Electroencephalogram Machine OB-1000

User Manual

Please read this user manual carefully before using the product and keep it properly.

www.oymotion.com

Electroencephalogram Machine

Model:

OB-1000-64LB

OB-1000-32LB

OB-1000-16LB

OB-1000-8LB

User Manual

OYMotion Technologies Co., Ltd.

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Catalogue

Chapter I Introduction

Thank you very much for purchasing the OB-1000 Electroencephalogram Machine produced by OYMotion Technologies Co., Ltd..

Before using, please read the manual carefully to understand the use of the device. After reading, keep the manual near the device for reference at any time.

Please contact OYMotion Technologies Co., Ltd. if the user manual is lost or damaged.

This manual contains the general information of this product, which is the first condition for the operator to use OB-1000 Electroencephalogram Machine for the first time. These general information includes the manufacturer's responsibility, guarantee, product introduction, applicable product model and size, product structure composition, technical specifications, equipment operation, equipment list, common faults and troubleshooting methods, maintenance and repair and after-sales service, etc. Before installing, operating or maintaining the equipment, please read the manual carefully to ensure the equipment work normally and ensure the safety of the operators and patients.

Electroencephalogram Machine must be used in strict accordance with the methods specified in the manual. The company will not be liable for the consequences caused by not using this product in accordance with the manual (such as not achieving the expected effect or even causing personal safety and property loss).

The company makes no guarantee of any kind, including (but not limited to) the implied warranties of merchantability and fitness for a particular purpose. The Company shall not be liable for accidental or indirect damage caused by the errors contained in the manual or by the provision of this manual.

The contents contained in the manuals for use can be changed without notification to the user.

1.1 Manufacturer's Responsibility

(1) The products produced by the Company shall meet the technical requirements of the products. If there is any failure, the Company shall be responsible for replacement and return;

(2) The Company shall only be responsible for the safety, reliability and performance of the products under the following circumstances, namely: the assembly operation, improvement and maintenance shall be carried out by the personnel approved by the Company, and the relevant

electrical equipment shall meet the national standards and shall be used in accordance with this manual;

(3) For personal or property loss caused by product manufacturing defects, the Company shall assume corresponding liabilities, but the Company shall not be liable for any of the following circumstances:

a. Buyers and operators do not use according to the instructions, or use according to safety precautions and warning instructions;

b. Violating the regulations on transportation, installation, use, maintenance, storage, resulting in damage to products, personal or property;

c. Still use beyond the service life of the product;

d. Damage to the equipment, operators or patients caused by the purchasers or operators who do not use the accessories of the company;

(4) For the equipment parts designated by OYMotion Technologies Co., Ltd. that can be repaired by the qualified technical personnel of the user, the company can provide the circuit diagram, component list, drawing notes and calibration rules as required.

1.2 Guarantee

Manufacturing process and raw materials: Our company guarantees that products (excluding accessories) are free from production process and raw material failures within one year from the date of shipment under the use and maintenance conditions specified in this manual.

Chapter Ⅱ Overview

2.1 Product Introduction

The EEG machine consists of an amplifier, battery and charger, non-invasive EEG electrode (EEG cap), event button module, OYMotion Wireless EEG Machine Collection and Analysis Software (OBS-1000), and Windows computer. Event button module and Windows computer are optional accessories.

2.1.1 Amplifier

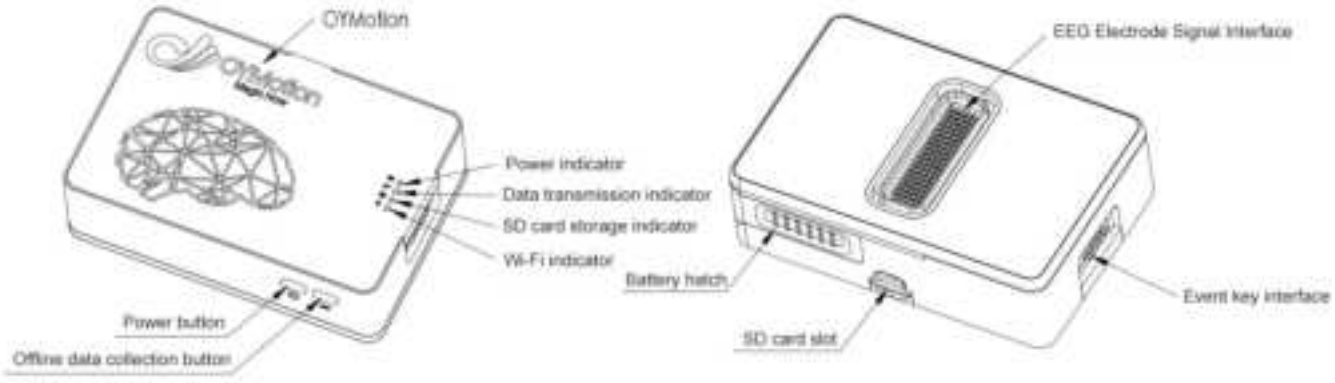


Figure 2.1.1 Amplifier

1) Button

- Power Button

Operation	Function
Press and hold for more than 2 seconds before releasing	Turn on/off
Press for 0.5 seconds and release (click)	Turn Wi-Fi on/off
Simultaneously press and hold the power button and offline data collection and storage button for 5 seconds	Reset to AP mode

- Offline data collection and storage button

Operation	Function
Press and hold for more than 2 seconds before releasing	Enable offline data collection (save to MicroSD card)

Press and hold for more than 2 seconds before releasing	Turn off offline data collection

2) LED lights

- Wi-Fi indicator light

State	Indicative information
Extinguish	Not connected to the network
Blinking every 0.1 second cycle	Connecting to router
Always-on	Connected to router
1 second cycle flashing	AP mode

- MicroSD card storage indicator light

State	Indicative information
Always-on	MicroSD card inserted
	Storing data
Extinguish	MicroSD card not inserted or data storage failed
1 second cycle flashing	MicroSD card is full

- Data transmission indicator light

State	Indicative information
Bright	Collecting data

- Power indicator light

State	Indicative information
Always-on	Battery capacity>80%
0.5 second cycle flashing	30%~80% of battery capacity
1 second cycle flashing	10%~30% of battery capacity

2 second cycle flashing	Battery capacity<10%

2.1.2 Batteries and chargers

The battery adopts a nominal capacity of 1010mAh, 3.7V lithium-ion battery, equipped with a matching charger.

Figure 2.1.2 Battery and Charger

2.1.3 Non-invasive EEG electrode (EEG Cap)

Support 64 channel, 32 channel, 16 channel, and 8 channel non-invasive EEG electrodes (EEG caps) that comply with the international 10-20 standard specifications for the lead positioning system, and can be selected in the OBS-1000 software system. Figure 2.1.3 shows a 64 channel non-invasive EEG electrode (EEG Cap).

Figure 2.1.3 64 channel non-invasive EEG electrode (EEG Cap)

2.1.4 Event Button Module (Optional)

The event button module has 8 buttons, which are connected to the event button plug through a cable. This connection plug is magnetically connected to the event button interface of the amplifier. The operator can manually trigger the input of 8 external event signals, which are synchronously transmitted and saved with EEG data.

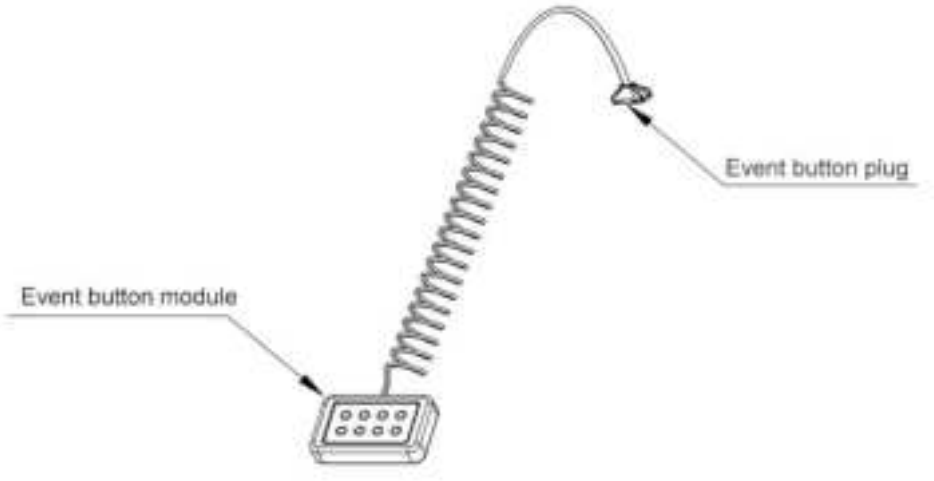


Figure 2.1.4 Event Button Module (Optional)

2.2 Intended Use and Scope of Application

Intended Use: Used for the analysis and diagnosis of mental disorders and brain parenchymal lesions of the test subjects, as well as the evaluation of brain functional status.

Scope of Application: Used for the collection, amplification, filtering, recording, playback, etc. of EEG signals.

2.3 Technical specifications

Indicator Category	Indicator Name	Index			
Number of Channels	Number of EEG channels	8	16	32	64
Sampling Rate	Option	250, 500, 1000, 2000, 4000			
	Maximum sampling rate	4000 SPS	4000 SPS	2000 SPS	1000 SPS

ADC (Analog to Digital Converter) specifications	resolving power	24 bit
	Input Range	(-187.5mV,+187.5mV)
	sensitivity	22.35nV min
	Input impedance	>500M Ω
	Common mode rejection ratio	-110dB
	Impedance check	√
	Signal-to-noise ratio	121 dB
Recording interface	Record to MicroSD card	When the sampling rate is set to 500Hz and 64 sensor channels are simultaneously collected, a high-speed MicroSD card with a capacity of 32GB can store data for approximately 70 hours
	Online data transmission	OYMotion Wireless EEG Machine Acquisition Software (OBS-1000)
	transport protocol	TCP
Event Flag	Software Event Flags	Customize in OBS-1000 analysis software
	Digital input	8 event buttons
	External input	External programs can send event flags through serial ports
Battery capacity (Energy)	Battery type	Rechargeable lithium battery 3.7V, 1010mAh
	Battery duration	3.5 hours
	Rated current	1A
IMU	Raw data collection	Accelerometers, Gyroscopes
	Sampling rate	50Hz
Connector	EEG electrode signal interface	100 pin connection port with magnetic adsorption 5x20
	Event button interface	10 pin connection port with magnetic adsorption 2x5
LED	LED indicator light	Battery level, Wi-Fi, MicroSD card, data streaming

Button	Function buttons	**Power button:** Device power on/off, device Wi-Fi on/off **Offline data collection and storage button:** Offline mode data collection on/off
Voltage	Input voltage	DC 3.7V
Amplifier size	Module size	83.6mm × 56.3mm × 23.7mm (length x width x height) Tolerance: ± 0.5mm
Net weight of amplifier	/	108g (including battery) tolerance: ± 5g
Amplifier gross weight	/	285g (including battery+non-invasive EEG electrode (EEG cap) tolerance: ± 5g

2.3.1 Normal working conditions

1) Environmental temperature: 5 ℃~40 ℃;
2) Relative humidity: ≤ 80%;
3) Atmospheric pressure: 86.0kPa~106.0kPa;
4) Power supply voltage: DC 3.7V.

2.4 Main Functions

The OB-1000 EEG machine is mainly used for non-invasive real-time collection, wireless forwarding, and storage of EEG data to MicroSD cards. Through the optional event button module, up to 8 external button signals can be synchronized and saved with EEG data. The OB-1000 supports four non-invasive EEG electrode schemes: 64 channels, 32 channels, 16 channels, and 8 channels. At the same time, the OYMotion Wireless EEG Machine Collection and Analysis Software (OBS-1000) can achieve functions such as adding and managing test objects, real-time collection of EEG signals, data management of EEG signals, waveform display settings, playback of EEG recorded data, event labeling and recording. The detachment of equipment electrodes can be detected through impedance inspection.

Chapter Ⅲ Equipment List

Number	Name	Model/Specification	quantity	unit
1	Non invasive EEG electrode (EEG cap)	OYMotionCap-8 □ 8-channel OYMotionCap-16 □ 16-channel OYMotionCap-32 □ 32-channel OYMotionCap-64 □ 64-channel	1	pcs
2	Tool kit (brush and syringe)		1	bale
3	GT5 conductive paste	473g	1	pcs
4	Amplifier	64 channel sensor, Wi-Fi wireless transmission, MicroSD card data storage	1	pcs
5	MicroSD Card (Placed in amplifier) (optional)	32GB Speed SD Card	1	pcs
6	Lithium Battery	DC 3.7V 1010mAh	2	pcs
7	Charger (including data cable)	Charging voltage and current: DC 5V/2A	1	set
8	USB flash drive (Containing OYMotion wireless EEG machine acquisition and analysis software)	Kingston 32G	1	set
9	Event button module (Optional)	8 physical buttons	1	pcs
10	Router (Optional)	Ruijie X32PRO	1	pcs
11	Network cable (Optional)		1	pcs
12	USB to USB serial data cable (Optional)	Black, dual USB male, with circuit boards at both ends, length 1m	1	pcs
13	USB-C/USB-A dual interface network card (Optional)		1	pcs
14	User Manual		1	pcs
15	Certificate of conformity		1	pcs
16	Warranty Card		1	pcs

Chapter Ⅳ Installation

4.1 Storage and transportation conditions

The storage environment for the electroencephalogram machine is -20 ℃ to 55 ℃, with a relative humidity of ≤ 90%, and an atmospheric pressure of 700hPa to 1060hPa. It is free of flammable, explosive substances, corrosive gases, and well ventilated indoors.

4.2 Transportation

It can be transported by general means of transportation.

⚠Caution

① When transporting or storing equipment for a long time, all components must be placed in the designated equipment packaging box or repackaged properly according to the requirements.

② During transportation, it is not allowed to mix and transport flammable, toxic, harmful, or corrosive materials.

③ During transportation, severe vibration, impact, and collision should be avoided.

④ Equipment should be protected from moisture, dust, and inversion during transportation.

4.3 Installation Environmental Conditions

1) Environmental temperature: 5 ℃~40 ℃;
2) Relative humidity: ≤ 80%.

4.4 Installation precautions

1) The Electroencephalogram Machine must be powered by a dedicated lithium battery with a DC voltage of 3.7V. Wait for the battery to be installed in place and close the battery compartment door before turning on the power switch of the EEG machine.
2) The environment for Electroencephalogram Machine examination should be kept quiet, with

soft light, suitable temperature, and no need for electrical shielding, unless proven necessary.

⚠Caution

If the EEG machine is not used for a period of time, the battery should be removed.

3) It is prohibited to use Electroencephalogram Machines in oxygen rich environments such as hyperbaric oxygen chambers.

4) Do not use or store the charger in direct sunlight, near hot equipment, or in other high-temperature areas. The battery should be charged in a well ventilated environment.

4.5 Equipment Installation

⚠Caution

Save the packaging materials for future transportation or equipment preservation.

4.5.1 Unpacking inspection

Check if the equipment and accessories are complete or damaged. Please carefully check the appearance of the equipment when receiving the goods to see if it is in good condition.

4.5.2 Installation requirements

1) The EEG machine should be installed in a well ventilated room with a temperature of 5 ℃ to 40 ℃, a relative humidity of ≤ 80%, and avoid direct sunlight;
2) Please do not disassemble the equipment or make arbitrary modifications, as this may cause risks such as fire, equipment damage, and personal injury;
3) Please do not install near objects that store chemicals, emit corrosive gases, or have electromagnetic interference. Otherwise, the equipment may malfunction, malfunction, and cause personal injury.

4.5.3 Equipment installation

Installation steps:

1. Installing a lithium battery and MicroSD card (optional)

Firstly, open the battery compartment door of the amplifier, press and hold the battery

compartment door and push it outward;

Secondly, sequentially install the lithium battery and MicroSD card (optional) into the corresponding positions in the amplifier according to the direction shown in Figure 4.5.3.1;

Finally, close the battery compartment door, and the lithium battery and MicroSD card (optional) are successfully installed.

Figure 4.5.3.1

2、Component connection (including event button module)

Firstly, connect the event button plug of the event button module to the event button interface of the amplifier through magnetic force;

Secondly, connect the EEG electrode signal interface of the amplifier to the EEG electrode signal plug of the non-invasive EEG electrode (EEG cap) through magnetic force, and all components are connected at this time. As shown in Figure 4.5.3.2.

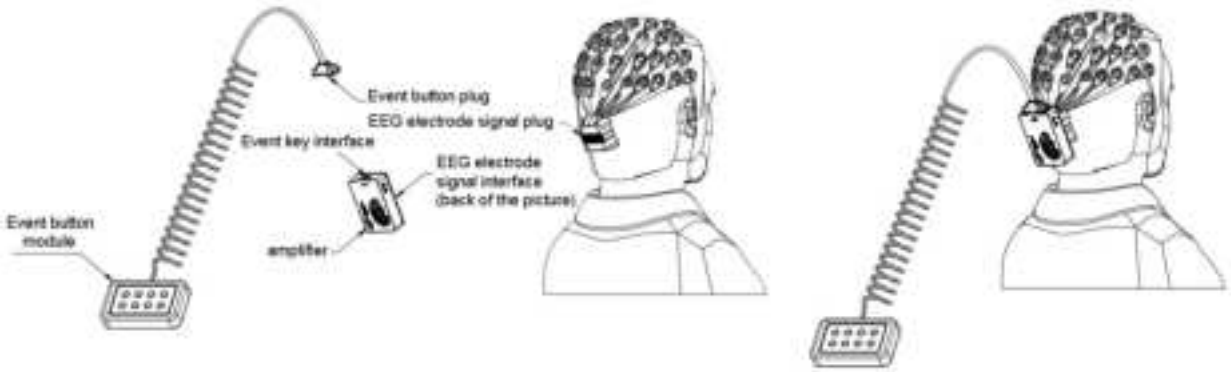


Figure 4.5.3.2

warning

The EEG electrode interface and event button interface do not allow any foreign object intrusion or finger touch.

4.5.4 Device Software Installation

The OYMotion Wireless EEG Machine Collection and Analysis Software (OBS-1000) has been copied to the USB flash drive when it leaves the factory. After finding the USB drive that has been packed in a plastic sealed bag from the packaging box, copy this software to a computer running Microsoft Windows 10 or above, extract it, and double-click to start the program. At this point, in conjunction with various components of the OB-1000 Electroencephalogram Machine, various functions can be set and controlled, as well as data analysis and display. Please refer to 5.3 Software Operation for the software operation section.

4.5.5 Battery Charging

The corresponding battery capacity symbol flashes when charging the battery.

When charging, the battery level display flashes from 0 to 25%; The battery level display flashes at 25-50% in two cells; The battery level display flashes three times at 50-75%; The battery level display flashes four times to 75-100%.

warning

- Do not disassemble the charger;
- Do not burn the charger;
- Do not use or store the charger in direct sunlight, near hot equipment, or in other high-temperature areas.

