

BWAnalysis Software Manual



DMR-BWIII-95
Rev. 4.0
04/17/2025





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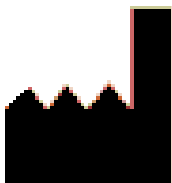
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1. Manufacturer Information



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2. European Authorized Representative – EC



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Important

For the safety of all users and the correct use of this equipment the complete reading of such manual before starting the installation and the operation of BWIII family equipment is mandatory.

This document aims to help the user to install the BWIII family (BWIII Basics, BWIII EEG, BWIII EEG Plus, BWIII PSG, and BWIII PSG Plus) equipment safely.

This User Instruction is exclusively for the operation of BWIII family equipment.

The BWIII family equipment must only be used by licensed professionals.

It is recommended that this User Manual be maintained at the same place as the equipment for consultations and referrals as there is important information which must be read and understood during the installation and operation of the BWIII equipment.

The equipment installation must be performed by a Neurovirtual technician, or medical facility technician, under supervision of the physician responsible, following the instructions included in this manual.

CAUTION: Federal law (USA) restricts this device to sale by or on the order of a licensed practitioner.

3. Introduction

Congratulations on acquiring BWAnalysis. The aim of this document is to help the user install the software BWAnalysis and guide them on its use and enjoying all its resources.

BWAnalysis is a system for acquiring and managing clinical and physiological data in digital format for electroencephalography, polysomnography and polygraphy examinations.



4. Installation

4.1. System Requirements

Because it is digital equipment, the user will have to have a PC with a minimum configuration to operate the BWAnalysis software. This configuration will provide fast and safe operation.

Processor:	Intel® Core™ i5 or i7 Processor
Operating System:	Windows 11 Professional 64-bit or 32-bit
Memory:	8 GB or higher
Hard disk:	1TB capacity or higher
Video:	Intel(R) UHD Graphics - evaluate according to needs
Monitor Size:	24 inches, suggested
Monitor Resolution:	1024x786 or higher
Laptop Monitor:	15 inches, suggested
Wireless:	802.11 n/g/b
Ethernet:	1 RJ45 Port
USB port:	3 ports available or more
Microsoft Word:	Office 2013 or higher



Antivirus and/or defense software could detect BWAnalysis as a harmful program. It is mandatory to create exceptions for it, otherwise the software will not be able to perform important tasks such as:

- **Create new studies.**
- **Access the ethernet/USB ports to connect the device.**
- **Record video.**
- **Create Word/PDF reports.**

Neurovirtual recommends the use of DELL® microcomputers because they are certified IEC 60950 standard, however nothing prevents the user from purchasing computers from any other certified manufacturer.


Use Neurovirtual Customer Support to check the minimum setting the computer must have for the proper functioning considering the equipment of BWIII family and BWMini family.

The computer, audio and video systems can be sold by Neurovirtual as computer items.



4.2. Software Installation

Following, we will see step by step how the BWAnalysis software installation should be accomplished.

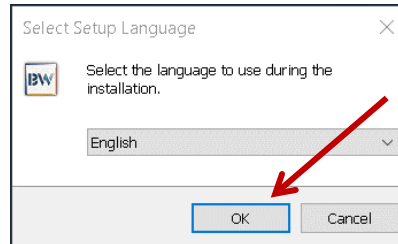
 **Please note that the software must be installed from the administrator user or administrator account of the computer.**

1st Step:

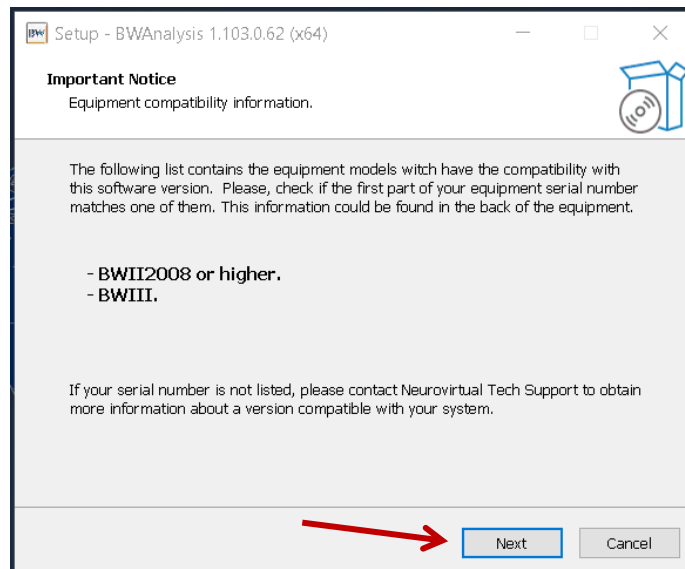
Turn the computer on and let Windows start.

2nd Step:

Run BWAnalysis Setup. Select your preferred language and press *OK*.



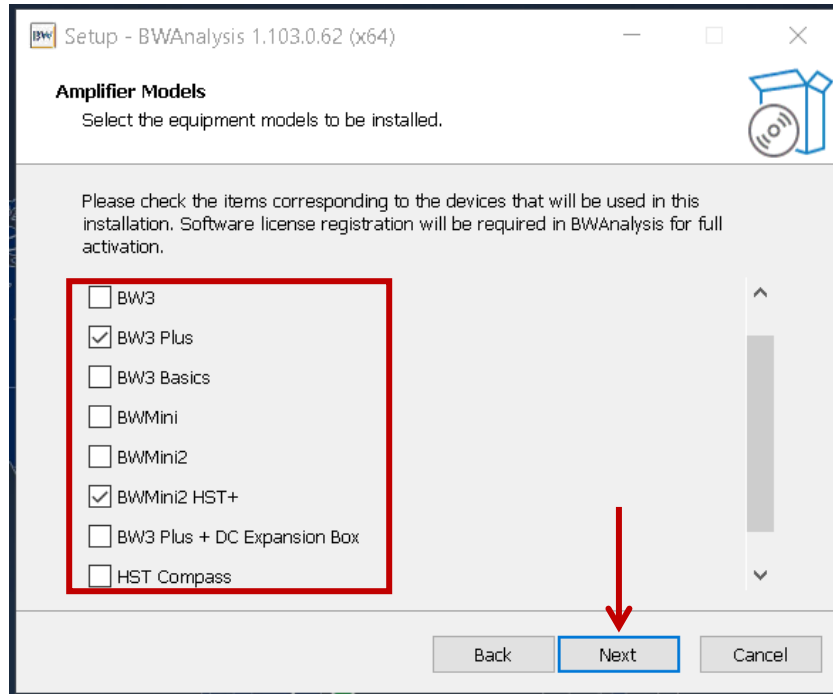
Then, in the next window, click *Next*





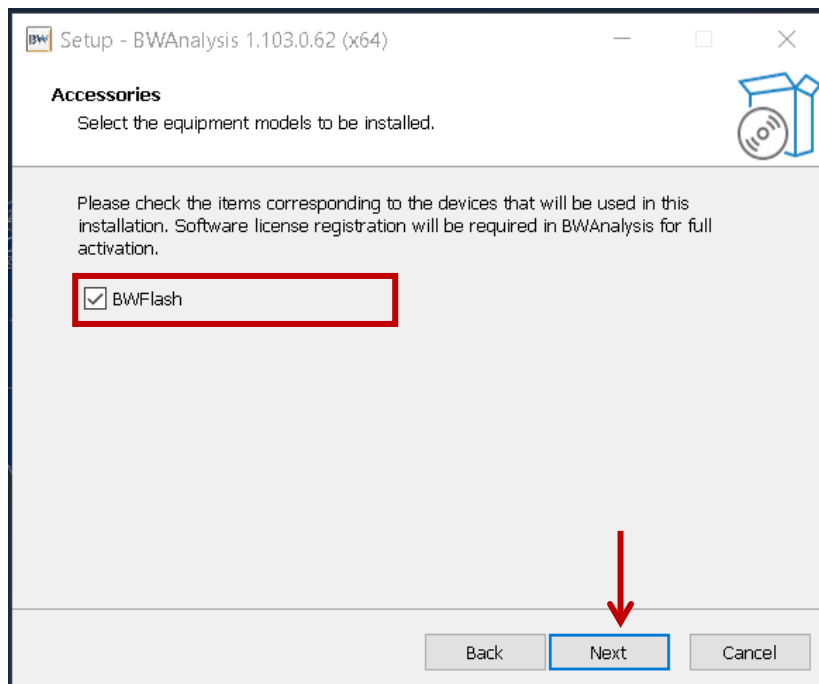
3rd Step:

Choose the device to use in the installation and click *Next*.



4th Step:

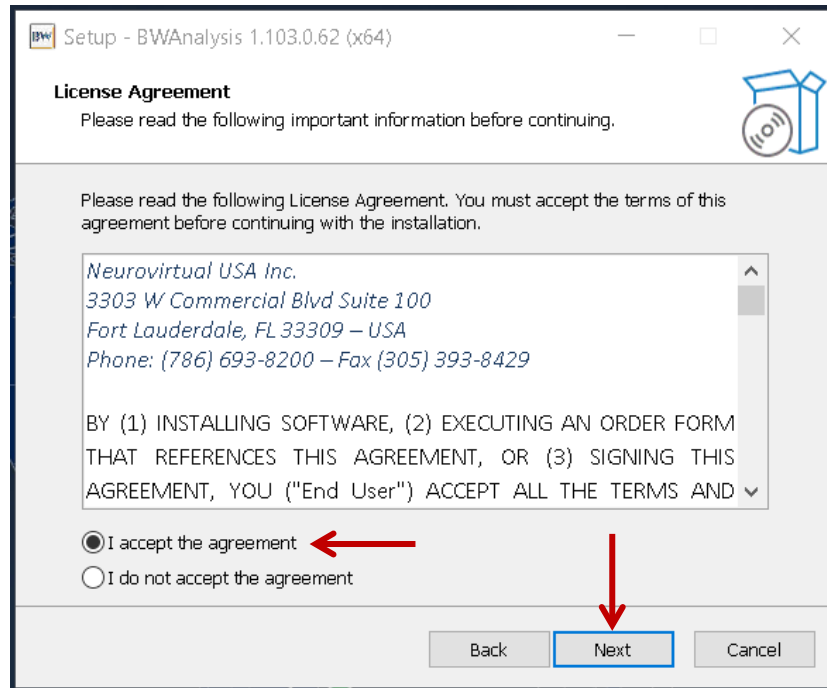
Only if you have a BWFlash with a USB connection to the computer and that is going to be used in the company of the BWMini v2, select the box and click *Next*.





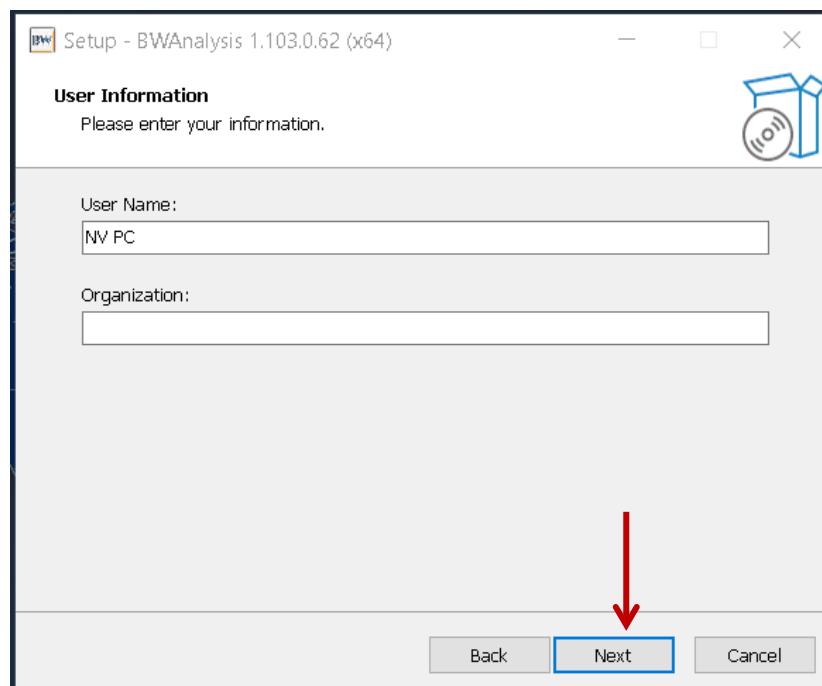
5th Step:

Read the License Agreement with close attention, Select the option *I accept the agreement* and then click the *Next* button to accept the license agreement and proceed with the installation or, click *Cancel* to cancel the installation.



6th Step:

Fill out Username and Organization if applicable. If not, leave it as default and click *Next*.

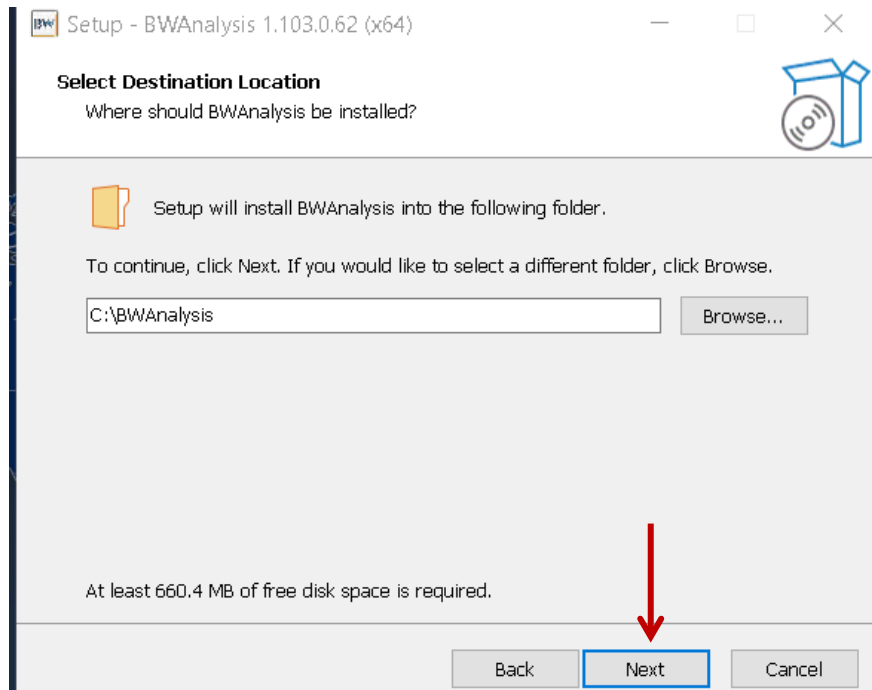




7th Step:

Users will have the option of selecting the destination location where the software is installed. It is recommended to leave the default location. If needed, define a different location by locking in the desired folder with the *Browse...* button. Then click *Next*.

Leaving the default location will avoid conflicts in the future with directory of essential features of the software. If desired, the location of the Data folder can be changed after installation. See Item 6.1 on page 38



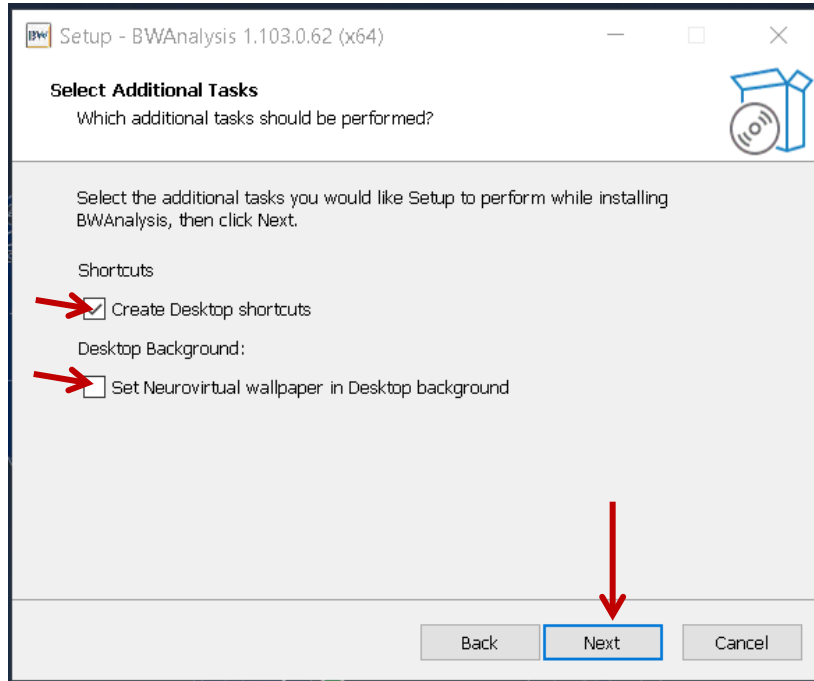
 **Always select a folder on the Local Disk (C: Drive) to assure the stability of the software at any time.**

 **Do not move the installed folder after the installation.**



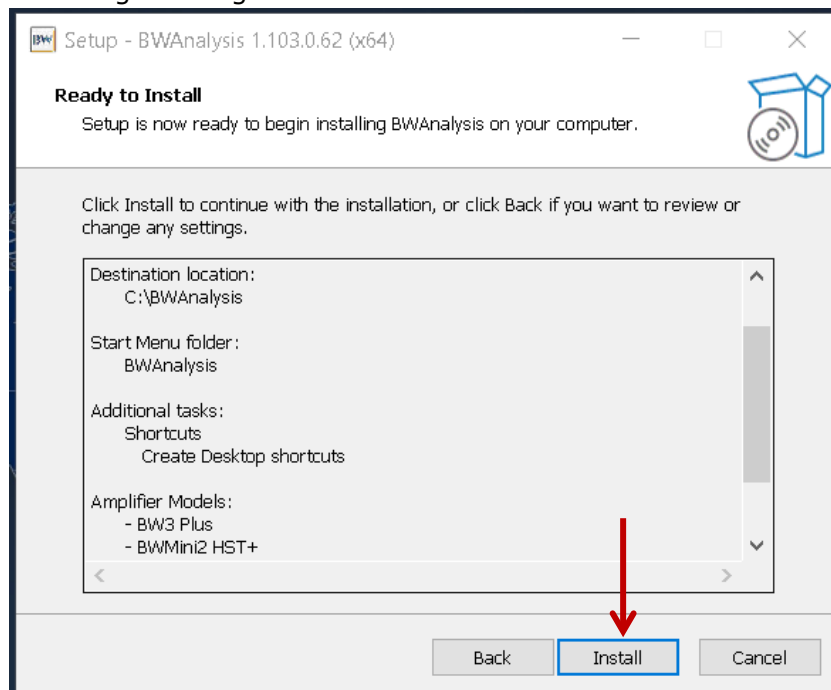
8th Step:

Add any of the additional tasks that can apply to the installation. It is recommended to *Create Desktop shortcuts* to have easier access to independent files such as Studies, Reports, Edit Studies and others.



9th Step:

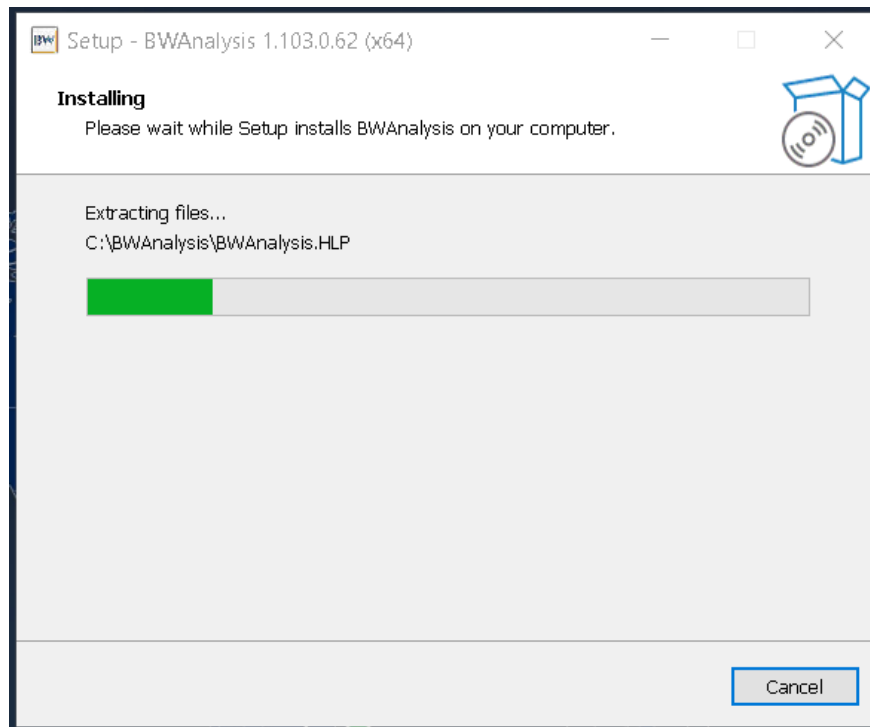
Confirm all the options that were chosen. If agree, click on *Install*, otherwise, you can click on *Back* to change settings or *Cancel* to finish the install.





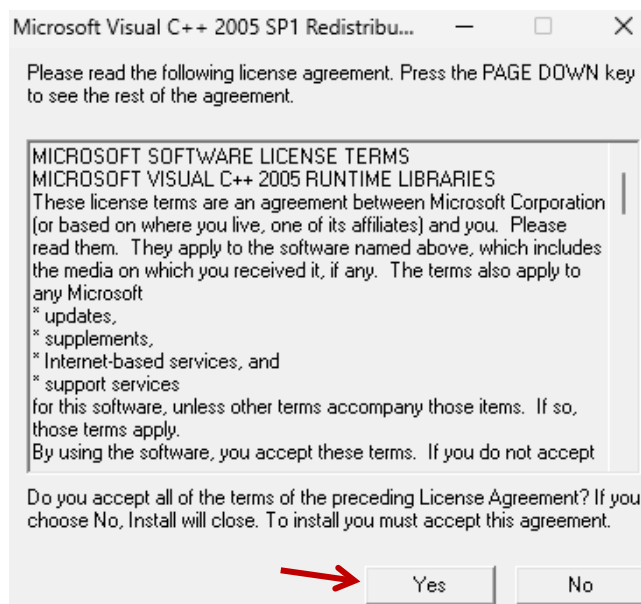
10th Step:

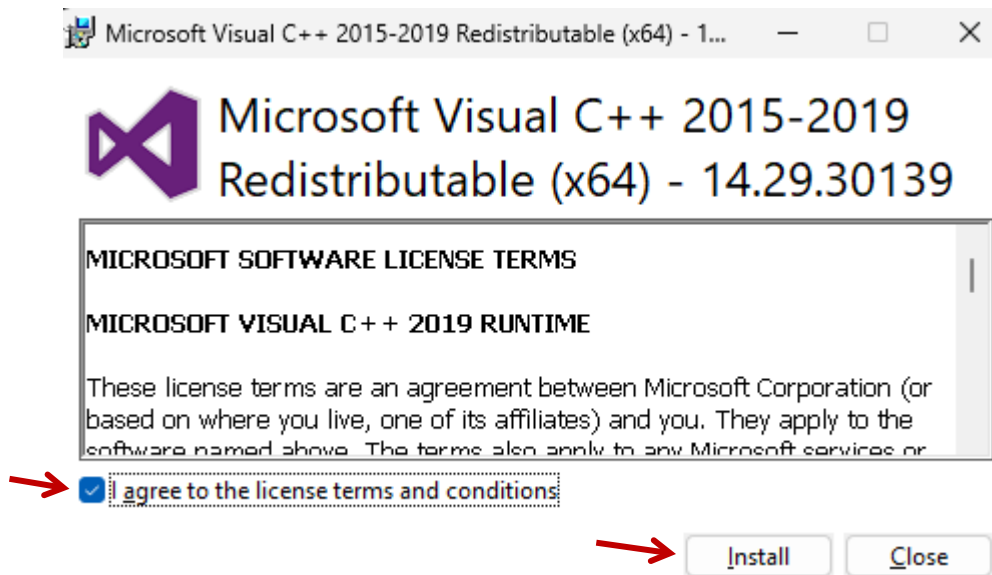
The installation takes a few minutes to complete. Please wait until the installation concludes.



11th Step:

A series of windows are going to show for the installation of Visual C++. Click on all the affirmative buttons (*Yes, Install*)



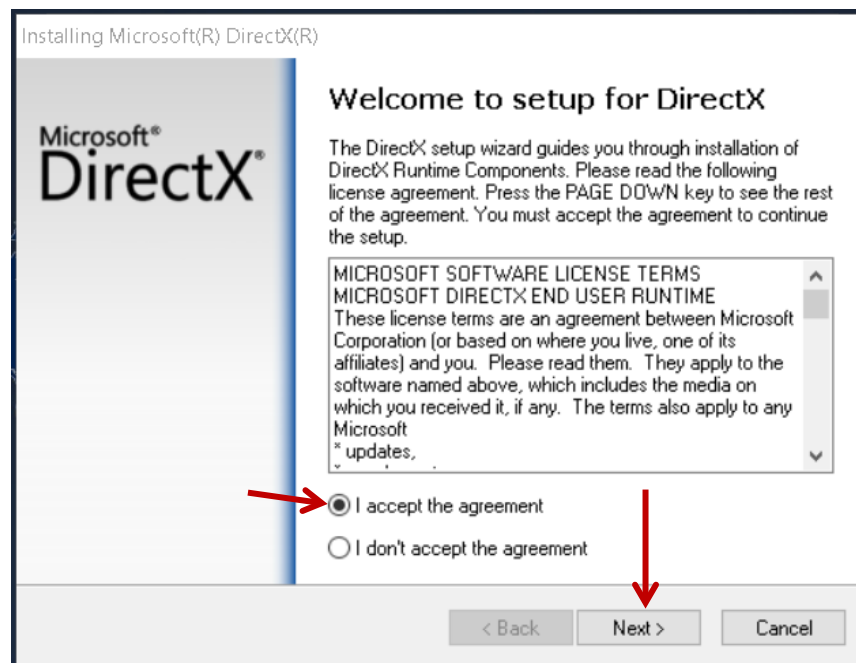


Note: If you already have Visual 2015 installed on your computer, you may see an error window on the installation, in which case you just need to click on the *Close* button.

12th Step:

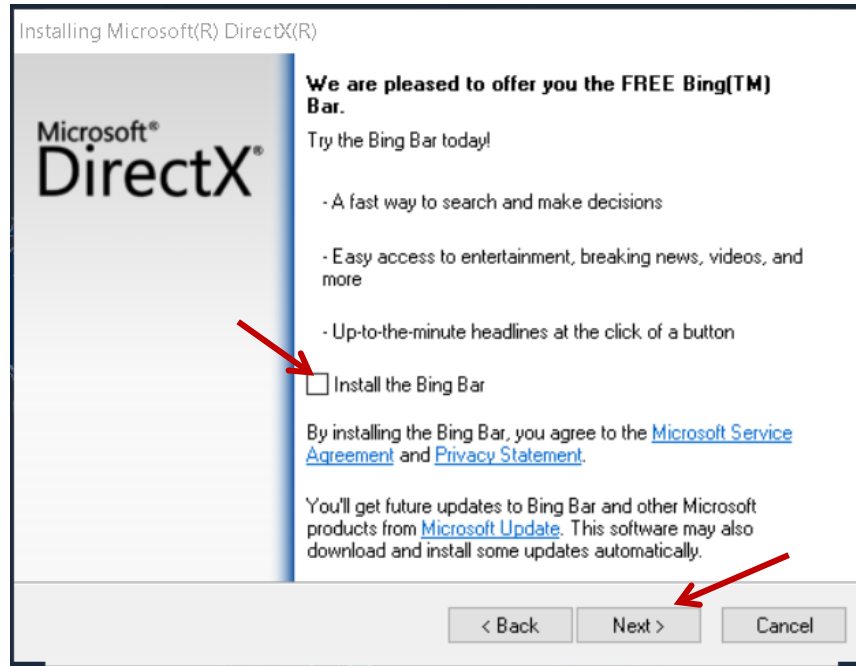
Subsequently, Direct X must be installed, this application will be necessary to perform brain mapping and other graphic tools in the software.

It must be select the *I accept the contract option*, then click on *Next*.



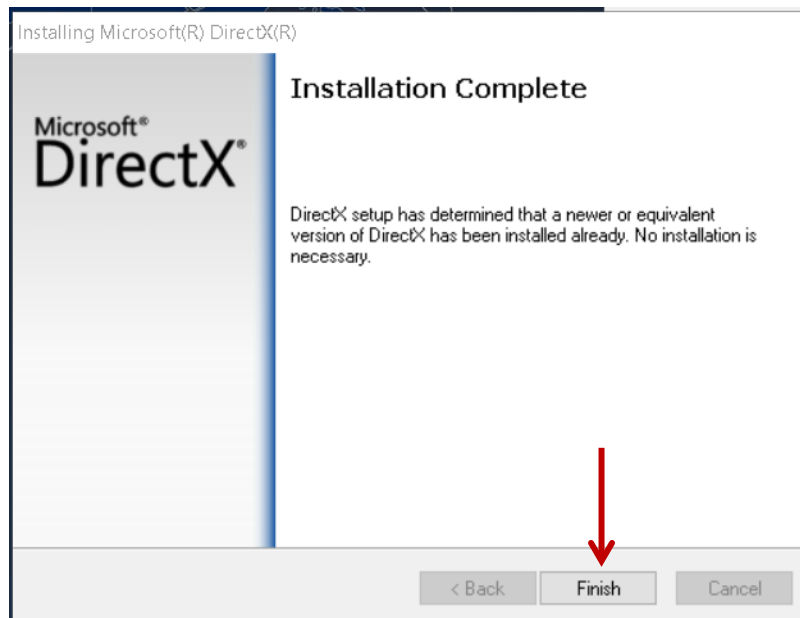


The installation of the Bing Bar is not required. It is recommended to uncheck the box but it can be checked, depending on your preference. Then press the *Next* button.



Note: If an error occurred during the installation of Direct X application, please contact Neurovirtual Technical Support to finish the installation.

Then conclude the installation by clicking on the Finish button.

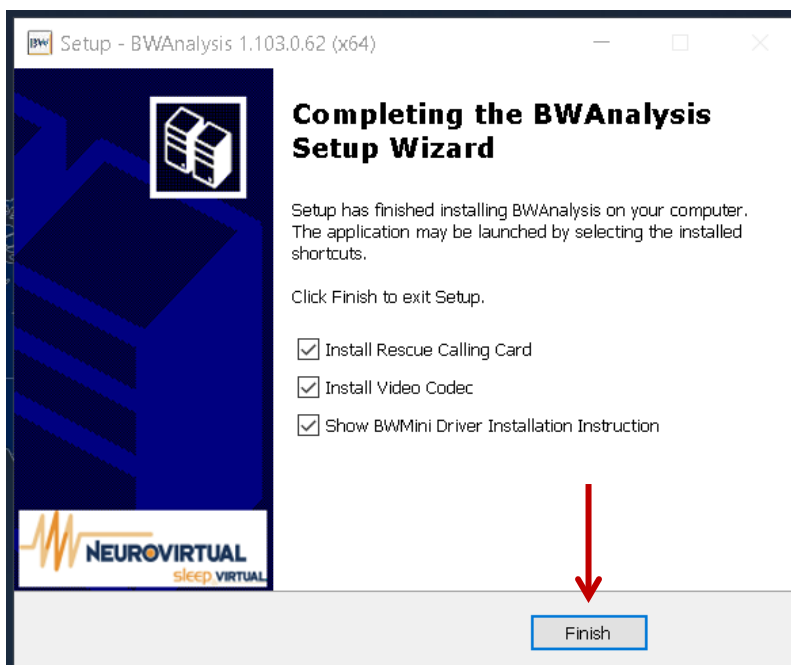





13th Step:

To complete the installation of the software, the Neurovirtual Tech Support application and the Video Codec Driver must be installed, those complements will be applied for video configurations, along with the remote connection with Technical Support.

To ensure its installation, make sure the options *Install Rescue Calling Card* and *Install Video Codec* are selected and click on the *Finish* button.



If BWMini family amplifiers were selected, you can have complementary installation instructions by checking the *Show BWMini Driver Installation Instruction* option. Otherwise, see item 4.4.3 on page 30.

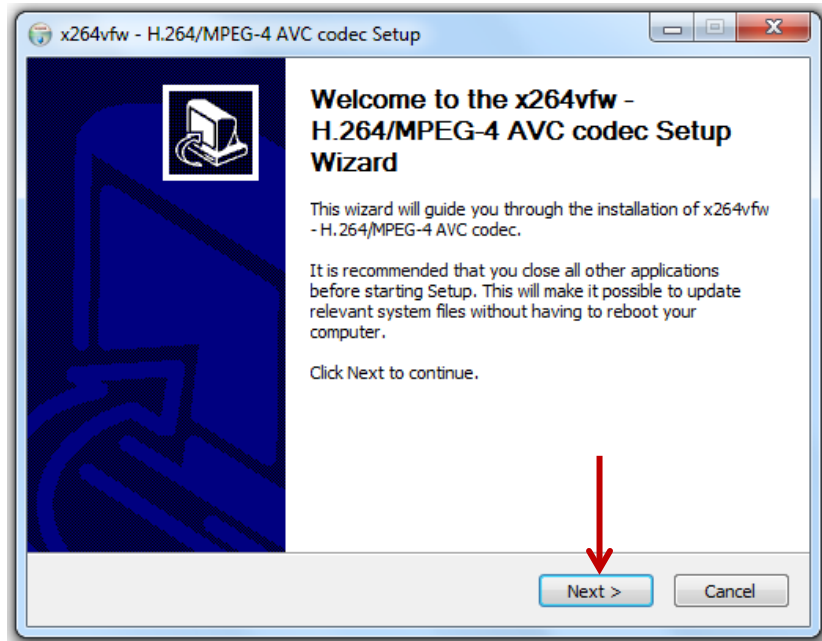
 **If the Completing Setup Wizard requests to reboot the computer and none of the mentioned checkbox appears, proceed rebooting your computer due to Windows Updates pending that might interfere with the proper performance of the software.**

Be aware that the complement installs will be missing and might present Video performance issues. Use Neurovirtual Customer Support to finish the installation successfully.

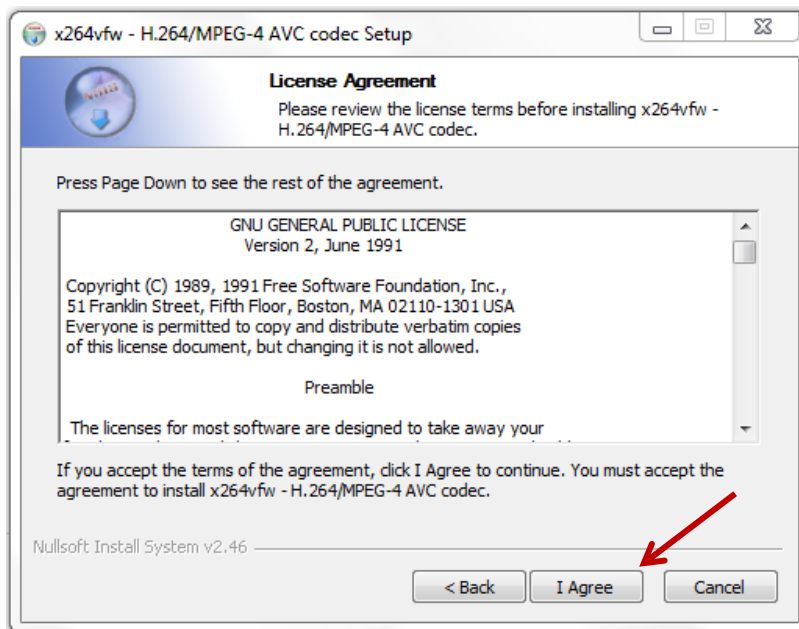


14th Step:

To install the Video Codec Driver, use the x264vfw codec Setup window. Click *Next* to continue with the installation.

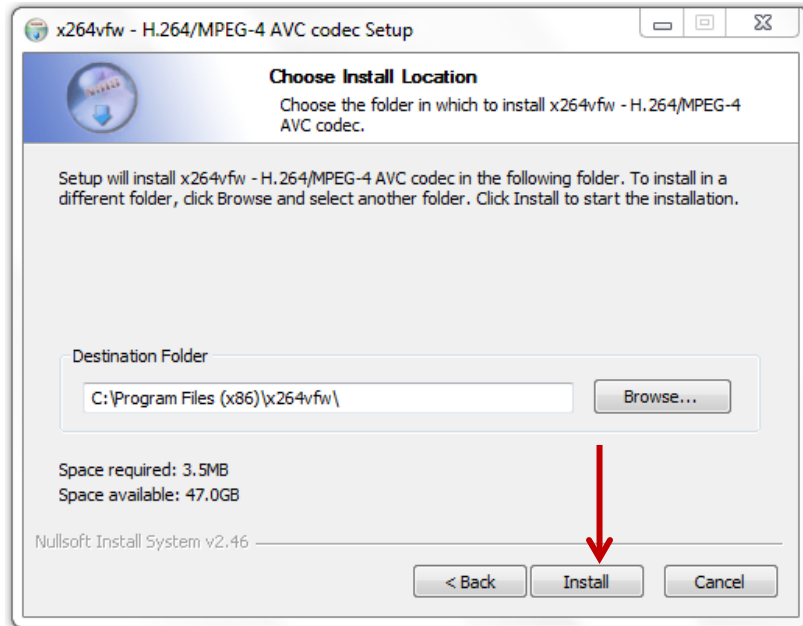


Then accept the License Agreement for Video Codec by clicking *I agree*.

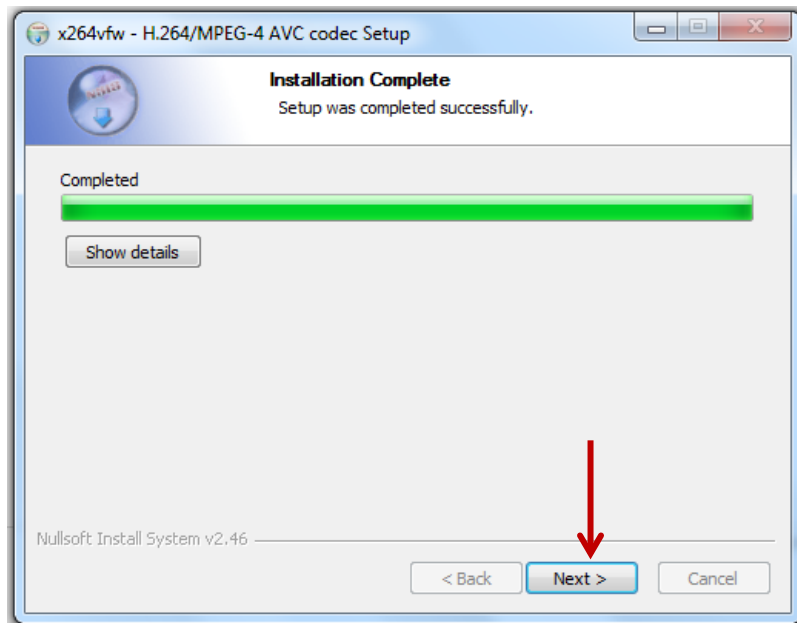




Do not change the location. Leave the default installation folder and click on *Install*.

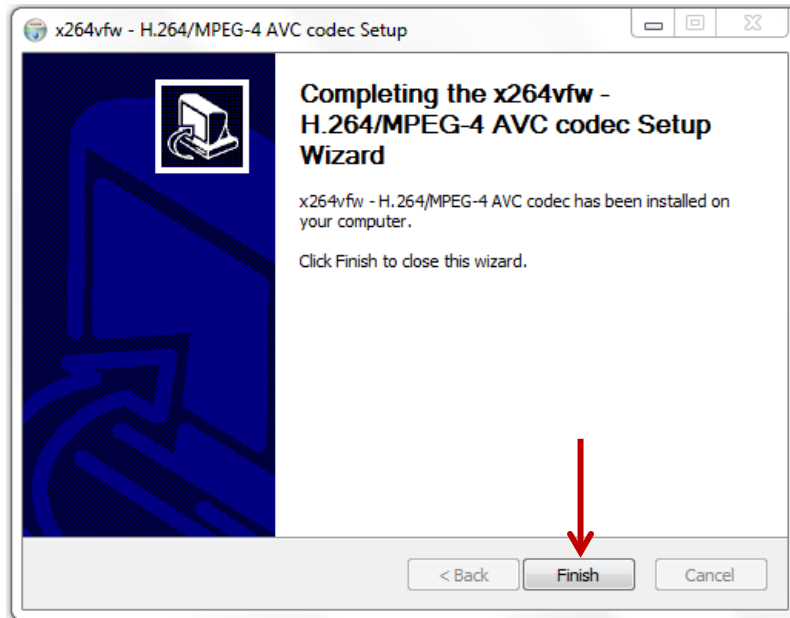


The installation will take a few minutes to complete. At the end click *Next*.



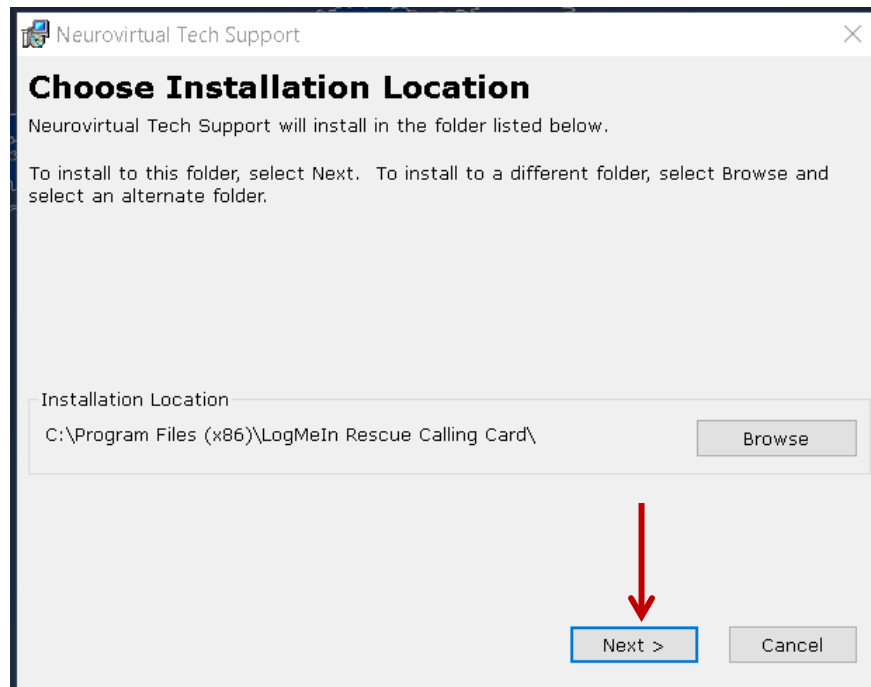


To complete the installation of the Video Codec, click *Finish*.



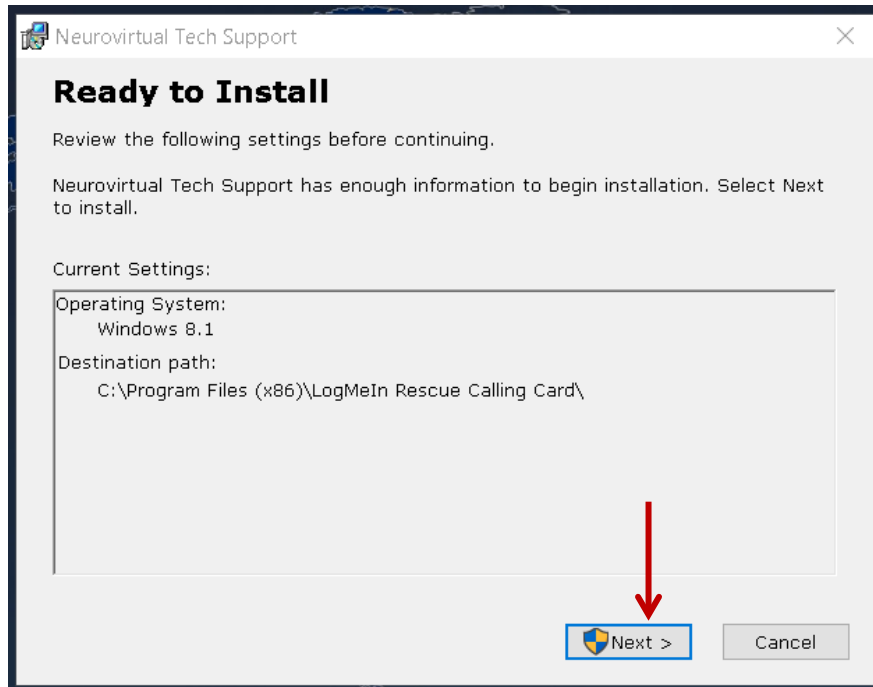
15th Step:

To install the Support Remote Connection, use the Neurovirtual Tech Support Setup window. Do not change the location. Leave the default installation folder and click *Next*.

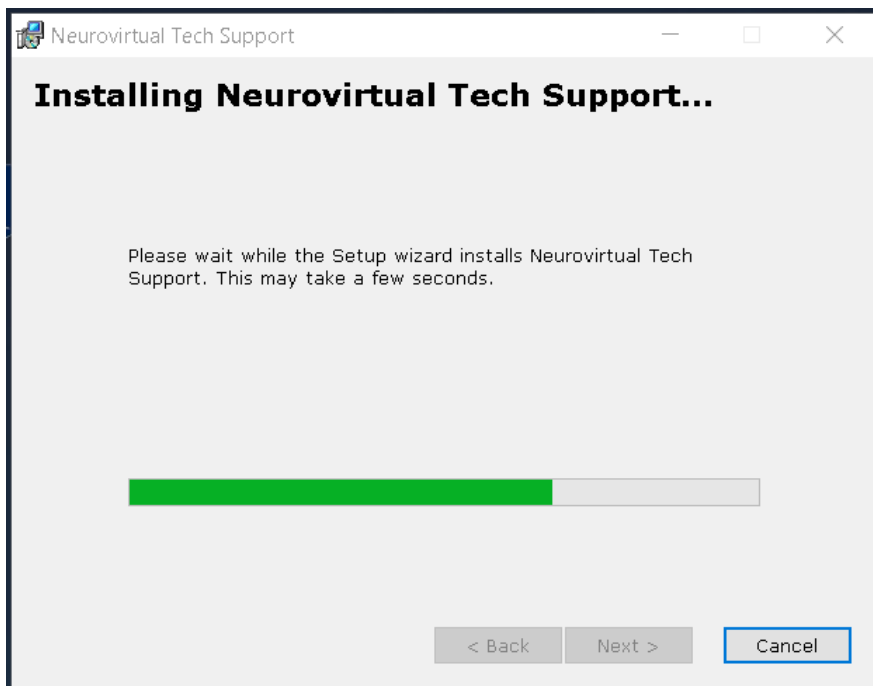




Details of the installation will appear, confirm and click *Next*.



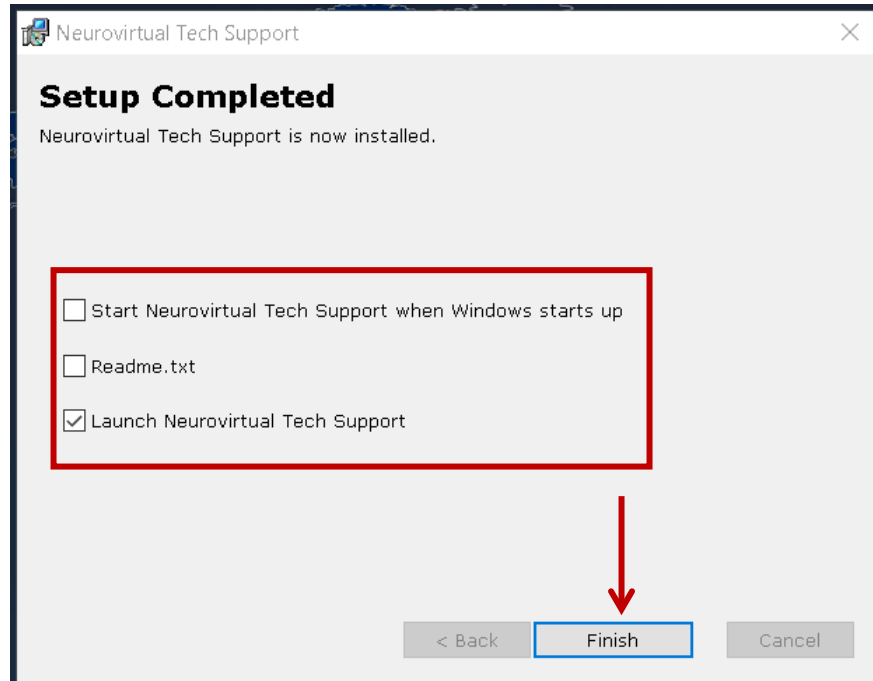
The installation will take a few minutes to complete.






Deselect the *Start Neurovirtual Tech Support when Windows starts up* option, as well as the *Readme.txt* option. Leave only selected the *Launch Neurovirtual Tech Support* option to open the Support window and confirm its performance.

To complete the installation, click *Finish*.



 **To run Neurovirtual Tech Support application, it is required internet connection. Fill out the basic information request on the window and click on Connect. One of our specialists will take your connection and assist you in the shortest time possible.**

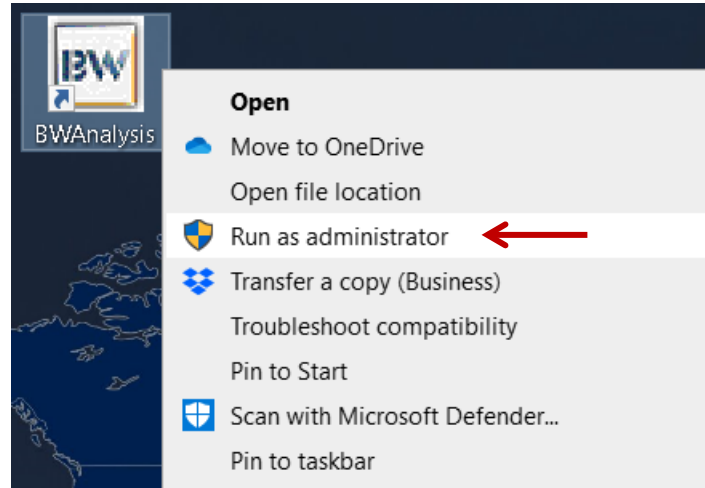


4.3. Software License

At this point, the software will be installed on your PC ready to be used to Exam Reading. If it's needed to record exams, you must run the software and register the license to start a new registration.

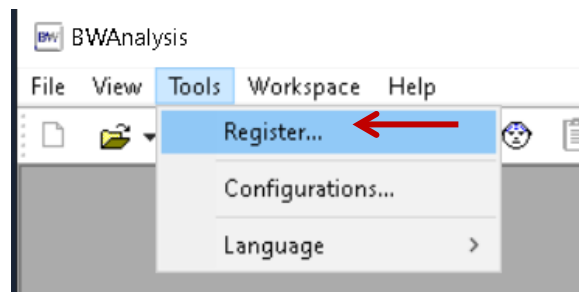
1st Step:

Press the right click on the icon called *BWAnalysis*, that is placed in your computer's working area. Then select the option *Run as Administrator*.




2nd Step:

Once the main screen opens, Click on *Tools* dropdown menu and click *Register...*



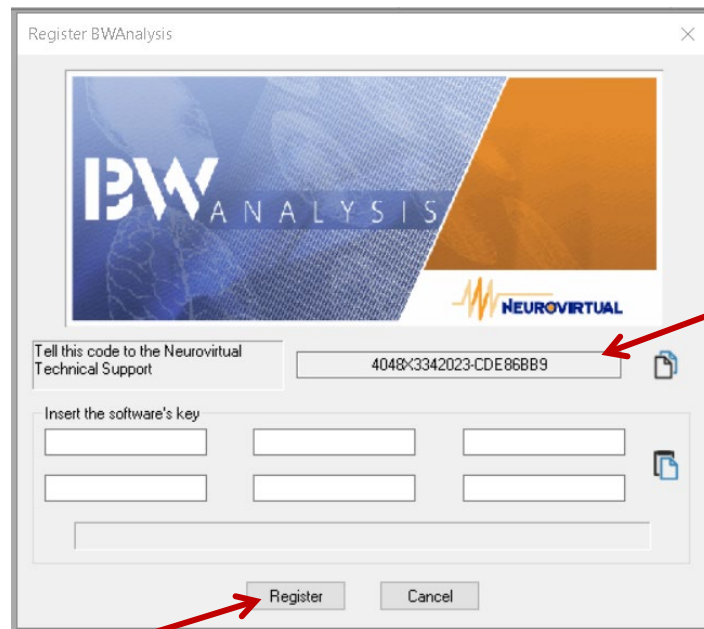
3rd Step:

The BWAnalysis Register window will be open containing a number that should be informed to Neurovirtual Support Specialists along with the serial of the equipment to be used.

 **If the number shows a 0 (zero) after the dash, the software was not Run as Administrator. Please close the software and try again.**



Support staff will provide the code/key that must be entered in its respective field on the six boxes below. Then click *Register*.



If the code is accepted, a confirmation message will appear. Click *Ok*.

