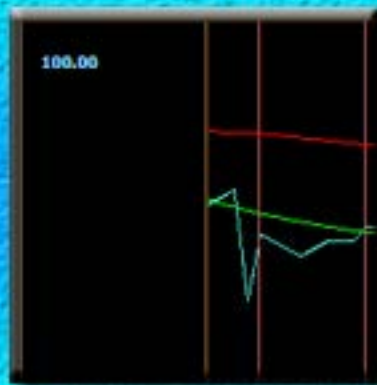


# Power Point Manual

Get On The  BrainMaster  
BUS Universe  
Simplified



“4ch PZOK  
ANI”  
level 2

# 4chPZOK

Level 2

- How can I modify the 4chPZOK Settings to change from dynamic to manual thresholding?

*All protocols are for demo and research purposes only. Clinicians must determine protocol choices. All protocols must be used within scope of practice and scope of competence.*

# 4chPZOK

## Level 2

- At level 1 the “4chPZOK” Setting provides ZScore training for 4 channel locations on the surface (not LORETA).
- By providing ZScore training the entire surface of the brain tends towards normalization. The setting rewards the brain when moving outliers towards a normal window while those in the normal range remain within.

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# 4chPZOK

## Level 2

- The variables involved for this type of training are:
  - A target window set by the “u” key. Both upper ZScore and lower ZScore limits are set by a single key. A valid setting for this variable is one that can capture an estimated 40% - 80% of all ZScores to be trained. A good value to start with is 1.2 SD (Standard Deviations). A “Blue” Line represents the percentage of ZScores within this window.

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# 4chPZOK

## Level 1

- In this module we shall learn how to modify “Dynamic Thresholding” to “Manual Thresholding” giving the technician greater control of the training.
  - The threshold provided by a “Green” Line. This green line which is manually controlled by the “c” key should be placed in the proximity of the blue line as to provide approximately 70-90% reward (red line).
  - The “Green” Line (manual threshold) provides reward when the percentage of ZScores within the window (blue line) peaks above the threshold (green line) and removes reward when the percentage of ZScores within the window (blue line) diminishes below the green line.

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FIRST: It is so very simple to make changes and experiment with BrainAvatar Settings Files without concern because if something just doesn't seem to work as planned, you always can reload the original Settings File you downloaded to your system.



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Consider manipulating the settings in your working folder as a sandbox. You can always replace it with the original setting file.



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# 4chPZOK

Level 2

## Lets Begin

- Make Sure the Atlantis Amplifier is plugged in.



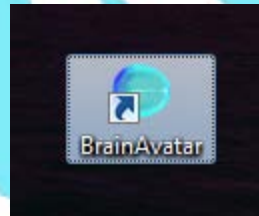
*All protocols are for demo and research purposes only. Clinicians must determine protocol choices. All protocols must be used within scope of practice and scope of competence.*



# 4chPZOK for Atlantis

## Level 2

- Open BrainAvatar by double-clicking the BrainAvatar Icon.

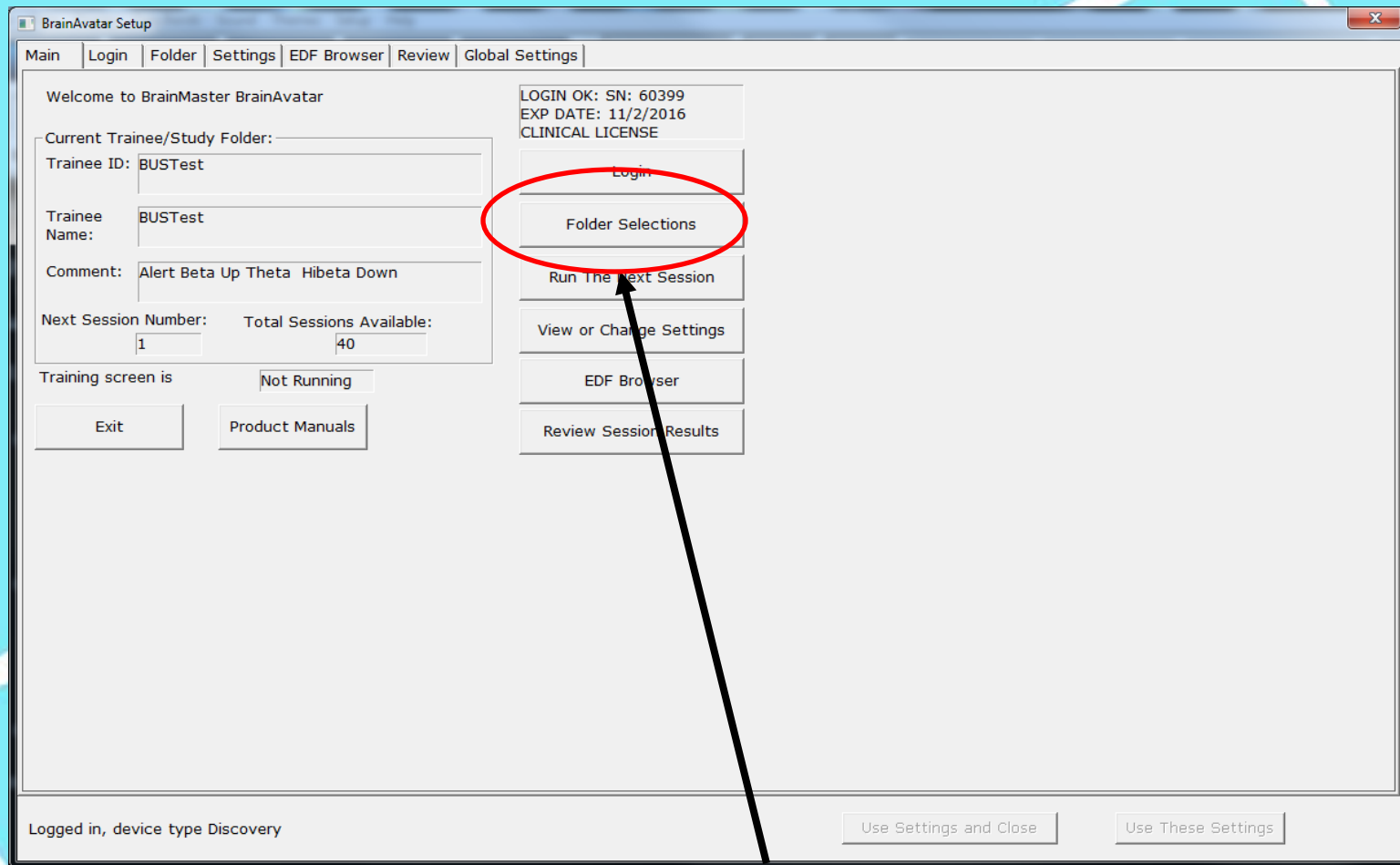


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- The Select Folder Screen will appear.
- By now you should know how to either create a new client folder or recall an existing client folder.
- For the purposes of this exercise let's open and utilize the "BUSTest" Folder which may already be resident on your system. If not, then create one.

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- The BrainAvatar Setup Window will Appear



- Click “Folder Selections”.

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- The Select Folder Screen will appear.

BrainAvatar Setup

Main | Login | Folder | Settings | EDF Browser | Review | Global Settings

Select Folder | Create Folder | Folder Notes | Session Librarian | Edit Folder Info.

Select Folder: (you may double-click to select)

Study Name	Birth Date	Sess	Max	Comment	Technician	Physician	Trainee Name	Created	Modified
..									
BUSTest	2000-7-4	40		Alert Beta Up T...	EEG tech		BUSTest	2016-8-3	2016-8-3

Study Name (Trainee ID): BroJad4chPZOKP3P4O1O2

Trainee Name: BroJad4chPZOKP3P4O1O2

Comment: comment

Sessions Used: 4

Max Sessions: 40

Session Librarian

Administer Session Genie | Push Current Study to Server and Delete | Archive Current Study | Archive Current Study and Delete

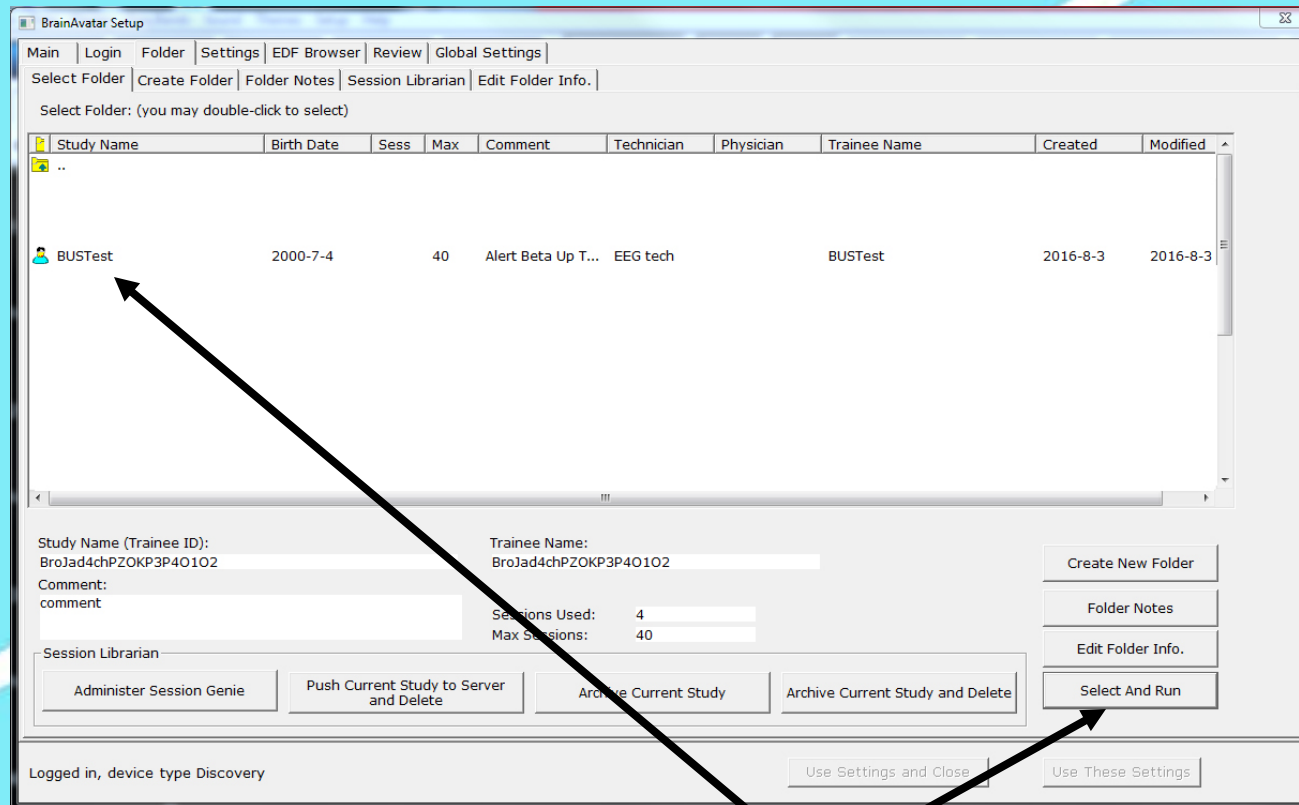
Create New Folder | Folder Notes | Edit Folder Info. | Select And Run

Logged in, device type Discovery

Use Settings and Close | Use These Settings

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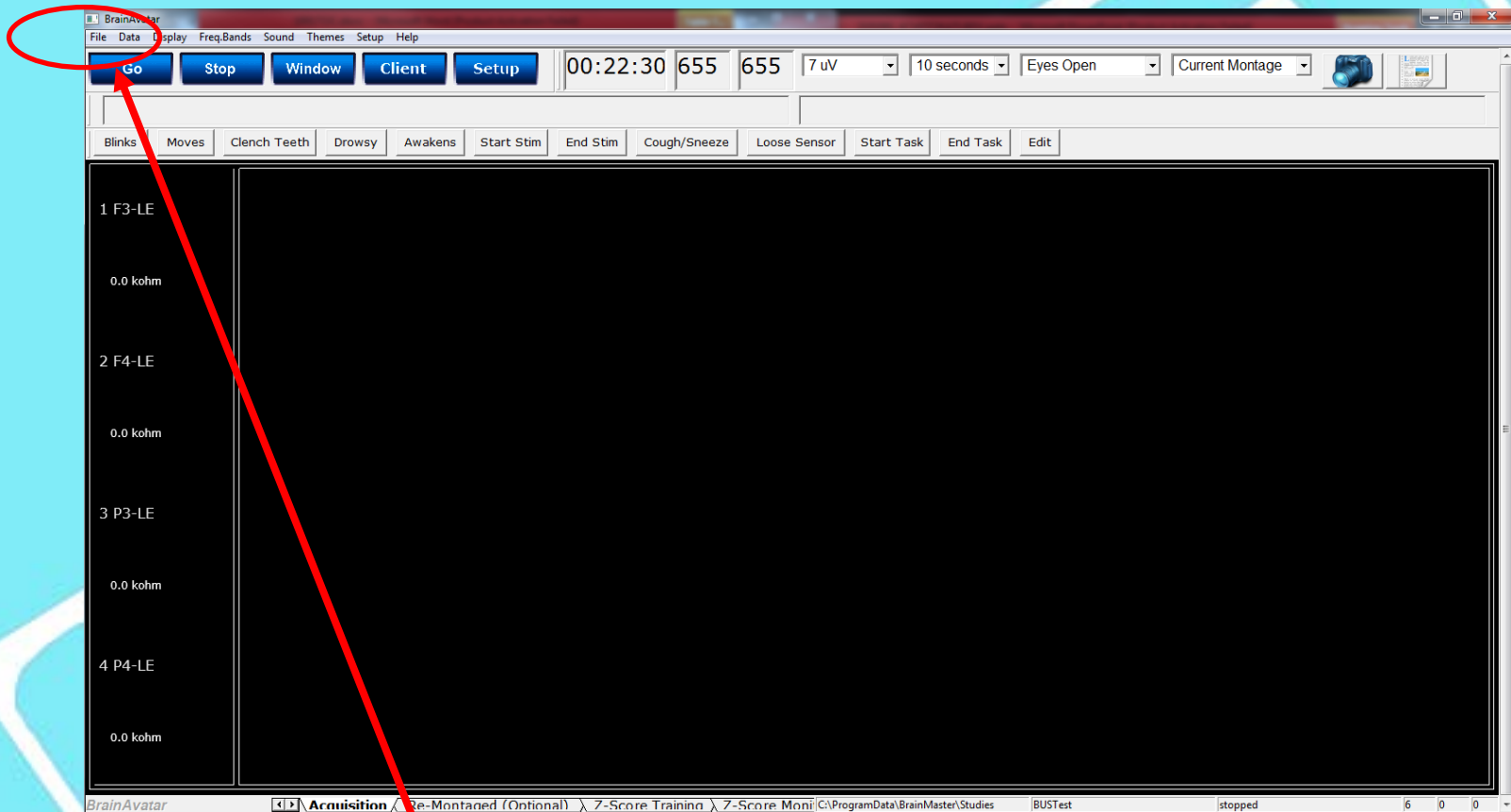
- The Select Folder Screen will appear.



- Click the Study (Folder) you would like to open (in this case BUSTest) and then click “Select and Run”.

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- The BrainAvatar Acquisition Screen is illuminated. Let's load the original 4chPZOK Level 1 Setting File.

