JeffTron

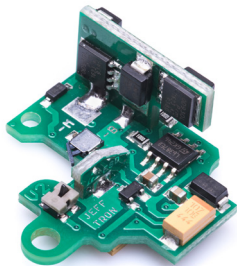**21st century electronics for AEG weapons**

PROCESSOR UNIT - V2

UP TO 4S / 14.8V LIPOL

Spring limit M180 and ROF 25bb/s

Installation of this device leave to expert
He must know how to solder and disassemble airsoft gun
Never use soldering gun!

Device parameters

It is processor controlled mosfet. Designed for airsoft electric guns (AEG). It adds six new shooting modes, controls rate of fire, pre-cocking, active braking and low battery indication. Device is fully integrated inside the gearbox version 2 instead of the original trigger contacts, compatible with Tokyo Marui standard. Specified for batteries up to 17V (Ni-xx 8.4 - 12V, lipol 7.4 - 14.8V). Gun trigger is used for programming this device, motor vibrates as a feedback for user.

Insertion procedure of processor unit into the gun

WARNING: Installation of this device into the gearbox requires expertise!

1. Remove and open the gearbox according to the normal weapon procedure.

2. Take out the original trigger contacts and clean the space after them.

3. Move selector plate in position where is cut off lever the upper position - see Fig. 1. This is because of protection microswitch on processor unit against break.

4. Insert processor unit in place of the original trigger contacts. If necessary, carefully grind gearbox or processor unit to fit in place. Don't damage the signal paths in processor unit.

5. Secure processor unit in place with screw, which has original trigger contacts. If it isn't fit, then use screw with pad included in package with this device.

6. Try if cut off lever moves enough with microswitch arm on processor unit. There have to be gap 0,5 - 1,0 mm between them - see Fig. 2. If cut off lever is too long, grind its end. If selector plate moves up cut off lever on SEMI, grind it according fig. 3. If is cut off lever above microswitch, grind it in the red marked place on fig. 4. It will lower it's end. Or try another cut off lever brand.

7. Test how the trigger turns on second microswitch. If is too big grind the trigger by Fig. 5, if too small shimm it's right axis with pad gears. Trigger can't press on the body of microswitch in the processor unit, because it will destroy it.

8. Solder and adjust cables by the connecting procedure. *(3, 4 page in manual)*

9. Reassemble the gearbox according to the normal weapon procedure. **1**
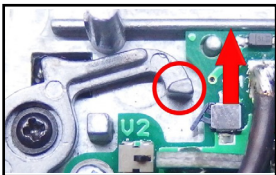
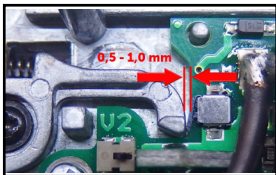Fig. 1 - Keep cut off lever up during insertion processor unit

Fig. 2 - Gap between cut off lever and a microswitch on the device

0,5 - 1,0 mm

Fig. 3 - selector plate fix for shooting semi fire instead auto

SEMI

AUTO

Fig. 4 - If is cut off lever too above switch, grind it in red marked place

Fig. 5 - Grind or underlay the trigger to prevent the microswitch damage

Fig. 6 - To fit cables into the gearbox, grind pins in red circles

Processor unit connecting procedure

1) Red cable with max. 1,5 qmm lead to the battery and motor positive.
Add fuse between battery and device (not included in package).
2) Black cable with max. 1,5 qmm lead to the battery negative (**-B** on board).
3) Black cable with max. 1,5 qmm lead to the motor negative(**-M** on board)
4) Blue cable with max. 0,5 qmm lead anywhere on the red cable (mark **+** on board). Lead him inside the gearbox with other cables or outside around gearbox on the left (if inside isn't enough place for it). Shorter cable length is better.

For right function is necessary to have a functional gearbox cut off lever, selector plate, antireverse latch, trigger and trigger block, as it has the standard gearbox. Be extra sure to connect the red and black wires appropriately, otherwise you should destroy the device, weapon or battery.

