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5. Additional settings: Throttle curves, ERPM limits, safety features etc.

Submitted by frank on Tue, 2017-10-03 19:51

Configuration of your VESC® or VESC® based ESC using the VESC®-Tool Software.

In this tutorial we will go through some tweaks, enhancing the safety and performance of your VESC®

an electric skateboard a strong Timeout Brake is not appropriate, since the rider would not be prepared to a sudden hard braking force. Only a very mild brake force can be handled by the unprepared rider and so should be the setting (e.g. 10A).
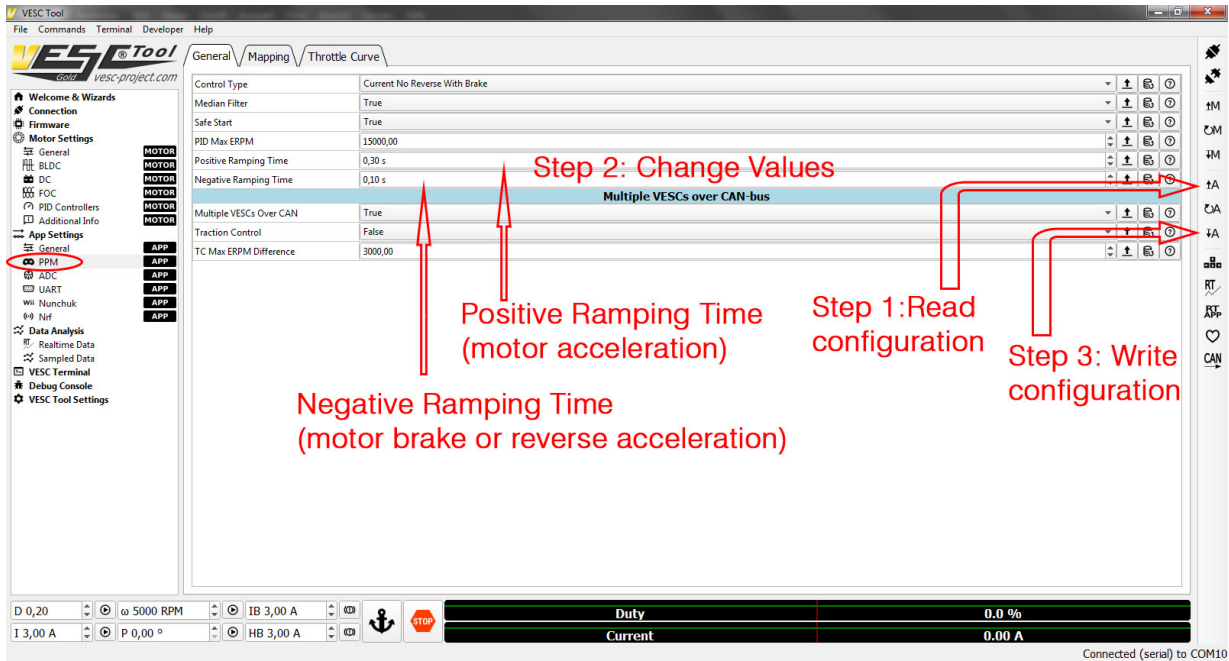

PPM Ramping Time

This features allows to adjust the response time to your input signal. A fast response time (e.g. 0.10 seconds) will make the handling very direct.
A slower time (0.90 seconds) will make the handling smoother.

It might be a good option to have a smoother response time for acceleration and a more direct response time for the brake (if applied).


Throttle Curves

Throttle curves will let you adjust the behavior of your motor in reference to the throttle input. This can be a very useful feature to adjust the throttle response to your individual needs. To get started we recommend to use the "Natural" function first. The curves can be found in *App Settings >>input device of usage (shown PPM)*.