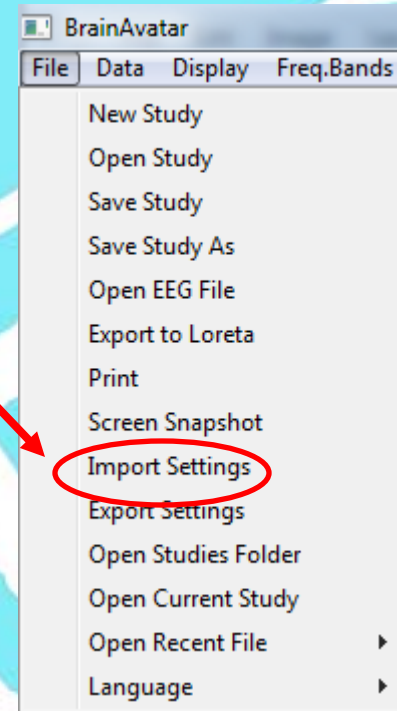


- Click “File” from the Main Menu at the top.


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- Next click “Import Settings”.



- Scroll to find the original PZOK Level 1 File and double click it.

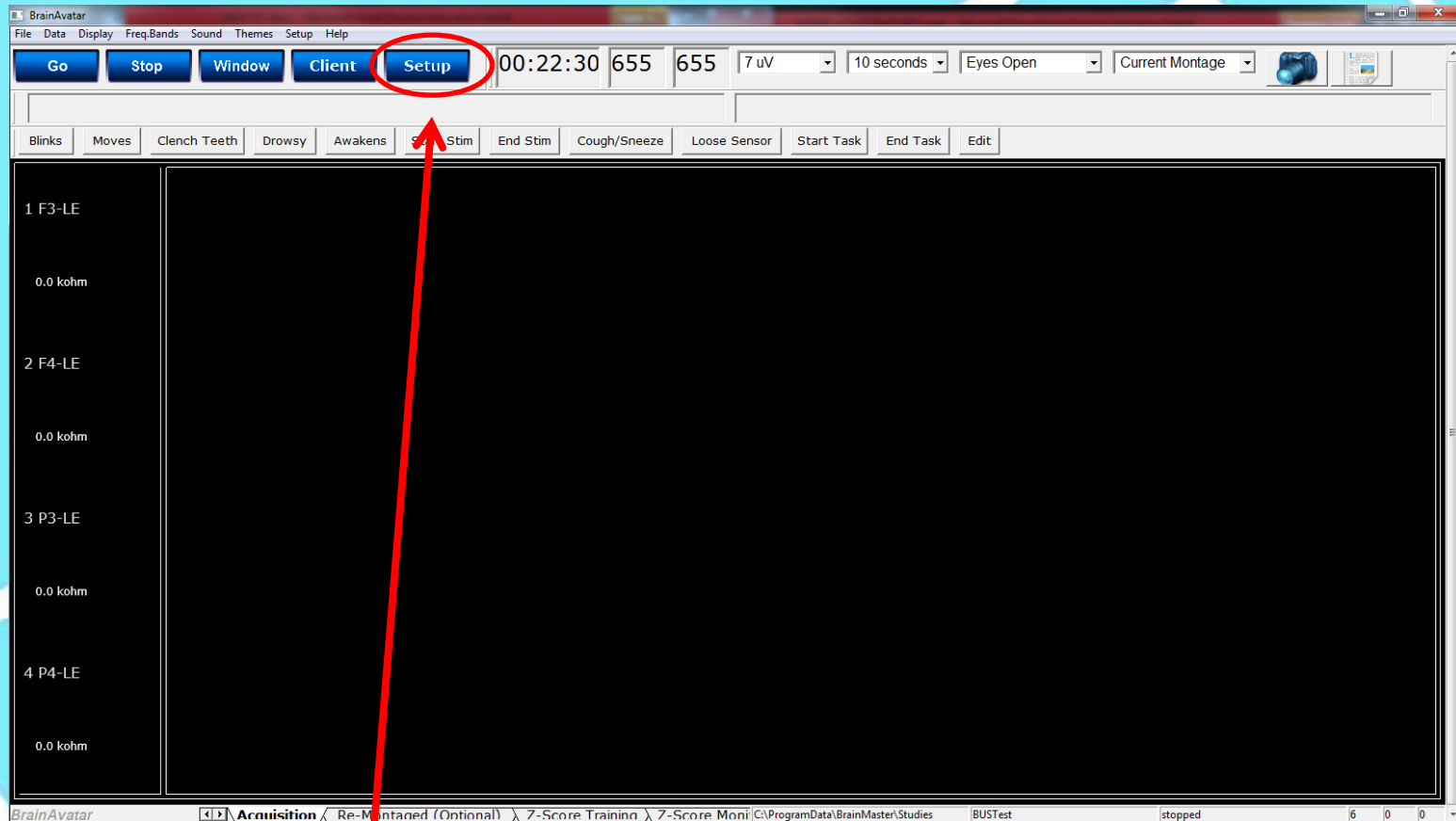
Name	Date modified	Type	Size
 2101001_4ChPZOKATLBDX.bdb2	8/23/2016 5:01 PM	BDB2 File	166 KB

- The original PZOK Level 1 setting is imported into the Client’s Study and is now ready for modification.

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification

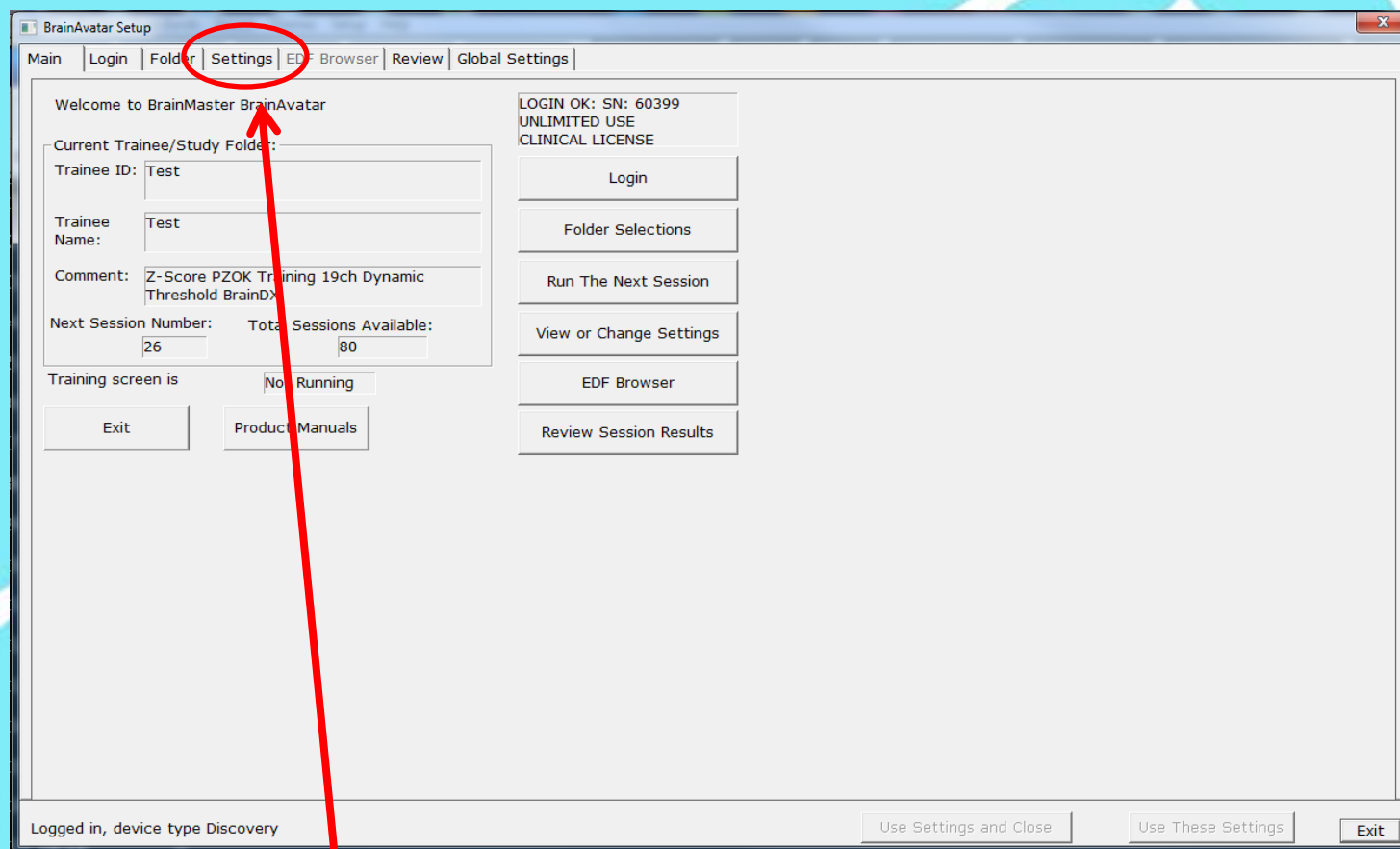


- Click "Setup".

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification



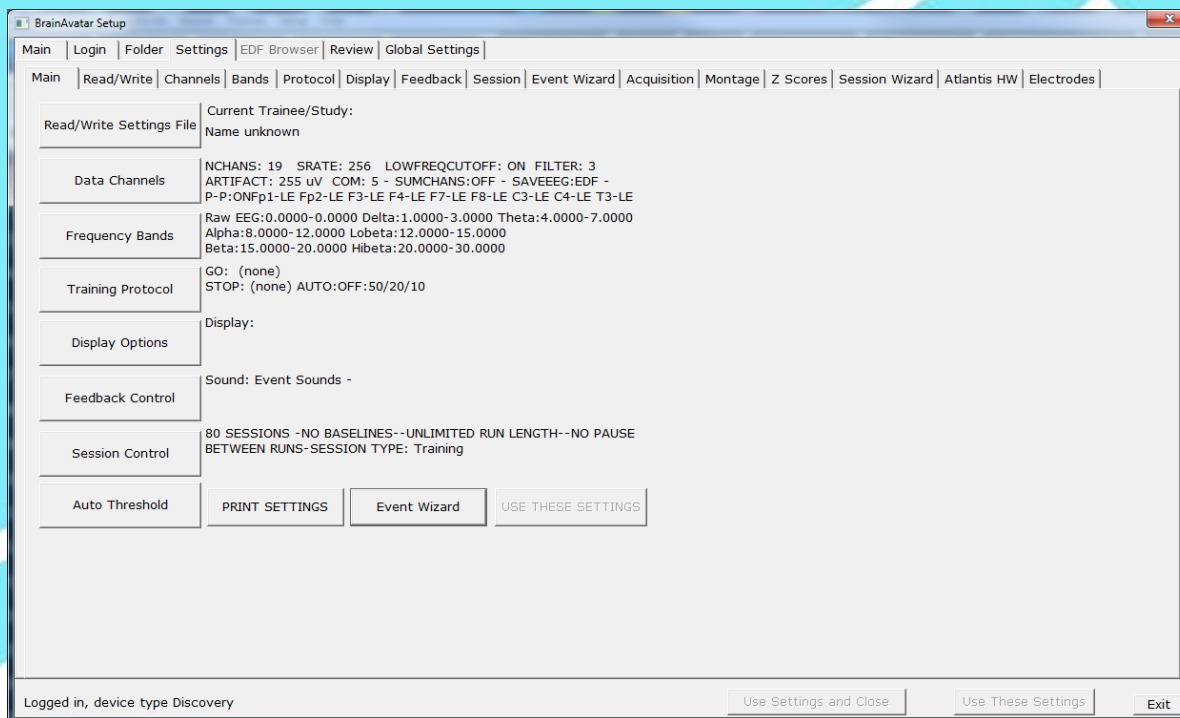
- Click “Settings”.

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification

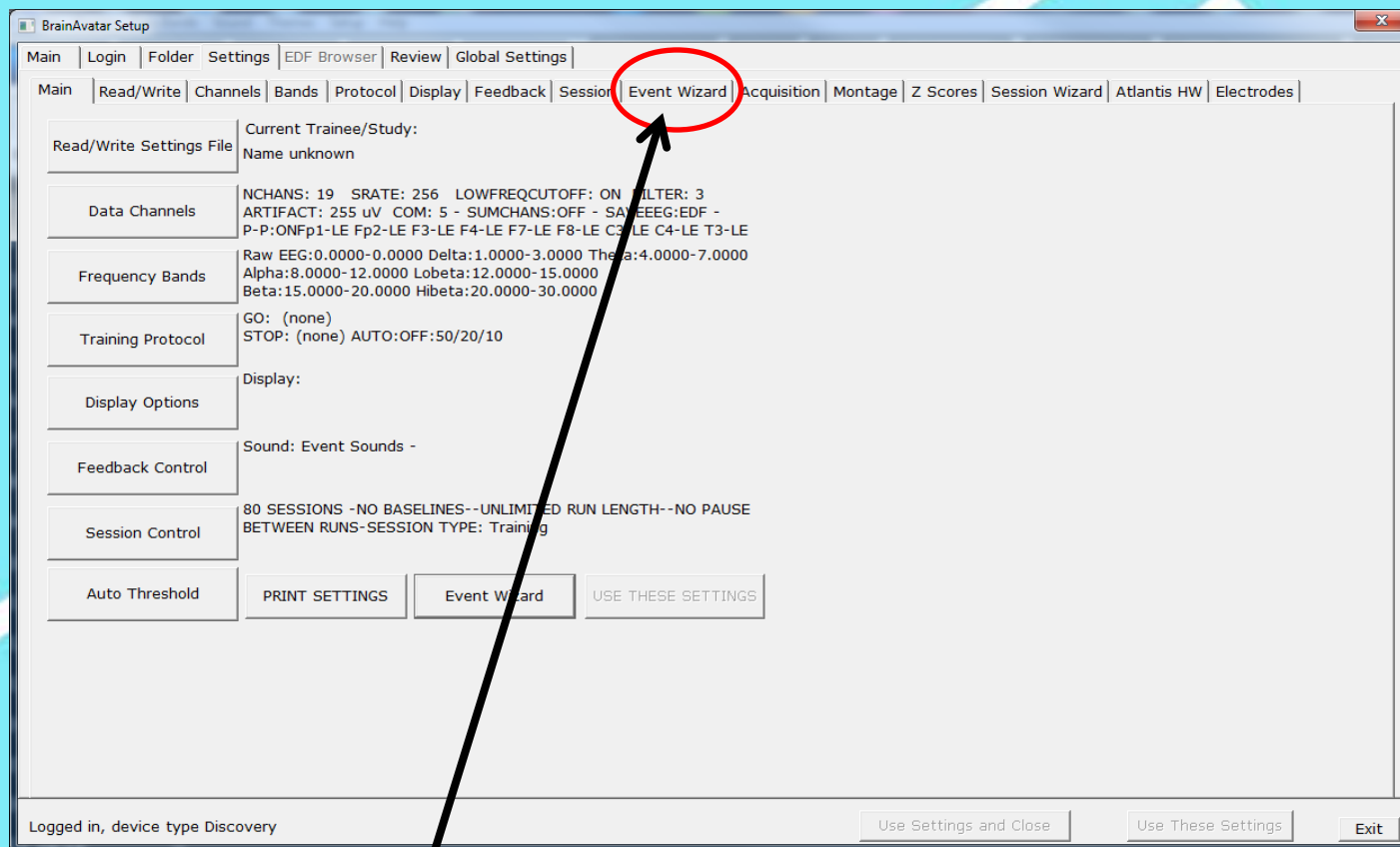


**YOU ARE NOW ABOUT TO ENTER THE “BRAIN CENTER” OF THE BRAINAVATAR PROGRAM. ANY HAPHAZARD MODIFICATIONS HERE WITHOUT KNOWLEDGE MAY CAUSE UNPREDICTABLE RESULTS. THIS INSTRUCTION MANUAL WILL GIVE YOU THE PROPER KNOWLEDGE TO ALTER THESE CONTROL SCREENS WITHOUT CONCERN. AGAIN, YOU CAN ALWAYS INSTALL THE ORIGINAL SETTING FILE IF NECESSARY.**

