

Deliverable 1

Inputs

- turn on/turn off button (B1)
- increase power button (B2)
- decrease power button (B3)
- presence sensor (P)

Outputs

- Status led (L1)
- Error led (L2)
- Power led (L3)

Notes

We assume that pressing again B2 or B3 while in the 5 seconds time window updates the new power and resets the 5 second timer. While for B2 and B3 it is stated that the pressing time must be at least 1 second, we will assume that also B1 has a smaller but non zero debouncing time.

Use Cases

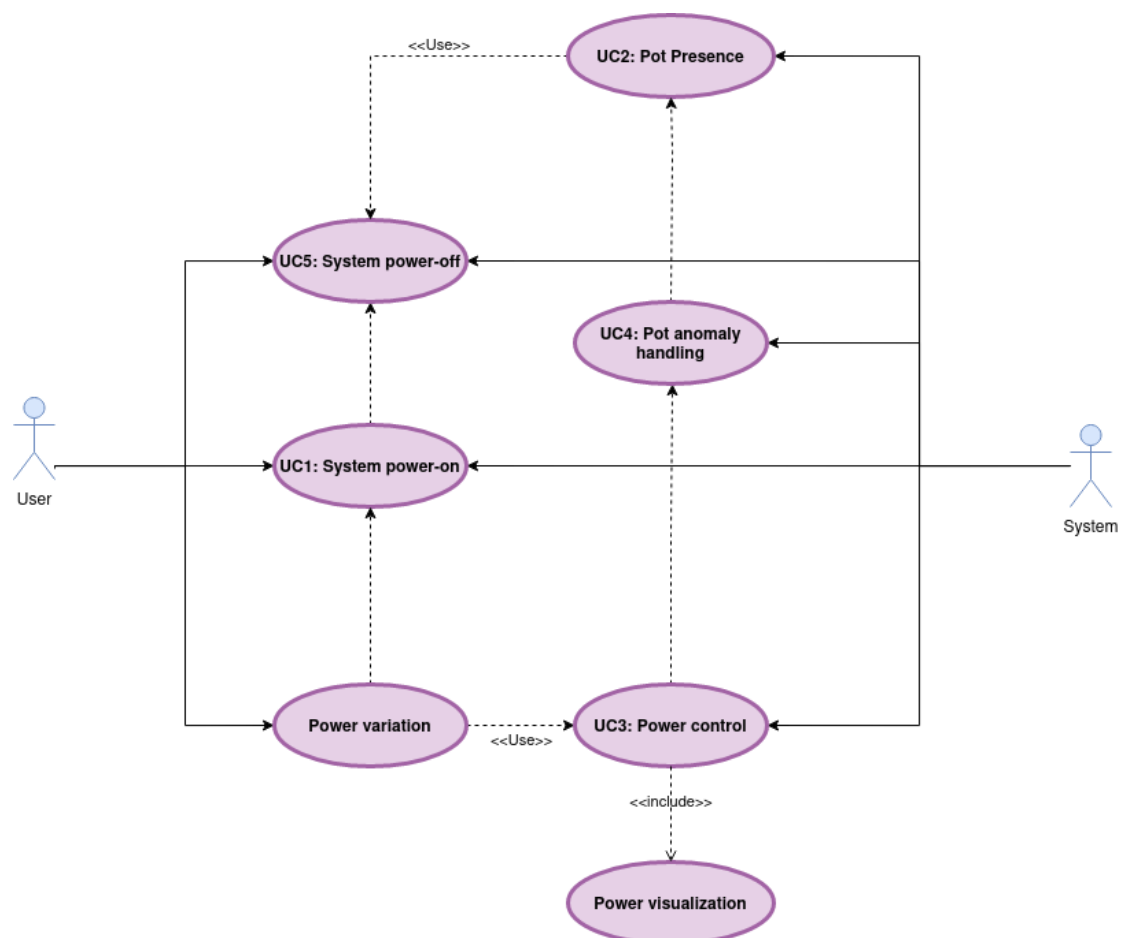


Figure 1: Use Case Diagram

UC1: System Power-on

- **Entry condition:** The system is powered off.
- **Description**
 - User presses B1.
- **Exit condition:** The system is powered on. L1 on.