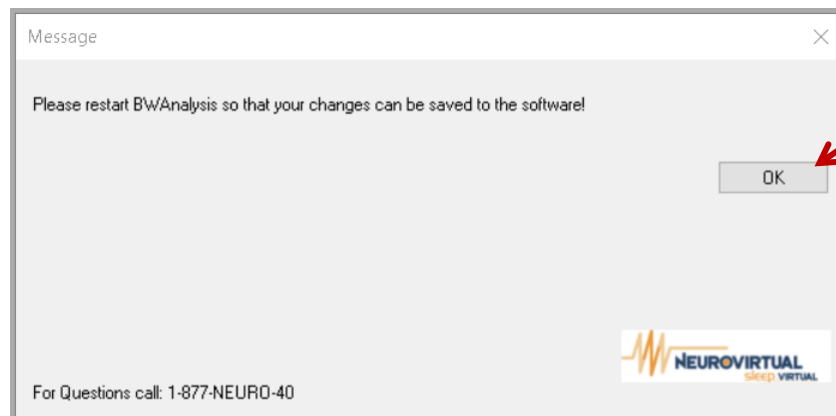


Otherwise, you will need to ask for another key or check your computer's date and time settings. See item 4.4.1.4 on page 27.



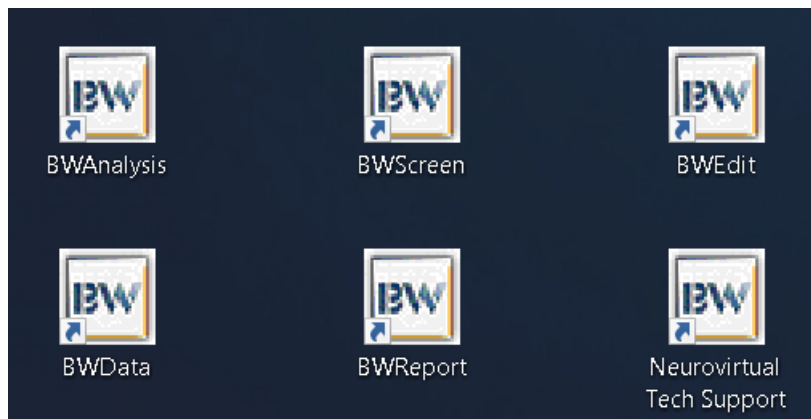
4th Step:

To save your change, close the BWAnalysis window. You will be able to use the register option once the software reopens.



If the *Create Desktop shortcuts* option was checked during the installation, the following icons will be displayed in your computer's working area:


- Four shortcuts to folders: BWData, BWReport, BWScreen and BWEdit
- Main software shortcut: BWAnalysis software
- Remote Support application shortcut: Neurovirtual Tech Support.



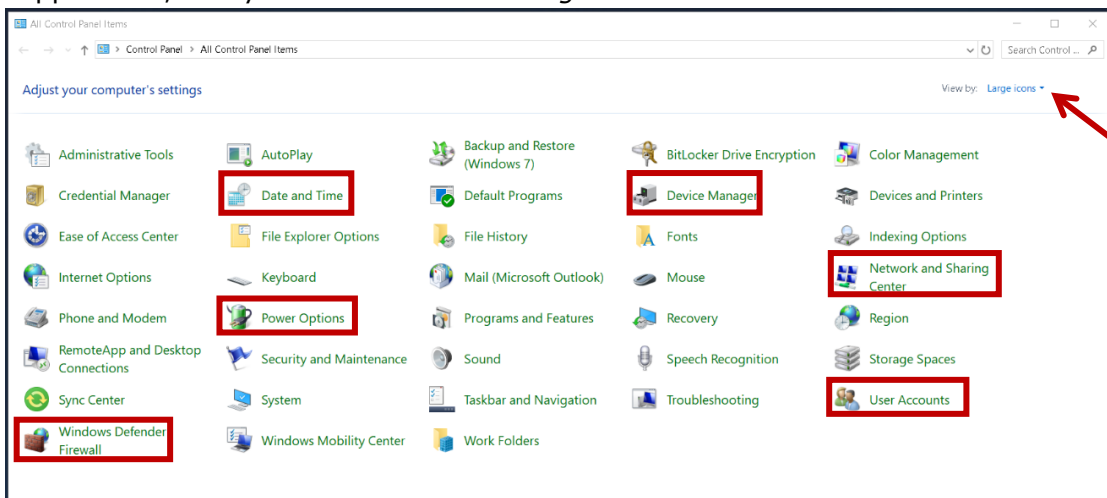


4.4. Windows Settings

For the correct operation, good performance and adequate connection of the Amplifier with the computer, some Windows configurations are recommended to perform.

 **The following actions are recommended to be taken to avoid interruption of the use of the software or hardware, due to access Windows restrictions or others. These actions may be evaluated by the IT team for their total or minimal application, according to the security policies of the institution. This evaluation must be done altogether with the Neurovirtual Support Team.**

Those settings can be done via Control Panel application from used computer. Once open the application, verify that the view is in *Large Icons* to access the features described.

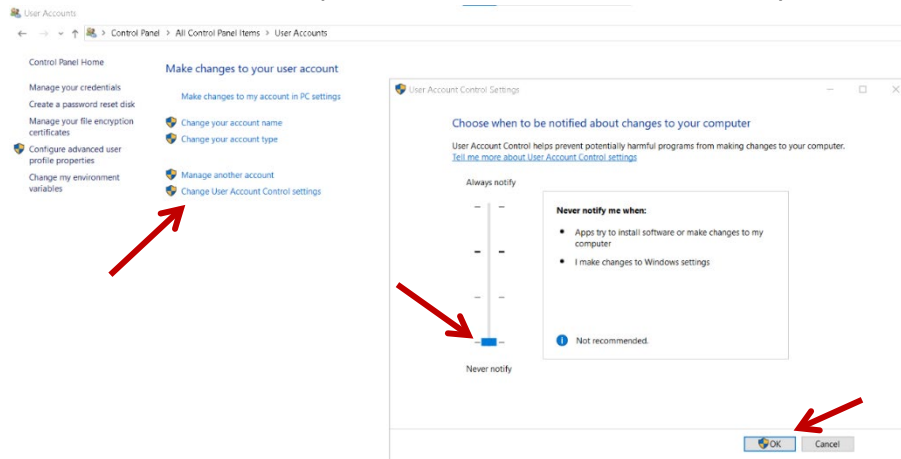


4.4.1. General Settings

4.4.1.1. User Account



Click on *User accounts*, then click on the option *Change User Account Control settings* listed. From the new window, drop the bar to its lowest level. Finally click on *OK*.

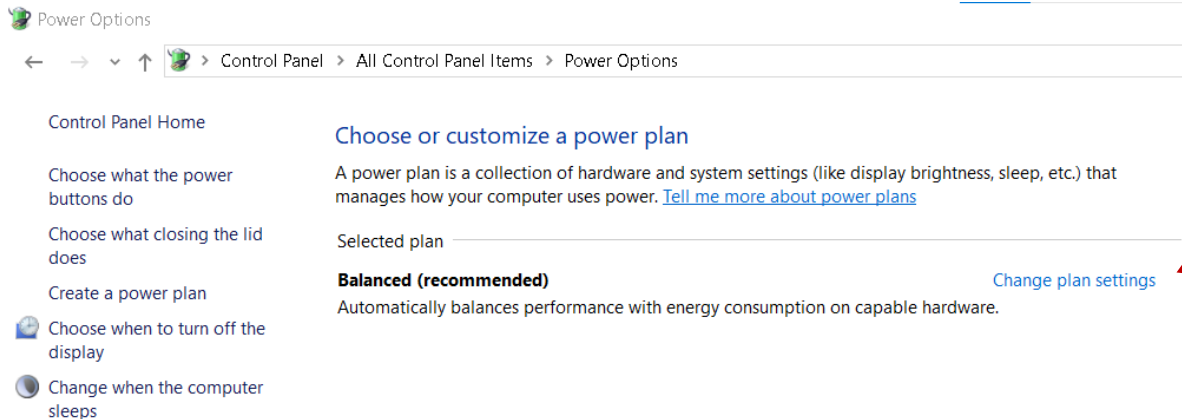




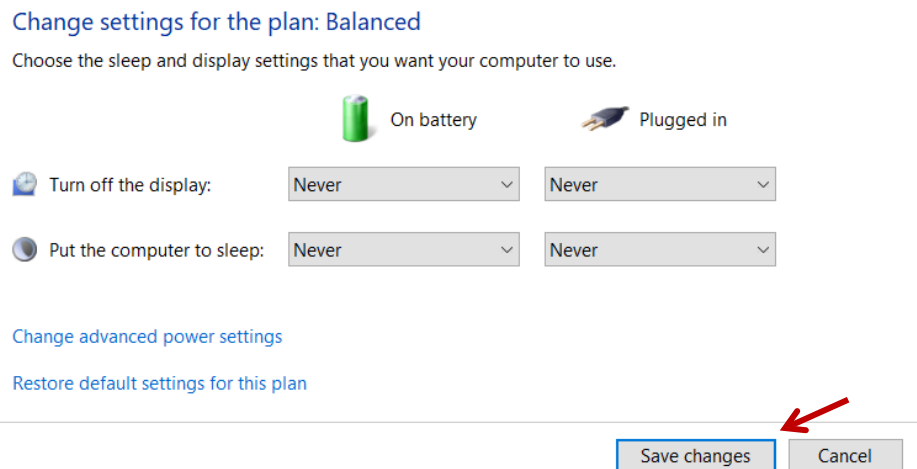
4.4.1.2. Power Options



It is recommended to use the Balanced default plan, but it can be selected any other. Click on *Change plan settings* for selectable plan.



On the new window, change all the boxes to Never. This will prevent the computer from slowing down performance or going into hibernation during long studies. After the changes have been made, click on *Save changes* button.



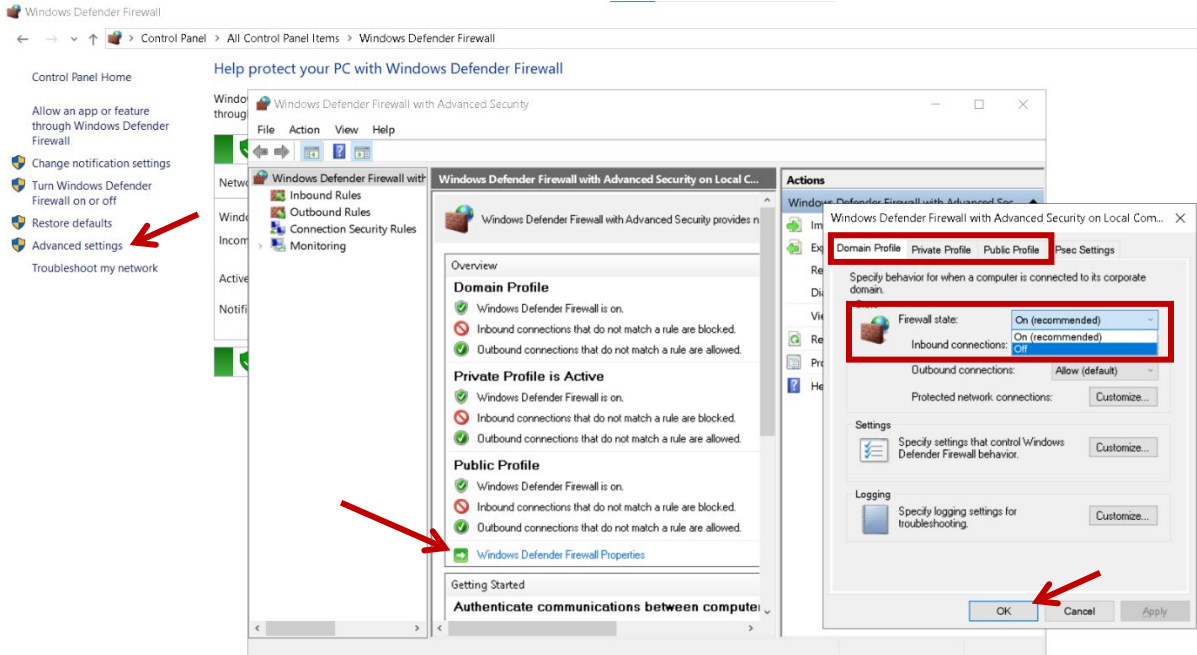
4.4.1.3. Windows Defender Firewall



It is recommended to disable allocated firewall to avoid restrictions due network connections (this depends on the physical connections the installation has implemented). Click on *Advanced settings* located on the left list of the window. A new pop-up window will show. Click on *Windows Defender Firewall Properties*, then on the new pop-up



window, locate the *Firewall Status* option and change it from On to Off. This action can be done in any or all the three profiles from the Firewall section (Domain Profile, Private Profile and Public Profile). When finishing selecting under user preferences, click *OK* and close all windows.

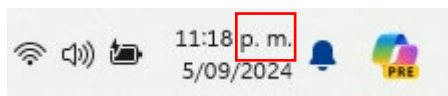


4.4.1.4. Date and Time format

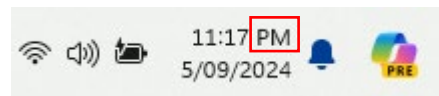


Date and Time

Confirm that the time format on your computer in the lower right corner of the Windows Toolbar is AM/PM, NOT a.m./p.m.

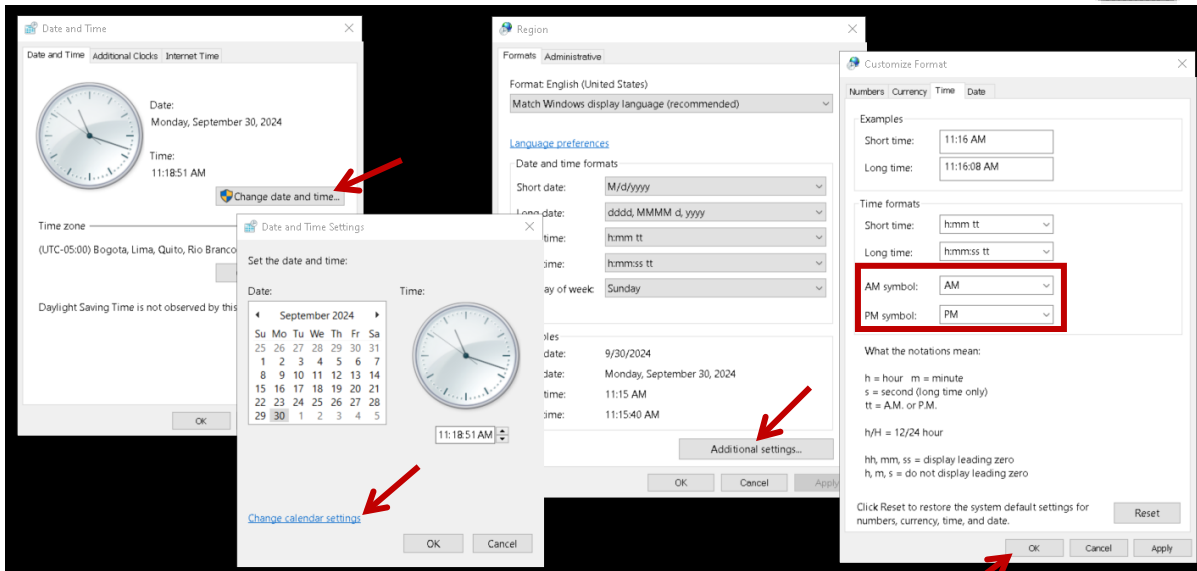


Wrong

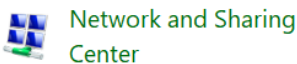


Correct

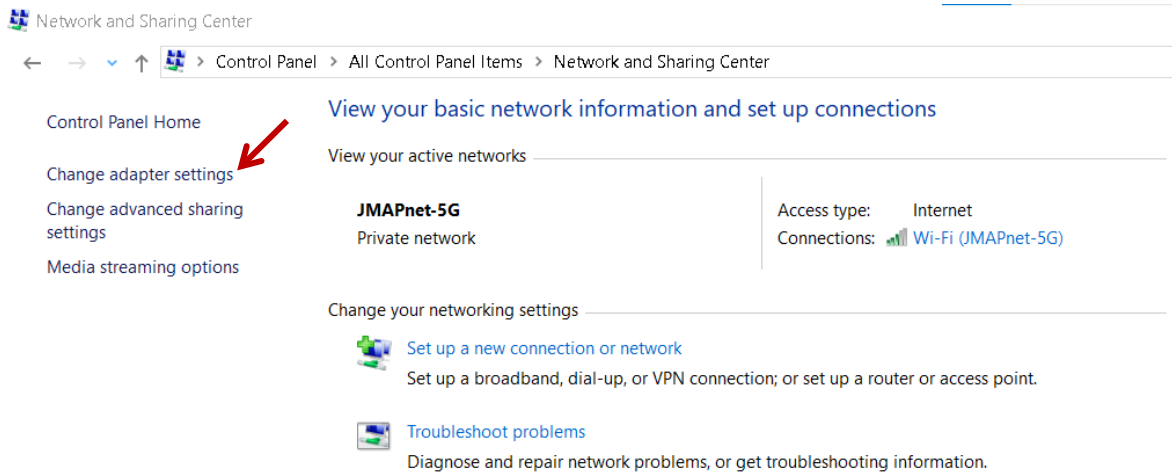
If the format is not the correct one, open *Date and Time* option, a new pop-up window shows. Click on *Change date and time...* button. On the new pop-up, click on *Change calendar settings*, then click on *Additional settings...* and on the latest pop-up window, locate the *Time* tab and change the AM and PM symbol to the correct format.



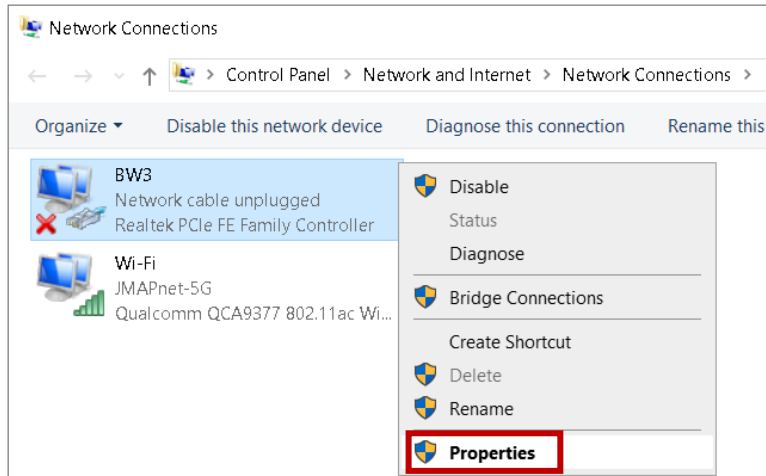
4.4.2. BW3 Family Amplifier Connection



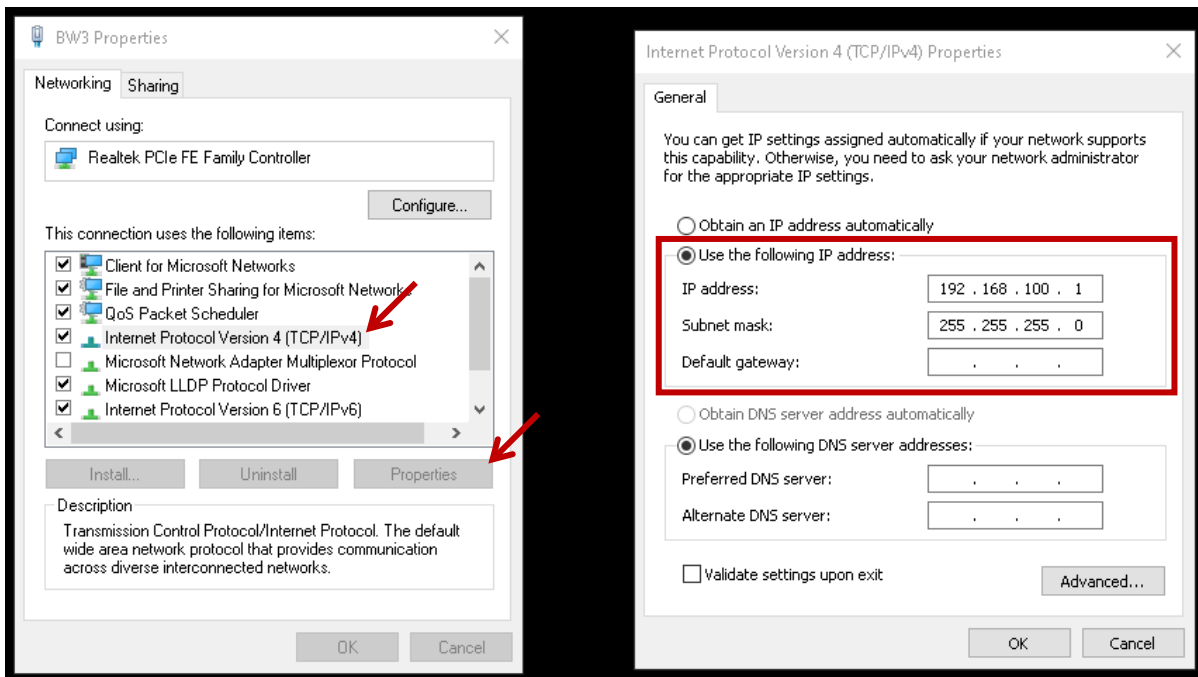
To establish connection for BW3 family amplifiers, it is required a connection to the computer with an ethernet cable (RJ45), and a fixed IP must be configured. To do this, open Network and Sharing Center settings, then click on *Change Adapter Settings*.



A new window will show the different network ports available. Identify the port assigned to the amplifier connection, it is recommended to *Rename* for easier identification. Do a right-click on the port and select *Properties* from the dropdown list options.



Identify the *Internet Protocol Version 4* option on the list, select it and click on *the Properties* button. On the new pop-up window, configure the IP as shown in the image. The IP is always 192.168.100.1. Click *OK* once it is set and *OK* again to close the two windows.



Check physical connections on the computer, as well as on the amplifier (the LEDs on the network port must be flashing) to remove the red X on the network port display.



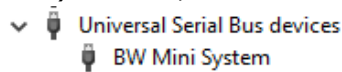
 **To assure connection of the amplifier, rename and assign IP for Camera and PAP devices, as well as avoid swapping physical connections.**

4.4.3. BWMini Family Amplifier Connection

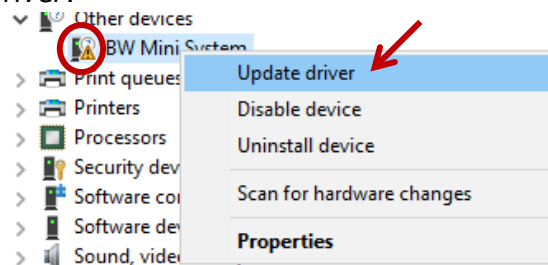
Device Manager

To establish connections for BWMini family amplifiers, it is required connection to the computer with a USB cable. For proper detection of those amplifiers, the Driver must be installed. To do this, open *Device Manager*.

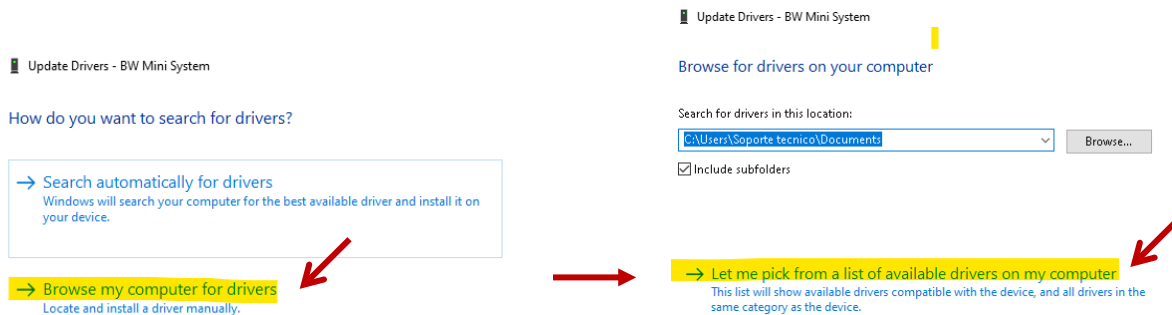
A new pop-up window will list the different types of devices. Search for BWMini System on Other Devices, libusb (WinUSB) devices, Universal Serial Bus devices, etc.



If the device BWMini System shows a warning sign (yellow triangle), do a right-click on it, then select *Update driver*.



A window will appear in which it must be chosen *Browse my computer for drivers...*, then click on *Let me pick from a list of available drivers on my computer*.

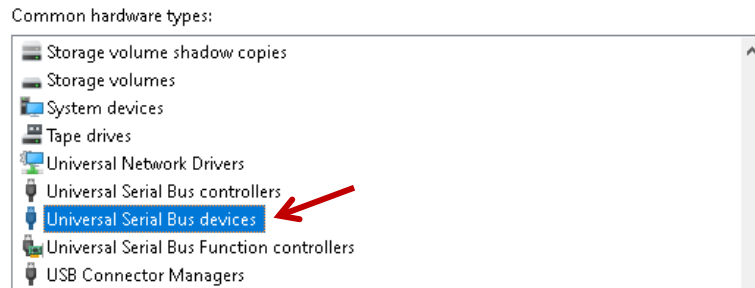


From the displayed list, select with double-click the option *Universal Serial Bus Device*.



Update Drivers - BW Mini System

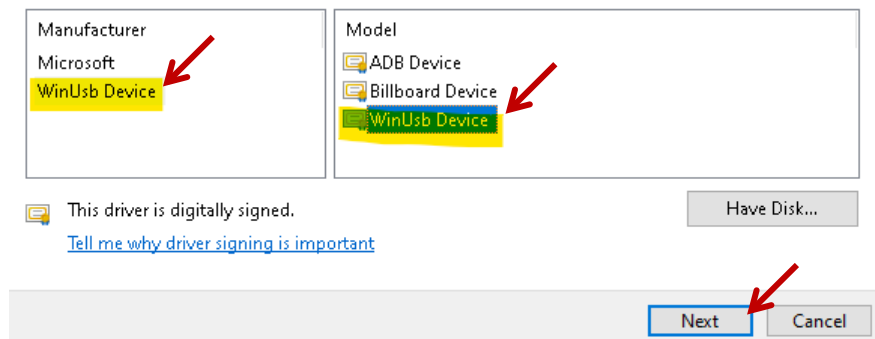
Select your device's type from the list below.



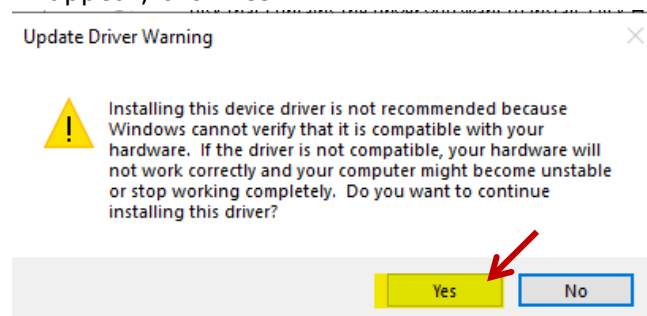
Select **WinUsb** Device on both Manufacturer and Model sections. Then click on *Next*.

Select the device driver you want to install for this hardware.

Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.



Following warning will appear, click Yes.



Then confirm that the device BWMini appears available.

If the icon shows gray out, unplug the USB cable from the computer, let the computer identifies the disconnection (by sound or wait for 10 seconds), then reconnect to reestablish the identification and new driver installation.



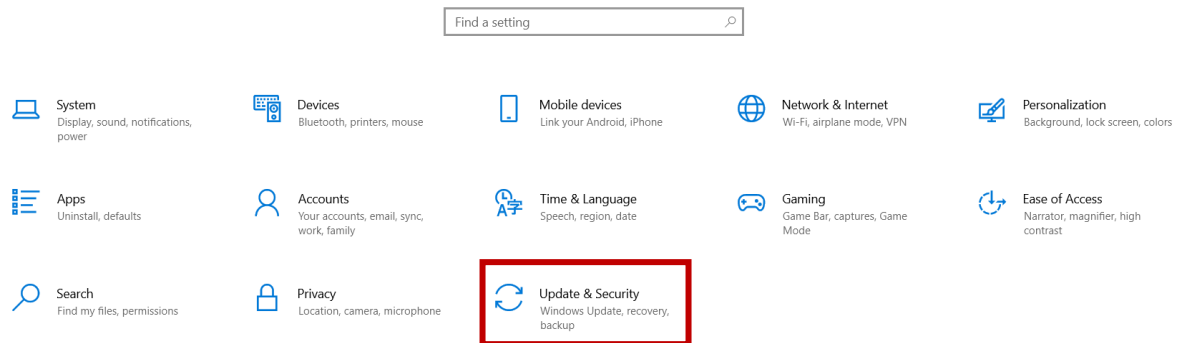
- > Keyboards
- ▼ libusb (WinUSB) devices
 - ⊙ BWMini System
- > Mice and other pointing devices
- > Monitors

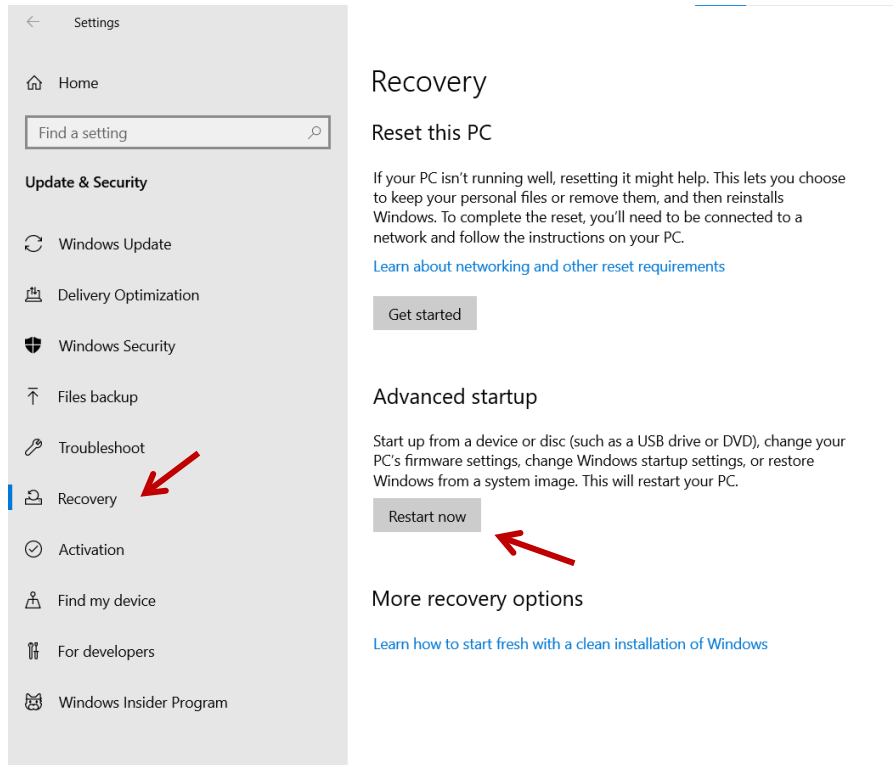


If the icon shows a circle with a question mark icon, Windows Signature is required to disable.

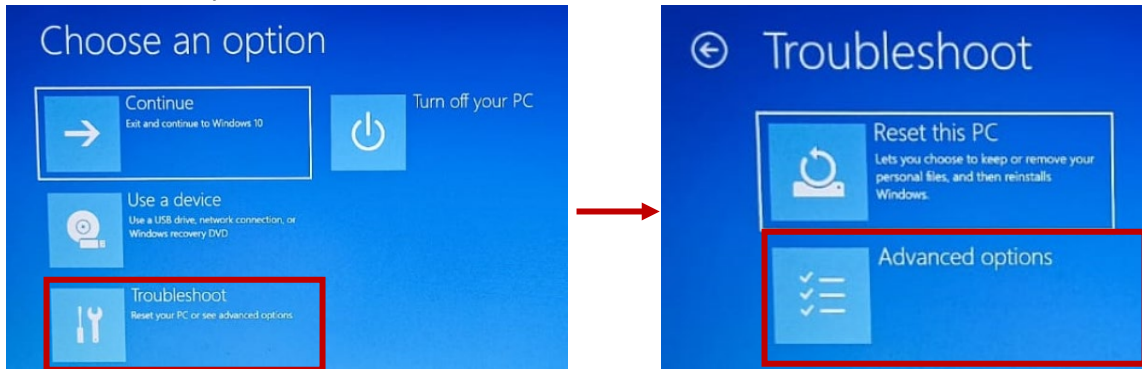
- > Keyboards
- ▼ libusb (WinUSB) devices
 - ⊙ BWMini System
- > Mice and other pointing devices
- > Monitors

To start the process, open Windows settings and select *Update & Security* option. Then select *Recovery* options on the left of the list. Click on *Restart now* button from Advanced startup section.

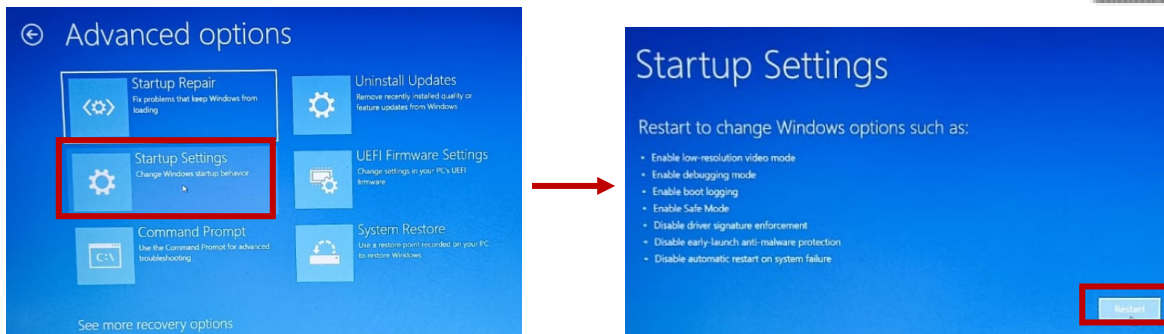




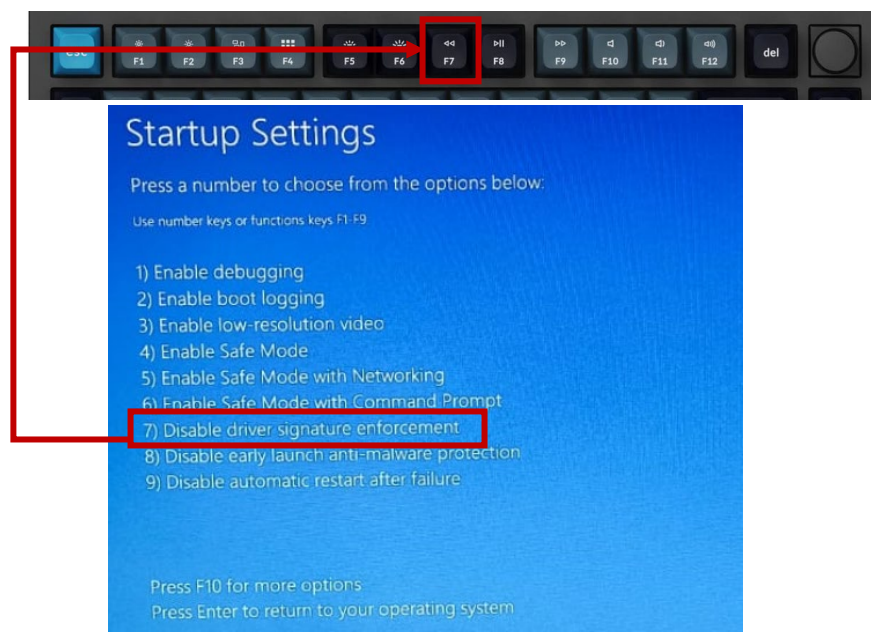
The computer will start the Advance restart (guided by blue screens appearance). Finish the process without forcing the computer to restart or shut down. Once the Blue Screen appearance shows, it will start with the section *Choose an option*. Click or move with the arrow keys and select *Troubleshoot*. On the new blue screen select *Advance options*.



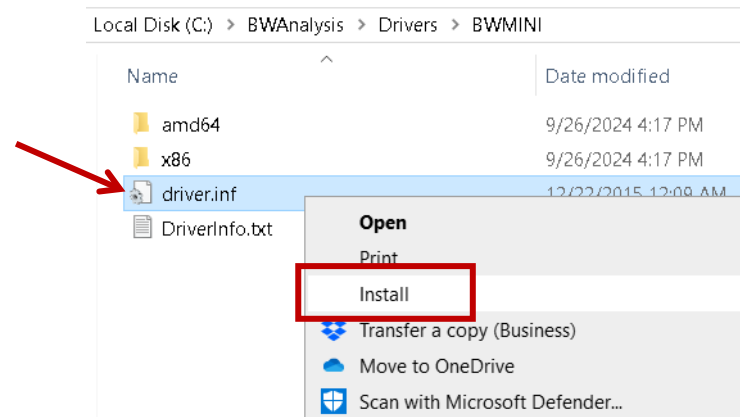
On the blue screen select the option *Startup Settings*. Then click on the button *Restart*.



The screen might show black as the restart is being processed. Wait for a couple of minutes until the blue screen appears again with a numeric list option. From the keyboard, press once the F7 key. Then leave the computer to finish the restart process on its own.



Once the computer is on, navigate to the folder BWAnalysis, then Drivers folder, then BWMINI folder. Do a right-click on the file driver and select the *Install* option. Accepts the installation. A confirmation message should appear. Otherwise, try again.



Restart the USB connection and confirm that the device BWMini appears available.

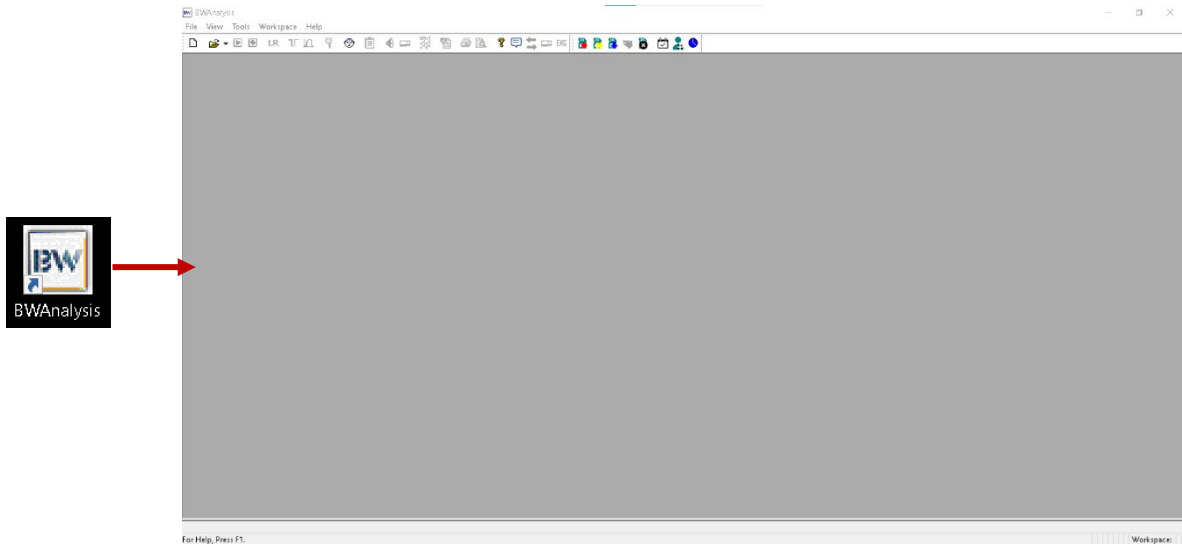


5. User Instructions

The BWAnalysis software is part of the electroencephalograph and polysomnography devices. The reception and revision regarding the exams will be registered through it. All the processes of reception and revision are integrated in a single program and the reception screen is the same used for the revision.

5.1. Knowing the BWAnalysis Screen

Click twice on the icon called BWAnalysis that is placed in your computer's working area. the main window will be shown as the following:

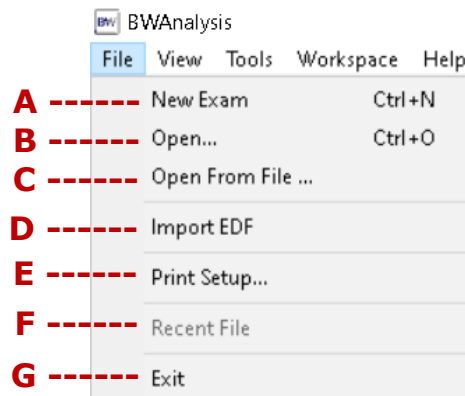


At the top, the ribbon, toolbar, and holter toolbar will be displayed. At the bottom, the status bar will be displayed.

5.1.1. Ribbon and Menus

The ribbon will allow you to perform various actions, from Licensing/Registering the software to viewing studies from other providers. Each word will display a list of options that will be explained below.

5.1.1.1. File Menu

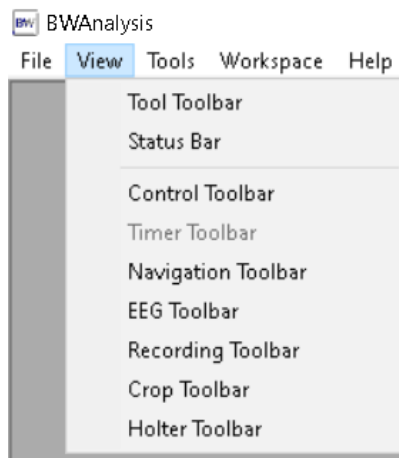




On the dropdown list displayed on *File* menu, the following options are displayed:

- A. New exam (or Control+N):** This option will give the possibility to create a new exam. *See item 8.1 on page 78*
- B. Open (or Control+O):** This option will open a window where all the created exams will be displayed. The list will reflect the studies saved on the Data folder path set (Default path will be C:\BWAnalysis\Data). For further details on the options shown on this window, *see item 8.5 on page 85*
- C. Open from File:** This option will allow you to choose the study of a folder other than the default one (Data). A Windows explorer window will open to allow the search for the study on the precise location (could be Desktop, Downloads, Pendrive, Shared Folders or Folders of a cloud), without having to relocate the files in the Data folder.
- D. Import EDF:** This option will make it possible to convert an exam in EDF format, into a *.egg* or *.psg* file which are the formats of Neurovirtual exams. Therefore, it will be possible to visualize, review, score and generate reports of other brands format from BWAnalysis software.
- E. Configure Printer:** This option will help to configure a real (physical direct or network connection) or virtual printer (*.pdf* or others) to later print the screens required.
- F. Recent File:** This option will show the last four (4) exams that were opened for reading/scoring and that were closed, making access quicker with only two clicks (file-study to be opened).
- G. Exit:** With this option current BWAnalysis window will close, finishing all processes from the software.

5.1.1.2. View Menu

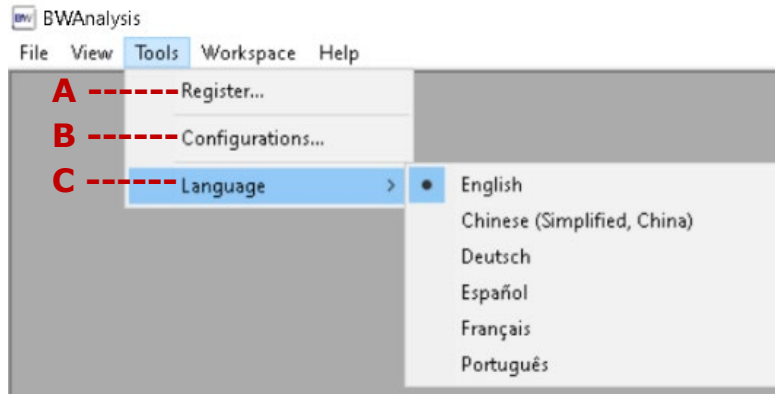


On the dropdown list displayed on *View* menu, shows the different toolbars that can be selected to display on the main window. Some of the tools on the toolbars might see disable until a new study is created for its correct use.

Note that when canceling one of the options, the respective bar will be hidden. If it's needed to see it again, do the same thing and click on the option to be shown.



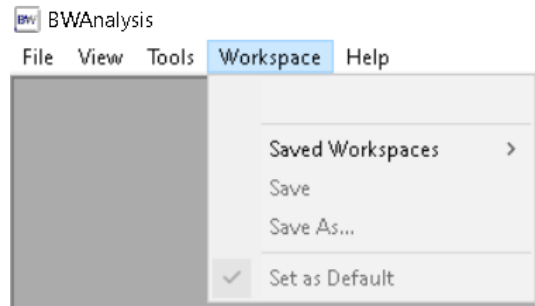
5.1.1.3. Tool Menu



On the dropdown list displayed on *Tools* menu, the following options are displayed:

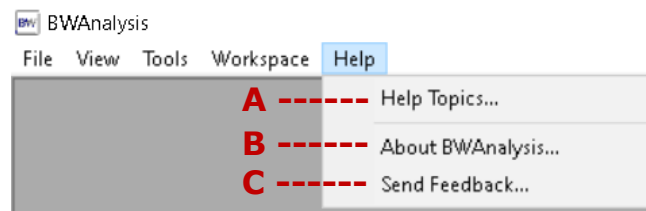
- A. Register:** This option allows to register the license of the software as required. *See item 4.3 on page 22.*
- B. Configurations:** This option will display all configurations that can be done depending on the amplifier and the type of study that will be recorded or reviewed. *See item 6 on page 38.*
- C. Language:** This option allows to modify the displayed language of the main window and tools integrated. By selecting the preferred language, the change was requested. To see the modification, the software must be restarted.

5.1.1.4. Workspace Menu



On the dropdown list displayed on *Workspace* menu, it is shown all options related to the saved workspaces that will save the sizes, toolbars selected and others. All options are disabled and will be available when opening a new study.

5.1.1.5. Help Menu



On the dropdown list displayed on *Help* menu, the following options are displayed:

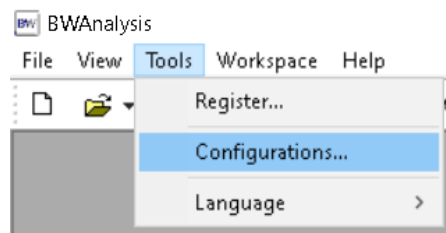
- A. Help Topics:** This option will display the BWAnalysis Software Manual in PDF format.



- B. About BWAnalysis:** This option will display the current version of the software used.
- C. Send Feedback:** This option will open a new window to send any Feedback in regards the software. Be aware that internet connection will be required for this feedback to be sent.

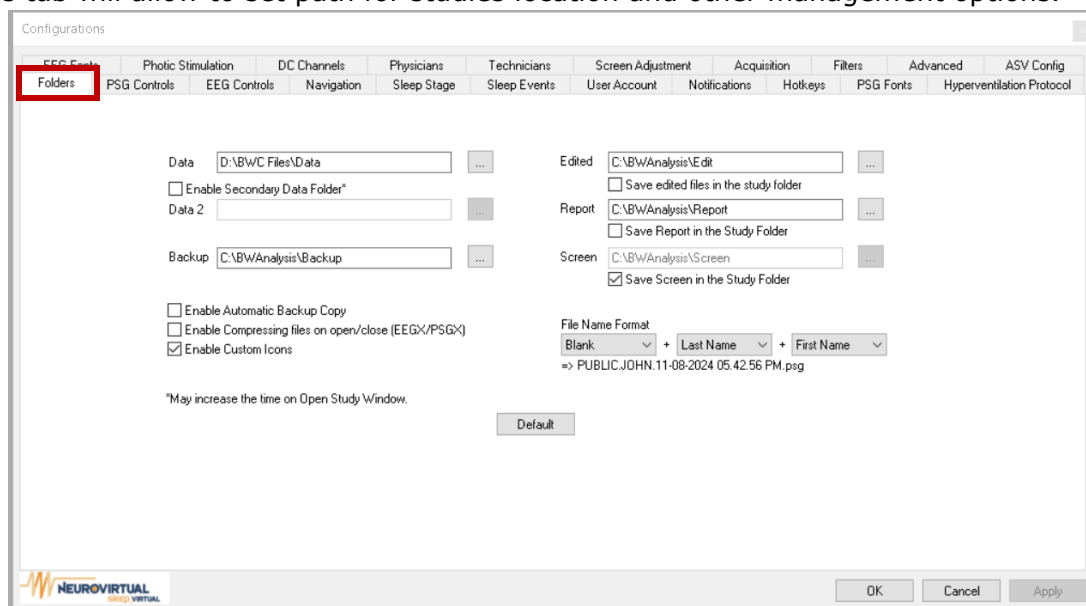
6. Configurations

To access all configurable settings, open the Tool dropdown list and select the option Configurations. Be aware that all following described options, are enabled on this dropdown list while no study is opened. If amplifier list shows, select the one to be used.



6.1. Folders

This tab will allow to set path for studies location and other management options.



6.1.1. Data

The Data folder will be the one that contains the studies performed on the patient. The default location is *C:\BWAnalysis\Data*. A second Data folder can be enabled for the visualization of the studies contained in it, directly in the BWAnalysis patient list.

6.1.2. Backup

The Backup folder can be set to save a copy (done manual or automatically) of the studies, in case you need to recover lost files



6.1.3. Edited

The Edited folder will contain all the created edit or cropped studies. The default location is *C:\BWAnalysis\Edit*. It can be set to save those in the same study folder to keep the files linked.

6.1.4. Report

The Report folder will contain all generated reports from all patients. The default location is *C:\BWAnalysis\Report*. It can be set to save those in the same study folder to keep the files linked.

6.1.5. Screen

The Screen folder will contain all screenshots saved from all patients. The default location is: *C:\BWAnalysis\Screen*. It can be set to save those in the same study folder to keep the files linked.

6.1.6. Folder Options

6.1.6.1. Enable Automatic Backup Copy

By enabling this option, an automatic copy of the exam recorded will be created on the Backup folder path set. The folder can be local, shared, cloud, external disk, etc. This copy will be created once the study is closed.

6.1.6.2. Enable Compressing files on open/close (EEGX/PSGX)

By enabling this option, the exam will be automatically compressed right when the study closes. It will be in PSGX or EEGX format depending on the type of exam.

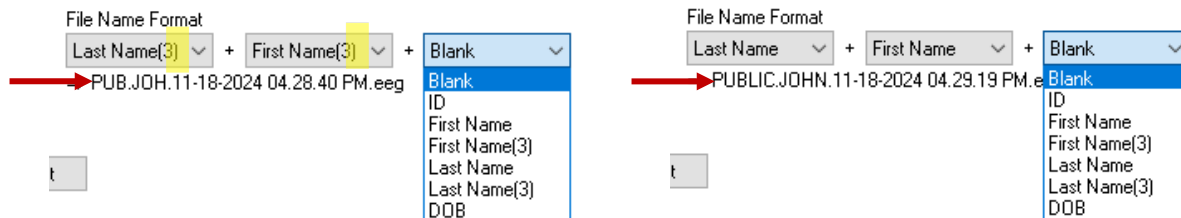
6.1.6.3. Enable Custom Icons

By enabling this option, the folder icon in the Data folder will have a distinctive circle in its right bottom corner, based on the status of the exam.

6.1.6.4. File Name Format

In this section, the user can modify the name of the study files based on the patient information, such as ID, FirstName, LastName and DOB.

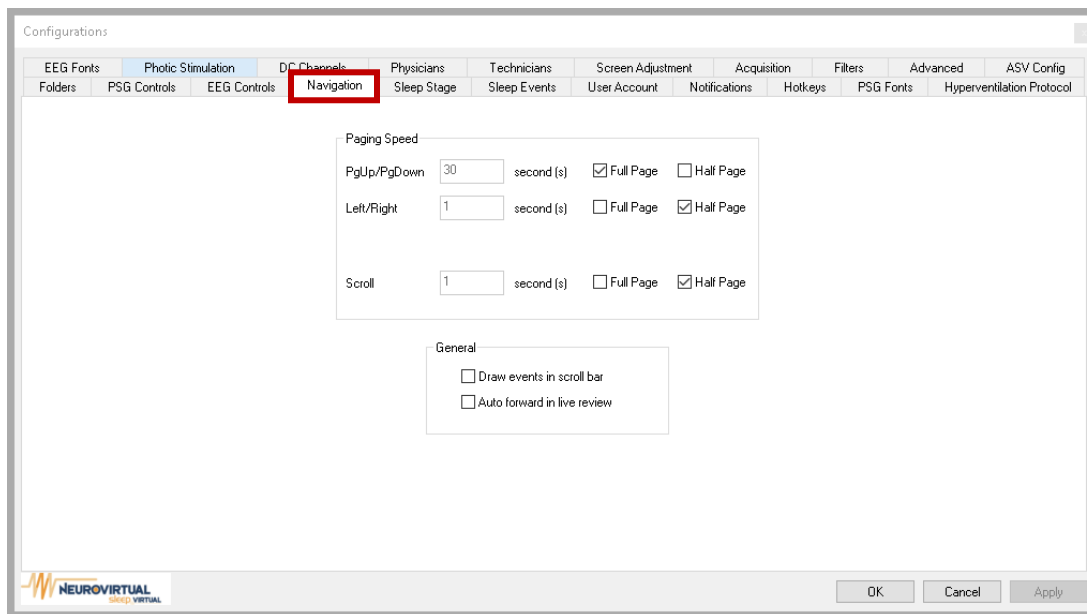
By selecting the Option with (3) on its name, it will save the first 3 letters of the selected option. Following you can find an example with a patient named John Public:





6.2. Navigation

This tab will allow to configurate the paging speed and scroll bar display for all studies.