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification

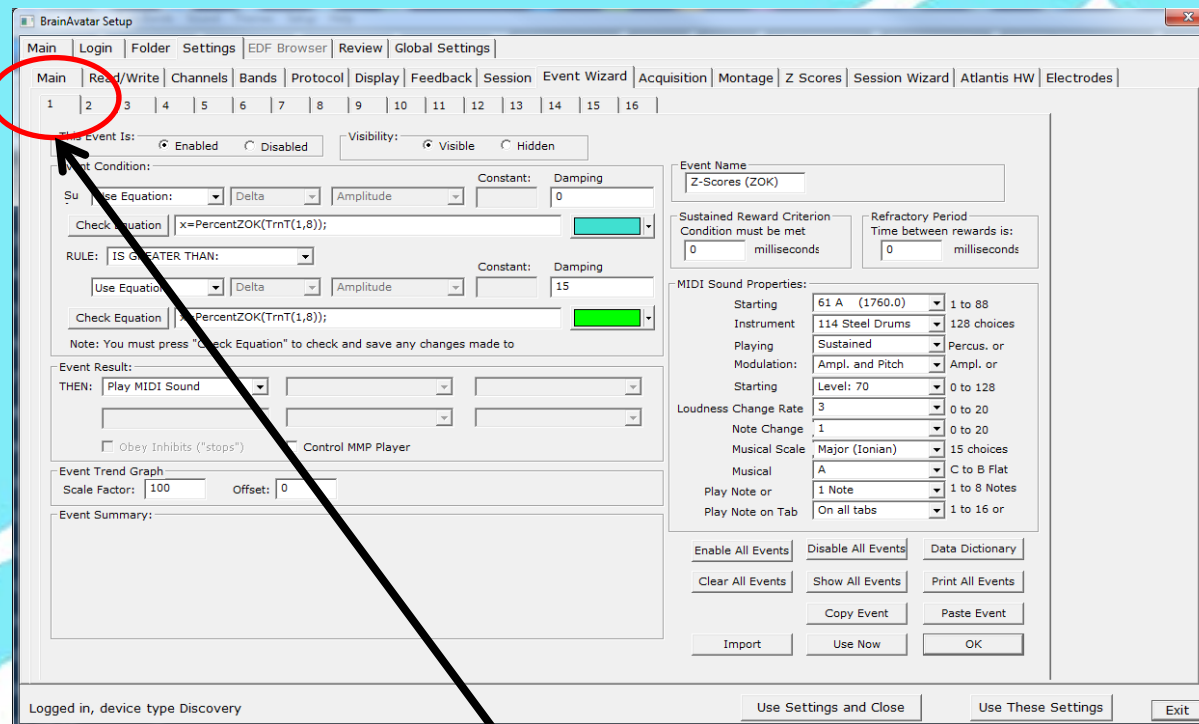


Click "Event Wizard".

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification



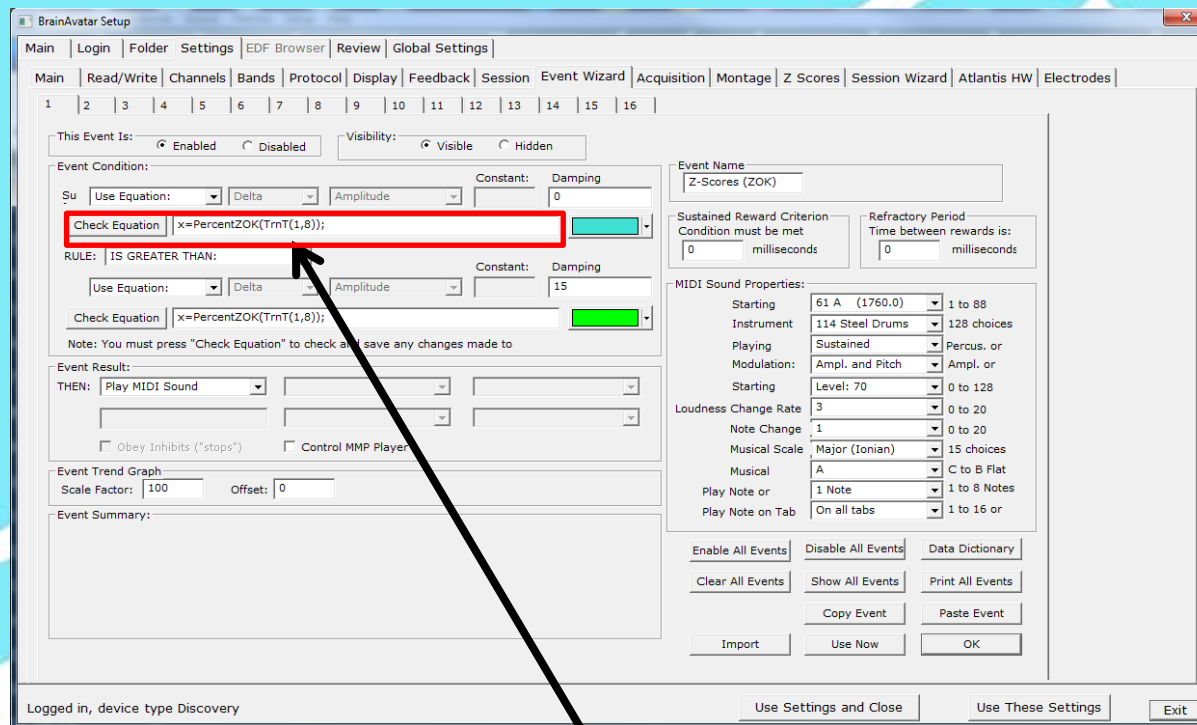
This is the Event Wizard which is the control center making the Protocol run. The setting we will be modifying is in “Event 1”. Click “Event 1”.

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification

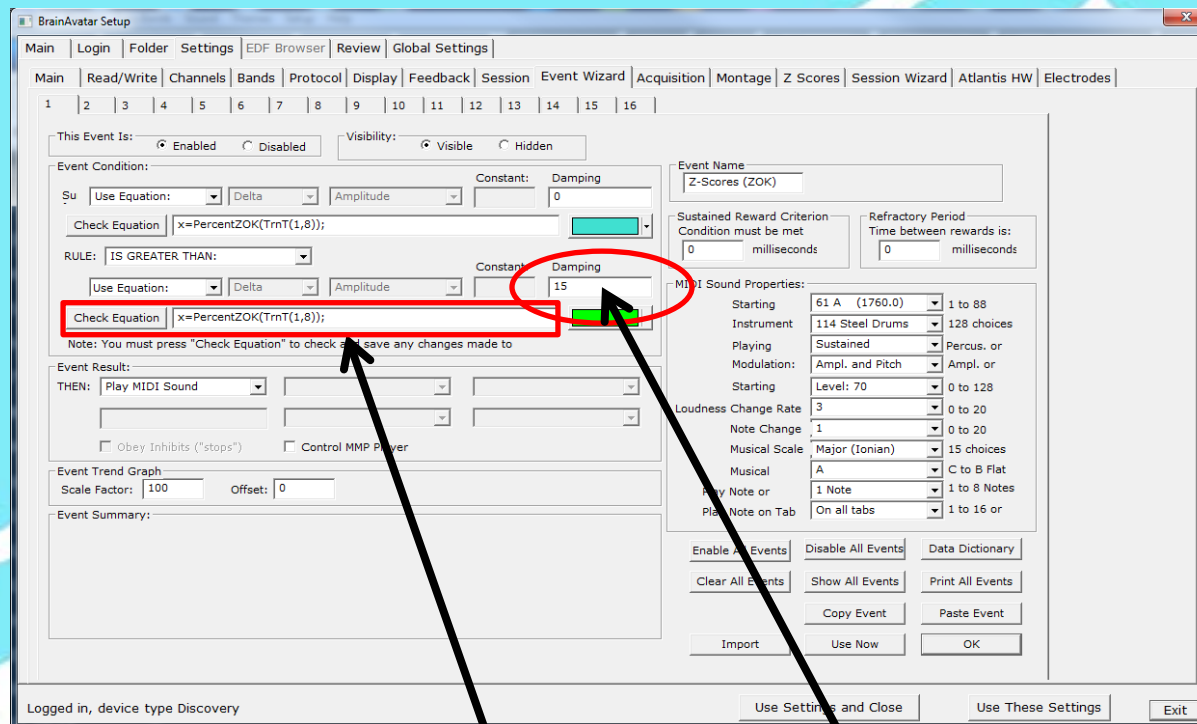


Let's interpret the line "Check Equation  $x = \text{PercentZOK}(\text{TrnT}(1,8));$ ". This formula utilizes the PercentZOK algorithm of the BrainAvatar Program.  $\text{TrnT}(1,8)$  stands for the Training Threshold of (channel 1), 4 channels of the "User Band" 8 which utilizes the "User Key" or "u" key for short to modify the size of the window which will include all of the ZScores that are OK (non-outliers).

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification

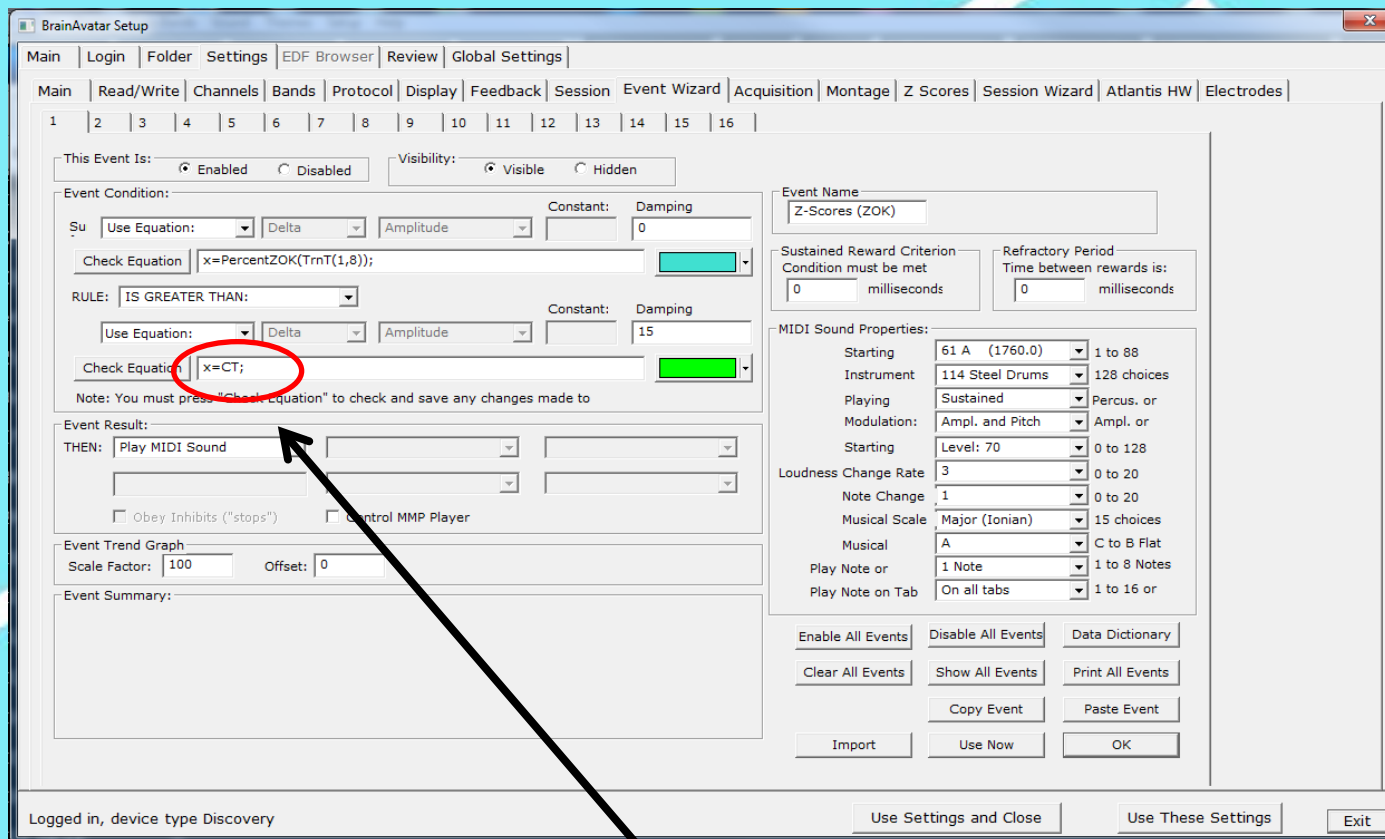


Let's interpret the line below the previous one "Check Equation  $x=\text{PercentZOK}(\text{TrnT}(1,8));$ ". This formula is exactly the same as the previous one and creates the reward threshold. By applying a damping factor of 15 the threshold (Green Line) is forced to shadow the PZOK (Blue Line) forming a threshold which is always in motion or a Dynamic Threshold.

