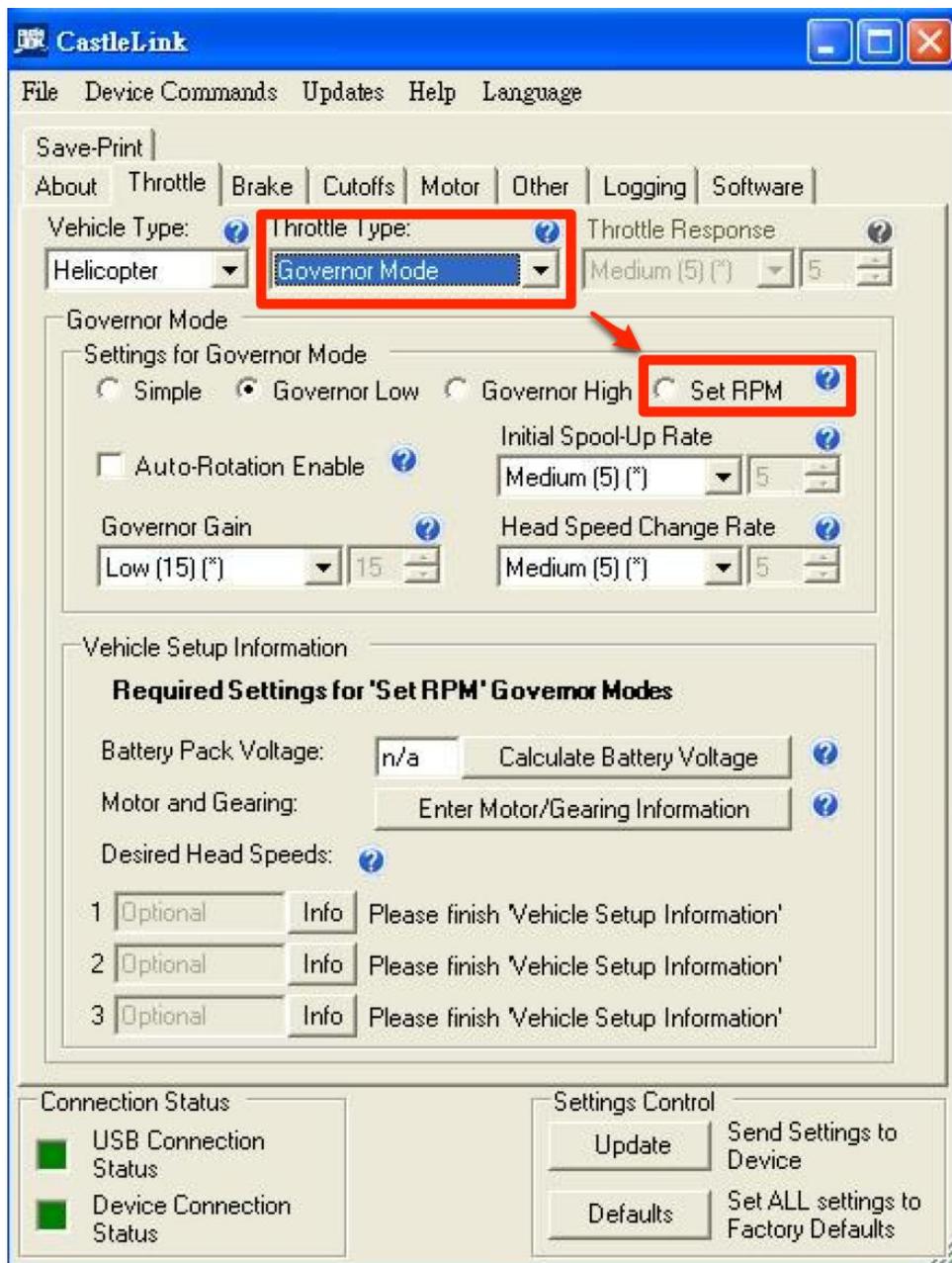


## Instruction for setting the ICE2 HV 120 governor mode with 800MX

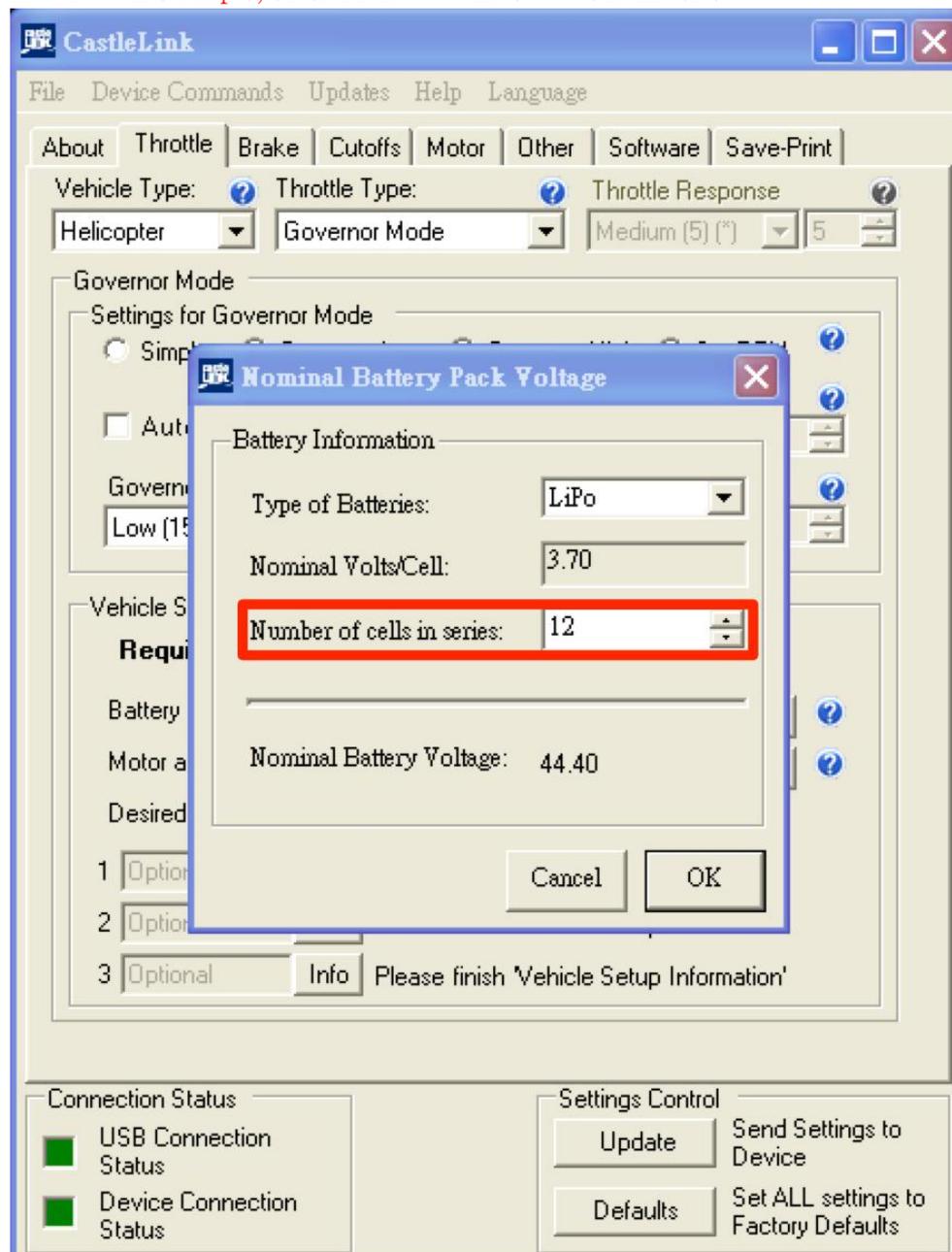
We recommend using the governor mode of ESC with 800MX motor. If you are using the governor mode in Castle ICE2 HV 120 ESC, we recommend setting the headspeed at around 2200RPM as the baseline, and then adjust according to your flight performance preference. (Warning: For safety reasons, do not set up for excessive speeds)  
The factory default setting of Castle ICE2 HV 120 is not set to governor mode. Therefore, for governor mode, you need to go through Castlelink on the PC to make some configuration changes.