Chapter Ⅴ Equipment Operation

5.1 Startup

When the amplifier of the electroencephalogram machine is loaded into the battery and turned off, press the power button for more than 2 seconds before releasing it. The power indicator LED on the amplifier lights up, indicating that it is turned on. According to the battery level, the power indicator LED will remain on or flash at a certain frequency, as detailed in 2.1.1 Power indicator light.

5.2 User wearing

Wearing steps:

1. Clean the skin on the head (such as washing hair, rubbing with alcohol or using a scrub);
2. Refer to the international 10-20 system to sequentially locate and mark the positions of Cz, Fp1, Fp2, T3, T4, O1, and O2 electrodes;
3. Wear an EEG cap, secure the EEG cap and mandible support;
4. Smooth the EEG cap and ensure that each electrode is in vertical contact with the scalp;
5. Inject an appropriate amount of conductive paste with a syringe and a flat needle, and use the flat needle to pry the hair below the electrode, making the conductive paste fully contact the scalp;
6. Connect the amplifier and turn it on. After operating according to software 6.3, conduct impedance testing, adjust the electrode with high impedance, or add conductive paste;
7. Start recording;
8. After recording, remove the EEG cap and assist the tested person in cleaning their scalp;
9. Place the 5x20 EEG electrode signal plug behind the EEG cap outside the container, place the electrode part of the cap into the container, soak and disinfect the electrode with clean water for about 30 minutes, and clean the electrode with a brush.

Attention: It is strictly prohibited to immerse the 5x20 EEG electrode signal plug behind the EEG cap in water to prevent metal corrosion; Do not soak the electrode part in disinfectant or hot water for a long time.

10. Place the EEG electrode signal plug above, let the rest of the EEG cap naturally droop, and

keep it dry for later use; High temperature drying or air drying is strictly prohibited.

Caution

- Professional medical personnel are required for operation and use. Allergies and special populations should use it with caution;
- If there is obvious damage, it is strictly prohibited to use. Before use, confirm the product logo and service life;
- It is recommended to use conductive paste with matching model GT5.
- Before use, a clean and soft cloth and 75% household alcohol should be used to wipe the spring needle and copper column to prevent poor contact.

5.3 Software operation

5.3.1 Overview

5.3.1.1 Purpose

OYMotion Wireless EEG Machine Collection and Analysis Software (OBS-1000) is a computer desktop software platform that cooperates with OYMotion EEG collection products, mainly capable of achieving the following functions:

- Adding and managing test objects
- Real time collection of EEG signals
- Waveform display settings
- EEG signal data management
- Event marking and recording

5.3.1.2 Operating environment

Hardware environment:

Processor: Quad core 2.4GHz and above with main frequency

Memory: DDR4 8G and above

Hard disk: 256G or above solid-state drive

Display resolution: 1920 * 1080 and above

Network card: Wi-Fi 4 wireless network card or above

Software environment:

Microsoft Windows 10, 64 bit operating system

⚠Caution

By default, the software is opened with a display ratio of 100% and a resolution of 1080P. If you want to display at a higher resolution, please choose a more suitable display ratio; If it is an extended display, please set this monitor as the main display and connect it with an HDMI cable.

5.3.2 Software Window Interface

This chapter mainly introduces and explains the various functional interfaces of the OYMotion

Wireless EEG Machine Collection and Analysis Software (OBS-1000).

Double click the shortcut of the computer desktop software  to open the software, and the startup interface is shown in Figure 5.3.2-1.

Figure 5.3.2-1

After the software starts, it jumps to the main window, as shown in Figure 5.3.2-2. It includes five functional buttons: **Subjects Exams, System Settings, Event settings, Connect Device, and About.**

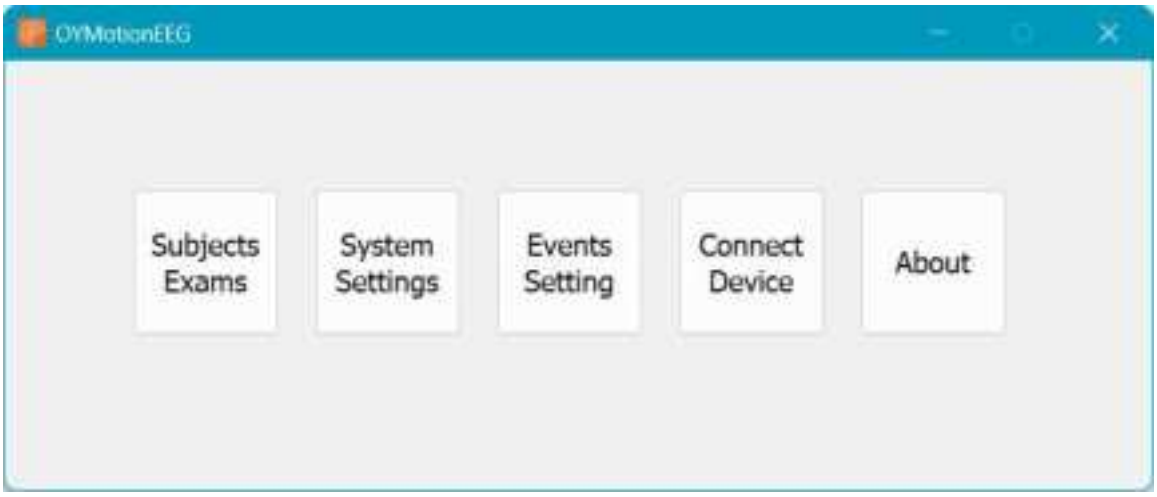


Figure 5.3.2-2

5.3.2.1 Subjects Exams

Click on "Subjects Exams" to open the Subjects Exams window, as shown in Figure 5.3.2.1-1.

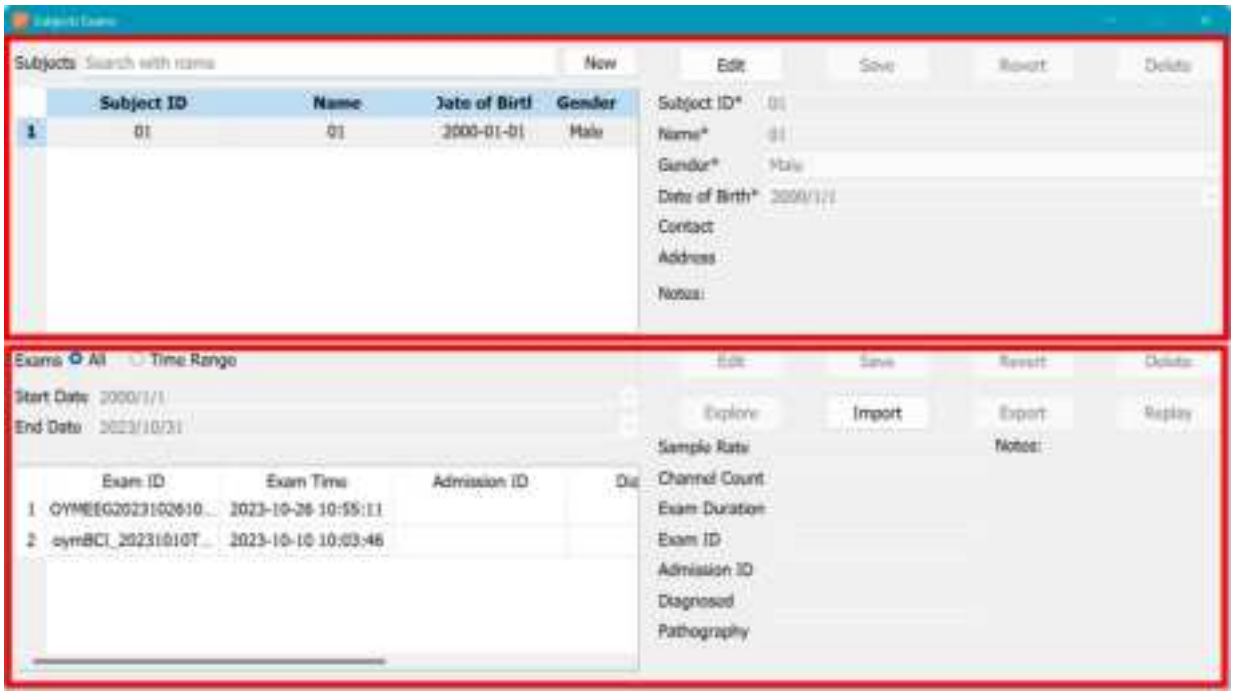


Figure 5.3.2.1-1

The Subjects Exams window mainly includes "Subjects" and "Subjects Exams".

(1) Subjects

You can create and query test objects, view and edit test object information (save, restore, delete), and perform the following operations.

- New Test Object: Click "New" to open the "New Test Object" window, as shown in Figure 5.3.2.1-2. Enter the information of the new test object (note: * is required!), click the "Create" button

below, and the system will save and add the information of the test object to the test object list. The "Test Object List" contains the test object groups recorded in the current database.

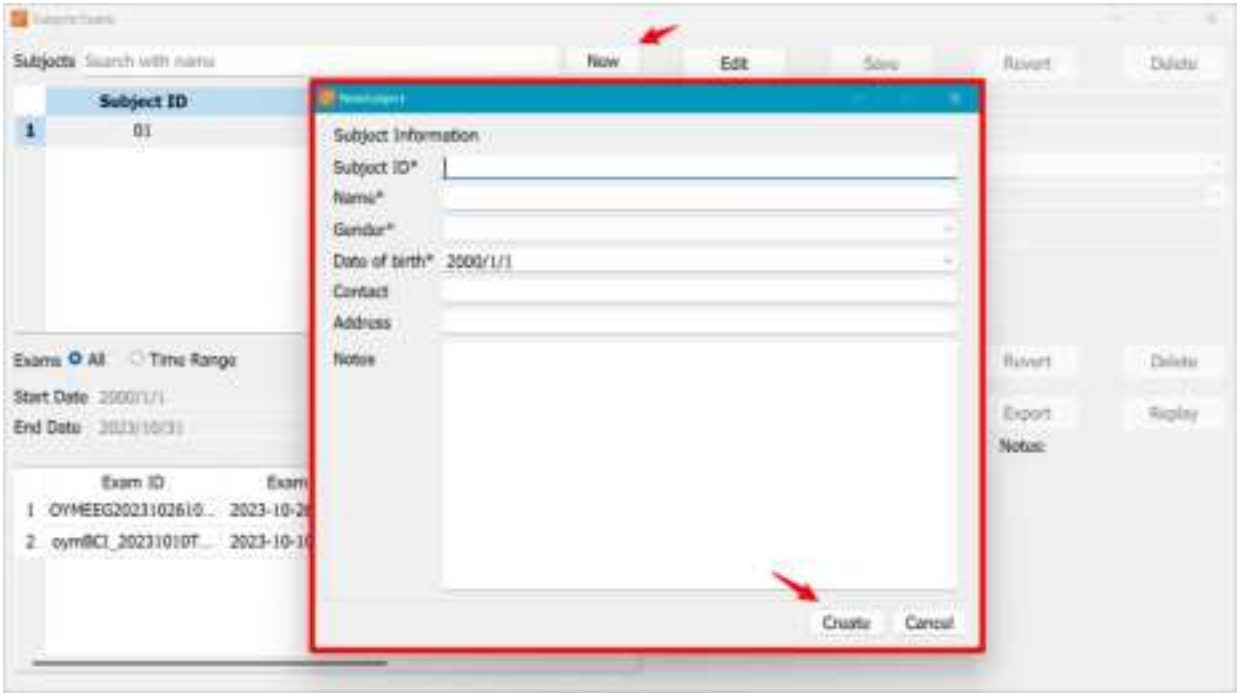


Figure 5.3.2.1-2

- Test Object Query

Click on the "Search with name" input box above the "Test Object List", enter the name, and the list will update in real-time to display the qualified test objects, as shown in Figure 5.3.2.1-3. Clear the input box and the test object group recorded in the current database will be displayed.

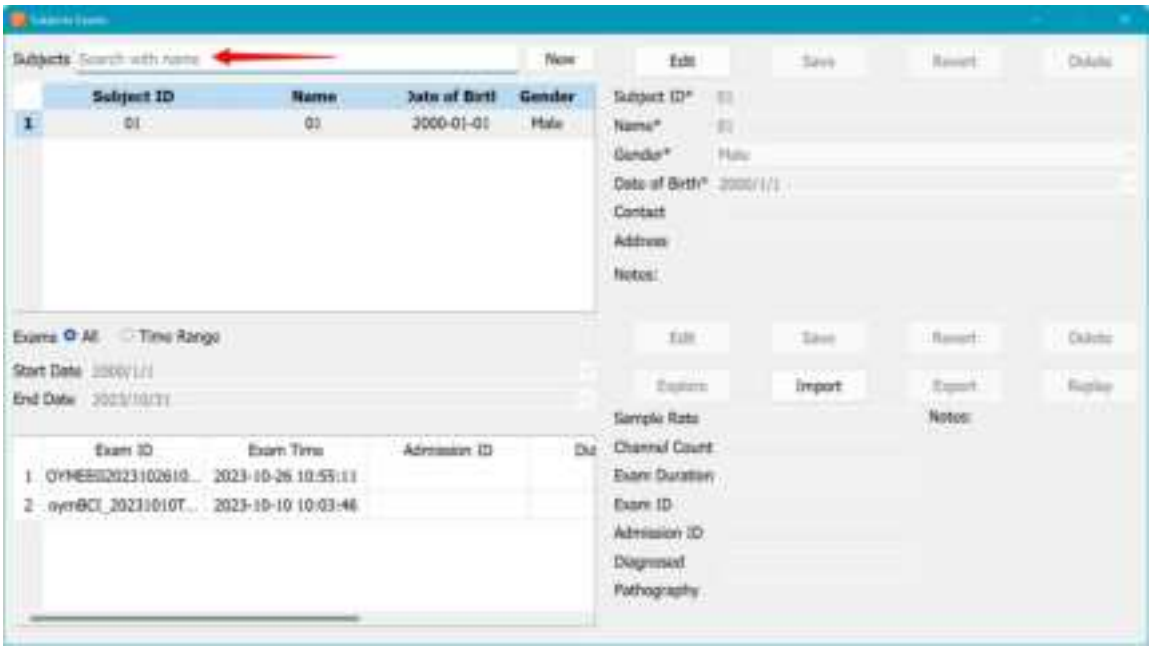


Figure 5.3.2.1-3

- View test object information: Click to select the test object you want to view, and the corresponding information will be displayed on the right side of the list, as shown in Figure 5.3.2.1-4.
- Test object information editing: Click "Edit", the button will turn blue, and the information editing status will enter, as shown in Figure 5.3.2.1-4.

To modify the information of the test object, click "Save" (the system will default to exiting the information editing status);

If there is an error in modifying the information, click "Revert" and the test object information will be restored to the information before the current modification (i.e. no modifications have been made to the information). At this time, it is still in the information editing state. If you exit, click "Edit" to complete the process;

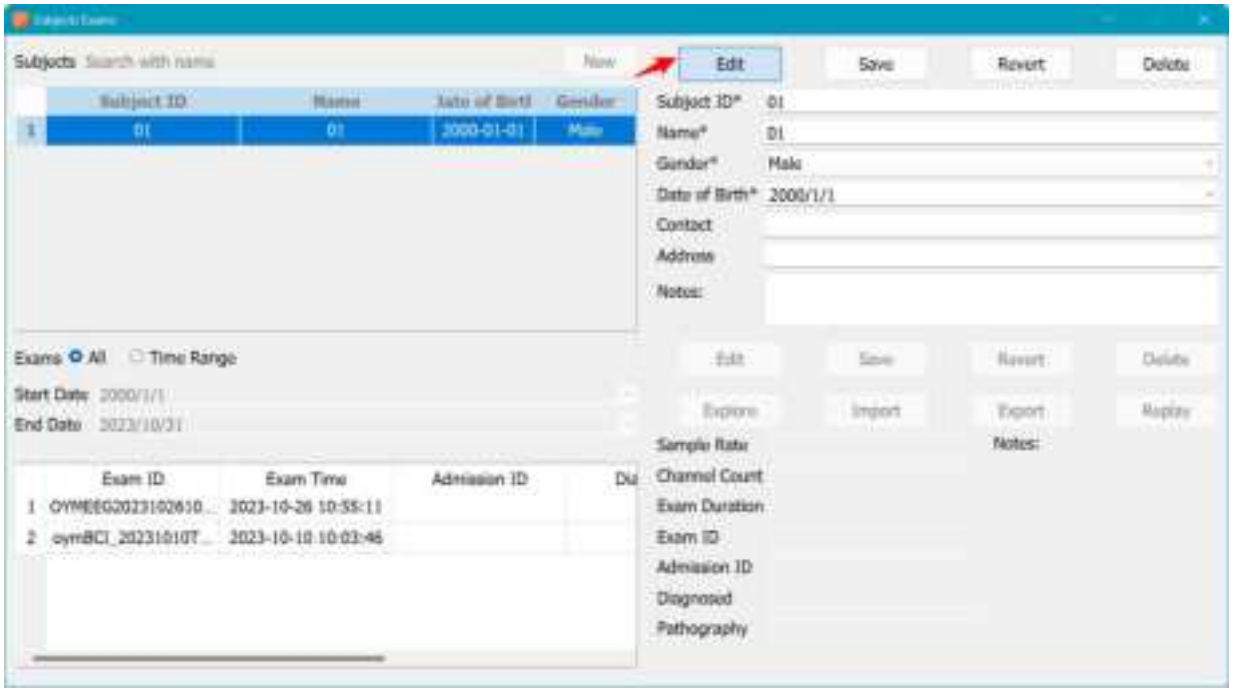


Figure 5.3.2.1-4

Click "Delete" and after confirmation, the information of the test object and all its record files will be deleted and this operation cannot be restored, as shown in Figure 5.3.2.1-5.