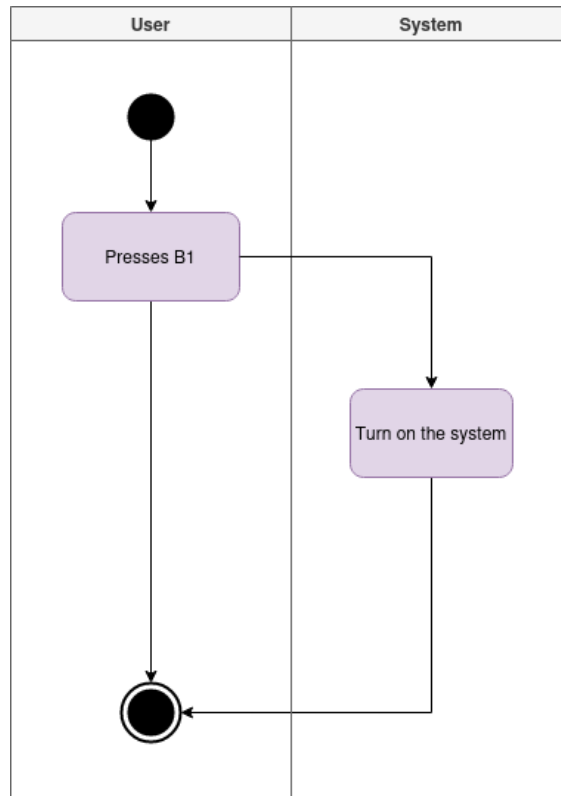


Figure 2: UC1 Activity Diagram

UC2: Pot Presence

- **Entry condition.** The system is on but there is no pot.
- **Description**
 - User presses B2.
- **Exit condition:** The system is on but without delivering power. L1 on.

UC3: Power control

- **Entry condition:** The system is on and there is a pot on the stove.
- **Description**
 - User presses B2
 - User waits for at least 5 seconds
- **Exit condition:** The system is on at 300W power. L1 is on. L3 blinks with a period of 2s.

UC3.1: Power control

- **Entry condition:** The system is on and delivering 300W.
- **Description**
 - User presses B2
 - User waits for at least 5 seconds
- **Exit condition:** The system is on at 500W power. L1 is on. L3 blinks with a period of 1s.

UC3.2: Power control

- **Entry condition:** The system is on and delivering 300W.
- **Description:**
 - User presses B2.
 - User presses B2 immediately after.
 - User waits 5 seconds.
- **Exit condition:** The system is on and delivering 1000W. L1 is on. L3 blinks with a period of 500ms.

