



GP8 Amp

USER GUIDE

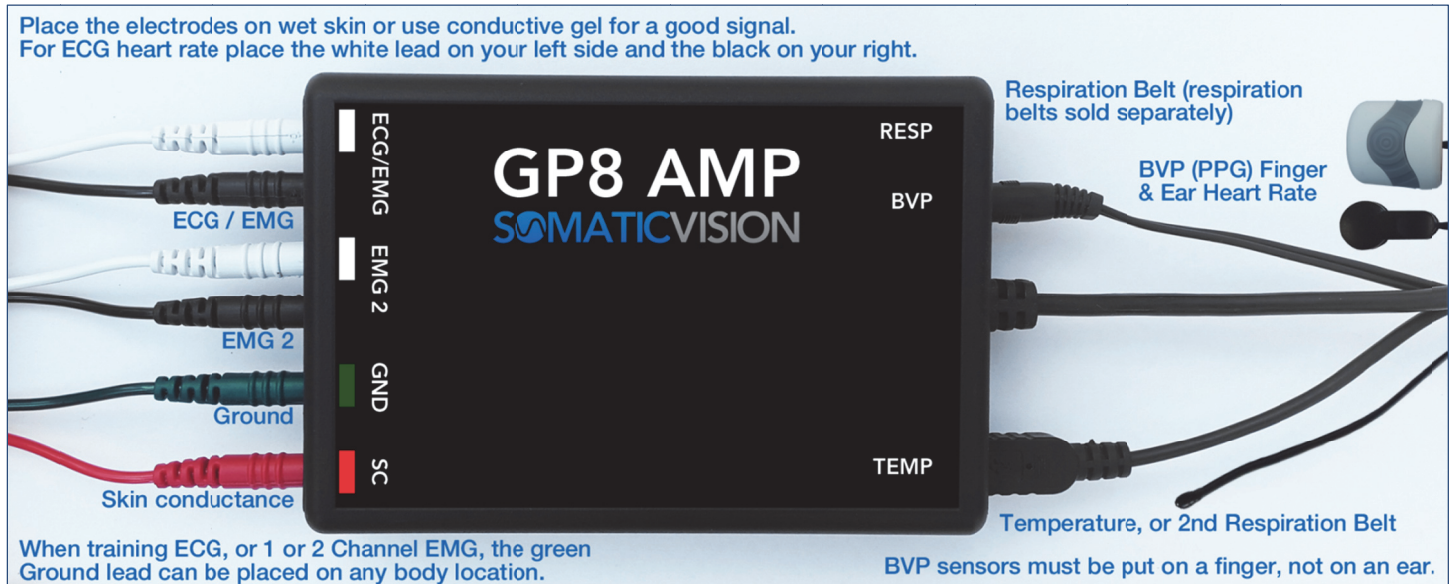
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Welcome to Alive Pioneer with the GP8 Amp

The GP8 Amp will allow you to make the most out of Alive Pioneer, adding the ability to **train ECG Heart Rate, BVP (finger sensor) Heart Rate, 2-Channels of EMG (muscle tension), Hand Temperature, and precise Skin Conductance.**

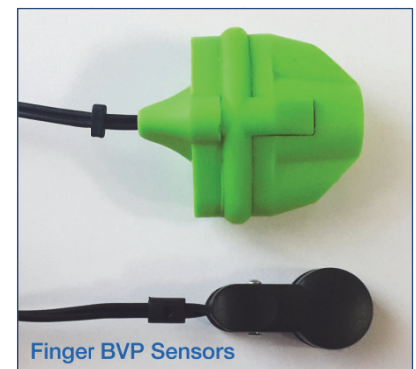
- 1) Start by setting up your GP8 Amp. **Attach a black, white (new) or green (original) BVP sensor and the Temperature sensor to the GP8 Amp.** If you have an older GP8 you must insert 2 AAA batteries, and will not have EMG 2 or BVP Heart Rate.
- 2) Connect the GP8 Amp USB cable to your computer. **If Alive stops detecting the GP8 Amp, detach the USB cable from your computer then reattach it.**
- 3) **Attach the 6 colored leads as shown.** White is positive, black negative, green is ground, and red is skin conductance. To prevent the wires from tangling you may wish to only attach the leads / sensors you plan on using.



- 4) The white, green and black BVP heart rate sensors read heart rate from your fingertips. **If a BVP sensor feels too tight on your middle finger, move it to your little finger (pinky).**



Don't place your finger all the way to the end of the white or green sensors. Place your finger tip on the small hole or light bulb, just past the middle of the sensor.



To train BVP change the Alive Main Menu – Heart Rate Source to BVP!

- 5) Keep the GP8 Amp away from other electrical devices. Placing the GP8 Amp on your lap may reduce electrical noise. **Be careful not to drop the GP8 Amp!**

Heart Rate & Skin Conductance



BVP STANDARD SETUP

To train with BVP heart rate and skin conductance, **place the red and green skin conductance leads on your index and ring fingers of your non-dominant hand.** Place a BVP sensor on your middle finger or little finger (pinky). If you get a lot of BVP movement errors you may wish to switch to chest or ankle ECG. **BVP movement errors are more frequent in the first minute after the sensor is first placed.**

ADJUST SMOOTHNESS DIFFICULTY!

With the higher heart rate accuracy of the GP8, especially if training ECG, it is easier to achieve high smoothness.

Therefore you may wish to **increase the Smoothness Difficulty** on the Main Menu to Intermediate or higher.



ECG STANDARD SETUP

To train ECG heart rate and skin conductance, attach the leads (electrodes) as shown. Place the black lead on your right ankle for a stronger signal.

MOVEMENT ERRORS

When training wrist-to-wrist ECG, if you move either wrist there will be heart rate errors. If you wish to use one of your hands to play a game such as Dual Drive, switch to BVP heart rate, or move one or both (white/black) ECG leads to your ankles. **If you have two black leads, you can use the longer one to reach your right ankle.**

When training ECG ensure the **white lead is on the left side of your body, and the black lead is on the right side.** The green lead can be placed on a finger or anywhere on the body.

