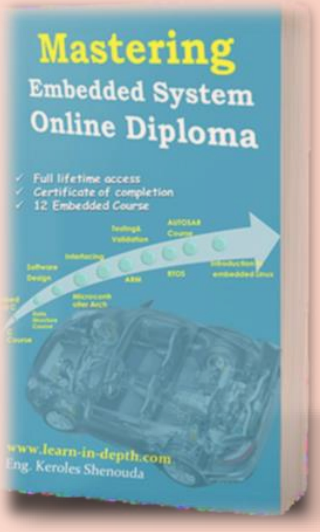

Term 1 Project 1

Pressure Detection System

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1. Case Study

- A client expects a software for a system with the following specifications:
  - A pressure controller that informs the cabin's crew with an alarm when the pressure exceeds a pre-defined value of 20 bars.
  - The alarm duration is 60 seconds.

- Assumptions:
  - The controller startup and shutdown procedures are not modeled.
  - The controller maintenance is not modeled.
  - **The pressure sensor never fails.**
  - The alarm never fails.
  - The controller never faces power cut.

2. Methodology

❖ Waterfall Method has been chosen for its simplicity.

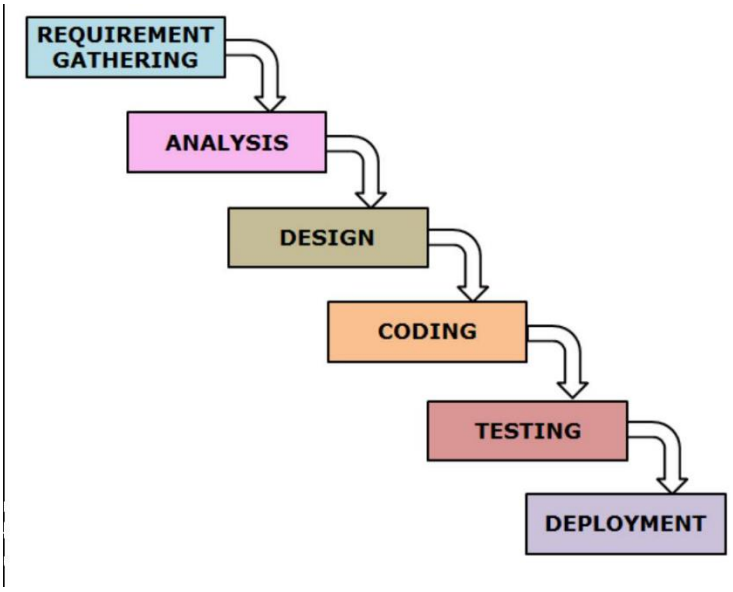

Figure (1) Waterfall Model

3. System Requirements

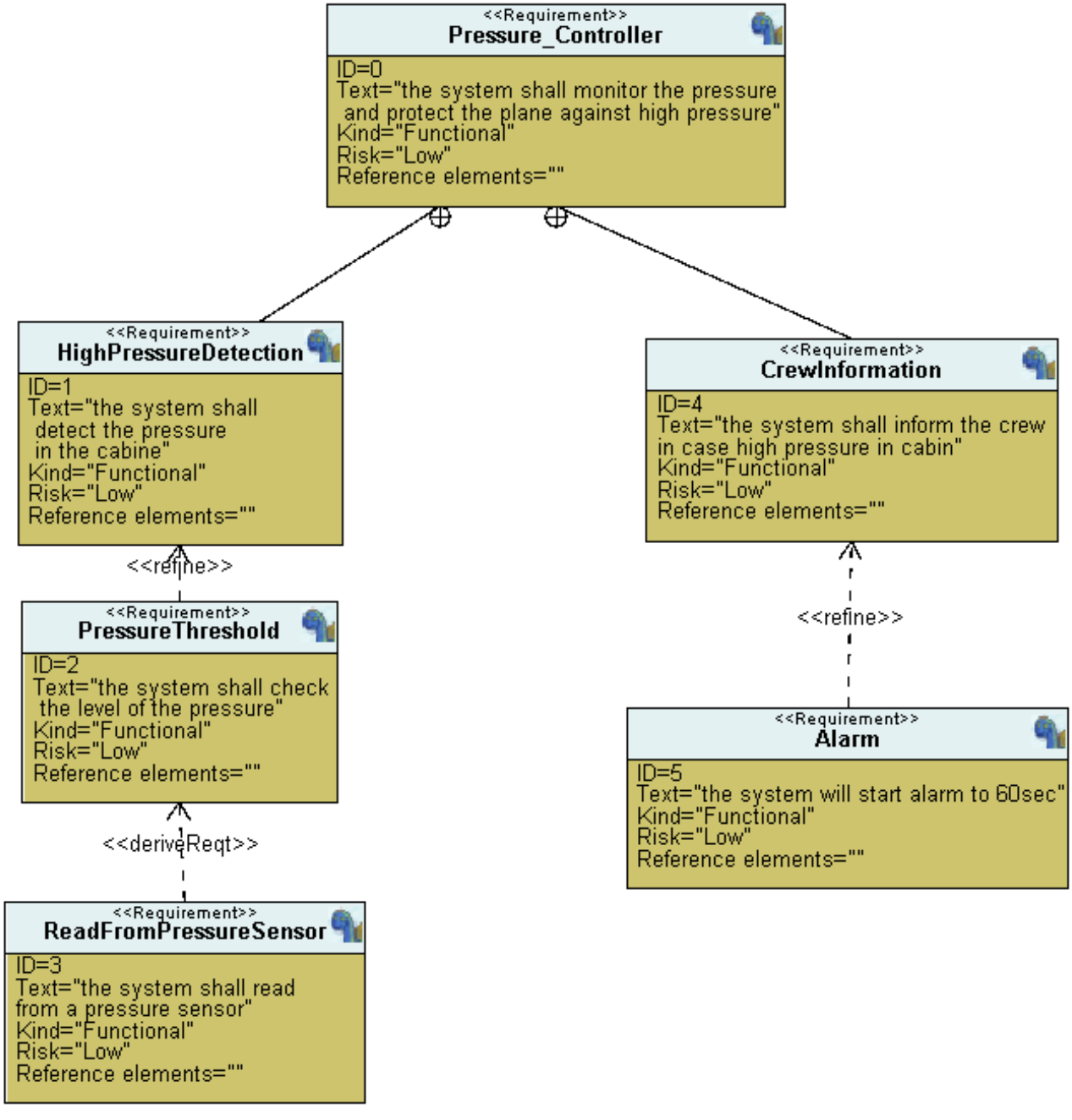

Figure (2) Requirements Diagram

4. System Analysis

✓ UML Use Case Diagram:

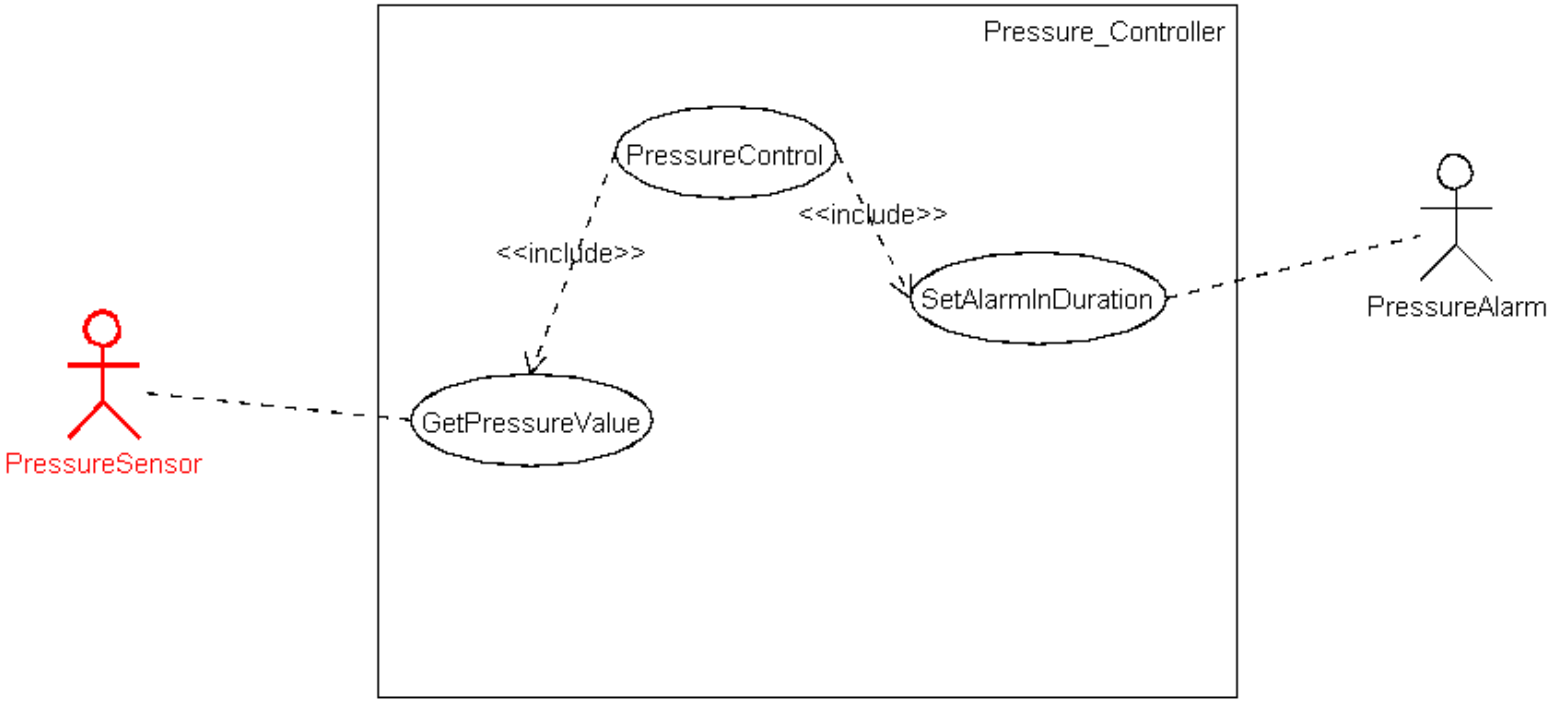

Figure (3) UML Use Case Diagram

✓ UML Activity Diagram

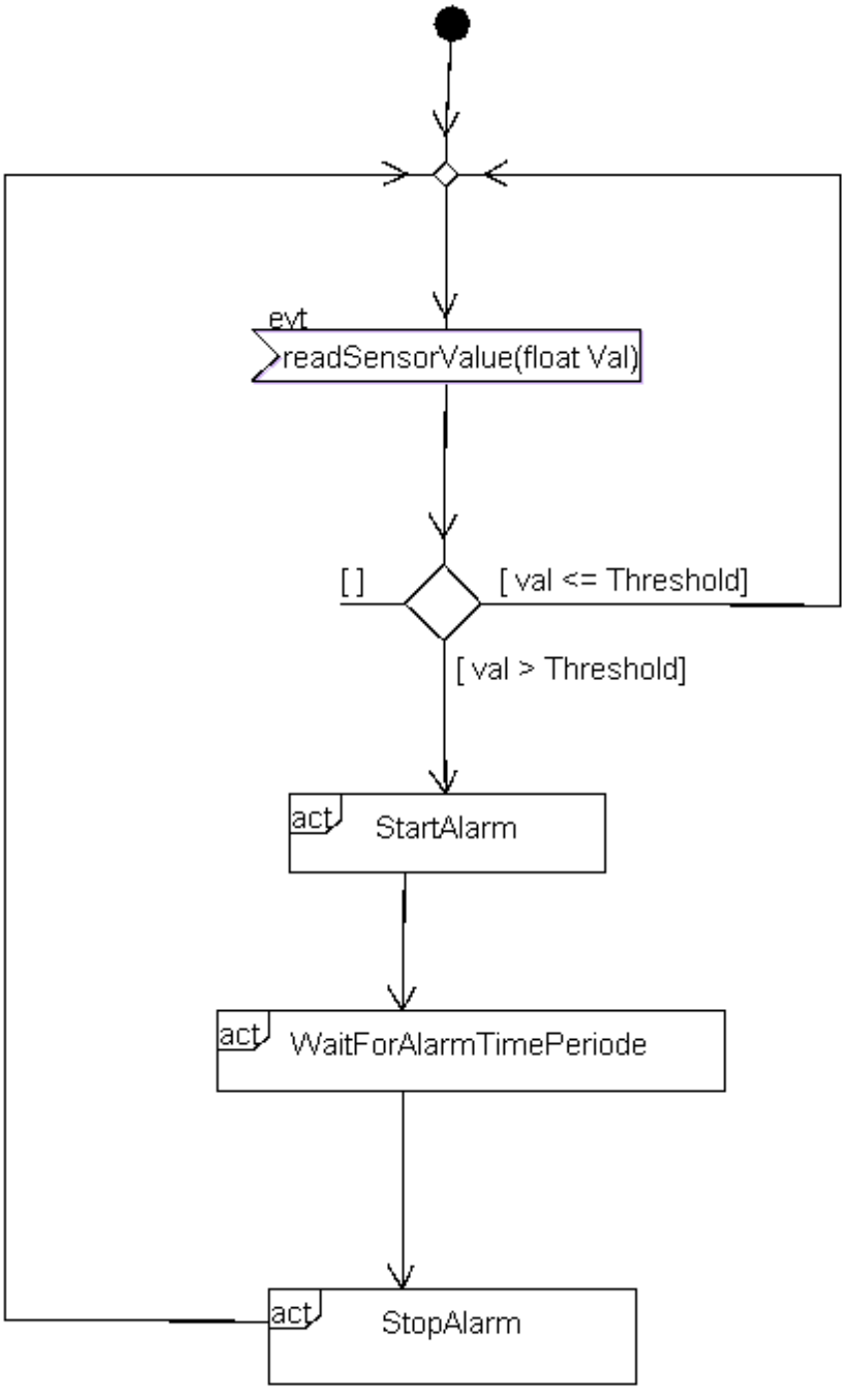

Figure (4) UML Activity Diagram

✓ UML Sequence Diagram

