NeuroField EEG Operation Manual

NEUROFIELD INC.

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NeuroField Inc.

Based on Software / Hardware design by Bradley W. Wiitala, B.S.E.E & Nicolas J. Dogris PhD.

Compiled and written by Nicholas Dogris. Doc Version NF64_3.5. Software Version 1.1.8.5
Product Information Guide written by Nicholas Dogris

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Contents

Product Information

PLEASE READ THIS SECTION CAREFULLY!
IT CONTAINS VERY IMPORTANT INFORMATION
ABOUT YOUR RECENTLY PURCHASED HARDWARE.

INTENDED USE

The NeuroField Q21 is a battery powered device that is intended for relaxation training and muscle reeducation.

CLASSIFICATIONS

In Accordance with IEC 60601-1

The NeuroField Q21 is classified as:

- Class II and battery powered equipment.

SPECIFICATIONS

- Rechargeable Smart Battery Pack Li-Ion = 12v DC
- Maximum Power Consumption = 1.5 Amps
- Storage transport temperature = 0 – 120 degrees Fahrenheit
- Storage transport humidity = up to 95%, noncondensing
- Operating humidity = up to 95%, noncondensing

INSTRUCTIONS FOR USE

Read and follow these instructions when connecting and using the Q21.

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all cautions.

Contraindications:

Field Code Changed

Uses:

- Acute psychiatric emergencies
- Sole treatment for management of severe hypertension

Warnings:

These are potentially harmful situations that may cause injury to a patient or operator:

Electric Shock and Flammability hazard

- Power off the Q21 and remove Li-Ion battery before cleaning or servicing.
- Do not expose Li-Ion battery to extreme temperatures.

Failure of Operation

- It is possible for any device to malfunction, therefore, always verify unusual data by performing a formal patient assessment.

Operator and Patient Safety

- Do not use this device near water.
- Only use the Model RRC2040 rechargeable battery provided by NeuroField, Inc for the Q21 device.
- Use only attachments/accessories specified by manufacturer.

Patient Safety

- Do not test or perform maintenance on the Q21 while using it on a patient.
- Device is optically and magnetically isolated for patient safety.

Data Validity

- Conditions that may cause inaccurate readings include interfering substances, excessive motion, low signal strength, and incorrect placement of patient applied parts.

Cautions:

These are conditions that may lead to equipment malfunction or damage.

Cleaning

- Turn the unit off before cleaning
- Clean with mild detergent and water only
- Use cleaning solution sparingly. Do not immerse the Q21 in liquid. Excessive cleaning solution may flow into the device and damage internal components.
- Do not use petroleum-based solutions or solutions containing acetone, Freon, or harsh solvents. These substances may damage the Q21 and cause a malfunction.

Maintenance and Repair

- There are no serviceable parts. NeuroField equipment is designed to provide years of service without the need for maintenance or calibration. There is no need for routine service or adjustment.

Disposal

- This device contains lead solder. When the unit has reached the end of its service life, the product described in this document and its accessories must be disposed of in accordance with local procedures and regulation.
- As you use the Q21 you will acquire solid wastes that require proper disposal or recycling. These include patient applied parts and packaging materials.

NOTICE: Special Instructions

Responsibility of the Manufacturer

NeuroField, Inc. is responsible for the effects on safety, reliability, and performance of the equipment only if:

- It is used in an area of normal room temperature and humidity, and unit is not subjected to excess moisture, vibration, dust, or shock.
- It is used in accordance with instructions in the “Operator Manual”.

Transport of Equipment

- Any transport of equipment should be done with the proper protection to prevent equipment from unnecessary jarring and movement within its container.
- The Model RRC2040 rechargeable battery is a lithium ion battery and must be carried on your person during any form of air travel. Lithium Ion batteries are **prohibited** in checked luggage and should not be exposed to extreme pressure as they can swell, combust and explode under extreme conditions.

SECTION 1

Software Installation

I. NeuroField EEG Software Installation

The following instructions are designed to help you download and install the NeuroField EEG software.

The minimum PC specifications for running the NeuroField EEG software are an i7 Intel processor, 16 Gb RAM, nVidia graphics card capable of 1920x1080 resolution and 250 Gb disk space. Currently NeuroField supports:

- Windows 10

Older operating systems are not supported and NeuroField does not support:

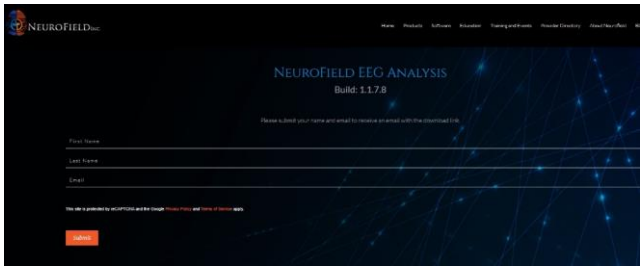
- Apple Macintosh systems
- Apple PC emulators
- Windows 8.1 or older.

Downloading the NeuroField EEG Software

The instructions here will walk you through the process of downloading the software from the NeuroField website, unzipping the files to your computer, and launching the installation.

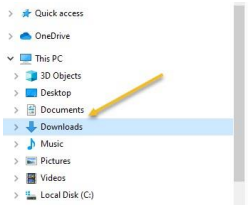
To Obtain a Download Link:

1. Go to the NeuroField website at www.NeuroField.org
2. Hover on “Software” and select the “Downloads” option from the dropdown menu.
3. Scroll down to section: “NeuroField EEG Analysis”.
4. Fill out the form with your first name, last name, and email. **NOTE:** be sure it is an email account you can access on the computer.
5. Click on the “Submit” button. An email with a link to the software download will be sent to the specified email account entered in step 4.

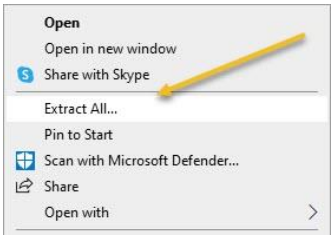


To Download and Extract the Software:

1. Go to the email from NeuroField, Inc. that contains your 'Download' link and click on the link. The Google Drive download page will appear.
2. Click on the  download arrow in the upper right-hand corner of the screen. A "Google can't scan this file for viruses" message will appear.
3. Click on the "Download anyway" button. Depending on which internet browser you are using the download status will appear either at the top or the bottom of your screen and a zipped file will download to your Windows "Downloads" folder. **Note: This may take a while** - you can check the downloading xxxMB status against the total (xxxM) listed at the top of the Google Drive page.
4. When the software is finished downloading, navigate to your "Downloads" folder.



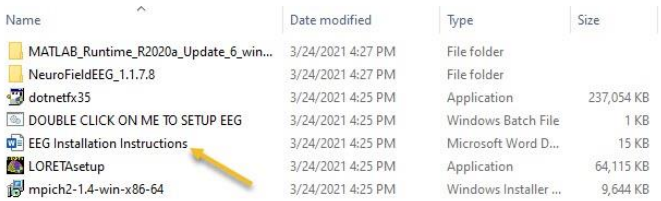
5. Right-Click on the zip file that you downloaded and select "Extract All" from the drop-down menu. The "Select a Destination Window" prompt will appear.



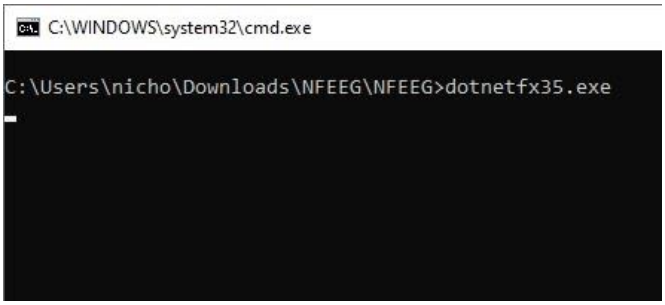
6. By default, the destination folder will be the same as the folder that the zip file is being extracted from. If you would like to change the location, you can browse to your preferred destination folder where the files will be extracted to and click on the "Extract" button. The "NFEEG" file folder with all its contents will be extracted into your Destination Folder. This folder now contains the NeuroField EEG setup software.

To Install the NeuroField EEG Software:

1. In your Destination folder, double-click on the “NFEEG” folder that was extracted from the .Zip file in the previous step. **NOTE**: **If the “Show extracted files when complete” box is ticked (It is ticked by default) the Volume folder will pop up for you at the conclusion of the file extraction.**
2. Double-click on the “NFEEG” folder to open it. A list of files will be displayed.
3. Open and read the ”EEG Installation Instructions” Word document. **NOTE: Each of the listed programs in this folder will be installed as part of the EEG Analysis software package.**



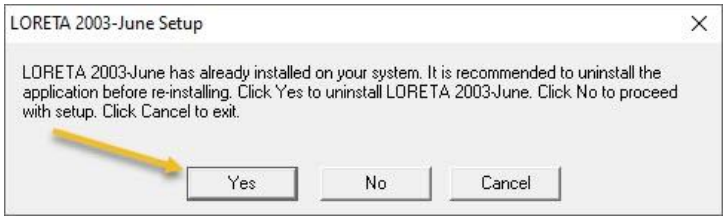
4. Double-Click the ”DOUBLE CLICK ON ME TO SETUP EEG” Windows Batch File. This will launch the NeuroField EEG Installer. Each of the programs will be installed in succession as displayed in the popup – beginning with “dotnetfx35.exe”.



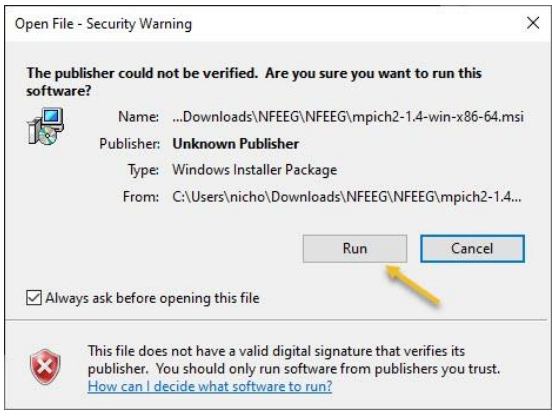
5. If prompted click ‘Run’ to begin the NeuroField EEG installation package.

6. Install LORETA. The next program to install is LORETA. Click Yes to begin installation. **NOTE:**

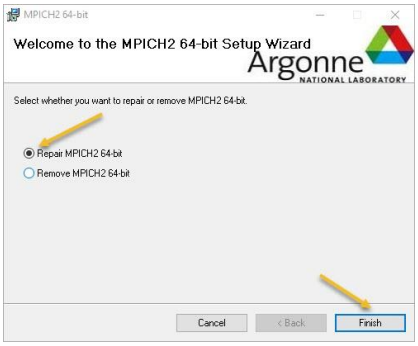
LORETA password displayed in installation window.



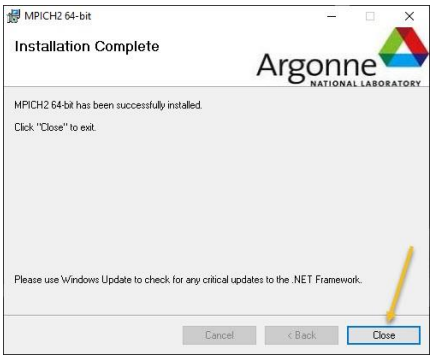
7. Install mpich. If prompted click on 'Run' to begin the mpich installation.



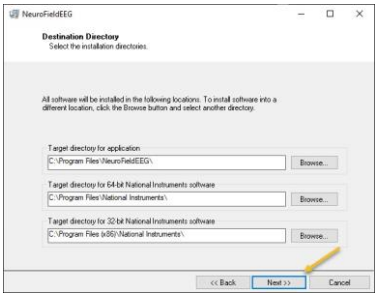
Be sure that ‘Repair’ is selected and click ‘Finish’ to begin installation of mpich.

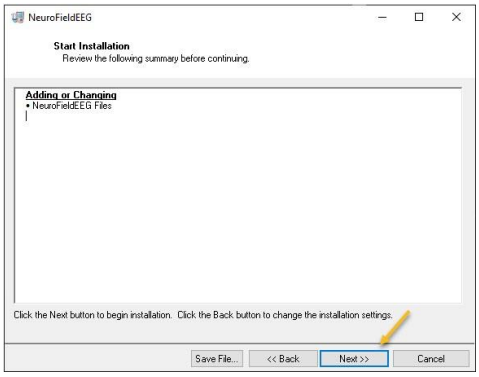


Click ‘Close’ on the next window.

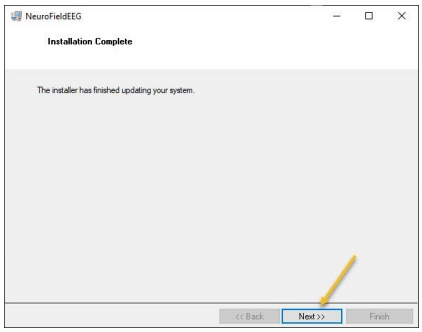


8. Install the NeuroField EEG program. Begin by clicking ‘Next’ on the Destination Directory window and ‘Next on the Start Installation window.

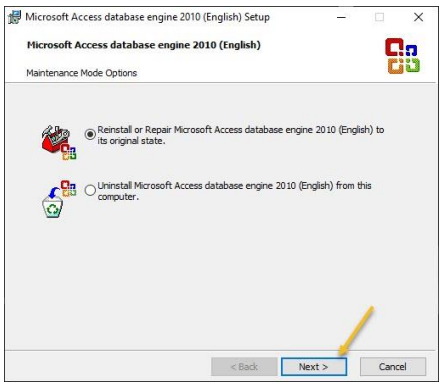




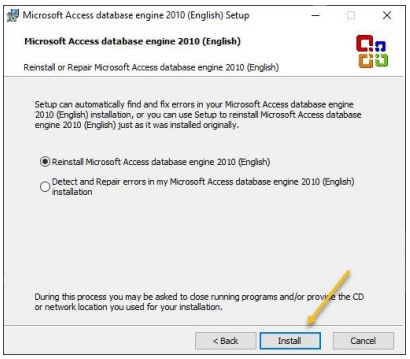
9. Click ‘Next’ on the ‘Installation Complete’ window.



10. Click ‘Next’ to begin the Access database engine installation**.**

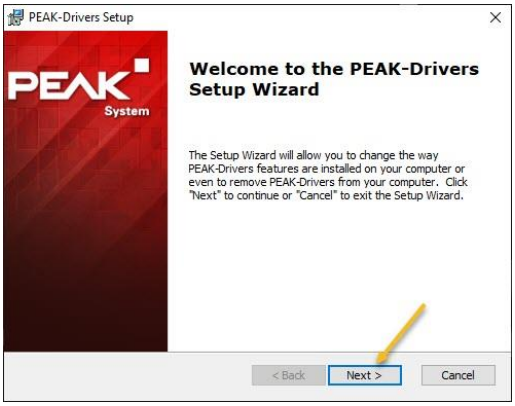


Click ‘Install’ on the next pop-up window.



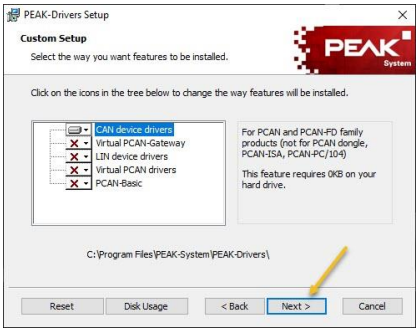
Click ‘Ok’ on the following pop up.

11. Install PEAK-driver set up. Click on ‘Next’ to continue.



If this is a first-time installation check the “I accept the terms in the License Agreement” radio button on the “License Agreement” and click “Next”. If it is an update, click on the “Modify” square.

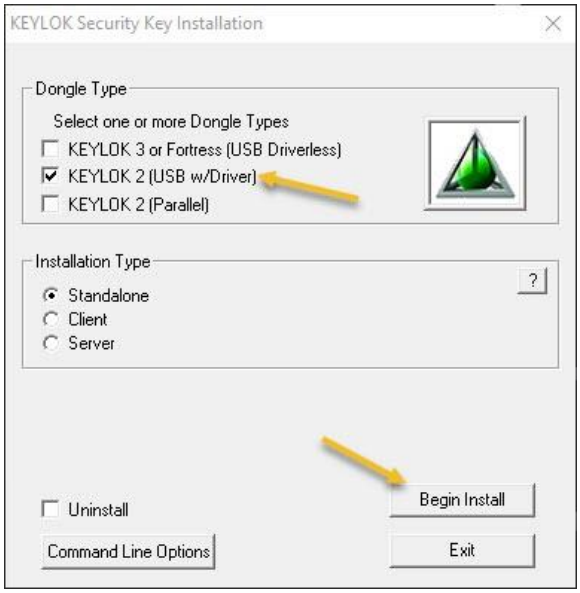
Click on ‘Next’.



Click on ‘Install’.

Click on ‘Finish’.

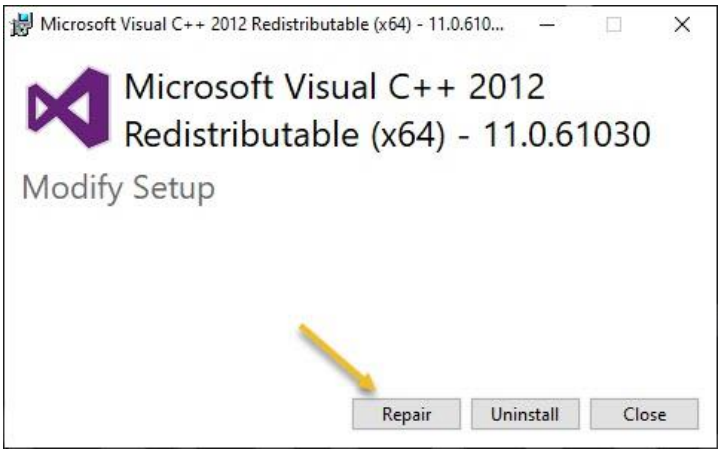
12. Install EEG dongle security software. Choose option 2 and click “Begin Install”.



