

SPRITE-25

by Castle Creations

The World's Smallest 25 Amp RC Motor Controller

1.0 Features of the *Sprite-25*:

- Microprocessor controlled
- Extremely low resistance (.0025 ohms)
- High rate (2800 Hz) switching (PWM)
- Up to 25 Amps continuous current (with proper air flow)
- Up to 20 Amps continuous current (with little or no air flow)
- Six to eight cells with three standard micro servos or two high-torque micro servos
- Up to ten cells with two standard micro servos
- Six to sixteen cells with BEC disabled
- Dynamic braking ensures folding props fold promptly
- Battery Eliminator Circuit (BEC) provides power to receiver and servos - eliminates separate receiver battery
- Auto Motor Cutoff with Reset
- Safe “power on” arming program ensures motor will not accidentally turn on
- Low torque “soft start” prevents damage to fragile gearboxes
- Auto shut down when signal is lost or radio interference becomes severe
- Rugged surface mount construction

2.0 Wiring Your *Sprite-25*:

Tools required:

Wire cutters
Wire strippers (optional)
Soldering Iron (25-40 watts - Do not use a soldering “gun”)

Parts required:

Solder (rosin core “electronic” solder - do not use acid core “plumbers” solder)
Battery connector

2.1 Adding the Battery Connector

The battery connector is attached to the left side of the controller (looking down at the heat sink/label). Cut the wires to the length you require on the battery side. Strip off of the wire insulation to expose just enough wire to attach the battery connector. (Note: if you do not have a pair of wire strippers, you can use a modeling knife to carefully cut through the insulation around the wire. Then the insulation should easily pull off the wire.) Attach the battery connector to the wires ENSURING THAT THE POLARITY (red wire to battery red wire, black wire to battery black wire) IS CORRECT, following the instructions for the battery connector.

IMPORTANT NOTE: YOU MUST BE SURE THAT THE POLARITY IS CORRECT WHEN CONNECTING THE SPEED CONTROLLER. Incorrect polarity could permanently damage the controller.

2.2 Attaching the Motor Leads

The motor is connected to the right side of the controller (looking down at the heat sink/label). Cut the wires to the length you require on the motor side. Strip the wire insulation to expose just enough wire to solder the wires to the motor terminals. (Note: If you do not have a pair of wire strippers, you can use a modeling knife to carefully cut through the insulation around the wire. Then the insulation should easily pull off the wire). There should be a ‘+’ symbol or a RED DOT on the end of your motor which indicates which terminal must be connected to the RED wire. Connect the other terminal to the black wire.

Align the wires carefully and solder to the motor terminals. Ensure that all connections (battery and motor) are correctly polarized.

IMPORTANT NOTE: YOU MUST BE SURE THAT ALL CONNECTIONS ARE CORRECT WHEN CONNECTING THE SPEED CONTROLLER. Incorrectly connecting the speed control could permanently damage the controller.

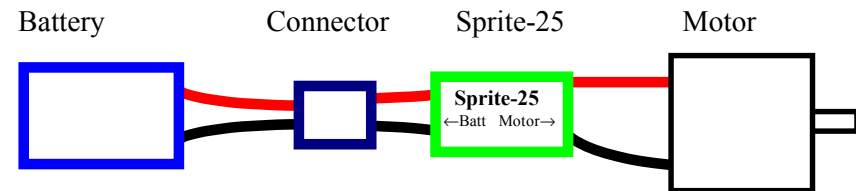


Fig 1: System power wiring diagram

2.3 Connecting the Receiver

Connect the receiver lead (the three color twisted wires with a connector on the end) to the throttle channel on your receiver (usually channel 3). Do not connect a battery to the receiver, as the Sprite-25 will supply power to the receiver and servos through the receiver connector. If you are using more than ten cells, you will need to use a separate receiver battery. See the section 3.0 (under the heading BEC) for instructions on disabling the BEC to use a separate receiver battery.

ALWAYS PERFORM A RANGE CHECK BEFORE FLYING WITH ANY NEW SPEED CONTROLLER! PERFORM YOUR RANGE CHECK AT FULL THROTTLE, HALF THROTTLE AND NO THROTTLE.

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3.0 Flying with Your *Sprite-25*:

Initialization sequence:

1. Connect the speed controller receiver connector to the proper channel on your receiver (usually channel 3)
2. Turn on your transmitter.
3. Connect the main power battery to the speed controller.
4. The speed controller will remain disarmed (will not operate) until it sees more than two seconds of "brake" throttle. Move the throttle arm to the lowest position on your transmitter, wait at least two seconds, and then test the controller to make sure that the throttle operates.
5. Go fly!
6. If the BEC cutoff occurs before you land, you may restart the motor and use low throttle if necessary by moving the throttle stick all the way down (to the brake position) and then throttling back up. BEC cutoff will occur again if the voltage drops too low.

