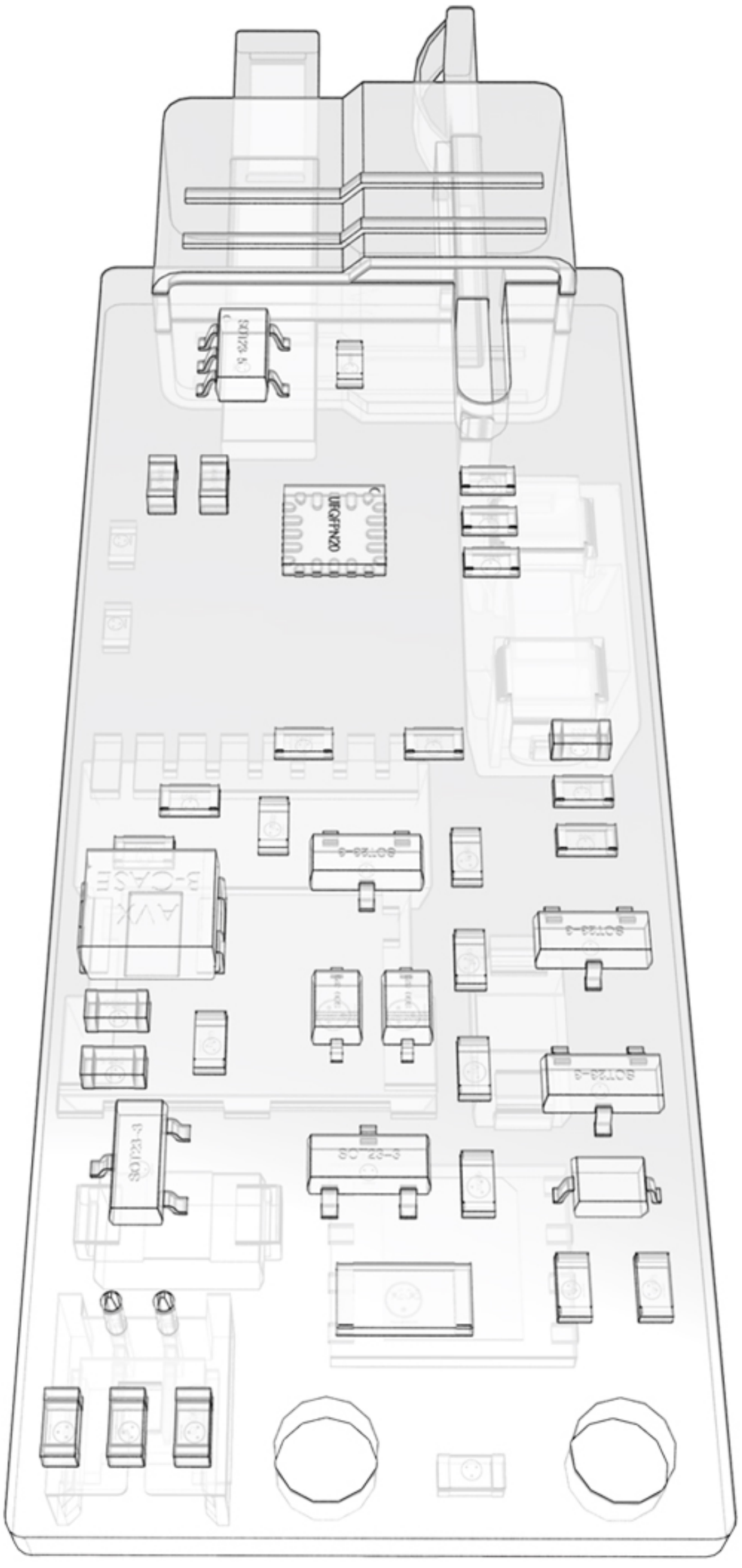
T238®

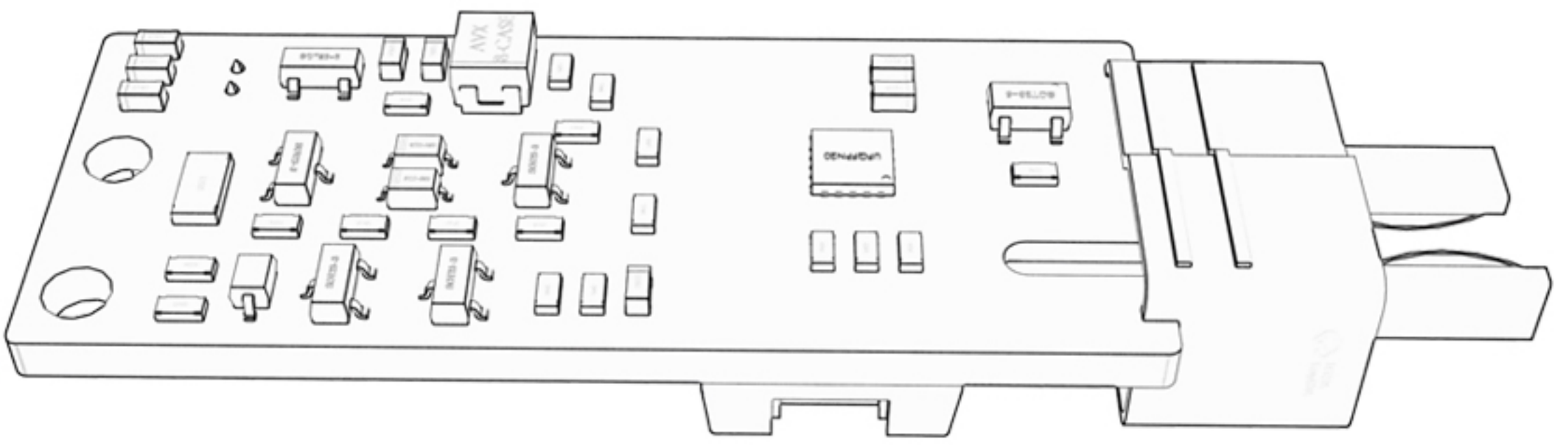


# RAISER

## PROGRAMMABLE MOSFET

T238.NET

# WARNING



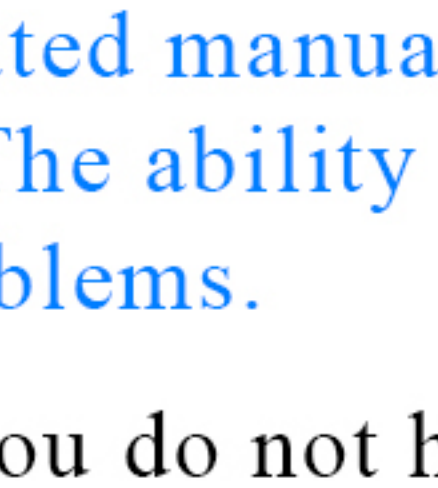
This product is a professional modification kit for gel ball/AIRSOFT/foam dart, specifically designed for professional players of gel ball/AIRSOFT/soft bombs. The installation process of this product requires the use of relevant professional tools, disassembly and assembly of gearboxes, welding of circuits and PCB boards.

The following are the technologies and experiences that may be used in this product, please be aware of them:

1. Ability and experience in dismantling and assembling gearboxes;
2. Ability and experience in soldering PCB boards;
3. Use relevant professional tools, such as soldering iron and screwdriver;
4. Understand the content of circuit diagrams and related manuals;
5. The ability to independently solve modification problems.

If you do not have the relevant skills and experience, please seek the help of professional players immediately, or contact customer service for help.

Thank you for your support and understanding.