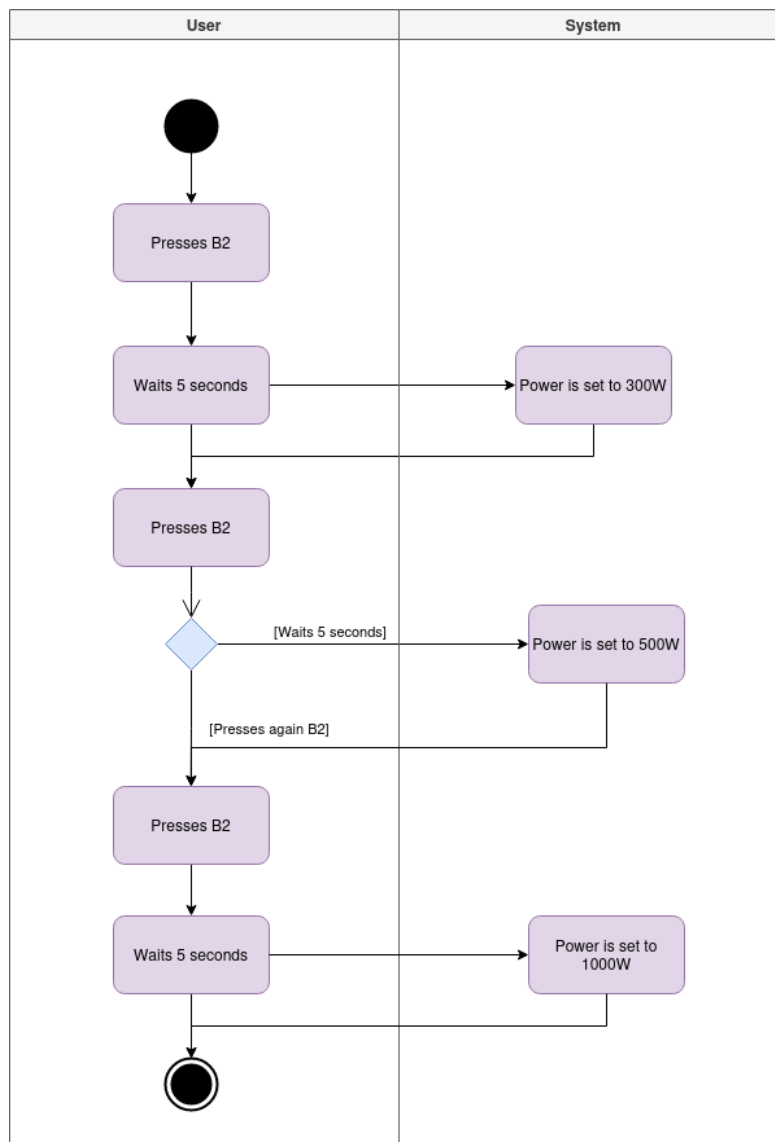


Figure 3: UC3, UC3.1, UC3.2 Activity Diagram

UC3.3: Power control

- **Entry condition:** The system is on and delivering 300W.
- **Description:**
 - User presses B2.
 - User waits 5 seconds.
 - User presses B3.
- **Exit condition:** The system is on and delivering 300W. L1 is on. L3 blinks with a period of 2s.

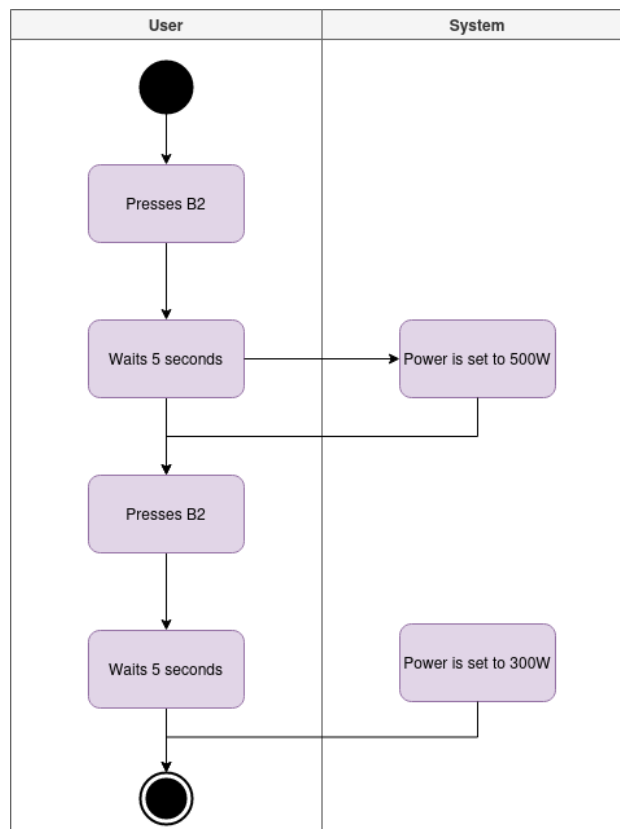


Figure 4: UC3.3 Activity Diagram

UC3.4: Power control

- **Entry condition:** The system is on and delivering 1500W.
- **Description:**
 - User presses B2.
 - User waits at least 5 seconds.
- **Exit condition:** The system is on at 1500W. L1 is on. L3 blinks with a period of 250ms.

UC3.5: Power control

- **Entry condition.** The system is on and delivering 300W.
- **Description:**
 - User presses B3.
 - User waits at least 5 seconds.
- **Exit condition:** The system is on but it is not delivering power. L1 is on. L3 is turned off.

