Instruction Manual for FrSky Neuron II 60

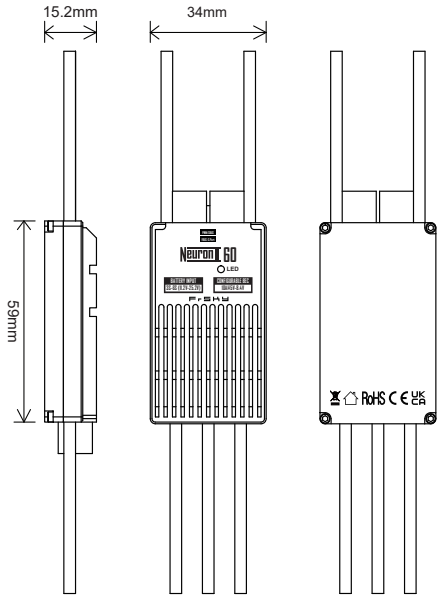
Introduction

Based on the performance and design features of the first-gen NEURON ESC products, the NEURON II line steps it up by offering a broader selection of ESC models to various demands in different applications.

The NEURON II 60 comes with a fully enclosed all-CNC machined aluminum casing design, ensuring efficient heat dissipation while handling a continuous current of 60A. The NEURON II series can transmit telemetry data from built-in sensors to the radio by the receiver, allowing users to get real-time insights right from the radio system. RPM, power consumption, temperature, input/output voltage, and current readings are all at your fingertips.

With added support for the FBUS protocol, the NEURON II takes convenience to a whole new level! Users can now easily configure the BEC output voltage and other ESC parameters directly from the transmitter via the receiver. Or with even more flexibility, hook up NEURON II ESC to the ETHOS radio's S.Port for seamless wired configuration without requiring a receiver (this feature will be available on ETHOS 1.5.0 and later versions). The traditional configuration method through a PC webpage is also retained. There's more! The NEURON II 60/80 comes with support for multiple signaling protocols which can be used to drive and configure a wide range of compatible motors.

Overview



Specifications

- Dimension: 59×34×15.2mm(L×W×H)
- Weight: 75g (with wires included.)
- Battery Input Voltage Range: 11.2-25.2V (3S-6S Li batteries)
- BEC Output Voltage Range: 10A@5V~8.4V (Adjustable & Voltage Step 0.1V)
- Continuous Current: 60A

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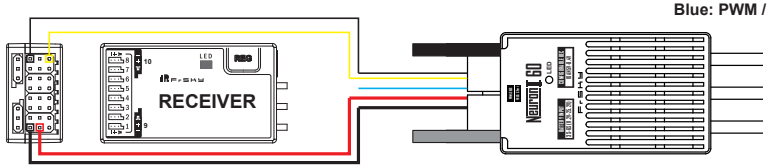
Features

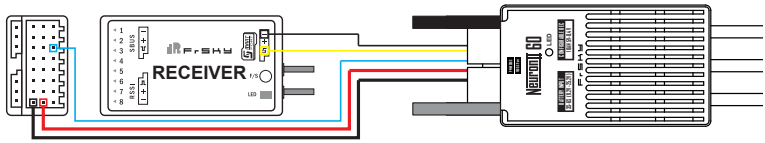
- All-CNC Machined Aluminum Case aiding in Heat Dissipation
- Various Telemetry Data (for ESC & SBEC) via FBUS / S.Port
  - Telemetry data for ESC: Batt Voltage & Current (Resolution 125mA, Precision ±2%), RPM, Power Consumption, Temperature.
  - Telemetry data for SBEC: Output Voltage & Current (Resolution 50mA, Precision ±2%).
- Adjustable SBEC Output Voltage & ESC Parameters by LUA scripts (on ETHOS, OPTX radios.) or PC Configuration Webpage (by STK tool)
- Supports Various Signaling Inputs for Motor Control (PWM, DShot, OneShot)
- High-Performance32-bit Microprocessor
- Over-Temperature and Over-Current Protection

