

neurogear[®]

premium neuromodulation



BBB

neurOgear®

Premium Neuromodulation

Non-Invasive Stimulation

Neuromodulation –dubbed as “Brain Stimulation”– is a technique that improves the function of certain parts of a brain by applying a force such as magnetic field or direct current to the area where brain function is stagnated. It has been scientifically proven to help individuals and to enhance the brain’s ability.

In 2019, BBB developed neurogear®, a medical grade neuromodulation device, which activates brain nerve cells without physical contact,, thanks to specifically targeted low intensity pulsed magnetic fields. Selecting the target of activation is possible by the QUADRUPOLE electromagnet design, the creation of exclusive technology behind neurogear®. It features various functions from emotion regulation, concentration enhancement and cognitive function improvement.



Technology Description: Effect of Magnetic Field

Neuro Activation Principle:

When a magnetic field is applied to the brain, an electric current or electric field is generated in the brain by electromagnetic induction which stimulates neurons. When a current is applied through the stimulating coil, a variable magnetic field is produced. As a result, a reverse eddy current or an electric field is induced to stimulate nerve cells and an action potential is generated.

A Gentle Magnetic Pulse:

The neurogear® uses precise, low intensity magnetic pulses to stimulate the brain without a physical sensation. The device helps to synchronize the brain with alpha waves of 10Hz, an ideal frequency that appears in a harmonious brain, which enhances concentration, wakefulness, learning ability, and a calm mind.



Technology Description:

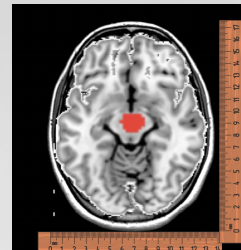
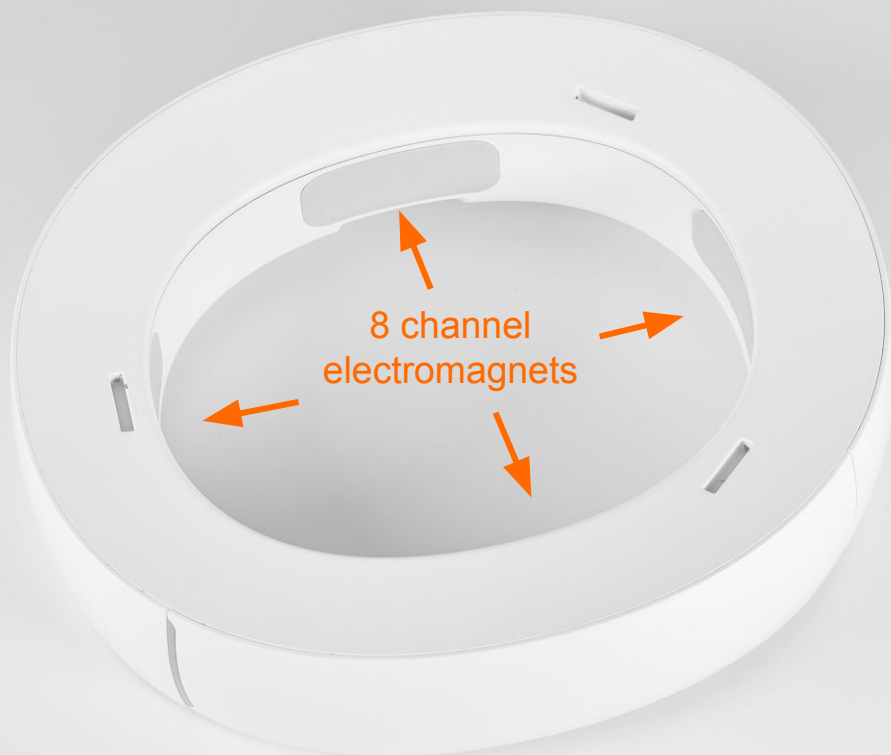
Quadrupole Electromagnetic Structure

DBS:

Deep Brain Stimulation (DBS) is a surgical treatment that transplants a neurostimulator or brain pacemaker into the brain. It is a type of electrotherapy that uses an electrical stimulator to send electrical stimulation to a specific area of the brain. The FDA has approved DBS for the treatment of hysterics, Parkinson's disease, and dystonia. It is used to alleviate a tremor in patients with Parkinson's disease that cannot be controlled with drugs.