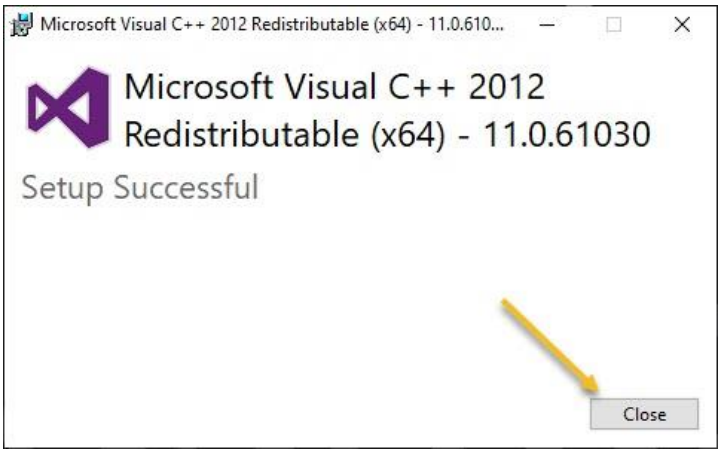
NOTE: Be sure that security dongle is not plugged into the computer’s USB port during installation of this portion of the installation package.

13. Click “Next” and “Finish on the next two pop-ups, respectively.

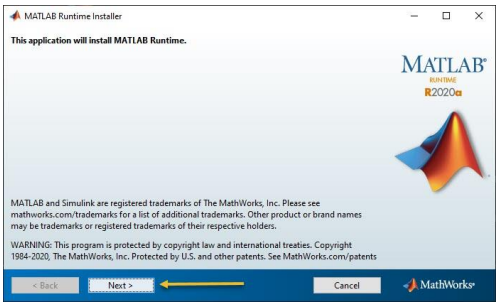
14. Install C++ redistributable – click “Repair” to begin.



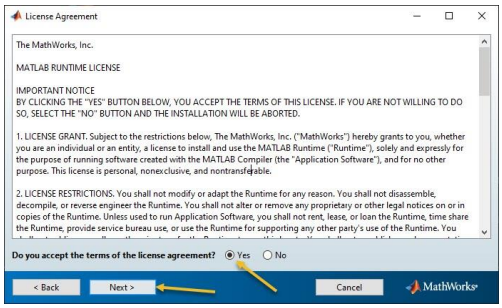
Click “Close” to conclude this portion of the installation.



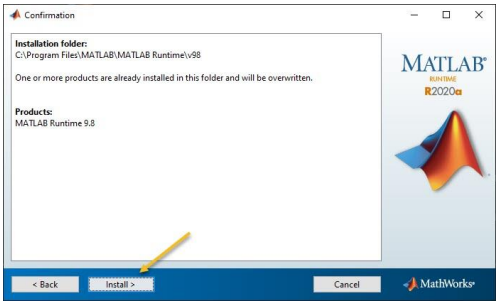
15. Install MATLAB Runtime Engine. First click on “Next” to begin.



Tick “Yes” to accept the license agreement and then click “Next”.



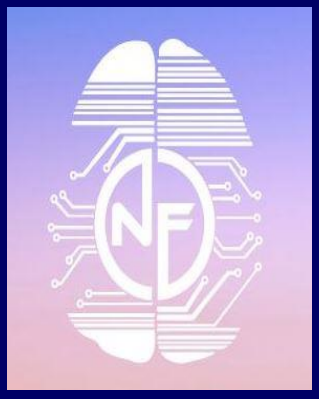
Click “Install”



Click “Finish” to conclude the installation.

The NeuroField EEG icon should now be present on your desktop and ready to run.

Double click to begin.



SECTION 2

Getting Started

I. Hardware Setup

To record EEG using the NeuroField EEG software it will be necessary to:

- Power the Q21 amplifier
- Connect the Q21 amplifier to the computer
- Maintain the battery power source
- Connect EEG Analysis Dongle

The Q21 Amplifier

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The Q21 is battery operated and uses the RRC2040 Li-Ion battery only. To insert the battery, turn the unit upside down, unscrew the two thumb screws and remove the plate.

Insert the battery so that it seats itself into the pins on the circuit board. To confirm that the battery is properly inserted press the power switch on the rear panel of the unit and then look at the front panel and you should see that the power light is illuminated.

Place the plate on top of the battery and tighten both thumb screws securely and turn the unit over.

NOTE: Your Q21 may have a back loading battery setup, in which case the battery can be slid into place by assuring that the pins are facing down or in line with the Q21 amplifier.

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Connect Q21 to the computer with the CANBus USB Adapter.

Begin by plugging the USB end of the adaptor into a USB port on the computer you intend to use the software with. If the NeuroField EEG program is open the red LED will blink if not it will be a solid red LED as shown in the image below. If the CANBus LED does not light or blink there may be a problem with the loading of the driver or the USB port itself.

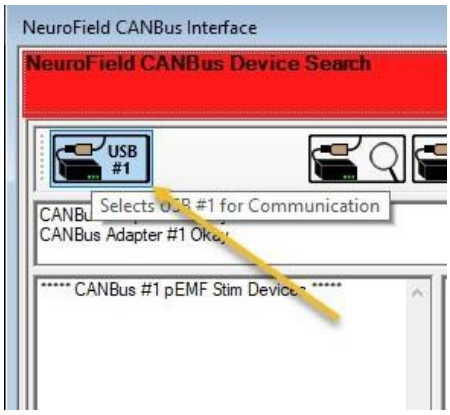
After connecting the provided RJ45 Ethernet cable into the other end of the USB CANBus adaptor, plug the cable into *either port* of the NeuroField Q21. There are two RJ45 input ports, and you can select either port to plug in the device as pictured below. The remaining port, the one not selected, may be used to add additional devices to the CANBus chain.

When completed, the Q21 will be connected to the computer. The image below shows the completed connection and, with the EEG Analysis dongle in place is now ready to be used by the NeuroField EEG software.

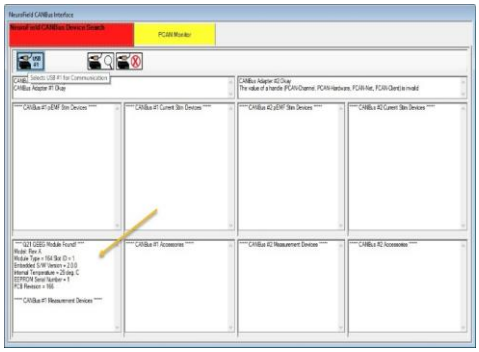
NOTE: These connections are verified when the program begins to run.

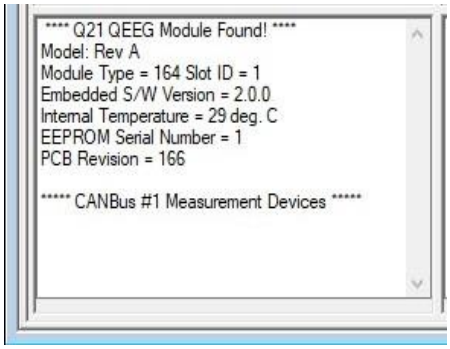
The USB#1 button will only be available if the CANBus to computer connection has been verified.

NOTE: if this button does not appear verify that you do not have multiple instances of the program open or other programs that are using the CANBus driver package.

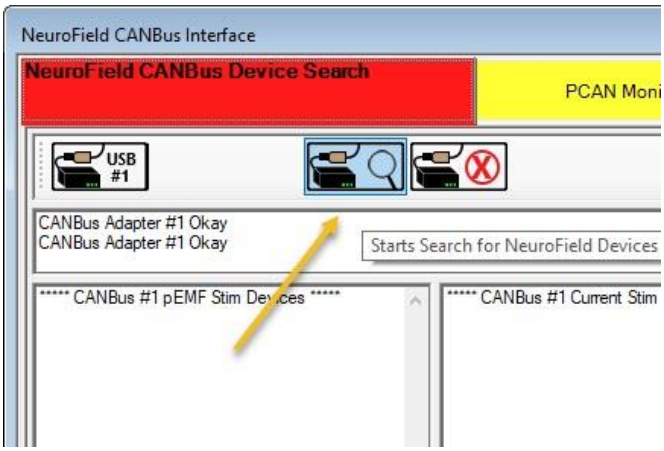


The devices, or in this case device, that are loaded with the program will be displayed in the appropriate panes, in the case below it is the Q21 and the relevant information pertaining to that device is displayed with it.





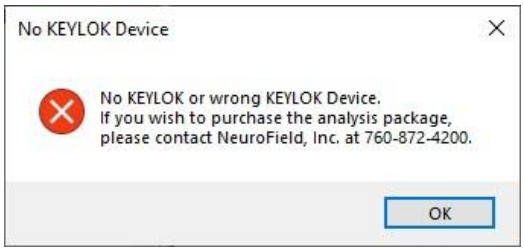
If by chance your device is powered on and connected and is still not visible in the NeuroField CANBus Interface, you can click on the magnify glass icon that will perform a query of the CANBus adaptor and report back all connected and powered on devices.



The NeuroField EEG Analysis Dongle

To use and operate the NeuroField EEG Analysis software the NeuroField EEG Analysis dongle must be plugged into one of the other USB ports on the computer. This dongle is the deliverable product when the EEG Analysis software is purchased. The driver for the dongle is loaded during installation.

If the blue dongle is not plugged in when the NeuroField EEG Analysis software is launched the following error messages will appear and the program will automatically shut down.



The Model RRC2040 rechargeable Li-Ion battery

There is an LED indicator on the battery itself, which when the button is pushed, will light up telling you the current charge of the battery:

- If the indicator lights up all the way and all the LED lights turn on, then you have a full charge.
- If you only see one LED, then it means that your battery is almost discharged.

Battery hygiene is important, as batteries have a lifespan and will eventually be unable to recharge. However, if you take good care of it, a battery can last a long time. Typically, it can last one year, maybe two if you charge it correctly. This means discharging the battery appropriately, and establishing a "good memory" for it. Batteries do have a memory, so:

- When you turn the unit on, keep it on all day or for approximately 8 – 10 hours.
- Shut it off at the end of the day.

Following this procedure will allow you to extend the life of your battery for as long as possible by "exercising" it and thus creating a longer run time.

If you are carrying this battery on a plane, do not check it with your luggage. Lithium Ion batteries are prohibited in checked luggage. It is safe and legal for you to place the battery in carryon bags. Always carry it with you on the plane.

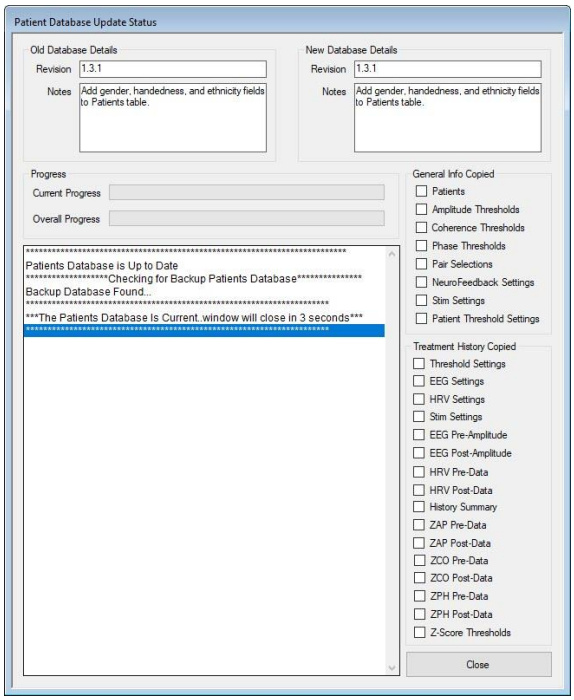
Having additional batteries on hand will help avoid any unforeseen down time due to failing batteries. For more information on purchasing additional batteries and all other NeuroField products please visit us at:

https://neurofield.org/neurofield-products

II. Patient Database

Loading the Patient Database

Following the CANBus hardware setup has been completed the NeuroField EEG Analysis software will load the patient database and let the user choose how to proceed from there. The window below lets the user know what version of the patient database is being loaded into the system. This will also be where any product updates to the database will occur.



The user does not have to interact with this window unless there is a structural update to the database being administered by NeuroField.

The Patient Database Update Status window will close automatically after 3 seconds.

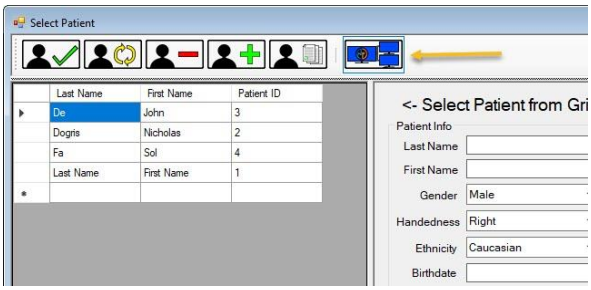
When this window closes the user will be placed at the Select Patient GUI that will allow to work with the patient records of the patient database that has just been loaded.

Networking the Patient Database

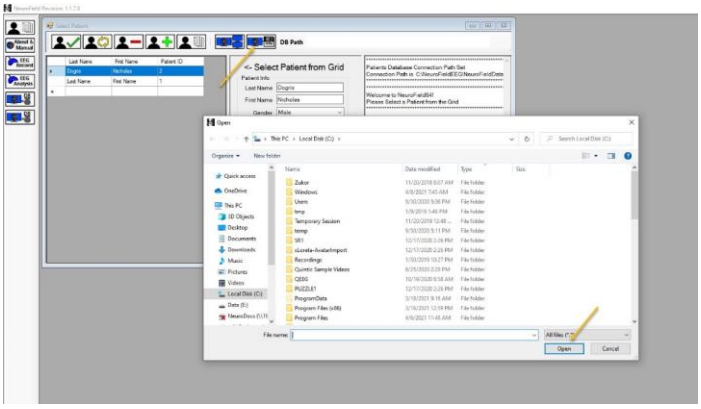
The user now has the option to point to a networked copy of the patient database. This may apply to those users who have multiple systems running NeuroField EEG Analysis and would like to keep their patient data synchronized over the network. This may also apply to those users who are also using NeuroField64 software and would like to synchronize the databases from each application together on the same computer.

NOTE: data may be synchronized on the same computer or to all computers that are on or have access to the same network resource – typically this means resources connected to the same router.

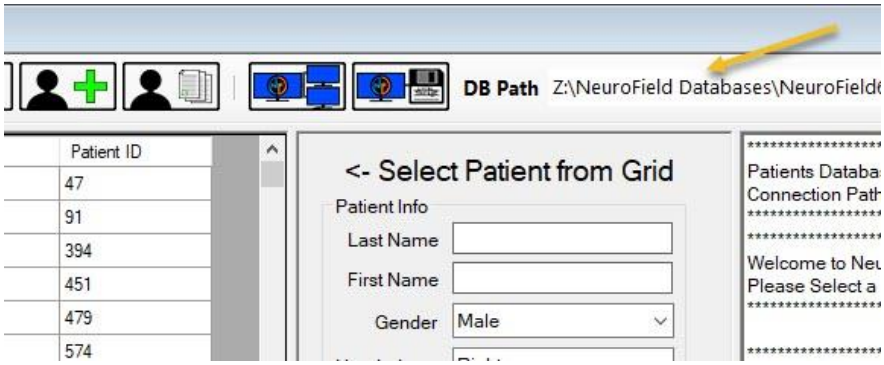
To network the patient database, begin by clicking the icon shown below that toggles the network option on/off.



This will make available the network selection control. Click this second button and navigate to the location of the desired Patient Database. Highlight the database and select open.

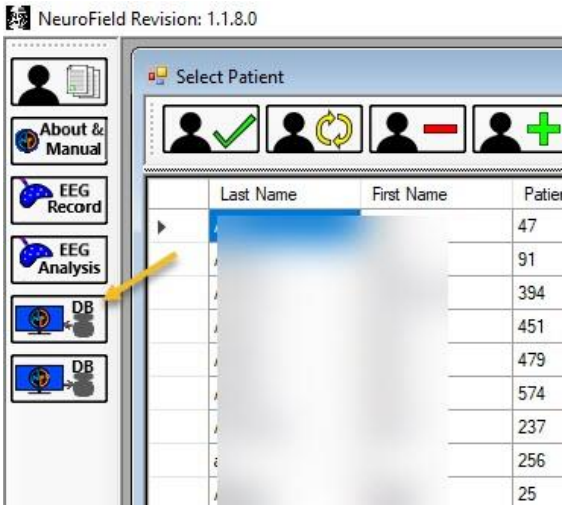


The path of the networked Patient Database will now be visible, and the networked database is ready to use.

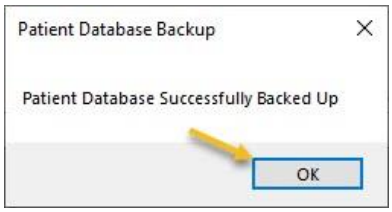


Backing up and Restoring the Patient Database

In the left margin of the NeuroField EEG Analysis software there are controls to back up the local Patient Database as well as restore the Patient Database from a backup. To begin first click the control to back up the database.

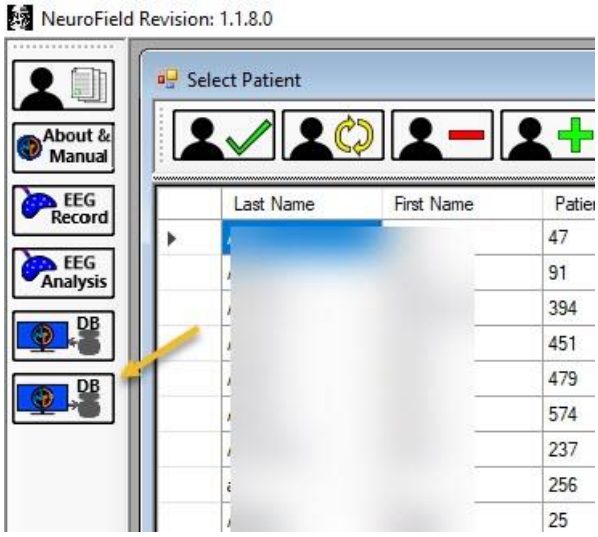


After the backup has been performed the user will be alerted with a popup window letting them know that the action was completed successfully.

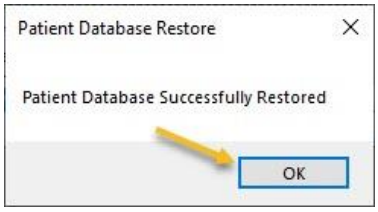


This action will create an Access file called 'PatientsBackup'. This file will be located at the following location on the user's computer: C:\NeuroFieldEEG\NeuroFieldData\PatientData.