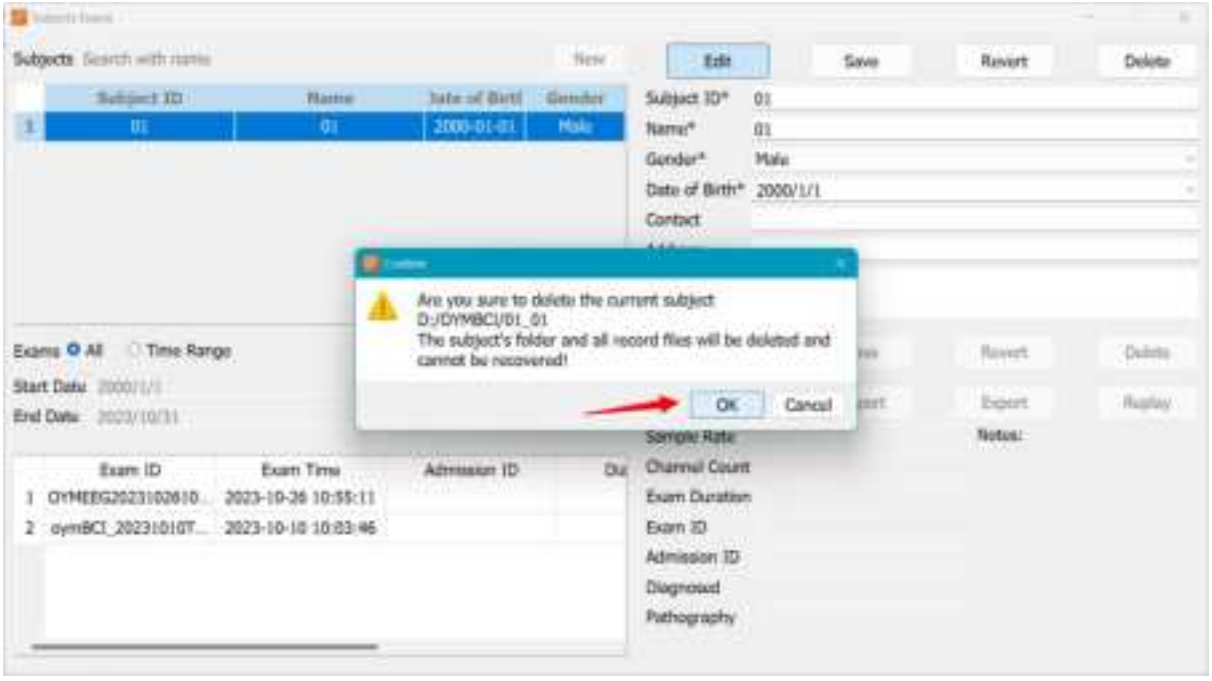


Figure 5.3.2.1-5

(2) Subjects Exams

Click to select the test object record to view, edit (save, revert, delete), explore, import, export,

and replay the test object record information. The specific operation is described as follows:

- View: Click to select the test object record that needs to be viewed, and the corresponding information will be displayed on the right side of the list, as shown in Figure 5.3.2.1-6.
- Edit: Click "Edit" and the button will turn blue. At this point, you will enter the information editing state. In the editing state, the options of opening folders, importing, exporting, and playing back cannot be clicked (you can click after exiting the editing state), as shown in Figure 5.3.2.1-6.

To modify the information of the test object record, click "Save" (at this time, the system will exit the information editing status by default);

If there is an error in modifying the information, click "Revert" and the test object information will be restored to the information before the current modification (i.e. no modifications have been made to the information). At this time, it is still in the information editing state. If you exit, click "Edit" to complete the process;

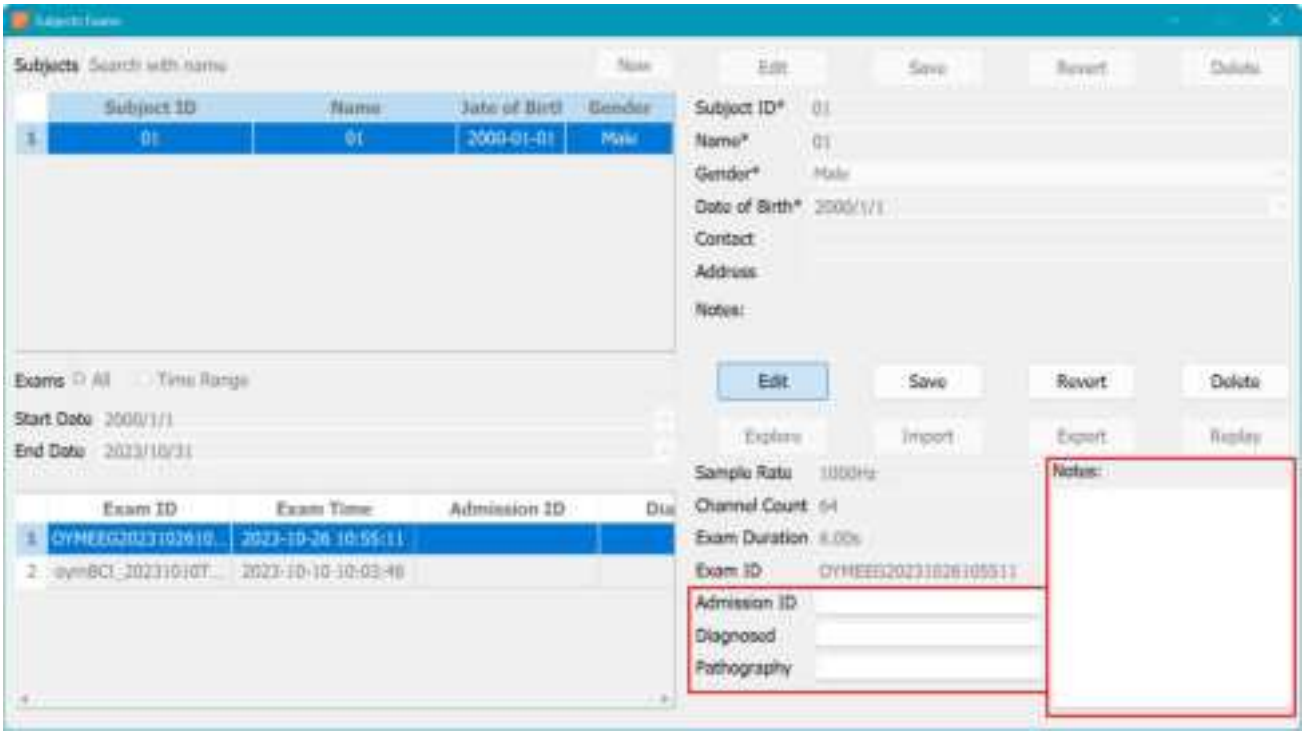


Figure 5.3.2.1-6

Click "Delete" and after confirmation, the test object record file will be deleted and cannot be restored, as shown in Figure 5.3.2.1-7.

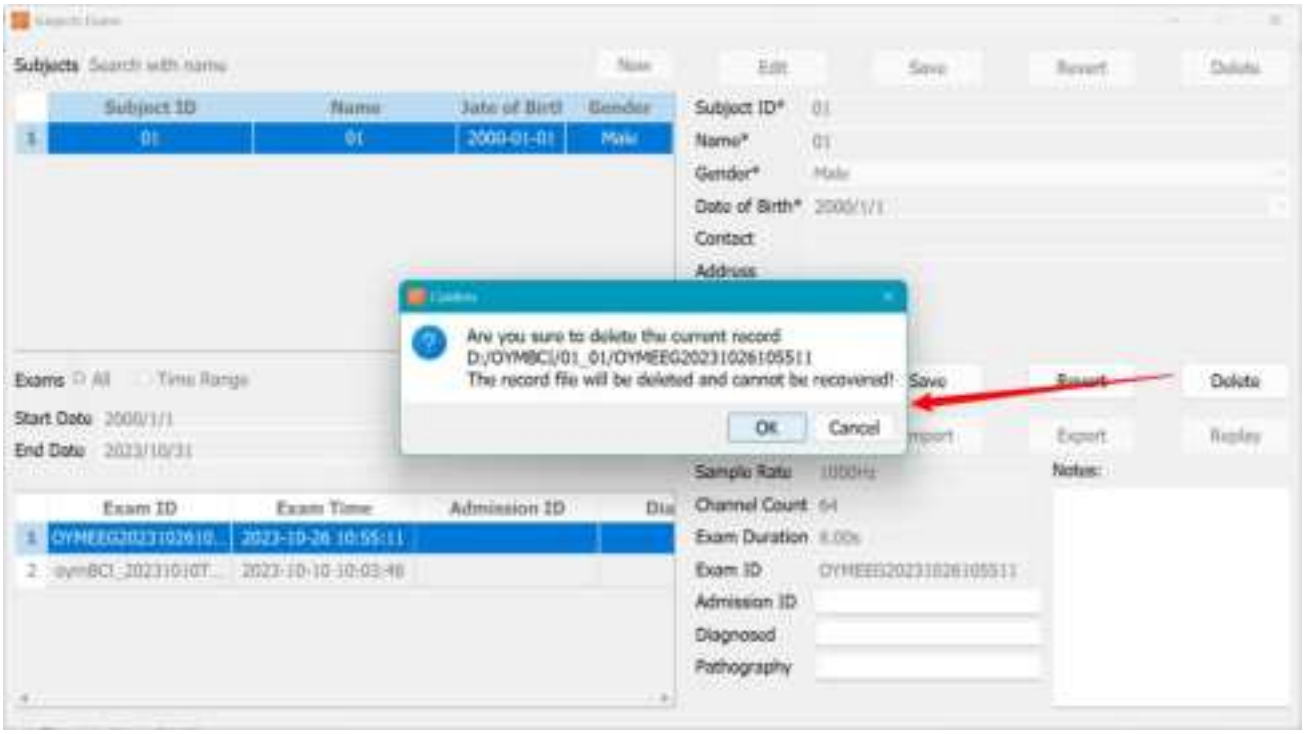


Figure 5.3.2.1-7

- Explore

Click "Explore"and the software will open the folder where the selected record is located.

- Export

Click "Export", select the file path as shown in Figure 5.3.2.1-8, confirm the file type, and the software will save the data record file with the file name entered by the user to this path.

There are two types of files:

① .Zip format, can be imported from other computers;

② ..xdf format, you can use SigViewer software to view playback and perform secondary analysis in software such as MATLAB.

Users can choose based on the type of replay software they are actually using.

Figure 5.3.2.1-8

- Import

Click "Import" and the page will jump as shown in Figure 5.3.2.1-9. Select according to the file type.

Offline recording : Select the corresponding EEG cap type and lead combination type, click" Select file ", as shown in Figure 5.3.2.1-9; Click "Import", as shown in Figure 5.3.2.1-10; After successful import, it appears in the list, as shown in Figure 5.3.2.1-11.

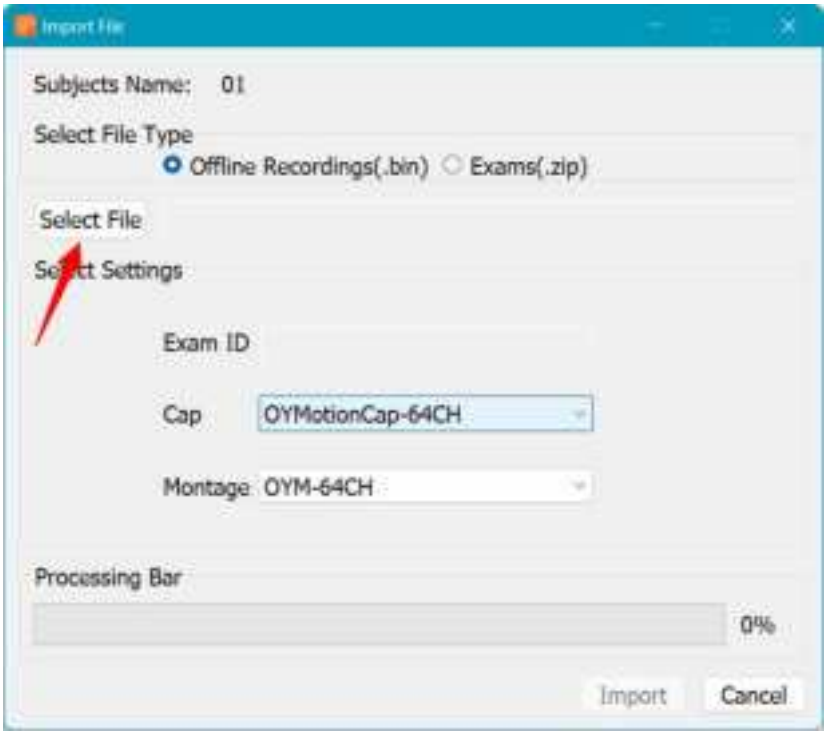


Figure 5.3.2.1-9

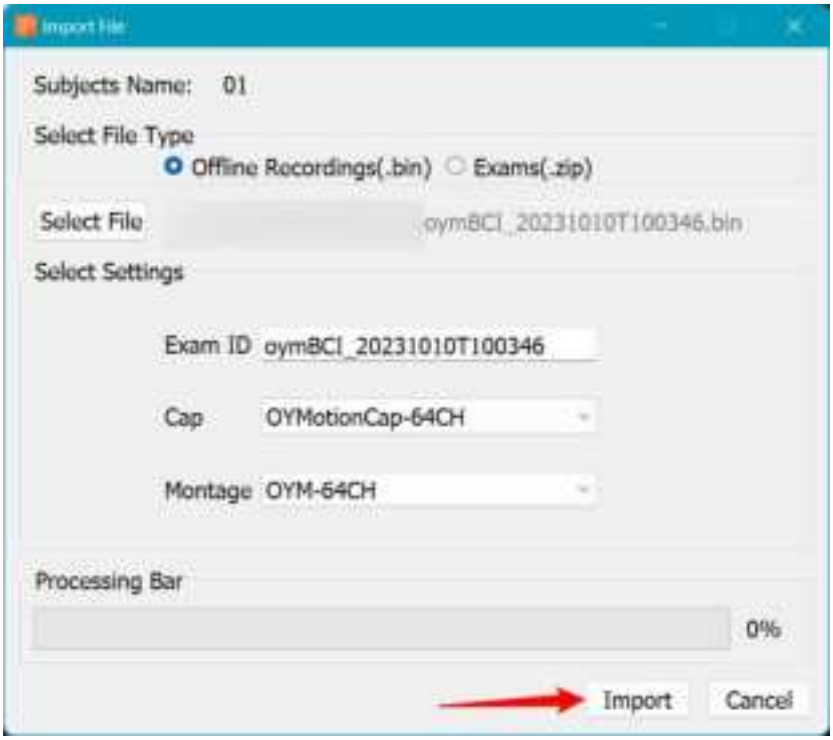


Figure 5.3.2.1-10

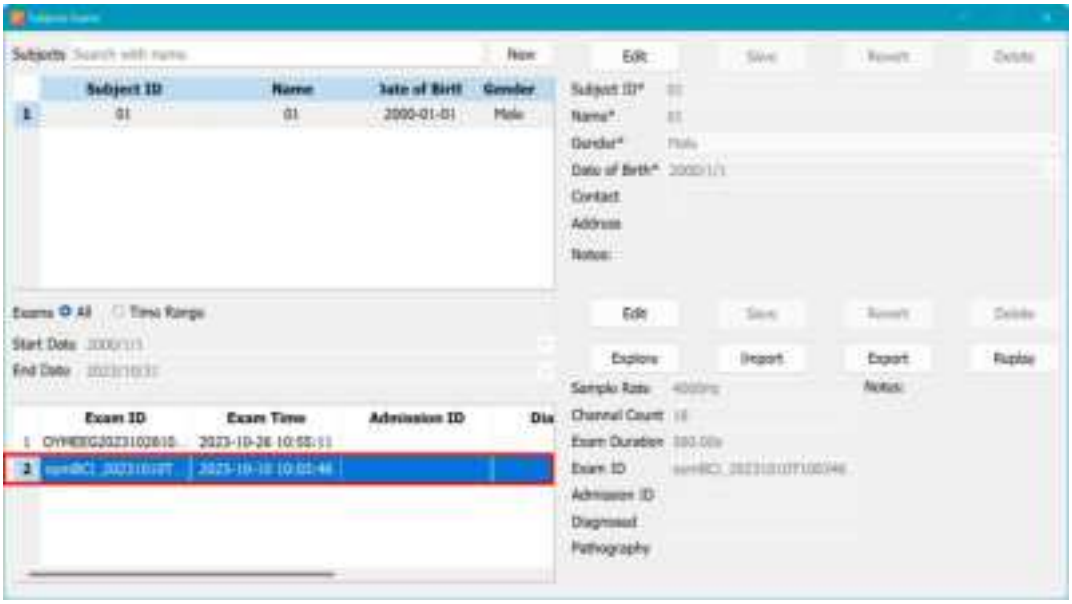


Figure 5.3.2.1-11

Compressed Record : Compressed records are files that have been exported under this software for import. Click on "Select File" and select the corresponding compressed file.

- Replay

Click "Replay" and a window "Add signals" will pop up (using third-party software for recording and playback), as shown in Figure 5.3.2.1-12.

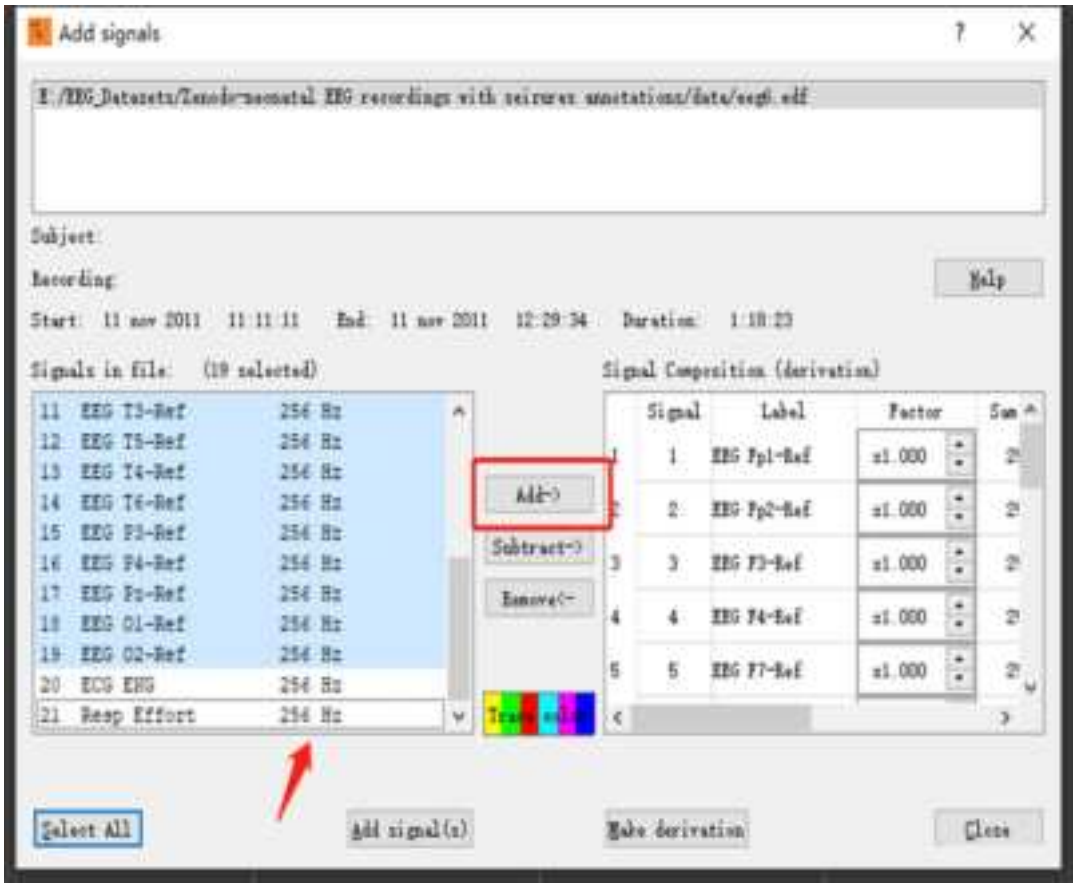


Figure 5.3.2.1-12

Click "Select All" to select all channels, click "Add signal (s)", and the test object record playback is shown in Figure 5.3.2.1-13.

