



**VERSATILE**  
CLINICAL  
EP/OAE

# AUDERA PRO: VEMP BIOFEEDBACK MONITOR

## QUICK GUIDE

The operating manual contains information pertinent to the use of the GSI Biofeedback Monitoring system. It may be used with the GSI Audera Pro when collecting cervical VEMPs (cVEMP). It is recommended that both operating manuals be reviewed in their entirety prior to use of the Biofeedback monitor and Audera Pro system on a patient.

### TESTING ENVIRONMENT

The GSI VEMP Biofeedback system requires placing the monitoring tablet at the appropriate angle and height so the patient can easily view the tablet when recording right and left cVEMPs. Suitable area allowing for placement of the VEMP EMG monitor mounted on the tripod should be available. A non-metal, comfortable bed that allows the patient to recline about 30 degrees may be helpful. The tablet and bio-signal hub should be sufficiently charged to ensure function for the duration of the test session.

The GSI Audera Pro will be utilized at the same time so it is important that the test environment be conducive to collecting good quality test data. To minimize the amount of electrical noise, it is recommended that the Audera Pro be plugged directly into a dedicated, earth-grounded electrical outlet. Any unnecessary equipment such as computer monitors, cellphones, fluorescent lights, electronic beds, etc. should be turned off during testing.

### SET UP

Wireless pairing and setting target values must be completed the first time the Biofeedback monitor is utilized.

#### PAIR THE BIO-SIGNAL HUB TO THE TABLET

1. Turn on the Biofeedback hub. A flashing green light will appear.
2. From the tablet Home screen, tap the GSI Biofeedback App icon.
3. From the home screen, tap the Settings icon.
4. From the Settings screen, tap the Scan button. Once a connection has been made the Device MAC address will be displayed.

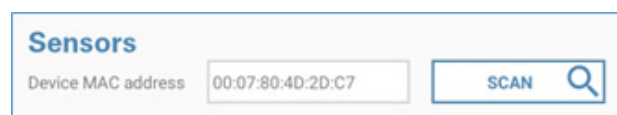
**BIOFEEDBACK  
APP ICON**



**SETTINGS  
ICON**



#### SETTINGS SCREEN



*NOTE: Once paired, the tablet should connect to the Bio-signal hub automatically. If not, repeat steps 1-4.*

#### SET TARGET VALUE

There are two options for establishing the patient target: relative or absolute. Relative values are specific to the patient and requires establishing the MVC (maximum voluntary contraction) on each patient prior to presenting the patient biofeedback target screen. Absolute Values are fixed microvolt values.

1. Determine the desired target option (Relative or Absolute).
2. Tap the on/off button to the right of the desired target type.
  - a. If using Relative Values for the target, enter the percent (%) of Maximum value and the Range (+/-) in percent.
  - b. If using Absolute Values for the target, enter the Fixed level in microvolts and the Range (+/-) in microvolts.

**NOTE:** The range setting directly affects the size of the acceptable target on the patient Biofeedback screen. The smaller the +/- range, the smaller the target and the more difficult the task.

3. Tap the Home icon to return to the home screen.

ON/OFF  
BUTTON



HOME  
ICON



FIGURE A

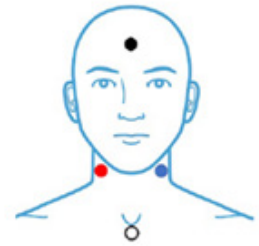


FIGURE B

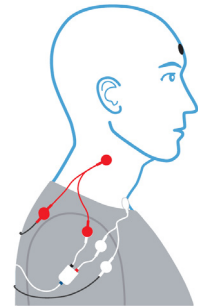
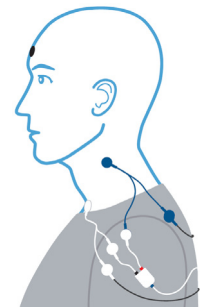


FIGURE C



## PREPARE THE PATIENT

1. Prepare the skin at four locations: right and left neck, high forehead, and just below the sternal notch. See Figure A.
2. Connect a snap electrode to the black snap lead of the 4-lead Audera Pro patient cable and apply to the high forehead. This connection will remain in place for right and left cVEMP collection.
3. Connect a snap electrode to the single snap end of the red, blue, and white Y-cables and apply to the prepared skin at locations in Figure A.
4. Connect the dual end of the white Y-cable to the EMG cable and the white snap lead of the 4-lead Audera Pro patient cable. This connection will remain in place for right and left cVEMP collection.
5. For right cVEMP testing, connect the dual end connectors of the red Y cable to the EMG cable and the red snap lead of the 4-lead Audera Pro patient cable. See Figure B.

