SiFi Band Product Information

General Information:

- **Product Name:** SiFiBand
- **Manufacturer:** SiFi Labs Inc.
- **Date of Issue:** 14/09/2025
- **Product Description:** The SiFiBand is an innovative, wearable device designed for monitoring a broad range of physiological signals. It is specialized for multi-channel electromyography (EMG) and is ideal for research in academic and professional settings, particularly in human-computer interaction.
- **Intended Use/Application:** Research and study purposes, especially in human-computer interaction and physiological monitoring.
- **Regulatory Compliance:** CE Marked. The SiFiBand is not intended for medical diagnostic or treatment purposes at this time.
- **Dimensions**: 20.4cm X 4.6cm X 1.3cm

Key Features:

Capable of Extended Signal Monitoring Continuously and Simultaneously:

- **Electromyography (EMG):** Specialized for capturing muscle contractions and activities with 8 channels at 1.6 kHz.
- **Electrocardiography (ECG):** Offers detailed cardiac monitoring at 500 Hz.
- **Photoplethysmography (PPG):** Studies pulse rate and blood oxygen levels using infrared, red, green, and blue light at 50 Hz.
- **Electrodermal Activity (EDA):** Provides insights into emotional states by measuring sweat gland activity at 50 Hz.
- **Skin Temperature Monitoring:** Measures metabolic changes and thermoregulation at 1 Hz.
- **Inertial Measurement Unit (6-axis IMU):** Captures movement dynamics, like acceleration and orientation, at 100 Hz. On-board sensor fusion for orientation provided.

Customization Option:

• **Signal Acquisition Frequencies:** The SiFiBand offers the flexibility to modify signal acquisition frequencies according to specific usage needs. This feature enables users to tailor the device's performance to various research requirements. Note that this feature availability will come from a future firmware update.

• **Filtering:** The device is equipped with numerical filtering capabilities that can be easily adjusted on-board. This feature allows for precise control over data processing and enhances the quality of the physiological signals captured.

• **Photoplethysmography (PPG) Modification:** Given that PPG is an optical-based sensor, factors such as skin thickness at the collection site or skin color can affect readings. The SiFiBand addresses this by allowing real-time modifications to both the intensity of the four light wavelengths (blue, green, red, and infrared) and the sensitivity of the photodiode. This customization ensures accurate and reliable PPG data across diverse user profiles.

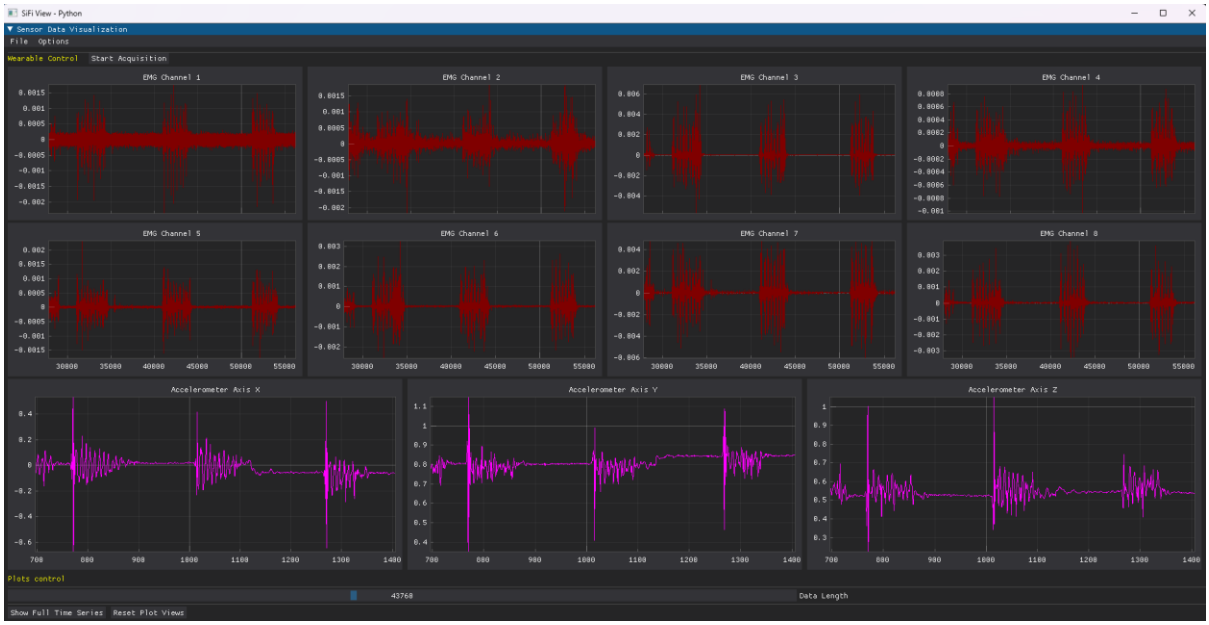
Power Efficiency:

- **Battery**: 300mAh Li-Po, providing 15h+ of continuous use with all sensors activated, rechargeable via USB-C port.

Connectivity and Interfaces:

- **Wireless Transmission:** The SiFiBand features Bluetooth Low Energy (BLE) for efficient wireless communication.
- **Graphical User Interface on Windows:** Users can connect to the SiFiBand through a user-friendly graphical interface on Windows systems, simplifying the process of monitoring and analyzing data.
- **Command Line Tool Compatibility:** The SiFiBand is equipped with a versatile command line tool (SiFi Bridge, https://github.com/SiFiLabs/sifi-bridge-pub) that is compatible with Windows, MacOS, and Linux. This tool supports any programming language that can create processes, including C#, Python, C++, and more, offering extensive flexibility for researchers and developers.

- **Mobile Deployment:** The command line tool can also be used to deploy applications on mobile phones through both Android and iOS platforms. This feature extends the device's usability to mobile environments, making it convenient for on-the-go data monitoring and analysis.



Example of a Python interface programmed using SiFi Bridge to display real-time electromyography (EMG) data across eight channels, alongside tri-axial accelerometer readings. The interface illustrates the variation in signal amplitude for each channel, which can be influenced by the positioning of the sensor armband and the specific gestures being performed by the user. Note that the scale for each graph is independent of the other (depending on the activation level being experience), the signal-to-noise ratio is the same for all channels.

Operational Guidelines:

- **Usage Precautions**: None
- **Maintenance and Cleaning**: Can be cleaned using isopropyl alcohol on the electrodes.

Accessories and Optional Add-ons:

- **Compatible Accessories**: USB-C cable to recharge. USB-C to snap electrode for continuous ECG (Included)

Note: Specifications are subject to change. Please refer to the latest updates from SiFi Labs Inc. for the most accurate information.

Technical Specifications

- **Dimensions**: 20.4cm X 4.6cm X 1.3cm
- **Weight**: 62g
- **Operating Conditions**:
  - Temperature: 0-40°C
  - Humidity:10-90% RH
  - IP XX