

AIRSOFT SMART CONTROL UNIT

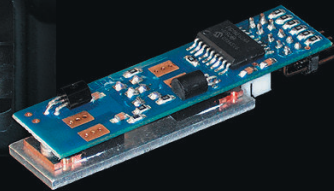
THE ULTIMATE UPGRADE FOR AIRSOFT ELECTRIC GUNS

**NO MATTER HOW FAST YOU TAP THE TRIGGER
IT WILL ALWAYS
COMPLETE THE FULL CYCLE!**

EASY TO INSTALL IN ANY VER 2 GEARBOX NO MODIFICATIONS OF THE AEG NEEDED
COMPLETELY SUBSTITUTES THE ORIGINAL SWITCH ASSEMBLY AND WIRING

- **NO GEARBOX JAMS!**
NO ANTI REVERSAL LATCH NEEDED!
- **REDUCED TRIGGER TRAVEL!**
- **FASTER TRIGGER RESPONSE!**
- **INCREASED ROF!**
COMBINED 3 ROUND BURST AND FULL AUTO MODE!
- **INCREASED BATTERY LIFE!**
COMPATIBLE WITH ALL KIND OF BATTERIES!
- **INCREASED MAIN SPRING LIFE!**
- **COMPATIBLE WITH ALL KIND OF GEARS AND SPRINGS!**
- **SAFE FOR LIPO BATTERIES**
BATTERY DEEP DRAIN PROTECTION INTEGRATED!

ASCU
AIRSOFT SYSTEMS



MAKE YOUR AEG FEEL LIKE A REAL GUN!

AS AIRSOFT SYSTEMS
www.airsoftsystems.com

INSTRUCTION MANUAL FOR THE AIRSOFT SMART CONTROLL UNIT (ASCU)

What is the ASCU?

The ASCU is a two parts electronic module (Control Unit and Sensor Unit), which when installed in an airsoft electric gun, drastically improves the way it works.

The original switch group is replaced by the Sensor Unit that monitors the actual position of the sector gear, the fire selector and the trigger. All the information is passed to the Control Unit where the software in the processor analyzes all the input information and controls the AEG's motor by a double MOSFET.

The ASCU makes every AEG with Marui type of gearbox ver.2 to work exactly as the most expensive and sophisticated airsoft rifles known as Profesional Training Weapons.

The ASCU system monitors the operation of the AEG in any time, and no matter how fast you pull the trigger, the AEG will always complete the full cycle, no matter if you shoot in Semi or Full Auto mode. After each shot or burst the piston will stop in its foremost position.

In Full Auto mode the ASCU has a preprogrammed 3-round burst which is activated only if the trigger is released before the third BB is shot, if the trigger remains depressed after this point the AEG will continue to fire in Full Auto until the trigger is released.

With the installation of the ASCU, the anti reversal latch, which is often a cause of gearbox jams, is no longer needed .

The ASCU has an integrated Low Drain Protection, which is specially designed to keep LiPo batteries from damage. The system will stop the fire when battery reaches deplete level but just before the minimum. The ASCU will also stop the AEG firing if any mechanical problem occurs in the AEG, which protects the internals of the gearbox from further damage. The ASCU gives a combined beeb+vibration signal to the player for the condition of the AEG. (for further information see the Operational Instruction Manual)

Main benefits from the ASCU:

- * Always completes full cycle of the gearbox.
- * No anti reversal latch needed!
- * No gearbox jams! * Reduced trigger travel to 3 mm only!
- * Faster trigger response!
- * Increased ROF!
- * Increased battery life!
- * Increased main spring life!
- * Combined 3 round burst and full auto mode!
- * Compatible with all kind of batteries, gears and springs!
- * Battery deep drain protection integrated!
- * Safe for LiPo batteries with automatic battery cutoff before the battery is drained too low!

The ASCU is designed in a way that it is easy to install in all AEGs with Ver.2 gearbox. In most of the models there is no need for any modification of the original parts of the airsoft rifle, nevertheless some models may need some minor and easy to do, modifications of some parts.

NOTE: We recommend you to use hi-end motors together with the ASCU, because the better the motor is the more effective the active brake is.

WARNING!

Please read carefully this Instruction manual before you proceed with the installation of the ASCU. We strongly recommend that the ASCU should be installed by an experienced airsoft service.

