

# Guide to Resolving Compatibility Issues Between Nexus Flight Controller and Scorpion Tribunus and Tribunus II ESCs

Effective Methods for Addressing RPM Port Impedance Problems

By: Angel Rojas

## Overview

The Nexus flight controller from RadioMaster is a popular choice among RC enthusiasts for its versatility and performance. However, users have reported an issue with compatibility when using the Nexus with Scorpion Tribunus and Tribunus II Electronic Speed Controllers (ESC).

**To be clear, this does NOT apply to the Tribunus III ESCs.**

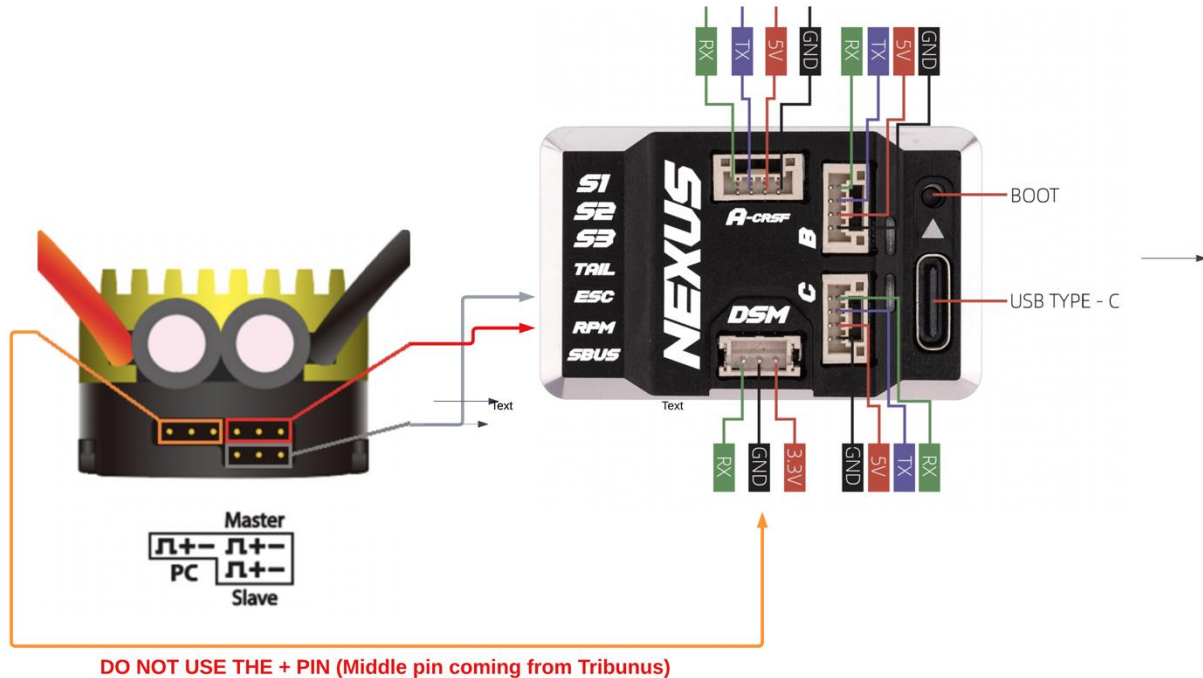
The problem stems from the RPM port on the Nexus having a very low impedance that is interpreted by the affected ESCs as a Bootloader jumper, causing the ESC to intermittently start up in Bootloader mode.

The main symptom that is experienced is that the ESC may not power on when battery power is connected, and / or the ESC may require being plugged in to battery, unplugged, then plugged back in to power up the model it is used in.

This guide outlines two methods to resolve this issue effectively.

# Method 1: Swapping Master and Slave Cables

One way to address the low impedance issue is to swap the Master and Slave cables on the Nexus flight controller and re-map the pins using the RotorFlight Configurator Command Line Interface (CLI). This method involves a series of commands to reassign the resources appropriately.