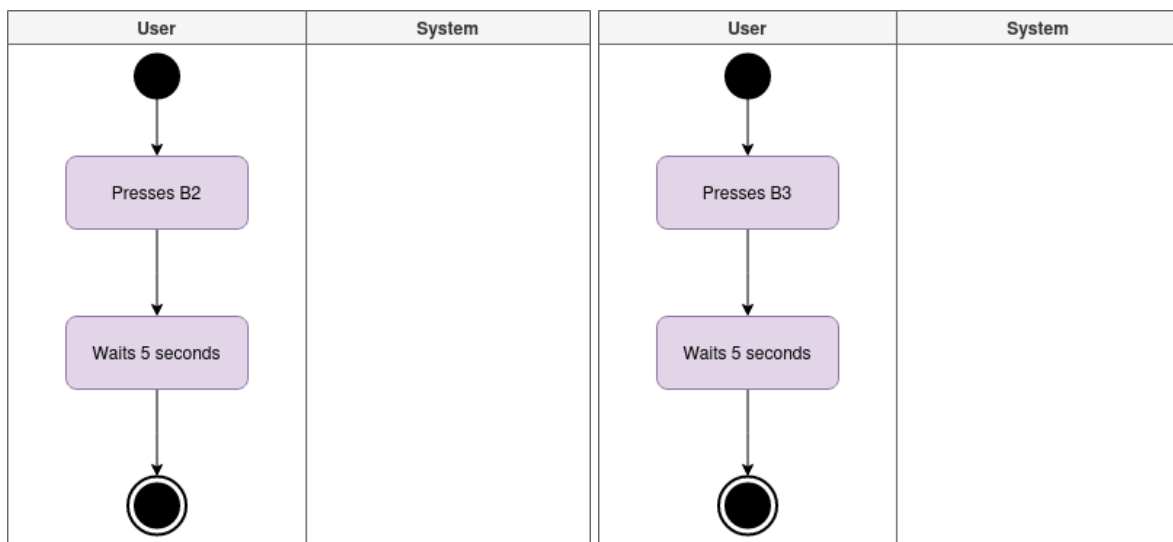


Figure 5: (a) UC3.4 Activity Diagram (b) UC3.5 Activity Diagram

UC 4: Pot anomaly handling

- **Entry condition:** The system is on and delivering more than 0W.
- **Description**
 - User removes the pot from the stove
 - User replaces the pot on the stove after 1 seconds
- **Exit condition:** The system is on and delivering the same power as before. L1 is on. L3 blinks.

UC4.1: Pot anomaly handling

- **Entry condition:** The system is on and delivering more than 0W.
- **Description**
 - User removes the pot from the stove
 - User waits for at least 10 seconds.
- **Exit condition:** The system is on but delivering no power. L1 is on. L3 is turned off.

