

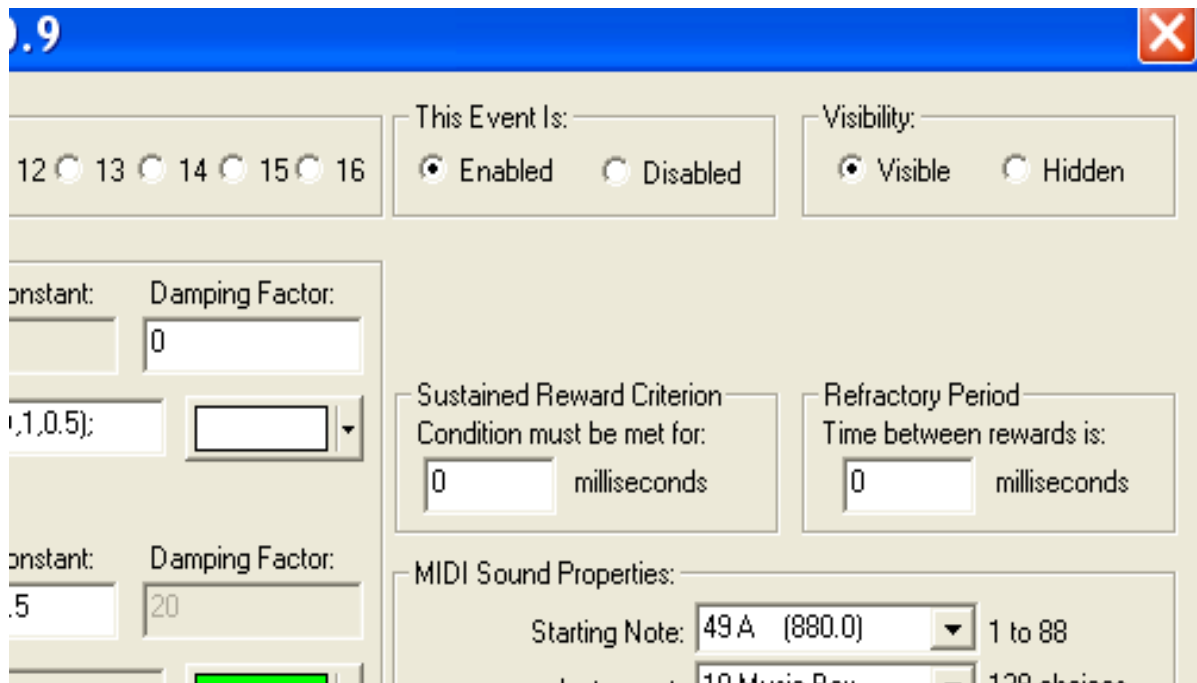
If the text stats display is delayed information so that the data can be read more easily, how can monitor actual feedback response?

Yes, the text stats panel is designed for people who like to watch the values change every 2 seconds. It is a human interface display, designed to be easy to watch. It is not suited to short-term judgments on what is happening on a real-time basis because it is possible that the text stats display could show data that does not match the actual training from instant to instant. However, if the numbers were to change faster, then they would be distracting and difficult to watch and monitor.

However, the Event Graphs (either wide or not) are good ways to monitor what is happening, in real-time, and will match what is seen and heard in the client training screens. You can display, in graph form, the main training event, the Flag event that makes the Flash games run, any particular component being trained (coherence of a particular frequency, power of a frequency at a particular site), and even the percent of time the training criteria is met.

The first thing to do is to make sure you have the proper settings in the Event Wizard when you design your Events. In addition to making sure the proper Events are “Enabled” so that they are active, and you also need to make sure that the Events you want to display are set to be “visible”.

The boxes on Event Wizard that control whether or not an Event is displayed is the “Visible” or “Hidden” options in the “Visibility” box of the Event Wizard:



You need to make sure that any Event you want to display is marked as “Visible”.

Next, you need to determine what scale you will use to display your Event. This option is found in the "Event Trend Graph" section of the EW:

RULE: GOES UP AND IS ABOVE:

Use Entered Value: Delta

Check Equation x=0:

Note: You must press "Check Equation" to check and sa

Event Trend Graph

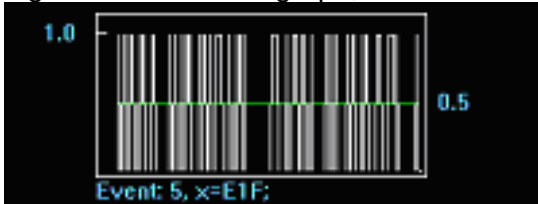
Scale Factor: 1 Offset: 0

Event Result:

THEN: Play MIDI Sound

Notice on the above illustration, which is typical to properly display the Event 5 flag, the Scale Factor is 1 and the Offset is 0.