To use both hands, **or to get the strongest possible ECG signal, place the white and black leads on your chest or ankles.** The green lead can also be placed on your chest or ankle, completely freeing both hands.

SKIN CONDUCTANCE ONLY

To train skin conductance without heart rate, place the red and green leads on your index and ring fingers. The white and black leads are used for heart rate (or EMG) training only.

OPTIMIZING HEART RATE SIGNAL QUALITY

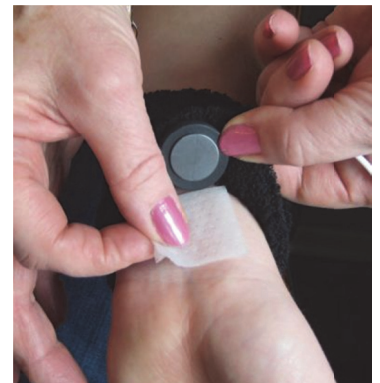
To check heart rate signal quality, see the Checking Heart Rate Signal Quality section on the next page.

Disposable (sticky) ECG electrodes can only be used once!

USING PERMANENT ECG ELECTRODES



To avoid using disposable electrodes, attach the permanent electrode disks to the white and black leads. **When using permanent electrodes first use an alcohol wipe to clean your wrists or ankles and the electrodes.** Use the wrist bands (or socks for ankle placement) to hold the leads in place. **If signal quality is poor use a conductive paste such as Ten20 on the electrodes.** Five permanent electrodes are found in a small plastic bag.

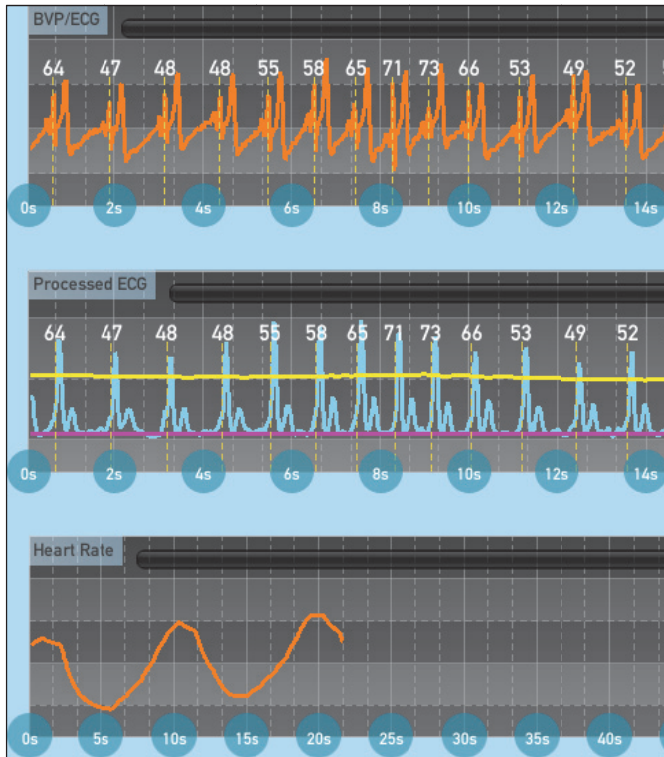


CHECKING HEART RATE SIGNAL QUALITY

Before checking signal quality choose ECG or BVP from the Heart Rate Source dropdown on the Alive Main Menu.

To check heart rate signal quality, open Graph Training and select the **Raw BVP/ECG Signal Quality** graph.

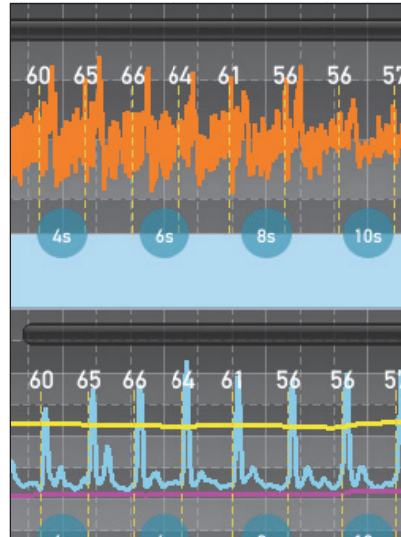
If training with ECG, make sure your signal looks like the orange line in the **HIGH QUALITY ECG** example below.



HIGH QUALITY ECG

If your ECG signal looks like this, with clear orange spikes, and each beat marked with a heart rate number, you are measuring accurate heart rate, and are ready to train.

The light blue Processed ECG line must rise above the yellow line to detect a heartbeat.



POOR CONNECTION

Although the heartbeats are measured accurately in this example, the ECG signal, shown in orange, is filled with noise and you may not get accurate heart rate readings.

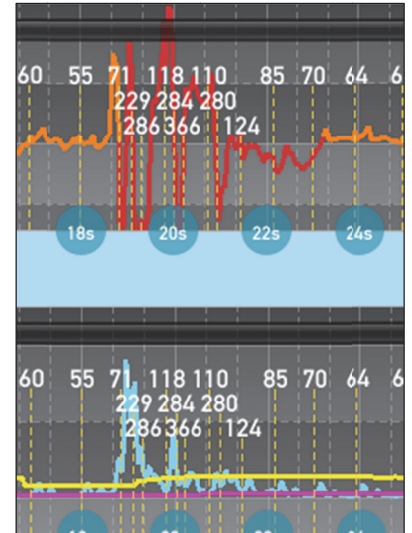
Make sure the electrodes are firmly in place.

If the room is cold, or your hands are cold, warm your hands by turning on a heater or with temperature feedback.

Use an alcohol wipe, conductive paste, or disposable electrodes.

Disposable (sticky) ECG electrodes can only be used once!

Move the GP8 Amp away from your computer or other electronics.



MOVEMENT ERRORS

If you are measuring ECG at the wrists, moving or tensing either wrist will result in heart rate measurement errors.

To prevent measurement errors, keep your wrists relaxed and still. Try placing both hands, palms up, on a table or chair, or on your lap.

To play a game that allows hand movement, or if you continue to get measurement errors, switch to BVP heart rate, move one or both electrodes to the ankle, or measure ECG from the chest.

