



# 20A and 30A Brushless Electronic Speed Controls

**SuperTigre's brushless electronic speed controls** are custom designed for sport flying applications. The 20 amp ESC is tailored for small-to-medium sized indoor or park flyer type airplanes. The 30 amp ESC is well suited for aircraft representing the next step up in size and weight. The built-in 2 amp battery eliminator circuits are suited for 3-4 nano-sized analog servos as are used in such models. A very simple set-up procedure and automatic low voltage cut-off setting make SuperTigre ESCs super-easy for any pilot to use. A safe-start function prevents accidental propeller rotation, and NiCd, NiMH, and LiPo compatibility suits a variety of different power sources. The brake function can be turned on or off.



It is strongly recommended to completely read this manual before use! Damage resulting from misuse or modification will void your warranty.

## IMPORTANT PRECAUTIONS



Read and follow these precautions carefully before use.

- NEVER use more than the specified voltage on the ESC's input.
- ALWAYS mount the ESC in a position where air can freely flow across it during operation.
- ALWAYS turn on the transmitter before connecting the battery to the ESC.
- ALWAYS disconnect the battery from the ESC when not in use.
- ALWAYS remove the propeller from the motor when working on the model!
- ALWAYS observe that a propeller might unexpectedly rotate anytime that power is applied to the ESC, which could cause severe injury! Never get near the propeller!!
- ALWAYS make sure the input battery is fully charged before connecting to the ESC. Otherwise the low voltage cutoff feature may not shut down the ESC at the proper voltage.
- Do not attempt to use with brushed motors.
- Do not allow water, moisture or any foreign material onto the ESC's PC board.
- To prevent a short circuit, use heat-shrink tubing to insulate any bare wires between the motor battery and ESC, and from the ESC to the motor.
- Allow the ESC to cool before touching and between flights.
- Keep out of reach of children.
- SuperTigre is not responsible for incidental damage or personal injury as a result of mis-use of this product.

## BATTERY ELIMINATOR CIRCUIT (BEC)

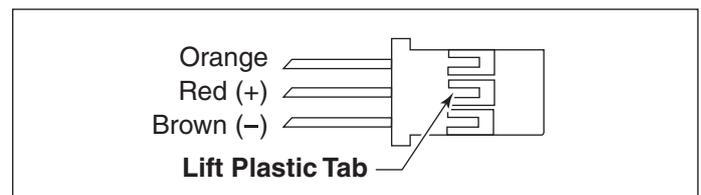
A BEC is built into each SuperTigre ESC which allows the receiver and servos to be powered from the main power battery, eliminating the need for a separate radio battery. Each ESC can deliver 2 amps continuously through the BEC circuit, which is well suited for powering 3-4 nano-sized servos.



**IMPORTANT!** BEC circuits are designed to handle **only a certain amount of current, power, and heat.** If the rated specifications are exceeded, the ESC might reset itself and automatically return the throttle back to minimum! This could happen with models having too many servos, or servos which draw high current (high torque or digital servos). **Performing 3D and acrobatic maneuvers often causes the servos to draw high currents which could cause a throttle reset!** Quickly re-arming the throttle channel (see STEP 7 – ARMING THE ESC AND SAFE-START FUNCTION) while in flight should allow you to regain control of the throttle. If performing 3D or acrobatic maneuvers, it may be necessary to upgrade to an ESC with a more powerful BEC circuit.

If a throttle reset occurs during flight, it's recommended to land the aircraft and re-check the system. It may be best to (a) reduce the number of servos, (b) use less powerful servos, (c) disable the ESC's BEC circuit as explained below and instead power the receiver and servos with a separate receiver battery as described below, or (d) disable the ESC's BEC circuit and power the receiver with a stand-alone BEC circuit that is rated for high power.

