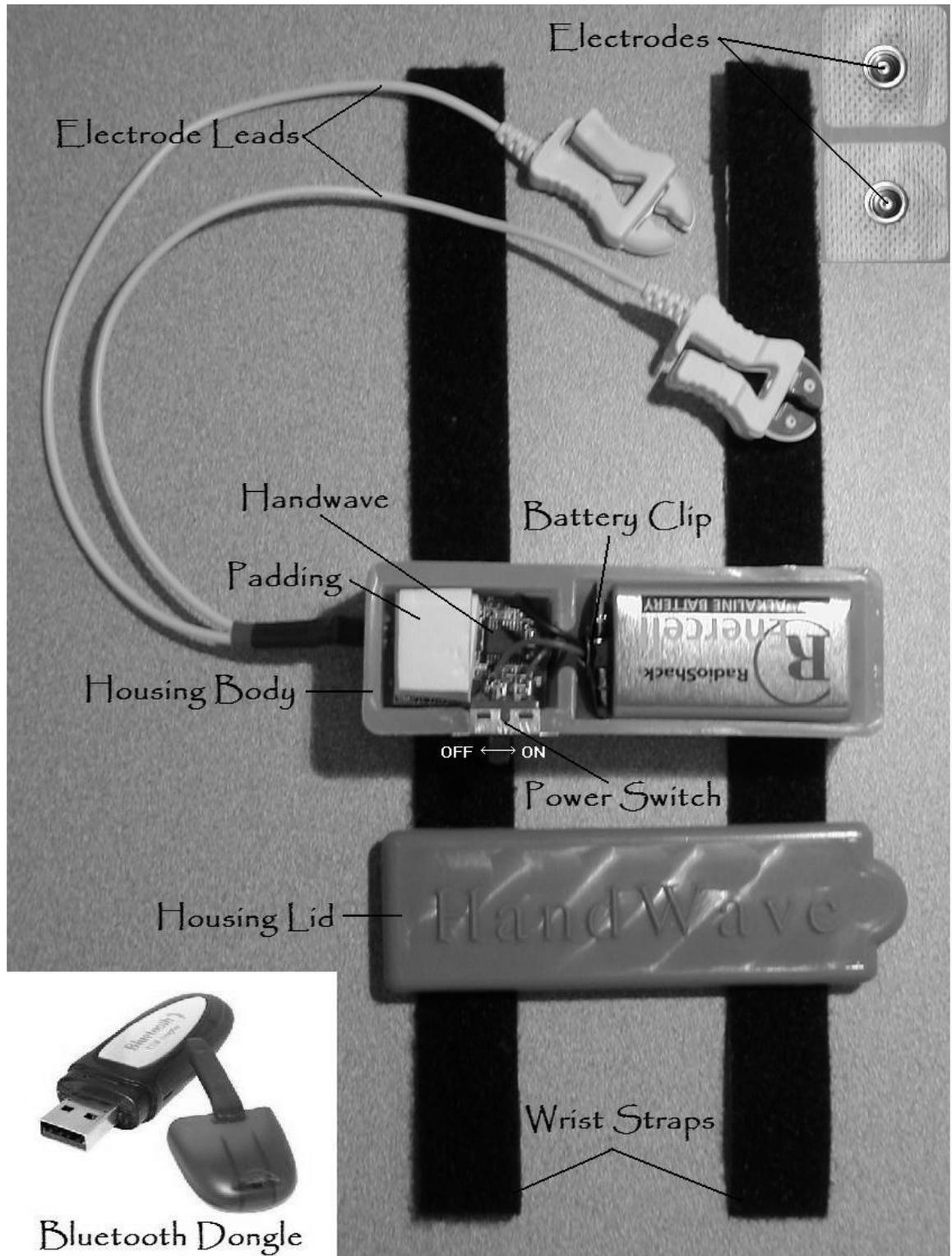# HandWave User's Guide

Complete HandWave system

HardWare

A complete HandWave system consists of:

- HandWave: Amplification Board & Bluetooth board
- Housing: Body & Lid
- Power Circuitry: Battery, Switch, & Leads
- Finger Electrodes or Electrode Leads & Disposable Contacts
- Wrist Straps: Velcro or Clips & Elastic
- Protective Padding
- Bluetooth-equipped base station

The power switch is in the ON position when it is thrown towards the battery. When powered, the HandWave LED will flash rapidly five times. The LED will also flash when data transmission is initiated or terminated.

The wrist straps may be made of Velcro strips, or mounted clips and elastic wristbands. The clips are safer for situations where the wearer may be moving about.

The electrode leads attach to the HandWave through the circular port in the housing. The pins are separated by a standard .1" pitch. Any silver-silver chloride (Ag/AgCl) electrode will suit the purposes of the device. Sources for purchasing electrodes are listed below: www.grasstelefactor.com   www.biopac.com

When opening the housing, use the semi-circular tab to pry the lid off. When reattaching the lid, a good amount of force is needed for the snap-fit. Do not hesitate to apply pressure; you will not break the plastic housing. Never attempt to replace or remove the sensor without first removing the switch from its press-fit in the housing.

The white padding is to prevent the HandWave from getting knocked around inside the housing. Using the padding may increase the lifetime of your device.

Software

The driver for the HandWave is written in Python code. An ActivePython installation package for machines running Windows can be found at:

http://www.activestate.com/Products/Download/Download.plex?id=ActivePython

You will also need to install the pyserial library in order to access the virtual serial ports:

http://pyserial.sourceforge.net/

The Python driver receives the data and prints the raw data in real-time as well as writing the actual conductivity (in micro-mhos/micro-siemens) to a text file. The driver is also capable of passing the data through a socket to other (graphics) applications, which are started in the python file by the command: os.startfile(""). A thermometer and/or a lie-detector type graphics application for windows machines are available on request.

The Python driver MUST be edited to match the virtual COM port, which may be different for each base station. The virtual COM ports can be added/changed in Bluetooth configuration under the "Client Applications" tab. Remember to take note of which COM port(s) is being used.

Feel free to change the platform on which you collect the data from the serial port, but be sure to copy the 'decoding' algorithm from the Python driver file in order to recover the conductivity data from the raw data.

The HandWaves are named according to the serial number on their respective Bluetooth modules. These are on the underside of the circuit boards, so if you have multiple HandWaves, you'll have to open up the housings or turn the devices on one at a time in order to determine which is which.

Finally, and this is IMPORTANT: the PIN code for connecting to the HandWave is '1'. (No quotes, just a single character/numeral). This is for protection from other Bluetooth users, who may try to connect to the HandWave (the sensor can only connect to one base station at a time). This limitation and the PIN code feature can be removed upon special request.

If you have any further questions, please email me at MarcStrauss@gmail.com.