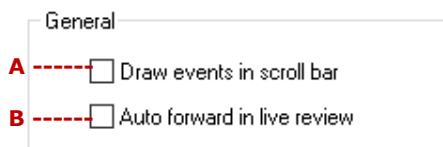
6.2.1. Paging Speed

This option defines Speed and assigns option to move the study. It can be done with:

- Page Up/ Page down keys from the keyboard.
- Right and Left arrow keys from the keyboard.
- Mouse Knob / Scroll.

The speed can be set for each of the previous options with a speed in seconds, Full Page movement or Half Page.

6.2.2. General



A. Draw events in scroll bar: By enabling this option, all sleep events scored in the studies will be seen in the scroll bar with its defined colors. Example:

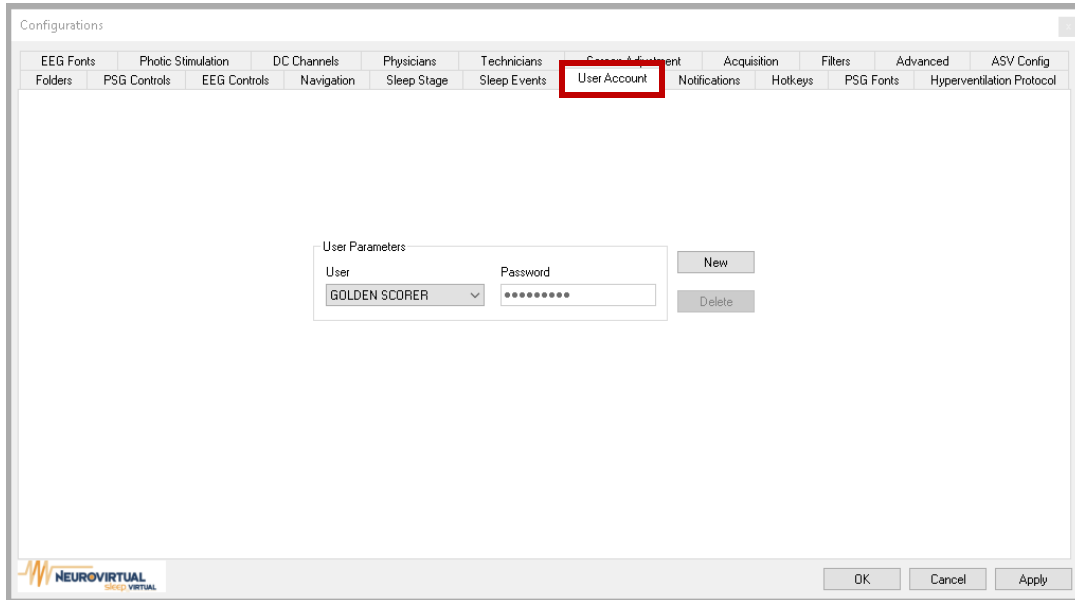


B. Auto forward in live review: By enabling this option, automatic navigation will be activated in LR for all recording studies.



6.3. User Account

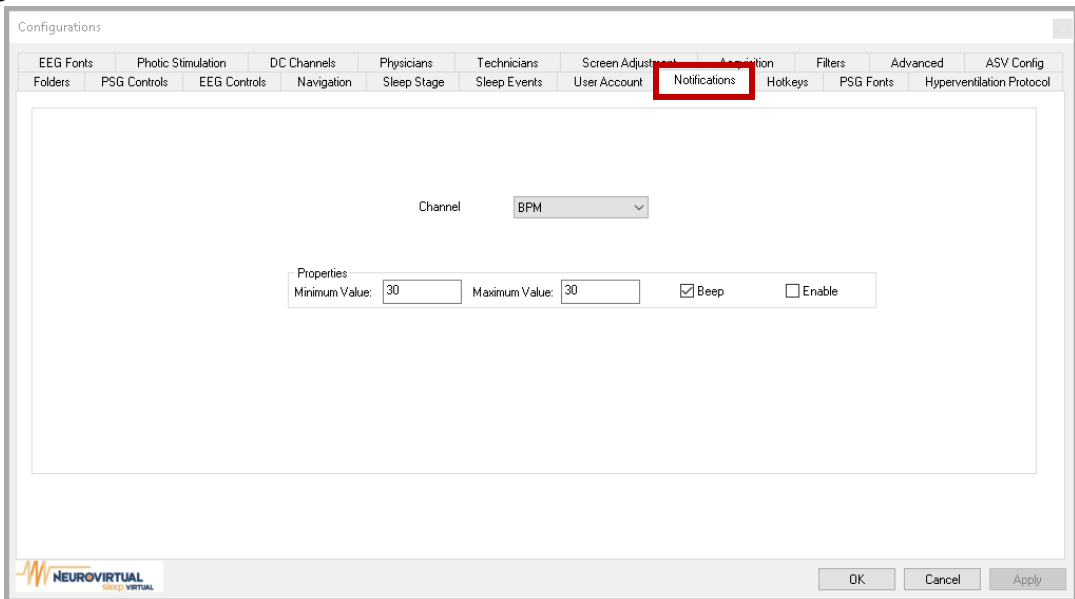
This tab will allow user accounts for Interscore. *See item 8.9.8 on page 141*



This option is available only to Authorized personnel, as it requires a password to log in. To create a new user, select the New button, then assigned the username and password. Click on Save to save the changes. If the user needs to be deleted, you can select the user from the dropdown menu and click the Delete button.

6.4. Notifications

This tab will allow us to configure visual and audible notifications when meeting the range.



To enable this option, it is required to select one of the configured channels (BPM, SpO2, DC1, DC2, DC3, DC4, DC5, DC6, DC7, OR DC8), then set a minimum and maximum value and check the box named *Enable*, this will only show a window notification. When the value is registered out of the range, it will open a window with



the details of the notification. To enable audible notification, check the box named Beep.

6.5. Physicians

This tab will allow to set a list of Physicians to be selected on Patient Information.

The screenshot shows the 'Configurations' window with the 'Physicians' tab selected. The 'Name:' field is empty. The list of names includes John Smith, MD, Carlos Gomez, MD, and Ismal Kingston, MD. The buttons 'Insert', 'Insert Before', 'Update', 'Delete', and 'Delete All' are visible on the right side of the list. The NeuroVirtual logo is at the bottom left, and 'OK', 'Cancel', and 'Apply' buttons are at the bottom right.

To set a Physician name, type the name in the blank field. Then click on the *Insert* button. If you want to update or delete any of the names, click the name on the list, then click on the button for the required action.

6.6. Technicians

This tab will allow to set a list of Technicians to be selected on Patient Information.

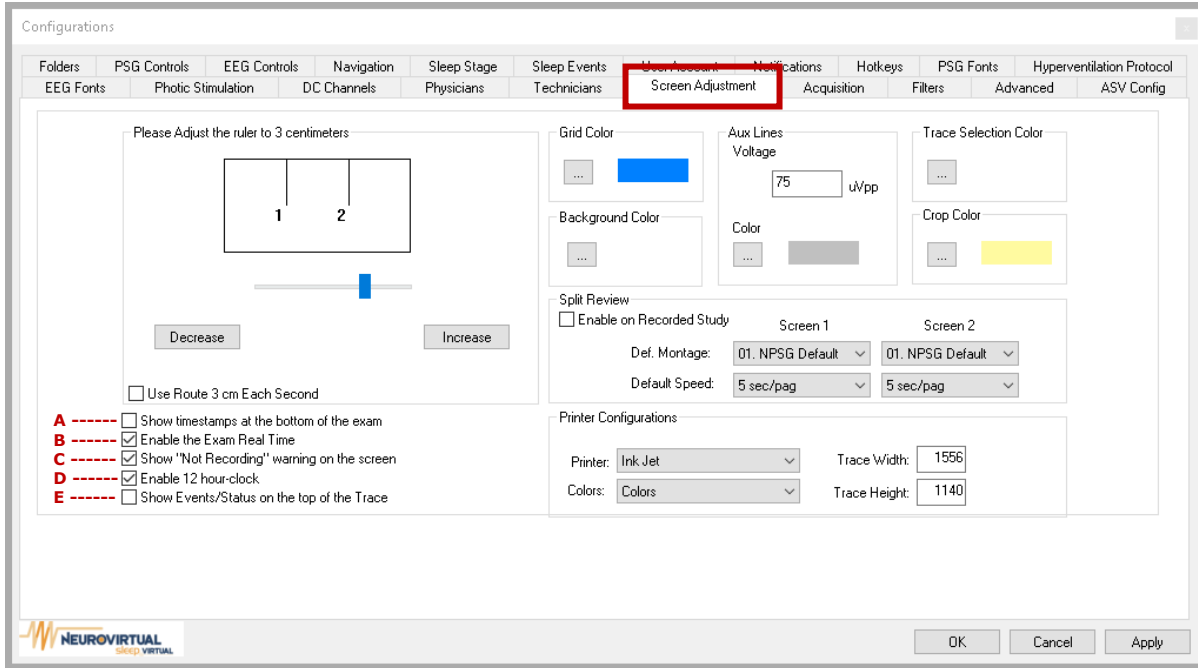
The screenshot shows the 'Configurations' window with the 'Technicians' tab selected. The 'Name:' field is empty. The list of names includes Susan Ajagbe, RRT and Tamara Nevill, RRT. The buttons 'Insert', 'Insert Before', 'Update', 'Delete', and 'Delete All' are visible on the right side of the list. The NeuroVirtual logo is at the bottom left, and 'OK', 'Cancel', and 'Apply' buttons are at the bottom right.

To set a Technician name, type the name in the blank field. Then click on the *Insert* button. If you want to update or delete any of the names, click the name on the list, then click on the button for the required action.



6.7. Screen Adjustment

This tab will allow to set default screen settings to display for all studies.



6.7.1. Please Adjust the ruler to 3 centimeters

This option allows the user to calibrate the screen to match 3 physical centimeters of the screen to show the trace with this measure. To enable it, check the box *Use Route 3cm Each Second*.

6.7.2. Grid Color

Use the ... button to change the color of the Grid.

6.7.3. Background Color

Use the ... button to change the color of the Background of the trace.

6.7.4. Aux Lines

This option allows the user to set a default Voltage in uVpp that will display as reference for on linked channels. Example:



Use the ... button to change the color of the Auxiliar Lines.

6.7.5. Trace Selection Color

Use the ... button to change the color of the Selected trace.

6.7.6. Crop Color

Use the ... button to change the color of the Cropped selected trace.



6.7.7. Split Review

Use this option to configure a horizontal Split Screen View while reviewing studies, in which each section will display different montages with different speeds each. Use the dropdown list to set the desired montage and speed for each screen. Example:

Split Review

Enable on Recorded Study

	Screen 1	Screen 2
Def. Montage:	EEG SS	NPSG Default SS
Default Speed:	30 sec/pag	120 sec/pag

By enabling this option, the default view will always be the Split Review with selected montages.

6.7.8. Printer Configurations

Use this option to configure the Printer, Color and Trace dimensions when printing.

6.7.9. Others

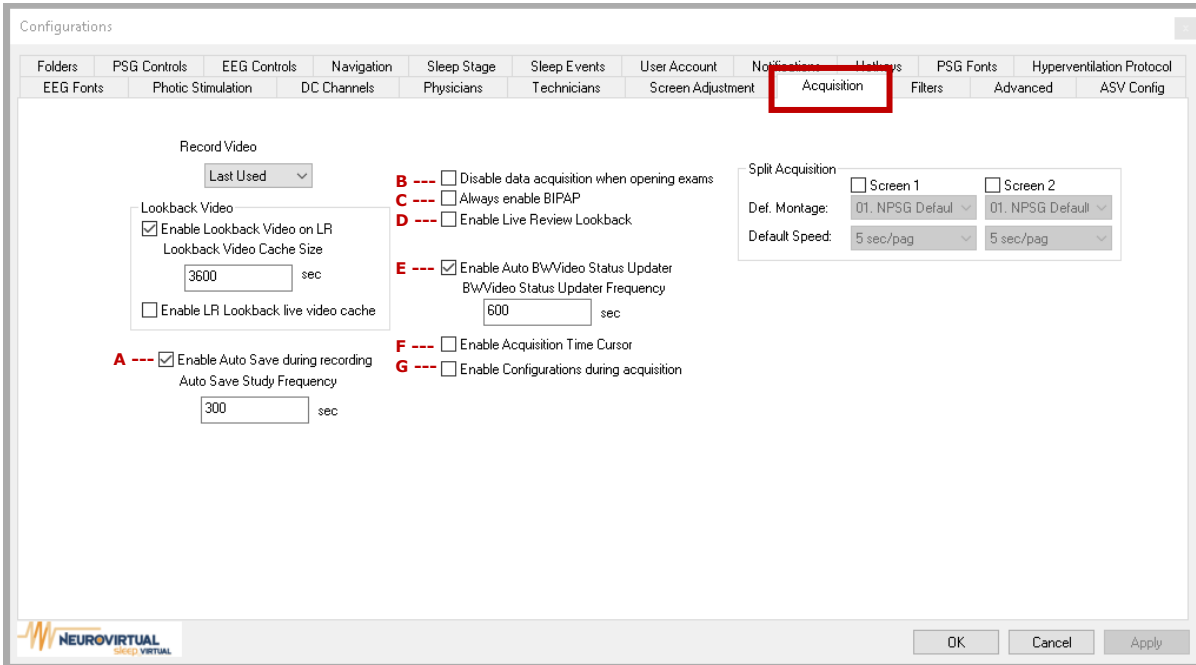
- A. Show timestamps at the bottom of the exam:** By enabling this option, the time of the exam will no longer appear at the top of the trace, but at the bottom.
- B. Enable the Exam Real Time:** By enabling this option, the real time of the recording (08:45:35 PM) will be displayed. If disabled, the Recording time will be the one displayed (00:00:00).
- C. Show "Not Recording" warning on the screen:** By enabling this option, a candy bar pattern will appear when you are acquiring but not recording/saving data. When disabled, the candy bar pattern will not be visible. Example: Enable vs Disable



- D. Enable 12 hour-clock:** By enabling this option, the time of the trace will show as 12 hours format, (6:00 PM). When disabled, the trace time will show 24 hours format (18:00).
- E. Show Events/Status on the top of the Trace:** By enabling this option, the events and status of the exam will no longer appear at the bottom of the trace, but at the top.

6.8. Acquisition

This tab will allow to set the configurations for Acquisition of all studies.



6.8.1. Record Video

Use the dropdown menu to set the default use of video. This can be Always, which will always record with video. Never, which will require the user to enable manually if needed or Last Use, that will save the last selection for previous study recorded.

6.8.2. Lookback Video

By enabling the *Enable Lookback Video in LR* option, it will allow to open a second Video window that will display the video recorded when opening the Live Review option. Set up the length of recording for each video with the *Lookback Video Cache Size* option. The videos within the last x seconds set will not be able to view, unless the *Enable LR Lookback live video cache* option is checked.

6.8.3. Split Acquisition

Use this option to configurate a horizontal Split Screen View, while recording of studies, in which each section will display different montages with different speeds each. Use the dropdown list to set the desired montage and speed for each screen. Example:



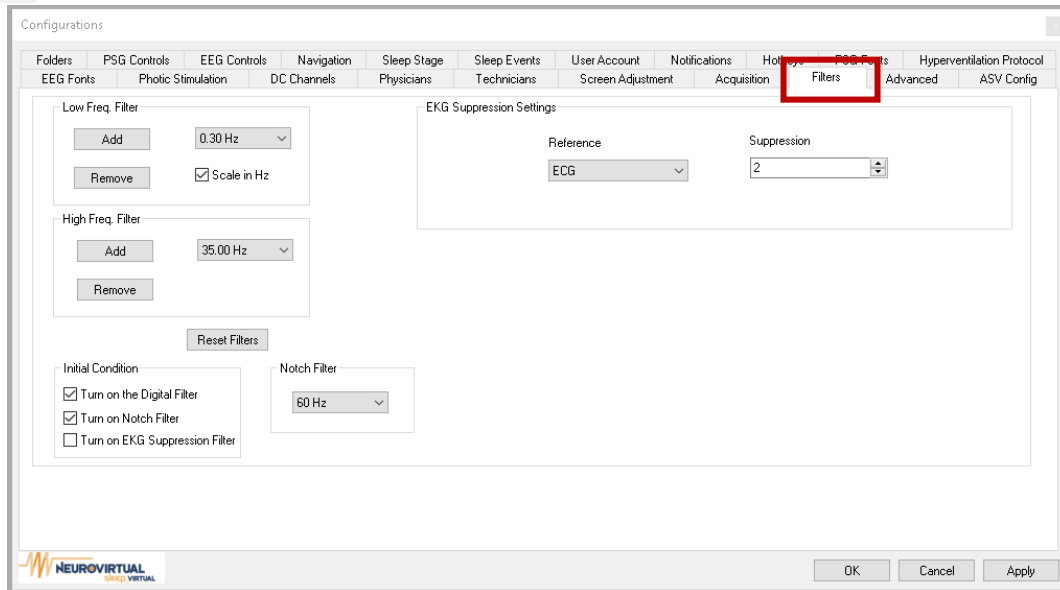
Split Acquisition	<input checked="" type="checkbox"/> Screen 1	<input checked="" type="checkbox"/> Screen 2
Def. Montage:	EEG SS	05. BIPAP Default
Default Speed:	30 sec/pag	120 sec/pag

6.8.4. Others

- A. Enable Auto Save during recording:** By enabling this option, the software will be saving automatically a short cache of the trace, avoiding loose of data when sudden shut down or crash presents. This frequency can be set with a value in seconds on the *AutoSave Study Frequency* option.
- B. Disable data acquisition when opening exams:** By enabling this option, recorded studies will no longer be available to continue recording after those are closed for the first time.
- C. Always enable BPAP:** By enabling this option, all studies will start with BPAP enabled automatically.
- D. Enable Live Review Lookback:** By enabling this option, once the Live Review option is selected, the recorded trace will show in full screen. When disabled, the screen will be vertically divided with the left screen showing the review and right screen showing the acquisition.
- E. Enable Auto BWVideo Status Updates:** By enabling this option, a Status frequency will be checked to confirm the correct recording of the Video. This frequency can be set with a value in seconds on the *BWVideo Status Updater Frequency* option.
- F. Enable Acquisition Time Cursor:** By enabling this option, a vertical line will move with the plot of the trace.
- G. Enable Configuration during acquisition:** By enabling this option, the Configuration windows will be accessible. Otherwise, the recording will be needed to stop and run the changes before restarting the recording. **Note:** some settings might require software restart to run correctly.

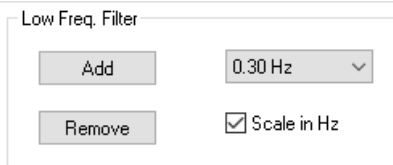
6.9. Filters

This tab will allow us to set Filter default settings for all studies.



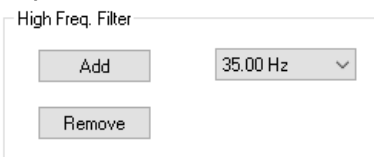
6.9.1. Low Freq Filter

Use this option to set the default Low-frequency filter that will be applied to all studies, by selecting the value from the dropdown menu. In addition, the user can add or remove any filter from the one listed.

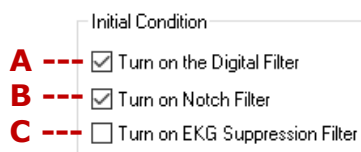


6.9.2. High Freq Filter

Use this option to set the default High-frequency filter that will be applied to all studies, by selecting the value from the dropdown menu. In addition, the user can add or remove any filter from the one listed.



6.9.3. Initial Condition



A. Turn on the Digital Filter: By enabling this option, the software will open as default all studies with the Digital Filters enabled.

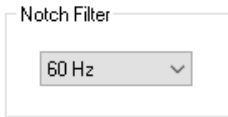
B. Turn on Notch Filter: By enabling this option, the software will open as default all studies with the Notch Filters enabled.



C. Turn on EKG Suppression Filter: By enabling this option, the software will open by default all the studies with the EKG Filters enabled.

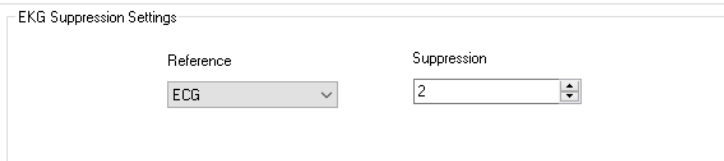
6.9.4. Notch Filter

Use this option to set by default the type of notch to be applied for all studies (between 50Hz and 60Hz).



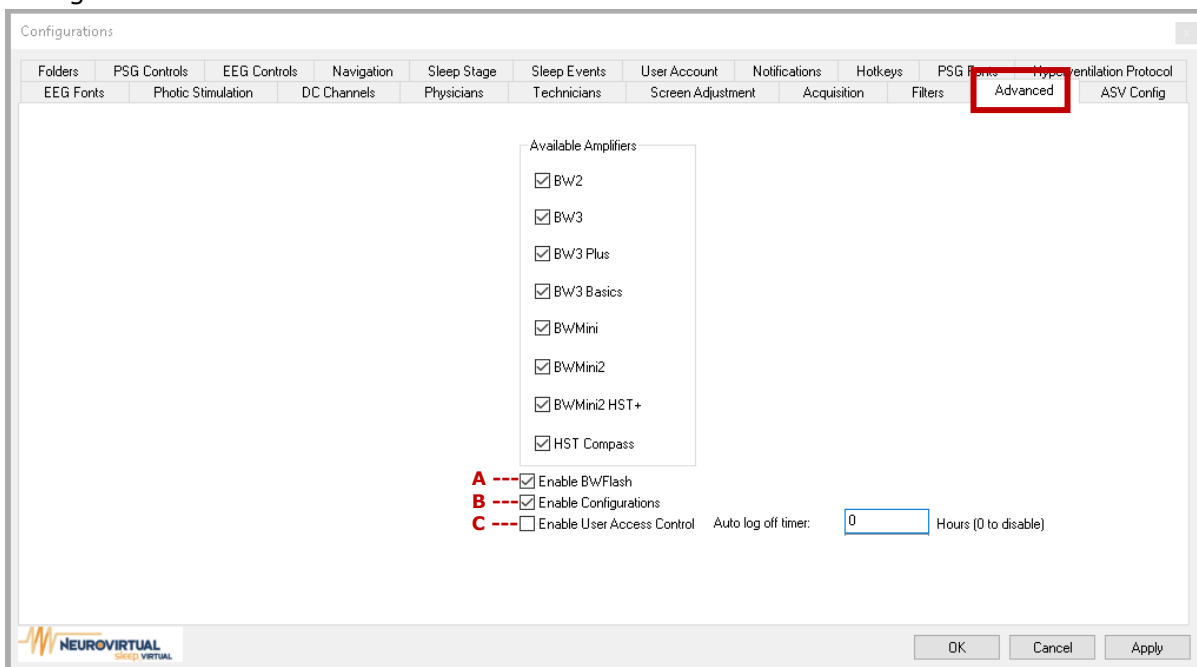
6.9.5. EKG Suppression Settings

Use this option to set by default the channel, from the dropdown menu, in which the software will select the EKG register for the EKG suppression application. Select the level of suppression from 1 to 10 depending on the intensity of the interference registered.



6.10. Advanced

This tab will allow to set the required amplifiers to be used, as well as other advance configurations.



6.10.1. Available Amplifiers

This option is available only to Authorized personnel, as it requires a password to log in. The list of the amplifiers will be available for selection to add or remove any that was



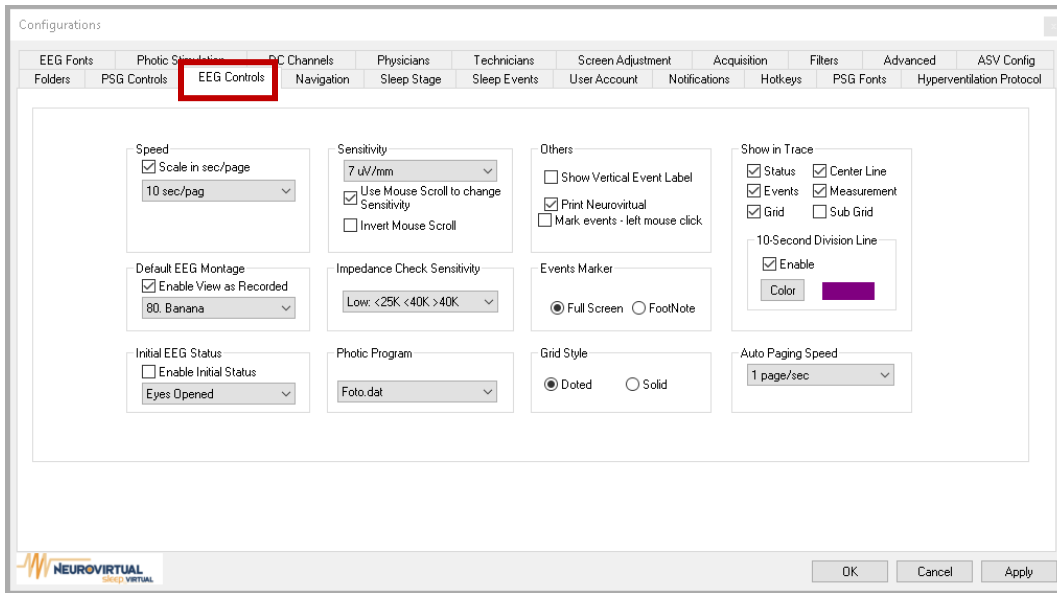
newly acquired or no longer to be used.

6.10.2. Others

- A. Enable BWFlash:** By enabling this option, the software will allow the use of the BWFlash device on the selected amplifiers.
- B. Enable Configurations:** By enabling this option, the configurations window will not be accessible from any of the dropdown menus.
- C. Enable User Access Control:** By enabling this option, the software will require a user and password to access the software, as well an automatic logoff timer due to inactivity, *see item 8.6 on page 88*. Set the time in hours from the field on the right. If left in 0 with this option enabled, it will only ask the user for the user and password to access.

6.11. EEG Controls

This tab will allow us to set configurations that will apply to all EEG studies for record, score or review.



6.11.1. Speed

Use this option to set, from the dropdown menu, the default speed displayed in EEG exams. The value range goes from 120mm/s to 0.4mm/s. By enabling the option *Scale in sec/page* the paging scale will changed to sec/pag, displaying the concordant range from 2sec/pag to 600sec/pag.



6.11.2. Default Montage

Use this option to set, from the dropdown menu, the default montage to display on EEG



studies before or after recording. By enabling the option Enable View as Recorded, all studies open after recording will display the channels as it was recorded, saving the changes done by the technician while recording, such as sensibility, channels enable, colors, etc.

6.11.3. Initial EEG Status

By enabling this option, start the exam with an initial state of wakefulness, eyes open, etc. The default settings can be selected from the dropdown menu.

6.11.4. Sensibility

Use this option to set, from the dropdown menu, the default sensibility for linked channels in EEG studies setups. The value range goes from 1uV/mm to 1000uV/mm. Increase the sensibility by turning the mouse wheel up or decrease it by turning the mouse wheel down, enabling the *Use Mouse Scroll to change Sensibility* option. It can be reverse this sensibility changes by enabling the *Inverse Mouse Scroll* option.

6.11.5. Impedance Sensibility

Use this option to set, from the dropdown menu, the default impedance level of sensibility acceptance in regards the connection of the electrodes on the scalp. The range is divided on a traffic light scale, green = excellent, yellow = acceptable, red = rejected. The levels are divided in 4 level scales as High, Medium-High, Medium and Low.

6.11.6. Photic Program

Set a default photo stimulation protocol selected from the dropdown menu.



6.11.7. Others

Others

Show Vertical Event Label

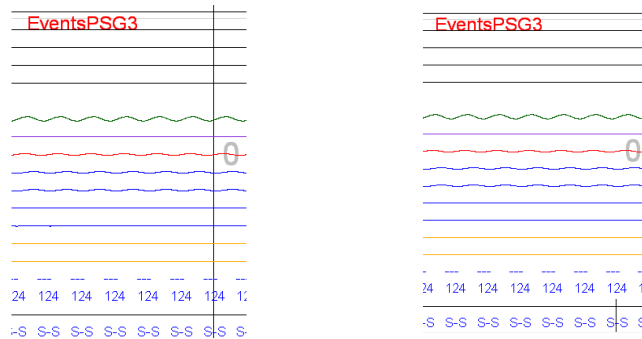
Print Neurovirtual

Mark events - left mouse click

- A. Show Vertical Event Label:** By enabling this option, it will display the event marked. These events include general events, tech events, montage changes, among others.
- B. Print Neurovirtual:** By enabling this option, the Neurovirtual logo will be displayed on the screenshots ribbon.
- C. Mark events – left mouse click:** By enabling this option, events will be marked with left click instead of right click.

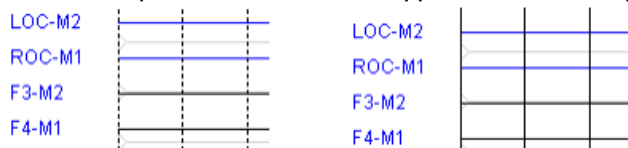
6.11.8. Event Marker

Use this option to select between a full vertical line marked on the trace that indicates an event was marked or to keep a shorted line at the bottom of the trace. Example: Full Screen vs Footnote



6.11.9. Grid Style

Use this option to select the type of line to display the Grid. Example: Doted vs Solid



6.11.10. Show in Trace

A ---

B -----



Show in Trace

Status Center Line

Events Measurement

Grid Sub Grid

10-Second Division Line

Enable

Color

- D. Show in Trace:** By enabling each of the individual options, the selected option will be visible on the trace, these include Status, Events, Grid, Center Line, Measurement and Sub Grid.
- E. 10 Second Division Line:** Use this option to set by default the color of a line that will divide the trace every 10 seconds.

6.11.11. Auto Paging Speed

Use this option to set, from the dropdown menu, the default auto-paging speed for automatic pagination of EEG studies. The value range goes from 1sec/page to 10sec/page.

Auto Paging Speed

1 page/sec ▼

6.12. EEG Fonts

This tab will allow to customize the size and color for Time, Event, Status, Periodic Display, Channels, and Tech Event Color on the EEG studies.

Configurations

EEG Fonts

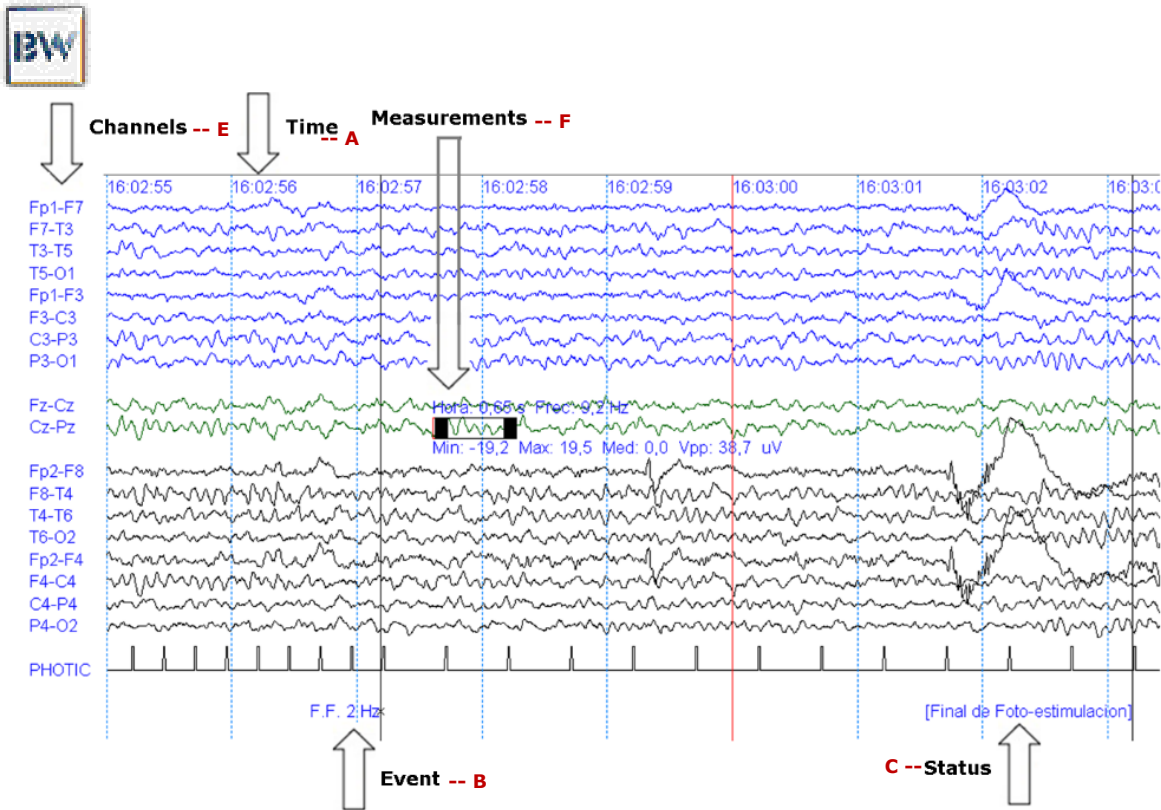
Please configure the font size and color of the items below:

	Size	Color		Color
A -----Time	13	Color	G -----Color Tech Events	Color
B -----Event	13	Color		
C -----Status	13	Color		
D -----Periodic Display	13	Color		
E -----Channels	13	Color		
F -----Measurements	13	Color		

NEUROVIRTUAL sleep VIRTUAL

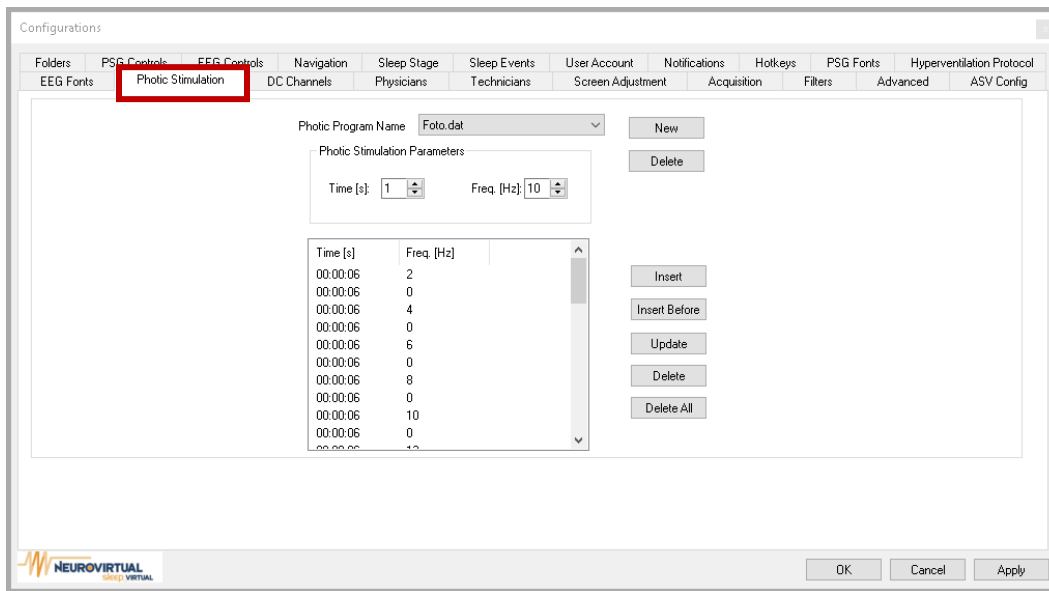
OK Cancel Apply

To set the size of the items, change the Size column field to the desired size. To set the color, click on the Color button and select from the displayed table. Example:



6.13. Photoc Stimulation

This tab will allow to customize the Photo stimulation Protocols.

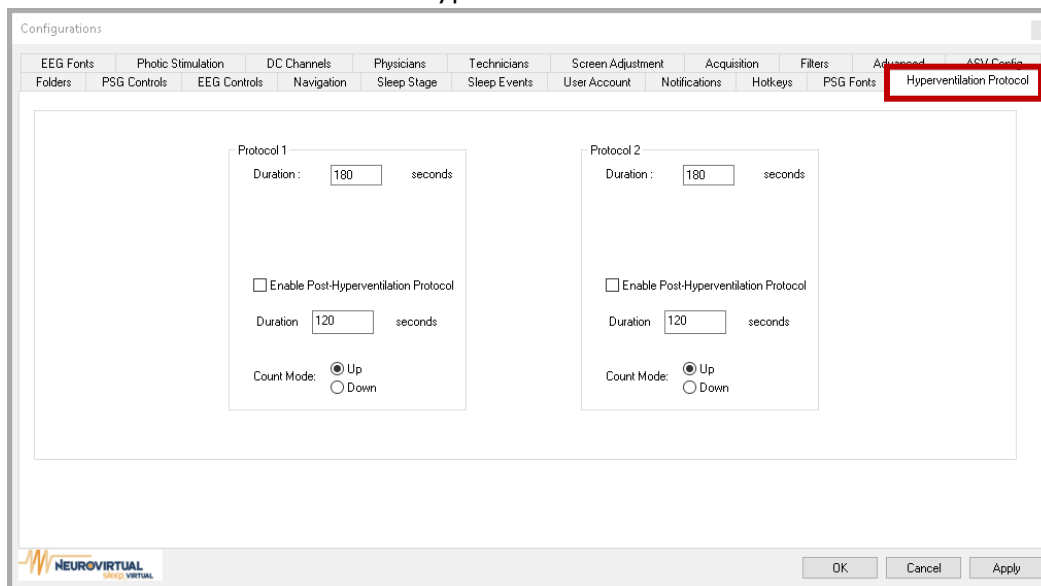


To create a new protocol, click on the *New* button and enter the name of the protocol, then click on *Save*, this protocol will be saved on the dropdown menu. Following, insert the frequencies one by one with the desired duration. To save the protocol, click on the *Apply* button. If any modifications are required, choose the protocol required for modifications and then click on the button with the required actions. Finish by clicking on the *Apply* button.

6.14. Hyperventilation Protocol



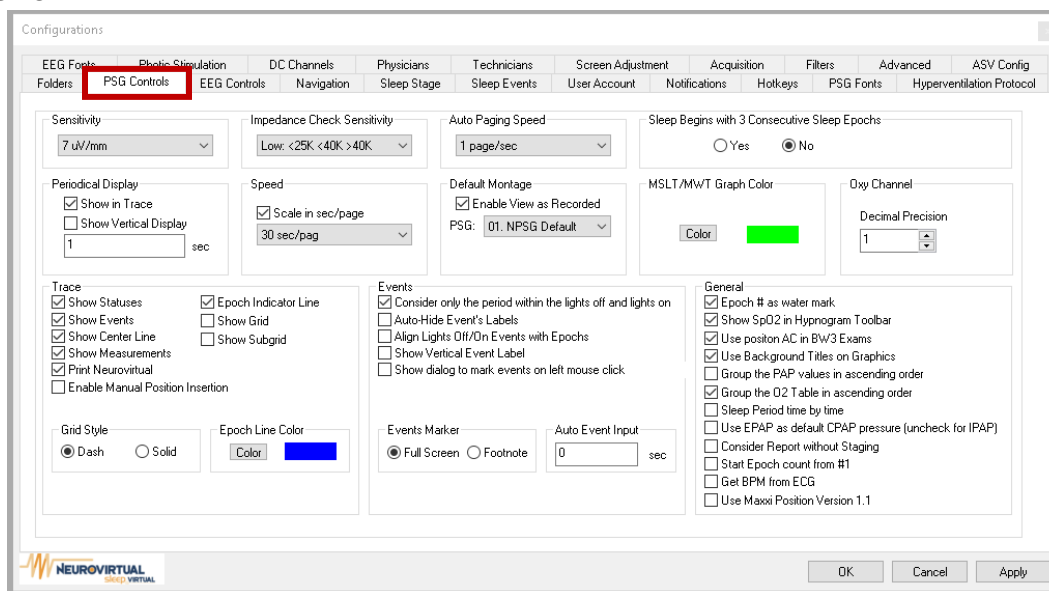
This tab will allow to customize the Hyperventilation Protocols.



To customize one of the protocols, set the duration in seconds of the Hyperventilation Protocol. If required Post Hyperventilation, enable it with the check box and set the required duration in seconds. You can select the Count to be increasing or decreasing.

6.15. PSG Controls

This tab will allow to set configurations that will apply to all PSG studies for record, score or review.



6.15.1. Sensibility

Use this option to set, from the dropdown menu, the default sensibility for linked channels in PSG studio setups. The value range goes from 1uV/mm to 1000uV/mm.





6.15.2. Periodic Display

This option allows to adjust how often the values on the trace will be displayed.

Periodical Display

Show in Trace

Show Vertical Display

1 sec

An example below, displaying the values every 5 seconds on a 30 sec/page epoch.



6.15.3. Impedance Sensibility

Use this option to set, from the dropdown menu, the default impedance level of sensibility acceptance in regards the connection of the electrodes on the scalp. The range is divided on a traffic light scale, green = excellent, yellow = acceptable, red = rejected. The levels are divided in 4 level scales as High, Medium-High, Medium and Low.

Impedance Check Sensitivity

High: <5K <10K >10K

High: <5K <10K >10K

Mid-High: <10K <25K >25K

Mid: <15K <30K >30K

Low: <25K <40K >40K

6.15.4. Speed

Use this option to set, from the dropdown menu, the default speed displayed in PSG studio. The value range goes from 120mm/s to 0.4mm/s. By enabling the option *Scale in sec/page* the paging scale will changed to sec/pag, displaying the concordant range from 2sec/page to 600sec/pag.

Speed

Scale in sec/page

8 mm/s

Speed

Scale in sec/page

30 sec/pag

6.15.5. Auto Paging Speed

Use this option to set, from the dropdown menu, the default auto-paging speed for automatic pagination of PSG studies. The value range goes from 1sec/page to 10sec/page.

Auto Paging Speed

1 page/sec

6.15.6. Default Montage

Use this option to set, from the dropdown menu, the default montage to display on PSG studies before or after recording. By enabling the option *Enable View as Recorded*, all studies open after recording will display the channels as it was recorded, saving the changes done by the technician while recording, such as sensibility, channels enable, colors, etc.

Default Montage

Enable View as Recorded

PSG: 01. NPSG Default



6.15.7. Sleep Begins with 3 Consecutive Sleep Epochs

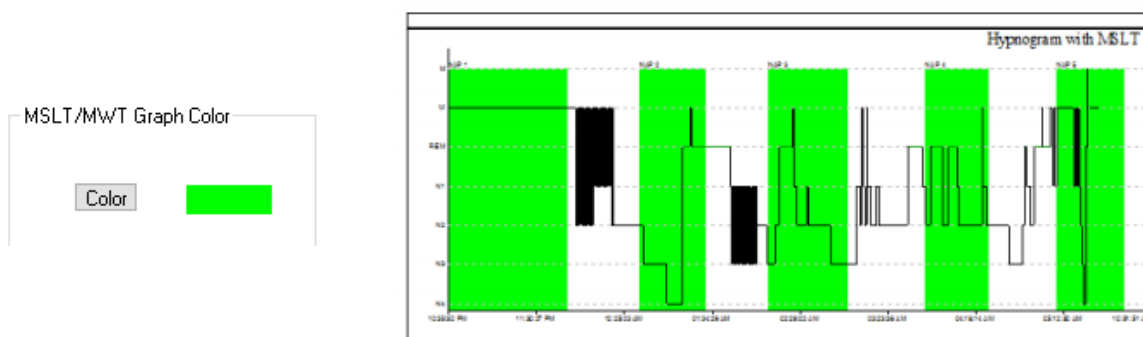
By enabling this option, the software will assume the beginning of sleep after three consecutive epochs scored with the same Sleep Stage.

Sleep Begins with 3 Consecutive Sleep Epochs

Yes No

6.15.8. MSLT/MWT Graph Color

Use this option to set, from the Color button, the default color to highlight that shows the different parts of the MSLT or MWT evaluated.



6.15.9. Oxy Channel

Use this option to set the default number of decimals desired to display on the Oxygen channel.

Oxy Channel

Decimal Precision

An example below, displaying the values with 1 decimal or with 3 decimals.

OXYGEN | 2,0 | 2,0 2,0 2,0 2,0 2,0 **OXYGEN** | 1,975 | 1,975 1,975 1,975

6.15.10. Trace

Trace

A --- Show Statuses **G** --- Epoch Indicator Line

B --- Show Events **H** --- Show Grid


C --- Show Center Line **I** --- Show Subgrid

D --- Show Measurements

E --- Print Neurovirtual

F --- Enable Manual Position Insertion

J --- Grid Style **K** --- Epoch Line Color

Dash Solid Color 

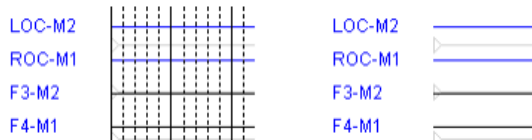
- A. Show Statuses:** By enabling this option, the statuses will be visible on the trace. These statuses include editing changes and start/stop recording, among others.
- B. Show Events:** By enabling this option, events will be visible on the trace. These events include lights on/off and start/stop recording, among others.
- C. Show Center Line:** By enabling this option, a center line will be displayed in the middle of the trace page.



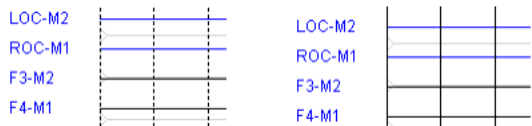
- D. Show Measurements:** By enabling this option, measurements marked will be displayed around the size box.
- E. Print Neurovirtual:** By enabling this option, the Neurovirtual logo will be displayed on the screenshots ribbon.
- F. Enable Manual Position Insertion:** By enabling this option, Manual Position Insertion will be available by default.
- G. Epoch Indicator Line:** By enabling this option, each epoch will be divided by an indicative line.
- H. Show Grid:** By enabling this option, an indicative line will be displayed every 1 second on the entire trace. Example: Grid ON vs Grid OFF



- I. Show Subgrid:** By enabling this option, and only when Grid enabled, an indicative line will be displayed every 0.2 second on the entire trace. Example: SubGrid ON vs SubGrid OFF



- J. Grid Style:** Use this option to select the type of line to display the Grid. Example: Dash Grid vs Solid Grid



- K. Epoch Line Color:** Use this option to set, from the Color button, the default color of the Epoch Indicator Line.

6.15.11. Events

Events

- A** --- Consider only the period within the lights off and lights on
- B** --- Auto-Hide Event's Labels
- C** --- Align Lights Off/On Events with Epochs
- D** --- Show Vertical Event Label
- E** --- Show dialog to mark events on left mouse click

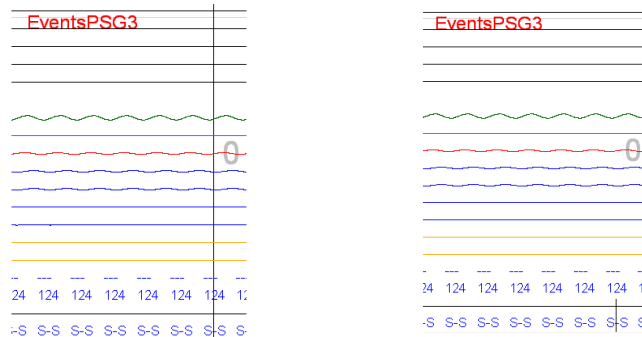
F --- Events Marker **G** --- Auto Event Input

Full Screen Footnote sec

- A. Consider only the period within the lights off and lights on:** By enabling this option, only the section marked with light Off and On will be evaluated.
- B. Auto-Hide Event's Labels:** By enabling this option, events label (text) will be hidden on the trace, the mark/ line still be enabled on the trace. These events include general events, tech events, montage changes, among others.
- C. Align Lights Off/On Event Label:** By enabling this option, it will align the light events with the beginning of the epoch where it was marked.



- D. Show Vertical Event Label:** By enabling this option, it will display the event marked. These events include general events, tech events, montage changes, among others.
- E. Show dialog to mark events on left mouse click:** By enabling this option, events can be marked by clicking with the left mouse button.
- F. Events Market:** Use this option to select between a full vertical line marked on the trace that indicates an event was marked or to keep a shorted line at the bottom of the trace. Example: Full Screen vs Footnote

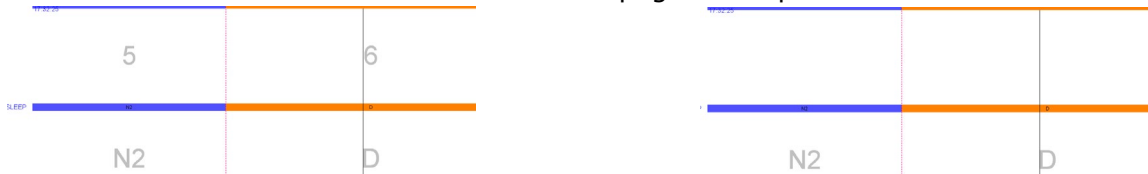


- G. Auto Event Input:** Use this option to set a time (in seconds) in which the Insert Event window will pop-up automatically while recording an study.

6.15.12. General

- A** Epoch # as water mark
- B** Show SpO2 in Hypnogram Toolbar
- C** Use position AC in BW3 Exams
- D** Use Background Titles on Graphics
- E** Group the PAP values in ascending order
- F** Group the O2 Table in ascending order
- G** Sleep Period time by time
- H** Use EPAP as default CPAP pressure (uncheck for IPAP)
- I** Consider Report without Staging
- J** Start Epoch count from #1
- K** Get BPM from ECG
- L** Use Maxxi Position Version 1.1

- A. Epoch # as water mark:** By enabling this option, the epoch number will appear as a watermark in the center of the trace page. Example: Enabled vs Disable



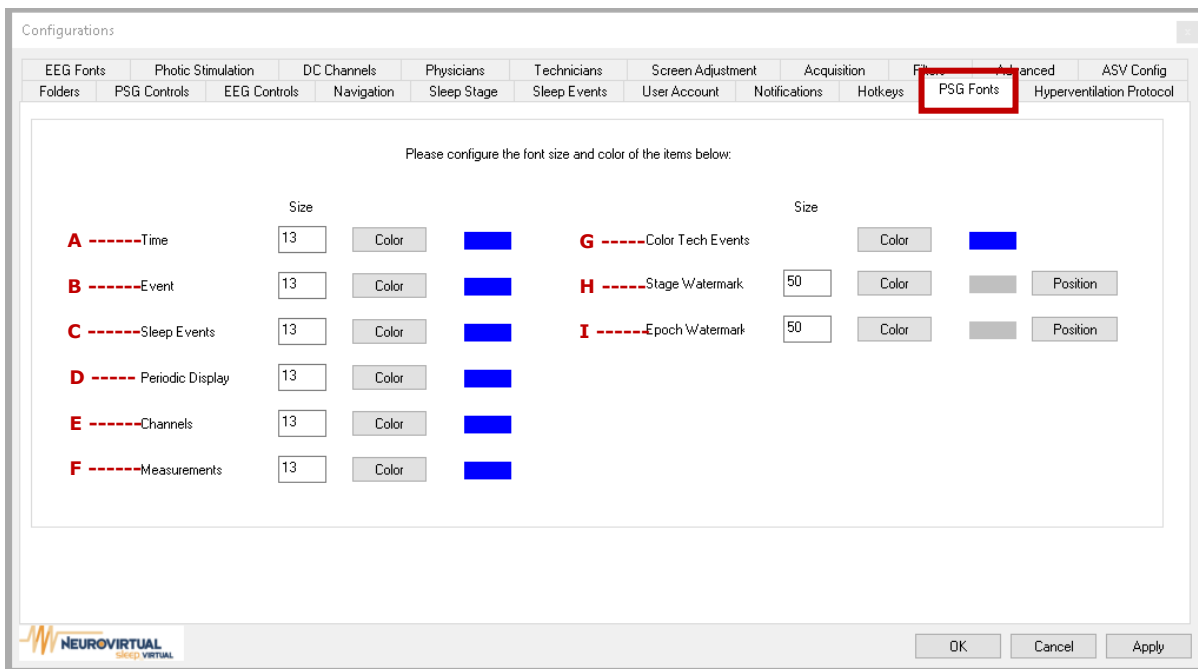
- B. Show SpO2 in Hypnogram Toolbar:** By enabling this option, SpO2 will be displayed in the hypnogram graph.
- C. Use position AC in BW3 Exams:** By enabling this option, the body position will be obtained from the AC sensor. If disabled, the body position will be obtained from the DC sensor.



- D. Use Background Titles on Graphics:** By enabling this option, the graphs generated in the reports will have a title.
- E. Group the PAP values in ascending order:** By enabling this option, the titration values on the PAP tables within the reports will be grouped in ascending order.
- F. Group the O2 Table in ascending order:** By enabling this option, the oxygen values on the O2 tables within the reports will be grouped in ascending order.
- G. Sleep Period time by time:** By enabling this option, sleep periods are scored each time by time.
- H. Use EPAP as default CPAP pressure (uncheck for IPAP):** By enabling this option, EPAP will be used as the standard pressure and disables IPAP.
- I. Consider Report without Staging:** By enabling this option, the general report will not need to have the sleep times scored to shows correct Data.
- J. Start Epoch count from #1:** By enabling this option, epoch starts at 1 instead of 0.
- K. Get BPM from ECG:** By enabling this option, the heart rate value displayed on BPM channel will be obtained via the EKG signal.
- L. Use Maxxi Position Version 1.1:** By enabling this option, it will be required to use a Neurovirtual Position sensor version 1.1 for its correct position identification. Disable to use a different reference or sensor.

