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BRAIN QUICK Software User Manual

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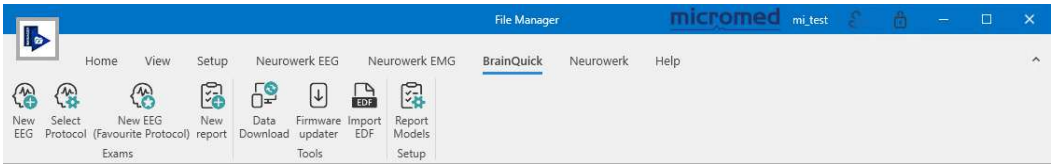
EEG RECORDING FROM ARCHIVE

FILE MANAGER is the entry point for EEG recording and all reviewing activities clinicians and physicians can perform on EEG studies.

The **Brain Quick Tab** of the ribbon bar collects all commands to start a new EEG recording.



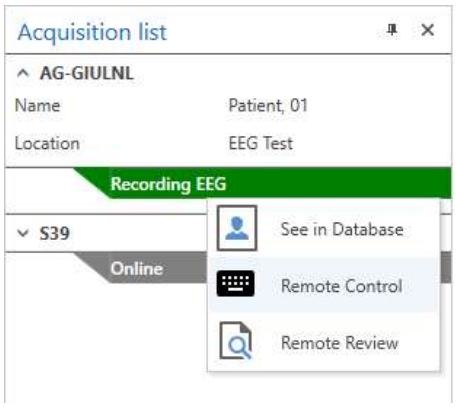
Clicking the **New EEG** button will open the **Brain Quick software** Acquisition window which allows to start either a new EEG or Video EEG recording with the last used acquisition protocol. An acquisition protocol is the collection of configuration parameters needed to perform an EEG recording, such as the headbox, one or more cameras, the connect configuration, i.e. the settings of the input channels of the acquisition device, and the photic stimulation protocol.

The Home Tab of the ribbon bar of Acquisition window collects all commands to start, save, pause and stop the acquisition, and to set up photic stimulation, chronometer, notes and cortical stimulator; **see the dedicated chapter of Brain Quick software User Manual for all the details.**

If there are on-going EEG recordings the Acquisition List panel allows to monitor the progress status of the on-going recordings; in the detail section related to the specific acquisition machine the patient name and the name of the acquisition resource are shown.

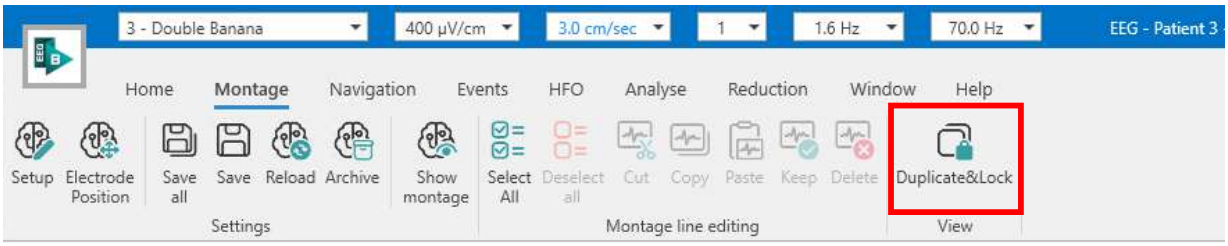
From the Acquisition List of other review stations of the system, it is possible to remotely review the on-going EEG study during the recording by selecting the acquisition system from the list and choosing the “Remote Review” option in the right click contextual menu.

In addition, it is possible to take the remote control of an acquisition station and live monitoring the on-going recording by choosing the “Remote Control” option in the right click contextual menu.