To restore the database that was backed up begin by clicking the control to restore the Patient Database.



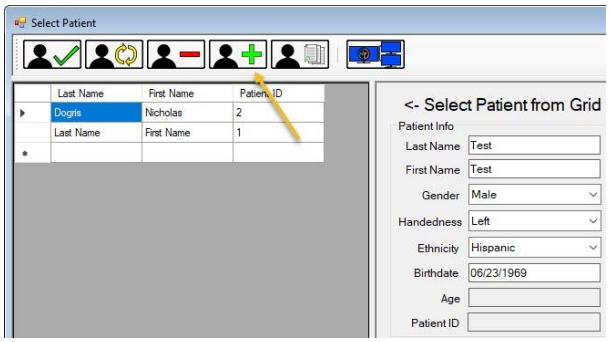
The user will be prompted with a message informing that the database has been restored.



The user will then be prompted to restart the program to allow the restore to be completed.

Adding a Patient to the Patient Database

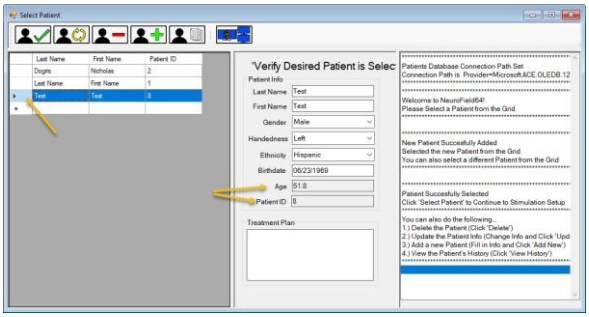
Fill in the 'Last Name' and 'First Name' fields for your patient.
Use the drop-down fields to select the appropriate values for Gender, Handedness and Ethnicity.
Fill in the "Birthdate" in xx/xx/xxxx format.
Fill in the "Treatment Plan" field with information you may want to store for that patient.
Click on the green '+' symbol as shown below.



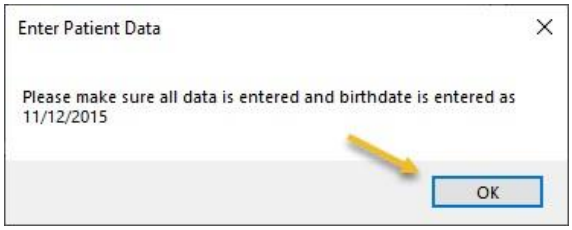
After the patient has been added to the database the user will receive the following message.

NOTE: the 'Age' field is greyed out and will be populated after the 'Birthdate' field is populated with a valid date and the patient has been successfully added.

NOTE: The Patient ID is greyed out and automatically created when the patient is added into the Patient Database.

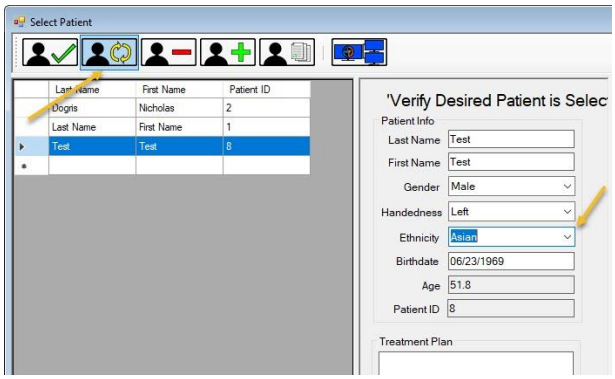


NOTE: if the patient's birthdate is invalid the user will receive the following message and be prompted to re-enter the birthdate.



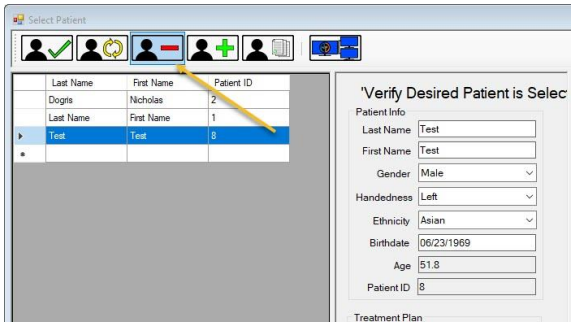
Updating a Patient from the Patient Database

To update a patient's record in the database. Begin by highlighting the record to change. Then changing the desired information and clicking on the yellow update control as shown below.

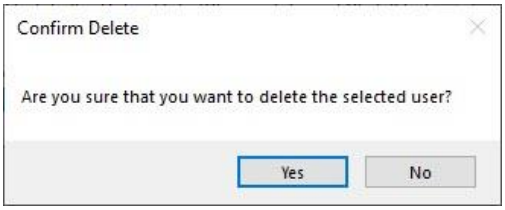


Deleting a Patient from the Patient Database

To delete a patient's record from the database. Begin by highlighting the record to delete and clicking on the red delete control as shown below.

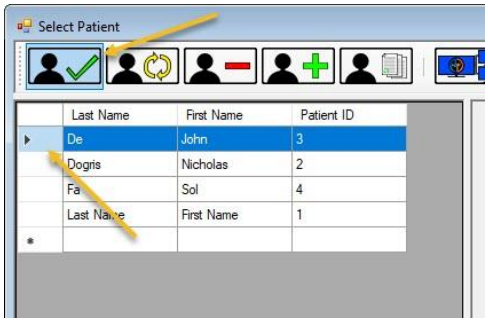


The user will be prompted with a window to verify the deletion of the record.

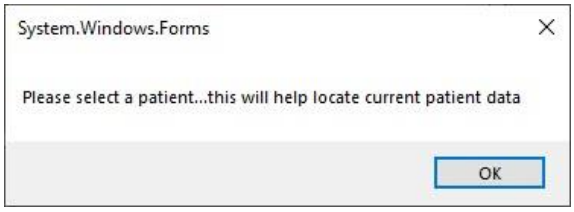


Selecting a Patient from the Patient Database

To begin either recording an EEG for the patient or performing analysis on the patient's data select a patient to work with from the patient table.



If the user attempts to proceed from here without first select9ing a patient the system will give the following message.



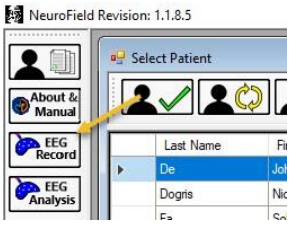
Once the patient has been selected the user is then given the option to either begin recording an EEG record or analyzing an EEG record. This can be performed by responding to the dialogue pop up window as seen below.

To record a new EEG

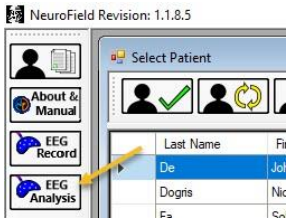
To begin analysis of an existing EEG

These options are also available in the left margin of icons as shown below

To record a new EEG



To begin analysis of an existing EEG



SECTION 3

Q21 EEG Recording

I. Q21 19 Channel EEG Acquisition

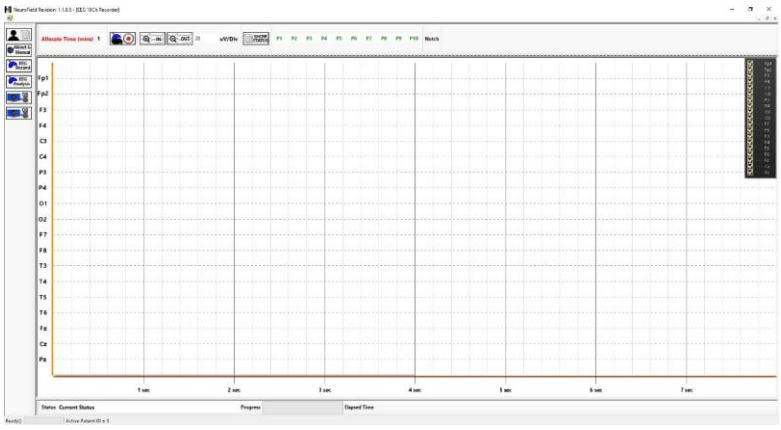
With the hardware set up and the patient selected the NeuroField EEG Analysis software is ready to begin acquiring 19 channels of pristine EEG data.

NOTE: Prior to beginning the patient will need to be capped and prepped for the EEG acquisition session – this process is outlined in Appendix VI.

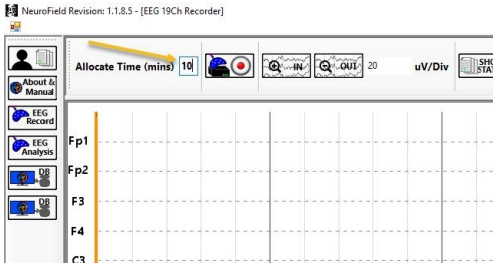
NOTE: Once the patient is capped the cap/electrodes will have to be connected to the Q21 prior to the onset of recording the EEG – as shown below.

Recording the EEG

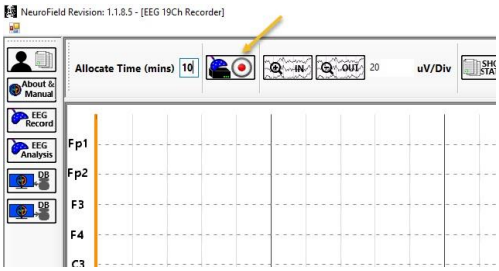
Upon selecting a patient and choosing to make a new recording the user will be given access to the recording environment. As shown below.



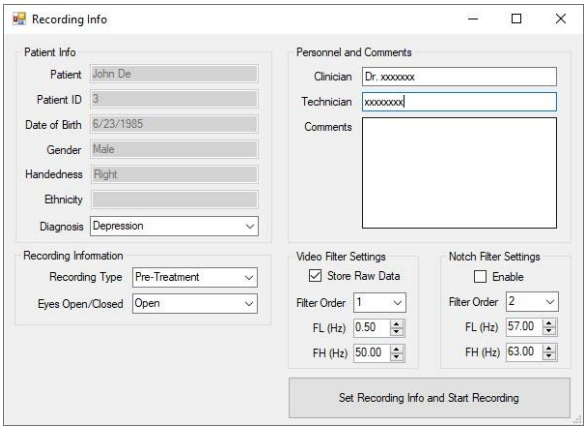
The user may now specify the length of the recording, **NOTE: this value is set to one minute by default.**



Once the desired time for the recording is allocated click on the red recording button.



This will open the Recording Info dialogue window. From this GUI the user may set information and parameters of the recording.

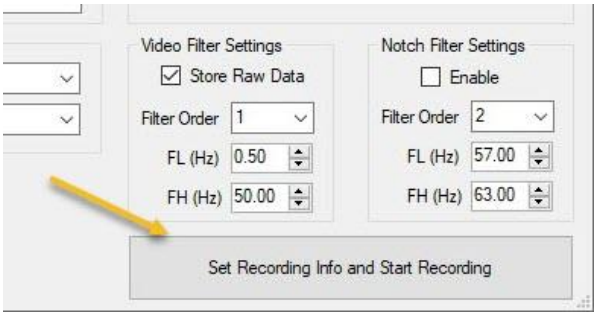


The patient information will be ported in from the patient database, the rest of the information is at the user's discretion as to how to customize the recording/report.

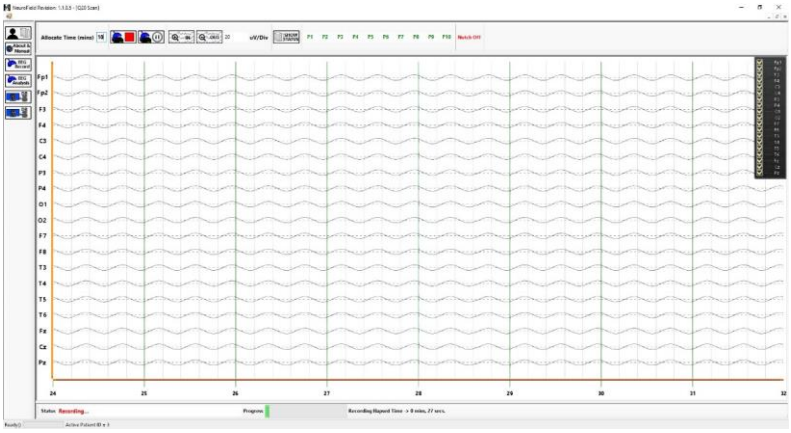
NOTE: the values set here will be transferred to the head map report generated at the conclusion of the analysis of the data.

NOTE: the notch filter is ticked by default.

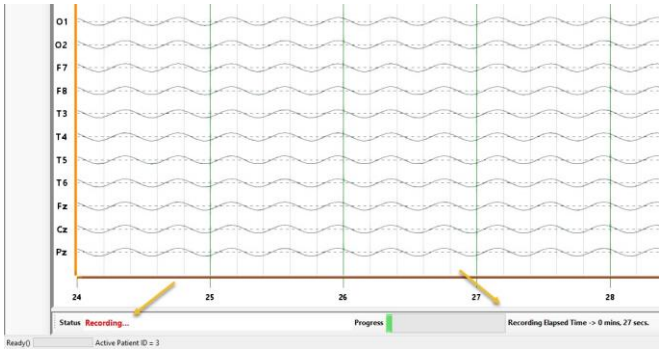
Once the user is satisfied with the information entered proceed to click the 'Set Recording Info and Start Recording' button. This will begin the recording of the patient's EEG.



Once the recording is initiated the EEG window will open.

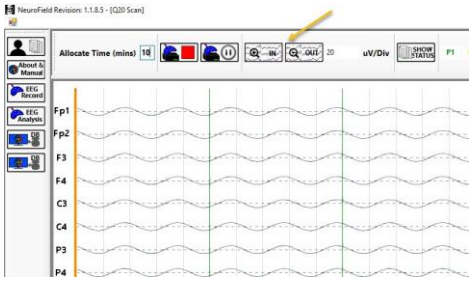


At the bottom of the recording window the user will be alerted to the status of the recording as well as the time remaining and time elapsed. The last two will be represented by a green status bas and a numeric counter, respectively.

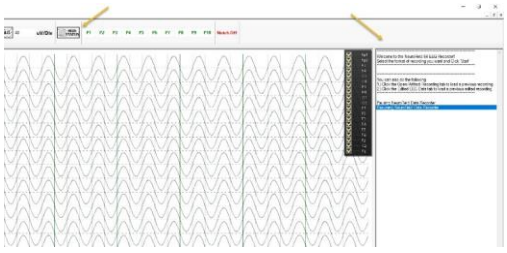


During recording the user may customize the view of the GUI in real time in each of the following four ways.

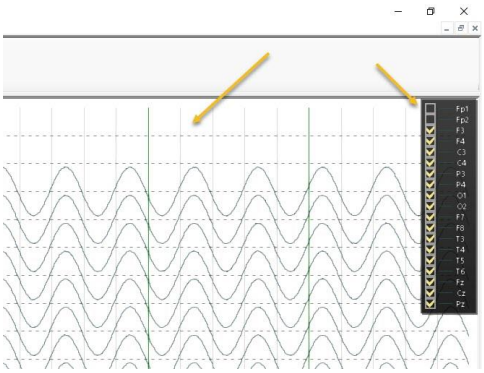
1. The ability to zoom in and out of the EEG signal in real time.



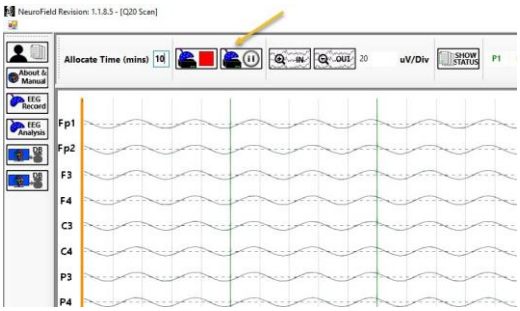
2. To toggle the information window on/off.



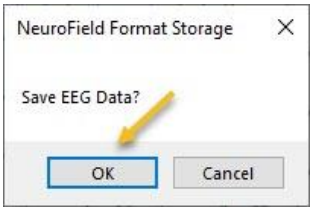
3. To turn on/off each of the 19 channels.



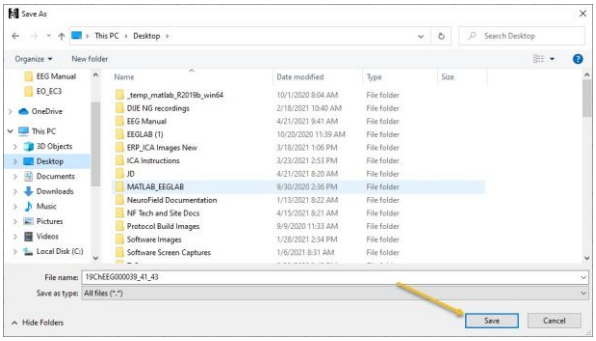
4. To pause and restart the recording.



At the conclusion of the allotted time of the recording the user will be prompted to save the recording.



The user will then be provided with the opportunity to select where the recording is saved.



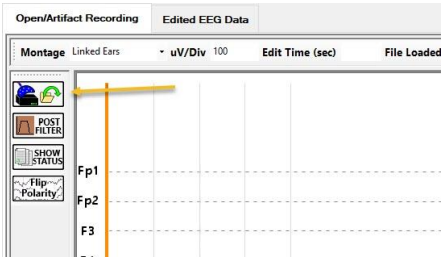
The EEG is now saved and ready for analysis.

Section 4

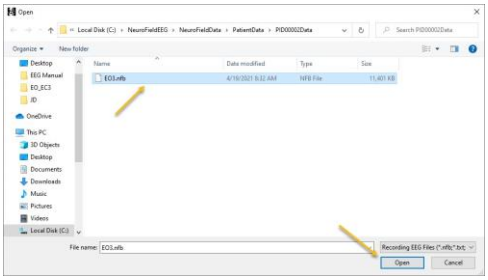
EEG Analysis and Reporting

I. Open/Artifact Recording Tab

Arriving at the Open/Artifact Recording Tab the user clicks on the Open Folder icon to begin analysis of an EEG as shown below.