HOW TO TRAIN HEART RATE AND SKIN CONDUCTANCE

Refer to the Alive User Guide, Alive Clinical User Guide and Alive Pioneer User Guide for tips on how to effectively train heart rate and skin conductance.

Before training heart rate you must choose if you want to measure heart rate from the ECG or BVP sensor. **Choose ECG or BVP from the Heart Rate Source dropdown on the Alive Main Menu.**

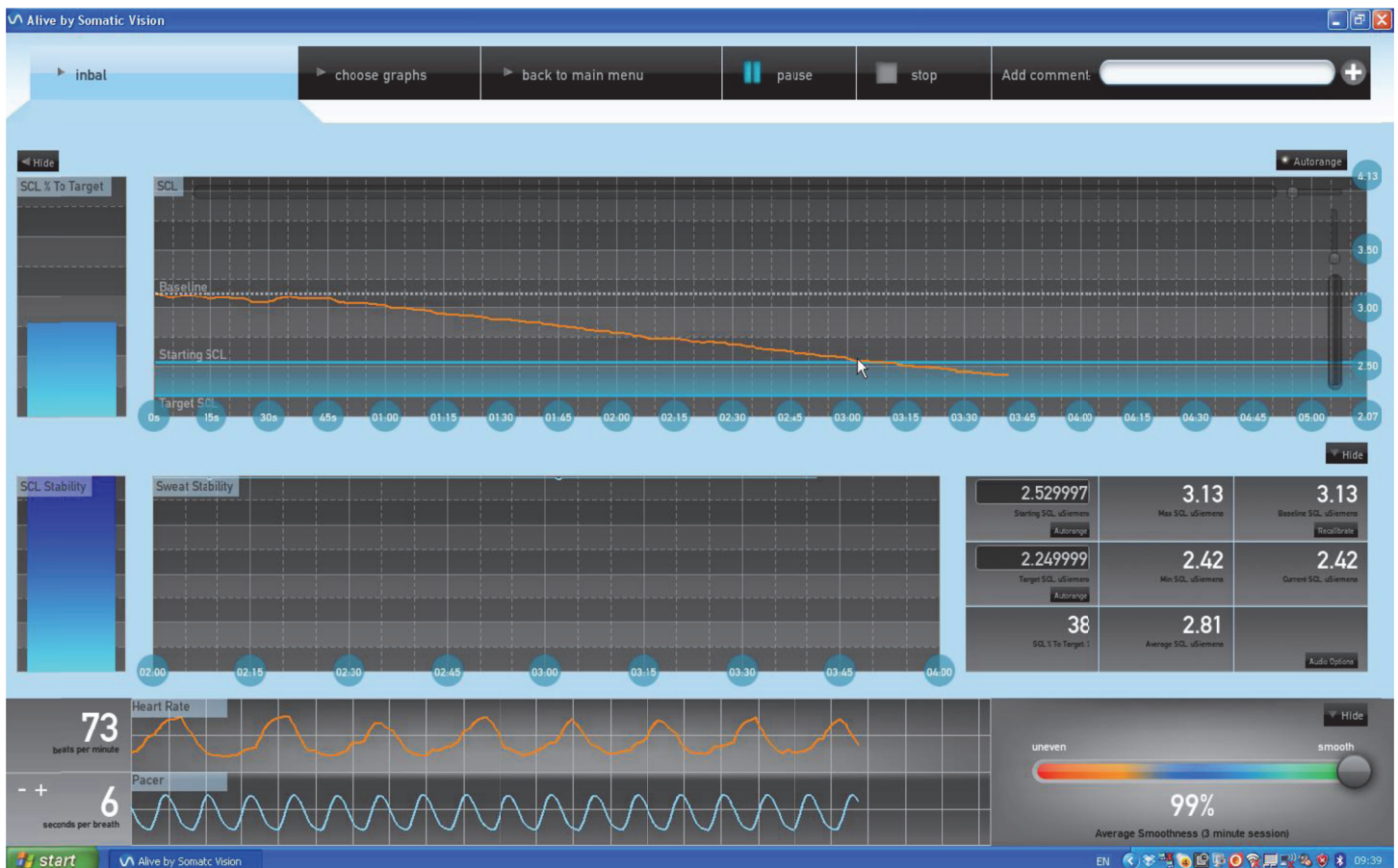
► Heart Rate Source: ECG - GP8 Electrodes

► User 2 - Heart Rate Source: BVP - GP8

If you want to train two users, or compare two heart rate sources, select a User 2 heart rate source. Otherwise make sure User 2 is set to None. **You can only train two heart rate sources using graphs labeled “- 2 User” and in Dual Drive. In Dual Drive one user clears the fog and the other controls the speed of the car.**

The Alive Pioneer User Guide has extensive information on training BVP Amplitude, an important but infrequently trained measurement of stress. Read the Alive Pioneer User Guide to get familiar with the new features in Alive Pioneer.

Read the Alive Clinical User Guide if you are not familiar with the standard Alive graph elements shown here. All GP8 Amp measurements, such as Skin Conductance, EMG and Temperature have similar graph training screens.



On the top main graph there is a blue area. You can drag the top and bottom lines to set the starting and target values. This determines your percent success as shown in the bar to the left of the main graph. **When using a manual measurement (EMG – Manual, SCL – Manual, etc.) this percent success is what will be displayed as feedback** in any Alive Environment or Game, so make sure you set the Starting and Target values appropriately. They can be adjusted at any time using the separate graphing screen that automatically appears when starting an environment or game.

Respiration Belts (sold separately)

Respiration Belts can be purchased from www.somaticvision.com/AlivePioneerGP8Amp

You can use one or two Respiration Belts with the GP8 Amp. Respiration belts must be replaced occasionally. If used daily expect 6 months – 1 year of maximum use.

The Respiration Belt is placed around the abdomen or chest (or both) to measure breathing. As you breathe, the belt stretches slightly and this stretch (near the middle of the belt) is measured.