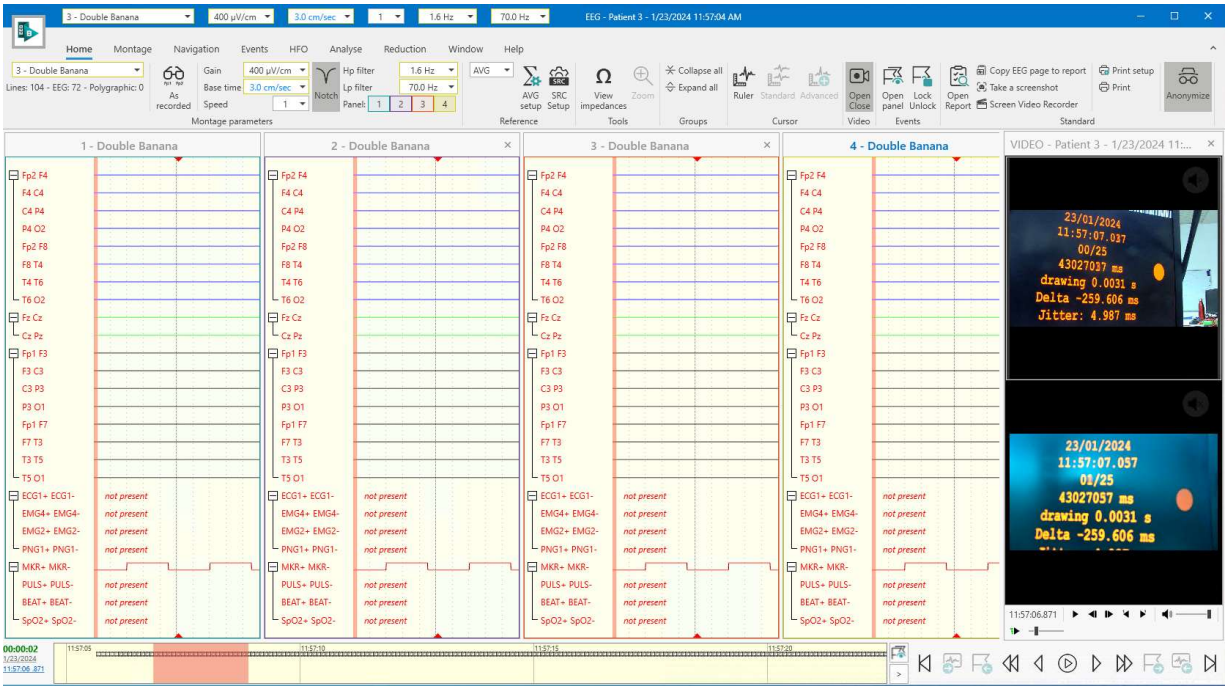


Acquisition List – Options

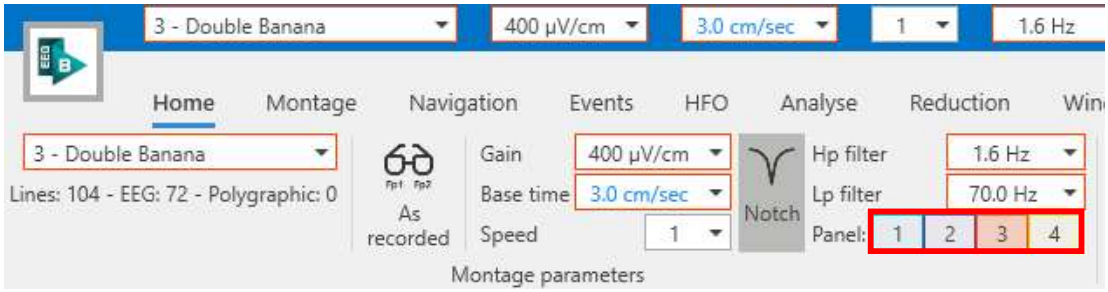
It is also possible to start a new recording by selecting the desired acquisition protocol; clicking the **Select Protocol** button will open a dedicated window of the Brain Quick software where all defined acquisition



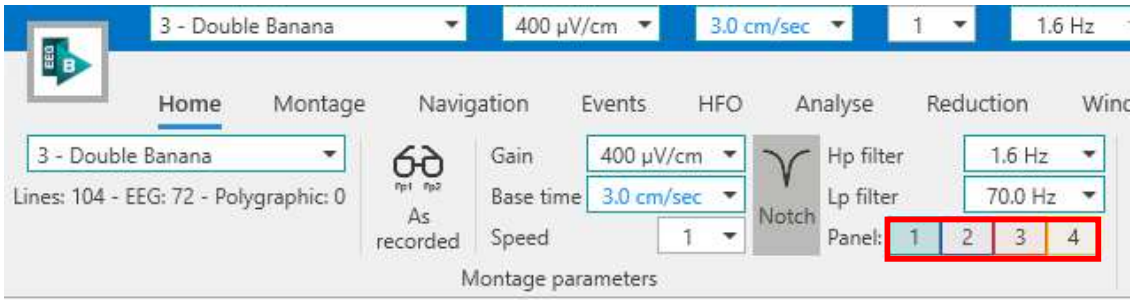
Duplicate and Lock function automatically opens additional panels for EEG visualization. The panels are synchronized and allow the user to scroll the trace, play video, modify montage and visualization parameters, analyze the EEG and insert notes and events. The user can have different EEG visualizations in different panels:



