

Galvanic Skin Response (GSR) User Guide

Biopac Systems, Inc.

Lucas Center 3T2 (P173)

I. Introduction

Galvanic Skin Resistance (GSR) uses a low frequency alternating current through two fingers to measure electrical resistance.

The resistance alters in response to sympathetically generated perspiration on the skin, and is a psychophysiological marker that may reflect emotion and anxiety.

It may be monitored in the magnet as described below.

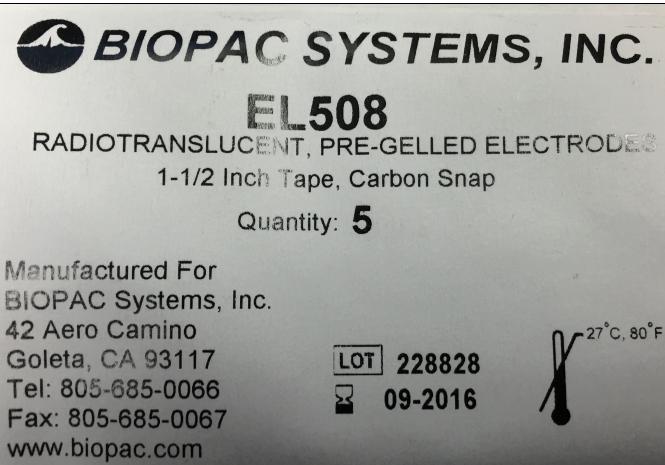
II. Electrodes

Electrodes:

Biopac Systems, Inc. (**EL508**) Radiotranslucent, pre-gelled electrodes, 1-1/2 inch tape, Carbon snap

Electrodes may be purchased from:

Biopac Systems, Inc., 42 Aero Camino, Goleta, CA, 805-685-0066, www.biopac.com



III. GSR computer & equipment in the control room



3T2 Physio Computer



3T2 Biopac Equipment



3T2 Biopac Equipment

IV. Placement of the electrodes

Recommended placement is on the 2nd ('index') and 4th ('ring) fingers, palmar side, middle phalanges.

Only use electrodes that have been sealed in the original pouch (see page 1). Using electrodes from a pouch that has been opened for any extended period results in less than optimum contact as the gel can dry up when exposed to air.

GSE clips & cables are very fragile so please treat them gently especially when moving subject in and out of the magnet bore.

Please do not step or pull on the cables.

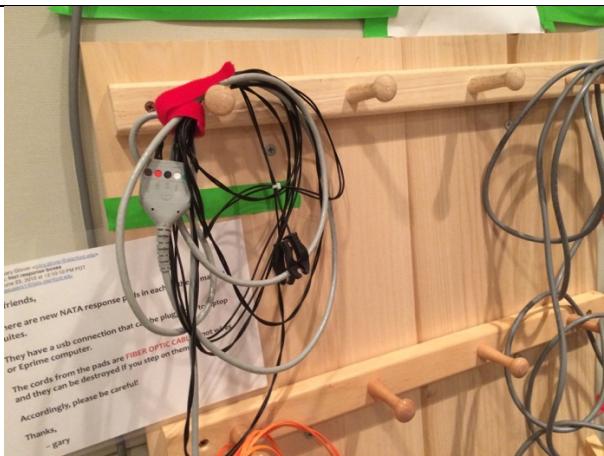
Before applying electrodes, clean the palmar side of the fingers with an alcohol wipe and dry thoroughly with a towel.

Subject must keep the hand still to avoid artifacts due to motion. Immobilize the elbow & forearm away from the abdomen to prevent motion.

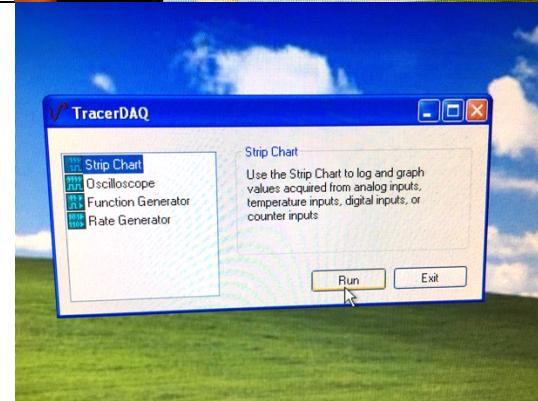
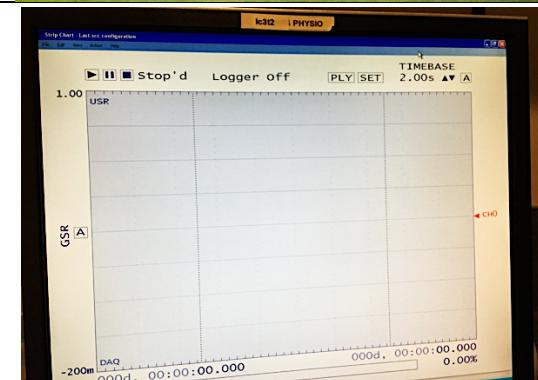
Immobilize the hand flat palmar side down on the thigh.

