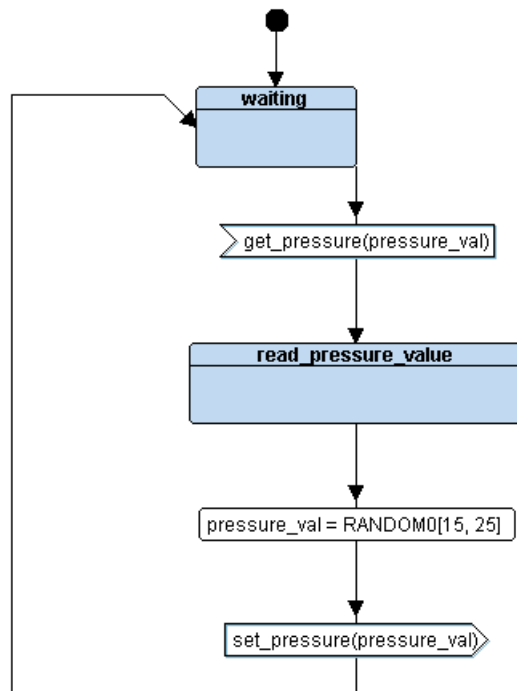


Figure 8.4 virtual pressure sensor driver implementing logic

8.5 Flash memory driver

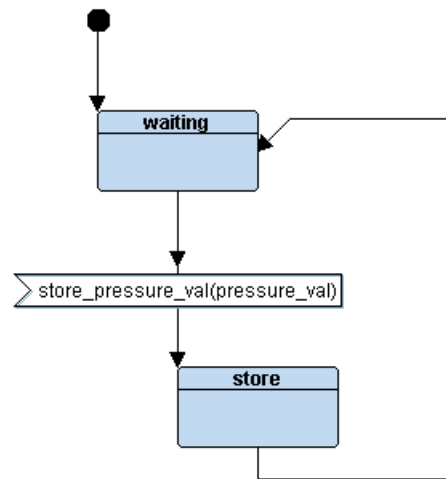


Figure 8.5 flash memory driver implementing logic

9 Logic verification

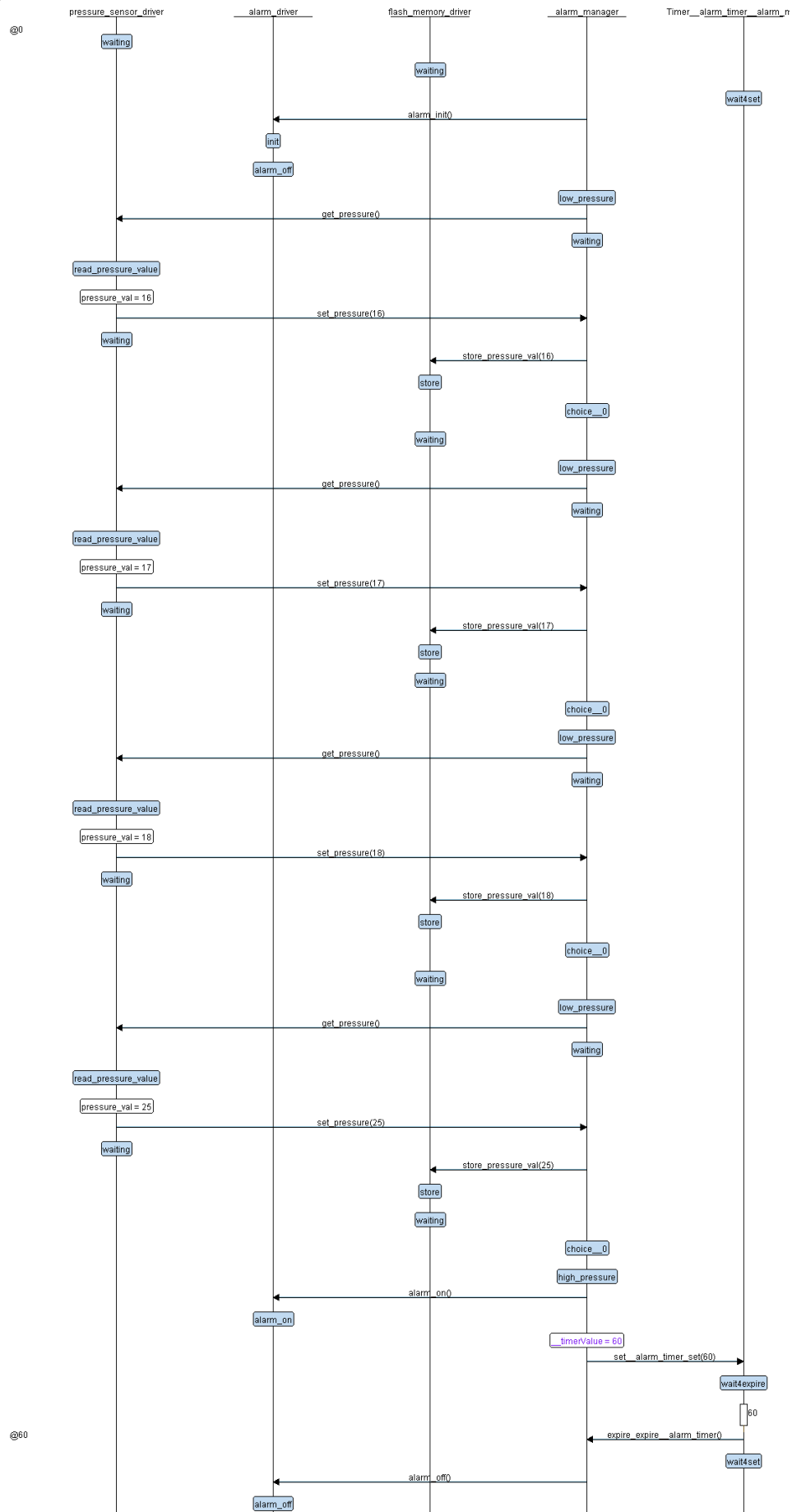


Figure 9.1 logic verification