By default, montage is the same of primary window and can be modified. To change montage and modify lines parameters on a single panel, the user can either click on the panel or select it from Montage Parameters group in Home Tab. Once one panel is selected, the parameters border color changes according to the selected panel. Parameters will be highlighted in different colors depending on how many panels are open.

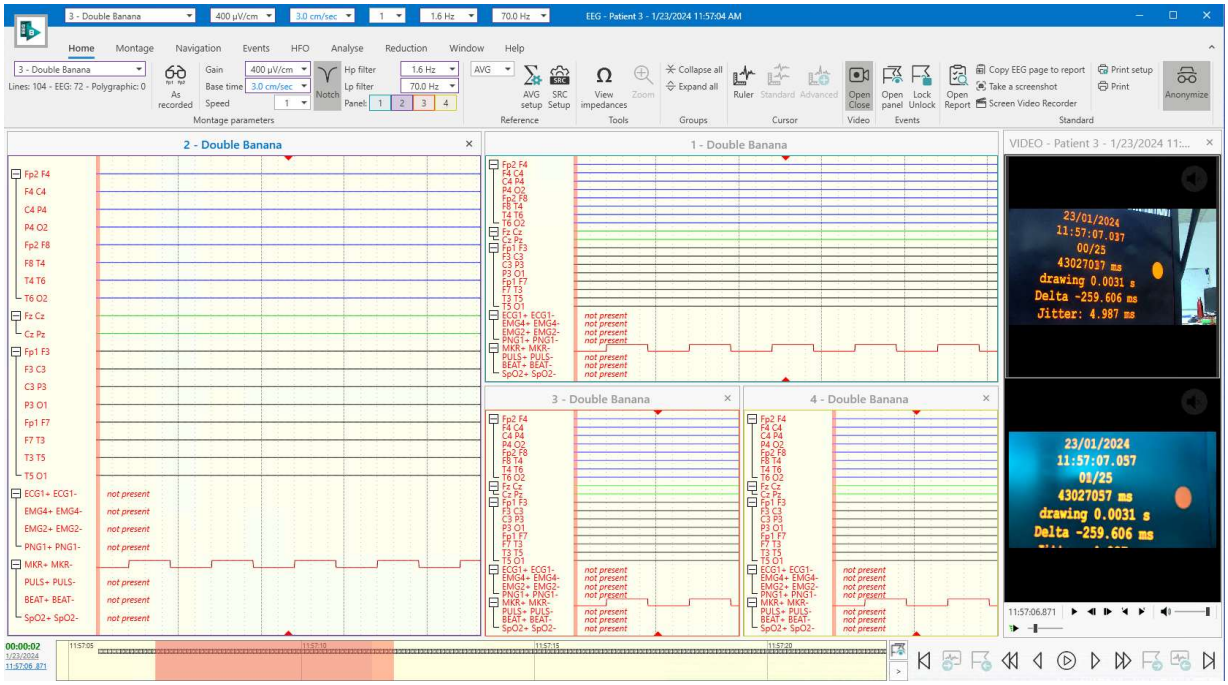


Montage parameters in case of third panel selected (red)



Montage parameters in case of first panel selected (light blue)

User can change montage parameters (Montage, Gain, Base Time, HP and LP filters) modifying them after panel selection. Show Montage function, available from Montage Tab, always displays montage related to first panel.
The function allows to open up to 4 synchronized EEG panels at the same time. Panels are dockable, so the user is able to drag and drop them to the desired position, even using multiple monitors.
To scroll through the EEG recording when Duplicate and Lock is enabled the user can use the buttons from Navigation tab of the Ribbon Bar, the buttons of the Navigation Bar or keys from the keyboard (see section Shortcuts). In case of Video EEG recording, video player buttons can also be used.