Connection Diagram

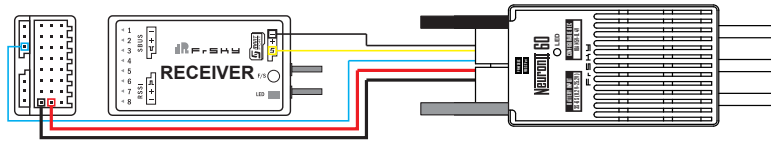
Yellow: S.Port / FBUS
Blue: PWM / SBUS



FBUS (FBUS Capable Receiver)



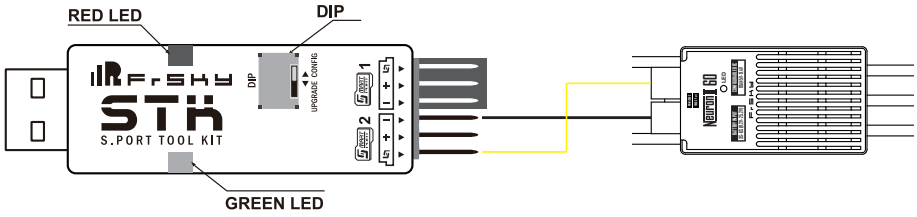
PWM + S.Port



SBUS + S.Port

Parameter Configuration (PC Webpage Programming via STK tool)

The FrSky ESC Neuron II 60 supports editing parameters through the STK tool. The STK tool is not included in the packaging and needs to be purchased separately by the user.



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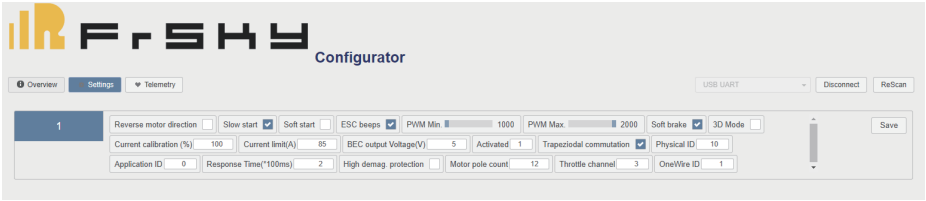
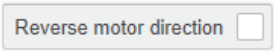
Note: To configure the Neuron II ESC, please connect the STK tool to your computer and connect the power supply to the Neuron II ESC. Once powering the ESC then, please click the "Connect" button on Webpage Configurator in 5 seconds to complete the connection.

The configuration methods provided below are for reference only. Due to firmware updates or other reasons, the functionality description may vary. Please refer to the latest official user manual for accurate configuration instructions.

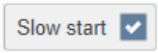
Here are the descriptions of various features on the web-based ESC configuration page of FrSky Neuron II.



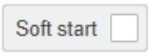
1. Reverse motor direction: This feature allows you to control whether the motor spins in the opposite direction. Checking this option will reverse the motor direction.



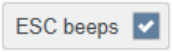
2. Slow start: It controls the gradual acceleration of the motor during startup to avoid sudden and strong reactions.



3. Soft start: This feature enables a smooth acceleration of the motor during startup, reducing the impact force and load on the motor.



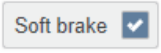
4. ESC beeps: It determines whether the ESC emits audible beeps during startup, serving as an indicator of its status.



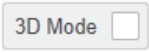
5. PWM Min: This setting determines the minimum PWM signal value that the ESC will recognize as the lowest throttle position.

6. PWM Max: It sets the maximum PWM signal value that the ESC will recognize as the full throttle position.

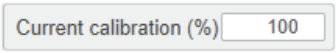
7. Soft brake: This feature controls whether the ESC implements a smooth braking action when transitioning to low throttle.



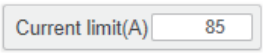
8. 3D Mode: It activates a special mode in the ESC suitable for performing aerobatic maneuvers and 3D flight actions.



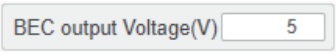
9. Current calibration(%): This option allows you to calibrate the ESC to accurately measure current, providing precise current data.



