

User Manual – TITAN II Bluetooth® EXPERT for V2 GB [HPA]

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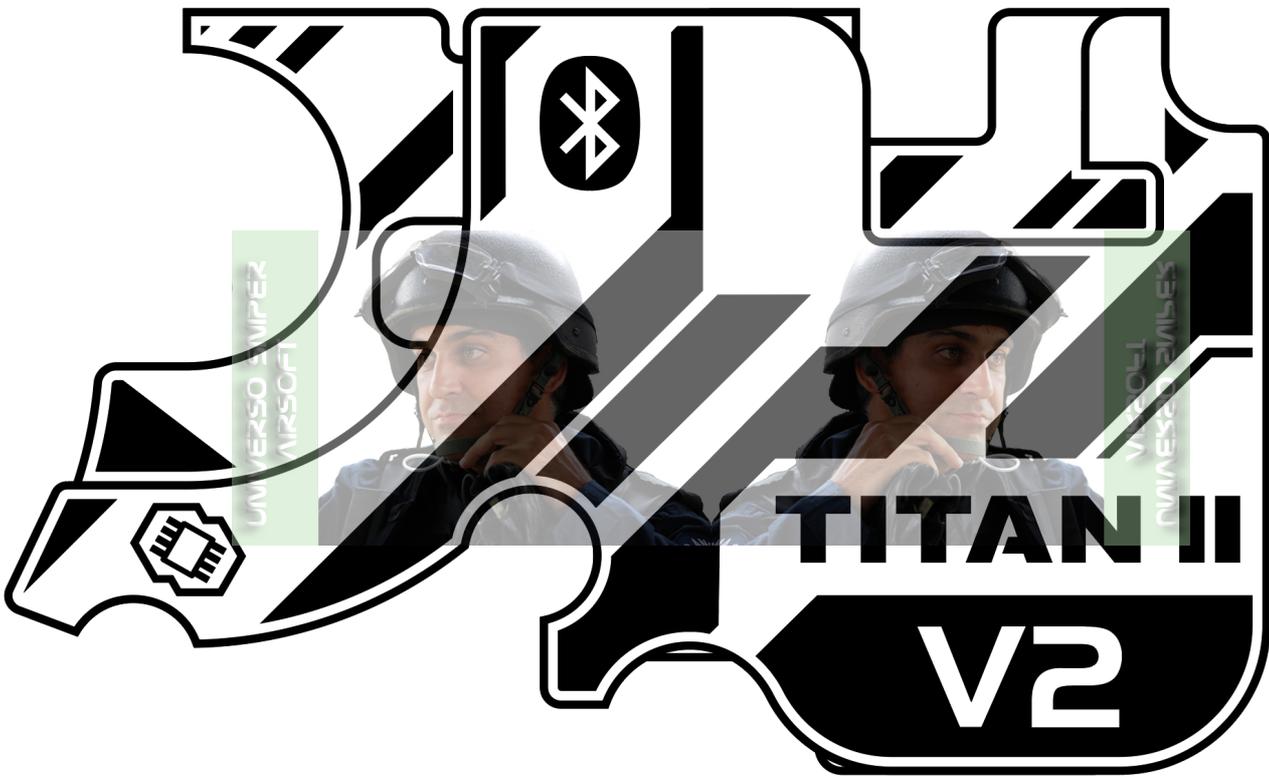
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TITAN II



General Information

Congratulations on your new TITAN II Bluetooth® V2 gearbox drop-in FCU mosfet HPA – our flagship optical Electronic Trigger Unit (ETU), replacing mechanical contacts in the replica. TITAN II Bluetooth® that turns your AEG into a future-proof advanced training weapon. Make no compromises and utilize years of experience of hundreds of thousands of users around the world, proving TITAN II Bluetooth® to be the best choice for advanced and professional players. Built-in Bluetooth® 5.2 gives you direct access to TITAN II Bluetooth® settings, AEG telemetry, and the ability to use a smartwatch, STATUS as well as other future parts of the GATE Ecosystem.

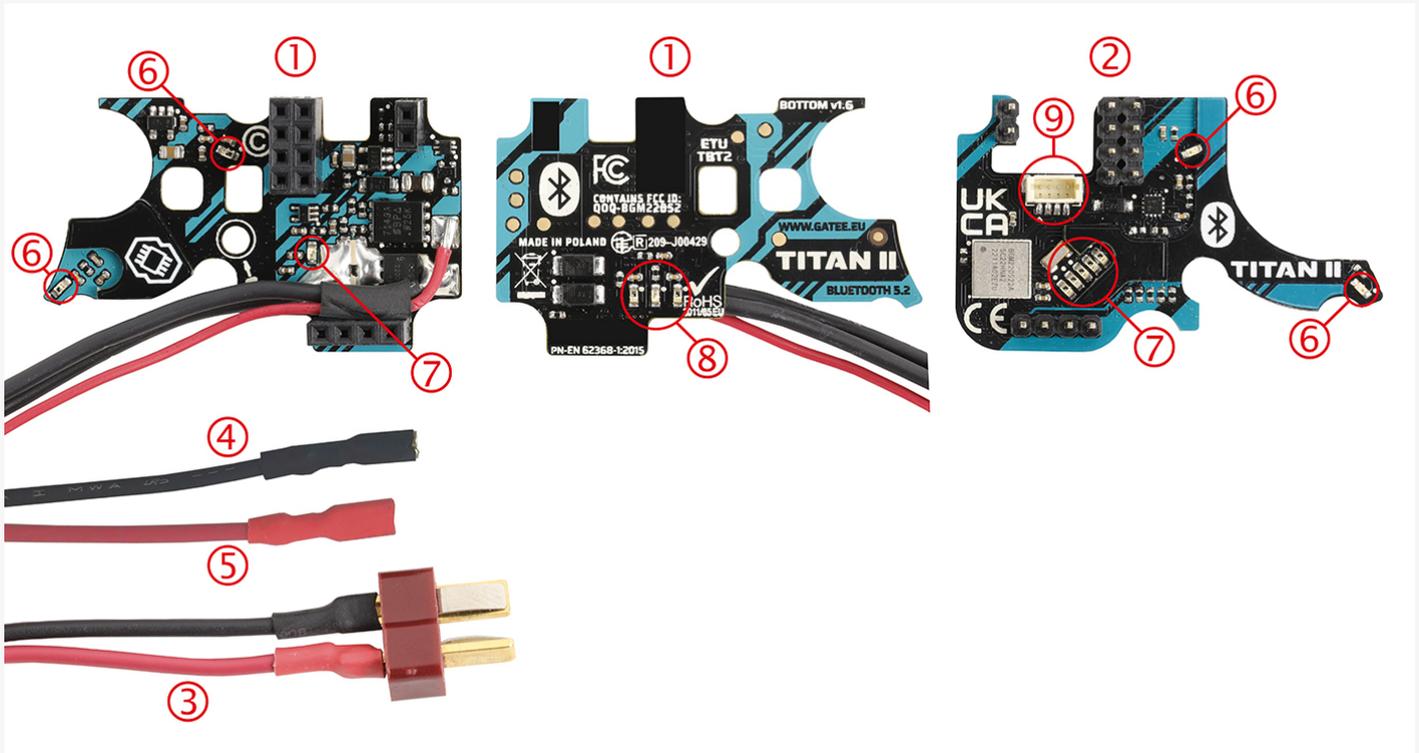
The information contained in this document is subject to change without notice.

Read carefully before use. Keep for future reference.

Failing to read this information may void the guarantee!

① When using the product, always follow basic safety rules to reduce the risk of injury from fire or electrical shock.

Device Structure



1. BOTTOM PCB (printed circuit board)
2. TOP PCB (printed circuit board)
3. Circuit power wires with JST connector
4. JST to DEANS-T adaptor
5. Main solenoid valve power supply
6. Sector gear position sensors
7. Trigger sensor
8. Fire selector sensor
9. Multifunctional port



Safety Summary

Please read this to ensure safe and correct use. Retain this information for future reference. The information contained in this document is subject to update without notice.

For your safety, this product should be installed by a skilled person.

Warning
Situations that may cause injury to yourself or others.

Caution
Situations that may cause damage to your device or other equipment.

Note
Notes, usage tips or additional information.

Warning
This device is not a toy and may not be operated by people (including children) with limited physical or mental abilities, as well as by people with no earlier experience in operation of electronic equipment. They may use the device only under the supervision of people responsible for their safety.

Warning

Before starting the installation process, make sure that your AEG magazine is empty and there are no BBs inside.

Warning

This equipment is not suitable for use in locations where children are likely to be present.

Warning

Persons under 18 years of age ought not stay unattended near the device during the installation or servicing of a device installed in an ASG replica.

Warning

Persons under 18 years of age ought not stay unattended near the device installed in an ASG replica ready for use.

Warning

Persons under 18 years of age are not allowed to install or commission the device in an ASG replica.

Warning

Persons under 18 years of age are not allowed to service this device.

Warning

Do not store or carry flammable liquids, gases or explosive materials in the same compartment as the device, its parts or accessories.

Warning

Take caution to prevent short-circuiting the battery as the consequences may be very dangerous to the health of the user.

Warning

Excessive trigger sensitivity may cause unintentional discharge (firing).

Warning

When an airsoft replica is not in use, its battery must be disconnected and the hop-up chamber must be empty.

Warning

While handling a replica with a connected battery, anyone within the range of the replica must wear personal protective equipment.

Warning

When not in SAFE mode, avoid using the device around strong electromagnetic fields, such as PMR transmitters exceeding European standards or when electrostatic discharges, e.g. lightning, occur in the atmosphere, which may cause malfunction of the device and unintentional discharge (firing).

Warning

When an airsoft gun is not in use, its magazine must be detached or kept empty with no BBs inside.

Warning

Incorrectly connecting positive and negative battery terminals will cause immediate damage to the device, which is not covered by warranty, and can lead to fire.

Warning

Pay attention to correctly connect positive and negative wires to the battery. Make sure you are connecting the positive terminal of the battery to the red wire of the device, and the negative terminal of the battery is connected to the black wire of the device. Incorrect power polarity may result in damage to the device and could even lead to fire or battery explosion.





Caution
Do not remove the device protective film or heat shrink tubes. Removing them will void the warranty.

Caution
Do not swap TITAN II Bluetooth® PCB boards between different sets. The serial numbers of each board must match. Mixing boards can cause incorrect measurements of voltage and current, which affects the smart fuse and can lead to device damage not covered by warranty.

Caution
For your own safety you ought to use an additional fuse between the battery and the device.

Caution
When operating under unusual conditions, perform maintenance outlined below for the climate similar to your area. Operating in extremely cold temperatures is not recommended. Do not expose TITAN II Bluetooth® to direct sunlight for long periods of time. Keep away from dust or sand, which can cause malfunctions and/or excessive wear. Keep TITAN II Bluetooth® out of snow, rain, and water. This will prevent electrical failure and fluid buildup inside the gearbox.

Note
The product Warranty Form is available here: <http://www.gatee.eu/warranty>.



Note
Bluetooth 4.0 or higher is required to connect to TITAN II Bluetooth® with a smartphone or other device. Installation

Introductory information

Caution
Regardless of your previous experience, follow all safety precautions to prevent any damage to your TITAN II Bluetooth®.

Caution
TITAN II Bluetooth® installation requires deep technical knowledge of gearbox internals. To avoid damage, we recommend it to be installed by a skilled person. If, however, you wish to proceed with TITAN II Bluetooth® installation on your own, you must read this full-length document and [watch the installation video](#) beforehand. Incorrect installation may result in, among others, sensor damage, which is not covered by warranty.

✔ **Note**

All HPA engines are compatible with TITAN II Bluetooth® V2 gearbox drop-in ETU FCU mosfet AEG HPA as a controller, except for the PolarStar Fusion Engine as there is no room for it in the body.

✔ **Note**

In TITAN II Bluetooth®, the trigger and gear sensors are protected from mechanical damage and are covered by warranty.

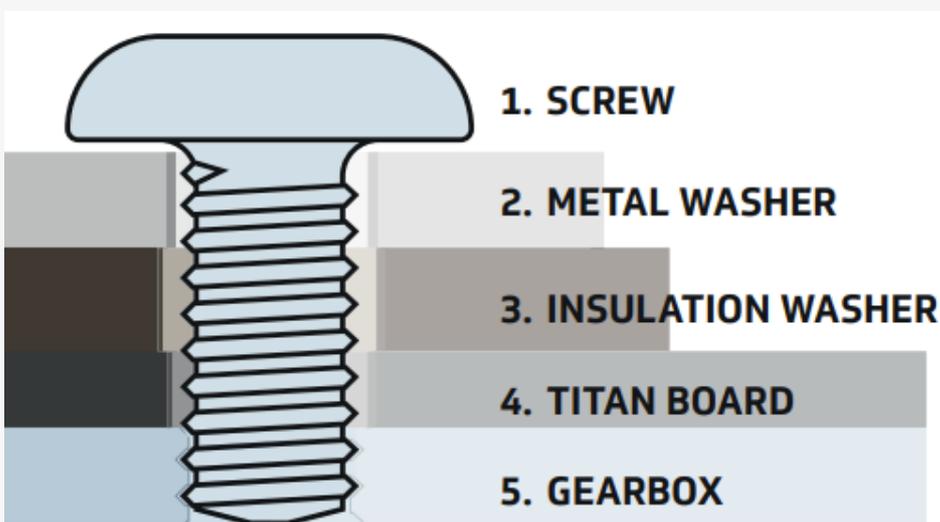


⚠ **Caution**

Do not remove the device protective film or heat shrink tubes. Removing them will void the warranty.

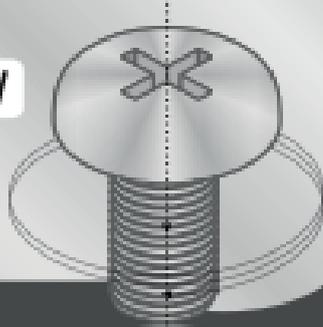
⚠ **Caution**

We recommend using an insulation washer when placing the BOTTOM board in the gearbox. When fastening the board, place the washers according to the graphic below.





SCREW



METAL WASHER



INSULATION WASHER



GATE

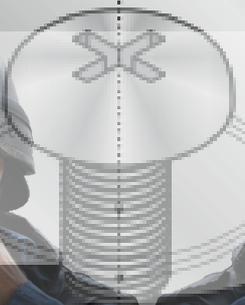
BOTTOM BOARD
V1.0



GEARBOX



SCREW



INSULATION WASHER



METAL WASHER



GATE

BOTTOM BOARD
V1.0



GEARBOX

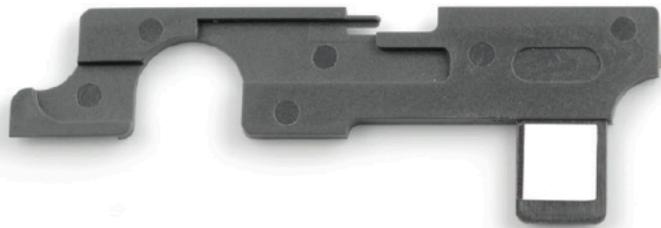


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V1R50FT

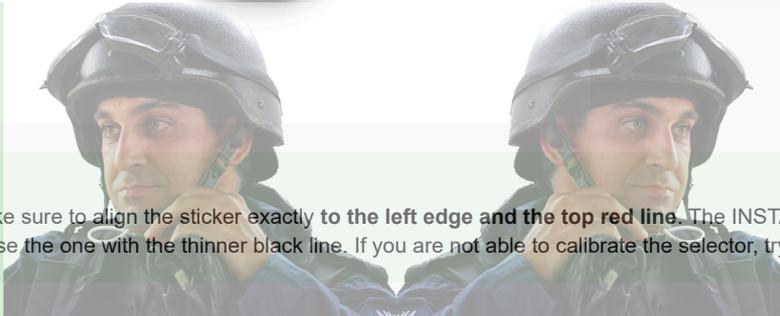
UNIVERSO SMIPER
V1R50FT

Caution
For triggers that have adjustable pivot, first adjust the range of trigger movement using the screws, only then calibrate the trigger.

Note
The selector sensor does not detect black surface. If the selector does not come with a metal connector or is not working correctly, you must use an appropriate sticker from the INSTALLATION KIT.



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AIRSOFT



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AIRSOFT



Note

Sticker position is crucial. Make sure to align the sticker exactly to the left edge and the top red line. The INSTALLATION KIT contains 3 different sticker types. First, use the one with the thinner black line. If you are not able to calibrate the selector, try the other ones.



Note

In case you have any difficulties while installing or using this product:

- contact us via <https://help.gatee.eu>
- send us an email: support@gatee.eu
- join [GATE Airsoft Community Discord Server](#)

Installation of the Unit in the Gearbox

INSTALLATION KIT Contents

- selector plate sticker set (6 pcs)
- M2 screw and washer set:
 - 1 x screw
 - 1 x pressboard insulation washer
 - 2 x steel washers
- M2.5 screw and washer set:
 - 1 x screw
 - 1 x pressboard insulation washer
 - 2 x steel washers
- connector set:
 - 1 x Deans-T connector with heatshrink tubes
 - 2 x motor connectors (2.8 x 0.5 mm – 0.11 x 0.02 in) with heatshrink tubes



Tools and Materials Needed

- a cross-head screwdriver
- a flat-blade screwdriver
- a metal file or milling machine
- solvent / petroleum ether
- grease
- device with the GCS app installed



Installation procedure

Follow the steps below in order to mount the TITAN II Bluetooth® drop-in module:

1. Remove the gearbox from the AEG body
2. Disassemble your gearbox and take out all the internals
3. Clean the gearbox case using solvent
4. Pay attention to the marked area. If you see that it is not smooth, use a metal file or grindstone to prepare the surface. The gearbox surface should be smooth, with no sharp edges which may damage TITAN II Bluetooth®.

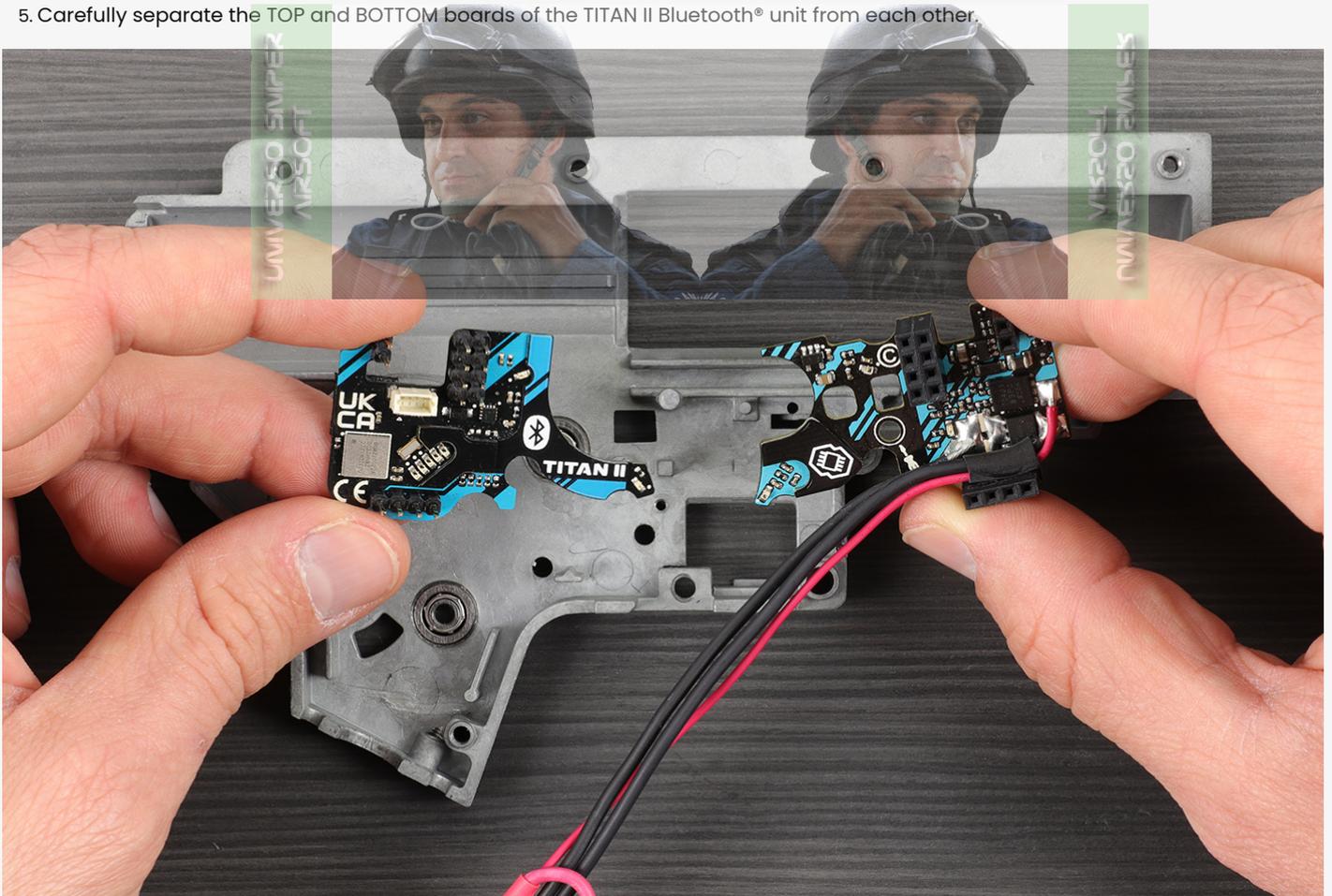
⚠ Caution

If the PCB does not perfectly fit in your shell, make the necessary modifications to the gearbox shell, **not to the PCB**.

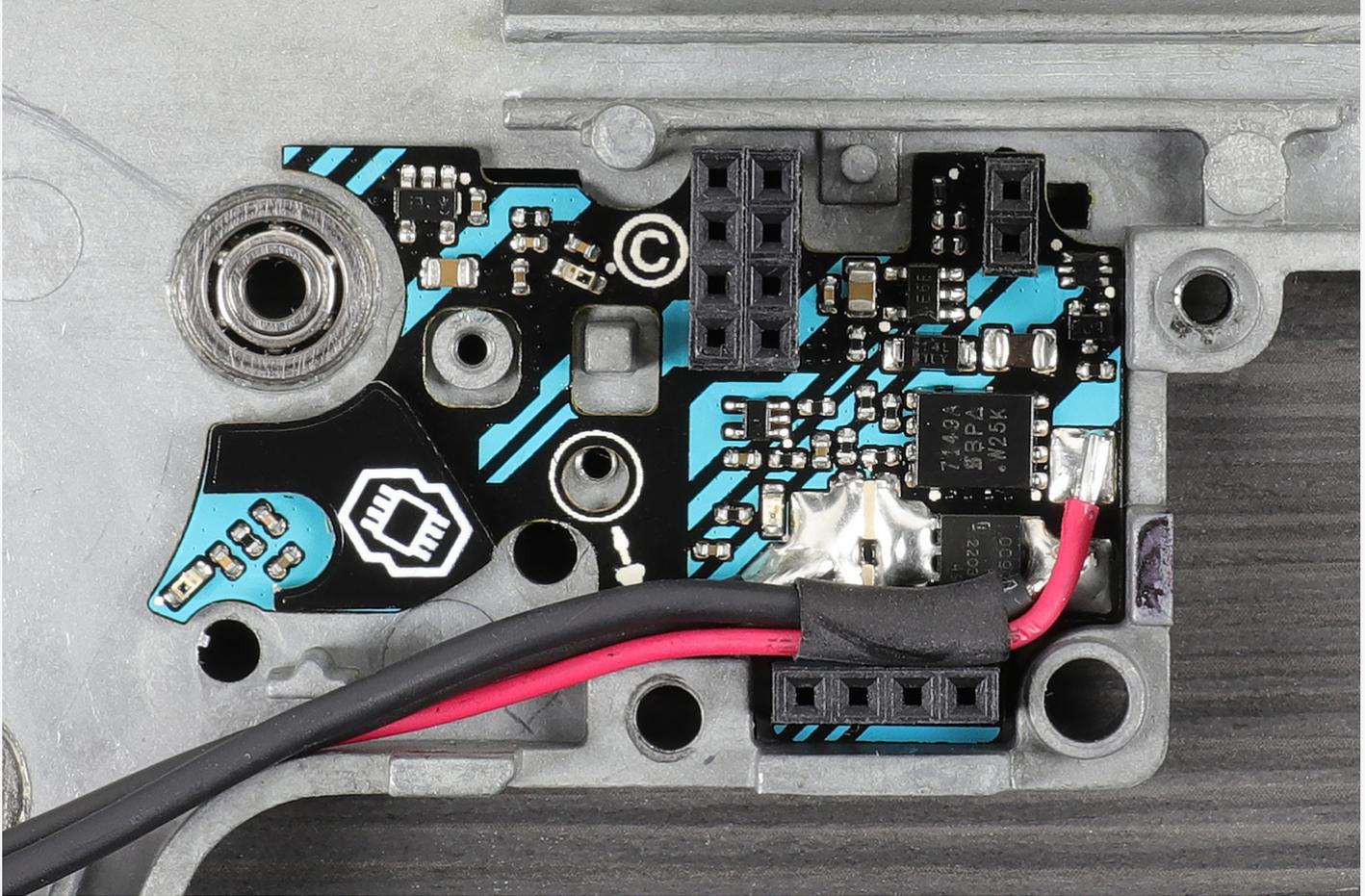
It is forbidden to make any modifications to the PCB shell such as drilling the screw hole, grinding the edges of the PCB, etc. Doing so may result in immediate damage to the circuit, which is not covered by the warranty.



