

# POLARSTAR

Fire Control Unit Instructions (REV 3.0+)

## Battery

The Fire Control Unit can be powered from battery packs between 7.4v and 10.8v. This includes common airsoft battery packs as well as small (<300mAh) lithium polymer packs. 7.4v and 8.4v battery packs are recommended since there are no benefits to using a higher voltage. **Alkaline batteries (including 9V batteries) should not be used as they do not meet the minimum continuous current rating of at least 1A and will lead to malfunction.**

**THE FCU WILL CONTINUE TO DRAW POWER FOR AS LONG AS THE BATTERY REMAINS CONNECTED.  
ALWAYS DISCONNECT THE BATTERY AFTER USE TO PREVENT THE BATTERY FROM DISCHARGING COMPLETELY.**

## Programming

To enter programming mode, press inward on the programming button. The display will show the firmware revision (e.g. rE 3.0) and the programming indicator will turn on. When the programming indicator is on the trigger is disabled and the system is in programming mode. Press the programming button again to exit programming mode. Setting changes are automatically saved upon exiting. While in programming mode the various settings may be accessed by pushing the programming button left or right. The values are changed by pushing the button up or down.

The FCU may be returned to the factory defaults by holding in the programming button while plugging in the power supply.

**Firmware Revision (e.g. rE3.0)** - This is not a user setting, but instead displays the firmware revision of the FCU. Pressing up or down on the programming button will display the upper or lower four (4) digits of the FCU shot counter. This value is displayed in hexadecimal format.

**FCU Mode (FC)** – As of revision 1.0 the FCU can control both the Fusion Engine and F1/Jack. This setting (FE or F1) determines which system the FCU is controlling and which system-specific settings are visible in the menu. Some settings are global and apply to both systems while others are specific to either the Fusion Engine mode or F1/Jack mode.

**Rate of Fire (rF)** - The ROF variable sets the cyclic rate of the system. The value on the display is the desired cyclic rate in Rounds per Second. If the FCU calculates that the set cyclic rate is too high to achieve based on other settings then it will automatically use the calculated maximum cyclic rate regardless of the number displayed.

**Max Semi Auto ROF (Sr)** – This setting controls the maximum semi auto rate of fire. Once a shot has been fired the FCU will ignore additional trigger pulls until the time in the Sr setting has elapsed. This is adjustable in 0.1ms increments from 10 shots per second (Sr 01) to as low as 1 shot every 9.9 seconds (Sr 99). Setting this to 0 turns off the timer and allows you to fire as fast as you can pull the trigger.

**Selector Modes (S1 & S2)** – The fire mode of each selector position is configured individually to allow the mapping of any fire mode to any selector position. S1 sets the mode of the semi-auto position and S2 sets the mode of the full auto position.

**00:** Full Auto

**01:** Semi Auto

**02-09:** 2-9 Round Burst

**Anti-Stiction Timeout (iS)** - The Anti-Stiction timeout is a countdown timer that enables the Anti-Stiction Pulse when the timer reaches zero. This is set in 10 second increments and is automatically reset after every shot.

**Anti-Stiction Pulse (iP)** - The Anti-Stiction pulse is added to the Poppet Dwell when the Anti-Stiction Timeout has elapsed. This is used to counter static friction ("stiction"). In many cases it is not needed and can be turned off by setting iP to 00.

**Poppet Dwell (dP)** - The poppet dwell variable controls how long power is applied to the solenoid and allows adjustment of the gas volume released through the nozzle. The higher the value, the longer gas is allowed to flow. The dwell is set in 0.1ms increments. Although this is a global setting, the Fusion Engine and F1/Jack do not have the same dwell values so there are actually 2 dP settings in the FCU. Only the dP setting for the active FCU Mode is shown/used.

**Nozzle Dwell (dN)** - The nozzle dwell variable controls how long power is applied to the nozzle solenoid, affecting the time that the nozzle is held rearward. The higher the value, the longer the nozzle is held to the rear, which allows tuning for slower feeding magazines. This setting is highly dependent on the magazine, BB and Hop-Up combination. In most cases, a dN setting of 8ms to 14ms is ideal. Setting this value too low will result in inconsistent feeding and potential jams. *(This setting only applies to Fusion Engine mode.)*

**Return to Battery Delay (dr)** - The RTB delay determines how long to wait for the nozzle to return forward while chambering the next round. Due to the design of the AEG magazine/Hop-Up, the actual delay time required varies each shot so the default value is set to a conservative 22ms. Although the dr value may be lowered for some setups, it should not be set below 17ms. *(This setting only applies to Fusion Engine mode.)*

**Closed Bolt Mode (Cb)** - Closed Bolt Mode allows simulation of a closed bolt mechanism by firing the round first, then cycling the nozzle. This allows for even faster trigger response and more consistent seating in the Hop-Up at the expense of dry-firing the first shot on a new magazine. *(This setting only applies to Fusion Engine mode.)*



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