▼First connect the Castle ICE2 HV 120 to your PC with a castlelink USB cable. Set the Throttle Type to “Governor Mode,” and change “Settings for Governor Mode” to “Set RPM.”



After selecting “Set RPM,” you will be prompted to enter other necessary settings, such as battery voltage, Gearing Information. Should these parameters need to be adjusted in the future, click on “Calculate Battery Voltage” or “Enter Motor/Gearing Information.”

▼The first window prompt is for battery voltage. Using 700E DFC with 800MX 520KV motor as an example, enter 12 in “Number of cells in series.”



▼Next you will be prompted to enter Motor and Gearing information. There are 4 settings that need to be completed: teeth on Pinion, teeth on Main Gear, kV of Motor, and Magnetic Poles in Motor. Take extra caution when entering these parameters, as incorrect values could lead to overheating of motor and ESC, affecting speed governor performance.

**Motor and Gearing Information**

**Gearing Information**

Use one of the following three methods to indicate the gearing on your vehicle.

Pinion / Main Gear

12 teeth on 'Pinion'

112 teeth on 'Main Gear'

Specified Gear Ratio

9.3333 to 1 gear ratio

No Gearing / Direct Drive

**Motor Information**

kV of Motor: 520

Magnetic Poles in Motor: 10

To determine the number of magnetic poles in your motor, check the motor's documentation or the motor manufacturer's website. For outrunner-style motors, this is the number of magnets around the outside shell of the motor.

If you cannot find this information, please call your motor manufacture or use the method below to figure it out. Please do not call Castle Creations, we will not know how your particular motor was built.

**Alternative Method**

If you are unable to determine your motors pole count, do not worry, there is another way to figure it out. First, enter your gearing information. Next, we will run your motor at a fixed RPM and use a tachometer to measure the actual head speed. With this information Castle Link can determine how many poles your motor has.

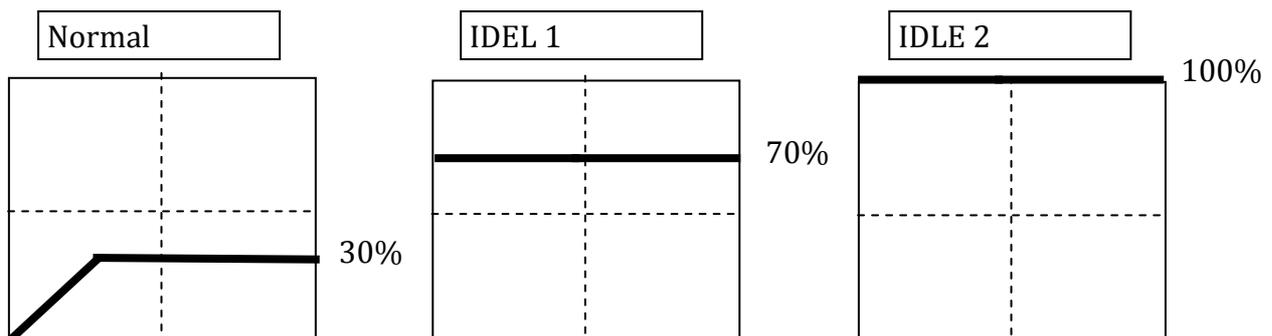
To proceed with the alternative method click the button below