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification

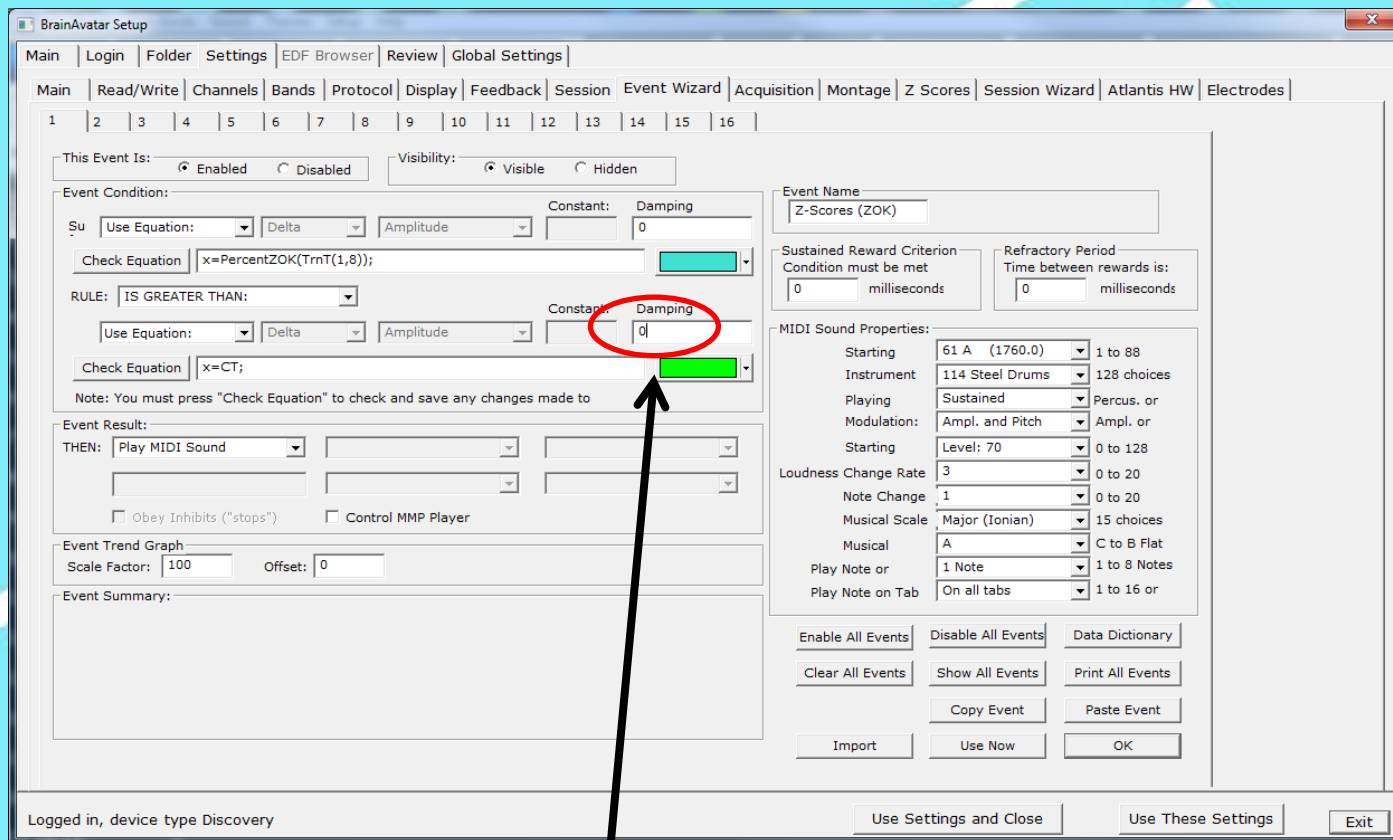


In order to remove Dynamic Thresholding and change the setting to Manual Thresholding substitute the equation  $x=CT;$  for the Dynamic Thresholding equation. CT activates the “c” key to control a manual threshold.

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification



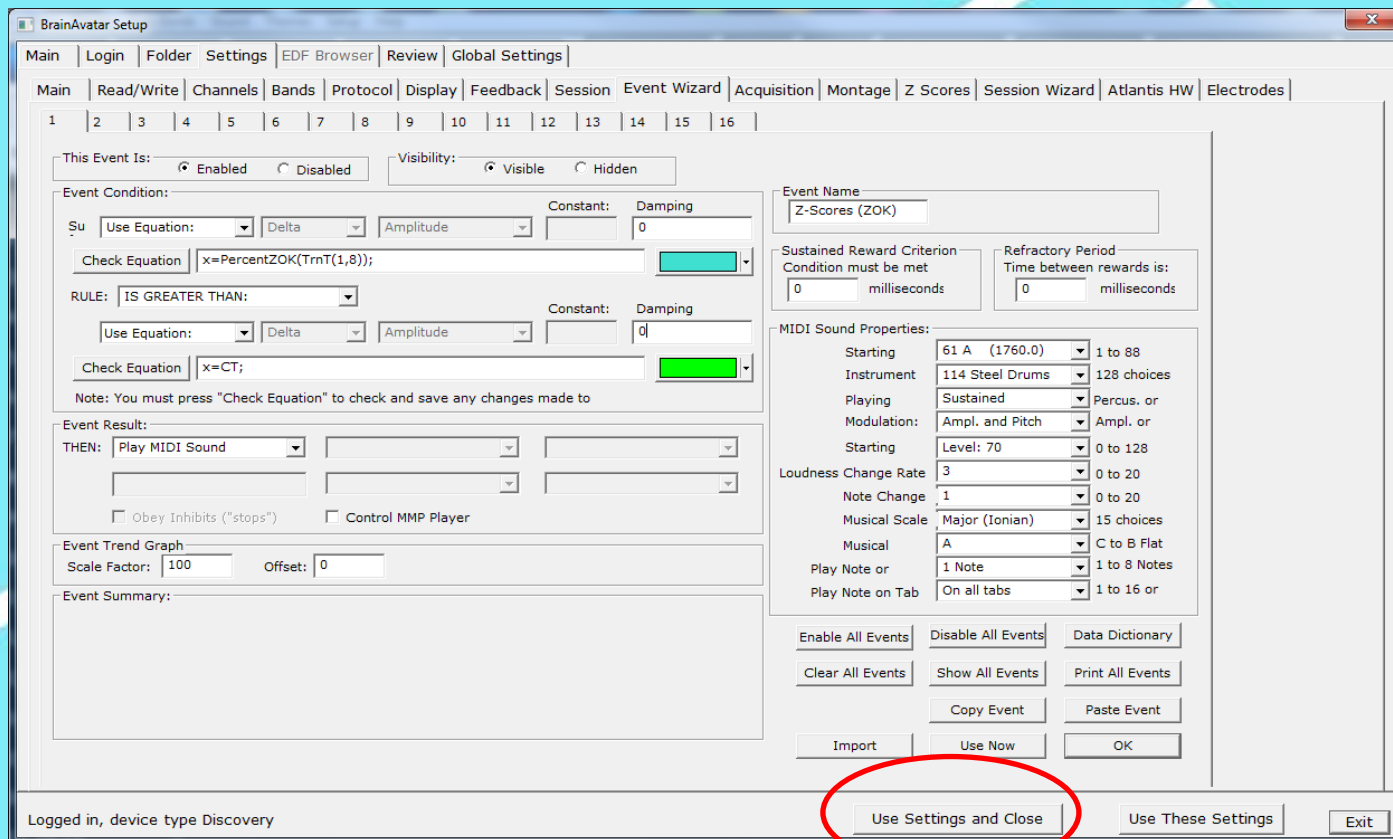
Also change the damping from 15 to 0 so there is no lag time in the control of the manual threshold.

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# 4chPZOK for Atlantis

## The Protocol is now ready for Modification

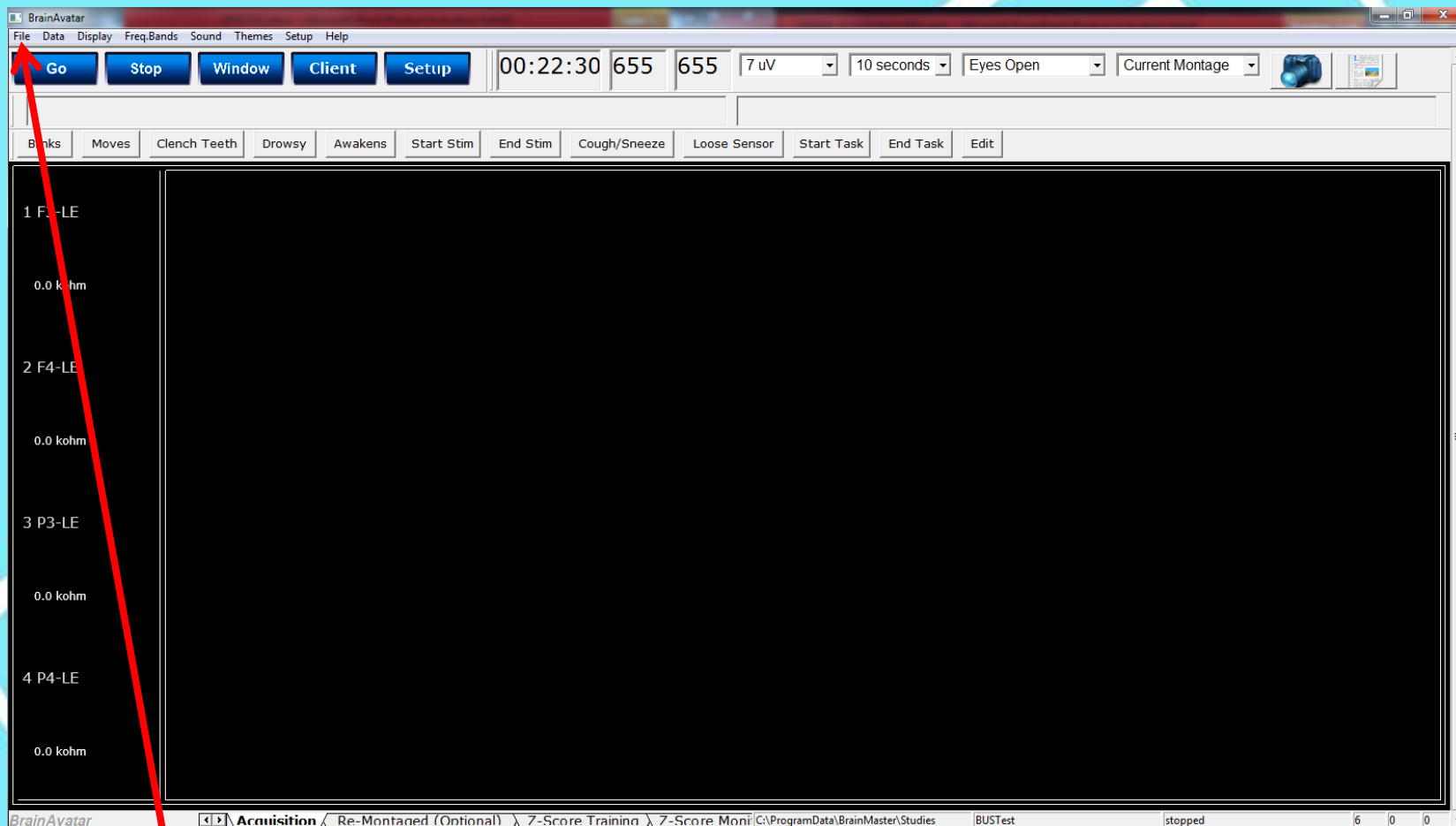


Complete the process by clicking “Use Settings and Close”.

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# 4chPZOK for Atlantis

Next we must save our changes



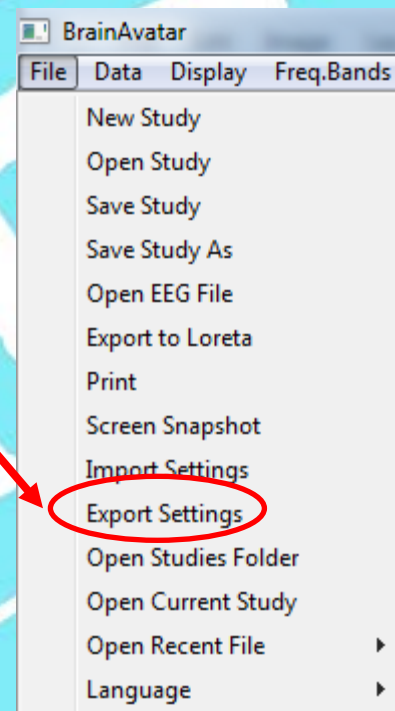
Click “File”.

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# 4chPZOK for Atlantis

## Level 2

Next click“ Export Settings”.

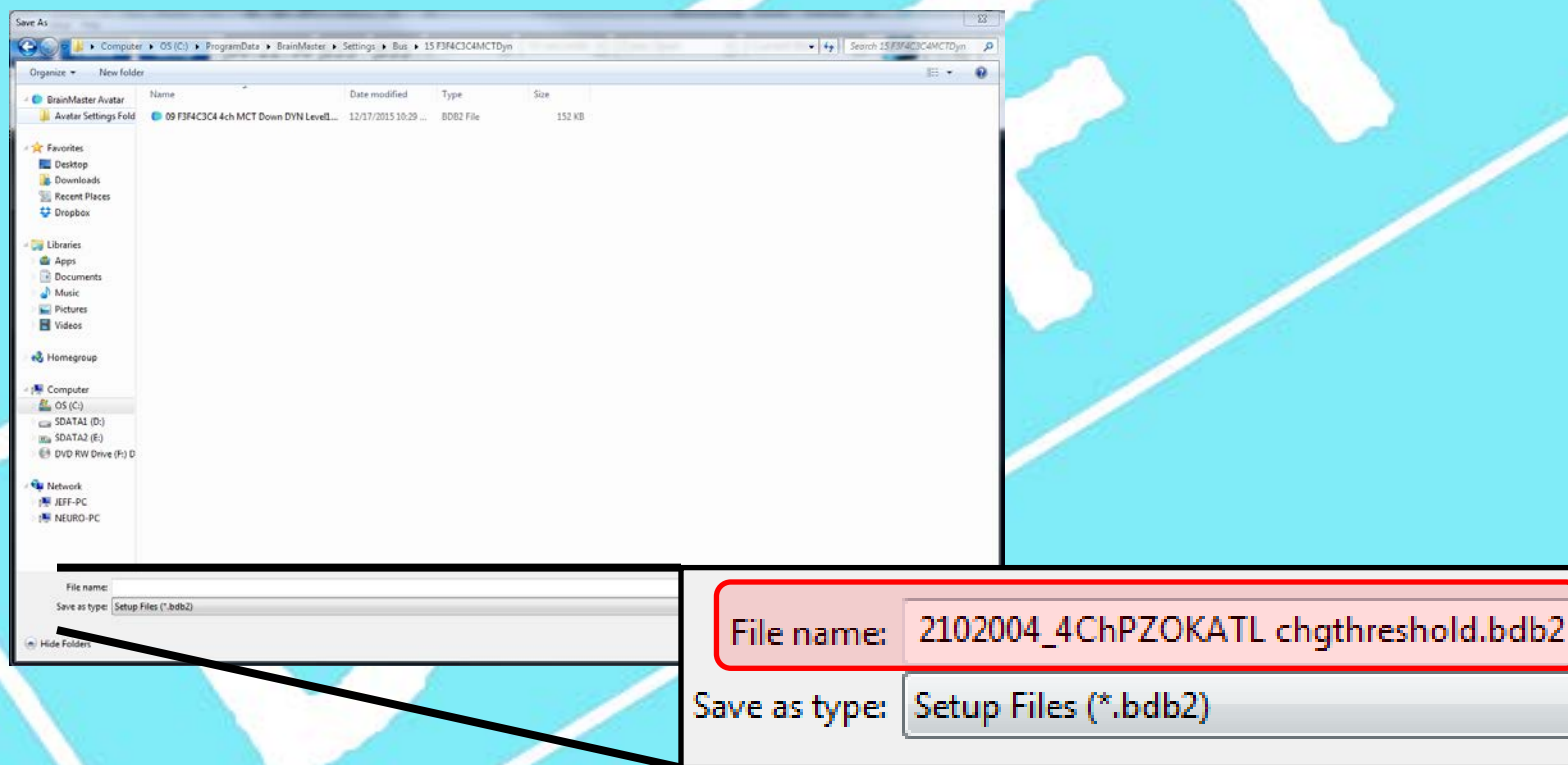


*All protocols are for demo and research purposes only. Clinicians must determine protocol choices. All protocols must be used within scope of practice and scope of competence.*

# 4chPZOK for Atlantis

## Level 2

Find the folder where you keep these settings and name the file appropriately in the “File Name:” window.