## NEED HELP

# ATTENTION

1.After connecting the battery for the first time, it is necessary to press the switch connected to the trigger switch socket to activate the system and start it up
2. This module does not have semi-auto function of advanced ETU , the semi-auto function needs to rely on the original semi-auto mechanism(such as cut-off lever) of the gearbox to complete
3. Please ensure that the discharge current of the battery is greater than the operating current of the motor
4. Please pay attention to protecting the circuit board and insulating its exterior. Do not cut, squeeze, polish, soak in water or other operations that may cause electrical faults on the circuit board
5. Pay attention to the positive and negative poles of the motor and battery, and do not connect them in reverse

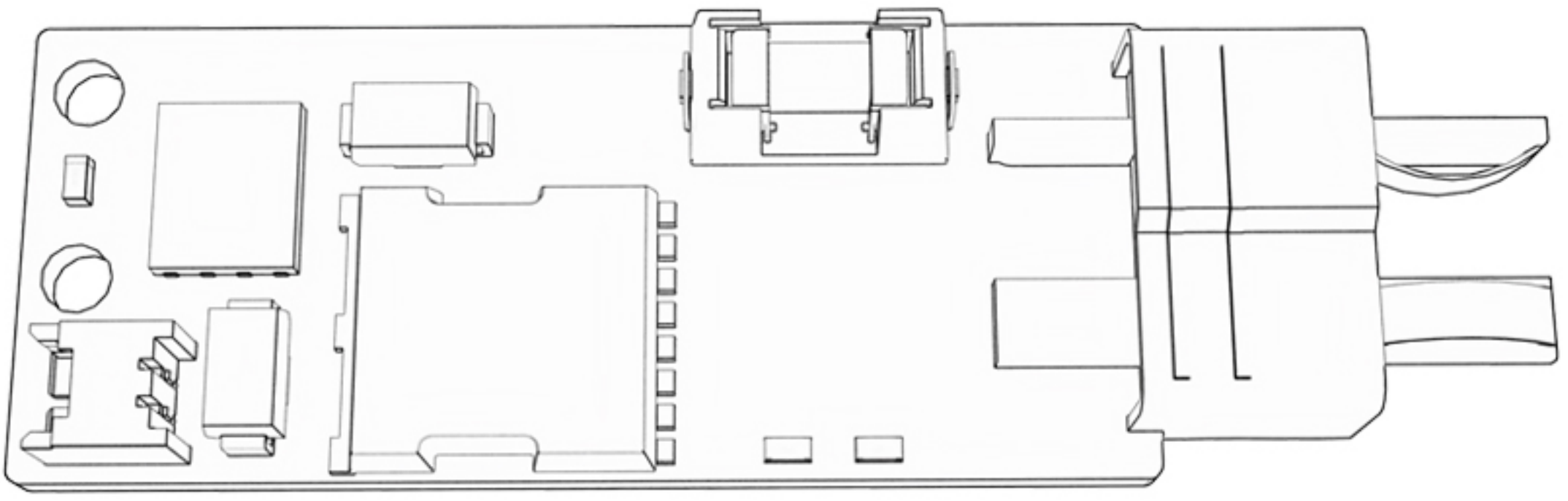
# DESCRIPTION

The T238 RAISER is a programmable MOSFET electronic active brake module designed specifically for gel ball/AIRSOFT/foam dart. If your gearbox has a semi-auto mechanism but cannot fire stably, you can use the RAISER electronic active brake function to improve single shot stability. At the same time, through the programmed brake delay function, the piston can be stopped in the rear position for pre compression spring, simulating the pre-cocking of firearms, reducing the response time from pulling the trigger to releasing the piston.
The RAISER can program electronic brake strength and electronic brake delay. In addition, it also has battery low voltage protection, chip overheating protection, short circuit protection, and overcurrent protection functions, which can effectively improve

the durability and stability of the gearbox. At the same time, the automatic sleep function can prevent battery over discharge. This module can use up to 14.8V batteries. Self soldering and wiring are required.