Wires with a battery in the stock

POSITION ON PCB
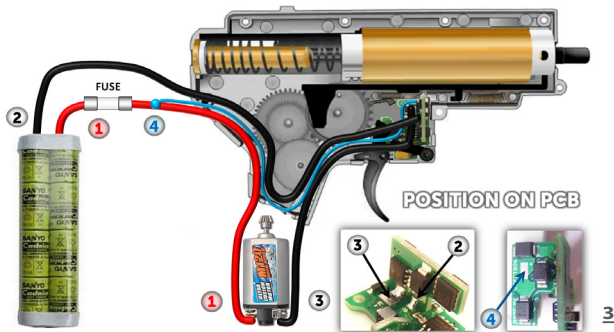
Wires with a battery in the handguard

FUSE

POSITION ON PCB
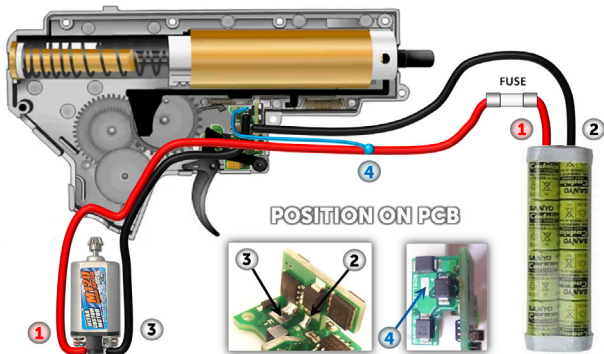
First battery connection

1. Connect battery - you will feel a short vibration, then a longer vibration in the grip with motor. This means that the power-up self-test is complete and OK.

2. Put the gun into SEMI and **fire the gun 3 times.** The Processor unit will now be "trained" for your gun, battery and gear timing. You should do this every time you power up the gun.

3. Put the gun into AUTO and pull the trigger shortly. Gun should fire a burst of 3 rounds. If you held down the trigger longer the gun will go to auto fire.

4. If everything works as it should, congratulations for the correct installation the processor unit. If not, read the **9 page** or **10 page** in manual.

Programming method

Anything you set here will be remembered even if you disconnect the battery.

Programming procedure:
1. Put the gun into SEMI and power up the gun. You will feel one short vibration.

2. Pull the trigger once (before the second longer vibration).

3. The gun will make 3 quick vibrations. You are now in programming mode and the device is waiting for option you want to change. If you do nothing for 2 seconds, it will go to step **4.**

> **a)** Push the trigger "X" times where X is the number of the option you want to change. *(1. FIRE MODE, 2. BURST TIME - Reduction, 3. BURST TIME - Increase, ...)*
>
> **b)** The gun will vibrate "X" times to confirm the option number selected. If you make a mistake, wait for 3 quick vibrations and try it again.
>
> **c)** To set attribute push the trigger "X" times where X is the number of the attribute you want to set. The gun will vibrate with each trigger push to confirm it's right detection.
>
> **d)** After a short pause, the gun make 3 quick vibrations to signal that processor unit accepted new settings and is ready for new input.
>
> **e)** Go to step **3. a)** to select another option or do nothing to exit program.

4. The gun will make a long vibration signaling that programming is done and the gun is ready to fire.

5. At last put the gun into SEMI and fire the gun **3 times** to teach device right burst timing. You should do this every time you power up the gun.

Brief programming scheme

Connection battery
Short vibration **--> PUSH TRIGGER = ENTER THE PROGRAMMING**

TRIGGER RELEASED

1. choice --------> 1. attribute: **Semi - Full** *(standard shooting)*
FIRE MODE   2. attribute: **Semi - Burst/Full** *(factory default)*
                     3. attribute: **Semi - Semi**
                     4. attribute: **Semi - Burst**
                     5. attribute: **Semi - Semi** *(delay)*
                     6. attribute: **Burst - Burst/Full**
                     7. attribute: **Semi/Burst - Burst/Full**

2. choice **BURST TIME - Reduction** *(1x pull = -12% burst time)*
3. choice **BURST TIME - Increase** *(1x pull = +12% burst time)*

