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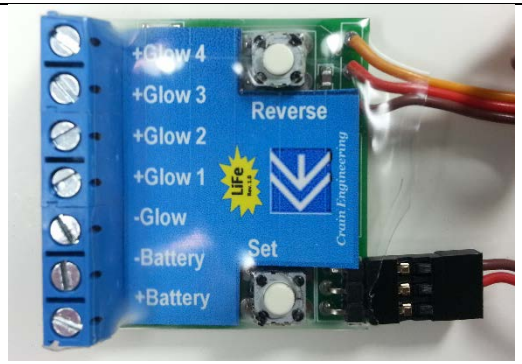
Multi Glow Plug Driver User Guide



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.

✓ **Works with all Battery types including 2 or 3 cell LiPo's and LiFe's.**

✓ **Typical configurations:**
- Two Cell LIPO (7.4 Volt) or three Cell LIPO (11.1 Volt)
- Two Cell LIFe (6.6 Volt) or three Cell LIFe (9.9 Volt)

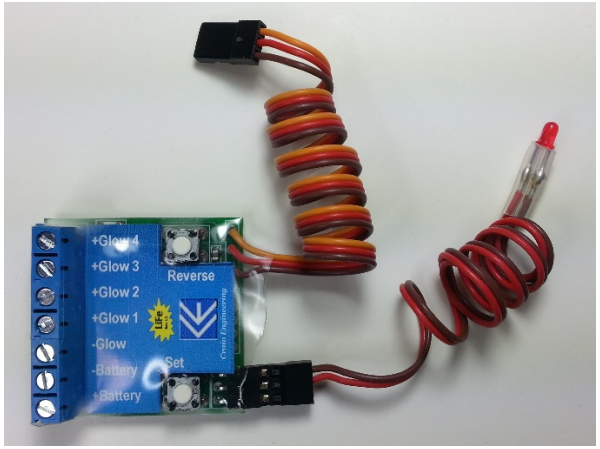
✓ **Compact and light weight**
- Design allows for use of small and lightweight LiPo and Life batteries.

✓ **Separate Glow Battery Supply**
- Safer Operation to avoid draining receiver batteries.

✓ **Auto shutoff for low battery Voltage**
- Protects batteries from damage.
- Especially important for LiPo and LiFe batteries.
- *LED slowly flashes to indicate low battery condition.*

✓ **Detects Low 'C' Rating**
- Automatically disables driver when battery doesn't have a sufficient 'C' rating to power multiple Glow Plugs.
- Resets simply by moving joystick to off position.
- *LED rapidly flashes to indicate 'Low C' condition.*

Multiple Cylinder/Multiple Engine Glow Driver



The 'Multi Glow Plug Driver' is a unique design that can drive from one to four Glow plugs. The plugs can be on an engine with multiple cylinders, multiple engines, or a combination of both multi Cylinder and Multi Engine. The unique design of the Multi allows you to drive all glow plugs with a single onboard glow driver battery. For single glow plug applications see our standard Glow plug drivers from Crain Engineering at http://craineng.net. These are more economical for single glow plug applications.

Setup Proceedure

✓ Connect your Glow Plug adapter positive lead into one of the **+ Glow** terminals and tighten the screw to hold the wire securely. Use one glow plug each for connector **+Glow 1** thru **+Glow 4**. The order doesn't matter.

✓ Then connect your crankcase to a ground wire using an automotive crimp connector making sure you get good electrical contact to the crankcase. It's a good idea to scratch the contact area on your crankcase with some sandpaper to make sure good electrical conduction will occur. Connect the other end of the ground lead to the

-**Glow** connector on the 'Multi Glow Plug Driver'. Tighten the screw terminal. For multiple engine applications a Crankcase ground wire is required for each engine. Splice multiple ground wires together and insert all grounds into the **–Glow** terminal.

- ✓ 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 down below your set point. As the throttle stick enters the set point and below the glow plugs and LED indicator light will go on. Throttle up past the set point and the LED indicator light and Glow plugs will turn 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 'low C' 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 protection. Automatic shutoff for Low Voltage and Low/Insufficient 'C' rating will occur if these conditions exist and the LED light will flash at different speeds to indicate which type of failure has occurred. The Low Battery Voltage and Low/Insufficient 'C' rating limits are determined when 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 to set these limits accurately.

- ✓ Note - When changing Glow Batteries to *a different voltage*, make sure to press the set switch again so the Glow Driver can establish limits based on the new battery voltage. *You only have to do this if the battery voltage changes. Changing to a different battery with the same voltage is ok. No new setting is required.*

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

LED Action	Meaning
Off	Glow Plugs are off
Constant On	Glow Plugs are 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.
Rapidly Flashing	Insufficient 'C' rating or excessively high current detected. The glow plug will not be energized in this state. Reset the condition by moving the throttle stick to the high throttle (off) position.

Trouble Shooting

Problem	Possible Cause and Solution
Glow Plug does not energize and indicator light is off	• Setup not complete. Turn on receiver, transmitter and plug in Glow Battery. Set throttle to ON position and press the **Set Switch.**
Glow Plug goes on at high throttle and off at low throttle	• Receiver Channel is reversed. Press the **Reverse Switch** on the Glow Driver.
LED is Slowly Flashing but Glow Battery is plugged in and charged	• Glow Driver not detecting battery. Check battery connections to Glow Driver. • Glow Driver expecting a different (higher) battery voltage. Probably due to change from a higher voltage battery to lower voltage. Press the **Set Switch** to teach the Glow Driver the new battery voltage.
LED rapidly flashes each time the Glow Plug is turned on but there is no short circuit	• Excessively high current was detected. • Perform setup again to re-learn the Battery Voltage. • If condition persists, switch to a battery with a higher "C" rating.

Contact Information

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