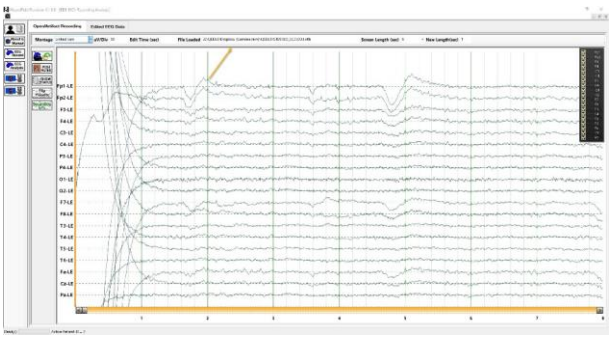


To load the .nfb file select the desired EEG recording and click Open.



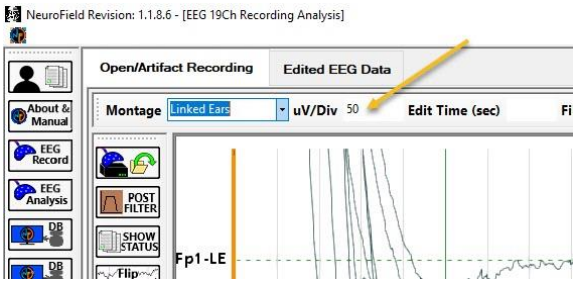
This will load the EEG into the program and the user can begin to analyze the data.

NOTE: the File Loaded window will inform the user as to which file has been loaded.



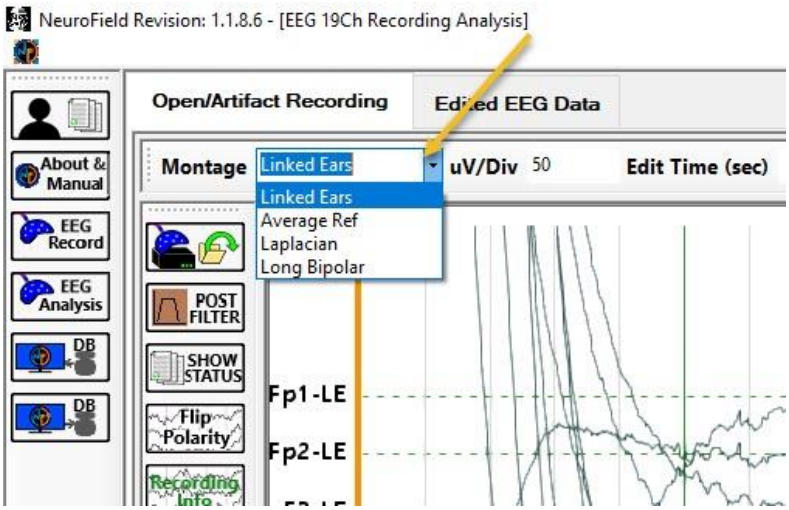
Set Zoom

The Zoom scale can be set to whatever value the user chooses, as shown below.
NOTE: the recommended default to begin is 50 uV.



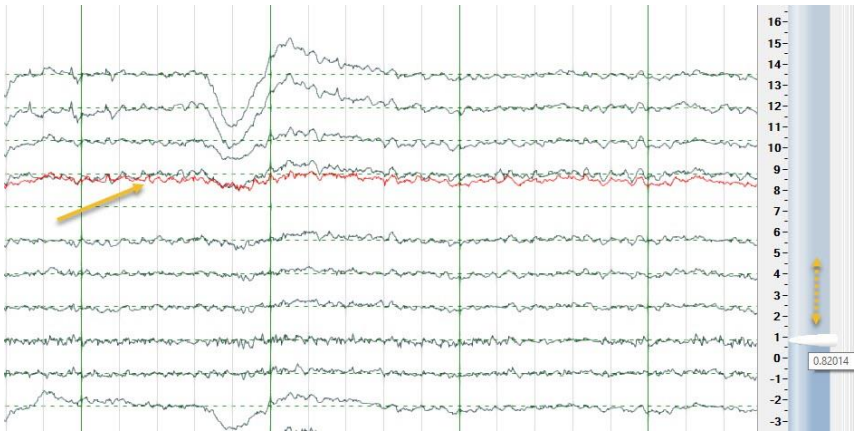
Select Montage

The user has the option to view the EEG in one of four montages: Linked Ears, Average Ref, Laplacian and Long Bipolar.

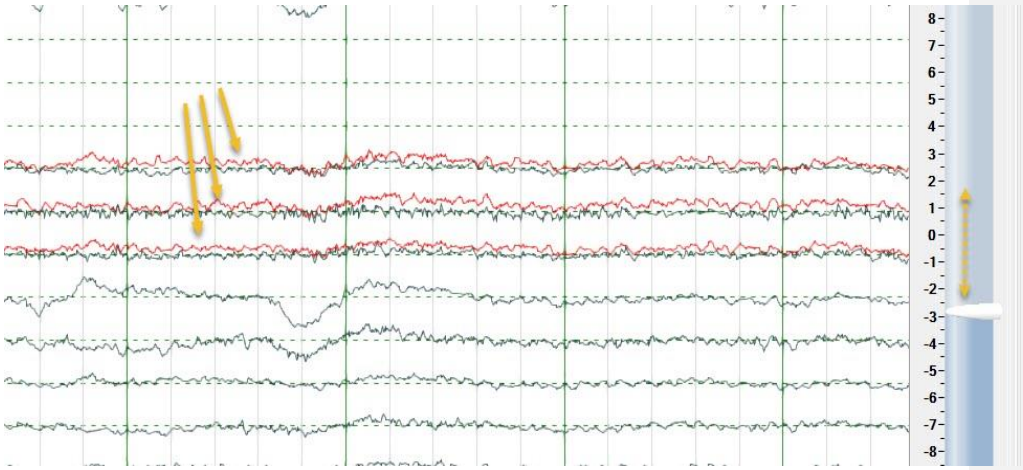


Field and Phase Tracing

The user has the option to select a channel (line) of the EEG record and sample it against others to verify field and phase. This is accomplished by clicking on one of the lines, this will turn the line red and open the sliding scale on the right-hand side of the display. The control on the scale can now be used to move the channel/line up or down.

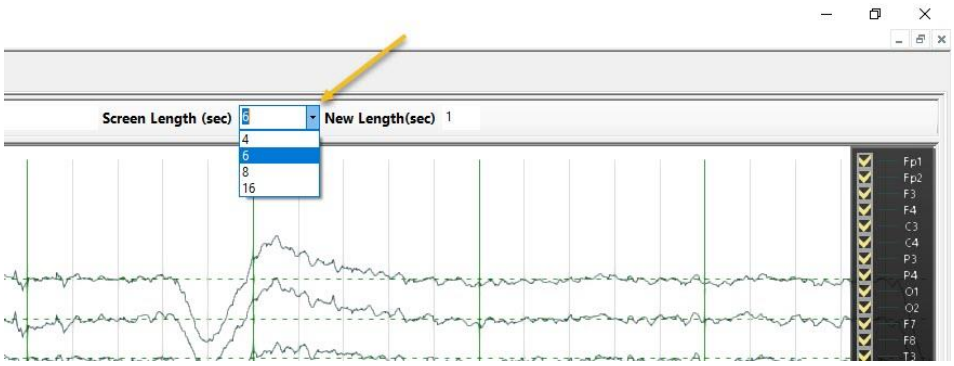


This can also be done using multiple channels/lines at the same time.
NOTE: the channels do not have to be adjacent to each other for this to work.



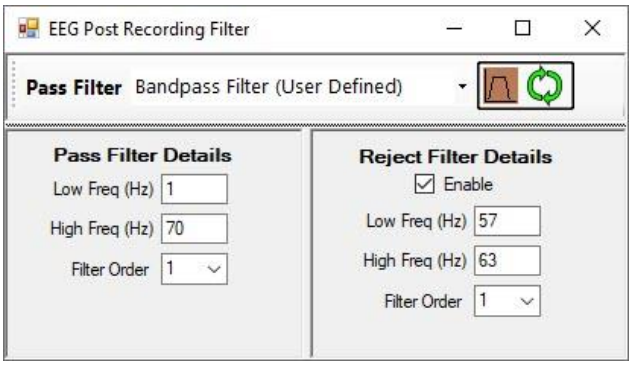
Screen Length

The user has the option to raise/lower the number of epochs displayed on the screen.
NOTE: the default value is 6.



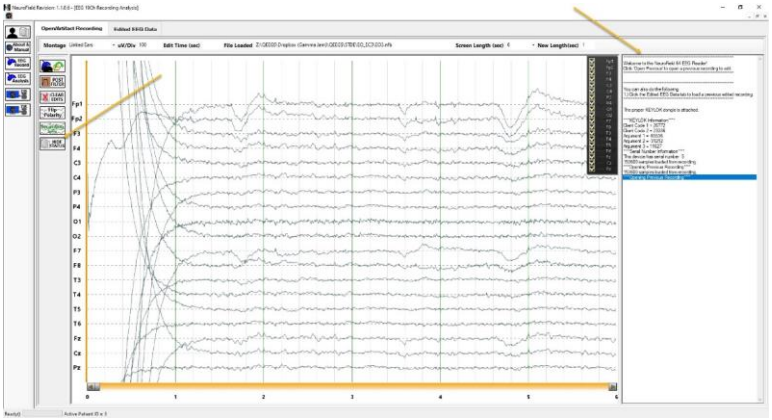
Post Filters

The user has the option to filter defined frequency bands or to create their own custom filter.



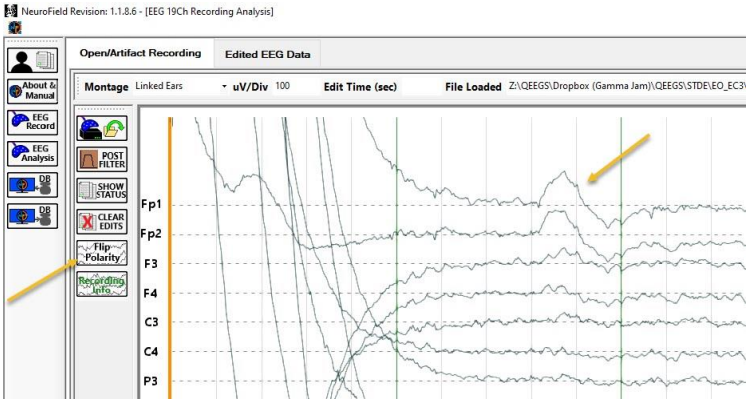
Show/Hide Status

The user can toggle the status information window on/off.



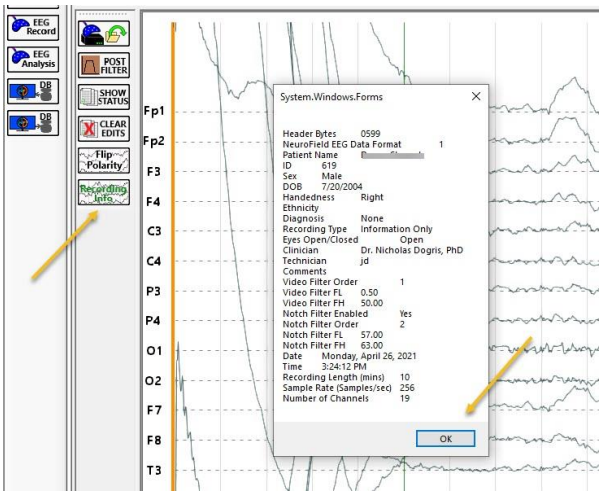
Flip Polarity

The user can flip the polarity of the EEG as shown below, note the eyeblink moving upward.



Recording Info

The user has the option to toggle the detailed recording information of the EEG on/off.

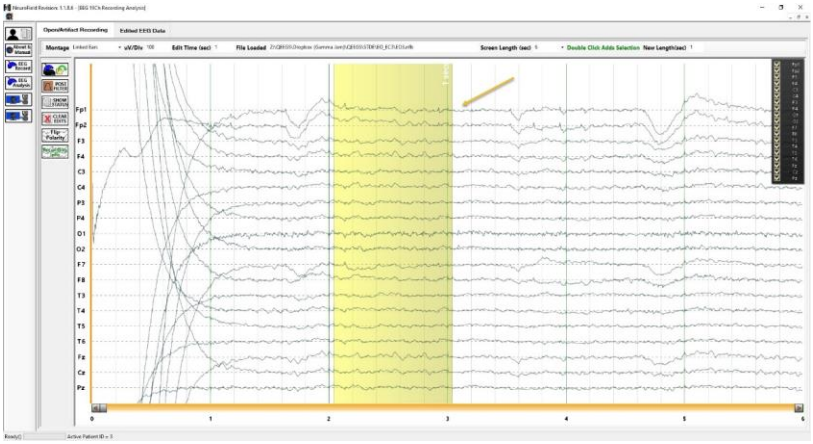


Toggle Channels On/Off

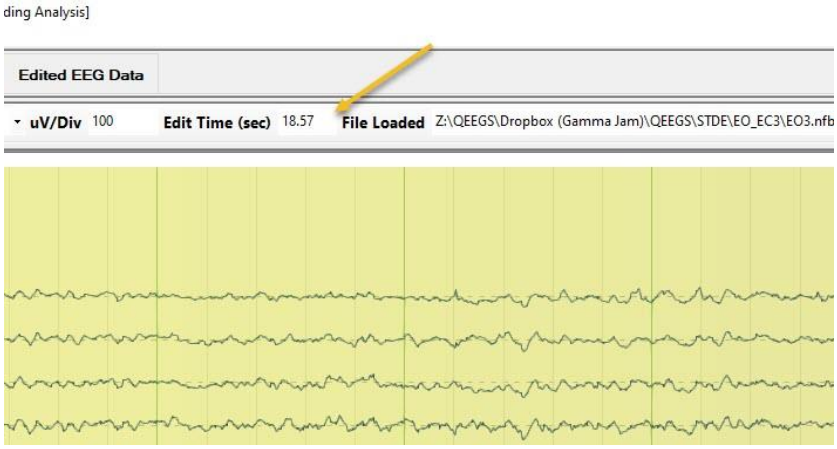
The user has the option to toggle channels on/off.

Selecting Data

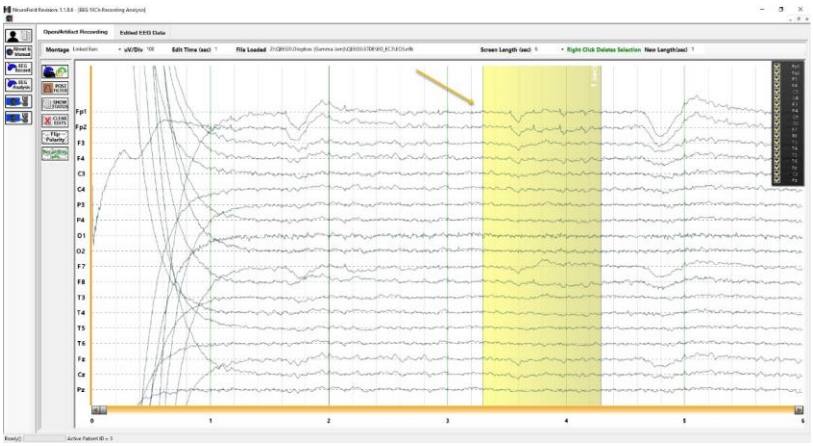
To begin selecting data left double click on the EEG record where you would like to begin selecting data. To unselect a selected section of data right click on it.



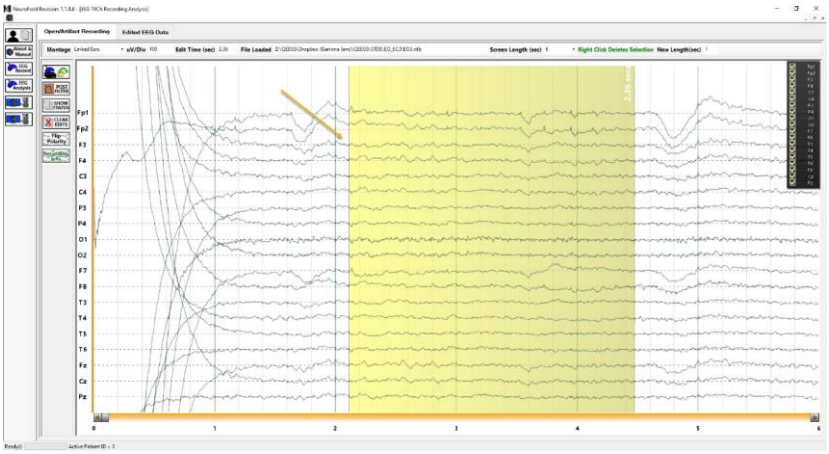
Note the Edit Time (sec) display at the top of the window. This will keep track of how much data you have selected.



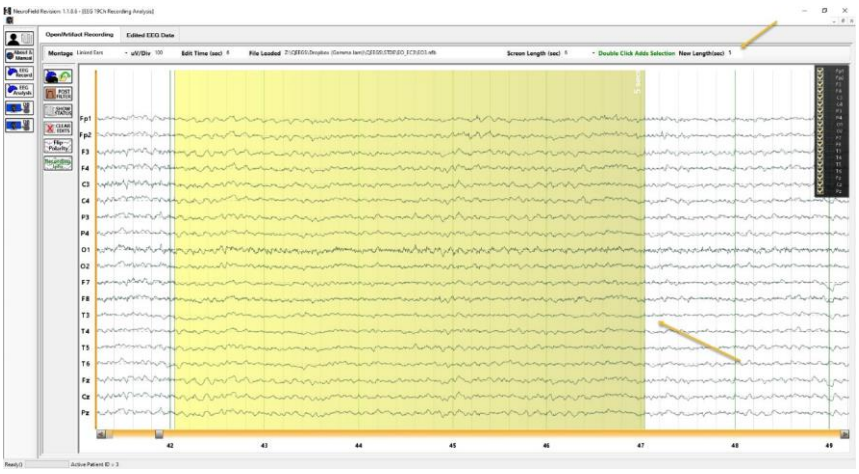
To move the originally selected section of data hover over the selected data until you see the cursor turn into the double horizontal arrow. Hold down the left click. The user can now move the section of selected data left or right.



