

# EEG sensor instruction

ERGOLAB  
INSTRUCTIONS

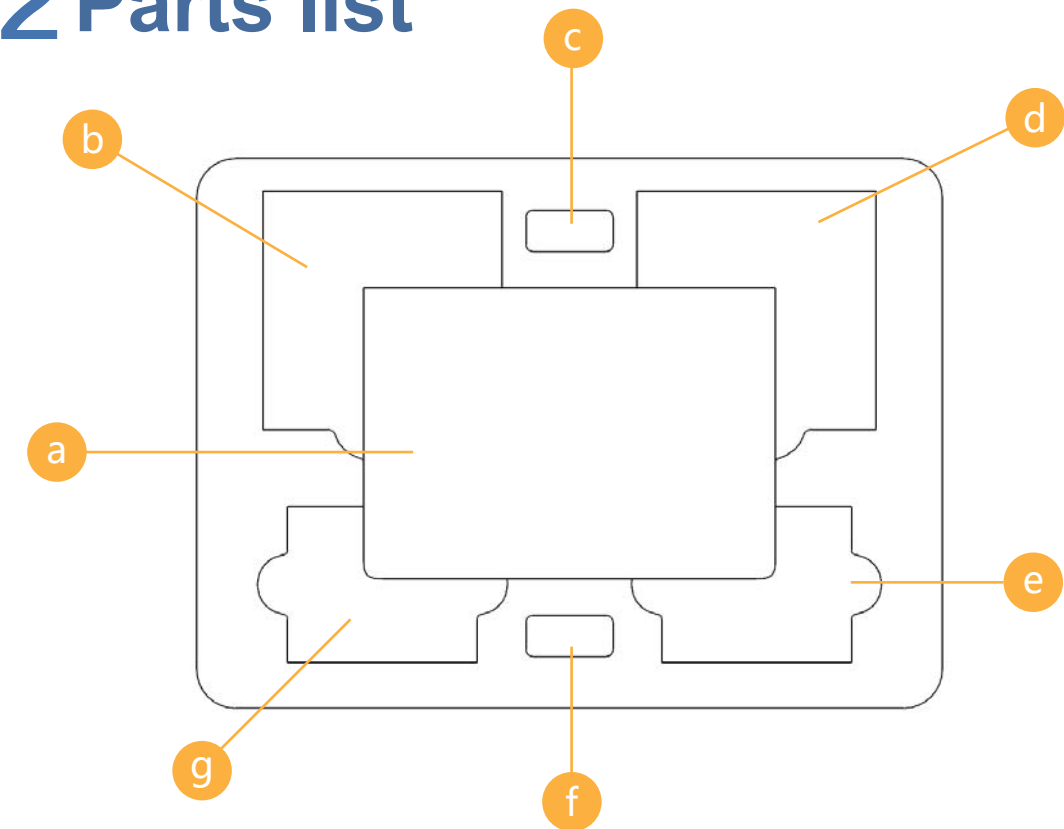
# 01 EEG physiological recoder

The smart wearable EEG sensor has three acquisition modes, including water electrode, wet electrode and dry electrode, which can be selected according to different research environments. The wet electrode sensor adopts a new generation of silver/silver chloride powder sintered electrode. The electrical end is fixed on the elastic cap through the silica gel head, and the other end is connected with the EEG amplifier through the equipment wiring. The electrode positioning is accurate and wearable. At the same time, the system is equipped with professional conductive gel, fast impedance drop, high signal to noise ratio, clear and stable signal. It is suitable for precise detection of EEG, ERP, BCI and other types of EEG research.

## Core advantages

- With three lead numbers of 16/32/64, which can be extended to 128/256 and other higher channels, suitable for different density measurement;
- The equipment selects high-precision components, the system resolution can reach 24bit, single channel sampling rate up to 256Hz;
- Two transmission modes, using Bluetooth 5.0 ultra wideband transmission, or using lead line for data transmission;
- The product can support BIO indicator (HRV/EDA/SKT signal) measurement at the same time, support intelligent insertion detection signal type;
- The sensor adopts portable wearable design, which can be directly attached to the back of the head or carried on the body in the form of a backpack.
- All sensors are uniformly calibrated for NTP network time before delivery to ensure time synchronization of all data collection and eliminate clock differences between different sensors and different computers. At the same time, the sensor and the system will automatically real-time synchronous calibration;
- New appearance design. Material and process upgrade to ensure product comfort and beauty;