## FEATURES

◆ Size (including deans T plug connector) 53X17X7mm
◆ Operating voltage 6.0-16.8V
◆ Automatically identify the battery cells
◆ Automatic sleep to prevent battery over discharge
◆ Motor line positive and negative pole short circuit protection
◆ Equipped with MOSFET chip overheating protection function
◆ Programmable brake strength and brake delay time
◆ Motor connection status monitoring
◆ Equipped with active braking technology
◆ Supports up to 800A starting current and 85A braking current



## FUNCTION

☐ One click power on. After connecting the battery for the first time, you need to press the switch connected to the trigger switch socket to activate the system and turn it on
☐ Motor connection status monitoring: When the motor is not connected, the green light will light up. At this time, the system will not work and the motor needs to be plugged in. Wait for the green light to turn off before returning to normal game mode.

☐Motor short circuit protection. When a short circuit is detected between the positive and negative poles of the motor, the green light will flash and the system will automatically shut down. Please disconnect the battery and troubleshoot before restarting

☐Low voltage protection for batteries. After connecting the battery, the system automatically recognizes the number of battery cells (such as 2S-7.4V, 3S-11.1V, 4S-16.8V). The default protection voltage for a single cell is 3.2V (for example, when using a 2S-7.4V battery, the protection voltage is 6.4V, and when using a 3S-11.1V battery, the protection voltage is 9.6V). When the system detects low voltage, the red LED will light up and the system will automatically shut down. Please replace the battery immediately

☐When the MOSFET chip overheats (exceeding 100 °C) and triggers the protection mechanism, the red light will flash, and the system will power off the motor. It must wait for cooling before returning to normal

☐Adjustable brake delay, when using a gearbox with a semi-auto mechanism(like cut-off lever of V2 gearbox), this function can add a delay time after the semi-auto mechanism is triggered to brake the motor, causing the piston to stop in the rear position for pre compression of the spring, simulating the pre-cocking of firearms, reducing the response time from pulling the trigger to releasing the piston

☐Adjustable firing rate, the system achieves the effect of controlling the firing rate by controlling the motor speed

☐Programmable automatic shutdown time, when there is no shooting for a period of time, the system will automatically shut down and sleep, reducing the standby current to prevent battery over discharge

☐This module relies on micro current startup to directly direct the current through the MOSFET chip to the motor, without passing through the original mechanical switch. Therefore, it can provide higher current to make the gearbox firing and response

faster. At the same time, the current passing through the original mechanical switch is greatly reduced, effectively preventing switch burning.

- ☐ This module can improve the firing rate of continuous firing, increase the stability of semi-auto firing, and at the same time provide the battery with higher endurance
- ☐ Active braking uses excess energy from the motor to promptly stop the over spin of the motor

## WORKING MODE

Power on: Connect the motor and switch. When connecting the battery for the first time, press the switch connected to the trigger switch socket to activate the system for power on. If the system initialization is successful, the motor will emit a "beep beep beep" prompt.