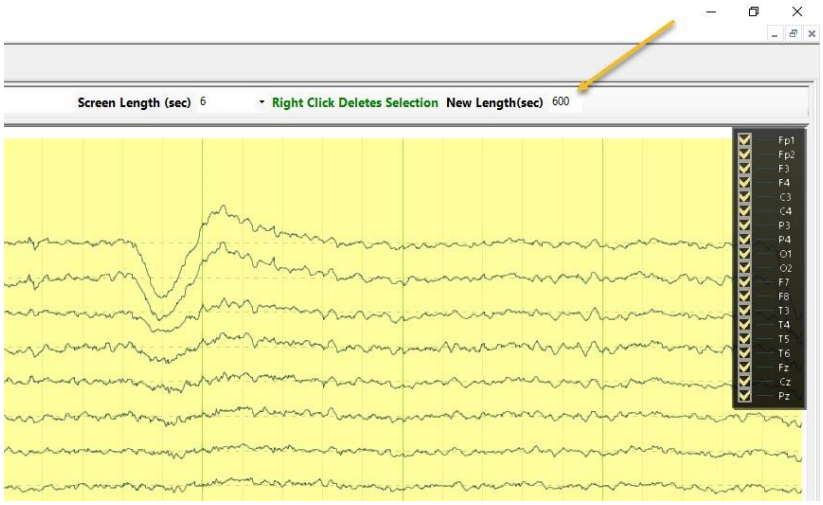
To extend or stretch a section of selected data hover over the edge you would like to extend (left or right) until the cursor turns into horizontal arrows with the vertical edge. Hold down the left click. The user can now extend the edge of the selected data.



To extend the length of segment that is selected per double click adjust the New Length (sec). The default value is 1 sec. The example below shows the value set to select a 5 sec section of data.



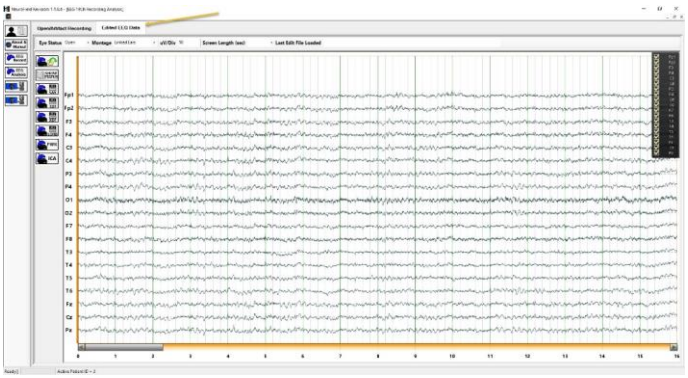
For a standard 10-minute recording the user can enter 600 for the New Length (sec) and left double click the start of the EEG to select the entire recording.



The user is now ready to view the selected data in the Edited EEG Data Tab.

II. Edited EEG Data Tab

All the selected data from the previous section is now displayed and the user may now analyze the selected data.

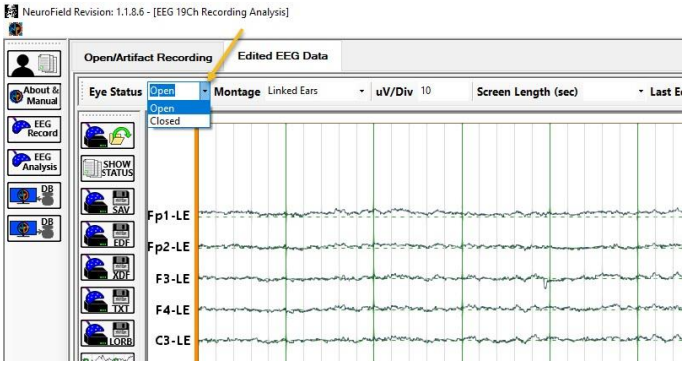


The user can also populate this window by opening a previously saved file.

Eye Status

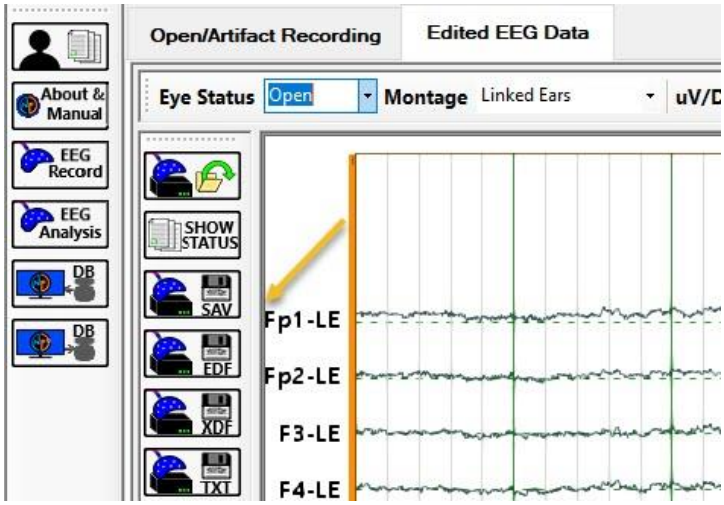
The user may set the Eye Status value to correlate with the EEG data.

NOTE: the Montage, Zoom and Screen Length (sec) values can be set as in the previous section.



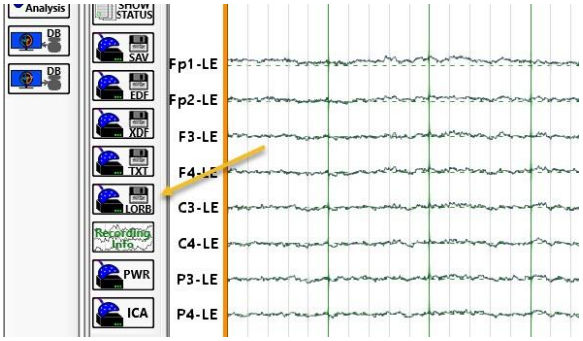
Save Data

The user may save the edited data set as: NFB, XDF, EDF, or TXT.

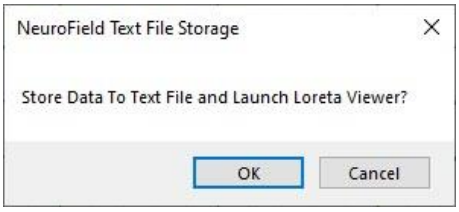


LORETA

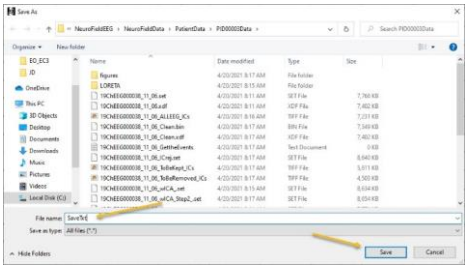
The user may view the edited data in LORETA by first clicking on the LORB button in the left margin.



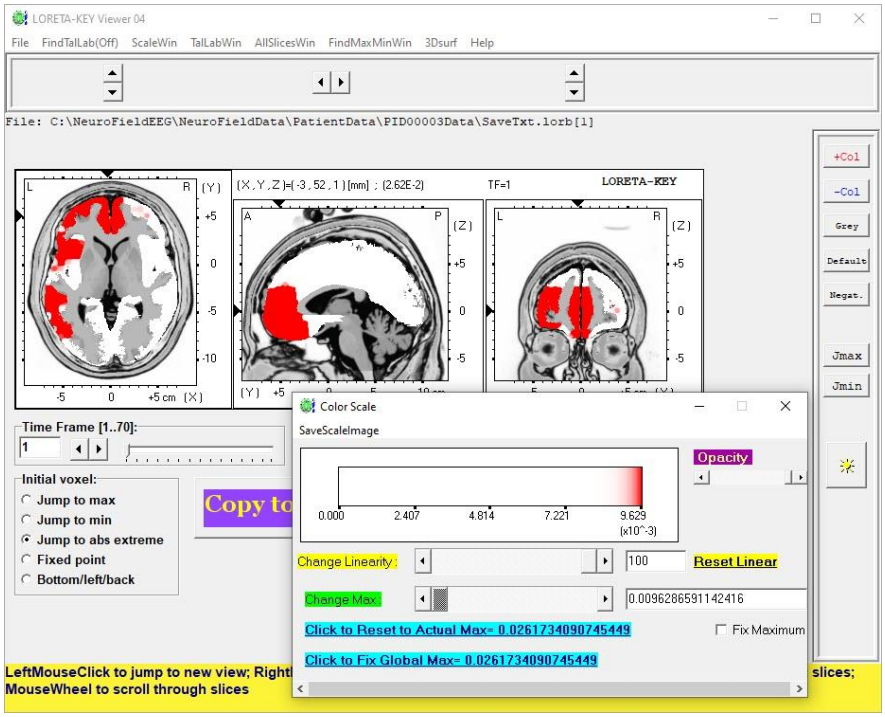
The user will be prompted to save the file as a TXT file.



By default, the user selected folder will open and allow the file to be saved.

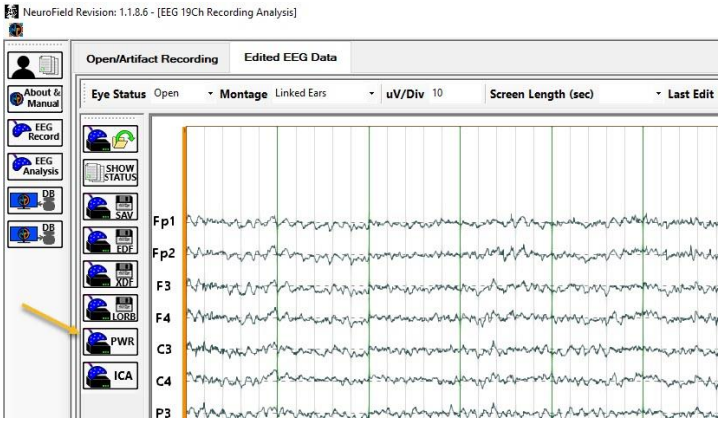


Once this is done the program will open the LORETA viewer and the user may begin LORETA analysis.

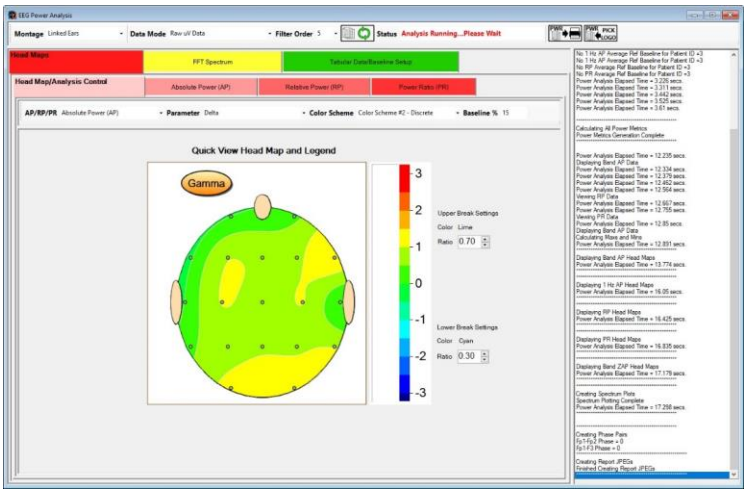


III. Power Analysis

To begin performing the Power Analysis that includes the Head Maps, FFT Spectrum and Tabular Data click on the PWR button in the left margin as shown below.

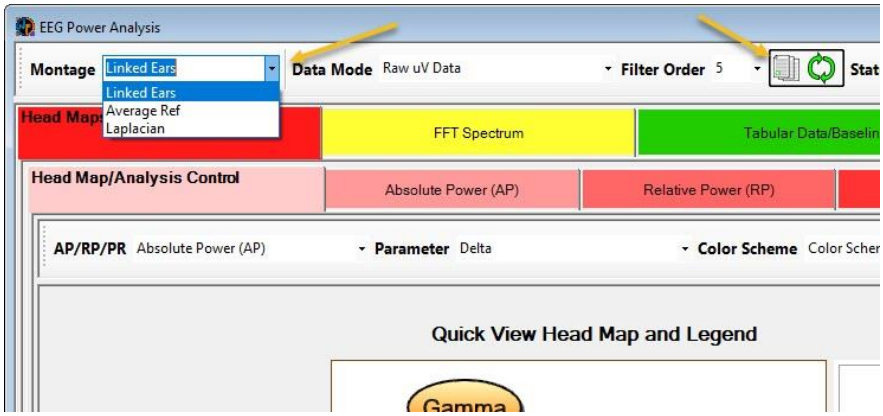


The program will perform its calculations and when finished the user will be at this window.



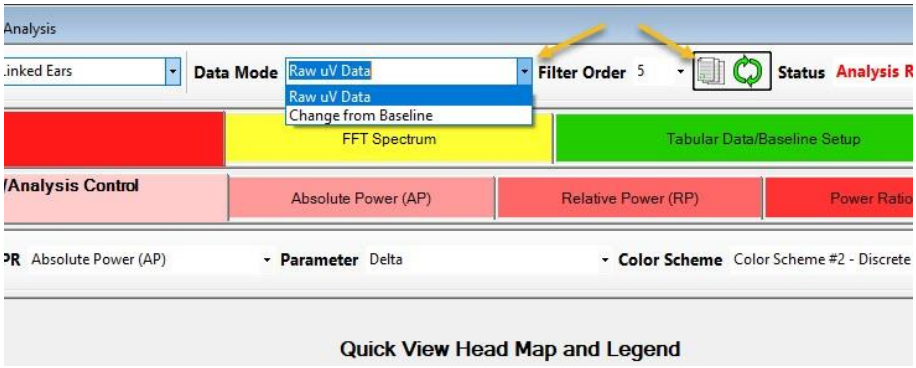
Montage

The user may choose to apply an alternative montage and recalculate the power analysis.



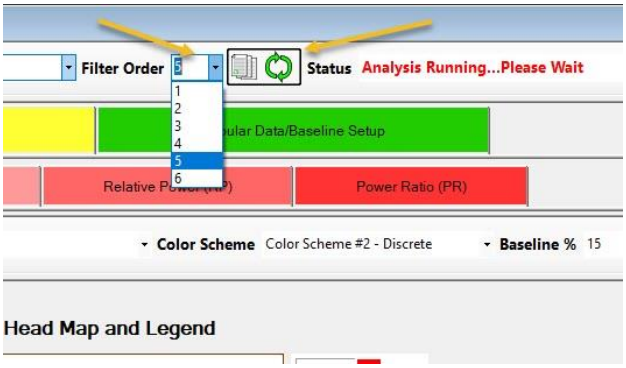
Data Mode

If the user has set up a baseline record (more on this in the Tabular Data/Baseline Setup section) they may select Change from Baseline and recalculate the power analysis.



Filter Order

The user may set the filter order to values 1-6 and recalculate the power analysis.

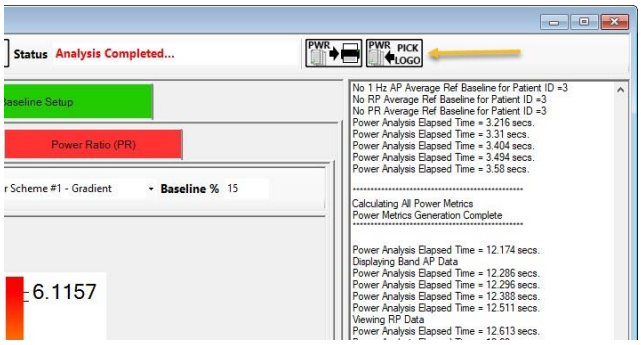


IV. Report Generator

The user has the option to create a customized report from the power analysis data.
The user may insert their own custom logo onto the cover page of the report, customize content and verbiage of the report and finally to print/save the created report.

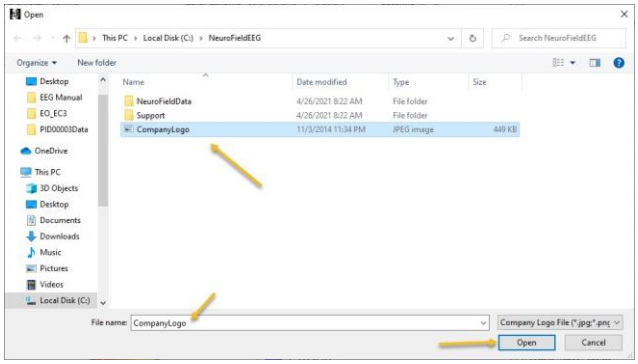
Select Custom Logo

The user may select a custom logo to place on the cover page of the report, this can be accomplished by first clicking the PWR PICK LOGO button as shown below.



The user is presented with a window alerting the user that the aspect ratio of the logo should be approx. 0.84 and that the default logo is 1197 x 1432 pixels. Click OK to select the logo.

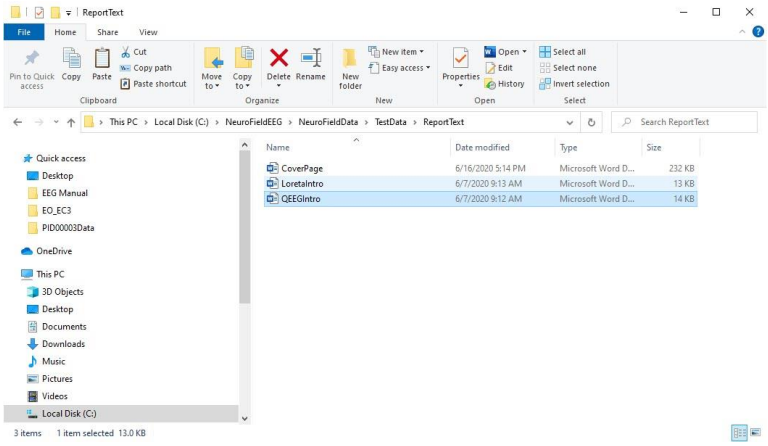
The selected logo will be placed on the cover page of the report generated by the NeuroField EEG software. Upon selecting the desired logo click OK.