This example shows more aggressive behavior to the negative throttle command (brake) and a slightly softer startup on positive throttle commands.
The softer your startup, the more aggressive it will get on the last bit of the throttle input and vice versa.
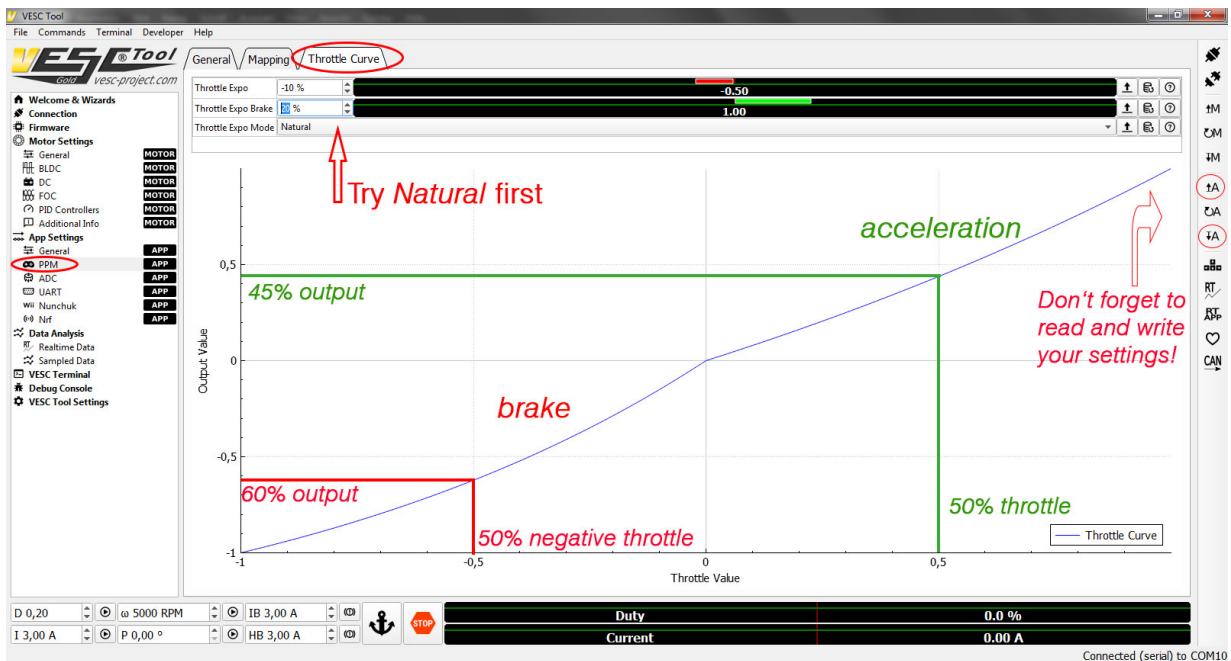
Changing the motor spin direction in VESC-Tool.

If your motor spins up in the wrong direction, you can either switch over two of the three motor leads, or you can invert the motor direction in Vesc-Tool.
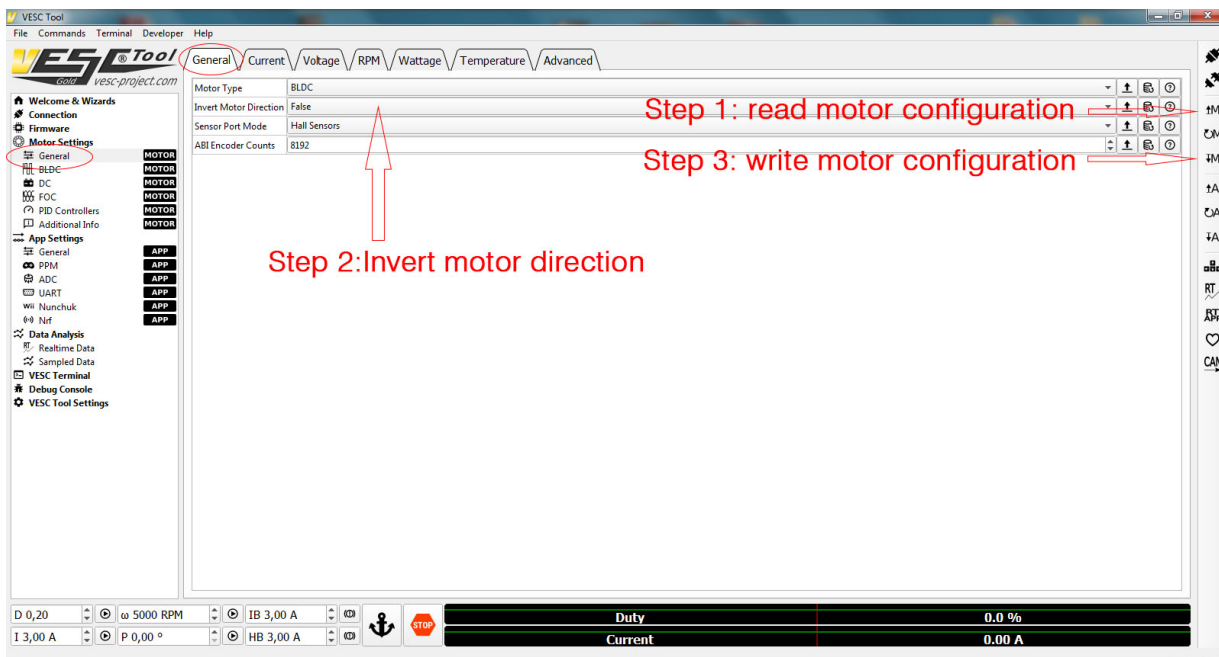
You want to set a limit of the motor RPM? This is how to do it. Simply apply a ERPM LIMIT.

