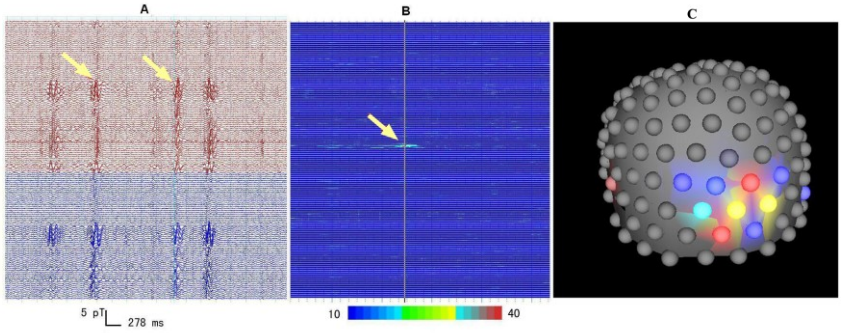
Menu View Guide



DISCLAIMER

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Features and specifications of this software program are subject to change without notice. This manual contains information and images about EEG Studio, its user interface, GUI and its other signal processing algorithms, publications that are protected by copyright.

Sending Your Comments and Critiques: We would like to hear from you. Your comments and suggestions for improving this document are welcome and appreciated. Please e-mail your feedback to BrainX@live.com

Thank you.

Contents

Warnings and Cautions

This software supports both magnetoencephalography (MEG) and electroencephalography (EEG) data. Though MEG and EEG waveforms appear similar, they have different unit in amplitude. If the MEG and EEG data recorded simultaneously, their time unit or temporal resolution is typically the same.

Modern EEG/MEG systems typically have EEG/MEG sensor/electrode channels as well as other channels. For example, trigger channel, head-localization channels and additional ADC (analog-to-digital) channels. To avoid problems, please pay attention to the channel names and the amplitude value/unit. Their values may be of different orders of magnitude. Unexpected results may occur if their values are mixed in measurements.

When performing waveform analysis, regardless of whether MEG or EEG or both are displayed, ensure that the data are appropriately filtered with DC-offset/linear-trend removal. If the waveforms had very large amplitude (e.g. > 3 pt), it is recommended that you identify possible noise.

There are a set of source localization algorithms in the program. Each source localization algorithm has been designed and tested for specific reasons. To ensure the quality and visibility, all source localization algorithms will generate a volumetric source image, which can be considered as an image with millions of “dipoles” or multi-value-voxel, which is significantly different from the conventional equivalent current dipoles or magnetic source imaging (MSI).

Head movement during MEG recordings may affect the accuracy of source imaging. If subjects move too much during MEG recordings, the MEG results are more than likely poor.

The accuracy of the structural images (MRI/CT) may also affect the EEG results if the conventional magnetic source imaging (MSI) is used. If MRI/CT is distorted, the combination of EEG/MRI/CT will be low-quality. In addition, multiple local sphere, head model or other structural constrained source localization my internally use the MRI/CT images. Any analysis based on those distorted images may yield unexpected or poor results.

The following warnings and cautions appear in this guide. Please ensure you are aware of all the operations and interpretations.

Preface

The View menu is used as the primary menu to setup the view of EEG/MEG waveform display. This guide describes the settings of the parameters for stationarily or dynamically showing the waveforms.

Intended Audience

This guide is intended for anyone needing to view or edit data collected using a EEG/MEG system. It assumes the reader is familiar with standard EEG/MEG procedures and with the Windows operating systems.

Document Structure

Documents are generally provided in both Microsoft Word® format and Adobe® Acrobat® PDF (Portable Document Format). All editions are distributed on Flash Driver, CD or websites with the related software, and include bookmarks and hyperlinks to assist navigating the document. Please feel free to send your critiques, corrections, suggestions and comments to BrainX@live.com.

Conventions

Numeric: Numeric values are generally presented in decimal but in special circumstances may also be expressed in hexadecimal or binary. Hexadecimal values are shown with a prefix of 0x, in the form 0x3D. Binary values are shown with a prefix of 0b, in the form 0b00111101. Otherwise, values are presumed decimal.

Units: Units of measure are given in metric. Where measure is provided in imperial units, they are typically shown in parenthesis after the metric units.

