EGI Support Report

EGI
dense array EEG

Oct 7, 2015

In this issue:

Net Station 5.2 software

Net Station 5.2 is now available and is free for anyone currently using Net Station 5.0. We are excited about this release as this represents our full transition from our 4.x generation of software. As you know, we needed to completely rewrite our software in order to be compatible with Apple's more modern operating systems. It's been a long journey, and we are pleased to announce that we are at the stage where you no longer need to move between Net Station 4.5.7 and Net Station 5.x in order to complete your workflow. This release includes the following features and improvements:

- Wavelet (Joint Time Frequency) tool
- GeoSource tool – takes MFF EEG data files and outputs MFF source data files
- Spectral/FFT display in acquisition and review
- Support for PsychToolBox in Acquisition
- Improved workspaces in both Acquisition and Review
- Montage editor in Acquisition and Review
- Event Set editor
- Keyboard mapping editor
- Save EEG selection
- Acquisition and Review preferences
- Improved topo map controls
- Improved event editing
- Protect ECI events from editing
- Other UI enhancements, such as snap-to-peak

Our focus hasn't only been on completing the feature sets that you are used to using. We know that innovation is equally important to you and Net Station 5.2 provides you with, among other things, improved video acquisition and support of multimodal imaging techniques. Here is a list of the new features:

- Smart Net support for the MicroCel Net
- Options for faster recovery rate, as low as 3 msec, which has been specially designed for EEG-TMS acquisition
- Pulse detection tool for EEG-based BCG cleaning*
- Support for Ethernet-connected digital PTZ cameras with improved video-EEG synchronization
  - existing PTZ cameras, whether firewire or USB, are not supported
- Support for recording data directly to a Network Attached Storage (NAS) device
- Support for full offline review of data stored on a Network Attached Storage (NAS) device

*Based on Iannotti, G. R., Pittau, F., Michel, C., Vulliemoz, S., & Grouiller, F. (2014). Pulse artifact detection in simultaneous EEG-fMRI recording based on EEG map topography. *Brain Topogr, 28*, 21-32.

System requirements for Net Station 5

- Net Station 5.2: Mac OS X 10.10.5; firmware version 1.6.15 when used with NA 400 amplifiers or

firmware version 11 when used with NA 300 amplifiers.

- 2 GHz Core 2 Duo or better
- 8 GB RAM
- Net Station installation requires 1.6 GB of storage

If you still have older Net Station files, we recommend that you keep a Mac OS X 10.6.8 computer for file conversion. When you are ready to upgrade, please contact EGI Support so that we can help you move to this version.

Questions? Contact EGI Support.

Contact Support

Net Station 5 MFF converter

It is only possible to convert the older .nsr file to the newer .mff format on a computer running Mac OS 10.6.8. To help you transition to working within the MFF environment on current Mac computers, we have created a standalone MFF Converter that will run on Mac OS 10.6.8 without needing Net Station or a HASP license.

Please contact EGI Support if you have questions or wish to download this legacy converter.

PST release of E-Prime SP2

We often get asked why there is a delay between PST releasing a new version of E-Prime software and us introducing it as our tested stimulus presentation partner. Just like when Apple releases a new operating system, we need to make sure that the timing accuracy that we guarantee can still be achieved, and so we complete a full array of quality tests. When PST released E-Prime SP2 (E-Prime 2.0.10.356 plus EENS 2.0.2.26) on 31 March 2015, the importance of these tests became very apparent, and now that we have released Net Station 5.2, we are in a position to advise how this release can be integrated into your system. See our Support Tip below to learn how we test for stimulus presentation accuracy.

Once you have upgraded to Net Station 5.2, with either your GES 300 or GES 400, our recommended configuration will be to upgrade to E-Prime 2.0.10.356 and EENS 2.0.2.26 on your E-Prime system.

If however you are using Net Station 5.1.2 or below, our recommendation is that you continue to use E-Prime 2.0.10.353 and EENS 2.0.2.26 so that you can maintain your stimulus presentation timing accuracy.

As many of you may still be using a Window XP E-Prime system, we can help you work through the operating system and E-Prime version upgrade. Please contact EGI Support for advice and provide us with your PC specifications, including the amount of RAM installed, so that we can customize our answer appropriately.

