

Custom Electrophysiology Setup How-To Guide

Leonardo Garma

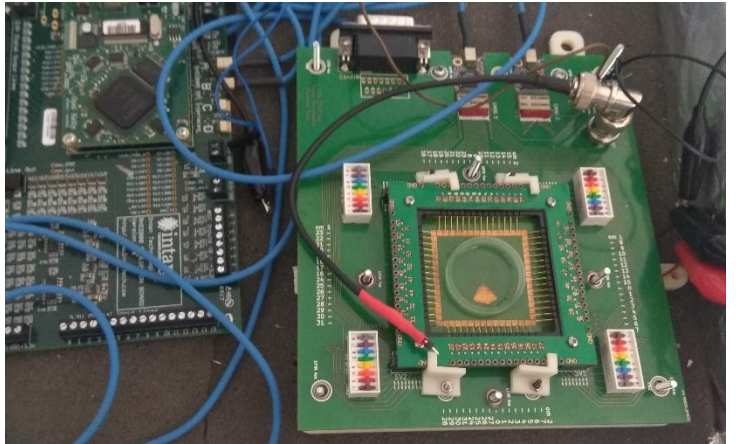
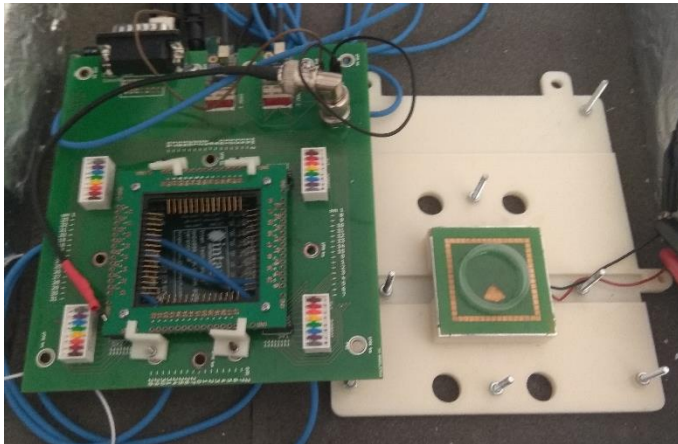
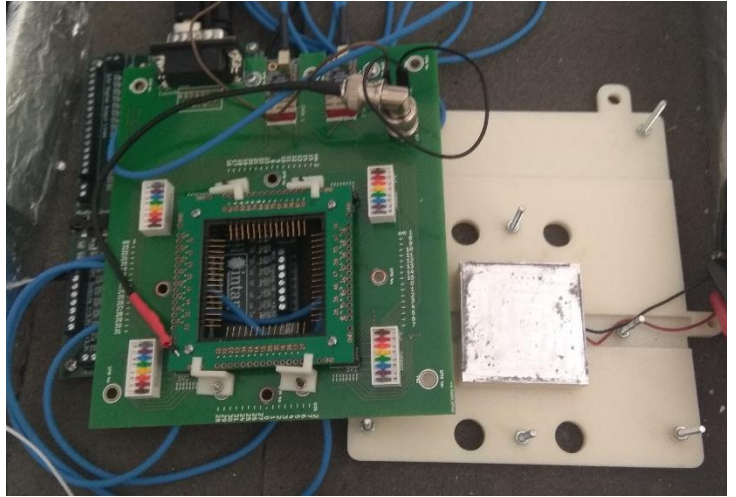
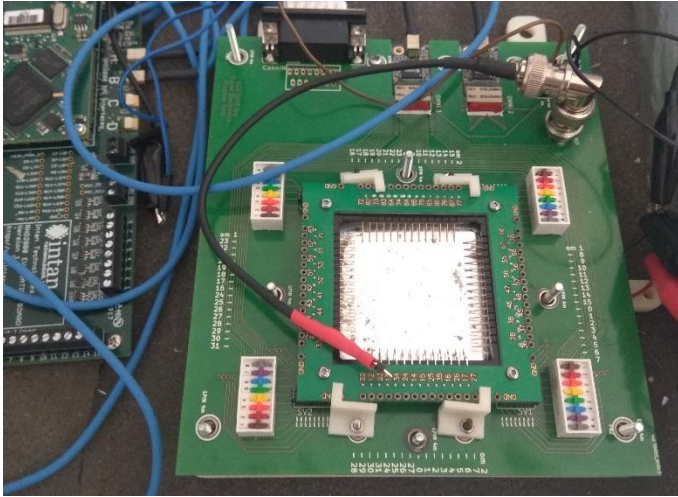
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leonardo.garma@gmail.com