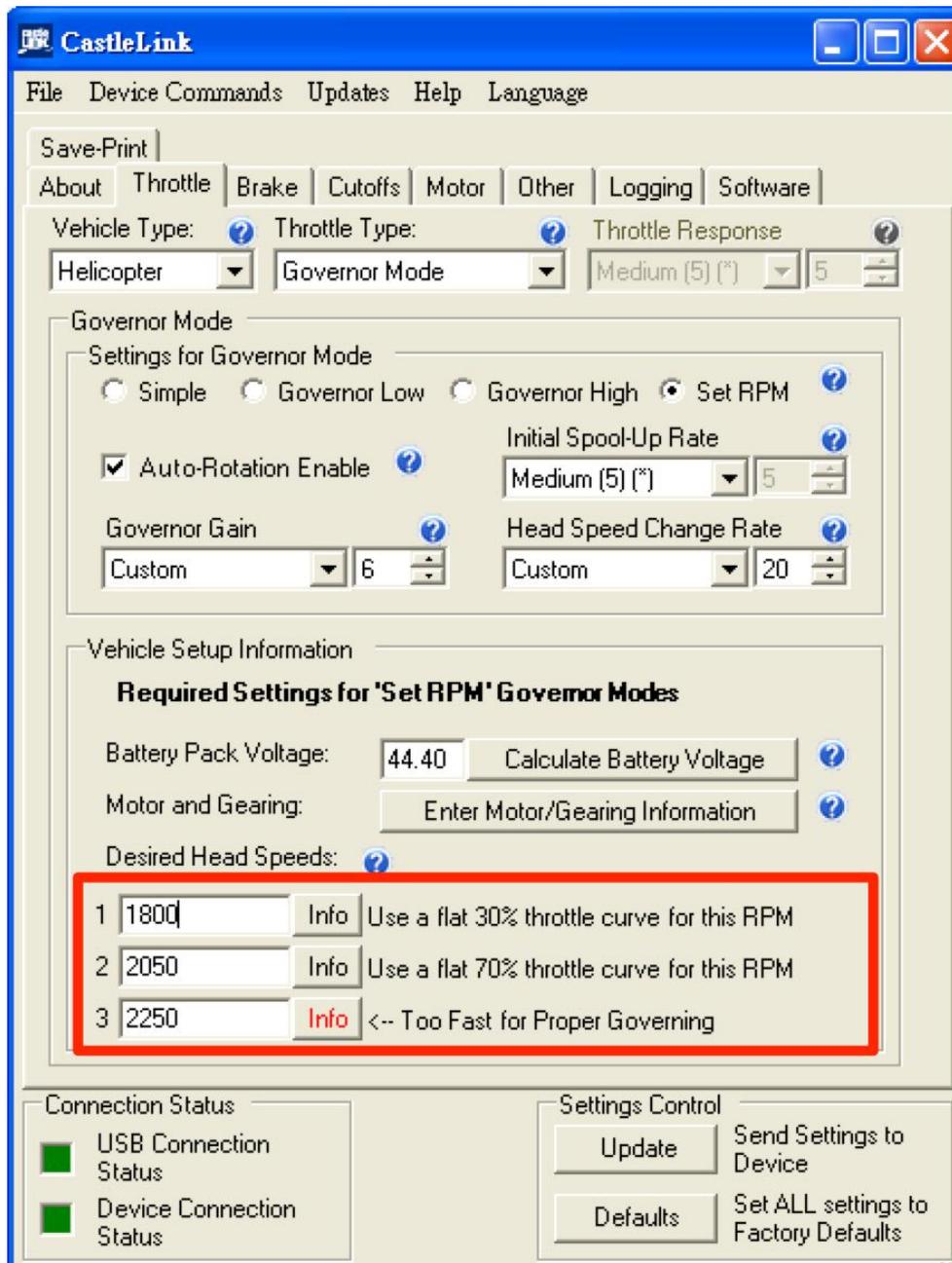
I Don't Know My Magnetic Pole Count

Cancel OK

## Headspeed Setting

Now we will set the headspeed under governor mode. 3 headspeeds can be selected by using different throttle curves. The throttle curves on your transmitter is set to 30%, 70%, and 100%.