A millivolt (mV) is one one-thousandth of a volt (0.001 V or 1 10^{-3}. These units commonly are used in EKG, EMG, and sometimes in EEG. A microvolt (uV) is one one-millionth of a volt (0.000000 V or 1 x 10^{-6}). This is the commonest voltage measure in EEG. A nanovolt (nV) is one-thousandth of one-millionth of a v (0.000000001 V or 1 x 10^{-9}). This measure is used in the specific area of EEG dealing with evoked potentials.

The unit of current is the ampere (A). In EEG, typical smaller amounts are encountered. A milliampere (mA) is one one-thousandth of an ampere (0.001 A or 1 x 10^{-3}). A microamplere (uA) is one one-millionth of an ampere (0.000000 A, or 1 x 10^{-6}).

Magnetic signal strength is given in Teslas (T), the SI unit of flux density (or field intensity) for magnetic fields, also known as the magnetic induction. Typical signal strengths in MEG measurements are in the order of pT (picoteslas = 10^{-12}) or fT (femtoteslas = 10^{-15}).

View Menu

The View menu provides GUI for users to setup the view of EEG/MEG waveform display. Many functions in the View Menu can also be found in the Main Frame Guide because the buttons or icons in the Main Frame provide some similar functions.

The purpose of such kind of "duplication function" in the software is to provide the best user experience and flexibility. You may user any way which is convenient and comfortable to you.

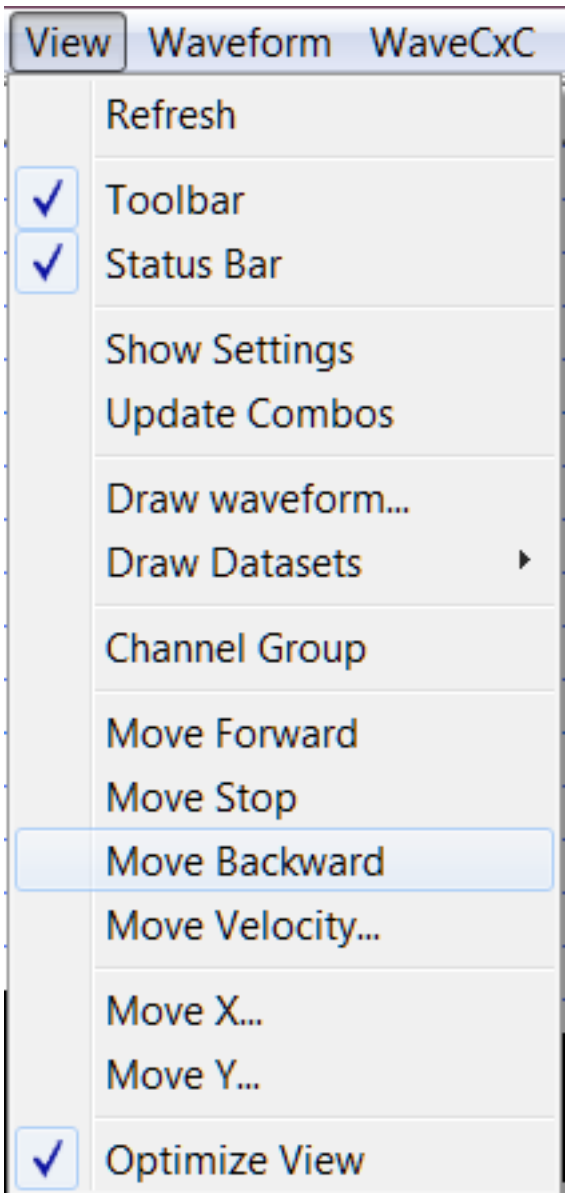

Figure 1. View Menu in MEG Processor.

Refresh

Refresh will re-draw the entire waveforms in the viewer of the main frame. Any data changes out of the viewer will be updated.

Toolbar

Show/hide the standard toolbar (typically on the top-left) in the Main Frame.

Status Bar

Show/hide the status bar (typically on the right-bottom) in the Main Frame.

Show Settings

Update the toolbar at the bottom of the Main Frame.

Update Combo Boxes

Update the combo boxes of the top of the Main Frame.

Draw Waveform

The Draw Waveform menu launches the dialog for precisely defining the display of the viewer in the Main Frame.