Customize Report Content

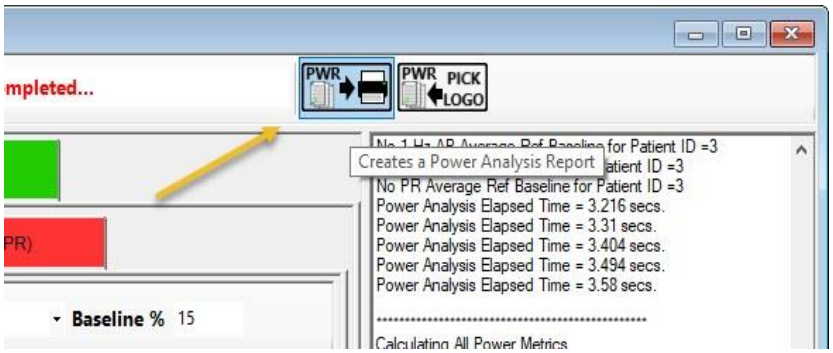
The user has the option to customize various portions of the report directly by accessing the word documents that are used to build the report. These documents can be accessed by navigating to the following folder on the user's PC:

C:\NeuroFieldEEG\NeuroFieldData\TestData\ReportText

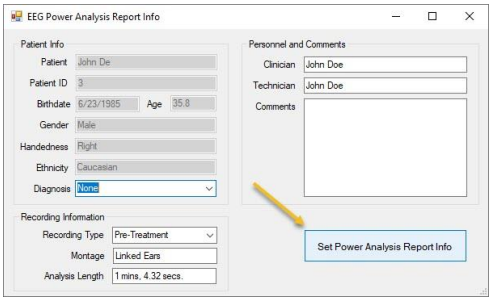


Run the Report

To create the report, begin by clicking on the PWR button in the upper right-hand corner.

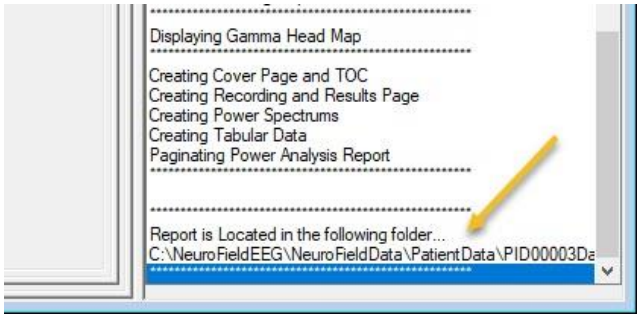


The user will be asked to confirm the recording information from the EEG, this is also an opportunity to edit some of these fields prior to creating the report. Once the information is to the user's satisfaction click on Set Power Analysis Report Info.



At the conclusion of the report being generated NeuroField EEG will notify the user.

The user is notified as to where exactly the report has been saved to in the status window located in the right margin pane.

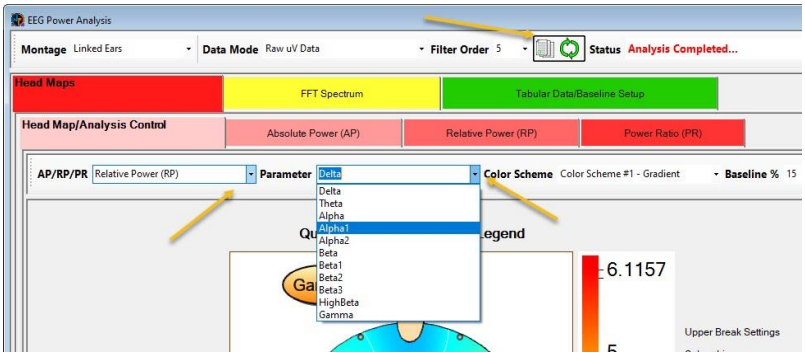


V. Head Maps

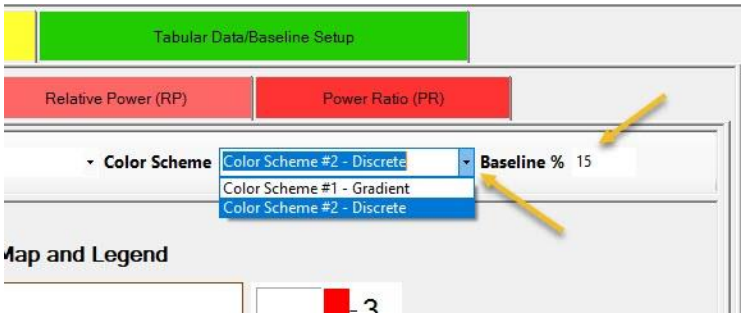
The Head Maps tab provides the user with multiple perspectives from which to view head map representations of the data. First the program will allow the user to identify and call up an individual head map with the Quick View Head Map and Legend GUI. The user may also view the full range of values in Absolute Power (AP), Relative Power (RP), and Power Ratio (PR). Each of these options are available as tabs under the Head Map tab.

Head Map/Analysis Control

The Head Map/Analysis Control tab gives the user the ability to call up an individual head map by selecting the view and band (s) as desired. When the user is satisfied with their selections, they may now click the run control to reprocess the map per the selected criteria. This is demonstrated below.

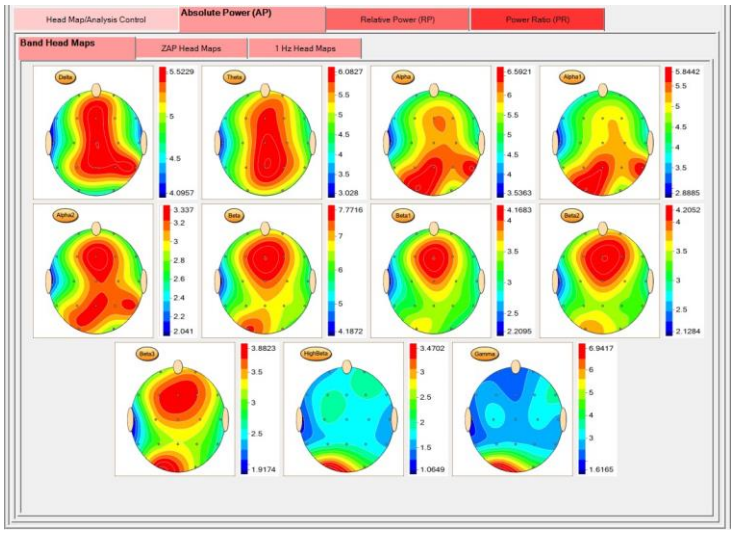


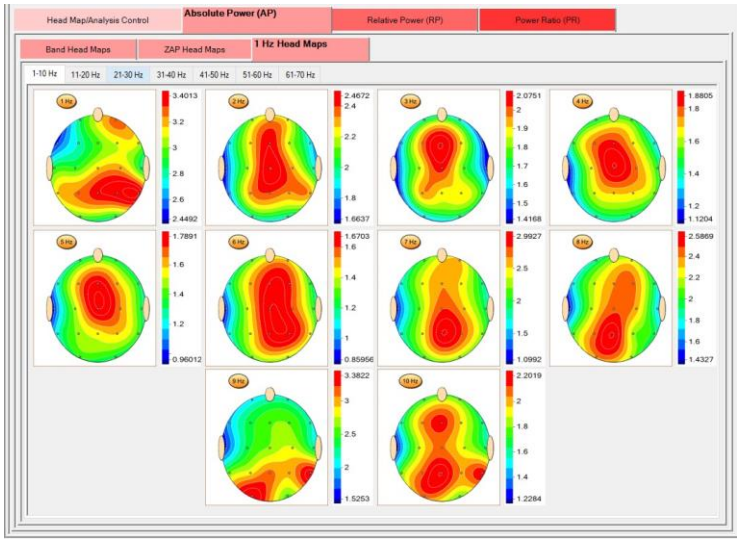
From this interface the user also has the option to select the color scheme and the Baseline Percentage.



Absolute Power (AP)

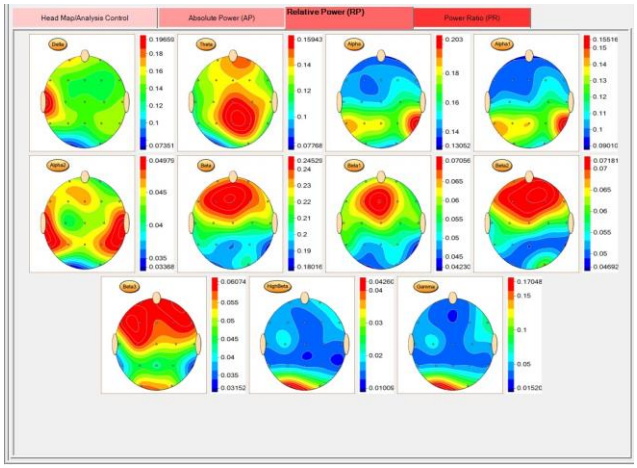
The Absolute Power (AP) tab gives the user the option to view absolute power head maps based on frequency band, Z-score and by Hz from 1 through 70.





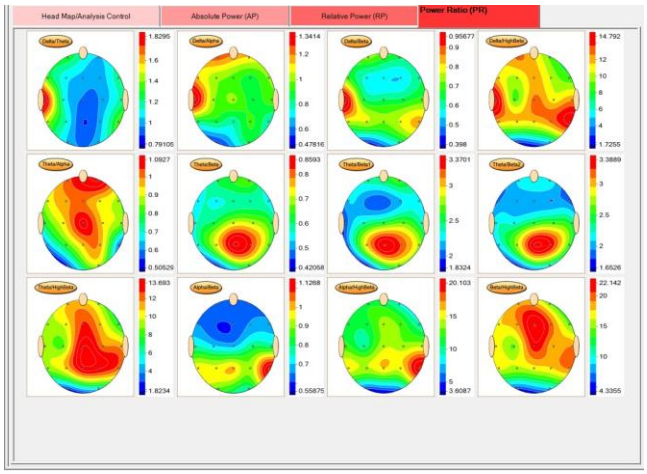
Relative Power (RP)

The Relative Power (RP) tab provides the relative power of each band.



Power Ratio (PR)

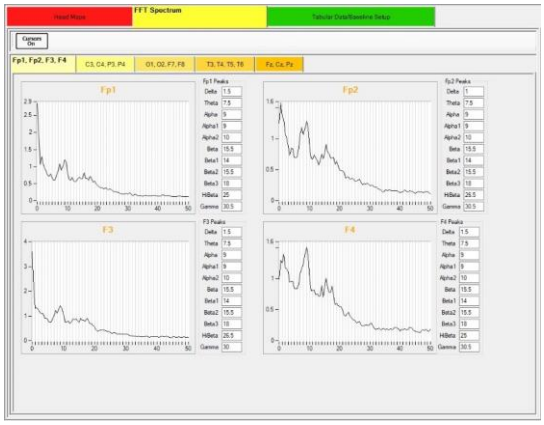
The Power Ratio (PR) tab provides power ratios between the selected bands.



VI. FFT Spectrum

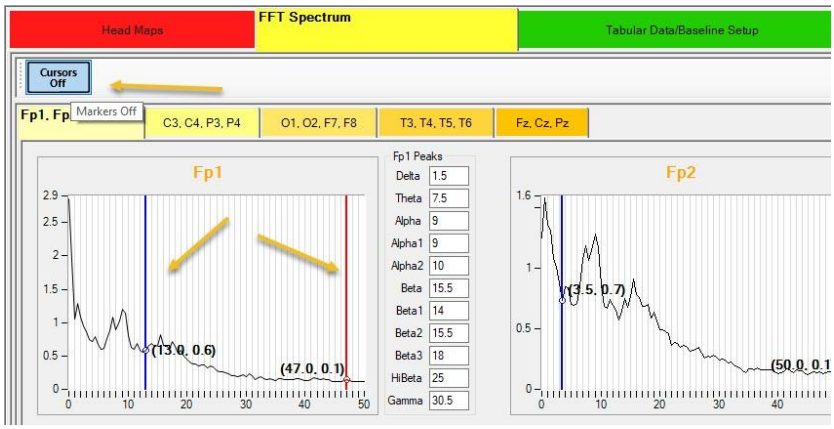
Channels and Values

The FFT Spectrum tab provides peak frequency data for each band at each site.



Cursors On / Cursors Off

By clicking the Cursors On / Cursors Off button the user can add sliding cursors to each image.

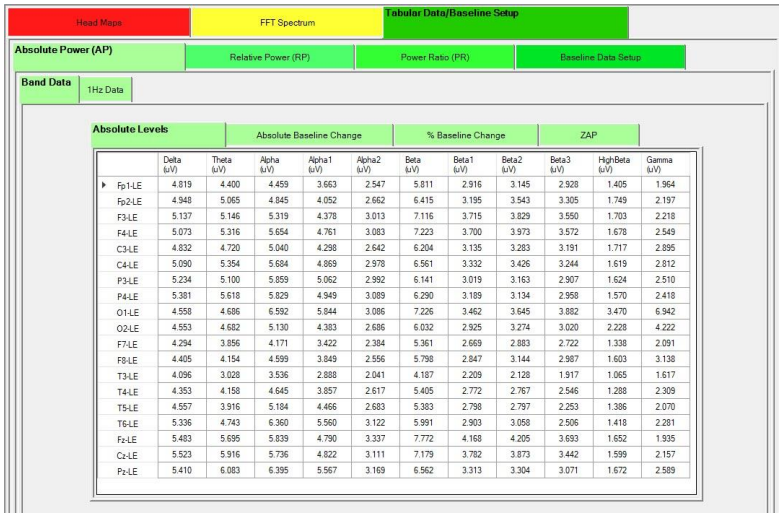


VII. Tabular Data/Baseline Setup

The Tabular Data/Baseline Setup tab presents the data in numeric form in terms of Absolute Levels, Absolute Baseline Change and % Baseline Change for Absolute Power (AP), Relative Power (RP), and Power Ratio (PR).

Absolute Power (AP)

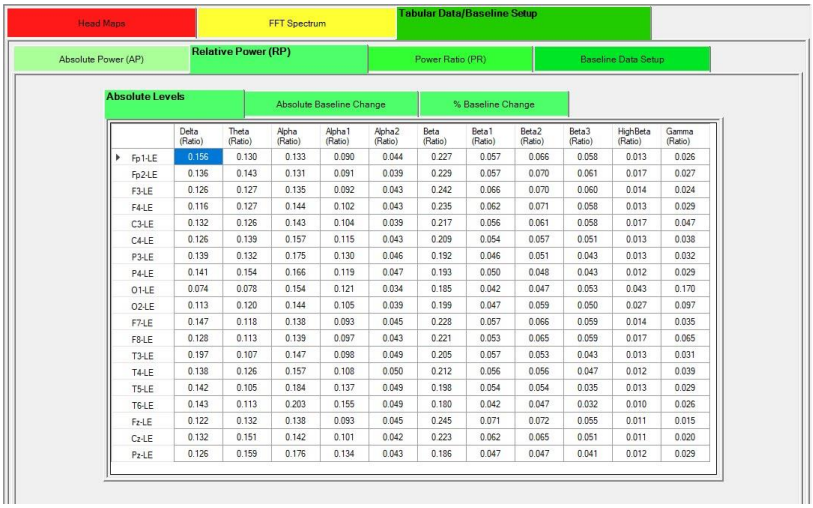
The Absolute Power (AP) tab provides the above numeric values as well as those for Z-score absolute value. The Absolute Power (AP) tab allows the user to view this data in terms of defined frequency bands or in 1 Hz bins (scrollable 1 – 70).



	Delta (uV)	Theta (uV)	Alpha (uV)	Alpha1 (uV)	Alpha2 (uV)	Beta (uV)	Beta1 (uV)	Beta2 (uV)	Beta3 (uV)	HighBeta (uV)	Gamma (uV)
Fp1-LE	4.819	4.400	4.459	3.663	2.547	5.811	2.916	3.145	2.928	1.405	1.964
Fp2-LE	4.948	5.065	4.845	4.052	2.662	6.415	3.195	3.543	3.305	1.749	2.197
F3-LE	5.137	5.146	5.319	4.378	3.013	7.116	3.715	3.829	3.550	1.703	2.218
F4-LE	5.073	5.316	5.654	4.761	3.083	7.223	3.700	3.973	3.572	1.678	2.549
C3-LE	4.832	4.720	5.040	4.298	2.642	6.204	3.135	3.283	3.191	1.717	2.895
C4-LE	5.090	5.354	5.684	4.869	2.978	6.561	3.332	3.426	3.244	1.619	2.812
P3-LE	5.234	5.100	5.859	5.062	2.992	6.141	3.019	3.163	2.907	1.624	2.510
P4-LE	5.381	5.618	5.829	4.949	3.089	6.290	3.189	3.134	2.958	1.570	2.418
O1-LE	4.558	4.686	6.592	5.844	3.086	7.226	3.462	3.645	3.882	3.470	6.942
O2-LE	4.553	4.682	5.130	4.383	2.686	6.032	2.925	3.274	3.020	2.228	4.222
F7-LE	4.294	3.856	4.171	3.422	2.384	5.361	2.669	2.883	2.722	1.338	2.091
F8-LE	4.405	4.154	4.599	3.849	2.556	5.798	2.847	3.144	2.987	1.603	3.138
T3-LE	4.096	3.028	3.536	2.888	2.041	4.187	2.209	2.128	1.917	1.065	1.617
T4-LE	4.353	4.158	4.645	3.857	2.617	5.405	2.772	2.767	2.546	1.288	2.309
T5-LE	4.557	3.916	5.184	4.466	2.683	5.383	2.798	2.797	2.253	1.386	2.070
T6-LE	5.336	4.743	6.360	5.560	3.122	5.991	2.903	3.058	2.506	1.418	2.281
Fz-LE	5.483	5.695	5.839	4.790	3.337	7.772	4.168	4.205	3.693	1.652	1.935
Cz-LE	5.523	5.916	5.736	4.822	3.111	7.179	3.782	3.873	3.442	1.599	2.157
Pz-LE	5.410	6.083	6.395	5.567	3.169	6.562	3.313	3.304	3.071	1.672	2.589

Relative Power (RP)

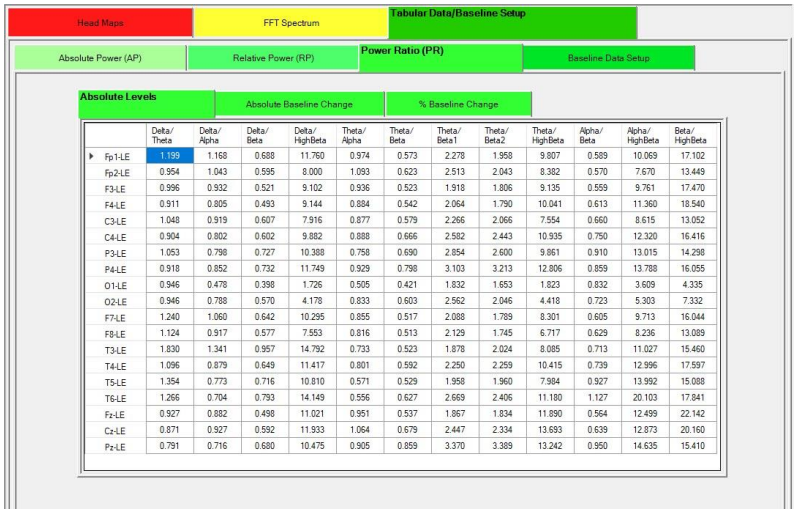
The Relative Power (AP) tab provides the relative numeric values.