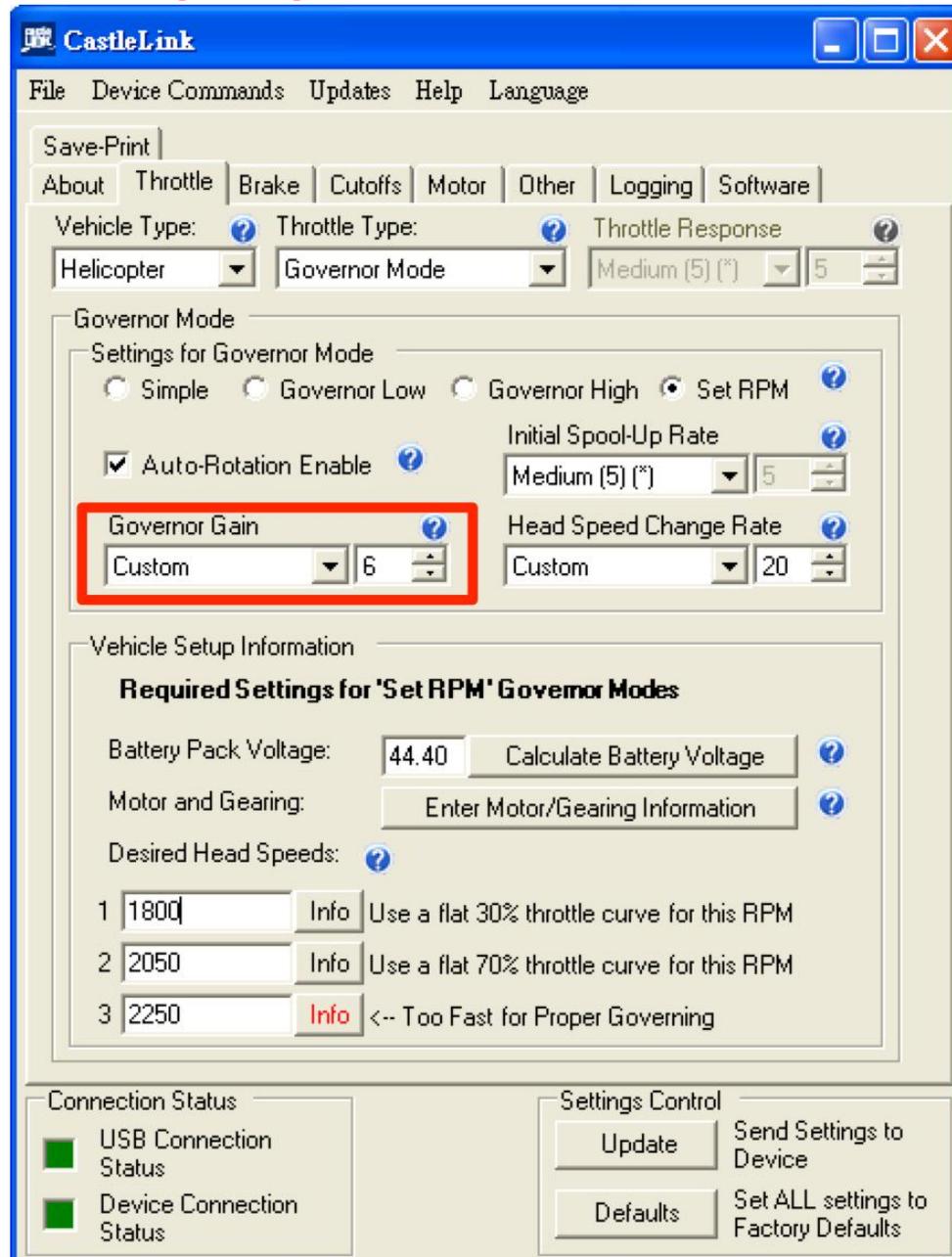


## Governor Gain

In addition, the Governor Gain setting in CastleLink works the same as the gain on your gyro. Too little, and the governor rpm response can appear mushy, and too much can induce oscillation. Generally if the main rotor can sustain the headspeed set in governor mode, lower governor gain value is always better to increase ESC longevity. The default factory setting for governor gain is 15, and can be adjusted in the range of 1 to 50; higher

the gain value equals higher the gain. Motors with higher torque requires less governor gain value.

