BRAINBIT BLACK

USER'S MANUAL

Version 1.0

Content

About the guide

The user manual describes in detail the functionality, features and operation of the BrainBit Black device.

For safety reasons, it is imperative that you read this manual before using your BrainBit Black.

Symbols and abbreviations used in this manual

This user manual contains the following symbols:

Warning – situations that could result in injury to you or someone around you.

Attention – situations that could damage the device or other equipment.

Note – recommendations or additional information.

OS **–** *operating system;*
PC **–** *personal computer;*
EEG **–** *electroencephalogram;*
EMG **–** *electromyogram.*

Precautionary measures

This information will help to avoid injury, as well as damage to your device during operation.

- *Do not use damaged chargers (charge cable and power adapter) or loose wall outlets.*
- *Do not connect the charger to BrainBit Black while on the body.*
- *Use only a properly rated power adapter to charge the device. Using an incompatible charger can result in serious injury or damage to the device.*
- *It is forbidden to touch the charger and the device with wet hands during the charging process.*
- *Avoid kinking any cables connected to the device.*
- *Do not place the device on top of or inside heating appliances (microwave ovens, stoves, etc.). Battery may explode if heated.*
- *Keep your device away from children and pets.*

- *Do not disassemble or repair the BrainBit Black by yourself. In the event of a product failure, contact the manufacturer's technical support service.*
- *It is not recommended to store the device with a discharged battery for a long period of time. Failure to follow the recommendations may result in damage to the battery! If you plan to store the device for a long time without active use, it is recommended to fully charge it.*
- *Do not try to forcefully press the on/off button.*
- *Do not allow moisture to enter the connectors of the device and accessories, as this can lead to clogging or oxidation of the connector contacts and damage to the device. The warranty does not cover such faults.*
- *Temperatures that are too high or too cold can damage the device*

and negatively affect the capacity and life of the battery.

- *Disposal of this device is carried out at special collection points. Contact your local authority for disposal instructions.*

Device information

General information about the product

The BrainBit Black device is designed for use with mobile and desktop applications in the Life / Health Tracking area. BrainBit allows real-time recording of biopotentials generated by the brain, chewing muscles and eye movements.

For the BrainBit Black device, software development tools (hereinafter referred to as software) – SDK have been created. The SDK is intended for use by software developers for operating systems (hereinafter referred to as OS) Android, iOS, MacOS and Windows.

This software development component is a simple tool for creating applications for:

- biofeedback;
- relaxation and meditation;
- assessing the quality of sleep;
- control of the safety of drivers;
- concentration of attention;
- industrial safety;
- BCI (brain-computer interface);
- neuromarketing;
- sports and fitness.

Specifications

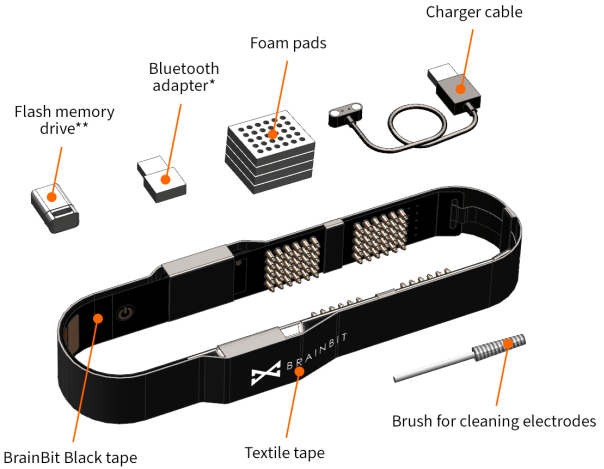
Linking the product with an external device	BLE 4.2
Registered signals	EEG
The number of channels for recording the EEG signal relative to the reference	4
Measured voltage range (peak-to-peak) for each channel	± 0,4V
Noise level of each EEG channel at short-circuited inputs	not more than 4 μV peak to peak
Noise level of EMG channel at short-circuited inputs	not more than 4 μV peak to peak
Battery charge current	100 mA
Battery full charge time	up to 3 h
Continuous work time	up to 15 h
Wireless distance range	5 m

Specifications for the charger

Input parameters: 100-240 VAC (alternating current), 50/60 Hz, 0,1-0,5A.
Output parameters: 5V, DC (direct current) 0,5A.

Contents of delivery

Name of component	Quantity
BrainBit Black tape	1
Textile tape	1
Bluetooth adapter*	1
Charger cable	1
Foam pads	4
Brush for cleaning electrodes	1
Flash memory drive**	1



** Supplied as an option for working with a PC.*
*** Comes with PC software.*

Marking

BrainBit Black is marked with the following information:

- manufacturer's name or trademark;
- product name;
- serial number.