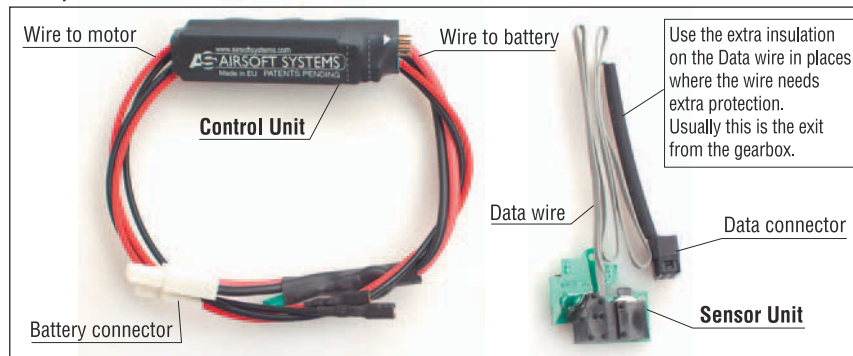
ASCU INSTALLATION STEPS.**Tools that you need:**

Set of Philips screwdrivers
box cutter
PVC tape

Tools that you may need:

Set of small files.
4mm drill.

Before installing the ASCU check all wires for any damage of the insulation.

ASCU parts:

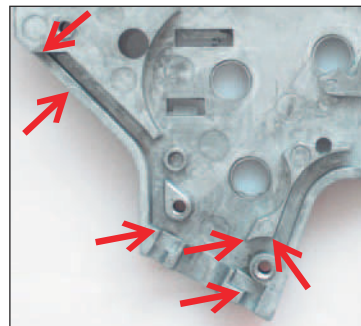
WARNING! If you are not familiar with the AEG's gearbox internals and you do not have good gearbox repair experience, please do not proceed with the installation and turn to your nearest airsoft service.

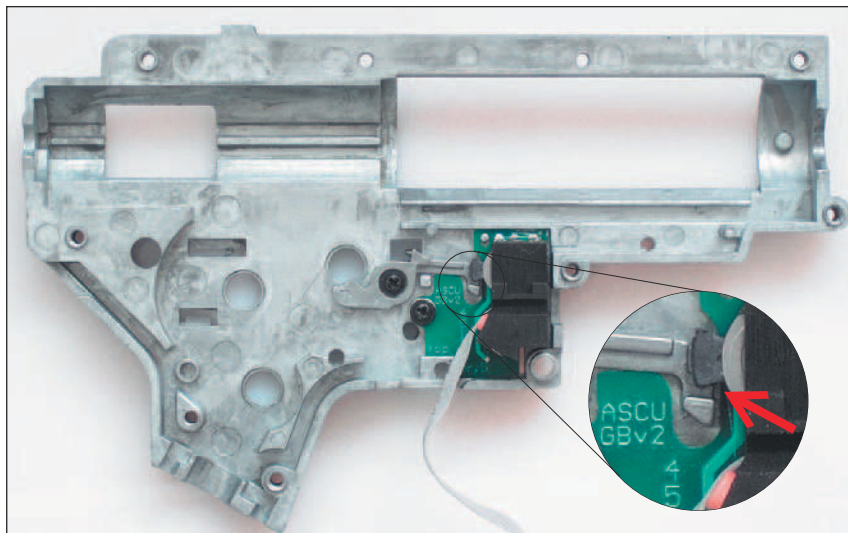
1. Remove the gearbox from your AEG by following the standard procedures.
2. Open the gearbox and remove the cylinder together with the piston and the spring. Remove the gears and the anti-reversal latch. Unscrew and remove both parts of the safety trigger block lever. Unscrew the switch assembly and remove it together with the wiring.

Gearbox Maintenance Tip! If your gearbox has a lot of grease inside and over the gears, clean it and lube the gears, and their axis with thin layer of silicone grease. Over lubricating can result in drop of ROF.

3. At this point check the gearbox shell for any sharp edges in the way of the wires. If there are any round them with a small file. Clean the gearbox shell from any left grit. Check also the receiver for any sharp edges in the wires way, and if there are any, round them with a small file. **All sharp edges in the wires way must be rounded because they can cut through the wires insulation and damage the ASCU.**

*The red arrows shows possible places of sharp edges.