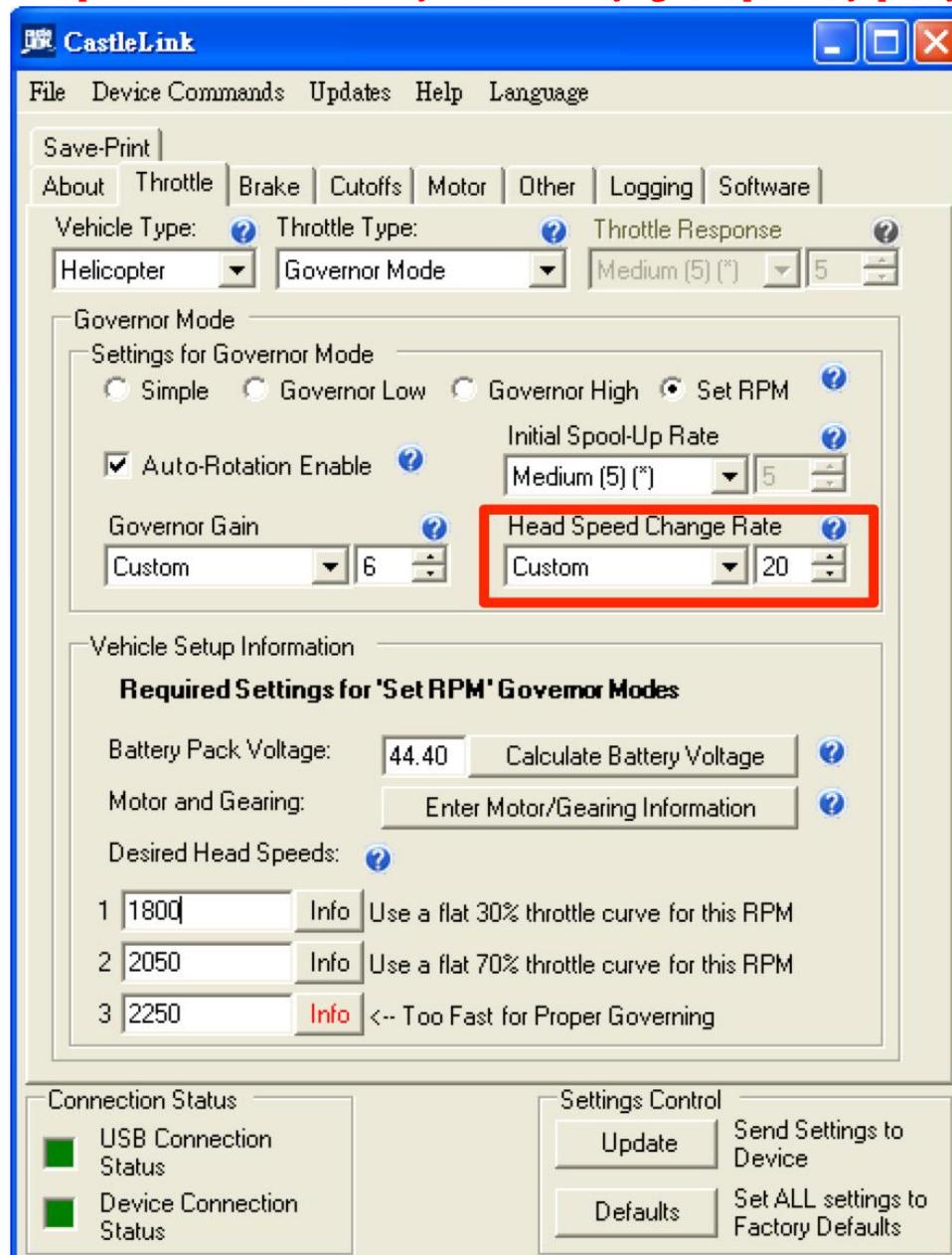
Align 800MX motor has an excellent torque characteristic, thus we recommend governor gain to be set between 5 to 8. Using team pilot Kenny Ko as an example, he believes 800MX exhibits enough torque to maintain consistent headspeed during most flight conditions, thus does not need the governor intervention to catchup the loss in headspeed; so he sets his governor gain to 6.