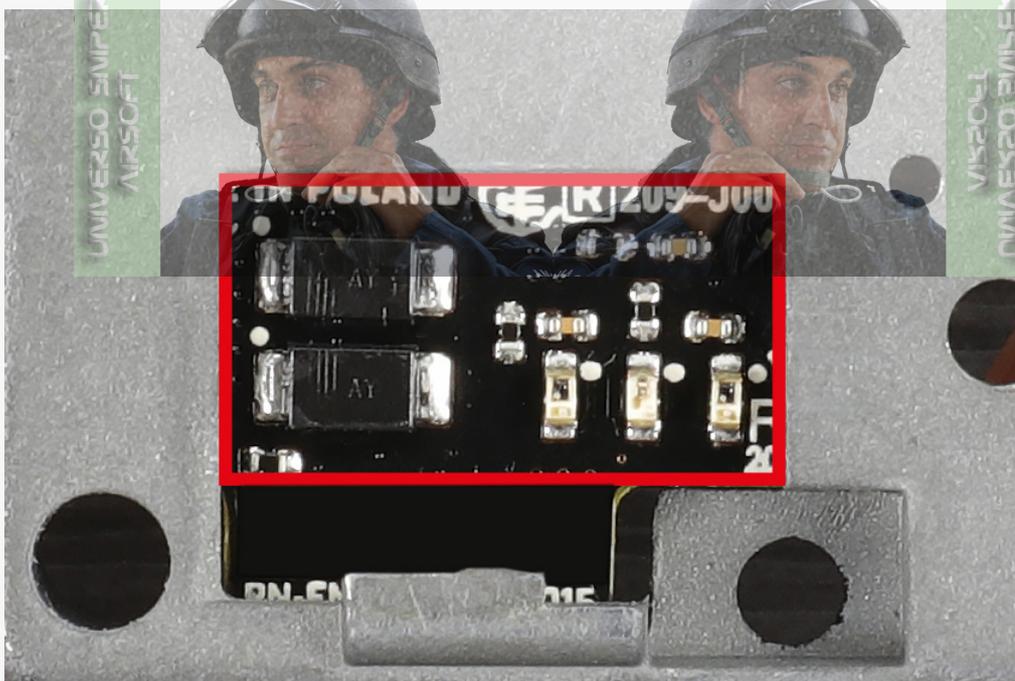
5. Carefully separate the TOP and BOTTOM boards of the TITAN II Bluetooth® unit from each other.



6. Place the BOTTOM board in the bottom part of the gearbox. Do not use a screw yet. Check if the board is laid flat in the gearbox.



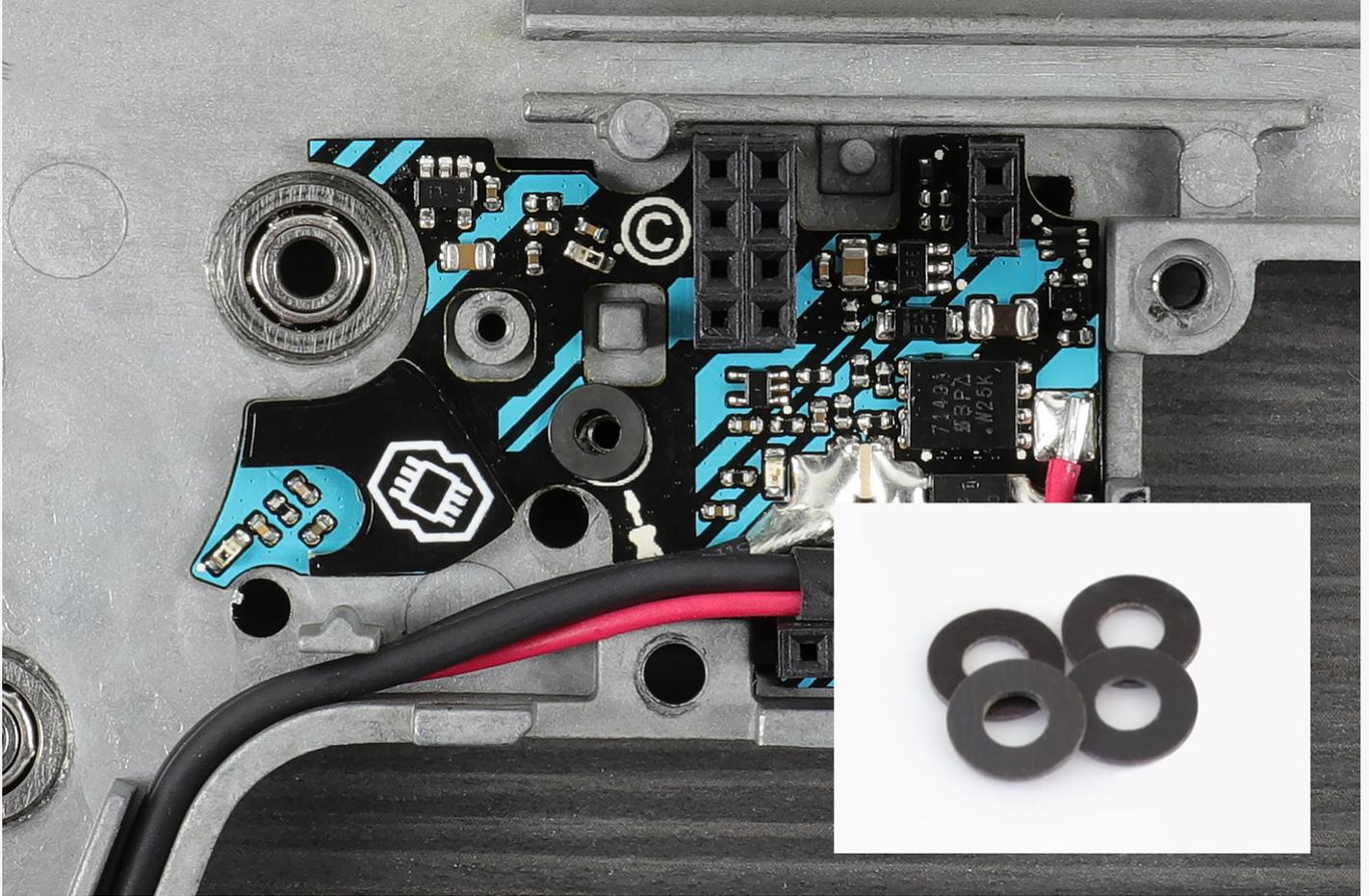
7. Make sure that the electronic components found on the side of the fire selector board do not touch the gearbox case.



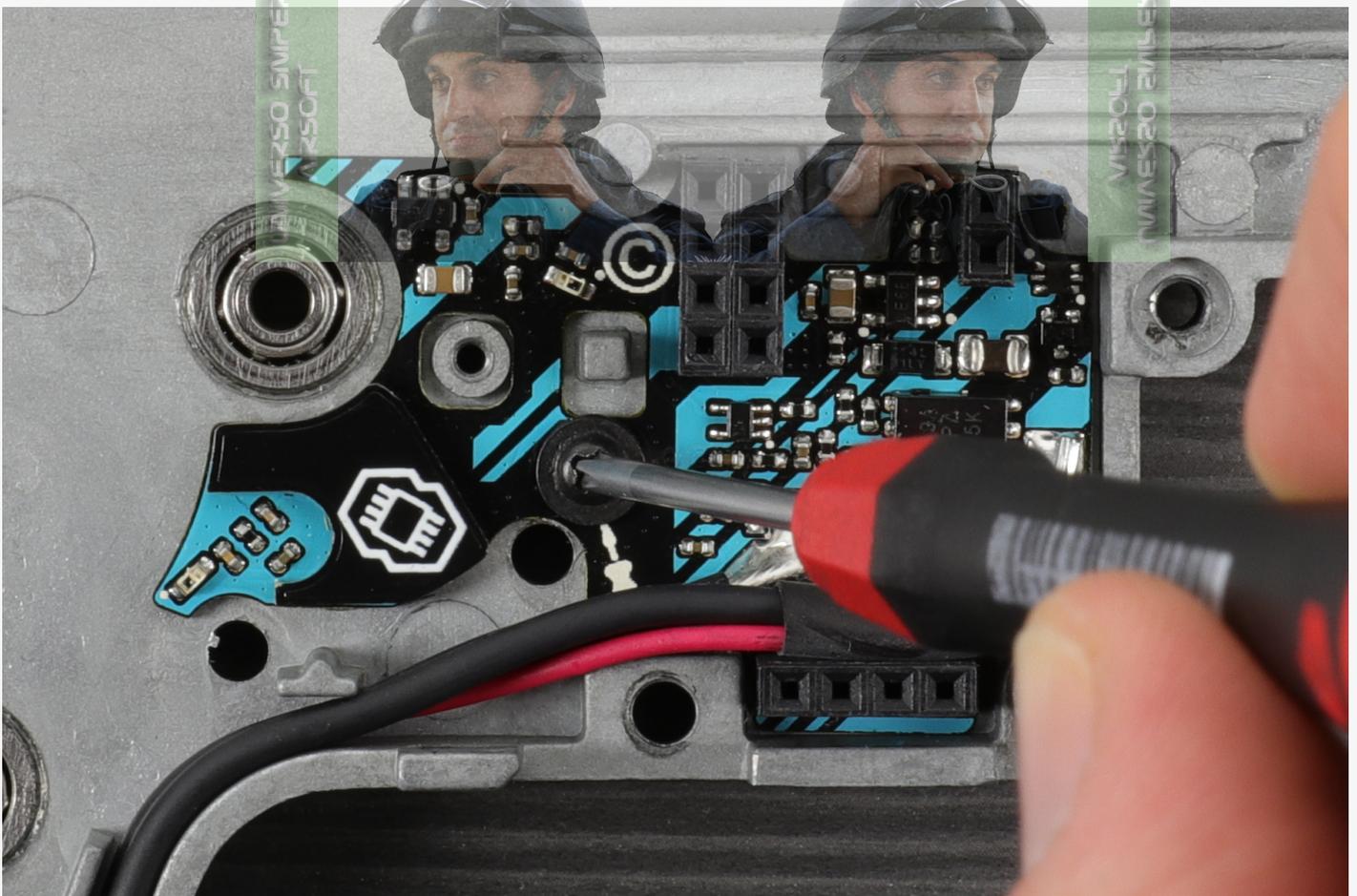
8. Use the (black) insulation washer from the INSTALLATION KIT.

⚠ Caution

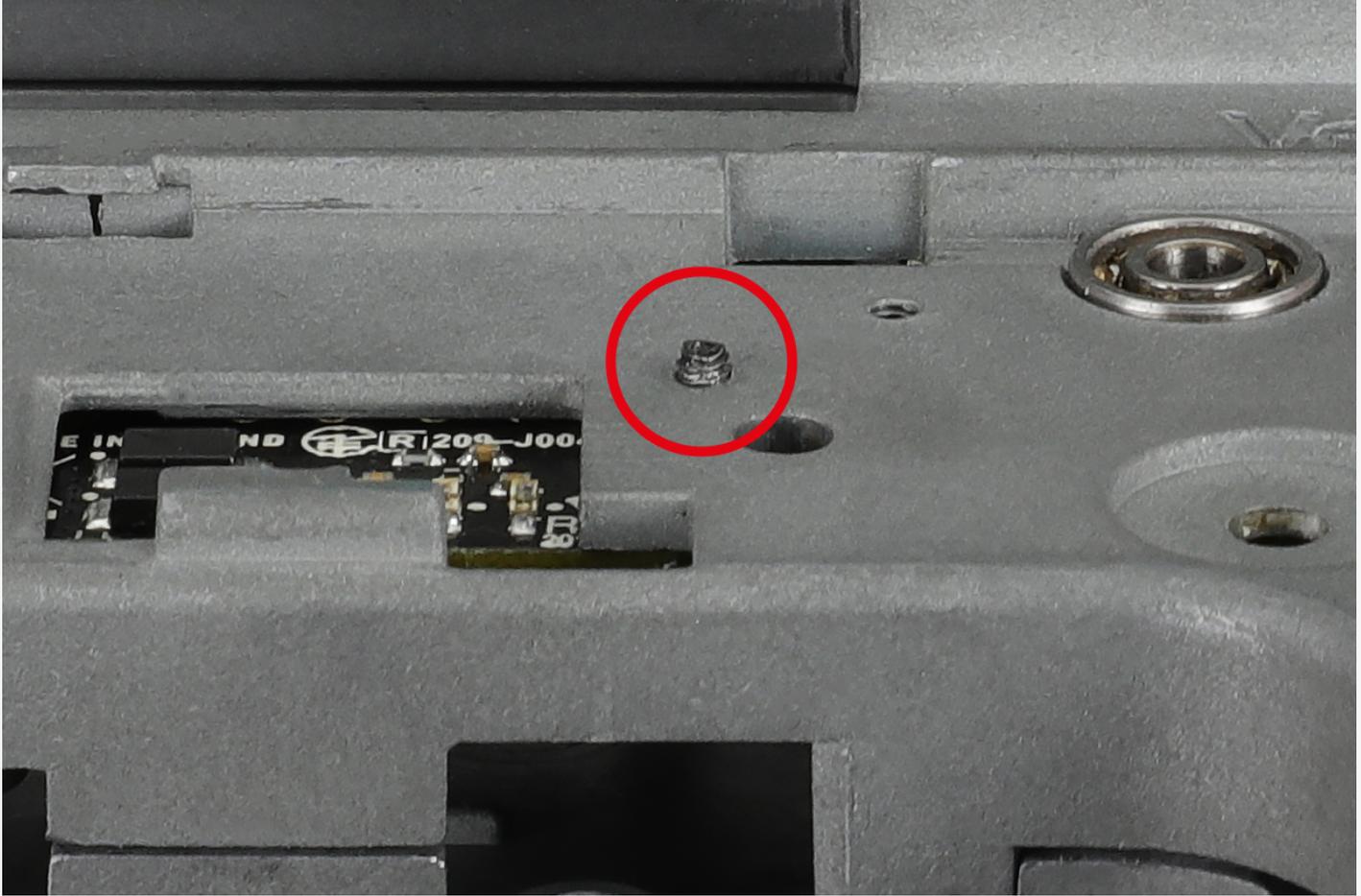
The insulation washer must protect the circuit board. The metal screw and the metal washer cannot touch the board directly as this can result in a short circuit and TITAN II Bluetooth® damage. Such damage is not covered by warranty.



9. Fasten the bottom board to the case. Use the original screw or the appropriate one from the INSTALLATION KIT.



10. Check if the screw is sticking out of the gearbox.

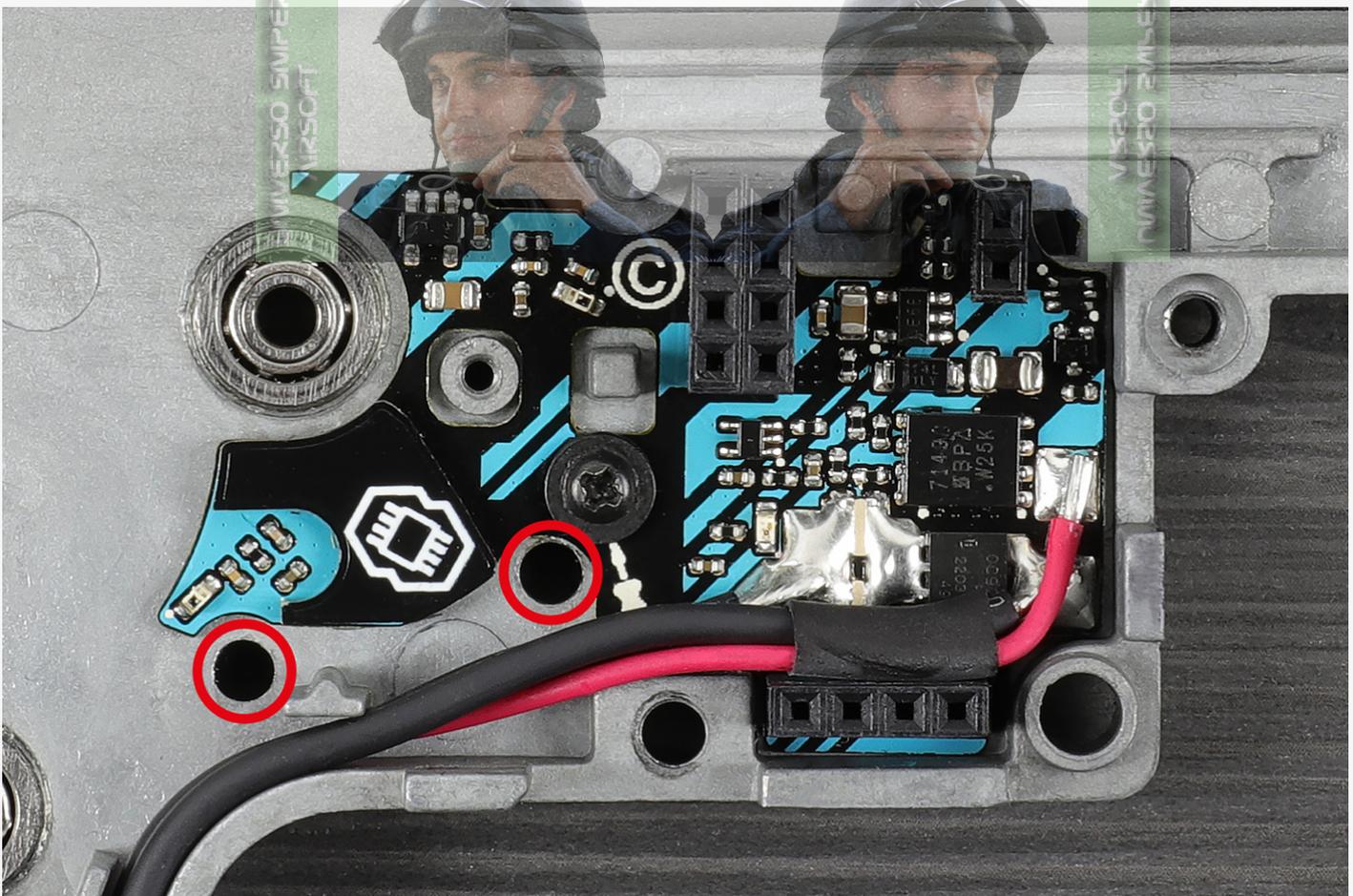


11. If so, add the metal washer(s) included in the kit. Make sure that the metal washer is placed between the screw and the insulation washer. It cannot be touching the circuit board directly. The screw is not supposed to protrude from the gearbox shell.

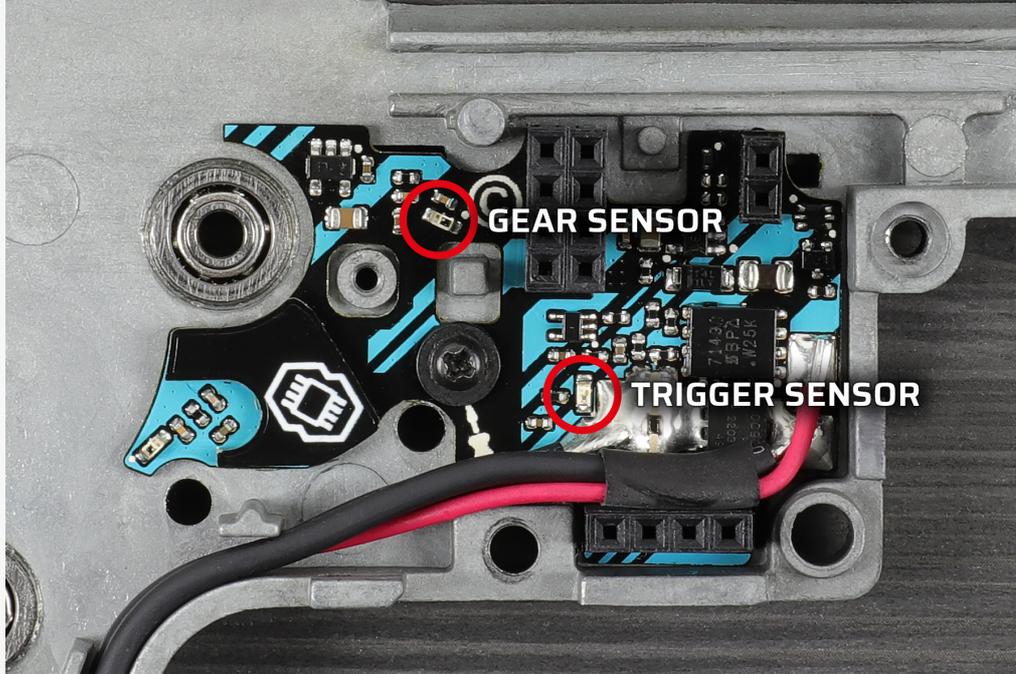


12. Check that the TOP board of the TITAN II Bluetooth® unit fits into the gearbox without any collisions with its structure. The geometry of the TITAN II Bluetooth® allows the use of a mechanical bolt-catch lever. However, due to the different types of this solution depending on the manufacturer of the replica, it is necessary to pay attention to whether the solution used in your replica does not interfere with the PCB of the system before assembling the gearbox. Read more about compatibility here: [Is TITAN/ASTER compatible with KWA gearboxes?](#)

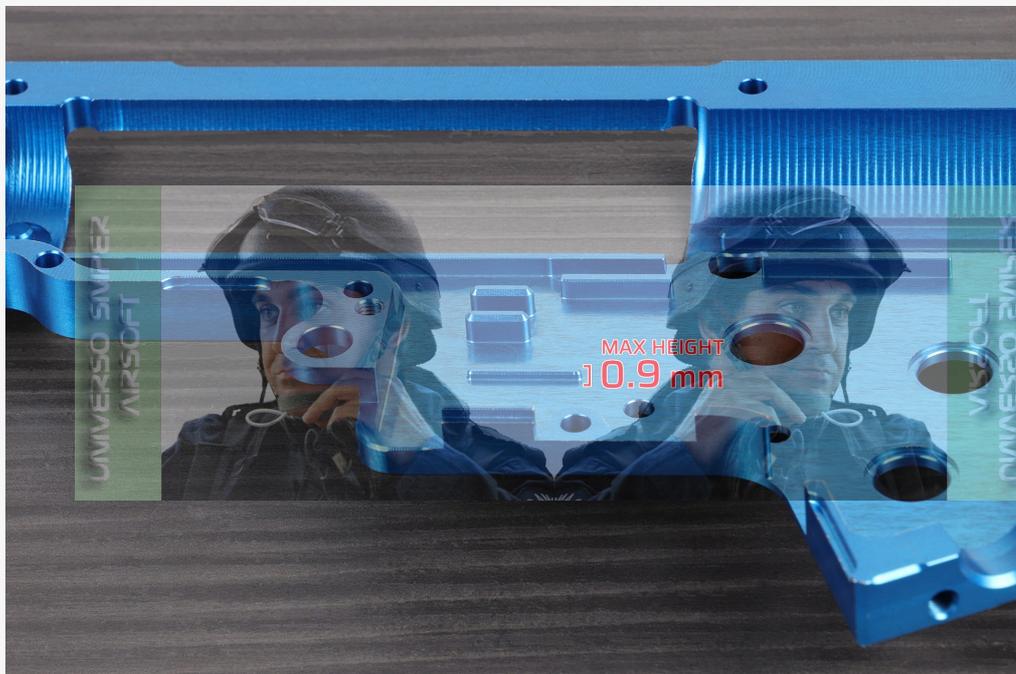
13. Make sure the marked areas are not covered by the board or wires.



