

EGR-334
Digital - Analog Interface
Homework 3.7
Week 6
Tuesday February 15, 2022
Due Tuesday February 22, 2022

ECG
HR Monitor

Name: Danis Nugroho, Logan Spearin, Zhengbin Chen, Sai Srinivas Tatwik Meesala

This Laboratory will Examine the Use of the INA121 Instrumentation Amplifier to Measure ECG.

1) Part 1) ECG:

Please Construct the Following ECG Network, Use Potentiometer for Gain Control of INA121 Between Pins 1 and 8, and Potentiometer for Gain Control of TCA0372 Rf.

Gain Can Be Adjusted First at INA121 then TCA0372 to Best Achieve Pulse Image on Analog Discovery Board, and Heart Beat on 8 Ω Speaker.

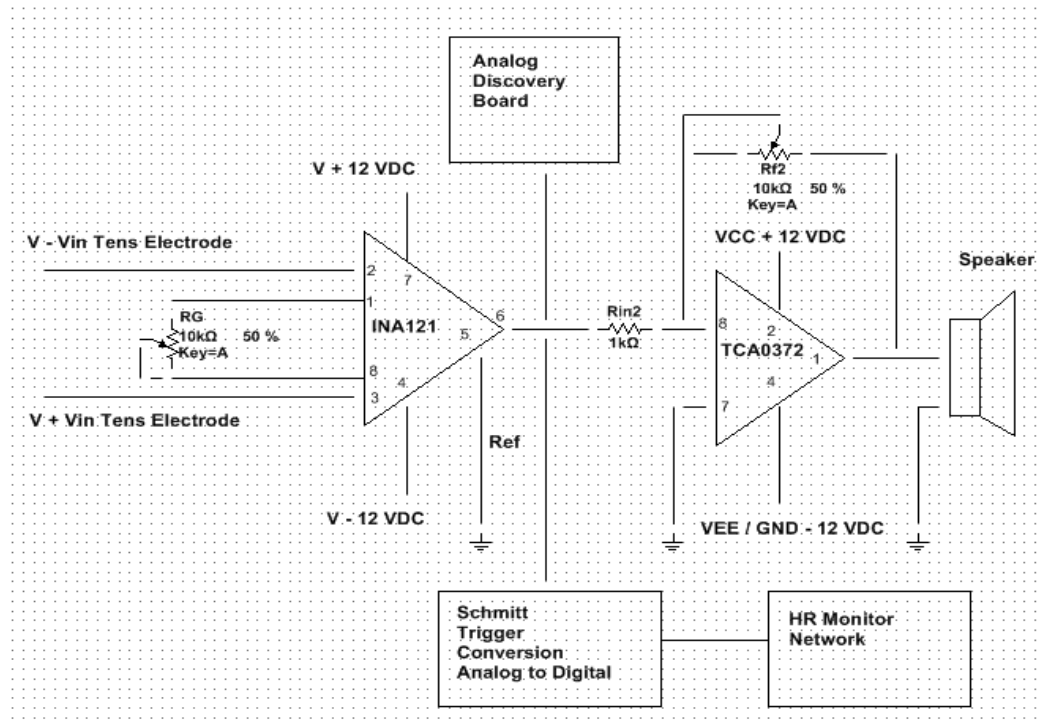
Care Must be Taken that Alligator Clips do Not Short to Skin and Movement is Minimized to Achieve Clean Pulse Image on Analog Discovery Board.

Lastly, to Further Minimize Noise, 0.01 μ F or 0.1 μ F Decoupling Capacitors should be Used between + 5 VDC, +/- 12 VDC Power at the Pin of Each IC.

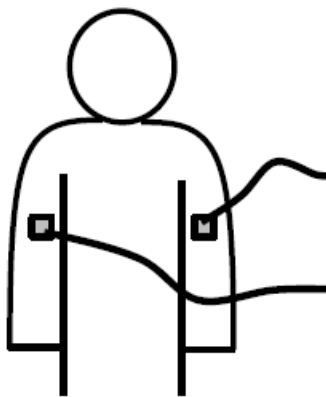
Further Shielding can be Obtained by Using Twisted Shielded Pair Cable, Coax Cable to Connect between Tens Electrodes and INA121. Shielding Foil or Third wire, Would need to be tied (One End Only) to Common.