**NOTE:** When testing the right ear, one of the two snap leads from the blue Y-cable will not be connected/remain open.

6. For left cVEMP testing, disconnect the EMG sensor from the red Y-cable and attach it to the open snap of the blue Y-Cable. See Figure C.

**NOTE:** When testing the left ear, one of the two snap leads from the red Y-cable will not be connected/remain open.

## SET THE MAXIMUM VOLUNTARY CONTRACTION (MVC)

Skip this section if using Absolute Value as target. The patient may fatigue quickly during cVEMP testing. Proceed through the Set MVC section as quickly as possible.

1. From the tablet home screen, select the Play button.
2. Instruct the patient to lift and hold their head a few inches above the table.
3. Press the SET MVC button when the patient achieves the maximum contraction. See Figure D.

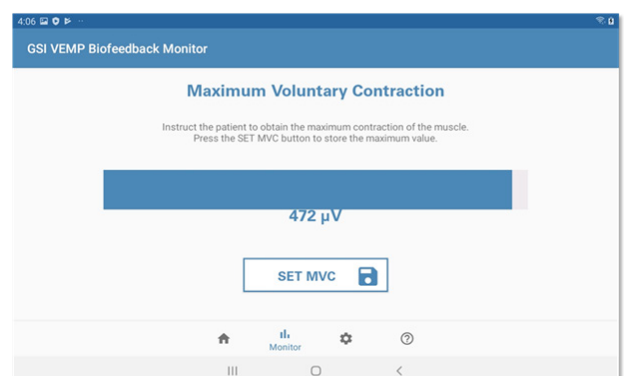
**NOTE:** Tap the Monitor icon to re-set the MVC.

4. Instruct the patient to lower their head.
5. When the MVC is set, the play button appears and the Biofeedback with cVEMP testing is ready to begin.

PLAY  
BUTTON



FIGURE D

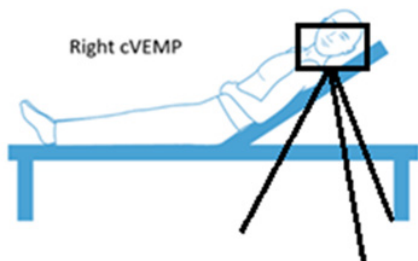


# PERFORM cVEMP WITH THE BIOFEEDBACK MONITOR

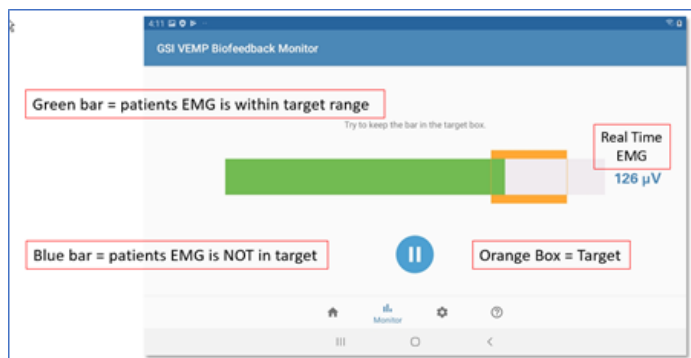
Follow the steps below to monitor the EMG level during cVEMP testing. It may be helpful to practice with the patient so they are familiar with the target screen.

1. Place the VEMP EMG Monitor so the patient can clearly see the tablet screen as shown. See Figure E.
2. Instruct the patient to lift and hold their head as soon as they hear the loud clicking sound and to relax when the sound stops.
3. Press the Play button from the home screen or the MVC screen to begin EMG monitoring, at the same time the Acquire button is pressed in the EP module, to begin the cVEMP collection.
4. Instruct the patient to view the Biofeedback screen and to try and keep the horizontal bar within the orange target area. The bar will be green when within the target. See Figure F.

**FIGURE E**



**FIGURE F**



5. When the test is complete, press the Pause button to pause or stop the monitoring.
6. Manually record the Time in Target results for reporting purposes.
7. Repeat cVEMP in other ear.

*NOTE: Refer to the cVEMP Quick Guide for analyzing and report writing of the cVEMP test results.*