The label applied to the package contains the following information:

SN – serial number;

 – manufacturer;

REF – catalog number;

LOT – batch code;

 – manufacturing date;

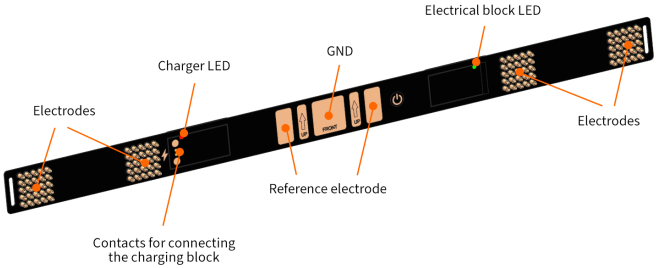
 – refer to instructions for use;

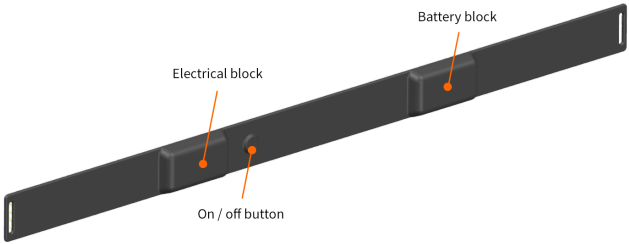
 – disposal of electrical and electronic equipment;

 – european certificate of conformity.

Beginning of work

BrainBit Black device appearance





Indication and operating modes of the device

The indicator is off – the device is turned off.

To turn off the device, press and hold the on/off button for 2 seconds.

The indicator is on – the device is turned on and in standby mode.

The indicator flashes in quick short flashes – the device is in pairing mode with an external device.

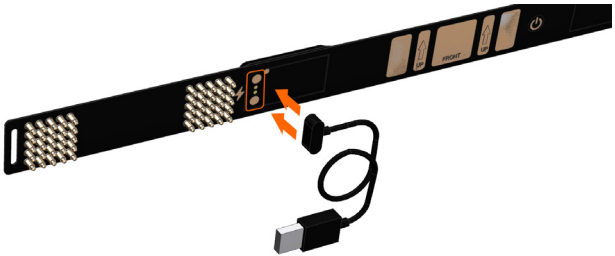
The transition to this mode is carried out from the standby mode. To enter pairing mode with a device, press and hold the on/off button for 4 seconds. Pairing mode is carried out once before using the device for the first time or when changing an external device.

The indicator blinks with a long flash once every 2 seconds – the device is in the signal acquisition mode.

Battery charge

Charge the battery before using the device for the first time or after an extended period without using the device.

Follow these steps to charge the internal battery:
1. Connect the supplied charger cable to the power adapter (charger).
2. Connect the charge cable to the device.
3. Plug the power adapter into an electrical outlet.



Use only a charger with the correct specifications. Using an incompatible charger can result in serious injury or damage to the device. Use only the cable supplied with the device to charge the battery.

After the battery has finished charging, disconnect the charger cable from the power source.

Display modes during battery charging

The indicator is off – the charger is not connected to a power source.

The indicator blinks red – the device is in battery charging mode.

The indicator lights up red – battery charged.

Platform Requirements

OS	Requirements
Android version not lower than 5.0	Support for BLE version at least 4.2
iOS version 12	
MacOS version 10.14 or higher	
Windows 10 with build version 1803 or higher	

When working with a personal computer (hereinafter referred to as a PC), it is recommended to use an external Bluetooth adapter version 5.0

Connecting your BrainBit Black device to an external device

To work with BrainBit Black, you need to connect to an external device.

Connecting to a mobile device

The mobile device must have the BrainBit Black app installed. If the app is

not installed on your mobile device, open the App Store or Play Store and download the BrainBit Neurofeedback app.

Connection procedure

1. Run the installed application.

For correct operation, give the BrainBit Neurofeedback application access to photos, media, files on the device and geolocation.

2. Choose the most convenient method of authorization in the application. The authorization in the application is carried out only when the application is launched for the first time.
3. Turn on your BrainBit Black by pressing and briefly holding (two seconds) the On/Off button.
4. Place the BrainBit Black over your head, considering:
   - the location of the reference and common electrodes on the forehead;
   - the location of the arrows in the area of the common electrode.

BrainBit Black recommended for 49-62 cm head.

Before using the BrainBit Black device, it is recommended to degrease the forehead (where the common electrode meets the reference electrode) and all electrodes on the device. This will allow you to receive a high-quality signal.

5. Make sure the electrodes at the back of the head and above the ears have adequate skin contact.
6. If necessary, fit the foam pads on the BrainBit Black tape over the electrodes (4 pcs.). They reduce the pressure of the electrodes on the head.