PST also released Chronos on 23 April 2015, the replacement and upgrade to their SRBox. EGI is planning to test Chronos with Net Station 5 and E-Prime and we will let you know the results when that occurs. We hope to complete the testing of the core SR Box like functionality by mid-month but testing the new features Chronos adds will probably take us until early November.

EGI is currently shipping Windows 7 computers running E-Prime 2.0.10.356 and EENS 2.0.2.26.

Questions? Contact EGI Support.

Contact Support

Support Tip – measuring stimulus presentation accuracy in E-Prime

Validating your experiment timing is a key step in launching a new study or reactivating an older one. To assist you with this step, we want to share with you the results of our recent testing of Net Station 5.2/E-Prime 2.0 so you will have a baseline for evaluating the timing accuracy you see on your system when you upgrade.
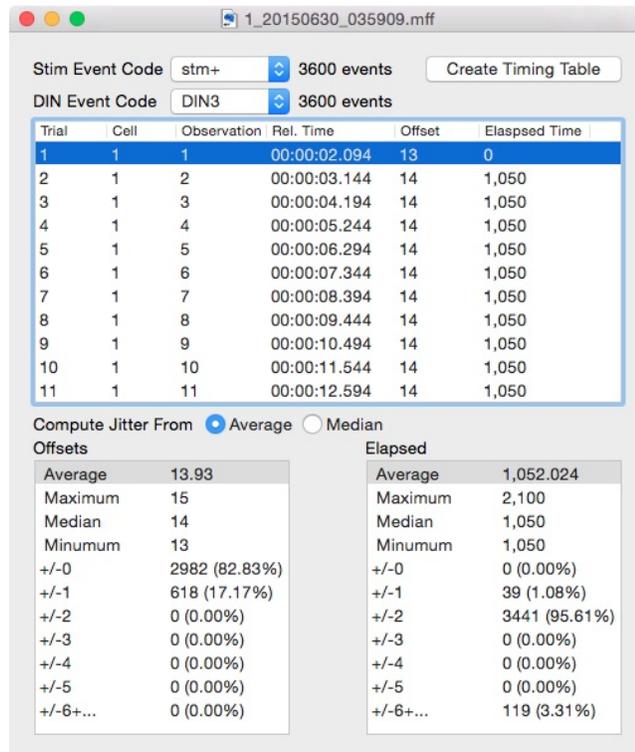
In a nutshell, these timing tests allow us to record a file that will allow the comparison between:

1. The time when E-Prime states that the stimulus is presented.
2. The time that our AV Device physically detects the presentation of the stimulus.

We know that the beauty of Event-Related Potentials is their exquisite temporal resolution, and so by quantifying the expected stimulus presentation offset we can have confidence in the timing characteristics of our experiment and take account of this offset during signal processing. Please contact EGI Support for advice on how to configure and run the timing test.

The calculation of the stimulus presentation offset is achieved by running your file through the Event Timing Tester, which you can find in your EGI Utilities folder. The output is shown below, and in this example we are comparing the stimulus event code associated with a visual stimuli and the DIN generated by the AV Device's photocell. When reviewing these results we know that there is going to be an offset present — that in itself is not a problem — but rather we are looking for two characteristics:

1. **That offset values do not drift across the experiment.** We judge this in two ways:
   - We review the Maximum and Minimum offset values to gauge whether there are any outliers within the data set. We want to see these values be tightly centered around the Average offset.
   - Then, by scrolling through all the offset values recorded, we check to see how consistent the offsets values are across the recording. We want to see that the values remain constant and not show any indication of drift across the timing test.
2. **That 99% of offset values are within +/- 3 ms of the average offset value.** We configure our E-Prime computers so that we can achieve stimulus presentation accuracy of +/- 3 ms in 99% trials. This means that, in 99% of the trials within the timing test, the stimulus offset recorded will be within +/- 3 ms of the Average offset value. As you can see in the example shown, which was taken from a timing test run in our Quality Department during our Net Station 5.2 regression testing, we have achieved this criteria: in 82.83% of trials there is no variation around the Average, and in 17.17% of trials the offset value is within +/- 1 ms of the Average offset value. The reason why we are able to control stimulus presentation timing to this extent is that we use Network Timing Protocol (NTP) in order to synchronize the two computers — your E-Prime PC and your Net Station Acquisition Mac — and therefore have more control over timing. When NTP is not used, for example when PsychToolBox uses our ECI, the stimulus presentation accuracy achieved is that 97% of offset values are within +/- 5 ms of the Average offset value.