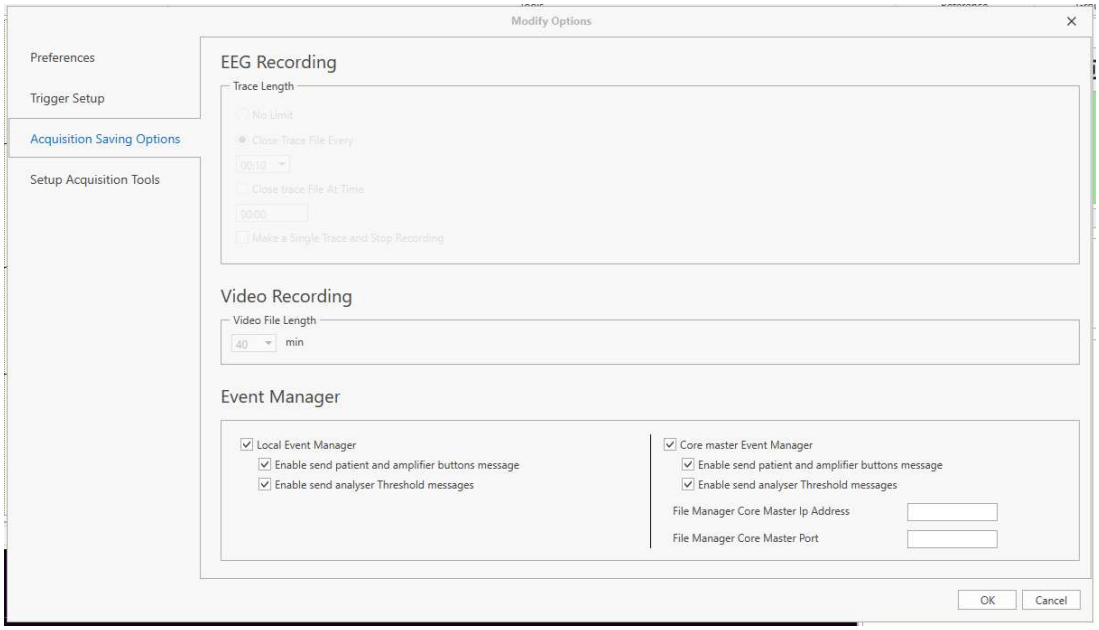


If the user starts Autoscroll feature when Duplicate and Lock is enabled, all EEG panels will scroll the trace according to the selected speed, and the user can stop Autoscroll from one of all open panels.

Duplicate and Lock function is available even during acquisition to visualize synchronized EEG acquisition in different panels, in case of high number of channels recorded, or in the case user needs to view the recording trace with different montages.
The workflow to enable and use duplicate and lock function is identical.

SIGNAL REFERENCE

The following referencing algorithms can be applied to the signal:



From this window the user can enable messages exchange to Event Manager. The user can enable the use of a Local Event Manager or/and the communication to the File Manager Core Master. The user can decide whether to enable Amplifier Buttons message or analyzer threshold messages to be sent. In case of communication with the File Manager Core Master the required parameters are File Manager Core IP Address and Port. “Event Manager” section is available only in case EVENT MANAGER license is enabled in the acquisition machine. More details about Event Manager are described in Advanced Guide Installation Manual.

CHECK IMPEDANCE

From the "Check impedance” button, it is possible to view the value of the impedances of the headbox channels. Check Impedance can be enabled during acquisition even without pausing the recording: in this case, recording is automatically paused and impedances check is executed.

