



## Glow Plug Driver User Guide



### What is a Glow Plug Driver?

A Glow Plug Driver is essentially an electronic servo that controls a power supply that allows you to turn your glow plug on and off from an on board battery. The Glow Driver plugs into your receiver either from a Y-Connector split off of your throttle channel or you can use an unused channel on your receiver. By programming mixes and switches on your transmitter you can make your glow plug a smart feature of your model.

### How do I use it?

Think of the Glow Plug driver as if it was just another servo. The only difference being that instead of a motor moving the control arm it is instead an electronic Power supply that turns your glow plug on and off. Glow Plugs use a considerable amount of power so we designed the glow driver to supply the glow plug with a separate and dedicated battery. This avoids the problem of draining your receiver battery.

The glow plug is turned on and off simply by setting your throttle stick to the position where you want the glow plug to be engaged and then pressing a "set" button on the Glow Driver. At high throttle settings you don't need the glow plug so it will be off when the throttle is above the set point. The Glow driver will remember this setting even after power is removed so you'll never have to set it again. The Glow Driver also has a "reverse" switch in the event that your throttle servo is operating in the reverse mode. The reverse setting is also saved in non-volatile memory just like the "set" switch.

### Benefits:

- A Glow Driver is especially useful in situations where access to the glow plug is obstructed by cowlings or the engine is mounted with the cylinder in the sideways or down positions.
- A glow driver eliminates the need to connect an external glow battery or glow power supply.
- A glow driver can give smoother operation at slow idle speeds.
- It will allow you to maintain a very low idle speed since the glow plug will be on at the idle speed.
- Avoids "Flame outs" at slow idle speeds.

### Glow Driver by Crain Engineering Features:

- ✓ **Constant Power Mode**
  - Automatically Adjusts power to compensate for battery charge state and voltage.
  - Automatically Adjusts for wiring and connector resistance.
- ✓ **Works with all Battery types from Single Cell NiCAD/NiMH up to 3 Cell LIPO's.**
- ✓ **LiFe Version**
  - Supports One, Two and Three Cell LiFe
- ✓ **Typical configurations:**
  - Single (1.2 Volt) NiCAD or NiMH
  - Single Cell LIPO (3.7 Volt)
  - Two Cell LIPO (7.4 Volt)
  - Three Cell LIPO (11.1 Volt)
  - NiCad/NiMH (4.8 Volt and 6.0 Volt) Battery Packs
  - Any combination of batteries from 1.2 Volt to 12 Volts.
- ✓ **Compact and light weight**
  - Design allows for use of small and lightweight LIPO batteries.
- ✓ **Separate Glow Battery Supply**
  - Safer Operation to avoid draining receiver batteries.
- ✓ **Auto shutoff for low battery**
  - Protects batteries from damage.

- Especially important for LIPO batteries.
- *LED slowly flashes to indicate low battery condition.*
- ✓ **Short Circuit Protection**
  - Automatically disables driver when Short is detected.
  - Resets simply by moving joystick to off position.
  - *LED rapidly flashes to indicate shorted condition.*
- ✓ **Open Circuit Indication**
  - Detects burnt out Glow Plugs.
  - Detects broken connections.
  - *LED flashes at moderate rate to indicate Open Circuit.*

### Recommended Setup

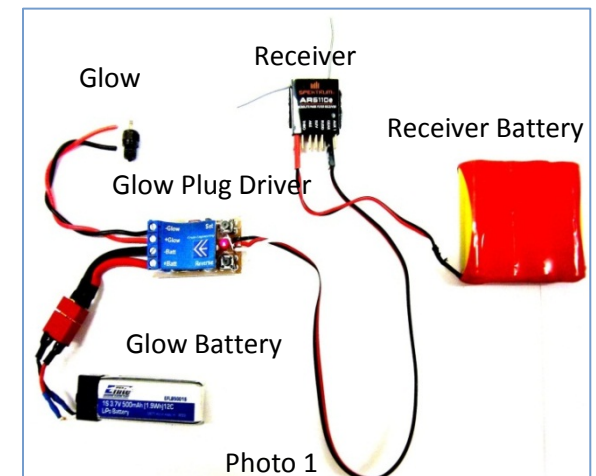


Photo 1 demonstrates our typical setup. This setup has the advantage of being very lightweight and space efficient. This setup uses a Single cell (3.7 Volt) 500mAh LIPO Battery as the Glow Plug power source. This battery will supply about 30 minutes of glow plug power on a fully charged battery. If you need more than 30 minutes glow plug power then we would recommend a two cell LIPO at around 500mAh. The two cell LIPO will double the time to 60 minutes. Of course there are many configurations that will work. We are showing this as only one of many possible configurations.