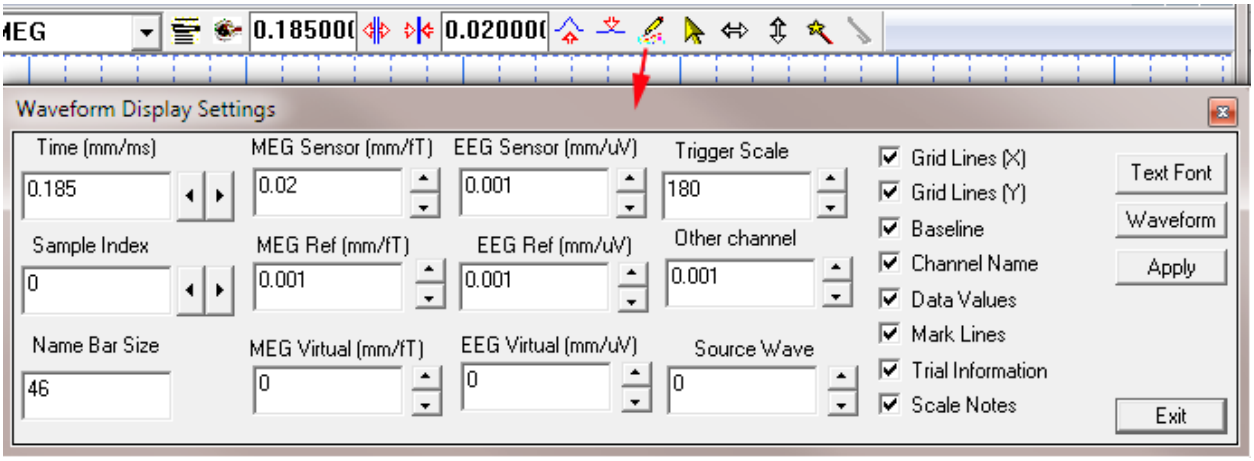

Figure 2. Settings for drawing the Waveforms of MEG/EEG data.

Define a range for viewing

To view data from a pre-defined data point, you may enter the sample index. The range of samples will be automatically decided according to the time-scale and the size of display window.

Define background and other parameters

As shown in Figure 7, you may decide the Name Bar Size and whether or not to show Grid Lines (Time-X, Amplitude-Y), Baseline, Channel Name, Data Values, Mark Lines, Trial Information and Scale Notes.

In addition, the dialog provides also the GUI for changing Text Font, Waveform color and width.

Draw Datasets

By the default, the program showed the waveform data of all the visible channels in one trial. However, the professional version of the program has the capability to show more than one trial though it requires more memory.

Channel Group

EEG Studio also has pre-defined channel groups, which reference specific collections of channel sensors, such as the MEG Left sensors or the MEG Right channels. You can also define new channel groups of your own. The Group combo box in the main window bar displays the available channel groups, as shown in Figure 4. These combo boxes allow you to control which groups of channels are displayed within a channel set. Select Show All to enable the display of all channels in the current set, regardless of their grouping. You can define new channels groups from the Group Set dialog, which displays when you select Channel Grouping from the Display Combo Boxes.