In the next edition of the Support Report, we will discuss how to use this information as a system diagnostic and how to generate your experiment-specific stimulus presentation offset.

New Geodesic Photogrammetry System (GPS) 3.0 software

When you install Net Station 5.2 software, you will see two new additions: GPS Acquisition and GPS Solver. Together, these applications represent our latest GPS 3.0 software release, which is used with our Geodesic Photogrammetry System. The GPS 3.0 software has been completely redesigned, incorporating new machine vision methods that enable semi-automatic identification of sensors from the images, and a new, more intuitive user interface. This upgrade makes the workflow for determining sensor positions much faster and...kind of fun! Tests with users indicate that most people can complete the sensor identification in about half the time required using the earlier software, and end with a smile on their face. See GPS 3.0 software in action.

To make collaborations easier, we have removed the need to use a specially configured HASP to utilize

GPS functionality. If you collect GPS images on a colleague's system, you can solve the sensor location files on your own version of Net Station when you return to your laboratory.

If you already own a GPS system, upgrades to GPS 3.0 are free for current GPS 2.0 users. There are no hardware changes needed and the software is backwards compatible with data acquired with GPS 2.0. Output files from the new software can be used with Net Station 4.5.7 and higher, and with third-party software. Note however, that GPS 3.0 does require a Mac computer running Mac OS X 10.10.

Please contact EGI Support to request an upgrade and for advice on configuring your computers properly. Contact EGI Sales if you would like to purchase a full GPS 3.0 system. To purchase a new GPS 3.0 system or to upgrade from a GPS 1.0 system, contact EGI Order Desk.

Support Tip – troubleshooting steps for dealing with data artifacts

One of the first things we learn when we are working with EEG data is … rubbish in leads to rubbish out! This is sometimes hard to remember, especially as it's so easy to apply our HydroCel and MicroCel GSNs, but the time that you take to apply the Net carefully and know how to identify and address artifacts is invaluable. Here are a few things to consider:

During Application:

- **All sensors should be contacting your patient's skin with equal pressure.** Not only is this more comfortable for the patient, but it creates an even tension across the head, which helps to ensure that your reference sensor, positioned at the vertex, is optimally positioned. You can use gauze, a small cap, Spandage, or other non-conductive material to ensure even pressure and contact with skin. Please contact us if you are questioning a method and are unsure of its compatibility with our system.
- **All sensors should have contact with the skin.** If your participant or patient has hair, regardless of whether it is thick or thin, lift the sensor up and sweep the hair out from under it so that you see skin before you place the sensor back down. Next, ensure a good contact with the skin by wiggling the sensor back and forth to softly wipe the skin with the sponge — this allows the baby shampoo within the electrolyte solution to gently clean away any surface oils that may be present.
- **Prevent bridging by not having the sensors drip water when you are applying the Net.** Gently shake the Net when you first pull it out of the bucket to eliminate the dripping electrolyte. Also remember to not press down on the sponges when making adjustments during the Net application as this may squeeze out electrolyte into surrounding sensors and cause bridging.
- If you do notice the sensors are too dry, you can use a pipette to sparingly add more electrolyte to each sensor.

Once the Net is on:

- Once you have verified all of the above, check that the Cz and Com are seated, hydrated, and not bridged with any surrounding sensors. If you notice the skin in between sensors is wet, use a towel to wipe away the moisture in between.
- Conduct a final check to ensure that no sensors have moved, and especially check to see that no sensors are sitting on hair instead of the scalp.
- Check for outside sources of noise, such as machines or anything touching the Net cables.
- Other people touching the patient may also be contributing to the noise. People and objects can conduct noise from other sources if they are touching the patient or a component of the EEG system.

Current versions of software and firmware from EGI

- Mac OS 10.10.5: Net Station 5.2 and GPS 3.0
- Net Amps 300 Firmware 0/11
- Net Amps 400 Firmware 1.6.15
- Windows XP SP 3: E-Prime 2.0.8.90, E-Prime Extensions for Net Station (EENS) 2.0.1.10
- Windows 7: E-Prime 2.0.10.356, EENS 2.0.2.26

How to contact our Sales Team

Wish to upgrade or add new products? [Contact EGI Order Desk.](#)

Contact EGI

EGI
dense array EEG