

## REPORT BY:

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## IMPORTANT NOTES AND ASSUMPTIONS:

- The potentiometer value ranges from 0 to 1023. Corresponding to that, the external light values displayed on the LCD also ranges from 0 to 1023.
- The slider value ranges from 0 to 555. Corresponding to that, the speed values displayed on the LCD also ranges from 0 to 555.
- The speed limit is 300.
- Task "ENGINE" is used to read the status of engine, and print it on LCD. It sets an event flag for task "ALARM", if the necessary conditions are satisfied.
- Task "DOOR" is used to read the status of door, and print it on LCD.
- The alarm for "exceeding speed limit", and "engine on while door open", uses LEDs [6:7]. Alarm stays on, if any one or both of them are true.
- The blinking period for alarm is 150 ms.
- Task 5 and Task 6(alarm), communicate using event flag.
- The 5 different levels of brightness are created according to the following potentiometer value range:
  - 0-204: Level 5 max brightness. Duty cycle percentage - 100
  - 204-408: Level 4 brightness. Duty cycle percentage - 80
  - 408-612: Level 3 brightness. Duty cycle percentage - 60
  - 612-816: Level 2 brightness. Duty cycle percentage - 40
  - 816-1023: Level 1 brightness. Duty cycle percentage - 20
- The priorities and task periods are as follows. (Lower number indicates lower priority.)
  - Task 1: Priority 10. Period 10 ms.
  - Task 2: Priority 20. Waits for 100 ms when it starts. During continuous run, there is no explicit wait used. Synchronized using os\_mbx\_wait. Sets event flag for task 4.
  - Task 3: Priority 5. The wait period depends on duty cycle computed.
  - Task 4: Priority 20. Synchronized using event flag set from task 2. And mutex for LCD write.
  - Task 5: Priority 20. Waits for 100 ms when it starts. During continuous run, there is no explicit wait used. Synchronized using os\_mbx\_wait. And mutex for LCD write. Also sets event flag for task 6.
  - Task 6: Priority 5. Blinking period is 150 ms. Synchronized using event flag set from task 5.
  - Task ENGINE: Priority 5. Period 5 ms. Sets event flag for task ALARM.
  - Task DOOR: Priority 5. Period 5 ms.
  - Task ALARM: Priority 5. Blink period is 150 ms. Synchronized using event flag from task ENGINE.
- The engine and door status is displayed on the right side of LCD as follows:
  - E:ON – engine on
  - E:OFF – engine off
  - D:OP – door open
  - D:CL – door closed
- Speed and light values can be changed, regardless of engine and door status, and vice versa.