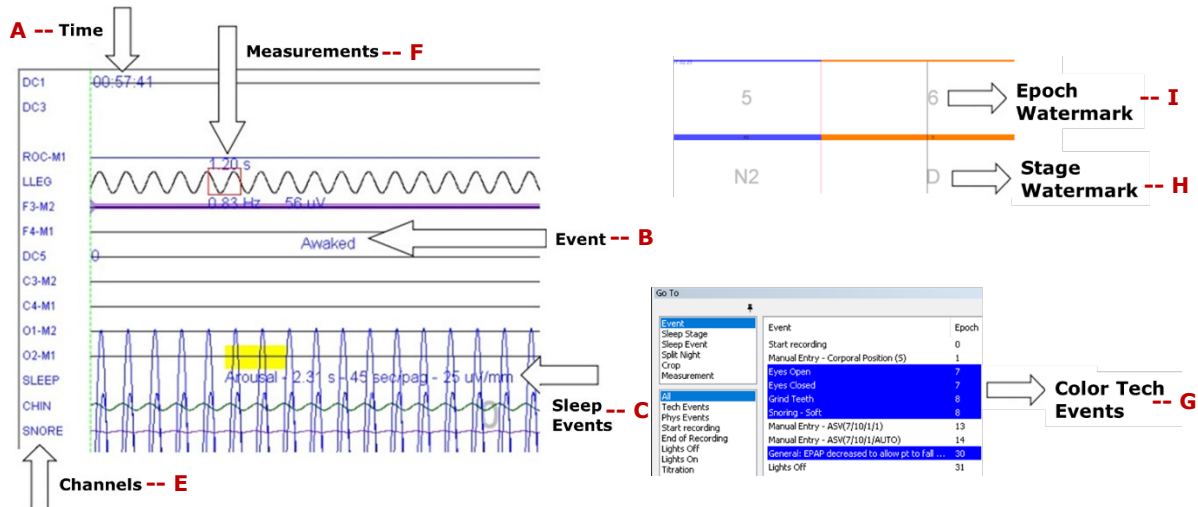
6.16. PSG Fonts

This tab will allow to customize the size and color for Time, Event, Sleep Event, Periodic Display, Channels, Measurements, Tech Color Event and Watermarks on the PSG studies.





To set the size of the items, change the Size column field to the desired size. To set the color, click on the Color button and select from the displayed table. Users will be able to set the position of the Stage and Epoch watermark (if enabled), by clicking on the Position button. Example:



6.17. Sleep Stages

This tab will allow to configure the Sleep Stages settings for all PSG studies.

Configurations

EEG Fonts | Photic Stimulation | DC Channels | **Physiology** | Technicians | Screen Adjustment | Acquisition | Filters | Advanced | ASV Config

Folders | PSG Controls | EEG Controls | Navigation | **Sleep Stage** | Sleep Events | User Account | Notifications | Hotkeys | PSG Fonts | Hyperventilation Protocol

A ----- Delete Events when Mark Stage Awake C ---- Disable paging when staging
 B ----- Stages as water mark
 E ---- Custom Stage Hotkey to Delete Stage 7 ---- D

Shortcut	Type	Color
0	Wake	Color
1	Wake	Color
2	REM	Color
3	NREM	Color
4	NREM	Color
5	NREM	Color
6	Wake	Color
7	NREM	Color
8	Wake	Color
9	Wake	Color
10	Wake	Color
11	Wake	Color

Restore Default

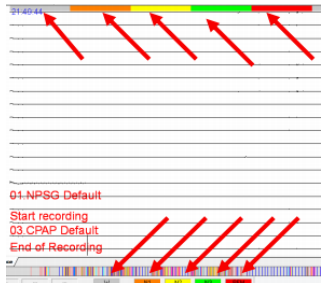
OK Cancel Apply

A. Delete Events when Mark Stage Awake: By enabling this option, events marked during the waking stage will be automatically removed.

B. Stages as water mark: By enabling this option, the Sleep Stage will appear as a watermark in the center of the trace page. Example: Enabled vs Disable



- C. Disable paging when staging:** By enabling this option, the software will not change epochs once the Sleep Stage has been scored, meaning the movement or paging must be done manually.
- D. Hotkey to Delete Stage:** Use this option to set as default the key from the keypad (numeric) that will be used to delete the scored epoch.
- E. Custom Stage:** Use this button to customize the stages name and type, as well as set a new stage such as "Active and Passive Sleep" for neonates.
- F. Color Button by Stage:** Use this button to set default color for each Sleep Stage set. The colors of each Sleep Stage can be seen at the top of the trace or in the status toolbar. Example:



6.18. Sleep Events

This tab will allow to configure the Sleep Events settings for all studies.

Name	Hotkey	Min-Max [s]	Color	Type
0 Periodic Breathing	C	10 100	Color	6
1 Obstructive Apnea	O	10 100	Color	7
2 Hypopnea	M	10 100	Color	8
3 Cheyne Stokes Breathing	H	10 100	Color	9
4 RERA	R	10 100	Color	10
5			Color	11

- A. One Click Event Use Last Event Length:** By enabling this option (one-click event must be enabled), any event marked with one click, on a specific channel, will keep the last custom duration of the same event previously marked.



- B. Enable the One Click Event Marking:** By enabling this option, an event will be marked/scored with just one click on any channel.
- C. Insert Arousal after Respiratory Events:** By enabling this option, it will allow respiratory events to be associated with arousal events and automatically scored.
- D. Auto-Hide Sleep Events Label:** By enabling this option, events will only show the corresponding-colored box, any other information will display when placing the cursor over the event.
- E. One Click Sleep Event Delete:** By enabling this option, a marked event will be deleted with just one click when cursor over the event.
- F. Enable update arousal after deleting:** By enabling this option, it will allows updating arousal events after deleting score.
- G. Enable update arousal after insert:** By enabling this option, it will allows updating arousal events after inserting score.
- H. Use these colors for the graphics:** By enabling this option, the colors set for each Sleep Event will be also displayed on the graphics.
- I. Enable value verification:** By enabling this option, it will verify the minimum and maximum value duration set for each marked sleep event. If the value is out of the range, it will ask before scoring the event outside the parameters.
- J. Enable invalid event alert:** By enabling this option (value verification must be enabled), it will not mark/score events that do not meet the standards.
- K. Disable events marking during Awake Stage:** By enabling this option, it will not mark/score events on WAKE Stage.
- L. Enable Switch Sleep Events:** By enabling this option, it will trigger a pop-up window that requests the change of the scored event.
- M. Select on Mouse Move:** By enabling this option, it will allows events to be scored according to mouse movement.
- N. Insert Desaturation after Respiratory Events:** By enabling this option, it will allow respiratory events to be associated with desaturation events and automatically scored.
- O. Desaturation Auto-Association on Insert:** By enabling this option, it will link a Respiratory Event with a Desaturation event. This linked should have a Drop Percentage assigned. Settings will be open once enabled or can be opened from the nut button. Example:



Event Association Configurations

Respiratory	O2 Desaturation	Minimum Drop (%)	Scoring Group*
0. Central Apnea			0
1. Obstructive Apnea			1
2. Mixed Apnea			2
3. Hypopnea 1A	3. 4% Desaturation	3	3
4. Cheyne Stokes Breathing			4
5. RERA			5
6. Periodic Breathing			6
7. Hypopnea 1B	3. 4% Desaturation	4	7
8.			8
9.			9
10.			10
11.			11

* Respiratory Events in the same Scoring Group will auto-select event types based on the Desaturation drop detection.

Reset Defaults OK Cancel

- P. Desaturation Auto-Association on Delete:** By enabling this option, it will delete any desaturation linked once the linked event is deleted.
- Q. Hotkey to Jump to Previous:** Use this option to set as default any key from the keyboard that will be used to move to the previous Sleep Event marked.
- R. Hotkey to Jump to Next:** Use this option to set as default any key from the keyboard that will be used to move to the next Sleep Event marked.
- S. Custom Sleep Event Button:** Use this button to customize all Sleep Events name, as well as set a new Sleep Events such as "3% Desaturation" or "Hypopnea 1B" for Respiratory or desaturation event type.
- T. Event Type list:** Use this dropdown list to navigate through the different Event Types to change settings such as color, hotkey, minimum and maximum duration, for each sub-event.

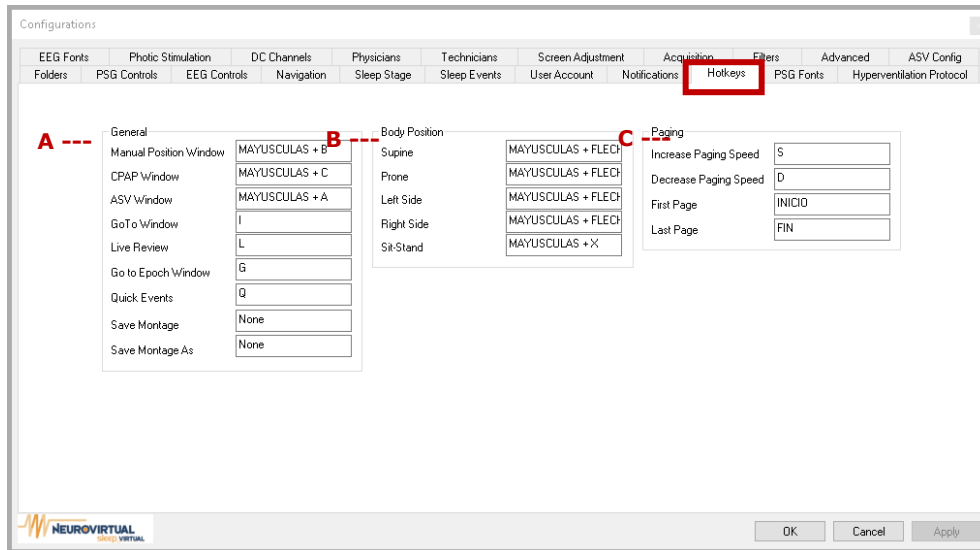
Enable update arousal after insert

Custom Sleep Event

	Hotkey	Min	Max [s]	Events Type	Color
0 Bradycardia	<input type="checkbox"/>	15	100	Cardiac	
1 Sinus Tachycardia	<input type="checkbox"/>	15	100	Respiratory	
2 Extrasystole-PVC	<input type="checkbox"/>	15	100	O2 Desaturation	
3 Arrhythmia-PAC	<input type="checkbox"/>	15	100	LM	
4 Asystole	<input type="checkbox"/>	15	100	Cardiac	
5 Wide Complex Tachycardia	<input type="checkbox"/>	15	100	Snoring	
				Arousal	
				Movement	
				Seizure	
				EtCO2	
					9
					10
					11

6.19. Hotkeys

This tab will allow to set default keys, from the keyboard, to do specific actions on the trace for record or review studies.



A. General: Use this section to set a hotkey that will the following pop-up windows:

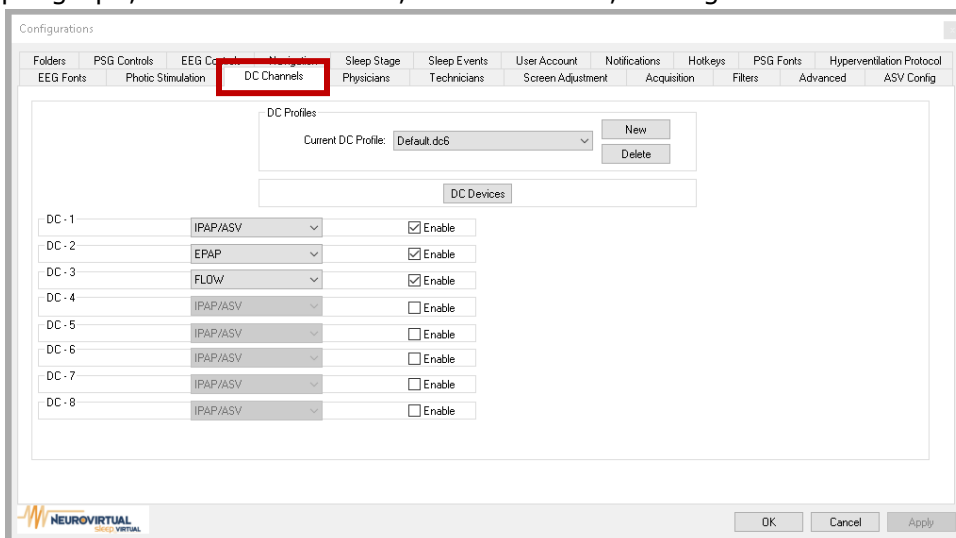
- Manual Position Window
- CPAP Window
- ASV Window
- GoTo Window
- Live Review
- Got to Epoch Window
- Quick Events
- Save Montage
- Same Montage As

B. Body Position: Use this section to set a hotkey that will automatically insert a specific Body Position.

C. Paging: Use this section to set a hotkey that will increase or decrease the paging speed, as well as move to the first or last recorded epoch.

6.20. DC Channels

This tab will allow to customize the different Profiles of devices connected via DC channel that will be used by each amplifier. Some of the devices that can be connected can be PAP, Capnograph, DC Position sensor, Patient Button, among others.



6.20.1. How to create a New DC Profile

Different DC Profiles can be created depending on the number of external devices that will be connected or used for each register.



To create a new DC Profile follow the steps:

1. Click on the *New* button.
2. Set the name that will be assigned to this DC Profile on the field *Current DC Profile*.
3. Click on the *Save* button.
4. Check the box *Enable* where each DC channel will be connected to the external device. You can change the DC Device from each channel dropdown list.

6.20.2. How to create a DC Device

Different DC Devices can be created depending on the device type that will be connected or used for each register. To create a new DC Device, follow the steps:

1. Click on the *DC Devices* button.
2. Click on the *New* button.
3. Set the name that will be assigned to this DC Device on the field *Devices*.
4. Click on the *Save* button. This will include the new device on the dropdown menu.

5. Select from the dropdown menu the *DC Type* that will be assigned to the type of data received.
6. Enter the minimum and maximum values expected to be recorded (Refer to your DC device's manual).
7. Set the minimum and maximum voltage output for each signal. Those can be automatic register by setting the DC channel where the signal is connected and then clicking on *Test* button (Refer to your DC device's manual).

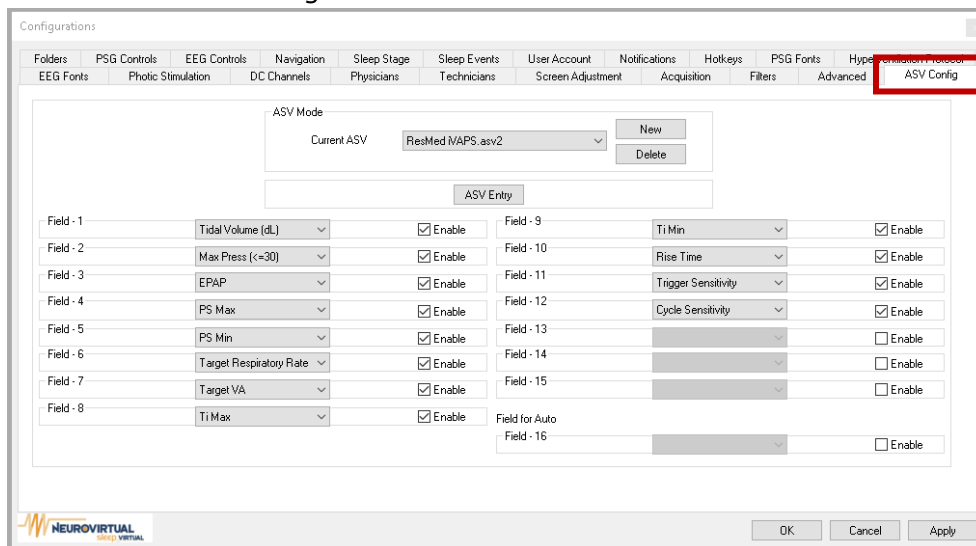
8. Enter the units of measure and/or check the box *Show Decimals*, if applied.
9. Click on the *OK* button to save all changes.

6.21. ASV Config

This tab will allow to customize the different ASV Profiles for different ASV protocols to

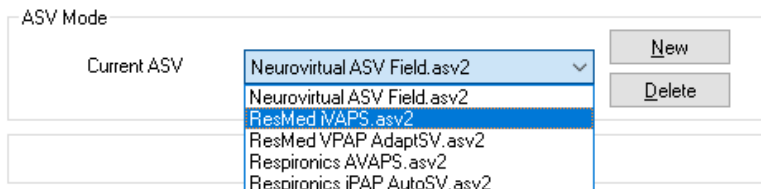


be used on different recordings.



6.21.1. How to create a New ASV Mode

Different ASV Modes can be created depending on the different titration therapy types that will be used for each register.



To create a new ASV Mode follow the steps:

1. Click on the *New* button.
2. Set the name that will be assigned to this ASV Mode on the field *Current ASV*.
3. Click on the *Save* button.
4. Check the box *Enable* where each ASV Entries will be assigned for Manual Entry. You can change the ASV Mode from each field dropdown list. Take in count that the ASV Type can't be selected twice on the Fields.

6.21.2. How to create a ASV Entry

Different ASV Entry can be created depending on the devices and variables to be evaluated for each register. To create a new ASV Entry, follow the steps:

1. Click on the *ASV Entry* button.
2. Click on the *New* button.
3. Set the name that will be assigned to this ASV Entry on the field *Devices*.
4. Click on the *Save* button. This will include the new entry on the dropdown menu.



ASV Entry

CPAP

CPAP

IPAP/ASV

Max Pressure

Max Press (<=25)

Max Press (<=30)

New

Delete

5. Select from the dropdown menu the *ASV Type* that will be assigned to the type of data to evaluate. If the *ASV Type* required is not identified. Select one of the OTHER options.

ASV Type ASV IPAP

Parameters

Unit: cm H2O

Decimal

6. Enter the units of measure and/or check the box *Show Decimals*, if applied.
7. Click on the *OK* button to save all changes.



7. Icon and Toolbars

7.1. Basic Icon Information

General Icons					
G-1		New Document	G-21		EKG Filter
G-2		Open Existent Study	G-22		Calibration Signal
G-3		Start/Finish	G-23		Impedance Consultation
G-4		Record	G-24		Generate Report
G-5		Live Review	G-25		Navigation back 1/2 epoch
G-6		Notch Filter (50/60Hz)	G-26		Navigation back 1 epoch
G-7		Digital Filter	G-27		Forward navigation 1 epoch
G-8		Disconnect/Connect Headbox	G-28		Forward navigation 1/2 epoch
G-9		Montage Editor	G-29		Automatic back navigation
G-10		Patient's Information	G-30		Increase speed
G-11		Toogle Sound Toolbar	G-31		Slow Down
G-12		Toogle Video Window	G-32		Auto Navigation Forward
G-13		Split Acquisition	G-33		Exam Information
G-14		Toogle Quick Events Toolbar	G-34		Amplitude Tracker
G-15		Print	G-35		Zoom
G-16		Print Preview	G-36		Start of Trimming
G-17		About	G-37		Clear Snipping Start
G-18		Leave Feedback	G-38		End of the cut
G-19		Change User	G-39		Confirmation of the crop
G-20		Enable Camera Acquisition	G-40		Cutout Configurations

Icons for EEG					
E-1		Choosing a period for mapping	E-13		Automatic photostimulation
E-2		Period Processing	E-14		Decrease light intensity
E-3		Hyperventilation (2 protocols)	E-15		Increase Light Intensity
E-4		Display Adjustment	E-16		Manual photostimulation
E-5		Enhancement Tool (Highlight)	E-17		Decrease Frequency
E-6		Spectrogram and Trend Editing	E-18		Increase Frequency
E-7		States	E-19		Events
E-8		Insertion of the first state	E-20		Inserting the First Event
E-9		Insertion of the second state	E-21		Insertion of the second event
E-10		Insertion of the third estate	E-22		Insertion of the third event
E-11		Insertion of the fourth state	E-23		Insertion of the fourth event
E-12		Insertion of the fifth state	E-24		Insertion of the fifth event



Icons for PSG					
P-1		Lights Off	P-13		Horizontal screen splitting during the review
P-2		Lights On	P-14		Go to the next Split Night
P-3		Manual position insertion	P-15		Statistics of the qualified
P-4		Manual insertion of IPAP/EPAP	P-16		Hide Events
P-5		Manual ASV insertion	P-17		Association of Respiratory Events with Awakenings
P-6		Manual Oxygen Insertion	P-18		Enable Amplifier Cannula
P-7		Manual insertion of Spo2	P-19		Enable EPAP in Titration
P-8		Manual BPM insertion	P-20		Go to an era
P-9		Mid-screen line	P-21		Custom PSG graphics
P-10		Split Night Kickoff	P-22		Automatic qualification
P-11		End of Split Night	P-23		Next Qualifying Event
P-12		Remove all Split Night	P-24		Previous Qualifying Event

Icons for Holter					
H-1		Start/Activate Holter	H-6		Schedule Exam
H-2		Finish Holter	H-7		Set Patient Name
H-3		Download SD Plot to PC	H-8		Update Date and Time
H-4		Download SD Video to PC	H-9		Activate BWFlash window
H-5		Format SD			

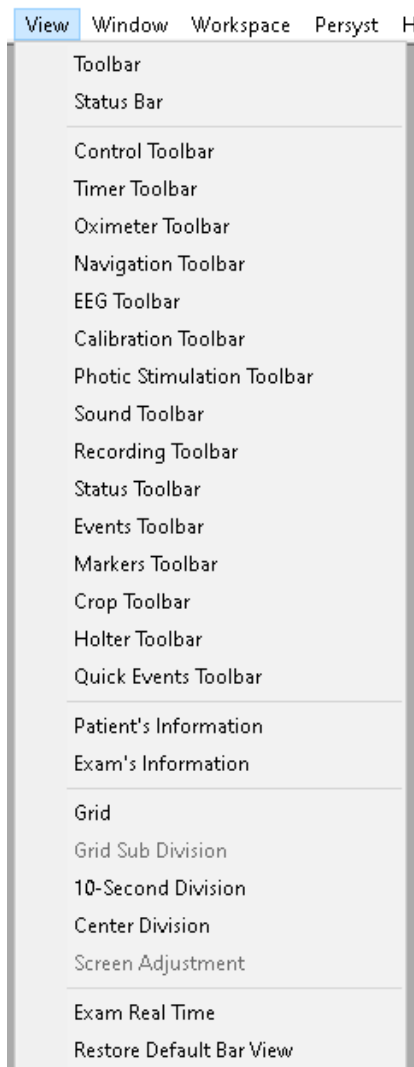


7.2. Toolbars

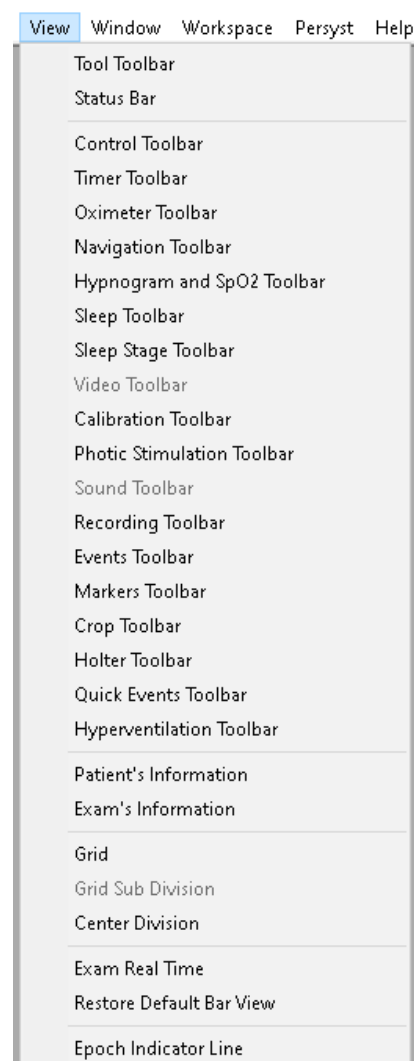
The toolbars are a group of icons within the software which are related to a specific type of study or process. To display those toolbars within the ribbon by leaving a "check" next to their name. When visible, place them within the window, drag the box to the desired place.

To enable the toolbars, do one of the following:

- A.** Right-click on one of the blank spaces (without icons) within the main window, this can be inside or outside an exam.
- B.** Locate the pointer in the window within a created exam, then click on the *View* dropdown menu. From there, choose the toolbars required.



EEG Examination Bars



PSG Exam Bars

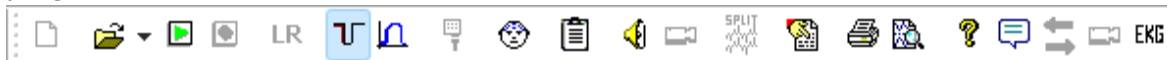


7.2.1. General Toolbars

The general toolbars are those that are enabled and functional in both types of studies (Electroencephalography and Polysomnography exams).

7.2.1.1. Tool Toolbar


This toolbar has the main exam options. The icons will be enabled as the exam progresses and/or conditions allow it.



On this toolbar, two filter types can be found available on the software. Both filters are commonly applied on PSG acquisition due to the possible interference from electrical network, facing artifacts that might present during a record accomplishment.

Use the Button  to turn on the 50/60Hz filter.

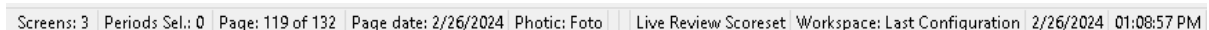
Use the button  to turn on the digital filters.

Use the Button  in order change the user logged. If the button is grayed out, the feature should be enabled from the Advance tab from the Configurations. [See item 6.10.2 on page 49](#)

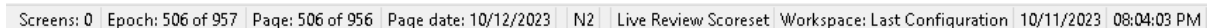
7.2.1.2. Status Bar

Although the same toolbar is displayed on both types of studies, the information is different for each

On EEG, it displays the number of recorded pages, the number of periods selected digital analysis, the date of the current view page, and the date and time of creation of the exam.

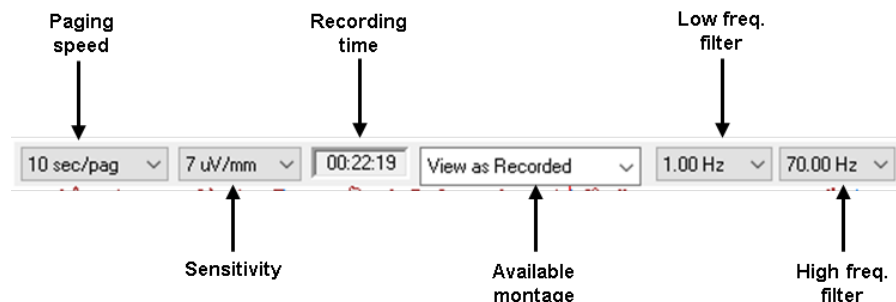


On PSG, it displays the number of recorded pages, the Epoch of current view page, the date of the current view page, the Sleep Stage of current view page (if scored), and the date and time of creation of the exam.



7.2.1.3. Control Toolbar

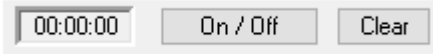
This toolbar allows to control the sensitivity and filters of the linked channels. It also allows to control the view of the trace (paging speed and the montage). In the middle of the toolbar, it displays a stopwatch, which counts the recorded time.





7.2.1.4. Timer Toolbar

This toolbar is intended to guide the user during the recording to mark an specific time of an action or instruction given to the patient.



To start the chronometer, click on the ON/OFF button. To stop the chronometer, click on the same ON/OFF button. To return to zero, click on the zero button.

7.2.1.5. Navigation Toolbar

This toolbar helps on the navigation through the exam.



The Button is used to rewind the record page by page.

The Button is used to rewind the record second by second.

The Button is used to forward the record second by second.

The Button is used to forward the record page by page.

The Button is used to forward page by page automatically.

The Button is used to rewind page by page automatically.

To speed up or slow down the automatic pagination, the keys (increase) and (decrease) can be used.

The Button is used to present all the record information. All Events, Sleep stages and Sleep events that were inserted in the record can be shown, excluded and visualized.

See item [8.7.11 on page 106](#)

Event	Time	Real Time	Date
Impedance Check	00:00:00	01:08:58 PM	02-26-2024
Start recording	00:00:00	01:08:58 PM	02-26-2024
1. Montage 1	00:00:00	01:08:58 PM	02-26-2024
CalibrationEEG	00:00:05	01:09:03 PM	02-26-2024
1. Montage 1	00:00:14	01:09:12 PM	02-26-2024
Impedance Check	00:00:17	01:09:15 PM	02-26-2024
Call Patient	00:00:21	01:09:35 PM	02-26-2024
Eyes Open	00:00:22	01:09:36 PM	02-26-2024
Eyes Closed	00:00:24	01:09:38 PM	02-26-2024
Eyes Open	00:00:26	01:09:40 PM	02-26-2024
Eyes Closed	00:00:27	01:09:41 PM	02-26-2024
H 5	00:00:58	01:10:12 PM	02-26-2024
H 10	00:01:03	01:10:17 PM	02-26-2024
H 15	00:01:08	01:10:22 PM	02-26-2024
H 20	00:01:13	01:10:27 PM	02-26-2024
Good HV Effort	00:01:16	01:10:30 PM	02-26-2024
H 25	00:01:18	01:10:32 PM	02-26-2024
H 30	00:01:23	01:10:37 PM	02-26-2024
H 35	00:01:28	01:10:42 PM	02-26-2024
H 40	00:01:33	01:10:47 PM	02-26-2024
H 45	00:01:38	01:10:52 PM	02-26-2024

The Button is used to evaluate the differential voltage between the channels. [See item 8.7.7 on page 103](#)

The Button is used to zoom a section of the trace. [See item 8.7.8 on page 104](#)



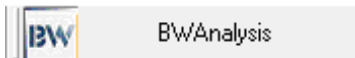
7.2.1.6. Calibration Toolbar

This toolbar provides the functions of calibration and impedances, used at the beginning of all studies recording. It also has the function for report generation, which is used once the study is recorded and reviewed.



7.2.1.7. Recording Toolbar

This toolbar shows the status of the recording as "Not Recording", "Calibration", "Recording" or simply stopped "BWAnalysis"



7.2.1.8. Events Toolbar

This toolbar allows you to mark a customized event using the dropdown menu from the E button. The first 5 events has its own shortcuts with the numeric buttons on the same toolbar. See item 8.7.1 on page 91



7.2.1.9. Markers Toolbar

This toolbar is the one that allows the navigation within the entire trace, in which the events scored or marked can be displayed on a specific color for easily identification.




7.2.1.10. Crop Toolbar

This toolbar allows editing of exams to make them shorter than the original. The other icons will only be enabled when the first one has been used. See item 8.7.13 on page 110



7.2.1.11. Quick Event Toolbar

This toolbar shows a list of Customized events that with a one-click can be marked on the trace. Use icon  to open this list.





7.2.2. EEG Toolbars

The EEG toolbars are those that are enabled and functional in Electroencephalography exams.

7.2.2.1. EEG Toolbar

This toolbar provides specialist functions for EEG. Use buttons **P** and **FFT** for digital analysis, [see item 8.8.5 on page 124](#). Use icon **H** ▾ for hyperventilation (will only be activated when the exam is being recorded), [see item 8.8.3 on page 123](#).



7.2.2.2. Photic Stimulation Toolbar

This toolbar allows to control the photo-stimulator connected to the amplifier, [see item 8.8.2 on page 122](#). Use the icon E-16 to enable manual photo-stimulation. Use the icons E-17 and E-18 to adjust the frequency manually. Use the icons E-14 and E-15 to adjust the intensity of the light.

Use the icon E-13 to enable the automatic profile for the photo-stimulation.

If a BWFlash kit is available (flash connected to the computer for its use), use of the BWFlash icon and features will be needed.

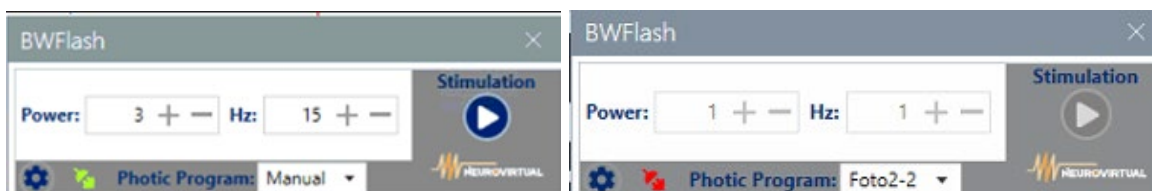


7.2.2.2.1. BWFlash

Once the BWFlash device is connected to the computer, make sure that the bottom left corner shows in green for correct connection and identification. Use the *Stimulation* button, to start or stop the manual or automatic photo-stimulation. To choose the program, select from the dropdown list Photic Program.

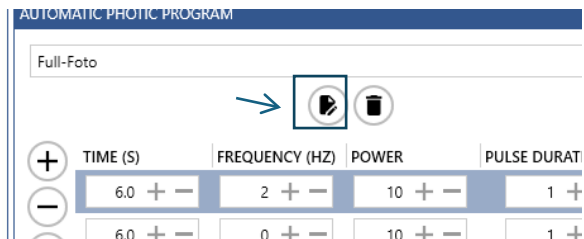
In *Manual* the BWFlash will respond to the intensity (Power) and frequency (Hz) that are programmed on the left side of the window, this will be reflected in the stimulation of the device as each value is increased or decreased.

In automatic program, by default it will show the custom program *Full-Photo*.

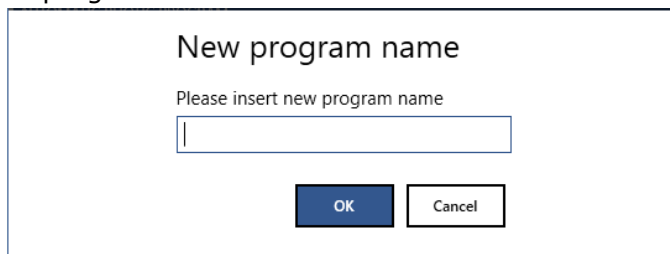


7.2.2.2.2. BWFlash Program

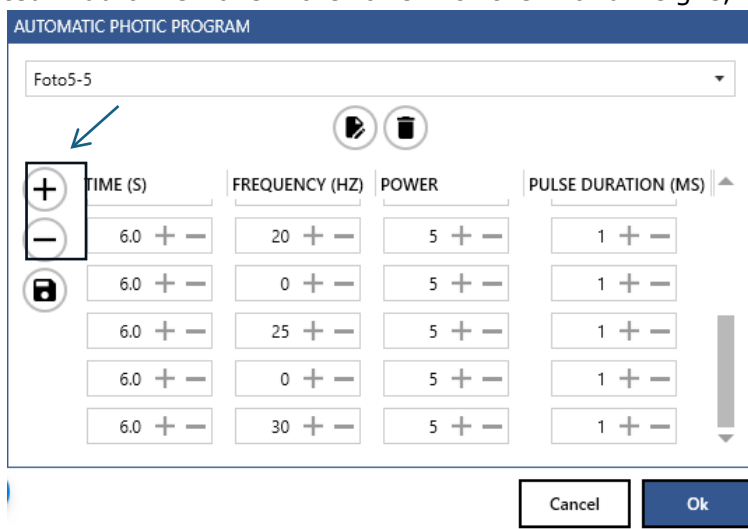
To create a custom program or modify an existing one, click the settings icon (gear). A new window will open, if you want to modify an existing program, choose the program from the dropdown menu and modify directly. Then save the changes.



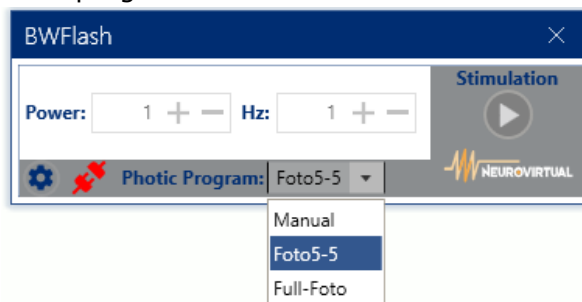
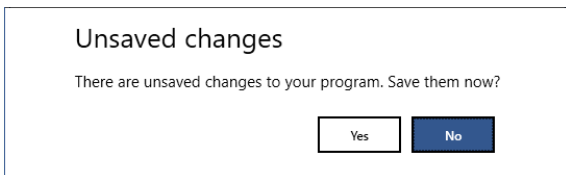
To create a photo-stimulation program, click on the edit icon. A new window will pop up, informing you that the changes have not been saved. Press "No" in case you do not want to save any changes made to the existing program and proceed with the assignment of the name of the new program.



Modify the values of time, frequency, power and duration with the + and – symbols next to each time listed. Add or remove more rows with the + and - signs, icons on the left.



When finished, save the program and select the program to start stimulation.





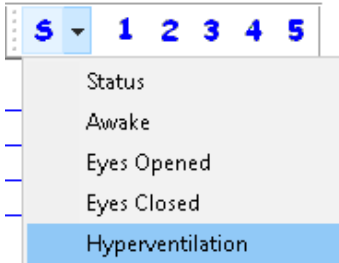
7.2.2.3. Sound Toolbar

This bar allows the activation and manipulation of the parameters for auditory stimulation from the computer or auxiliary speakers. Use icon G-11 to open this toolbar.



7.2.2.4. Status Toolbar

This toolbar allows you to mark a customized status using the dropdown menu from the S button. The first 5 events have its own shortcuts with the numeric buttons on the same toolbar. See item 8.8.1 on page 120



7.2.3. PSG Toolbars

The PSG toolbars are those that are enabled and functional in Polysomnography exams.

7.2.3.1. Oximeter Toolbar

This toolbar saturation and heart rate values will be displayed while the exam is in record and when the exam is under review. While not recording, the lights indicators will all appear in red and will only change when acquiring and identify a sensor connected and acquiring saturation values, showing the light indicators in green. If the oximeter is disconnected or damaged, one of the indicators will displayed in red, for correct troubleshooting.



7.2.3.2. Sleep Toolbar


This toolbar provides specialist functions for PSG. Use icons P-1 to P-2 for Lights indicators. Use icons P-3 to P-6 to manually insert position, SPO2, BPM, Oxygen and titration values. Between others.





The Button is used to mark the moment when the record room lights were turned off. The Button is used to mark the moment when the record room lights were turned on.


The Button is used to manually set the position where the patient is. After this position selected, it is necessary to click OK to confirm the insertion.





The Button  is used to manually set the titration pressure values used. After CPAP/IPAP, EPAP and Backup Rate (if apply) are set, it is necessary to click OK confirm the insertion.

The Button  is used is used to manually set the ASV titration mode values used. Select the Profile to be used. After all required fields are set, it is necessary to click OK confirm the insertion.

The Button  is used to manually set the Oxygen applied to the patient's treatment. After this value is set, it is necessary to click OK to confirm the insertion.

The Button  is used to manually set the Saturation values presented by the patient. After this value is set, it is necessary to click OK to confirm the insertion.

The Button  is used to manually set the Heart Rate values presented by the patient. After this value is set, it is necessary to click OK to confirm the insertion.

The Button  is an Assistant Scoring tool what will analyze the recording and automatically detect and marked Sleep Events and Sleep Stages along the trace.



The assisted scoring feature provided in this software is intended solely as an assistive tool to support healthcare professionals in the analysis and interpretation of sleep-related data. It is not designed to replace or substitute the clinical judgment, diagnosis, or treatment decisions of a qualified physician or healthcare provider.

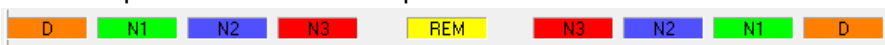
This feature is not intended to be used independently by individuals without the supervision, review, and approval of a licensed healthcare professional. Users are expressly advised that all data, results, and reports generated by this feature must be evaluated and validated by a qualified medical professional before any medical conclusions or treatment decisions are made.

The developers and distributors of this software accept no responsibility or liability for any clinical decision or action taken based on the use of this feature without proper medical oversight. The assisted scoring feature should be used in conjunction with a full clinical evaluation, including but not limited to diagnostic assessments performed by a healthcare professional.

By using this software, you acknowledge and agree that the responsibility for the interpretation of any assisted scoring data and the subsequent medical decisions remains solely with the healthcare provider, and any risks associated with the improper use of this feature are assumed by the user.

7.2.3.3. Staging Toolbar

This toolbar shows the sleep stages scored in the exam, from the four previous epochs, current epoch and next four epochs.





7.2.4. Holter Toolbars

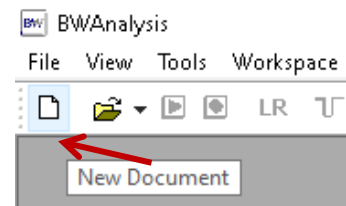
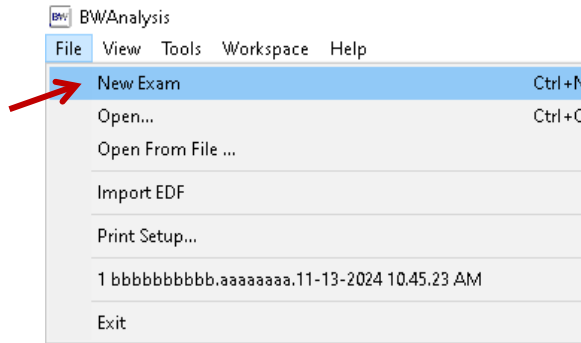
This toolbar will only be functional when using a BWMini amplifier. Use icons H-1 to H-3 to start, stop and download studies from holter option. Use icons H7 to H9 to program Holter studies. Between others.



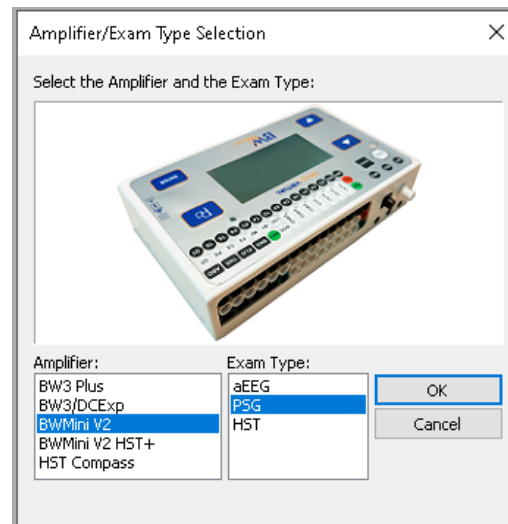
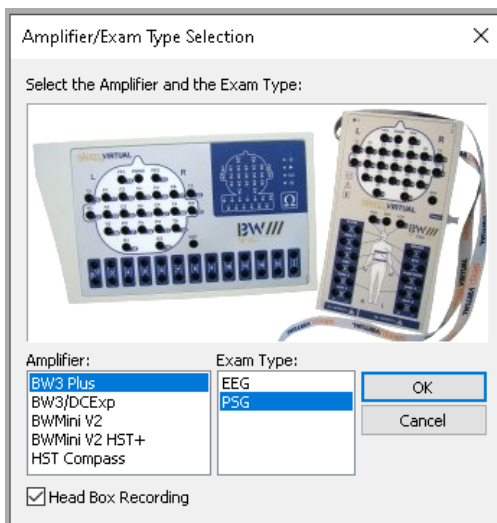
8. Using the BWAnalysis Program

8.1. Creating a New Exam

To create a new exam, select from the *File* dropdown menu, the option *New Exam*. A new exam can be created using the keys Ctrl + N from the keyboard or simply click on the blank sheet icon from the Tool Toolbar.



A new window will appear showing the different amplifiers or models configured to be used on the same computer. Choose the one to be used, considering the photo of the device and the type of exam to create the correct study. If selected the wrong amplifier, the exam will not start. If Headbox is used, it will be needed to check the corresponding checkbox when you are creating the exam. Otherwise, some features might not work as expected.



After clicking *OK*, a new window appears asking to fill in the patient information. The only mandatory information to create an exam are Name and Lastname (fields marked with *). All others are optional.



* Last Name: * First Name: Age
Patient I.D.: Birth Date: / /

In case one of those fields is not filled in, an error message will be shown alerting about it. Click *OK* and fill it out to start the reception.

Message

The patient's first name or last name can not be empty.

NEUROVIRTUAL
sleep VIRTUAL

For Questions call: 1-877-NEURO-40

Note that the other fields and different available tabs (General Information, Doctor's Information, Contact Information, etc.) can be filled in before, during or after the recording of the exam. Note that all data entered in these boxes is imported directly into the patient's final report.

New Patient

* Last Name: * First Name: Age
Patient I.D.: Birth Date: / /

Sex: Male Neutral Female Unknown
Handedness: Right-handed Left-handed

Weight: lb Height: ft B.M.I.:
Neck Size: in Questionary Score: Diagnose Code: FSS:

ID1: ID2: ID3: Room ID:

Referring Physician: MSLT or MWT Exam with video recording

General Information Physician Information Technician Information Reading Technician Contact Info

Medications: Comments:

History:
Observation:

Enable PASSWORD Password:

* Required Fields

Address: City:
State: Country: Zip Code:
Phone #: Cellphone #: Workphone #:
Email:

Enable PASSWORD Password: DC Profile: Default.dc6
Date/Time: 11/26/2024 8:43:35 PM


* Required Fields




Be aware that if an MSLT or MWT exams are needed to be performed, a PSG or HST study must be created, and the corresponding checkbox needs to be checked.

Be aware that the Birth Date format obey the language format, for English it will be mm/dd/yyyy. For example: 03/29/1977. Thus, the software will calculate the patient's correct age, and it will be shown on the trace printed sheet.


Once the minimum or desired data has been entered, the *OK* button must be clicked. The exam will be created immediately with the order established according to the configurations you have (*see item 4.4.1.4 on page 27*) followed by the date and time of creation of the exam.

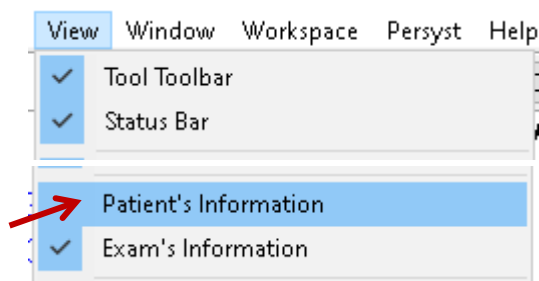
 BWAnalysis - [Smith.Test.11-26-2024 08.43.35 PM.psg - Trace - Smith, Test]

The same name displayed will be the name on the patient's folder displayed:

 Smith.Test.11-26-2024 08.43.35 PM

8.1.1. Revising the Patient's Information (Record)

In order to return to the patient's information after creating the exam, click on the button  or select on the *Exhibit* dropdown menu, the option *Patient's Information*.



The *Patient Information* window can be opened and modified at any stage of the exam. When creating the exam, during the recording and even at the end of the exam, by clicking on the corresponding icon.

Use the following as guidance to enter the correct information on each field:

New Patient	
Last Name	Patient's Last Name(s). (Required) It is recommended to write it in capital letters.
First Name	Patient's Name(s). (Required) It is recommended to write it in capital letters.
Patient I.D	Patient identification (ID, Passport, etc.). This can only contain numeric values.
Birth Date	Enter it month, day and year XX-XX-XXXX.
Age	Age is calculated immediately if the date of birth was entered correctly.




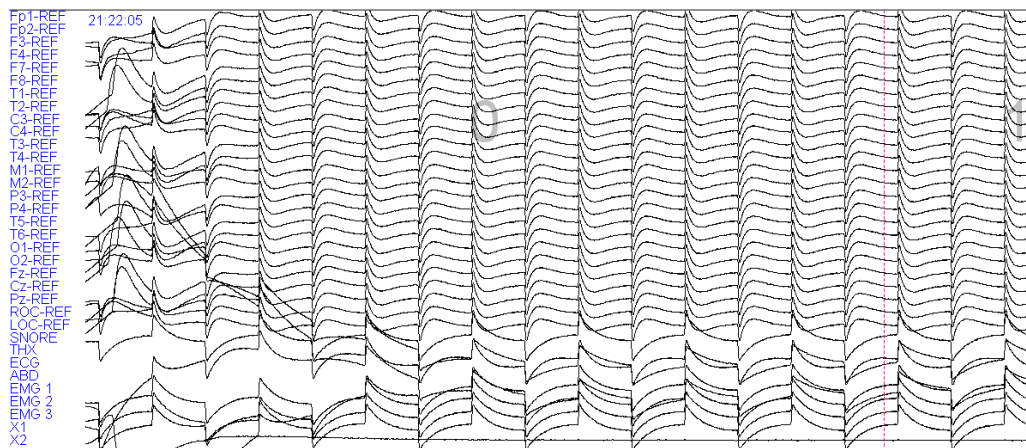
Sex	Gender of the patient. It is recommended to choose an option, although it is not mandatory, since, in the page recordings and the report, "Unknown" will be shown, if this information was not included.
Handedness	Determine which is the patient's predominant hand.
Weight	Patient weight can be entered in g/Kg/lb
Height	Patient height can be entered in cm/m/in/ft
B.M.I.	Body mass index is calculated using Weight and Height data. These must be entered properly and with the correct units.
Neck Size	Patient's neck circumference in cm/in.
Questionary Score	Customizable. A numerical value desired by the user can be entered.
Diagnose Code	An Alphanumeric value desired by the user can be entered
FSS	An Alphanumeric value desired by the user can be entered
ID1, ID2 and ID3	An Alphanumeric value desired by the user can be entered
Room ID	The room, office or laboratory where the exam is recorded.
Referring Physician	Write the name of the doctor who ordered the test or who sent the order.
MSLT or MWT	It should only be enabled when these types of exams are to be performed, MSLT (Multiple Sleep Latency Test) or MWT (Wakefulness Conservation Test). Otherwise, it could create errors in the report.
Exam with video recording	Enable video recording on the exam. If it is enabled and there is no camera connected to the computer, the video will be recorded in black, blue or colored stripes. Recording with Video will make the exam heavier and will not provide relevant information to the study.
General Information	
Medications	In this space, the medications that the patient currently uses are written.
Comments	Any comments or alphanumeric information that are necessary for the study may be included.
History	The patient's medical history, background or relevant information that will be imported to add into the report.
Observation	Alphanumeric observations or information relevant to the exam.
Physician Information	
Reading Physician	In this box you can write the name of the doctor who is performing the qualification and reading of the exam. There is also the possibility of displaying the list of doctors that were included in the configurations. (see item 6.5) and choose the appropriate name.
Conclusions	In this section, the doctor has the possibility of including the conclusions after evaluating and scoring the exam, information that might be included into the report.
Technician Information	
Technician	In this box you can write the name of the technician who is performing the exam registration. There is also the possibility of displaying the list of technicians that were included in the configurations. (see item 6.6) and choose the appropriate name.
Comments	In this section, the technician can include relevant comments that they want to be imported into the report or visible to the reading physician in the reading of the exam.
Reading Technician	
Reading Technician	In this box you can write the name of the technician who performs the preliminary reading of the exam. There is also the possibility of



	displaying the list of technicians that were included in the configurations.
Comments	In this section, the technician can include relevant comments that they want to be imported into the report or visible to the reading physician in the exam score.
Contact Info	
Address	Write the patient's residence address or any alphanumeric data required.
City	Write the patient's city of residence or any alphanumeric data required.
State	Write the state where the patient resides, or any alphanumeric data required.
Country	Write the country where the patient resides, or any alphanumeric data required.
Zip Code	Write the zip code of the place where the patient resides or any alphanumeric data that is required.
Phone #	Write the patient's phone number or any alphanumeric data required.
Cellphone #	Write the patient's cell phone number or any alphanumeric data required.
Workphone #	Write the patient's work contact number or any alphanumeric data required.
Email	Write the patient's email or any alphanumeric data required.
Other	
Enable Password	When enabling this option, a password must be established for the study in question. That the password must be entered on next field.
DC Profile	Sets the profile of the DC channels that you want to use with the studio, so that each channel receives and displays the values appropriately.
Date/Time	It is set automatically and will be part of the name that identifies the study in the data folder.

8.2. Calibration


To start or finish the calibration of the equipment, use the button  located on the Calibration toolbar. The calibration signal should be displayed on all channels in a similar signal pattern (high and low peaks). In some cases, it's necessary to wait a short period of time to obtain the required signal.

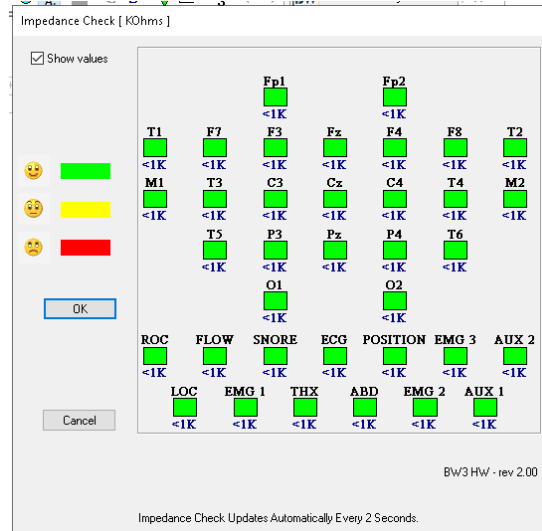




8.3. Impedances

8.3.1. Check Impedances

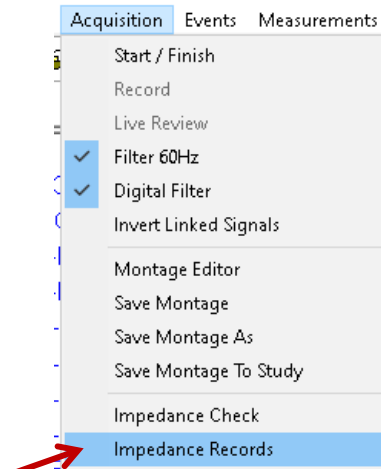
To check the impedances, use the button  located on the Calibration toolbar. A window will immediately be displayed with the impedances in color code (green=excellent, yellow=acceptable, red=ejected) and their numerical value. This color code can be modified according to the value in the impedance sensitivity settings (see item 6.11.5 on page 50 for EEG and 6.15.3 on page 55 for PSG). The user can disable the impedance value (electrode resistance against the scalp), by checking the box "Show values" on the top right of the Impedance window.

