

Brodak 3-line FM-eTC Electronic Throttle Control Single or Multi-Engine

This electronic controller allows you to exercise fine throttle control of an electric motor-powered airplane, either single-engine or multi-engine, using the third line on a 3-line handle. A rod must be used to connect the throttle hole on the 3-line bellcrank to the slider on the throttle control, such that the minimum and maximum positions of the handle correspond with the 0% and 100% positions of the slider. (100% throttle is actually reached about 1/4" before the end of the travel, though.)

When the throttle control motor #1 pins are connected to an ESC which is powered with two or more cells of a LiPo battery, the 5-volt BEC of the ESC will power the throttle control and the throttle control will generate the **throttle-off** signal needed to initialize the ESC. This is the connection you must use with a single-engine airplane.

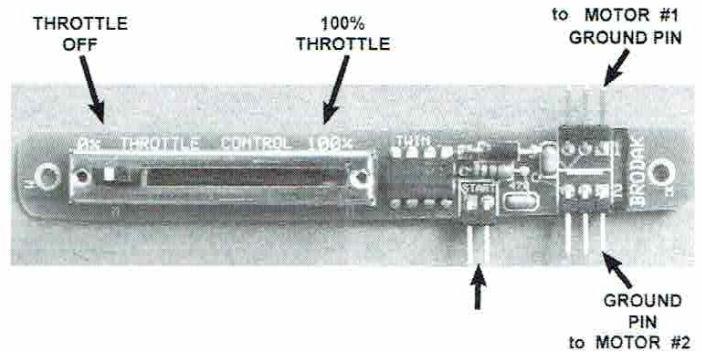
If you are powering a **two-motor** airplane, you must use a separate ESC for each brushless motor and the throttle signal must be sent to each ESC, using both motor #1 and motor #2 connections. The connection to motor #2's ESC does **not** connect to the middle wire (the 5-volt BEC) so that there is **no** need to worry about a conflict with the BEC of #1 or to modify the wire.

If you are powering more than two motors, a single, standard "Y" connector can be used for two more motors. But, if you do connect more than one ESC to the motor #1 or motor #2 connection, it is good engineering practice to disable **all but one** of the BEC supplies from the ESCs (by breaking the connection of the **center wire** in all but one of the "Y" connectors) so that a slight difference in BEC voltage doesn't result in one ESC trying to charge another.

Making sure the throttle control is set at 0%, push the **start button**. The throttle control will confirm that it is active by **blipping** motor #1 and then you can use the throttle control to control the motor(s), from off to full throttle, as many times as you wish. (If you push the start button when the throttle control is not at 0%, it won't respond but will wait until you do bring it to 0%

first—to make sure the motor doesn't start unexpectedly.)

As a **safety** feature, the motor(s) may be stopped at any time by pushing the start button a second time. To restart the motor(s), it is necessary to disconnect the battery momentarily and then re-connect it.



In a twin-motor installation, both motors receive the same throttle value but you can increase the line tension if you making the pitch of the inboard prop slightly greater, so it has more thrust.

The battery must be connected to **both** ESCs through a two-wire "Y" cable, either made-up or with a commercial version (e.g., Mpi's MAXX #6932, using Dean's Ultra plugs). (For three or more motors, it is still advisable to use just one battery and also wire in a separate connection to the ESCs.)

4840