To improve signal quality, it is recommended to install wet foam pads.

Taking care of your device

Cleaning the BrainBit Black Tape

It is recommended to wipe the BrainBit Black tape after each use with a damp, soft, lint-free cloth. Clean with a mild soap solution if necessary.

Cleaning and disinfection of electrodes

Use the supplied brush and disinfectant or alcohol to clean and disinfect the electrodes.
1. Pour the disinfectant into a small container.
2. Wet the brush in liquid, clean the electrodes between the contacts.
3. Wipe the electrode with a soft, dry, lint-free cloth to remove any debris.

Do not use abrasive detergents or tools to clean the electrodes.

Cleaning the textile tape

It is recommended to periodically wash the textile tape in warm water with the addition of detergent. Blot the textile tape with a dry cloth and leave it flat until it dries completely.

Possible malfunctions and methods of their elimination

Please read the list of common problems and solutions before contacting technical support.

Malfunction	Troubleshooting methods
The device does not turn on	*The device may be discharged.* 1. Connect the supplied charger. 2. Make sure the device has started charging. The indicator blinks red. 3. Wait until the device is fully charged. The indicator lights up red. 4. Turn on the device by pressing and holding the on / off button for 2 seconds.
When the charger is connected, the indicator is off	*The electrical outlet may be defective.* 1. Make sure the device is plugged into a working electrical outlet. *The power adapter may be defective.* 1. Replace the power adapter with the correct specification. *The charge cable may be damaged.* 1. Check the charge cable for visible kinks or cuts. 2. Replace the charge cable.

The device does not connect to a mobile device or PC	*The appliance may be turned off.* 1. Make sure the device is turned on. The indicator on the device is green. 2. Search for BrainBit Black again. *There may be problems pairing your device.* 1. Put your BrainBit Black device into pairing mode. For thiso: • turn off the device; • turn on the device by pressing and holding the on/off button for 2 seconds; • press and hold the on/off button for 4 seconds to enter pairing mode. Indicator blinks in quick short flashes. 2. Enter Bluetooth setting mode. Make sure Bluetooth is turned on. 3. Select BrainBit Black from the available devices. 4. Pair with your device.

Loss of communication between devices/loss of data	*Unstable communication between BrainBit Black and mobile device or PC.* 1. Check if the BrainBit Black device with a mobile device or PC is in line of sight. Line of sight must be maintained between devices. This is because the BLE radio uses a 2.4 GHz radio frequency. At this frequency, radio waves do not bend well around obstacles. 2. When working with a PC, connect the supplied Bluetooth adapter and disable the built-in. 3. Check if any other products, especially multimedia (headsets, etc.), other than BrainBit Black, are connected via Bluetooth to the mobile device or PC. The channel bandwidth is divided among all connected devices. Consequently, the fewer devices are using the channel, the more opportunities the BrainBit Black device has to transfer quality data over the BLE radio channel. 4. Reduce the distance between your BrainBit Black and your mobile device. The maximum distance at which devices can operate is highly dependent on external factors such as interference, interference from radio sources operating on the same frequency as BLE (2.4 GHz), etc. Therefore, it is not possible to unambiguously indicate at what distance the stable operation of the radio channel is possible. 5. Make sure there is no metal structure nearby. Metal is impervious to radio waves, and metal objects can distort the characteristics of the transmit-receive paths of the BLE radio channel.

The interelectrode resistance is higher than the permissible values of the norm in all channels. The indicator of the quality of contact of the electrode with the skin is red	*Possible poor contact with reference or common electrode.* 1. Treat the contact area with an alcohol solution.
The interelectrode resistance is higher than the permissible values of the norm in some channels. The indicator of the quality of contact of the electrode with the skin is red	*Possible poor contact of the electrode with the scalp.* 1. Part the hair where the electrode will be applied. 2. Treat the contact area with alcohol. 3. Soak the foam pads in water and place them on the electrodes.

Disposal

Do not dispose of your BrainBit Black with household waste. Disposal of the device is carried out at specialized points in accordance with local legislation.

Manufacturer’s warranty

The warranty period is 12 months.

The guaranteed shelf life of the product is 6 months from the date of manufacture.

In the event of repairs or elimination of defects within the established warranty periods, these periods are extended by the time during which the product was not used due to discovered defects or repairs. When replacing the product as a whole, the warranty period is calculated anew, and is counted from the day of replacement.

Warranty repair of the product is carried out by the enterprise (manufacturer) at its expense. Post-warranty repair is carried out by the enterprise (manufacturer), and the cost of repair is paid by the consumer of the product.

If the product breaks down during the warranty period as a result of improper operation, then the cost of repair is paid by the consumer of the product.

FCC Warningÿ

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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