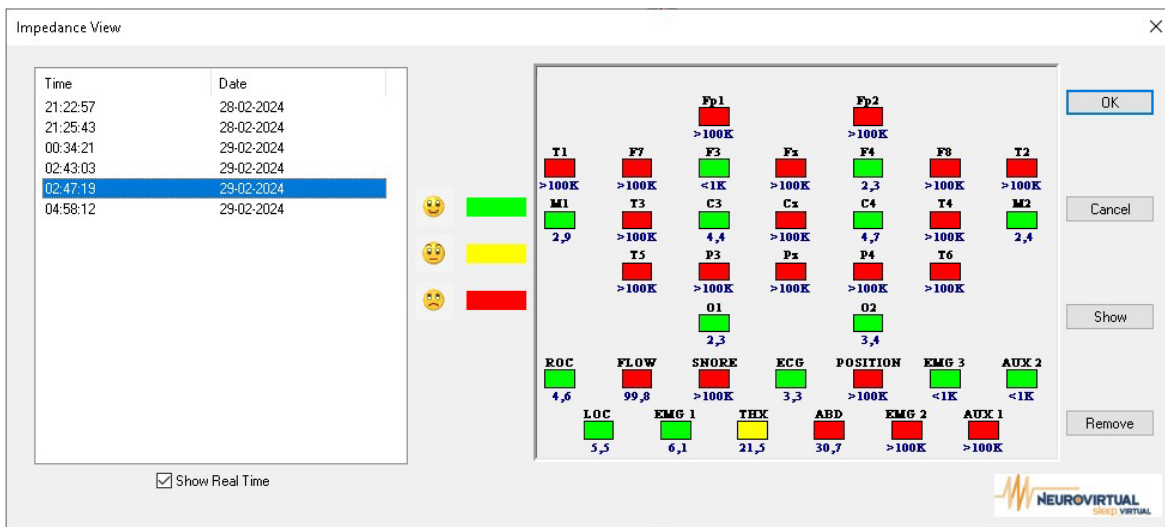


Be aware that, if the color of any of the impedances is in red, the user must replace the respective electrode or verify the correct location of the electrode. Once done, click on *OK* to close the window. The last impedance shown will save the impedances on the recording.

8.3.2. Checking Impedance History

In order to review the impedance history, select on the *Acquisition* dropdown menu, the option *Impedance Records*. A new window will open from where the user can check all the impedances recorded during the exam.





On the left of the window will be displayed the list of impedances recorded with the date and time the check was performed. On the right, it will display the image of the impedances as those were recorded.

8.4. Conducting an Exam in General

To record and save an exam, this must be started, composed of two parts: Acquisition and Recording.

8.4.1. Acquisition

To start or end the acquisition of an exam, click on the button . Immediately, the signal from each of the electrodes and/or sensors will begin to be displayed on the trace.

In this stage, it must be verified that all the connected channels are showing the appropriate signal and that none presents interference or artifact. Otherwise, it is necessary to check the impedances of the electrodes again and physically verify the connections.


It should be noted that when you are in Acquisition, there are several indications that the exam is not yet being recorded yet, only the signals are displayed.

- Recording Timer on the Control Toolbar
- Visible candy bar patten (see item 6.7.9 point C on page 44)
- Status Toolbar will change from "BWAnalysis" to "NOT recording".
- The date and time of the video (only if enabled) will not be displayed, *see item 9.3.4 on page 151*.

Once assured that the signals are as required, the exam can start recording.



8.4.2. Recording

To start or end the recording of an exam, click on the button . Immediately, the trace and video (if in use) displayed on the screen will be recorded on the computer's hard drive, for later reading.

If this button is not pressed, despite displaying the signals on the screen, there will be no evidence of what has been viewed, and the exam will remain at 00:00 seconds of recording.


It is important to verify that:

- The exam timer starts counting and does not stop
- The candy bar pattern disappears
- The Status Toolbar is set to "Recording"
- The date and time of the video (only if activated) is displayed, *see item 9.3.4 on page 151*.

8.5. Opening an existing exam

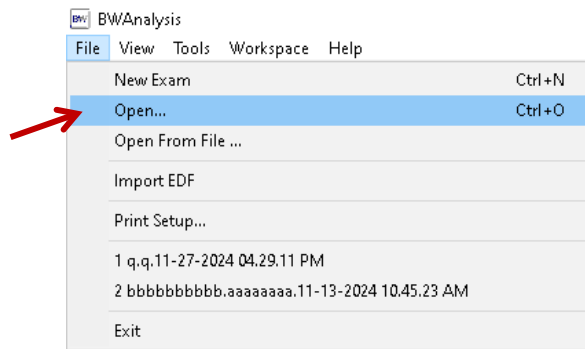
All the exams recorded, soon after their accomplishment, are automatically filed inside the folder configured to save Data. It is recommended for the user to create a shortcut for the Data folder in its working area, facilitating the record location. Whether the user wants to open an exam, to score or review it, to continue the registration or for any other reasons, one of the three (3) options to open an exam can be done.

8.5.1. Open from Open button

Click the button  located on the Tools Toolbar. After that, follow the instructions described after the second option.

8.5.2. Open from File Menu

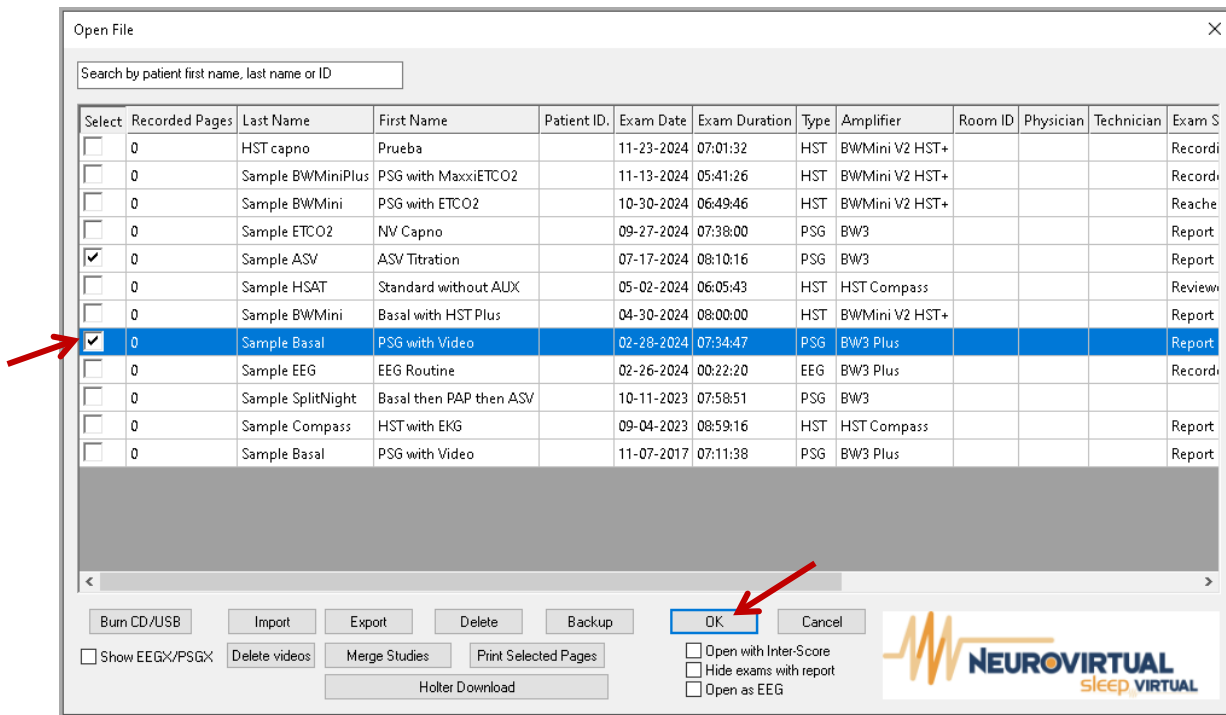
Click the *File* dropdown menu, then select the option *Open*. The program will open a window with a list of all exams saved in the Data folder.



This will pop-up the window listing the exams with some basic information for its identification. Locate the exam(s) required to be open, select it/them with the checkbox

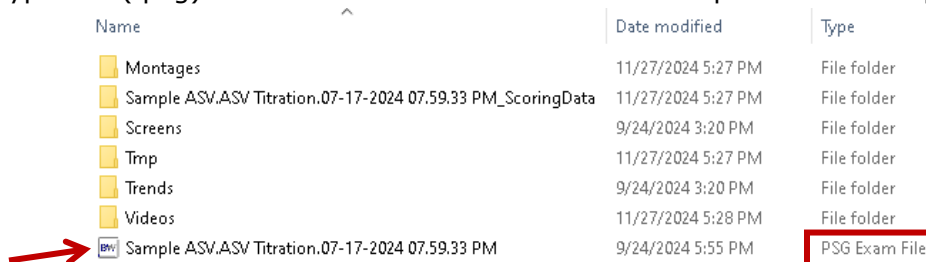


on the select column and click on OK. If selected more than one, all exams will be open in the same window, but in different tabs.



8.5.3. Open from Data Folder

Double click on the shortcut for the folder Data that is located on your desktop. Note that all the data regarding the accomplished records are in this folder. Open the folder with the name of the desired record, then double-click on the EEG Exam File (.eeg) / PSG Type File (.psg) shown on this folder. The exam will open on the computer screen.



8.5.4. Other Open File features

Once the Open File window has pop-up with the list of exams recorded, you can search, burn on USB, Export, Import, and other actions such as:



Open File

A ---

Select	Recorded Pages	Last Name	First Name	Patient ID	Exam Date	Exam Duration	Type	Amplifier	Room ID	Physician	Technician	Exam S
<input type="checkbox"/>	0	HST capno	Prueba		11-23-2024	07:01:32	HST	BWMini V2 HST+				Record
<input type="checkbox"/>	0	Sample BWMiniPlus	PSG with MaxxiETCO2		11-13-2024	05:41:26	HST	BWMini V2 HST+				Record
<input type="checkbox"/>	0	Sample BWMini	PSG with ETCO2		10-30-2024	06:49:46	HST	BWMini V2 HST+				Reache
<input type="checkbox"/>	0	Sample ETCO2	NV Capno		09-27-2024	07:38:00	PSG	BW3				Report
<input type="checkbox"/>	0	Sample ASV	ASV Titration		07-17-2024	08:10:16	PSG	BW3				Report
<input type="checkbox"/>	0	Sample HSAT	Standard without AUX		05-02-2024	06:05:43	HST	HST Compass				Review
<input type="checkbox"/>	0	Sample BWMini	Basal with HST Plus		04-30-2024	08:00:00	HST	BWMini V2 HST+				Report
<input type="checkbox"/>	0	Sample Basal	PSG with Video		02-28-2024	07:34:47	PSG	BW3 Plus				Report
<input type="checkbox"/>	0	Sample EEG	EEG Routine		02-26-2024	00:22:20	EEG	BW3 Plus				Record
<input type="checkbox"/>	0	Sample SplitNight	Basal then PAP then ASV		10-11-2023	07:58:51	PSG	BW3				
<input type="checkbox"/>	0	Sample Compass	HST with EKG		09-04-2023	08:59:16	HST	HST Compass				Report
<input type="checkbox"/>	0	Sample Basal	PSG with Video		11-07-2017	07:11:38	PSG	BW3 Plus				Report

B --- C --- E --- H --- J --- K ---

L --- Show EEGX/PSGX --- D --- Delete videos --- F --- Merge Studies --- I --- Print Selected Pages --- G --- Holter Download

M --- Open with Inter-Score
N --- Hide exams with report

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- A. Search for study:** Search for a study by name, surname or identification number.
- B. Burn CD/USB:** Burn a study on a CD or USB with the executable of the selected exam(s).
- C. Import:** Search from a different location to create a local copy on the Data folder so that they are displayed in the list.
- D. Delete videos:** If the selected study has recorded videos, use this button to delete only those video files leaving the trace and its information saved.
- E. Export:** Create a copy of the selected studies from the Data to another folder of the user's choice.
- F. Merge Studies:** Combining two or more exams from the same patient, that were performed with the same amplifier and same type of study. The newly merged exam will be saved in the Edit folder from BWAnalysis.
- G. Holter download:** Download Holter exams to appear in the list.
- H. Delete:** Delete the selected studies from the Data folder.
- I. Print Selected Pages:** Print screens that were recorded from an exam, either on a physical or virtual printer (PDF).
- J. Backup:** Create a save copy of the selected exams to a pre-established folder. *See item 6.1.2 on page 38.*
- K. OK:** Select one of several exams and click Ok to open them all in the same window, but in different tabs.
- L. Show EEGX/PSGX:** Display only compressed Exams (Marked as Completed) that are in EEGx and PSGx formats.
- M. Open with Interscore:** Enable InterScore or Multiple Scoring.
- N. Hide exams with reports:** Enable the hiding of exams that have already been read and have a report.




Note that if you want to sort any of the data groups (Characteristics) in ascending or descending order, just click on the name of the column required, Example: Clicking on Duration will show them from the longest to the shortest exam and vice versa if clicked again.

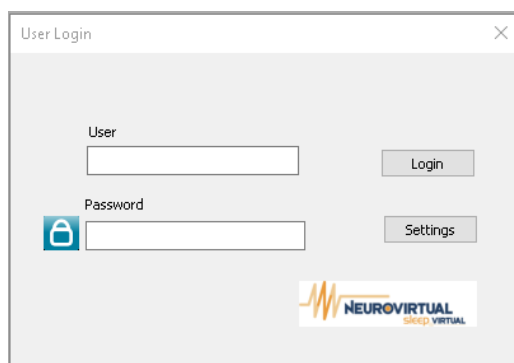
8.6. User Account – Advance Security

In order to comply with the security logs and restrictions, the administrator user can create different users that require to log once the software is opened and request a re-log when a timeout is identified. The activation of this feature and the timeout (in hours) can be configured from the Advance tab from Configurations.

8.6.1. User Login Configuration

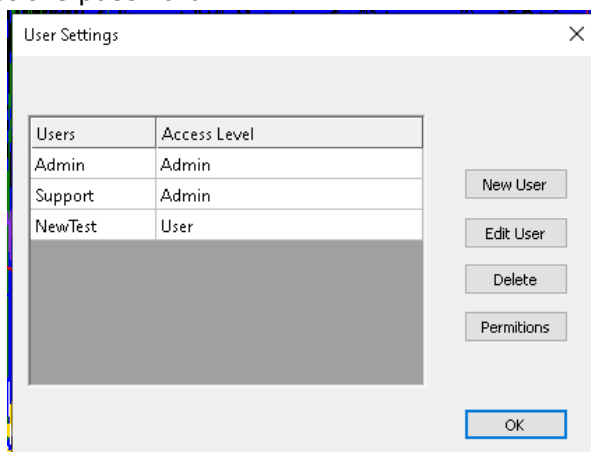
All users can use the Button  in order change the user logged. If the button is grayed out, the feature should be enabled from the Advance tab from the Configurations. Once the feature is enabled and the software reopened, the User Logging window will appear.

If it's the first time accessing, insert the corresponding credentials and click on Settings. This option is available only to Authorized personnel, as it requires a password.



The User Login dialog box contains two input fields: 'User' and 'Password'. The 'Password' field has a lock icon to its left. To the right of the 'User' field is a 'Login' button, and to the right of the 'Password' field is a 'Settings' button. At the bottom right, there is a logo for 'NEUROVIRTUAL sleep VIRTUAL'.

Once Settings button is clicked, a new window with the list of Users and Permissions will show. From this window the administrator can add or exclude users, change the permissions and reset the password.

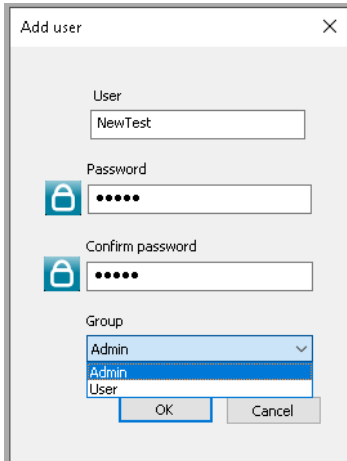


The User Settings dialog box features a table with two columns: 'Users' and 'Access Level'. The table contains three rows: 'Admin' with 'Admin' access, 'Support' with 'Admin' access, and 'NewTest' with 'User' access. To the right of the table are buttons for 'New User', 'Edit User', 'Delete', and 'Permissions'. An 'OK' button is located at the bottom right.

Users	Access Level
Admin	Admin
Support	Admin
NewTest	User

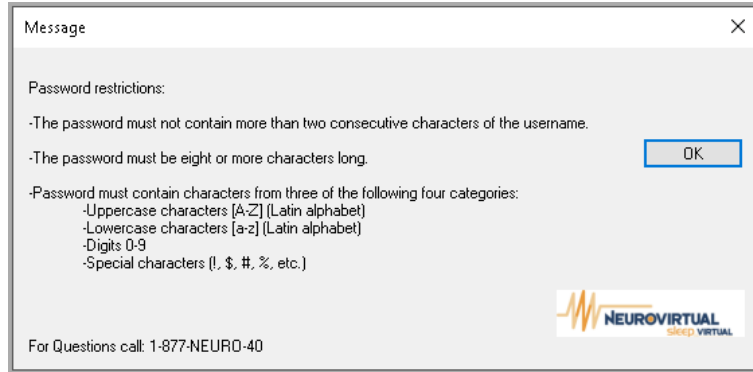


In order to add a new user, click on the *New User* button. The *Add User* window will show, it is required to assign a username, a password and the group type that the user will be using (Default: Admin / User). Note that the password must comply with the restrictions listed on the Warning message below.



The 'Add user' dialog box contains the following fields and controls:

- User:** Text input field containing 'NewTest'.
- Password:** Password input field with a lock icon and masked characters.
- Confirm password:** Password input field with a lock icon and masked characters.
- Group:** A dropdown menu with 'Admin' selected. The list below it shows 'Admin' and 'User' as options.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom.




The 'Message' dialog box displays the following password restrictions:

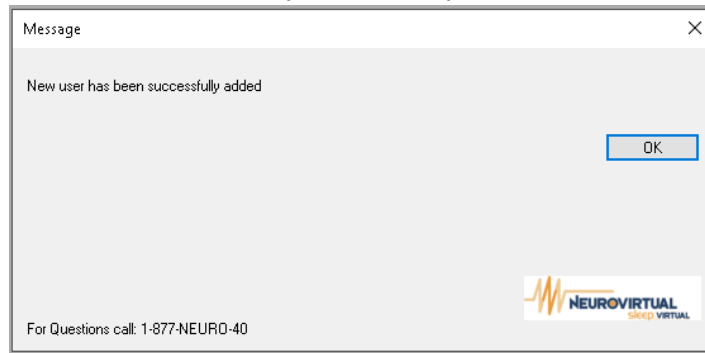
- The password must not contain more than two consecutive characters of the username.
- The password must be eight or more characters long.
- Password must contain characters from three of the following four categories:
 - Uppercase characters [A-Z] (Latin alphabet)
 - Lowercase characters [a-z] (Latin alphabet)
 - Digits 0-9
 - Special characters (!, \$, #, %, etc.)

Buttons: 'OK' and 'Cancel'.

For Questions call: 1-877-NEURO-40



Once the information is completely, click the *OK* button to create the user, a confirmation window will show if all information complies the requirements.




The 'Message' dialog box displays the following success message:

New user has been successfully added

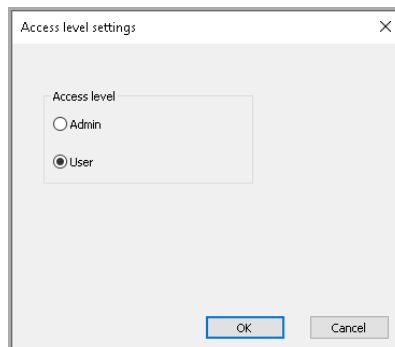
Buttons: 'OK' and 'Cancel'.

For Questions call: 1-877-NEURO-40



In order to edit a user, select the user from the list, then click on the *Edit User* button. The *Edit User* window will show all fields allowed to be edited. From this window, the password can be reset, as well as the change of the group assigned.

In order to change the Group or Access Level to a user, select the user from the list, then click on the *Permissions* button. A new window will show the Group list, select the type to be assigned, then click on the *OK* button.

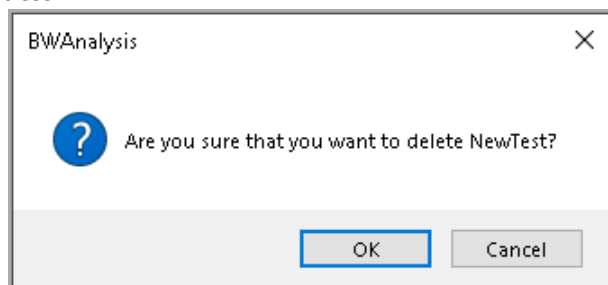


The 'Access level settings' dialog box contains the following controls:

- Access level:** A group box containing two radio buttons: 'Admin' (unselected) and 'User' (selected).
- Buttons:** 'OK' and 'Cancel' buttons at the bottom.



In order to exclude a user, select the user from the list, then click on the *Delete* button. A confirmation window will appear before deleting the user. Confirm the exclusion by clicking on the *OK* button.



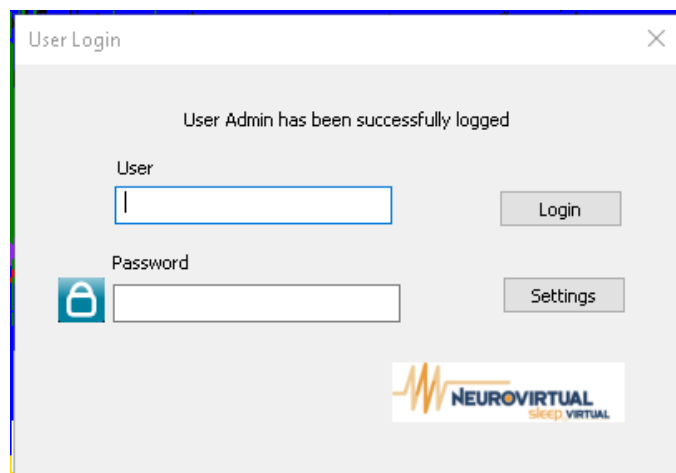
The access of each user will be registered in some Logs to review at any time. If no user was logged in or the feature is not enabled, the logs will still save information under the name *No user logged in*.

The Logs will save detailed information of the software actions the access user performed, such as:

- Exam Records
- User Tool Logs
- Assembly Tool Logs
- Configuration Tool Logs
- Custom Charting Tool Logs
- Error logs
- Video deletion action

8.6.2. Timeout feature

Once the feature is enabled on the Advance tab from Configurations, it can be assigned a limit of time where the user is out of the BWAnalysis screen control (this request will not appear if the exam has the acquisition running). This access will be requested after that period (in hours) has passed. Note that the previous username will appear as the last logged user. To reestablish control of the software, the user must insert the credentials for the same or different user, then click on the Login button.





8.7. Performing and Reviewing a General Exam

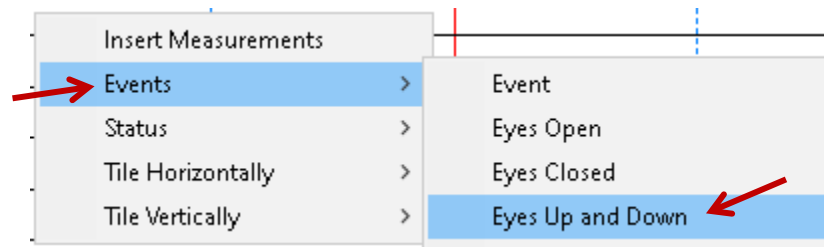
8.7.1. Events

During the acquisition (technician event) or after the recording, while analysis/reading of studies (physician event), the user can insert some "notes" in the trace, which can be located during the revision. These "notes" are named Events, and they can be personalized so it facilitates their insertion.

Events can be actions that do not last for a long time in the exam, for example, coughing, sneezing, patient movement, eyes open and/or closed within the protocol of opening and closing eyes, etc. Thus, actions like Vigil, Hyperpnea, Photo-stimulation and other common occurrences during an EEG or PSG recording.

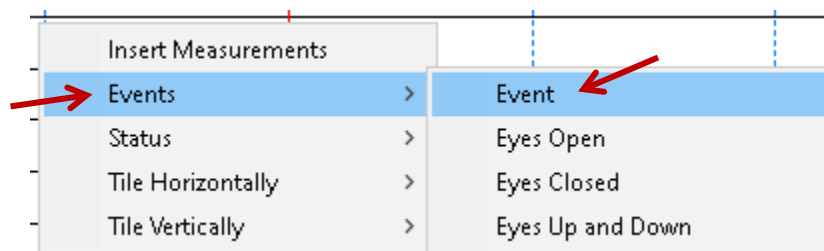
8.7.1.1. Inserting an Event

In order to insert an event in the trace, do a right-click anywhere on the screen. A box with different options will be shown. Select the option Events and note the new menu shows all pre-defined events (personalization of the events can be done to suit the study performance). Select the desired event with a click, to insert it.



Events can be also marked from the Quick Event Toolbar or from the Event Toolbar in which the default or personalized events will be listed. Or using the keys *Ctrl + Number* keys (from 0 to 9) from the keyboard, to mark one of the first ten events of the list.

In case your box of events is with the 25 available events filled out and you need to mark another event (normally spontaneous event), click the option called Event to open the Tech Event window. Mentioned window can be opened with the spacebar from the keyboard.



From the Tech Event window, it can be set different event type where the user can write the necessary information. choose from whom the event is marked (Physician or Technician). Hit the Enter key from the keyboard or click the *OK* button to insert it in the trace.

Tech Event

Sleep Stage

Position

RR

BPM

SpO2

Snore

Respiratory Event Type

General

Physician Technician

OK Cancel

Note: All events marked will be available on the GoTo list and will be possible to differentiate when those were inserted by the Physician or the Technician.

Go To

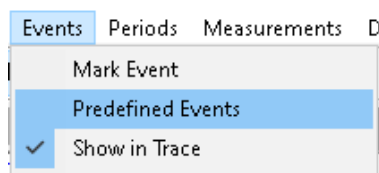
Event	Time	Real Time	Date
Sleep Stage: W	00:00:00	08:31:32 PM	11-27-2024
Position: S	00:00:02	08:31:35 PM	11-27-2024
RR: 55	00:00:04	08:31:37 PM	11-27-2024
BPM: 80	00:00:06	08:31:40 PM	11-27-2024
SpO2: 98	00:00:08	08:31:42 PM	11-27-2024
Snore: Snoring	00:00:12	08:31:47 PM	11-27-2024
Respiratory Event Type: Obstructive Apnea	00:00:16	08:31:52 PM	11-27-2024
General: Tech in Room	00:00:21	08:31:57 PM	11-27-2024

Go To

Event	Time	Real Time	Date
General: Seazure	00:00:26	08:32:03 PM	11-27-2024

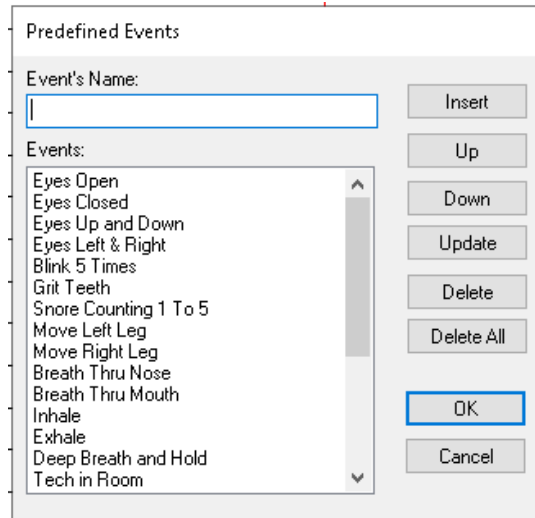
8.7.1.2. Personalizing Events

In order to personalize the events (modify, add, delete or reorganize), click on *Events* on the menu and then click the option *Predefined Events* option.





Note that a window named Predefined Events will be shown, where you can insert, move up or down an existent event, update or exclude one or all events. Keep in mind that the maximum number of events is 25, this includes even those that are blank, therefore, if you want to add or modify any of the existing ones, it must first delete one or more of those that you do not want to have in the list.



To add a new event, set the new name in the *Events Name* field, then, press the *Insert* button, the event will be added at the end of the list of available events. Keep in mind that before adding, it must be removed or set free fields to add the new events.

To exclude an event from the list of events, select the desired event and click the *Delete* button.

To update an event, select the desired event and type the updating name in the field *Event's Name*, then click the *Update* button.

There is also the possibility of Delete all and enter only the events to be used. It is recommended to leave between the first 5 and 10 events the ones that are going to be used the most for the use of shortcuts.

8.7.2. Revising the Record

In order to review the record, you have the following options:

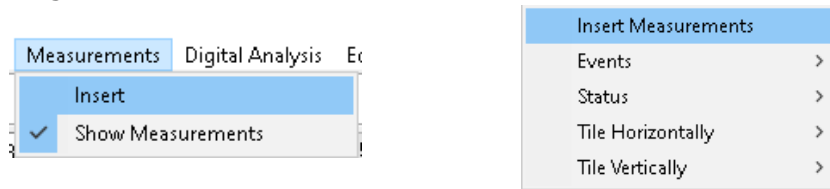
- Use the Navigation Toolbar.
- Use one of the Paging Speed options configurated from the Navigation tab from the Configurations. (PgUp/PgDown keys from the keyboard, Left and Right arrows from the keyboard or use the scroll from the mouse).

8.7.3. Measurement

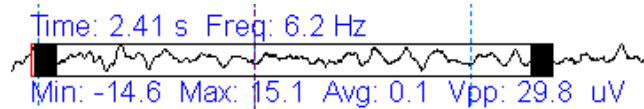
The BWAnalysis software makes available for the users a resource where you can measure width and wave frequency values in an EEG record plan.

8.7.3.1. Inserting Measures

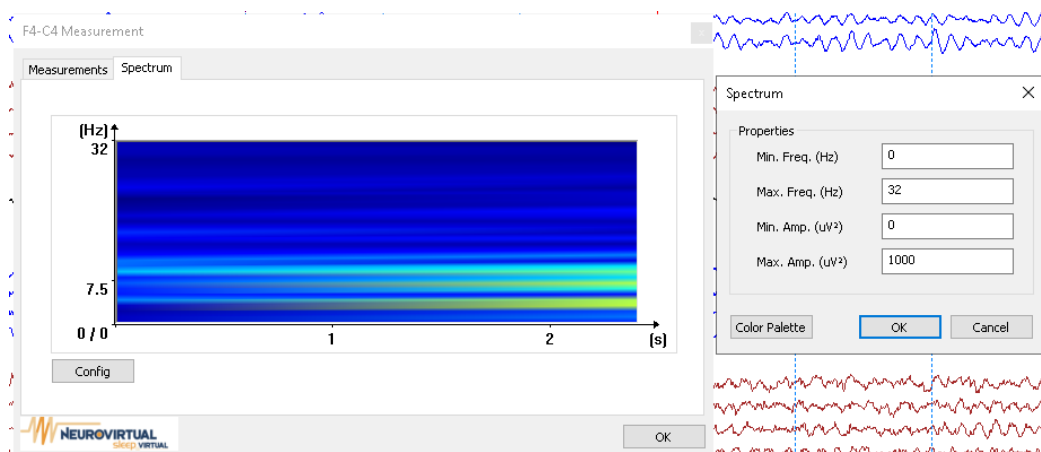
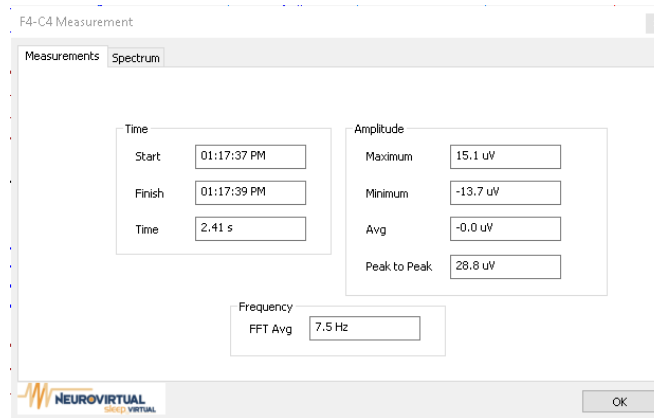
In order to insert one or more measures in a trace, click the Measurements dropdown menu, then choose the *Insert* option. On EEG studies, Insert Measurement can be insert also from the right-click on trace.



After that, the cursor will become a measurement instrument. Click on a determined wave and drag the mouse, determining the wave area to be measured. Thus, the user will obtain the time, the frequency and width of the measured wave.




Each measurement will be shown in the plot as a red box, and only when you place the cursor over this box, it will turn blue and show the information of the measurement. To have more detailed information, double-click on the measure box. The new window will show Time, Amplitude and Frequency details, as well as a Spectrum graphic of the selected wave.

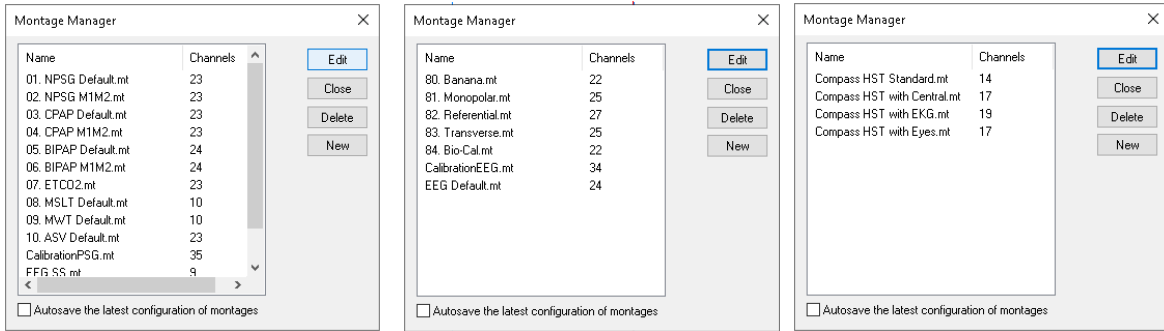




8.7.4. Montages Editor

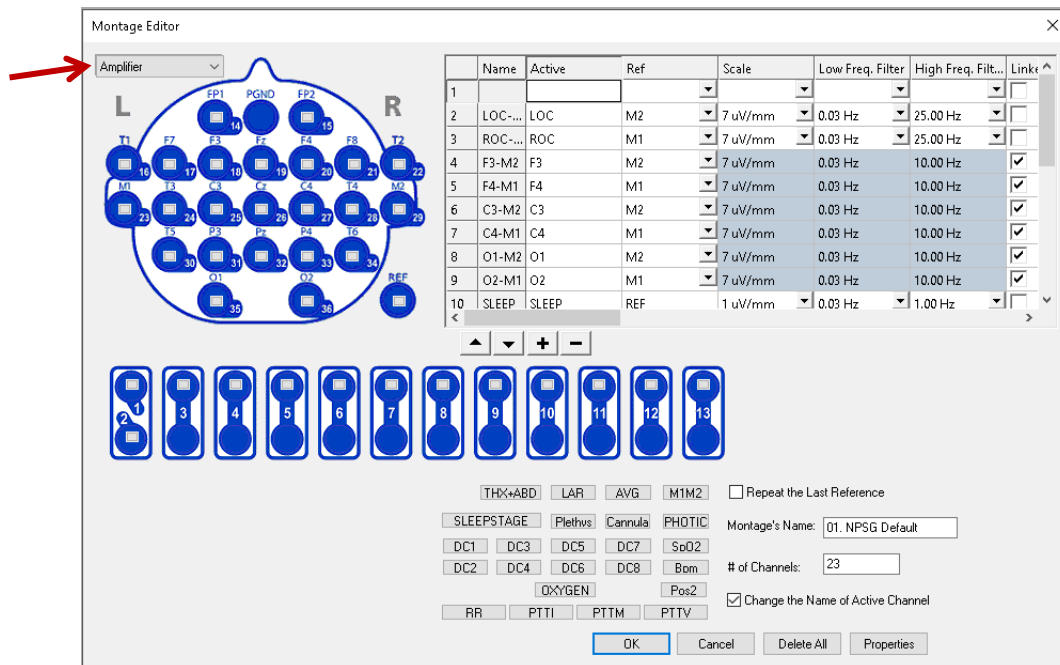
The Software has several default montages, which can be changed from the dropdown menu on the *Control Bar* (see item 7.2.1.3 on page 71). All of the montages can be modified or removed as required, as well as adding other montages by creating them. To manage all of those actions, use the button  from the Tool Toolbar.

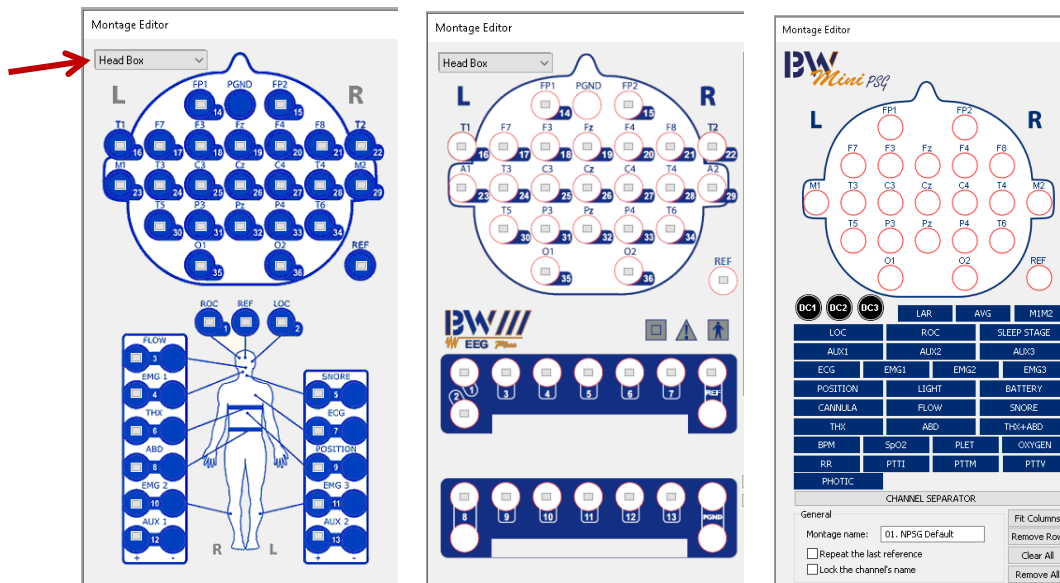
A new window will open where the list of montages set for the used amplifier.



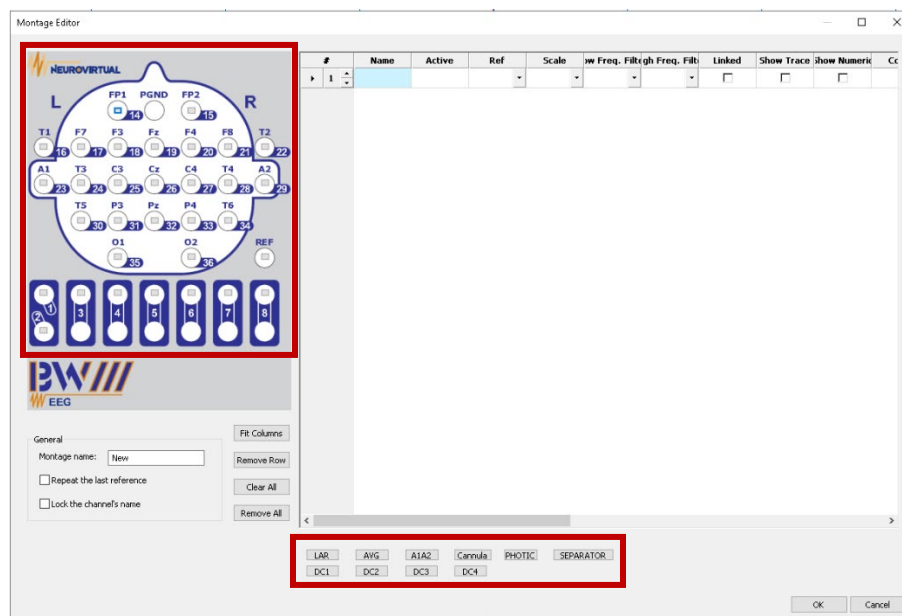
To create a new montage, click on the *New* button. To modify an existing one, select the montage and click on *Edit* button. To delete an existing montage, select the montage and click on the *Delete* button.

When selecting *Edit* or *New*, a new window will open allowing to make the modifications or create an assembly from scratch. Note that the display of the channels depends on the equipment to be used. If the equipment is PSG Plus or an EEG Plus, the user will be able to choose between the amplifier display and the headbox display.





Depending on the equipment and the type of study, the channels that can be chosen will also be shown.



8.7.4.1. Column configuration

From this window, it can be selected the channel to use, the required reference and the different configurations of these channels, such as: scale, filters, show trace or numeric, color, associated events, type of signal, among others.

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
#	Name	Active	Ref	Scale	Low Freq. Filter	High Freq. Filter	Linked	Show Trace	Show Numeric	Color	Data Types	Associated Event	Filter	Reverse	AuxLines	AuxL. Type Group	AuxLines Vpp	AutoScale	Clip Wave	EKG Filter
1	ROC-M1M2	ROC	M1M2	7 uV/mm	0.03 Hz	25.00 Hz	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Blue	Other	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75.00	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	C4-M1	C4	M1	7 uV/mm	0.03 Hz	35.00 Hz	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Black	Other	Arousal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	SNORE	SNORE	REF	15 uV/mm	15.00 Hz	70.00 Hz	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	BlueViolet	Other	Snoring	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	ECG	ECG	REF	25 uV/mm	10.00 Hz	35.00 Hz	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Red	EKG	Cardiac	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	75.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	THX	THX	REF	35 uV/mm	0.03 Hz	3.00 Hz	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Blue	Respiratory Effort	Respiratory	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	RLEG	EMG 2	REF	15 uV/mm	10.00 Hz	70.00 Hz	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Gold	LM	LM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	150.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	ASV	DC1	REF	7 uV/mm	0.03 Hz	10.00 Hz	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Black	DC	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	SpO2	SpO2	REF	0	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Black	SpO2	O2 Desaturation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	BPM	BPM	REF	0	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Black	Heart Rate	Cardiac	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	PLET	PLET	REF	35 uV/mm	0.03 Hz	70.00 Hz	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Black	Other	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- A. Name:** Set any name required after having configured the channel. It is recommended a short name to avoid taking space of the trace.
- B. Active:** Active is the principal channel that will be chosen first.
- C. Ref:** Reference electrode. If monopolar channel, choose after active. If bipolar channel, the REF channel should be automatically chosen.
- D. Scale:** The default sensitivity that the channel has in the montage. Set a medium value that avoid it being too small or overlap others.
- E. Low Freq Filter:** Low cut filter. Depending on the type of signal will be the value that will be given.
- F. High Freq Filter:** High cut filter. Depending on the type of signal will be the value that will be given.
- G. Linked:** Channels that are linked will respond to the external settings of the Control Toolbar. Own Filters and Sensitivity will be locked.
- H. Show Trace:** Allows the signal trace of that channel to be seen. If the channel is a numeric value, you may see only a straight line.
- I. Show Numeric:** Allows the alphanumeric value of the channel to be seen. If the channel does not have a number, you will see two lines indicating no value "--" periodically.
- J. Color:** A different color can be set for each channel. The software has 42 different colors to choose from.
- K. Data Types:** Determines which type of data belongs to each channel.
- L. Associated Event:** Determines the type of event which will be associated to the different sub-events that can be scored on the channel.
- M. Filter:** Applies the high-cut and low-cut filters. If not checked, the signal will show the raw acquisition and might show noise.
- N. Reverse:** It is only used when the signal is upside down, to invert it.
- O. AuxLines:** Sets lines above and below as peak-to-peak indicator or range measurement limit.
- P. AuxL Type Group:** When enabled, all channels with the same Data Type will enabled the Auxiliar Lines.
- Q. AuxLines Vpp:** Establishes the Auxiliar Lines uV peak to peak range that will be applied to each channel.
- R. AutoScale:** The computer automatically adjusts the sensitivity.
- S. Clip Wave:** This option completely flattens the top curve of the wave, if it exceeds the maximum amplitude of its channel.
- T. EKG filter:** Allows filtering the EKG wave from the channel.

The sensitivity of this montage can also be modified, both individually and for all the linked channels. It is important to note that the higher the sensitivity number, the less amplitude the wave will be seen and vice versa, additionally.

8.7.4.2. EEG Channels

Select the monopolar channel and the reference, which in this case must be another monopolar channel. For example, to create the F3-A2 channel, select the Active channel by clicking on F3, then select the REF channel by clicking on A2

Name	Active	Ref	Scale
1	F3		7 uV/mm

Name	Active	Ref	Scale
1	F3-A2	A2	7 uV/mm

The row will be created with the default parameters for an EEG channel with Linked option enabled, meaning that the Sensibility, High-cut and Low-cut filters are disabled. Those settings can be configured from the Control Toolbar. All manually added channels will have Black as default color, which can be changed from its dropdown menu.

Name	Active	Ref	Scale	Low Freq. Filter	High Freq. Filter	Linked	Show Trace	Show Numeric	Color	Data Types	Associated Event	Filter	Reverse	AuxLines	AuxL Type Group	AuxLines Vpp	AutoScale	Clip Wave	EKG Filter
1	F3-A2	F3	A2	7 uV/mm	0.03 Hz	35.00 Hz	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Black	Other	Arousal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

When adding each channel, a new blank row will automatically be added under it. If an error message appears instead of the new blank row, the user needs to set the number of channels required for the montage.

Depending on the device in use, the user will have the option to add, remove or move between the configured channels with the buttons $\uparrow \downarrow + -$, if available. Otherwise, the user can use the right click menu options.

- Clear Row
- Clear All
- Insert Row
- Remove Row
- Remove All

8.7.4.3. PSG Channels

Select the bipolar channel, if selected from the headbox, the REF will be automatically ser as REF (channel). If selected from the amplifier, the user might require selecting the REF channel manually.

#	Name	Active	Ref	Scale
1	FLOW	FLOW	REF	10 uV/mm

Name	Active	Ref	Scale
1 X3-REF	X3	REF	10 uV/mm

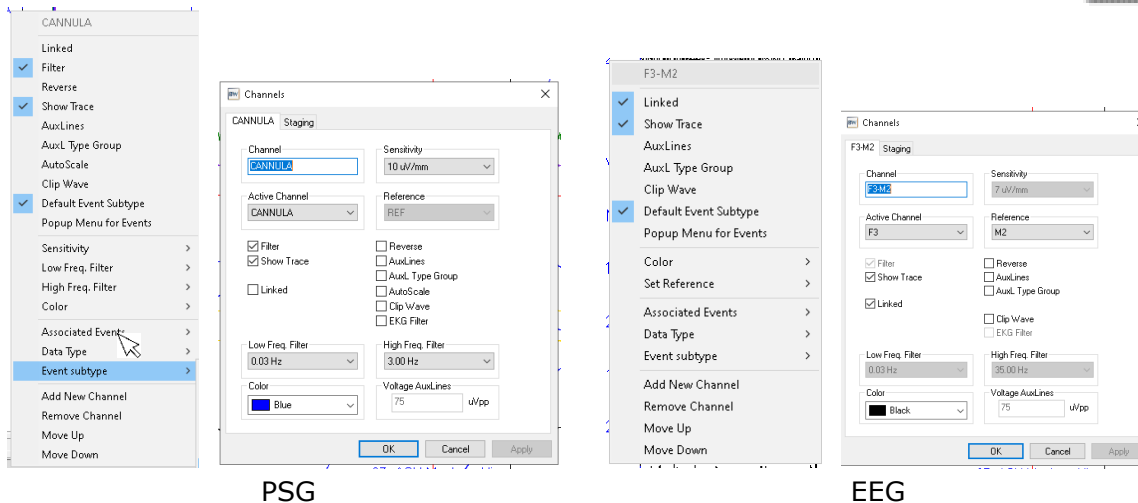
The row will be created with the default parameters for each PSG channel. Those parameters depend on the type of signal that is going to be acquired. Example:

	Scale (uV/mm)	Low-cut (Hz)	High-cut (Hz)	Linked	Show Trace	Show Numeric	Data Types	Associated Event	Filter
EEG	7 or linked	0.53 or linked	35 or linked	X	X	-	Other	Arousal	X
EOG	7/10 or linked	0.53 or linked	35 or linked	X	X	-	Other	Arousal	X
EMG*	≥ 15	10	70	-	X		EMG /LM	Movement /LM	X
Snore	≥15	10	70	-	X		Other	Snore	X
Respiratory*	≥10≥	0.03	1	-	X		Tape/ Flow/ DC	Respiratory	X
EKG	≥25 or Autoscale	10	35	-	X		EKG	Cardiac	X
SPO2	-	-	-	-		X	Spo2	Desaturation	X
POS	-	-	-	-		X	Position	None	X
BPM	-	-	-	-		X	Heart Rate	Cardiac	X
PLET	≥35	-	-	-	X		Other	None	X
DC Channel	-	-	-	-		X	CC	None	X
ETCO2	-	-	-	-		X	CC	None	X
Oxygen	-	-	-	-		X	Other	None	
Light	-	-	-	-		X	Other	None	
Battery	-	-	-	-		X	Other	None	

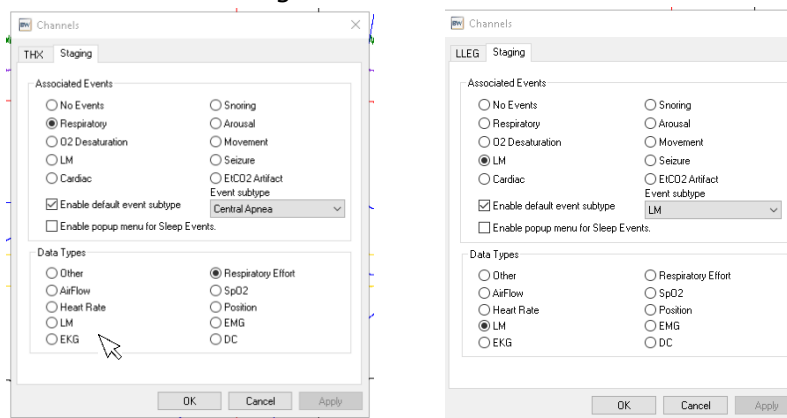
EMG: Right Leg, Left, Chin and Others
Respiratory: THX, Flow, Cannula, ABD, Cflow, CO2 wave

8.7.5. Individual Configuration for Each Channel

In order to configure the individual channel standards, the user can position the mouse on top of the channel name. By using the up and down arrow keys from the keyboard or the scroll of the mouse, the scale (width) will be modified. The user can also right-click on top of the channel to open a list of settings that can be applied to the selected channel. For user comfort, it is recommended to double click the channel name to open the channel parameters window.



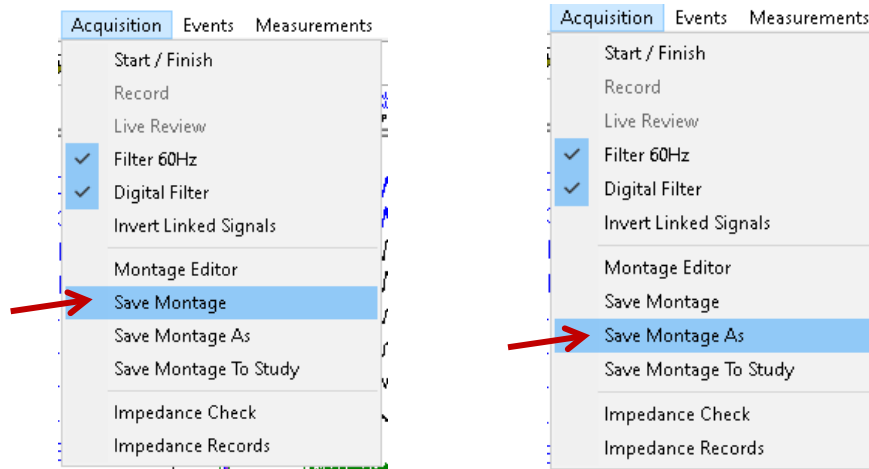
All modifications mentioned on the Montage Editor can be done from the channel pop-up window. It is important to verify that each of the channels has the corresponding Data Type to display the correct view of the signal, as well as the correct Associated Event for correct sub-event scoring.



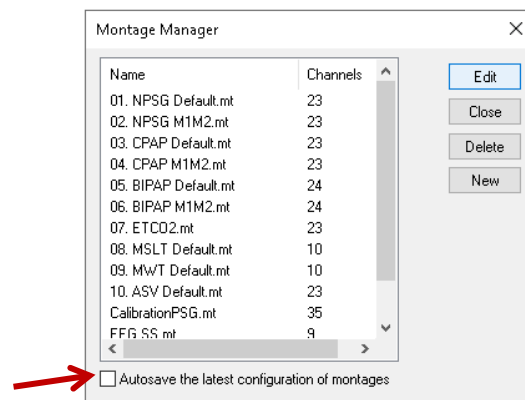
Follow the next table as a suggestion for Associated Event and Type of Data to set for each sample channel.