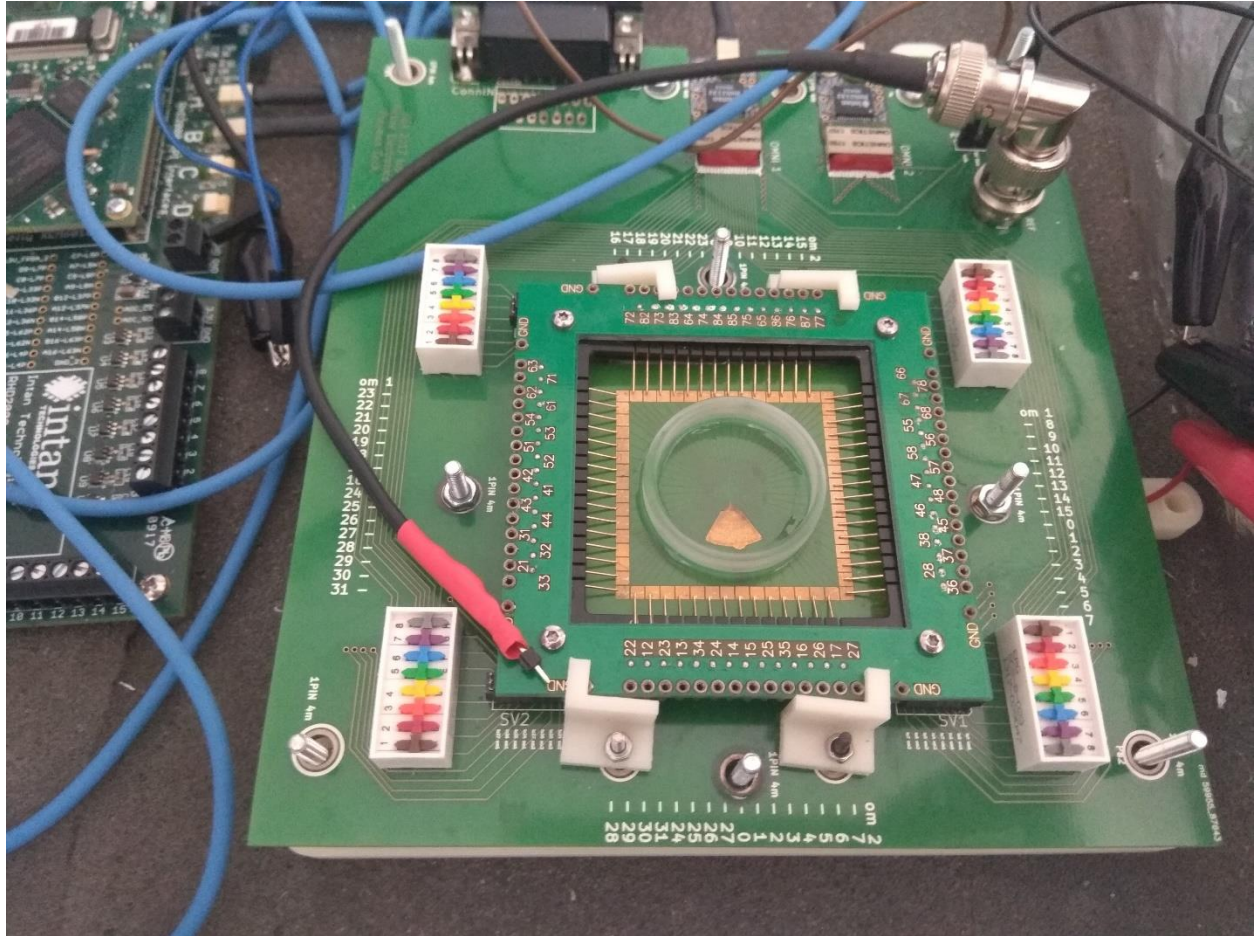
Reference material:

- **INTAN documentation and manuals**
 - http://www.intantech.com/files/Intan_RHD2000_eval_system.pdf
 - http://www.intantech.com/files/Intan_RHD2000_series_datasheet.pdf
 - <http://www.intantech.com/downloads.html>
- **Original paper**
 - <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0214017>
- **Data processing example script**
 - <https://github.com/leo-gg/INTAN>

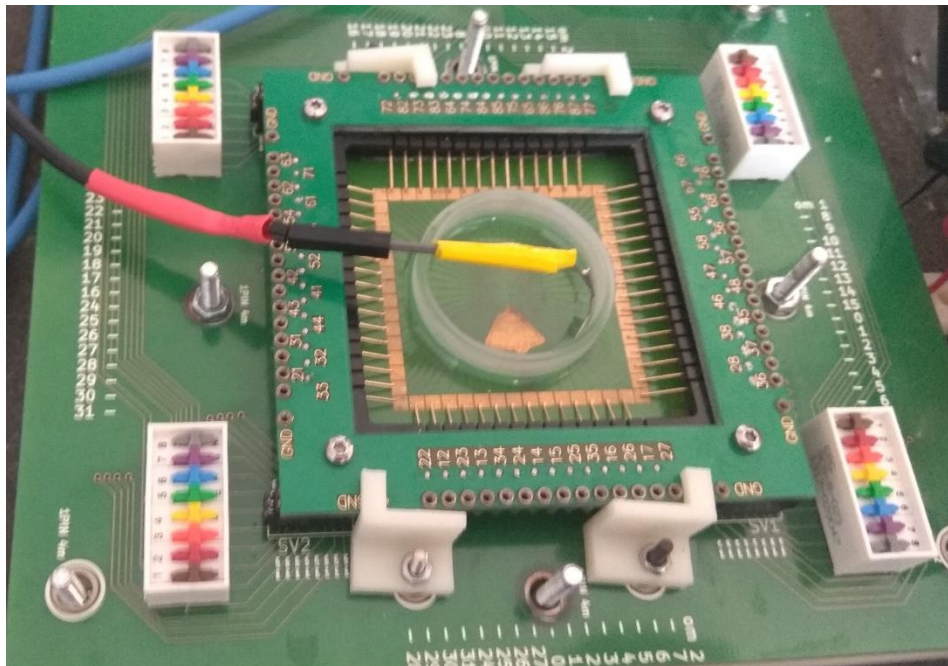
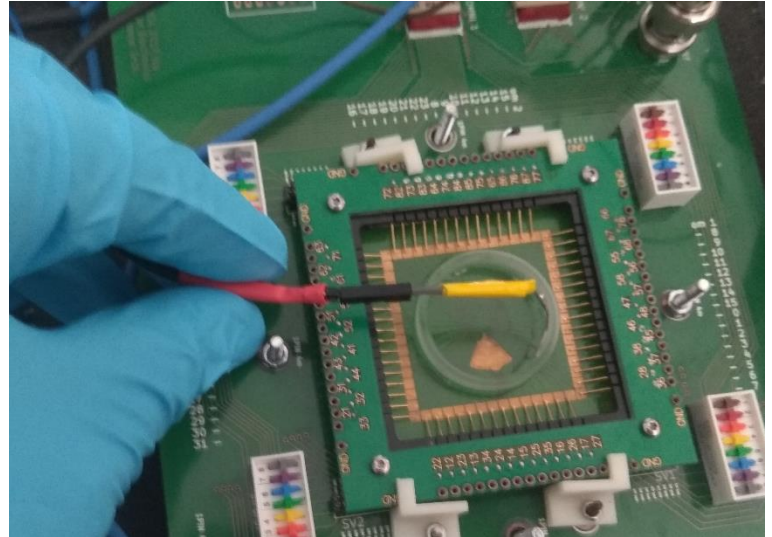
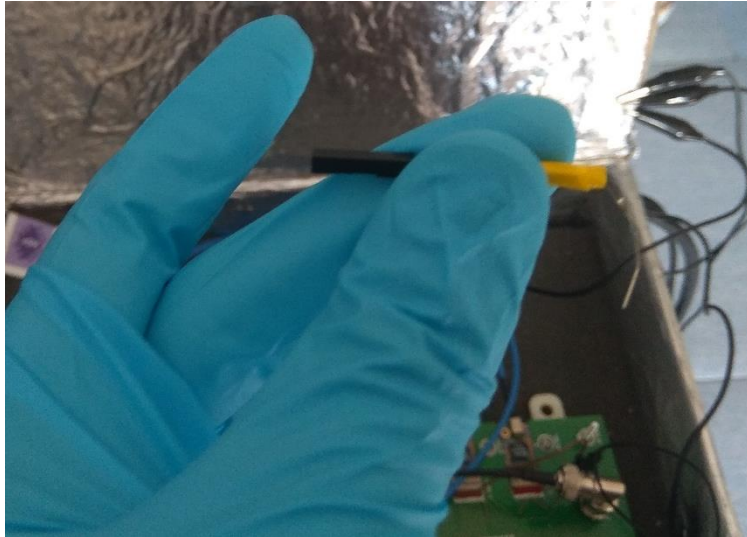
Step 1: Lift the PCB, place your MEA in the holder and put the PCB back in place