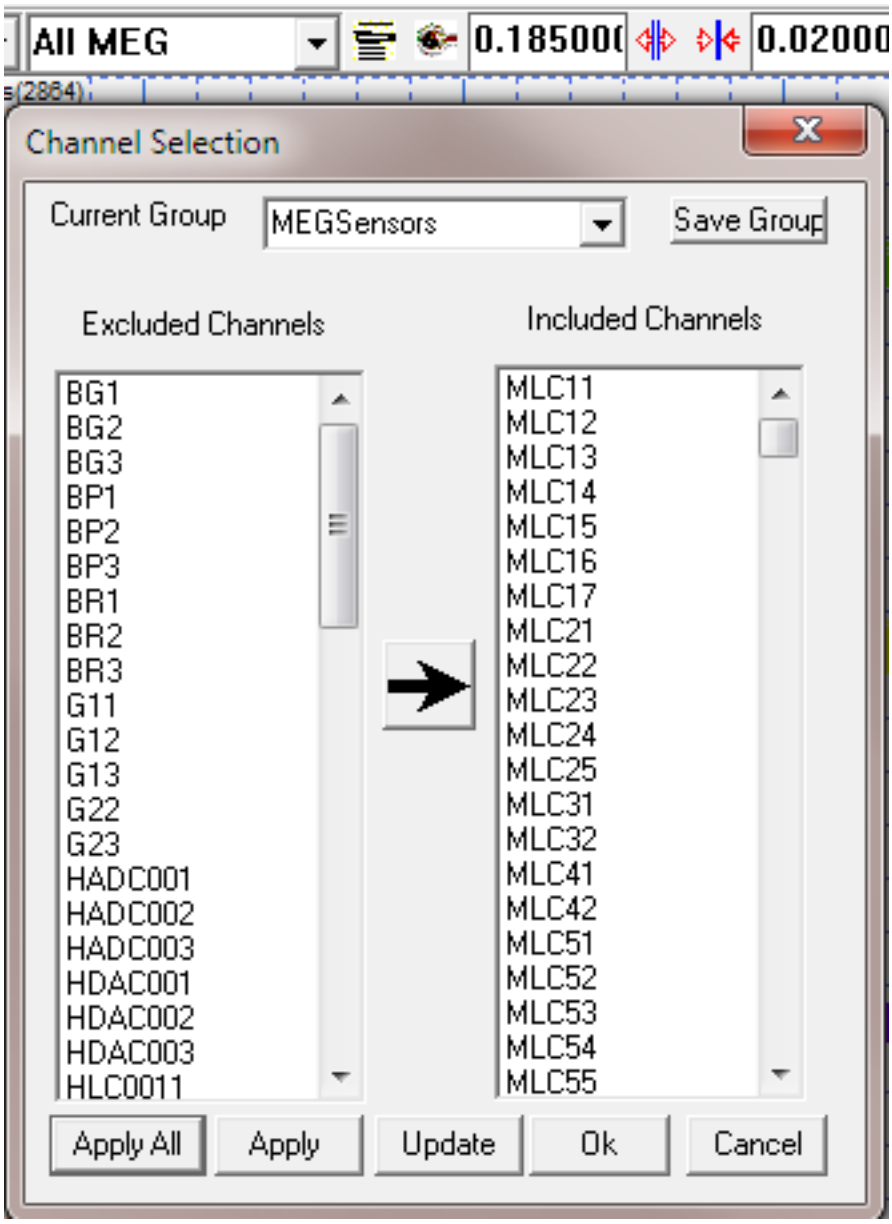

Figure 3. Dialog for Channel Selection for displaying a customized channel set.

A third method of selecting the channels to display is to choose them by channel set and/or individual channel name in the Channel Select dialog. You can also define new channel sets using this dialog. To add or remove individual channels from the selected list, highlight them in the Unselected or Selected lists, then use the appropriate arrow button to move them over. When you click Apply or Ok, the selected channels will display in the strip chart.

Move Forward

"Move Forward" menu starts animation and move the waveform in the forwarding direction (relative to the select line) in the Main Frame Viewer.

Move Stop

"Move Forward" menu stop animation of the waveforms in the Main Frame viewer.

Move Backward

"Move Backward" menu starts animation and move the waveform in the backwarding direction (relative to the select line) in the Main Frame Viewer.

Move Velocity

To setup the animation parameters of waveforms, click the Move Velocity menu. "Move Backward" menu starts animation and move the waveform in the back warding direction (relative to the select line) in the Main Frame Viewer.

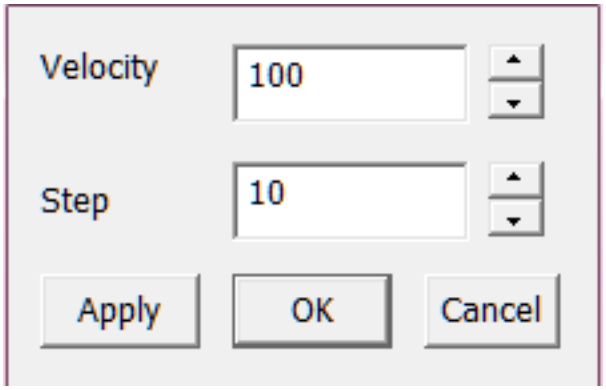

Figure 3. Settings of waveform animation.

The velocity is relative speed in millisecond which depends on the speed of the computer. The Step is data points in time.

Move Waveform in X (horizontal) Direction

Change the working mode in the Main Frame viewer to moving waveform in horizontal direction. The cursor changes with the mode of the viewing.

You may move the Overlay Waveform (All Sensors) left-right by clicking the corresponding buttons in control panel.

Move Waveform in Y (vertical) Direction

Change the working mode in the Main Frame viewer to moving waveform in vertical direction. The cursor changes with the mode of the viewing.

You may move the Overlay Waveform (All Sensors) up-down by clicking the corresponding buttons in control panel.

Optimize View

Change the working mode in the Main Frame viewer to optimized view mode. The optimized view mode show better performance.

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