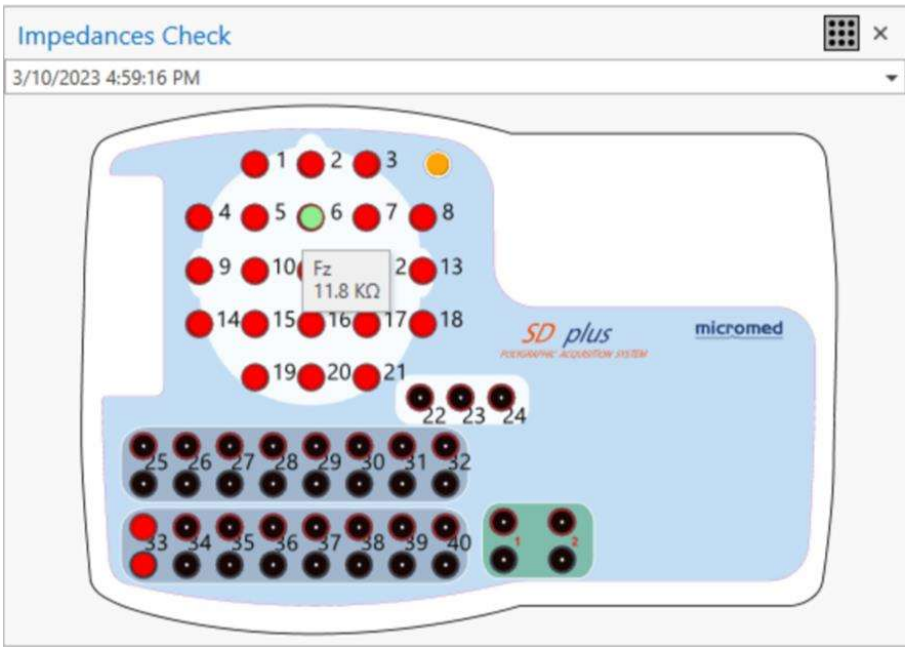
This panel can be used to view impedance values during EEG acquisition and check cable connections and adjust impedances between electrodes and the patient's skin. The measured impedance values can be saved in the recorded EEG file and read back at any time during the acquisition.

The Impedance Check panel offers two visualisation modes:

- a table with the list of impedance values for all the active channels
- a headbox image with channels colored in different way according to the impedance value

In the first visualization mode, the table shows the list of active channels with relative current impedance for both positive and negative inputs. For each input, then, a different color is associated according to the measured impedance: white if tending to 0 KΩ, green below 10 KΩ, orange between 10 and 20 KΩ, red if higher, as also shown in the figure.

Note. Threshold limits considered in the impedance check can be customized; default values are 10 KΩ as warning threshold and 20 KΩ as overflow threshold.



In the second visualization mode, the image of the headbox connected is shown and each input channel is colored in green, orange or red according to the related current impedance value; by hovering the mouse over a specific channel it is possible to see the exact impedance value measured.

It is possible to switch among the two visualization by clicking the  button in the top right corner of the impedance check panel.

In the end, it's possible to export the customization performed or import an existing one, using "Import/Export" button in the window.

TIME BAR

Time Bar is an area placed under the EEG trace panel that represents information about the position of EEG page displayed in the trace and about the entire duration of the exam giving an overview on the presence of video files, notes, selections and other events. The time bar allows the user to quickly locate interesting parts of the recording. By taking advantage of this information, the user can more easily navigate the trace and can quickly locate the parts of greatest interest.

The time bar of the BRAIN QUICK acquisition software indicates the length of the associated trace with indication for events added during acquisition.

Brain Quick Review Software Time bar includes the following elements:

- Date and Time of the beginning of EEG signal page in visualization. Each time the user moves along the trace these values are refreshed at once.
- Timer from the beginning of the recording
- Completed Visualization Interval area with vertical lines of division (parameters for time reference)
- Complete EEG tracks area with vertical lines of division (parameters for time reference)
- Page Cursor
- Interval Cursor visualized as a horizontal line under the interval of visualization
- Vertical lines for the representation of NOTE Events (default colour blue)
- Vertical lines for the representation of TRIGGER Events (default colour green)
- First horizontal line as indicator for the presence of VIDEO (default cinematograph film)
- Second horizontal line for SELECTION event as indicator for VIDEO to archive (default colour red)
- Third horizontal line for SELECTION event as indicator for EEG to archive (default colour green)
- Fourth horizontal line for SELECTION event as indicator for TIMER, like hyperpnea (default light blue)
- Fifth horizontal line for SELECTION event as indicator for MAP to analyse (default colour orange)
- Sixth horizontal lines for customizable EVENTS (defined by user)
- Horizontal lines for HFO SELECTION (e.g. colour red)

During the review, the Time Bar includes two slider:

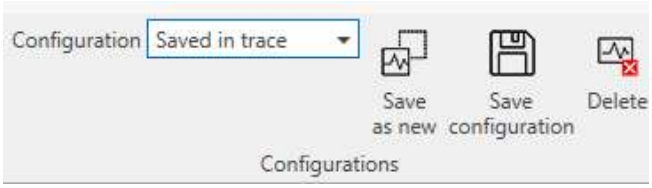
- **Page Slider:** allows the user to scroll the trace and represents the position of the EEG page displayed in the entire duration of EEG exam.
- **Interval Slider:** represents the position of the Interval displayed in Time bar in the entire duration of EEG exam and allows the user to scroll through the recording

In review, the Time Bar can manage a temporal interval including one or more traces, consecutive or not, previously selected and related to the same patient. In addition, it can work as a calendar with interval included between the start of the first EEG trace and the end of the "last" EEG trace.