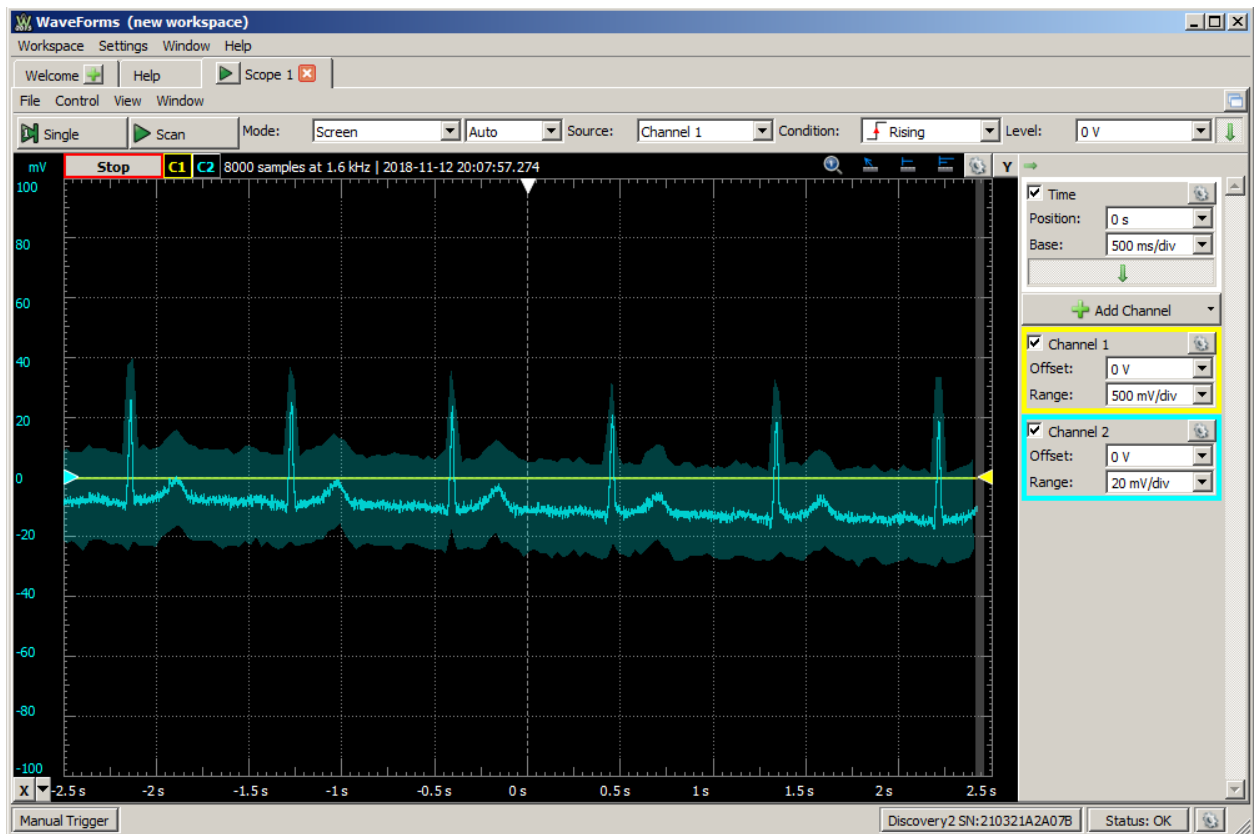
A Simple Twisted Pair Cable Can be Constructed by Twisting Lengths of Two Wires between Tens Electrodes and INA121, or a Simple Twisted Shielded Pair Cable Can be Constructed by Twisting Lengths of Three Wires between Tens Electrodes and INA121 and Connecting Remaining Wire to Common. Lastly, if Really Zealous, Filtering Can Be Applied.

ECG Network can be Seen Below:

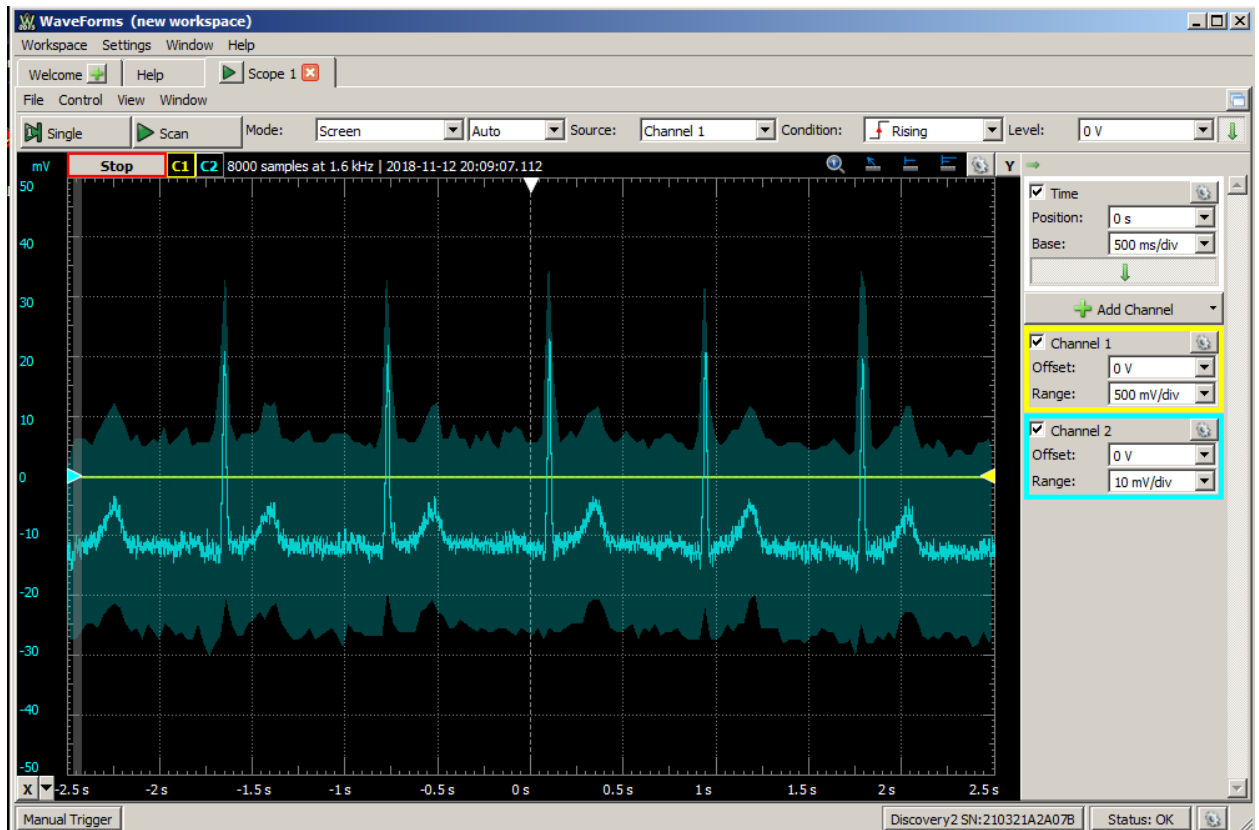


Proper Tens Electrode Connections Shown Below:

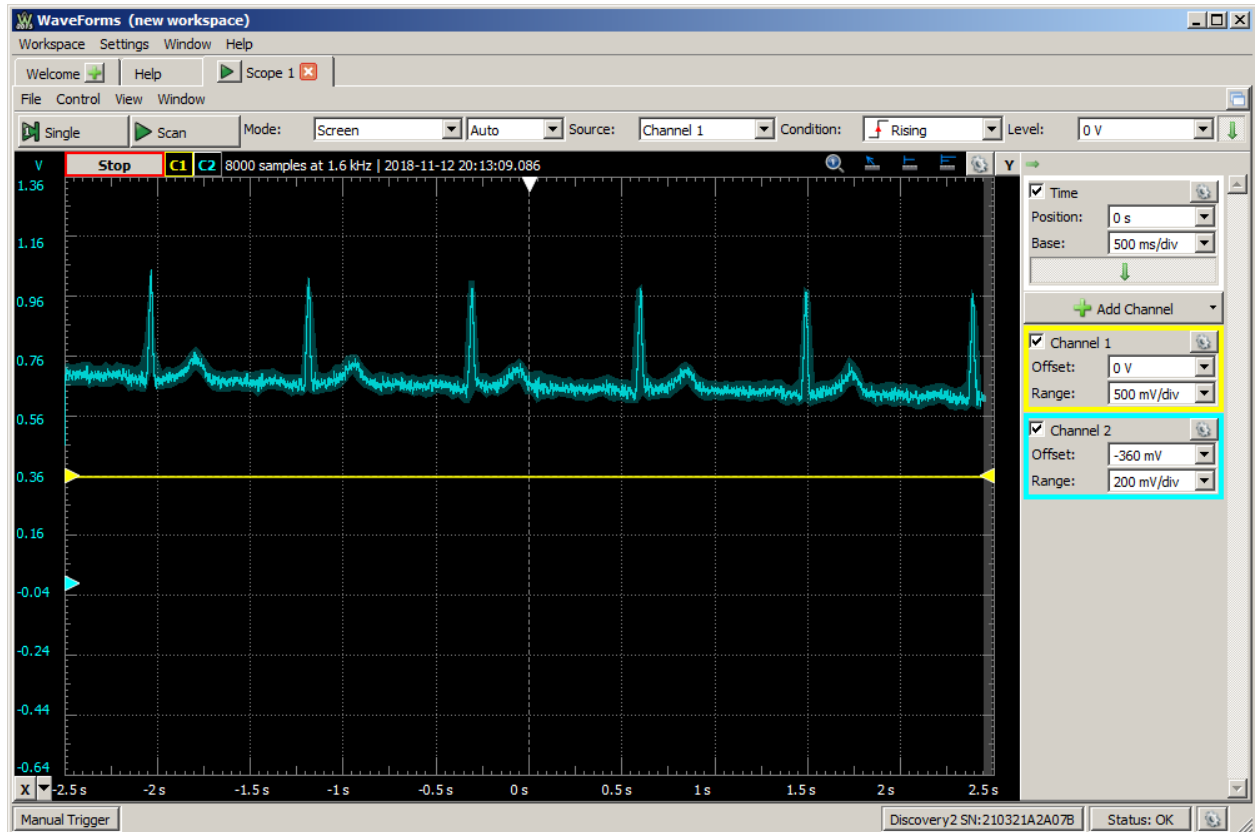




Part 1) ECG v1.0 Analog Discovery Board Tens Electrodes, Alligator Clips No Shielding



Part 1) ECG v2.0 Analog Discovery Board Tens Electrodes, Alligator Clips No Shielding



Part 1) ECG v3.0 Analog Discovery Board Tens Electrodes, Alligator Clips No Shielding