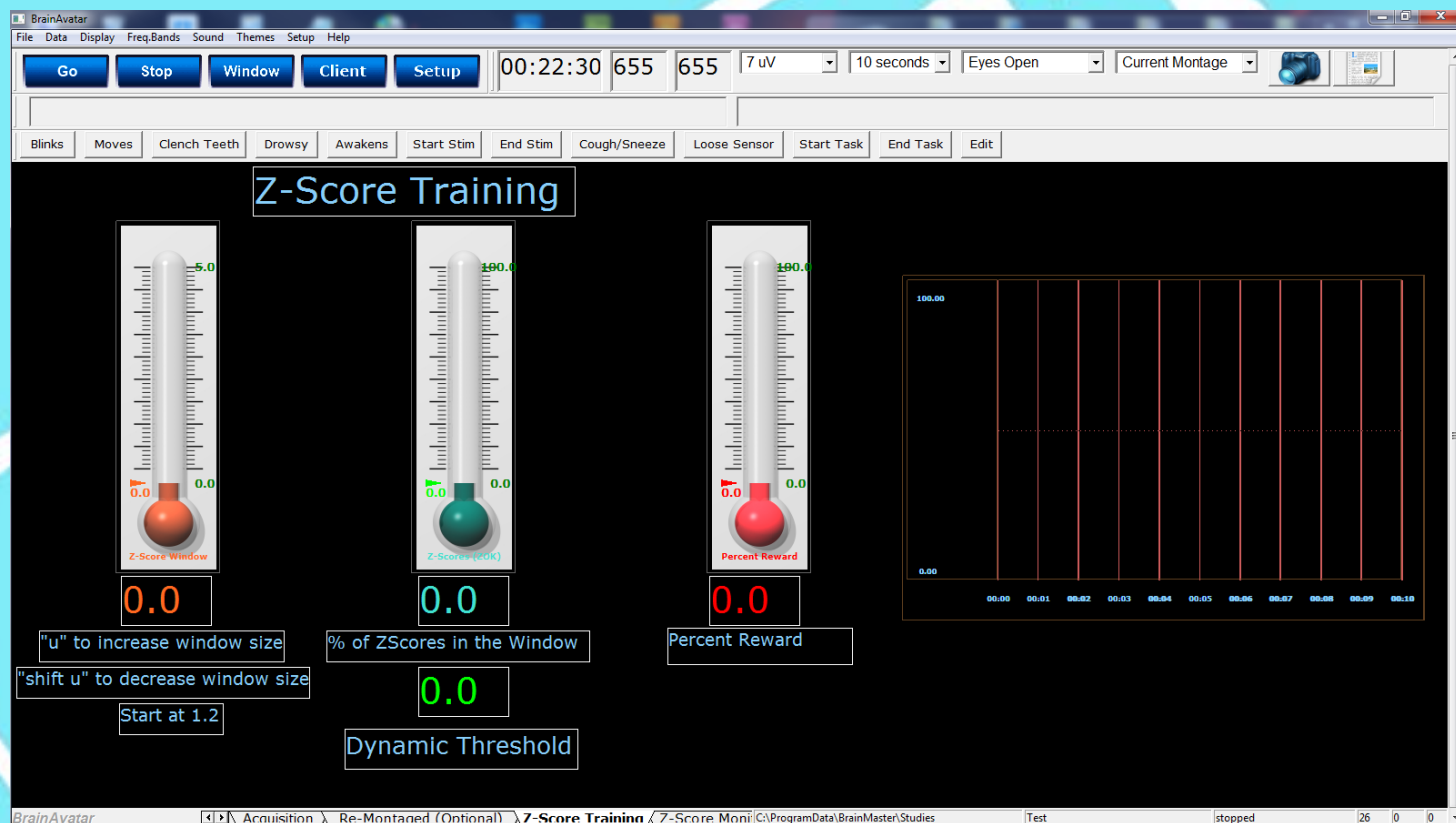
*All protocols are for demo and research purposes only. Clinicians must determine protocol choices. All protocols must be used within scope of practice and scope of competence.*



# 4chPZOK for Atlantis

## Level 2

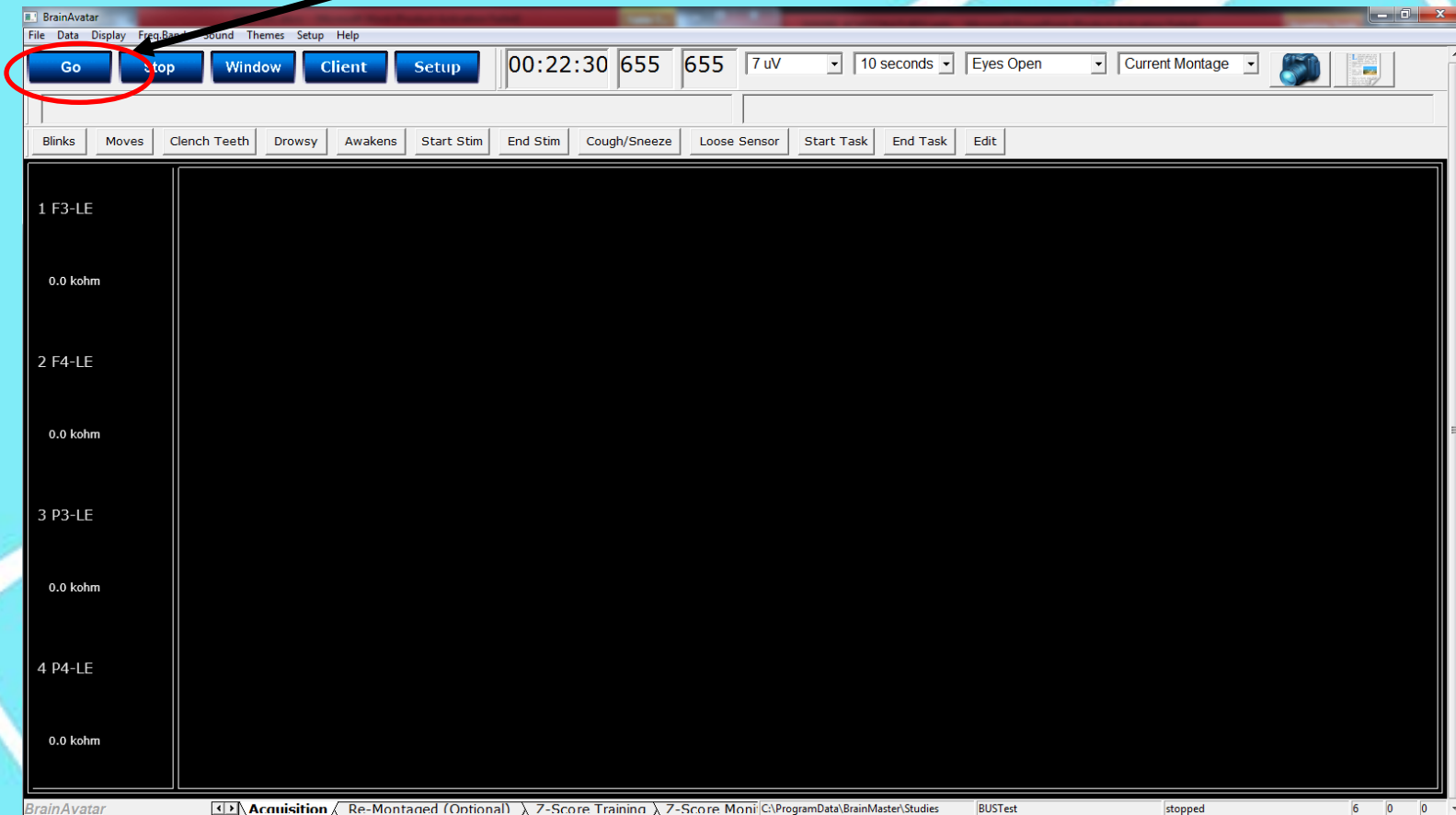
The Protocol Is now ready to run with the revised thresholding.



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# 4chPZOKMAN

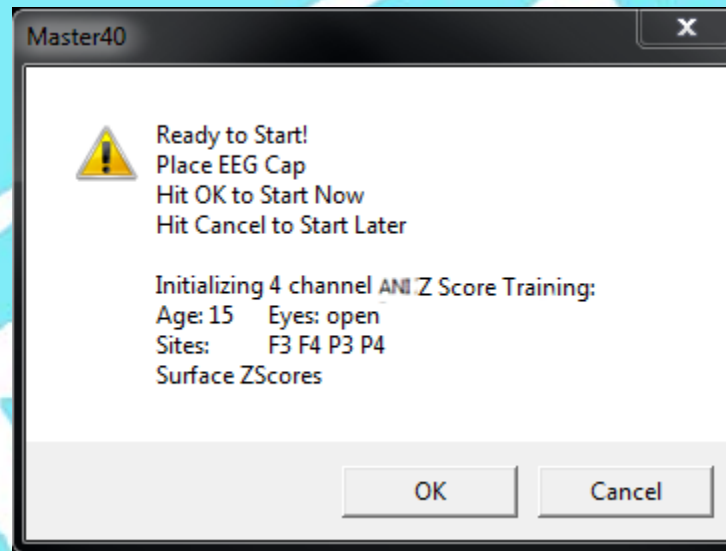
To run the protocol Select the Go Button



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# 4chPZOKMAN

The Following Pop Up will appear



This is an indication to place the 19ch cap or the 4 electrodes and ground on the clients head prepping them properly and checking for impedance.

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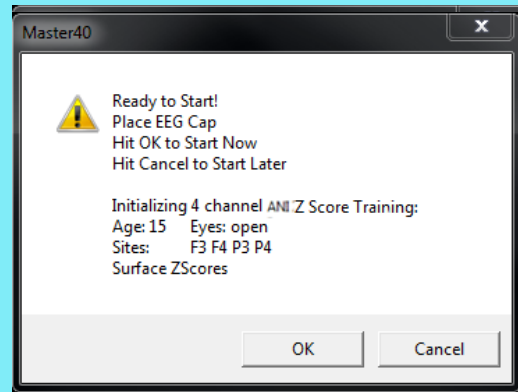
# 4chPZOKMAN



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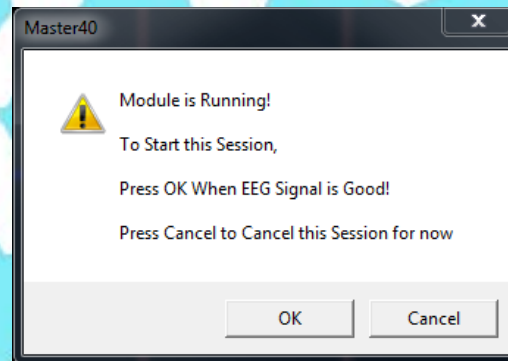


# Click Go



When you select OK BrainAvatar will begin generating EEG.

1. Check to make sure that the EEG is generated properly.
  - a. If not, check all your connections and impedances. Make sure there is no external interference and that all cell phones are off
  - b. If the EEG is correct then select OK on the Pop Up and the session will commence.



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# 4chPZOKMAN

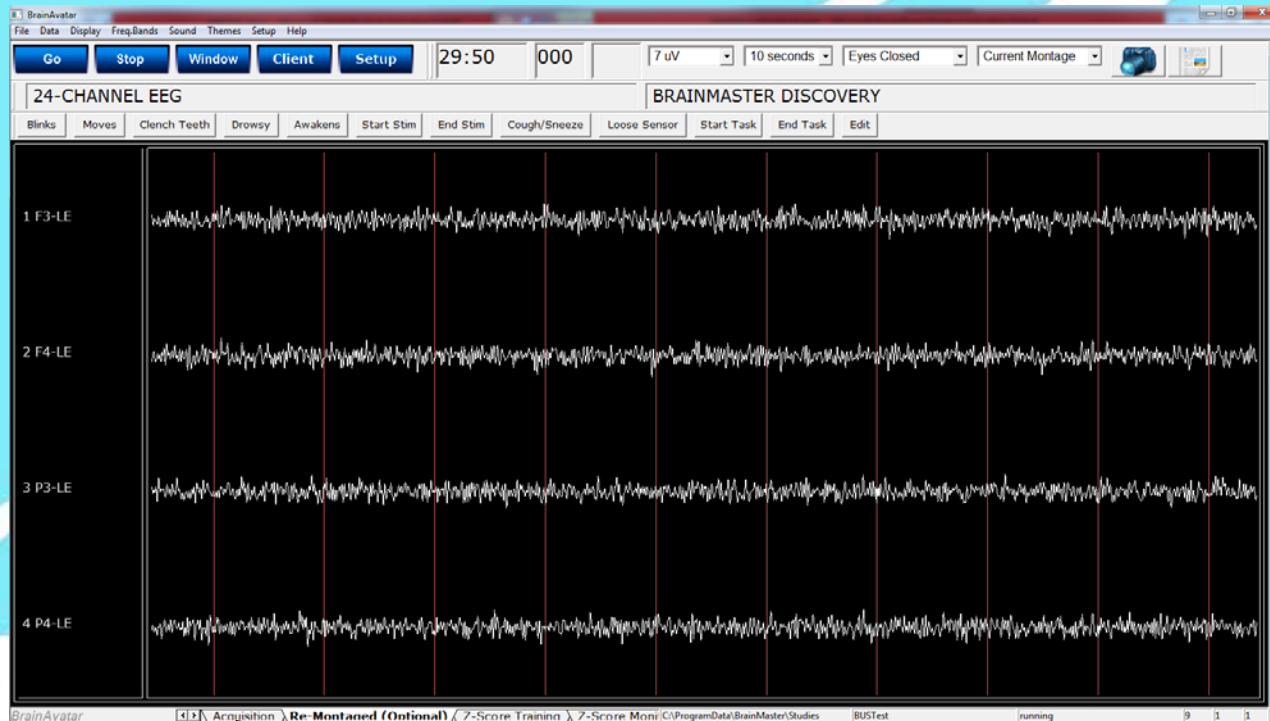
The protocol is designed to run for :

1. 10 contiguous 3 minute runs or 30 minutes. You may shorten the length of the session by selecting the “STOP” key at any time.
2. Thresholding is now Manual meaning that reward is set manually by use of the “c” key to raise the threshold and “shift c” to lower the threshold.
3. The ZScore window is initially set at  $\pm 1.2$  SD. This setting should provide a % z-score in the window value of 40%-80% (Blue Meter and Line). If the value is higher than this range decrease the size of the window by tapping the “shift u” key, if the value is lower than this range increase the size of the window by tapping the “u” key.
4. The Percent Reward (Red Meter and Line) should run between 70% - 90% (Changing the c key will change the reward threshold thus effecting the red line).
5. See the following slides for details regarding the above.
6. A variety of games are provided to help engage the client.