Channel	Sleep Event Association	Type of data for detection
Flow	Respiratory	Airflow
Chest	Respiratory	Respiratory Effort (Breathing)
ABD	Respiratory	Respiratory Effort (Breathing)
EMG	Movement	EMG / LM
C3	Seizure, Arousal	Other
O2	Seizure, Arousal	Other
EKG	Cardiac	EKG
EOG-L	Arousal	Other
Pulse	Cardiac	Heartbeat
Oximeter	O2 Desaturation	SPO2
Snore	Snoring	Snoring



After all changes have been made directly to the channels, it must be saved to keep the same view for other exams and users. To do this, click on the Acquisition dropdown menu, then select the *Save Montage* option. This will overwrite the original montage. In case its needed to save as a new montage, select the *Save Montage As* option, which will create a new one with the name assigned.

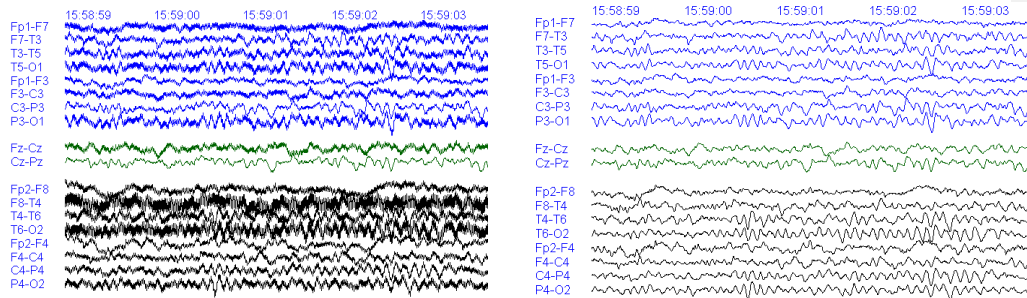


To save the changes done on each channel automatically, the user can check the *Save Automatically* checkbox from Montage Editor window. This option is not recommended for institutions where the computer is used by multiple users, as this option will permanently modify the original setup, which may alter the view for the next user.



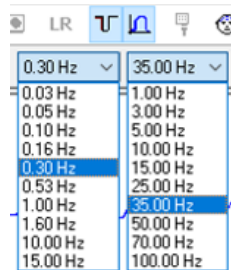
8.7.6. Filters

The software offers two functions to filter the signals and improve their quality. Use the Button  in order to turn on the 50/60Hz filter. Use the button  in order to turn on the digital pass filter. Both filters are used to remove and filter out other types of noise and artifacts in the signal. Example: Both Filters OFF vs Both Filters ON

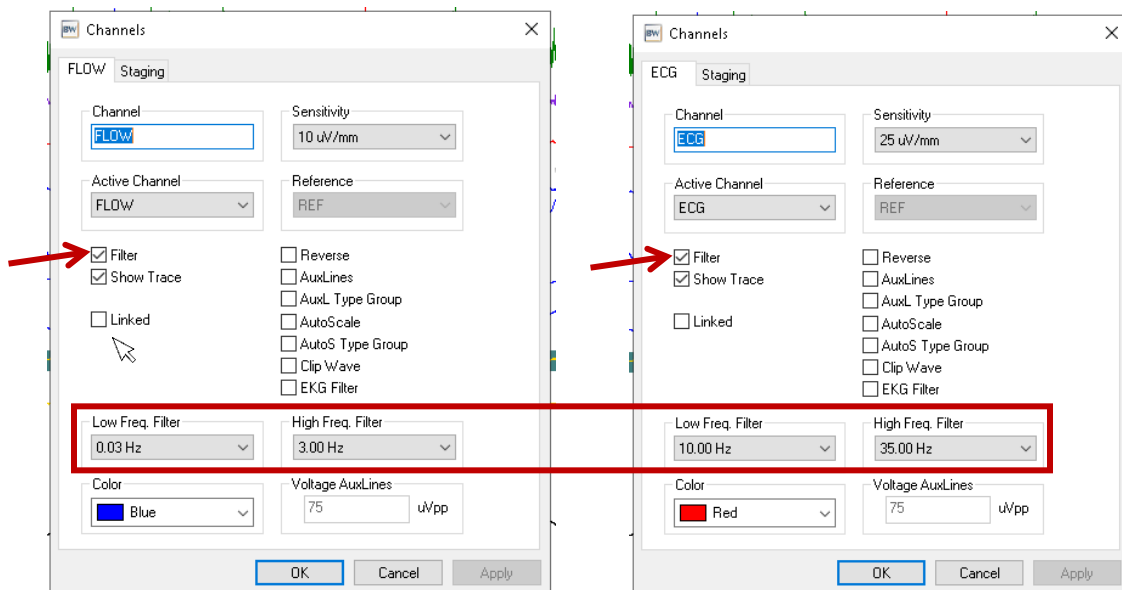


In addition, while the exam is under acquisition or review, modifications may need to be done to the high and low filters in a general montage or in a specific channel.

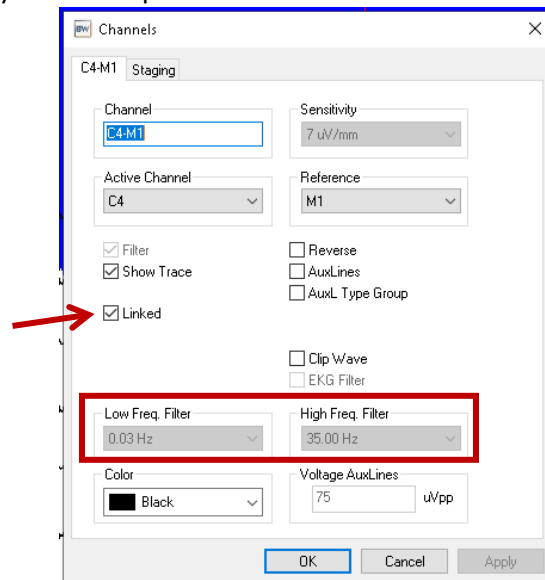
To modify the Low Frequency (Left) or High Frequency (Right) filters of the entire trace (signals linked), locate the *Control toolbar* and choose the Filters dropdown list. If the filters are grayed out, the notch and digital filter buttons from the Tool Toolbar might be disabled. Enable both buttons to be able to modify the filter values. If the value to be chosen is not in the list, refer to the Filters tab from Configurations.



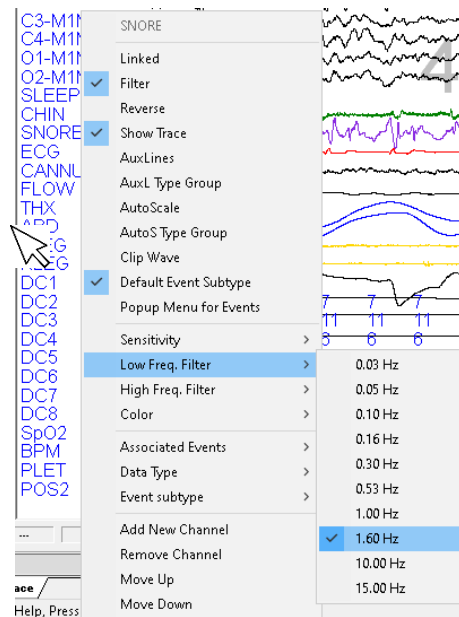
To modify the filters for a specific channel, double-click on the channel name to open the Channel properties. Verify that the *Filter* checkbox is enabled for the filter values to be applied to the channel. When finished, click on apply and accept.



Note that in EEG, the filters are disabled, since in most EEG setups, the channels are linked. If needed, disable the *Linked* checkbox to be able to modify the filters. When finished, click on apply and accept.



The change of the filters can also be done by locating the cursor on top of the name of the channel, then right-click to access the channel settings in a list. Choose the Low Freq Filter or High Freq Filter option to display the list of values and select the desired one.

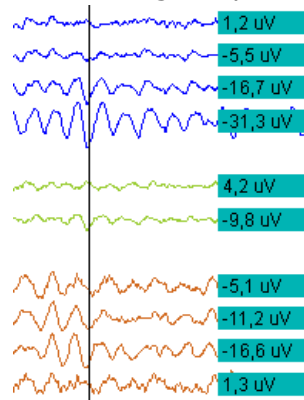


8.7.7. Amplitude Tracker


The amplitude of any wave in the trace can be verified by using the Amplitude Tracker. Use the **+** button, located in the Navigation Toolbar, to enable this feature. It will show



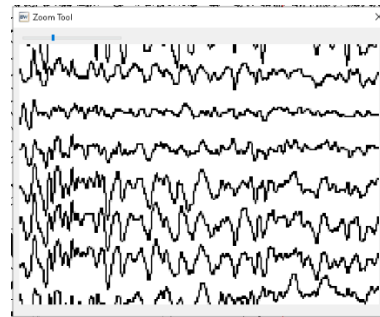
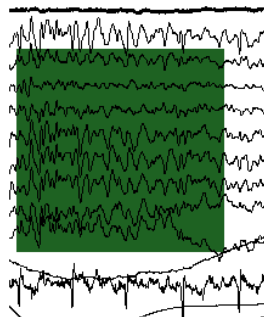
a measure in microvolts (μV) for each wave at the right side of the screen, the value will change when moving the mouse cursor along the path.



8.7.8. Zoom

The Zoom tool allows to select parts of the path to increase its size and see a wave in more detail. Use the  button to activate the feature, then choose a section of the trace by clicking and dragging. A new window is opened, displaying sliding bar which will allow to increase the size of the image and therefore have a zooming in option.

T2-REF
M1-REF
C3-REF
Cz-REF
C4-REF
M2-REF
O1-REF
O2-REF
ROC-REF
LOC-REF
FLOW
EMG 1
THX



8.7.9. Live Review

This tool allows the user to review and score the trace that has been recorded while the acquisition is running. This prevents the user from stopping the acquisition to perform those actions.

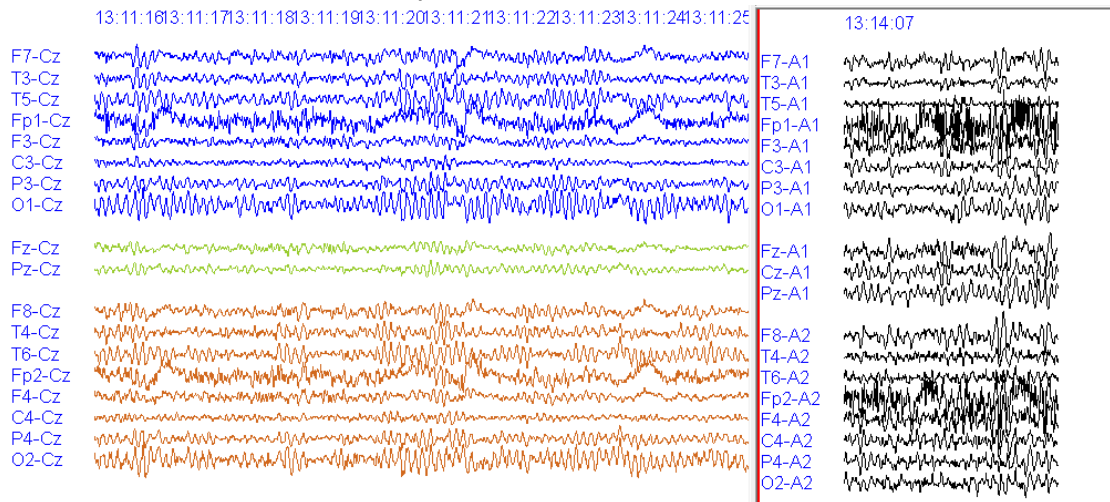
Using this feature, the user will be able to edit an already recorded trace and perform any type of modification. The user can change the montage, sensitivity, filters and speed and among others for the view of the recording. The user will be also able to score sleep stages, mark sleep events (apneas, snoring, etc.), take measurements, record screens, select sections of the study to be cropped, insert any type of status, events, comments or notes (seizures, patient movements, etc.).

In case the studio is being recorded with video, a BWVideo Review window will be displayed with the recorded video up to the point where it has been cut.

Use the button **LR** to enable the revision while recording. By default, the screen will be split with the Left side showing the recorded trace, while the Right side will be shown the live recording. A message window will appear confirming the view.




To make any changes to any of the screens, make sure that the screen to be modified is selected, identifying a red line across the channel's name. To select the screen to be modified, click on the window you want to switch to.

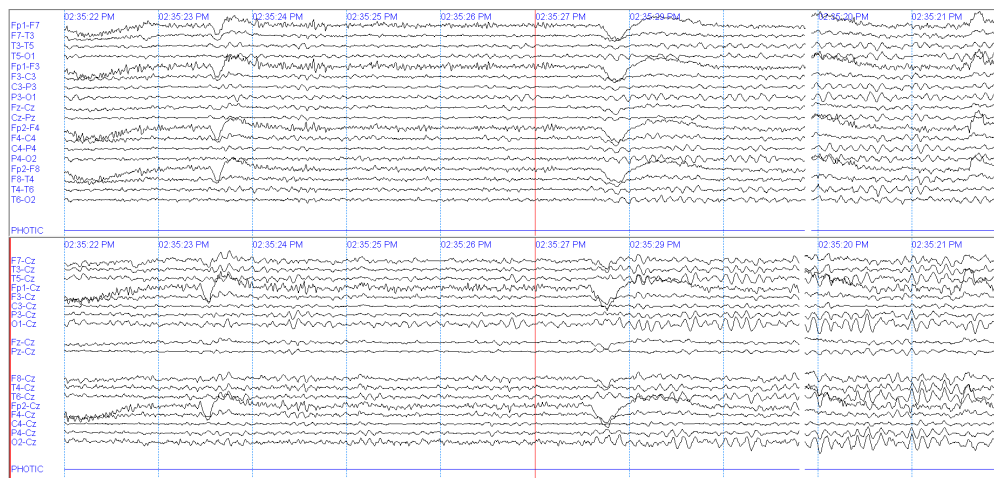


The view can also be displayed in full screen view instead of split screen, which will display the recorded trace. To return to the live recording, it is required to turn off the **LR** button.

8.7.10. Split Acquisition and Split Review

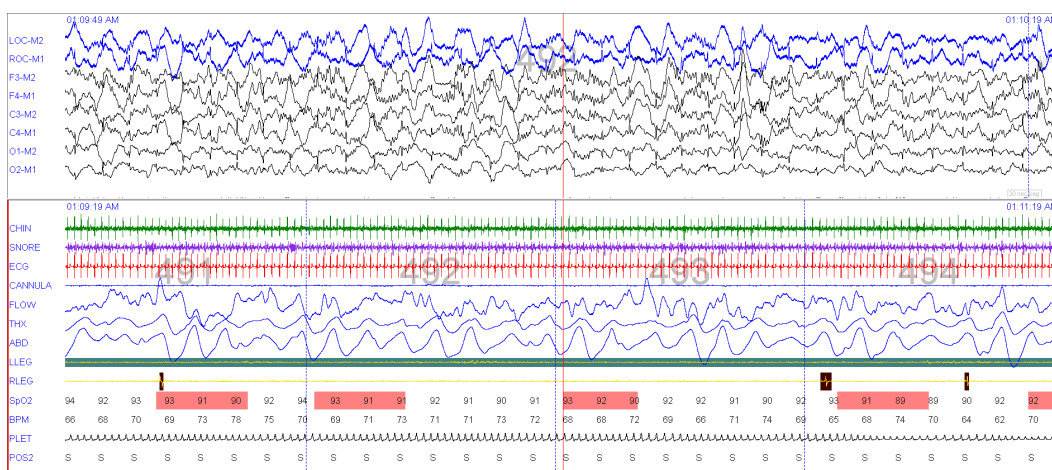
This feature will allow the user to divide the trace screen into two horizontal parts. On each part, different montages, speeds, sensitivities, filters, among others, can be configured. This feature is used for PSG studies in which the user can separate the monopolar channels and visualize them differently from the other bipolar sensors used in this type of study.

To enable, use the Button , located on the Tools Toolbar to enable Horizontal Live Recording Split View. This button will be available for both EEG and PSG studies.




When opening PSG studies, use the button , located on the Sleep Toolbar in order to enable Horizontal Review Recording Split View.

The default montages to be shown once the Split buttons are enabled, can be set from the Acquisition and Screen Adjustment tabs from Configurations window.



To make any changes to any of the screens, make sure that the screen to be modified is selected, identifying a red line across the channel's name. To select the screen to be modified, click on the window you want to switch to.

8.7.11. GoTo – Exam Information

The GoTo, or exam information, is opened by clicking on the button . This window opens and displays all the information and actions that have been performed during the exam, for both EEG and PSG.

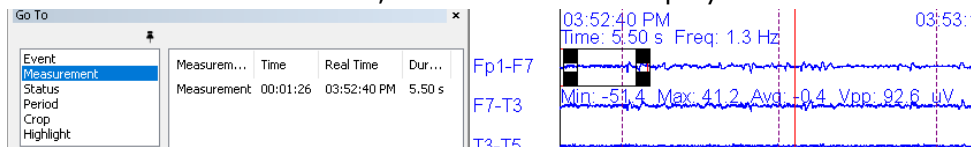
8.7.11.1. For EEG

A. Event: Where are listed all the events of different categories such as:

- Tech Events will be highlighted in the color that is configured. It will show the event specifications, the recording time and the real exam time where it was inserted.
- Phys Event will show the events that were included in the Reading Physician.
- Start Recording will show all the "Start Recording" events, when the exam starts.
- End of Recording will show all the "End of Recording" events, when the exam ended.
- Montages will show all the montages used in the exam.

Event	Time	Real Time	Date
Impedance Check	00:00:00	03:51:14 PM	01-27-2021
Impedance Check	00:00:00	03:51:14 PM	01-27-2021
Start recording	00:00:00	03:51:14 PM	01-27-2021
80. Banana	00:00:00	03:51:14 PM	01-27-2021
Eyes Closed	00:00:57	03:52:11 PM	01-27-2021
Eyes Open	00:01:09	03:52:23 PM	01-27-2021
Eyes Closed	00:01:20	03:52:34 PM	01-27-2021
Eyes Open	00:01:26	03:52:40 PM	01-27-2021
H 5	00:03:56	03:55:10 PM	01-27-2021

B. Measure: All measurements inserted on the trace will be listed. When the user double-clicks on one of them, the software will display it on the trace.



C. Status: It will show all the statuses that are marked by the technician or those that are marked automatically, also with all the information.

Status	Time	Real Time	Date
Hiperventilación	00:03:51	03:55:05 PM	01-27-2021
Final de la Hiperventilación	00:06:15	03:57:29 PM	01-27-2021
Flash Estimulación: Foto	00:08:01	03:59:15 PM	01-27-2021
Final de Foto-estimulación	00:11:49	04:03:03 PM	01-27-2021

D. Period: The periods that have been included will be listed. When the user double-clicks on one of them, the software will display it on the trace.

Period	Time	Real Time	Date
Hiperventilación	00:00:19	03:51:33 PM	01-27-2021
Final de la Hiperventilación	00:01:40	03:52:54 PM	01-27-2021
Flash Estimulación: Foto	00:01:45	03:52:59 PM	01-27-2021
Final de Foto-estimulación	00:05:03	03:56:17 PM	01-27-2021
Final de Foto-estimulación	00:13:52	04:05:06 PM	01-27-2021
Final de Foto-estimulación	00:18:39	04:09:53 PM	01-27-2021
Final de Foto-estimulación	00:20:55	04:12:09 PM	01-27-2021


03:52:54 PM

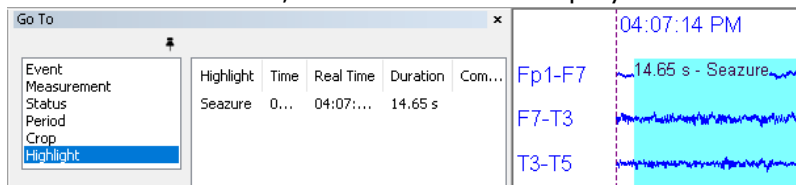
E. Crop: The cropped sections selected will be listed. When the user double-clicks on one of them, the software will display it on the trace.

Label	Time	Real Time	Duration
Crop 3	00:04:57	03:56:11 PM	00:01:30
Crop 4	00:09:24	04:00:38 PM	00:00:10
Crop 6	00:19:07	04:10:21 PM	00:00:13
Crop 5	00:09:36	04:00:50 PM	00:00:05
Crop 1	00:00:30	03:51:44 PM	00:00:05
Crop 2	00:00:38	03:51:52 PM	00:00:04

03:51:44 PM



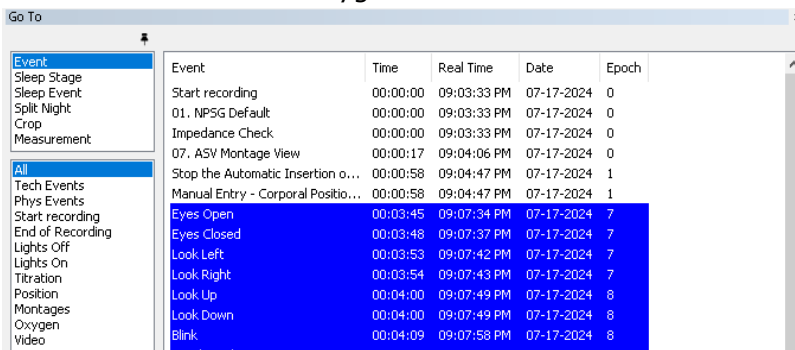
F. Highlight: The highlight boxes inserted on the trace will be listed. Use the button , located on the EEG Toolbar in order to insert a highlight box. When the user double-clicks on one of them, the software will display it on the trace.



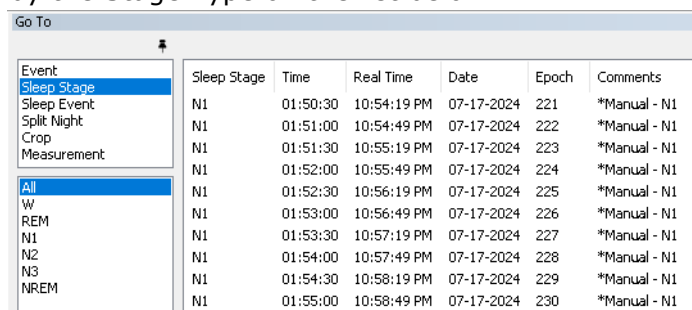
8.7.11.2. For PSG

A. Event: Where are listed all the events of different categories such as:

- Tech Events will be highlighted in the color that is configured. It will show the event specifications, the recording time and the real exam time where it was inserted on the trace.
- Phys Event will show the events that were included in the Reading Physician.
- Start Recording will show all the "Start Recording" events when the exam starts.
- End of Recording will show all the "End of Recording" events, when the exam ended.
- Lights Off will show all the Lights Off events included on the track.
- Lights On will show all the Lights On events included on the trace.
- Titration will show all the Manual Titration events inserted on the trace.
- Position will show all the Manual Position events inserted on the trace.
- Montages will show all the montages used in the exam.
- Oxygen will show all the Manual Oxygen events inserted on the trace.



B. Sleep Stage: All Sleep Stages that have been scored will be listed. It can be separated by the Stage Type on the list below.



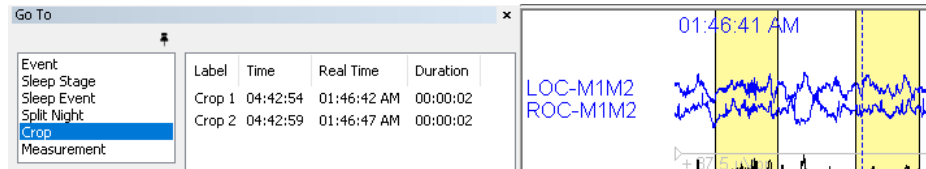
C. Sleep Event: All the sleep events will be displayed. It can be separated by the Sleep Event Type on the list below.

Event	Time	Duration	Real Time	Date	Comments	Epoch	Sleep...
Sleep Stage							
Sleep Event							
LM	00:42:34	2.10 s	09:46:23 PM	07-17-2024	*Assist - LM	85	N3
LM	00:42:38	6.30 s	09:46:27 PM	07-17-2024	*Assist - LM	85	N3
Hypopnea	00:42:44	106.00 s	09:46:33 PM	07-17-2024	*Assist - Hypopnea	85	N3
LM	00:42:44	0.90 s	09:46:33 PM	07-17-2024	*Assist - LM	85	N3
Arousal	00:45:19	7.94 s	09:49:08 PM	07-17-2024	- 30 sec/pag - 7 uV/mm - 88/90	90	N3
LM	00:45:21	2.40 s	09:49:10 PM	07-17-2024	*Assist - LM	90	N3
Spontaneous Arousal	00:45:34	3.19 s	09:49:23 PM	07-17-2024	- 30 sec/pag - 7 uV/mm - 92/93	91	N3
Central Apnea	00:48:08	10.00 s	09:51:57 PM	07-17-2024	- 240 sec/pag - 150 uV/mm - 88/92	96	N3
Respiratory Arousal	00:48:18	3.00 s	09:52:07 PM	07-17-2024	- 240 sec/pag - 150 uV/mm - 90/92	96	N3
Central Apnea	00:48:23	10.00 s	09:52:12 PM	07-17-2024	- 240 sec/pag - 150 uV/mm - 85/86	96	N3
Central Apnea	00:48:40	10.00 s	09:52:29 PM	07-17-2024	- 240 sec/pag - 150 uV/mm - 89/92	97	N3
Arousal	00:48:45	3.00 s	09:52:34 PM	07-17-2024	- 30 sec/pag - 7 uV/mm - 89/89	97	N3

D. Split Night: The Split Events (Start and End) that have been inserted will be listed.

Status	Time	Real Time	Date	Epoch
SPLIT NIGHT	03:55:26	12:59:15 AM	07-18-2024	470
SPLIT NIGHT END	07:58:29	05:02:29 AM	07-18-2024	956

E. Crop: The cropped sections selected will be listed. When the user double-clicks on one of them, the software will display it on the trace.

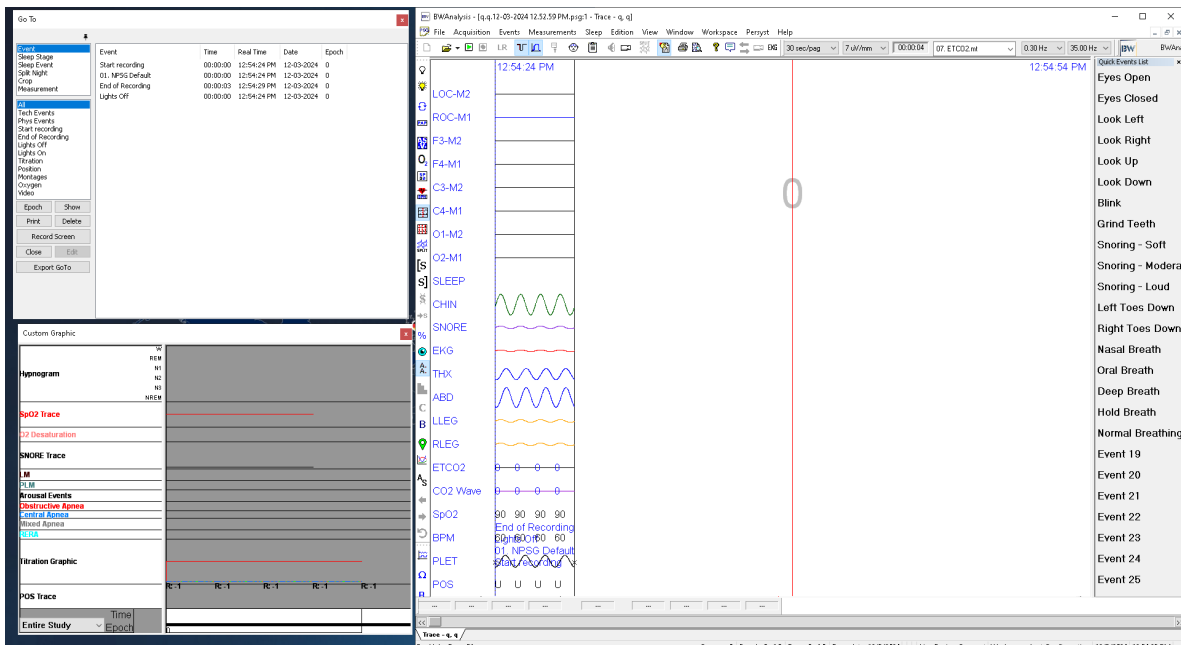


F. Measurement: All measurements inserted on the trace will be listed. When the user double-clicks on one of them, the software will display it on the trace.

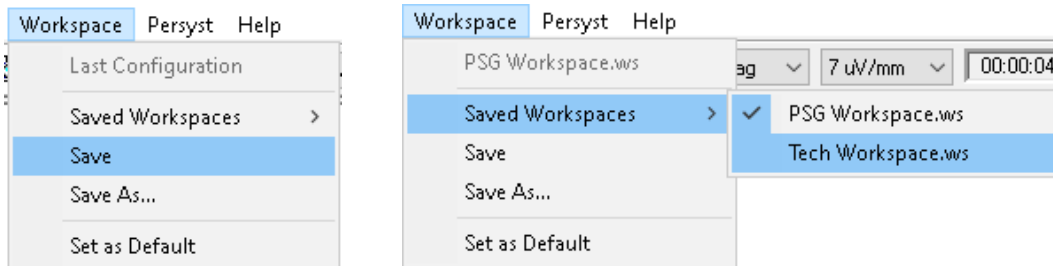


8.7.12. Workspace

The user can customize the workspace under its need, avoiding modifications of the view for other users. This view includes adjusting the window size, toolbar's view, features enabled, among others. To do this, open an exam and locate the window as required, enabling the necessary toolbars and graphics required along the screen.





Once the workspace is configured, click on the Workspace dropdown menu, then select the Save or Save As option. If new, the software will request to assign a name for the display. The saved workspace can be seen and selected from the Saved Workspace, were a list of all saved will be displayed.




8.7.13. Crop Edition

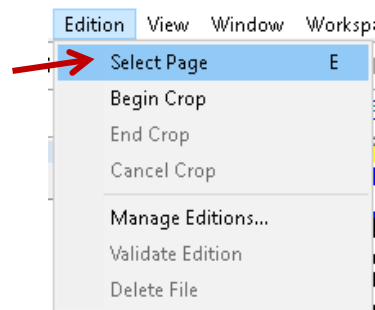
The user will be able to create an edition/crop of exams. Through it, select only the section of the trace that the user may be interested in, create an exclusive file with that selected trace. The complete record can be either kept or deleted. Some cases in which the Edition tool can be use are:


- When the study was recorded on top of another patient.
- When the study was recorded for more hours than stipulated,
- When the study presented many interferences or disconnections, it is desired to leave only the appropriate parts for reading.
- When the study presents specific seizure or special event within the recording.
- Among others.

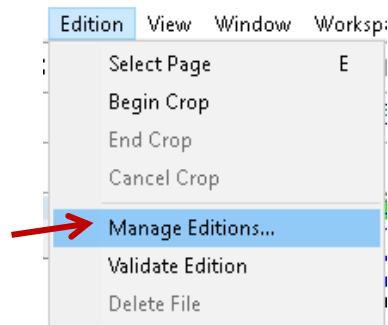
To do this, locate the trace section to be selected, then use the button  located on the Crop Toolbar, and click on the beginning of the trace, this option can be enabled by clicking on the *Edition* dropdown menu, with the *Begin Crop* option. Then, locate at the end of the desired trace and use the  button to finish the selection of the trace. Note that the selected trace section can be a combination of as many traces as required, this option can be enabled by clicking on the *Edition* dropdown menu, with the *End Crop* option.

Use the button  to cancel the selection of the editions at any time the Beginning Crop is enabled, this option can be enabled by clicking on the *Edition* dropdown menu, with the *Cancel Crop* option.

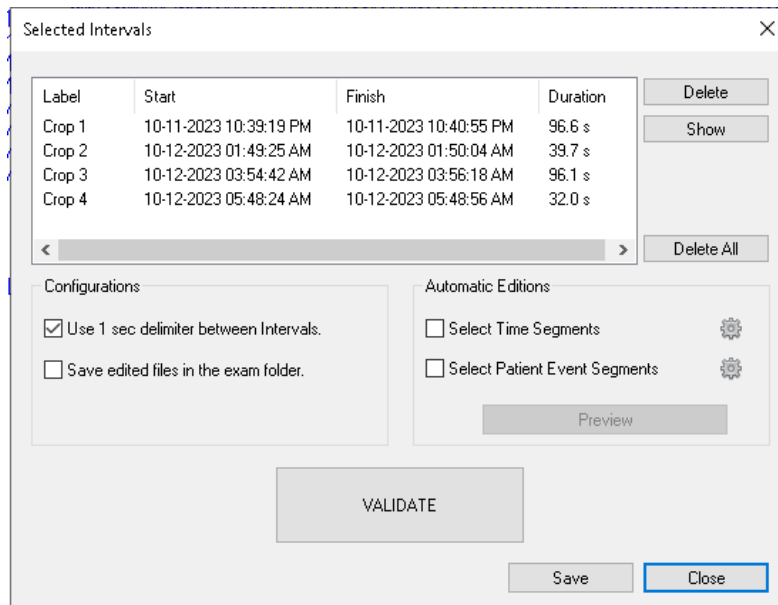
Another option to do the selection can be by positioning on the desired part of the trace and pressing the E key from the keyboard or clicking the *Edition* menu, then select the *Select Page* option. With this, the page will be selected, and the background color might change, depending on the settings done on the Configurations.



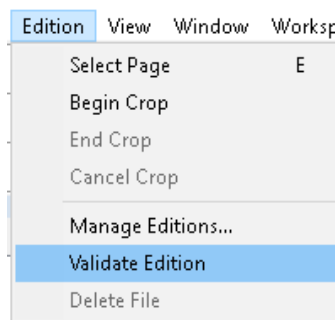
Once all sections have been selected the user can verify the pages selected for the edition, show on the screen or remove them from the edition. To do this, use the button  or click on the *Edition* menu and select the *Manage Editions* option.



Note that a window *Selected Intervals* will be open. Select the desired interval and click the button *Show* to be shown on the screen or click the button *Delete* to exclude the respective section from the edition. The user can also remove all of the selections by using the *Delete All* button.



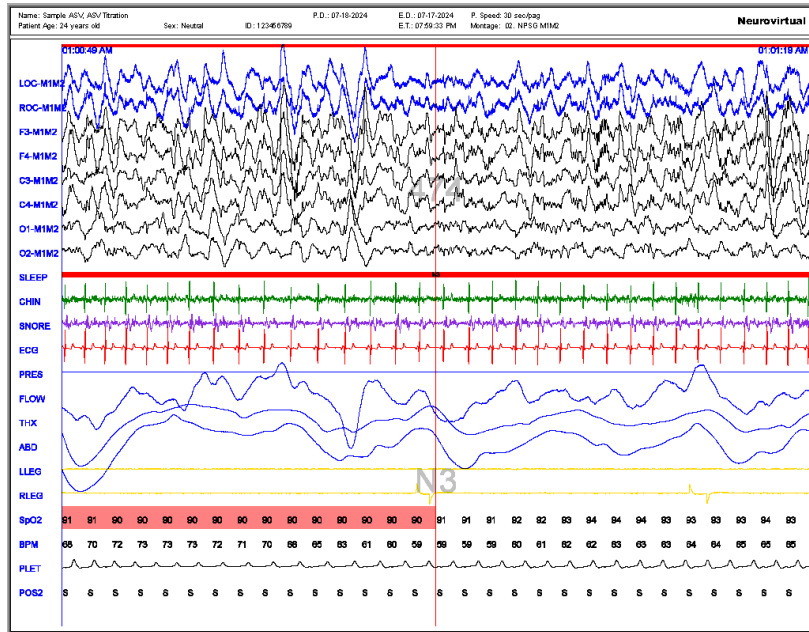
Once the selection is verified, click on the Validate button to confirm the edition and start the creation of new files with only the selected trace to be displayed. This validation can be done when the Selected Intervals window is not open, by using the button or from the Edition dropdown menu, with the option Validate Edition.



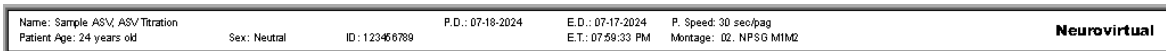
All the edited exams will be kept in a path set from Folder tab on the Configurations. It is recommended to create a shortcut for this folder in its working area, facilitating the location of editing exams.

8.7.14. Page Preview

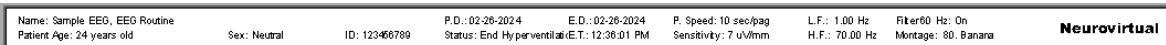
While reviewing a study, it might be required to print a specific page. Use the button from the Tool Toolbar, to preview the page displayed on the screen before printing it on a physical or virtual printer (PDF) or before adding it to the patient's final report.



At the top on the preview can be seen the patients basic information and the exam, such as: Patient's name, Gender, ID, Date of the page on which the screenshot was taken, Status, Date and Time of creation of the exam, Page speed with which the plot is used at the time of taking the screenshot and the Montage in use just at that moment.



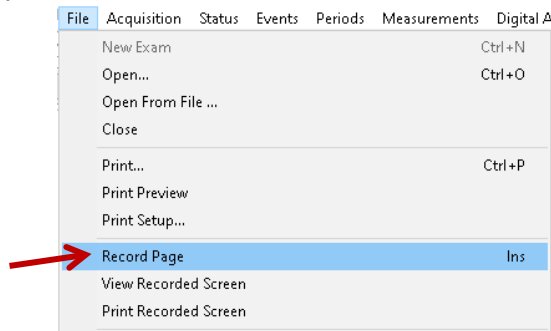
In EEG studies, there is other additional information such as: Sensitivity, Notch Filter, High Short Filter and Low Short Filter.



8.7.15. Recording Pages

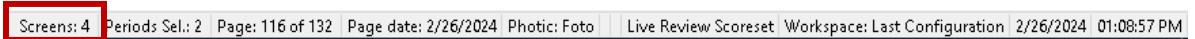
Record Page is the act of saving a screenshot of the trace as an image. This image will be saved as a .png file in the SCREENS folder, which can be inside the Study folder itself, or a different path previously set.

In order to record pages, position on the desired page and press the Insert key from the keyboard or click the *File* menu, then select the Record Page option.

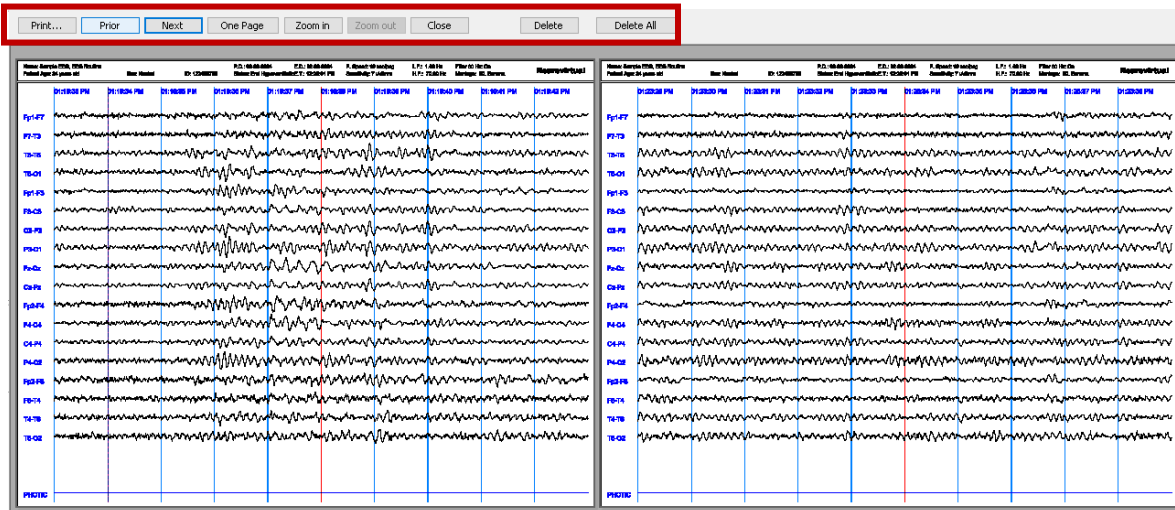




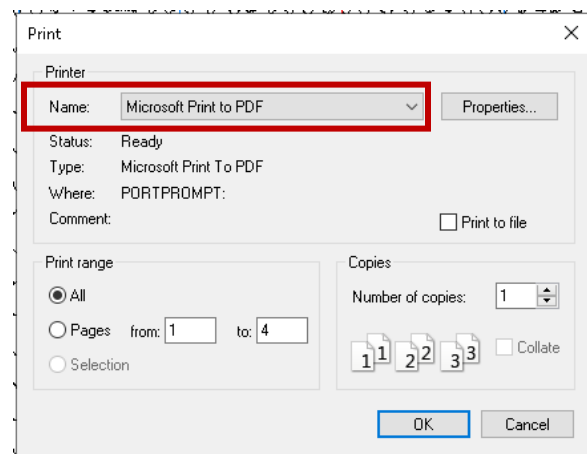
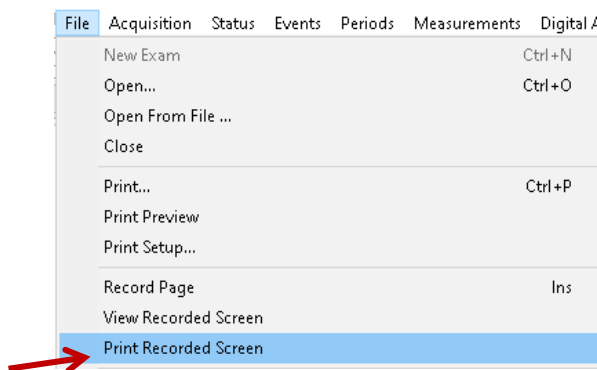
Note that the number of saved pages will be shown on the status bar under Screen name. You can save as many pages as you think are necessary.




In order to visualize the saved pages, click the *File* dropdown menu *File* and select the *View Recorded Screens* option. A new screen will open with the same Current Page Preview interface, from where you can navigate between the pages, see them by 2 pages at the same time, print, remove and other options.

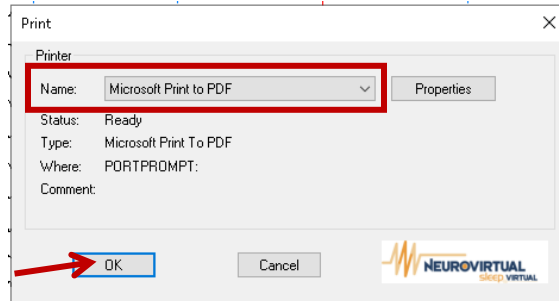


In order to print the Recorded Pages, click on the *File* menu and select the *Print Recorded Screens* option. Select the physical or digital printer, then click on the OK button. With it all previously saved pages will be printed at the same time.

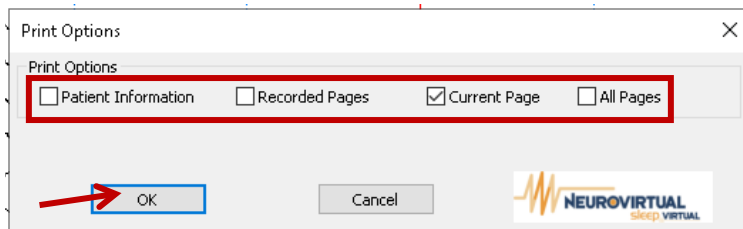


8.7.16. Printing

To print the Trace, Patient info or Recorded Pages, the user can use the  button, located on the Tool Toolbar. A new window with Printer settings will pop up. Select the physical or digital printer, then click on the OK button.



Then, select one of the listed options to be printer. From this window, the user can also print the Patient Information, the Current Page shown on the screen, the previously Recorded Pages or the entire study. After selecting, click on OK to start the printing.



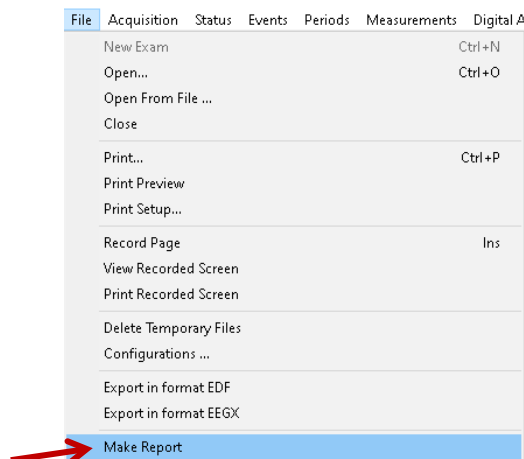
When the PDF file is finished, it will open on the screen, otherwise on physical printer it will print all the pages.

8.7.17. Technical Reports

After a study has been reviewed and/or scored, the user will have the option to generate a report with the information gathered from the study. The listed reports from the software are a complete sample depending on the type of exam performed, those templates can be personalized according to customer requirements.

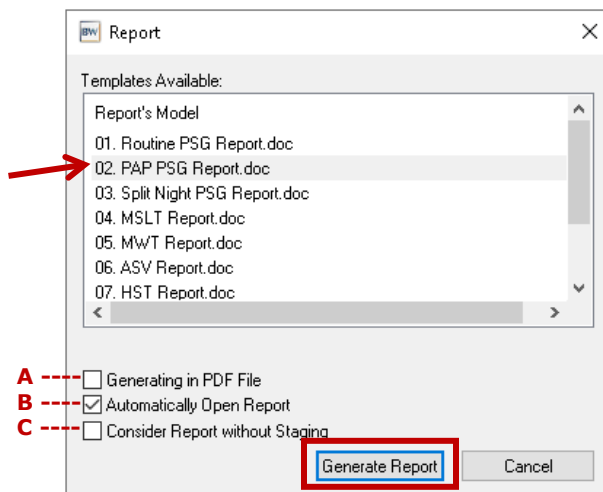
8.7.17.1. Default Report List

To generate a report, open the desired reviewed/scored exam, then click on the *File* dropdown menu and select the *Make Report* option. A new window with the Report model list will pop-up. This window can be also opened using the button **R** located on the Calibration Toolbar.





Select the Report Model to be used, then click on the Generate Report button. Note that the report will be automatically generated in the same format that the report model format (available in .doc and .docx).



From the Report generation window, the user can select the additional options to:

- A. Generate the report in PDF format.
- B. Open the Report file as soon as the generation is done.
- C. Set the software to ignore the sleep stages. Normally to generate HSAT reports.

In order to visualize the report created, locate the report file on the folder where it was saved (it could be located on the Report folder or on the Study folder, depending on the configuration set on Folder tab from Configurations window).

Note that inside the folder you will find all the generated reports. The files can be found through the patient's name.

	Sample ASV.ASV Titration.07-17-2024 07:59:33 PM	11/29/2024 9:06 PM	Microsoft Word 97 - 2003 Document
	Sample EEG.EEG Routine.02-26-2024 12:36:01 PM	11/29/2024 9:08 PM	Microsoft Word 97 - 2003 Document

Double click on the desired patient's name and a report will be shown on your screen.

8.7.17.2. Personalized Reports

To add personalized reports on the Templates Available list, to be later generated, it is required to create a new template. To introduce the variables that the software requires to display the correct data, the user can guide from the **User Manual Variable**, from which can be select the variables to customize the template as needed.

BWAnalysis also allows us to create custom variables from new inserted events, use of mathematical operations with the pre-existing variables, and special custom graphic variables. Below you will find instructions on how to create the previously mentioned:

A. Mathematical Operations: To create equations with different types of mathematical operators, it is required to use the correct characters for each operation as well as the isolation of operations with parentheses (). Example:

- Sum uses the symbol +:

$$\text{Total Apneas (TST)} = \text{\$}\#N_AP_OBSTRUCTIVE+N_AP_MIXED+N_AP_CENTRAL\#\text{\$}$$

- Subtraction use the symbol -:

$$\text{Total Apnea (TST)} = \text{\$}\#N_AH_RERA-N_RERA-N_HYPOPNEA\#\text{\$}$$

- Division use the symbol /:

$$\text{NREM Duration (in hours)} = \text{\$}\#NREM_TIMES/60\#\text{\$}$$

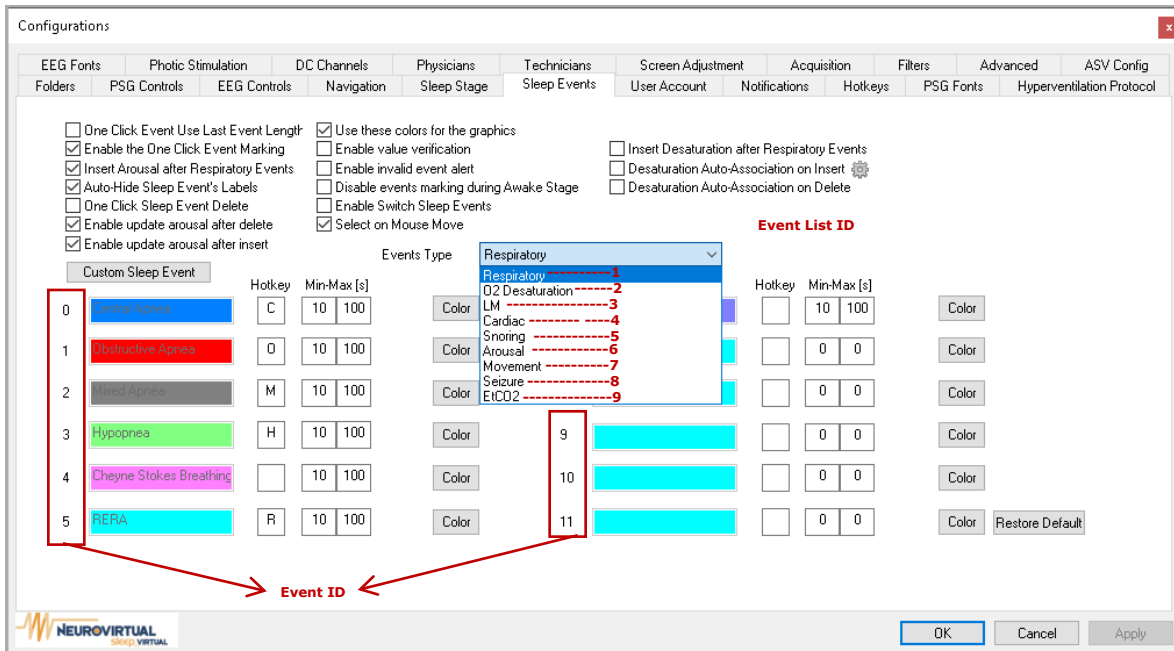
- Multiplication use *:

$$\text{Total Duration Apnea Mixed (in minutes)} = \text{\$}\#DTOT_AP_MIXED*60\#\text{\$}$$

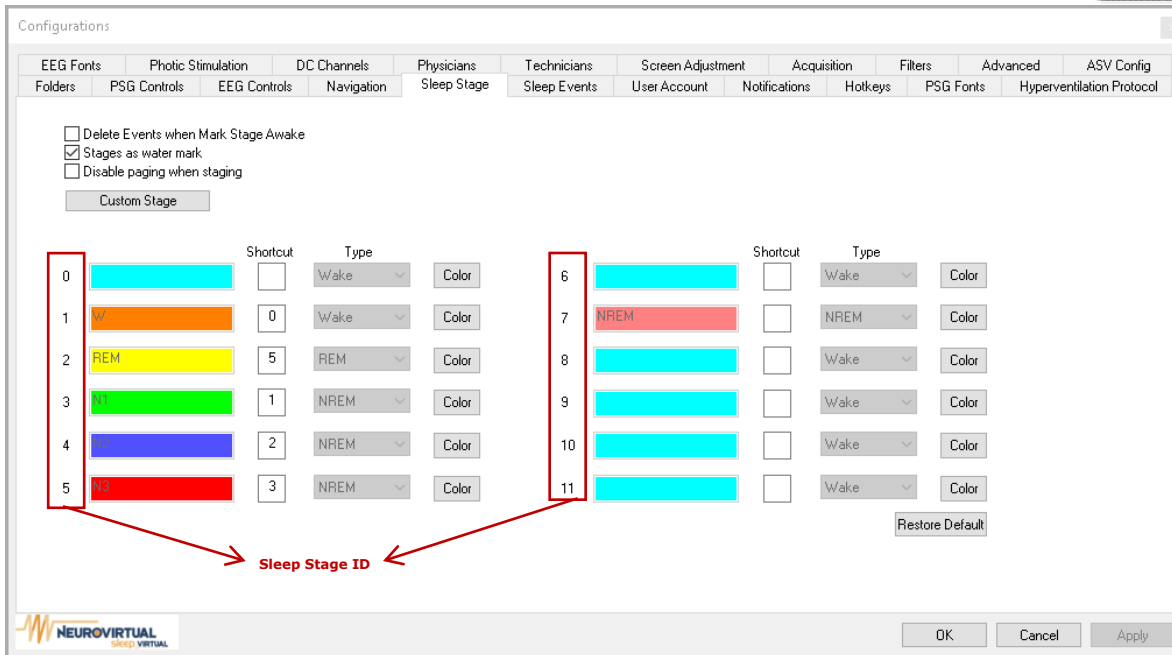
- Advanced Equations (Order of Operation):

$$\text{IndexApnea (TST)} = \text{\$}\#N_AP_OBSTRUCTIVE+N_AP_MIXED+N_AP_CENTRAL/(TST_TIME/60)\#\text{\$}$$

B. Variables for Custom Events: To create custom events variables, it is required to identify the Event List ID and the corresponding Event ID of the desired event. From the Sleep Events tab, *see item 6.18 on page 61*, it can identify both as show below:



Depending on the custom structure to be used, the Stage ID might be required, those IDs are shown in front of the Sleep Stage name. For example, the Sleep Stage ID for N1 is 3.