2. **Save As New**: allows to save the user defined electrodes position in a new configuration
3. **Save Configuration**: allows to modify and save the selected configuration
4. **Delete**: allows to delete the selected configuration

Note: IFCN Standard is the default configuration, which cannot be modified or deleted. User can only save the changes made on IFCN standard in a new configuration. New configurations are stored in the machine, hence at Unit level.

When the user works on Saved in Trace configuration, the modifications are directly saved in the EEG file.



The **list of electrodes** is composed of four columns called: **Label**, **Active**, **Latitude** and **Longitude**.

1. **Label**: indicates the electrode name. The EEG channels here visible are selected in the "Modify Connection" window, in acquisition, recallable only in the acquisition phase of EEG traces.
2. **Active**: indicates if the electrode is enabled or not. The user can activate the electrodes by clicking the left mouse button on the corresponding checkbox, making a symbol appear. Repressing the left mouse button, the symbol disappears and the electrode is disabled.
3. **Latitude**: indicates the latitude of the electrode and can be modified by the user. Click the left mouse button on the interested electrode cell and type the new value or selecting the electrode visualized in the brain image and dragging it in the desired position.
4. **Longitude**: indicates the longitude of the electrode and can be modified by the user. Click the left mouse button on the interested electrode cell and type the new value or selecting the electrode visualized in the brain image and dragging it in the desired position.

The **head** contains the head image that can be loaded by user and it is represented with circles that represent the active electrodes. These circles can be moved inside the red circle dragging them with the mouse; in the latitude and longitude columns the values change automatically. The name of the electrode appears when the user moves the mouse over each circle.

EVENTS

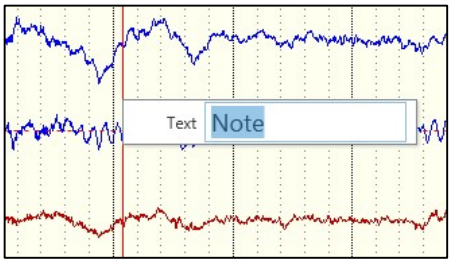
BRAIN QUICK software allows the user to insert notes to distinguish events during review and acquisition.

EVENTS DESCRIPTION

During the exam, the user has the possibility to insert events to distinguish particular situations during the recorded trace. There are three main events insertion modalities, which are described in the following:

Direct Notes Insertion

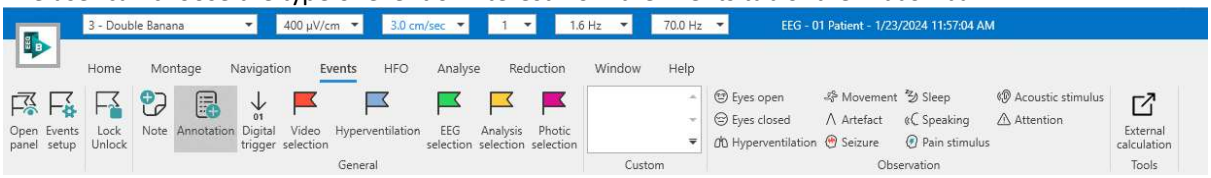
Direct notes insertion on the EEG page can be done with right mouse click on the part of the trace of interest: a text box appears if “note” is selected and the user can type the note text. Pressing Enter from the keyboard the note will be inserted in the EEG trace.