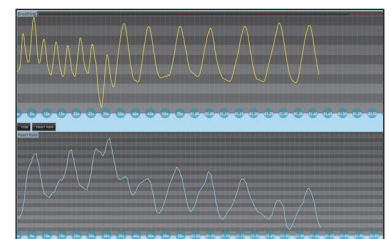
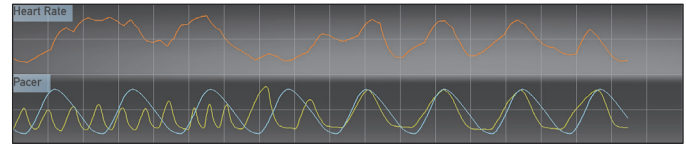
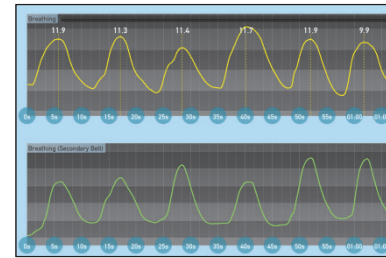
Your **respiration data is shown as a yellow line** in the breath pacer area in the Alive Bottom Graphs.

There are two Graph Training screens designed for respiration training: **Respiration Simple** and **Respiration Full**. These screens are also useful without Respiration Belts.

The yellow respiration line shows how your breathing affects your heart rate and smoothness. **Respiration training can be used to synchronize breathing and heart rate changes.**

To begin using the Respiration Belt:

- 1) **Attach the Respiration Belt cable to the RESP slot** of your GP8 Amp (the 2nd belt would go in the TEMP slot).
- 2) Open the **Respiration Simple** graph from Alive Graph Training. **Click Play**.
- 3) Give a gentle pull on both sides of the respiration belt, to get a feel for how tension on the belt stretches the belt slightly and moves the yellow Respiration line in Alive.
- 4) Loosen the Respiration Belt by moving the belt through the clip.
- 5) Loop the Respiration Belt around the abdomen or chest and connect it to itself to form a belt. The center Respiration Belt box should be in front. Tighten the belt until you see the yellow line move with each breath. If you are breathing mostly into your chest, either move the belt to your chest or practice abdominal (belly) breathing. You may wish to review the **Ways to Breathe** and **Advanced Breathing** Alive Workshops.
- 6) There may be parts of your breathing that are not detected. This depends on the belt tightness. You will need to experiment to determine the optimal belt tightness.
- 7) Observe the yellow line rise as you inhale and lower as you exhale. Notice whether or not your breathing and heart rate are in sync. Experiment with how your breathing affects your heart rate.
- 8) **Slow your breathing in a gentle and effortless manner. Find a comfortable breathing speed that smooths your heart rate and approximately synchronizes the rise and fall of your breathing and heart rate. Observe how changing your breathing changes the synchrony of heart and breath. If your heart rate starts lowering a long time before you exhale, you may be breathing slower than you need.**



EMG

EMG measures the electrical activity of a muscle or muscle group.

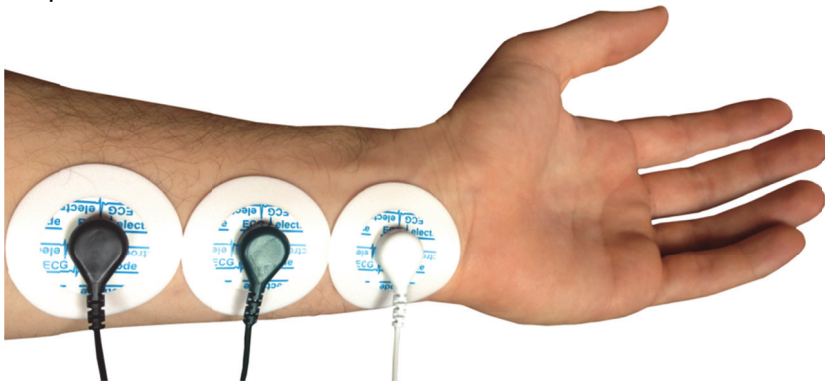
This is a brief introduction to EMG. **To get the most out of EMG training attend a biofeedback workshop that includes EMG training.**

USES OF EMG

- **General relaxation**
- **Relaxation of a specific muscle**
- **Activation (tensing) of a specific muscle**
- Learn how movements and posture activate and release various muscles
- And much more...

APPLYING EMG ELECTRODES

EMG uses disposable sticky electrodes. 50 disposable sticky electrodes came in a package with your GP8 Amp.



Find a muscle that you wish to measure. Hair may make measuring EMG more difficult, so for now find a place with relatively few hairs. A conductive paste, such as Ten20 Conductive Paste, can be used to improve the connection on hairy areas. Put the conductive paste only on the center grey part of the electrode (so you don't interfere with the sticky part).

Disposable electrodes can only be used once, on a single body location. If you wish to change the electrode position remove the current electrodes, discard them, and place new electrodes in the new desired position.

If you find you are getting a poor signal you may wish to first clean the site with an abrasive cream, such as NuPrep, or an alcohol wipe. After you clean the site, place new disposable electrodes.

Place 3 disposable sticky electrodes in a row. These should go in the direction of the muscle fibers.

For example they can be placed on the flexor muscle underside the wrist to measure wrist flexion muscle activity. The electrodes can be placed one right after another. Note: It is also possible to place the electrodes in a triangle formation, or to place them further away from each other to measure muscle activation over multiple muscles, or over a larger area. If you measure an area near the chest, or that crosses from one side of the body to the other, **you may also see the ECG signal (heart beat) in your EMG.**

Attach the white, black, and green lines from the GP8 Amp to the disposable electrodes.