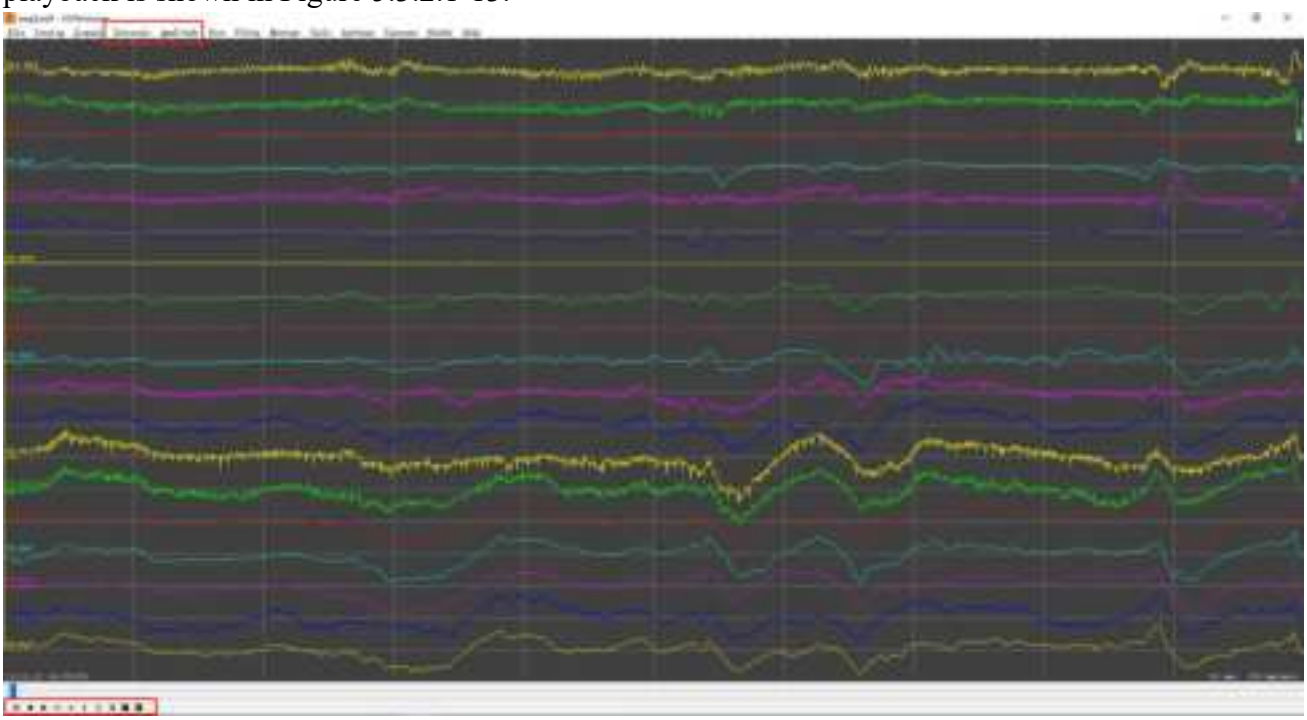


Figure 5.3.2.4-13

Click on the menu bar "Amplitude" and select "Fit to panel" as shown in Figure 5.3.2.1-14. Next, you can watch the replay normally.

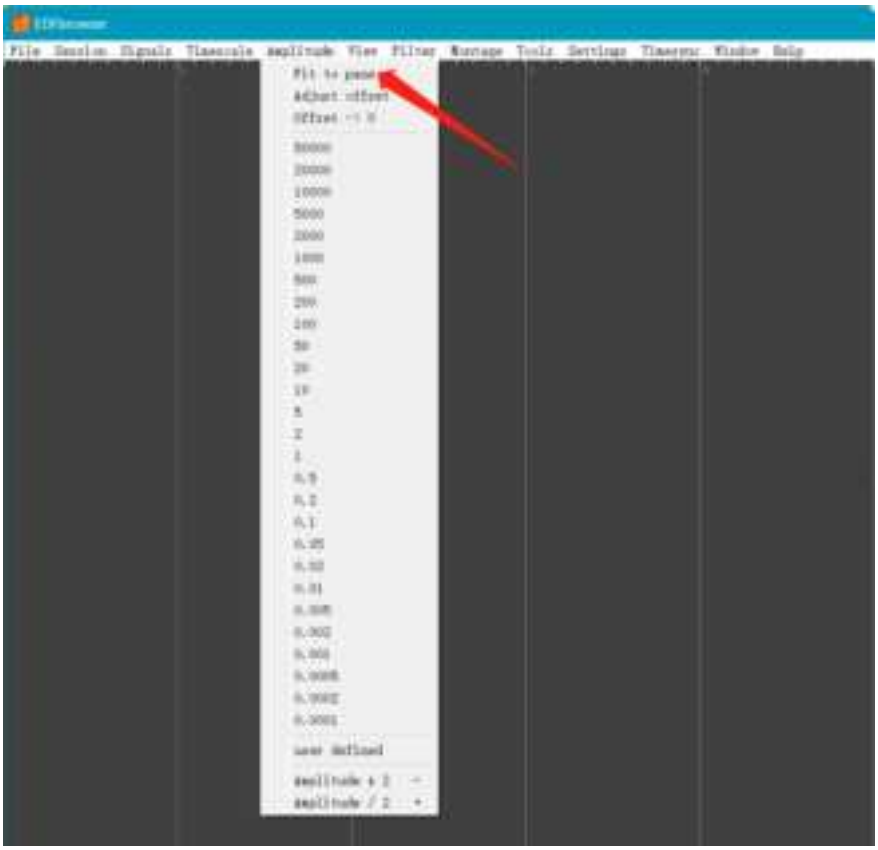


Figure 5.3.2.1-14

During the replay process, the event list can be viewed, as shown in Figures 5.3.2.1-15.

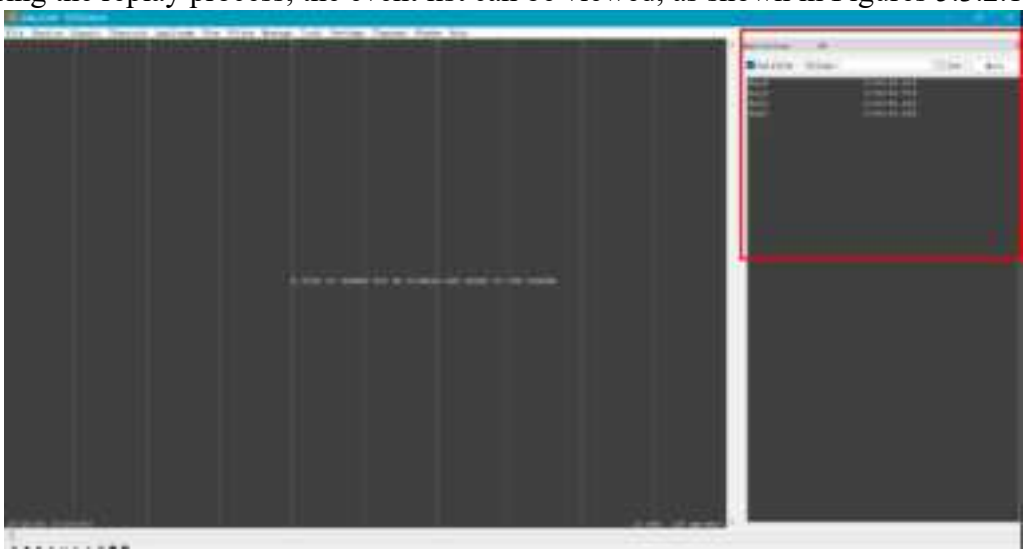


Figure 5.3.2.1-15

5.3.2.2 System settings

Click on "System Settings" and a pop-up window will appear as shown in Figure 5.3.2.2-1,

displaying the default save path. Click Select to change the save path.

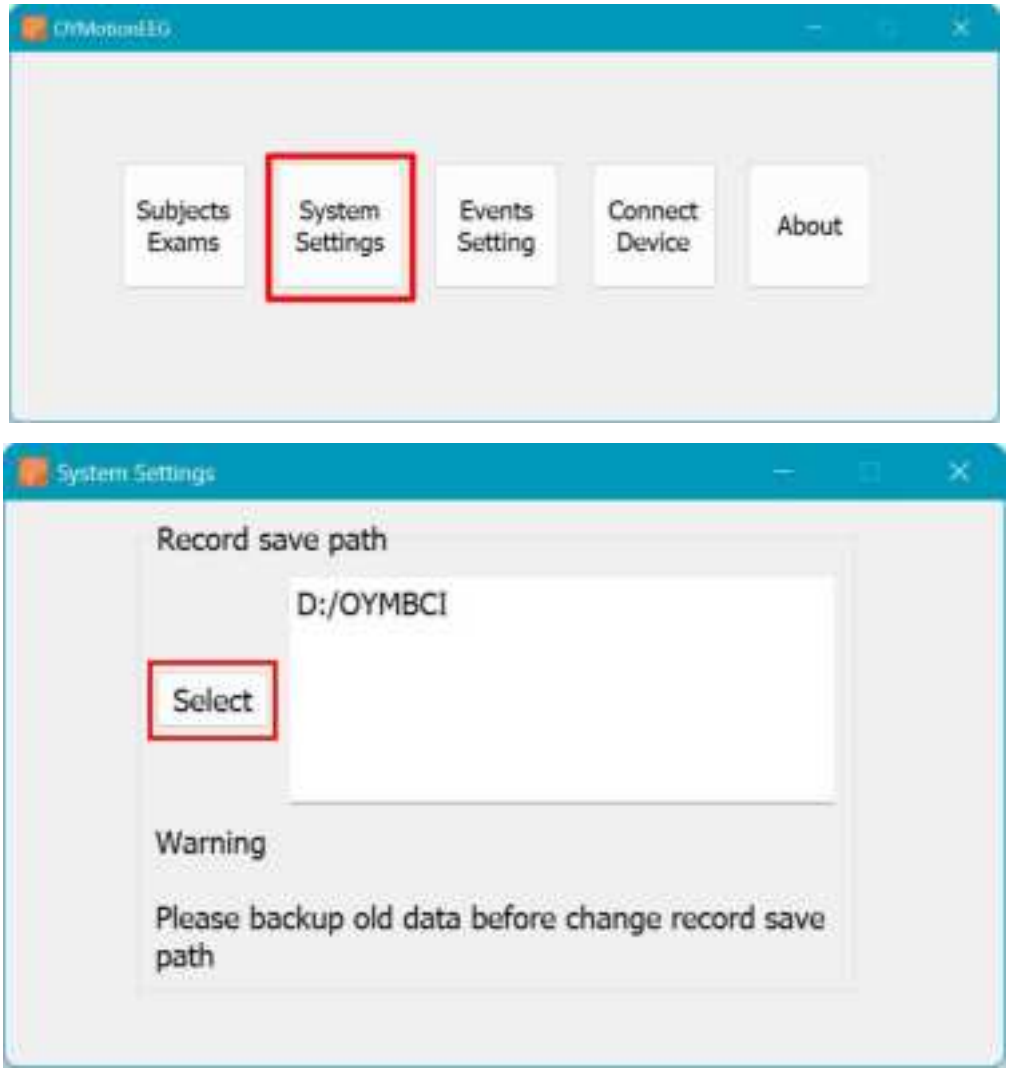
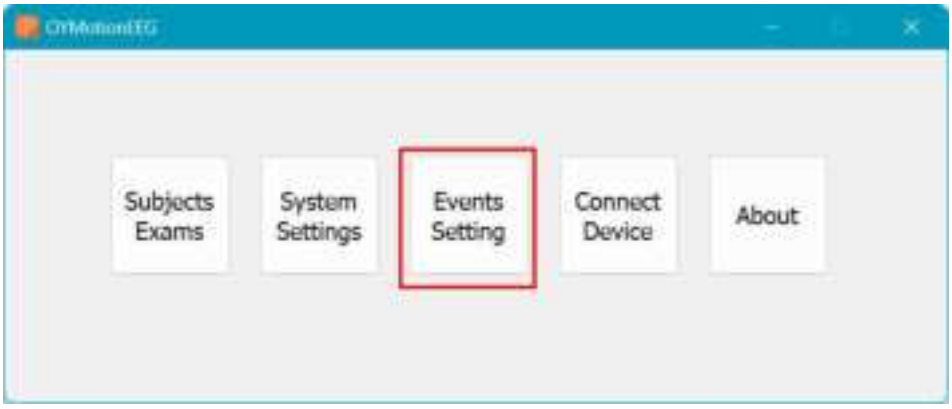


Figure 5.3.2.2-1

5.3.2.3 Event Setting

Click the "Event Setting" button and a pop-up window will appear as shown in Figure 5.3.2.3-1.



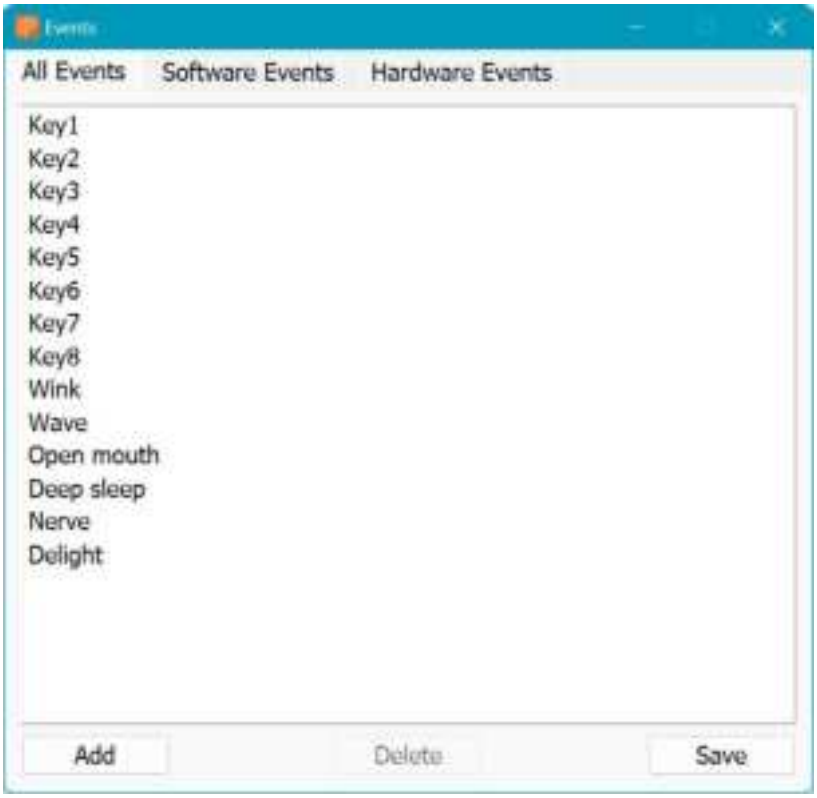


Figure 5.3.2.3-1

Event settings are divided into three parts: all events, software events, and hardware events.

(1) All events

There are already 14 default events (Key1~Key8, Wink, Wave, Open mouth, Deep sleep, Nerve, Delight) in the 'All Events' list, and default events cannot be edited.

Under this interface, users can perform the following operations:

① Add

Click the "Add" button, and the default name of the new event is "New Event". Users can edit the name and click "Save" to complete the addition of the new event, as shown in Figures 5.3.2.3-2, 5.3.2.3-3, 5.3.2.3-4, and 5.3.2.3-5.

