USER GUIDE

NanoHARD

LAST UPDATE ON DECEMBER 22, 2016

WWW.GATEE.EU

GATE

GATE Menet, Wojtak Sp. J. does not take any responsibility for damages, injuries and accidents resulting in the use of this product or the use of Air Electric Gun with the product installed.

NOTICE

Information contained in this document is subject to updating without notice.

FOR YOUR OWN SAFETY, PLEASE READ THIS USER MANUAL CAREFULLY BEFORE INSTALLING THE DEVICE

DANGER!

Caution must be exercised to prevent short circuiting the battery as the consequences can be very dangerous.

FOR YOUR SAFETY

We recommend that this product should be installed by an experienced airsoft service.

WARNING: Before starting installation process, please ensure that your AEG is empty and there are no BBs inside.

WARNING: Always use a fuse between the battery and the mosfet.

WARNING: Incorrectly connecting positive and negative battery terminals will cause immediate damage to the unit and it can lead to fire.

WARNING: To use the Battery Protection function (p.6), it must be enabled before (p.10).

NOTE:

Please check if you have downloaded the latest manual from the Technical Support section of our website: **www.gatee.eu**. The Product Warranty Form is also available there.

In case you have any difficulties while installing or using this product, we recommend to email us at **support@gatee.eu.**

PRODUCT DISPOSAL INSTRUCTIONS

The symbol shown here means that the product is classed as Electrical or Electronic Equipment and should not be disposed with other household and commercial waste at the end of its working life. The Waste of Electrical and Electronic Equipment (WEEE Directive 2012/19/UE) has been put in place to recycle products using best available recovery and recycling techniques to minimize the impact on the environment. Purchasers shall take any old electrical equipment to waste recycling public centers or points of sale.

CERTIFICATE OF CONFORMITY

GATE Menet, Wojtak Sp. J. hereby declares under our sole responsibility that the product GATE NanoHARD is in conformity with the essential requirements of the following Directives:
EC DIRECTIVE 2011/65/EU
This product has been certified as RoHS Compliant.

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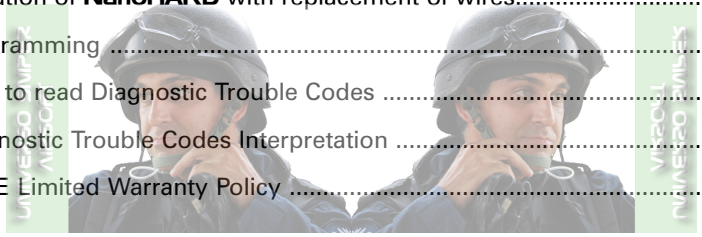


01. OVERVIEW

NanoHARD is a multifunctional programmable AEG Controller. It has 8 functions. Thanks to its special coating, it is resistant to atmospheric conditions (Military Specification MIL-V-173C). Battery protection supports: Li-Po 7.4V / 11.1V / 14.8V. You can also disable the protection and use other batteries.

KEY FUNCTIONS

MOSFET

MOSFET

Do you want to achieve higher rate of fire and faster trigger response? Are you planning power upgrade of your rifle? In that case, you need a MOSFET.
It targets the energy from the battery directly to the motor, bypassing the mechanical trigger contacts. As a result, you gain a higher rate of fire of the rifle and faster trigger response, and the contacts are protected against burn out.

BATTERY PROTECTION

Protection against Over-Discharge of Battery (UVP Protection)

Modern LiPoly batteries are very sensitive to over-discharge. If you do not want to damage the battery and you care about its service life, this protection is indispensable. The microprocessor constantly monitors the battery voltage. When it drops down to a critical level, it will not permit firing.

DEBOUNCING

Debouncing (Digital Interface)

This provides full compatibility with the micro-switches. It is fully resistant to contact bounce. You gain a bigger ROF, a faster trigger response and your MOSFET is less prone to heating.

3rd GEN MOSFET

3rd Generation MOSFET

The usage of modern transistors and microcontroller has enabled us to create the smallest and most reliable AEG Controller in the market.