# 02 Parts list



a Instructionx1

b EEG capx1

c Receiverx1

d Amplifier、linex1

e Conductive pastex1

f encryptorx1

g Charger、linex1



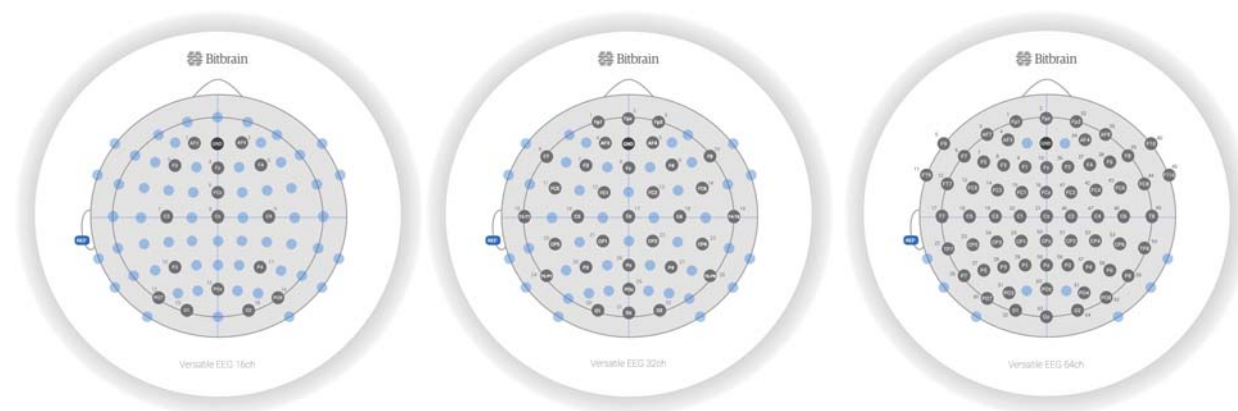
# 03 Manner

- 1. Eeg-wired collection mode: DATA is collected by USB wired mode with fast transmission rate and stable signal, but the transmission distance is affected by the length of lead wire, which is suitable for close experimental research, such as laboratory environment;
- 2. Eeg-wireless acquisition mode: Data is collected in bluetooth wireless mode. The transmission distance is 10 meters, but the transmission rate is relatively slow, which is suitable for long-distance experimental research, such as real field environment.



# EEG derivative

16 dot /32 dot /64 conductive pole position, can be customized during use:



- 16 dot map
- 32 dot map
- 64 dot map

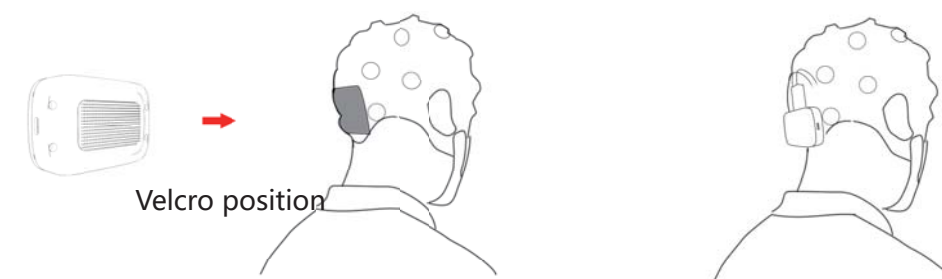
# 04 Operation process

The operation process of EEGSensor includes five main steps: wearing eeg caps, wearing devices, connecting devices, starting devices, and connecting software for data collection. As shown below:

## ① Wearing eeg cap

- Subject to clean head skin (shampoo);
- Use the head circumference measuring tape to measure the head circumference and select the right type of brain. Electric cap (S/M/L), and determine the head Cz midpoint;
- With Cz as the reference point, the eeg cap was placed on the subject's head and the jaw was fixed Support, ensure that each electrode is in vertical contact with the scalp;
- Using a flat-end needle syringe, inject an appropriate amount of guide into each electrode hole in turn. Electrogel (Operation tips: Insert the syringe into the electrode hole and turn it gently Remove the hair from the electrode and inject conductive gel to make it more effective Contact with scalp)

## ② Wearing devices



- 16 dot, 32 dot: stick the amplifier on the back of the EEG cap and insert the EEG lead wire