4. choice **MOTOR SPEED - Reduction** *(1x pull = -5% speed)*
5. choice **MOTOR SPEED - Increase** *(1x pull = +5% speed)*

6. choice --------> 1. attribute: **Short (0,4s)**
DELAY   2. attribute: **Medium (1,0s)** *(factory default)*
                     3. attribute: **Long (1,8s)**

7. choice --------> 1. attribute: **OFF** *(factory default)*
PRE-COCKING   2. attribute: **ON**

8. choice --------> 1. attribute: **OFF**
FAST SHOT   2. attribute: **ON** *(factory default)*

9. choice --------> 1. attribute: **OFF** *(PRE-COCKING function disabled)*
ACTIVE BRAKE   2. attribute: **Low intensity**
                     3. attribute: **Medium intensity** *(factory default)*
                     4. attribute: **High intensity**

10. choice ------> 1. attribute: **OFF** *(factory default)*
LOW BATTERY   2. attribute: **2S li-pol** *(Low: 6.6V, dead: 6.2V)*
INDICATION   3. attribute: **3S li-pol** *(Low: 9.9V, dead: 9.4V)*
                     4. attribute: **4S li-pol** *(Low: 13.2V, dead: 12.6V)*
                     5. attribute: **3S li-fe** *(Low: 7.7V, dead: 7.2V)*
                     6. attribute: **4S li-fe** *(Low: 10.2V, dead: 9.6V)*

11. choice **FACTORY RESET** *(hold trigger->vibration->unplug battery)*

Long vibration **<-- PROGRAMMING FINISHED AFTER IDLE FOR FEW SECONDS**
Ready to fire

Detailed programming scheme 1/2

FIRE MODE

1.attribute: same as normal AEG (without Processor unit)

2.attribute: on AUTO press trigger short to shoot burst (3 shots), if trigger is hold down longer it goes to auto fire *(factory default)*. SEMI fire unchanged.

3.attribute: it fires single shot with selector on AUTO. SEMI fire unchanged.

4.attribute: it fires burst (3 shots) with selector on AUTO. SEMI fire unchanged.

5.attribute: it fires only single shot with forced time delay for the next shot *(programmable delay- 6.choice)*. Motor vibrates when it is ready to fire. The first 3 shots on SEMI are without delay *(skipped after 2 min inactivity)*.

6.attribute: it fires burst (3 shots) on SEMI. On AUTO short trigger press fires burst. If trigger is hold down longer the gun will go to auto fire. The first 3 shots on SEMI are single shots (skipped after 2 min inactivity).

7.attribute: on SEMI short trigger press fires single shot, if trigger is hold down longer the gun will shoot burst (3 shots). On AUTO short trigger press fires burst, if trigger is hold down longer the gun will go to auto fire. The first 3 shots on SEMI are single shots (skipped after 2 min inactivity).

BURST TIME - Each trigger press will shorten/lengthen burst time about 12%. You can refine burst cycle or increase/decrease the number of bullets fired in burst. To change the number of shots about 1 press trigger 8x to10x. *(Factory setting is 3 shots, range 1 - 10 shots)*

MOTOR SPEED - Each trigger press will slow down/speed up motor about 5%. It is useful for too high gun rate of fire (RoF). *(Factory default is 100%)*
  WARNING - Do not slow down motor speed too low, it could destroy processor unit. Recommended minimum RoF is 10 bb/s.

DELAY - The time, in which it is not possible to shoot again in **FIRE MODE 5**. Default delay is *Medium*, you can choose shorter or longer period of time. Motor vibrates shortly after pass time delay. It is notification to shoot again.