	Delta (Ratio)	Theta (Ratio)	Alpha (Ratio)	Alpha1 (Ratio)	Alpha2 (Ratio)	Beta (Ratio)	Beta1 (Ratio)	Beta2 (Ratio)	Beta3 (Ratio)	HighBeta (Ratio)	Gamma (Ratio)
Fp1-LE	0.156	0.130	0.133	0.090	0.044	0.227	0.057	0.066	0.058	0.013	0.026
Fp2-LE	0.136	0.143	0.131	0.091	0.039	0.229	0.057	0.070	0.061	0.017	0.027
F3-LE	0.126	0.127	0.135	0.092	0.043	0.242	0.066	0.070	0.060	0.014	0.024
F4-LE	0.116	0.127	0.144	0.102	0.043	0.235	0.062	0.071	0.058	0.013	0.029
C3-LE	0.132	0.126	0.143	0.104	0.039	0.217	0.056	0.061	0.058	0.017	0.047
C4-LE	0.126	0.139	0.157	0.115	0.043	0.209	0.054	0.057	0.051	0.013	0.038
P3-LE	0.139	0.132	0.175	0.130	0.046	0.192	0.046	0.051	0.043	0.013	0.032
P4-LE	0.141	0.154	0.166	0.119	0.047	0.193	0.050	0.048	0.043	0.012	0.029
O1-LE	0.074	0.078	0.154	0.121	0.034	0.185	0.042	0.047	0.053	0.043	0.170
O2-LE	0.113	0.120	0.144	0.105	0.039	0.199	0.047	0.059	0.050	0.027	0.097
F7-LE	0.147	0.118	0.138	0.093	0.045	0.228	0.057	0.066	0.059	0.014	0.035
F8-LE	0.128	0.113	0.139	0.097	0.043	0.221	0.053	0.065	0.059	0.017	0.065
T3-LE	0.197	0.107	0.147	0.098	0.049	0.205	0.057	0.053	0.043	0.013	0.031
T4-LE	0.138	0.126	0.157	0.108	0.050	0.212	0.056	0.056	0.047	0.012	0.039
T5-LE	0.142	0.105	0.184	0.137	0.049	0.198	0.054	0.054	0.035	0.013	0.029
T6-LE	0.143	0.113	0.203	0.155	0.049	0.180	0.042	0.047	0.032	0.010	0.026
Fz-LE	0.122	0.132	0.138	0.093	0.045	0.245	0.071	0.072	0.055	0.011	0.015
Cz-LE	0.132	0.151	0.142	0.101	0.042	0.223	0.062	0.065	0.051	0.011	0.020
Pz-LE	0.126	0.159	0.176	0.134	0.043	0.186	0.047	0.047	0.041	0.012	0.029

Power Ratio (PR)

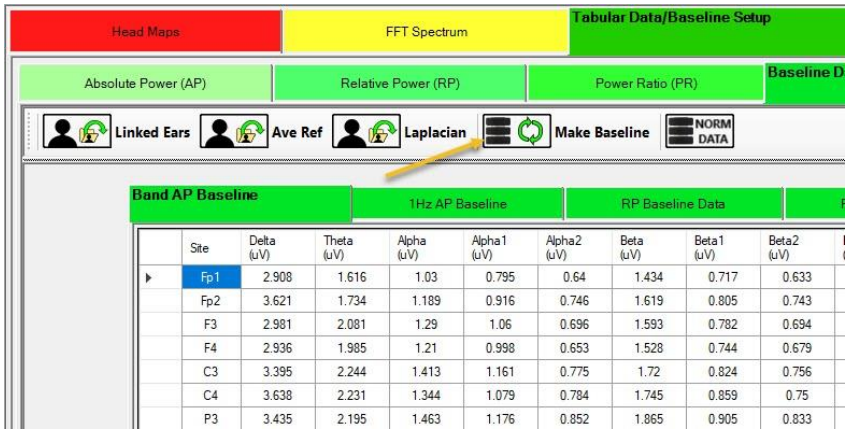
The Power Ratio (PR) tab provides the numeric values relative to each other frequency band.



	Delta/ Theta	Delta/ Alpha	Delta/ Beta	Delta/ HighBeta	Theta/ Alpha	Theta/ Beta	Theta/ Beta1	Theta/ Beta2	Theta/ HighBeta	Alpha/ Beta	Alpha/ HighBeta	Beta/ HighBeta
Fp1-LE	1.199	1.168	0.688	11.760	0.974	0.573	2.278	1.958	9.807	0.589	10.069	17.102
Fp2-LE	0.954	1.043	0.595	8.000	1.093	0.623	2.513	2.043	8.382	0.570	7.670	13.449
F3-LE	0.996	0.932	0.521	9.102	0.936	0.523	1.918	1.806	9.135	0.559	9.761	17.470
F4-LE	0.911	0.805	0.493	9.144	0.884	0.542	2.064	1.790	10.041	0.613	11.360	18.540
C3-LE	1.048	0.919	0.607	7.916	0.877	0.579	2.266	2.066	7.554	0.660	8.615	13.052
C4-LE	0.904	0.802	0.602	9.882	0.888	0.666	2.582	2.443	10.935	0.750	12.320	16.416
P3-LE	1.053	0.798	0.727	10.388	0.758	0.690	2.854	2.600	9.861	0.910	13.015	14.298
P4-LE	0.918	0.852	0.732	11.749	0.929	0.798	3.103	3.213	12.806	0.859	13.788	16.055
O1-LE	0.946	0.478	0.398	1.726	0.505	0.421	1.832	1.653	1.823	0.832	3.609	4.335
O2-LE	0.946	0.788	0.570	4.178	0.833	0.603	2.562	2.046	4.418	0.723	5.303	7.332
F7-LE	1.240	1.060	0.642	10.295	0.855	0.517	2.088	1.789	8.301	0.605	9.713	16.044
F8-LE	1.124	0.917	0.577	7.553	0.816	0.513	2.129	1.745	6.717	0.629	8.236	13.089
T3-LE	1.830	1.341	0.957	14.792	0.733	0.523	1.878	2.024	8.085	0.713	11.027	15.460
T4-LE	1.096	0.879	0.649	11.417	0.801	0.592	2.250	2.259	10.415	0.739	12.996	17.597
T5-LE	1.354	0.773	0.716	10.810	0.571	0.529	1.958	1.960	7.984	0.927	13.992	15.088
T6-LE	1.266	0.704	0.793	14.149	0.556	0.627	2.669	2.406	11.180	1.127	20.103	17.841
Fz-LE	0.927	0.882	0.498	11.021	0.951	0.537	1.867	1.834	11.890	0.564	12.499	22.142
Cz-LE	0.871	0.927	0.592	11.933	1.064	0.679	2.447	2.334	13.693	0.639	12.873	20.160
Pz-LE	0.791	0.716	0.680	10.475	0.905	0.859	3.370	3.389	13.242	0.950	14.635	15.410

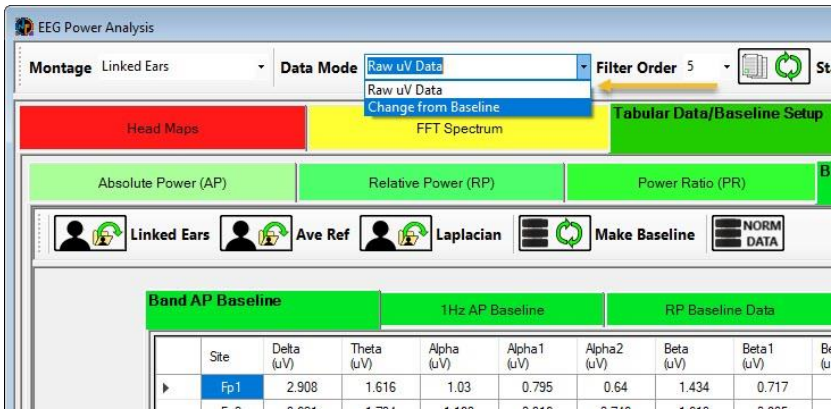
Baseline Data Setup

The Baseline Data Setup tab gives the user the ability to set a baseline based on the current values of the loaded data set and to compare future data sets to it. To set the baseline simply click the Make Baseline button as shown below.



Site	Delta (uV)	Theta (uV)	Alpha (uV)	Alpha1 (uV)	Alpha2 (uV)	Beta (uV)	Beta1 (uV)	Beta2 (uV)
Fp1	2.908	1.616	1.03	0.795	0.64	1.434	0.717	0.633
Fp2	3.621	1.734	1.189	0.916	0.746	1.619	0.805	0.743
F3	2.981	2.081	1.29	1.06	0.696	1.593	0.782	0.694
F4	2.936	1.985	1.21	0.998	0.653	1.528	0.744	0.679
C3	3.395	2.244	1.413	1.161	0.775	1.72	0.824	0.756
C4	3.638	2.231	1.344	1.079	0.784	1.745	0.859	0.75
P3	3.435	2.195	1.463	1.176	0.852	1.865	0.905	0.833

To compare future data sets to the established baseline, load the second dataset and select Change from Baseline from the drop-down menu as shown below.



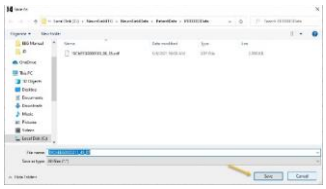
Site	Delta (uV)	Theta (uV)	Alpha (uV)	Alpha1 (uV)	Alpha2 (uV)	Beta (uV)	Beta1 (uV)
Fp1	2.908	1.616	1.03	0.795	0.64	1.434	0.717

VIII. Independent Component Analysis (ICA)

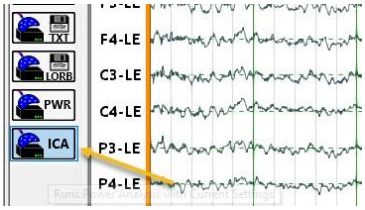
The user has the option to further analyze the EEG data through Independent Component Analysis (ICA) the process takes roughly 15-20 minutes to complete. Begin by saving the current data set as a XDF file or by opening a XDF file previously saved. NeuroField EEG utilizes the open-source software EEGLAB to conduct its analysis. EEGLAB is a robust platform that has far reaching capabilities and more information can be found at: https://sccn.ucsd.edu/eeglab/index.php for more information.

Delorme, A. and Makeig, S. (2004). EEGLAB: An open-source toolbox for analysis of single-trial EEG dynamics including independent component analysis. Journal of Neuroscience Methods, 134(1):9–21.

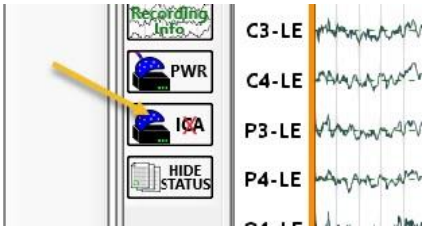
NOTE: clicking the ICA button prior to saving the dataset will prompt the user to save the data set as an XDF file or to open an existing XDF file.



Once the XDF file is either saved or loaded respectively the user may now click the ICA button. The user may monitor the progress in the upper right corner of the Status Window.

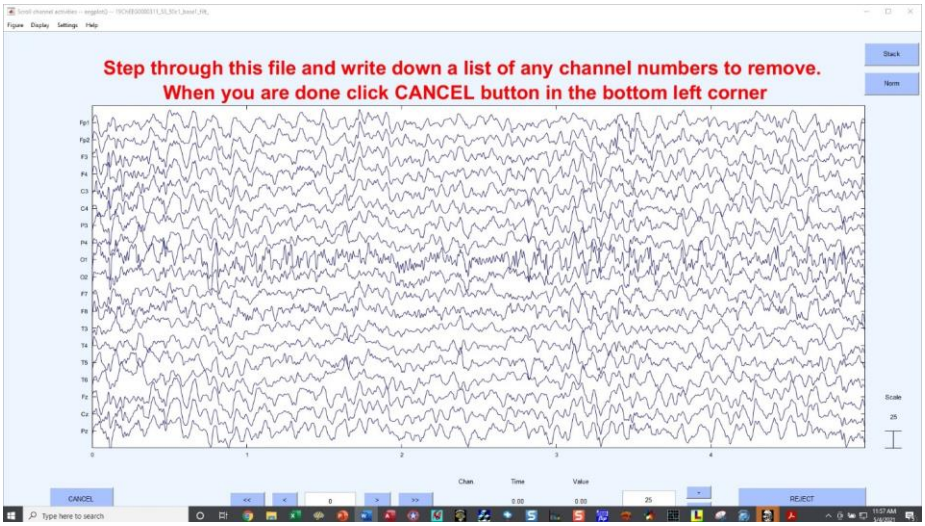


NOTE: the ICA button will now have a red X to prevent the user from starting multiple sessions.

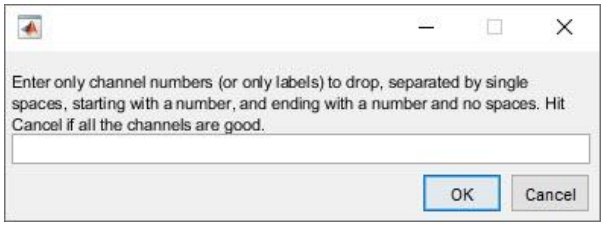


The first step is to reject bad channels in the EEG data, the screen shown below will pop up first. The user does this by scrolling through the data using the left and right arrows. Write down the names of any channels that you wish to reject and then click the Cancel button.

NOTE: if you see flat lines and no identifiable date change the zoom control number to 20 in the lower right-hand corner and press Enter.

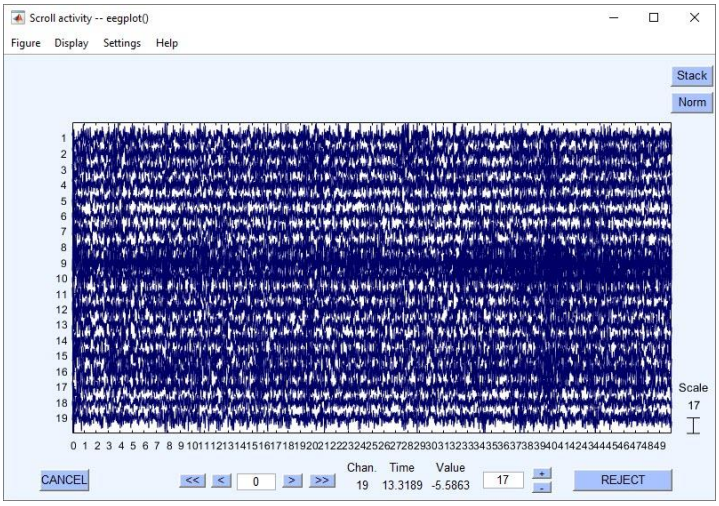


Channels that have been flagged to drop can now be entered into the next pop-up window, when this is done click OK. If there are no channels to drop, simply click OK.



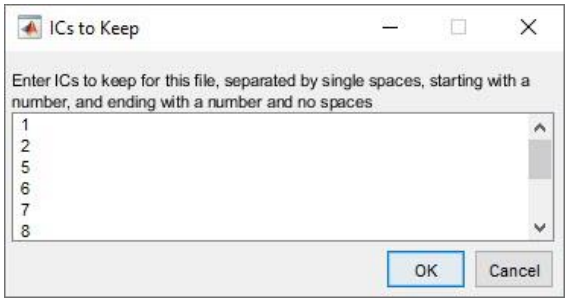
NeuroField EEG will then launch an auto edit program and select segments of the data that it thinks are artifact. Your job is to review the epochs that the program selects and then either reject them or accept them. You can accept what the program presents to you and then click on the reject button to continue or you can click on the cancel button to bypass this process and continue with the analysis.

You can also work through the entire file and make changes to what the program selects by right clicking on each segment which will save the data instead of selecting it. This process can be tedious and take a long time. In most instances simply rejecting the data is the best course of action, however, in some cases running AMICA can also remove artifacts and do a better job than this process. You can always run the analysis again as the original data will not be impacted by this process. The resulting dataset can be saved as a separate file or can overwrite the previous file, either enter the new file name on the next pop up or click OK to overwrite.



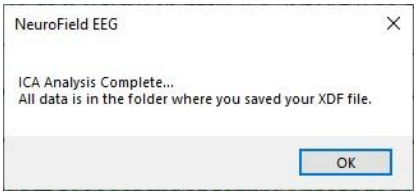
Once the data rejection process is complete NeuroField ERP will launch the adaptive mixture independent component analysis (AMICA) on the data. AMICA is a learning algorithm that can "learn" the temporal signatures of the data for the purpose of "seeing" underlying neural activity. It can be used to "clean" the data and remove eye blinks and other artifacts as well. This process will take around 15 minutes. Do not interrupt the process of close the program during this time. Once it is completed NeuroField EEG will launch ICLABEL which is a program that is designed to help you categorize the independent components identified in the AMICA process. Several images will be flashed on the screen and when the process is complete you will see this screen.

Click ok and then you will see this screen.