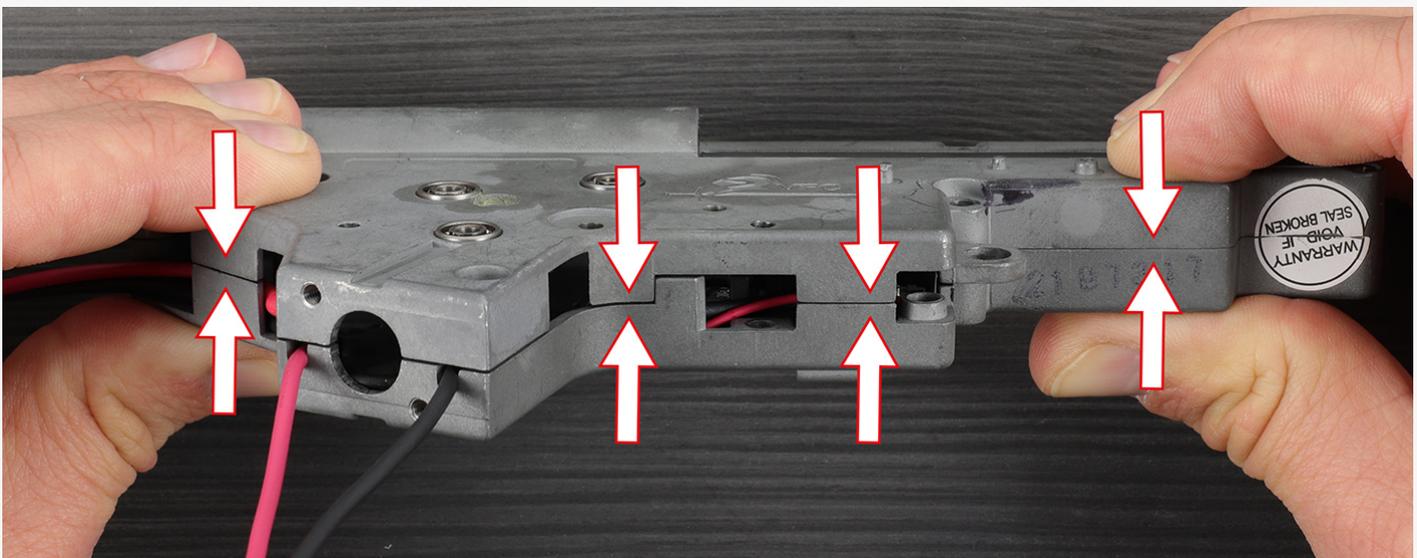
14. Check if the sensors are clean and not covered by wires.



15. Depending on gearbox shell, modification may be required for the element indicated below. If its height exceeds 0.9 mm, it is necessary to grind it down so that it does not exceed the mentioned value along its entire length.



16. Check if both parts of the gearbox fit together perfectly.



17. Mount the trigger without the spring. Insert the TOP TITAN II Bluetooth® board. Close the gearbox. When the gearbox is closed, carefully check if the trigger can move smoothly and is not touching any TITAN II Bluetooth® components.



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a. Installation of a single solenoid valve engine, e.g. PULSAR S, PolarStar Jack, Inferno Gen. 2

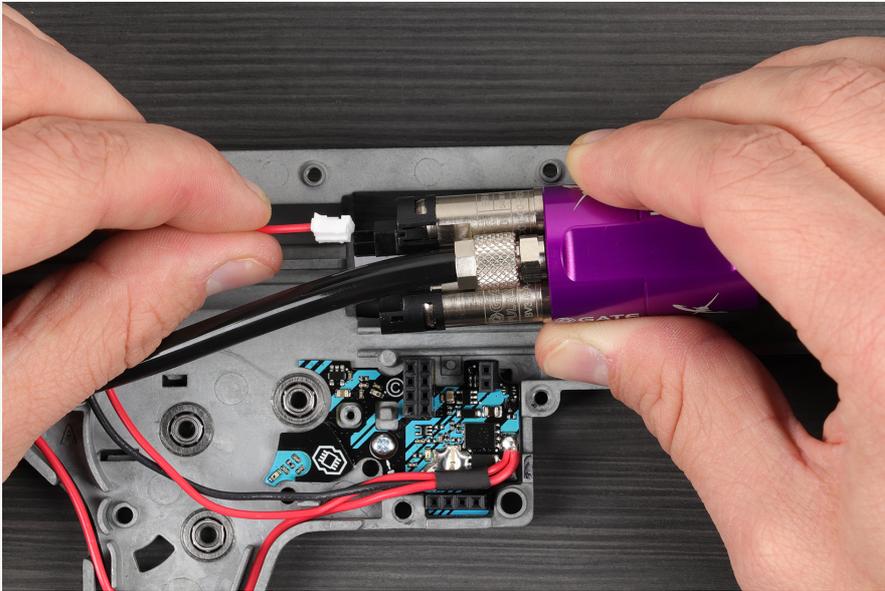
i. connect the plug from the main wire harness to the engine valve



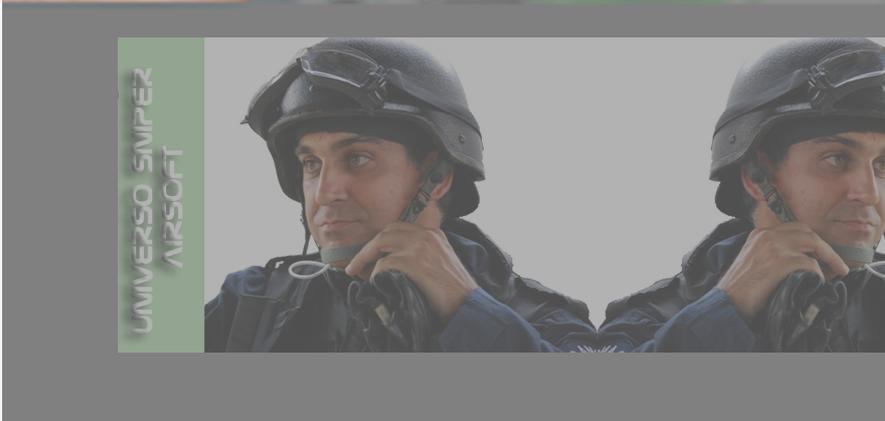


i. PULSAR D:

1. Connect the plug from the wire harness coming from the BOTTOM PCB to the **lower valve – Poppet Valve**

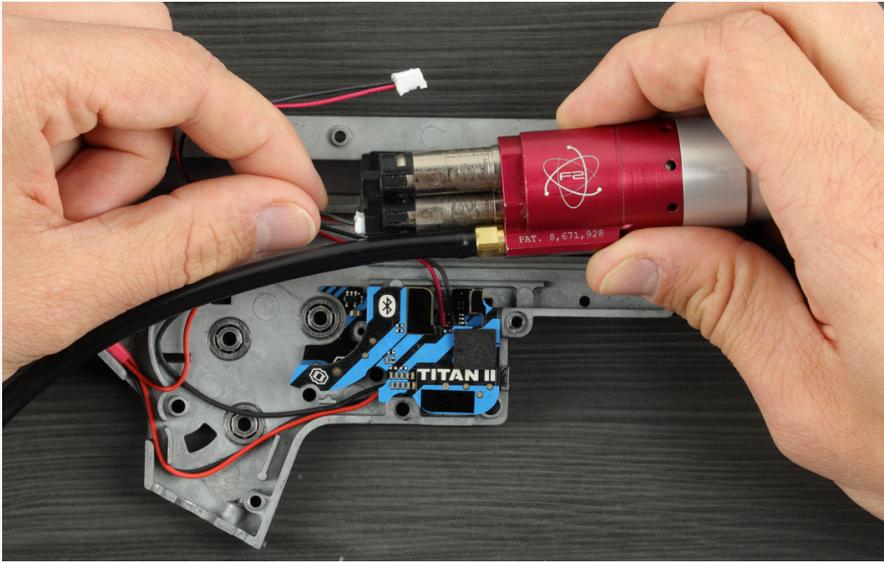


2. Connect the cable for the second valve to the TOP PCB. Pay attention to correctly plug it into the multifunctional socket on the TITAN II Bluetooth® PCB, and connect the other end to the **upper valve – Nozzle Valve**

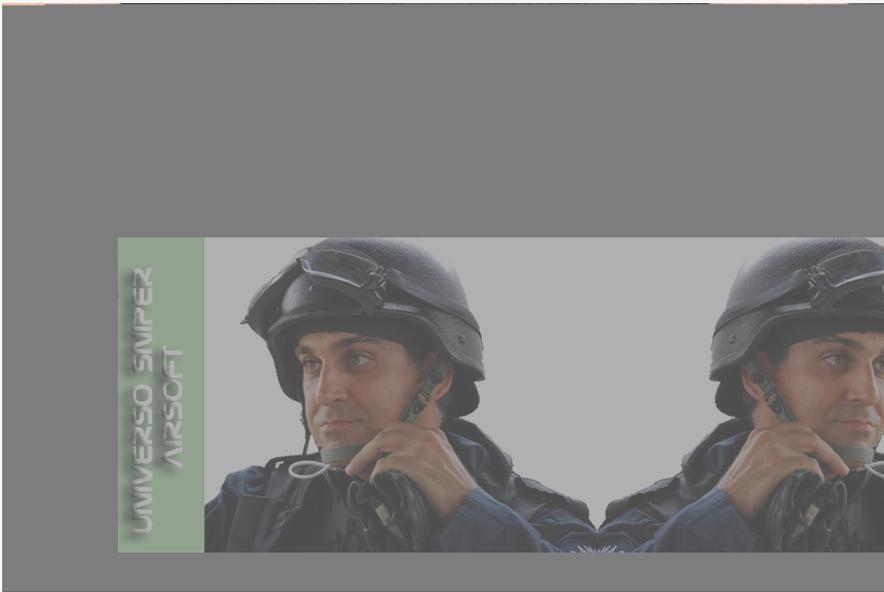


ii. PolarStar F2:

1. Connect the plug from the wire harness coming from the BOTTOM PCB to the **lower valve – Poppet Valve**



2. Connect the cable for the other valve to the TOP PCB. Pay attention to correctly plug it into the multifunctional socket on the TITAN II Bluetooth® PCB, and connect the other end to the **upper valve – Nozzle Valve**



✔ **Note**

As a rule of thumb, connect the wires coming out of the TITAN II Bluetooth® BOTTOM PCB to the **Poppet Valve**, and connect the wire harness coming out of the multifunctional port to the **Nozzle Valve** of the dual solenoid valve engine.

19. If you intend to use accessories such as bolt-catch or magazine sensor, go to this section: [Installation of Accessories](#). However, please note that if the sensors are trigger and selector sensors, they must be configured before configuring the engine itself. Install accessories before closing the gearbox and return here.
20. If everything is OK, close the gearbox. Tighten the two screws on the top part of the gearbox case.



21. Prepare the selector plate. If the selector plate does not have a copper connector, you need to modify it. The black surface does not reflect light, so sensors will not work properly.

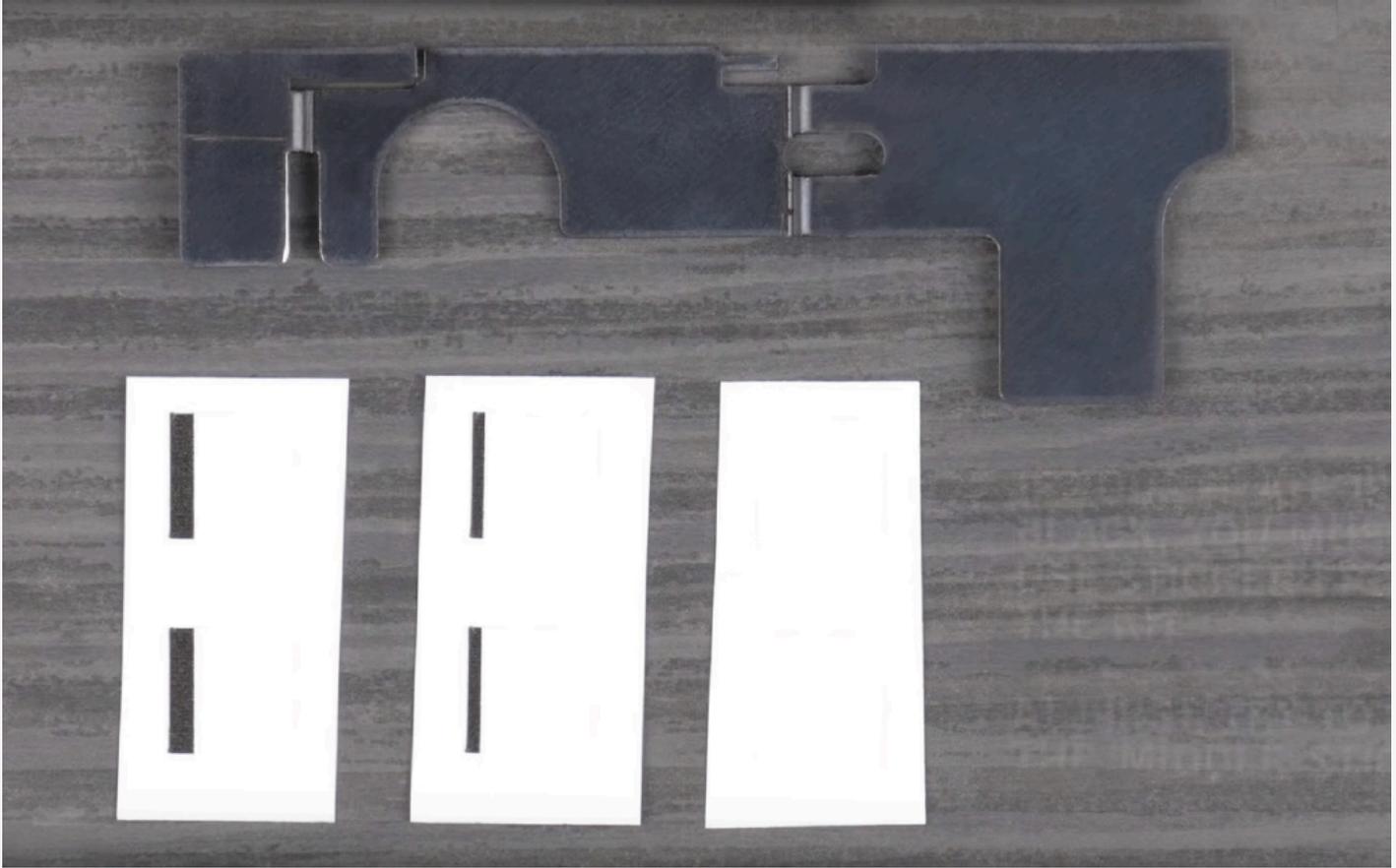


22. In order to modify the black plate, use a sticker from the INSTALLATION KIT. Try the sticker with the thinner black line first.

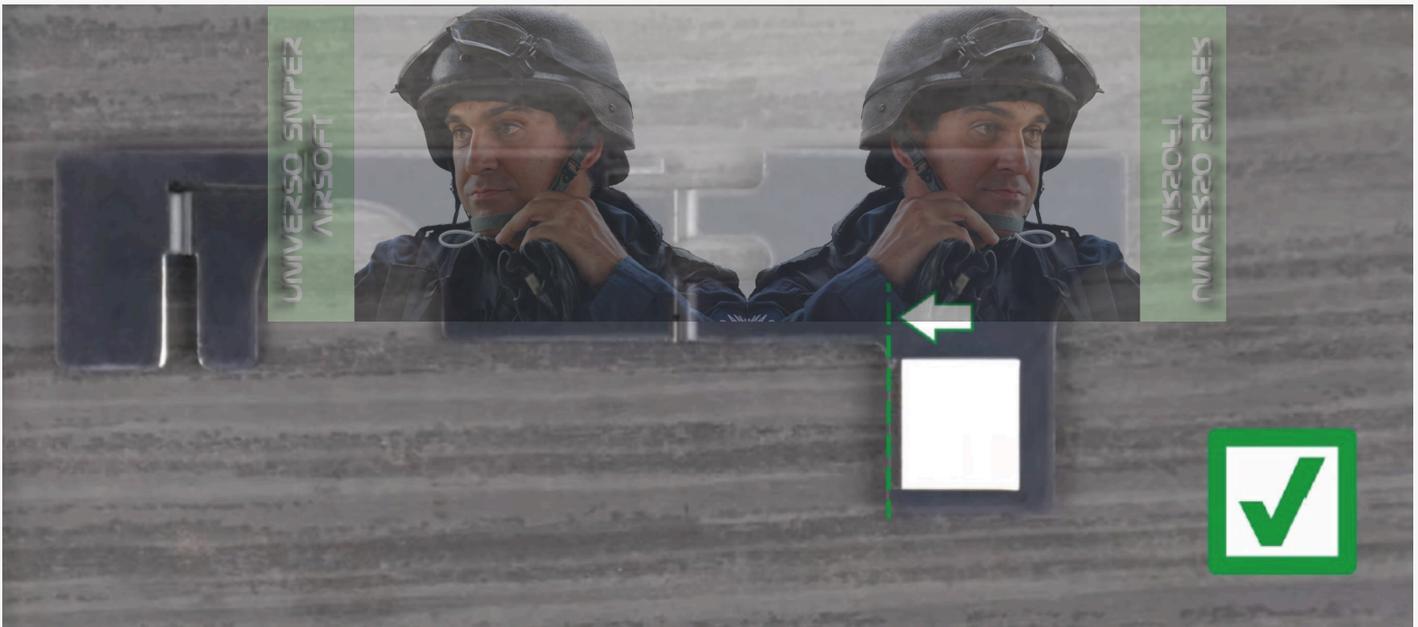


Note

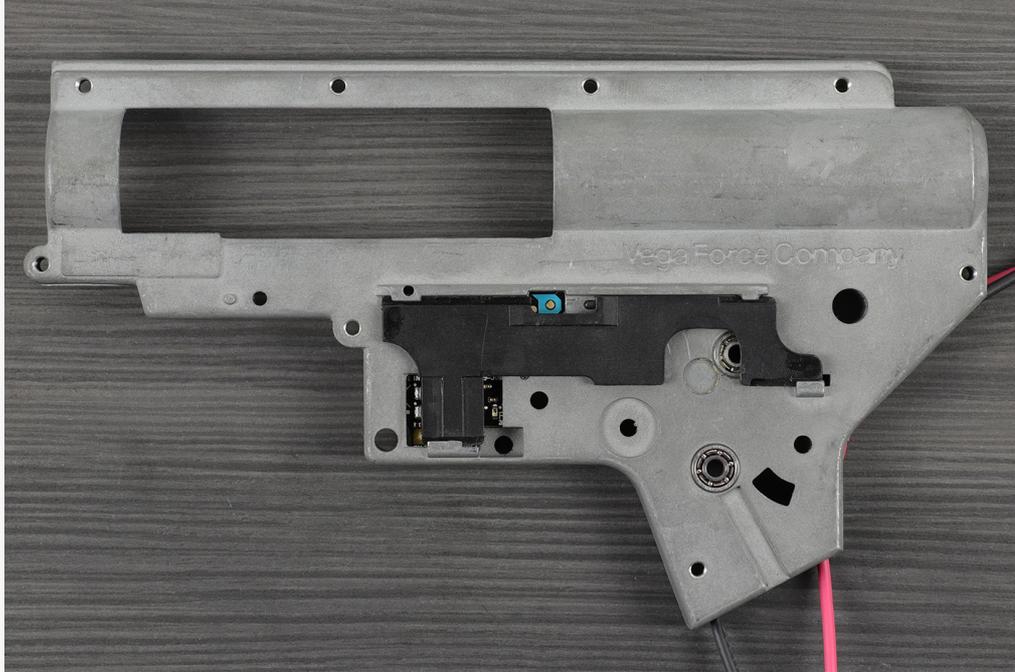
If the selector plate has a copper connector, do not make any modifications.



23. The black plate after modification. Sticker location is crucial. Carefully align it to the left-hand side.



24. Install the selector plate.



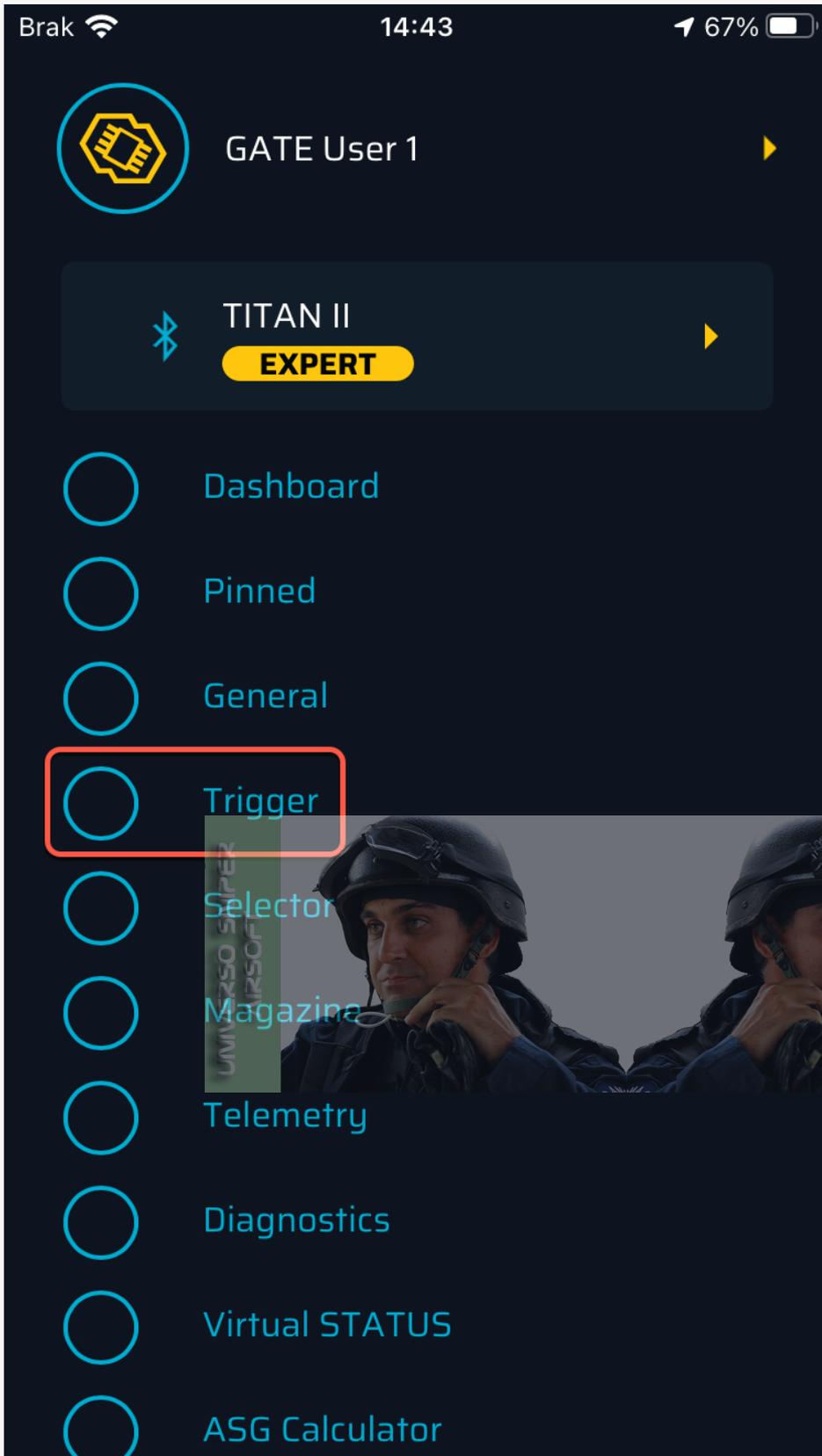
25. Connect TITAN II Bluetooth® to your device.

1. Download and install the GCS app on your device @ GATE CONTROL STATION
2. Start **Bluetooth®** communication on your device
3. Connect the battery to TITAN II Bluetooth®
4. Launch the GCS app and confirm all the required approvals
5. Tap "+" on the **Dashboard** of the app
6. In the list of devices, locate your TITAN II Bluetooth® – if it is not found, drag the screen down to refresh or tap **Refresh Scan**
7. Enter the **PIN** code found on the included stickers
8. Update the TITAN II Bluetooth® firmware
9. It is recommended to restore the factory settings after each firmware update
10. Choose the type of replica you want to use – **AEG or HPA, and in the case of the HPA, the type of HPA engine used**

26. Check the operation of the trigger sensor and selector by performing test calibrations. After the replica is completely assembled, conduct the calibrations again:

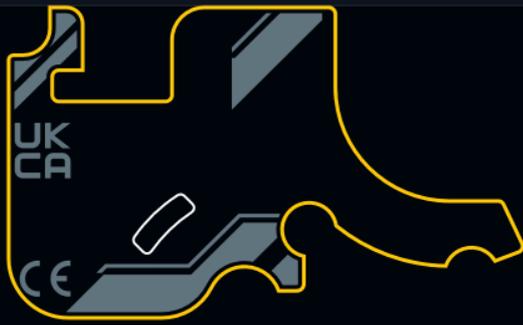


1. In GCS, go to the **Trigger** tab. Perform the first trigger calibration.





Trigger



Trigger Preferences

1-Stage

Your trigger is not working correctly
Please calibrate it now



Equalizer

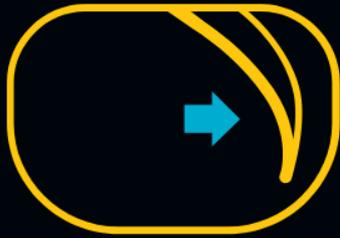
2 Level



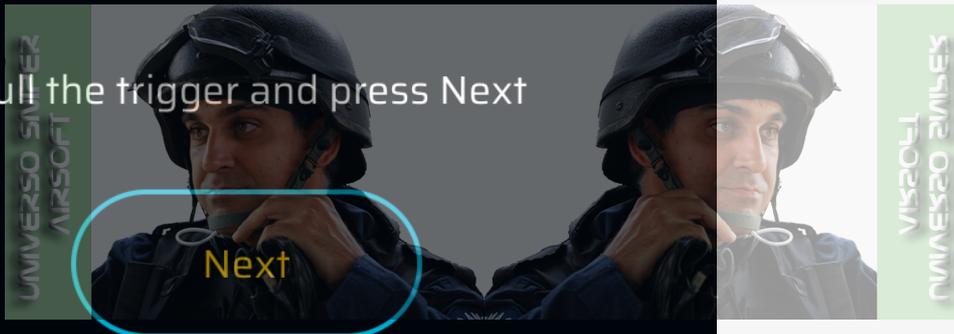


Calibration

Correct calibration is crucial. Generally, you only need to calibrate the trigger once, however, should an issue occur, you can always recalibrate it.