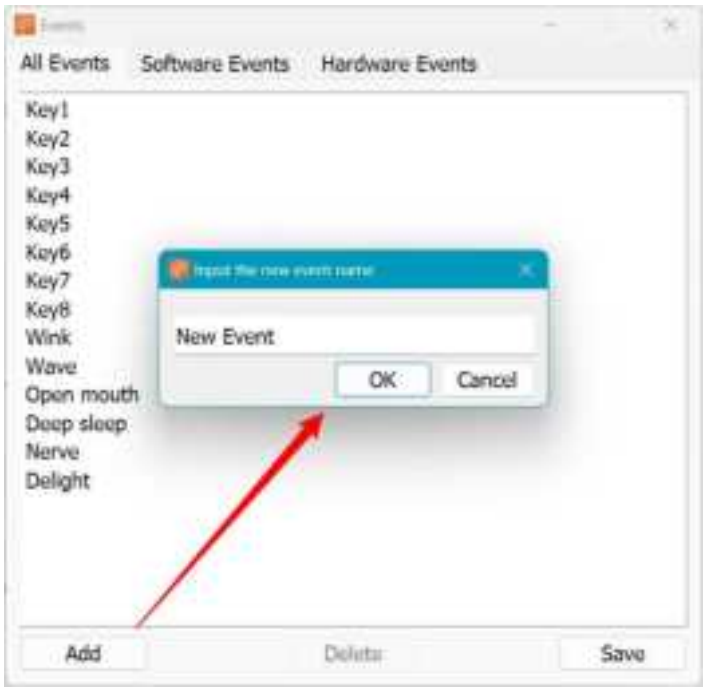


Figure 5.3.2.3-2

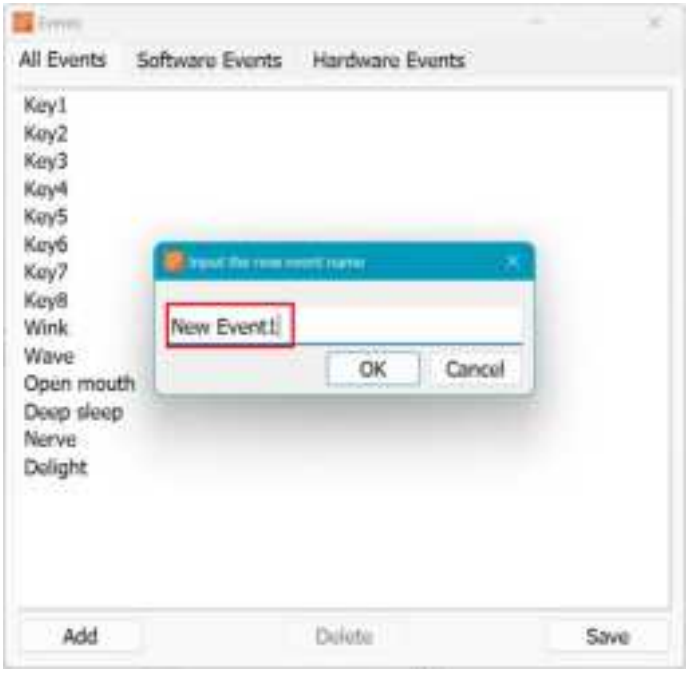


Figure 5.3.2.3-3

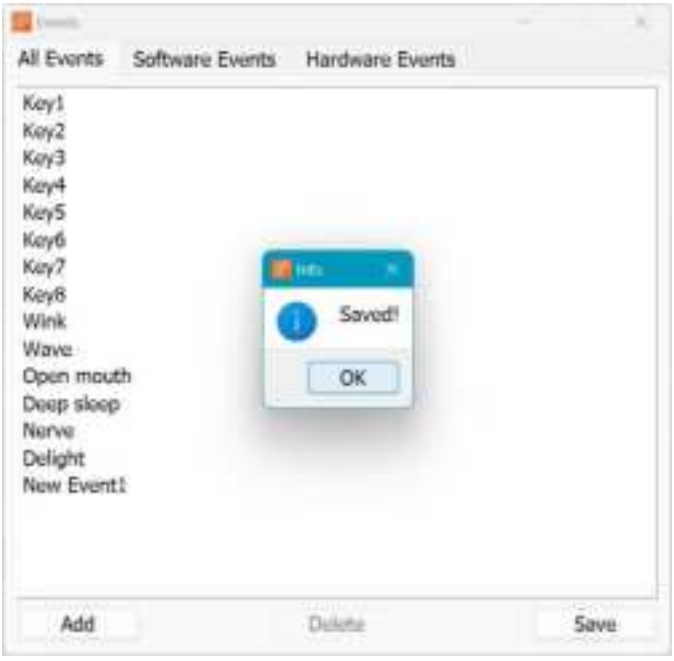


Figure 5.3.2.3-4

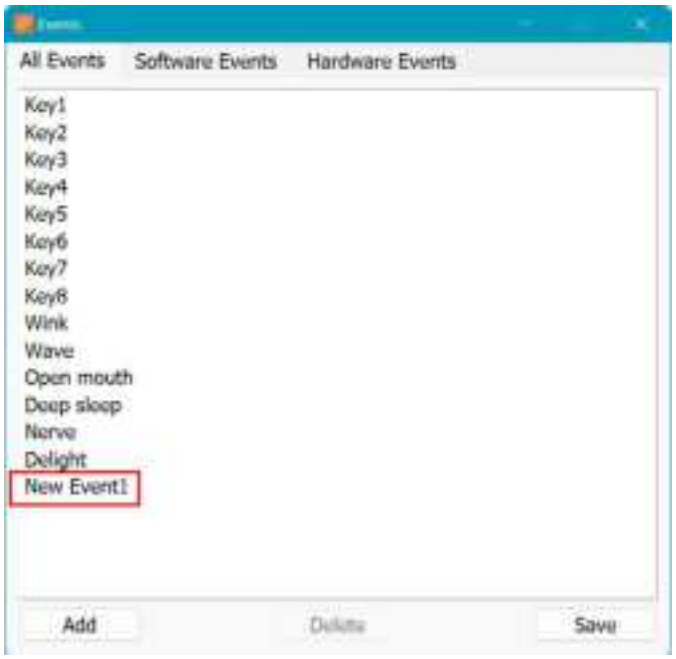


Figure 5.3.2.3-5

② Delete

For the events that have been "Add", click to select them to "Delete" and "Save". The event deletion is completed, as shown in Figures 5.3.2.3-6, 5.3.2.3-7, and 5.3.2.3-8.

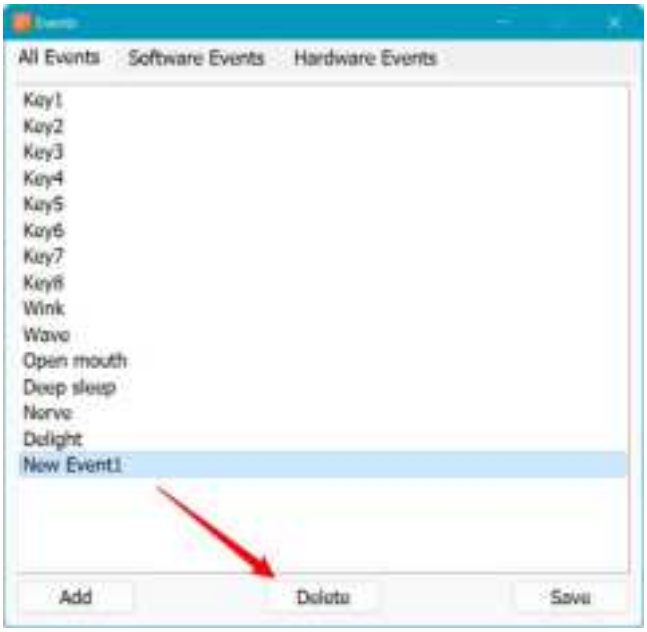


Figure 5.3.2.3-6

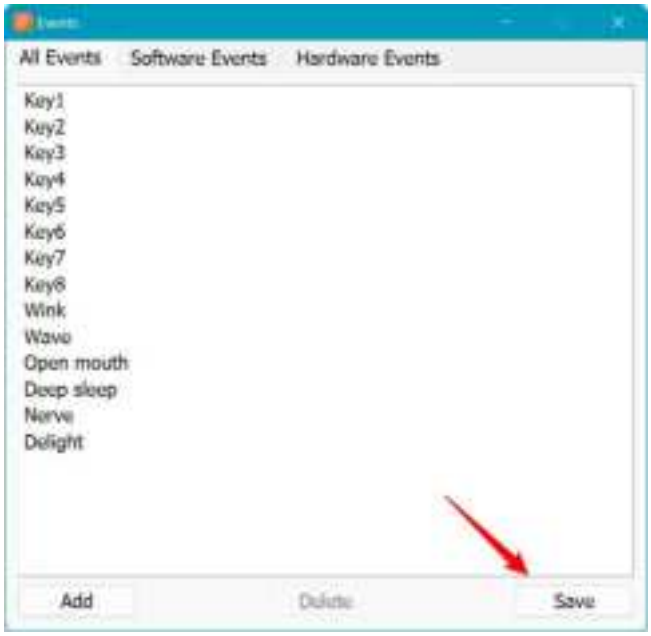


Figure 5.3.2.3-7

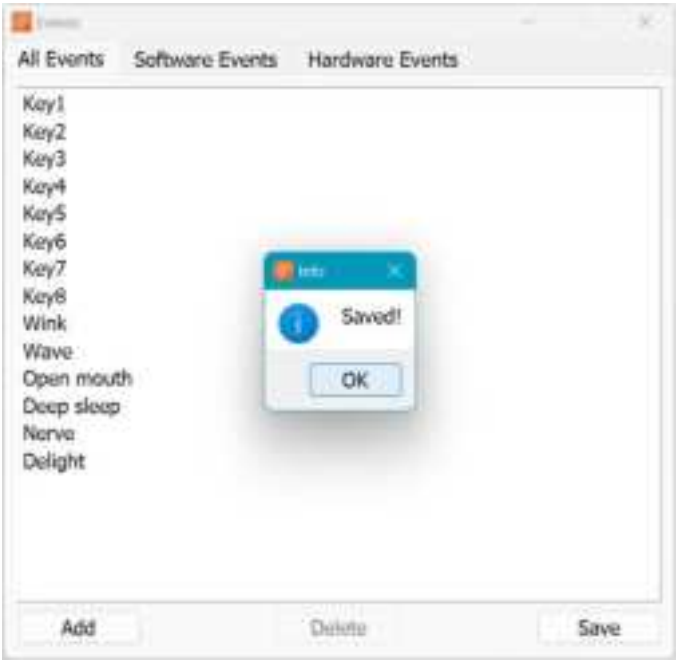


Figure 5.3.2.3-8

If the event has been used as a software or hardware event, a warning window will pop up. If the event is confirmed to be deleted, the corresponding software/hardware event list will also be deleted, as shown in Figure 5.3.2.3-9.

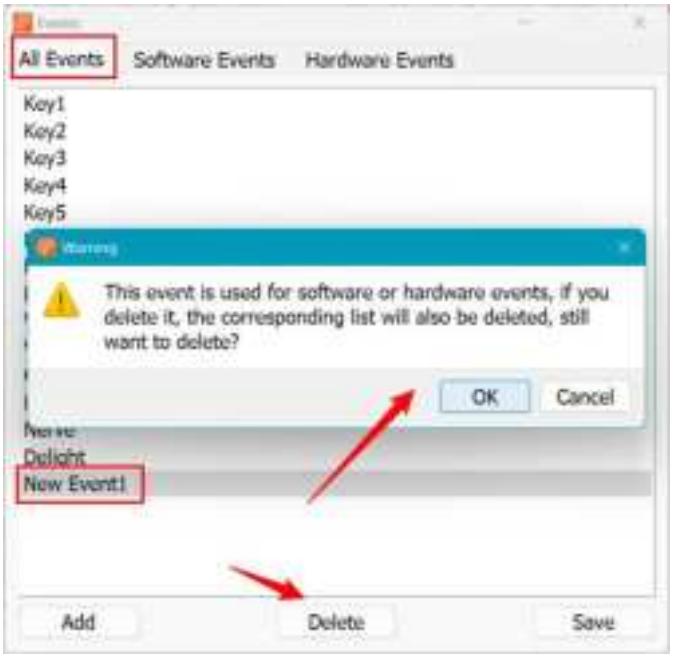


Figure 5.3.2.3-9

③ Modify the added event name

Double click on the name of the event that needs to be modified to edit its name. If the edited

name is the same as a certain item in the list, the software will pop up an error warning "Event cannot be repeated" when saving. At this time, it is necessary to modify the name of the corresponding duplicate event, as shown in Figure 5.3.2.3-10.

Note: The default event cannot have its name modified.

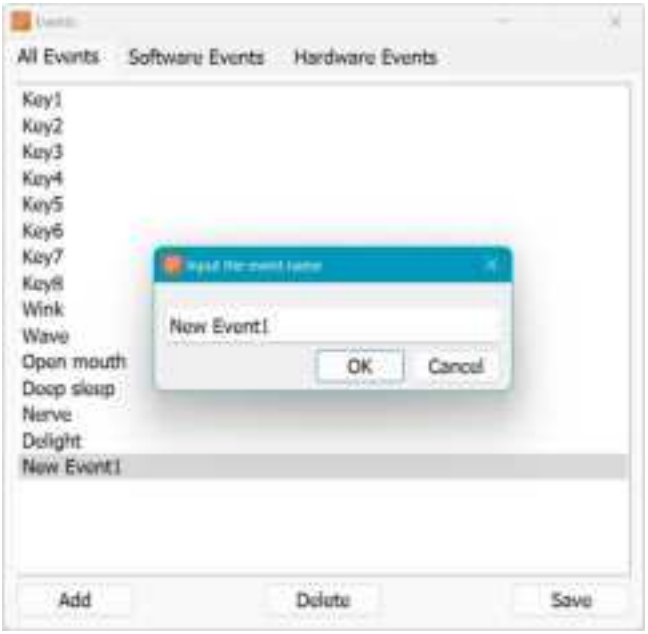


Figure 5.3.2.3-10

④ Save

After the "Add" and "Delete" events are completed, clicking the "Save" button will prompt you to save the results.

(2) Software Events

Software events include event combinations and corresponding events, as shown in Figure 5.3.2.3-11.

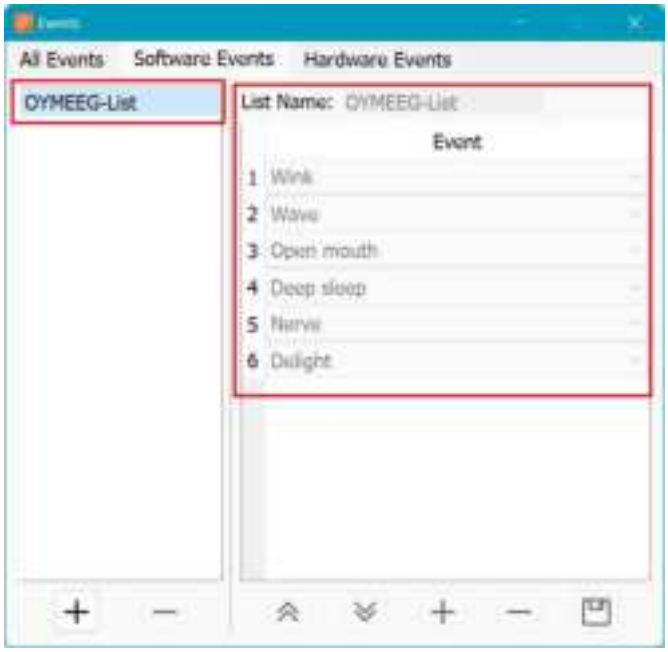


Figure 5.3.2.3-11

Button Description:

 Represents event combination or event creation;

 Indicates event combination or event deletion;

 Indicates that the selected event is ranked one position forward in the event list, used to modify the order of events;

 Indicates that the selected event is ranked one position backward in the event list, used to modify the order of events;

 Represents saving the operation performed.

① New/Delete Event Combination

Each event combination corresponds to a set of event lists, and the system comes with one OYMEEG List event combination. Users cannot perform any operations under this combination list.

Click the button below the event combination list to create a new list. The default name of the new list is "New List", and users can edit the name. Click "OK", and "New List " is successfully created, as shown in Figures 5.3.2.3-12 and 5.3.2.3-13. 

Click to select "New List " that has been successfully created, and click the button to delete "New List ".

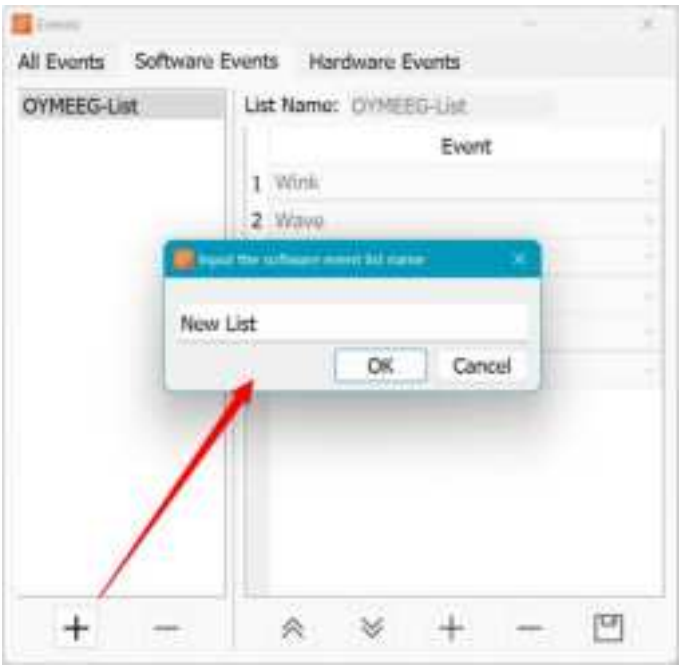


Figure 5.3.2.3-12

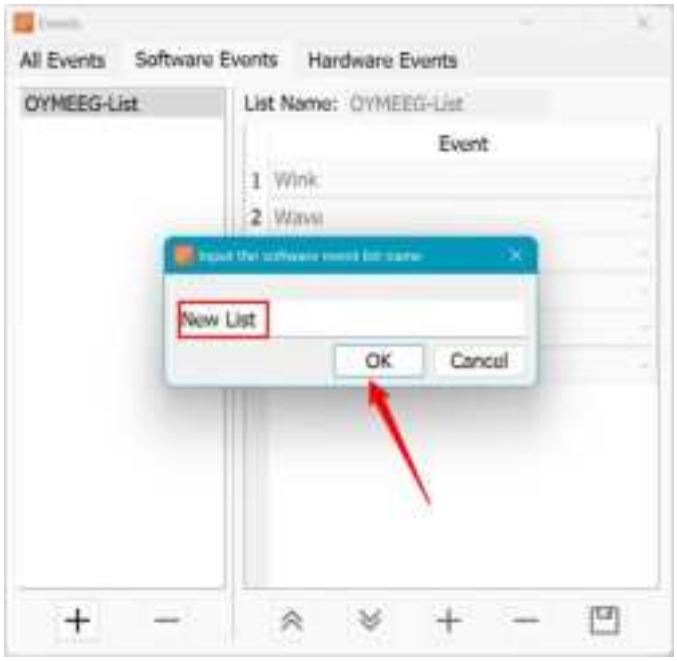


Figure 5.3.2.3-13

② New/Delete Event

Each event combination corresponds to a set of event lists, under "New List ":

Click the button below the event list to create a new event, as shown in Figure 5.3.2.3-14; +

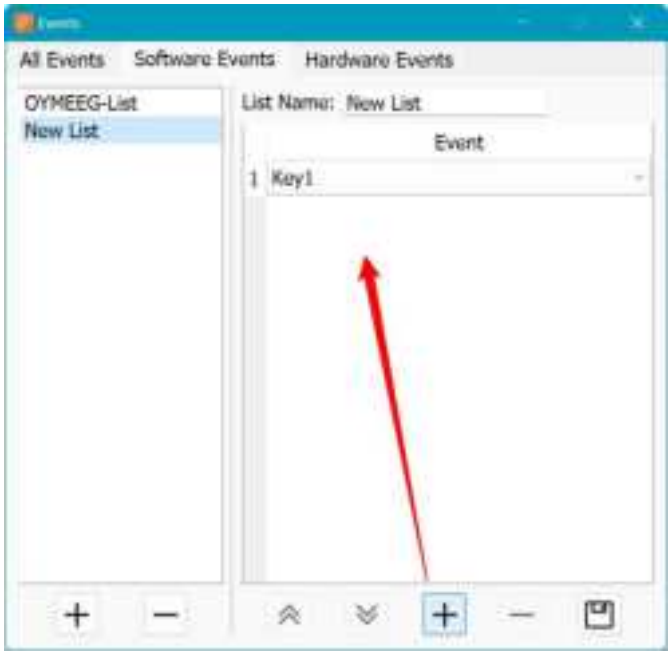


Figure 5.3.2.3-14

Click the drop-down button at the end of the event name to select an event from the drop-down list; Click on the event name/sequence number in the event list below to select the event (with a dark blue background), as shown in Figure 6.3.2.3-15;