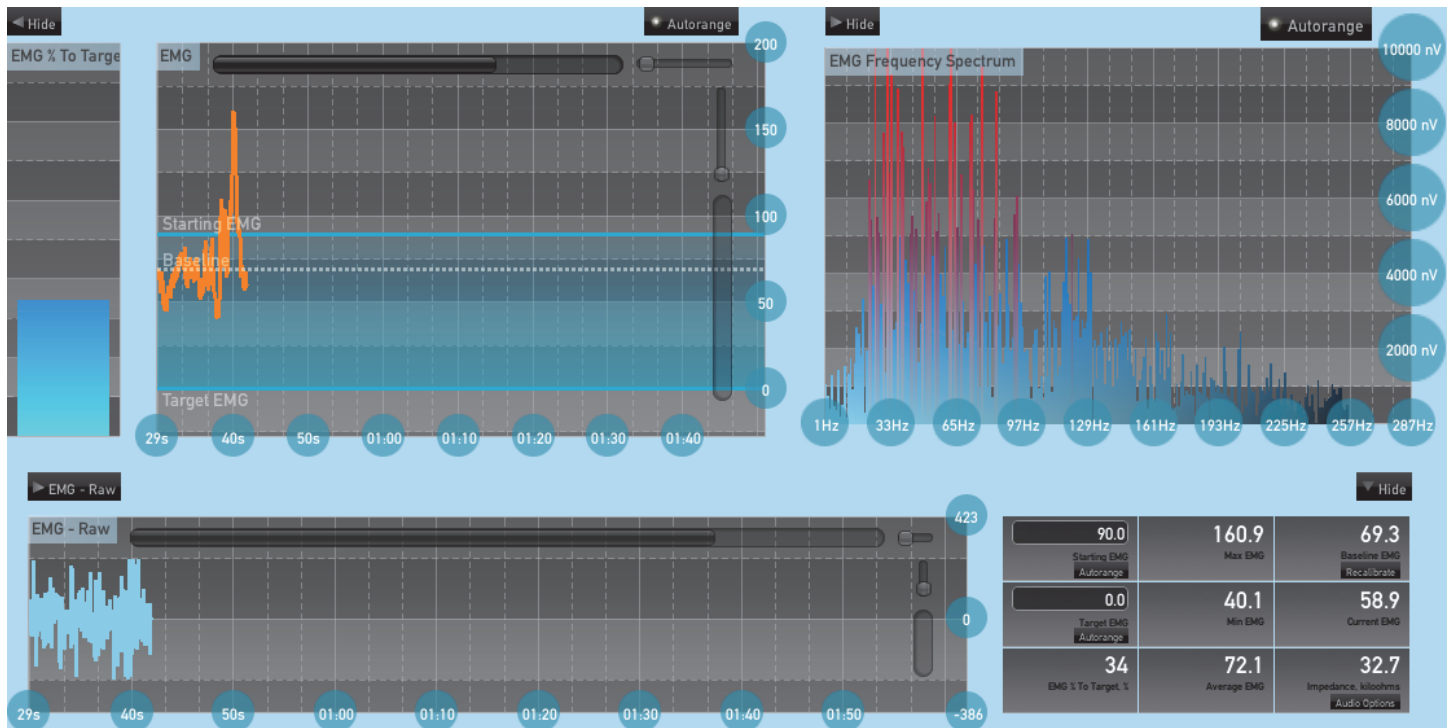
COMMON ELECTRODE PLACEMENTS

For general relaxation or stress assessment electrodes can be placed on the forehead, in a line going across the forehead, or on the shoulders.

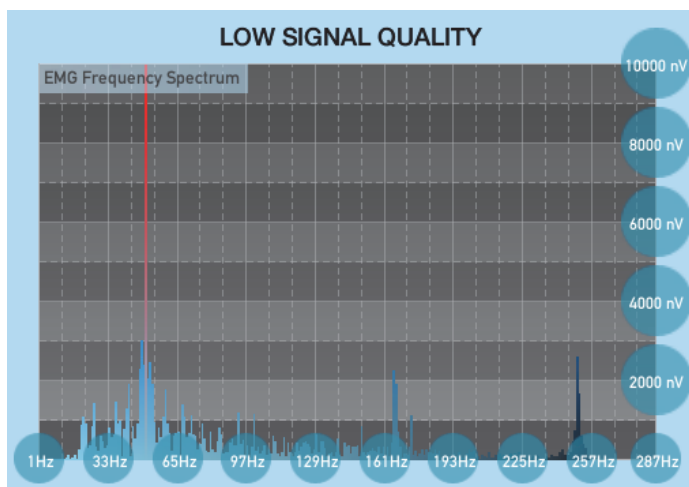
Other common placements include the neck, jaw (for jaw tension or grinding of the jaw) or back (posture). **It's highly recommended that you take a training course that teaches EMG feedback to maximize effectiveness and ensure safety while training EMG.**

CHECKING EMG SIGNAL QUALITY

To check EMG signal quality, open Graph Training and select **EMG Graphs**.



High EMG – High muscle activity results in a large rise of the orange EMG line and many high values in the EMG Frequency Spectrum. **During High EMG you can't determine EMG signal quality.**



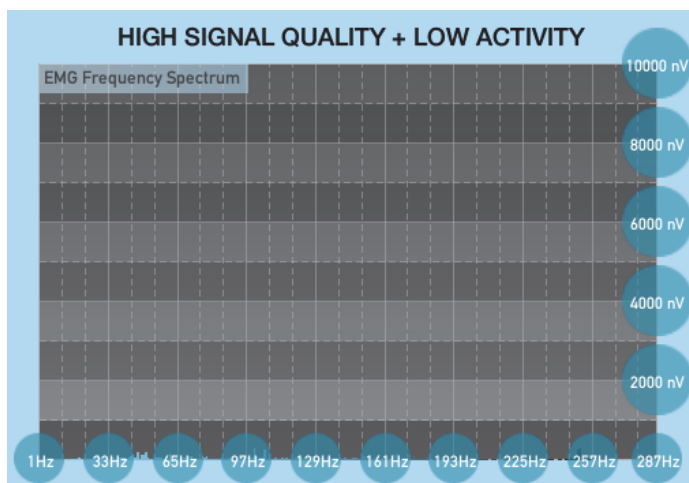
LOW SIGNAL QUALITY

Low signal quality results in thin spikes, especially around 50 or 60 Hz. Even with low signal quality you can often effectively train EMG. **If you see large spikes at 50 or 60 Hz, enable the 50 or 60 Hz filter above the main EMG Graph.**

IMPROVING SIGNAL QUALITY

There are two main causes of poor signal quality:

- 1) Electrical noise. Try moving the GP8 Amp away from your computer or other electronics. **Enable the 50 or 60 Hz filter at the top of the EMG Graph.**
- 2) Bad electrode contact / connection. To fix a bad electrode connection, **replace the disposable electrodes**, use NuPrep or an alcohol wipe, or use a conductive paste on the grey electrode disk. In some cases you may choose to remove hair around the area to get an ideal connection.