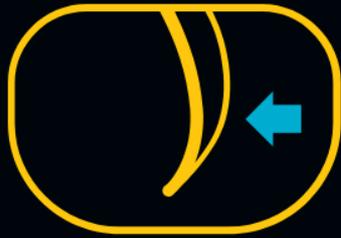
Pull the trigger and press Next





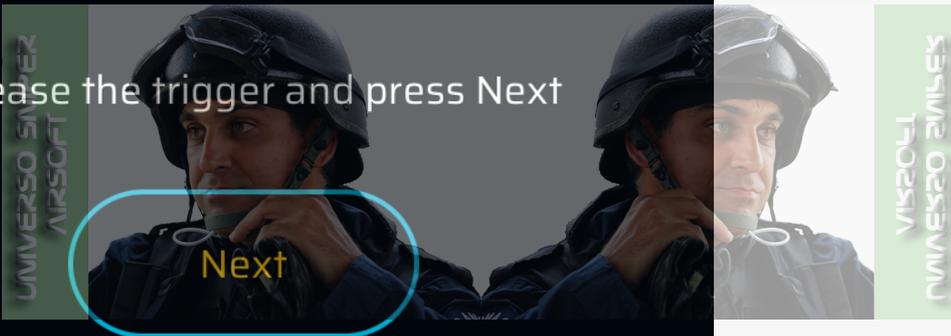
Calibration

Correct calibration is crucial. Generally, you only need to calibrate the trigger once, however, should an issue occur, you can always recalibrate it.



Release the trigger and press Next

Next





Calibration



Please wait...





Calibration

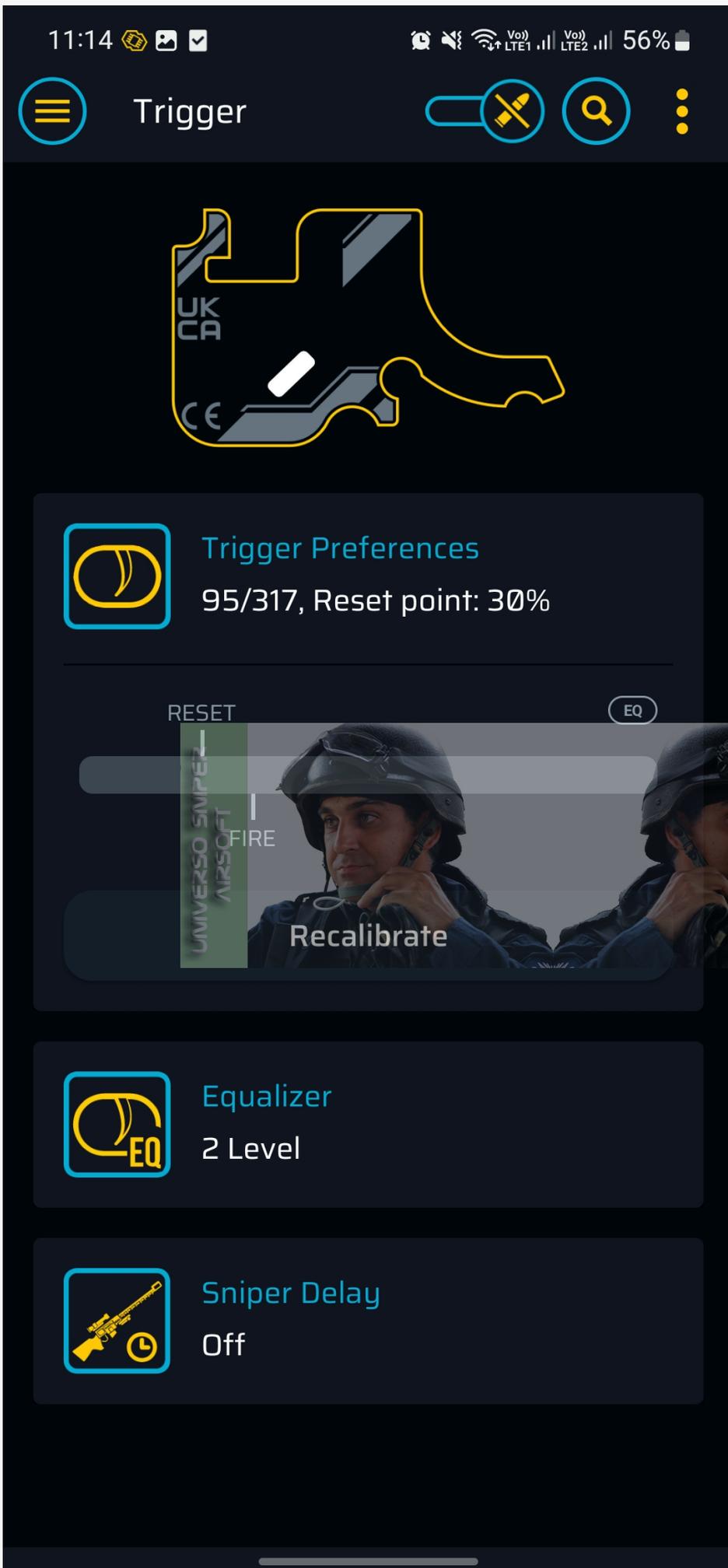
Trigger Calibration complete

294 Trigger sensitivity levels detected

OK

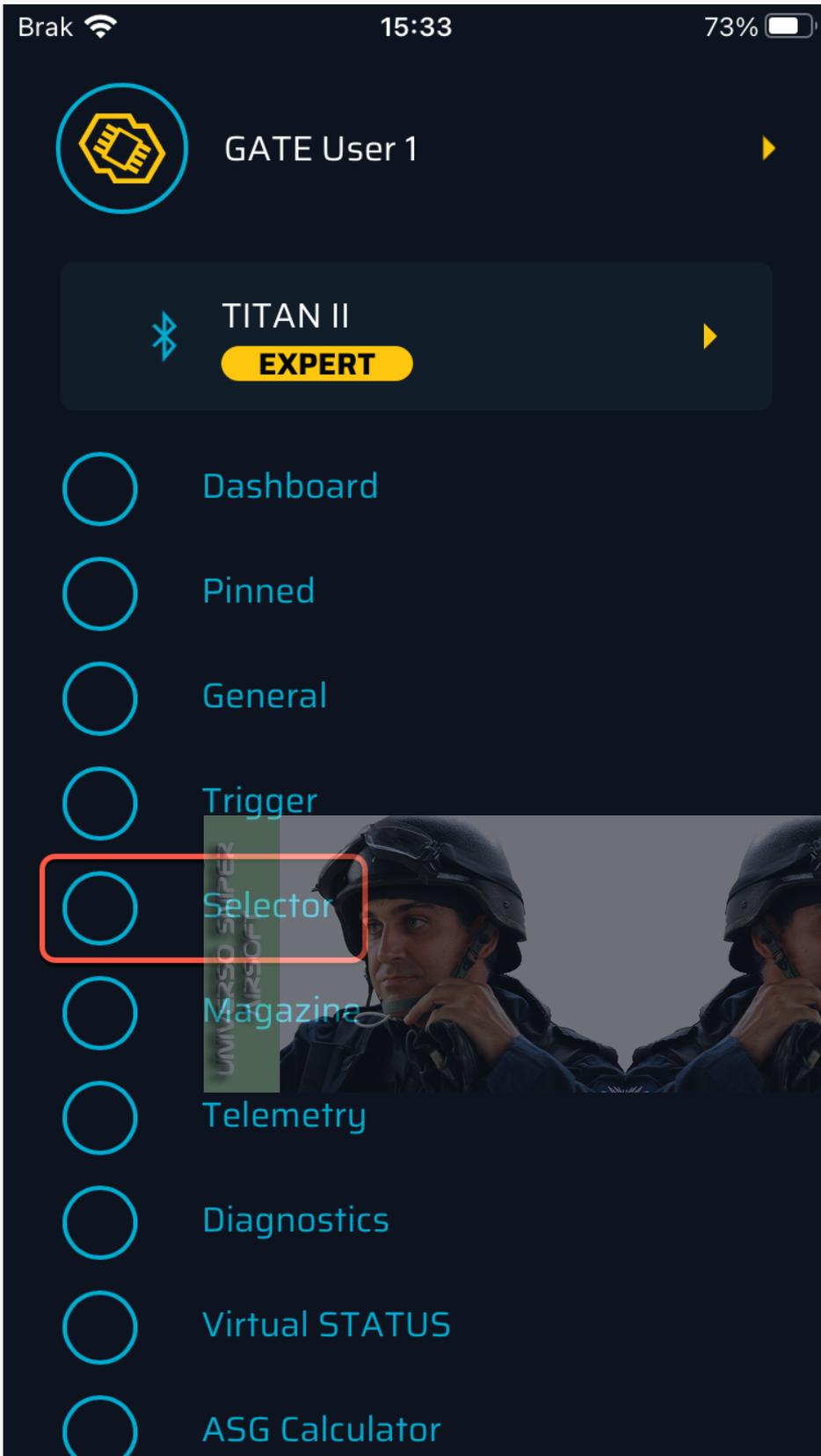


2. Slowly pull the trigger. The sensor indicator should move with the extent to which the trigger is pulled.



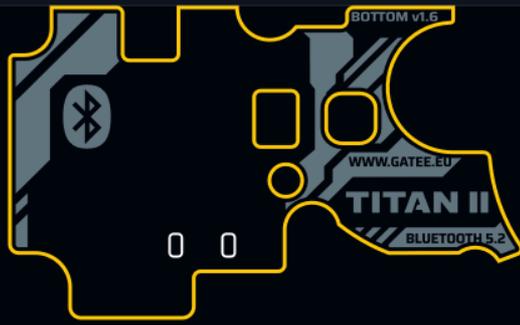
27. Check fire selector sensor calibration:

1. In GCS, go to the **Selector** tab. Perform the first calibration of the selector sensor.





Selector

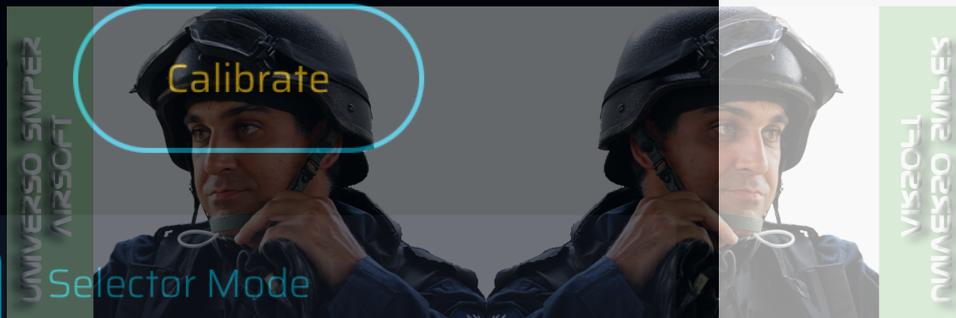


SAFE

SEMI

AUTO

Your Selector is not working correctly
Please calibrate it now



Selector Mode

SAFE-SEMI-AUTO



BURST Mode

Full: 3 BBs



Calibration

SEMI



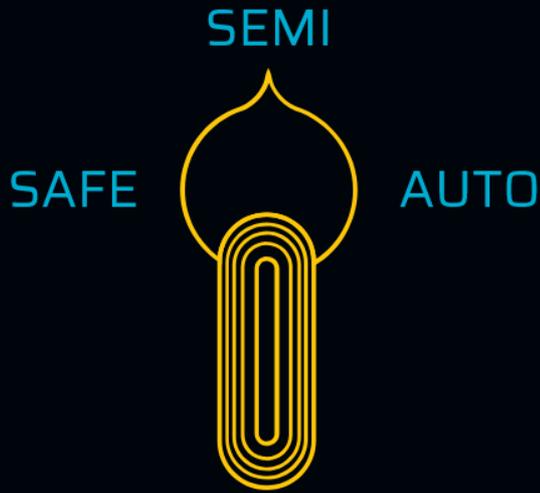
Switch Selector to SAFE and
press Next

Next

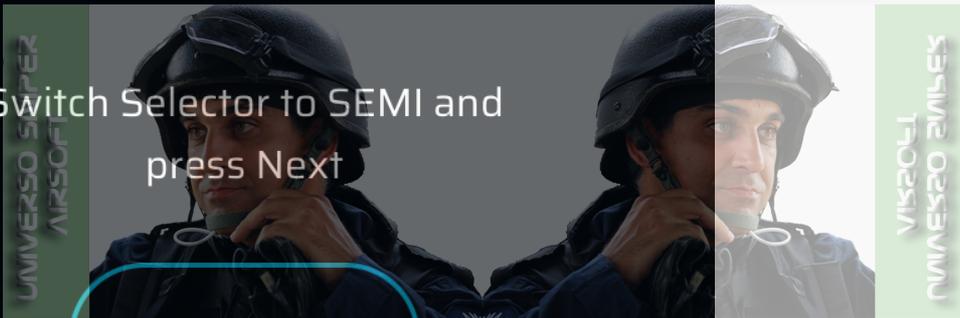




Calibration



Switch Selector to SEMI and
press Next





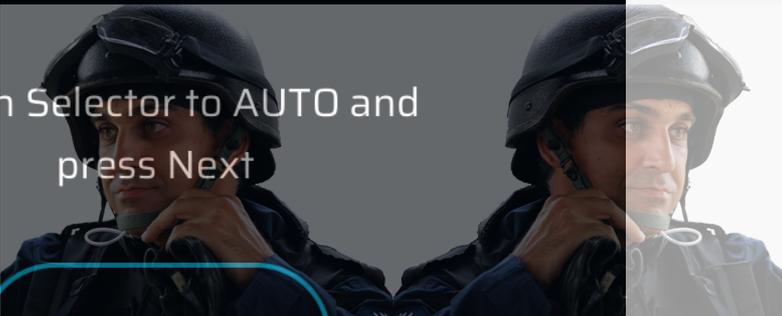
Calibration

SEMI



Switch Selector to AUTO and
press Next

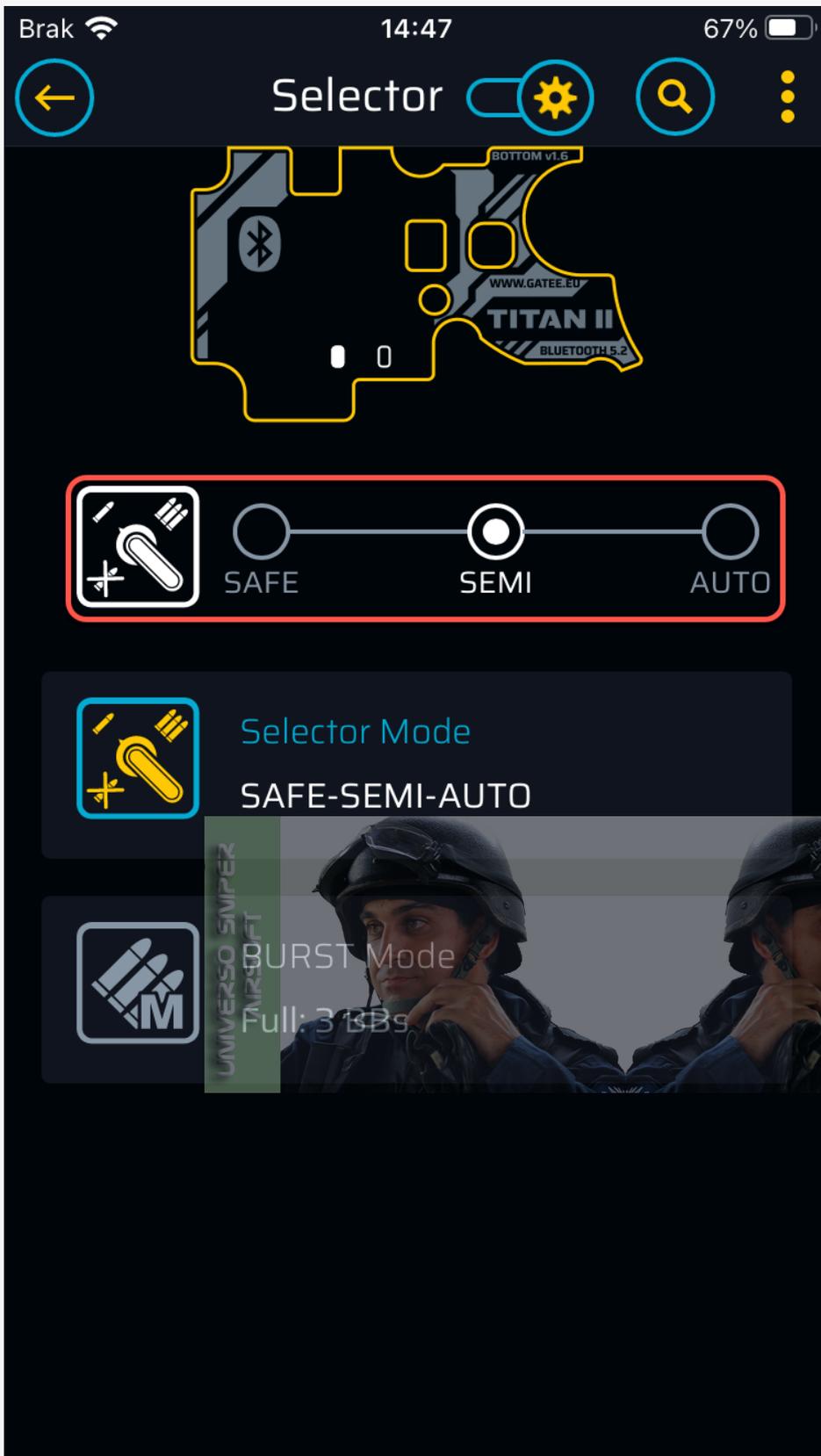
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AIRSOFT

Next

2. Move the selector plate to see if TITAN II Bluetooth® detects SAFE, SEMI and AUTO. You will notice changes in the marked areas.



3. If the sensor does not function correctly, you need to modify the selector plate with another sticker as mentioned above in steps 21-23 and shown below:



28. If all the sensors are working flawlessly, you can assemble the entire gearbox.

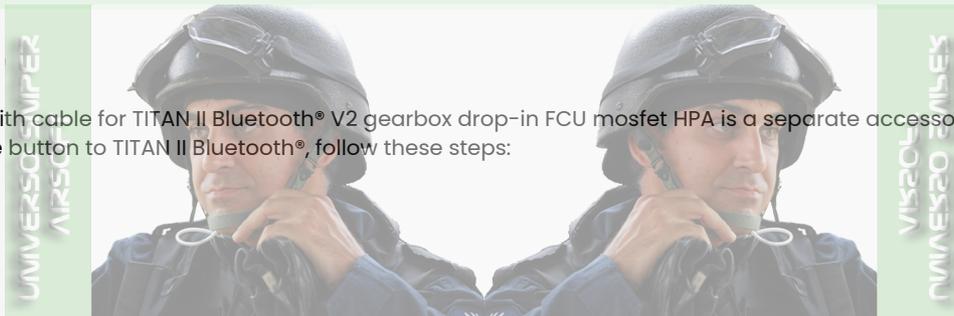
Caution
After assembling the entire replica, recalibrate the trigger and selector sensors.

Installation of Accessories

Note
Please note that in the case of dual solenoid engines, it is not possible to connect any extra devices requiring a power supply such as an electric magazine or BB tracer.

Bolt-Catch Button

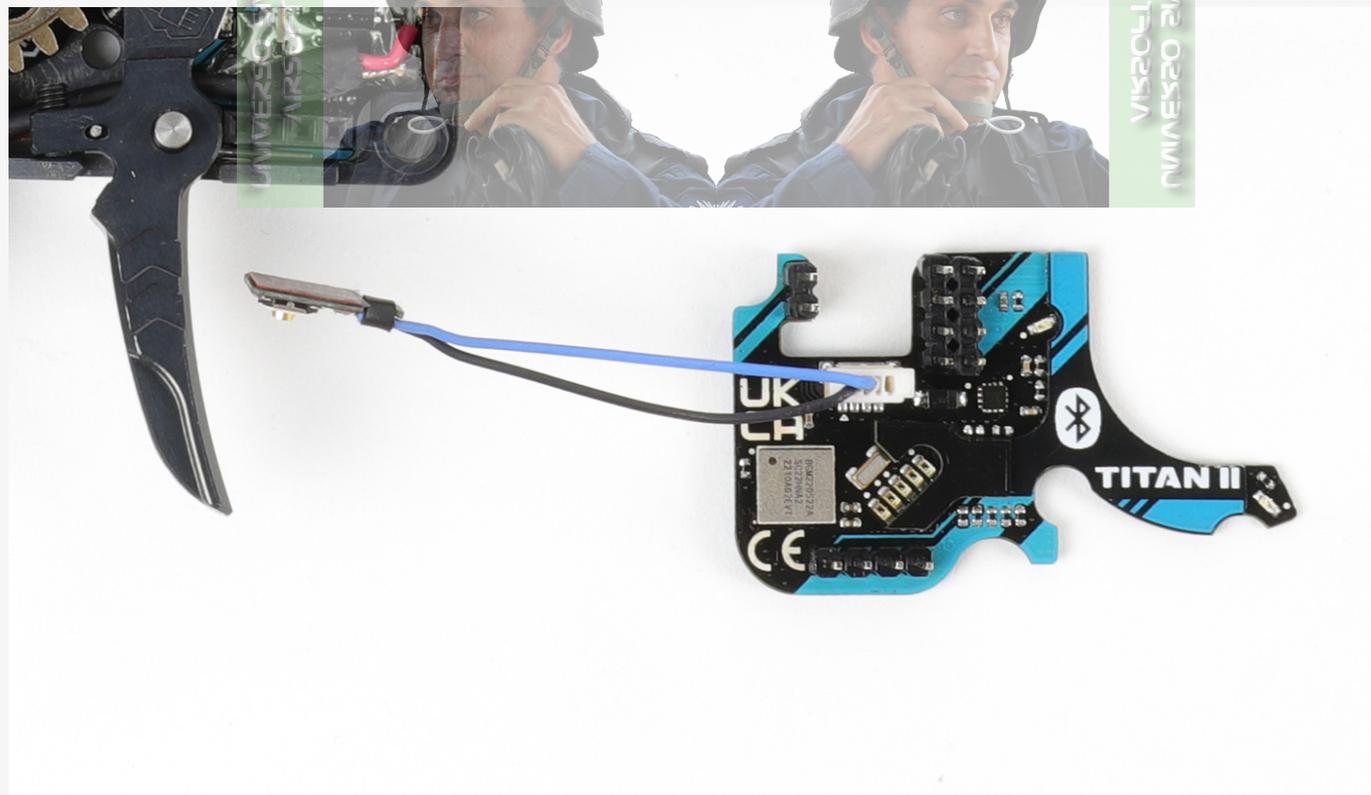
The bolt-catch button with cable for TITAN II Bluetooth® V2 gearbox drop-in FCU mosfet HPA is a separate accessory that is not included. To connect the button to TITAN II Bluetooth®, follow these steps:



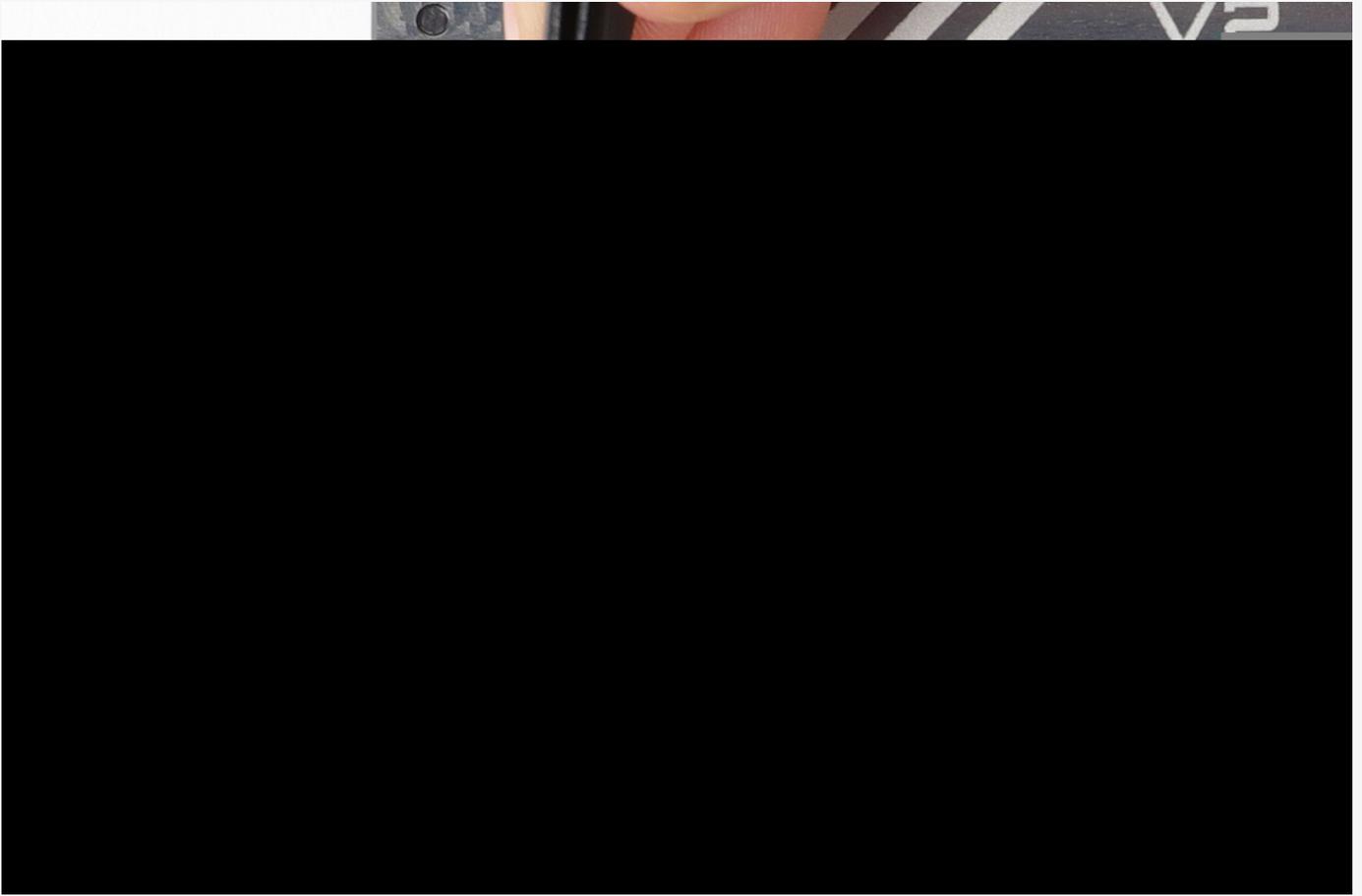
1. Prepare your gearbox for accessory installation. Lay the gearbox flat on a stable surface as shown in the following photo. Next, remove the screws securing the gearbox halves.