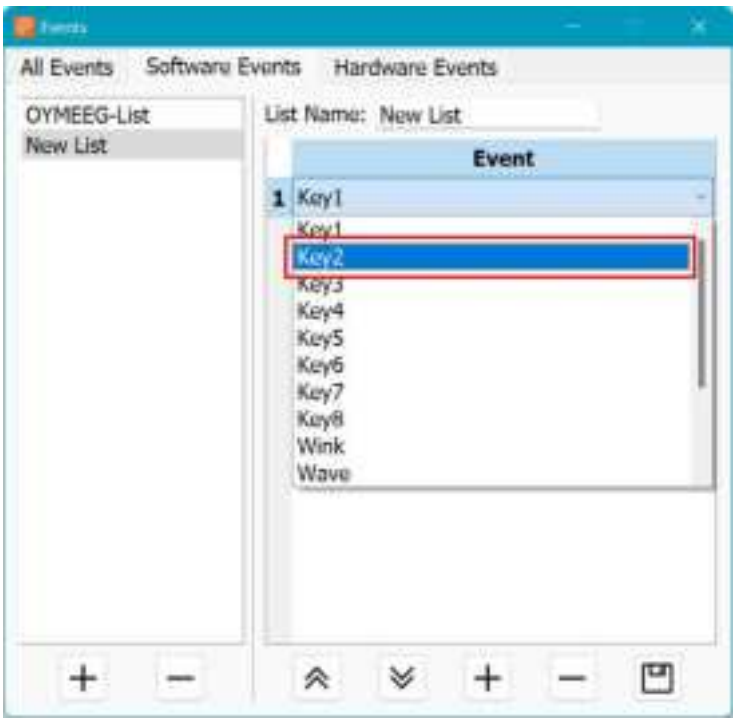


Figure 5.3.2.3-15

By creating multiple events to form an event list, the number of events in the software event list

should not exceed 12, as shown in Figure 5.3.2.3-16;

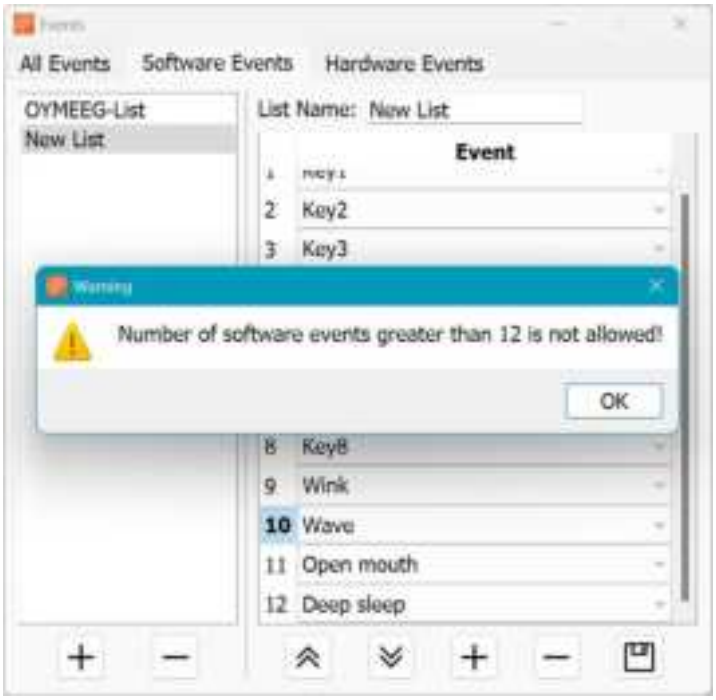


Figure 5.3.2.3-16

Select an event and click below the event list to delete it;

Select the event and click the up and down button below the event list to modify the event sequence, as shown in Figures 5.3.2.3-17 and 5.3.2.3-18;

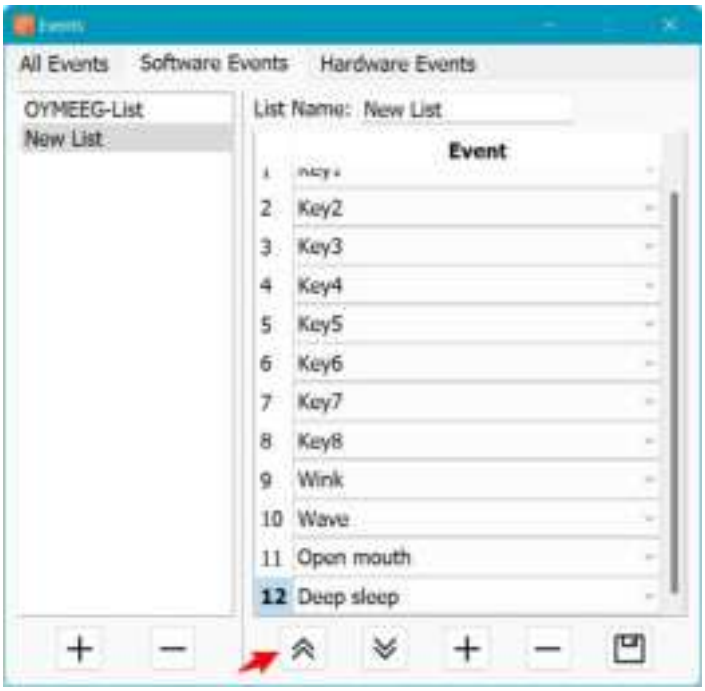


Figure 5.3.2.3-17

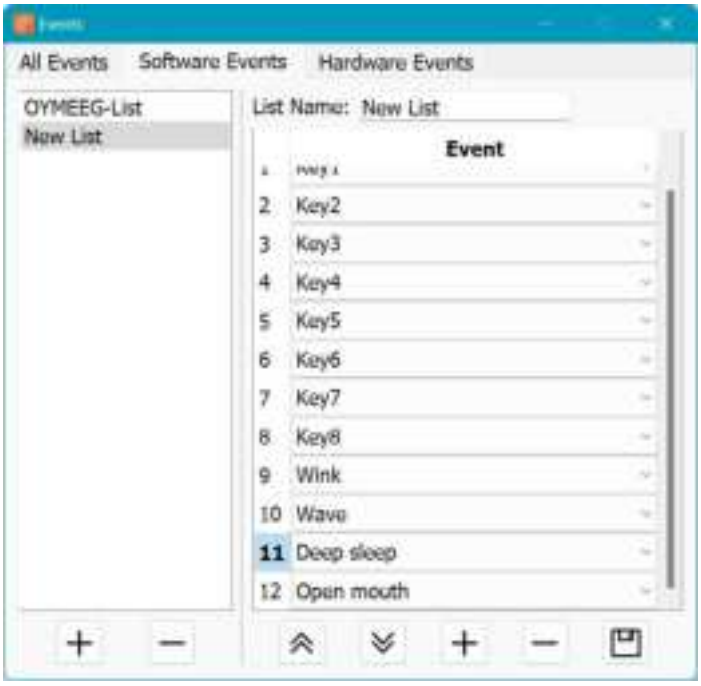


Figure 5.3.2.3-18

After completing the operation, click the save button to complete the editing. 

(3) Hardware Events

Hardware events include event combinations and corresponding events, as shown in Figures 5.3.2.3-19:

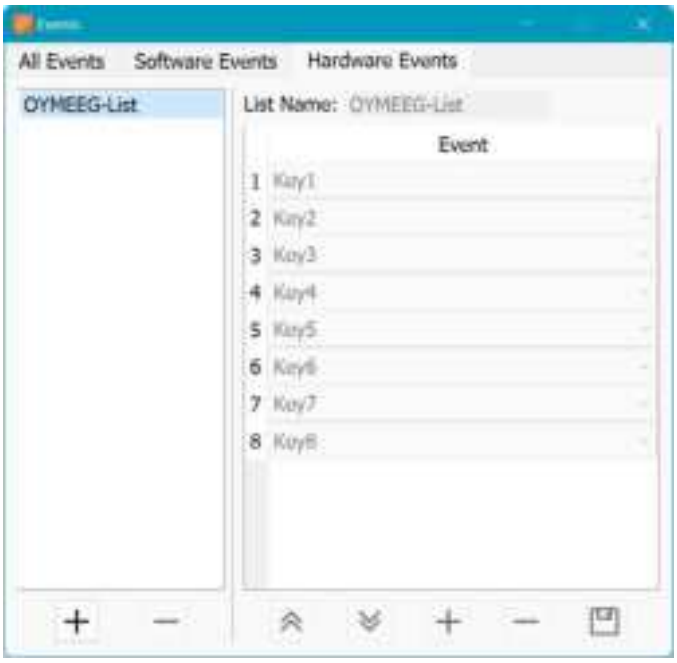


Figure 5.3.2.3-19

Hardware event operation buttons refer to (2) Software events.

⚠Caution

The number of events in each hardware event list cannot exceed the number of hardware triggered buttons (8)!

5.3.2.4 Connect Device

(1) Connect Device

Explanation: The device refers to an amplifier.

Software interface

Click on "Connect Device" and a pop-up page will appear as shown in Figure 5.3.2.4-1.

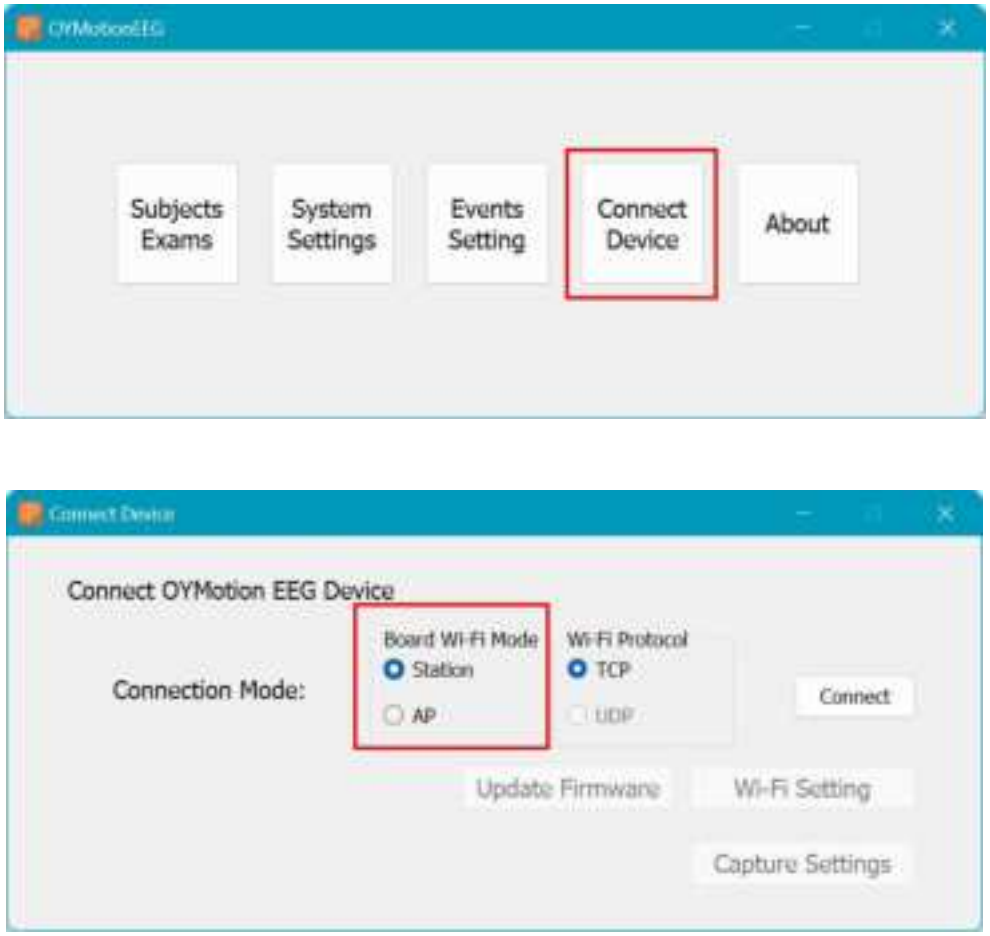


Figure 5.3.2.4-1

- There are two types of onboard Wi-Fi modes:

AP mode: The mode used when connecting the device for the first time. After the AP mode is successfully connected, Wi-Fi settings are made. After the Wi-Fi settings are successful, the software interface is set to Station mode to perform collection settings.

In this mode, the device acts like a router, and the computer needs to be connected to the Wi-Fi signal sent by the device to work. The Wi-Fi name starts with OB1000 and ends with the amplifier device serial number, such as OB1000-1CF4AB00. Usually, the Wi-Fi name is labeled on the product packaging.

Station mode: The mode when connecting to the device again after successfully setting up Wi-Fi. In this mode, the device acts like a client and needs to be connected to the Wi-Fi signal emitted by the router to work.

- There are two types of Wi-Fi transmission protocols:

TCP: Stable connection, but may cause device data blocking and result in some degree of packet loss.

UDP: User Datagram Protocol, which provides a method for applications to send encapsulated IP packets without establishing a connection.

When connecting devices, both AP mode and Station mode choose TCP protocol.

Caution

When connecting devices, please allow the application to pass through the firewall.

After the device is turned on, check the current status of the device by observing the Wi-Fi indicator light:

- The Wi-Fi indicator light flashes rapidly every 0.1 second cycle, indicating that the device is connecting to the router's Wi-Fi;
- The Wi-Fi indicator light flashes every 1 second cycle, indicating that the device is not connected to the router's Wi-Fi, and is in AP mode at this time;
- The Wi-Fi indicator light becomes constantly on, indicating that the device has successfully connected to the router's Wi-Fi, and is in Station mode;
- The Wi-Fi indicator light is off, indicating that the device is in offline mode.

Connecting devices

① When the device is turned on, the Wi-Fi indicator light flashes every 1 second, and it is in AP mode;

② On the software interface, select the "AP" mode, click the "Connect" button as shown in Figure 5.3.2.4-2, and successfully connect as shown in Figure 5.3.2.4-3;

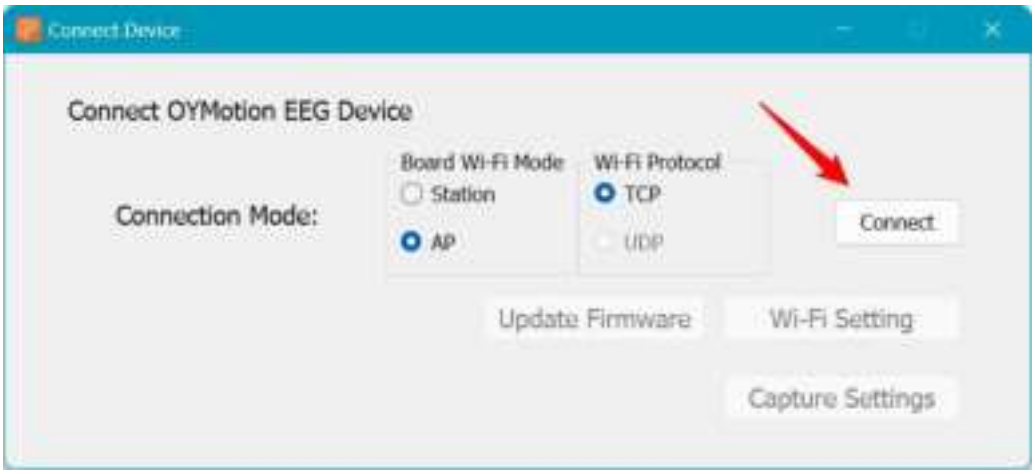


Figure 5.3.2.4-2

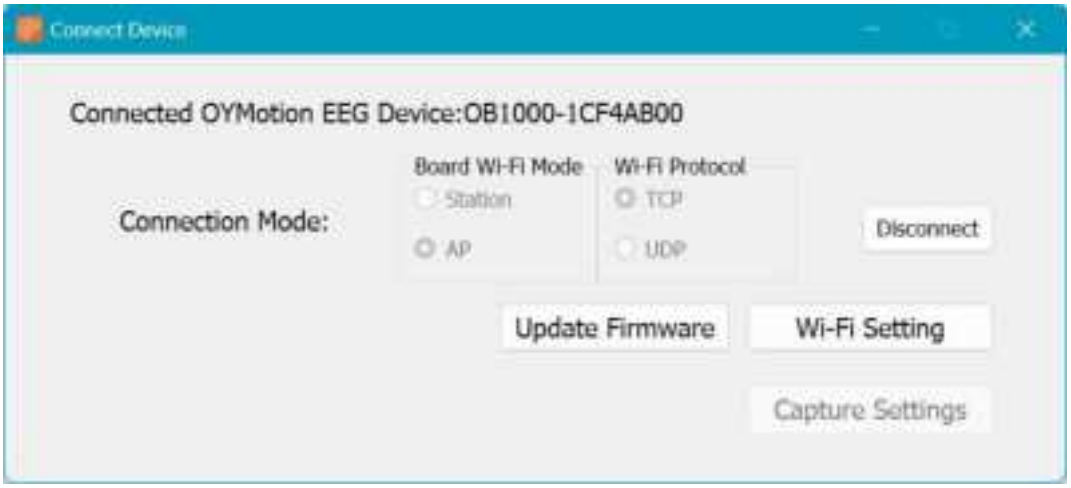


Figure 5.3.2.4-3

③ Click on "Wi-Fi Setting" in Figure 5.3.2.4-3, and click on "Config Wi-Fi " in the pop-up window, as shown in Figure 5.3.2.4-4;

Figure 5.3.2.4-4

Select the router's Wi-Fi name in the Wi-Fi list, double-click it, perform wireless network authentication, enter the password, and click "Send", as shown in Figure 5.3.2.4-5;

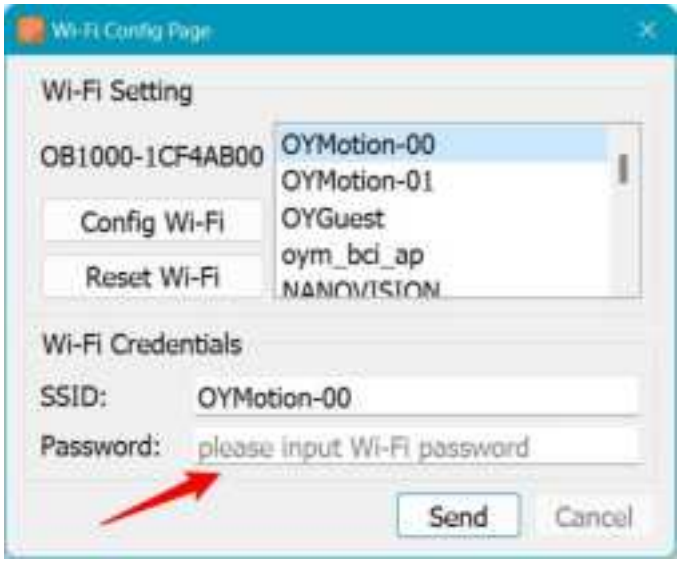


Figure 5.3.2.4-5

④ At this point, the device's Wi-Fi indicator light is constantly on, indicating that the device has successfully connected to the router's Wi-Fi. On the software interface, adjust the mode to "Station" and click "Connect", as shown in Figure 5.3.2.4-6;

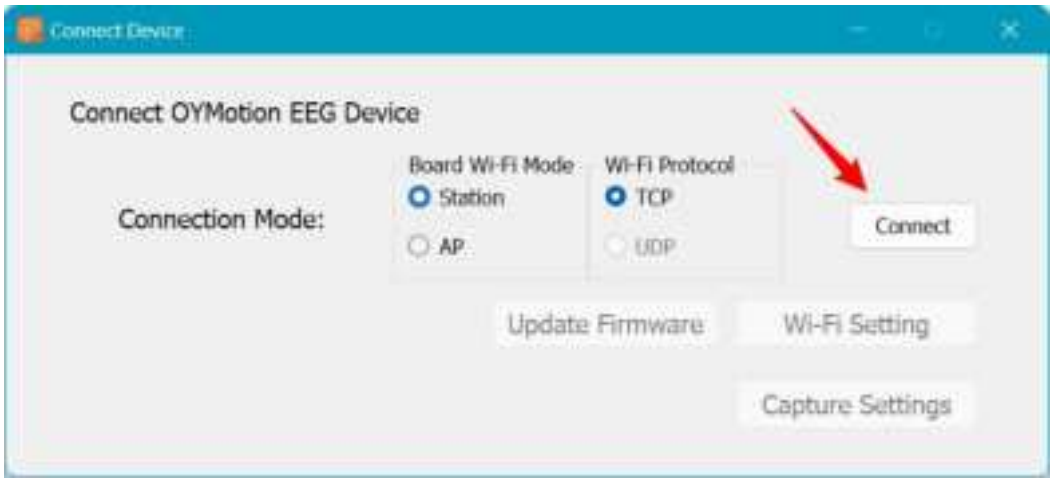


Figure 5.3.2.4-6

⑤ Click "Connect" and the "Scan Device" window will pop up. Click "Scan" as shown in Figure 5.3.2.4-7; The device has successfully scanned and clicked "Connect" as shown in Figure 5.3.2.4-8. After successful connection, the current window will automatically close and proceed to the next step.