This creates a graph for the Event flags as follows, with 0 as the bottom of the graph and 1 as the highest value on the graph, and 0.5 as the mid-point:



However, you can change the Scale Factor and Offset so that the graph displays best for your purposes. So if you want to display the Z-scores of a particular component, say the Theta coherence between channels 1 & 2, you would put the following statement in the Event Equation box (using the appropriate variable label for which ever component you wish to display):

Event Wizard Designer for BrainMaster 3.0.9

Event Number:

1 2 3 4 5 6 7 8 9 10 11 12 13

Event Condition:

IF: Use Equation: Delta Amplitude Constant: 0.0

Check Equation x=ZC012T:

RULE: IS GREATER THAN:

Use Entered Value: Delta Constant: 0.0

Make sure to remember to click the "Check Equation" box after entering the equation.

Then you would go down to the “Event Trend Graph” section and enter the following values:

Check Equation

Note: You must press "Check Equation" to check and save any

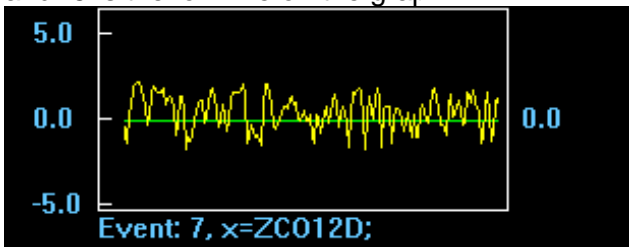
Event Trend Graph

Scale Factor: Offset:

Event Result:

THEN:

This will produce the following graph, where 0 is the mid-point, and +5 is the high line on the graph and -5 is the low line on the graph.



This is an easy way to display the z-scores which fluctuate above and below 0. You could also adjust these numbers to best suit your visual needs, perhaps to a smaller range, if you desired.

Also notice that the z-score color is yellow; this can be changed to make the lines easier to differentiate on the training screen and to watch. This is done by changing the color in the color-palette drop-down window next to the Event equation line:

tion: Amplitude Constant: Damping Factor:

on

AFTER THAN:

If you want to display the percent time that the Training Event is met, you would want to set one of the Events to have the equation of $x=E1P$; (if the training event is Event #1); and you may want to select a distinctive color to display this data as well (the cyan color in this case):

Event Wizard Designer for BrainMaster 3.0.9

Event Number: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Event Condition:

IF: Use Equation: Amplitude Constant: Damping Factor:

Check Equation

RULE: Constant: Damping Factor:

Use Entered Value:

Check Equation

Note: You must press "Check Equation" to check and save any changes made to equations

And then you would want the Event Trend Graph to have a Scale factor of either 100 (for a max of 100%) or perhaps 50 (for a max of 50%) for better differentiation of smaller percentage moves:

Note: You must press "Check Equation" to check and save any changes n

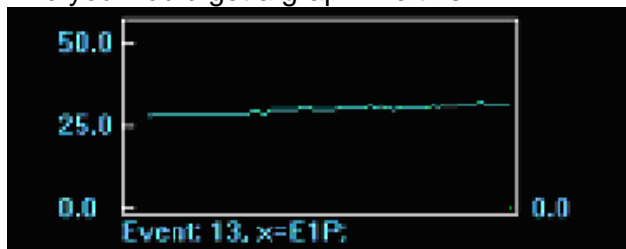
Event Trend Graph

Scale Factor: Offset:

Event Result:

THEN:

And you would get a graph like this:



Continue to do this for each Event that you wish to Display on your training screen.

Remember to click "OK" at the lower right hand corner of the Event Wizard before closing the EW to make sure you save your changes.

Then, to display the Event Graphs on the main training screen, click the "Display" drop-down menu and un-check [Text Stats](#) and then check either [Trends \(events\)](#) or [Wide Trend \(events\)](#) like this:

Training/Control Screen - BrainMaster 3.0.9

Data **Display** Freq.Bands Color Sound

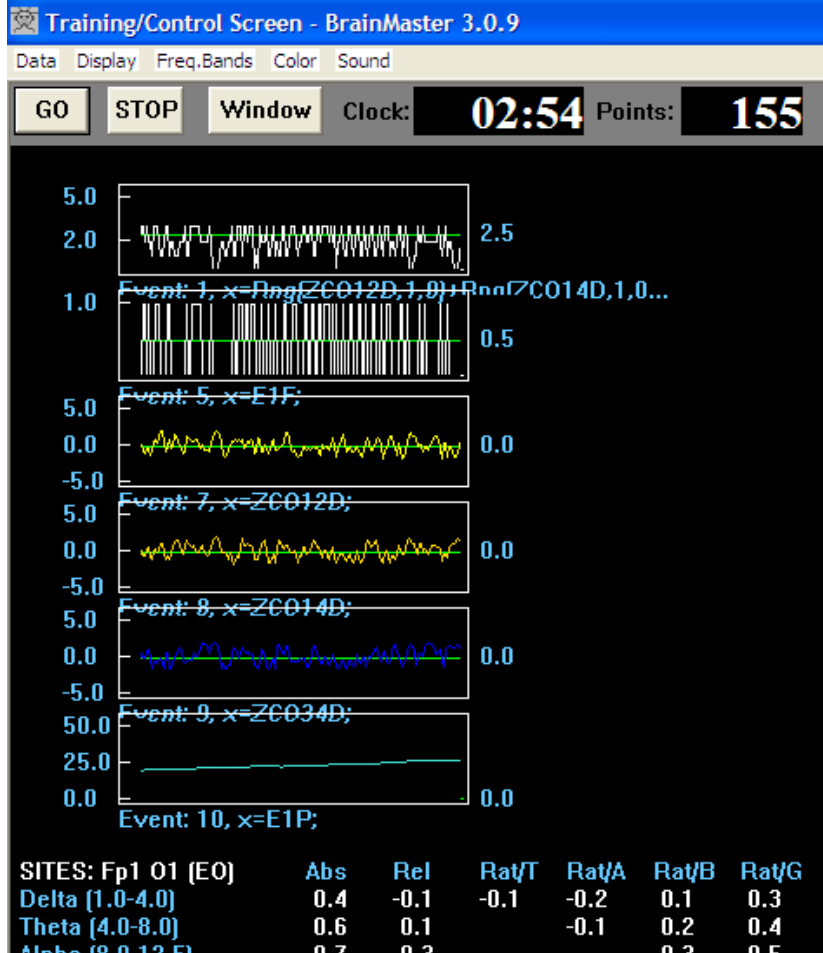
GO Raw waveform
 Filtered waveform
 Phase Space
 Frequency spectrum
 Thermometer
 Mini BMirror (FFT)
 Mini BMirror (Filter)
 Coherence
 Text Stats
 Trends (component)
 Trends (events)
 Wide Trends (events)
 Z Scores

Time: **00:09** Points: **040** Close

View Playback

EEG CHANNEL 3: Fp2:

You will then get a display with Event Trends that look something similar to this:



In the above screen, the first Event Trend graph is for the actual training event, and when the calculation of the training equation is greater than 2.5 (i.e. 3.0), the reward tone is given and the training screen advances (so long as “rule” states that a Midi Tone is played).

The second Event Trend graph operates essentially the same as the first, only this is for Event #5 which is required to run the flash games. Since the flash games advance when the Event equation equals “1”, when the white line crosses the 0.5 line, the reward tone is given and the training screen advances (so long as “rule” states that a Midi Tone is played).

The 3rd, 4th, and 5th Event Trend graphs are for graphing 3 separate component’s z-scores; notice that each has it’s own line color for easier differentiation.

The final Event Trend graph is for graphing the “percent time condition met” variable, or the E1P variable. This graphs the percent of time that the Event #1 condition, the training condition, is met (or the percent of time the line in the Event #1Trend graph crosses the line); as well as the percent of time that the Event #5 condition (the flash games event) is also met. Also notice in this example that the scale of the graph is 50 which means it will only display values up to 50%; if it was deemed necessary to have a higher scale, it is easy to change the Event Trend Graph Scale Factor to a higher number. You could also set the scale so that it displayed percentages between any 2 percentage ranges, such as 25%-100%, or whatever range works best for your situation (so long as the percentage that is calculated is within the range set).

Another advantage to having only the Trend Graph displays selected, and not having the Text Stats displayed, is that there is more room to have training screen displays without having to cover up z-scores or other displays.

Below is an example of a protocol with 4 separate components being trained. The first and second Trend graphs are for Event #1 (the training event) and Event #5 (the Flash Games event).

In Event #1 there is an equation for 4 separate components being trained in a z-score range. The 4 different event graphs with the colors of yellow or dark blue (the 3rd, 4th, 5th, 6th graphs below) are Trend graphs for each of the separate components that make up the equation in Event #1.

The final Trend graph is for the Percent Time variable to track what percentage of time the training condition is being met.

But with the screen arrangement below, the Animation training screen that is displayed is not covering any other data available, and is a nice arrangement for the use of a single-screen when doing z-score training. There is a limitation, however, that in order to display the coherence z-score display, it would be necessary to scroll the screen up and cover some of the power z-score data; and there would be loss of viewing of the 1st or 2nd Trend graphs, but the last Trend graph still displays the percent time met, so there is still a way to graphically monitor/observe training progress.