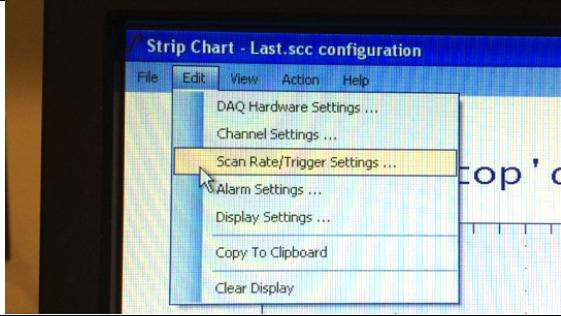
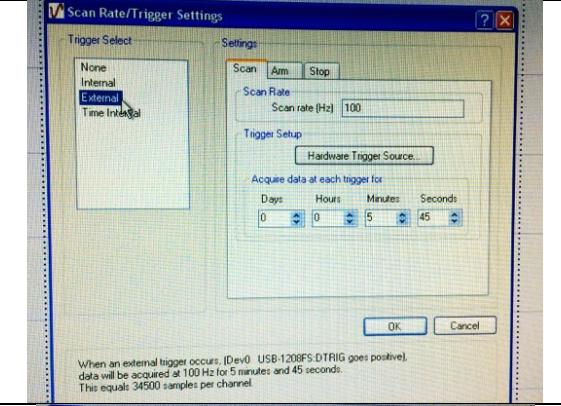
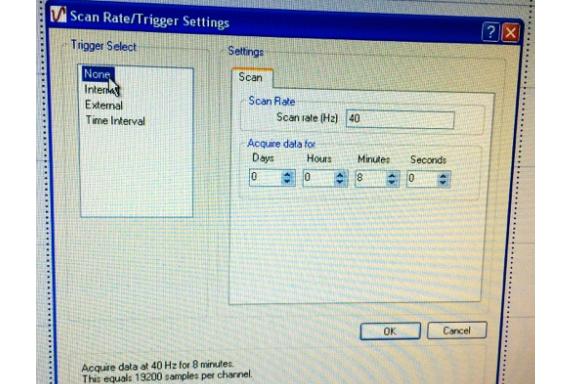
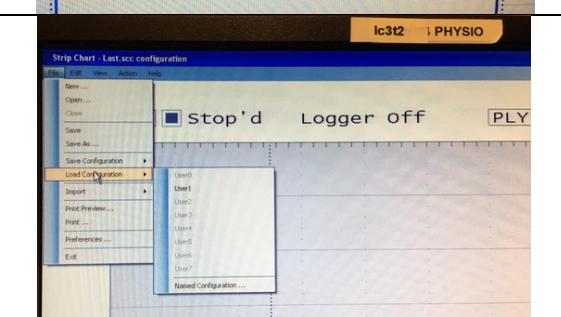
If an exam lasts more than 3 hours, you may need to repeat this procedure to apply new electrodes as the gel can dry out rendering a less than optimum contact and results.

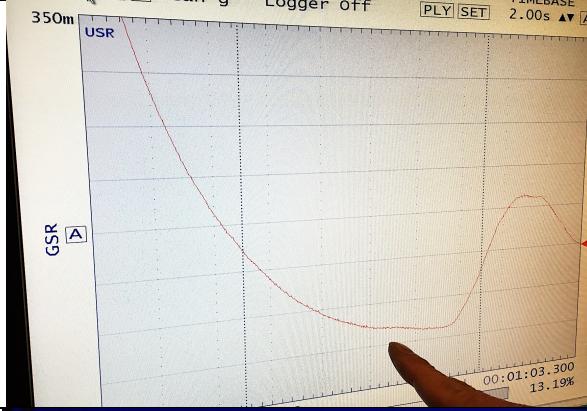
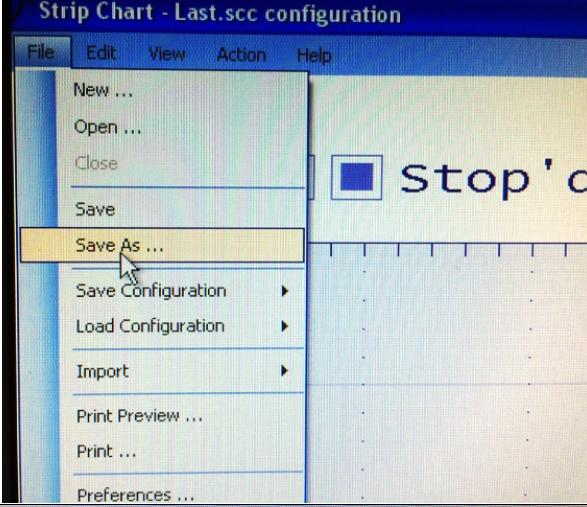
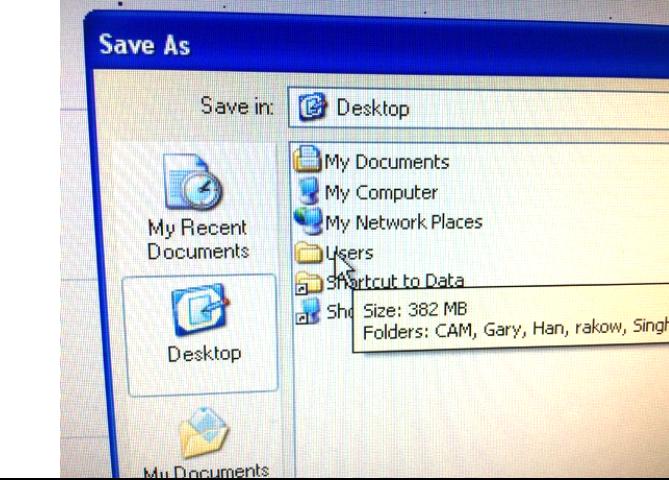
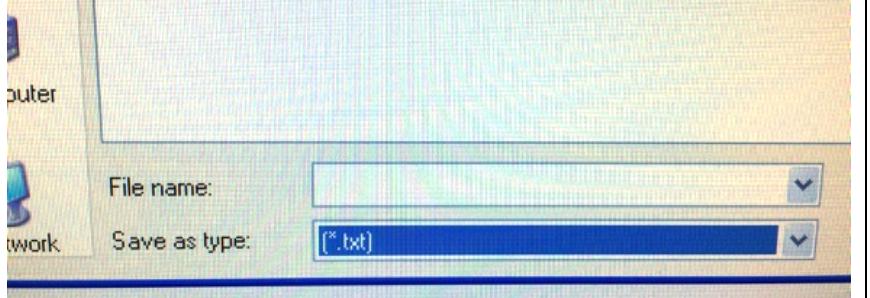
Hands of the scan subjects must be separated (not touching) and the cables must exit directly out of the magnet bore, without loops, and without touching the subject's body or the magnet bore walls.