RPM limits can be a very useful feature. Possible application: You may want your bike, board, boat, car, etc. to reach a certain top speed only. The VESC-Tool allows you to specify a ERPM-Limit. Many people don't know what the difference between ERPM and RPM is and why VESC-Tol doesn't simply use an RPM value. The relation between RPM and ERPM has

something to do with the motor you use and the VESCs doesn't know the exact construction of your motor. But you may know it or you can find out easily.

All you need to know to calculate the ERPM is the number of pole pairs your motor features. Poles are e.g. the magnets of a BLDC-Outrunner/Inrunner motor. If your motor has 14 magnets installed, your motor has 7 pole pairs. In this case the RPM limit of your motor is simply the ERPM limit divided by 7.

Example: 7 Pole Pairs in motor, ERPM limit set to 70000 >>> RPM = 70000 / 7 = 10000 RPM.

There are separate settings for forward and reverse motor operation. In some application you may want a speedy forward movement but a slow running motor in reverse operation.

Excusion: ERPM limits, motor KV, system voltage and hardware limits.

To reach the 10000 RPM at 44.4 V, our motor would need to have a minimum of 226KV. (226 RPM/V x 44,4V = 10034 RPM).
In consequence the setting above would only make sense for motors with a higher KV than 226KV if you run them at 44.4V.
Depending on the Hardware you use, it may be limited to 60000 ERPM (e.g. HW rev. 4.xx) and you should pick a motor not reaching this limit.
Going beyond this limit may damage your Hardware! The VESC SIX design can reach up to 150000 ERPM.

If your motor would reach higher than 60K ERPM and you are using a HW 4.xx controller, you want to set the ERPM limit to 60000 to stay on the safe side and avoid hardware damages.

Preventing overheating of your system (motor and ESC) that might result in failing brakes (Acceleration Temperature Decrease).

When your motors feature temperature sensors, your VESC will cut off the power once the motors reach a pre-defined critical temperature. Same happens when the VESC will get to hot. This feature protects your system from over temperature damages. The downside is, that you can't use your motor as a generator (brake) once it, or the VESC, or both got to hot.

The *Acceleration Temperature Decrease* feature allows you to lower the critical temperature cutoff for acceleration by x % (15% default), while the brakes continue to work at the defined full value.

This results in a soft power cutoff when you motors, the VESC, or both reach e.g. 85% of the defined temperature cutoff value, leaving 15% safety temperature headroom for the brakes.

The higher the value, the more safety range you will gain for the brakes, but the less you can push the system to its pre-defined temperature limits. If you set the value to high, you will experience power cutoffs during a regular system usage.

By changing the value you will be able to find a sweet balance between a useful max. system temperature and saftey temperature headroom.
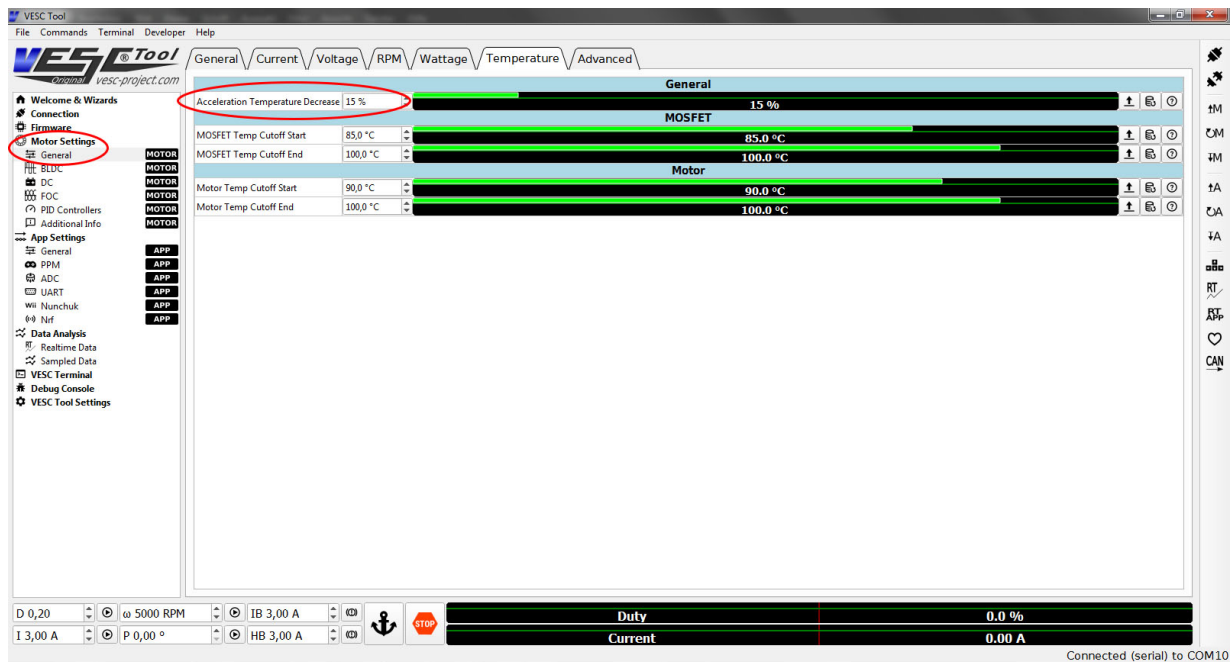
Max output power of your system in Watt.