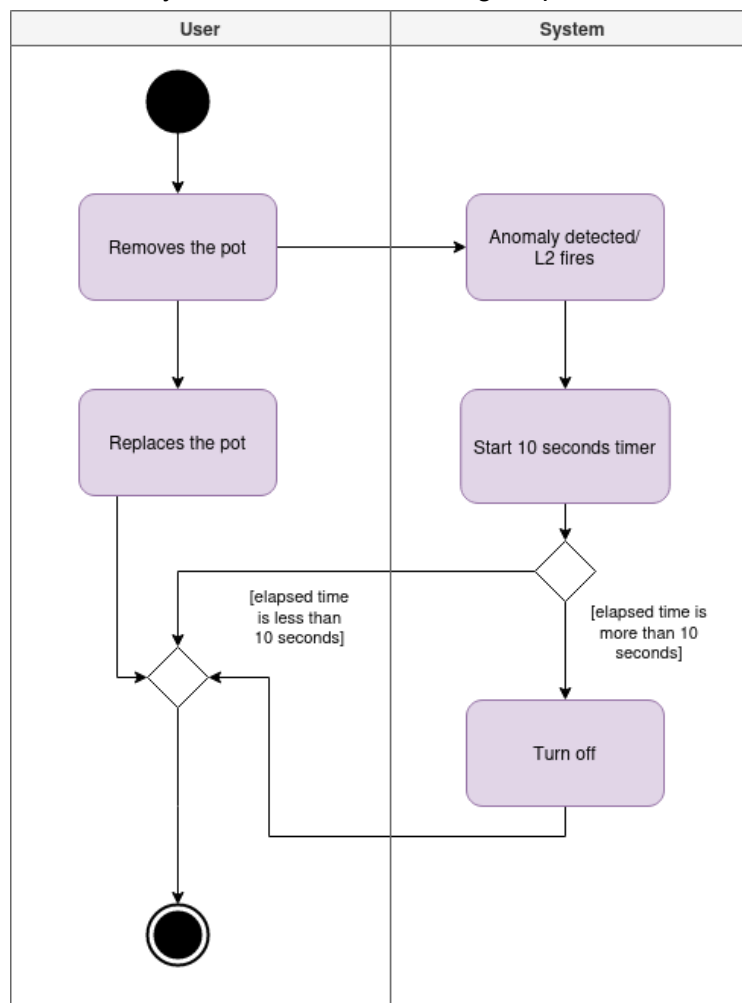


Figure 6: UC4, UC4.1 Activity Diagram

UC5: System Power-off

- **Entry condition:** The system is on.
- **Description**
 - User presses B1 for at least 1 second.
- **Exit condition:** The system is turned off.

