BSL HOME QUICK GUIDE

BIOPAC® Systems, Inc.
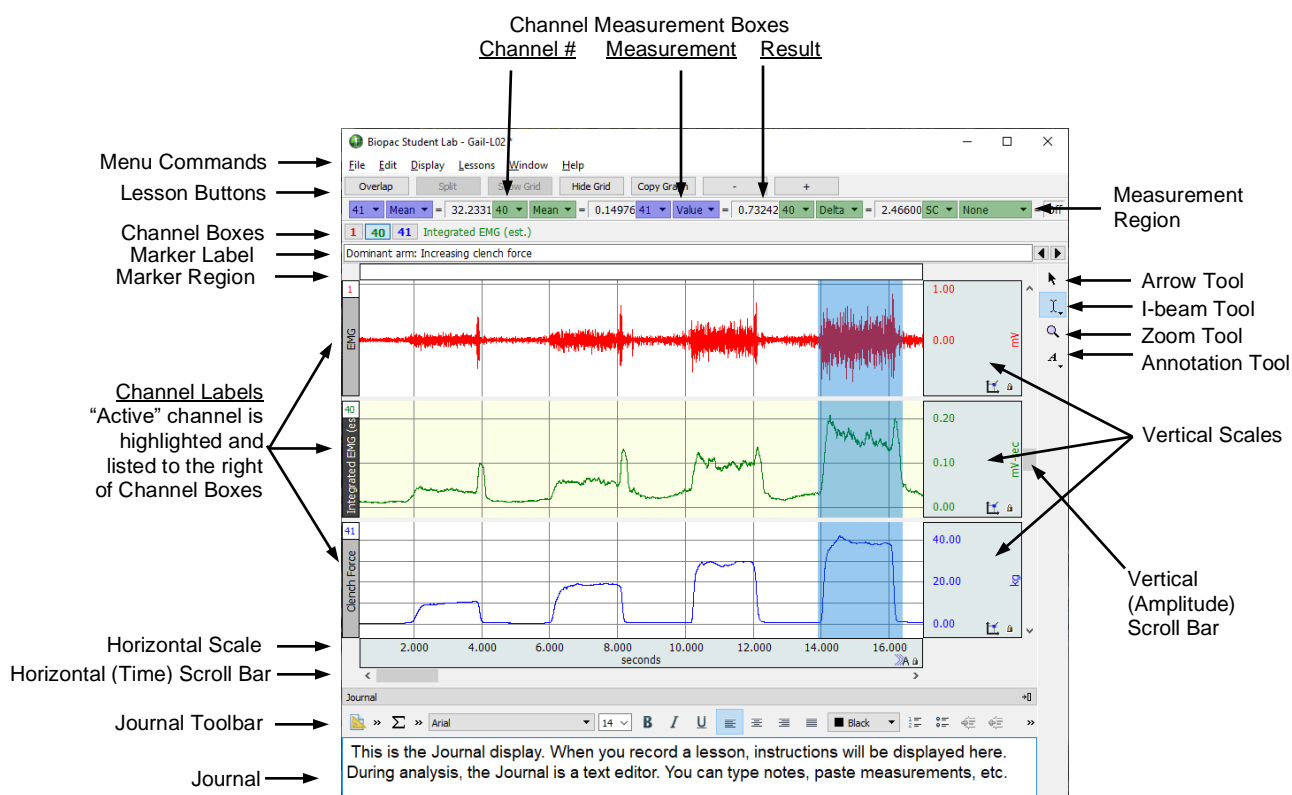Registered to ISO 9001:2015
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Biopac Student Lab

➲ **OVERVIEW OF THE BSL DISPLAY**

All BSL Home lessons have a Data window (graph) and a Journal.

- The **Data window (graph)** displays the recorded data and is where you perform measurements and analysis.
- The **Journal** is below the Data window and allows you to enter notes and paste graphics. The Journal provides instructions to assist you with setup, calibration, and recording, and is also where you make notes and store measurements.

Refer to the **BSL Home Display** below to identify tools and options that you can use as you complete the Setup, Signal Check, Recording, and Data Analysis of each BSL Lesson. The sample display shows three channels of data and two channel measurement boxes, but the lesson display will vary for each lesson and at different points within each lesson.