Notes can be inserted directly typing the note from the keyboard and pressing Enter, in this case the note will be inserted in the middle of the EEG page.
To avoid accidental events insertion, the events insertion can be locked using the Lock/Unlock button (which is present in the Home tab, in the Events tab and in the HFO tab of the Ribbon bar) shows a locked padlock:

Continuous Event Insertion (from the Ribbon bar)

The user can choose the type of event of interest from the Events tab of the Ribbon bar:



Events can be of different types:

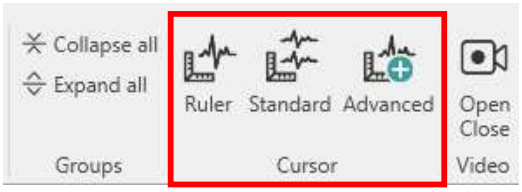
- General events: such as Notes, Annotations, Digital triggers and Selections
- Observation events: such as Eyes open, Eyes closed, Hyperventilation, Movement and Stimuli events
- Custom events: defined by the user

After clicking on a event the system enters continuous event insertion modality. This modality is indicated on the bottom right of the EEG window, with a flashing red warning. For example, if the user chooses "Video selection" event the warning" Inserting Video Selection" will appear:

Then the user has to click or click and drag on the EEG trace to insert the selected event. While event insertion modality is active the user can insert as many events as he wants (of the selected type).
Continuous event insertion modality remains active until the user clicks again on the event button on the Ribbon bar or clicks on the Lock/Unlock button or presses Esc key from the keyboard.

MEASURE CURSORS

Measure cursors are tools which allows to measure oscillations amplitude, duration and frequency in a quick way. They can be enabled by clicking on the **Cursor** section from the Home tab of the Ribbon bar:



Finally there is the Distance cursor, another tool that allows the user to measure time differences between two defined points on the trace.

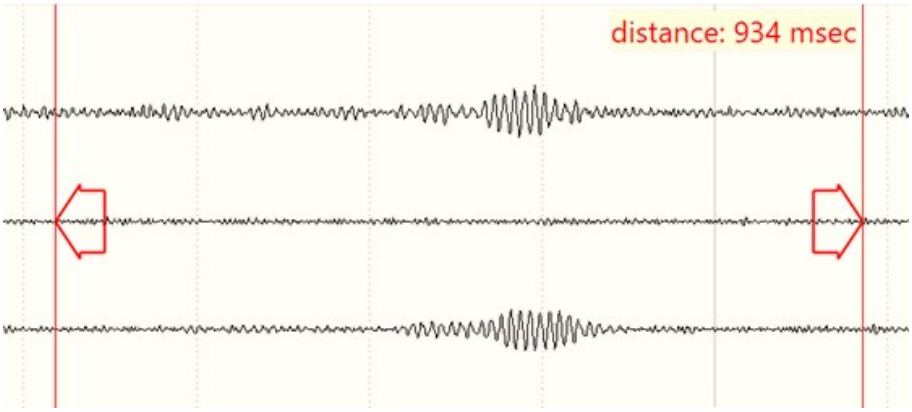
These features and how to use them are explained below.

DISTANCE CURSOR

Distance cursor is a tool that allows the user to measure time differences between two defined points on the EEG trace. It is composed of two vertical red lines with red arrows, which identify the start and end point selected for the distance measurement. A textbox displays the distance measured between the selected start point and end point.

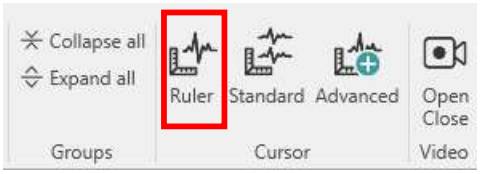
The user can enable and disable distance cursor by directly clicking with the mouse on the EEG trace:

1. Double-click on the EEG trace to set the start point for distance measurement
2. Double-click on the EEG trace to set the end point for distance measurement
3. Distance information is displayed
4. Double-click on the EEG trace to close distance cursor



RULER MEASURE CURSOR

Ruler cursor is a tool that allows the user to measure oscillations amplitude in a quick and qualitative way. It can be enabled by clicking on **Ruler** button from the Home tab of the Ribbon bar:

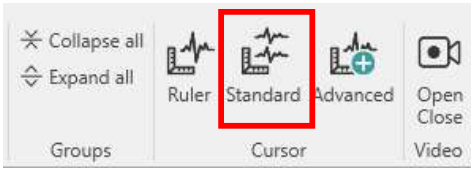


A floating ruler with graduated axis appears when hovering the mouse on the EEG trace. The ruler can be positioned in correspondence with the oscillations of interest to measure their amplitude and it can be fixed on the EEG page using shortcut CTRL+F and unfixed using again CTRL+F.