If you want to limit the output power of your system, you can define a max. Wattage value that will not be surpassed.

This feature allows you to stay safe and adjust to a power level you can handle. It might also help you to stay within legal power parameters.

Define a value for max. Wattage and max. Braking Wattage
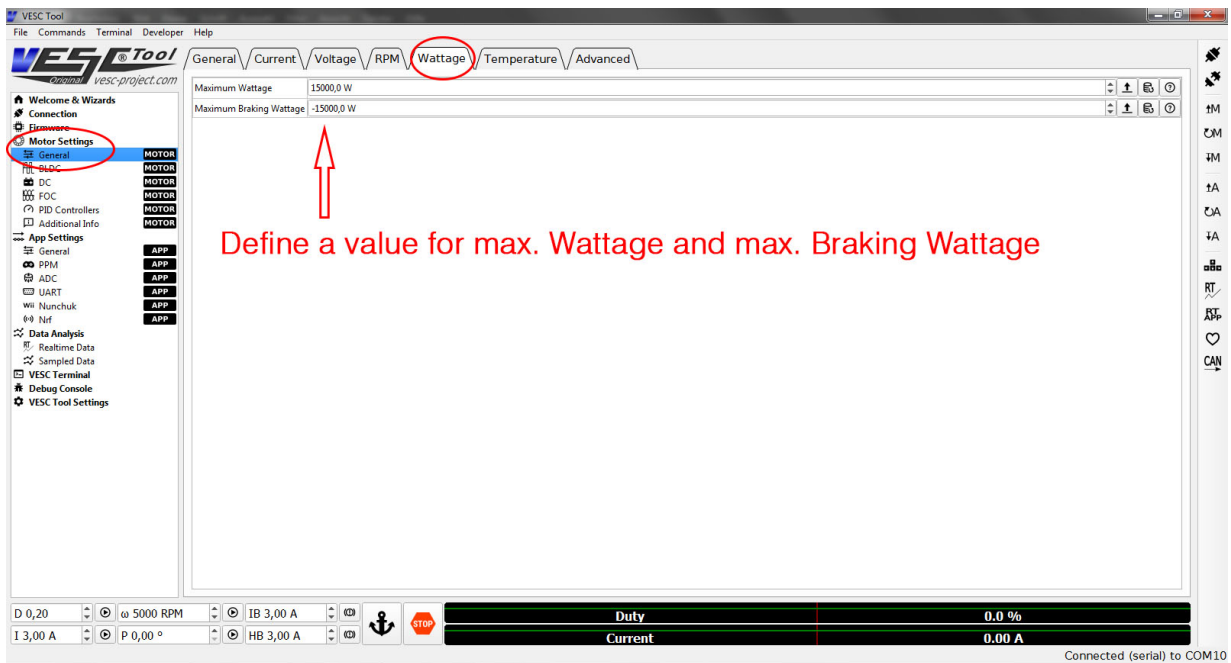
‹ 4. Input Wizard for NRF remote   up   6. Uploading custom firmware files ›

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Mon, 2017-10-16 17:51
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Handbrake function

Where can I get handbrake function in the tool?

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Bike 2

Info zu Projekt!

W.Buecker

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Wisdomwagon
Thu, 2019-06-13 19:32
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What are the numbers below the VESC tool window

, and how to use them ? There are bunch of setting so what are they ?

_____

Cool but not frozen.

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