BSL Home Display

Channel Measurement Boxes
Channel #   Measurement   Result

Menu Commands
Lesson Buttons
Channel Boxes
Marker Label
Marker Region
Channel Labels "Active" channel is highlighted and listed to the right of Channel Boxes
Horizontal Scale
Horizontal (Time) Scroll Bar
Journal Toolbar
Journal

Measurement Region
Arrow Tool
I-beam Tool
Zoom Tool
Annotation Tool
Vertical Scales
Vertical (Amplitude) Scroll Bar

➲ **MENU COMMANDS**

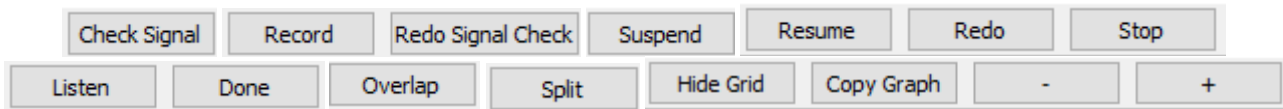| File | Edit | Display | Lessons | Window | Help |

Menu options will change during stages of a lesson and analysis.

File	Copy files, print graphs, set graph display preferences (Show/Hide grids), set Journal preferences.
Edit	Copy measurements and wave data from the Data window and paste to the Journal or to other programs for further analysis. Copy graphs (snapshot of waveform display) to other programs.
Display	Use **Autoscale** and **Zoom** functions to control how data looks on the screen. See Viewing Data.
Window	Changes the window display.
Lessons	Open BSL Home lessons or Review Saved Data from a previously saved recording.
Help	View this *Quick Guide* and the **BSL Tutorial**, or link to Support Materials from the web.

⮕ **RUNNING A LESSON**

- Choose a Lesson file from the **Lessons menu**.
  - You will be prompted to choose, or name, a folder into which BSL will save your lesson data
  - If the BSL software cannot communicate with the MP41 recording hardware, you will be prompted to check the connections and retry. You must be connected to the MP41 to record lesson data.
- Each BSL Lesson is divided into sections for Experimental Methods (Set Up, Signal Check, and Record), Data Analysis, and Data Report. Follow the step-by-step procedures in the **BSL Lessons PDFs** to complete the lesson, noting the symbols in that instruct you to insert markers or enter measurements in your Data Report.
- To further guide you, each lesson has on-screen prompts and each lesson's **Journal** has abbreviated instructions for Set Up, Signal Check, and Recording.

⮕ **LESSON BUTTONS**

| Check Signal | Record | Redo Signal Check | Suspend | Resume | Redo | Stop |
| Listen | Done | Overlap | Split | Hide Grid | Copy Graph | - | + |

Lesson buttons are located under the menu commands at the top of the graph to guide you through the recording procedure. Appropriate options are generated after each selection. The buttons are lesson-specific and may include buttons such as Overlap and Split to assist in comparing the relationship between signals.

⮕ **DATA ANALYSIS**

- To conduct Data Analysis on a previously recorded file, choose **Review Saved Data** from the Lessons menu and browse to select a data file to analyze. You do not need to be connected to an MP41 to analyze data.
- During **Data Analysis**, you can manipulate the recorded waveforms, observe the data, and take measurements.
- Use Edit menu commands to copy measurements and wave data (numeric values) from the Data window to the Journal or to other programs (like Word or Excel) for analysis and reporting, or to copy graphs (snapshot of waveform display) to other programs.
- Use the Journal Stamps to quickly paste the date or time into the Journal at the point of cursor insertion

⮕ **VIEWING DATA**

Cursor Tools Icons appear by default in the upper right corner of the Data window.

Arrow tool, a general-purpose cursor used for selecting waveforms and scrolling through data. All other cursors default to this mode when the cursor is moved outside the graph area.

I-beam tool, used to select a single point or an area of a waveform(s) for measurement or editing. To select an area of data, hold down the mouse button and drag the mouse left or right.

Zoom tool, used to select, and magnify any portion of a wave to see detail. To draw a zoom box, hold down the (left) mouse button and drag to form a "box" encompassing the area you wish to magnify. To undo the Zoom command, choose **Zoom previous** from the **Display** menu.