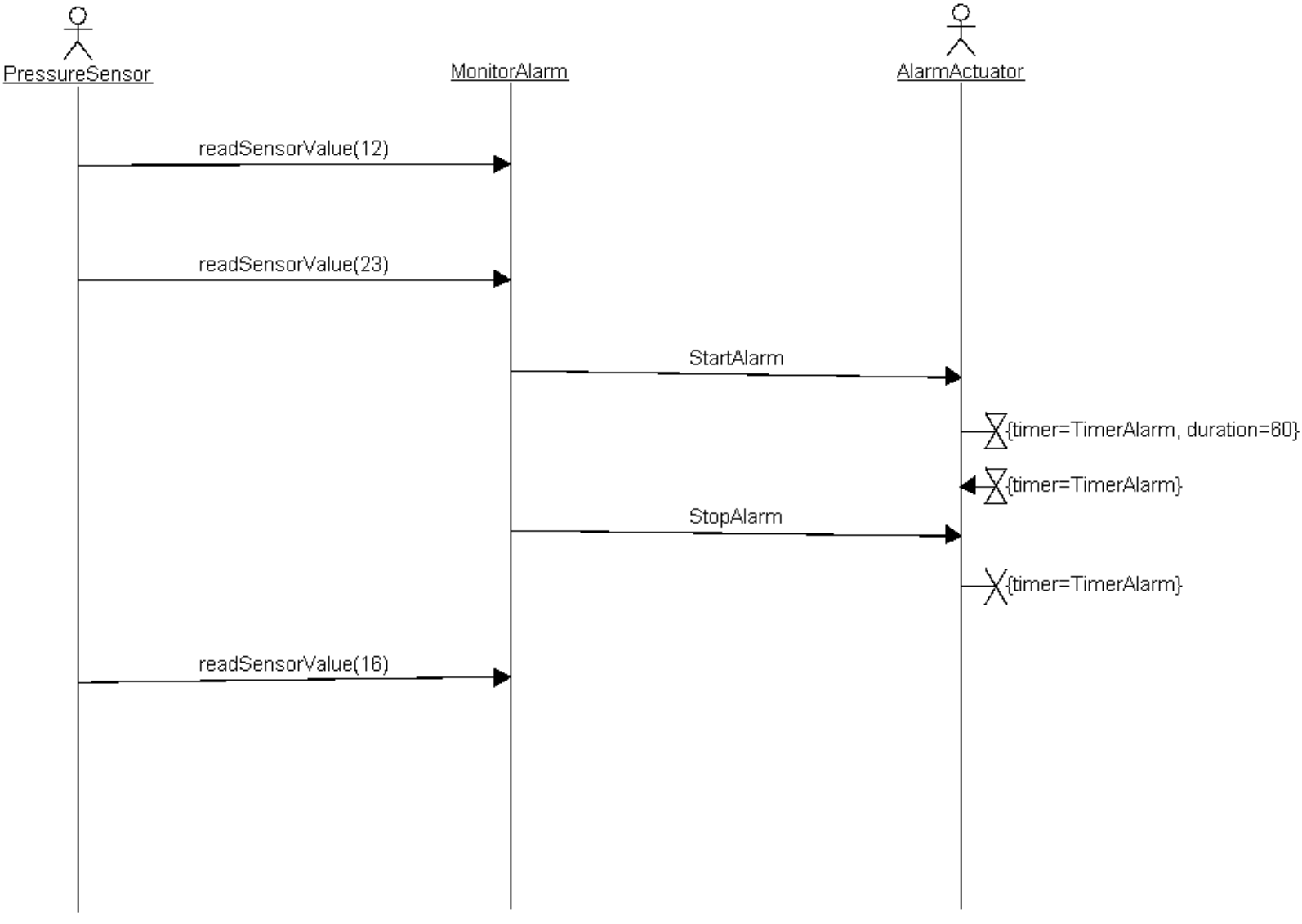

Figure (5) UML Sequence Diagram

5. System Design

✓ UML Class Diagram

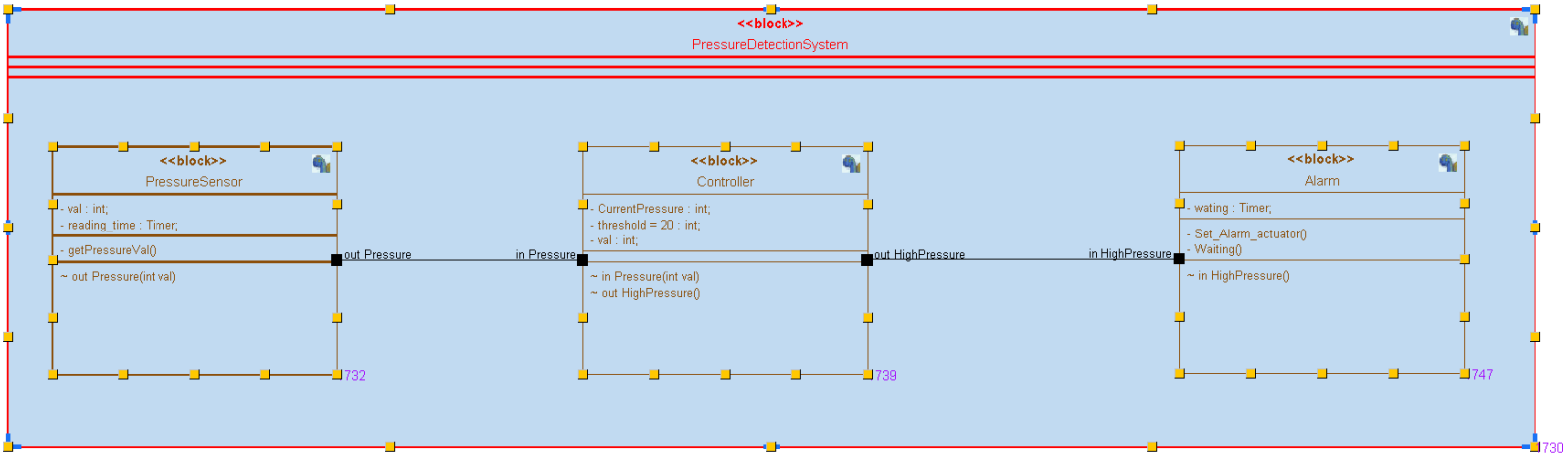

Figure (6) UML Class Diagram

✓ UML State Diagrams:

- ➢ Pressure sensor Block State Diagram

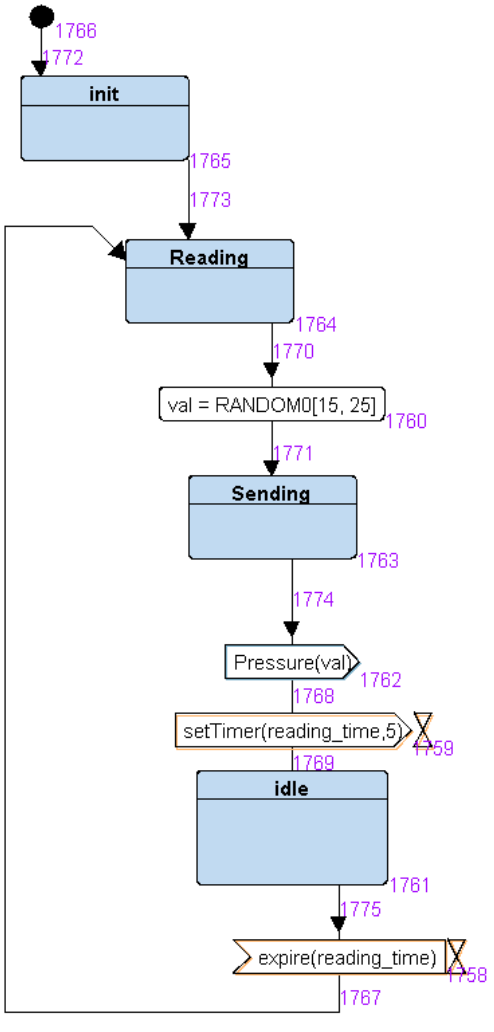

Figure (7) Pressure sensor Block State Diagram

➢ Controller Block State Diagram

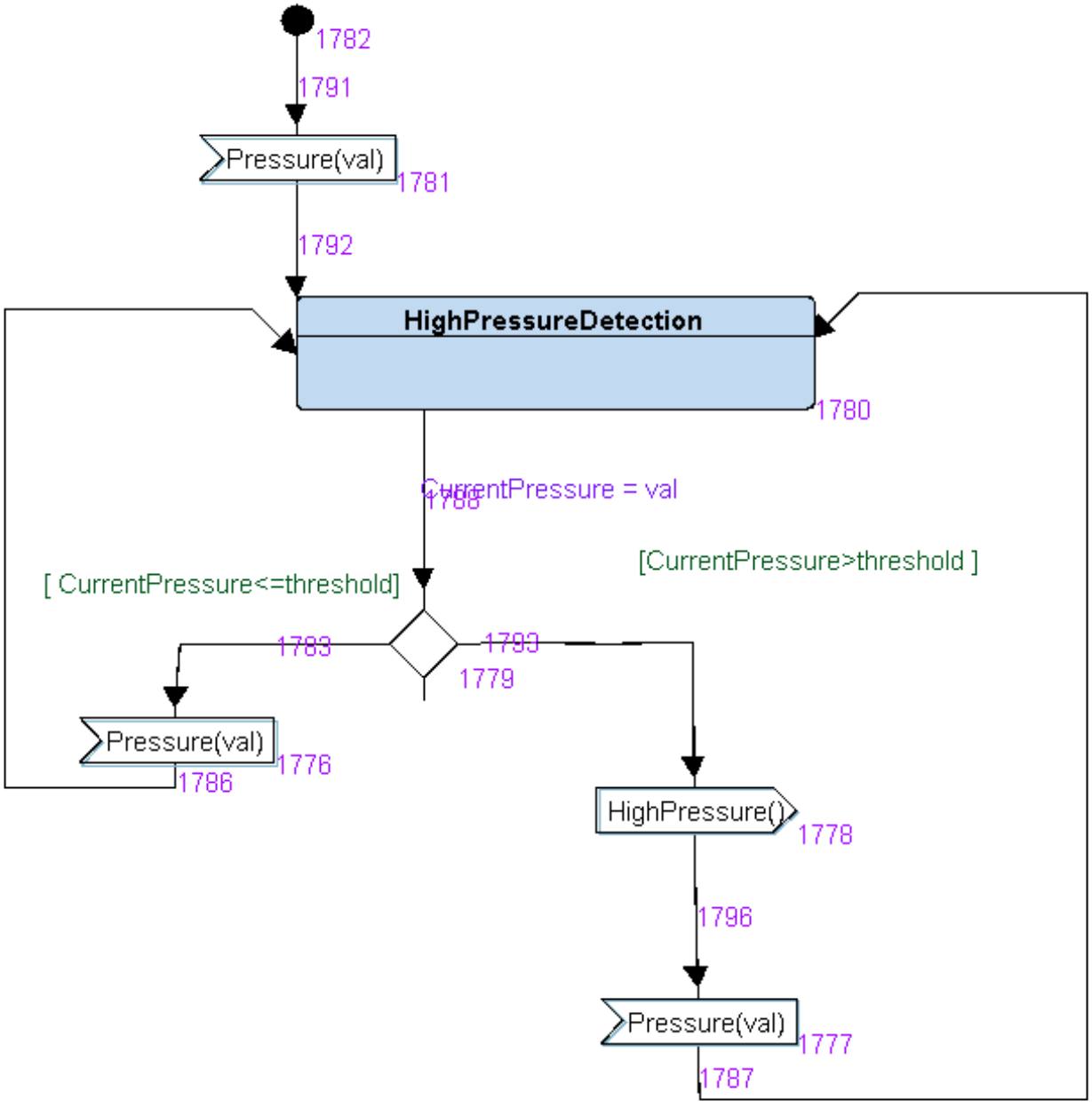