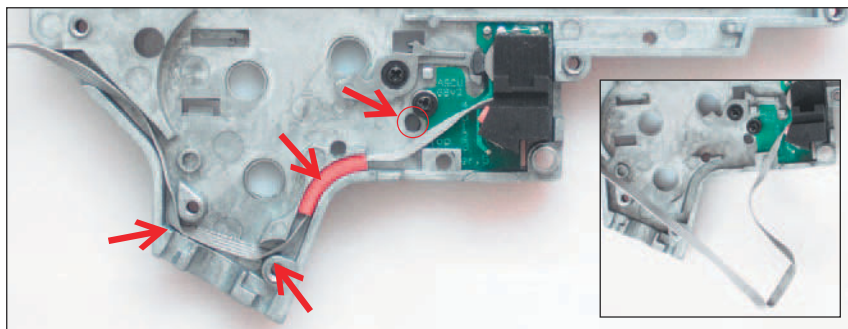
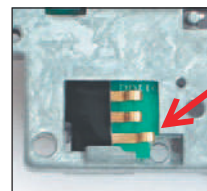




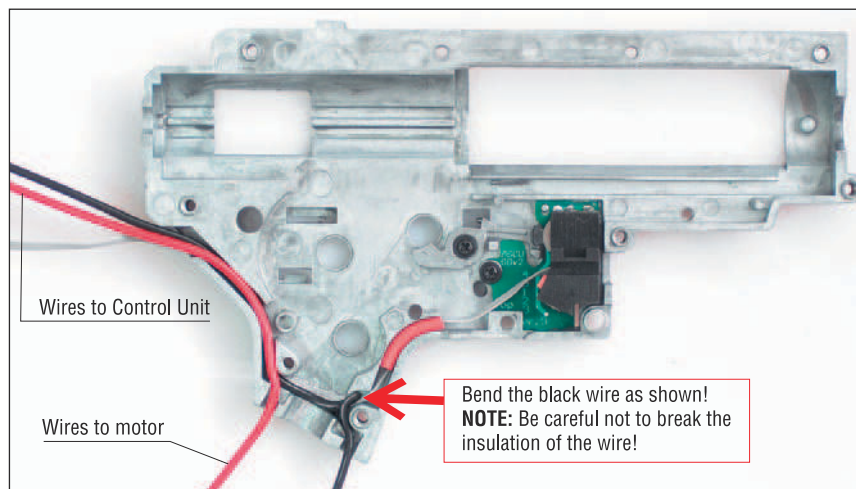
4. In the place of the original switch group install the ASCU Sensor Unit. **Be careful to place the cutoff lever under the lever of the cutoff sensor - exactly as shown on the picture above.** Fix the Sensor Unit by screwing back the screw that was used for the original switch assembly. Test the movement of the cut-off lever. You can add 2-3 drops of silicon lubricant under the cut.off lever.

NOTE: In some models the opening on the sensor plate for the fixing screw must be 4,5 mm, In this case use a 4,5 mm drill by hand to widen the opening.

Turn the gearbox shell to the other side and check the bottom flat pin of the Sensor Unit. **There must be no contact between it and the gearbox shell.** If there is contact, use a file to remove enough material from the gearbox in the contact zone.

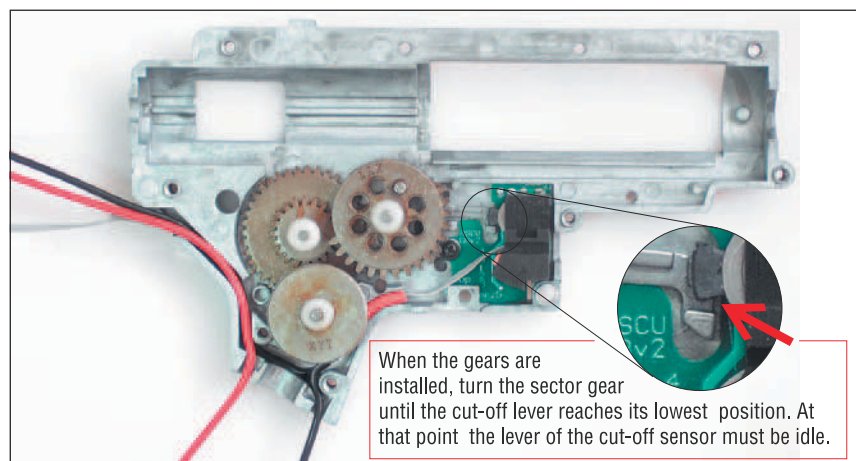


5. Place the Sensor Unit data wire exactly as shown on the picture. Bend the data wire in pinion gear zone as shown on the picture. Fix front part of data wire using 2 cm of wire rubber insulation. Make sure the data wire is not covering the opening for the gearbox fixing pin!