Annotation tool, used for inserting notes into the selected graph channel.

Select a Channel To select a channel, click its waveform, its label, or its channel box with the Arrow tool. When selected, a channel's label is highlighted, and its channel box appears depressed.

Show/Hide a Channel To toggle channel display: **Ctrl-click** (Windows) or **Option-click** (Mac) the channel box. The channel box displays a "slash" when that channel is turned off; data is not lost but simply hidden so you can focus on the visible channel(s). Hidden channels can be toggled back into view at any time.
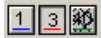
Position a Waveform Use the Horizontal Scroll Bar—or the marker tools—to move to another time in the recording. Use the Vertical Scroll Bar to adjust vertical position, independent for each waveform.

Scale Range To adjust the display range during analysis, click in the Horizontal (Time) or Vertical (Amplitude) Scales and set the Upper and Lower values. Horizontal Scale applies to all channels; Vertical Scale is unique to each channel.

Grids Use the File menu > Display Preferences option to show or hide grids during analysis. Grid line settings are controlled using the Scale dialog. Vertical grid lines can be unique to each channel.

Autoscale The Display menu has two Autoscale options:

- **Autoscale Horizontal** fits the entire recording into the Data window.
- **Autoscale Waveforms** sizes the data to fit the channel display region.

TIP To quickly view the entire recording, select Autoscale Horizontal and then select Autoscale Waveforms.

➲ **MEASUREMENTS AND RESULTS**

Channel Selection: Use the pull-down channel selection box to indicate the channel you want to take a measurement from. The "**SC**" option will automatically take measurements from the <u>s</u>elected <u>c</u>hannel. The "selected" or "active" channel has its channel label highlighted on the left edge of the display, its channel box is depressed, and its label name is displayed next to the channel boxes.

Measurement: The pull-down menu gives you access to an array of measurements.

Result: The result of the selected measurement appears to the right of the measurement title (i.e., mean = 132.54900 mmHg). A result of "********" means the measurement is invalid because not enough data was selected. If the result is cut off, point the cursor over the result box to generate a tag that displays the full result precision and units.
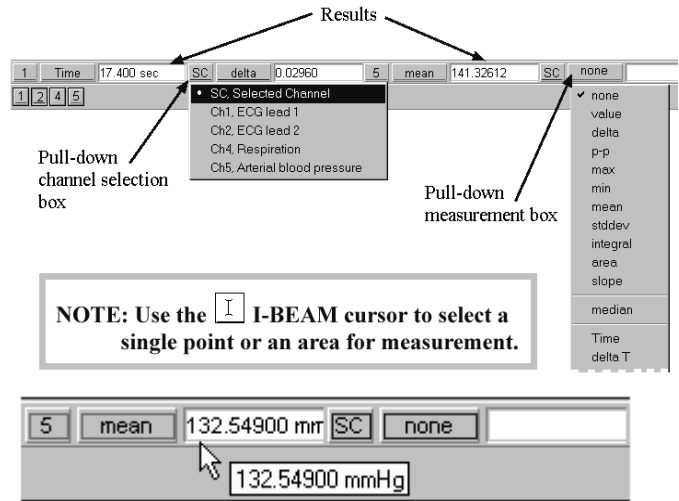
➲ **MARKERS**

Markers and labels appear at the top of the data window. To move from marker to marker, use the left and right arrows.

- ◆ **Append markers** appear above the marker label bar as diamonds, and are colored blue when selected. Append markers are automatically generated by the software to mark the start of each recording segment.

- ▼ ▼ **Event markers** appear below the marker label bar as inverted triangles. Event markers are used to describe data being recorded and may be generated by the software or manually inserted. Automatic event markers are green when selected and manually inserted markers are yellow with a line above. Press "**F9**" or "**Esc**" to insert an event marker *during* acquisition. Click beneath the marker label bar to insert an event marker *after* acquisition. To add (or edit) a descriptive marker label, click in the label box and type.

➲ **TROUBLESHOOTING – FREQUENTLY ASKED QUESTIONS**

- ▪ **I'm trying to run a lesson, but I get a message that BSL cannot communicate with the MP41 unit.**

    Make sure the MP41 unit is securely connected to a computer USB port. (To analyze saved data, you do not need to be connected to the MP41 unit.)