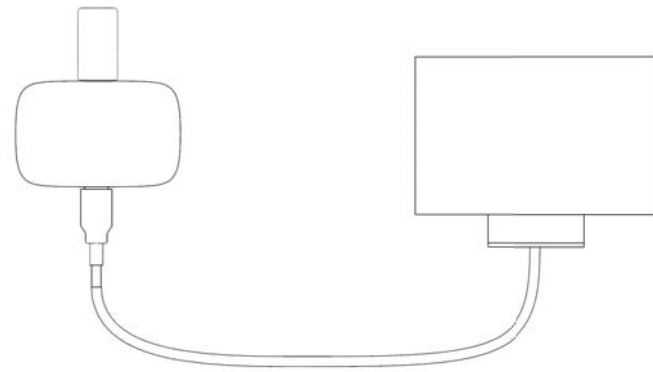


- 64dot: Place the amplifier on your arm and plug in the BRAIN conductance wire



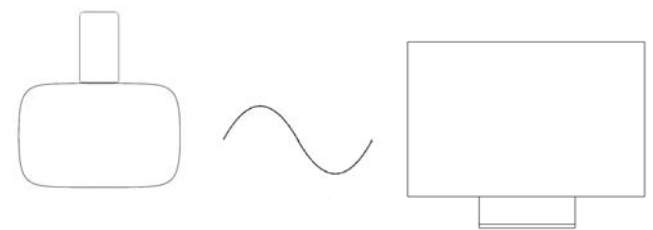
# Operation process

## ③ Connecting devices



- **Wire connection**

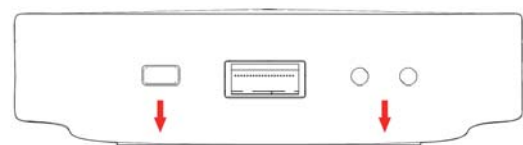
Connect the USB port at the bottom of the device with the port on the computer that receives data software use lead wires to connect



- **Wireless connection**

Insert the equipped receiver into the receiver Computer port for data software

## ④ Starting devices



Switch position    Position of indicator light

Press the bottom switch to start the equipment

## ⑤ Connecting software for data collection



Use EgroLAB software to connect  
And data transfer

# 05 Specification parameter

Collect	Gathering indicators	EEG, PPG, EDA, SKT, FSR, HR	
	Acquisition methods	Wired connection, wireless Bluetooth connection	
	System sampling rate	256Hz	
	System resolution	24bit	
	Acquisition software	Android APP or Windows cross-platform software	
Type-C	Function	Data acquisition    Charging input    Insertion detection	
	External input	PPG, EDA, SKT, EMG, ECG, FSR, HR	
Communication	Communication methods	2.4GHz	
	Transmission rate	2Mbps	
Magnification	500~3000		
CMRR	-110dB		
<b>Single signal parameter</b>			
EEG	Collection scope	-1500 $\mu$ V~1500 $\mu$ V	
	Precision	0.183 $\mu$ V	
	Sampling rate	256Hz	
PPG	Collection scope	0~240bpm	
	Precision	1%	
	Sampling rate	64Hz~128Hz	
EDA	Precision	0.01 $\mu$ S	
	Sampling rate	64Hz~128Hz	
SKT	Precision	0.01 $^{\circ}$ C	
	Sampling rate	64Hz~128Hz	
HR	Precision	1bpm	
	Sampling rate	64Hz~128Hz	
<b>Mechatronics specification</b>			
Sensor specifications	84*54*22mm    59g		
Common charging interface	USB Type-C		
Battery life	>20h		
Communication distance	10m		
Operating environment	Working temperature	-20 $^{\circ}$ C~50 $^{\circ}$ C	Working temperature    10%~90%RH
	Storage temperature	-40 $^{\circ}$ C~50 $^{\circ}$ C	Storage temperature    5%~90%RH

# 06 Indicator status

The following describes the status of sensor LED lights in use, and the corresponding meaning:

Battery indicator light:

- >60%
- 59%~40%
- 39%~20%
- 20%~10%
- <10%

When charging, the battery light flashes at low frequency, and the color is determined by the electric quantity. After charging, the green light is steady on, and the Bluetooth light is off.

After startup, the battery light will be on every 5s and off for the rest of the time:

Bluetooth light color	Bluetooth light status	Meaning
<span style="color: gray;">●</span>	Put out	When the device is in charge mode, the Bluetooth light is off
<span style="color: blue;">●</span>	Normally on	(Wired) The device is disconnected after being turned on
<span style="color: blue;">●</span>	High frequency blinking	(Bluetooth) After the device is turned on, it is in broadcast state
<span style="color: blue;">●</span>	Normally on	It is connected to the receiving end
<span style="color: green;">●</span>	Low frequency blinking	After the software is connected, data is reported
<span style="color: orange;">●</span>	Low frequency blinking	The collection end is abnormal
<span style="color: red;">●</span>	Power off after steady on	When the power is less than 3%

# 07 Indicator

## ErgoLAB synchronization test cloud platform acquisition system

ErgoLAB is a professional and efficient cloud architecture comprehensive platform independently developed by Jifa Technology, which can be applied to scientific research, personnel status recognition, human-information system intelligent evaluation and other directions. It integrates subjective and objective experimental design, multi-equipment synchronous acquisition, data analysis and statistics, as well as AI model training and deployment into a complete test process system.



## EEG/ERP EEG processing and analysis

The system includes a pre-processing module for EEG signals, such as manual correction, data filtering, interpolation of bad conductance, etc. EEG signal data analysis module, including time domain analysis, real-time brain topographic map analysis, PSD analysis, ERP analysis, and so on, and then in-depth analysis of brain signals. To learn more, visit [resources.ergolab.cn](http://resources.ergolab.cn).



This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction

FCC ID: 2ADKA-ERGOLAB-EEG