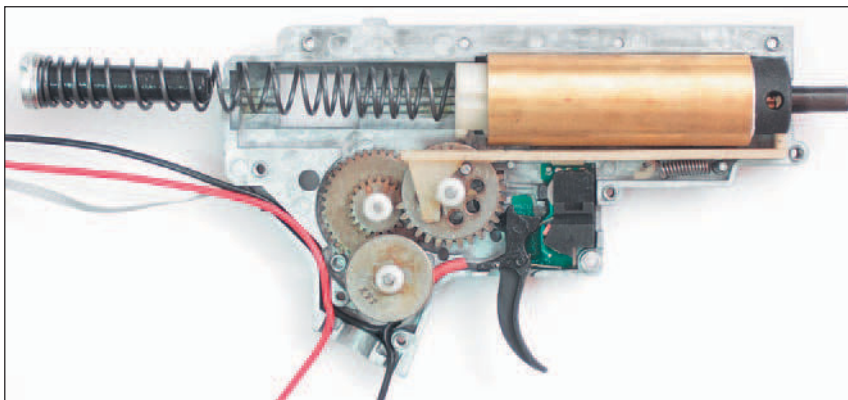
6. Take the ASCU Control Unit with the attached to it wiring and place first the black wire in the wire channel as shown on the picture. Leave 12 cm of the black wire out of the bottom part of the gearbox.
NOTE: Be careful that the data wire and black wire are firmly against the wall of the gearbox shell. Otherwise the pinion gear of the motor may cut the wires during gearbox operation and damage the ASCU.

7. Place the red wire in the wire channel of the back of the gearbox as shown on the picture, by keeping the black and red wires between the gearbox and the Control Unit with equal lengths.



8. Replace the gears. Be sure to put the sector gear with the sector gear teeth facing bottom as shown on the picture!

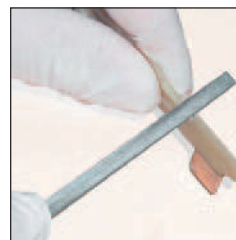
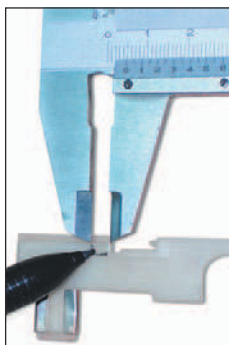
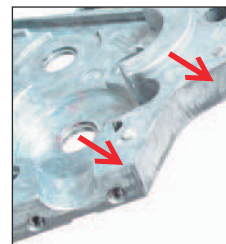
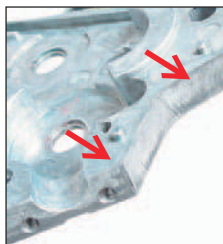
WARNING! Do NOT replace the anti-reversal latch and the safety trigger block lever! You do not need them anymore.



9. Replace the cylinder together with the piston and the tappet plate. Reconnect the tappet plate spring. Replace the trigger. Insert the main spring and the spring guide.

10. Close the gearbox.

IMPORTANT! If it is not easy to close firmly the gearbox check the two projections on the other part of the gearbox shell, if they are too high you have to remove them by using a small file. Be sure to clean very well the gearbox shell from the shreds after that.



11. Remove the selector plate, and the selector plate spring. Cut off a 5 x 5 mm piece of the front part of the inner cut, as shown on the picture above. Clean the edges with a file.