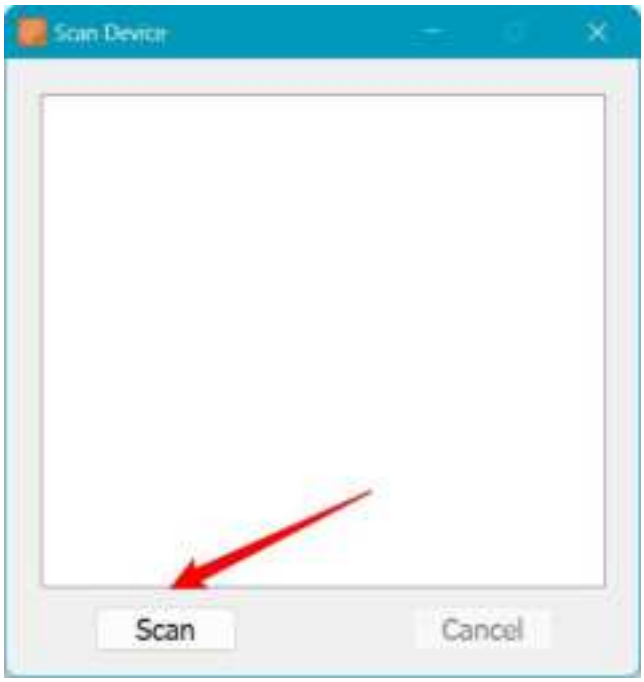


Figure 5.3.2.4-7

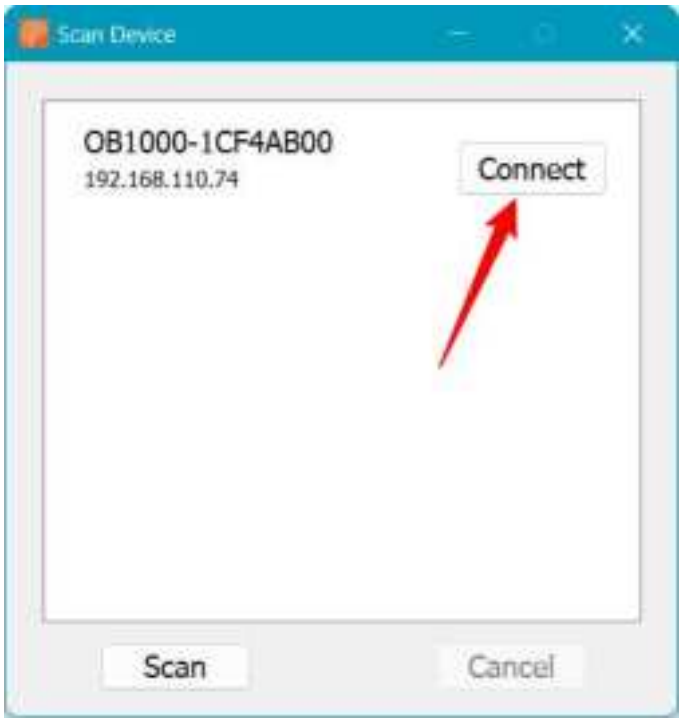


Figure 5.3.2.4-8

(2) Capture Settings

Click on "Capture Settings" as shown in Figure 6.3.2.4-10, and the "Record Settings" window will pop up as shown in Figure 5.3.2.4-10.

Figure 5.3.2.4-9

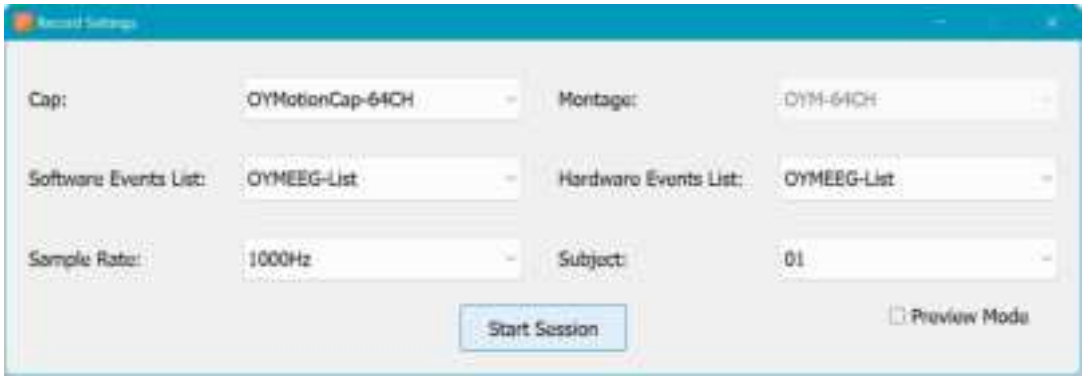


Figure 5.3.2.4-10

In the "Record Settings" window, you can set the EEG cap, Software Event List, Hardware Event List, Sample Rate, and Subject, as shown in Figure 5.3.2.4-11, 5.3.2.4-12, 5.3.2.4-13, 5.3.2.4-14, 5.3.2.4-15;

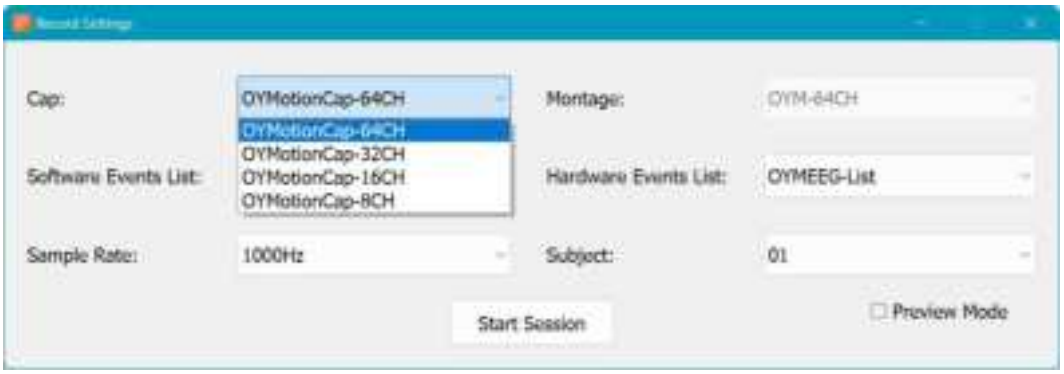


Figure 5.3.2.4-11

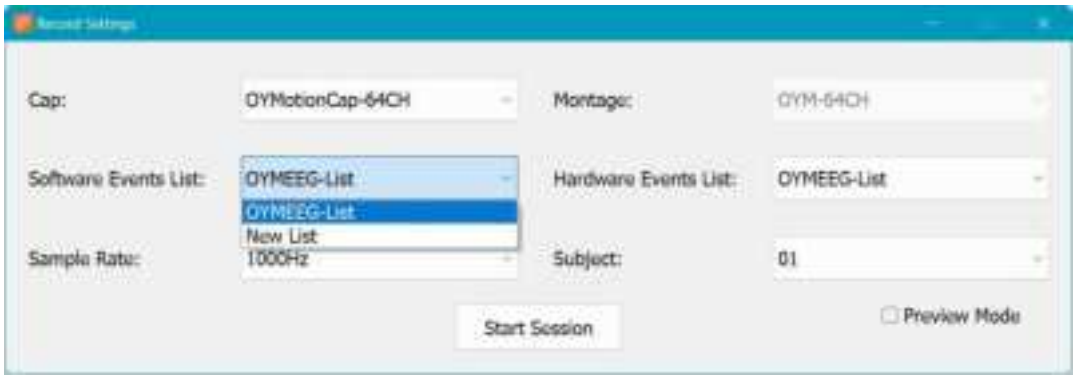


Figure 5.3.2.4-12

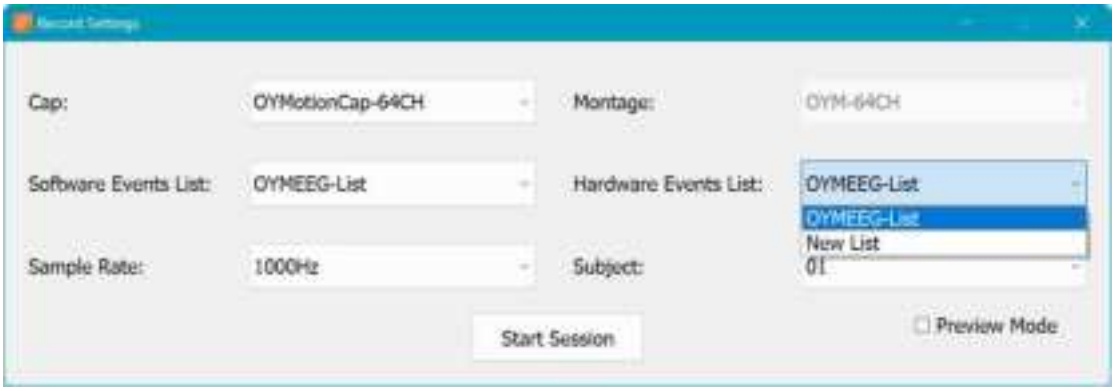


Figure 5.3.2.4-13

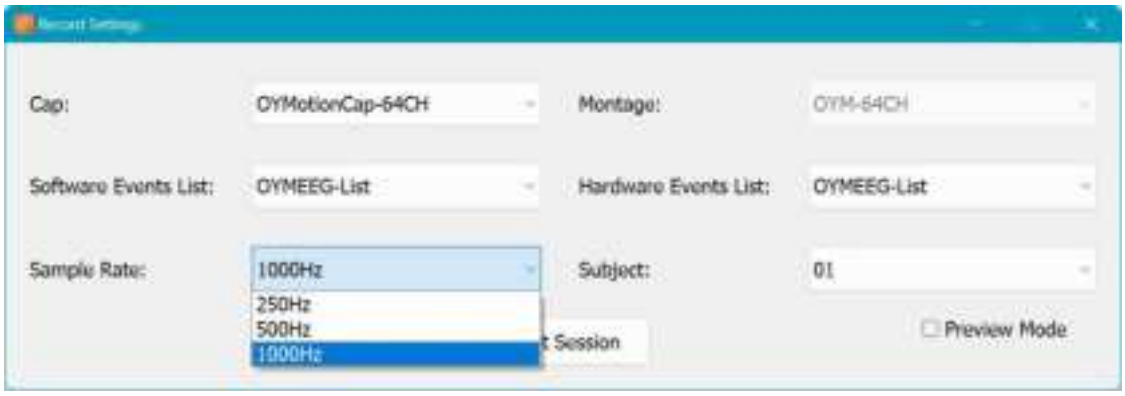


Figure 5.3.2.4-14

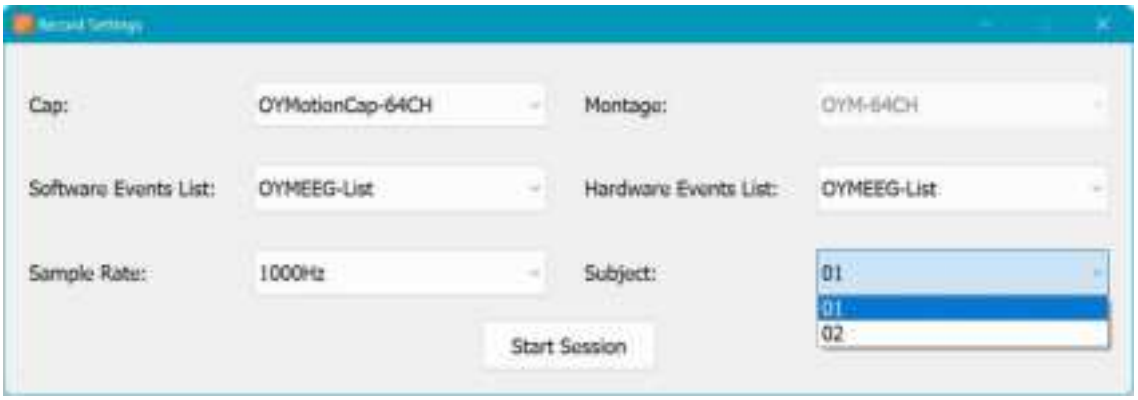


Figure 5.3.2.4-15

- If you need to record the EEG acquisition process, click "Start Session". The collection interface has buttons for "Start Record" and "Stop Record", as shown in Figure 5.3.2.4-16.

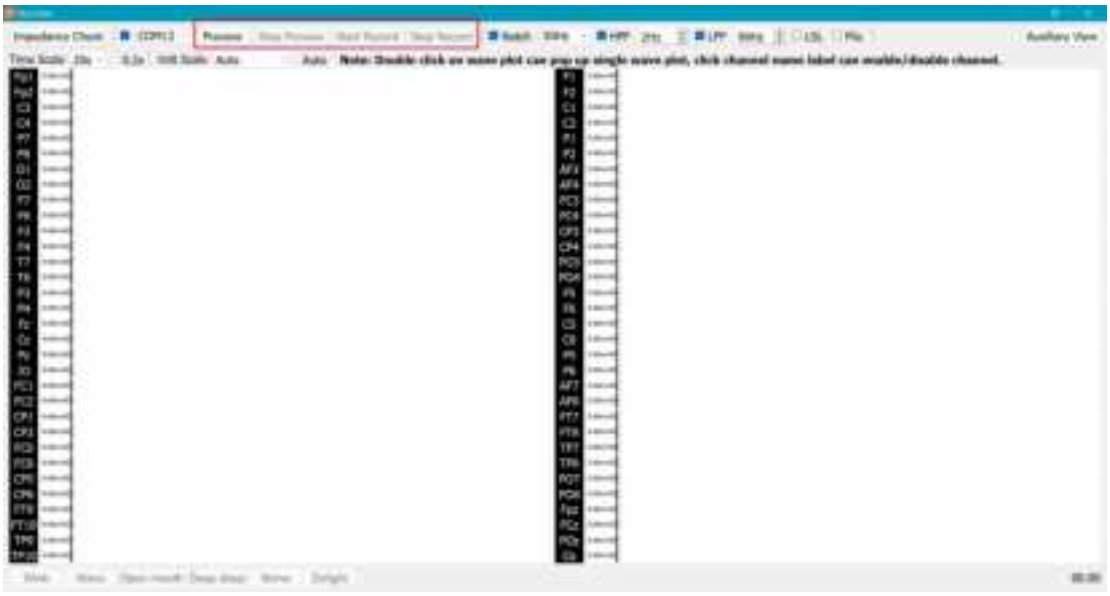


Figure 5.3.2.4-16

- If the collection process does not require recording, you can check "Preview Mode". In the preview mode, only the sampling rate can be set, as shown in Figure 5.3.2.4-17. Click "Start Session", and there is no "Start Record" or "Stop Record" button on the collection interface, as shown in Figure 5.3.2.4-18.

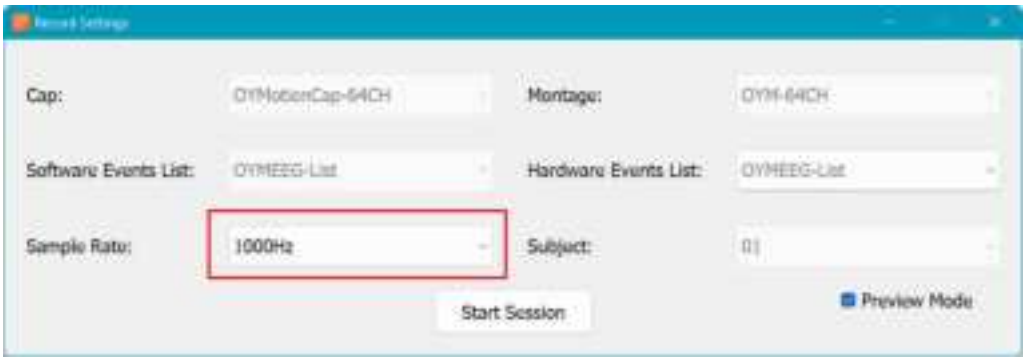


Figure 5.3.2.4-17

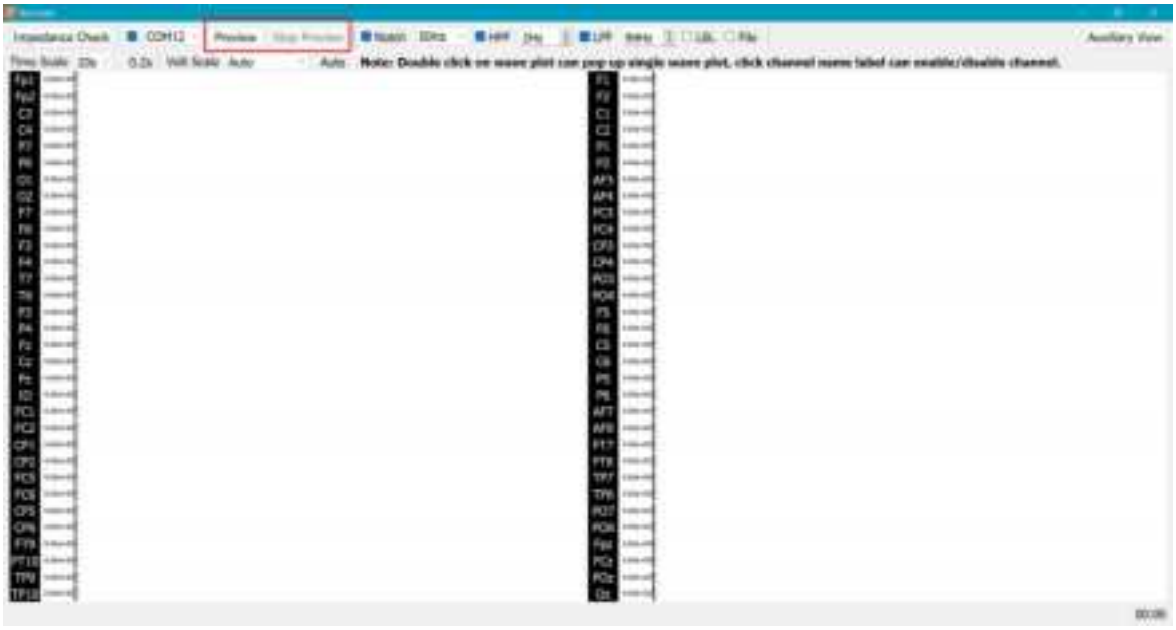


Figure 5.3.2.4-18

(3) Collection

Collection is divided into two modes: online and offline.