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# 4chPZOKMAN

Take a moment and check that EEG is good. If not, then take necessary action

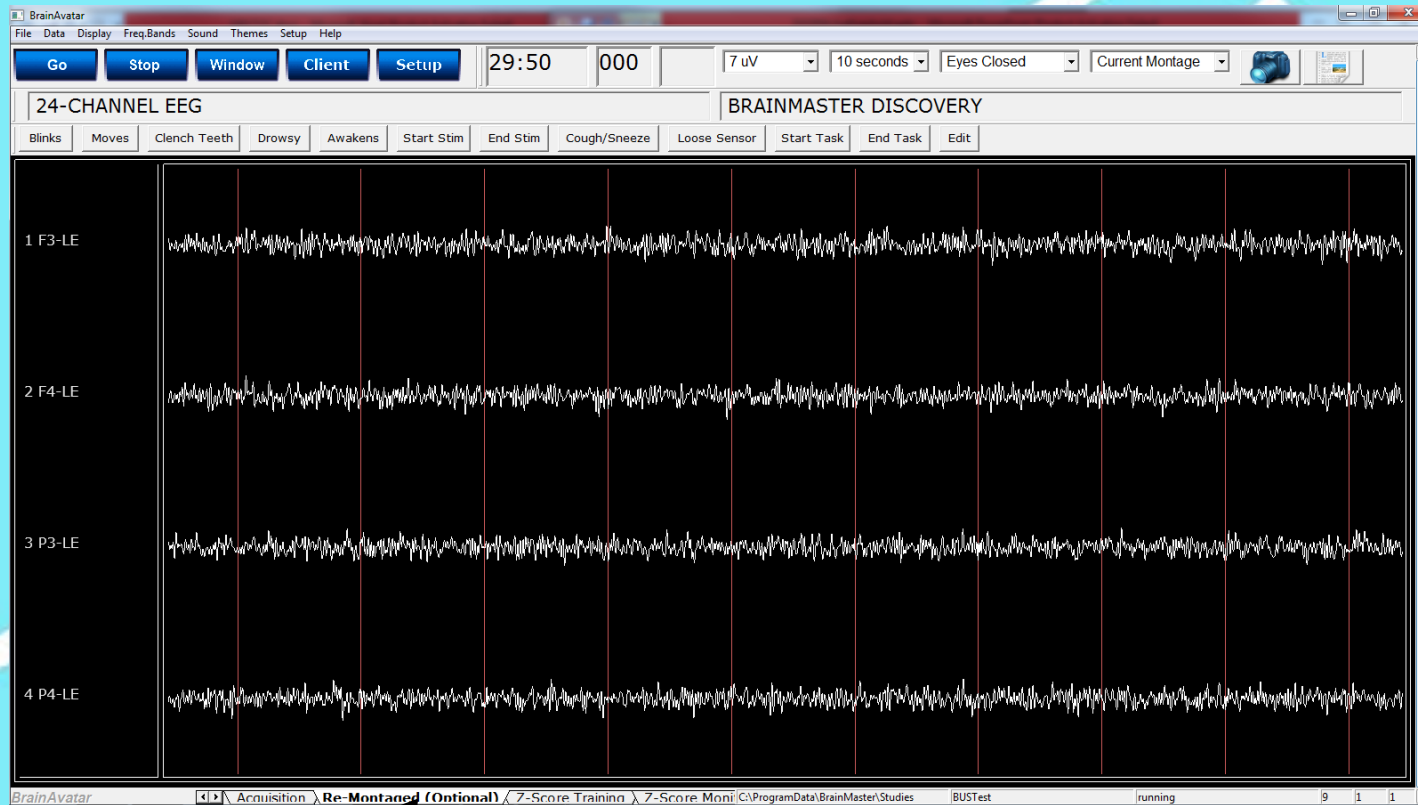


Next...you may switch from the Acquisition Tab to the Re-Montaged (Optional) Tab to view the recording using a preset Linked Ear Reference Montage.

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# 4chPZOKMAN

This is a good time to check for neurological phenomenon like seizure activity



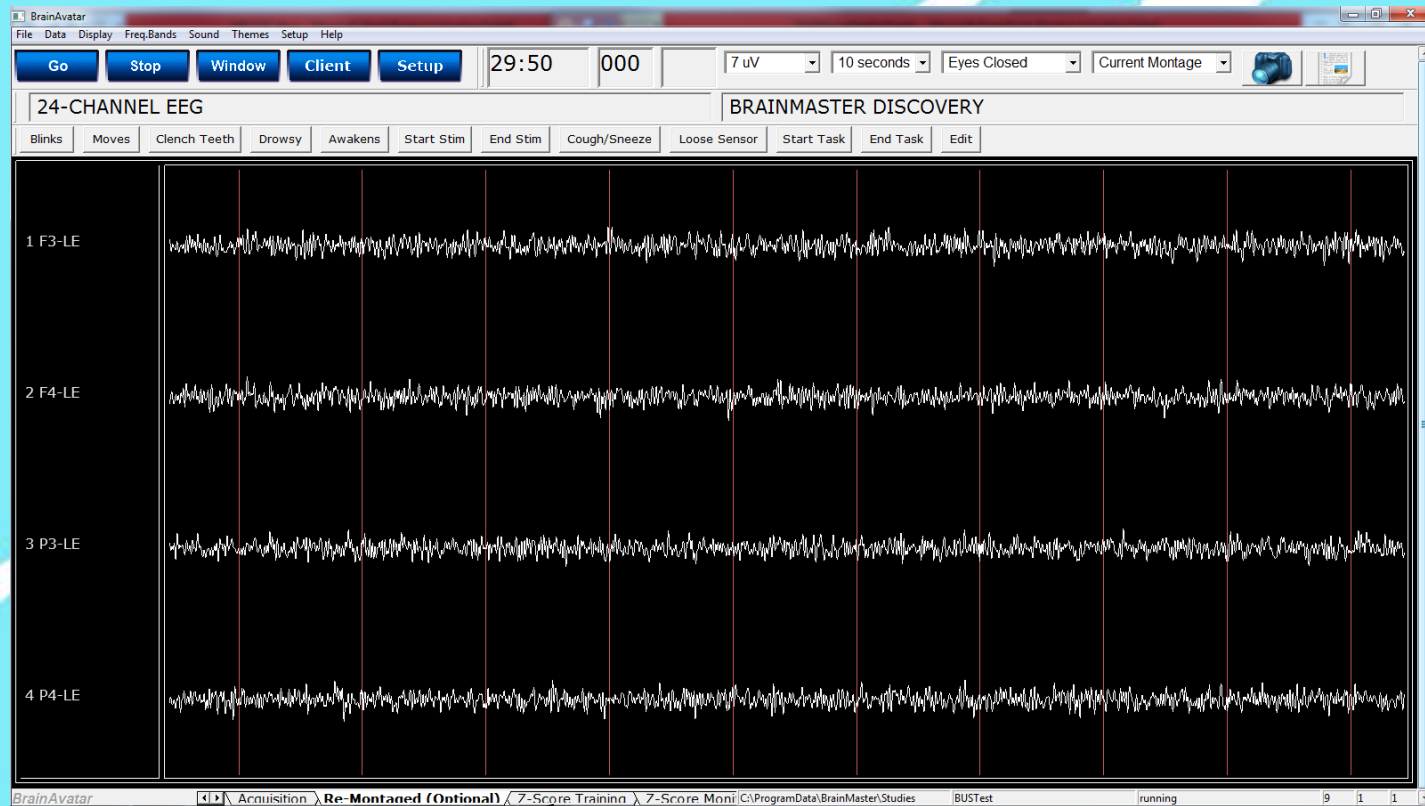
Notice in this montage bilateral pairs are grouped together for convenience of viewing. In future levels you will learn how to select your preferred montage.

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# 4chPZOKMAN

Take a moment and analyze the raw EEG to detect sources of artifact and/or neurological issues such as dipoles, seizure or asymmetries in bilateral pairs.

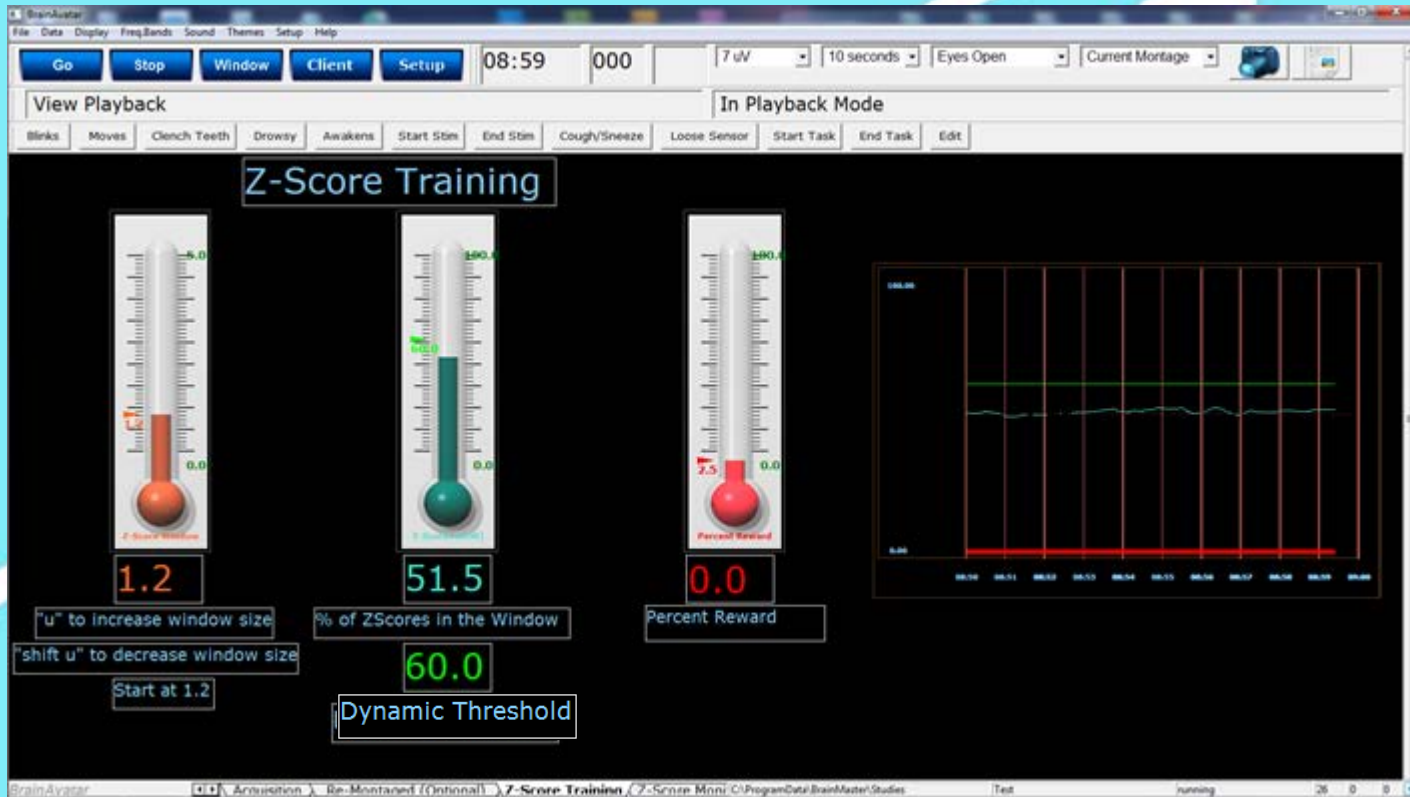


Next switch to the ZScore Training Tab.

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# 4chPZOKMAN

The ZScore Training Tab is where the PZOK training is actually monitored.

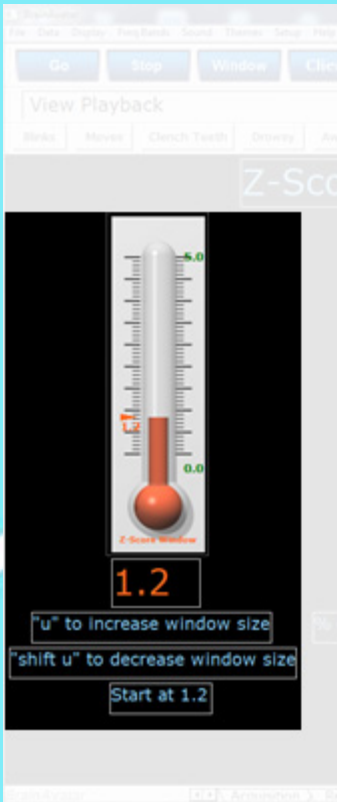


The following pages shall elaborate on the components of this screen.

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# 4chPZOKMAN

The Z-Score Training Tab is where the PZOK training is actually monitored.



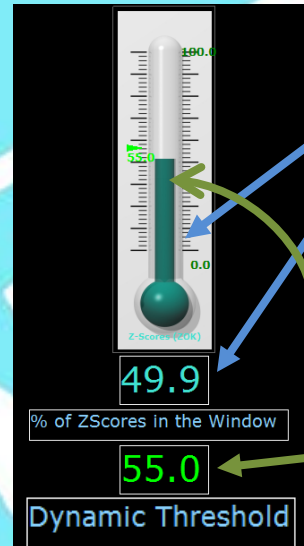
## Z-Score Window Thermometer

- Sets the size of the ZScore window.
- Start at  $\pm 1.2SD$ .
- Wait a few seconds until the variables stabilize.
- If the blue variable (% of ZScores within the window) is below 40% tap the “u” key once and wait to see if it settles between 40% to 80%. Repeat if necessary.
- If the blue variable (% of ZScores within the window) is above 80% tap the “shift-u” key once and wait to see if it settles between 40% to 80%. Repeat if necessary.

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# 4chPZOKMAN

The Z-Score Training Tab is where the PZOK training is actually monitored.



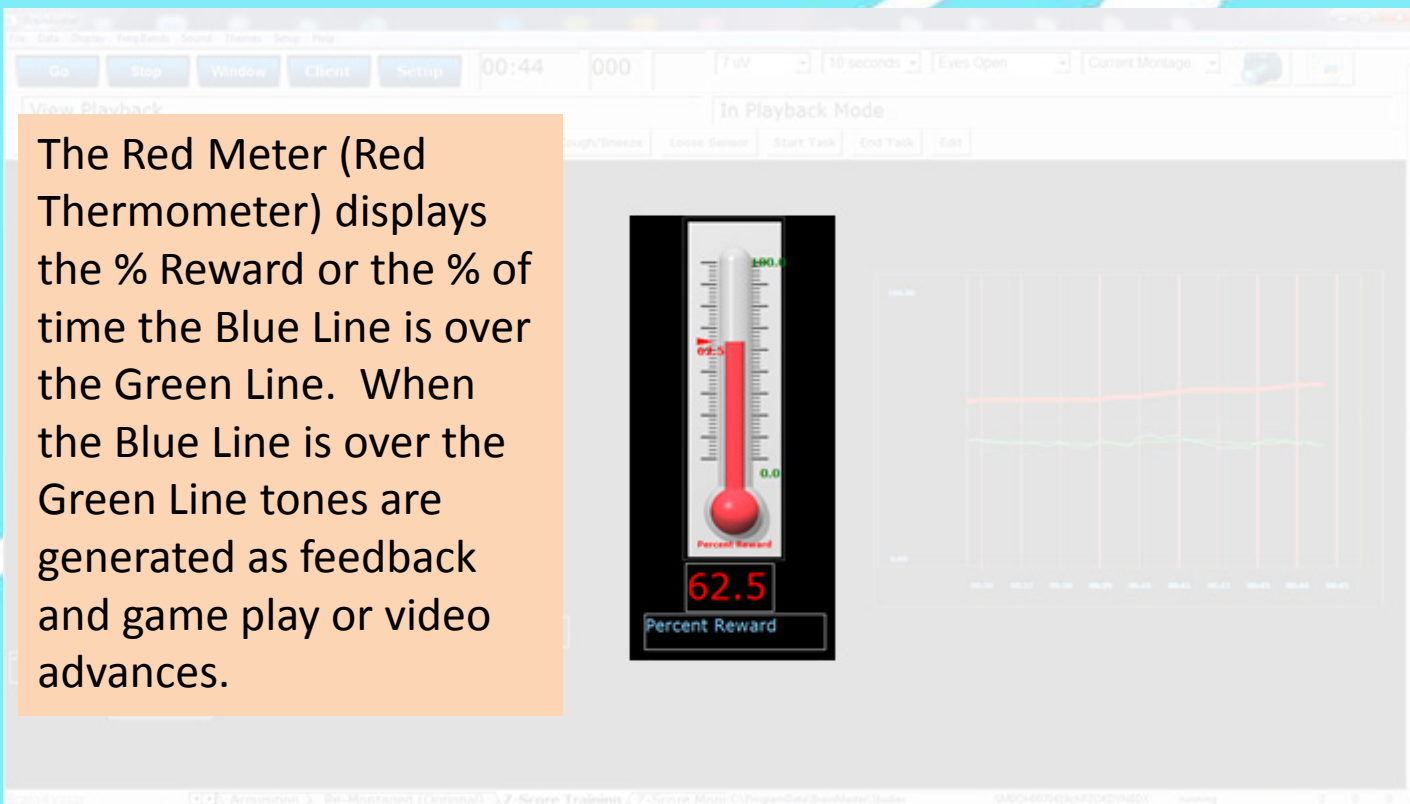
The Blue Meter (Blue Thermometer) displays the % of Z-Scores (% ZScores that are OK) that are within the window. The window was set on the previous page.