Figure (8) Controller Block State Diagram

➢ Alarm Block State Diagram

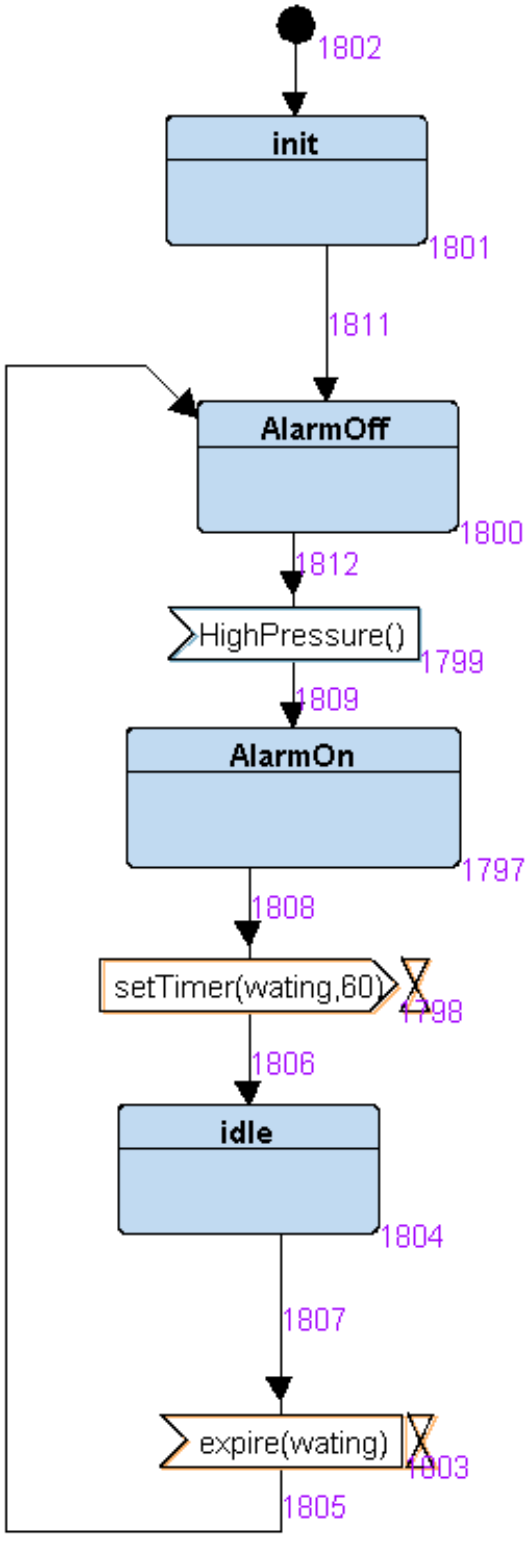

Figure (9) Alarm Block State Diagram

✓ Simulated UML Sequence Diagram

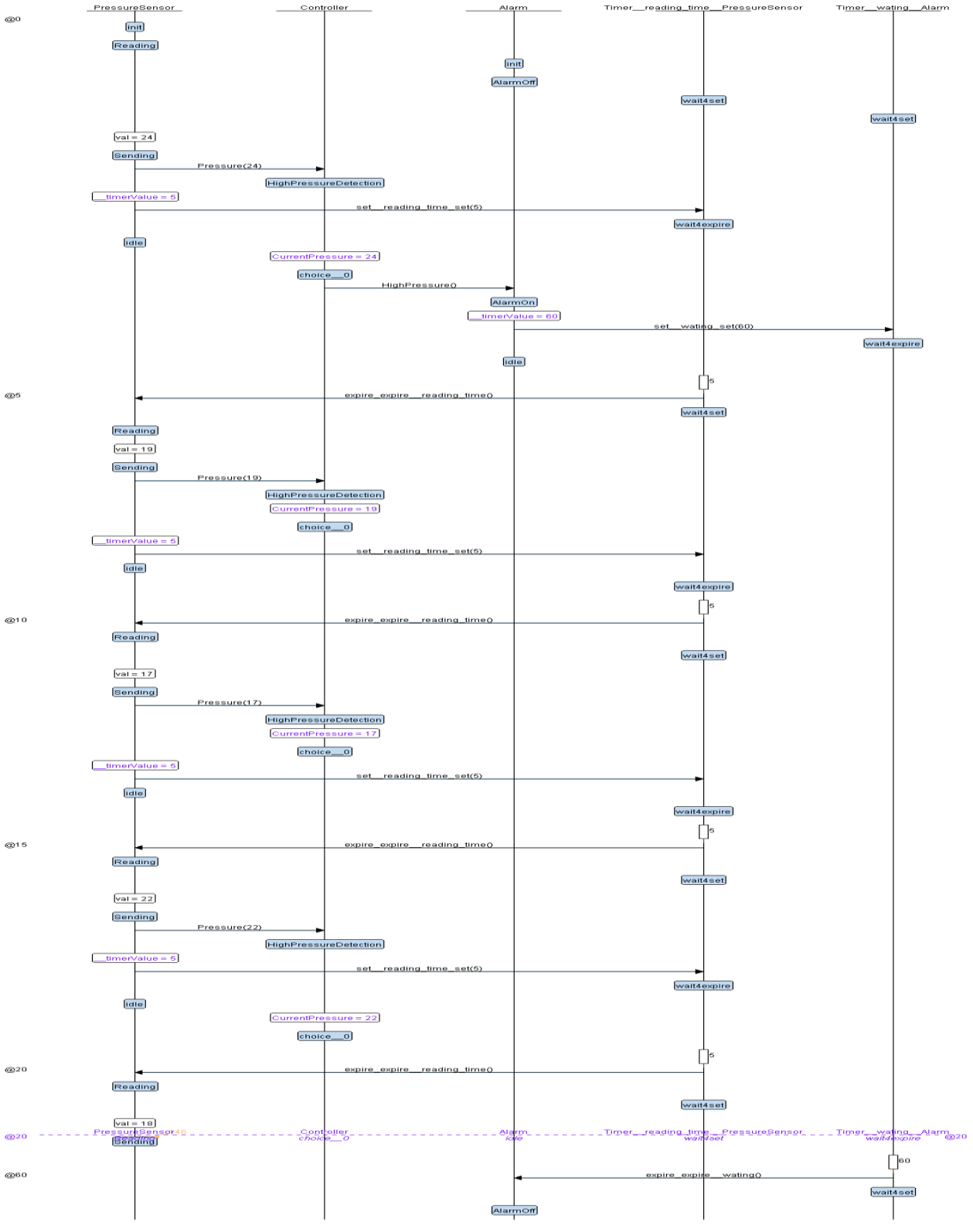