14.8V Li-Po Ready

14.8V LI-PO Ready

The system can be used with batteries up to 14.8V LI-PO. Minimum operating voltage is 3V and maximum voltage is 17V.

COATING

Coating

Thanks to its special conformal coating, it is resistant to atmospheric conditions (Military Specification MIL-V-173C).

ON/OFF ACTIVE BRAKE

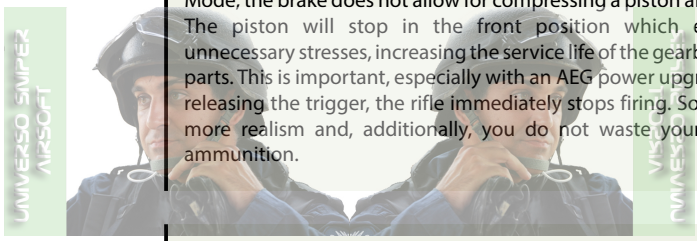
ON/OFF Active Brake

The Controller provides you with the opportunity to decide if you want to use the Active Brake function. If you do not need this, you can turn it off easily. It will lead to improving the lifespan of your motor.

ACTIVE BRAKE

Active Brake

Do you care about realism? Would you like to increase the life of the gearbox? Does your rifle have such a high rate of fire that you are not able to make a single shot? The Active Brake sorts things out. In SEMI Mode, the brake does not allow for compressing a piston after a shot. The piston will stop in the front position which eliminates unnecessary stresses, increasing the service life of the gearbox and its parts. This is important, especially with an AEG power upgrade. After releasing the trigger, the rifle immediately stops firing. So, you gain more realism and, additionally, you do not waste your precious ammunition.



SMART FUSE

Smart Fuse

We have developed an electronic fuse with an accurate current sensor. A combination of current, voltage and temperature measurements makes your AEG installation highly reliable. It protects the MOSFET against overheating, overloading and short-circuiting. If your airsoft gun becomes jammed, the function protects the motor and battery against damage.

BUILT-IN SELF-TEST

Built-In Self-Test

It allows you to quickly check whether the AEG Controller works properly. If you have problems with your AEG, the BUILT-IN SELF-TEST allows you to check that the problem is not caused by the Controller.

INCLUDED IN THE KIT:

01 **NanoHARD**

02 **Additional kit of Deans-T Connectors**

03 **Double signal wire for trigger contacts**

04 **Single signal wire for trigger contacts**

05 **Programming button**

06 **Jumper (2pcs.)**

02. INSTALLATION

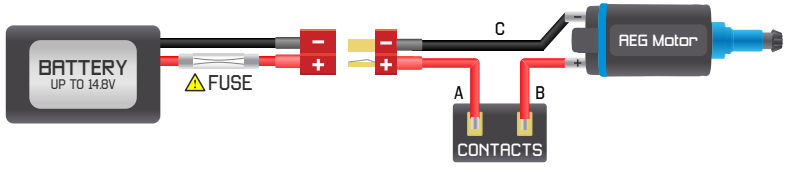


FIG 1. STANDARD AEG WIRING SCHEME

To adapt the standard AEG installation to work with **NanoHARD** it is necessary to get to the trigger contacts. In case of GB v2 contacts these are located inside a gearbox. With a version 3 gearbox, the installation will be easier because the contacts are on the outside of the gearbox. Please consult a local airsoft technician if you have never disassembled a gearbox before or if you have any installation concerns.

DANGER! **Incorrectly connecting positive and negative battery terminals will cause immediate damage to the unit and it can lead to fire.**

a) Installation of NanoHARD without replacement of wires. Using this method, the original wiring is kept intact, and the connections are modified. Referencing Fig 1., de-solder A wire from the one of the trigger contacts and then solder it to the B wire. It does not matter which wire you disconnect from the trigger switches, just join the two wires together at one terminal. In the place of the A wire, solder the additional single signal wire (No. 04 – provided in the kit). The GATE wire is very thin because it handles very low current and it is only used for switch-detection. Now connect the device between the battery and AEG. Do not forget about the signal wire. Connect it to the top pin.