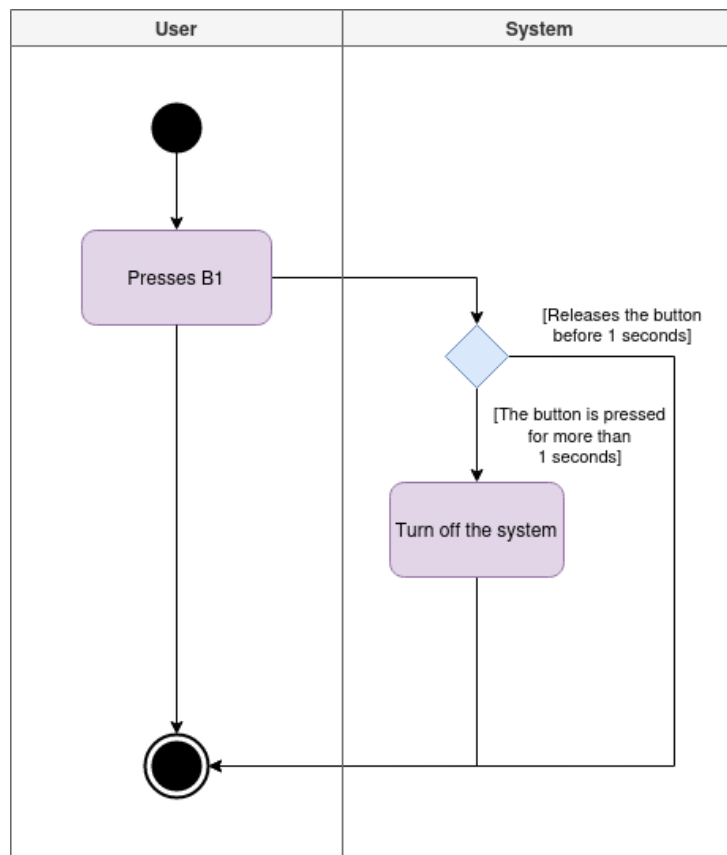


Figure 7: UC5 Activity Diagram

State Diagram

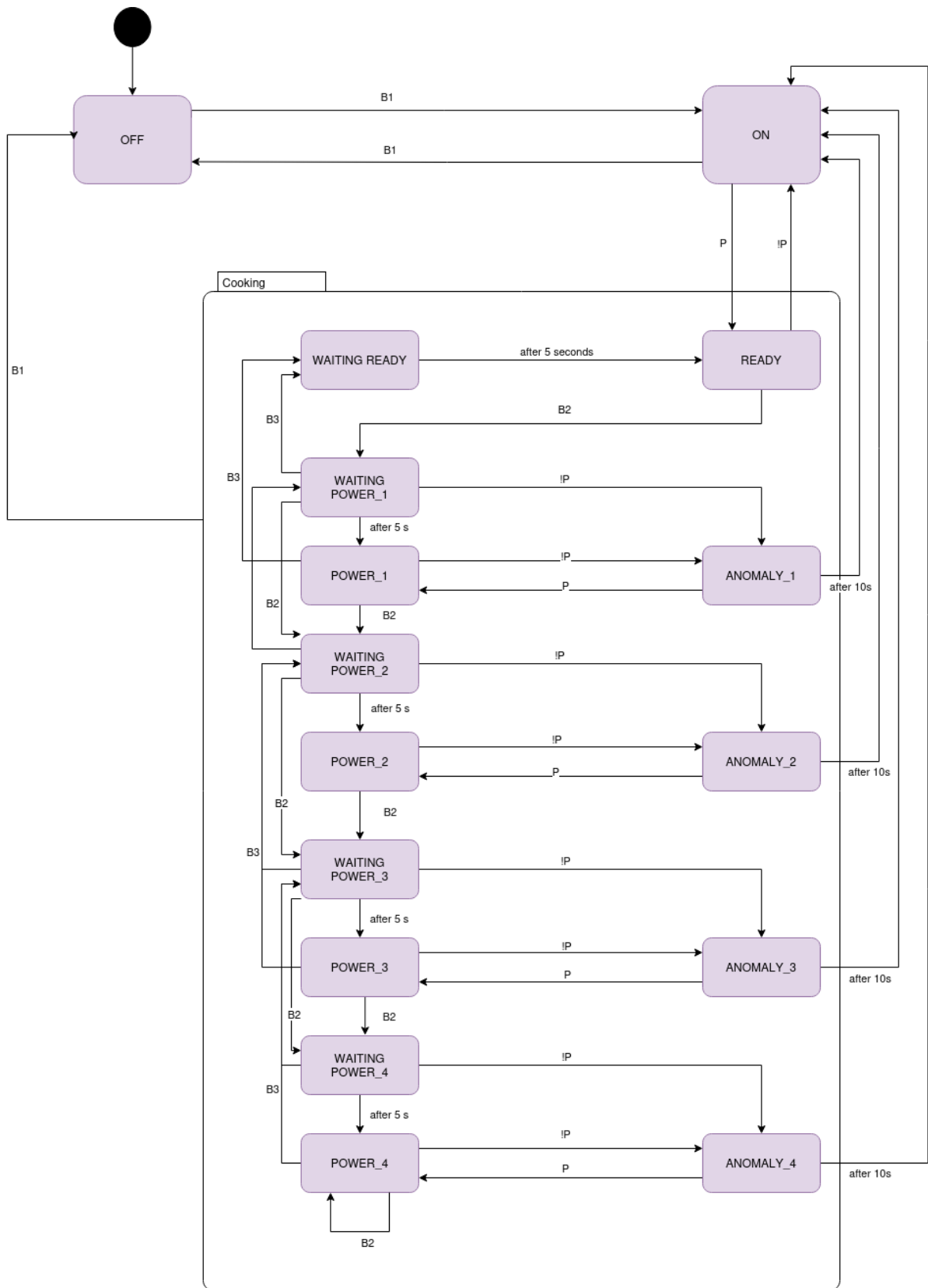


Figure 8: State Machine Diagram

For graphic reasons, outputs are omitted from the state machine diagram and listed here:

- while transitioning from OFF to the ON state, L1 is turned on.
- while transitioning from any state to the OFF state, L1, L2 and L3 are turned off.
- while transitioning from a WAITING_POWER_X state to POWER_X, L3 starts to blink at the frequency given in the requirements.
- while transitioning from a WAITING_POWER_X or POWER_X state to ANOMALY_X state, L2 is turned on and L3 is turned off.
- while transitioning from an ANOMALY_X state to a POWER_X state, L2 is turned off and L3 starts to blink at the frequency given in the requirements.
- while transitioning from READY to POWER1, L3 starts to blink with a period of 2 seconds.
- while transitioning from WAITING_READY to READY, L3 is turned off.

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Time spent 9h