2. Open the gearbox and then remove the TOP TITAN II® board and plug-in the bolt-catch button into the multifunctional port.



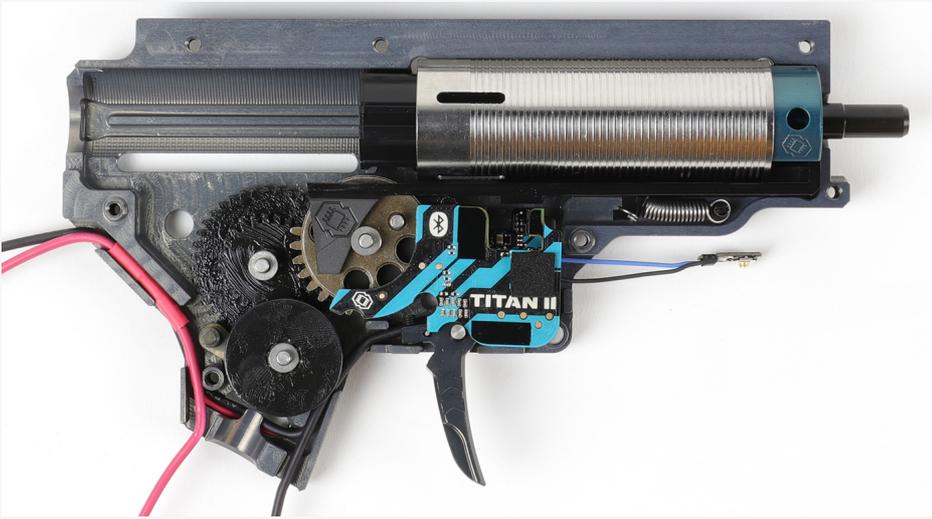
3. Remove the protective film from the tape being careful not to damage the adhesive layer.



4. Degrease the bolt-catch lever and stick the button in the place shown in the photo.



5. Connect the TOP board of TITAN II Bluetooth® unit with the BOTTOM board. Run the wires from the bolt-catch button out of the gearbox as shown in the following photo.



6. Close the gearbox shell, and make sure that the gearbox shell does not pinch the bolt-catch cables as this might cause permanent damage to the accessory.



Magazine Sensor

The magazine sensor with cable for the TITAN II Bluetooth® V2 gearbox drop-in FCU mosfet HPA is a separate accessory that is not included. To connect the sensor to TITAN II Bluetooth®, follow these steps:

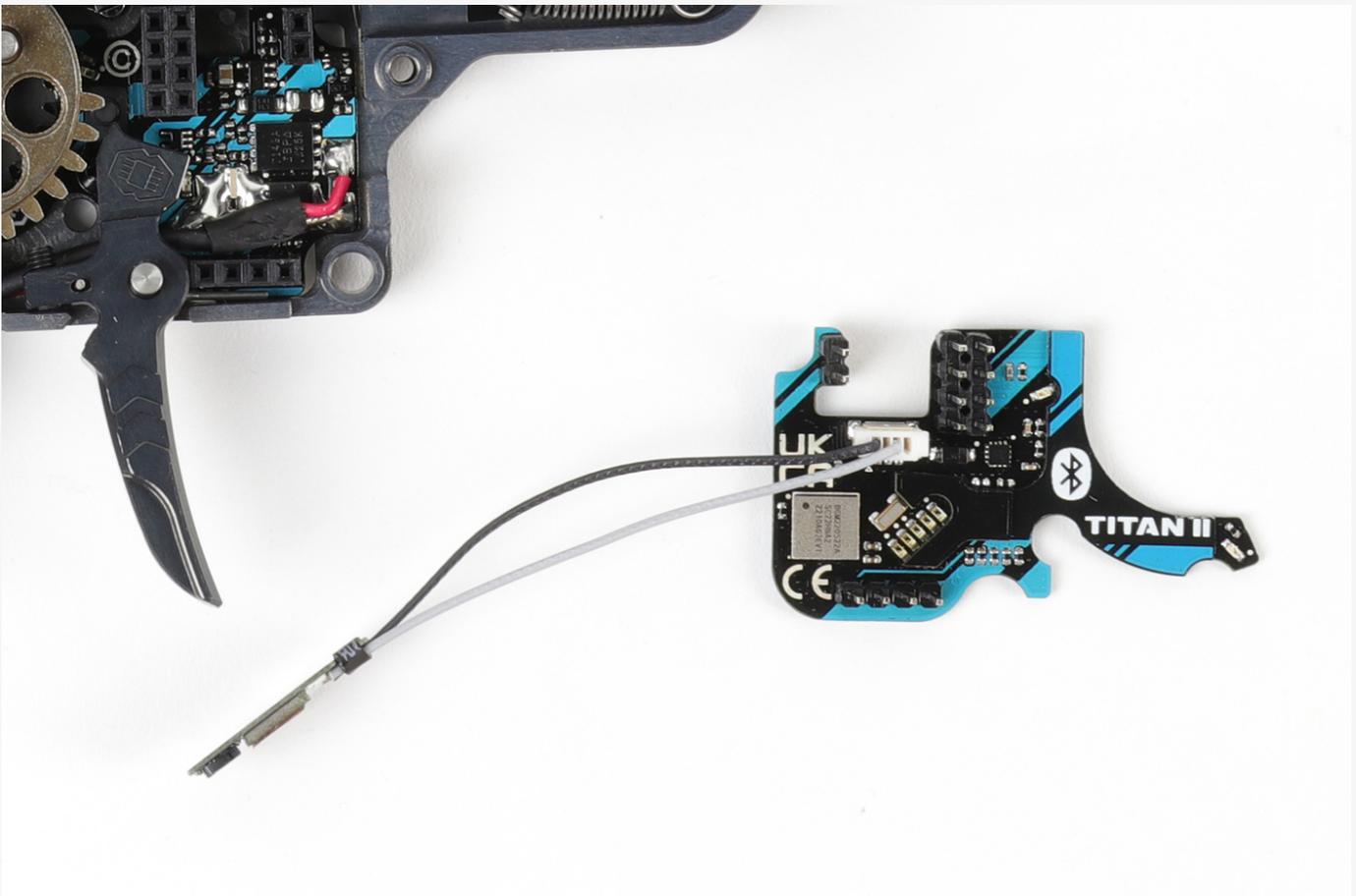
1. Prepare your gearbox. Lay the gearbox flat on a stable surface as shown in the following photo.



2. If possible, remove the piston spring before unscrewing the gearbox screws. Otherwise, unscrew the gearbox screws and carefully remove the cover making sure that the spring does not shoot out of the gearbox.



3. Remove the TOP TITAN II board and plug the magazine sensor into the multifunctional port.



4. Connect the TOP board of TITAN II Bluetooth® unit with the BOTTOM board. Run the wires from the magazine sensor out of the gearbox as shown in the following photo.



5. Close the gearbox shell, please make sure that the gearbox shell does not pinch magazine sensor cables as this might cause permanent damage to the accessory.



6. Remove the protective film from the tape being careful not to damage the adhesive layer.



7. Degrease the gearbox in the place of gluing and stick the magazine sensor in the place shown in the photo. **Align the plate to the bottom of the gearbox.**



Magazine Compatibility

The magazine sensor only supports magazines with a completely flat top surface. Magazines with longer side panels may not work properly. If you have such magazines, here is a solution to ensure compatibility with the sensor. Stick a 2 mm shim on the lower surface of the magazine, which will make the sensor work correctly.

Installation of the Divider for connecting many accessories

The Divider with cable for the TITAN II Bluetooth® V2 gearbox drop-in FCU mosfet HPA is a separate accessory that is not included. To connect the divider to TITAN II Bluetooth®, follow these steps:

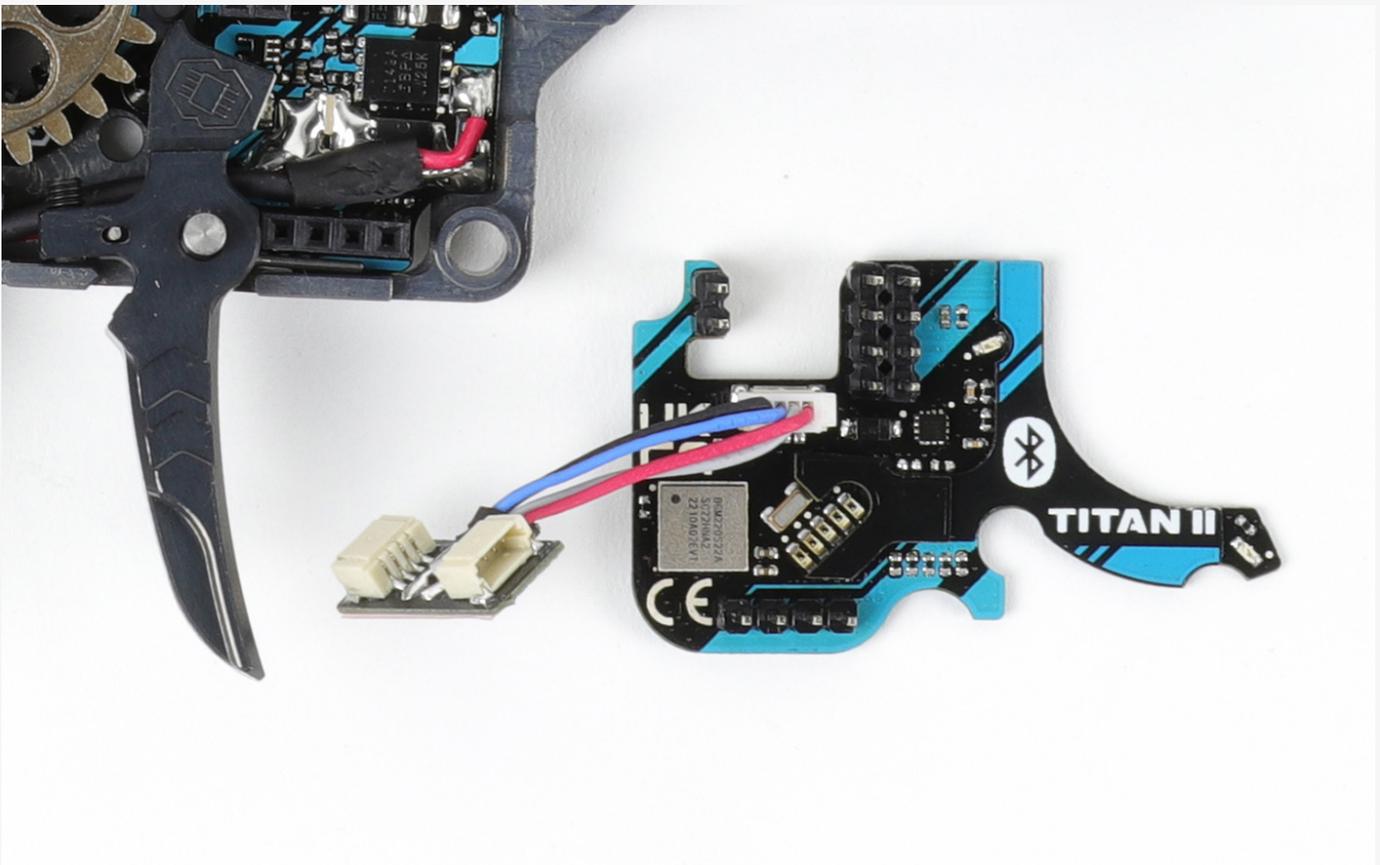
1. Prepare your gearbox. Lay the gearbox flat on a stable surface as shown in the following photo.



2. If possible, remove the piston spring before unscrewing the gearbox screws. Otherwise, unscrew the gearbox screws and carefully remove the cover making sure that the spring does not shoot out of the gearbox.



3. Remove the TOP TITAN II Bluetooth® board and plug the magazine sensor into the multifunctional port.



4. Connect the TOP board of TITAN II Bluetooth® unit with the BOTTOM board. Run the wires from the magazine sensor out of the gearbox as shown in the following photo.



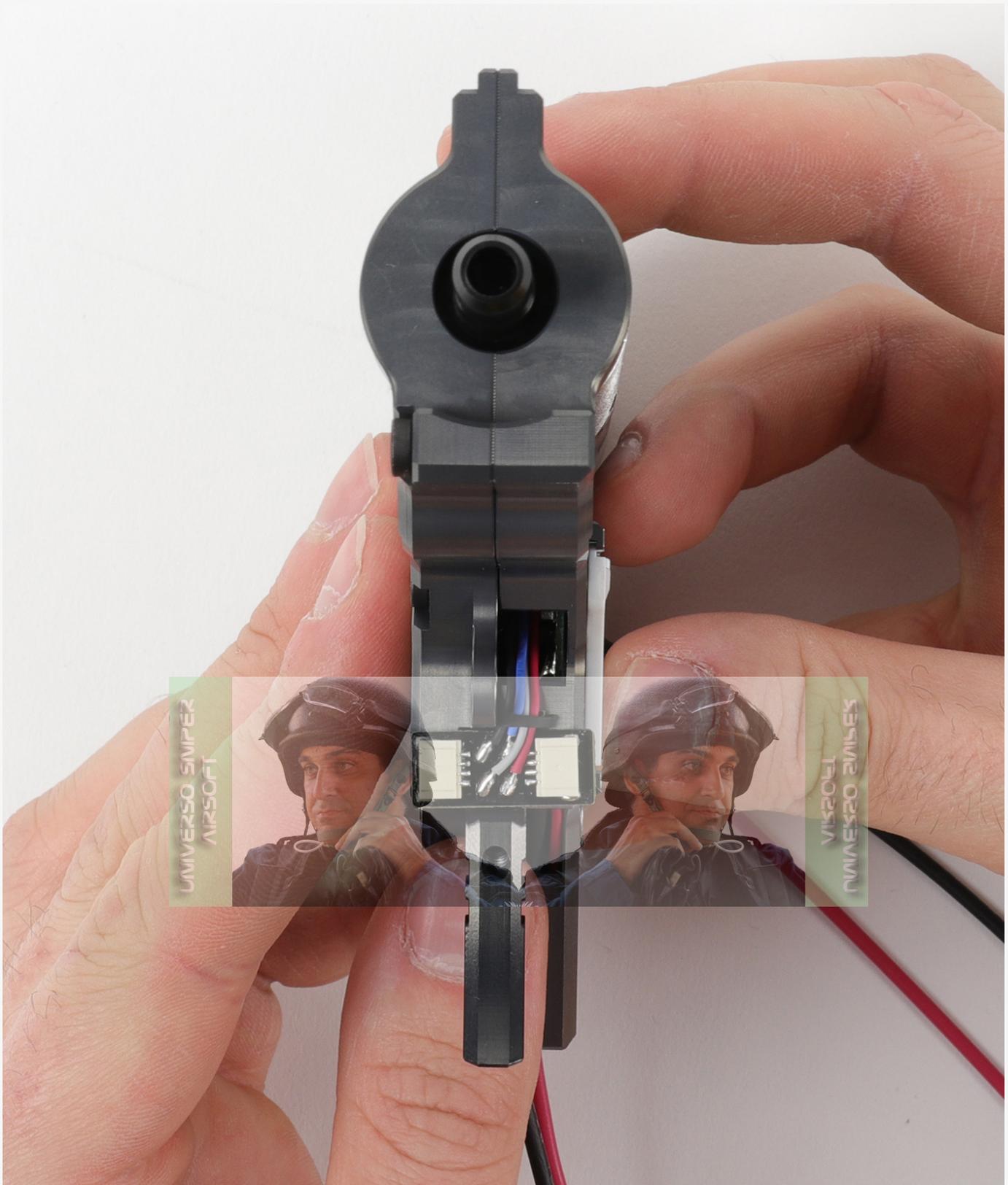
5. Close the gearbox shell, please make sure that the gearbox shell does not pinch the divider cables as this might cause permanent damage to the accessory.



6. Remove the protective film from the tape being careful not to damage the adhesive layer.



7. Degrease the gearbox in the place of gluing and stick the divider in the place shown in the photo.



Note

Please note that in the case of dual solenoid engines, it is not possible to connect any extra devices requiring a power supply such as an electric magazine or BB tracer.

Connecting Accessories Requiring Power



Note

Please note that in the case of dual solenoid engines, it is not possible to connect any extra devices requiring a power supply such as an electric magazine or BB tracer.

Connecting accessories that require power can be done via the [Universal DIY Power supply cable \(GEL BLASTER / Electric Magazine / Tracer\) for TITAN II Bluetooth®](#) to TITAN II Bluetooth®. The cable can be connected directly to the I/O port, and on the TITAN II Bluetooth®, however, we recommend connecting the cable via a [Divider ready for connecting many accessories - 1x power supply](#)

and 2x multifunctional for TITAN II Bluetooth® to TITAN II Bluetooth® for convenience in the later assembly and disassembly of the replica. Solder the free ends of the cable according to the polarity to the wires or power fields of the accessory.

Caution

Once connected to the I/O port, accessories can only be powered through this I/O port. The previous power source must be disconnected. The voltage flowing from the unit is equal to the voltage of the battery connected to it while the maximum current consumption can be 6 A.

In some magazines, there may be a problem manifested by the fact that they are still powered by the circuit when the trigger is released. If this is the case, solder the supplied capacitor into the circuit so that one lead of the capacitor is soldered to the negative supply wire and the other to the positive supply wire. The place where the capacitor is soldered can be anywhere depending on the room in the replica. When powering Gel Blaster magazines, we recommend soldering it directly to the contacts in the magazine socket.



Multifunctional Port Activation in GCS

Note

If the sensors are magazine and bolt-catch sensors, configure them **after** configuring the HPA engine. Go to section [Calibration of HPA Engine Control Times](#) and come back here.

Note

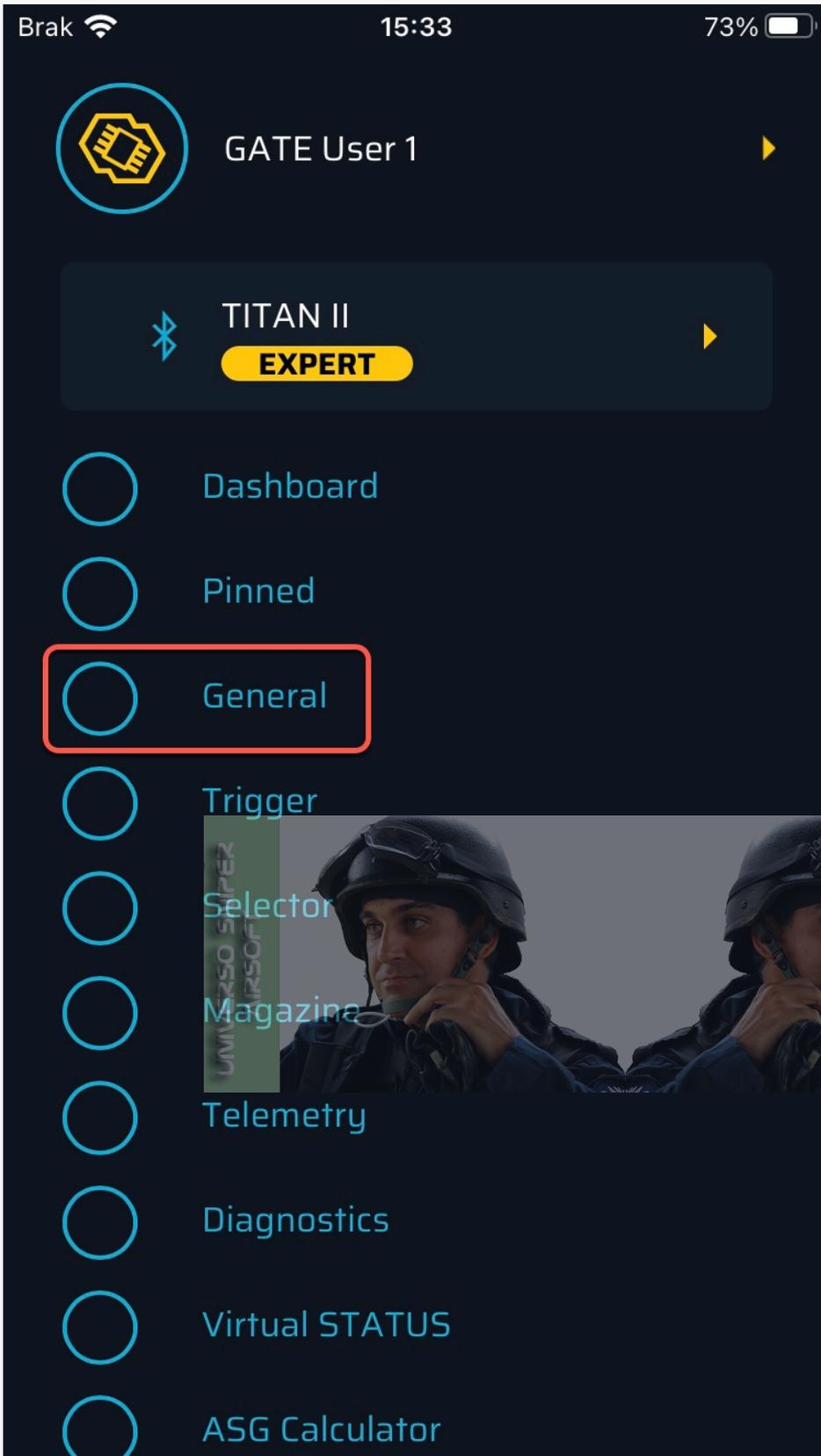
Note that if the sensors are trigger and selector sensors, you need to configure them before configuring the HPA engine.

Note

An external trigger and selector can be connected to the Multifunctional Port.

1. Download and install the GCS app on your device  GATE CONTROL STATION .
2. Start **Bluetooth**® communication on your device.
3. Connect the battery to TITAN II Bluetooth®.
4. Launch the GCS app and confirm all the required approvals.
5. Tap "+" on the **Dashboard** of the app.
6. In the list of devices, locate your TITAN II Bluetooth®. If it is not found, drag the screen down to refresh or tap **Refresh Scan**.
7. Enter the **PIN** code found on the included stickers.
8. Update the TITAN II Bluetooth® firmware.