HIGH SIGNAL QUALITY + LOW ACTIVITY

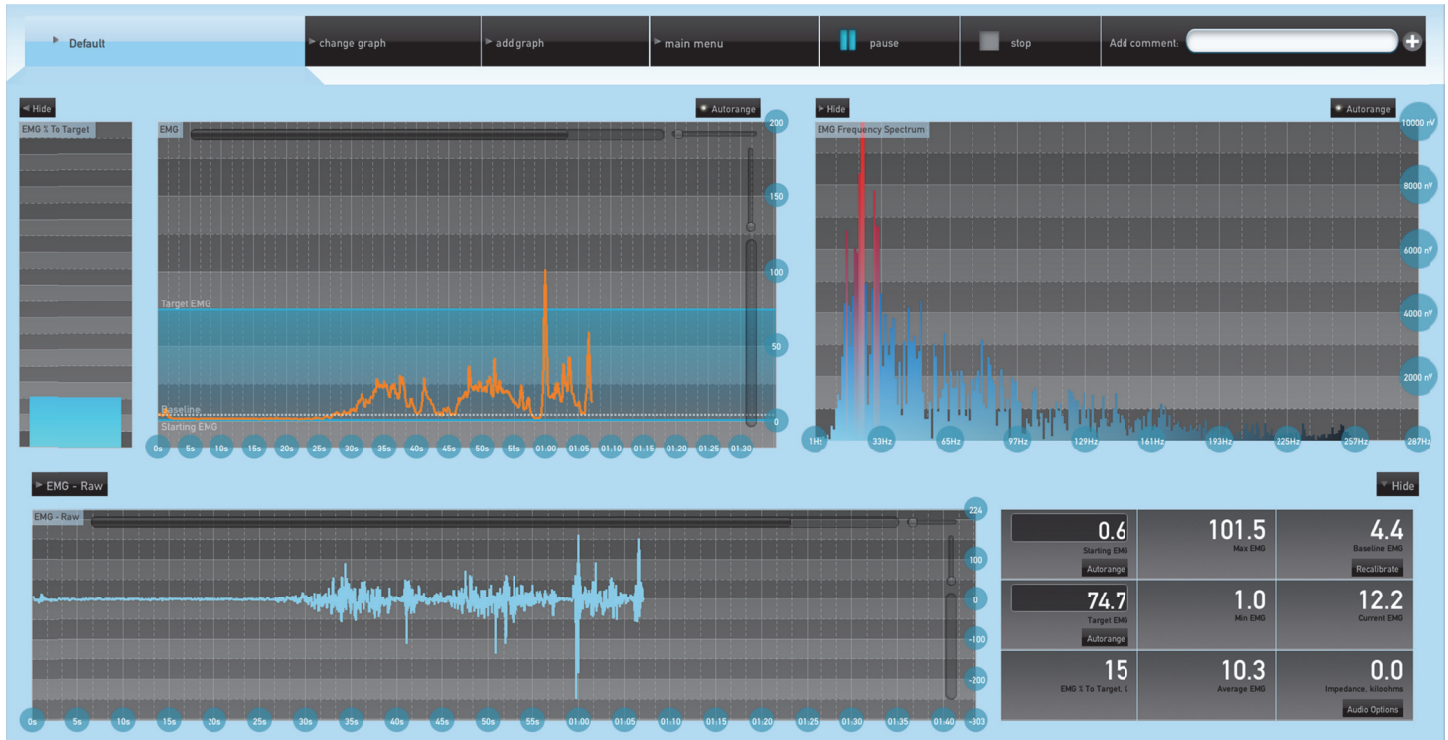
If you have high signal quality, and the muscle measured is relaxed, the EMG Frequency Spectrum will display only very low values as shown to the left.

EMG GRAPH FEEDBACK

Open Alive, select a user, and then open Graph Training. In Graph Training choose EMG Graphs from the “change graph” drop down menu.

1 CHANNEL EMG GRAPH WORKSHOP

1. **Attach the EMG sensors** to the underside of your wrist, then **open the EMG Graph in Alive.**
2. **Practice tensing your wrist**, flexing it, holding your hand in the air, and wresting it on a table or your lap. Observe the changes in the various graphs as you do this.



3. **Change the lower left graph to show EMG Relaxation – Automatic.** Use the drop down to the upper left side of the graph. By default this would show EMG-Raw.
4. **Try to raise the EMG Relaxation line** by relaxing or changing the position of your wrist. Rest your wrist on the table, with your wrist down, or wrist up, experiment to find the most relaxing position, then relax further by consciously releasing the muscles in your wrist as you exhale.
5. **Change the lower left graph to show EMG Tension – Automatic.**
6. **Try to raise the EMG Tension line.** See how long you can keep the EMG Tension line at the top (but be careful, **don't hurt yourself!**)
7. Now set your own custom goal, **move the starting and target lines in the main graph.** If you want to relax, the starting line should be above the target line. When you are meeting your goal, **the bar to the left of the graph will fill.**
8. Click main menu to return to the **Alive Main Menu.**
9. **Select an EMG Feedback from the Feedback Drop Down.** You can choose EMG – Manual, in which case you will set the starting and target values, or one of the Automatic EMG feedbacks.
10. Go to Games -> Mini Games and select Dream House. **Control the building of the house by meeting your EMG goals.**

2 CHANNEL EMG – TRAINING TWO INDEPENDENT MUSCLE GROUPS

You can train one muscle to activate while another muscle stays relaxed using the **2 Channel EMG DIFF 1 - 2** Graph or Feedback. To train two muscles to activate or relax together use **2 Channel EMG SUM 1 + 2.**

Temperature

Temperature in your hands increases when you relax.

You can learn to increase your hand temperature dramatically.

This is a brief introduction to temperature feedback. To get the most out of temperature feedback you may wish to attend a biofeedback workshop that includes temperature training.

