



Disclaimer:

- All the contents of this manual is from the Internet. MAYTECH only try to collect and summarize it to provide accurate information to the end user, but will not promise the information completely meet your requirements. This manual only allows end users for free reference, in the use of Simon K firmware, and does not allow for any commercial activities, also not as commercial activity information and basis of MAYTECH and its dealers.

- Although SimonK firmware released under GUN license, MAYTECH do not make any modifications to the source code. So we cannot not guarantee SimonK firmware is entirely suitable for MAYTECH ESCs.

- MAYTECH firmware has its own intellectual property rights. All Electronic Speed Controller (ESC) are with MAYTECH firmware. Only if customers require ESCs to be flashed with Simon K firmware, MAYTECH will flash it to the ESCs voluntarily. We DO NOT charge any cost. Besides, Simon K firmware sources are provided by customers or end users. The sources include, but not limited to, blogs, microblogs, e-mails, links, or other instant message tools etc.

I. What is Firmware?

According to Wikipedia, firmware is the combination of persistent memory and program code and data stored in it.

Generally speaking, it can be considered to be a built-in program and command in electronic products. After MCU powered up, firmware will control MCU process signal. It is the soul of the hardware.

As the factory will download firmware to MCU Flash memory, many people call this process Flash.

In RC model industry, such products need to flash firmware, as ESC, receiver, digital servo, battery charger, etc.

II. What is Simon K Firmware?

According to Google, Simon K firmware is a series of ESC firmware developed by Simon Kirby. This firmware has the advantage of rapid response, easy handling and good compatibility, which greatly enhances multirotor performance.

Simon K firmware is continuously optimized and upgraded since its birth. At the beginning, only ESCs with an ATMEL micro controller can be upgraded. Now, it can also support SiLabs and Intel 8051 MCU. Besides, the firmware codes are open. You can modify the codes yourself.

III. Why do I need to flash Simon K firmware?

A). Continuous 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 Simon K 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 Simon K firmware.

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

D). New reasons you can find...

IV. How to flash Simon K firmware?

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

First, pls ensure that your ESC support Simon K 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.

V. How to get Pre-flashed ESCs with Simon K 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 MAYTECH to flash them for you. Without any extra cost or time, you can enjoy the excellent performance of Simon K firmware.

VI. MAYTECH™ ESCs VS. Simon K firmware ESC

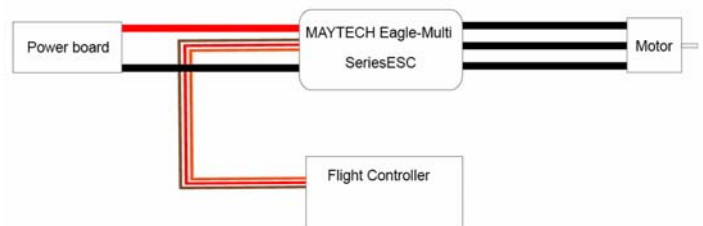
MAYTECH™ ESCs usually come with MAYTECH™ firmware. This firmware has more functions than Simon K firmware, such as Helicopter governor mode, set Batt. type, set Brake type, Timing mode, Low-voltage protection, etc.

If you need ESCs specially for multirotor application, as many functions are realized by the flight controllers. You only need a high quality ESC. Your best choice is Simon K firmware ESC.

All MAYTECH™ ESCs (Harrier-Suprem™ \ Harrier-eXtrem™ \ Harrier-Economical™ \ Falcon-Pro™ Series, etc.) can be flashed to Simon K firmware, and the Harrier-Suprem™ 8A to 85A ESCs are recommended. But If you like us flash Simon K firmware to other series ESCs, pls contact us, we are very glad to do it for you. MAYTECH™ Eagle-Multi™ (Abbr.MTMK) series ESCs are flashed to Simon K firmware on the basis of MAYTECH™ Harrier-Suprem™ series ESCs.

VII. 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. Pls refer to the pic below:



VIII Simon K firmware ESC start-up tones

All ESCs make the motors sing, so does Simon K 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!

