During the course of the project, we were unable to find a suitable circuitry for the current sensor. We tried many different type of op-amps LM733, LM741, LM833, etc. We found most of these chips no meeting spec requirements. We need to sense current up to 31 A and voltages up 250 V. Even though we were not using voltages up 250V during the course project, the op-amps could not be use for voltages greater than 10 V. During further research after open house, we found a promising circuit called ACS741. This is a hall-effect based sensor that can deal with current up to 30 A. To drive the circuit, we need to supply 4.5 V to 5 V which can be supplied by the microcontroller itself.

We found that the circuit can be bought from the following locations:

[http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=170543617239&hlp=false&rvr\_id=185052525222&crlp=1\_263602\_304652&UA=%3F\*F%3F&GUID=e829a95912c0a0aad4968ff6ff547a60&itemid=170543617239&ff4=263602\_304652](http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=170543617239&hlp=false&rvr_id=185052525222&crlp=1_263602_304652&UA=%3F*F%3F&GUID=e829a95912c0a0aad4968ff6ff547a60&itemid=170543617239&ff4=263602_304652) @ $8.55

<http://www.pololu.com/catalog/product/1187> @ $8.95

These are pre-built circuits on PCB. One can also order the hall-effect sensor from digikey @ ~$2 and design the circuit with the provided datasheet. The PCB looks to be nothing more than the schematic provided with chip. Information about where to buy the chip only is located below:

<http://search.digikey.com/scripts/DkSearch/dksus.dll?Detail&name=620-1260-2-ND>

<http://search.digikey.com/scripts/DkSearch/dksus.dll?Detail&name=620-1260-1-ND>

The difference with the chips as far as I could tell was the operating temperatures.