
Github:
https://github.com/bomlee?tab=repositories

Analog Filter Simulering
git@github.com:bomlee/AnalogFitlerSimulation.git

ESP to Matlab
git@github.com:bomlee/ESP32_BT_To_MATLAB.git

ADC
git@github.com:bomlee/ADS8688_ADC_ARDUINO.git

DAC
git@github.com:bomlee/MAX525_DAC_ARDUINO.git

CPP code
git@github.com:bomlee/ExoAiderConCat.git

Fileshare:
I have made a copy of my work folder and past it to the Fileshare Exo-Aider.
Fileshare/Exo-Aider/ES/Backup Simon Computer

To get access contact IT Service or ask Karl.
support@its.aau.dk

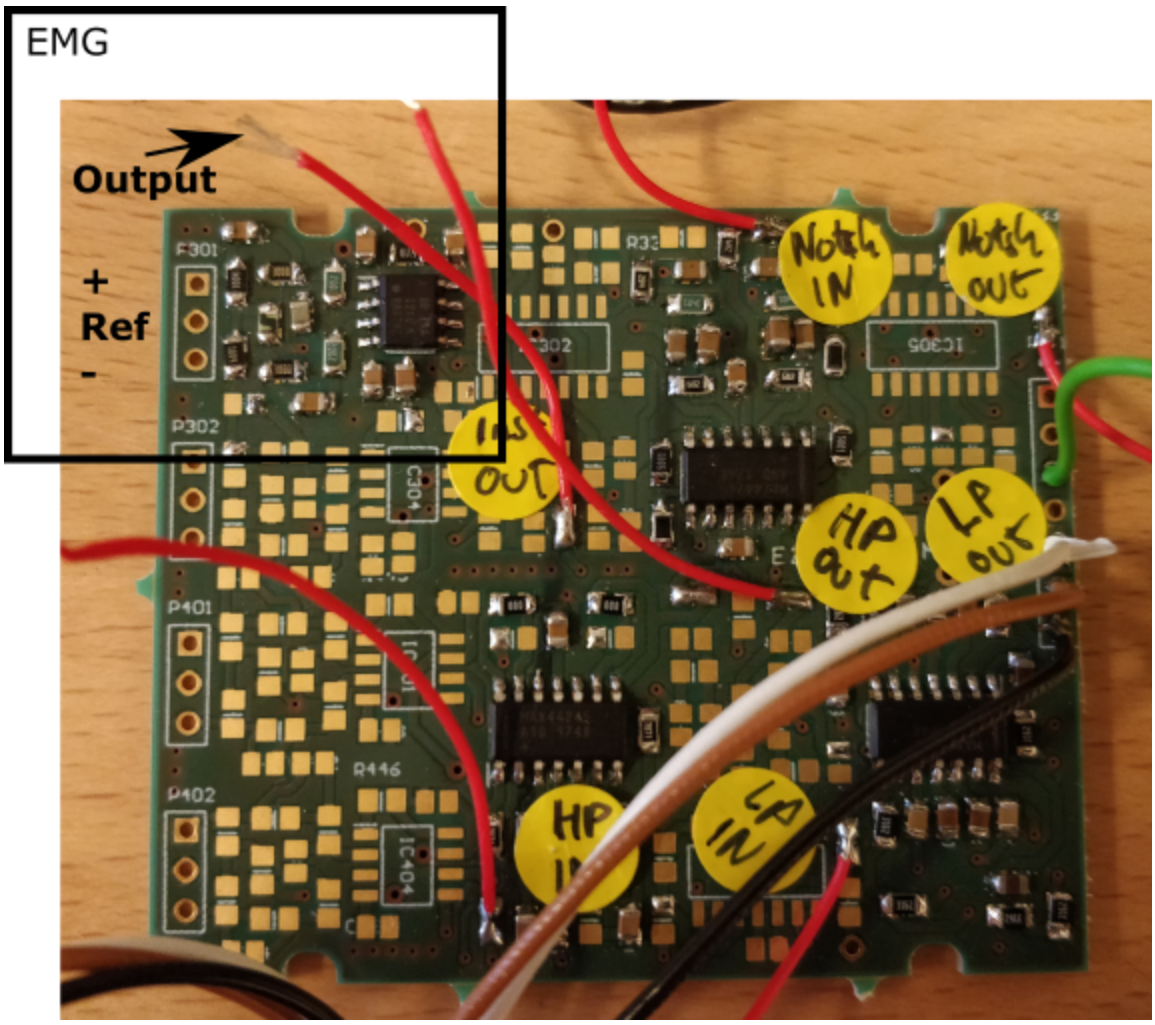
Guide
https://www.en.its.aau.dk/instructions/Files/Group+folders+in+Windows/