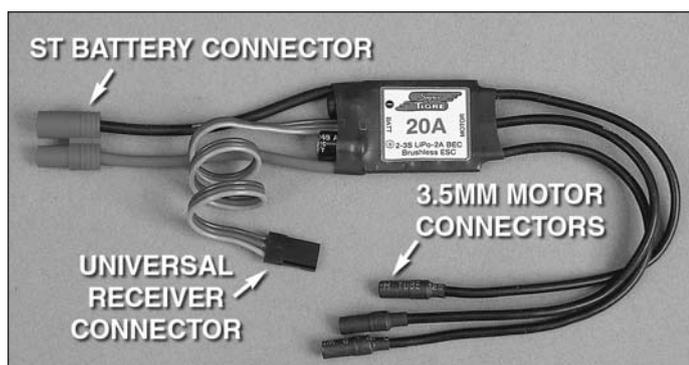
### TO DISABLE THE BEC:



1. Make sure no battery is connected to the ESC's power input.
2. Looking at the top side of the ESC's receiver plug, using a small flat blade, carefully raise the plastic tab in the middle which holds the pin for the RED (+) wire. Gently pull the red wire out of the plug. Be sure to cover the bare pin with heat-shrink tubing or electrical tape so that it cannot short-circuit against other items.
3. Connect the ESC's receiver plug into the throttle channel on the receiver.
4. Connect a radio switch harness to the battery slot on the receiver, making sure the switch is in the "OFF" position. Connect a fully charged receiver battery to the switch harness. In most small electric planes a 300-600mAh NiCd or NiMH battery will be adequate. A larger battery is recommended for larger airplanes or when using 3 or 4 servos.

5. Turn on the transmitter, then the receiver's switch harness. Then connect the motor battery to the ESC. Reverse this order to shut the receiver off.

## STEP 1 - CONNECTING TO THE RECEIVER



Firmly press the ESC's receiver connector into the throttle slot on the receiver (refer to your radio's instruction manual). The orange "signal wire" should be in the same position as would the white wire on Futaba servos, the blue wire on Airtronics' "Z" connector, the yellow wire on Hitec servos, or the orange wire on JR or Spektrum servos. **Caution: An Airtronics Servo Adapter must be used when connecting to an old style Airtronics radio.**

## STEP 2 - MOTOR CONNECTIONS

SuperTigre ESCs are compatible with most types of size appropriate brushless motors, and are perfectly matched to function with SuperTigre brushless outrunner motors, which can be found at most hobby retailers:

- SUPG8030 SuperTigre 370 Out-runner Brushless Motor
- SUPG8040 SuperTigre 400 Out-runner Brushless Motor
- SUPG8050 SuperTigre .10 Out-runner Brushless Motor

SuperTigre ESCs include 3.5mm female bullet connectors installed on each motor lead (plug-and-play ready for 3.5mm male connectors on SuperTigre motors). It is not important to match colors of the wires on the motor to the ESC, as they are not polarized. If the motor rotates backwards, simply switch **any two** of the ESC's motor connectors. Once connected, make sure all connections are insulated electrically. Failure to do so could result in permanent damage to the motor/ESC, and void all warranties.

## STEP 3 - MOUNTING THE ESC

Determine the best location for the ESC, inside or outside the fuselage.

### IMPORTANT!



It's highly recommended to install the ESC so that air can freely flow across it during operation! This is especially important when using the maximum number of cells on the input, when ambient temperatures are very high, or if using servos that draw higher currents or if performing maneuvers that cause the servos to work hard. If the airplane's structure doesn't allow for air to flow naturally through the fuselage, create vent holes fore and aft in the fuselage to allow air to pass through and across the ESC for cooling. Do NOT pack the ESC with foam padding as it will not allow the ESC to properly radiate heat and will likely cause a thermal shutdown.

The best method to mount the ESC in the aircraft is with Velcro®. If the ESC will be mounted on wood, first saturate the wood with thin CA glue and allow it to dry. To mount the ESC on shrink covering, first clean the surface with rubbing alcohol. Then, cut a small piece ½ x ½" (12.7 x 12.7mm) of Velcro (both hook and loop), and attach the hard hook material to the fuselage. Clean the side of the ESC with rubbing alcohol and attach the loop material.