Quadrupole Electromagnetic Design:

The neurogear® has implemented a technique that can safely stimulate deep brain regions in a non-invasive way rather than traditional surgical procedures. The round headgear has eight electromagnetics in total which are bi-directional. Through continuously changing the magnetism of each electromagnet to N and S pole, it builds up a magnetic field stimuli on the specific target region. The result is activated nerve cells of the target regions. Stimulating the deep brain is possible by operating eight electromagnetics at the same time, so that meaningful stimuli are loaded on the deep brain regions.



Description:

5 Modes, 5 Types of Neuroscience



"Our brain circuits are an interconnected network like an environment, and they are also very vulnerable ecosystems at times. That's why depression matters."

- Alex Korb , < The Upward Spiral >

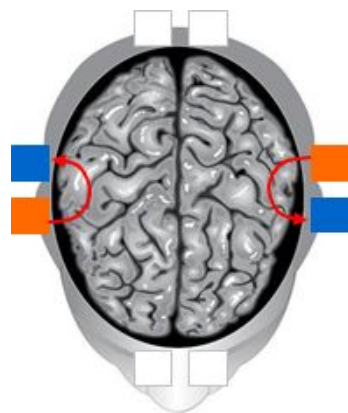
Description:

5 Modes, 5 Types of Neuroscience

1. De-Stress Mode

Broken balance between right and left brain can lead to feelings of depression, anxiety, and emotional instability. An unstable brain degrades the brain center which controls emotions by disturbing the exchange of electric signals and fails in the temporal lobe which associates with cognitive regulation.

The neurogear® introduces De-Stress Mode to restore the balance between right and left brain. The mode changes N and S pole of four electromagnetics (two in the left and right, respectively) out of eight. Repeating the process concentrates electrical activities on “central part of the temporal lobes.” Amygdala, thalamus and hippocampus are activated, and the brain balance is recovered.



2. Relax Mode

The awake brain has more than 10hz of brainwave, while the frequency decreases to 5hz during periods of sleep. All areas of the brain have this in common, and the cycle repeats every 1 to 2 hours.

In Relax Mode, the magnetism of all 8 electromagnets repeatedly goes back and forth between N and S pole, and magnetic field stimulation is transmitted to the entire brain. During this time, the magnetic field resonates with 6 to 10hz oscillations – which is similar to a sleeping brain wave state, so the brain can rest as if it's sleeping.



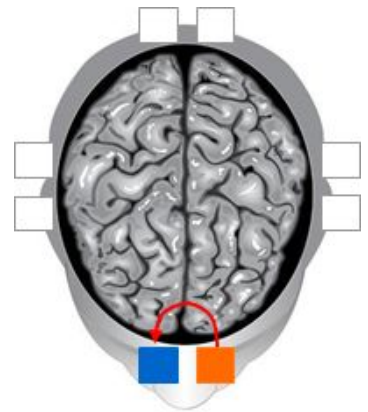
Description :

5 Modes, 5 Types of Neuroscience

3. Focus Mode

The frontal lobe is responsible for a human's most complex and higher-order thinking skills such as judgment, planning, and logic skills. An impaired frontal lobe reduces impulse control, memory and planning skills. In severe cases, it can lead to health conditions like ADHD or Alzheimer's disease.

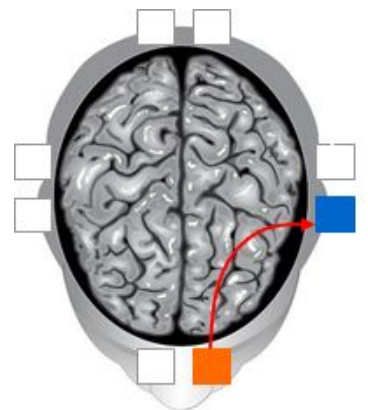
In Focus Mode, the magnetism of two electromagnets on the forehead repeatedly changes its N and S pole to concentrate significant stimulation on the target area, the frontal lobe. Through this process, activated frontal nerve cells elevate judgement, computing power and the ability to control behavior.



4. Memory Mode

Among frontal lobes, the left frontal lobe is closely involved in long-term memory formation and memory retrieval. Sluggish activity in this part brings a loss in memory recovery and retention, which may result in various forms of memory impairment.

In Memory Mode, front and left electromagnets operate by N and S pole, respectively, and a magnetic field is concentrated on the "left frontal lobe." Through this process, the left frontal lobe responsible for memory can be activated to improve memory and cognitive ability.



