

# **(PROJECT 3 DEMO): FLESHING OUT THE STUBS**

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**REV: 19 Jan 2021**

**Reviewer:** \_\_\_\_\_

**Score (of out 150 pts):** \_\_\_\_\_

**Group Members:**

**1.** \_\_\_\_\_

**2.** \_\_\_\_\_

**3.** \_\_\_\_\_

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## **1.0 COMPILE, LOAD, AND EXECUTE CODE ON ATMEGA (5 PTS)**

## **2.0 TASK QUEUE (10 PTS)**

Doubly linked list: How implemented and integrated?

## **3.0 SCHEDULER (25 PTS)**

How implemented & integrated?

Time base management

- How was hardware timer implemented for scheduling?
- Show main task loop runs at 0.1 sec intervals – i.e. all tasks from task queue execute with a 0.1 sec period
- Show how the global time base for 0.1 sec main task was accomplished

## **4.0 MEASUREMENT TASK (20 PTS)**

Show (1) HV Current, (2) HV Voltage, and (3) temperature measurements changing on the display screen using the analog input simulation circuit's potentiometer.

## **5.0 ALARM & DISPLAY TASK (50 PTS)**

Explain the state machine for each of the alarms: (1) HVIL, (2) HVIL Interrupt, (3) Overcurrent, and (4) Voltage out of range.... how does the display communicate alarm acknowledgement to the alarm task?

Show that the alarms for (1) Overcurrent and (2) Voltage out of range appear on the display screen in state “ACTIVE, NOT ACKNOWLEDGED” using the analog input simulation circuit's potentiometer input to adjust their values to trigger the alarm.

Show that the display automatically navigates to the **alarm screen** when the alarms are set and cannot be navigated away from until alarms are acknowledged.

Show that the alarms can be acknowledged on the alarm screen, i.e. they change state to “ACTIVE, ACKNOWLEDGED” from “ACTIVE, NOT ACKNOWLEDGED”

Show that the alarms can transition to “NOT ACTIVE” from both the “ACTIVE, ACKNOWLEDGED” and “ACTIVE, NOT ACKNOWLEDGED” states

## 6.0 CONTACTOR AND HVIL INTERRUPT TASK (40 PTS)

Explain the state machine used for the contactor task including information about the HVIL interrupt alarm

Explain whether or not your contactor task has a critical code section..

- If the contactor task does have a critical section, explain how you made this section of code non-preemptable

Close the contactors using the display’s Battery ON/OFF screen and **then** show that opening the circuit for the HVIL input triggers the HVIL interrupt alarm which opens the contactors... show that this sequence automatically brings up the alarm screen, showing the HVIL fault being “ACTIVE, NOT ACKNOWLEDGED”

Acknowledge the HVIL faults and **then** show that the contactors cannot be reclosed using the display’s Battery ON/OFF screen

Reclose the HVIL circuit and show that HVIL faults have cleared (are “NOT ACTIVE”), **then** show that the contactors can be reclosed using the display’s Battery ON/OFF screen