If the wires are not long enough to make all necessary connections to the ESC yet achieve good balance in the aircraft, it's best to extend the length of the wires to the motor (not to the battery).

## STEP 4 - NECESSARY TRANSMITTER SETTINGS

For proper ESC operation, it's very important to set the transmitter's throttle channel adjustments, as follows:

1. Set the throttle channel's travel adjustment (ATV,EPA or ATL) to 100%.
2. Set the throttle trim and sub-trim to neutral or zero.
3. Set the throttle channel's reversing switch to reverse on Futaba transmitters. Other transmitters might require you to set the throttle reversing switch to normal.

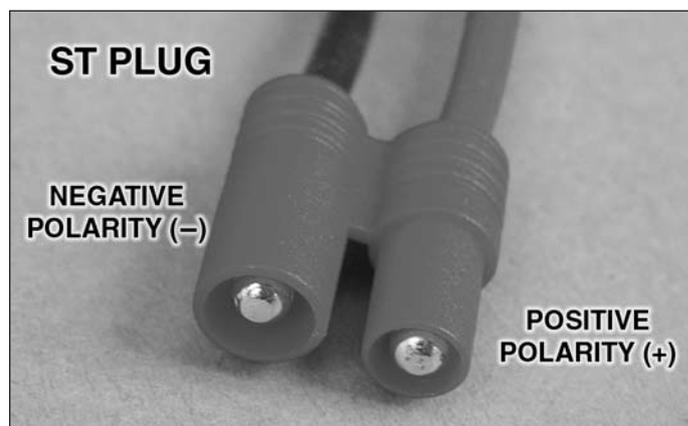
## STEP 5 - CONNECTING THE BATTERY

### IMPORTANT!

**REMOVE THE PROPELLER FROM THE MOTOR BEFORE CONNECTING THE BATTERY!**



**WARNING! Never accidentally short together the positive (+) and negative (-) battery connections! Doing so will result in permanent damage.**



SuperTigre ESCs have a unique "ST" type polarized battery connector as shown here, which is custom-matched to the connector on SuperTigre LiPo batteries. These plugs are polarized and cannot accidentally be connected backwards. SuperTigre offers several sizes of LiPo batteries to suit various needs, which can be found at most hobby retailers:

SUPP1010	640mAh	11.1V	LiPo
SUPP1020	910mAh	11.1V	LiPo
SUPP1030	1250mAh	11.1V	LiPo
SUPP1050	1500mAh	11.1V	LiPo
SUPP1060	1800mAh	11.1V	LiPo
SUPP1070	2100mAh	11.1V	LiPo

To adapt your SuperTigre ESC to batteries having different types of connectors, see your local retailer for these SuperTigre adapters to meet your needs:

- SUPM0010 Adapter - SuperTigre LiPo Battery to Deans® Ultra Plug® Female
- SUPM0020 Adapter - SuperTigre LiPo Battery to Deans Micro
- SUPM0030 Adapter - SuperTigre LiPo Battery to Standard Male
- SUPM0040 Adapter - Deans Ultra Male to SuperTigre ESC
- SUPM0050 Adapter - Deans Micro to SuperTigre ESC
- SUPM0060 Adapter - Standard Female to SuperTigre ESC
- SUPM0070 Chg lead - Banana Plugs to SuperTigre LiPo Battery

### IMPORTANT!



The battery must be fully charged BEFORE being connected to the ESC. The ESC will then automatically set the low voltage cut-off point based on the INITIAL voltage of the battery multiplied by 0.67. So, if the battery is NOT fully charged when connected to the ESC, the ESC may set a low voltage cut-off that is too low, and may not be good for your battery. Make sure the battery is fully charged prior to every use.

