Feasibility Testing Report – Low Battery through Arduino

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Related System: Low Battery Alert

This test was to set up a prototype of a system that would provide a low battery alert. This system will work through the Arduino. When completed, this system will poll the battery, sound an alert, and change the Arduino to low power mode.

Testing Procedure

The first part of this testing was to connect the Arduino. This was done by connecting a resistor divider to the battery output (the voltage of the battery should be more than 5V which is max of what the ADCs could read). A capacitor was also attached to do some low pass filtering.

Low Battery Sensor Code

The rest of the test was to create a function that will test the value of the ADC input and compare it to a tolerance.

Initialization

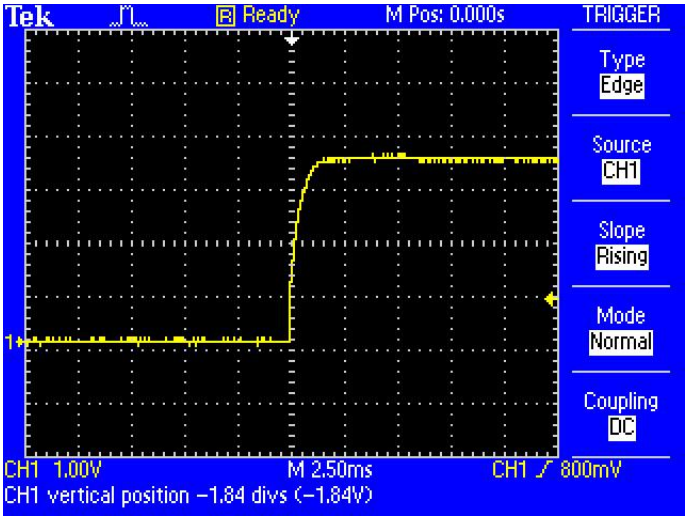
The code will set the ADC that is monitoring the sensor. The tolerance level will also be set that will decide if the battery is getting too low. In addition to this, serial prints enable was set.

Low

This function looks at the value of the ADC and returns a true or false of if the battery is getting too low. The function has no inputs and will return a Boolean.

Results

The timing of this function is important. This was found using an oscilloscope and looking at the output. This will show the level that the battery is at and also the rise time that will happen at a transition of turning the battery off to on.



Conclusions

First and foremost, it is clear that this method of monitoring low battery does work. Secondly, it is clear that this will not be a timing issue and that filtering is not needed. It will be important to look at a sagging voltage and decide on the threshold then.

Next Steps

The next step would be to order or obtain an audio alert that will work with an Arduino. Also, the output should be monitored with the battery that the team plans on using.