Instructional Guide for using Tribunus ESC's with Power Supply or Long Power input cable in flight or for bench testing / endurance testing

Scorpion Tribunus ESC's are designed for use in Flight Applications. This implies that in the stock configuration, the Tribunus ESC's are designed to work only with a form of battery as power input, and reasonably short length of battery wires.

The Tribunus ESC's are **NOT** designed to be used with POWER SUPPLIES, or exceptionally LONG POWER INPUT cables, without additional precautions. Using the Tribunus ESC's in these situations, without the additional required precautions will **VOID THE WARRANTY.** See specific details below.

Using the Tribunus ESC's with Power Supply for bench testing –
Using a power supply to power an ESC while spinning a motor is an exceptionally bad idea unless proper precautions are taken. In many situations, BLDC motors act as generators which can create current which gets fed back to the ESC. In a normal situation with a battery, this generated current gets absorbed by the battery. However, most power supplies (even high-quality ones) do not have the same capability to absorb, or dissipate this generated current. The result is that the power supply can generate a very high, instantaneous, voltage spike. If the voltage spike is above the capability of the ESC components, then it will directly damage your ESC.

If you are required to power your Tribunus ESC with a power supply, then you must take the necessary precautions or else you will VOID your warranty!

In order to stabilize the voltage and protect the ESC from damage when used in this situation, you must have a way to absorb generated current. This can be either a very large, high voltage, and high capacitance capacitor, or even a lipo battery which is connected in line to the power supply (ensure power supply voltage, is not higher than the battery voltage). In the case of capacitors, the amount of capacitance required, depends on your exact use case, so please take this into your calculations prior to testing using a power supply. If you are unsure and unable to calculate this, then we recommend only that you simply use a battery to power your ESC.

Using the Tribunus ESC's on a test stand or even in flight with very long power input cables –
Over long length of wires, Voltage will drop. If you are using longer then stock length power input cables from your battery to the ESC (in the case of a bench test stand where the motor / ESC is far away from the battery, or even in large aircraft where the battery is located far away

from the ESC), and pulling high current loads, then this can cause the voltage to sag and become unstable. This unstable voltage is very hard on the ESC components and likely will lead to ESC failure.

<u>If you are required to power your Tribunus ESC with very long power input cables, then you must take the necessary precaution or else you will VOID your warranty!</u>

In order to stabilize the voltage and protect the ESC from damage when used in this situation, you will need to add additional capacitors along the length of the power input cables. We recommend to solder and additional capacitor bank (2 x same capacitor as what is on the ESC) every 10”-15” of wire. Doing this will provide stabile voltage along the length of the wire and protect your ESC from damage.

If you have additional questions about this topic, and require more information, then please do not hesitate to contact us at

<u>support@spihk.com</u>

Scorpion Power Systems
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