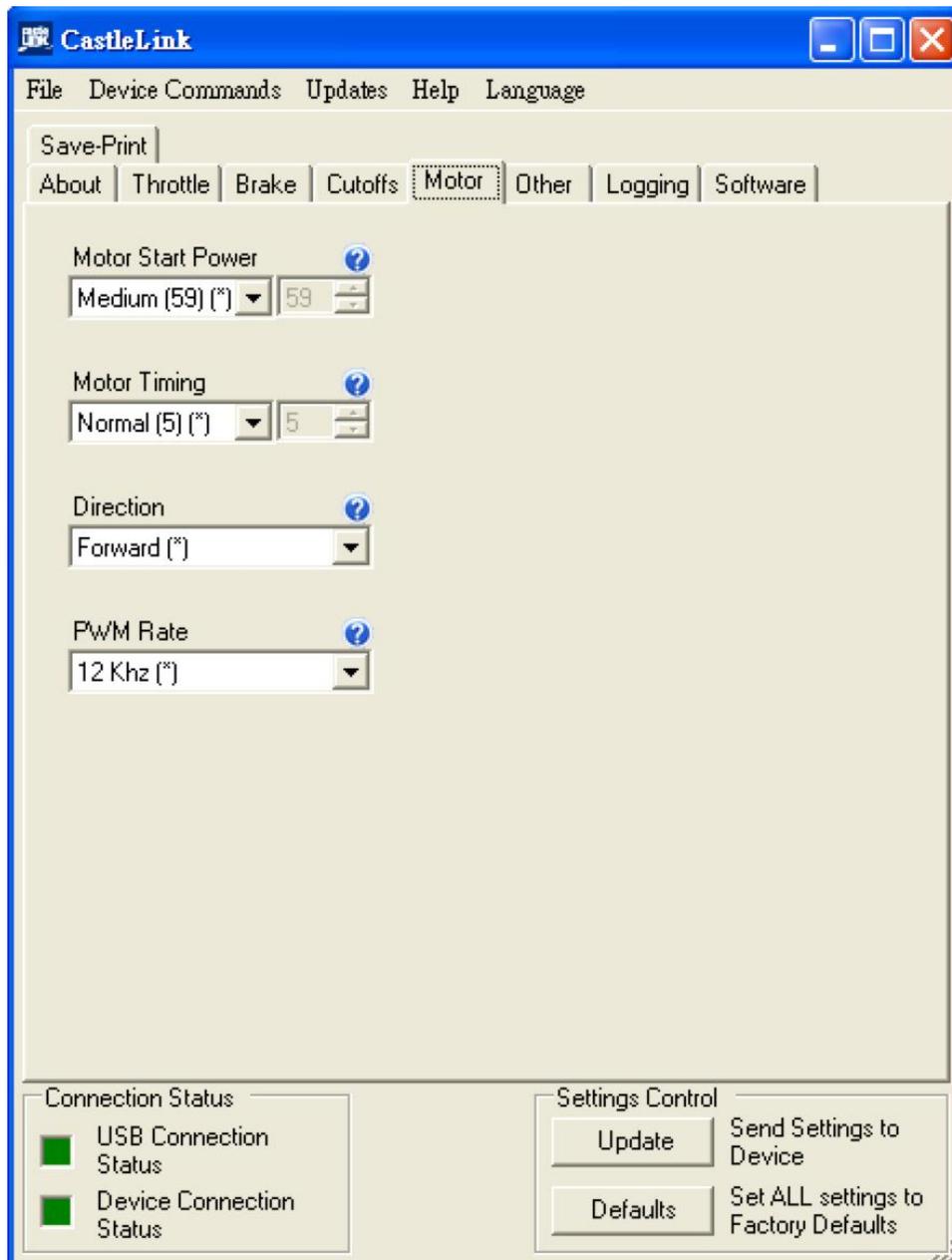
## Head Speed Change Rate

This setting controls how quickly the power is ramped up or down in two different situations. First, it is used to control the power ramp when switching from one head speed to another in any of the governor modes. Secondly, it is also used to control how fast the power will ramp when recovering from an Auto-Rotate motor stop. This setting will only work if you have selected a heli, control-line, or external governor vehicle-type. The higher the value, the faster the head will accelerate to the new head speed. The range for this setting is 0 to 20, with factory default value of 5.

800MX already has fast acceleration rate, so we recommend setting of 15 to 20. For example, auto-rotation bailout or mid-air blade stop requires rapid acceleration to flying headspeed. 800MX has the ability to restore to flying headspeed very quickly.



▼ settings under the Motor tab. We recommend using the default settings for 800MX motor.



### Motor Start Power:

This setting controls how much power is allowed into the motor to get it started for the first few revolutions from a dead stop. Stuttering motor startup is a good indication of too low of starting power, which can be resolved increasing this setting. Make sure the stuttering is not caused by obstruction of foreign object, then start with a low setting first, and experiment to find which looks best to you from there. The setting range is 0 to 100, with higher number equaling to higher power. Factory default setting is 59.

**800MX is highly efficient with minimal start power requirement, so we recommend the default "Medium (59)" setting.**

## Motor Timing:

Motor timing advance changes the timing advance range used on the motor. Generally, low advance gives more efficiency and less power. High advance gives more power at the expense of efficiency (motor heat). Every system will respond to changes in advance differently. All Castle Creations controllers automatically determine the correct and best range of timing advance for any motor they are plugged into when running in sensoreless mode. You can move up or down within that range via these settings. The setting parameter is 0 to 20, higher value equals higher advancement. Default factory setting is Normal (5).