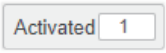
10. Current limit: It lets you set the maximum current output limit of the ESC to protect both the ESC and the motor from overloading.



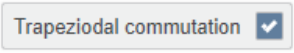
11. BEC output Voltage: You can specify the output voltage of the ESC's built-in BEC (Battery Eliminator Circuit).



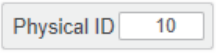
12. Activated: Display ESC Activation Status.



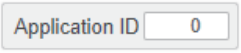
13. Trapeziodal commutation



14. Physical ID: This setting specifies the physical ID used for communication.

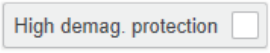


15. Application ID: This setting specifies the Sensor ID used for communication.

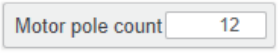


16. Response Time(*100ms): It determines the time gap between communications.

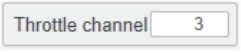
17. High demag. protection



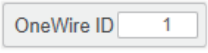
18. Motor pole count: It refers to the number of magnetic poles inside the motor. You need to set the correct pole count to ensure proper motor rotation and ESC commutation.



19. Throttle channel: Specify the serial port signal channel for the throttle channel input signal used to control the ESC, such as SBUS/FBUS.



20. OneWire ID: This feature assigns a unique ID to each ESC when using OneWire bus communication.



These features offer a wide range of configuration options to meet the requirements of different types of aircraft and flight preferences. Specific features and options may vary based on the version of FETtec Configurator and device support. Please consult the relevant documentation or official guides for more detailed information before using these options.

Parameter Configuration (ETHOS Lua Programming via FBUS / S.Port)

Here are the descriptions of various features on the ETHOS LUA configuration page of FrSky Neuron II ESC.

Rotation Direction — Normal

This feature allows you to control whether the motor spins in the opposite direction. Checking this option will reverse the motor direction.

Use Sin Start — ON

Use Sine Wave Start

Soft Start — OFF

This feature enables a smooth acceleration of the motor during startup, reducing the impact force and load on the motor.

ESC Beep — ON

It determines whether the ESC emits audible beeps during startup, serving as an indicator of its status.

PWM Min(Effective after restart) — 1000

This setting determines the minimum PWM signal value that the ESC will recognize as the lowest throttle position.

PWM Max(Effective after restart) — 2000

It sets the maximum PWM signal value that the ESC will recognize as the full throttle position.

Soft Brake — ON

This feature controls whether the ESC implements a smooth braking action when transitioning to low throttle.

3D Mode(Effective after restart) — OFF

It activates a special mode in the ESC suitable for performing aerobatic maneuvers and 3D flight actions.

Current Calibration — 100%

This option allows you to calibrate the ESC to accurately measure current, providing precise current data.

Current Limit — 85A

It lets you set the maximum current output limit of the ESC to protect both the ESC and the motor from overloading.

BEC Voltage	5.00V

You can specify the output voltage of the ESC's built-in BEC (Battery Eliminator Circuit).

Trapezoidal Mode	ON

Trapeziodal commutation

Phy Id	10

This setting specifies the physical ID used for communication.

App Group Id	0

This setting specifies the Sensor ID used for communication.

Time Gap	200ms

It determines the time gap between communications.

Motor Pole Count	12

It refers to the number of magnetic poles inside the motor. You need to set the correct pole count to ensure proper motor rotation and ESC commutation.

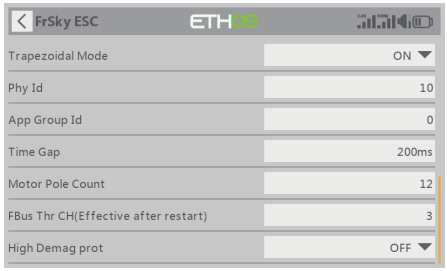
FBus Thr CH(Effective after restart)	3

Specify the serial port signal channel for the throttle channel input signal used to control the ESC, such as SBUS/FBUS.