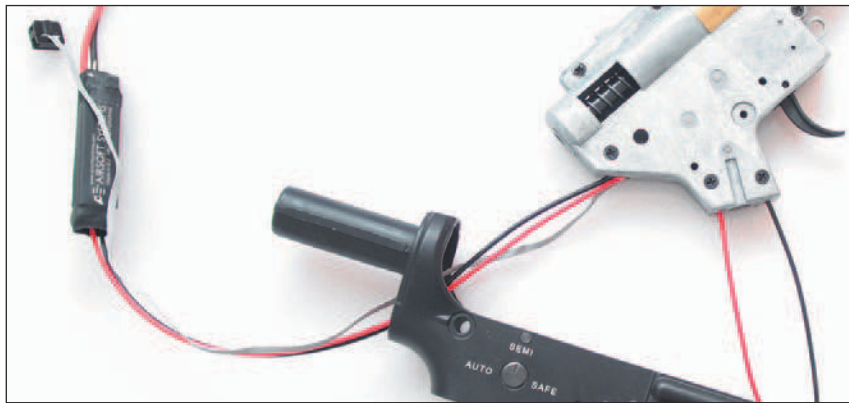
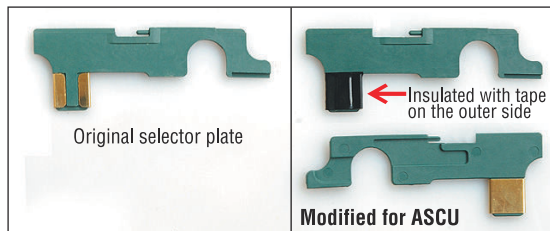
NOTE: You can also use a selector plate for gearbox ver.2 that is for semi-auto AEGs only, as the ones sold in Germany.

IMPORTANT! Do not use selector plates without metal plate!

12. Insulate the outer metal part of the selector plate using a piece of tape as shown on the picture on the right.

Replace the selector plate back to the gearbox.

Do not put back the selector plate spring.



13. Pass first the Control Unit through the opening in the pack of the lower receiver, and after that pass the data wire through the same opening as shown on the picture.



14. Connect the data wire to the Control Unit. The projection on the data wire connector must face the top flat part of the ASCU Control Unit as shown on the picture. If it is connected the other way this will not damage the ASCU, but it will not work until you connect it the right way.

**Further actions depend of what kind of AEG you are installing the ASCU in.
(M4/M16/AR-15 or MP-5)**

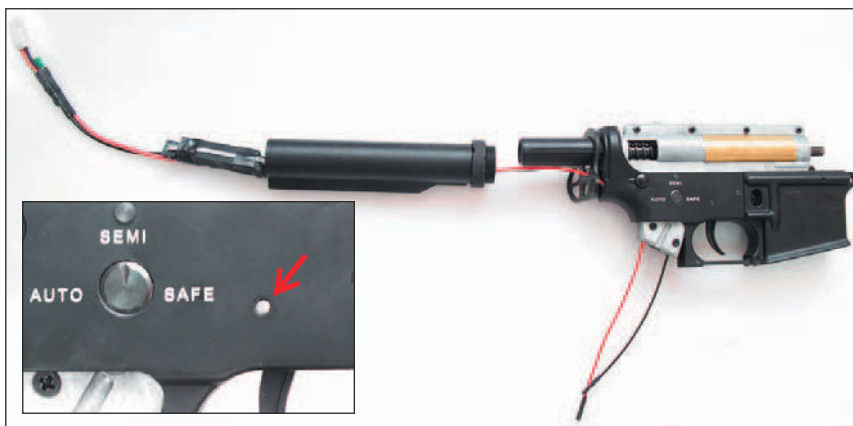
FOR M4/M16/AR-15 AND SR-25 AIRSOFT RIFLES follow the next steps.

IMPORTANT: The ASCU is designed for mounting with the wires coming out from the back of your gearbox, which means the wires and the Control Unit must be placed either in the stock (for M16 and SR-type of rifles) or in the stock tube.
Installation in the front hand guard is not recommended because there is a high risk of damaging the data wire in the process of assembly and disassembly of the upper and lower receiver. However the trend is that in all upgraded AEGs the battery is in the stock area.



NOTE: For models with stock tubes: Check the stock tube for any sharp edges in the wires' way and if there are any, round them with a small file. If the wire channel in the stock tube is too narrow for the wires, take with a file 1-1,5 mm of material from the stock tube as shown in the picture. Clean the receiver from any shreds. **Take these steps only if there is need to.**

After you have passed the Control Unit through the opening of the back of the lower receiver and then passed the Data Wire plug through the same opening:



1. Insert the gearbox in the lower receiver and fix it in place with the receiver pin. Before that check the opening for the gearbox pin for any obstructions and if it is properly aligned. Insert the gearbox pin.