General



HPA Engine

Single Solenoid Valve



Multifunctional Port

On



Battery

Protection: LiPo, Warning: 3.3 V

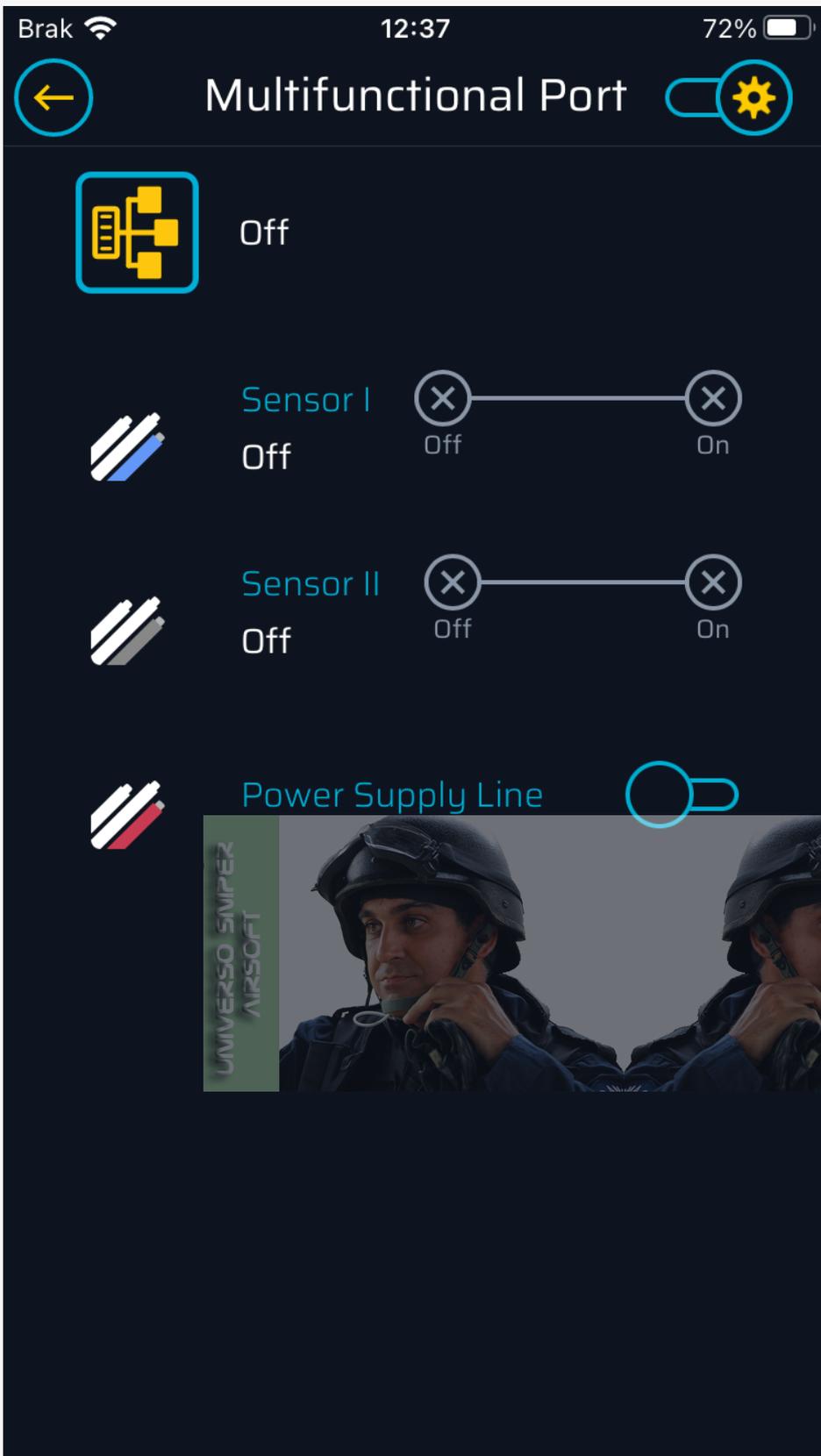


Series Safety Limit

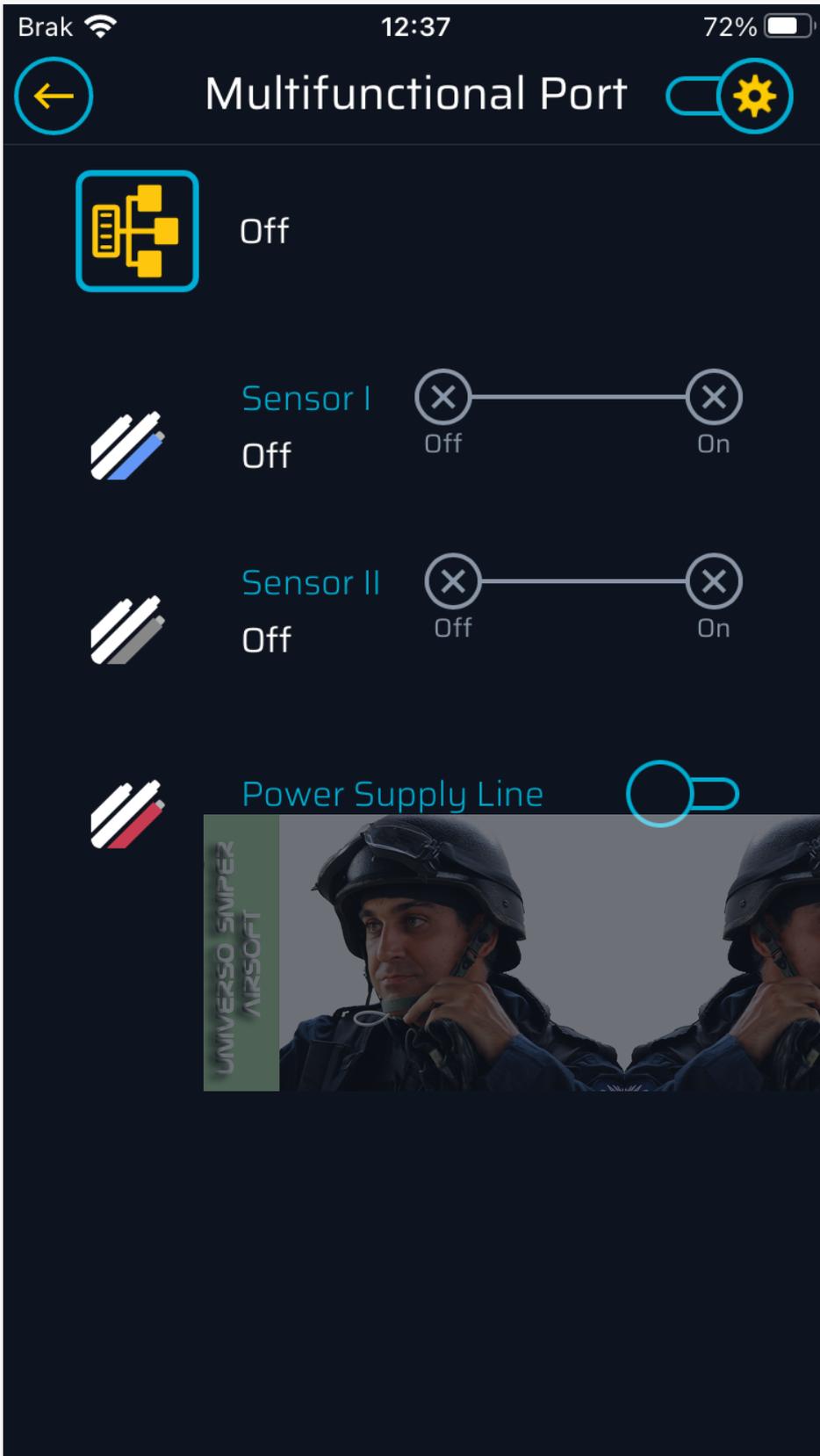
Off



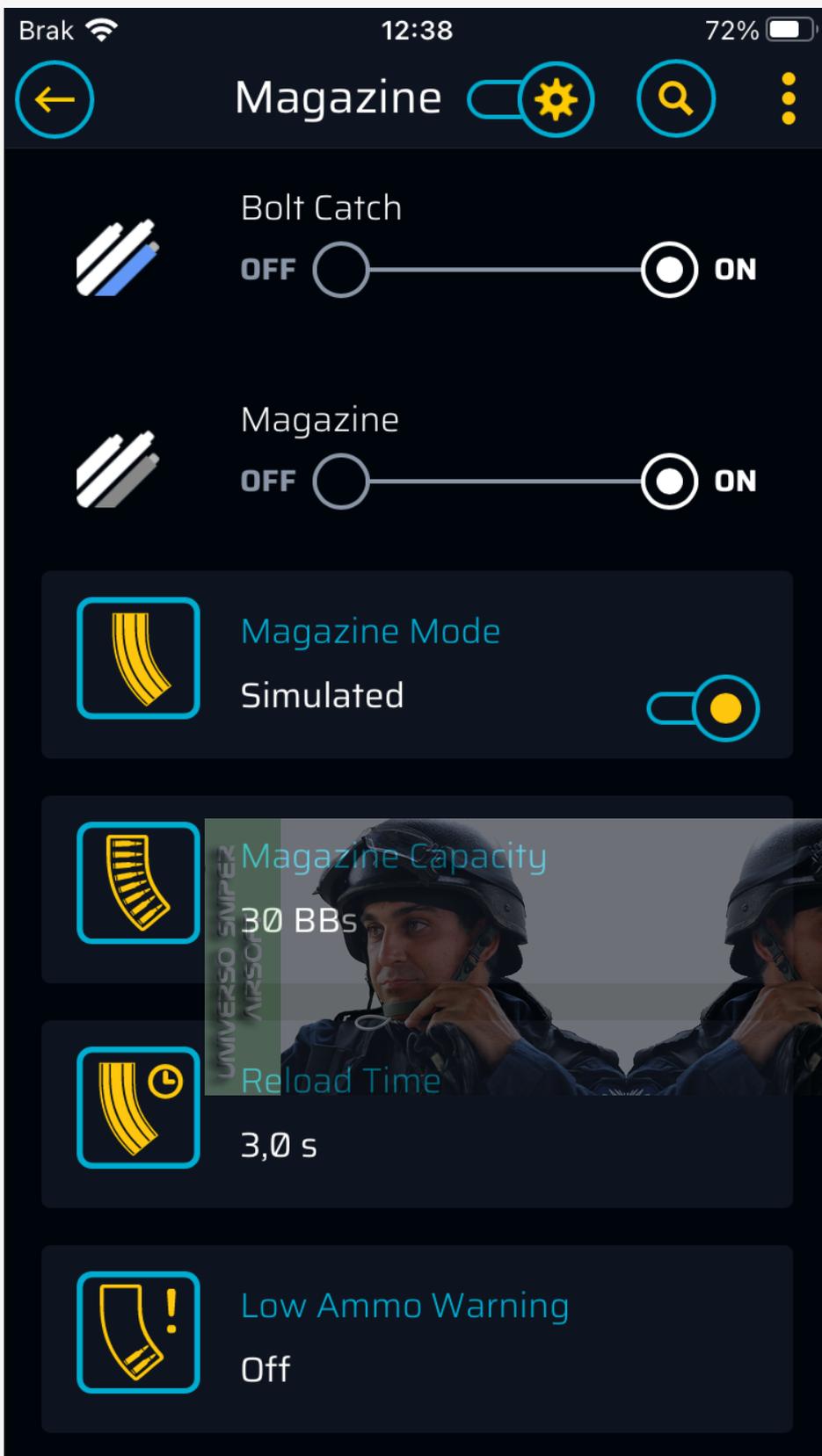
10. Tap **Sensor I** and select **Bolt-Catch** if you want to use the bolt-catch button.



11. Tap **Sensor II** and select **Magazine** if you want to use the magazine sensor.



12. Turn on **Magazine Mode Simulation** in the **Magazine** tab and set the appropriate magazine capacity.



13. The bolt catch sensor and magazine sensor can act as an external trigger sensor and selector in custom replicas. You can also use a universal accessory cable and use buttons/switches as desired. Their installation, due to the variety of non-standard or custom replicas and the existing technical solutions in them, may strongly vary. Leave the design and process of such installation in the hands of a qualified person.

Configuring the Magazine and Bolt-Catch Sensor

You can configure the sensors in the **Multifunctional Port** tab

Bolt-Catch

You can configure the sensors in the **Multifunctional Port** tab

Go to tab **General** > **Multifunctional Port**

In the **Multifunctional Port** tab, you can enable or disable the external sensors like **Bolt-Catch Sensor**, as well as check if the sensor is working properly.

- Tap the **Sensor Signal I (marked blue)**
- To enable the sensor select **Bolt-Catch**
- To turn off the sensor select **OFF**





Set Magazine Capacity for correct functioning



On



Sensor Signal I
Bolt Catch



Selector

Bolt Catch



Sensor Signal II
Off



Power Supply Line



Magazine sensor

You can configure the sensors in the **Multifunctional Port** tab

Go to **General>Multifunctional Port**

In the **Multifunctional Port** tab, you can enable or disable the external sensors like **Magazine Sensor**, as well as check if the sensor is working properly.

- Tap the **Sensor Signal II (marked grey)**
- To enable the sensor select **Magazine**
- To turn off the sensor select **OFF**





Set Magazine Capacity for correct functioning



On



Sensor Signal I

Bolt Catch



PRESSED

RELEASED



Sensor Signal II

Magazine



OUT

IN

Selector

Magazine



Power Supply Line



Configuring Magazine Capacity Simulation

- 1. Go to the **Magazine** tab

- **Magazine mode** – means enabled or disabled magazine simulation mode and the need to reload the magazine
- **Magazine Capacity** – here you set the real or predefined number of BBs in the magazine after firing which the replica will stop shooting and you will need to reload
- **Reload Time** – the amount of time which prevents the replica from firing after emptying the magazine of a predefined number of BBs. Does not work when you have set the magazine and bolt-catch sensors. Represents the time needed to reload the replica – after this time has elapsed, you can continue to fire.





Bolt Catch



PRESSED



RELEASED

Magazine



OUT



IN



Magazine Mode

Off



Magazine Capacity

30 BBs



Reload Time

3.0 s





Magazine Mode



Simulated

Magazine Mode



Allows to switch on Magazine Simulation and Bolt Catch in NGRS gearboxes.



Changes not saved

SAVE





Bolt Catch



PRESSED



RELEASED

Magazine



OUT



IN



Magazine Mode

Simulated



Magazine Capacity

30 BBs



Reload Time

3.0 s



4. In the **Magazine Capacity** tab, set the number of BBs after which the replica will stop firing and a reload sequence will be required.

The reload time does not matter when using the magazine sensor and bolt-catch. It can be left at the default value.



Magazine Capacity



30 BBs

Capacity

30 BBs

2

0

3

0

1

4

1

Depending on firmware edition, allows you to set magazine capacity simulation from 1 BB up to 250 BBs. Please note that in all gearboxes except NGRS, all the BBs fired are counted until the counter reaches the set capacity, even if the real magazine is replaced in the middle of magazine simulation.

In NGRS gearboxes, thanks to the magazine sensor, if the real magazine is replaced during magazine simulation, the counter is reset to the full simulated magazine capacity.

In all cases, you are informed about an empty simulated magazine with vibrations — a high one and two low ones.



Your Bolt-Catch and Magazine sensors have been configured. The reload sequence has been activated.

1. To disable Magazine Simulation Mode, go to the **Magazine** tab and change the position of the **Magazine Mode** switch to **OFF**



Caution

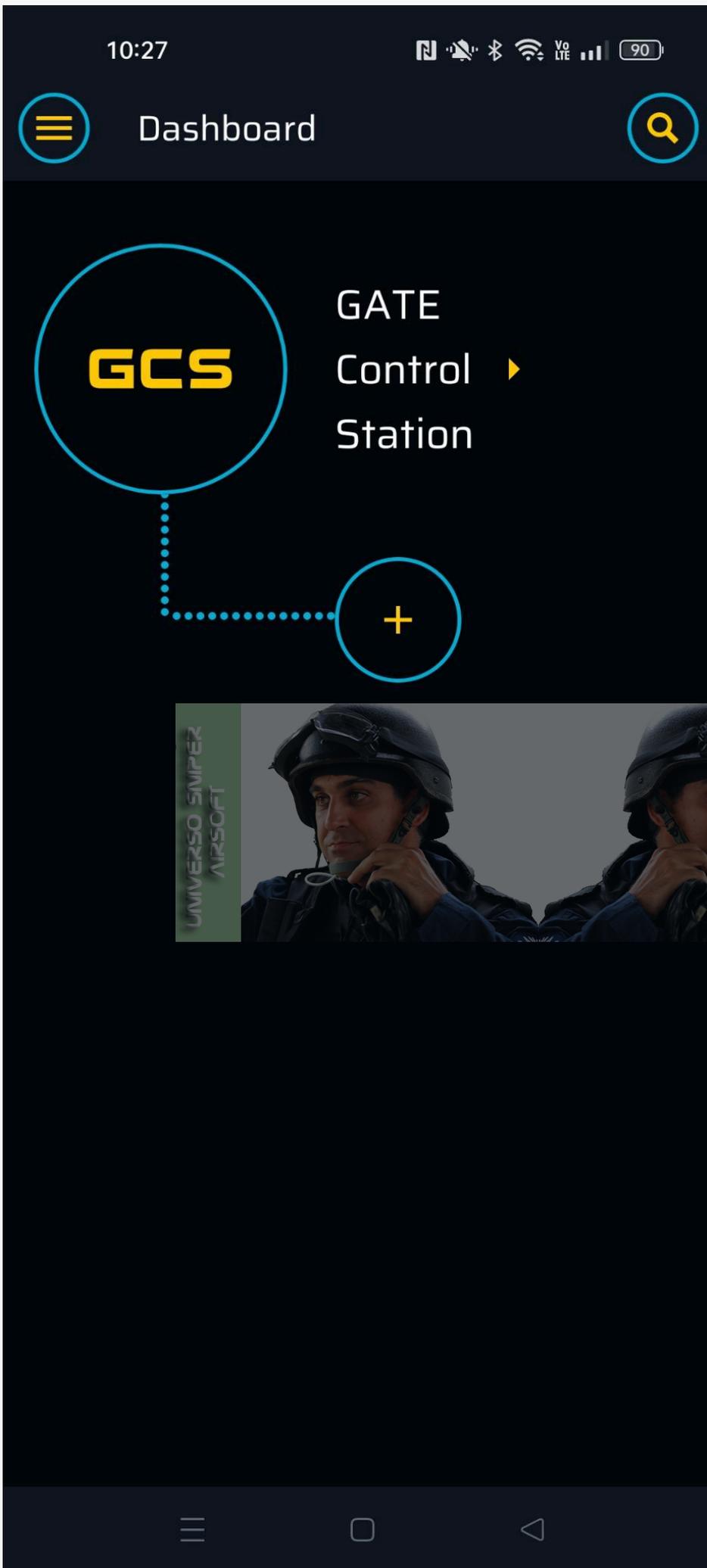
Because of the installed bolt-catch button, disassemble the upper receiver very carefully, so as not to damage the sensor or wires.

Disassembly should be carried out checking the position of the wires and the bolt-catch sensor at all times.
Please bear in mind that damage to the bolt-catch button and its wires is not covered by the warranty. If necessary, you can find spare parts at  GATE Enterprise .

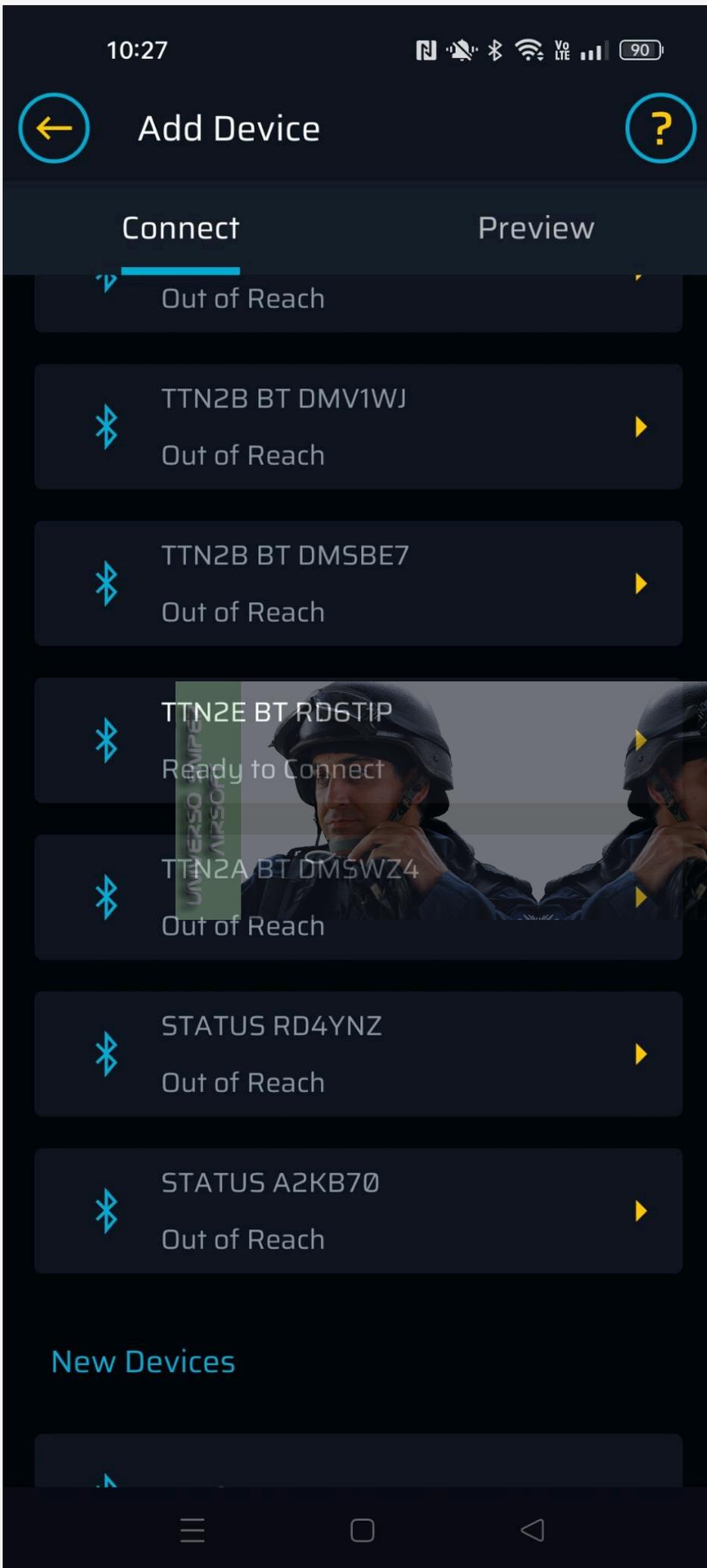
Calibration of HPA Engine Control Times



1. Connect to TITAN II using the GCS app by selecting "+" in the Dashboard.

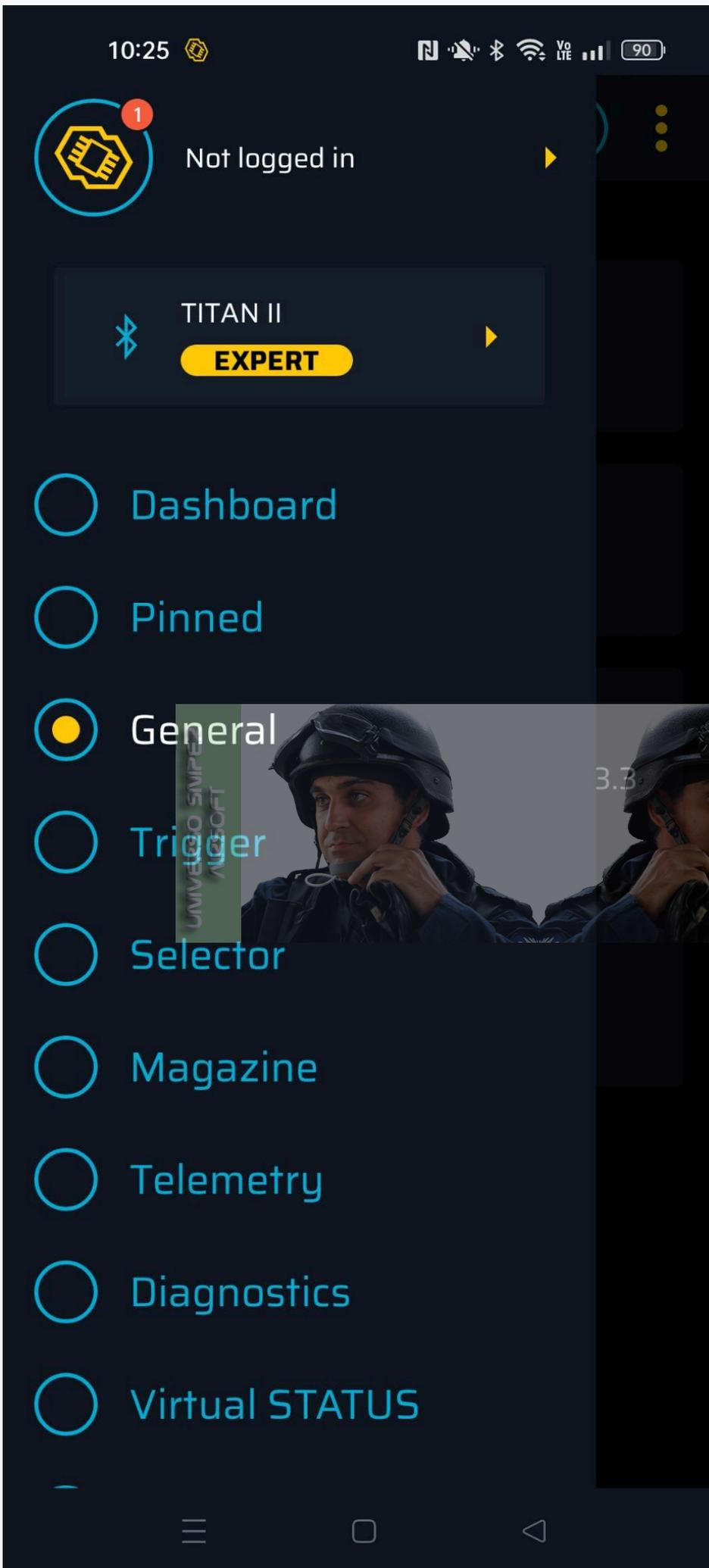


2. Select TITAN II Bluetooth® from the list. If this is the first time you connect, you must enter the PIN code that came with the product.