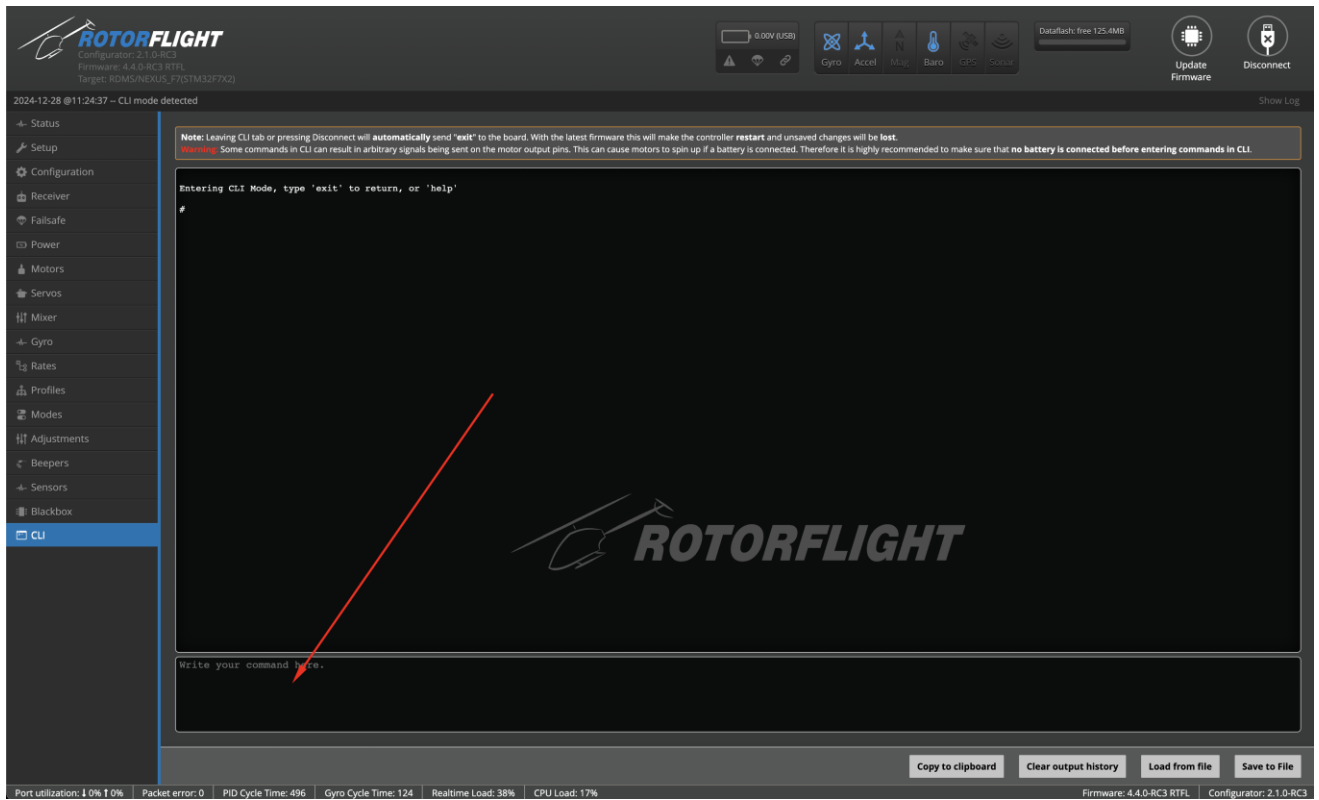
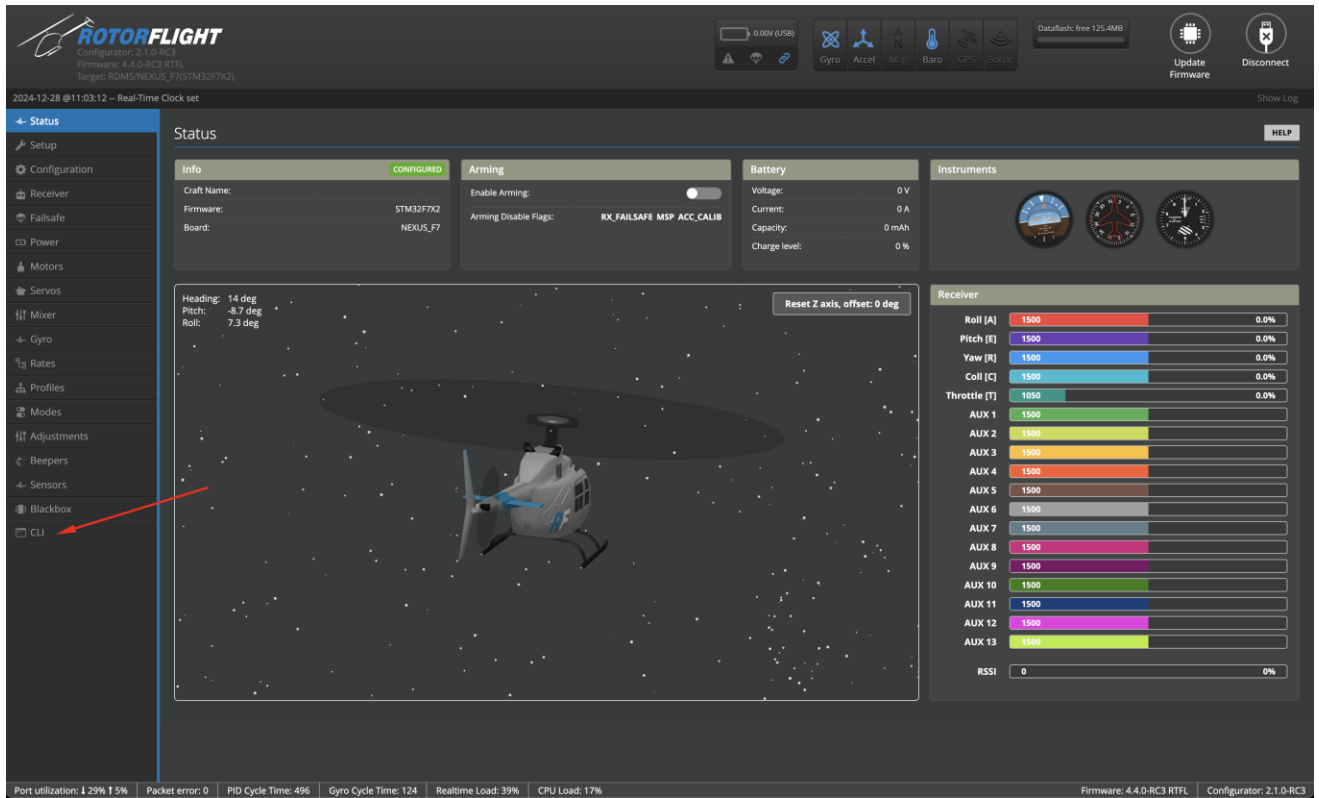
## ASSUMPTIONS:

- You are running the latest version of RotorFlight Configurator
- Your Nexus is upgraded to the latest version of the RotorFlight software

## Steps to Swap Cables and Re-map Pins

1. **Disconnect the Master and Slave cables:** Carefully disconnect the Master and Slave cables from their respective ports on the Nexus flight controller.
2. **Swap the cables:** Connect the Master cable to the Slave port and the Slave cable to the Master port.
3. **Open the RotorFlight Configurator:** Launch the RotorFlight Configurator on your computer and connect your Nexus flight controller.

#### 4. Access the CLI: In the Configurator, navigate to the CLI tab to enter the command line interface.



## CLI Commands

To re-map the pins, enter the following commands in the CLI:

```
resource MOTOR 1 none
resource FREQ 1 none
resource MOTOR 1 A02
resource FREQ 1 B06

save
```

By issuing these commands, you are reassigning the MOTOR and FREQ resources to new pins, effectively addressing the low impedance issue.

## Reversing the Changes

If you need to revert the changes for any reason, you can do so by typing the following commands in the CLI:

```
resource MOTOR 1 none
resource FREQ 1 none
resource MOTOR 1 B06
resource FREQ 1 A02

save
```

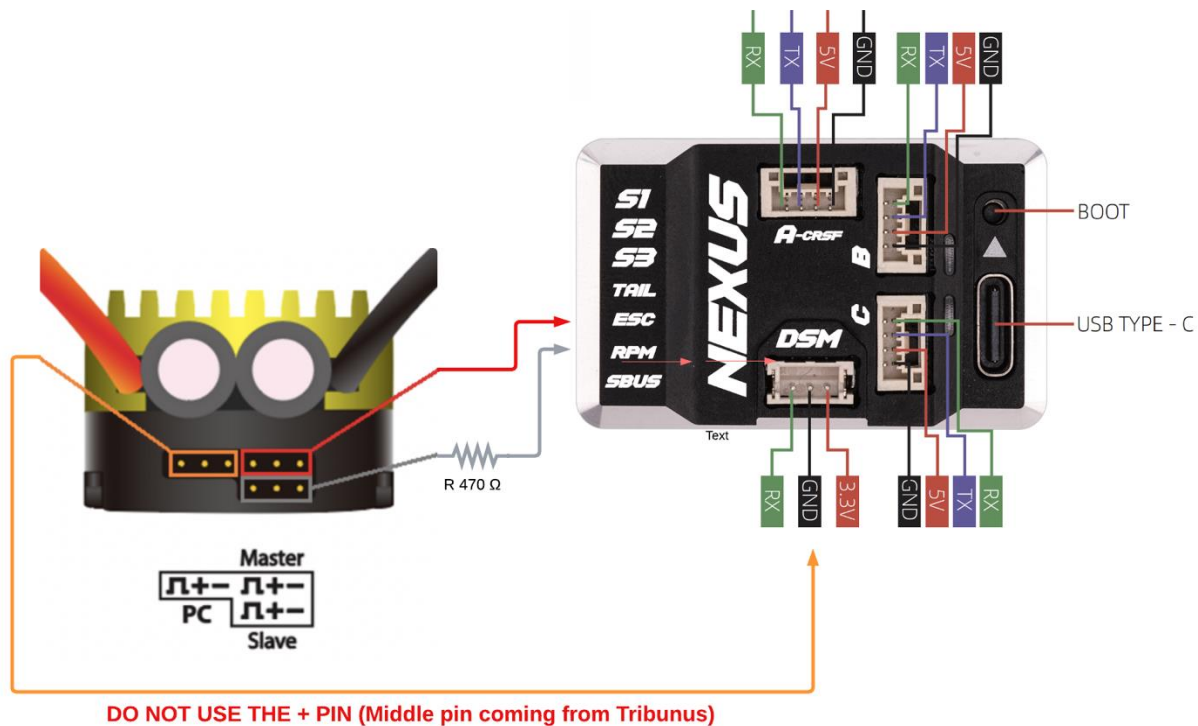
These commands will restore the original pin assignments.