V. GSR program at computer in the 3T2 control room

3T2 Physio computer is located to the left of the ePrime computer.		
To start program, select “Shortcut to TracerDAQPro” on Desktop of lc3t2 Physio computer.		
Select “Strip Chart” from list then select “Run”.		
Strip Chart window is opened.		

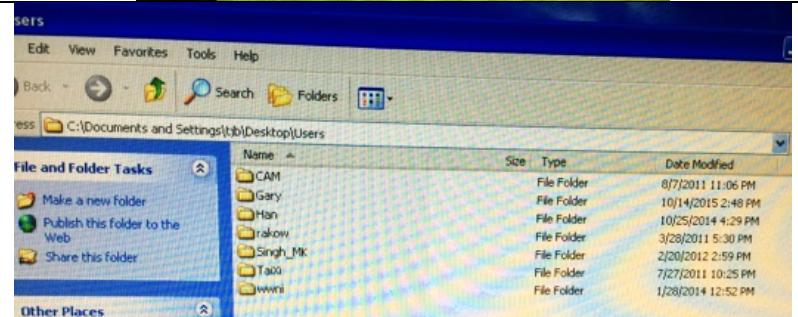
<p>To modify “Scan Rate/Trigger Settings” select “Edit” pull down menu.</p>	
<p>“External Trigger” settings The data acquisition will begin automatically if “External” is selected and using Glover sprlio research psd for functional scans. To exit window, select “Ok” or “Cancel.</p>	
<p>No trigger settings (“None”) To exit window, select “Ok” or “Cancel.</p>	
<p>To load a saved configuration, select ‘File’ and scroll down to ‘Load Configuration’; then select your saved configuration.</p>	
<p>To begin manual recording select Arrow icon at top left of Strip Chart Window.</p>	

<p>Test the Strip Chart recording by having the subject take in a deep breath and “bear down” or use a Valsalva maneuver (forceful attempted exhalation against a closed airway, as if blowing up a balloon).</p> <p>There will be a lag time between the time the breath is taken and the response is seen in the waveform amplitude.</p>	
<p>To save recorded data, select “Save As” from “File” pull down menu.</p>	
<p>Select “Desktop”, then “Users”, then the appropriate folder for your lab or research study.</p>	
<p>To read the acquired data, please “Save As” using the Text option “(*.txt)”.</p>	

To transfer saved data, select “Users” on Desktop.



Locate your lab's folder or research Study.



Obtain Matlab code to read GSR txt files. Go to <http://rsl.stanford.edu/glover/fmriutil/> and get readgsr20.m.

This program resamples at a specified rate in seconds/sample, e.g. TR, and writes an output text file. This allows The user to create a regressor that may be used in a GLM or other statistical test.

Index of /glover/fmriutil

Name	Last modified	Size	Description
Parent Directory		-	
linux/	22-May-2012 14:43	-	
osx_intel/	20-Jan-2011 12:59	-	
readgsr20.m	08-Jul-2008 11:37	1.0K	
sprlio_instructions.pdf	11-Jul-2008 10:02	128K	
sprlio_postprocessing.pdf	21-Jun-2010 12:55	68K	

VI. Storing the GSR cables in the 3T2 magnet room – VERY IMPORTANT!

At the end of the exam, carefully loop GSR cables, tie with a Velcro wrap and hang on the cable board.