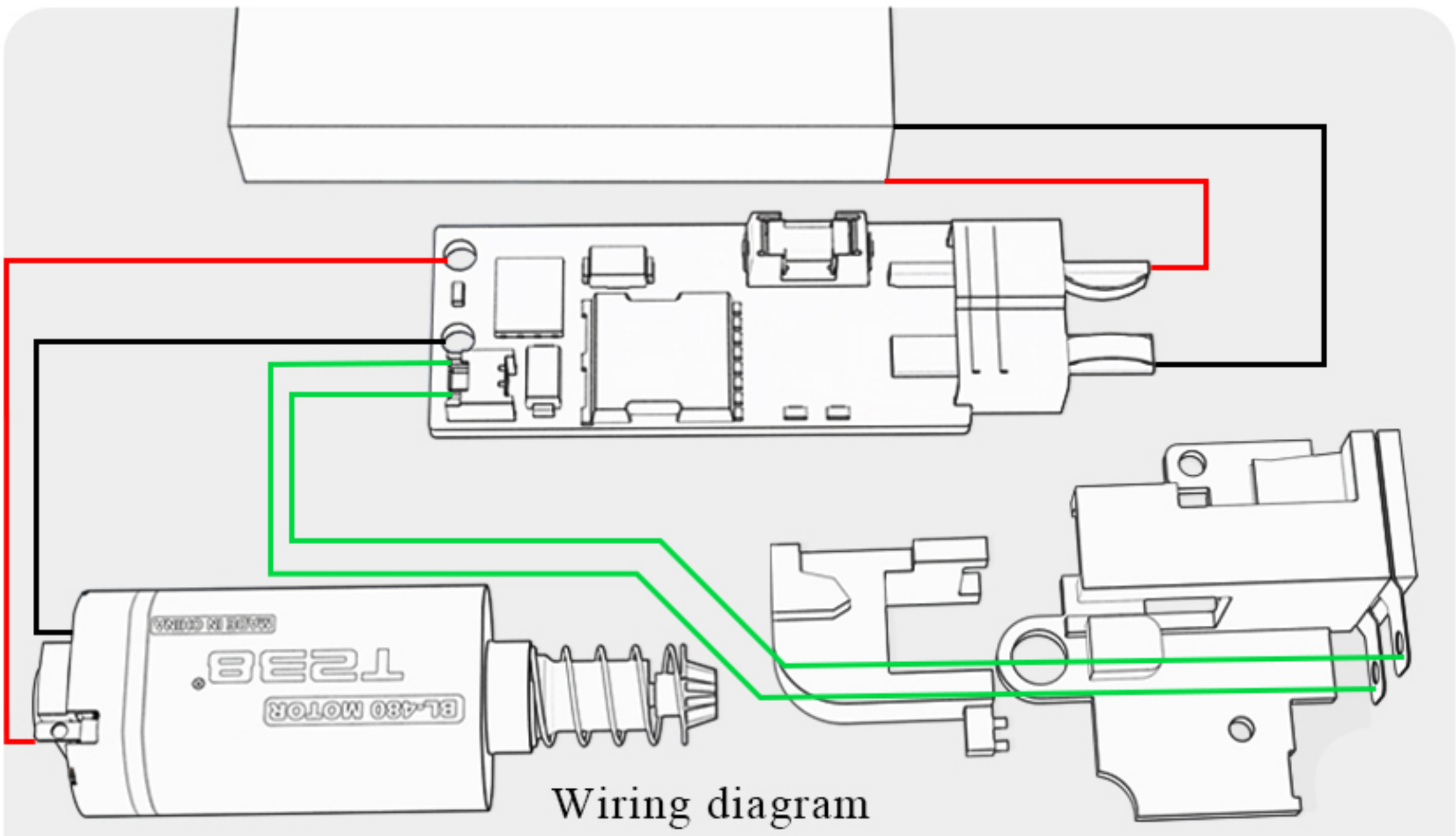
Firing: Press the switch connected to the trigger switch plug, the system will power on the motor. After releasing the switch, the system will immediately power off the motor and brake it.

Semi-auto: This function needs to be completed in conjunction with the semi-auto mechanism of the gearbox itself. When the switch connecting the trigger switch socket is pressed, the system will power on the motor. After the motor rotates one circle, the semi-auto mechanism will be triggered to release the switch. When the system detects that the switch is released, the motor will be powered off and the active brake will be applied.

## TECHNICAL REQUIREMENTS

➤ Try to use batteries with sufficient discharge current. The discharge current of the battery is equal to the discharge coefficient X the battery capacity ÷ 1000 (assuming a discharge coefficient of 30C and a capacity of 1200mah, the discharge current of the battery is equal to 30 * 1200/1000=36A)