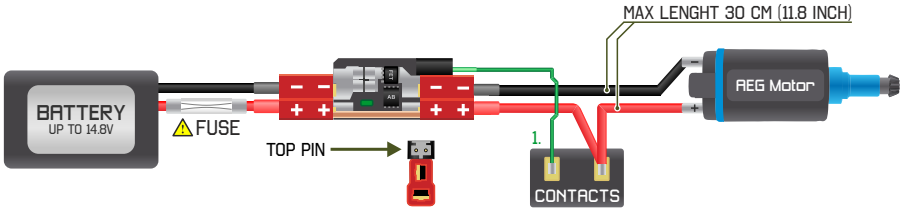


FIG 2. CONNECTION-MODIFICATION SCHEME

b) Installation of NanoHARD with replacement of wires. Replacing the existing AEG wiring with high-quality, low-resistance wiring in conjunction with the installation of a MOSFET allows for the ultimate in system efficiency. 16 awg or thicker wire is recommended. Solder the dual signal wire (No. 03 – provided in the kit) to the trigger contacts. Connect the motor directly to the **NanoHARD**.

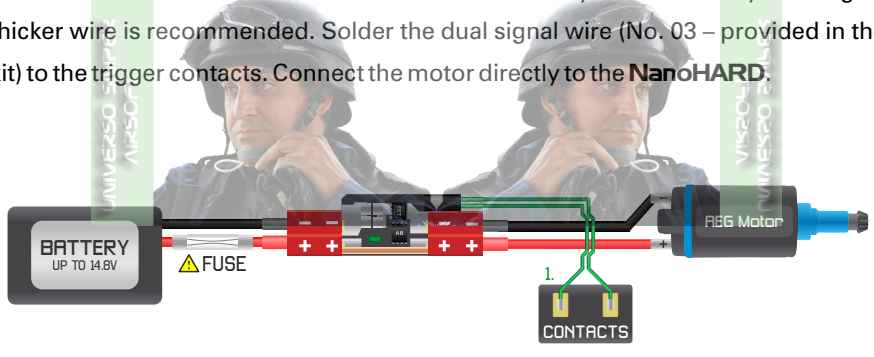
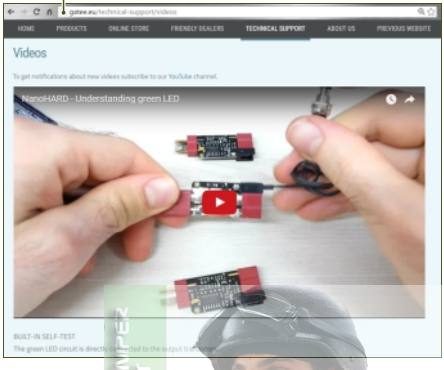


FIG 3. COMPLETE RE-WIRING SCHEME

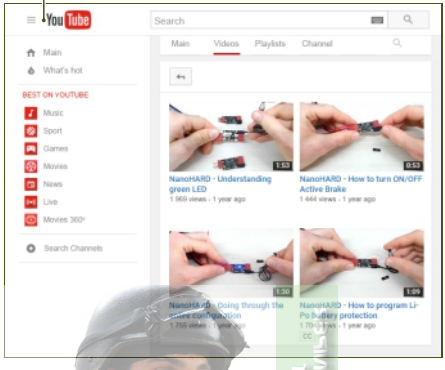
03. PROGRAMMING

We invite you to watch videos about **NanoHARD** programming on the GATE website or on our YouTube channel:

GATEE.EU/TECHNICAL-SUPPORT/VIDEOS

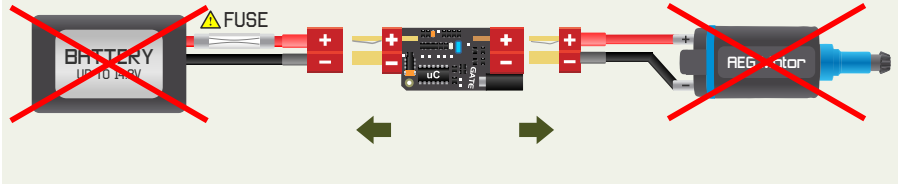


YOUTUBE.COM/GATEMOVIES

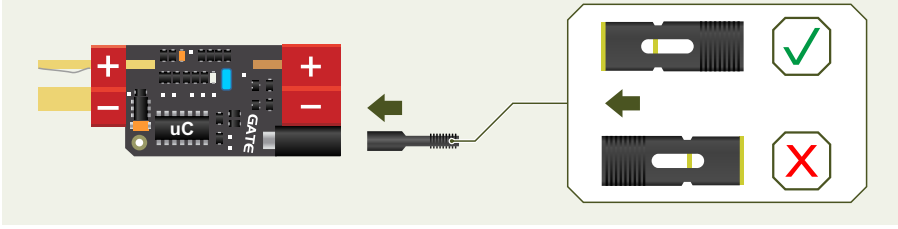


BATTERY PROTECTION AND ACTIVE BRAKE SETTINGS

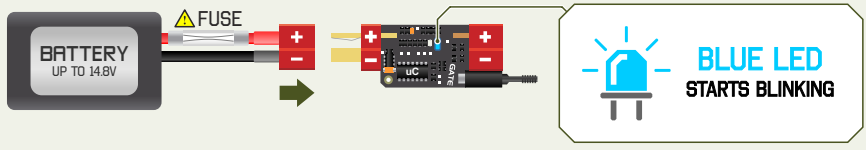
Step 1. Disconnect BATTERY and MOTOR from **NanoHARD**.



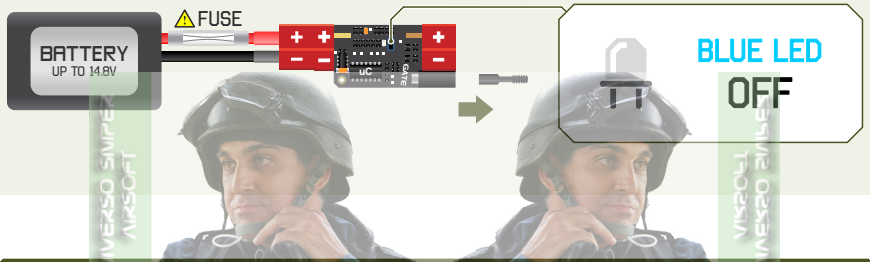
Step 2. Connect JUMPER to **NanoHARD**.



Step 3. Connect BATTERY to **NanoHARD**.

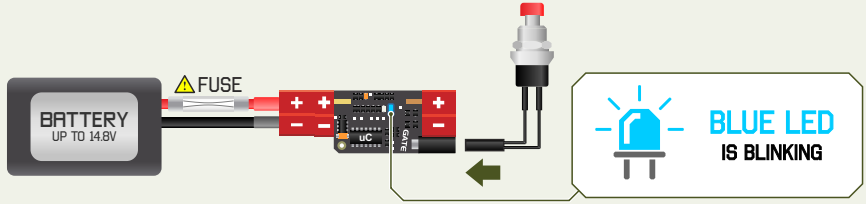


Step 4. When **blue LED** is **OFF**, disconnect JUMPER from **NanoHARD**.

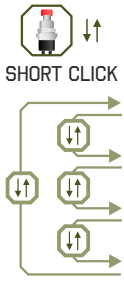


IMPORTANT If you disconnect JUMPER when the **blue LED** is **ON**, go back to **Step 1**

Step 5. You are in programming mode. Connect the **BUTTON** included in the kit to **NanoHARD**.