**LOW VOLTAGE CUT-OFF:** SuperTigre ESCs include a low-voltage cut-off feature that stops motor rotation if the battery's voltage drops too low. This protects the battery from damage due to under-voltage conditions. When the low voltage cut-off stops motor rotation it will still supply power to the receiver and all control surfaces except throttle, so you can maintain control of the aircraft.

## STEP 6 - SETTING UP THE BRAKE FUNCTION

SuperTigre ESCs include an adjustable brake function. To keep the factory default brake setting of "off", skip to the next section. To turn the brake "on":

1. With the transmitter power turned off, move the throttle stick to full position.
2. Turn on the transmitter and connect the fully charged battery to the ESC.
3. After 5 seconds the motor will beep twice.
4. Move the throttle stick to the minimum position. The motor will beep twice.
5. Again move the throttle stick to full power. The motor will beep twice to confirm the brake is now "on".
6. Move the throttle stick back to "off". The motor will now beep four times indicating the motor is "armed", and the motor WILL ROTATE anytime the throttle stick is advanced.

Once the brake is set, it does not require resetting after the ESC has been switched off.

If the brake had previously been turned on, but you wish to turn the brake off, repeat the above process. This time the motor will only beep once with each stick movement, but will beep four times again at the end to indicate the ESC is armed.

## STEP 7 - ARMING THE ESC & SAFE-START FUNCTION

If ready to apply power to the motor:

1. Turn the transmitter's power on.
2. Move the throttle stick to the minimum or brake position (towards you).
3. Connect a fully charged battery to the ESC. The motor will beep to indicate the brake setting (once for off, twice for on).

4. Move the throttle stick to full. The motor will again beep once or twice to indicate the brake setting.
5. Move the throttle stick to "off" or "brake" and the motor will beep four times. The ESC is now "armed", and the motor WILL ROTATE anytime the throttle stick is advanced.

If the ESC does not operate properly or makes a low pitched beeping sound following the above set-up procedure, disconnect the battery from the ESC, reverse the throttle setting on the transmitter and repeat the ESC set-up.

**SAFE-START:** As a safety precaution to prevent the motor from rotating when the battery is first connected, you must "arm" the ESC every time you connect the battery. The propeller will NOT rotate until the ESC is armed. To arm the ESC, move the throttle stick to full position, then back to "off" (or "brake"). **Now the motor will rotate anytime the throttle stick is advanced away from the "off" position! Care must be exercised when near the model's propeller!**

## STEP 8 - RANGE TEST

Because electric motors generate electrical noise, it's critical to range-test the airplane with the motor on, before flying. With the antenna collapsed and a helper holding the airplane, operate the flight controls while walking away from the airplane. You should be able to get approximately 75 to 100 feet away before losing control of the airplane's surfaces. Next, check the range with the motor running at half throttle. The range should be close to the range you got with the motor off. If it is not, you may need to move the receiver, receiver antenna, servo leads or the speed control to a different location.

SPECIFICATIONS 	<b>20A</b> (SUPM1020)	<b>30A</b> (SUPM1030)
<b>Input volts:</b>	6-12 NiCd/MH 2-3 LiPo (20V max. w/o BEC)	6-12 NiCd/MH 2-3 LiPo (20V max. w/o BEC)
<b>Output current:</b>	20A cont. max. (24A surge)	30A cont. max. (34A surge)
<b>BEC:</b>	5V / 2.0A	5V / 2.0A
<b>Max. power:</b>	200 watts	300 watts
<b>Operating frequency:</b>	8.5kHz	8.5kHz
<b>On-resistance:</b>	0.015 ohms	0.015 ohms
<b>Timing angle:</b>	12 degrees	12 degrees
<b>Brake:</b>	on / off	on / off
<b>Low volts cut-off:</b>	batt volts x 0.67	batt volts x 0.67
<b>Thermal cut-off:</b>	230°F (110°C)	230°F (110°C)
<b>Dimensions:</b>	1.7 x 1.0 x 0.3" (43 x 25 x 7mm)	2.0 x 1.0 x 0.3" (51 x 25 x 7mm)
<b>Weight:</b>	1.1 oz. (32 g)	1.2 oz. (35 g)

