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# Axis Labs Inc.

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## **Lead Hardware engineer position - tech question**

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Prepared by Marc Bishara

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*July 5, 2018*

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# The Question:

You are asked to design a circuit to control two inputs based on voltage thresholds.

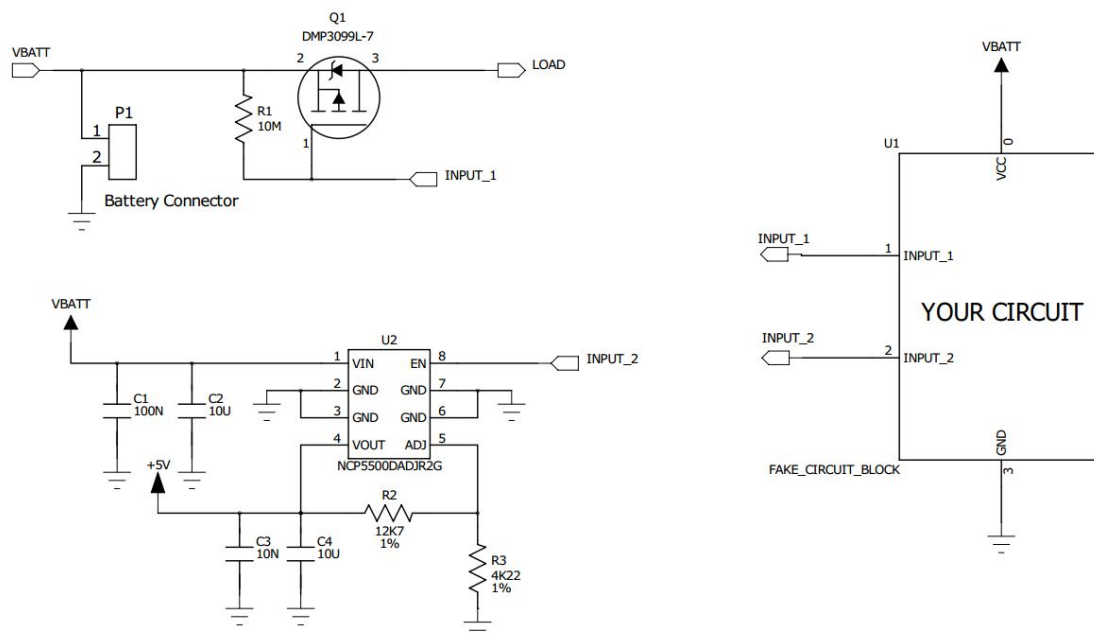
In this system there is a 2 cell LiPo battery with a voltage range of 6V to 8.4V (representing empty to full capacity respectively). Your hardware should monitor the LiPo voltage, starting from full charge, if it falls under 6V the system should pull the gate of a P-FET high (AKA pull it to Vbatt). When the voltage reaches 6.5V the gate should be driven to GND, it should remain grounded between 6.5V and 8.4V.

The same circuit should have a second threshold level. Starting from full charge when it falls under 7.9V it should toggle the enable line of a power supply HIGH (Aka VBatt). When the voltage reaches 8.2V it should disable the power supply by toggling the line to GND. In this case the hysteresis is 0.3V.

The system should be powered from the VBatt rail. Total system current consumption should not exceed 20uA.

Please provide a simple estimate of the current consumption of the circuit.

Please provide a rough unit cost estimate at 10k units.



# The logistics:

If you have any questions about the problem above don't hesitate to contact me by email. Please prepare an answer for this question prior to your scheduled in-person interview. You don't need to have all the details figured out, just enough to be able to defend your design decisions. A simple schematic, a text explanation of the design, a simple BOM, a simple power consumption calculation are just suggestions of the kind of material you can prepare for your answer.

## Agenda for the interview:

1 Hour long:

15 min - tour of the office

15 min - discussing your answer to the technical question

30 min - Questions from other members of the AXIS team

The agenda is only preliminary, please plan for the interview taking up to 90min.

Address:

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If you have trouble finding the place don't hesitate to call me: +1(289)244-7229