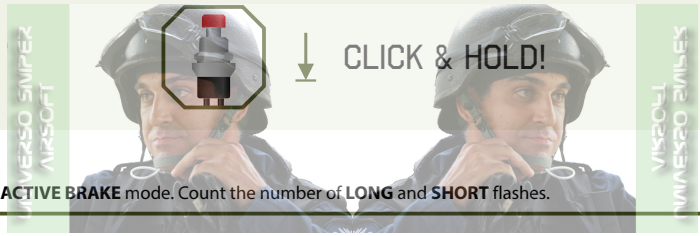


Step 6. Set battery protection function. Count the number of flashes.



BATTERY PROTECTION		
FLASHES		**SETTINGS**
1 flash		OFF
2 flashes		LiPoly 7.4V
3 flashes		LiPoly 11.1V
4 flashes		LiPoly 14.8V

Step 7. Save and go to **ACTIVE BRAKE** settings.



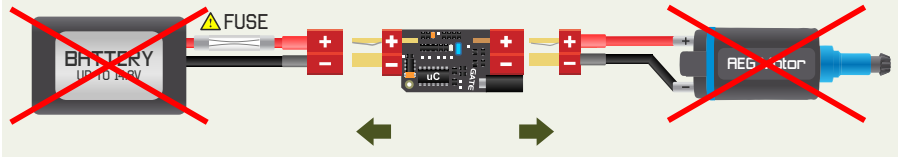
Step 8. Set **ACTIVE BRAKE** mode. Count the number of **LONG** and **SHORT** flashes.

ACTIVE BRAKE		
FLASHES		**SETTINGS**
1 long flash 1 short flash		OFF
1 long flash 2 short flashes		ON

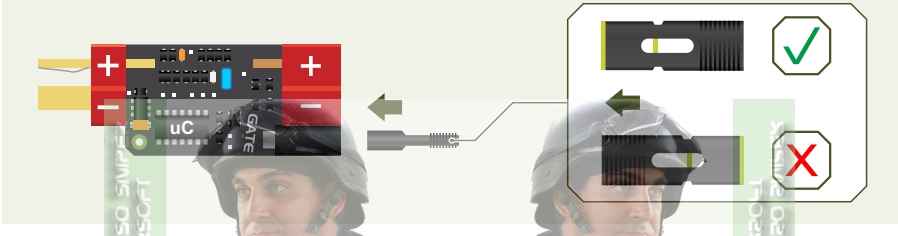
Step 9. Save and exit.

04. HOW TO READ DIAGNOSTIC TROUBLE CODES (DTC)

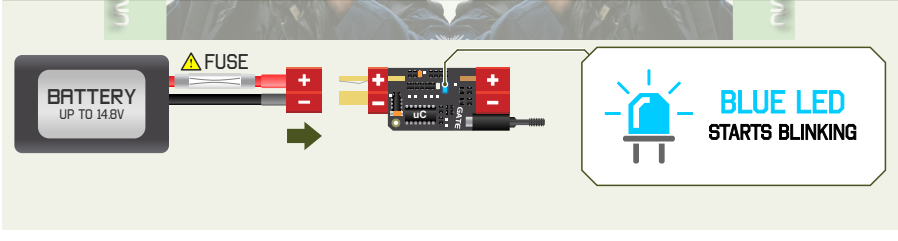
Step 1. Disconnect BATTERY and MOTOR from **NanoHARD**.



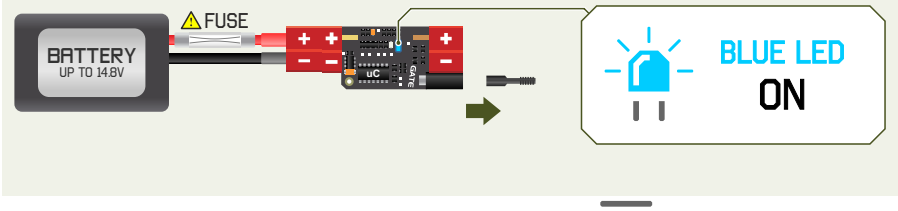
Step 2. Connect JUMPER to **NanoHARD**.



Step 3. Connect BATTERY to **NanoHARD**.