Figure (10) Simulated UML Sequence Diagram

6. Proteus Simulation

➢ Pressure Sensor Reading simulation

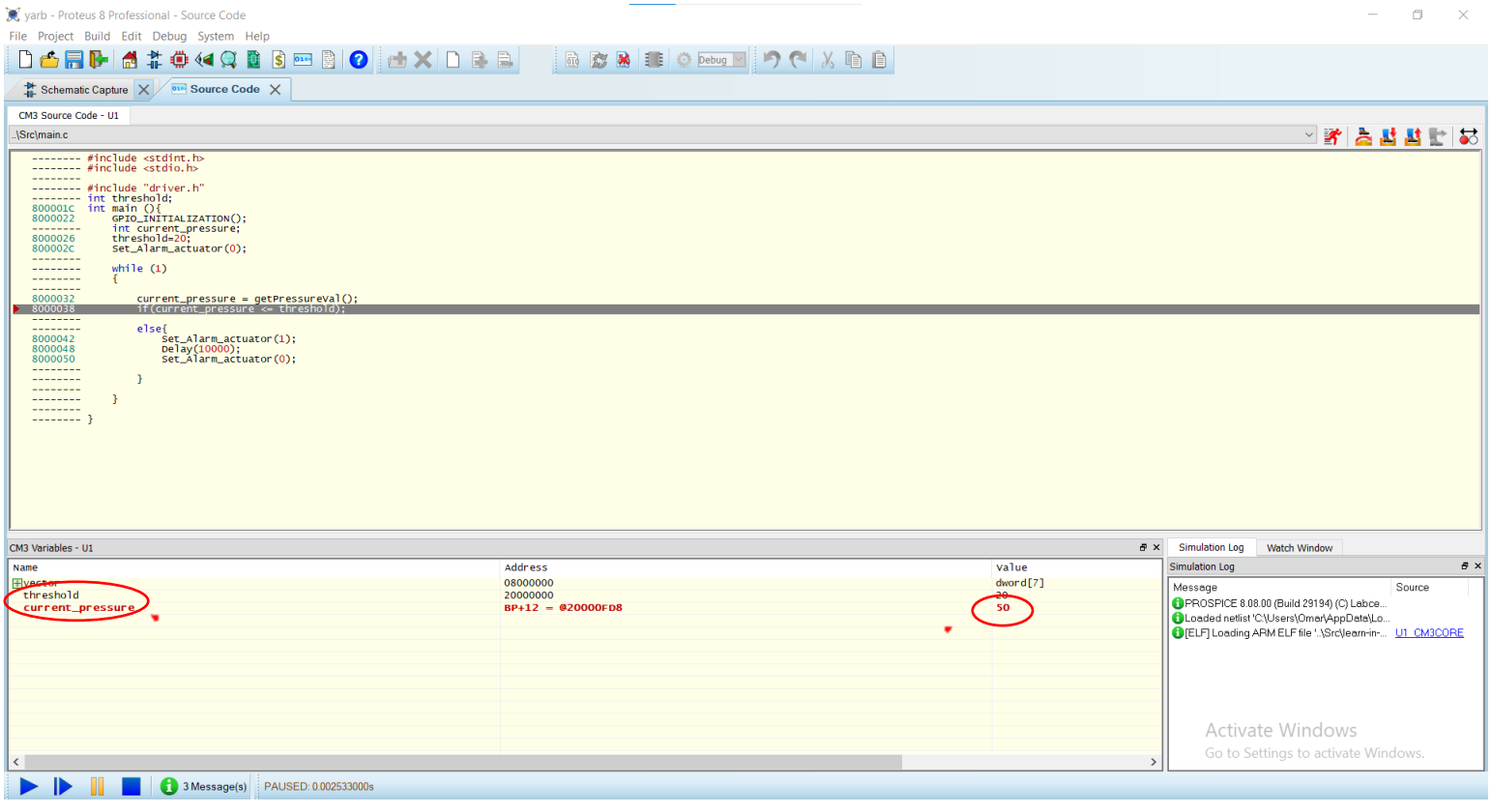

Figure (11) Pressure sensor Reading simulation.