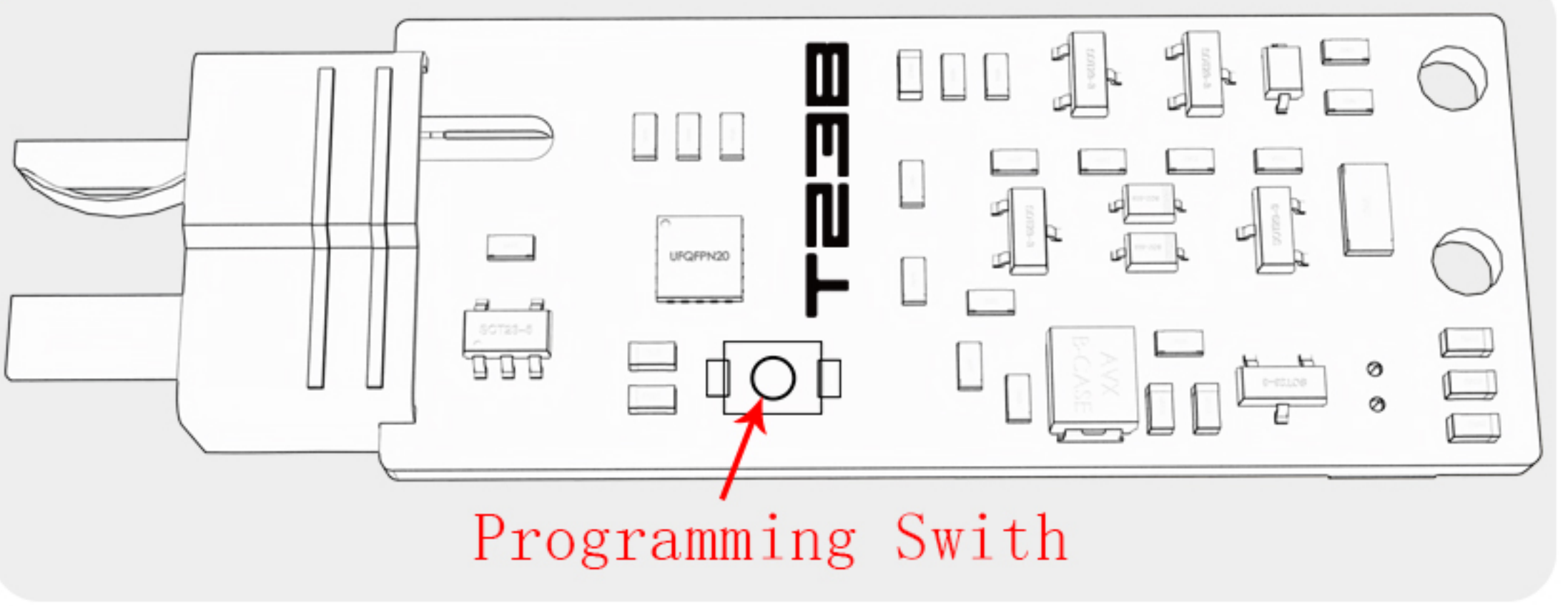
➤ It is recommended to use silver plated wire of 1.0 square meter or more for motor wires
➤ It is recommended to use springs below M180 to prevent excessive current from damaging the fuse
➤ Use high magnetic motors and high discharge rate batteries to reduce motor and battery heating caused by frequent triggering
➤ In sleeping state, the total current of the system does not exceed 200uA, which is one hundred thousandth of that in firing state. It is recommended to disconnect the battery if not used for a long time




Wiring diagram
(switch wires do not differentiate between positive and negative poles)

## INSTALLATION

1. Measure the length of each wire according to the wiring diagram and solder the wires to the soldering pad (the exposed soldering pads on the PCB board are non stressed positions, do not pull the wires after soldering to avoid damaging the module)
2. Disassemble the gearbox. If using a gearbox with a semi-auto mechanism, please keep the semi-auto mechanism (such as a cut-off lever or mechanical trigger switch).
3. Connect the trigger switch socket to the two independent pins of the gearbox switch
4. Install other components of the gearbox