4.0 Using the Features of Your *Sprite-25*

BEC - The BEC power is supplied to the receiver and servos through the receiver connector wires. If you wish to disable the BEC and use a separate receiver battery (required for the use of more than ten cells), you must first cut the red wire in the trio of receiver wires. Simply use a pair of wire cutters to remove a short section of the red wire near the receiver connector, and be sure to insulate the cut wire with a bit of electrical tape. Then you may safely use a battery with your receiver. **MAKE SURE YOU KNOW HOW MUCH TIME IS LEFT ON YOUR BEC AFTER CUTOFF.** To check this, run the motor on the bench until cutoff occurs. Then "twiddle" the transmitter sticks (moving the servos and control surfaces) until the receiver stops working. Note the amount of time you have on the BEC after cutoff, and make SURE you land while you still have BEC power. It is a good practice to land before HALF of the remaining BEC time has expired. Note that restarting the motor will reduce the amount of BEC time after cutoff. Note that increasing the number of cells will REDUCE the amount of BEC time after cutoff.

Brake - moving the transmitter throttle stick to the bottom position enables the prop brake. **Two seconds after the throttle has been in the brake position, braking will occur.** If the brake does not come on in the lowest throttle position, adjust your transmitter trim down slightly.

Cutoff - The motor cutoff will occur when the input battery voltage drops below 4.9 volts for more than one half second. Once motor cutoff has occurred, moving the throttle to the braking position (full off) will rearm the controller. This will allow restart of the motor at low throttle after cutoff has occurred. **WARNING: Repeated restarting of the motor may drain the battery to the point where the radio receiver will stop operating, resulting in a loss of control of the model.**

Loss of Transmitter Signal, or excessive radio noise cutoff - Motor cutoff will also occur if the signal from the transmitter is lost, or if the radio noise becomes excessive. After radio connection has been reestablished, the motor can be restarted by moving the throttle to the braking position (full off) for two seconds.

Safe Power Up - The Safe Power up feature is a "finger saver", designed to prevent the motor from starting accidentally on power up. To arm the controller, the transmitter stick must be held in the "Brake" position (all the way down) for at least two seconds. Until the controller is armed, it will not provide any power to the motor, regardless of where the throttle stick on your transmitter is

positioned. Before flying your model, be sure to "blip" the throttle to ensure that the controller is armed.

5.0 Troubleshooting

Everything is hooked up correctly, the BEC (receiver and servos) works, but the throttle does not work.

The controller is not seeing the two seconds of "dead space" (low throttle) and is not arming. Try moving your throttle stick all the way down, and moving the trim all the way down. Wait for two seconds and try the throttle again. If it still does not arm, you may need to reverse the throttle control on your transmitter (see your radio documentation). You may also check to make sure that your endpoint adjustments on your radio (if it has them) are set all the way open.

Every time I throttle all the way up, the controller "cuts off" after a few seconds, even with fresh charged batteries.

The controller will automatically shut down the motor if the battery voltage falls below 4.9 volts for more than half a second. This is to protect your airplane from a loss of control caused by too low a voltage at the receiver. If the cutoff is kicking in with fresh charged batteries, it means that the voltage is dropping very quickly. This is usually an indication of a motor that is drawing too much current for the batteries to handle. Try using a smaller prop on the motor, or using batteries with a higher rating (for example, if you are using 600 AE cells, you might try going to 800 AR cells.)

The brake doesn't seem to work when I'm doing a static test.

The brake has a 2.5-second delay before activating. You will probably never see the brake operating on the ground, because the motor will be almost completely stopped by the time the brake activates. This delay is to prevent damage to gearboxes and belt drives. In the air, the motor will likely still be turning when the brake activates, and the brake action will be much more noticeable.

Nothing seems to work, receiver and servos are dead, and the throttle is dead.

Check all connections to ensure that they are correct, and that the polarity (+/-) connections are correct. Ensure that the battery is not connected to the motor side of the speed controller. If everything is correctly connected, and the receiver and servos still do not work, contact the dealer where you purchased your Sprite-25, or contact **Castle Creations** directly. (see info below)

CONTACT/WARRANTY INFORMATION

Your Sprite-25 is warranted for 90 days from date of purchase to be free from manufacturing and component defects. This warranty does not cover abuse, neglect, or damage due to incorrect wiring, over voltage, or overloading. If you have any questions, comments, or wish to return your Sprite-25 for warranty or after warranty repair/replacement contact **Castle Creations** at:

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