Step 2: Fix the PCB in place using the 3mm screw nuts



Step 3: If using a external reference, connect a *clean* reference and place it in contact with the media in your MEA



Step 4: Switch on the power supply for the FPGA. If you need to keep your cells warm, don't forget to switch on the power supply for the Peltier!



Step 5: Start the INTAN interface software

The screenshot displays the INTAN interface software window. On the left, a file explorer shows the contents of the 'INTAN Interface' folder, with a red arrow pointing to the 'RhOD2000interface' file. The main window is titled 'Intan Technologies RhOD2000 Interface (Demonstration Mode with Synthesized Biopotentials)'. It features a 'Run' button, a 'Stop' button, and a 'FIFO log' indicator showing '0 ms (0% full)'. Below these are buttons for 'Record', 'Trigger', and 'Select File Format'. A 'Select Base Filename' field is present, with a note that the date and time stamp will be added. The 'Ports' section has radio buttons for 'Port A (32 channels)', 'Port B', 'Port C', 'Port D', 'Board ADC Inputs', and 'Board Digital Inputs'. The 'Channels' section includes a 'Rename Channel' button and 'Enable/Disable (Space)' and 'Disable All on Port' buttons. The 'Voltage Scale' is set to '+/-500 μ V' and the 'Time Scale' is set to '200 ms'. The 'Bandwidth' section has tabs for 'Bandwidth', 'Impedance', 'DAC/Audio', and 'Configure'. The 'Amplifier Sampling Rate' is set to '20.0 kS/s'. The 'Amplifier Hardware Bandwidth' section shows 'Desired/Actual DSP Cutoff: 1.00 Hz / 0.78 Hz', 'Desired/Actual Lower Bandwidth: 0.10 Hz / 0.09 Hz', and 'Desired/Actual Upper Bandwidth: 7.50 kHz / 7.60 kHz'. The 'Software Filters' section has checkboxes for 'Software/DAC High-Pass Filter' (set to 250 Hz) and 'Notch Filter Setting' (set to Disabled). The 'CPU Load Management' section has a checkbox for 'Plot Points Only to Reduce CPU Load'. The right side of the window displays a grid of 32 channels, each with a label (e.g., A-000, A-001, A-002, A-003, A-004, A-005, A-006, A-007, A-008, A-009, A-010, A-011, A-012, A-013, A-014, A-015, A-016, A-017, A-018, A-019, A-020, A-021, A-022, A-023, A-024, A-025, A-026, A-027, A-028, A-029, A-030, A-031) and a scale of '500 μ V' and '200 ms'. At the bottom, a status bar indicates 'No USB board connected. Ready to run with synthesized data.'