ATTACHING THE TEMPERATURE SENSOR

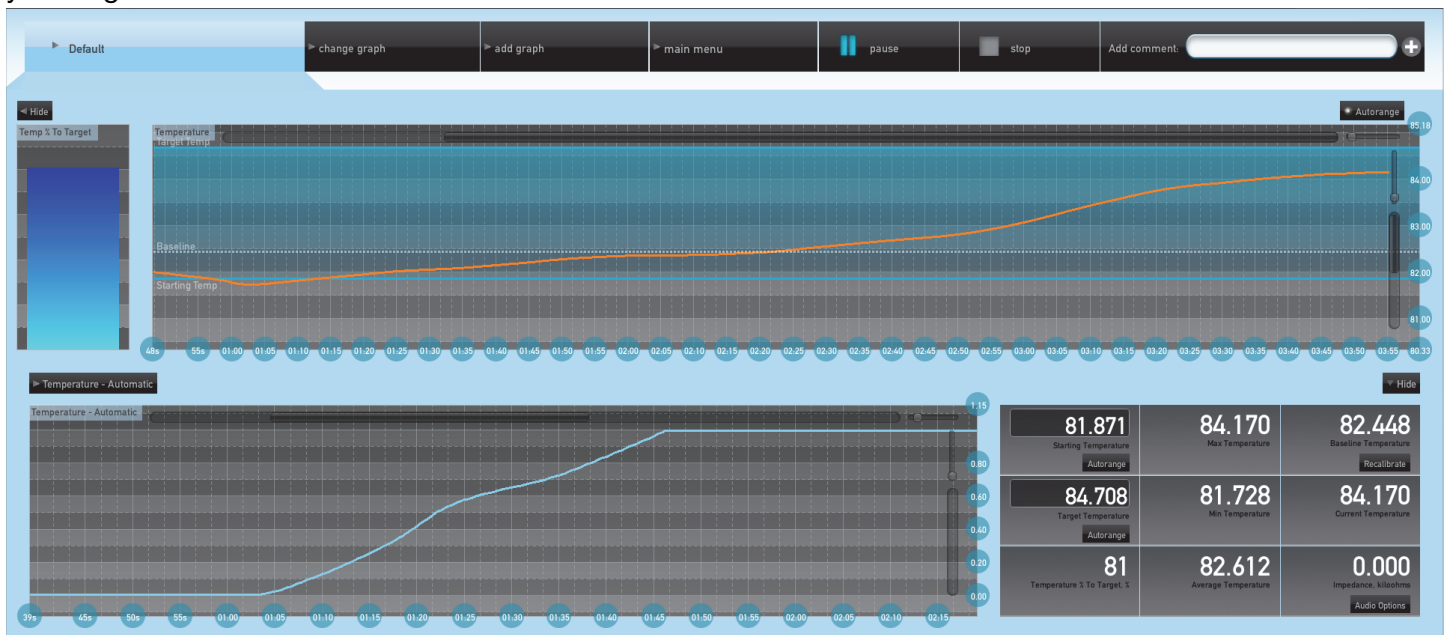
Attach the temperature sensor to the GP8 Amp in the **mini-USB slot nearest the 4 leads**.

Place the other end of the temperature sensor on one of your fingers. **Use one of the skin conductance Velcro finger straps (or some thin paper medical tape) to hold the temperature sensor in place.** Place the sensor on the underside of your finger tip, or just to the side of the electrode if you are also training skin conductance.

The tip (head) of the temperature sensor must be exposed to the air on one side (not covered by a strap or tape) otherwise heat will build up. **Don't put your finger on your thigh, or anywhere on your body, or on anything that will cover (or warm) the tip of the temperature sensor.** A room temperature of 72-77°F (22-25°C) is ideal.

If the room is colder than your hands it takes 30 seconds to 1 minute for temperature to calibrate. **Place the temperature sensor on your finger, then wait for 1 minute** or until the temperature measured stops increasing, then begin training.

The Temperature – Automatic measurement will not start until 50 seconds after you put the temperature sensor on your finger.



WHY DOES RELAXATION CAUSE HAND WARMING?

Relaxation increases blood flow in your periphery, especially your hands. When you are anxious, your body draws blood inwards, to the organs, and to major muscles in the legs. This prevents possible bleeding from injury during a flight-or-flight scenario, and brings more blood to where it is needed.

HOW WARM CAN I MAKE MY HANDS?

Over time, many people can learn to warm their hands to 90-95°F (30-35°C). Normal starting hand temperatures vary widely from 65°F to 90°F (18°C to 30°C).

Everyone can learn to increase their hand temperature.

It isn't important to raise your hand temperature dramatically. You can have a successful session by increasing your hand temperature 0.5 or 1°F.

HOW DO I WARM MY HANDS?

It takes time to raise your hand temperature. Give yourself time for at least a 10 minute session, and know it may take many sessions to learn to raise your hand temperature dramatically.

Hand warming requires relaxation, and letting go of trying. **People often start to succeed when they stop trying.**

Try this:

Open the temperature graph in Alive: Attach the temperature sensor, hit play and wait a minute until the line stops moving. Then zoom in using the vertical zoom slider to the right of the main temperature graph.