3. After connecting TITAN II Bluetooth® to GCS, tap the TITAN icon.





5. Tap the **HPA Engine** tab.

10:25



General



HPA Engine

Single Solenoid Valve



I/O Port Settings

Off



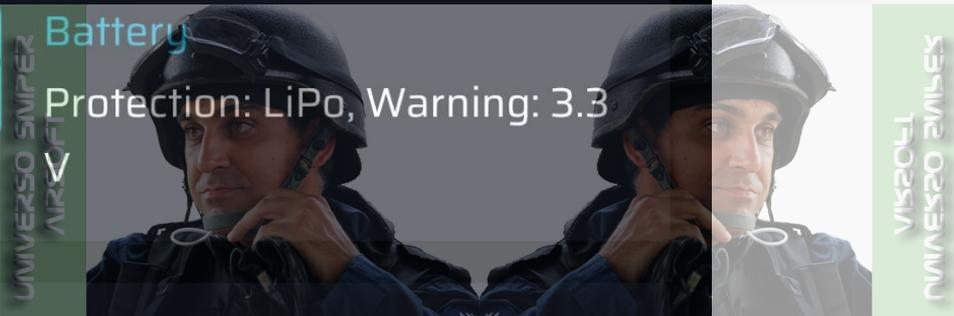
Battery

Protection: LiPo, Warning: 3.3

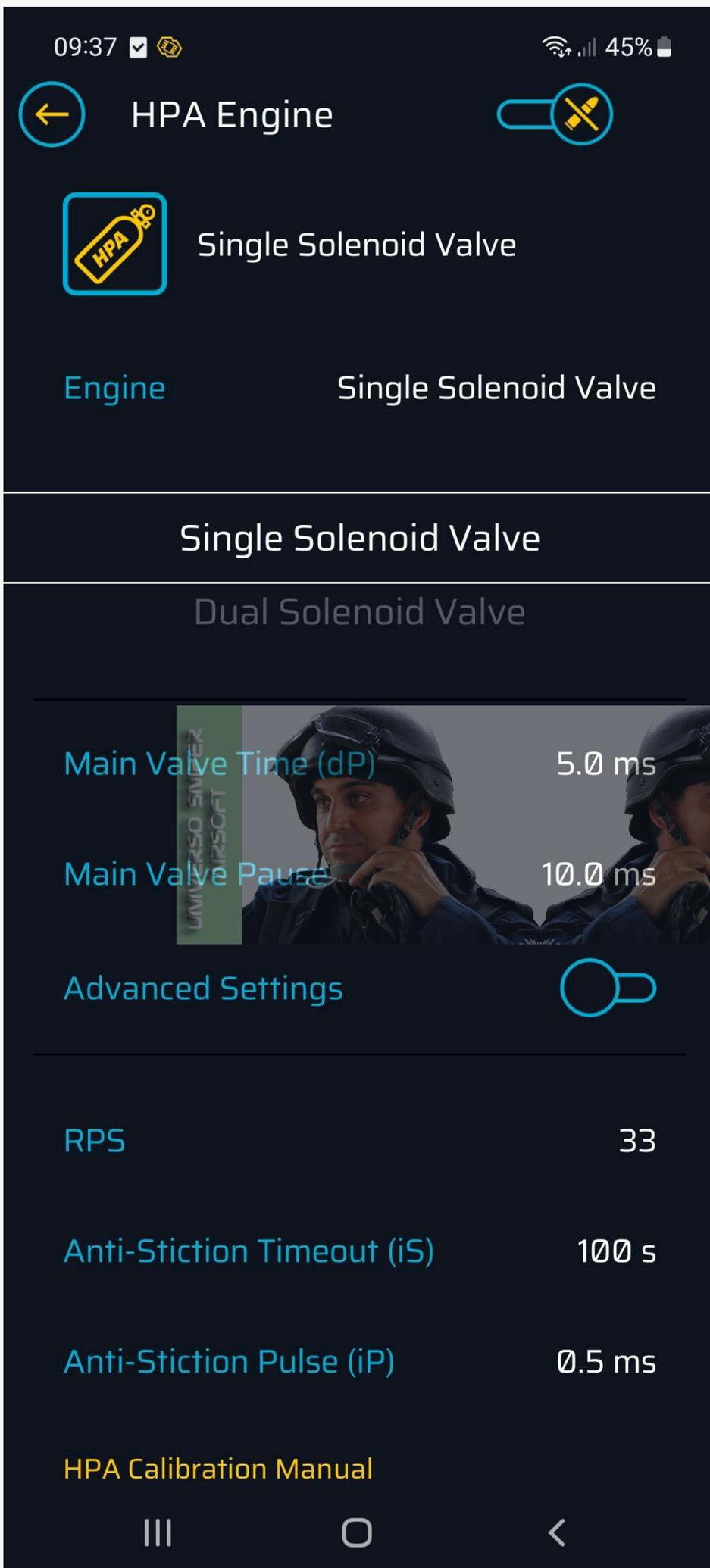


Series Safety Limit

Off



6. Set the correct engine type – Single or Dual Solenoid Valve or PULSAR D depending on the engine you have.



7. Select the valve operating times appropriate for the configuration of your replica as described below.

Single Solenoid Valve Engine Calibration

09:28    46% 

 **HPA Engine** 

 **Single Solenoid Valve**

Engine Single Solenoid Valve

Main Valve Time (dP) 5.0 ms

Main Valve Pause 10.0 ms

Advanced Settings

Anti-Stiction Timeout (iS) 100 s

Anti-Stiction Pulse (iP) 0.5 ms

HPA Calibration Manual

Engine
TITAN II supports different types of engines - here you can choose what type of engine you have so that the program controls it



1. Set the **Main Valve Time** to **15 ms**.
2. Then proceed to chrono the replica. Depending on the weight of the BBs, the length of the barrel and the hop-up bucking, use the pressure regulator to preset the desired BB muzzle velocity.
3. Then decrease the **Main Valve Time** by **1 ms** at a time until the FPS do not start to drop. If you notice a decrease in FPS, return to the previous time value at which there was no decrease in FPS. This means that the **Main Valve Time** has been calibrated correctly.
4. Next, go to the **Main Valve Pause** setting. This value depends on the quality of the magazine you are using. The weaker the spring in the magazine, the longer the pause will have to be. Proceed here similarly to the **Main Valve Time** calibration. Set **25 ms** and decrease by **1 ms** at a time until you notice pauses in the feed of the BBs through the magazine; then return to the previous time setting. If you continue to observe problems with BB feed, you should increase this time.

Dual Solenoid Valve Engine Calibration



1. Set the **Main Valve Time** to **15 ms**.
2. Then proceed to chrono the replica. Depending on the weight of the BBs, the length of the barrel and the hop-up bucking, use the pressure regulator to preset the desired BB muzzle velocity.
3. Then decrease the **Main Valve Time** by **1 ms** at a time until the FPS do not start to drop. If you notice a decrease in FPS, return to the previous time value on which there was no decrease in FPS. You can then calibrate the time more precisely by changing the setting every 0.1 ms. This means that the Main Valve Time has been calibrated correctly.
4. Next, go to the **Main Valve Pause** setting. This value depends on the length of time the BB remains in the barrel. Set this value between **15** and **1 ms**, and check which value will give a stable muzzle velocity result for your replica. Typically, this time is between 2 and 4 ms.
5. Next, go to the **Nozzle Valve Time** setting, this value depends on the quality of the magazines you use. The weaker the spring in the magazine, the longer the interval will have to be. Proceed here similarly to the **Main Valve Time** calibration. Set the value around 25 ms, and then decrease it until you notice gaps in the magazine feeding the BBs, then return to the previous time setting. If you continue to observe problems with BB feed, you should increase this time.



6. The last value is the **Nozzle Valve Pause** calibration. This function is responsible for the time the controller should wait after releasing the nozzle, the standard time for the nozzle in the dual solenoid valve engines to return to the closed position is about **13-15 ms**. Therefore, it is not recommended to go below these values with the time for this function due to the fact that it can negatively affect the accuracy of the replica and the muzzle velocity.

If you're experiencing issues with engine calibration, restore default settings, which should work correctly in most cases.





HPA Engine



Dual Solenoid Valve

Engine

Dual Solenoid Valve

Operation Mode (OB/CB)

Close Bolt

Main Valve Time (dP)

5.0 ms

Main Valve Pause

10.0 ms

Nozzle Valve Time (dn)

15.0 ms

Nozzle Valve Pause (Return to

10.0 ms

Battery Delay - dr)

Advanced Settings

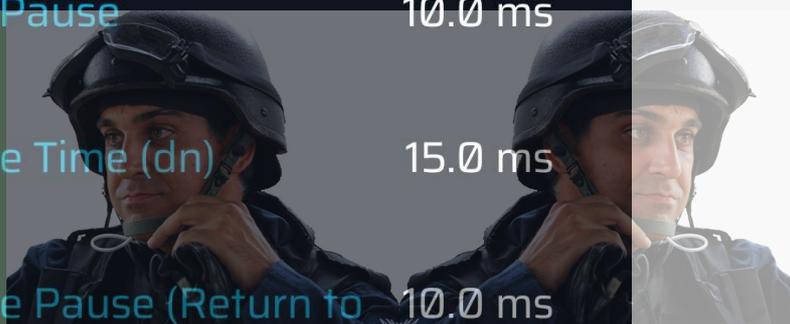


RPS

33

Anti-Stiction Timeout (iS)

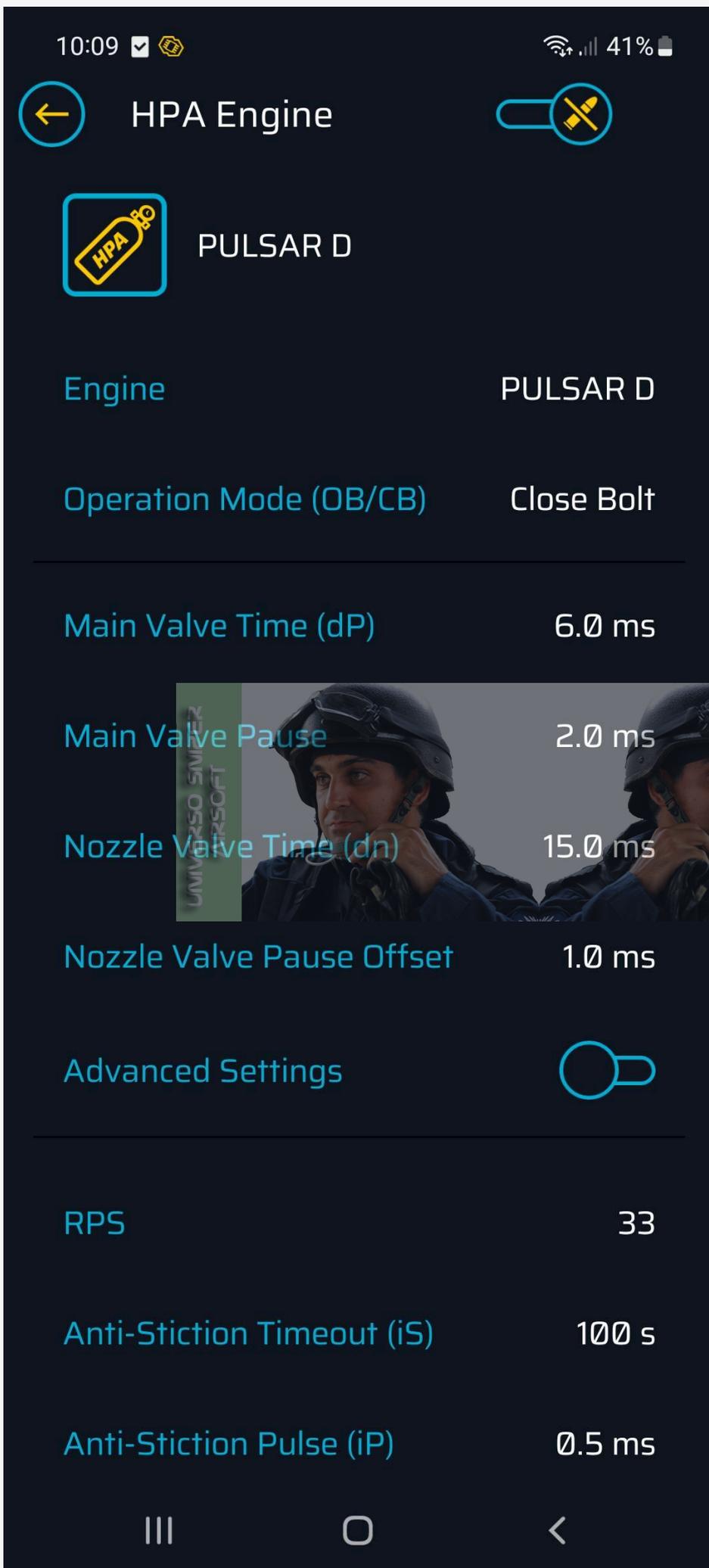
100 s



UNIVERSO SIMPER
AIRSOFT

UNIVERSO SIMPER
AIRSOFT

1. Start calibration by restoring the default settings, which should work well in most replicas and will be a good starting point for precise calibration.



2. Then proceed to chrono the replica. Depending on the weight of the BBs, the length of the barrel and the hop-up bucking, use the pressure regulator to preset the desired bullet muzzle velocity.

3. Then decrease the **Main Valve Time** by **0,1 ms** at a time until the FPS do not start to drop. If you notice a decrease in FPS, return to the previous time value on which there was no decrease in FPS. This means that the **Main Valve Time** has been calibrated correctly.
4. Next, go to the **Main Valve Pause** setting. This value depends on the length of time the BB remains in the barrel. Set this value between **0.1** and **3 ms**, and check which value will give a stable muzzle velocity result for your replica.
5. Next, go to the **Nozzle Valve Time** setting, this value depends on the quality of the magazines you use. The weaker the spring in the magazine, the longer the interval will have to be. Proceed here similarly to the **Main Valve Time** calibration. Set the value around 25 ms, and then decrease it until you notice gaps in the magazine feeding the BBs, then return to the previous time setting. If you continue to observe problems with BB feed, you should increase this time.
6. The last value is the **Nozzle Valve Pause Offset** calibration. Nozzle Offset – is the amount of time added to the TITAN's measured time to move the nozzle to its maximum forward position to fire when the nozzle is already stabilized in the hop-up chamber. This improves focus and FPS stability. For stable operation of the replica, it is worth setting this time between 1-3 ms.

✔ **Note**

Please note that in the case of dual solenoid engines, it is not possible to connect any extra devices requiring a power supply.

Tooltips

Engine – TITAN II supports different types of engines – here you can choose what type of engine you have so that the program controls it correctly

Operation Mode (OB/CB) – Dual Solenoid Valve Engine mode – here you can select the mode of operation of the dual solenoid valve engine:

Closed bolt – the engine will always perform a shot cycle with the BB already loaded into the hop-up chamber – this improves the stability of the engine's operation and BB trajectory.

Downsides: the first shot is dry fire, lower ROF

Open bolt – the engine will always perform a shot cycle milliseconds after the BB is loaded into the hop-up chamber

Downsides – stability of operation and BB trajectory,

Upsides – higher ROF, the first shot is not dry fire

Main Valve Time (dP) – Main Valve Time (Poppet Dwell – dP) – the opening time of the main solenoid valve – with this option you can adjust the muzzle velocity of the HPA replica and gas consumption

Main Valve Pause – the interval time between the next shot cycle in the case of a single solenoid valve engine and the interval time between the intermediate solenoid valve cycle and the nozzle cycle in a dual solenoid valve engine. It affects the stability of the hop-up and engine operation (FPS).

Nozzle Valve Time (dn) – Nozzle Valve Time (Nozzle Dwell – dn) – nozzle control valve open time, this time defines how long the nozzle will stay in the back position, for weaker magazines this time must be longer

Nozzle Valve Pause (dr) – Nozzle Valve Pause (Return to Battery Delay – dr) – the interval time between the end of the nozzle reverse cycle and the next main/intermediate valve cycle, in other words, the sum of the time that the nozzle has to return to its initial position

Nozzle Valve Pause Offset – Innovative Nozzle Position Detection and Automatic **Nozzle Valve Pause** Calibration System

In PULSAR D, thanks to the innovative nozzle position detection system, the nozzle return time to the sealed position with the hop-up bucking is measured during each shot cycle. As a result, this time is dynamically adjusted to the real nozzle return time with each shot, as the pressure of the BBs on the nozzle changes. A full magazine results in greater BB thrust and longer nozzle movement time. This allows the maximum ROF to always be achieved and eliminates the possibility of setting the time too short, causing the air to be fed too quickly to release the BBs, which can cause FPS instability and hop-up problems, resulting in the replica's lack of accuracy.

Instead of calibrating the Nozzle Valve Pause, you set the Nozzle Valve Pause Offset which is added to the actual measured Nozzle Valve Pause as an additional time buffer. This is a form of additional protection for the firing delay, which realistically affects the stability of the replica's performance and greater accuracy.

Anti-Stiction Timeout (iS) – the time after the last shot is fired after which additional boost time will be added: Anti-Stiction Pulse (iP)

Anti-Stiction Pulse (iP) – in cold temperatures after a long pause in firing, the valve cools down and its response time increases; this time allows the pulse for the first shot after a long pause to be extended so that the first shot is exactly like the subsequent shots

RPS – Rate of Fire – ROF (RPS) – in this case it is a simulation of the rate of fire based on the length of the times set. After calibrating the engine, the maximum achievable RPS will be displayed. They can be adjusted downward by reducing the number of RPS

Alternative SAFE Mode

If the user has configured the selector so that SAFE mode is not assigned to any selector position, the user can activate SAFE mode at any time by doing the following:

1. Set the selector lever to SAFE
2. Change the selector position to SEMI
3. Return to SAFE position again.

Caution

Note that the above sequence must be performed within 0.5 s. Activation of SAFE mode will be confirmed by a short low tone vibration. The SAFE mode is deactivated when the fire selector position is changed.

Restoring Factory Settings

Note

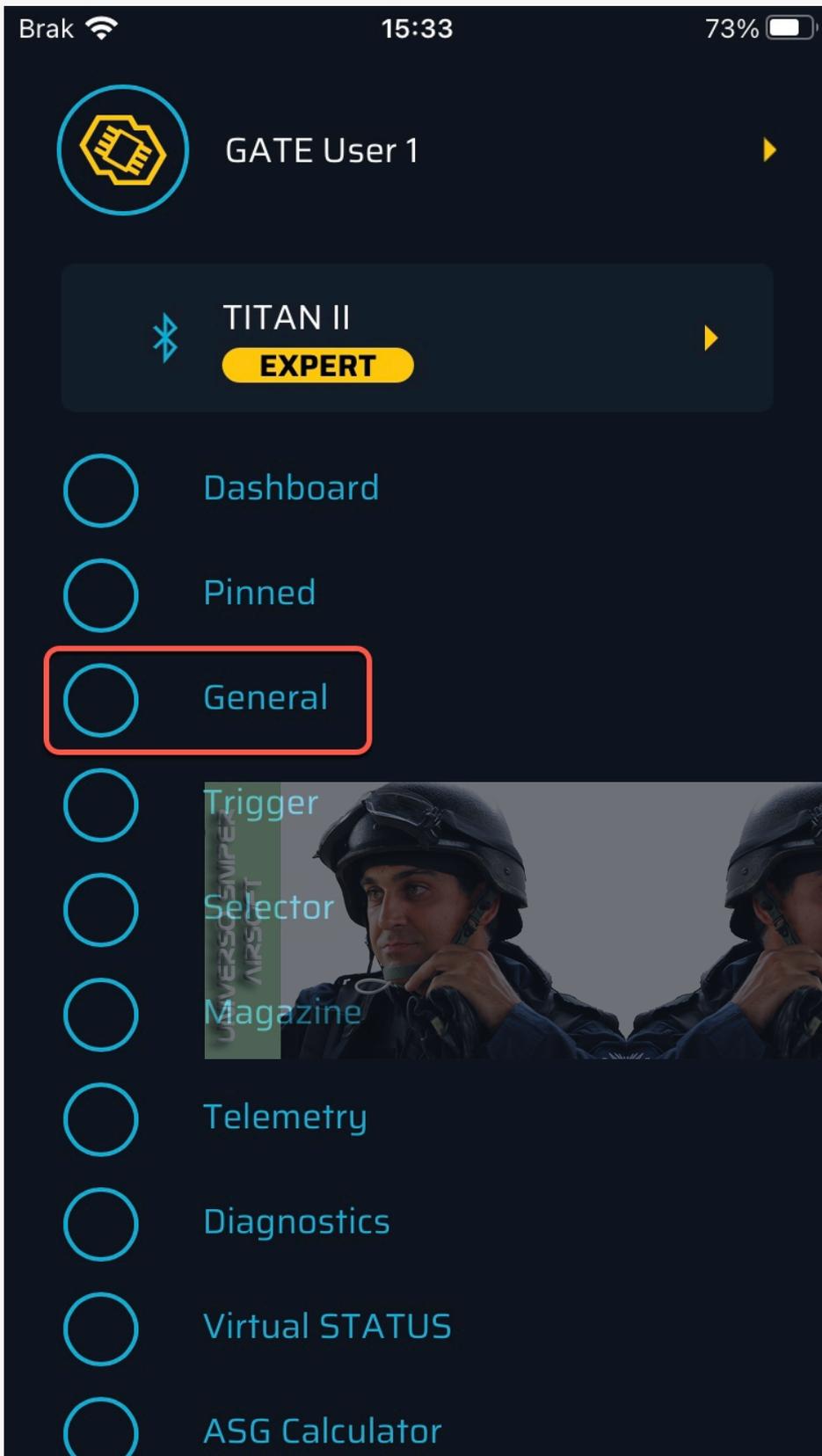
Restoring the factory settings results in resetting the default settings, erasing adaptations, calibration of the trigger sensor and fire selector as well as statistical data.