Detailed programming scheme 2/2

PRE-COCKING - If this function active, the piston is partly compressed after fire on semi. There isn't almost any delay between trigger press and shot. If you hold the trigger after firing at least 3 seconds, gun shots again, but this time with a piston in a released position - use it before storing gun. Pre-cocking works only with functional active brake (9. choice). *(Factory default = OFF)*

FAST SHOT - It works only with **MOTOR SPEED – Reduction** *(4.choice)*. The first shot is always at 100% RoF, next shots are fired with user set lower RoF. This function is used for quick gun response. *(Factory default = ON)*

ACTIVE BRAKE - If this function active, it uses the excess energy from the motor to stop it. On SEMI fire piston isn't partially stretched, spring is fully released, parts in gearbox aren't under strain and nozzle locks hop-up chamber in greater part (depends on RoF). The braking effect is the most powerful with high torque motor. In AUTO mode piston stops in random position due the gearbox design. But it stops much faster with active brake. You can choose 3 intensity of active braking or turn it off completely. Higher power braking is suitable for weapons with high RoF.
(In the factory default option is turned on medium braking intensity)

LOW BATTERY INDICATION - it is used for only Li-xx batteries with the right number of cells. When processor unit detects low battery voltage, it will vibrate after each shot. Now replace the battery at the nearest opportunity. When the battery is depleted the gun vibrates instead of fire. The battery isn't disconnected, device very slowly discharges it. *(Factory default = OFF)*

FACTORY RESET - When you enter this option, immediately press and hold the trigger until you feel long vibration -> the gun will no longer respond for anything. Disconnect and connect the battery = device is back in factory settings. **8**

Startup codes

After connecting battery processor unit does a power up self check, which lasts a few seconds. It results vibrating the motor with meaning:

1 vibration - All systems are OK. This vibration is about half second long.

2 vibrations - Battery voltage is less than 6.5 volts.

3 vibrations - Battery voltage is more than 17.0 volts.

4 vibrations - Trigger is pulled during startup. Keep your finger off the trigger, disconnect and reconnect battery. If your finger is not on the trigger, check the trigger wiring for a shortcut.

Post firing codes

If it is any problem during firing, it will be signaled by vibrations from the motor:

1 vibration - Battery is Low. This is a single vibration immediately after shooting. If the battery drops much further, the gun will stop firing. Now is a good time to change your battery.

2 vibrations - Over current detected. Motor is stopped immediately and the gun will not fire. (Motor may "click" when trigger is pulled). Check for shorts wiring or motor.

3 vibrations - Overheating detected. Release the trigger, disconnect the power and inspect your gun for faults

WARNINIG - Disconnect battery, when you don't use gun for longer time, because processor unit drains small amount of current from battery all the time.

Troubleshooting

ISSUE: It doesn't complete shots in semi fire mode
SOLUTION: May be damaged microswitch for trigger, check its proper function. Also may be bad shot timing, so do a **Factory reset** *(11. choice)*.

ISSUE: The gun with the selector switch on SEMI shoots like on AUTO.
SOLUTION: Processor unit doesn't detect cut off lever motion. Make sure that cut off lever moves enough to detect it by microswitch in processor unit. You can grind selector plate to cut off lever moves lower, so it would microswitch detect.

ISSUE: The gun sometimes shoots 2 bullets, then 3 bullets in burst.
SOLUTION: 2x - 4x press trigger in 3.choice **BURST TIME - Increase**. This increases the time for burst so the piston always completes three cycles.

ISSUE: The gun is still in the SAFE position - you can't press the trigger.
SOLUTION: Wires are bad routed around trigger and prevents moving the trigger block. Disassemble the gearbox and rearrange wires.

ISSUE: Weapon shoots itself in automatic fire without pressed trigger
SOLUTION: Mosfet is destroyed in processor unit, it is necessary to replace it for a new one.

ISSUE: You are not sure how you programmed processor unit, now it doesn't do what you wanted.
SOLUTION: Best way is to do **FACTORY RESET** *(11. choice)* and start again.

ISSUE: The gun does something strange or nothing.
SOLUTION: STOP! Release trigger, disconnect battery and search for the problem before something will be irreversibly damaged!

WARNINIG-Disconnect battery, when you don't use gun for longer time, because processor unit drains small amount of current from battery all the time. <u>**10**</u>

MANUFACTURER

Ing. Filip Němec
Dr. Janského 724, 537 01 Chrudim II
ID: 87936062, TAX ID: CZ8503013475
Made in Czech Republic

www.JeffTron.net

WARRANTY 2 YEARS

WARNING!
ELECTROSTATIC
SENSITIVE DEVICE

CE RoHS