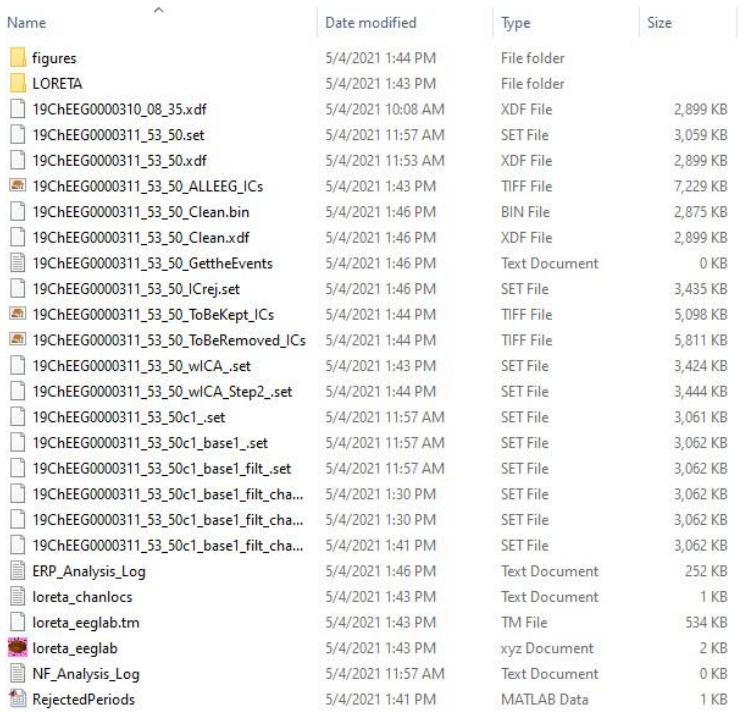
AMICA allows the user to remove artifact from the data to reveal true neural functioning. At this point in the analysis NeuroField EEG is telling you which components it wants to keep. Your job is to review the components and to either accept or reject the list that of components that are being presented in the text box.

At the conclusion of the ICA analysis the user will see this pop-up window.



NeuroField EEG stores all the component images in the “figures” folder located in the same folder where you saved/opened the original XDF filer.

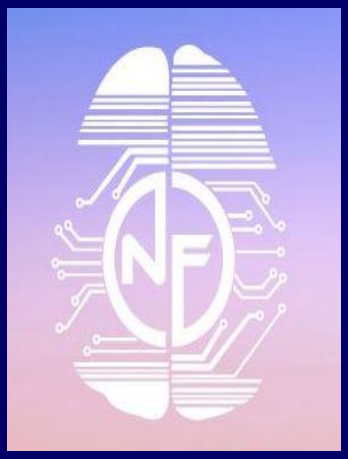
Navigate to that folder and inspect each of the images. The acceptance criteria is that the component is at least a 85% or more match to the brain database and not at match of any of the other artifacts listed in the ICLABEL list. Like most programs, ICLABEL is very good at categorizing data, but can make mistakes which is why you must visually inspect the data as well.



Name	Date modified	Type	Size
figures	5/4/2021 1:44 PM	File folder	
LORETA	5/4/2021 1:43 PM	File folder	
19ChEEG0000310_08_35.xdf	5/4/2021 10:08 AM	XDF File	2,899 KB
19ChEEG0000311_53_50.set	5/4/2021 11:57 AM	SET File	3,059 KB
19ChEEG0000311_53_50.xdf	5/4/2021 11:53 AM	XDF File	2,899 KB
19ChEEG0000311_53_50_ALLEEG_ICs	5/4/2021 1:43 PM	TIFF File	7,229 KB
19ChEEG0000311_53_50_Clean.bin	5/4/2021 1:46 PM	BIN File	2,875 KB
19ChEEG0000311_53_50_Clean.xdf	5/4/2021 1:46 PM	XDF File	2,899 KB
19ChEEG0000311_53_50_GettheEvents	5/4/2021 1:46 PM	Text Document	0 KB
19ChEEG0000311_53_50_ICrej.set	5/4/2021 1:46 PM	SET File	3,435 KB
19ChEEG0000311_53_50_ToBeKept_ICs	5/4/2021 1:44 PM	TIFF File	5,098 KB
19ChEEG0000311_53_50_ToBeRemoved_ICs	5/4/2021 1:44 PM	TIFF File	5,811 KB
19ChEEG0000311_53_50_wICA_.set	5/4/2021 1:43 PM	SET File	3,424 KB
19ChEEG0000311_53_50_wICA_Step2_.set	5/4/2021 1:44 PM	SET File	3,444 KB
19ChEEG0000311_53_50c1_.set	5/4/2021 11:57 AM	SET File	3,061 KB
19ChEEG0000311_53_50c1_base1_.set	5/4/2021 11:57 AM	SET File	3,062 KB
19ChEEG0000311_53_50c1_base1_filt_.set	5/4/2021 11:57 AM	SET File	3,062 KB
19ChEEG0000311_53_50c1_base1_filt_cha...	5/4/2021 1:30 PM	SET File	3,062 KB
19ChEEG0000311_53_50c1_base1_filt_cha...	5/4/2021 1:30 PM	SET File	3,062 KB
19ChEEG0000311_53_50c1_base1_filt_cha...	5/4/2021 1:41 PM	SET File	3,062 KB
ERP_Analysis_Log	5/4/2021 1:46 PM	Text Document	252 KB
loreta_chanlocs	5/4/2021 1:43 PM	Text Document	1 KB
loreta_eeglab.tm	5/4/2021 1:43 PM	TM File	534 KB
loreta_eeglab	5/4/2021 1:43 PM	xyz Document	2 KB
NF_Analysis_Log	5/4/2021 11:57 AM	Text Document	0 KB
RejectedPeriods	5/4/2021 1:41 PM	MATLAB Data	1 KB

All of the images will be saved in the same folder where you placed your .XDF file. Learning how to interpret this data and utilize it is beyond the scope of this manual.

Please visit www.schoolofneurotherapy.com to sign up for classes and learn more about the complex world of EEG!!



SECTION 5

Appendix

I. NeuroField Contraindications

1. There are no known contraindications for EEG recording.

II. Legal

The NeuroField Q21 is an EEG amplifier that is designed to measure electrophysiological data that is produced by the human brain. The NeuroField Q21 is not intended to be used for the diagnosis of medical problems and does not diagnose medical problems. The NeuroField Q21 is intended for the use of stress reduction and relaxation. NeuroField, Inc. does not make any claims that this device can cure, heal, or medically treat disease.

III. License Agreement

LICENSE AGREEMENT

By installing and/or using NeuroField64 (the "Software"), you agree to be bound by the terms of this license agreement. If you do not agree to the terms and conditions of this license agreement, you may not install or use the Software. This agreement is between you ("you") and NeuroField, Inc. (the "author").

This license agreement may be altered or changed at any time by the author without prior notice.

1. GRANT OF LICENSE

You have permission to use this Software for your own personal, professional, or home use. You must be a licensed health professional in order to use NeuroField for public use. You do NOT have permission to modify, distribute, defragment, decompile, reverse engineer, or copy this Software or any element of the Software by any electronic or non-electronic methods. All title, ownership rights and intellectual property rights in and to the Software and any and all copies thereof are owned by the author. The Software, including, without limitation, all code, databases, protocols, procedures, media, sound, video, animation, models, textures, images, text, screens, derivative works and all other elements of the Software may not be copied, resold, rented, leased, distributed, or used for any commercial purpose without prior written permission from the author.

2. NO WARRANTY/LIABILITY

You agree the author is held harmless and is not liable for any special, incidental, indirect, punitive, or consequential damages, injury, lost revenue, lost data, or harm whatsoever arising out of the use, misuse, inability to use, sale, registration, production, creation, development, or removal of this Software or any element of the Software. You use this Software at your own risk. No warranty or guarantee of any kind is expressed or implied. You agree the author and any other party involved with the production, creation, distribution, sale, or development of this Software or any element of the Software will not be liable for any reason under any circumstance. In no event shall the author's total liability to you for all damages and losses exceed the amount paid by you for the Software.

No advice or information, whether oral or written, obtained by you from the author or any other party involved with the production, creation, distribution, sale, or development of this Software shall create any warranty not expressly stated herein.

3. GENERAL PROVISIONS

If any condition or provision in this license agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining conditions and provisions will continue in full force without being impaired or invalidated in any way. This license agreement will be governed by the laws of the State of California. With respect to every matter arising under this license agreement, you consent to the exclusive jurisdiction and venue of the state and federal courts sitting in Bishop, California.

Any permissions granted herein are provided on a temporary basis and can be withdrawn by the author at any time without notice. All rights not expressly granted are reserved.

If you acquired the Software and do not accept the terms of this license agreement, you must return the Software along with all packaging, manuals, hardware and other material contained with the Software to the store where you acquired the Software for a full refund and if you downloaded the Software, you must delete it. Returning the Software must be done prior to installing or using the Software. If the software is used then you had "agreed" to the terms and conditions outlined in this license agreement and forfeit your refund. There is no trial period use of this software.

You hereby acknowledge that you have read and understand the foregoing license agreement and agree that the action of installing or using the Software is an acknowledgment of your agreement to be bound by the terms and conditions of the license agreement contained herein.

IV. Shipping Policy

GOODS WITHIN THE U.S.A. – All goods posted within the U.S.A. are delivered to you via Federal Express 2-Day Air, unless otherwise specified.

All goods are SECURELY packaged to minimize the risk of damage. Any damage that does occur is the responsibility of Federal Express, and you can contact Federal Express for satisfaction concerning the cost involved.

GOODS SHIPPED INTERNATIONALLY – In 2004, the European Parliament passed the Restriction of the Use of Certain Hazardous Substances (RoHS) directive to "protect human health and the environment by restricting the use of certain hazardous substances in new equipment" and to complement the Waste Electrical and Electronic Equipment (WEEE) regulations. This Directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.

V. Warranty/RMA Policy

NeuroField, Inc. uses FedEx as the primary shipment carrier. If your system was damaged in transit or is missing components please notify NeuroField, Inc. immediately. Failure to do so will result in the customer paying for parts, repairs, and/or damages.

Shipping Coverage

NeuroField, Inc. offers replacement on damaged or non-functional items within thirty (30) days of purchase provided that damage was caused by either freight transport or factory defect. There is a service/repair charge for items returned after thirty (30) days of purchase.

Equipment Coverage

NeuroField systems have a one (1) year warranty from the time of purchase. This warranty covers factory defects only and does not cover damage caused by the customer. Any damage incurred can be repaired by NeuroField, Inc., charge estimates dependent on inspection of damaged hardware.

Battery Coverage

The RRC 2040 Lithium Ion Battery for the Q21 EEG amplifier carries a three (3) month warranty through NeuroField, Inc. against factory defects.

Misc

There are no review periods upon purchase of the NeuroField system. All sales are FINAL. No refunds will be offered regardless of the request.

Return/Repair Procedures and Policies

All returns must be accompanied by a return merchandise authorization number (RMA#). The RMA number may be obtained by contacting NeuroField either via e-mail or by calling our office. We will provide you with return instructions.

1. NeuroField, Inc. is not responsible for any packages sent back without an RMA#.
2. The customer is responsible for paying for the return shipping.
3. We recommend sending any return items to NeuroField, Inc. via a traceable source.
4. Please insure your return packages for any package losses or any damages in shipping. NeuroField, Inc.is not responsible for any damages incurred in shipping.

5. Please legibly write the RMA# on the outside of the returned package. Please provide return address and telephone number in the package.
6. Ship all RMA's to:
   NeuroField Inc.
   RMA#
   386 West Line St.
   Bishop, CA 93514
7. Original shipping charges are non-refundable.
8. NeuroField, Inc. cannot accept returns on any consumable products, electrodes, or cables.
9. Please allow 7-10 business days for repair.
10. If the system is being repaired on warranty the customer is not responsible for return shipping. If the system is being repaired/upgraded outside of warranty the customer must pay for return shipping.
11. NeuroField, Inc. is not responsible for any loss of revenue on the part of the customer as a result of conducting repairs.
12. Should the customer wish to expedite repair and/or return shipping an additional fee will be charged.

VI. Capping the Patient Accessories & Prep

-

Cap and Ear Electrodes

NeuroField supports the use of a cap for 19-Channel training and uses the Lexicor D25 pinout with the Q21 unit. Only the caps noted below for ordering are approved for use with the Q21 EEG. Any other Cap must be evaluated and approved for use with NeuroField devices. Please contact NeuroField, Inc. for further information on cap evaluation and approval.

Caps

Caps can be purchased from Electro-Cap International, Inc. https://electro-cap.com/index.cfm/caps/
When ordering you must ask for a specific type of cap. The caps that work with the Q21 are coded as:

- Cap Code# = E1-L, or E1-M, or EI-SM. The L, M or SM designates the size of the cap, so you will need to choose one of those letters for each cap size you order.

3 ½" Ear Clips

Clips can be purchased online at https://bio-medical.com/catalogsearch/result/?q=ear+clips

- Ear Clip Code# = ECA E5-9SDROPS. These are very short "drop-down" ear electrodes and are important to order over the longer ones as they help to minimize noise.

Paste, Electro-Gel, Sponge Disks, Syringes, NuPrep, Swabs, & Sintered Electrodes

In order to properly setup the above accessories to your hardware and run a session, you will need to order and use the following supplies**:** **Note:** For Instructions on how to apply the paste and gels see the various "Placing and Connecting" instructions below.

https://bio-medical.com/catalogsearch/result/?q=+10-20+paste

- TEN 20 Paste

https://bio-medical.com/catalogsearch/result/?q=+electrogel

- Electro-Gel


https://bio-medical.com/catalogsearch/result/?q=+Sponge+disks

- Sponge Disks


https://bio-medical.com/catalogsearch/result/?q=syringes

- Syringes & Blunt tip Inserts

https://bio-medical.com/catalogsearch/result/?q=nuprep

- NuPrep

https://bio-medical.com/catalogsearch/result/?q=+alcohol+swabs

- Alcohol swabs

Prepping & Capping

As the old saying goes “Garbage in / Garbage Out”. So, there are a few hints and tricks you can follow to not only prepare your client ahead of time to assist the data acquisition process, but to also ensure that while you are capping your patient you will easily and quickly acquire a good signal.

Patient Prepping Prior to Appointment

There are specific requests that you can tell your patient prior to their appointment in order to prepare them for a successful data acquisition. The following are some of the most common requests to communicate prior:

- Ask client to refrain from any Conditioners or Hair Product (gel, wax, hair spray) in the hair for the time of the recording. Encourage them that shampoo is fine, and they should not avoid washing their hair.
- Ask client to be awake for at least 1 full hour before the time of the recording. Also, if possible, to avoid any caffeine before the recording.
- At the time of the QEEG, ask client to remove any earrings or clips/pins in the hair that would sit beneath the cap.

Prepping & Capping Best Practices

- NuPrep (clean) the forehead, temples, and any area where skin is exposed. If you have someone who has no hair, clean the entire head if possible. NuPrep the ear lobes where you will be placing the ear electrodes.
- Place foam disks on the 2 forehead electrodes (Fp1 & Fp2). Place over the Fp1 & Fp2 points on the forehead of the client (just above the eyebrows without the foam disk sticking to the eyebrows). Gently pull cap down on the client's head holding on to the ear ring areas.
  Note: Before proceeding it is a good idea to select a specific path around the cap that you follow each time you Cap a patient i.e. gel all electrodes down the midline first, then all electrodes on the left side, then all electrodes on the right side. This will help ensure you always know where you are in the capping process.
- Take up Electro-Gel into your syringe avoiding any air bubbles. Begin inserting gel by placing your syringe to the client’s scalp and gently parting the hair to expose the scalp area. Then, lifting the syringe just slightly away from the scalp, hold the electrode between your fingers, and inject a small amount of gel into the electrode. You only need slightly more than the size of a pea. With the hand that was holding the electrode, settle it back down on to the scalp creating a suction.

- Continue along each area making sure to not miss any electrodes. Be careful when doing the Fp1 & Fp2 above the eyebrows, they have the highest chance of dripping into people's eyes or onto their clothing. Also, be careful putting too much gel at the Ground and Fz sites, they are the closest together and have the highest chance of creating a salt bridge.
- Once done with the head, you will need to put a small pea of gel into the cups of your ear electrodes, making sure to clip them to the same area of the ear that you previously cleaned.

You are now ready to calibrate your QEEG cap.

VII. Contact Information & Troubleshooting

Contact Info:

Email: Contact@NeuroField.org

Mailing Address:

Nicholas Dogris, Ph.D.
NeuroField, Inc.
PO Box 506
Bishop, CA 93515

Physical Address:

NeuroField, Inc.
386 W. Line Street
Bishop, CA 93514
Phone 760-872-4200
Fax 760-873-8007

Official NeuroField Product Website: www.NeuroField.org

VIII. Technical Information in EMC Standards

Electromagnetic Emissions		
The [ME EQUIPMENT or ME SYSTEM] is intended for use in the electromagnetic environment specified below. The customer or the user of the [ME EQUIPMENT or ME SYSTEM] should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The Q21 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The Q21 is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Electromagnetic Immunity			
The Q21 is intended for use in the electromagnetic environment specified below. The customer or the user of the Q21 system should assure that it is used in such an environment.			
Immunity test	**IEC 60601 Test Level**	**Compliance**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	Complies	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	Complies	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Complies	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % UT (>95 % dip in UT) for 0,5 cycle 40 % UT (60 % dip in UT) for 5 cycles 70 % UT (30 % dip in UT) for 25 cycles <5 % UT (>95 % dip in UT) for 5 s	Complies	Mains power quality should be that of a typical commercial or hospital environment. If the user of the [ME EQUIPMENT or ME SYSTEM] requires continued operation during power mains interruptions, it is recommended that the [ME EQUIPMENT or ME SYSTEM] be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	Complies	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE UT is the a.c. mains voltage prior to application of the test level.			

Electromagnetic Immunity

The Q21 is intended for use in the electromagnetic environment specified below. The customer or the user of the Q21 should assure that it is used in such an environment.

IMMUNITY test	IEC 60601 TEST LEVEL	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2,5 GHz	0.15-80 MHz 3 Vrms 1kHz AC Mains 80 MHz - 2.5 GHz 3 V/m 80% @ 1kHz	Portable and mobile RF communications equipment should be used no closer to any part of the [ME EQUIPMENT or ME SYSTEM], including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = 1.1\sqrt{P}$ $d = 1.1\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a Field strength from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Q21 is used exceeds the applicable RF compliance level above, the Q21 should
be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Q21.
b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V1] V/m.

Recommended separation distances between portable and mobile RF communications equipment and Q21

Q21 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of Q21 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and Q21 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1.1\sqrt{P}$	80 MHz to 800 MHz $d = 1.1\sqrt{P}$	800 MHz to 2,5 GHz $d = 2.3\sqrt{P}$
0,01	0.12	0.12	0.23
0,1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.69	3.69	7.38
100	11.67	11.67	23.33

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

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