Overview

This document describes how to set up a Cyton Board, install the OpenBCI GUI, record data on the OpenBCI GUI with the Cyton Board, and to time sync an EmotiBit Device and Cyton Board Device utilizing the Clap Method

Setting up Cyton Board Strap

- ## Overview: Attaching Cyton Board to a Strap for ECG Monitoring

This methodology outlines the steps to securely attach a Cyton board for ECG (Electrocardiogram) monitoring onto a strap by using electrode sticky patches, wires, and zip ties. Proper attachment ensures reliable data collection while keeping the setup comfortable for the users

- ## Prerequisites

  Before you begin, ensure you have the following prerequisites:
  - **Hardware:**
    - Cyton Board: Ensure you have a functional Cyton board.
    - Strap: A comfortable, adjustable strap that can be worn by the users
    - Electrode Sticky Patches: High-quality ECG electrode patches.
    - Electrode Wires: Wires with suitable connectors for the Cyton board.
    - Zip Ties: Small, reusable zip ties.
    - Scissors: For cutting zip ties.
    - Adhesive Tape: To secure wires in place if needed.
    - ECG Electrodes: Skin-compatible ECG electrodes, if not included with electrode patches.

- ## Procedures

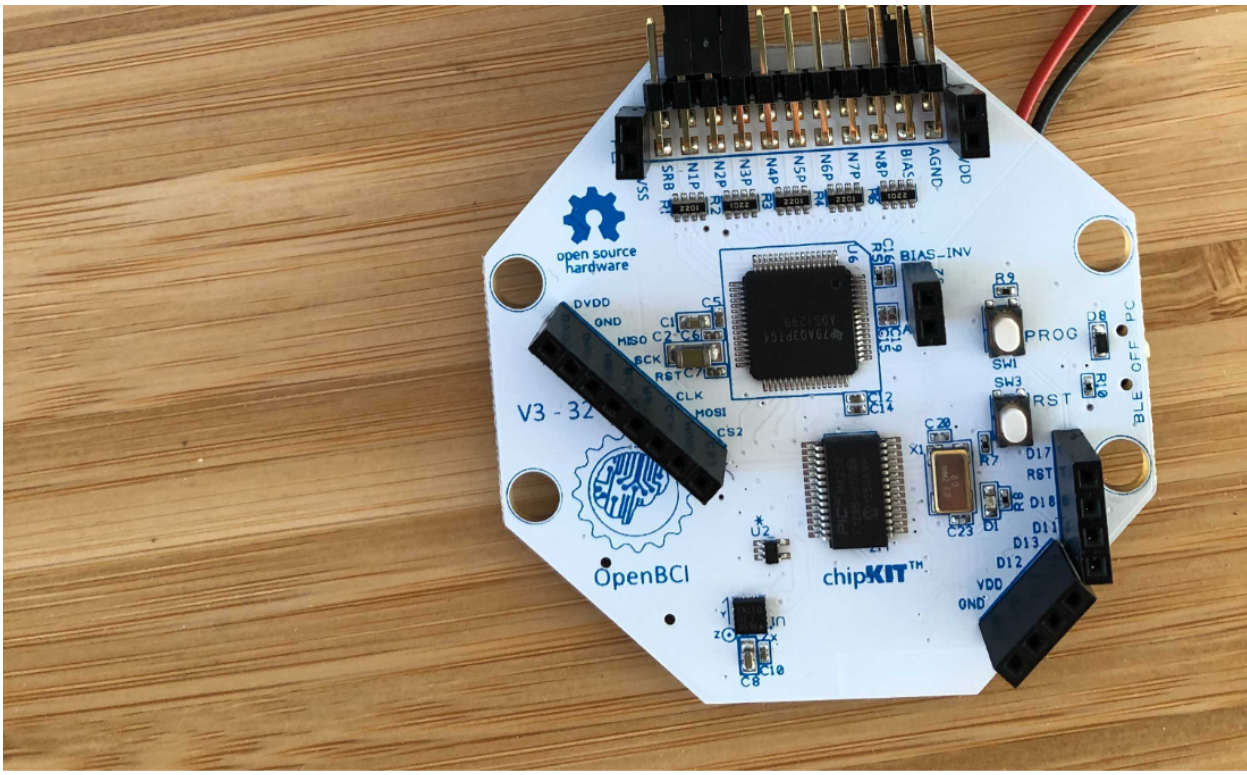
  1. Prepare the Cyton Board
     - ➢ Ensure that your Cyton board is in working condition. Check for any loose components or damaged connectors.

  2. Prepare the Strap
     - ➢ Choose a strap that is comfortable and adjustable, ensuring it fits securely around the user's chest or body.

  3. Attach Electrode Sticky Patches to the Strap
     - ➢ Identify the locations on the strap where you want to place the ECG electrodes.
     - ➢ Peel the backing off the adhesive side of the electrode patches.
     - ➢ Carefully press the adhesive side of each electrode patch onto the chosen locations on the strap. Ensure they are securely attached.

  4. Attach Electrode Wires to the Electrodes
     - ➢ Connect one end of each electrode wire to the ECG electrodes on the strap.
     - ➢ Make sure the connections are secure, and the wires are not tangled or twisted.