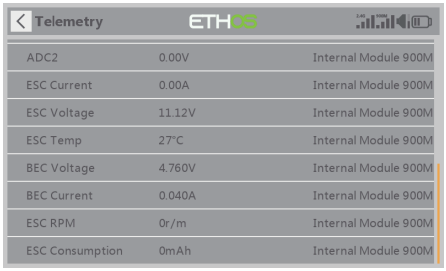
High Demag prot	OFF

High demag. protection

Here is the telemetry sensor configuration and feedback for the ETHOS system.



Parameter configuration



Telemetry feedback

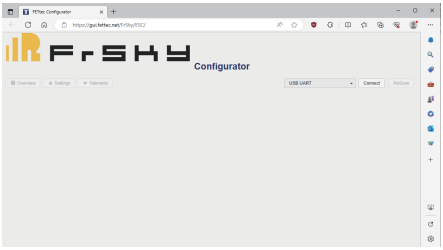
Warnings

- Before using the ESC, please read through the manuals of all power devices and models. Ensure rational power configuration, or it will make the unit overloaded and damaged.

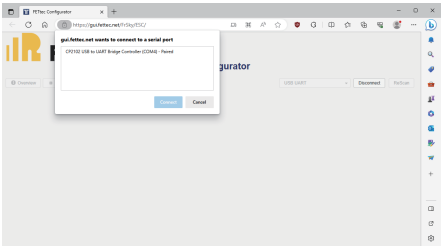
- Always keep your model away from unsafe elements, such as concrete buildings and high-voltage power lines. Fly your models according to the manual strictly, or it may cause damage and serious injuries.
- Always disconnect the batteries from the ESC after use, or it may drive the motor to rotate and cause injuries. If the ESC is connected to the battery for a long time, the battery will be fully discharged, which may lead to the malfunction of both batteries and the ESC.

Firmware Upgrade for NEURON2 ESC

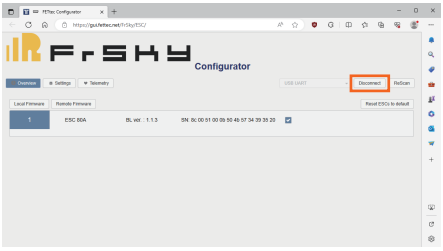
- Configuration Device: STK Tool (Separate Purchase Required)
- Webpage Configurator: https://gui.fettec.net/FrSky/ESC/



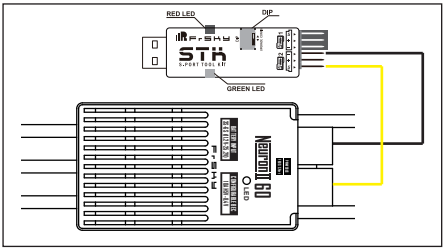
Step 1: Connect the STK tool to the PC, and select the "USB UART" port on the Configurator webpage.

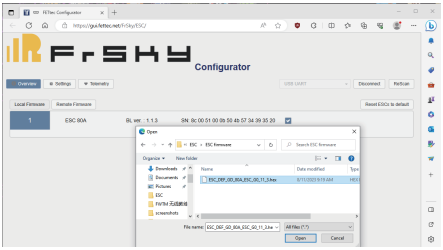


Step 2: A connecting request window prompts up at this moment and then click the "Connect" button.

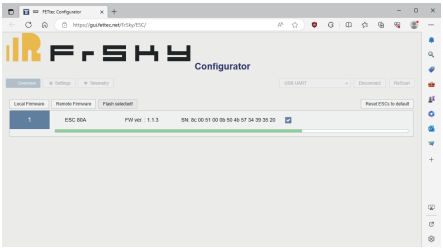


Step 3: Connect the NEURON2 ESC to the S.Port 2 and switch the Dip to "Upgrade" mode. Once powering the ESC then, please click the "Connect" button in 5 seconds to complete the connection.





Step 4: Click the "Local Firmware" button and find the path of the firmware to update the ESC.



Step 5: Click the tab "Flash selected" waiting for the completion of the flashing bar. A prompt of the "Warning" window means the flash is done.