The ruler cursor y-axis is equal to the gain and the x-axis is equal to 1 second.

STANDARD MEASURE CURSOR

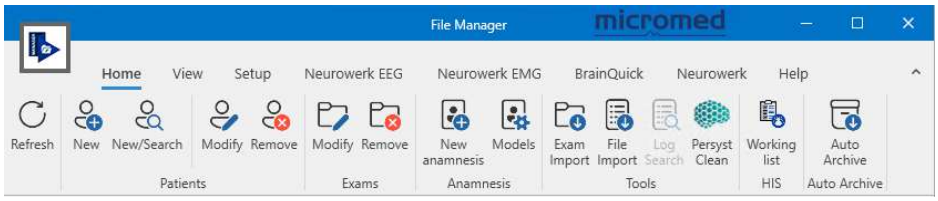
Standard Measure Cursor is a tool which allows to measure oscillations amplitude, duration and frequency in a quick way. It can be enabled by clicking on **Standard** button from the Home tab of the Ribbon bar:



When clicking on Standard button the Standard Measure Cursor directly opens in the middle of the EEG page. It is composed of a red area, which delimits the part of the EEG trace to be measured. The selection applies to all the montage lines.
Standard Measure Cursor displays information updated in real time about the:

- Initial and final timing position of the vertical selection
- Temporal duration of the interval
- Peak-to-peak amplitude of the interval

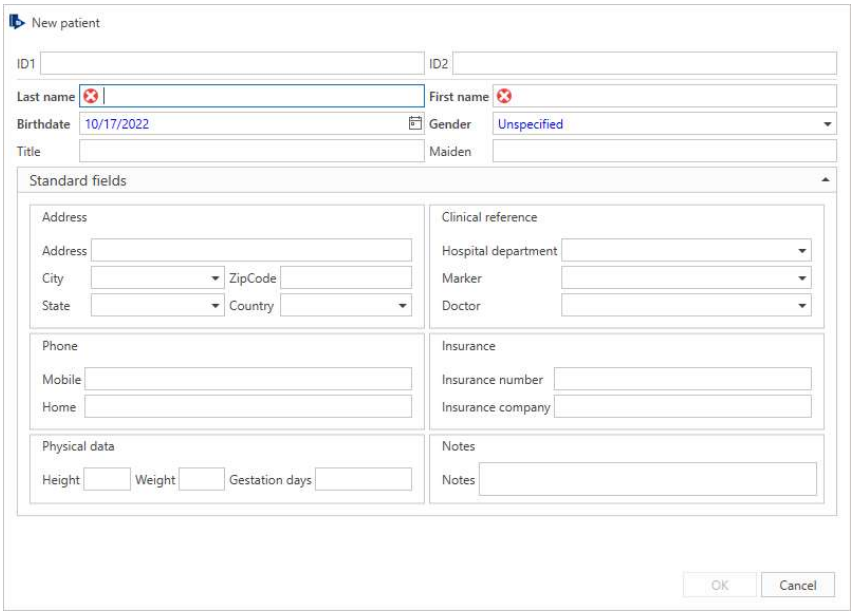
- **Auto Archive**
- **Users**



Patients Group

The Patients group offers four buttons for the creation, search, modification, or removal of a single patient. While the “New” and “New/Search” buttons are always available, the “Modify” and “Remove” buttons are enabled only when a patient has been selected.

Clicking the **New** button opens the dialog for the creation of a new patient. As shown in the figure below, the dialog offers several fields that can be populated with the patient personal data. The only DEFAULT required fields are “Last name”, “First name” and “Birth Date”; mandatory fields are marked with a red X when empty. The “ID1” and/or “ID2” fields may also be set as mandatory. For more information, see the section related to **Labels Customization**.



Once all the mandatory fields are filled, the “OK” button will become enabled.

Note. “First name”, “Last name”, “Birth Date” and “ID1” fields are used by the FILE MANAGER application for the unique patient identification check performed every time a new patient is created or an existing patient demographic data is edited.

When creating a new patient record, FILE MANAGER checks if another patient with the same demographic data already exists, to avoid any unwanted duplicates. If a matching patient record exists, the user is asked for confirmation before proceeding.