Final Project

* + 1. Answers to #7:

1. SPI channel: ***4***

N32 pins used: ***pin B14, pin F4 and pin F5***.

1. **ADC input in analog input AN0 (pin B0).**
2. Peripherals used by Digital output pins RD11, RD0: ***Output compare (OC1RS), Timer3***
3. We choose: ***Timer2, priority 5 (for 5 KHz ISR)***

***Timer4, priority 4 (for 200 Hz ISR)***

1. **Block diagram:**

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1. **Proposed Layout:**

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* + 1. Answers to #7:

1. Imax (max. current expected to sense) = ***1.01 A*** for battery and motor.
2. Vmax (voltage across 15 mΩ sense resistor) = ***0.15 V.***
3. We choose: ***R1 = 10 Ω***

***R2 = 105 Ω***

1. We choose RC filter: ***R = 830 Ω and C = 1 μF***
2. **Table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| R0 | Expected Current | Measure Current | Sensor | ADC Counts |
| 10 (+) | 600 | 530 | 2.37 | 831 |
| 20 (+) | 300 | 280 | 2.02 | 702 |
| 40 (+) | 150 | 140 | 1.83 | 634 |
| Open | 0 | 0 | 1.63 | 559 |
| 40 (-) | -150 | -140 | 1.42 | 478 |
| 20 (-) | -300 | -280 | 1.22 | 404 |
| 10 (-) | -600 | -530 | -9.84 | 254 |

* + 1. Answers to #8:

**Circuit Diagram:**

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* + 1. **Best plot:**

A close up of a map

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