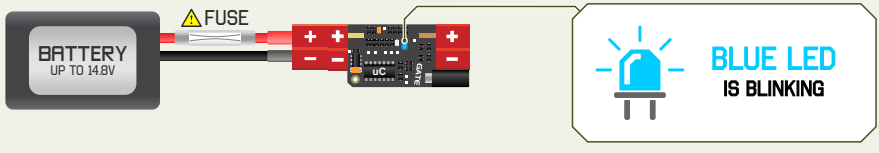


Step 4. When **blue LED** is **ON**, disconnect JUMPER from **NanoHARD**.



IMPORTANT If you disconnect JUMPER when the **blue LED** is **OFF**, go back to **Step 1**

Step 5. You are in a diagnostic mode.



Step 6. Read Diagnostic Trouble Codes, count the number of flashes.

DIAGNOSTIC TROUBLE CODES

FLASHES	DTC
1 long flash	None
1 short flash	Low voltage
2 short flashes	Low voltage HR
3 short flashes	Current too high
4 short flashes	Temperature too high

There may be several codes at once, eg. Low voltage and Too high current: 1 short flash; break; 3 short flashes; break

IMPORTANT Diagnostic Trouble Codes are stored even if battery is disconnected

Step 7A. Exit

Step 7B. Clear DTC and Exit

05. DIAGNOSTIC TROUBLE CODES - INTERPRETATION

If you have a problem with your AEG, the Diagnostic Trouble Codes can help you verify where the problem lies. Please note that the DTC signalize a problem with your AEG or battery, not with your NanoHARD.

To diagnose the current problem, remember to clear the old DTC that are stored in **NanoHARD** memory (p.15). Then try to shoot your gun. Now, only the current DTC are stored in memory.

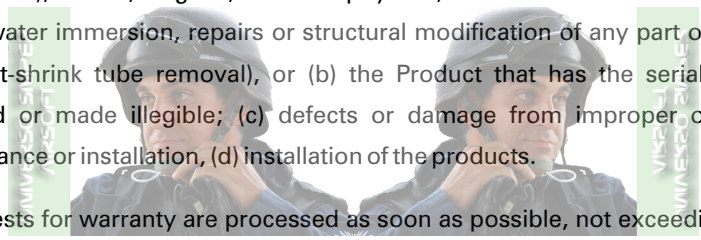
DTC		
None		There is no Trouble Code.
Low voltage		Please check: 1) if the battery is charged, 2) if the battery protection is set correctly (p.12), 3) if your AEG works with another battery. The battery may be damaged.
Low voltage HR (high resistance)		Please check: 1) if the battery is charged, 2) if the battery connector is damaged, 3) if your AEG works with another battery. The battery may be damaged.
Current too high		Please check: 1) if your motor is shorted (damaged), 2) if your motor is jammed, 3) if there is a short circuit in your AEG installation.
Temperature too high		Please check: 1) if there is a short circuit in your AEG installation, 2) if your motor is damaged.

06. GATE LIMITED WARRANTY POLICY

GATE Menet, Wojtak Sp. J. warrants that its Product is free from manufacturing and material defects at the date of purchase and for a period of one (1) year from the date of purchase and it is not-extendable. This Limited Warranty is conditioned upon proper use of Product by Purchaser.

1. This Limited Warranty is valid provided that the owner provides a proof of purchase and properly completed warranty form.

2. This Limited Warranty does not cover: (a) defects or damage (eg. mechanical, thermal or chemical) resulting from accident, misuse (misinterpretation of the instructions), abuse, neglect, unusual physical, electrical or electromechanical stress, water immersion, repairs or structural modification of any part of Product (eg. heat-shrink tube removal), or (b) the Product that has the serial number removed or made illegible; (c) defects or damage from improper operation, maintenance or installation, (d) installation of the products.



3. Requests for warranty are processed as soon as possible, not exceeding seven (7) working days. The company's obligation under this Limited Warranty shall be limited to providing replacement of part/s only.

Contact: support@gatee.eu