IX. 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



Users' Manual for Eagle- Multi (MTMK) Series ESCs with SimonK Firmware

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.

X. Simon K ESC breakdown

Simon K 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 multikopter.
- 2), Choose ESCs continuous current higher than maximum current of the motor.
- 3), Ensure good heat-radiation of the multikopter.

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

XI. MAYTECH Eagle-Multi™ (MTMK) Series ESCs Specification

MAYTECH Eagle-Multi™ (MTMK) Series ESCs (base on Harrier- Suprem™ with SimonK Firmware, Recommended)								
NO.	Model No.	Cont. Current	Burst Current (10sec)	BEC	Li-Po	Net Weight(g)	Size(mm) (L × W × H)	Golden Connector
1	MT8A-BEC-MK	8A	10A	5V / 1A	2-4Cells	9	27×22×7	NO
2	MT10A-BEC-MK	10A	13A	5V / 1A	2-4Cells	9	27×22×7	NO
3	MT12A-BEC-MK	12A	16A	5V / 1A	2-4Cells	9	27×22×7	NO
4	MT20A-BEC-MK	20A	30A	5V / 2A	2-4Cells	19	42×24×13	NO
5	MT25A-BEC-MK	25A	35A	5V / 2A	2-4Cells	19	42×24×13	NO
6	MT30A-BEC-MK	30A	40A	5V / 3A	2-4Cells	27	56×25×8	NO
7	MT35A-BEC-MK	35A	50A	5V / 3A	2-4Cells	27	56×25×8	NO
8	MT40A-SBEC-MK	40A	60A	5.5V / 4A	2-6Cells	35	65×26×10	with 3.5mm
9	MT45A-SBEC-MK	45A	65A	5.5V / 4A	2-6Cells	35	65×26×10	with 3.5mm
10	MT50A-SBEC-MK	50A	70A	5.5V / 4A	2-6Cells	41	73×30×10	with 3.5mm
11	MT55A-SBEC-MK	55A	75A	5.5V / 4A	2-6Cells	41	73×30×10	with 3.5mm
12	MT60A-SBEC-MK	60A	80A	5.5V / 4A	2-6Cells	51	66×26×15	with 3.5mm
13	MT65A-SBEC-MK	65A	85A	5.5V / 4A	2-6Cells	51	66×26×15	with 3.5mm
14	MT70A-SBEC-MK	70A	90A	5.5V / 4A	2-6Cells	48	65×25×14	NO
15	MT75A-SBEC-MK	75A	95A	5.5V / 4A	2-6Cells	48	65×25×14	NO
16	MT85A-SBEC-MK	85A	100A	6V / 5A	2-6Cells	57	58×35×9	NO
17	MT8A-OPTO-MK	8A	10A	NO BEC	2-4Cells	8	27×22×7	NO
18	MT10A-OPTO-MK	10A	13A	NO BEC	2-4Cells	8	27×22×7	NO
19	MT12A-OPTO-MK	12A	16A	NO BEC	2-4Cells	8	27×22×7	NO
20	MT20A-OPTO-MK	20A	30A	NO BEC	2-4Cells	17	42×24×13	NO
21	MT25A-OPTO-MK	25A	35A	NO BEC	2-4Cells	17	42×24×13	NO
22	MT30A-OPTO-MK	30A	40A	NO BEC	2-4Cells	24	56×25×8	NO
23	MT35A-OPTO-MK	35A	50A	NO BEC	2-4Cells	24	56×25×8	NO
24	MT40A-OPTO-MK	40A	60A	NO BEC	2-6Cells	31	65×26×10	with 3.5mm
25	MT45A-OPTO-MK	45A	65A	NO BEC	2-6Cells	31	65×26×10	with 3.5mm
26	MT50A-OPTO-MK	50A	70A	NO BEC	2-6Cells	37	73×30×10	with 3.5mm
27	MT55A-OPTO-MK	55A	75A	NO BEC	2-6Cells	37	73×30×10	with 3.5mm
28	MT60A-OPTO-MK	60A	80A	NO BEC	2-6Cells	47	66×26×15	with 3.5mm
29	MT65A-OPTO-MK	65A	85A	NO BEC	2-6Cells	47	66×26×15	with 3.5mm
30	MT70A-OPTO-MK	70A	90A	NO BEC	2-6Cells	44	65×25×14	NO
31	MT75A-OPTO-MK	75A	95A	NO BEC	2-6Cells	44	65×25×14	NO
32	MT85A-OPTO-MK	85A	100A	NO BEC	2-6Cells	53	58×35×9	NO

