

IX-EEG Recorder

Hardware Manual



IX-EEG



IX-EEG and EEG cap (A-EEG-CAP-LM)



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Overview

The IX-EEG is a 24-channel recorder for measuring up to 19 channels of EEG data, two biopotential channels, a GSR channel and an event marker simultaneously from a single human subject. The EEG is recorded using a 10-20 electrode EEG cap with silver/silver chloride electrodes. The recorder is furnished with LabScribe software with the EEG advanced analysis module and connects directly to a USB port on either a Macintosh or Windows computer. The biopotential and GSR electrodes are connected to the subject by snap leads connected to disposable pre-gelled Ag/AgCl electrodes.

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Included Items

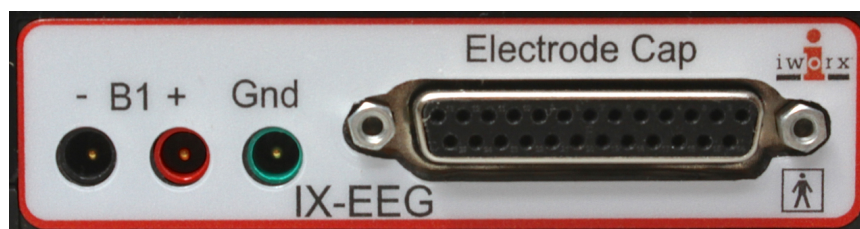
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USB cable (C-USB)

LabScribe data acquisition software and EEG Analysis module (LS-30EEG)

The A-EEG-CAPSYS accessory kit is designed to work with the IX-EEG and includes the EEG cap and cable assembly (A-EEG-CAP-LM), EEG gel (16 fl oz), disposable sponge discs, disposable ECG electrodes, body harness, needle/syringe kit, head-measuring tape, GSR (C-ISO-GSR) and ECG/EMG (C-ISO-SL5) electrodes, and instruction manual.

Front Panel



IX-EEG Front Panel

B1: Accepts biopotential electrodes.

Gnd: Accepts biopotential ground electrode.

Electrode Cap: Accepts connector cable from EEG cap.

Rear Panel



IX-EEG Rear Panel

EM/Sync: Accepts event marker.

USB connector

GSR: Accepts GSR electrodes.

B2: Accepts biopotential electrodes.



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SPECIFICATIONS

INPUTS

EEG inputs	19 channels of EEG, using a 10-20 EEG cap (Ag/AgCl electrodes recommended)
Biopotential inputs	2 channels for ECG, EMG, EOG, etc.
GSR input	1 channel
Event Marker	1 channel

A/D CONVERTER

Input range	+/- 180 mV
Sampling speed	500 samples/second per channel simultaneous
Resolution	24 bit
System noise	1 uV p-p input shorted noise at 100 samples/sec 2 uV p-p input shorted noise at 500 samples/sec
Interface	USB

GENERAL

Power	USB
Enclosure and dimensions	Plastic; 10 cm W, 12 cm D, 3 cm H
Warranty	3 years
Software	LabScribe with EEG analysis module Preset standard montages

How to Use the IX-EEG

The IX-EEG works in conjunction with LabScribe data recording and analysis software and LabScribe's EEG advanced analysis module.

To set up and start to use the IX-EEG recorder:

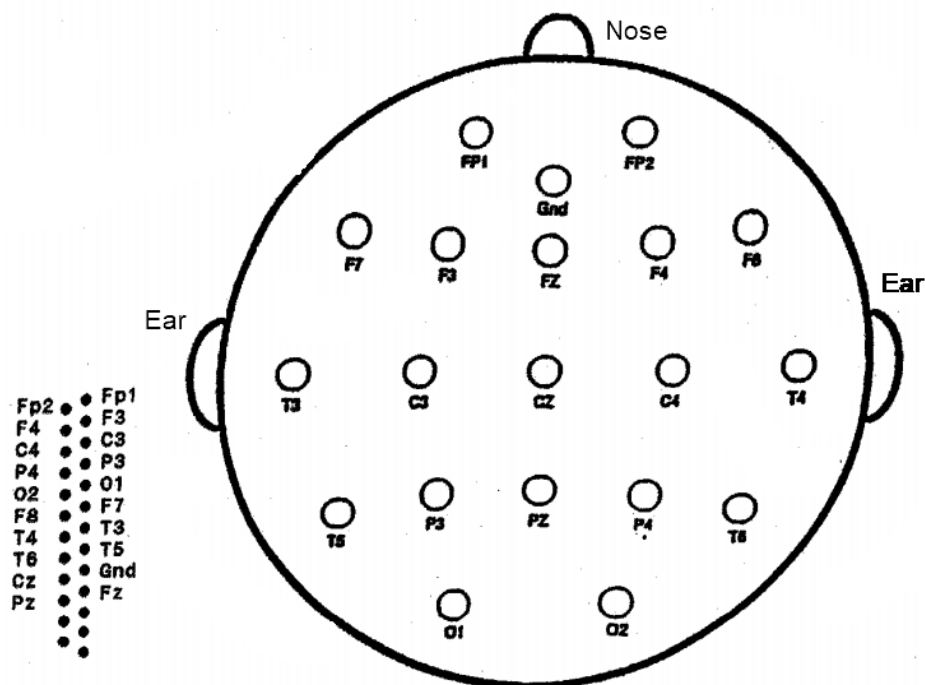
- 1) Using the supplied USB cable, connect the IX-EEG to a USB port on your computer.
- 2) Double-click on the LabScribe shortcut to open the software. You should see a message indicating that the IX-EEG has been recognized by the software.
- 3) Load the appropriate Settings group and select an experiment. The experiment opens with LabScribe already preconfigured with the appropriate settings. Follow the instructions on the accompanying pdf documents to set up and perform the lab exercise.
- 4) Channels can also be configured manually by using the LabScribe Preferences panes, accessed in the Windows Edit menu, and the Macintosh LabScribe menu. Here channels can be turned on or off, preset filters can be selected, and computed channels can be configured. See the LabScribe User Manual for details.



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- 5) Prepare your subject for EEG recording, as instructed in the Electro-Cap manual. The steps are summarized here:
 - Remove all jewelry and metal objects from the subject's head.
 - The subject should be sitting.
 - Place the body harness under the armpits and around the chest. Use the Velcro to pull the elastic snug, but not uncomfortable. The snaps should be centered on the chest.
 - Place disposable sponge disks around the Fp1 and Fp2 forehead electrode mounts in the cap, sticky side toward skin.
 - Mark the Fp line on the subject. Measure from nasion (the midline indentation just beneath the brow line) to inion (the small midline protuberance on the occipital region of the skull) directly over the top of the head. Divide this measurement by ten and measure that distance up from nasion. Make a horizontal mark on the forehead at this location.
 - Align the Fp1 and Fp2 electrodes with the forehead mark, and pull the cap onto the head using both hands.
 - Attach the cap to the body harness by pulling both straps down to the harness simultaneously. Cross the right strap to the left side and snap it to the harness. Cross the left strap to the right side and snap it to the harness.
 - Adjust the buckles to tighten the straps.
- 6) Connect the cap connecting cable to the IX-EEG recorder.
- 7) Fill each electrode cavity with EEG gel, as follows:
 - Press the white mount against the scalp with one hand. Hold the syringe in



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the other hand and insert the blunt needle into the hole. Lift the needle off the scalp and inject gel into the cavity until a small amount comes out of the hole.

- With some downward pressure, rock the needle rapidly back and forth. Alternatively, remove the syringe and insert the wooden end of a cotton swab. Twirl it between your fingers.
- Wipe off excess gel.

8) Check that you have a solid connection on all channels. To accomplish this, perform an impedance check, as follows:

- Open the **IX-EEG-Impedance-Check** settings file that can be found in the Human Psychophysiology category of the Settings menu.
- Perform the impedance check on all channels by activating Channel 1. Click Record. Read the impedance values for all channels at the right-hand side of the screen. All values should be at 10 kilohms or less. Stop recording and repeat Step 7 for any channels that don't pass this impedance check.
- Return to your experimental settings file.

9) Your subject is ready for recording.



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