2. A.) For models with full stock:

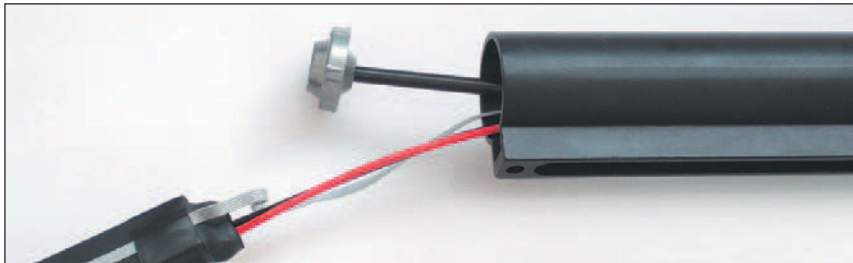
Connect the data wire to the Control Unit. Fix the data wire plug to the Control Unit by a piece of tape. Then pass the Control Unit and the wires through the stock spacer plate and the opening of the stock and screw the stock in place. Fix back in place the grip and the motor.



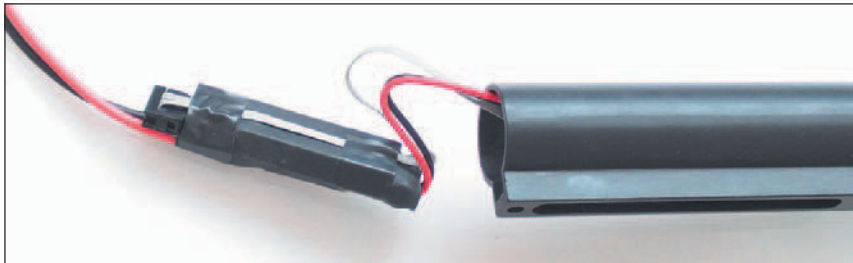
2. B.) For models with stock tube:

Pass the Control Unit and the Data Wire through the stock tube. Place the wires in the wire channel of the stock tube, keeping the data wire protected under the red and black wires as shown in the picture above. Very carefully slide the stock tube into the receiver while watching that the wires stay in the wire channel. If the stock tube does not slide in easily refer to the last NOTE on the previous page. **Be very careful not to damage the wires during this operation!**

3. Connect the data wire to the Control Unit. Fix the Data Wire plug to the Control Unit by a piece of tape.



4. Replace the stock tube fixing bolt. **Be very careful not to damage the wires during this operation!**



5. Bend the wires as shown on the picture above and push the Control Unit into the stock tube. Replace the stock. Fix back in place the grip and the motor.

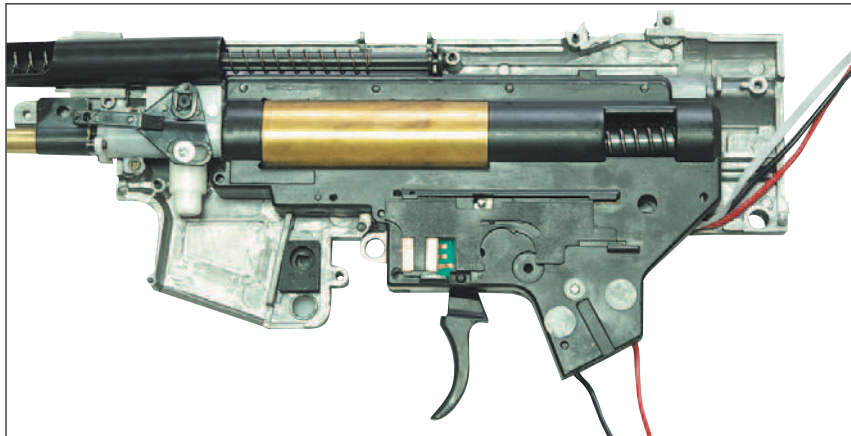
FOR MP-5 TYPE OF AIRSOFT RIFLES follow the next steps:

IMPORTANT:

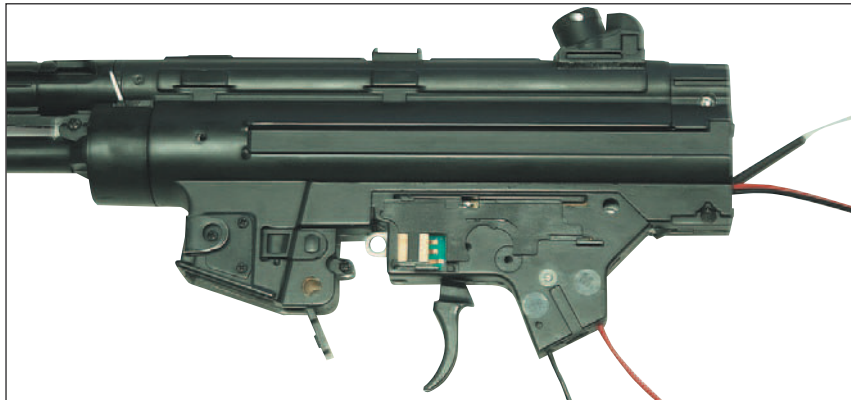
In MP-5 type of airsoft rifles the ASCU Control Unit can be installed only in full stock models.

After installing the Sensor Unit in the gerabox following the previous instructions in this manual, follow the next steps:

1. Cut the selector plate exactly the same way as showed on page 6.



2. Place the gearbox in the receiver with the wires and the ASCU Control unit showing from the back of the receiver.



3. Close the receiver and connect the data wire to the Control Unit. Fix the data wire plug to the Control Unit by a piece of tape. Fix together with tape the red, black and data wires.
4. Pass the Control Unit and the wires through the opening of the stock and fix the stock back in place. Replace the lower receiver, the safety levers and the motor.

ASCU

AIRSOFT SMART CONTROL UNIT

USER MANUAL

The ASCU is designed to be maximum user friendly and easy to operate. After it is installed in to your AEG, the ASCU does not need any kind of programing or tuning. It is very simple to use with clear feedback signals.

1. Connecting the Battery. A single beep signal will indicate that the battery is connected and the AEG is ready for use. If there is no beep refer to the Troubleshoot section.
2. When the fire selector lever is on "SAFE" the AEG will not fire when the trigger is pulled.
3. When the fire selector lever is on "SEMI" the AEG will fire a single shot each time the trigger is pulled. The ASCU will manage the gearbox always through a full cycle and will stop it exactly when the cycle is completed and the piston is in its foremost position.
4. When the fire selector lever is on "AUTO" and the trigger is pulled the AEG will fire fully automatic until the trigger is released. If in "AUTO" mode you tap the trigger once, or the trigger is released before the third shot is completed the AEG will fire a 3-round burst.
5. When the battery is depleted, the AEG will stop firing and you will hear a double beep signal. Change the battery with a charged one.
6. The AEG will also stop firing and you will hear a double beep if there is a mechanical problem in it. If the AEG stops firing with a double beep, and in the same time the battery is not depleted (Check with another charged battery) this means that there is a mechanical problem. Refer to the troubleshooting section.
7. Always strictly follow all safety rules!

MAIN AIRSOFT GUN SAFETY RULES:

1. ALWAYS keep the gun pointed in a safe direction.
2. ALWAYS keep your finger off the trigger until ready to shoot.
3. ALWAYS keep the gun unloaded until ready to use.
4. ALWAYS use eye protection.

Airsoft Systems LTD is not responsible for any injuries or damages caused by the use or misuse of the ASCU!

TROUBLESHOOTING

In this sections you will find important information about the behavior of the ASCU and eventual problems. The ASCU is designed to monitor the parameters your AEG works in. If by any reason mechanical or electrical the AEG does not work within the normal parameters, the ASCU will stop it and inform you with a double beep signal.