XII. MAYTECH Other SimonK Firmware ESCs Specification

MAYTECH SimonK Firmware ESCs base on Harrier-eXtrem™ (MTMKHX) Series								
NO.	Model No.	Cont. Current	Burst Current (10sec)	BEC	Li-Po	Net Weight(g)	Size(mm) (L × W × H)	Golden Connector
1	MT20A-BEC-MK-HX	20A	30A	5V / 2A	2-4Cells	18	36×29×9	NO
2	MT25A-BEC-MK-HX	25A	35A	5V / 2A	2-4Cells	18	36×29×9	NO
3	MT30A-BEC-MK-HX	30A	40A	5V / 3A	2-4Cells	25	51×29×8	NO
4	MT35A-BEC-MK-HX	35A	45A	5V / 3A	2-4Cells	25	51×29×8	NO
5	MT40A-SBEC-MK-HX	40A	60A	5V / 5A	2-6Cells	45	70×30×11	with 3.5mm
6	MT45A-SBEC-MK-HX	45A	65A	5V / 5A	2-6Cells	45	70×30×11	with 3.5mm
7	MT60A-SBEC-MK-HX	60A	80A	5V / 5A	2-6Cells	55	70×30×11	with 3.5mm
8	MT65A-SBEC-MK-HX	65A	85A	5V / 5A	2-6Cells	55	70×30×11	with 3.5mm
9	MT20A-OPTO-MK-HX	20A	30A	NO BEC	2-4Cells	16	36×29×9	NO
10	MT25A-OPTO-MK-HX	25A	35A	NO BEC	2-4Cells	16	36×29×9	NO
11	MT30A-OPTO-MK-HX	30A	40A	NO BEC	2-4Cells	23	51×29×8	NO
12	MT35A-OPTO-MK-HX	35A	45A	NO BEC	2-4Cells	23	51×29×8	NO
14	MT40A-OPTO-MK-HX	40A	60A	NO BEC	2-6Cells	41	70×30×11	with 3.5mm
15	MT45A-OPTO-MK-HX	45A	65A	NO BEC	2-6Cells	41	70×30×11	with 3.5mm
16	MT60A-OPTO-MK-HX	60A	80A	NO BEC	2-6Cells	51	70×30×11	with 3.5mm
17	MT65A-OPTO-MK-HX	65A	85A	NO BEC	2-6Cells	51	70×30×11	with 3.5mm

MAYTECH SimonK Firmware ESCs base on Harrier-Economical™ (MTMKHE) Series								
NO.	Model No.	Cont. Current	Burst Current (10sec)	BEC	Li-Po	Net Weight(g)	Size(mm) (L × W × H)	Golden Connector
1	MT20A-BEC-MK-HE	20A	25A	5V / 2A	2-3Cells	23	51×25×9	NO
2	MT25A-BEC-MK-HE	25A	30A	5V / 2A	2-3Cells	23	51×25×9	NO
3	MT30A-BEC-MK-HE	30A	35A	5V / 2A	2-3Cells	26	51×25×9	NO
4	MT35A-BEC-MK-HE	35A	40A	5V / 2A	2-3Cells	26	51×25×9	NO
5	MT40A-BEC-MK-HE	40A	45A	5V / 3A	2-4Cells	36	66×27×11	NO
6	MT45A-BEC-MK-HE	45A	50A	5V / 3A	2-4Cells	36	66×27×11	NO

Remark: MAYTECH SimonK Firmware ESCs base on Falcon-Pro™ (MTMKFP) Series ESCs Specification, pls contact MAYTECH Sales Team