The Green Meter (Green Tab on the Thermometer) displays the location of the Manual Threshold.

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# 4chPZOKMAN

The Z-Score Training Tab is where the PZOK training is actually monitored.



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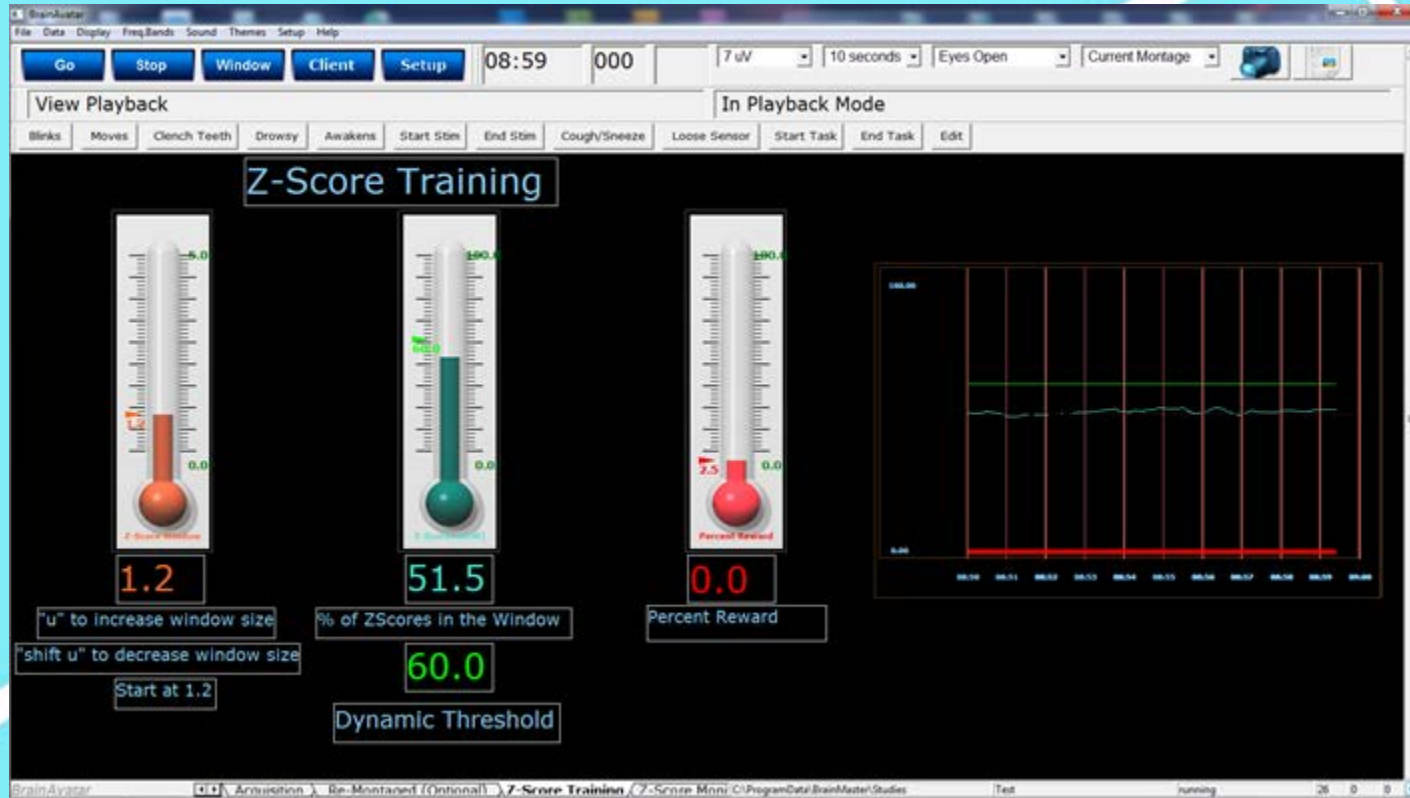
# 4chPZOKMAN



Notice in this example...the window is set at  $\pm 1.2$ SD's. The percent of ZScores that are OK is 51.5%. The threshold is set at 60% and this yields a percent reward of 0.0% because the blue line (% of ZScores that are OK controlled by "U") never exceeds the threshold (Green Line controlled by "C").

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# 4chPZOKMAN



Let's say our target is to have approximately 70% of the ZScores be OK (in the window) our first choice would be to increase the size of the window from 1.2 to 1.3 by tapping the "u" key once.

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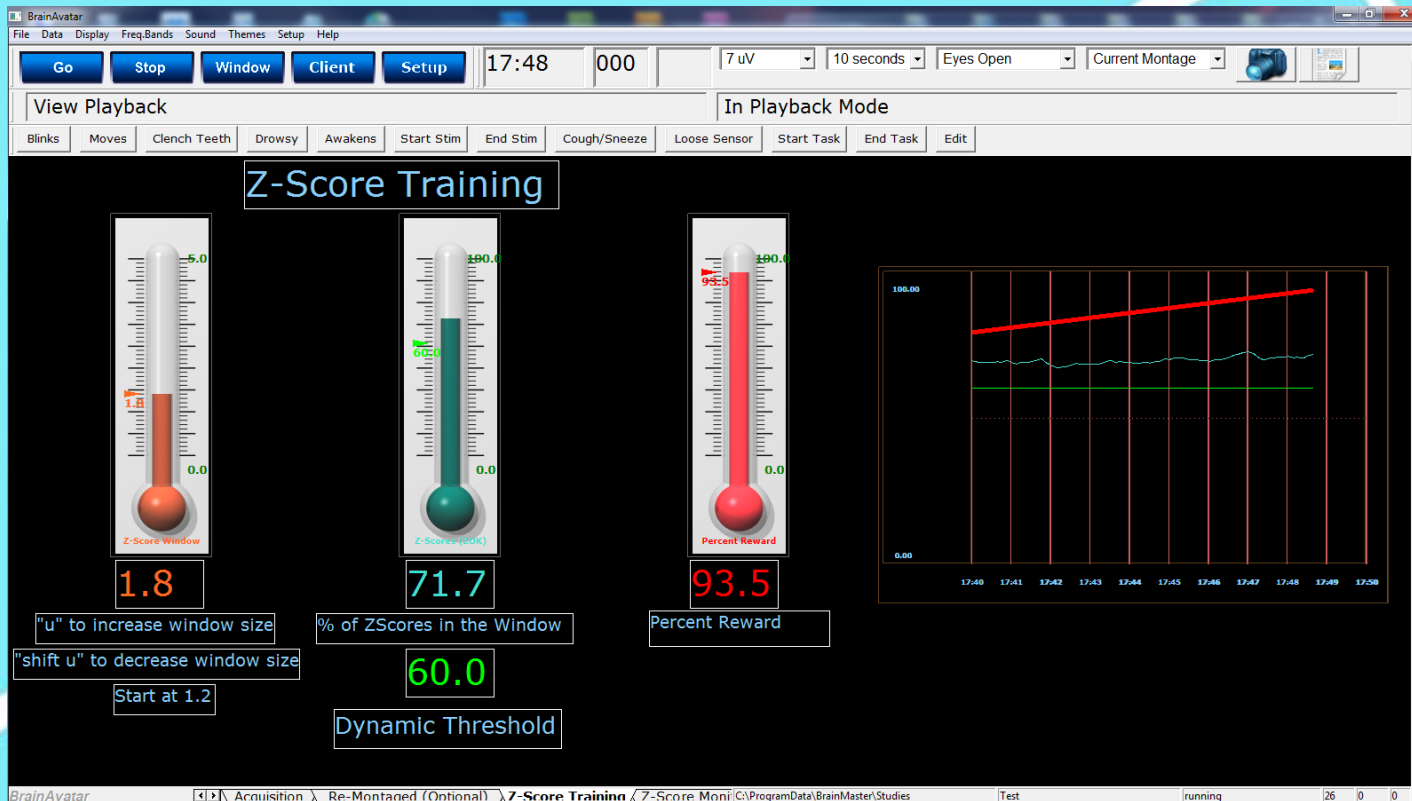
# 4chPZOKMAN



Notice by tapping the “u” key once the window size has changed from 1.2 to 1.3 and after a brief stabilization period notice the Percent of ZScores that are OK have risen from 51.5 to 55.0. Perhaps tap the “u” key a few more times until the PZOK has risen to approximately 70.0.

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# 4chPZOKMAN

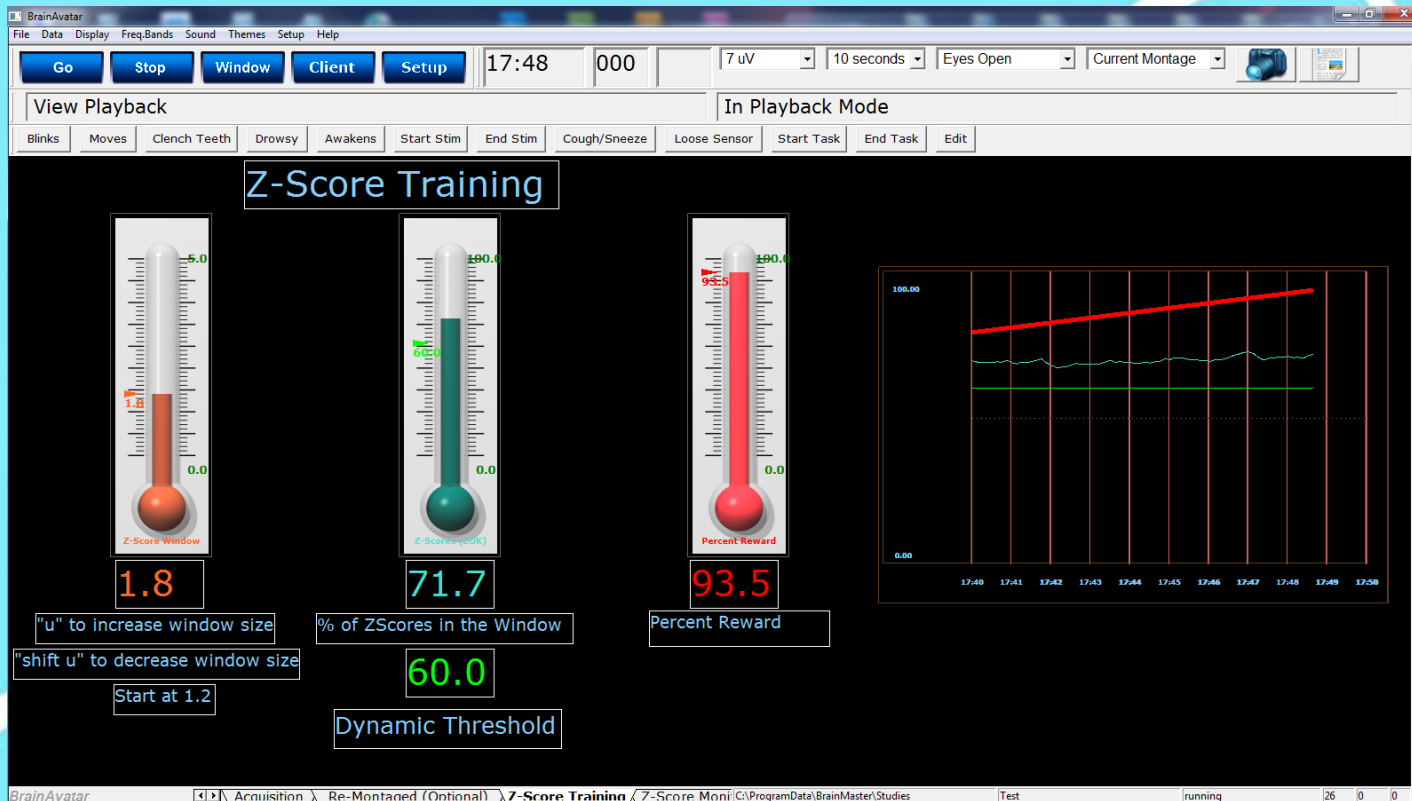


Notice by tapping the “u” key until the window has increased to 1.8 the PZOK has risen to 71.7%. You might also have noticed that as soon as the blue line crossed the green line reward tones were generated. Also, after a while the red line is noticed to increase reflecting the percent of time the blue line remains over the green line (%reward).