Malfunction	Possible reason	What to do
When battery is connected there is no beep signal	▶ Bad battery or AEG cable plug ▶ Bad or no connection of one of the wires with the motor ▶ Burned fuse ▶ Damaged Control Unit	▶ Check the plugs . ▶ Check the motor connections with the black and red wires ▶ Change the fuse ▶ Send the AEG to service.
When the fire selector is on "SEMI" or "AUTO" the AEG will not fire.	▶ No connection between the Sensor Unit and the Selector Plate.	▶ Check the connection between the lamellas on the back of the Sensor Unit and the selector plate. There must be a positive connection of the selector plate with the first and the second lamellas when the selector plate is in "SEMI" position, and positive connection between the selector plate and the three lamellas, when the selector plate is in "AUTO" position (We recommend that this must be done in an authorized service)
When the fire selector is on "SEMI" the AEG fires auto.	▶ Misplaced selector plate.	▶ Check the selector plate assembly .
When the fire selector is on "SAFE" the AEG fires.	▶ Misplaced selector plate.	▶ Check the selector plate assembly .
When the fire selector is on "SEMI" the AEG works fine, but when it is on "AUTO" it stops with a double beep.	▶ The selector plate is not cut properly.	▶ Cut the selector plate according to the instructions in this manual.
The AEG makes only a few automatic shots, no matter if the selector is on "SEMI" or on "AUTO"	▶ The cutoff lever is not moving. ▶ The cutoff lever sensor is not installed under the lever of the cutoff sensor	▶ Check the cutoff lever. If it is not moving freely, apply a bit of lubricant, or change it. ▶ Install the cutoff lever under the lever of the cutoff sensor.
The AEG behaves strangely. It fires by itself when the selector is not on "SAFE"	▶ The data wire is damaged and short-circuited.	▶ Take out the data wire and check it for damage of the insulation. Insulate with tape or change the wire. Send to service.

Malfunction	Possible reason	What to do
The AEG stops firing with a double beep signal when the battery is charged.	▶ The motor is overtightened. ▶ The gears are overtightened. ▶ The motor is underpowered. ▶ The battery is damaged. ▶ A broken or worn gear.	▶ Regulate the motor regulating screw. ▶ Check the shimmings. ▶ Change it with more powerful motor. ▶ Check with another charged battery. ▶ Change the gear.
When the fire selector is switched from AUTO to SEMI, the AEG keeps firing in auto mode.	▶ The groove in the selector plate for selector eccentric is too wide.	▶ Change the selector plate with one with narrower groove.
The wires are getting too hot, or the Control Unit is getting too hot.	▶ Bad motor. ▶ Bad battery. ▶ Overtightened gears ▶ Short-circuit.	▶ Change the motor with more powerful one. ▶ Change the battery. ▶ Re-shim the gears. ▶ Check the wire insulation all the way from the Control Unit to the motor and fix where it is damaged.

As there are a lot of AEG producers, and no matter that all of them are producing AEGs with gearboxes that are clones of the Tokyo Marui ver.2, some times there are very small difference in dimensions and shapes of some parts. This is why during the installation of the ASCU may happen that the original cut-off lever or the original selector plate do not work as required with the ASCU, and have to be changed with better ones.

For any other problems send your AEG to the nearest authorized service.

For complete list of authorized services check on www.airsoftsystems.com

For updates and other information check on www.airsoftsystems.com and the technical support forum.

A NEW LEVEL OF PERFORMANCE

THE ULTIMATE UPGRADE FOR AIRSOFT ELECTRIC GUNS

The ASCU is a two piece computer electronic control unit for airsoft electric guns, that brings out a new level of performance for the standard AEGs, that until now, was only available in the most expensive training weapons.

The Control Unit is very compact and can be placed in the stock tube of an M4 type of AEG.

The sensor unit completely replaces the switch assembly and wiring in the gearbox.

The ASCU monitors the actual position of the sector gear and stops the motor always in the exact moment, when the cycle of the sector gear is completed.

The ASCU is not battery sensitive and can work with all kind of batteries used in AEGs; NiCd, NiMH, LiPo and LiFe, from 7,2 to 12 V. The ASCU has an integrated battery drain protection, so it can be used safely with LiPo batteries.

The ASCU extremely improves the trigger response and the rate of fire, and also the shots per charge capability of the battery.

The ASCU features a 3-round bursts mode added to the full auto mode.

ASCU version for gearbox Ver.3 is under development.

The ASCU Control Unit is ready to accept a newly designed, patent pending, hop-up unit, that detects when the magazine is empty and cuts off the fire. The unit works with all standard AEG magazines. For updates on the hop-up unit release check on www.airsoftsystems.com

PATENTS PENDING

Made by AIRSOFT SYSTEMS Ltd - Bulgaria
www.airsoftsystems.com

Distributor:

AS AIRSOFT SYSTEMS
www.airsoftsystems.com