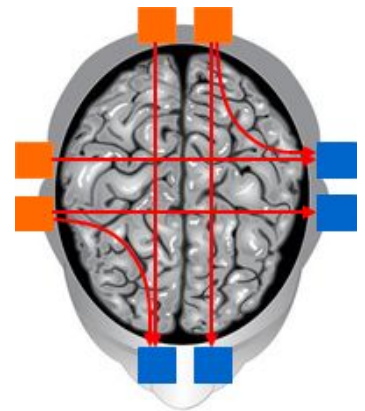
Description:

5 Modes, 5 Types of Neuroscience

5. Boost Mode

Creativity is demonstrated when a strong connection has made between frontal lobe (in charge of higher cognitive function) and the perceptual domain. neurogear® improves creative thinking which incorporates the audiovisual sense by enhancing connectivity of the temporal lobe (responsible for hearing) and occipital lobe (responsible for vision).

In Boost Mode, all eight electromagnets are activated and the connectivity among the frontal-temporal-occipital lobes are boosted, facilitating synesthesia thinking in which senses are integrated, and expressing creativity. Boost your artistic creativity, go further in mathematics and science, and improve your problem-solving ability and insights by thinking outside the box.



Soften the stress
Restore balance
Feed your focus
Secure the scattered
Deliver more

Time for Relaxation



“Depression is miscommunication between brain circuits.”
- Alex Korb , < The Upward Spiral >

Headset and Cradle. That's it.



●
headset

●
electro-magnet 4-way, 8 channel

●
head strap

●
led

●
headset cradle

●
touch screen control panel



Specifications:



Type

Electro-Magnetic Stimulation

1 Headset, 1 Controller, 1 Cable

Dimensions

Headset + Controller

11.5 (w) X 13.4 (d) X 7 (h) in

(290 (w) X 340 (d) X 180 (h) mm)

Weight

Headset 3.75 lbs (1.7 kg)

Controller 2.75 lbs (1.25 kg)

Control System

Android OS 7.0

Power

AC Adapter Input

100-240VAC 50-60Hz 1.4A

AC Adapter Output

24V DC - 2.71A

Amplitude

0.1 mT - 10 mT

(100 μ T - 10,000 μ T)

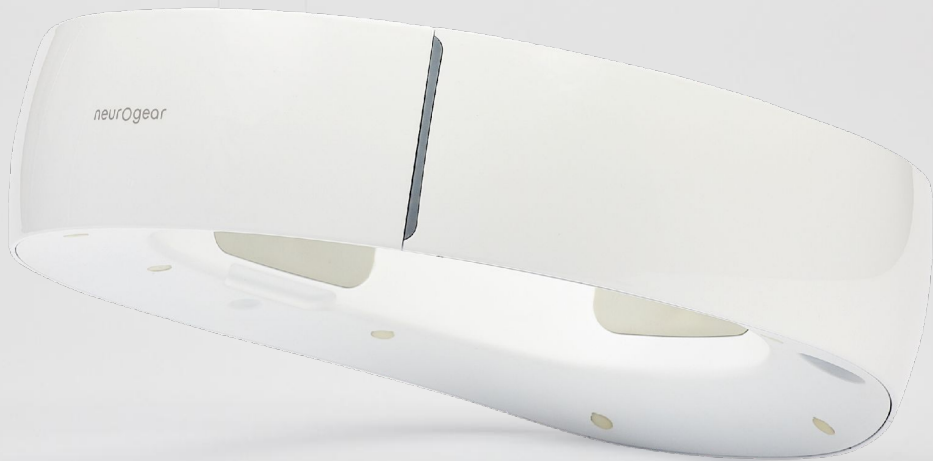
Frequency Range

1-30Hz

Manufactured

Korea

**NO SOUNDS
NO VIBRATIONS**



BBB

FAQ:

Can I use neurogear at home?

Yes! neurogear offers pre-set modes for everyone such as stress relief, mood control, improvement of cognitive function and enhancement of creativity

Where can neurogear be used?

Since neurogear is made for everyone, you can use it for various purposes and in diverse places. You can use it in a company welfare program for workers to take a break, relieve the stress of daily life, and get back to work being more focused. You can have neurogear at cram schools or other educational institutions to advance students' learning ability. It can also be used in social welfare facilities and nursing homes to improve the cognitive abilities of the elderly.

What are the technical advantages of neurogear and as a non-invasive neuromodulation device?

There are a variety of non-invasive neuromodulation devices in the market. After 20 years of active research, various products have been developed. Non-invasive neuromodulation using magnetic fields, current, and ultrasonic wave are widely used in clinical trials. neurogear has been developed using clinically-proven safe magnetic field technology and is distinguished from other devices with its small and light body, and multiple coils for maximum effect. In addition, there is no auditory or physical stimulation so that you can stay comfortable during operation.

How does the direct magnetic field in the head affect the body?

