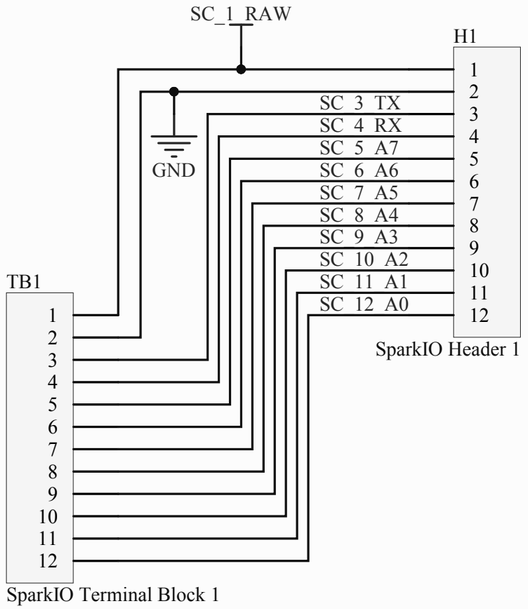
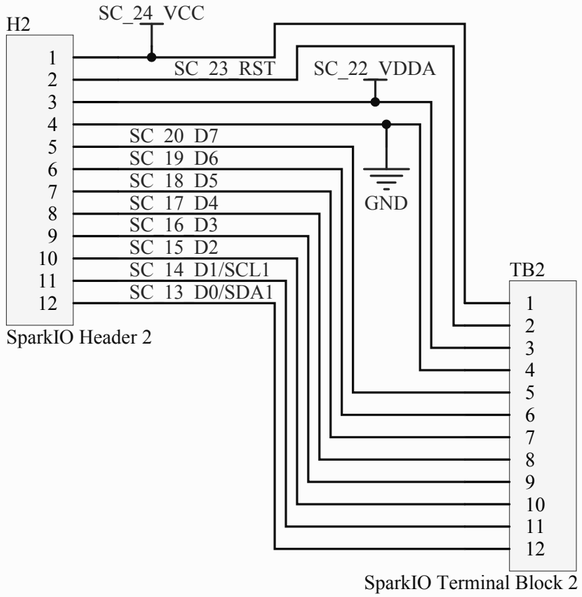




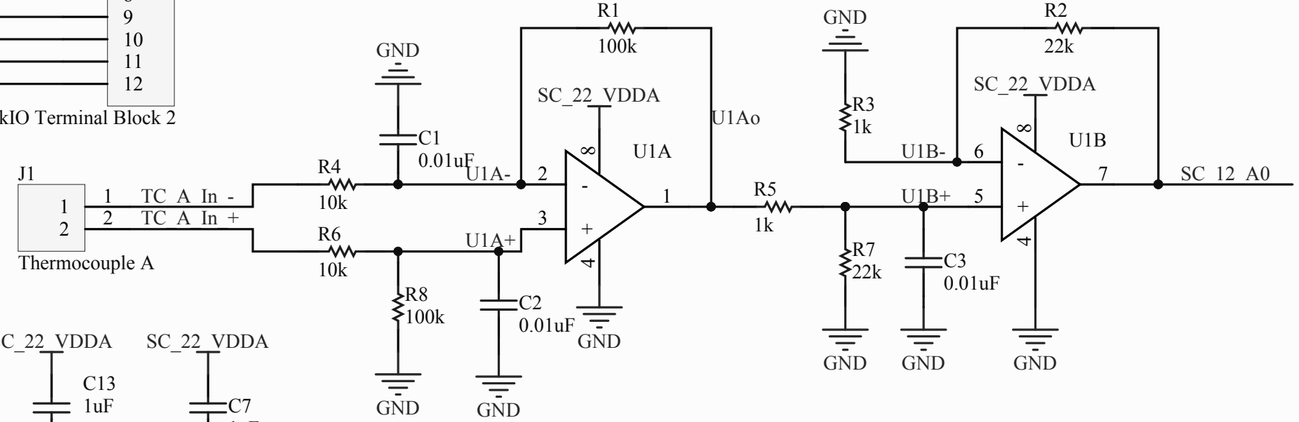
*SparkIO Module
RAW = Diode drop down from +5VUSB
VCC = 3.3V, 500mA Max
VDDA = 3.3V through 500mA ferrite, analog VDD
RST = Reset switch on Spark.io Module
Spark Core has male headers - need female headers here