Path
smb://es.aau.dk/Fileshares/Exo-Aider

If any questions, contact
Email: simonkro@gmail.com or phone: 24 97 77 08
This document can also be found on Fileshare: Exo-Aider\ES\Backup Simon Computer

Hardware Issues

1) As of right now, there is no signal getting through the analog PCB, ie. the sEMG does not work.
   I think the issue is related to the differential amplifier at the beginning of the board. Try to attach the long cables from the sleeve to the input channels of the sEMG and measure the output (inst OUT). The +- is for the twisted cable.



2) I will recommend to get rid of the hardware implemented 50 Hz notch filter and implement it as a digital fourth order filter on the ESP32. This is due to the Active Twin T notch filter is very sensitive to component tolerances!

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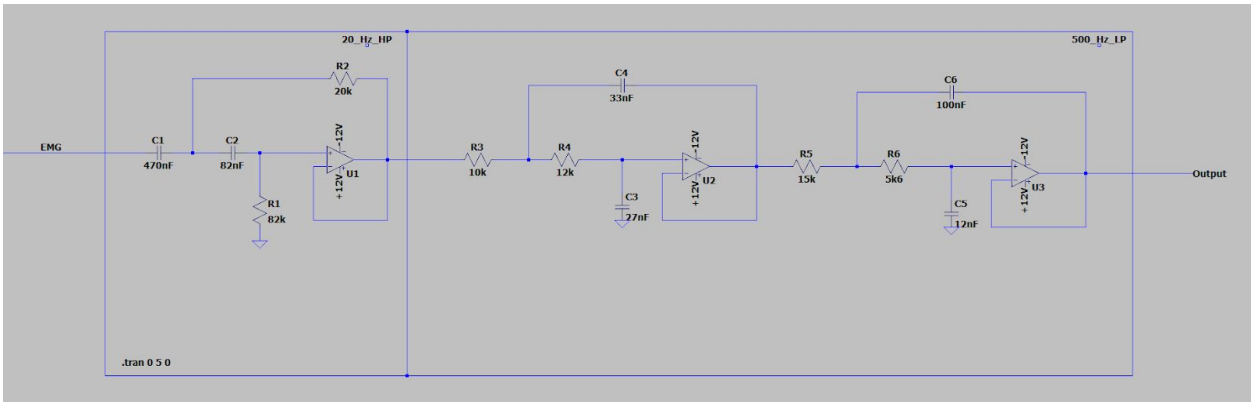
3) Though inspection of Jans EMG/Filter design (Fileshare: Exo-Aider\ES\Backup Simon Computer\PCB\Scaned documentation\Jan - sEMG and Filter Designs)
   Update the HW Lowpass/Highpass on the sEMG board to the values illustrated below .
   This design has a better response compared to version zero



   This is also included in the simulation found in.
   Exo-Aider\ES\Backup Simon Computer\AnalogFitlerSimulation\Version one

4) When the digital PCB is power up the first time, there can be a huge power drag. This can cause issues if using a lab power supply.
5) SPI bus can run on a 1 MHz clk. It might be possible to increase this speed if proper design considerations are made on the digital board for version one.
   Look for design rules!
6) The sEMG channels on the digital PCB are floating when nothing is connected. They are biased to a constant voltage around two volt. Pull down resistor might fix this issue.

Recommended

1) See if sEMG and FSR can be implemented on the same PCB and seperate it from the digital PCB.
2) Remove the DC/DC 5 V power supply.
   Use instead a linear 5 V regulator from the 12 V power supply.

Code

1) The code needs to be optimized to ensure a one kHz loop.
   I tested it with the micros(), implemented in the Arduino environment, but this gave inconsistent results with big variations (not compatible with ESP32?)! However it looks like the code is running slower than one kHz
2) The data rate over BT can be decreased by a factor of two if the 2 Bytes ADC data is send raw to the computer. The same applies to the IMU data.

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