

# Dragon-55™

By Castle Creations

55 Amp Brushless Micro Speed Control

**Warning!** High power motor systems can be very dangerous! High currents can heat wires and batteries, causing fires and burning skin. Follow the wiring directions carefully! Model aircraft equipped with high power motors can kill. Always fly at a sanctioned field. Never fly over or near spectators. Even though this controller is equipped with a safety arming program, you should still use caution when connecting the main battery.

## 1.0 Features of the Dragon-55™:

- Microprocessor controlled
- Extremely Low Resistance (.0023 ohms)
- High rate (11 KHz) switching (PWM)
- Up to 55 Amps continuous current (with proper air flow)
- Six to eight cells with three or four micro servos
- Up to ten cells with two micro servos.
- Sixteen cells MAX with BEC disabled.
- Dynamic braking ensures folding props fold promptly
- Dual Battery Eliminator Circuits (BECs) provide power to receiver and servos - eliminates separate receiver battery
- Runs motor in forward OR reverse
- 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 Dragon-55™:

### 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 Servo Ratings with BEC Enabled

Servo Type	5-6 cells	7-8 cells	9-10 cells
Standard (micro) servos	4	3	2
High Torque servos	3	2	Not Recommended

## 2.2 Adding the Battery Connector

The battery connector is attached to the side of the controller that has only two power wires, and also has the radio connector. 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.

## 2.3 Connecting the Motor for Forward (Counter Clockwise) Rotation

The motor is connected to the side of the controller that has THREE power wires. Cut the wires to the length you require on the motor side. DO NOT CUT the wires leading from the motor. Strip the wire insulation to expose just enough wire to solder the wires to the motor terminals. There are three wires extending from the motor, one with a blue heat shrink jacket, one with a yellow heat shrink jacket, and one with a red heat shrink jacket. Connect the RED controller wire to the RED motor wire. Connect the BLACK controller wire to the BLUE motor wire. Connect the WHITE controller wire to the YELLOW motor wire.

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

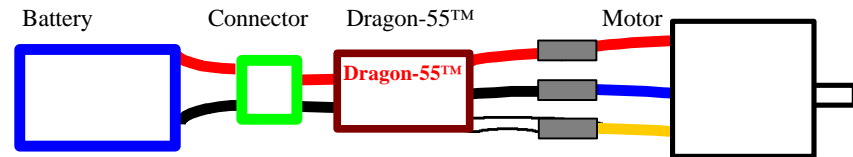


Fig 1: Forward Rotation wiring diagram

## 2.4 Connecting the Motor for Reverse (Clockwise) Rotation

**IMPORTANT NOTE:** THIS VERSION OF THE DRAGON-55 SPEED CONTROL USES THE SAME WIRING AS FORWARD ROTATION. EARLIER VERSIONS OF THE DRAGON-55 MAY HAVE REQUIRED DIFFERENT WIRE CONNECTIONS FOR REVERSE.

Reversing the rotation of the motor is accomplished following these simple steps:

1. Follow the wiring directions and diagram above as shown for forward (counter clockwise) rotation.
2. Install the jumper provided with the Dragon-55 on the black 2-pin connector extending from the motor end of the control. See Figure 2.
3. **Re-time the motor for reverse rotation** as directed in the motor manufacturer’s instructions. You may damage your motor or controller if you do NOT re-time the motor for reverse rotation.

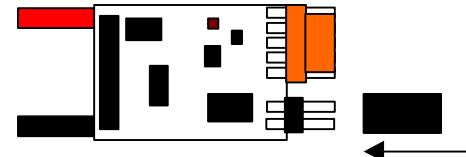


Fig 2: Reverse Rotation jumper installation

## 2.5 Connecting the Sensor cable

Connect the sensor cable connector to the matching connector on the Dragon-55. The connector is keyed – it will connect correctly only in one direction. See the Figure 3 below for the proper sensor wire connection.

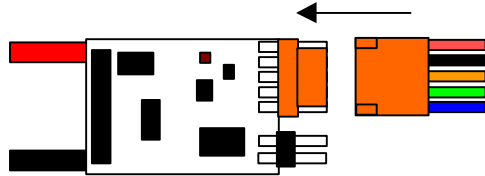


Fig 3: Sensor Cable connection

## 2.6 Connecting the Receiver

AirTronics systems require a minor change to the wiring in the receiver connector supplied with the speed controller. Reverse the red (power) and brown (ground) wires in the connector plug so that the plug is orange/brown/red. Use a knife blade to lift the retention tabs on the connector plug to remove the red and brown wires. Insert the wires back into the plug and press down the retention tab.

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 Dragon-55™ will supply power to the receiver and servos through the receiver connector. If you are using more than ten cells, you must use a separate receiver battery. See the section 4.0 (under the heading BEC) for instructions on disabling the BEC to use a separate receiver battery.

## 3.0 Flying with Your Dragon-55™:

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

*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 four seconds of “brake” throttle. Move the throttle arm to the lowest position on your transmitter, wait at least four 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 Dragon-55™

**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.

**Brake** - moving the transmitter throttle stick to the bottom position enables the prop brake.

**Cutoff** - The motor cutoff will occur when the input battery voltage drops below 5.2V for more than one half second. Once motor cutoff has occurred, moving the throttle to the braking position (full off) can re-arm 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 a 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, moving the throttle to the braking position (full off) for four seconds can restart the motor.

**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 four 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 four 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 four 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 5.2 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 800AR cells, you might try going to 1000SCR cells.)

**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. If everything is correctly connected, and the receiver and servos still do not work, contact the dealer where you purchased your Dragon-55™ or Contact **Castle Creations** directly. (See info below)

## CONTACT/WARRANTY INFORMATION

Your Dragon-55™ 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 Dragon-55™ for warranty or non-warranty repair/replacement contact **Castle Creations** at:

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