The magnetic field strength used by neurogear is very low and can't be felt by most individuals. It is harmless to human bodies if you keep the basic use time of 20 minutes, once a day.

Why is it effective even though it is much weaker than clinical TMS?

The NASA irradiated micro-magnetic fields directly to nerve cells and demonstrated cell activation in early 2000. Since then, many micro-field studies have reported effects on nerve cell activation, cognitive function improvement, and depression mitigation.

What is the technical difference with tDCS?

neurogear can expect high signal transmittance without physically bothering users because it uses magnetic fields. The transcranial direct current stimulation (tDCS) flows current to the skin. In order to make the current flow, a sponge soaked in saline solution is required to reduce the skin resistance. Users may feel discomfort, irritation, and experience side effects such as skin burn.

Is neurogear, a medical device for clinics and can it be used in conjunction with medication?

neurogear can be used by medical professionals in clinics, or at home. A medical professional can direct individuals to use the neurogear as a complementary therapy together with medication.

Is neurogear FDA registered?

The neurogear is a Class 1, FDA registered product.

FAQ:

Does neurogear have an immediate effect? Is there a cumulative effect?

There is immediate improvement, but if you continue to use it for five weeks or more, 10-30% of improvement is expected depending on the individual. In cognitive function testing of five participants conducted by the Brain Imaging Center at the California Institute of Technology, it was shown that the error rate reduced by over 30%.

Can it be used for teenagers?

No side effects were reported in a clinical study of 1,034 adolescents aged between 11 and 18 years. Neuromodulation using magnetic fields is more suitable for pregnant women and adolescents who may be sensitive or reluctant to other forms of therapy.

What is the technical principle behind Focus Mode (increasing concentration) of neurogear?

Unlike conventional neurofeedback products that synchronize the whole brain with sound and light, neurogear uses a magnetic field of specific frequency to selectively activate areas related to cognitive function and learning ability. The optional activation maximizes the effect while minimizing unnecessary irritation.

Does Memory Mode (reinforcing cognitive function) of neurogear improve impaired functions? Or does it have preventive effect?

neurogear helps to improve damaged cognitive function. You can expect 2-5% of immediate improvement in cognitive function, and the figure rises to 10% if you continue to use more than five weeks. A long-term study of 307 individuals confirmed that the effect lasts for up to 16 weeks after 4-6 weeks of use.

Are there any other techniques to stimulate deep brain in a non-invasive way?

Among existing TMS, there is Deep TMS. It is a helmet type that uses a coil which wraps around the entire head to target the deep brain. Alternatively, neurogear uses micro-magnetic fields and have a small and light body to mitigate psychological burdens of the user.

Can't I use existing TMS to stimulate deep brain?

TMS is designed to stimulate only one part of a brain with a single coil. neurogear uses multiple coils to stimulate deep brain. BBB is currently pending a patent on coil placement.

What is the primary strength of neurogear?

It's safe to use with low risk of side effects, easy to use, affordably priced compared to other forms of brain therapy and has no physical stimulation so that users can comfortably receive therapy.

About our company:

BBB

- 2021.05 neurogear® product launch
- 2019.04 neurogear® developed
- 2018.10 Raised \$15 million in Series B round
- 2018.09 Selected as a National Project Supervision Institution “Bio Big-Data”
- 2017.11 Launched elemark™ dual check in Korea
- 2017.08 Signed OEM contract with GenBody Inc. for supply of rapid test readers for arboviruses and DOA
- 2017.06 Signed MOU with Korea University Guro Hospital to develop next-generation immunodiagnostic kit for cancer, myocardial infarction, and chronic disease
- 2017.06 Signed MOU with Pusan University to construct infrastructure to commercialize research
- 2017.04 Signed OEM contract with Philosys Inc. for supply of glucometers for hospital use
- 2016.08 Signed agreement with KT for use of elemark™
- 2016.08 Raised \$5 million in Series A round
- 2016.02 Signed strategic MOU with NOOM inc. targeting the mobile healthcare market
- 2015.10 Winner of Zhongguancun Innoway “2015 Demo The World” in Smart Hardware Sector
- 2015.08 Established regional office at NASA Ames Research Center, Silicon Valley, U.S.A.
- 2015.05 Tech-In-Asia Award Winner @beGlobal Seoul 2015
- 2015.04 Signed OEM contract with GreenCross MS for supply of in-vitro diagnostic devices for hospitals
- 2015.01 Joined HAX Batch 6 program
(HAX, Hardware startup accelerator based in Silicon Valley and Shenzhen)
- 2014.10 Founded headquarters in Korea





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