## Considerations

It is essential to be aware of potential considerations when using this method. According to feedback from D. Rudder in a forum, the 16-bit mode is slightly less precise (around 0.001%) and may take a few more pulses to recover from lost sync. The main difference is that with a 32-bit timer, you can have up to four RPM inputs per timer, while a 16-bit timer can only handle one RPM input. However, if you have only one RPM input, there is no noticeable difference, and this should not be an issue for helicopters.

## Method 2: Adding a 470 Ohm Resistor to the Slave cable

Another effective solution is to add a 470-ohm resistor in line with the Slave cable (RPM Lead). This method is straightforward and involves the following steps:



### ASSUMPTIONS:

- You are comfortable soldering a resistor in-line with the Slave Cable

### Steps to Add a Resistor

- Obtain a 470-ohm resistor:** Purchase a 470-ohm resistor from an electronics supplier or hobby store.
- Locate the Slave cable:** Identify the Slave cable on the Nexus flight controller that connects to the Scorpion Tribunus or Tribunus II ESC.
- Identify the signal lead:** the signal lead is usually colored in white or yellow and corresponds to the pin on the top row of the Nexus or the left-most pin for the connector on the Tribunus (see diagram below)



- Cut into the Slave cable's signal lead:** Using a pair of wire cutters, carefully cut the Slave cable's signal lead, ensuring you have enough length on both ends to work with.

5. **Solder the resistor:** Solder one end of the 470-ohm resistor to one side of the cut Slave cable and the other end of the resistor to the other side of the cut lead. Ensure the connections are secure and insulated to prevent any short circuits.
6. **Reconnect the Slave cable:** Reconnect the modified Slave cable to the Nexus flight controller and the Scorpion Tribunus II ESC.

## Testing the Solution

After implementing either method, it is crucial to test the system to ensure the issue has been resolved. Power on your RC setup and observe the startup process of the Scorpion Tribunus II ESC. If the ESC no longer intermittently starts in Bootloader mode, the solution has been successful.

## Advantages and Disadvantages

Each method has its advantages and disadvantages. Swapping the Master and Slave cables and re-mapping the pins may seem more complex but allows for a software-based solution that does not require modifying the hardware. On the other hand, adding a 470-ohm resistor is a simple hardware fix but involves cutting and soldering wires, which some users may find challenging.

In summary, resolving the compatibility issue between the Nexus flight controller and Scorpion Tribunus II ESC can be achieved using either of these two methods. By following the steps outlined in this guide, you can ensure a smooth and reliable operation of your RC setup. Always remember to test your modifications and seek advice from experienced enthusiasts if you encounter any difficulties.

## Credits

I would like to extend my heartfelt gratitude to the individuals whose invaluable contributions made this solution possible. Patrick Mauck directed me to Jonas Wackershauser's brilliant pin re-map solution, which provided a software-based approach to the issue. Mike Wilson was instrumental in guiding me towards the hardware fix involving the 470-ohm resistor, offering a straightforward alternative. A special thanks to Kyle Dahl, who not only confirmed the incompatibility issue but also demonstrated a willingness to support the RC Helicopter community by offering to add a comprehensive guide to the Scorpion website. Their collective efforts have greatly enhanced our understanding and resolution of this compatibility issue.