**800MX features high torque, allowing rapid startups without advancing timing. We recommend “Low (0)” or “Normal (5)” settings.**

## PWM Rate:

This setting changes the frequency with which the controller sends power pulses to the motor. With some motor types, the higher the frequency the more efficient the motor will run, but always at the expense of increased heat within the controller. If you decide to experiment with changes to PWM, use a wattmeter, a tachometer and a temperature gun to find out how changes affect your entire power system. An increase in PWM frequency will always increase the controller temperature. It may or may not decrease the temperature of the motor.

**800MX’ s unique winding and magnet design contributes to an already efficient motor, so even with increased PWM values, the motor can continue to keep the operating temperature low. Other brands of motors with single winding will not be able to handle higher PWM settings (they recommend 8Khz). For 800MX motor, we recommend PWM value of 8 to 12 Khz, or the “Outrunner Mode.”**

## Warning tones and LED signals:

Castle ICE2 HV 120 provides 6 different LED signals, as well as warning beeps, to alert you any abnormalities that occurred in flight, such as loss of power or loss of signal.

In case you were forced to land by an abnormal incidence, do not unplug the ESC power immediately; observe the warning LED and beeps to understand the cause of abnormality.

**1 beep and flash**

**Start failure:** The motor was jammed or locked.

**2 beeps and flashes**

**Low Voltage Cutoff:** Your batteries are likely discharged. Check that batteries are fully charged and that Phoenix detects the proper number of cells at power-up.

**3 beeps and flashes**

**Over-Current:** Current draw exceeded the safe capacity of the controller. Reduce current draw by changing to a smaller propeller, different gear combination, or fewer cells.

**4 beeps and flashes**

**Motor Anomaly:** Controller encountered abnormal motor behavior such as a prop strike or other physical interference. May also indicate lost synchronization or magnetic overload within the motor.

**5 beeps and flashes**

**Radio Signal:** Signal from receiver is corrupt or non-existent. Check transmitter and receiver.

**6 beeps and flashes**

**Over temperature**