## Setup Procedure

Referring to Photo 1 follow the steps below:

- ✓ Connect the Glow Plug positive and negative wires to the + **Glow** and - **Glow** connectors and tighten the screw terminals.
  - ✓ Connect the Glow Plug Battery positive and negative wires to the + **Batt** and - **Batt** connectors and tighten the screw terminals.
  - ✓ Connect the 3 wire servo connector from the Glow Driver to an unused channel of your receiver *OR* use a Y-connector to share the throttle servo with the Glow Driver.
  - ✓ Turn your receiver and transmitter on. Move the throttle stick on your transmitter to the position where you would like to turn on the glow plug. Press the **Set Switch** on the Glow Driver. The LED light on the Glow Driver will be lit. Now move the throttle stick up and then down. As the throttle stick passes through the set point the glow plug and LED indicator light will go on and off.
- **Important Note** – The **Set Switch** does more than just set the turn on/off setting. It is also when the Glow Driver learns what Glow Battery you are using to drive the Glow Plug. When doing the setup make sure to have a fully charged Glow Battery connected to the Glow Driver. When the **Set Switch** is pressed the Glow Driver will read the battery voltage and establish the low voltage and short circuit limits for the battery. Like all settings, these values are remembered. **If you change the Glow Plug battery to one with a different voltage then you must press the Set Switch again so the Glow Driver can re-learn the new battery voltage. Only if you change to a battery of different voltages will you need to do this. If you change batteries where the new battery is the same voltage as the old, you do not have to redo the setup.**
- ✓ If the Glow plug is on at high throttle and off at low throttle then press the **Reverse Switch** on the Glow Driver. This will reverse the on/off direction.

## Operation and LED Status

As mentioned in the Features Section, the Glow Driver has Short Circuit protection, Auto Battery shutoff, Low Voltage indication, and Open circuit indication. The Low Battery and Short Circuit Limits are determined at the time you press the **Set Switch**. Make sure you have a fully charged battery connected to the glow plug driver when you press the **Set Switch** in order for the Glow Driver read the battery voltage correctly.

- ✓ **Note** - When changing Glow Batteries to a *different voltage*, make sure to press the set switch again so the Glow Driver can establish new Short Circuit and Low Voltage limits.

The LED Indicator Light has five modes of operation. They are defined in the table below.

LED Action	Meaning
Off	Glow Plug is off
Constant On	Glow Plug is on
Slowly Flashing	Glow Battery Voltage is Low. The glow plug will not be energized when this occurs. Recharge the battery to correct. Note – If this occurs and you know the battery is fully charged it is probably because you changed from a different battery voltage. Press Set Button to correct.
Moderate Speed Flashing	Open Circuit. The Glow Plug is either burned out or the wiring is open circuited.
Rapidly Flashing	Short Circuit or excessively high current detected. The glow plug will not be energized in this state. Reset the condition by simply moving the throttle stick to the off position.

## Trouble Shooting

Problem	Possible Cause and Solution
<b>Glow Plug does not energize and indicator light is off</b>	<ul style="list-style-type: none"> <li>• Setup not complete. Turn on receiver, transmitter and plug in Glow Battery. Set throttle to ON position and press the <b>Set Switch</b>.</li> </ul>
<b>Glow Plug goes on at high throttle and off at low throttle</b>	<ul style="list-style-type: none"> <li>• Receiver Channel is reversed. Press the <b>Reverse Switch</b> on the Glow Driver.</li> </ul>
<b>LED is Slowly Flashing but Glow Battery is plugged in and charged</b>	<ul style="list-style-type: none"> <li>• Check battery connection to Glow Driver.</li> <li>• Glow Driver expecting a different battery voltage. Probably due to change from a higher voltage battery. Press the <b>Set Switch</b> to teach the Glow Driver the new battery voltage.</li> </ul>
<b>LED rapidly flashes each time the Glow Plug is turned on but there is no short circuit</b>	<ul style="list-style-type: none"> <li>• Excessively high current was detected.</li> <li>• Perform setup again to re-learn the Battery Voltage.</li> <li>• If condition persists, switch to a battery with lower voltage or “C” rating.</li> </ul>

## Contact Information

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