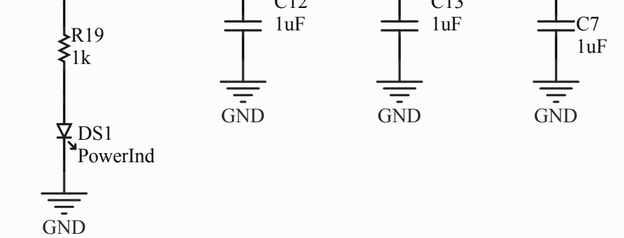
Op Amp Circuits are a cascaded two stage amplifier:
A Gain = 10 stage followed by a Gain = 22 stage to accomplish overall gain of 220

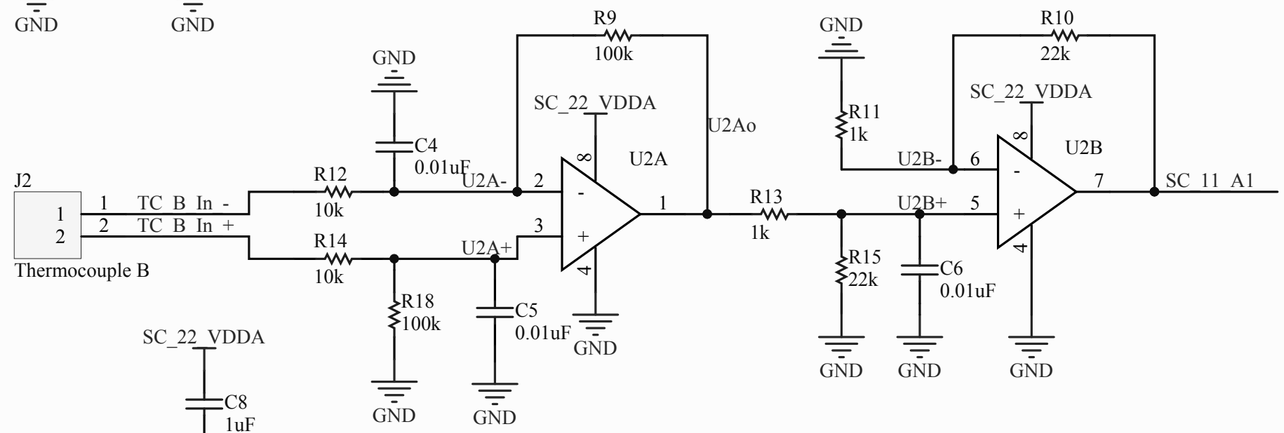
Linear approximation of a K-type thermocouple is about 40.8uV per degree C from -200C to +1350C
At 25C: V=1020uV = 1.02mV
At 100C, V=4008uV = 4.008mV
At 1000C, V=40.8mV
At 1350C, V=55.08mV

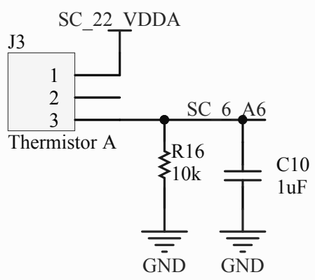
Desired range is roughly up to 600F or 0C to 350C
At 0C: V=0V
At 350C: V=14.28mV

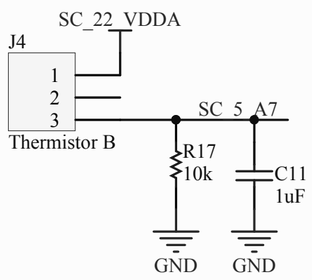
To scale this voltage to 3.2V, gain needed is
A = 3.2V/14.28mV = 224







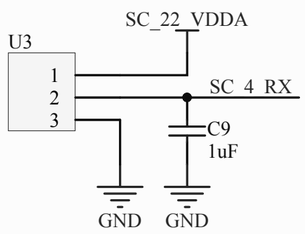




Thermistor A Input

Thermistor B Input

Thermistor Inputs - Assuming 10k



Cold Junction Temperature Compensation Thermistor
*Must be located very close to thermocouple connectors
U3 is analog thermistor IC

Title	***SparkIO Thermal Shield - Analog***		* * * * *
Size: A4	Number:*	Revision:A	
Date: 7/15/2014	Time: 11:43:27 PM	Sheet 1 of 1	
File: C:\Users\Jim\Documents\GitHub\probe\SparkIO Thermal Shield\SparkIO Thermal Shield - No Aux ADC.SchDoc			

Altium