- ▪ **I'm trying to run a lesson, but I get a message that the calibration signal was not detected.**

    First, make sure the dial on the MP41 unit is turned to the correct position (as prompted on the onscreen instructions) and you are holding the check button down. If the problem persists, you may need to modify your computer's audio settings. The following steps should resolve the issue:

    1. Go to Control Panel and open **Sound**.
    2. Make sure the MP41 is connected to the computer and select the **Recording** tab from the **Sound** dialog (right).
    3. Select **Microphone** USB PnP Audio Device and click **Properties**.
    4. From the Properties dialog, select the Levels tab and move the slider to set the volume to 40 and click **OK**.
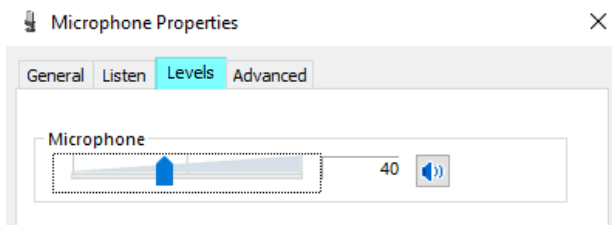
    This will re-establish the MP41 device default setting.
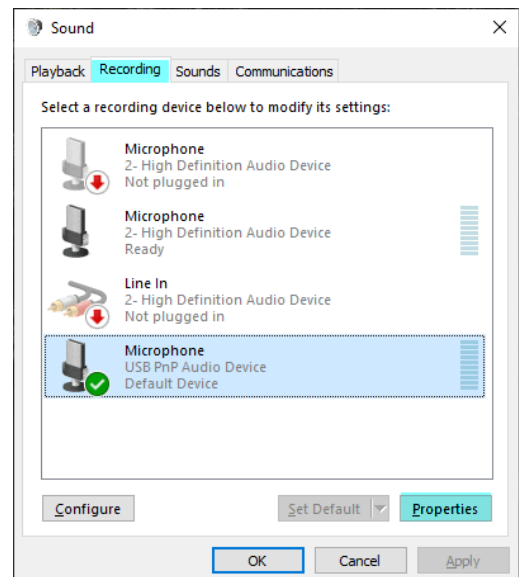
- **I'm getting a lot of noise in my data. Is there a way to eliminate this?**

   If using a "two-wire" mains-powered laptop, measured physiological signals will likely be corrupted by 60 Hz or 50 Hz noise, subject to the frequency of power transmission in the country. To resolve this issue, choose one of the following courses of action:

   1. Operate the laptop using its internal batteries only (remove the laptop from its two-wire power adapter).

   2. Replace the two-wire laptop power adapter with a three-wire (grounded) power adapter.

   Furthermore, other externally-powered mains attached equipment connected to the recording laptop can cause 50 or 60 Hz interference. This equipment, (typically powered USB hubs) should be disconnected or a grounded power supply (3 wire to mains) should be used.

   Also, please make sure that the data collection (physiology measurement) area is free of mains extension cords, power strips and power adapters. These items behave as radiators of 50 Hz or 60 Hz alternating mains power. These radiators should be located distant from the body.

- **When I have remote labs with my instructor on Zoom, my microphone isn't working while using BSL Home. Why?**

   This is because the MP41 unit uses your microphone as the device to interface with your computer. If attending an online video conference or class while running BSL Home, use your phone for the audio portion.

- **I'm trying to "Review Saved Data," but I cannot locate my previously recorded file.**

   Files are saved to the folder designated when the lesson was started. By default, this is the "Data Files" folder created during installation, usually C:\Program Files (x86)\BIOPAC Systems, Inc\Biopac Student Lab 4.1\Data Files. When opening data files, remember to set "Files of Type" in the Open dialog to the type of file you are looking for, i.e. BSL "Lesson" files.

- **I can't see the Journal, or I can see only the first lines of the Journal.**

   To adjust the display to see more of the Journal, place the cursor on the bar that separates the graph display from the Journal (above the Journal and below the horizontal scroll), hold down the mouse button and drag the bar.

- **I can't find the print command.**

   There is no print command available <u>during</u> recording. After a recording is saved, and the saved file is opened for analysis in Review Saved Data mode, the print commands will be available under the File menu.