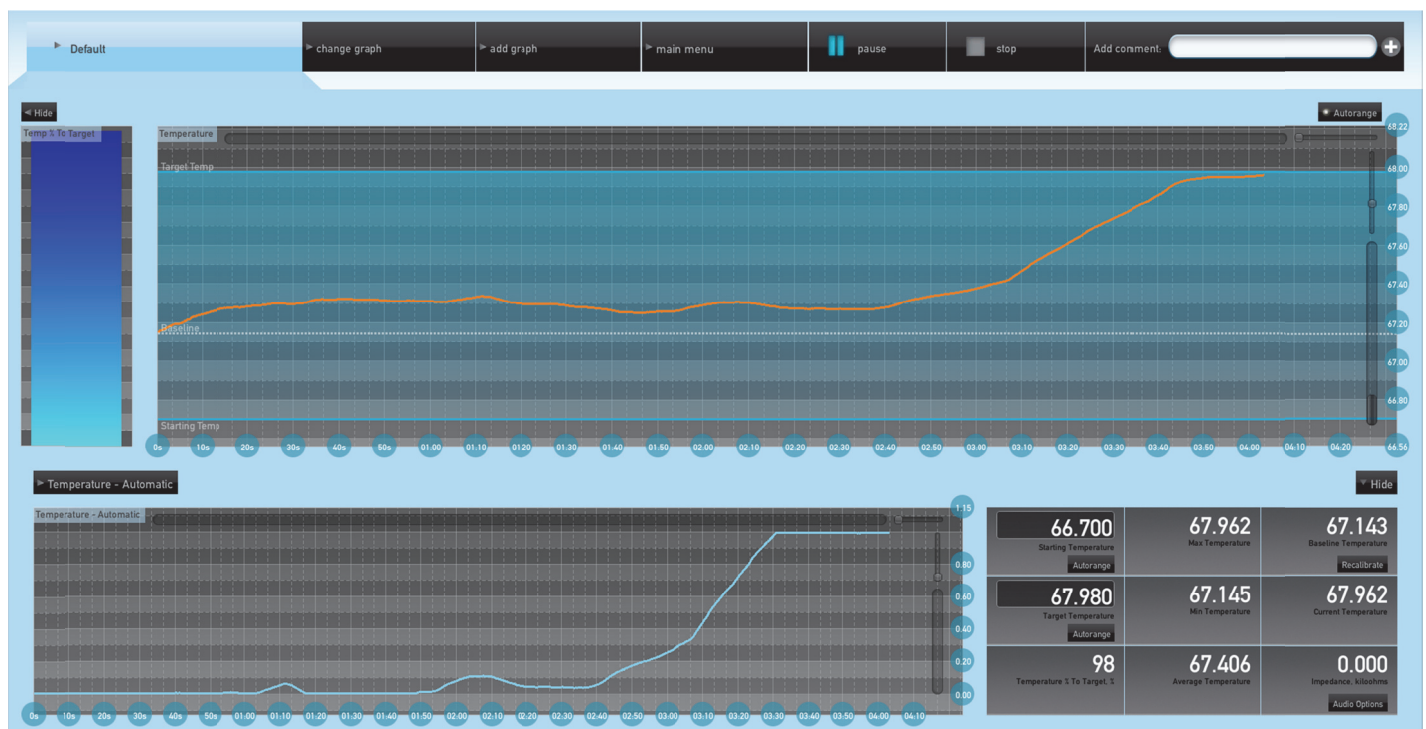
Experiment with decreasing and increasing your hand temperature. Relax your breathing. On each exhale gently breathe warmth down into your hands. Relax your body. Feel your muscles become heavy. Now stop trying to change your hand temperature, and just relax and watch the small changes in temperature.

The GP8 Amp temperature is very sensitive, and can measure changes of 0.01°F. This makes it easy to start learning as you can see small changes in finger temperature and know that you are heading in the right direction.

TEMPERATURE GRAPH FEEDBACK

Open Alive, select a user, and then open Graph Training. Graph Training is available from the Alive Main Menu as the top button on the left side.

In Graph Training choose Temperature Graph from the “change graph” drop down menu.



TEMPERATURE GRAPH WORKSHOP

1. **Place the temperature sensor** on one of your fingers, using a Velcro finger strap to hold it in place.
2. **Wait for 30 seconds or until the temperature line stops rising.** It can take up to a minute for the temperature sensor to fully warm up when placed on your body.
3. **Use the vertical zoom slider on the right side of the main temperature graph to zoom in on the temperature line.** Very small changes in temperature can be measured, and zooming in will help you see when you start to succeed.
4. **Try to decrease your finger temperature.** Tense your body or think of things that upset you.
5. **Relax and do nothing.** After tensing it should be easy to relax. Don't try to relax, just stop tensing. Stop doing anything. **Notice if the finger temperature line rises.**
6. Now take a few minutes and relax further. **See if you can feel your hands warming.** Notice if you are trying and stop trying. Relax and see what happens. Tense and release your muscles. Breathe warmth down to your hands on each exhale. Stop trying to raise your hand temperature and turn your attention to something pleasant or boring. Over time you can learn to relax and warm your hands.
7. Click main menu to return to the **Alive Main Menu.**
8. **Select Manual or Automatic Temperature Feedback from the Feedback Drop Down.**
9. Go to Environments -> Petals of Light.
10. If you selected Temperature – Automatic, Petals of Light will open immediately. If you selected Temperature – Manual, you will now need to drag the starting and target lines on the main temperature graph. Set the starting line to be either where you temperature is now, or some value that you consider to be a low temperature. Set the target temperature to your desired final hand temperature, but don't set this too high, it will just make you frustrated.
11. Expand the mandala shapes by increasing your finger temperature.

Purchasing Disposable Electrodes

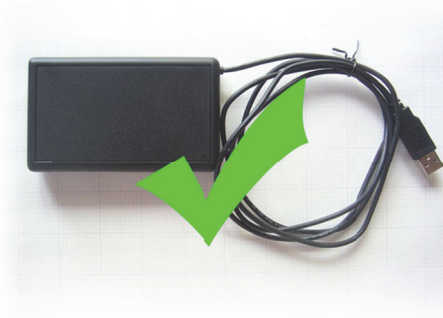
If you train with EMG, or use disposable sticky electrodes for heart rate training, **you will need to purchase additional packets of ECG electrodes.** Purchase ECG electrodes for EMG training. ECG electrodes are mostly standard, so any Ag/AgCl (silver chloride) 30mm-50mm gelled electrode should work well.

We don't sell additional disposable electrodes. We ship with one package of these disposable electrodes:

50 pieces: <http://www.ebay.com/itm/50-pcs-one-pouch-ecg-ekg-electrodes-foam-43-45-best-price-on-eBay-/190854753698?hash=item2c6fd46da2> **1000 pieces:** <http://www.ebay.com/itm/1000-pcs-20-pouches-ecg-ekg-electrodes-foam-43-45-best-price-on-eBay-/190840469040?hash=item2c6efa7630>

Care of Your GP8 Amp

Store the USB cable with large open loops.



Never wind the cable around the case or bend the cable sharply at the case entry.