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# 4chPZOKMAN

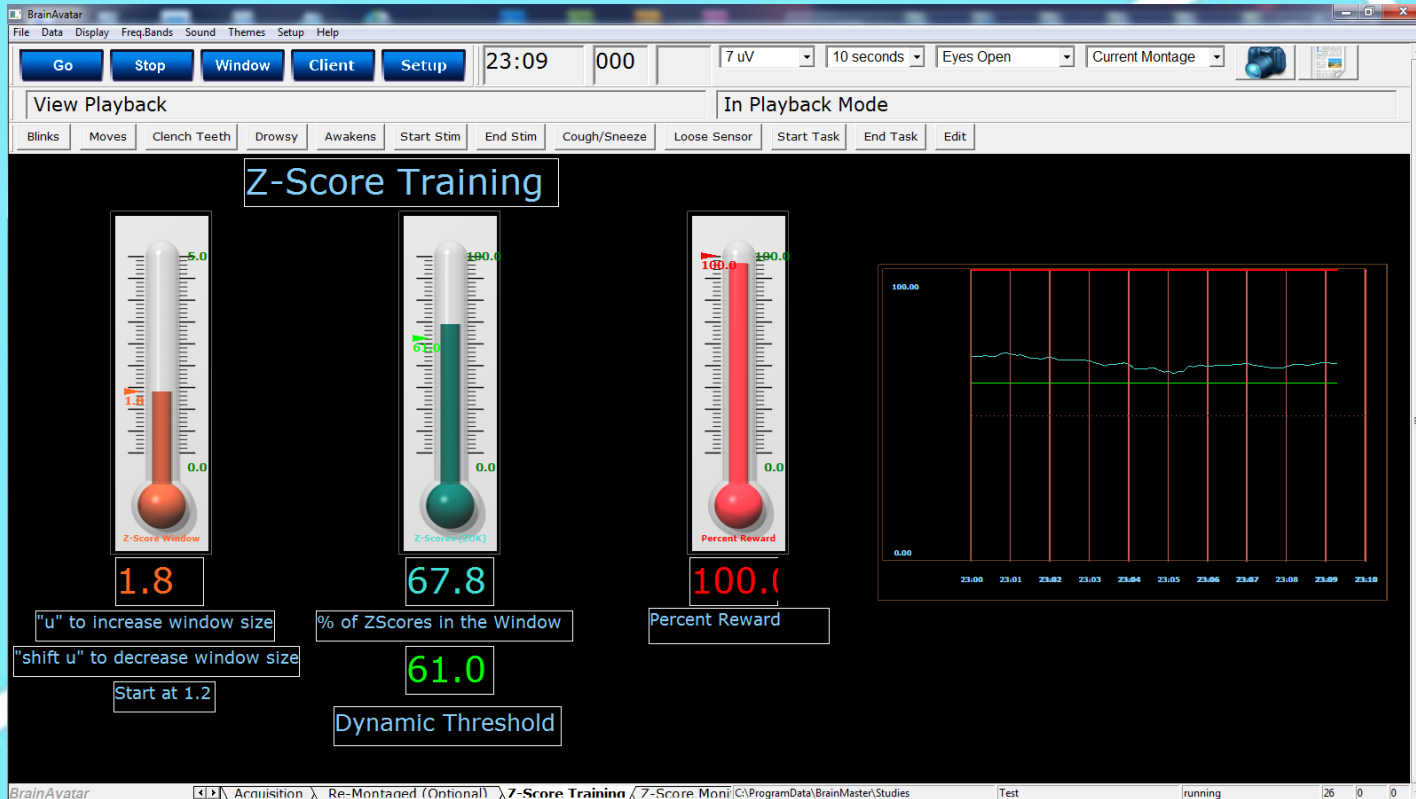


Let's say the target for %reward is 60%. Now that the window is set to produce around 71.7% ZScores within the window, all that is left is to adjust the "c" key (raising the green line) in order to produce the %reward target above 60%. Let's tap the "c" key once and see what happens.

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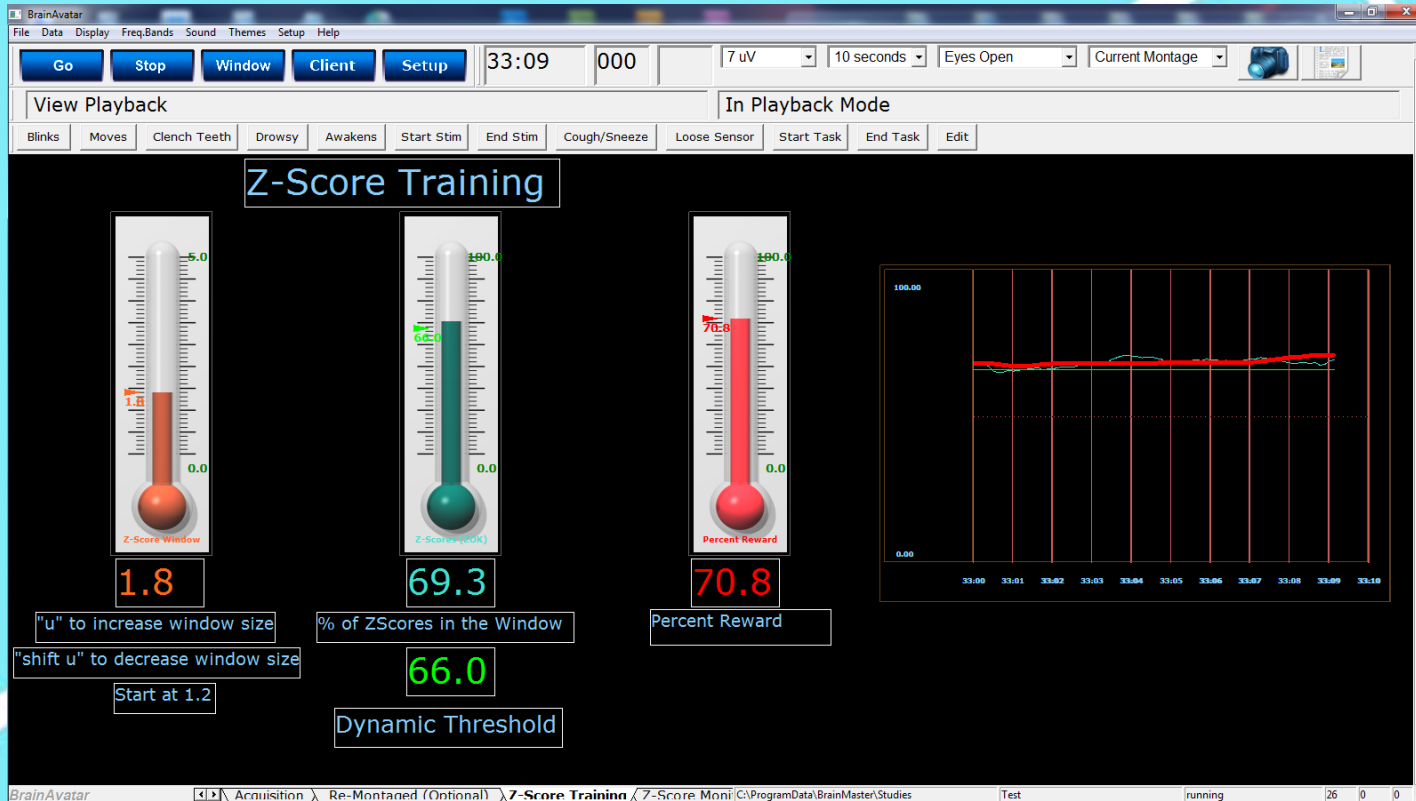
# 4chPZOKMAN



Notice by tapping the “c” key once the threshold (green line) has increased from 60 to 61. However since the blue line (Percent ZScores which are OK) has remained above the green line 100% of the time, the red line (% reward) reflects that fact. No reward tones are generated when the %reward = 100%. Now, lets tap the “c” key a few more times so that the % reward settles close to our target near 70%.

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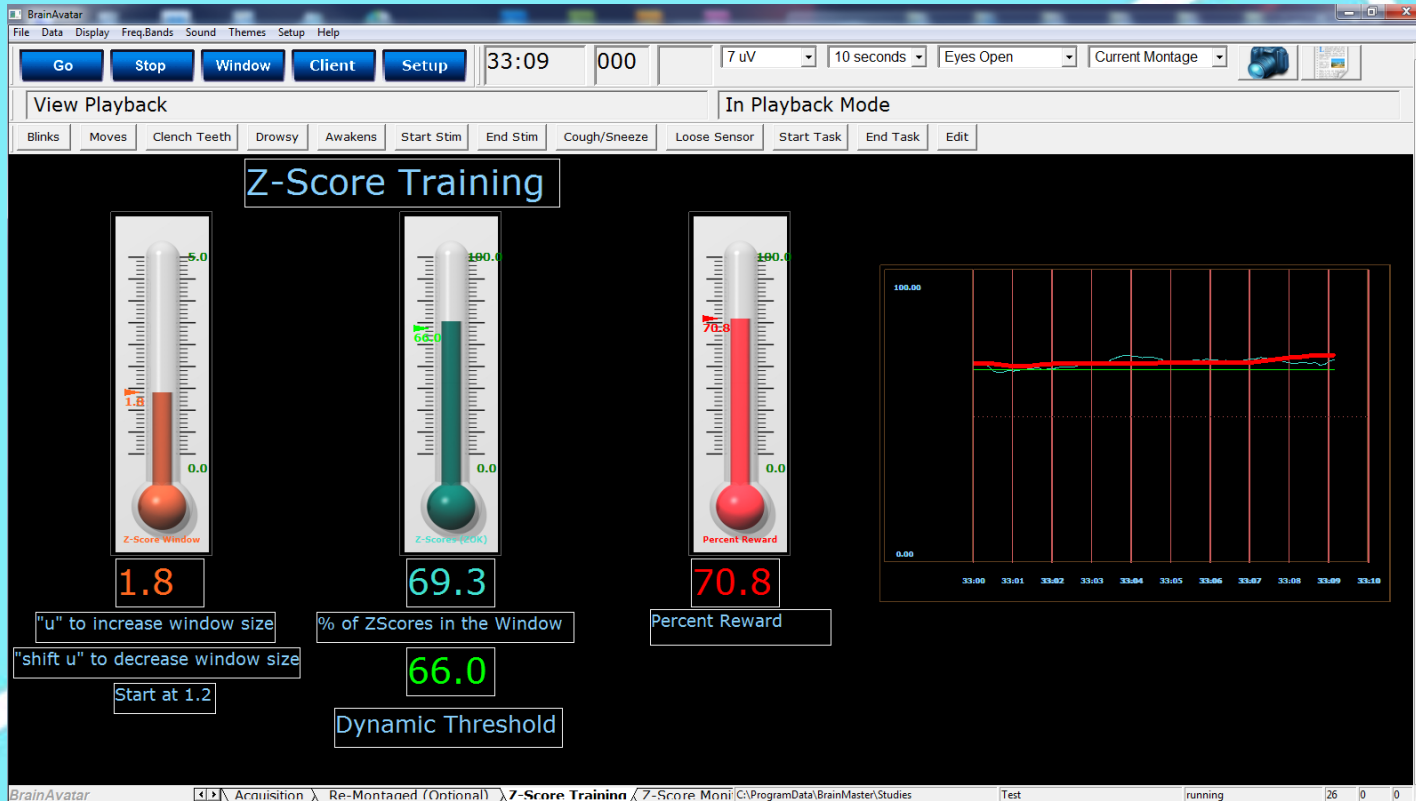
# 4chPZOKMAN



Notice by tapping the “c” key until the threshold reaches 66.0 the percent reward achieves 70.8% and a steady cascade of reward tones are delivered.

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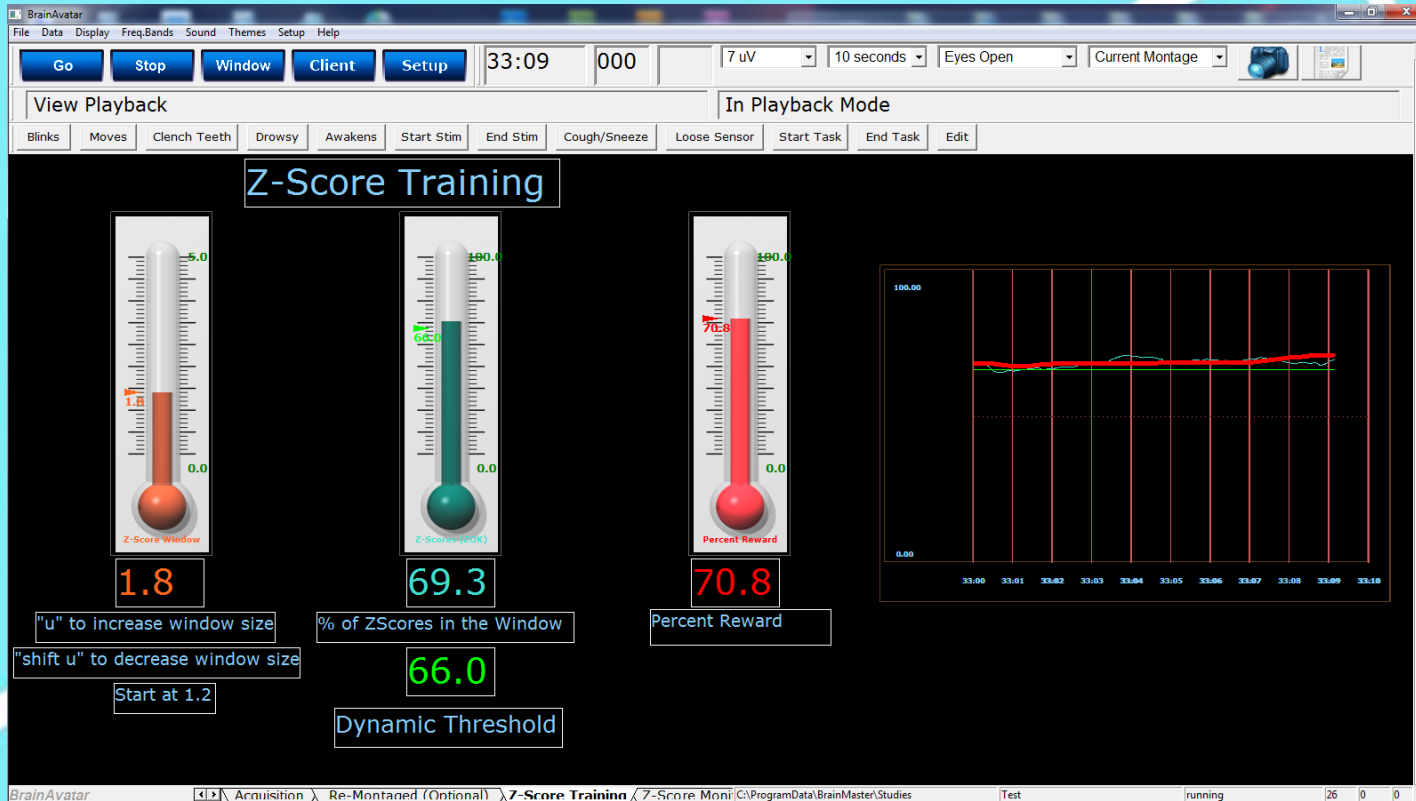
# 4chPZOKMAN



A good training practice is to alternate the difficulty of the training every trial or 3 minute period by varying the “c” key. For instance in the previous slide the threshold level (“c” key) was set at 66.0. To make the training easier it may be reduced by 3 to 63.0 for the next three minutes.

*All protocols are for demo and research purposes only. Clinicians must determine protocol choices. All protocols must be used within scope of practice and scope of competence.*

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Then after three minutes the threshold may be increased by 3.0 back to 66.0 to make the training more difficult. Again, try to adjust the threshold ("c" key) as to keep the %reward (red Line) between 70% - 90%. By alternating thresholds in this fashion, signals are sent to the brain to aid in self-regulation.

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One way to determine a client's success is to be able to maintain the Window size so that the Blue Line (% of ZScores that are OK) remains between 40%-80% and the Red Line (% Reward) remains between 70% to 90%.

For example...this client's window was set at  $\pm 1.8$  SD's. At that setting the Blue Line %ZOK was 69.3%. The Red Line (% reward) became 70.8%.

Let's say after a few sessions the blue line (Percent of ZScores that are OK) increases to 90%. This means that a larger percentage of ZScores are normalizing. The size of the window should be decreased so that the training calls for even more outliers to achieve normalization.

By going through this process you can easily monitor the success of the client. Of course the most important factor are the positive changes the client reports in her/his daily life more so than the data produced by the training.

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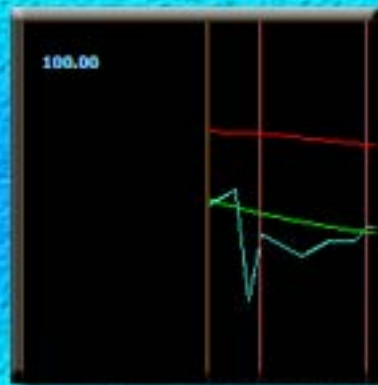


# Power Point Manual

Get On The  
BUS



BrainMaster  
Universe  
Simplified



“4ch PZOK  
ANI”  
level 2