- **Online mode**

The collection interface is shown in Figure 5.3.2.4-19. Click "Start Record" to start recording and collecting data; Click "Stop Record" to stop recording and collecting data.

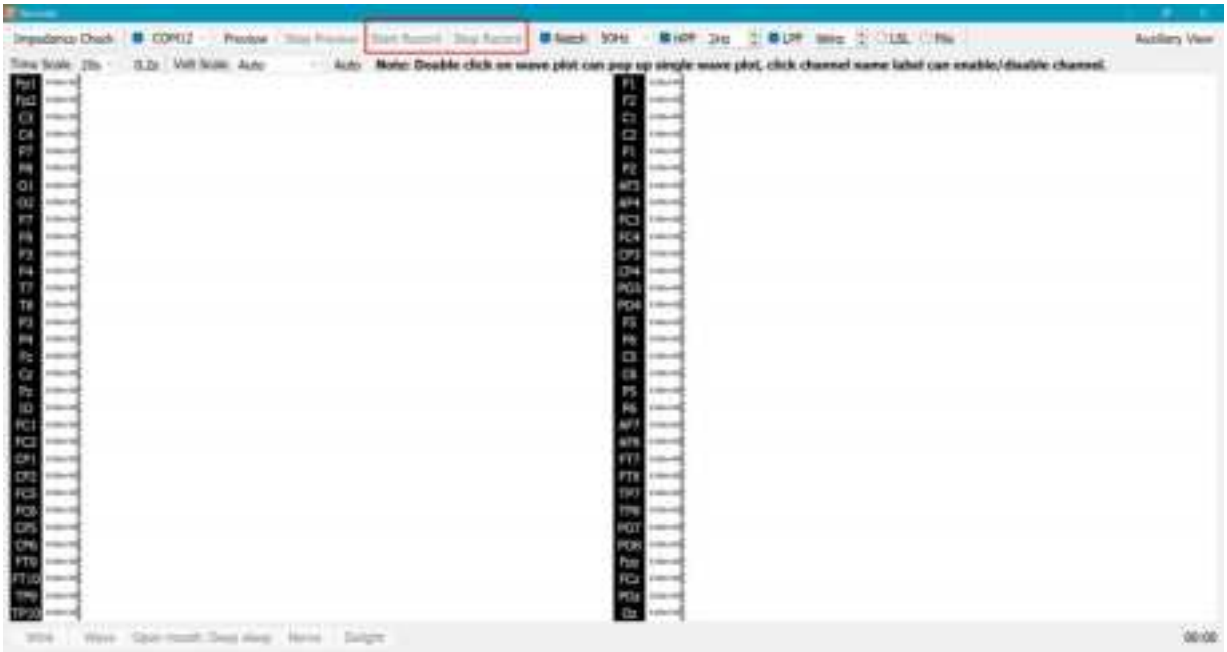


Figure 5.3.2.4-19

Before collecting, the following operations need to be carried out:

1) Impedance check (taking 64 channels as an example)

Impedance check can measure the impedance between electrode pairs, and the impedance of each channel can be measured separately to determine whether the electrode is in correct contact with the skin. The electrode is displayed in green, indicating that it is connected, while red represents that it is not connected, as shown in Figure 5.3.2.4-20.

Note: Except for Cz, all electrodes are paired with the reference electrode, so if the reference electrode is not connected, it will display that all channels have been disconnected. Cz is paired with GND (IO) electrodes, so when the two electrodes are connected, Cz and GND (IO) will be displayed as connected. Users who use 8CH and 16CH EEG caps can read the GND (IO) electrode state while ignoring Cz.

Figure 5.3.2.4-20

2) Disable/Enable Channel

In the acquisition window, click on the channel name to disable or enable the corresponding channel. The background of the disabled channel will turn gray, as shown in Figures 5.3.2.4-21 and 5.3.2.4-22. Click on the name of the disabled channel to open it.

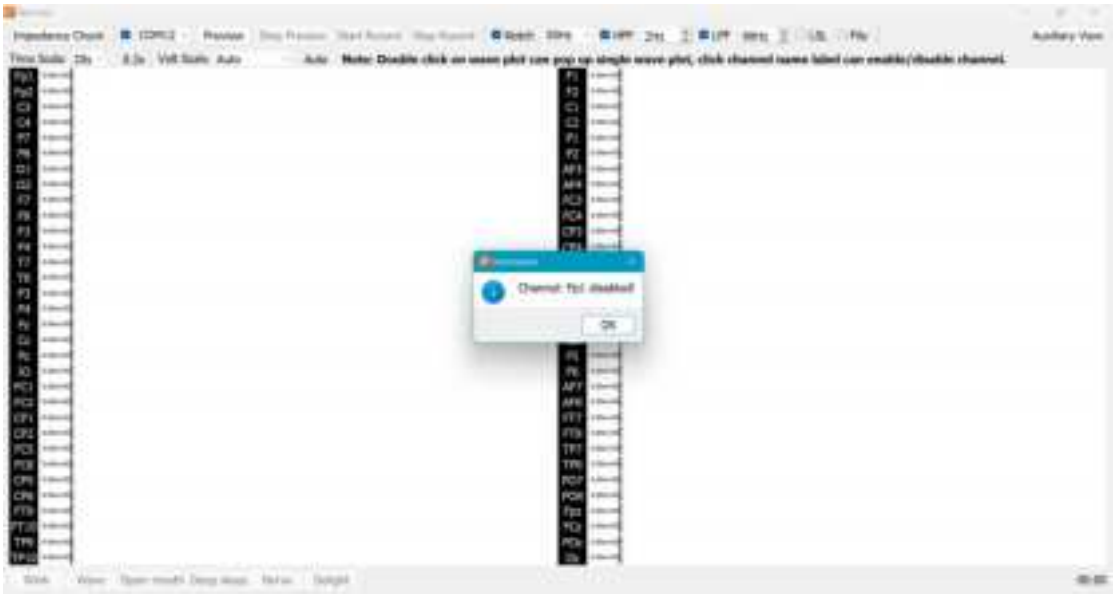


Figure 5.3.2.4-21

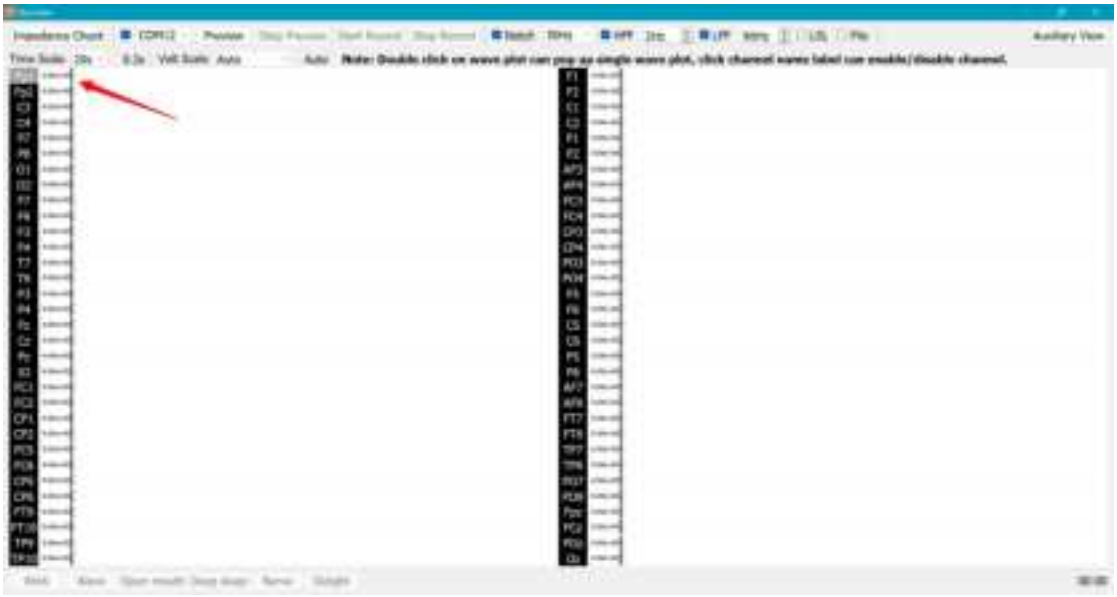


Figure 5.3.2.4-22

3) View the specified channel waveform

Double click on the waveform of the specified channel to open an independent waveform window for the specified channel, as shown in Figures 5.3.2.4-23 and 5.3.2.4-24.

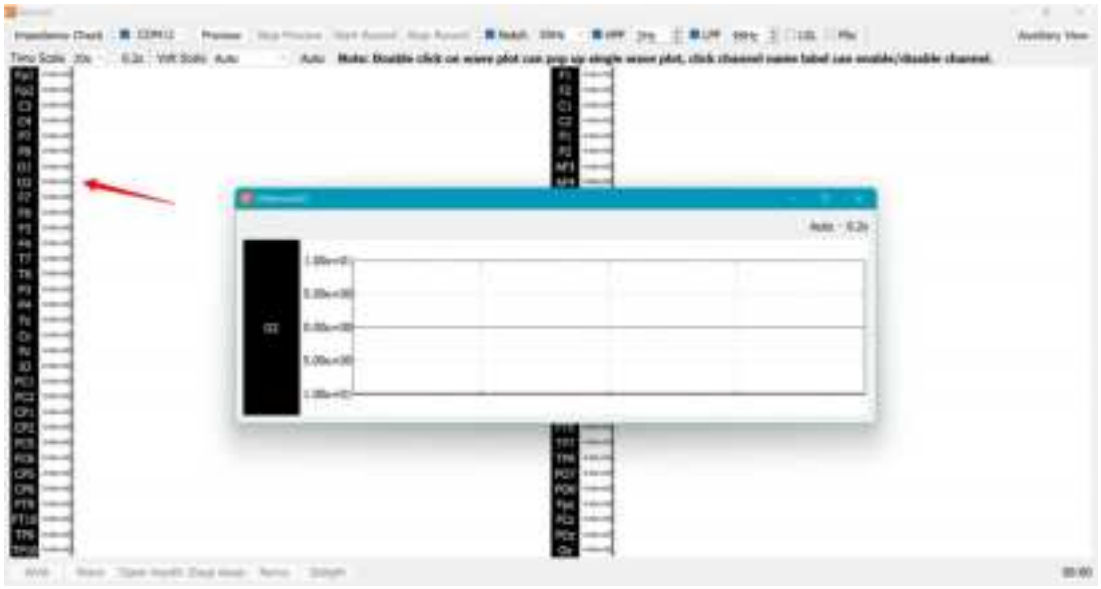


Figure 5.3.2.4-23

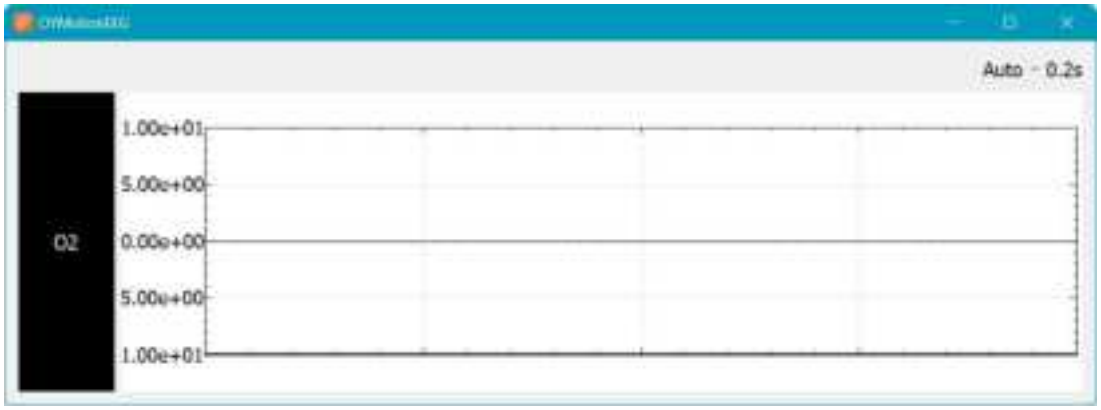


Figure 5.3.2.4-24

4) Filter Settings

On the collection interface, click on the filtering option to set the filtering settings, as shown in Figure 5.3.2.4-25.

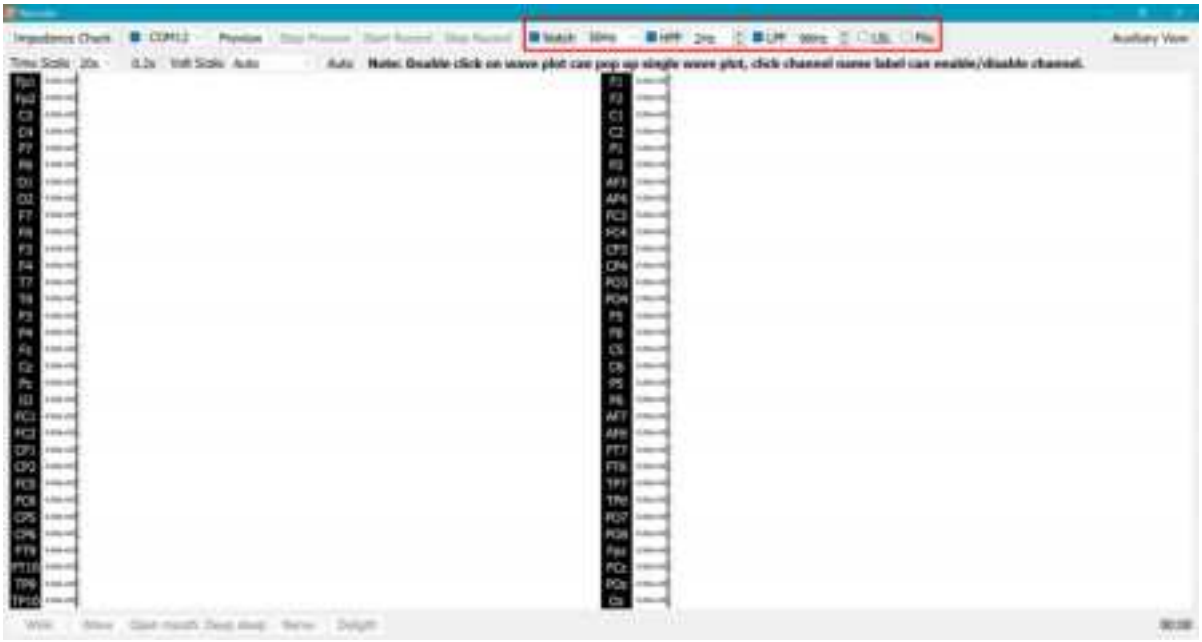


Figure 5.3.2.4-25

There are five filtering options available:

- Notch: It can quickly attenuate the input signal at a certain frequency point to achieve a filtering effect that hinders the passage of this frequency signal. Checking the blue box indicates that this filtering option is enabled and parameters can be selected, as shown in Figure 5.3.2.4-26.

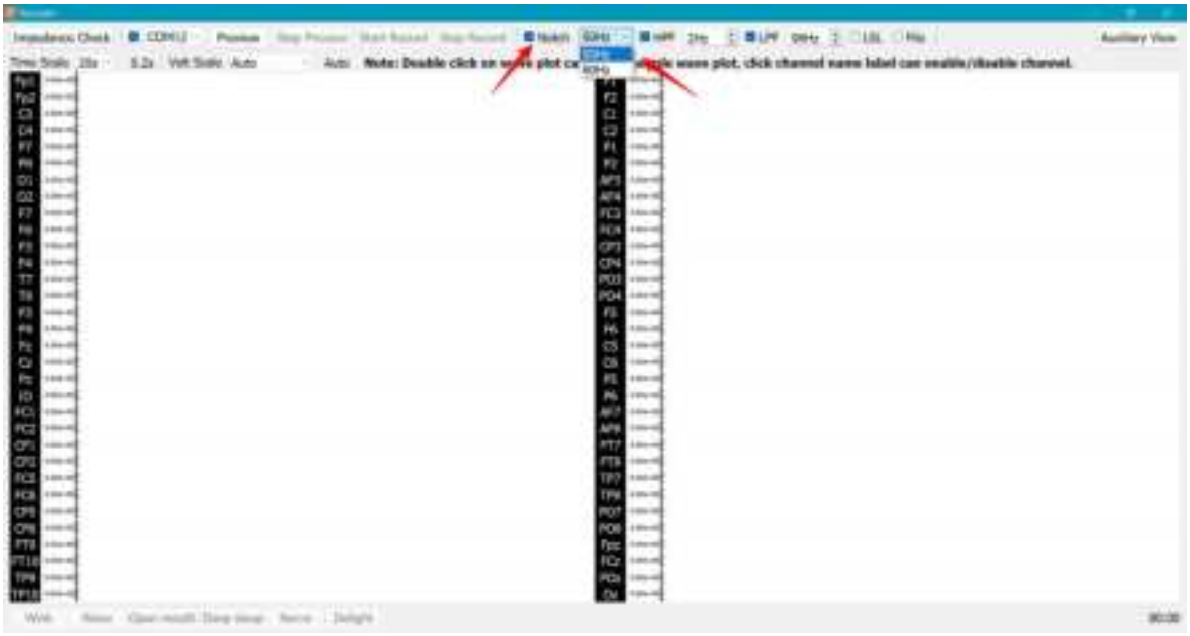


Figure 5.3.2.4-26