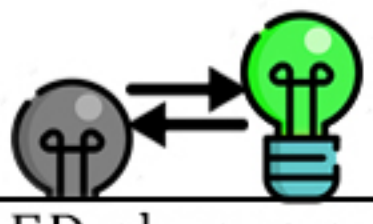
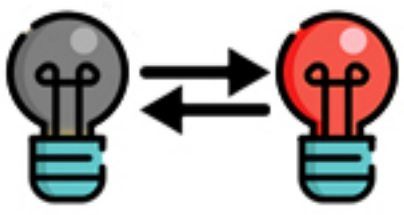
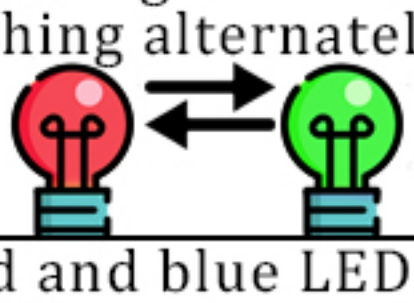
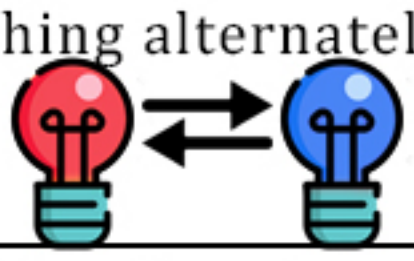

# PROGRAMMING

1. When powered on, press and hold the programming switch for 3 seconds. After hearing a long "beep" sound, release the programming switch and the module enters programming mode
2. After entering programming mode, the red LED will light up and the motor will continue to emit a brief "beep" sound. The number of "beeps" indicates the number of options. To enter the option, please hold down the programming switch within 2 seconds after the "beep" sound ends, until you hear a long "beep" sound. The module will enter the corresponding option (see the attached table for the corresponding functions and parameters of the option)
3. After entering the corresponding option, the green light will light up, and the motor will continue to emit a brief "beep" sound. The number of "beeps" indicates the function or parameter of the option. If you want to program the corresponding function or parameter, please press and hold the programming switch for 2 seconds after the "beep" sound ends until you hear two long "beeps". The module programming is completed and automatically saves and exits the programming mode (see the attached table for the corresponding functions and parameters of the option)

## Option Table

| Option\ Parameter | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Voltage | 3.2V(Default) | 3.0V | OFF | Restore factory settings |
| Braking Force | 100%(Default) | 60% | 40% | OFF |
| Brake Delay | OFF(Default) | Starting from 20mS, each level increases by 5mS, with a maximum of 9 levels corresponding to 60ms | | |
| Shutdown Time | 30Min(Default) | 1H | 1.5H | OFF |
| Rate of Fire | 100%(Default) | 80% | 60% | 40% |

# TROUBLESHOOTING

| Fault phenomenon | Reason |
|---|---|
| Blue LED always on  | Trigger switch short circuit, please check if the trigger switch or socket is damaged, and if the switch circuit is short circuited |
| Green LED always on  | The motor is not connected. Please check if the coil and brushes of the motor are damaged, or if the motor wires are connected to the motor normally |
| Green LED flashing  | There is a short circuit in the motor wires or the battery discharge current is too low, please check whether the positive and negative wires connected to the motor are normal |
| Red LED always on  | Low voltage prompt, please check if the battery voltage is |
| Red LED flashing  | MOSFET chips overheating, please wait for chip cooling before use. If overheating frequently occurs, please check if the gearbox and gears are running smoothly. If blockage occurs, it can increase current and cause MOSFET chips to overheat |
| Red and green LEDs flashing alternately  | The battery voltage is too high or too low. Please replace the battery that meets the requirements of this module before attempting again |
| Red and blue LEDs flashing alternately  | Temperature sensor circuit malfunction, please contact after-sales service for timely handling |
| Pulling the trigger does not light up the blue LED  | The trigger switch and switch socket are not connected correctly. Please check if the trigger switch or socket is damaged and if the switch circuit is connected properly |

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