Step 6: Set your recording parameters and output filename

Bandwidth Impedance DAC/Audio Configure

Amplifier Sampling Rate

Amplifier Hardware Bandwidth

Desired/Actual DSP Cutoff: 1.00 Hz / 0.78 Hz

Desired/Actual Lower Bandwidth: 0.10 Hz / 0.09 Hz

Desired/Actual Upper Bandwidth: 7.50 kHz / 7.60 kHz

Software Filters

☐ Software/DAC High-Pass Filter Hz

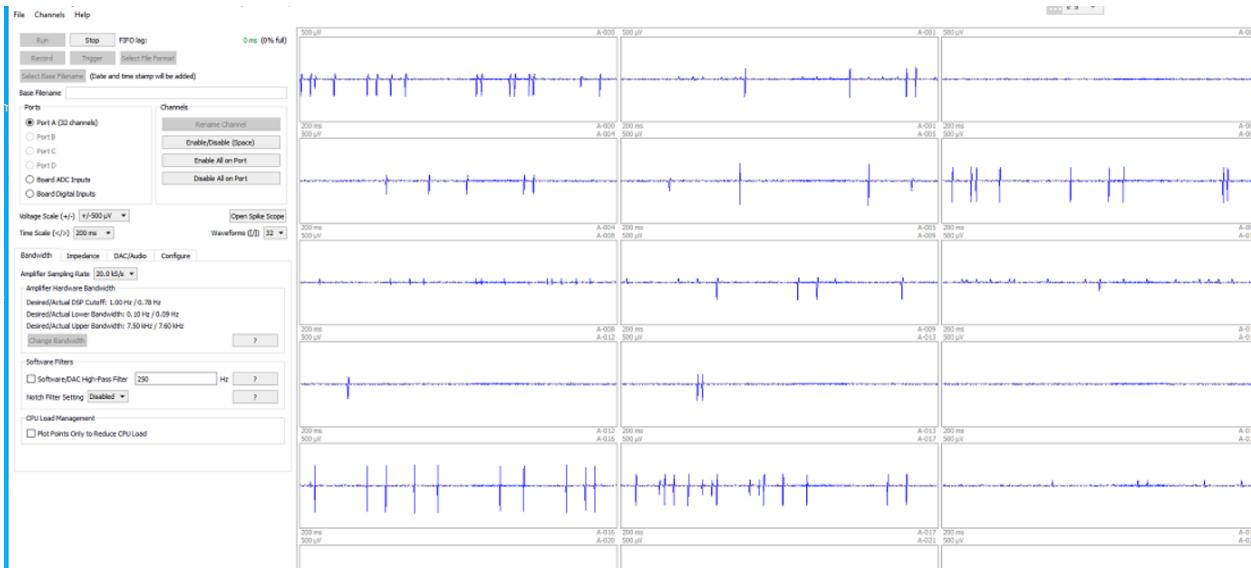
Notch Filter Setting

FIFO lag: 0 ms (0% full)

(Date and time stamp will be added)

Base Filename

Step 7: Press Run to see the live signal or Record to start a recording



Step 8: Clean up!

- **Stop the recording**
- **Switch off the equipment**
- **If you used an external reference, clean it and put it back in place**
- **Unscrew the PCB and store the nuts**
- **Retrieve your MEA**