➢ Alarm On Simulation

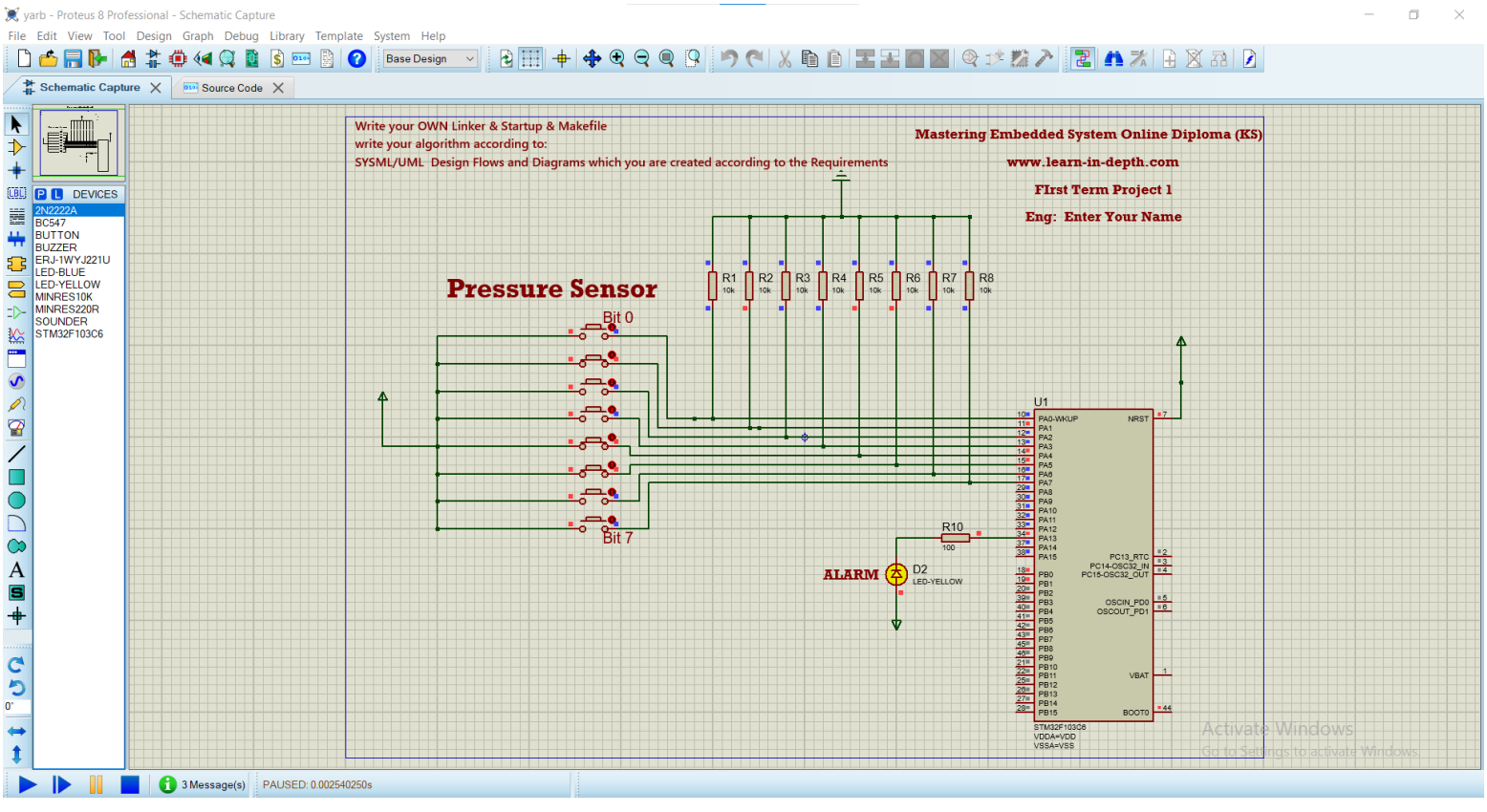

Figure (12) Alarm On Simulation

➢ Waiting for Alarm Duration

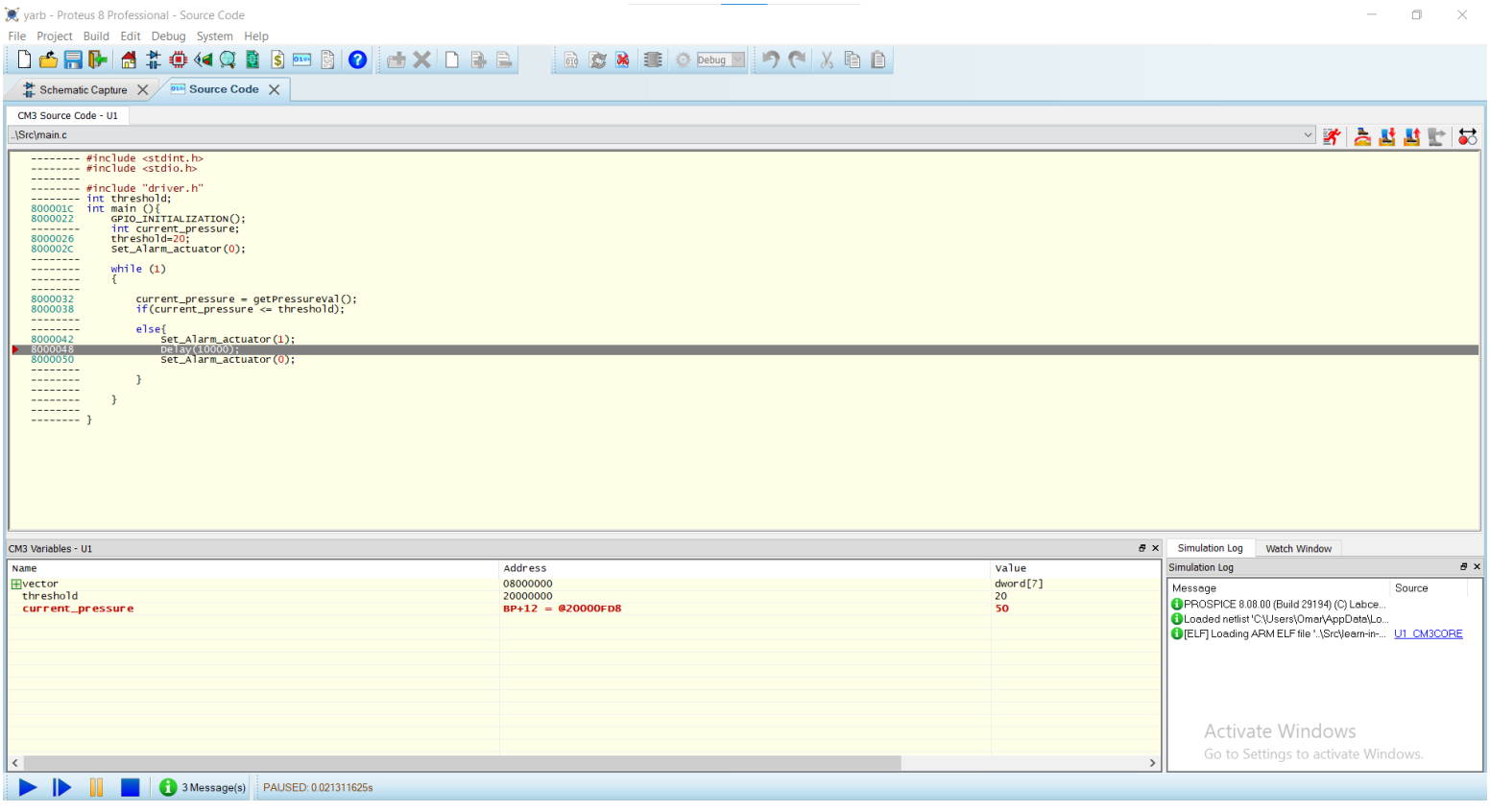

Figure (13) Waiting for Alarm Duration

➢ Alarm Off After Duration (Simulation)

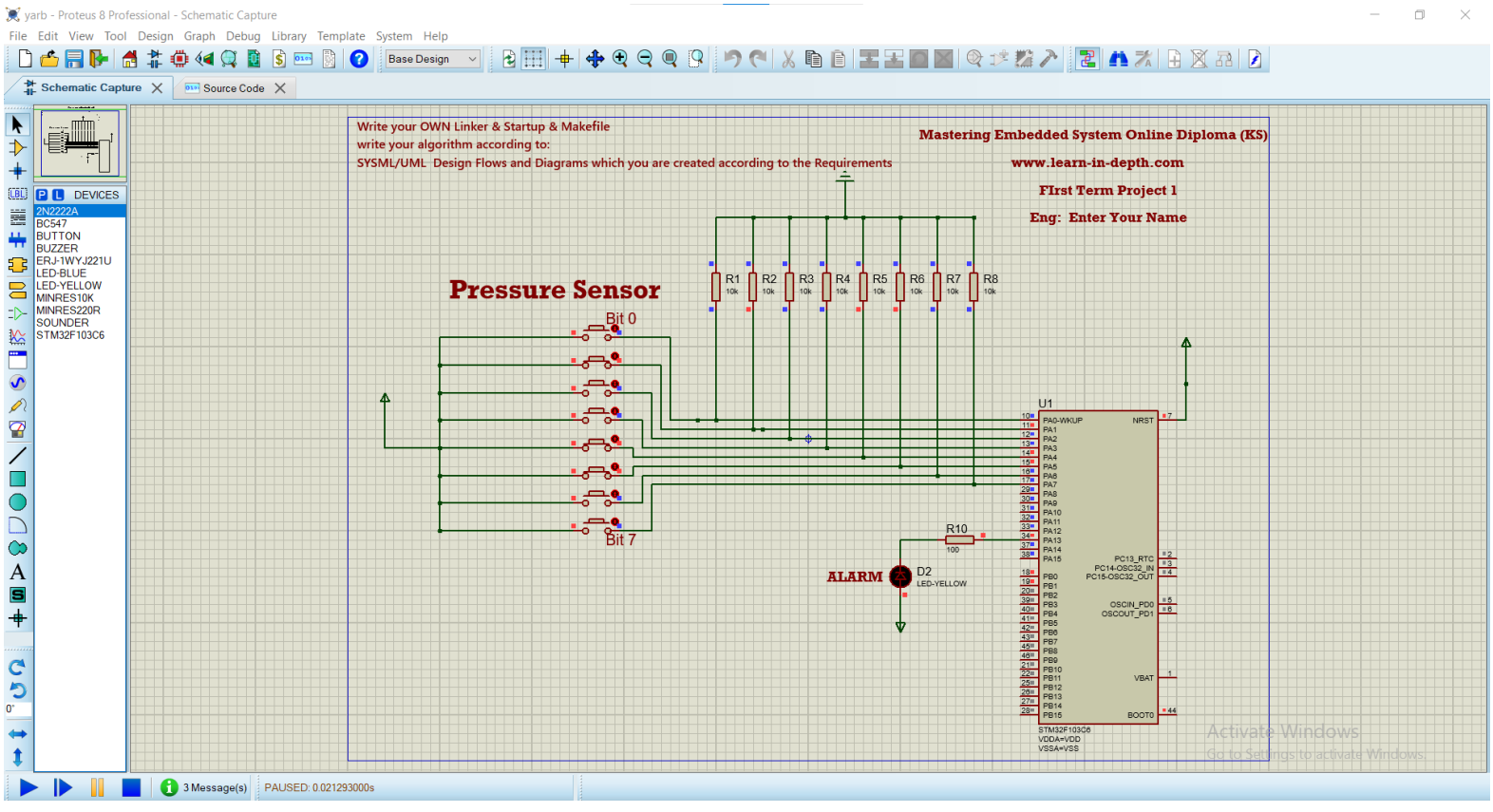

Figure (14) Alarm Off After Duration (Simulation)

7. Links

❖ GitHub repository:

https://github.com/Omarshraf/Mastering-Embedded-system-diploma

❖ Google Drive:

https://drive.google.com/drive/folders/1nFKbCSfA6HO3gxWb7gHA_-mJ96wSZw69

❖ Learn in depth progress page:

https://www.learn-in-depth.com/online-diploma/oa509952%40gmail.com

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