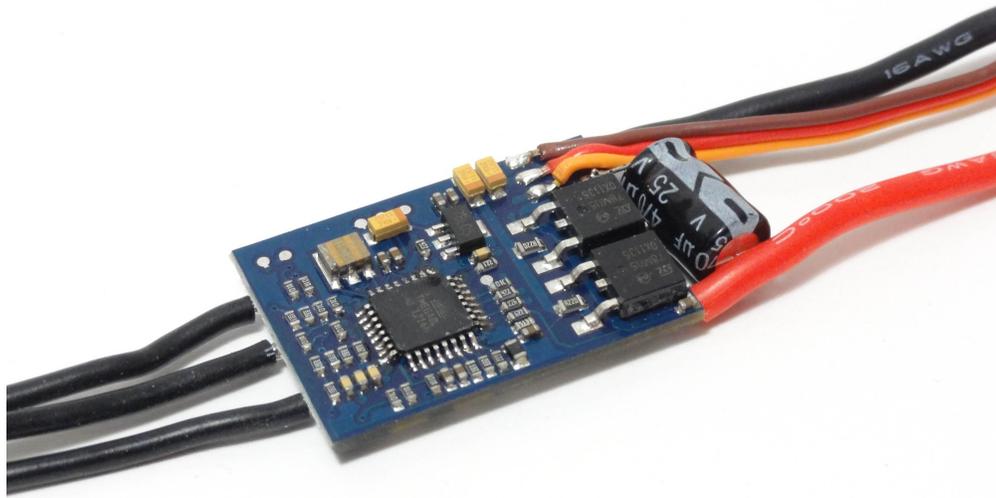


Lynxmotion

Imagine it. Build it. Control it.™

SimonK Firmware ESCs (Electronic Speed Controller)



Revision 1.0

1. What is “Firmware”?

Generally speaking, firmware is code program built into the microcontroller unit (MCU) of electronic products. After the microcontroller unit is powered up, the firmware will control MCU's signals. Since the factory will download the firmware to the MCU's Flash memory, many people call this process “Flashing”. In the RC model industry, products such as ESCs, receivers, digital servos, battery chargers and more need firmware in order to operate.

2. What is SimonK Firmware?

SimonK firmware is a firmware specifically for ESCs (electronic speed controllers) developed by Simon Kirby. This firmware has been found to offer faster response compared to normal ESC firmware, easy handling and good compatibility, all of which greatly enhances multirotor performance.

SimonK firmware is continuously being optimized and upgraded. In the beginning, only ESCs which used an ATMEL microcontroller could be upgraded, though now, the firmware can also be used on SiLabs and Intel 8051 MCUs. In addition, the firmware code is open, meaning you can modify the code yourself to better suit your ESC and/or application.

3. Why do I need to flash SimonK firmware?

A) Exploration. This is the common interest of RC model enthusiasts. If you want to know about the principles and hardware structure of the ESC, you can start by flashing SimonK firmware, which will allow you to learn the MCU download process.

B) Pursuit of changes. When you are tired of one ESC “personality”, you can update it by flashing SimonK firmware.

C) When troubles come out. When your ESC cannot power up your new motors, but your companions' can. You need to implement SimonK firmware to your ESC. SimonK firmware has excellent compatibility. It can start almost every motor, except for damaged ones.

D) New reasons you can find...

4. How to flash SimonK firmware?

Maybe you once downloaded firmware to the microcontroller in your college laboratory. But that does not mean you can flash SimonK firmware into ESC's MCU.

First, please ensure that your ESC support SimonK firmware. Second, pls meet following requirements.

A). Hex or Bin file. The firmware for the ESCs is available in a .hex or .bin file. One file contains the complete firmware for one ESC.

B). Interface Software (eg. AVR Studio) Depending on your platform you will need dedicated interface software installed on your computer to flash your ESC with the new firmware.

C). MCU programmer (eg. JTAG or USB ASP)

D). PIN-header or micro-clips to connect programmer to MCU Then you can flash the ESC with the video and other information on internet.

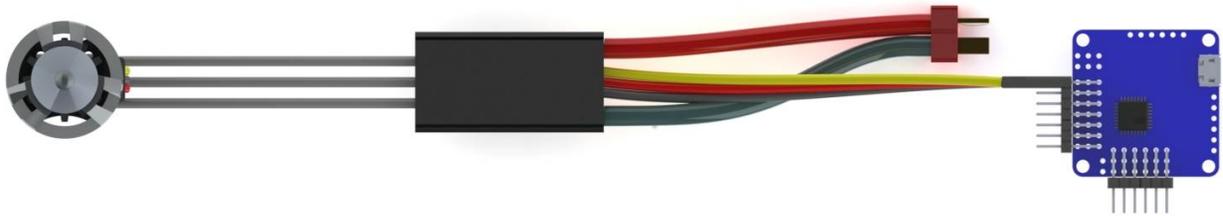
Note: You can flash your ESC multiple times but only the last flashed firmware is active on the micro controller. If the wrong firmware is flashed, you may end up with a damaged ESC when it's powered by the battery supply. It's important to safely test your ESC after the firmware upgrade.

5. How to get Pre-flashed ESCs with SimonK firmware?

Flashing your own ESCs is not so easy as you download music to your iPhones. It takes time, a flash tool and some research. For modelers who do not have any knowledge about MCU, the flashing process is difficult. Or some model flyers just need their models fly well and do not care about flashes. If you are in one of them, you can choose Lynxmotion already flashed ESC.

6. Install your ESCs

We believe it is easy for you to install ESCs to multi-rotor platform. We still kindly remind you to make sure the correct and solid connection of each connector to silicon wire, battery wire to power distribution board, power distribution board to ESC, ESC to motor. Please refer to the pic below:



7. SimonK firmware ESC start-up tones

All ESCs make the motors sing, so does SimonK firmware ESC. When connected to power, you need firstly unlock the flight controller. Then ESCs make 3 beeps (di da di), to tell you self-detection finished. If flight controller also makes control instructions, a long beep (di----) will tell you ESCs have received throttle signal from flight controller and ready to start. Then pull up the throttle stick, motor starts to run. OK! Let's go!

8. How to do throttle calibration

Normally, you do not need to do throttle calibration for new multicopter ESCs. However, in some special cases, you still need to do it. Remove your props, and disconnect the battery. Push your radio throttle to maximum, connect the flight battery, wait for the 3 beeps(di da di), wait for 1s, you will hear a short beep(di). Then immediately lower the throttle to minimum. You will then hear another unique 2 beeps (di di), indicating you are setting the low value. If you hear a long beep, it means the low throttle set. Disconnect the battery, throttle calibration is done. If you hear a short beep, it means low throttle set failed. You need to do the calibration again. If still no success, pls contact us.

9. SimonK ESC breakdown

SimonK firmware ESC has big starting-up torque, if your flight controller algorithm is not reasonable or motor quality is not high, too much throttle increment will cause burst current too high to burn ESC. We all do not want it happen. To avoid it, we give you the following suggestions:

- 1), Choose low-heating ESCs for your Multicopter.
- 2), Choose ESCs continuous current higher than maximum current of the motor.
- 3), Ensure good heat-radiation of the ESC.

If your ESC damaged during flight, please contact Lynxmotion, we will solve the problem for you as soon as possible.