

# IQ2306 Errata

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## 2 IQ2306 Mechanical Hardware

No known issues.

## 3 IQ2306 Electrical Hardware

### 3.1 Desoldering of Power Wires

#### 3.1.1 Problem Description

Power wires are soldered to the exposed power pads on the PCB. After some time vibration and/or tugging causes the solder joint to fail. This occurs even when the solder joint between the wire and the PCB has sufficient solder and is properly wetted.

#### 3.1.2 Workaround

Ensure the power pads are clean before soldering. Use soldering iron temperatures suitable for lead-free solders. Before soldering the wire thoroughly mix the existing solder with your new solder. Add solder to the wire before attaching the wire to the PCB. Finally, solder the wire to the PCB, making sure the joint is wetted and mixed.

#### 3.1.3 Future Solution

Future versions of the PCB will leave the ENIG (gold) surface and will not have solder paste applied to them.

## 4 Speed Firmware

### 4.1 Incorrect Throttle Mapping In 3D FC Mode

#### 4.1.1 Problem Description

When an FC is in 3D mode it remaps the bottom half of DShot commands, such that increasing throttle/ $\mu$ s is increasing speed, not increasing velocity. This goes against the motor controller's internal math, which natively computes velocity, not speed. Thus, the commands have to be remapped. The remapping is incorrect on Firmware 18. Specifically, when the motor is set to 3D FC mode and 3D Clockwise mode the throttle is inverted where center stick is max speed and top is +0, bottom is -0.

#### 4.1.2 Solution

Update the motor to firmware version 19 or higher.

### 4.2 Erratic Behavior Using DShot Command Frequencies Above 4kHz

#### 4.2.1 Problem Description

Sending DShot commands to the motor at over 4kHz causes erratic behavior. The motors may spontaneously spin, change direction, change settings, and beep.

#### 4.2.2 Workaround

Use command frequencies of 4kHz or lower.

#### 4.2.3 Future Solution

IQ will release a firmware update.

## 4.3 Anticogging Disabled

### 4.3.1 Problem Description

Anticogging data is loaded onto every motor, but is disabled by default on the speed firmware. The Anticogging algorithm takes time to compute. This extra calculation time leads to the PWM updates being applied one cycle late, which decreases efficiency and can lead to motor overheating.

### 4.3.2 Workaround

Leave Anticogging disabled on modules running the speed firmware. If Anticogging must be enabled the commutation frequency must be reduced.

### 4.3.3 Future Solution

IQ will release a firmware update or Anticogging will remain disabled by default.

## 4.4 Unexpectedly Hot

### 4.4.1 Problem Description

You may have flown a similar vehicle with similar propellers and similar motors and find the IQ2306 runs hotter than normal. This should not be the case, however, hot motors may be caused by a number of issues.

### 4.4.2 Workaround

Below is a list of solutions in order of likelihood:

1. IQ2306s in velocity mode react significantly faster than standard ESC/motor combinations. The flight controller might be sending noisy command signals to the motor modules and their fast reaction time means they react to the noisy commands. Try balancing your props, lowering the flight controller's PID gains, lowering the flight controller's low pass filter frequencies, increasing the strength of the low pass filters (from first order to second order), or reducing the IQ2306's Input Filter Cutoff in the Tuning tab of the Control Center.
2. Some of the settings in the Advanced tab of the Control Center can cause the motor to run poorly or not at all. If you changed these revert to the defaults.
3. The IQ2306 may have overheated previously, which may have caused the enamel in the motor coils to melt and the wires to short. This disables one of the three phases in the motor. Though the motor may spin with only two phases it will be very inefficient. The built in thermal protection was designed to prevent this situation, though it may not be successful in all situations.
4. If the motor has taken damage it is possible to move the PCB or the encoder magnet in the shaft. This leads to decalibration and subsequent poor motor commutation. This is not repairable.

## 5 Position Firmware

No known issues.

## 6 Control Center

### 6.1 Coast and Brake Buttons Do Not Work

#### 6.1.1 Problem Description

In the Testing tab of the Control Center there are two dedicated buttons for stopping the motor. The coast button should disable the FETs on the controller and allow the motor to coast to a stop. The brake button

should short the three phases of the motor together, bringing the motor to a stop quickly. Neither of these buttons have any affect on the motor.

#### **6.1.2 Workaround**

Send a PWM or Voltage command of 0 to emulate the brake function.

#### **6.1.3 Future Solution**

IQ will release a GUI update.

### **6.2 Other**

#### **6.3 Reflashing With ST Demonstrator Does Not Go Past First Window**

The ST Demonstrator is not compatible with many computer to UART methods. The FC passthrough and Arduino USB to UART methods are known to not function.

##### **6.3.1 Workaround**

Use an FTDI or CP2102 device for reflashing.

##### **6.3.2 Future Solution**

IQ will release a GUI update with firmware flashing built-in.