SuperTigre ESCs include these additional features and functions:

- Fully proportional forward with on/off brake
- Safe-start protection system
- Smooth throttle response
- BEC handles up to 2.0A, perfect for 3 or 4 nano sized servos and a receiver
- LiPo, NiCd and NiMH battery compatible
- Detects input voltage and automatically sets low-voltage cut-off (initial batt volts x 0.67)
- Audible set-up tones
- 8.5kHz switching frequency, for good run-time and cool operation
- 8.5cm battery wires (3.3 inches), 16AWG, new "ST" plug with 3.5mm male gold plated terminals
- 15cm motor wires (6 inches), 16AWG, with 3.5mm female bullet connectors
- Universal radio connector

## TROUBLESHOOTING GUIDE

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**Motor and Rx do not work:** Make sure the motor battery is fully charged. Make sure good contact is being made between the motor battery and ESC, and from the ESC to the receiver. Try powering the receiver directly from a separate Rx battery...if the receiver now works, the problem may be the ESC and require servicing.

**The ESC functions but can't be controlled:** Make sure the ESC is plugged into the receiver's throttle slot. Make sure the Tx is properly adjusted.

**The receiver glitches or stutters while the motor is running:** The receiver or its antenna is mounted too closely to the ESC, motor battery, or power wires. Make sure all electrical connections fit snugly.

**The motor stops after only a few minutes of rotation, but all other surfaces in the aircraft can still be controlled:** The propeller might be too large, causing high current draw; and, the ESC's temperature protection function is stopping motor rotation automatically. Make sure the motor is not damaged (bent shaft, tight bearing, etc.) causing high current draw. The ESC may need more cooling air flowing over it. Are too many servos being used in the model, or servos which are drawing too much power?

## SERVICE PROCEDURES

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ESC's that operate normally when received by Hobby Services will be charged a minimum service fee and return shipping charges. Before sending your ESC in for service, it is important that you review the "Troubleshooting Guide" on this instruction sheet. The ESC may appear to have

failed when other problems exist in the system – such as a defective transmitter, receiver or servo, or incorrect adjustments/installation.

- Retailers are not authorized to replace ESCs thought to be defective.
- Do not cut the input wires of the ESC before sending it for service. A fee will be charged for cut wires which must be replaced for testing.

## 180 DAY LIMITED WARRANTY – U.S.A. & CANADA ONLY

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SuperTigre warrants this product to be free from defects in materials and workmanship for a period of 180 days from the date of purchase. During that period, we will repair or replace, at our option, any product that does not meet these standards. You will be required to provide proof of purchase date (receipt or invoice). If, during the warranty period, your ESC shows defects caused by abuse, misuse or accident, it will be repaired or replaced at our option, at a service charge not greater than 50% of the current retail list price. Be sure to include your daytime telephone number in case we need to contact you about your repair. This warranty does not cover components worn by use, application or reverse voltage, cross connections, poor installation, subsection of components to foreign materials, any alterations to wires or tampering. In no case shall our liability exceed the original cost of the product. Your warranty is voided if:

- You apply reverse voltage to the ESC by connecting the motor battery backwards.
- You allow any wires to become frayed which could cause a short.
- You use more than the rated number of cells in the motor battery.
- You tamper with any of the electronic components.
- You allow water, moisture or any other foreign material onto the PC board.

Under no circumstances will the purchaser be entitled to consequential or incidental damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. If you attempt to disassemble or repair this unit yourself it may void the warranty.

For service to your SuperTigre ESC, send it post paid and insured to:

Hobby Services  
3002 N. Apollo Dr. Suite 1  
Champaign, IL 61822  
(217) 398-0007  
E-Mail: [hobbyservices@hobbico.com](mailto:hobbyservices@hobbico.com)  
Internet Address: [www.supertigre.com](http://www.supertigre.com)