Factory settings can be restored only when the TITAN II Bluetooth® is connected to the GCS app. Follow the steps below:

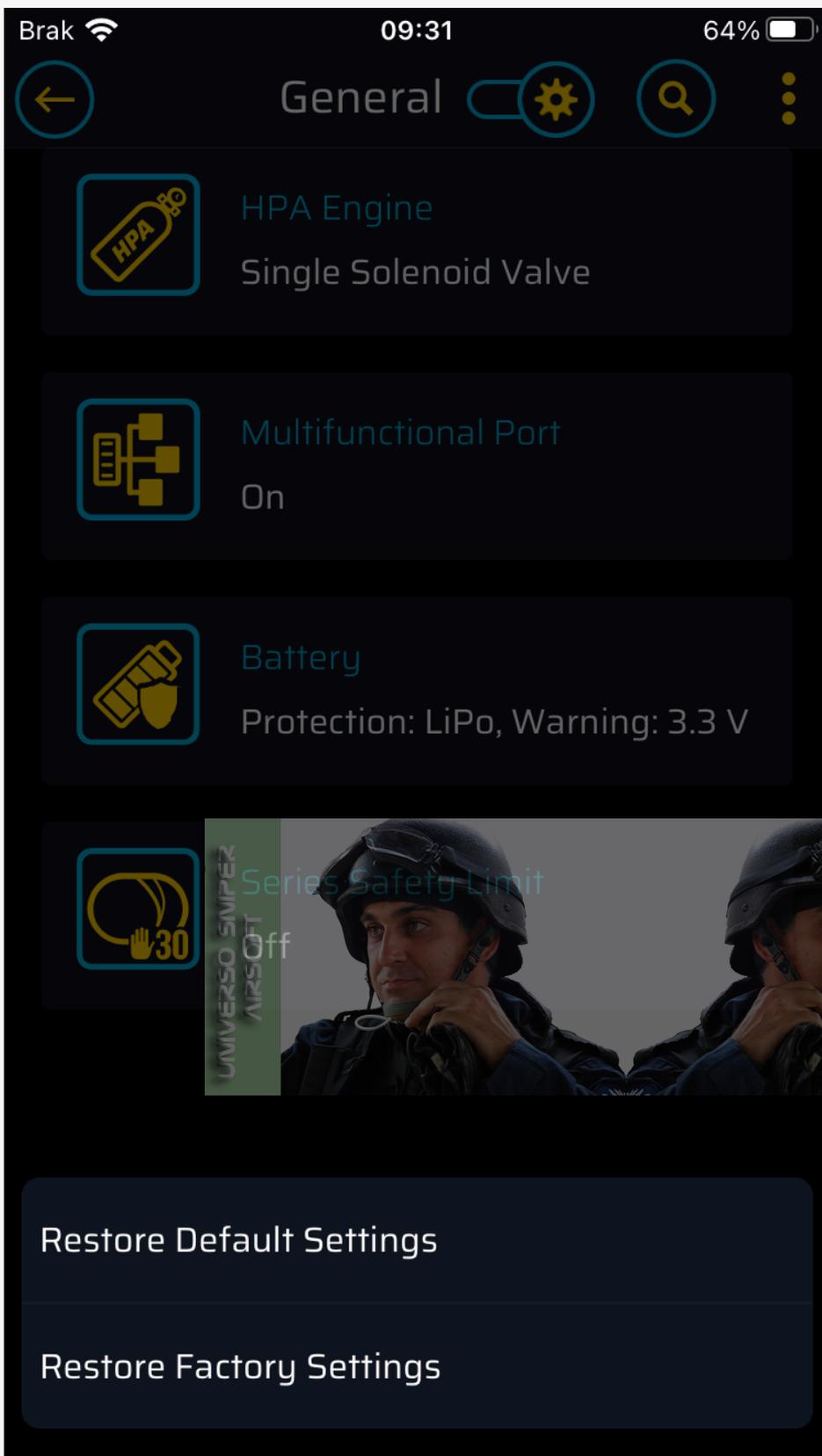


1. Launch the GCS app and connect the selected TITAN II Bluetooth® device to it.

2. Go to the **General** tab.



3. Open the menu in the upper right corner and select **Restore factory settings**.



Restoring Default Settings



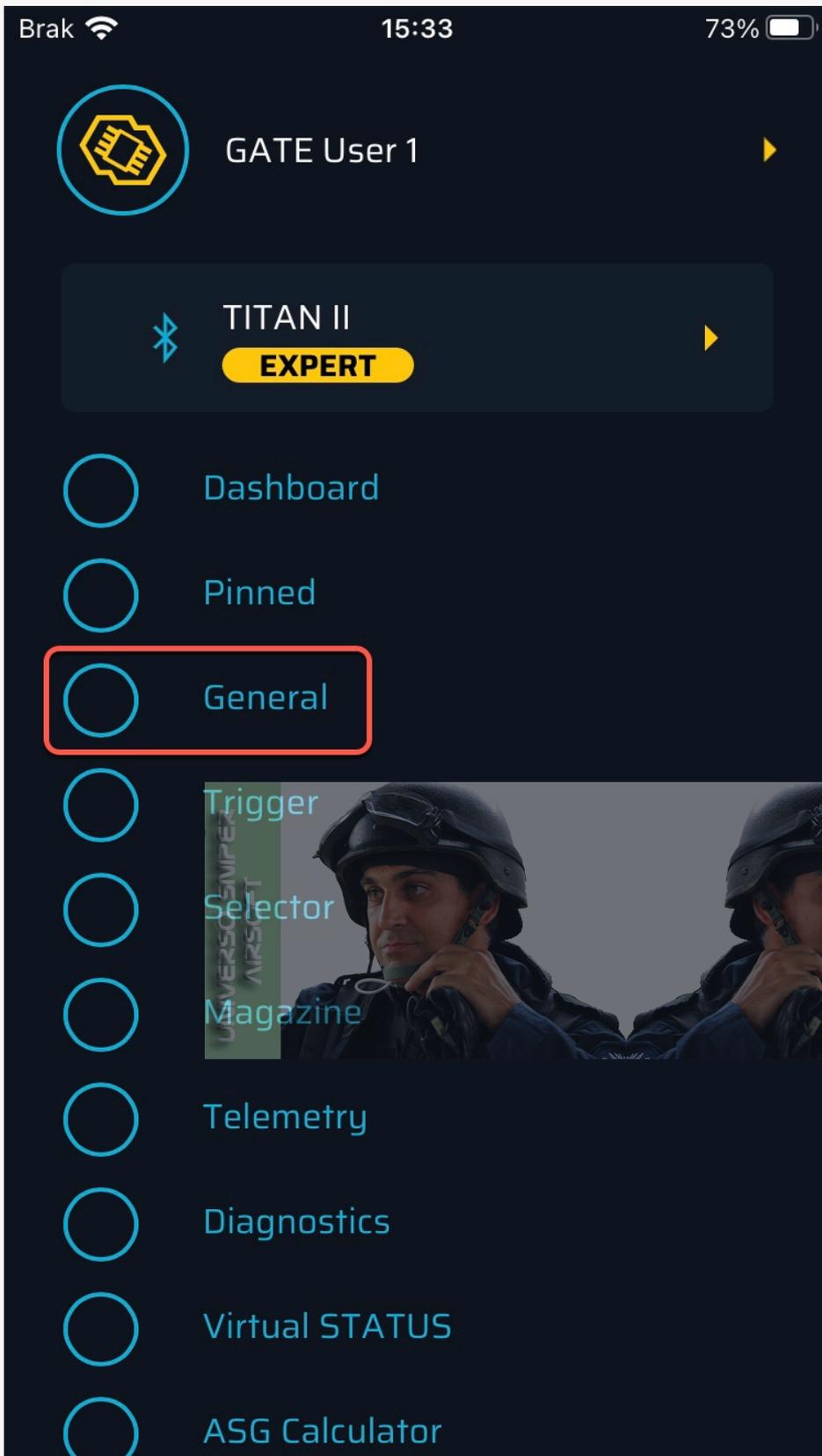
Note

Restoring the default settings results in resetting your personal settings. This action **does not** erase adaptations, calibration of the trigger sensor and fire selector or statistical data.

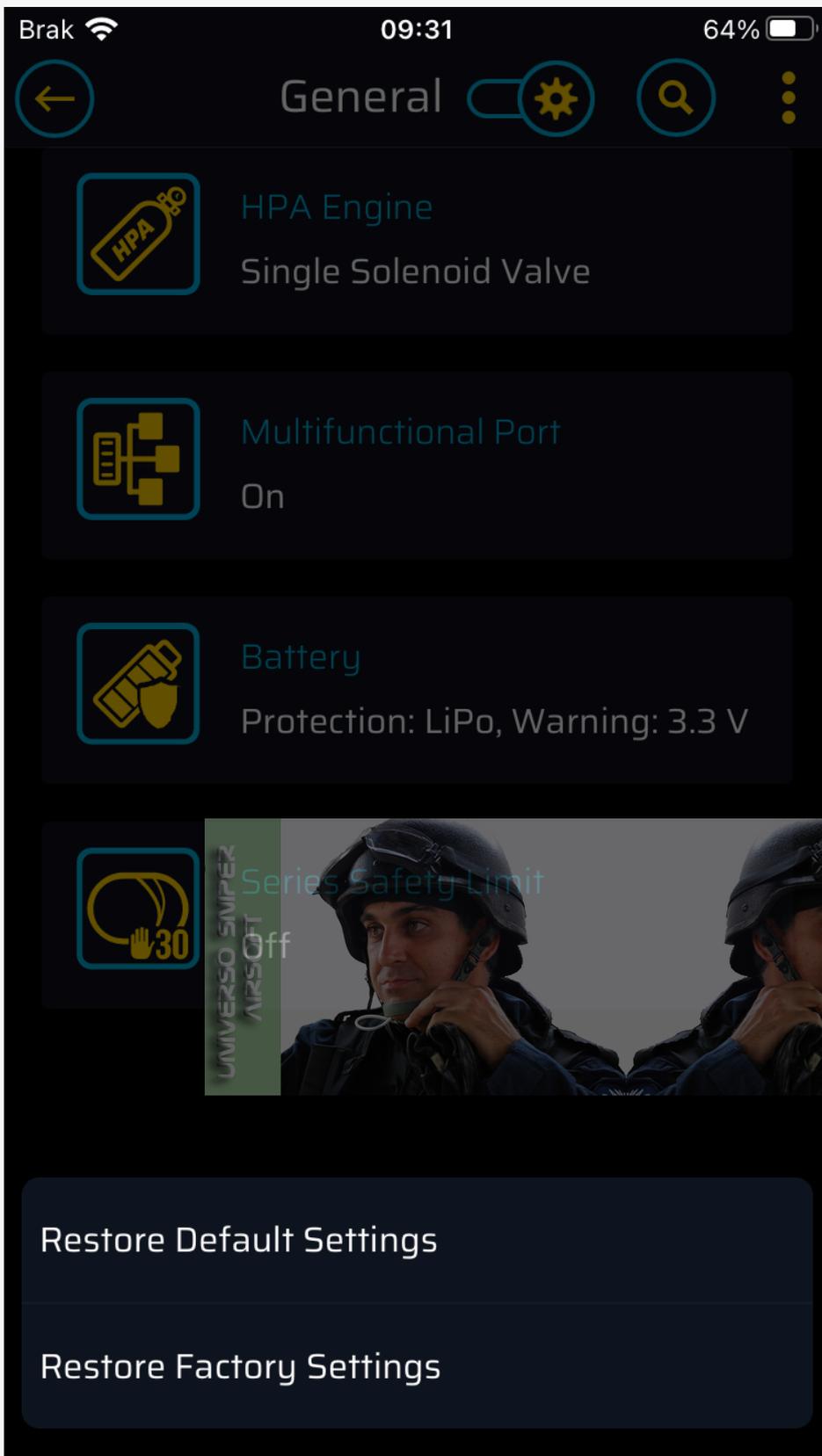
Default settings can be restored only when TITAN II Bluetooth® is connected to the GCS app. Follow the steps below:

1. Launch the GCS app and connect the selected TITAN II Bluetooth® device to it.

2. Go to the **General** tab.



3. Open the menu in the upper right corner and select **Restore Default Settings**.



Troubleshooting

Diagnostic Trouble Codes

Diagnostic Trouble Codes (DTC) enable detecting basic malfunctions and problems with your replica or TITAN II Bluetooth®. You are notified of the main errors by vibrations. DTCs can be read and cleared in the DTC menu in GCS.



Note

It is good practice to clear the DTCs in GCS before each skirmish.

Diagnostic Trouble Codes – TITAN II Bluetooth® V2 gearbox drop-in ETU mosfet HPA

WARNING

ERROR

No errors

No errors detected. Enjoy airsofting

Under Voltage Protection 1 (UVP1)

Protection against battery over-discharge (battery protection) activated

What happened:

1. Discharged battery
2. Battery type or number of battery cells set incorrectly

What to do:

1. Charge the battery
2. Set the correct battery type or number of battery cells

Under Voltage Protection 1 (UVP1 Warning)

Warning against battery over-discharge

What happened:

1. Discharged battery
2. Battery type or number of battery cells set incorrectly

What to do:

1. Charge the battery
2. Set the correct battery type or number of battery cells

Under Voltage Protection 2 (UVP2)

Voltage has dropped below a critical level for your device to work properly

What happened:

1. Discharged battery
2. The battery is worn out and there is excessive internal resistance
3. Inadequate battery type for the current replica configuration
4. Excessive electrical resistance between your device and the battery
5. Motor too strong for the connected battery
6. Motor connection short circuit
7. Jammed motor
8. Damaged motor

What to do:

1. Charge the battery
2. Replace battery
3. Use a battery with more capacity or higher voltage
4. We recommend using a battery with a Deans-T connector; if you need to use an adaptor, check the quality
5. Use standard or high-torque motors instead of high-speed ones
6. Check and fix motor wire insulation
7. Unjam the motor
8. Replace the motor

Under Voltage Protection 3 (UVP3)

Protection against battery over-discharge (battery protection) activated immediately after connecting the battery

What happened:

1. The number of cells is different from the number set in GCS
2. Discharged battery

What to do:

1. Set the same number of cells in GCS as in the battery
2. Charge the battery

Over Temperature Protection (TEMP)

Excessive device temperature – over-temperature protection activated

What happened:

1. The outside temperature is too high in relation to the requirements of your TITAN II Bluetooth
2. Frequent short circuits and device electrical overloads

What to do:

1. Wait until the temperature drops

Under Temperature Protection (MIN TEMP)

Temperature below a critical level for your device to work properly

What happened:

1. The outside temperature is too low in relation to the requirements of your TITAN II Bluetooth

What to do:

1. Wait until the temperature increases

Series Safety Limit (SSL)

Series Safety Limit activated

What happened:

1. The function is active in GCS
2. The allowed limit of shots in a series has been exceeded

What to do:

1. Increase the limit of shots in GCS
2. Disable function in GCS

Selector Error (SEL-ERR)

Selector Error

What happened:

1. Badly calibrated selector
2. Outside light reaching selector sensor
3. Selector plate not reflecting light

What to do:

1. Perform selector calibration
2. Insert the gearbox into the body
3. Modify the selector plate using the sticker from the INSTALLATION KIT

Switched Selector (SEL-SW)

The selector has switched during a shot

What happened:

1. The selector was switched deliberately during a shot
2. Sensors detect switching the selector at the edge of a selector position

What to do:

1. Inspect selector sensors; if the switch takes place near one of the three selector positions (SAFE, SEMI or AUTO), you must modify the selector plate

Selector Sensor Overexposed (SEL-OE)

Selector Sensor Overexposed

What happened:

1. Too much external light reaching the selector sensor

What to do:

1. Cover the gearbox against external light

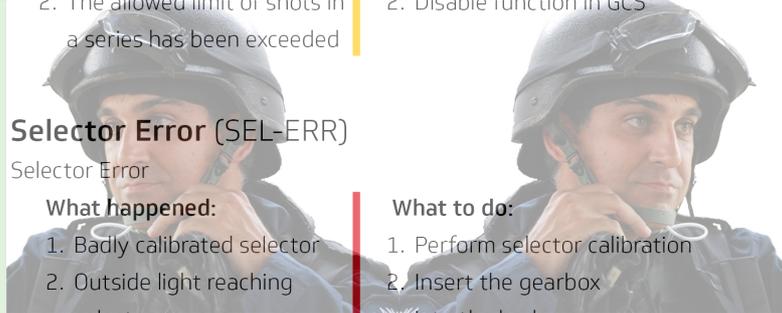
Selector not Calibrated (SEL-CAL)

Selector Calibration not Performed

What happened:

What to do:

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What happened:

1. Selector calibration not Performed

What to do:

1. Calibrate the selector

Trigger Error (TRIG-ERR)

A pulled trigger detected when connecting the battery

What happened:

1. Trigger pulled while connecting the battery
2. Trigger sensitivity set too high
3. Dirty trigger sensors
4. Badly calibrated trigger
5. Trigger sensor covered by wires

What to do:

1. Release the trigger
2. Using GCS set a lower trigger sensitivity
3. Clean the trigger sensors
4. Check the routing of the wires inside the gearbox
5. Perform trigger calibration

Trigger Sensor Overexposed (TRIG-OE)

Trigger Sensor Overexposed

What happened:

1. Too much external light reaching the trigger sensor

What to do:

1. Cover the gearbox against external light

Trigger Not Calibrated (TRIG-CAL)

Trigger Calibration Not Performed

What happened:

1. Trigger Calibration Not Performed

What to do:

1. Calibrate the trigger

Main Transistors Error (FET1 (E01))

Main Transistors Error

What happened:

1. Device Internal Error

What to do:

1. Clear the DTC
2. Unplug your device from the battery and wait 10 s
3. Connect your device to the battery and wait again 10 s
4. Check the DTC again – if the error persists, contact us: <https://help.gatee.eu/page/contact>

Voltage Measurement Error (VME1 (E03))

Voltage Measurement Error

What happened:

1. Device Internal Error

What to do:

1. Clear the DTC
2. Unplug your device from the battery and wait 10 s
3. Connect your device to the battery and wait again 10 s
4. Check the DTC again – if the error persists, contact us: <https://help.gatee.eu/page/contact>

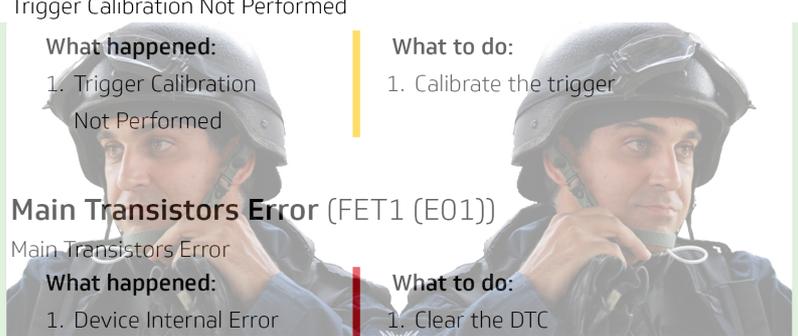
Temperature Sensor Error (TSE (E04))

Temperature Sensor Error

What happened:**What to do:**

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What happened:

1. Device Internal Error

What to do:

1. Clear the DTC
2. Unplug your device from the battery and wait 10 s
3. Connect your device to the battery and wait again 10 s
4. Check the DTC again
 - if the error persists, contact us: <https://help.gatee.eu/page/contact>

Current Sensor Error (CSE (E05))

Current Sensor Error

What happened:

1. Device Internal Error

What to do:

1. Clear the DTC
2. Unplug your device from the battery and wait 10 s
3. Connect your device to the battery and wait again 10 s
4. Check the DTC again
 - if the error persists, contact us: <https://help.gatee.eu/page/contact>

Motor Sensor Error (MSE)

Motor Sensor Error

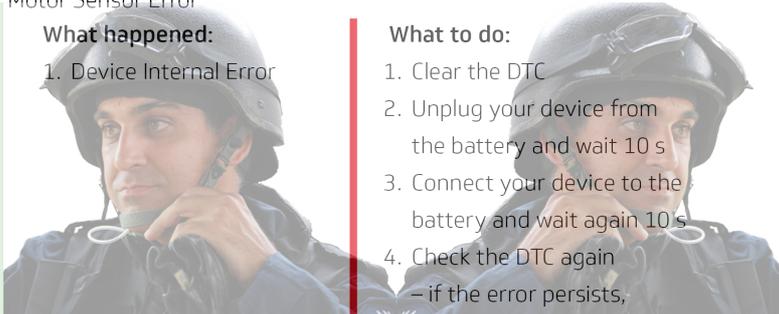
What happened:

1. Device Internal Error

What to do:

1. Clear the DTC
2. Unplug your device from the battery and wait 10 s
3. Connect your device to the battery and wait again 10 s
4. Check the DTC again
 - if the error persists, contact us: <https://help.gatee.eu/page/contact>

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Self-Test Failure (SELF)

The device failed on self-test

What happened:

1. Device Internal Error

What to do:

1. Clear the DTC
2. Unplug your device from the battery and wait 10 s
3. Connect your device to the battery and wait again 10 s
4. Check the DTC again
 - if the error persists, contact us: <https://help.gatee.eu/page/contact>

Multifunctional Port Voltage Protection

Multifunctional Port interface's voltage is out of range

What happened:

1. A discharged battery was connected to the unit
2. Wrong battery was connected to the system

What to do:

1. Change the battery
2. Check the wires connected to the multifunctional port
3. Clear DTCs
4. Disconnect the device from

- the battery and wait 10 s
- 5. Connect the device to the battery and wait 10 s again
- 6. Check DTC again - if the error persists, contact us: <https://help.gatee.eu/page/contact>

Multifunctional Port Current Protection

Excessive Multifunctional Port interface's current detected – overcurrent protection activated

What happened:

1. Damaged cables connected to the multifunctional port
2. A device with excessive power consumption was connected to the multifunctional port

What to do:

1. Check that the device connected to the multifunction port meets the allowed parameters
2. Check the wires connected to the multifunctional port
3. Clear DTCs
4. Disconnect the device from the battery and wait 10 s
5. Connect the device to the battery and wait 10 s again
6. Check DTCs again - if the error persists, contact us: <https://help.gatee.eu/page/contact>

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[User Manual – PULSAR S HPA Engine](#)

[User Manual – PULSAR D HPA Engine](#)

Technical Specifications

The design and production of the device is based on harmonized standards.

Supply Voltage Range	5-8.6 VDC
Rated Current	10 A
Current Consumption	27 mA
Low Power Mode	100 µA
Connectivity	Bluetooth® 5.2 Low Energy
Dimensions (Length x Width x Thickness)	47.2 mm x 28.9 mm x 14.5 mm
Finished Product Weight	28.2 g
Operating Temperature Range	min. -15° C, max. +50° C

Legal Notice

Please read the Legal Notice before operating your device and keep it for future reference. This document contains important terms and conditions with respect to your device. By using this device, you accept these terms and conditions.

Exclusion of Liability

GATE Enterprise sp. z o.o. sp. k. is not liable for any damages, injuries or accidents of any kind resulting from the use of this product or airsoft gun with the product installed, including (but not limited to) incidental or special damages to airsoft gun, airsoft gun parts, batteries and gearbox internals.

Disclaimer

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GATE Limited Warranty Policy

GATE Enterprise sp. z o.o. sp. k. warrants that its Product is free from manufacturing and material defects at the date of purchase and for a period of two (2) years from the date of purchase and it is nonextendable. This Limited Warranty is conditioned upon proper use of Product by Purchaser.

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

This Limited Warranty does not cover: (a) defects or damage (e.g. 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, or (b) the Product that has its serial number removed or made illegible; (c) defects or damage from improper operation, maintenance or installation, (d) installation of the products.

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 parts only.

The color of the product may vary slightly depending on the batch.

Product Disposal Instructions

The symbol shown here means that the product is classified 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/EU) 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 centres or points of sale.



Certificates and Regulations

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Product Compliance

Declaration of Conformity

GATE Enterprise sp. z o.o. sp. k. hereby declare under our sole responsibility that GATE TITAN II Bluetooth® is in conformity with the essential requirements of the following directives: 2014/53/UE, 2011/65/UE.



Product Compliance Regarding the Use of the BGM220S Module

The BGM220S modules have been tested against the relevant harmonized standards and are in conformity with the essential requirements and other relevant requirements of the Radio Equipment Directive (RED) (2014/53/EU)

This device complies with FCC's e-CFR Title 47, Part 15, Subpart C, Section 15.247 (and related relevant parts of the ANSI C63.10.2013 standard) when operating with the embedded antenna or with the antenna type(s) listed in 11.1.1 Qualified Antennas. 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 undesirable operation. Any changes or modifications not expressly approved by Silicon Labs could void the user's authority to operate the equipment

This radio transmitter (IC: 5123A-BGM220S for the BGM220S12A and IC: 5123A-BGM220S2 for the BGM220S22A) has been approved by Innovation, Science and Economic Development Canada (ISED Canada, formerly Industry Canada) to operate with the embedded antenna and with the antenna type(s) listed in 11.1.1 Qualified Antennas, with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain listed, are strictly prohibited for use with this device. This device complies with ISED's license-exempt RSS standards. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device

Contains a radio module

当該機器には電波法に基づく、技術基準適合証明等を受けた特定無線設備を装着している。



This device contains
FCC ID: QOQ-BGM220S2
IC: 5123A-BGM220S2

Contient le module transmetteur: 5123A-BGM220S

当該機器には電波法に基づく、技術基準適合証明等を受けた特定無線設備を装着している。

This equipment operates on a secondary basis and, consequently, must accept harmful interference, including from stations of the same kind, and may not cause harmful interference to systems operating on a primary basis.

The BGM220S22A are certified in Japan with certification number 209-J00429.

The BGM220S22A modules have a RF certification for import and use in South-Korea. Certification number is: R-R-BGT-BGM220S2.
The BGM220S modules come at launch with a pre-qualified Bluetooth Low Energy RF-PHY Tested Component having Declaration ID of D044526 and QDID of 155407, and having a listing date of 2020-09-04.

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👍 Aún no le ha gustado a nadie