The custom variable works based on the structure below:

Number of Sleep Event:	\$\$NUM_ES_%A_%B_%C#\$\$
Number of Sleep Event by Sleep Stage:	\$\$NUM_ES_%A_%B_%F#\$\$
Number of Sleep Event in determined Body Position:	\$\$NUM_ES_%A_%B_%C_%D#\$\$
Number of Sleep Event in determined Body Position:	\$\$NUM_ES_%A_%B_%F_%D#\$\$
Index of Sleep Event:	\$\$INDEX_ES_%A_%B_%C#\$\$
Index of Sleep Event by Sleep Stage:	\$\$INDEX_ES_%A_%B_%F#\$\$
Sleep Event Duration (sec.):	\$\$T_ES_%A_%B_%C#\$\$
Sleep Event Duration by Sleep Stage (sec.):	\$\$T_ES_%A_%B_%F#\$\$
Sleep Event Max Duration (sec.):	\$\$TM_ES_%A_%B_%C#\$\$
Sleep Event Max Duration by Sleep Stage (sec.):	\$\$TM_ES_%A_%B_%F#\$\$
Number of Sleep Events for each PAP Pressure:	\$\$NUM_ES_%A_%B_%C_%E_PRESX#\$\$
Index of Sleep Events for each PAP Pressure:	\$\$IDX_ES_%A_%B_%C_%E_PRESX#\$\$

Where:

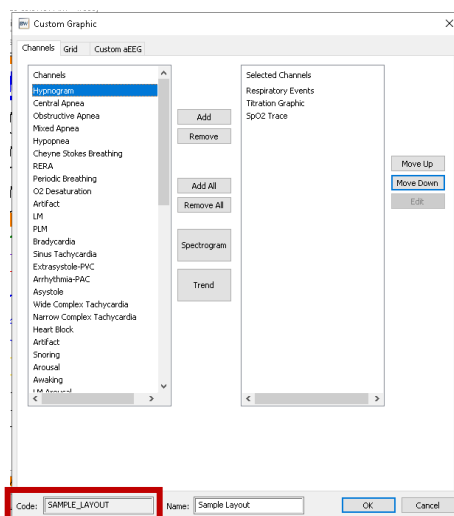
- %A = 1 to 9 (Event List ID)
- %B = 0 to 11 (Event ID)
- %C = REM, NREM, VIG, TRANS, TST, TOT
- %D = S, P, R, L, SS, U (Position)
- %E = POS_TOT, POS_SUP, POS_NSUP (Simple Position)
- %F = S0 to S11 (Sleep Stage ID)

Example:

- Number of Respiratory Event number 7 in TST:
Use: \$\$NUM_ES_%A_%B_%C#\$\$, leave the variable as: \$\$NUM_ES_1_7_TST#\$\$
- Number of Cardiac Event number 6 in TST in Supine:
Use: \$\$NUM_ES_%A_%B_%C_%D#\$\$, leave the variable: \$\$NUM_ES_4_6_TST_S#\$\$

C. Variables for Custom Graphics: To add a custom graphic variable, it is required to identify the Code assigned to the custom graphic. This can be located on the bottom of the Custom Graphic once editing or creating a new one, see item 8.9.9.3 on page 144. Examples are shown below:

D.



In order to fit the custom graphic in a specific space of the report, it can be used any of the size options below (This format also works for default graphics):

SIZE	VARIABLE STRUCTURE	VARIABLE EXAMPLE
Standard Size:	##CODE##	##SAMPLE_LAYOUT##
Extra Small Size:	##<"XS", CODE>##	##<"XS", SAMPLE_LAYOUT>##
Small Size:	##<"S", CODE>##	##<"S", SAMPLE_LAYOUT>##
Medium Size:	##<"M", CODE>##	##<"M", SAMPLE_LAYOUT>##
Large Size:	##<"L", CODE>##	##<"L", SAMPLE_LAYOUT>##
Extra Large Size:	##<"XL", CODE>##	##<"XL", SAMPLE_LAYOUT>##
Full Page Size	##<"FULL", CODE>##	##<"FULL", SAMPLE_LAYOUT>##
Portrait Size:	##<"AUTO", CODE>##	##<"AUTO", SAMPLE_LAYOUT>##

When finished, confirm that the personalized document is in the accepted format (.doc and .docx) and is saved on the Template folder from BWAnalysis folder (C:\BWAnalysis\Template).

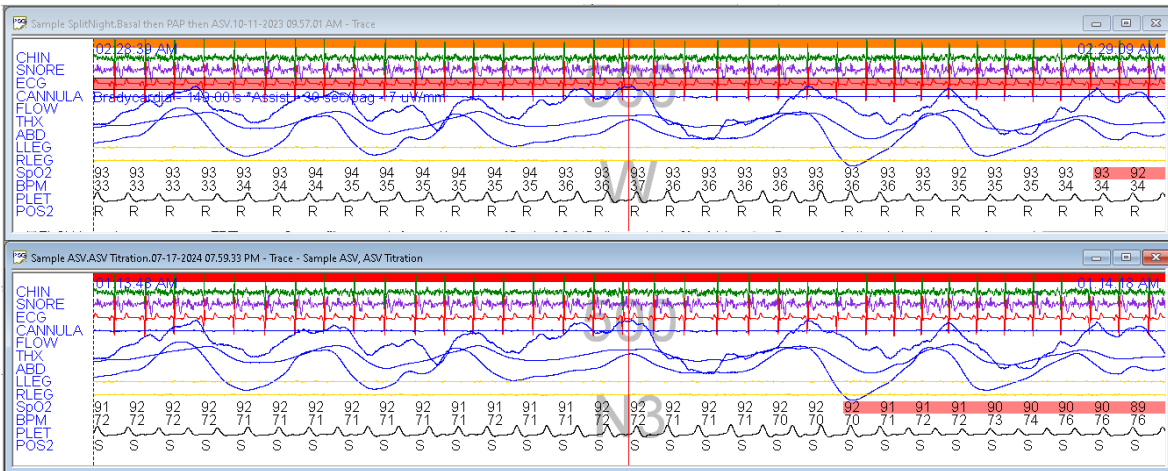
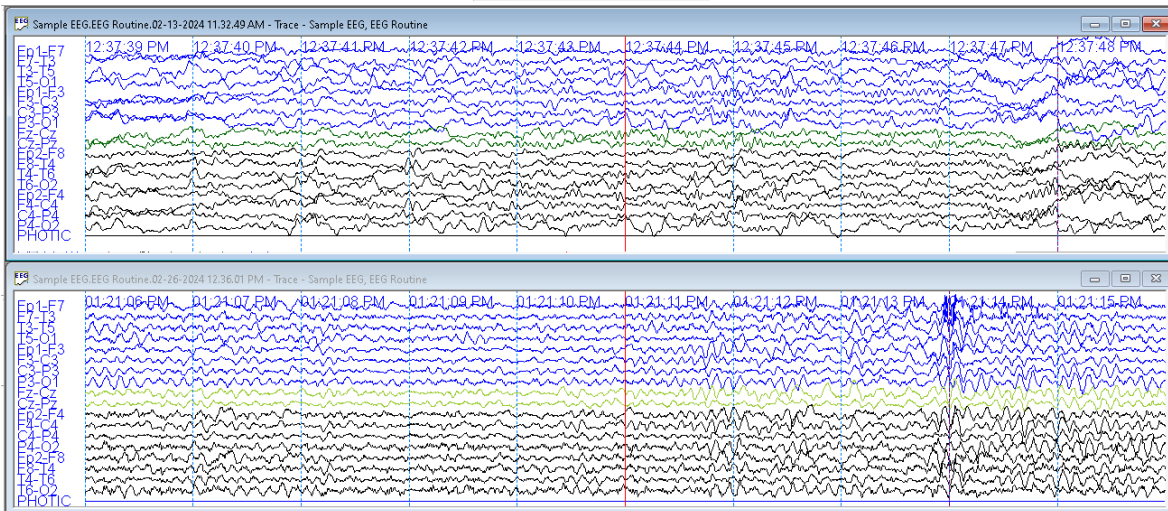
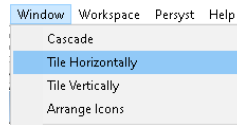
Note that all variables require the format ##XXXXXX##, no spaces in between, if the format is not followed, the user may encounter 0 values.

 **Some of the required variables might not be listed on the User Manual Variable field due customization or new implementation. If there is any special table or variable required, contact Neurovirtual Support.**



8.7.18. Comparative analysis

The software allows the user to visualize several exams simultaneously, comparative analysis between two (2) or more exams. To view this comparison, open the exams to be compared, then click the Window dropdown menu and choose the desired comparison option.



8.8. Performing and Reviewing an EEG Exam

To start an EEG exam, a new study must be opened. Select the amplifier to be used and the Exam type as EEG, even if it is a Video telemetry.

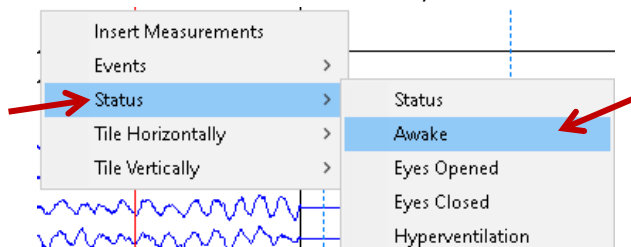
8.8.1. Status

Similarly to Events, this tool can also allow the user to insert some "notes" in the trace, to be seen while revision. These "notes" are named Status, and they can be personalized so it facilitates their insertion.

Thus, actions like Awake, Hyperventilation, Photo-stimulation and other common occurrences during an EEG exam can be marked on the trace, delimiting the moment when the status presented.

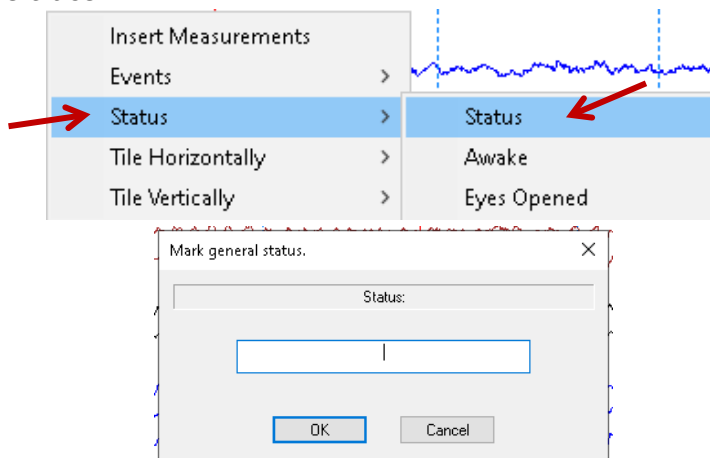
8.8.1.1. Inserting a Status

In order to insert a status in the trace, do a right-click anywhere on the screen. A box with different options will be shown. Select the option Status and note the new menu shows all pre-defined status (personalization of the status can be done to suit the study performance). Select the desired event with a click, to insert it.



Status can be also marked from the Status Toolbar in which the default or personalized events will be listed.

In case the list of status is with the 15 available events filled out and its needed to mark another status (normally spontaneous status), click the option called Status to open the Mark general status window. Hit the Enter key from the keyboard or click the *OK* button to insert it in the trace.

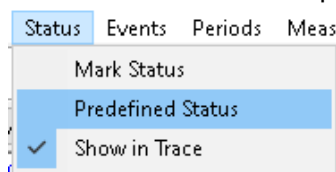


Note: All status marked will be available on the GoTo list.

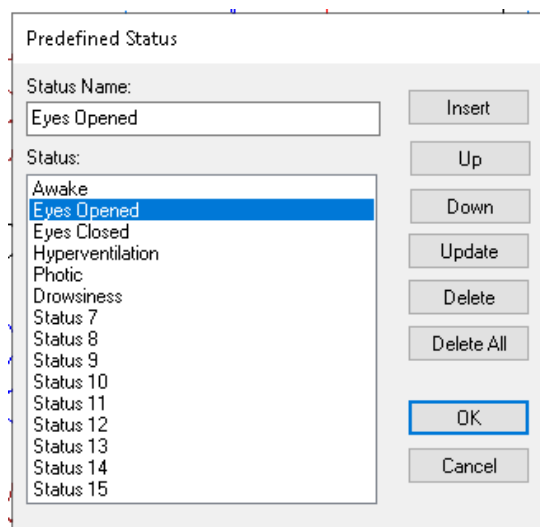
Event	Status	Time	Real Time	Date
Measurement	Hyperventilation	00:00:53	01:10:07 PM	02-26-2024
Status	End Hyperventilation	00:03:53	01:13:07 PM	02-26-2024
Period	Hyperventilation	00:04:29	01:13:43 PM	02-26-2024
Crop	End Hyperventilation	00:04:29	01:13:43 PM	02-26-2024
Highlight	Awake	00:16:35	01:25:48 PM	02-26-2024
	Photic: Foto	00:19:17	01:28:31 PM	02-26-2024
	End Photic Protocol	00:21:57	01:31:11 PM	02-26-2024

8.8.1.2. Personalizing Status

In order to personalize the status (modify, add, delete or reorganize), click on *Status* on the menu and then click the option *Predefined Status* option.



Note that a window named *Predefined Status* will be shown, where you can insert, move up or down an existent event, update or exclude one or all events. Keep in mind that the maximum number of status is 15, this includes status that are blank, therefore, if you want to add or modify any of the existing ones, you must first delete one or more of those that you do not want to have in the list.



To modify the name of a status, select the status from the list, then set the new name in the *Status Name* field and then press the *Update* button, changing the name of the status to the same position as the status selected.

In order to exclude a status from the list of status first of all, select the desired status and click the *Delete* button.

In order to update a status, select the desired status and type the updated name in the field *Status's Name*, then click the *Update* button.

There is also the possibility of Delete all and enter only the status to be used.



It is recommended to leave between the first 5 statuses, the ones that are going to be used the most for the use of shortcuts.



8.8.2. Photo Stimulation


To activate the Photic Stimulation, the photo stimulator must have been previously connected to the device. If the Photo Stimulation Toolbar is not visible, remember to


enable it by clicking in the workspace free space, and select it from the dropdown menu. Note that the buttons on this bar will only be activated if the studio is in the Recording state.

Use the  button to enable or disable the manual photo-stimulation.


Use the  button to decrease and the  button to increase the frequency manually.

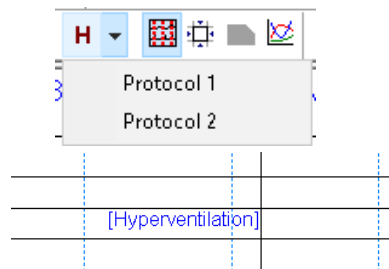
Use the  button to decrease and the  button to increase the intensity of the light.

Use the  button to enable the automatic profile for photo-stimulation. This functionality uses a protocol previously created by the photo stimulation user.

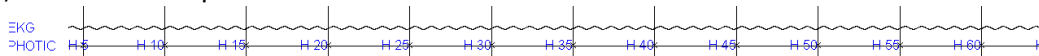
If a BWFlash kit is available (flash connected to the computer for its use), use the  button to open the BWFlash program that controls the indicated kit.

8.8.3. Hyperventilation

The hyperventilation protocol is a time when the patient is requested to do hyperventilation for a predefined period. Use the  button, located on the EEG Toolbar, to start the Hyperventilation protocol. The software has the option to set 2 different Protocols which can be selected from the same mentioned button. Note that the acquisition must be running for the button to be enabled. When started, a new Hyperventilation will be marked as a Status on the trace.



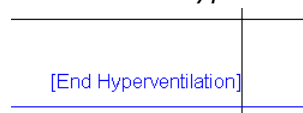
The count of the hyperventilation will start, marking an event every 5 seconds on the trace, this until the penultimate event is reached:



When Hyperventilation ends, only if the pos-hyperventilation was configured this second part of the protocol will start automatically. The *P-Hyperventilation* event will be marked on the trace and a count will start, marking an event every 5 seconds on the trace. To differentiate it from normal Hyperventilation, the events will be marked as PH5, PH10, PH15, etc.



When the protocol is over (with or without pos-hyperventilation) the last event will be marked on the trace as a State called *End of Hyperventilation*.





8.8.4. Audio Stimulation

Audio stimulation can be done with headphones or speakers. Use the button to open the Sound Toolbar.



In this bar, the user can modify the volume (how loud the stim will be, the tone or pitch (how high or low, set in a Hz scale) and the frequency (how constant the stim). Once the Stimulation is started or ended, an event will be marked on the trace.

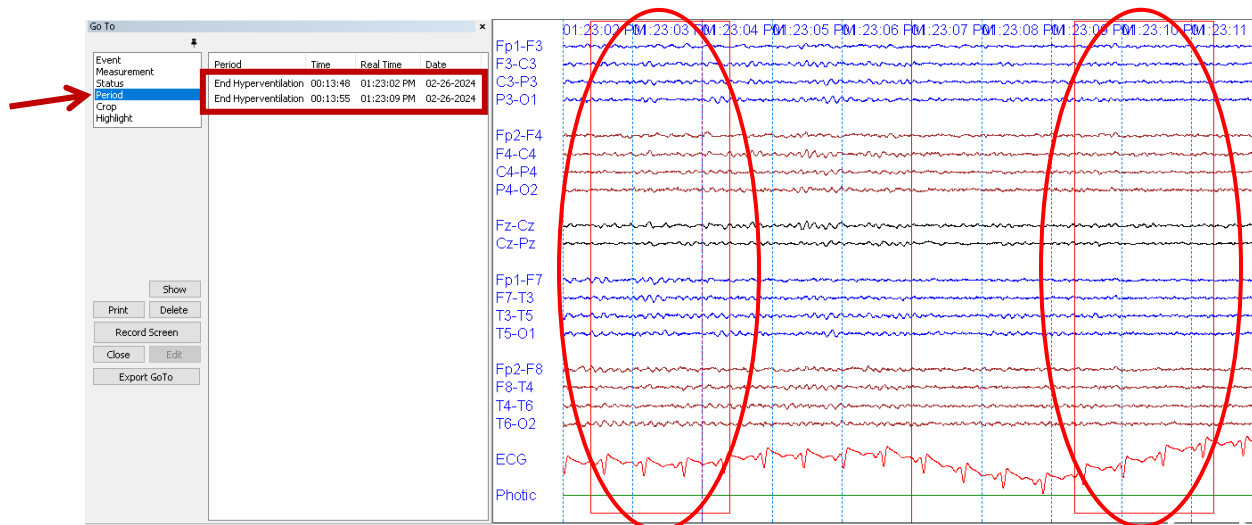


It is important to verify that the audio system in use is functional, and the volume of the computer is turned on.

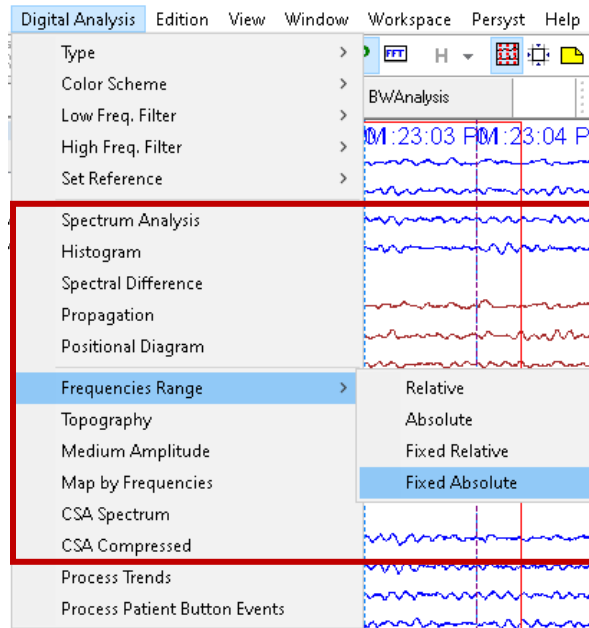
8.8.5. Digital Analysis

The digital analysis tool allows us to visualize graphically the behavior of brain waves in periods of time chosen by the user.

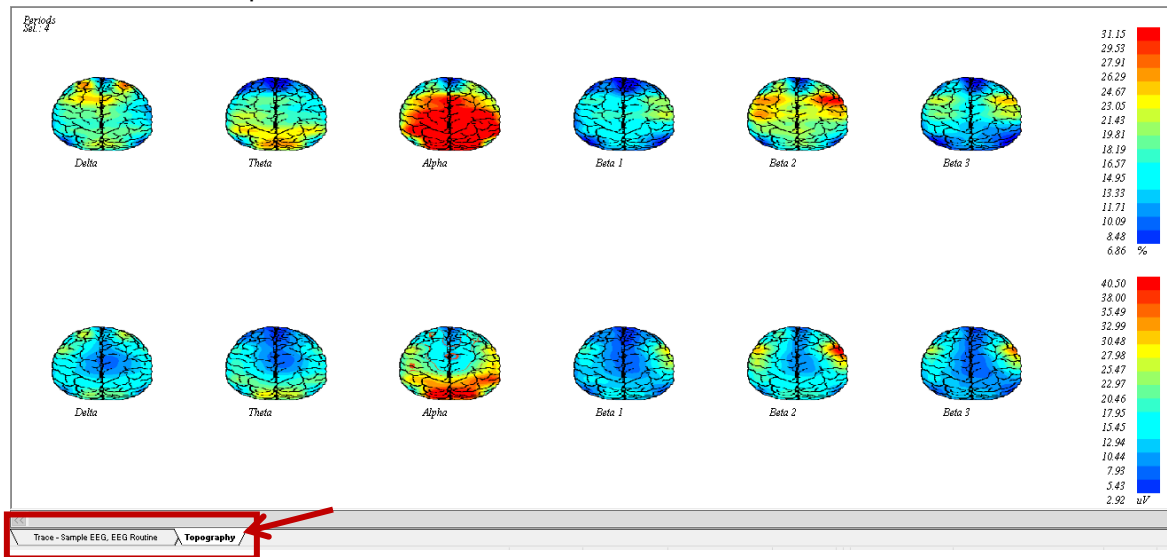
To select the periods, use the button , located on the EEG Toolbar. Locate the cursor over the trace and choose the period to analyze by doing a single click where a red rectangle with two seconds of duration will be inserted. If you want to perform the analysis of a larger section, the user must choose several consecutive periods. The user may create as many periods as necessary. Note that all periods will be listed in GoTo list, on the Period section.




When two or more periods are selected, Use the button , locate on the EEG Toolbar. This will perform all the processing and analysis of the chosen sections. Then, click on the Digital Analysis dropdown menu and choose the desired analysis.

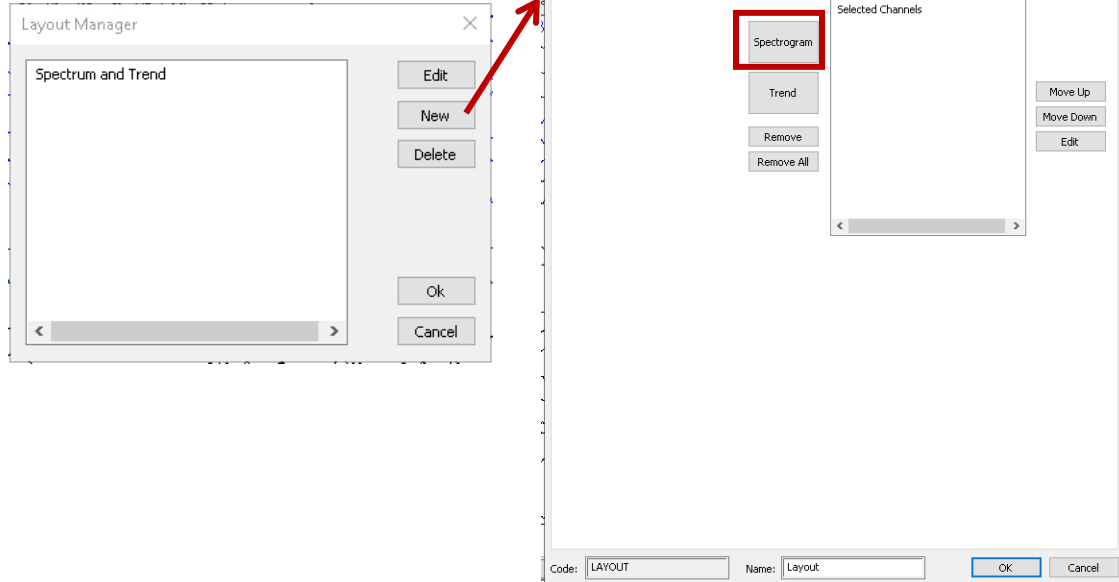


Depending on the one chosen, a new tab will appear (at the bottom of the screen) where the digital analysis will be displayed. The shown analysis can be saved, if required to include it in the report.

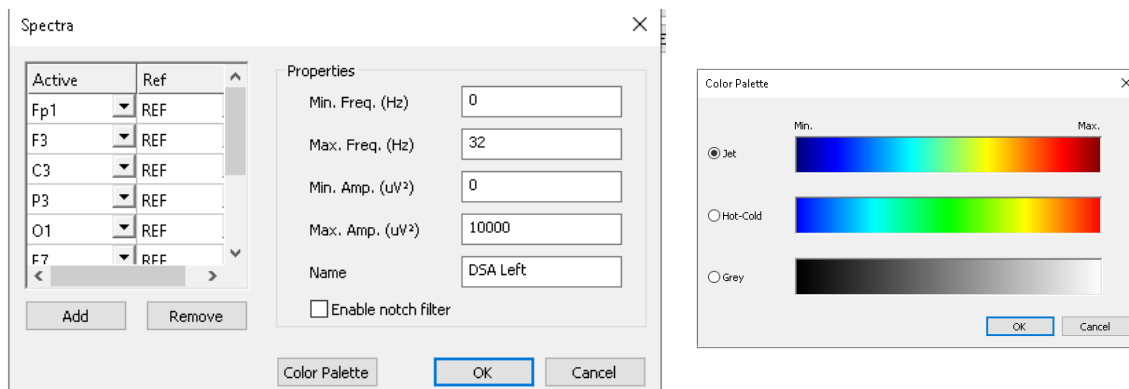


8.8.6. Spectrogram

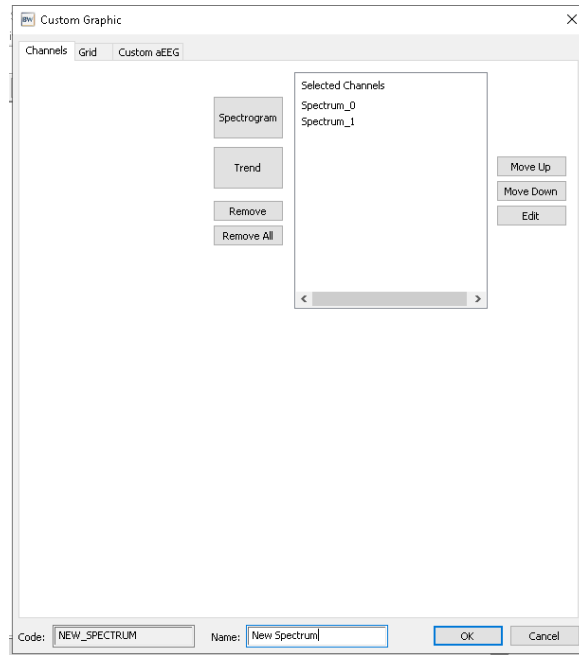
For spectrogram creation, an exam that is already recorded and completed must be opened. Use the button , located on the EEG Toolbar to open the *Layout Manager*, a list of custom graphics might be displayed. To create a new Spectrogram, click on the *New* button, then, on the Custom Graphic window, click on the Spectrogram button.



A new window called Spectra will be displayed, from where the settings of the Spectrogram can be set. Choose all the Active and REF electrodes for the Spectral analysis. Add or exclude as many rows as needed, using the Add and Remove buttons. From this window can also be modified the Properties (parameters) according to the user preference (including the color palette). Once the configurations are set, click on OK to add the Spectrogram to the Graphic Channels. It can be added as many Spectrograms as required.

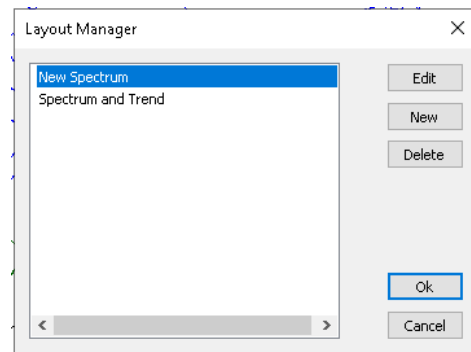
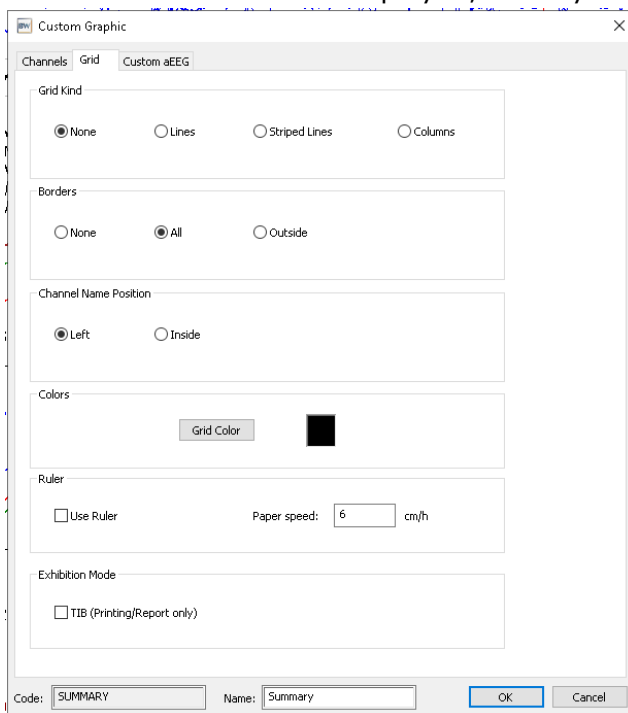


At the bottom left of the Custom Graphics, the name of the graphic on the *Name* field. Note that the Layout field will generate the code with the name assigned. This will be useful; in case you want to include it in the report. Once the name is assigned, click on the *Accept* button.

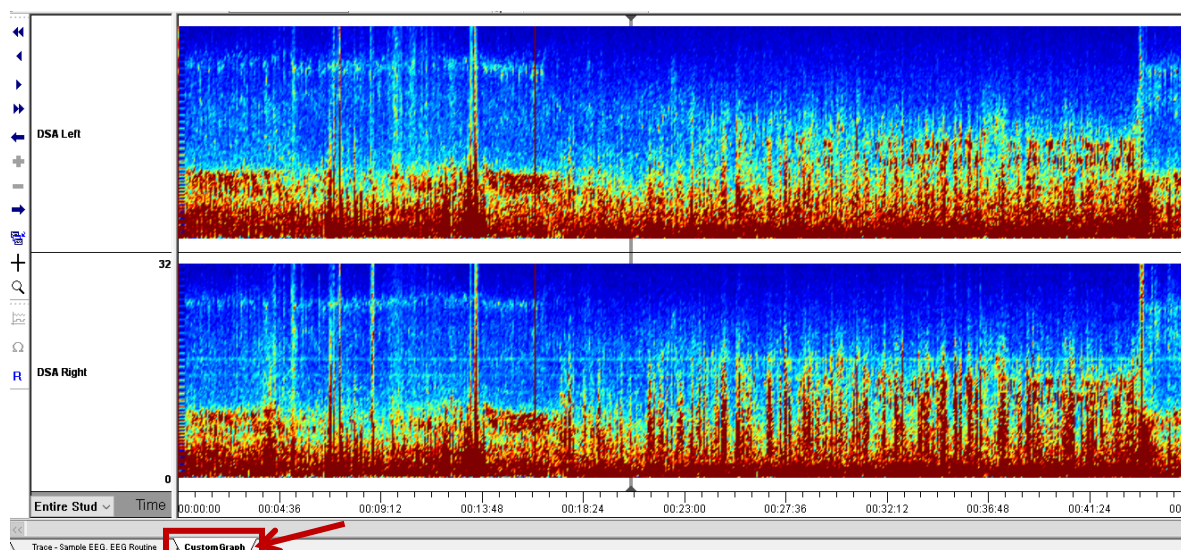


The graphic view can be configured from the Grid tab on the Custom Graphic configurations. From there, it can be selected how to see the Type and Color of Grid, to show or not the Borders of the graphic, the position of the Channels. Most of the configurations will be displayed on the Software as well as on the Generated Report if the graphic is added.

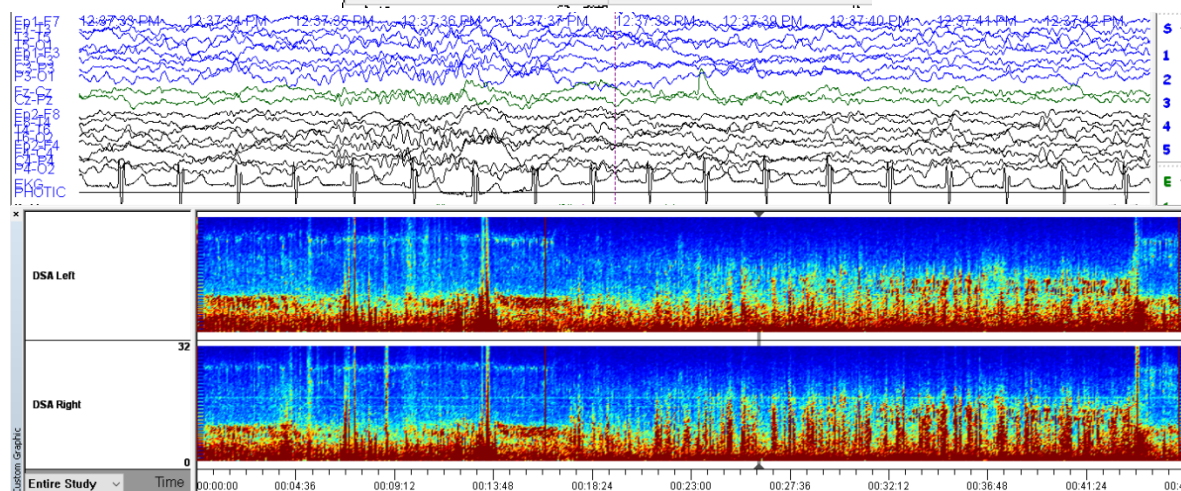
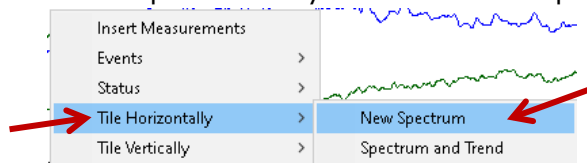
The initial window will be displayed, already with the new custom graphic created.




From the layout manager window can Edit, Add or Remove any additional Spectrogram required. To run the spectrogram, double-click on the spectrogram created. A new tab will appear (at the bottom of the screen) where the graphic will be displayed.



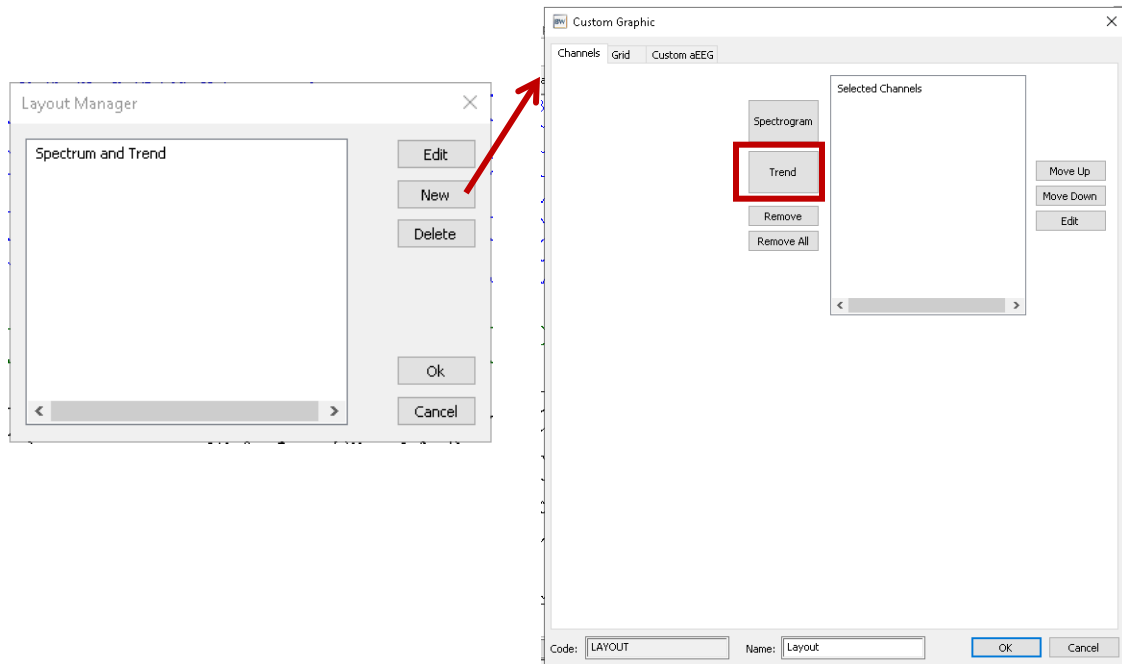
The spectrogram graphics can also be opened on the same screen as the trace. In order to do this, locate the cursor anywhere on the trace, right click and select the Tile Horizontal option. Then, from the menu select the graphic to be displayed. If selected Tile Vertical, the screen will be split vertically between the Graphic and the trace.



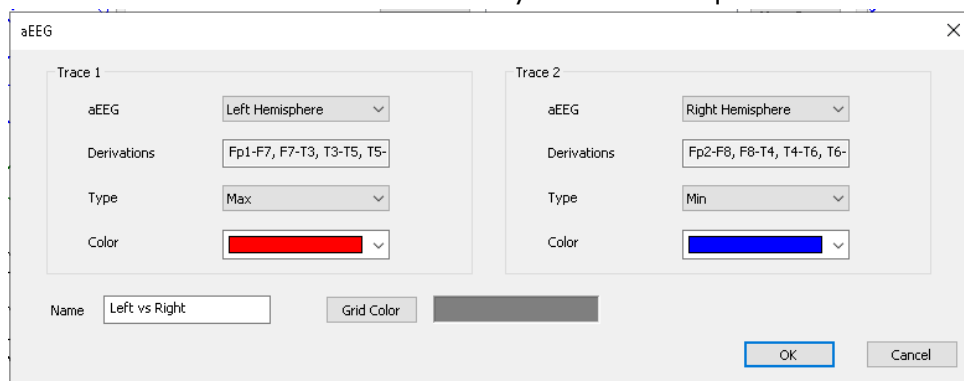
8.8.7. Trends

For Trend (Amplitude Analysis) creation, an exam that is already recorded and completed must be opened. Use the button  , located on the EEG Toolbar to open the *Layout*

Manager, a list of custom graphics might be displayed. In order to create a new Trend, click on the *New* button, then, on the Custom Graphic window, click on the Trend button.



A new window called aEEG will display, from where the settings of the Trend can be set. Choose the channels to be compared (only two channels or hemispheres), the type of amplitude assigned (minimum, maximum, average, percentage, among others) and the color for each analysis. Once the configurations are set, click on OK to add the Trend to the Graphic Channels. It can be added as many Trends as required.

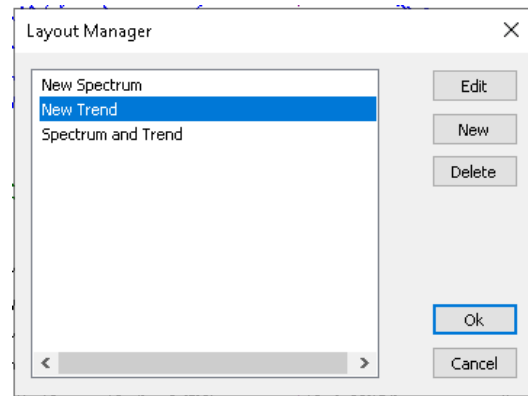
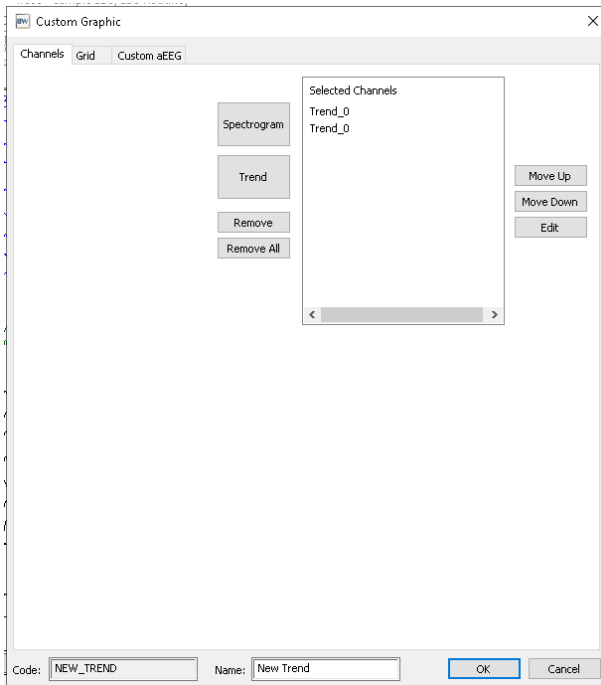


At the bottom left of the Custom Graphics, the name of the graphic on the *Name* field. Note that the Layout field will generate the code with the name assigned. This will be useful; in case you want to include it in the report. Once the name is assigned, click on the *Accept* button.

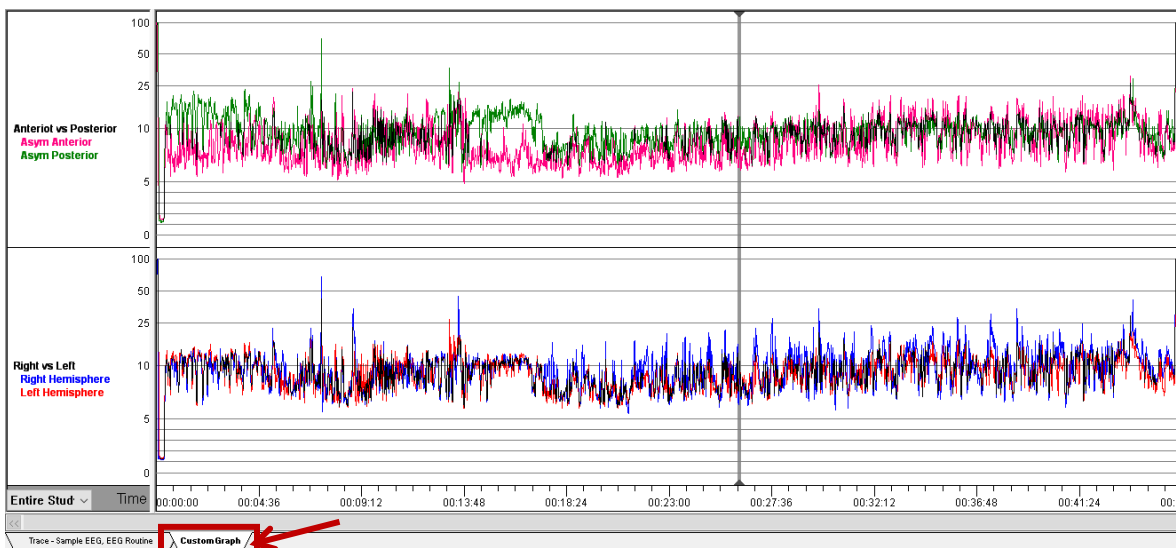
The graphic view can be configured from the Grid tab on the Custom Graphic configurations. From there, it can be selected how to see the Type and Color of Grid, to show or not the Borders of the graphic, the position of the Channels. Most of the



configurations will be displayed on the Software as well as on the Generated Report if the graphic is added. The initial window will be displayed, already with the new custom graphic created.



From the layout manager window can Edit, Add or Remove any additional Trends required. To run the spectrogram, double-click on the Trend created. A new tab will appear (at the bottom of the screen) where the graphics will be displayed.



The Trend graphics can also be opened on the same screen as the trace. In order to do this, locate the cursor anywhere on the trace, right click and select the Tile Horizontal



8.9.1.2. Split Night

When performing a Split Night exam, the diagnosis part of the exam is conducted as normal. When identified, the titration system is set to the patient and the indicators must be enabled. Use the [S] button to start the treatment section and use the [S] button to finish the treatment section. In case its required to delete the Split marked, use the button or refer to Exam Information (GoTo) and delete the Splits that appear in the list. If the position of the Splits is needed to be checked, use the button to move between the events marked.

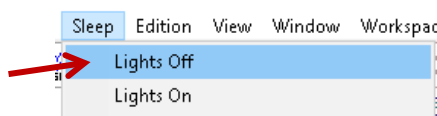
8.9.1.3. MSLT/MWT

When performing an MSLT or a MWT exam, as there are several naps, it is necessary that for the correct analysis of the data shown in the report. Confirm that the *MSLT or MWT* checkbox found in the *Patient Information* window is checked.

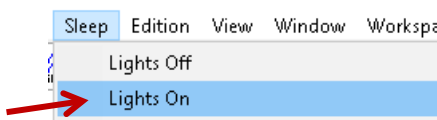
8.9.2. Turning the Lights On and Off

While the exam is being recorded or after it's recorded, it is recommended to mark the lights off and lights on to delimit the recording of the study for its processing.

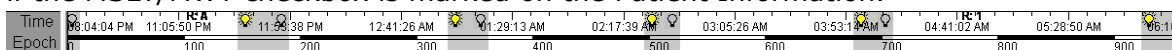
The Button is used to mark the moment when the record room lights were turned off. The lights off can be also marked by clicking on the *Sleep* dropdown menu, select the *Lights Off* option.



The Button is used to mark the moment when the record room lights were turned on. The lights on can be also marked by clicking on the *Sleep* dropdown menu, select the *Lights On* option.

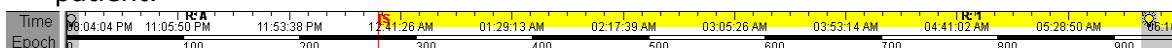


It is important to note that for MSLT or MWT exams, multiple pairs of light events will be needed (4 to 5 lights off and 4 to 5 lights on). This process will be successfully done if the MSLT/MWT checkbox is marked on the Patient Information.



If a Split Night exam is recorded, it can be marked in two different ways:

- Mark a single event of lights off and a single event of lights on, using the button [S] to mark the beginning of the treatment section (when applying the titration to the patient).



- Mark as many pairs of lights as needed when the treatment section of the study is required to be limited. Example: When the user requires a Split Night but can't tolerate the treatment, the user needs to use the [S] button to start the treatment section and use the [S] button to finish the treatment section (highlight). Between those events, the lights off and lights on needed to be applied, as well as the other two sections where the treatment was not used.

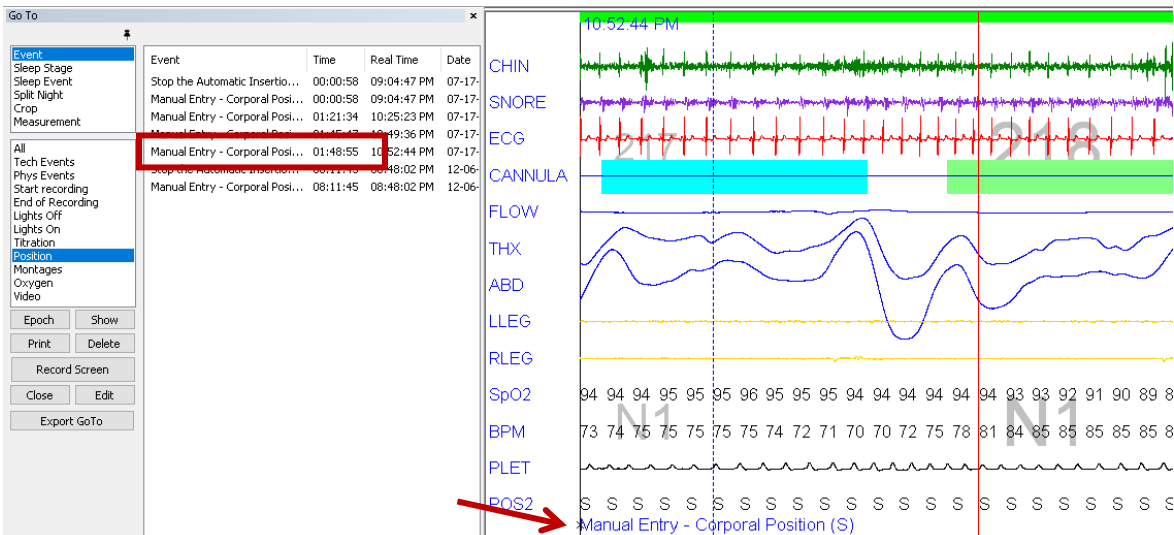
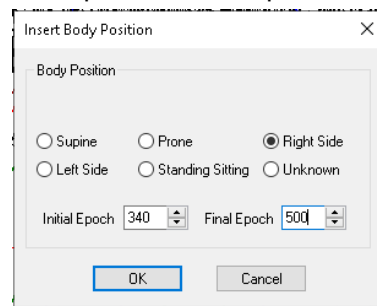
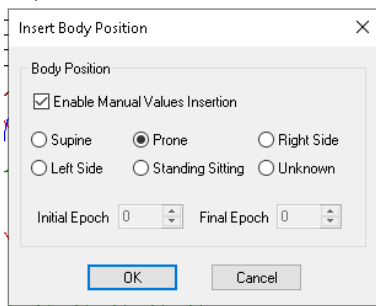


8.9.3. Manual Value Insertion

It is possible that, for various reasons, some values that are automatically detected, such as the position (with the position sensor), the oxygen saturation (with the oximeter sensor), the titration values (with the synchronized CPAP), among others, do not adequately detect the values due to failure or damage in the devices or connections. For this reason, the software allows the manual entry of the values.

8.9.3.1. Position

Use the [P] button to manually set the position where the patient is. After this position is selected, it is necessary to click OK to confirm the insertion. If it is activated in an exam in progress, the checkbox should be selected to allow the manual insertion, and the position will remain as the last one selected until the window is opened again and changed the selection of position. When the change is made in an exam already recorded and finished, the user must enter the start and end epochs for the position to be chosen.





8.9.3.2. PAP

Use the **PAP** button to manually set the titration pressure values used. After CPAP/IPAP, EPAP and Backup Rate (if apply) are set, it is necessary to click OK confirm the insertion. When the manual insert is done, the values will be displayed on each of the DC Channels previously configured. Note that when a change is made in an exam already recorded and finished, the user must enter the start and end epochs for the titration values to be added.

Insert the Manual PAP Pressure

PAP Pressure

Enable Manual Values Insertion

IPAP 10 cm of H2O

EPAP 8 cm of H2O

Enable Manual Backup Rate (BiPAP S/T)

3

Initial Epoch 983 Final Epoch 984

OK Cancel

Insert the Manual PAP Pressure

PAP Pressure

Enable Manual Values Insertion

IPAP 23 cm of H2O

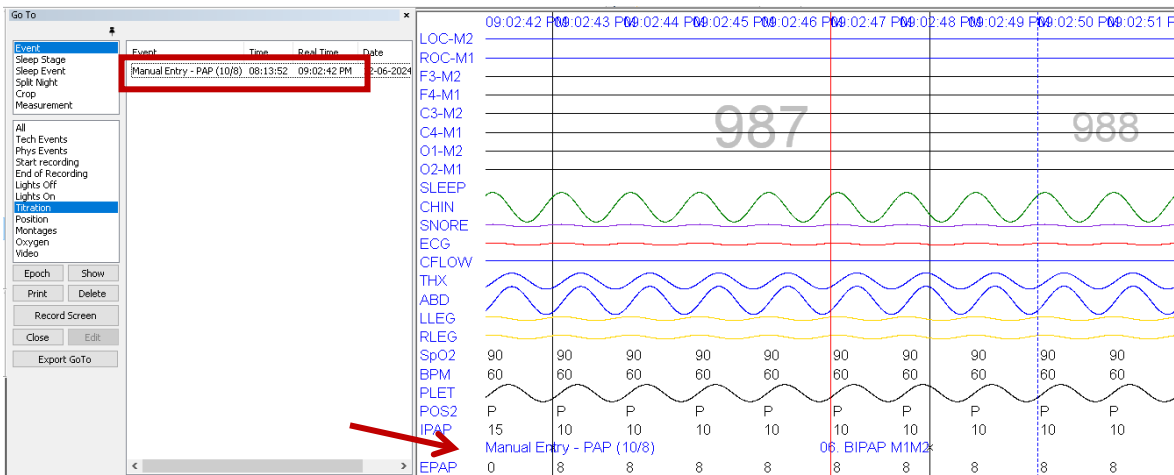
EPAP 12 cm of H2O

Enable Manual Backup Rate (BiPAP S/T)

0

Initial Epoch 0 Final Epoch 0

OK Cancel

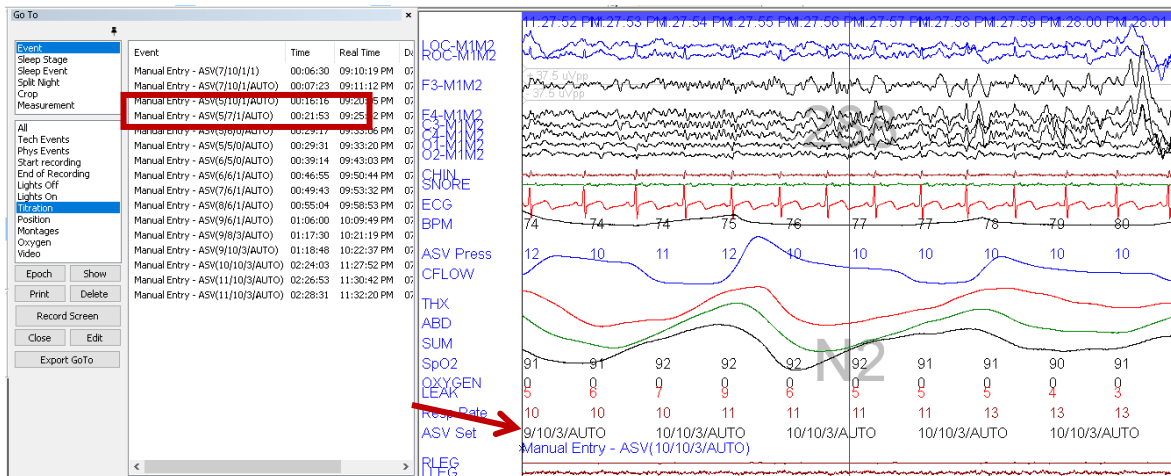


8.9.3.3. ASV

Use the **ASV** button to manually set the ASV titration mode values used. Select the Profile to be used. After all required fields are set, it is necessary to click OK confirm the insertion. When the manual insert is done, the values will be displayed on the DC where IPAP/ASV DC Type was set.