5. Connect Electrode Wires to the Cyton Board
   - ➢ Identify the appropriate channels on the Cyton board to connect the electrode wires.



Connections for 5-lead ECG, shown above

Connect wires from the strap electrodes to the Cyton board's NP1 (positive) and ground (GND) terminals. Refer to your Cyton board's documentation for channel mapping. Documentation: [Setting up for ECG]

6. Secure the Wires
   - ➢ Use adhesive tape to secure the wires to the strap if necessary. Ensure that the wires are neatly organized and do not interfere with the user's movement or comfort.

7. Attach the Cyton Board to the Strap with Zip Ties
   - ➢ Position the Cyton board on the strap in a location that minimizes interference with the user's comfort.
   - ➢ Use zip ties to attach the Cyton board securely to the strap. Thread the zip ties through the board's mounting holes or any suitable anchor points on the board.
   - ➢ Tighten the zip ties securely but not too tightly to avoid damaging the Cyton board or the strap.

8. Start ECG Monitoring
   - ➢ Power on the Cyton board and connect it to the OpenBCI GUI or any data collection software.
   - ➢ Start ECG monitoring and data recording by following these steps

OpenBCI GUI Installation, Cyton Board Setup and Recording ECG DATA Documentation

- Overview
    - This documentation provides step-by-step instructions for installing the OpenBCI GUI and setting up a Cyton board for reading ECG (Electrocardiogram) levels. The OpenBCI GUI is a user-friendly interface for visualizing and recording data from OpenBCI devices, such as the Cyton board. This setup also involves connecting wires from a strap to the Cyton board for ECG monitoring.
- Prerequisites

  Before you begin, ensure you have the following prerequisites:
    - **Hardware:**
        - OpenBCI Cyton Board.
        - Cyton Dongle (for wireless data transfer).
        - Electrodes, electrode wires, and a strap for ECG measurement.
        - A computer with available USB ports.
    - **Software:**
        - A compatible operating system (Windows, macOS, Linux).
        - Installing OpenBCI GUI
        - Follow these steps on this webpage install the OpenBCI GUI:
        - Installing OpenBCI GUI

Procedures

1. Launch the GUI:
    - ➢ Navigate to the extracted **OpenBCI_GUI Directory** in your downloads folder and double click **OpenBCI_GUI.exe** to open and run the **OpenBCI_GUI**
2. Setting Up the Cyton Board
    - ➢ Now that you have the OpenBCI GUI installed and launched, follow these steps to connect the Cyton Board:
3. Connecting the Cyton Board on the computer:
    - ➢ Plug the Cyton Board into an available USB port on your computer using the Cyton Dongle for wireless data transfer.
4. Configuring Cyton Board for ECG Monitoring in the OpenBCI GUI
    - ➢ Attach the ECG electrodes
        - Attach the user's body near the abdominal region to allow the Cyton Board to detect ECG Data.
    - ➢ Launch the OpenBCI GUI:

- ➢ Follow these steps on this webpage to launch the OpenBCI GUI and streamline data for ECG utilizing the Cyton Board Dongle. Documentation: Setting up for ECG

5. Troubleshooting
   - ➢ If you encounter any issues during installation or setup, refer to the OpenBCI documentation or community forums for assistance. Common troubleshooting steps include checking connections, updating drivers, and ensuring that Node.js and npm are up to date.

Clap Method

- ## Overview

Clap Method document the steps for a "clap method" to time sync the EmotiBit device and the OpenBCI Cyton Board device and their respective software, follow the steps below:

- ## Prerequisites

Before you begin, ensure you have the following prerequisites:

- **Hardware:**
  - EmotiBit device
  - OpenBCI device
  - EmotiBit software
  - OpenBCI software

Procedures

1. Prepare the Devices:
   - ➢ Follow these guides to set up the Cyton Board and Emoti Bit Devices with their respective softwares:
     - https://github.com/EmotiBit/EmotiBit_Docs
     - OpenBCI GUI Installation, Cyton Board Setup and Recording ECG DATA Documentation
   - ➢ Make sure that the EmotiBit and OpenBCI software are installed and ready to run.
2. Start the Data Collection Software:
   - ➢ Launch the EmotiBit Oscilloscope software on your computer and the OpenBCI software simultaneously.
3. Ensure that both software applications are properly configured to collect data from their respective devices.
4. Stabilize the devices signals
   - ➢ Allow both devices to record baseline data for at least 30 seconds. During this time, ensure that there are no sudden movements or changes in heart rate that could interfere with the data.
5. Perform *Clapping* Actions

   - ➢ Clap the EmotiBit and OpenBCI devices together to create noticeable peaks in the data.
   - ➢ Repeat this clapping action six times in quick succession to ensure sufficient data points.

- ➢ After clapping the devices, let 30 seconds pass without any additional actions. This step is crucial to observe how the data settles and returns to the baseline.

6. Data Analysis:

   - ➢ After the 30-second waiting period, you can analyze the data collected during and after the clapping actions.
   - ➢ This analysis may involve checking for spikes or noticeable changes in the recorded data