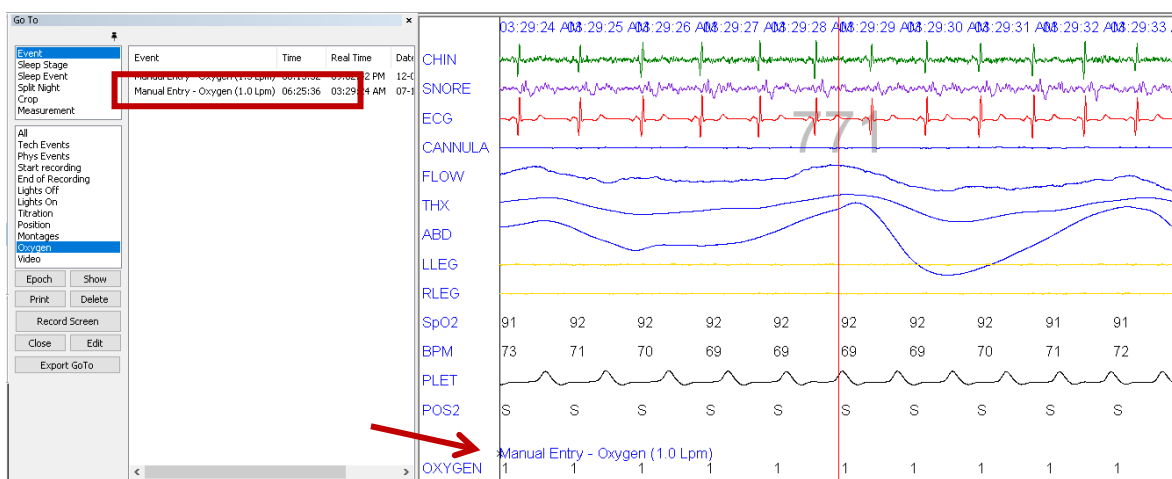
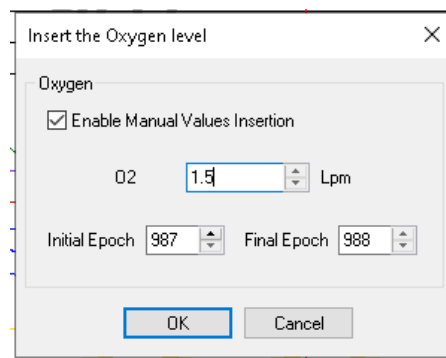
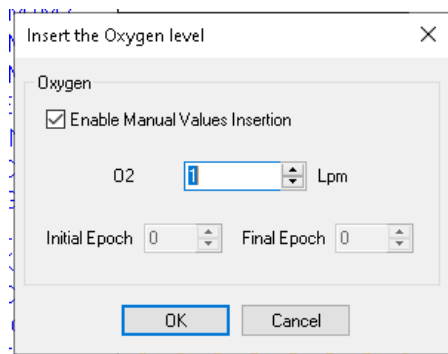
The user can insert up to 16 values under the ASV Profile selected. Use the dropdown menu from the top right to change between the profiles to accommodate the procedure or variables required for each patient. Note that when a change is made in an exam

already recorded and finished, the user must enter the start and end epochs for the titration values to be added.



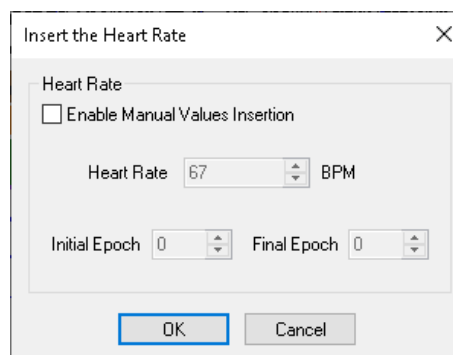
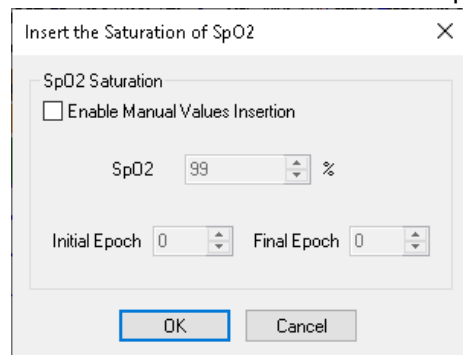
8.9.3.4. Oxygen

Use the button to manually set the Oxygen applied to the patient's treatment. After this value is set, it is necessary to click OK confirm the insertion. If it is activated in an exam in progress, the checkbox should be selected to allow the manual insertion, and the value will remain as the last one selected until the window is opened again and changed the selection of oxygen. When the change is made in an exam already recorded and finished, the user must enter the start and end epochs for the oxygen to be added.



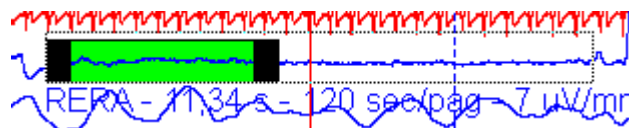
8.9.3.5. Saturation and Heart Rate

Use the button to manually set the Saturation values presented by the patient. After this value is set, it is necessary to click OK to confirm the insertion. Use the button to manually set the Heart Rate values presented by the patient. After this value is set, it is necessary to click OK to confirm the insertion. If it is activated in an exam in progress, the checkbox should be selected to allow the manual insertion, and the value will remain as the last one selected until the window is opened again and changed the selection of value. When the change is made in an exam already recorded and finished, the user must enter the start and end epochs for the value to be added.





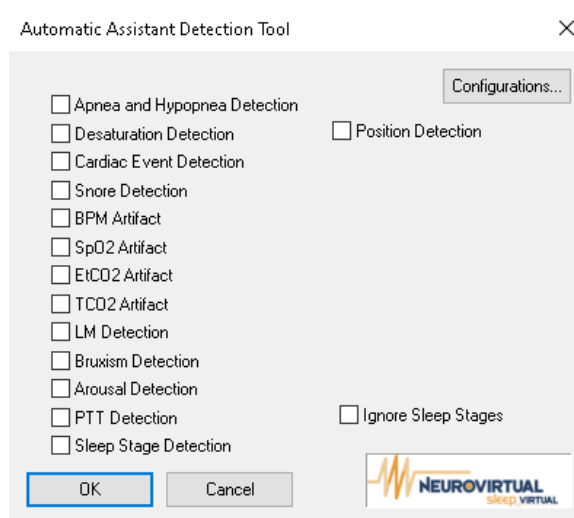
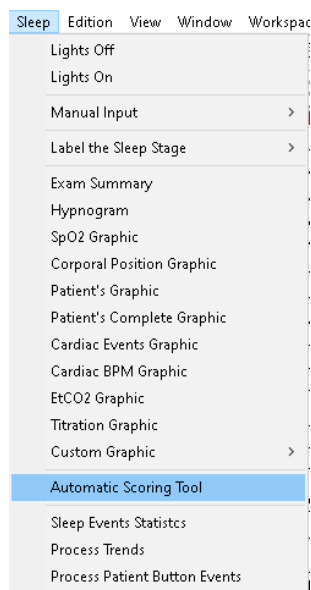
- Events can be deleted by placing the cursor over the event and pressing the delete key on the keyboard.
- Events can be changed by placing the cursor over the event and pressing the keys that were set as shortcuts. Example. Change to Obstructive Apnea with the O key.
- The duration of each event can be modified by clicking and dragging from the corner of the already marked event.



- Each channel in the montage can have an event subtype assigned to it, to score the same event each time. To do this, double-click on the name of the channel and modify on the *Stage* tab the assign subtype event in the dropdown menu.

8.9.6. Assistant Scoring

The Assistant Scoring feature will help the user on the scoring of the study, by analyzing the recording, and automatically detect and marked Sleep Events and Sleep Stages along the trace. Use the **AS** button, located on the PSG Toolbar, to start this feature. The window can also be opened by opening the Sleep dropdown menu and selecting the Automatic Assistant Detection Tool option.

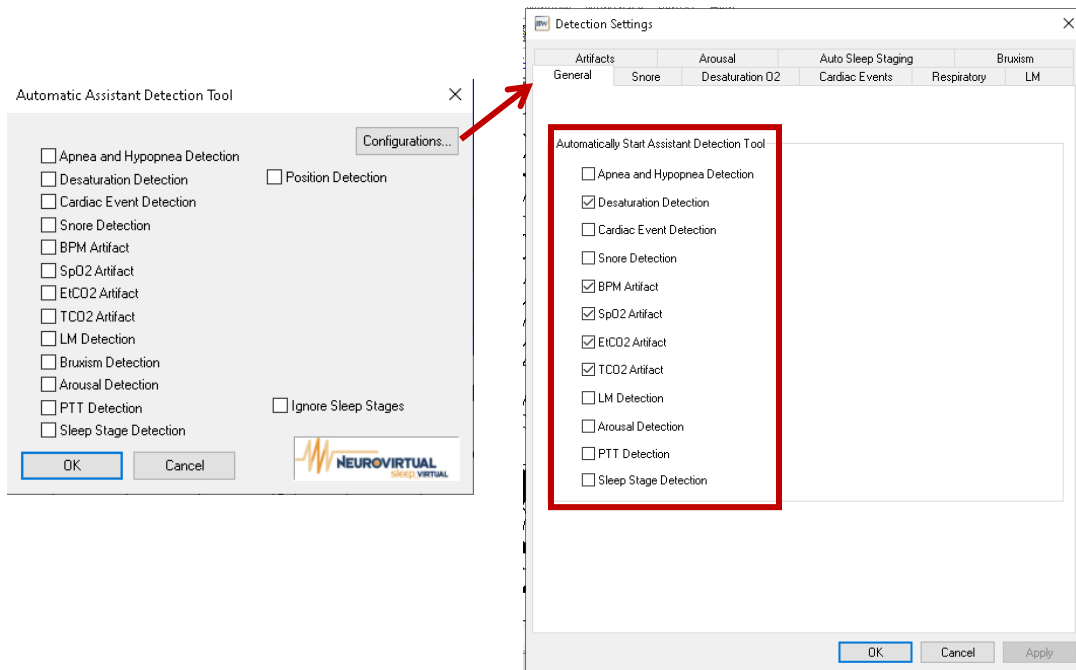


All assistant detections marked can be identified on the GoTo from the Comment column, those will be marked as *Assist – Info.

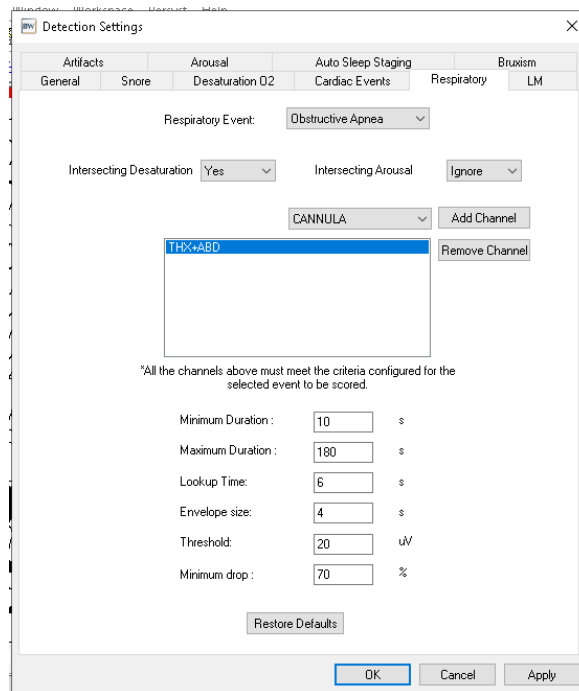
Event	Sleep Stage	Time	Real Time	Date	Epoch	Comments
Sleep Stage	REM	03:12:00	01:30:01 AM	10-12-2023	384	*Assist - REM
Sleep Event	N1	03:12:30	01:30:31 AM	10-12-2023	385	*Assist - N1
Split Night	N3	03:13:00	01:31:01 AM	10-12-2023	386	*Assist - N3
Crop	REM	03:13:30	01:31:31 AM	10-12-2023	387	*Assist - REM
Measurement	REM	03:14:00	01:32:01 AM	10-12-2023	388	*Assist - REM

Event	Sleep Event	Time	Duration	Real Time	Date	Comments
Sleep Stage	LM	06:04:53	0.90 s	04:23:31 AM	10-12-2023	*Assist - LM
Sleep Event	LM	00:01:00	1.90 s	10:19:02 PM	10-11-2023	*Assist - LM
Split Night	Bradycardia	05:35:59	8.00 s	03:54:37 AM	10-12-2023	*Assist - 600 sec/pag - 7 uV/mm
Crop	Hypopnea	01:03:16	10.00 s	11:21:19 PM	10-11-2023	*Assist - Hypopnea
Measurement	Hypopnea	00:04:00	23.00 s	10:22:03 PM	10-11-2023	*Assist - Hypopnea
All	O2 Desaturation	06:12:09	23.00 s	04:30:47 AM	10-12-2023	*Assist - 89/93 - 4%
Respiratory	Hypopnea	00:15:25	25.00 s	10:33:28 PM	10-11-2023	*Assist - Hypopnea
O2 Desaturation						
LM						

The user can set the feature to run automatically once it's opened. To enable this, click on the Configurations button from the main feature window, then on the General tab, select the desired detections to be run when opening any study.



If other detections are used, it is needed to set review the detection set up first. On the Configurations window, click on the tab from the required detection and adjust any of the detection parameters necessary. Example, on the Respiratory detection, it is needed to add the channels for each RespEvent to be scored, as well as its detection parameters.



The assisted scoring feature provided in this software is intended solely as an assistive tool to support healthcare professionals in the analysis and interpretation of sleep-related data. It is not designed to replace or substitute the clinical judgment, diagnosis, or treatment decisions of a qualified physician or healthcare provider.

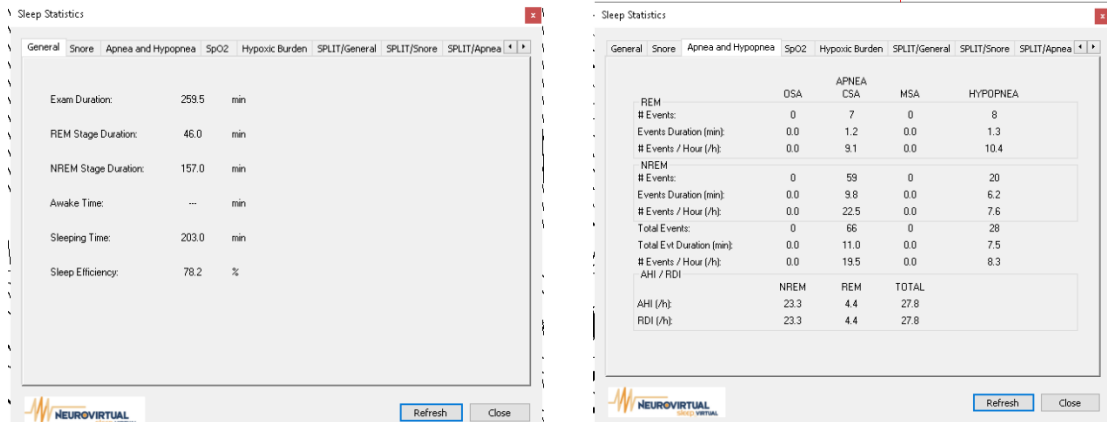
This feature is not intended to be used independently by individuals without the supervision, review, and approval of a licensed healthcare professional. Users are expressly advised that all data, results, and reports generated by this feature must be evaluated and validated by a qualified medical professional before any medical conclusions or treatment decisions are made.

The developers and distributors of this software accept no responsibility or liability for any clinical decision or action taken based on the use of this feature without proper medical oversight. The assisted scoring feature should be used in conjunction with a full clinical evaluation, including but not limited to diagnostic assessments performed by a healthcare professional.

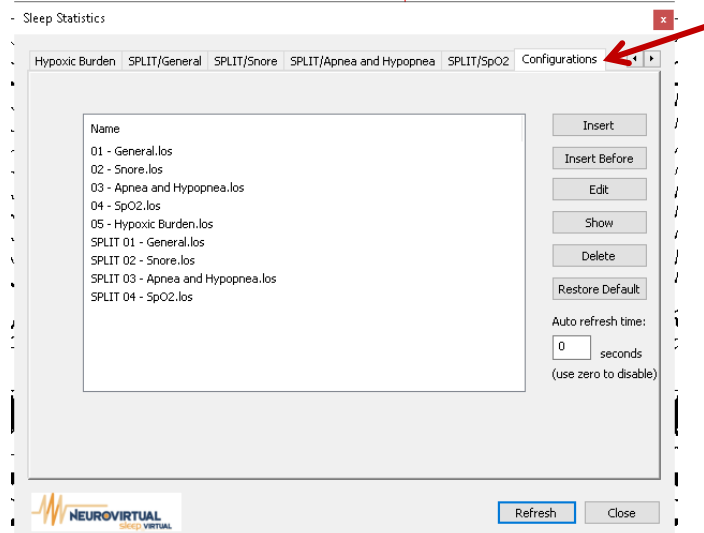
By using this software, you acknowledge and agree that the responsibility for the interpretation of any assisted scoring data and the subsequent medical decisions remains solely with the healthcare provider, and any risks associated with the improper use of this feature are assumed by the user.

8.9.7. Statistics

When scoring is being done, while recording or scoring, a preview of the information that will be shown in the report can be displayed, use the button % button, located on the PSG Toolbar to open the Statistics window. From this pop-up window, the user can visualize not only the durations of the sleep stages and efficiency but also the different sleep events main information in REM, NREM, TST and TIB, this information can be displayed in both the Diagnoses and Split Night (if apply).



Although the user can configure these visualizations. To do this, click on the last tab, Configurations, then select the one that will need to be adjusted or create a new one. Use the buttons from the right to edit the Statistics view as required.



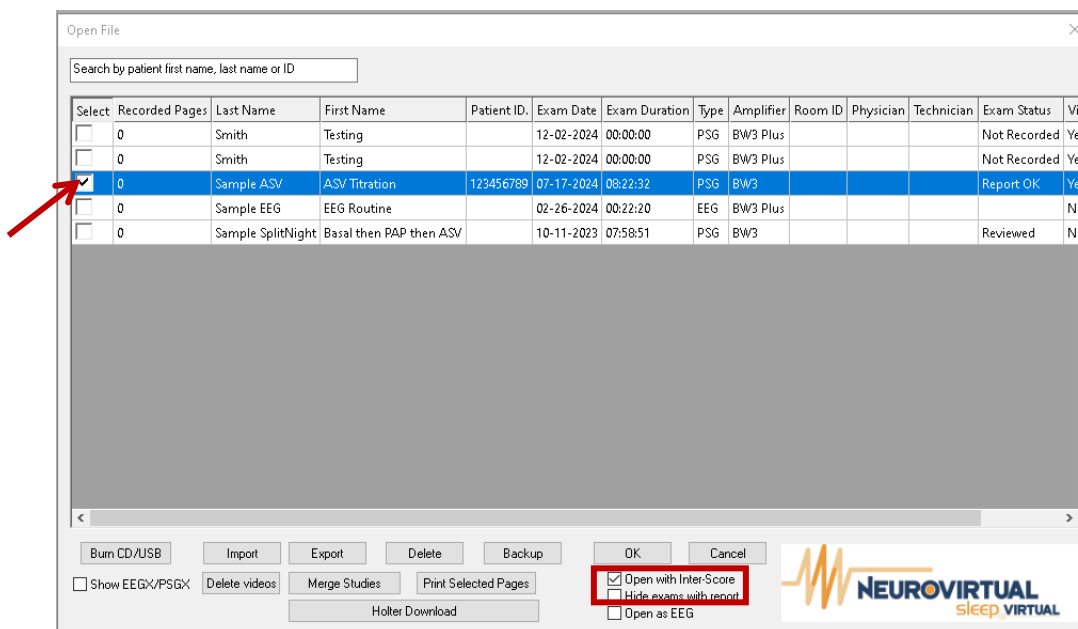
Note that any change made requires the software to be close and reopen to be visualized.

8.9.8. Scoring Set and Interscore

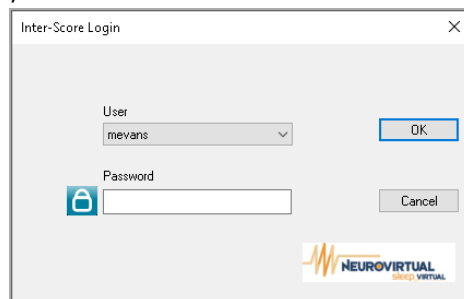
The Interscore feature is a tool that allows the comparison of different scorings done from different users to the same exam, without modifying the other scorings. The results are displayed on a Report that shows the difference between the score of each of the users and the main score, called Golden Score. Before using the feature, make sure that the users have been created on the User Account tab from Configurations window.



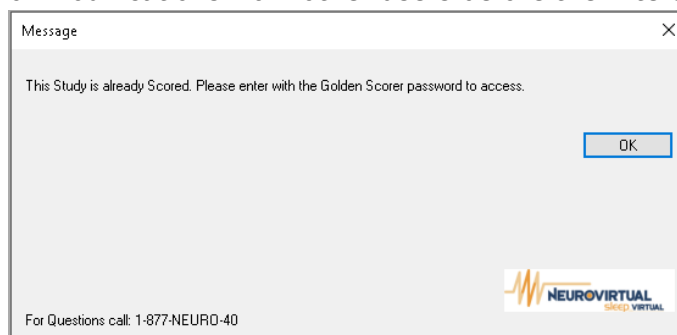
In order to use this feature, use the button to open the Open File window. Locate the desired study to be analyzed from the list, then select it by checking the box on the Select column. Before opening the study, check the *Open with Inter-Score* option located at the bottom of the window, then click OK to open the study.




From the Inter-Score Login window, select the user that will be scoring the study. Click on the OK button to access, then score the exam as normal.



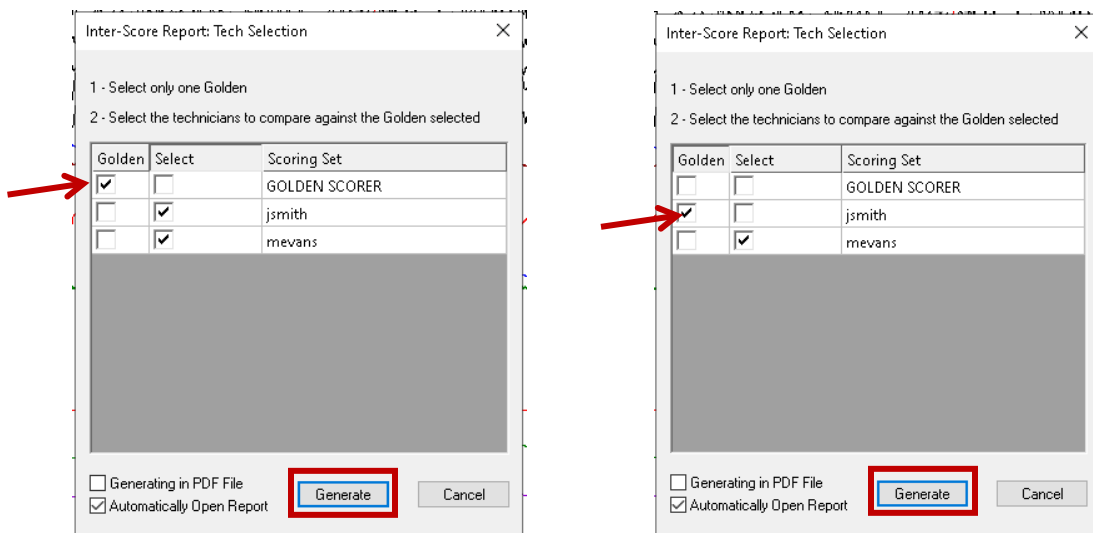
If the software is closed, the user will not be able to access again to modify the scoring, avoiding malicious or modifications from other users before the Interscore as processed.



Note that at least 2 users must score the study for the comparative to work as expected. When all users have scored the study, it is required to access with the Golden Scorer user (use the default password "sleep2010" to access). This user is recommended to use as the main Golden scorer but it is not mandatory. The access with this user is done only for the generation of the Interscore report.

To generate the Interscore Report, use the  button, located on the PSG Toolbar. This will open the Inter-score Report Tech Selection window. From there, select the main Golden score user as GOLDEN column, then select other scores to be analyzed on the Select column. Example:

GOLDEN SCORER as main GOLDEN scoring vs jsmith is the main GOLDEN scoring.

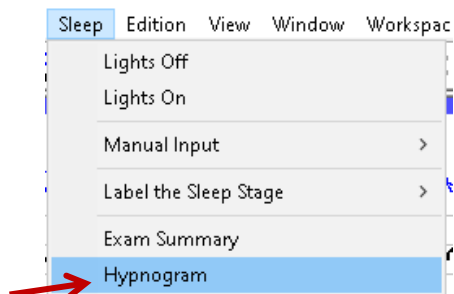


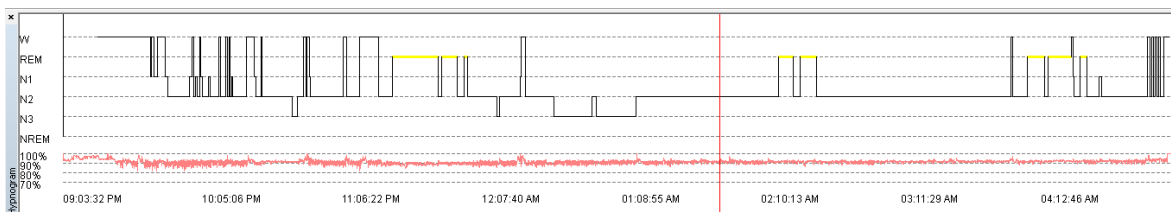
After selecting the users as required, click on Generate button to generate the comparative report.

8.9.9. Graphics

8.9.9.1. Hypnogram

In order to generate the Hypnogram graphic to be seen at all times on the screen, click the View dropdown menu, then select the Hypnogram and SPO2 Toolbar.

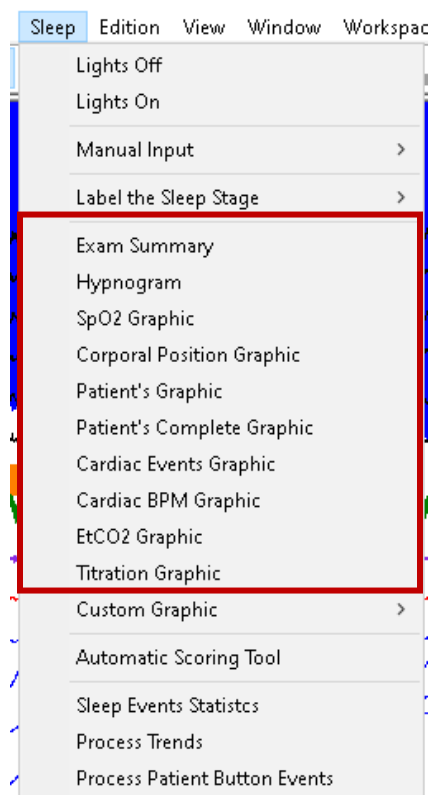





8.9.9.2. Default PSG Graphics

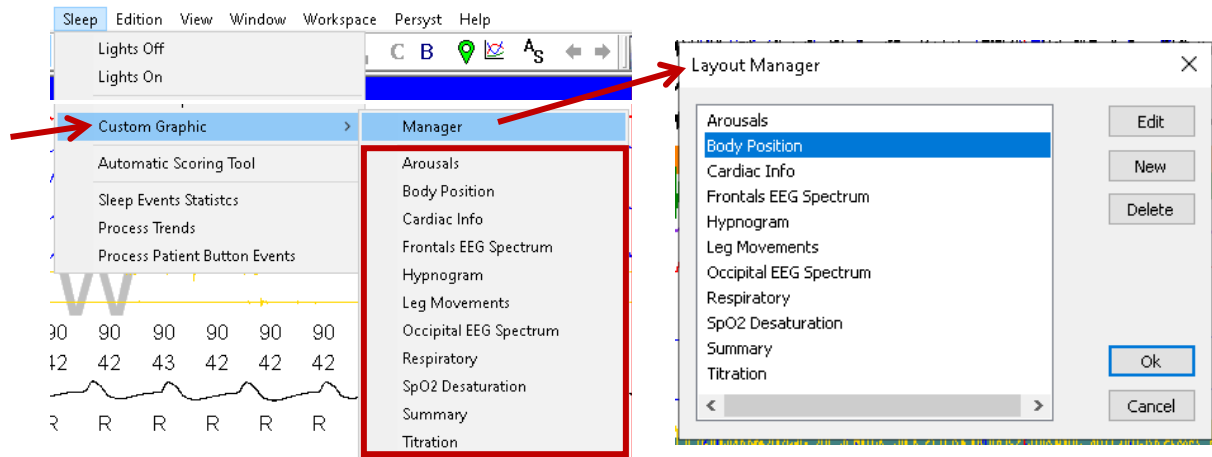
The software can generate different graphics that will reflect the trace of a specific channel, the trace of a numeric channel or the sleep event marked within a trace.

In order to open the default graphics, click the Sleep dropdown menu, then select any of the default graphics listed. Those graphics can be generated as they are shown in the Reports.



8.9.9.3. Custom PSG Graphics

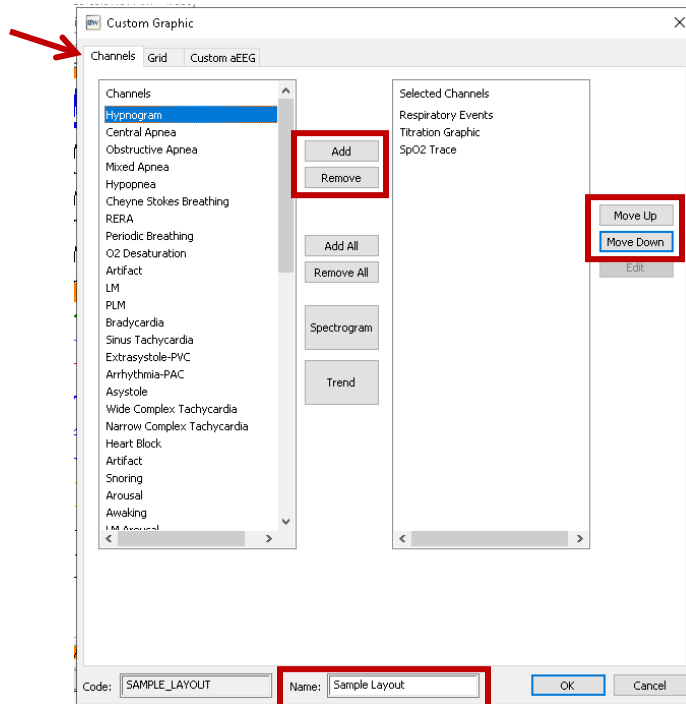
The user can also personalize the graphics to suit their requirements. In order to open a graphic, use the button , located on the PSG Toolbar or Sleep Toolbar, depending on the study type opened. The Layout Manager window will appear with the list of Graphics created. The user can also open this window by clicking on the Sleep dropdown menu, then selecting the Custom Graphic. The first option will open the Layout Manager, the other options on the list are the custom graphics listed on the Manager.



In order to exclude a graphic from the list of layouts, select the desired graphic and click the *Delete* button.

In order to edit a graphic, select the desired graphic and click the *Edit* button. The user can also create a new graphic. Click on the *New* button.

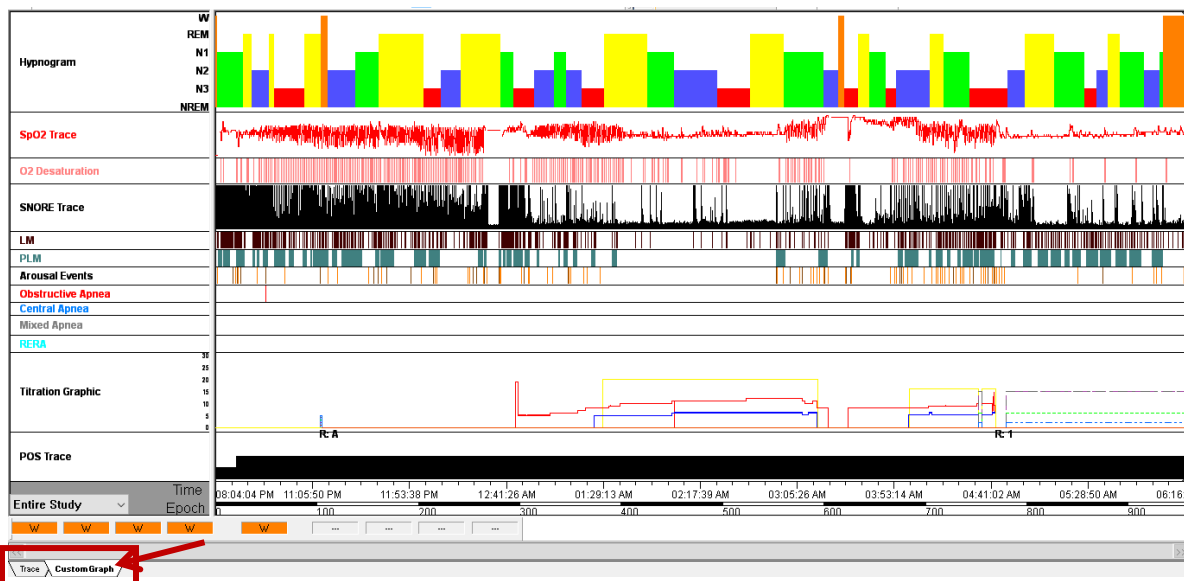
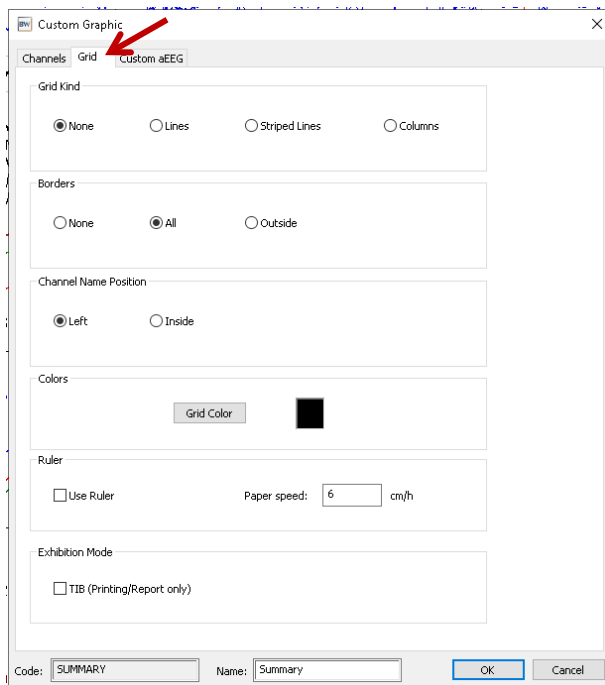
When using the *Edit* or *New* button, the Custom Graphic properties window will appear, showing a list on the left with the different channels that can be selected. To add on the channels, click on the desired channel, then click on the *Add* button. The same way you can remove the not desired channel by selecting the channel on the right and clicking on the *Remove* button. From this window, you can edit the position of the channels with the *Move Up* and *Move Down* buttons, as well as assign a specific event to be displayed on the graphic list.





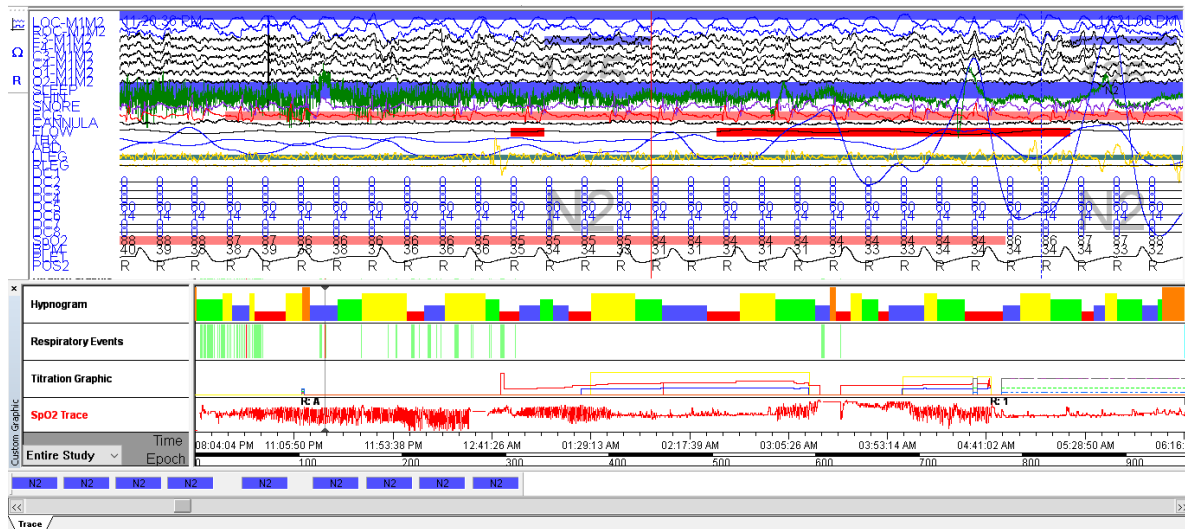
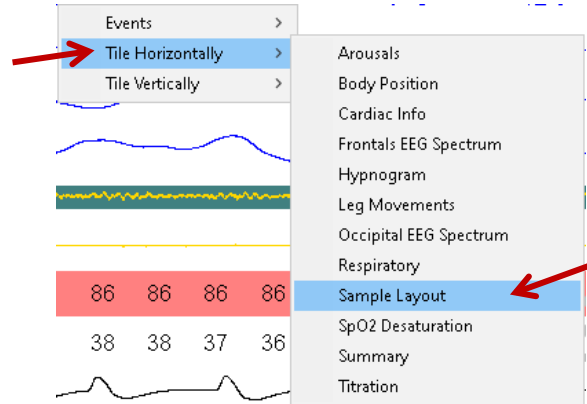
Note that the options Spectrogram and Trend will be available for PSG, those can be configured but will process only the EEG signals, for more information of this configuration, check Custom EEG Graphics section.

The graphic view can be configured from the Grid tab on the Custom Graphic configurations. From there, it can be selected how to see the Type and Color of Grid, to show or not the Borders of the graphic, the position of the Channels, enable the Ruler with a certain speed and if enable the TIB or not. Most of the configurations will be displayed on the Software as well as on the Generated Report if the graphic is added.



Depending on the one chosen, a new tab will appear (at the bottom of the screen) where the graphics will be displayed.

The custom graphics can also be opened on the same screen as the trace. To do this, locate the cursor anywhere on the trace, right click and select the Tile Horizontally option. Then, from the menu select the graphic to be displayed. If selected Tile Vertical, the screen will be split vertically between the Graphic and the trace.



9. Problems and Possible Solutions

9.1. New exam option blocked

If the software may not allow to create a new exam, it might be because the license is limited according to the purchase agreement. The permanent license will be provided under the commercial agreement. In the meantime, a periodic license might be provided.

If the new exam icon is disabled, the user should contact technical support to request update of the license key. The user must provide the serial number of the equipment in use, the type of exams that are performed and informed if the camera is going to be used.



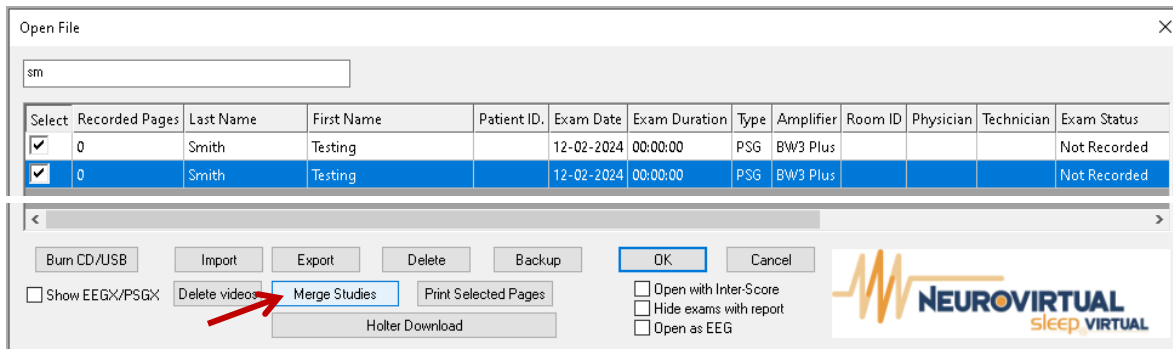
With the information mentioned, the customer support engineer will provide an Activation Key and the icon will be active again.



9.2. Merging Studies

To merge two exams, the user should follow the steps:

- Open the Open window where all recorded studies will be listed.
- Select from the checkbox the files to be merged.
- Verify that the selected files have the same patient name, were recorded on the same amplifier and are from the same type of study recorded.
- Click on the Merge Studies button
- The resulting file will be saved in the Edit folder set.



If the software version in use is older than version 1.99, make sure that the studies are in order (date-wise). If it is a higher version, the software will detect and sort the exams automatically.

9.3. Video Issues

Exam videos are saved inside the Videos folder inside the patient's exam folder. If there are no files inside this folder, the exam was recorded without video.

9.3.1. Video not displayed after recording

If videos are not showing even when the files can be seen on the Videos folder, it might be due to the Time format of the computer where the study was created (AM/PM correct ones). If the format was recorded as a. m. / p. m., it can cause problems in the display of the video when it is open for reading. The video window might be seen completely grayed out or show a message informing them there are no recorded videos.

Name	Date modified	Type
FFT	12/1/2024 4:13 PM	File folder
Sample EEG.EEG Routine.02-26-2024 12.36.01 p. m_ScoringData	12/1/2024 4:44 PM	File folder
Screens	11/29/2024 6:04 PM	File folder
Tmp	11/28/2024 2:13 PM	File folder
Trends	11/28/2024 2:43 PM	File folder
Videos	12/3/2024 12:12 PM	File folder
Sample EEG.EEG Routine.02-26-2024 12.36.01 p. m	12/1/2024 4:44 PM	EEG Exam File

It is recommended to change the settings of the computer to apply the correct Date and Time format to accomplish the video file name format as:

LastName.FirstName.MM-DD-YYYY HH.MM.SS AM/PM(YYYY-MM-DD HH.MM.SS.mms)

DATE FORMAT

MM= Month

DD= Day

YYYY= Year

TIME FORMAT

HH= Time at which recording began

MM= Minute in which recording began

SS= Second in which recording began

mmm= Millisecond in which recording began

Sample ASV.ASV Titration.07-17-2024 07.59.31 PM(2024-07-18 05.03.34.322) 7/18/2024 6:14 AM WMV File

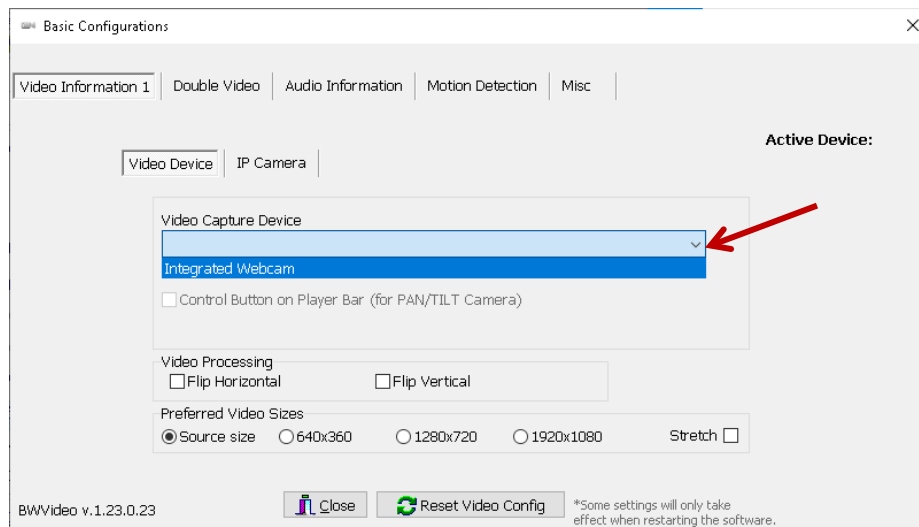
9.3.2. Black, Blue or Color bars in BWVideo view

The most frequent problem regarding video is the disconnecting of the camera. When using an analog camera and this gets disconnected, the Video image shows as a blue or black screen.



Always verify that the camera is connected to the power outlet and the physical connections are adjusted before checking the software options.

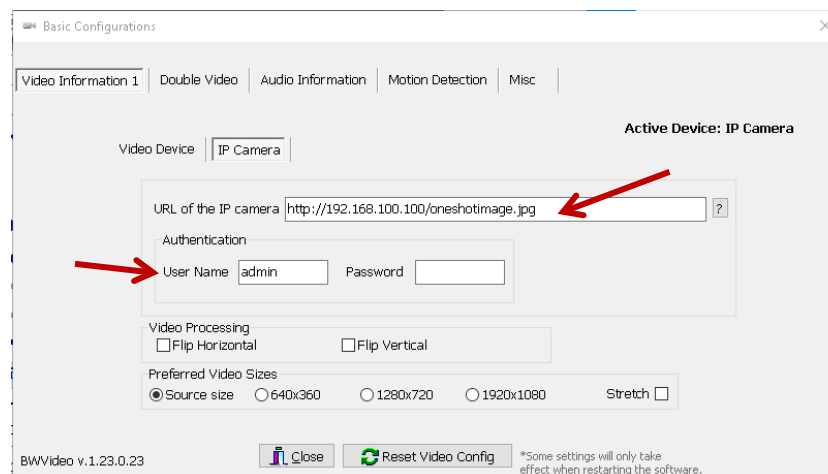
For analog cameras, cameras that work with video capture devices (Dazzle, Diamond, EasyCap, etc.) and cameras that connect to the computer via USB Type-A connection, always select *Video Device* tab from Video Information 1, then verify the desired camera in the drop-down menu to be chosen. If the software doesn't detect the camera, choose another available one.



When using an IP camera and this doesn't get identified, the Video image shows as a color bars screen.



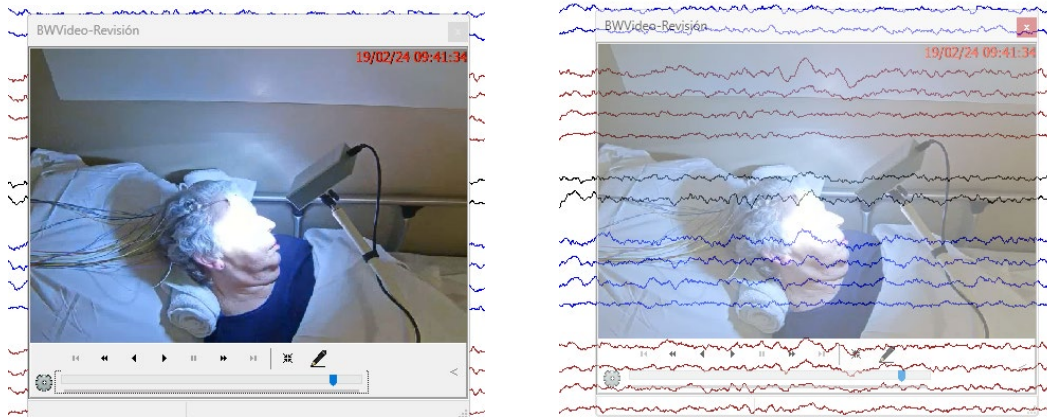
For IP cameras, that are normally connected via network cable directly to the computer or network switch. Always select *IP Camera* tab from Video Information 1, then check the IP set on the URL as well as the credentials (Username and Password).



If any of the options were changed for its correction, remember to restart the BWVideo for the changes to be saved and visible. To do this, the user can stop the acquisition and start it again, or you can completely close the BWAnalysis, then reopen it.

9.3.3. Transparent Video

The video window has the option of turning a little transparent to view the trace without stopping the recording. This can be done during the acquisition or revision of the exam.

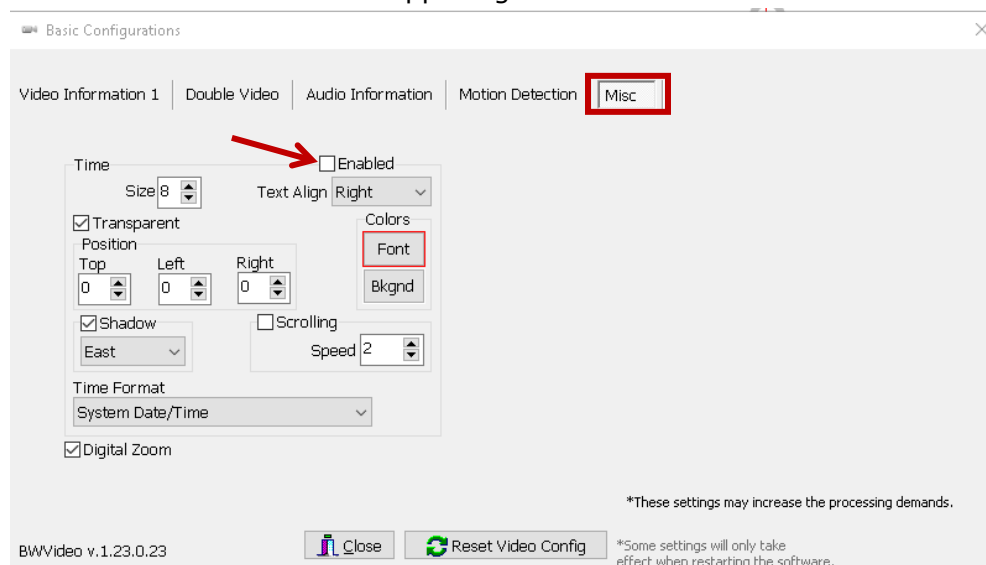


To turn it ON or OFF, simply select the video window, then press the SHIFT key from the keyboard.

9.3.4. Date and Time label missing

The video may not have the date and time label visible. If the video was recorded without it, there is no way to place it later, however, for new videos it is possible to enable it. To do this, click on the gear icon that is located at the lower left corner of the video window, then click on the *Misc* tab.

From this tab, check the box *Enable* on the Time section. From there the user can configure the color, size and position of the Date and Time label. By default, the font will be red and small and will be in the upper right corner.





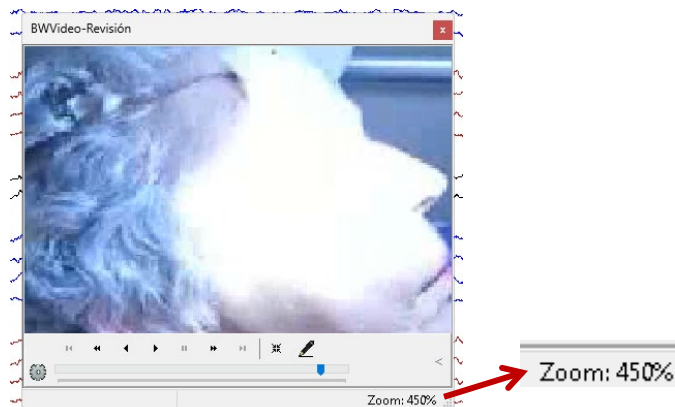
Enabled box **not** checked



Enabled box checked

9.3.5. Video with Zoom

It happens when the pointer is positioned over the video image and the mouse scroll is moved. To remove it, simply move down the scroll and move the cursor out of the video window.



Any perception or suspicion of abnormal functioning, we recommend the operator to immediately get in touch with Neurovirtual Customer Support for verification.