



Flipsky Remote Controller VX4Pro

User Manual

V1.0.0

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1 Overview

Thank you for purchasing this product!

The remote controller VX4 adopts 240*240 high definition color display screen which can show data clearly under sunshine. The Mini-sized designation is easy to carry with beautiful outlook. Also, a new communication chip SX1280 is used, which is based on LoRa spread spectrum modulation technology. Compared with the traditional FSK or OOK-based on modulation, the LoRa modem applies spread spectrum modulation and FEC (forward error correction) techniques to widen the radio modulation communication range leading to stronger signals and longer communication distance. An important aspect of LoRa modems is their superior immunity to interference. It has up to 19.5dB of co-channel rejection.

Please read the user guide carefully. Flipsky shall not be liable for any defects that are caused by neglect, misuse or mistreatment by the customer, including improper installation or testing, or for any products that have been altered or modified in any way by the customer. Moreover, Flipsky shall not be liable for any defects that result from the customers design, specifications or instructions for such products. Flipsky deserves the right to change products design, appearance, specifications etc.

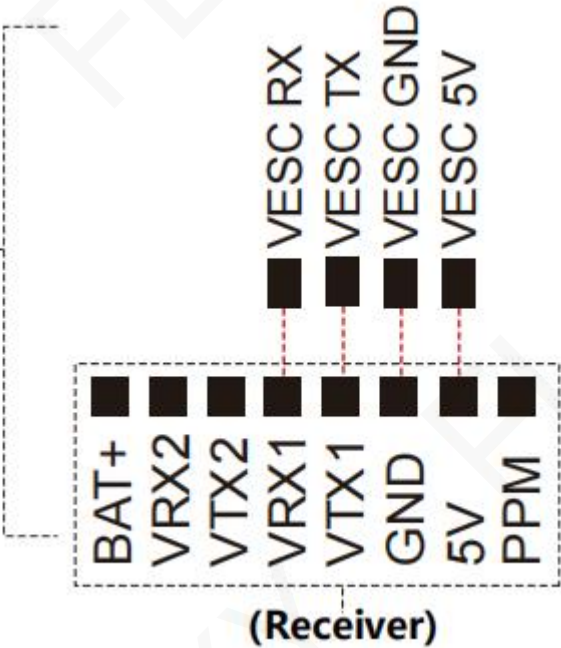
2 Product Introduction & Wiring diagram

2.1 Product Introduction

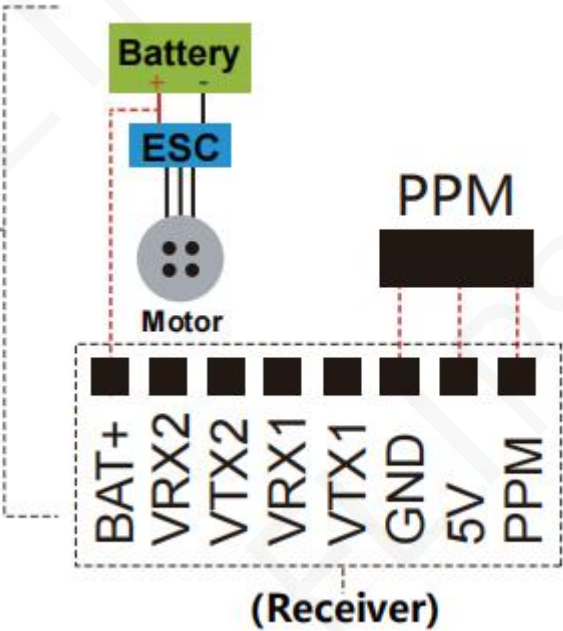


2.2 Wiring diagram

UART control mode
(with forward and reverse switching
function for escs based on VESC
and FTESCs)



PPM control mode
(Applicable to all ESCs)



3 Operation Instruction

3.1 Power On / Off

- Power on: Press power on / off button for 2 seconds to turn on, and the remote screen display "FLIPSKY" and vibrates at the same time;
- Power off: Press power on / off button for 2 seconds to power off, and the remote vibrates at the same time.

Notes: The Remote will power off in 10 minutes without any operation, except for cruise control mode.

3.2 Throttle Lock

- Add the throttle lock function. The throttle is default locked after power on. Double click the power button to unlock or lock the throttle.

3.3 Remote Home Screen Switching

- VX4 remote controller can display two home screens:
 - The previous displaying screen (Home Screen 1) can display battery power, speed, mileage, etc.
 - The new displaying screen (Home Screen 2) can display more information, such as motor ERPM, battery voltage, ESC mosfets temperature, motor temperature, signal ping, motor & battery current, power, duty cycle mileage and speed etc.; Among them, the ESC CPU loading display is suitable for FTESC series only.

- Switch the home screen display:

Long press the power and function button at the same time until the remote controller vibrates, and the home screen display can be switched.

Notes: The remote controller defaults to Home Screen 2 (as screenshot 2).

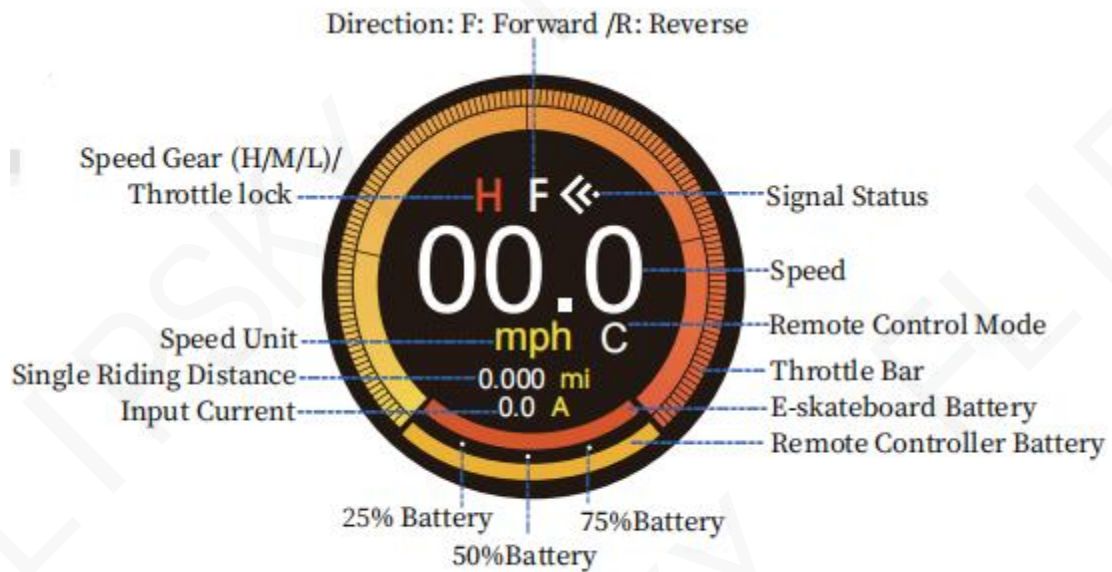
- Remote controller for all FTESCs or one separately (suitable for ESC Type FSESC only):

Display "Normal" (screenshot 2) stands for all CAN devices FTESCs on synchronous control. If you've finished CAN SCAN in Identify Motor Para or ESC Setup Interface, then long press the power and function buttons at the same time in Home Screen 2 to control one of escs separately.

For example, when the 2WD with Master ID: 62 and Slave ID: 177. Long press the power and function buttons at the same time in Home Screen 2 to control one of escs like master board or slave board separately. If master board under control only, the "NORMAL" changes to "ID:62", and if the slave board only, the "NORMAL" changes to "ID:177" instead. Long press the power and function

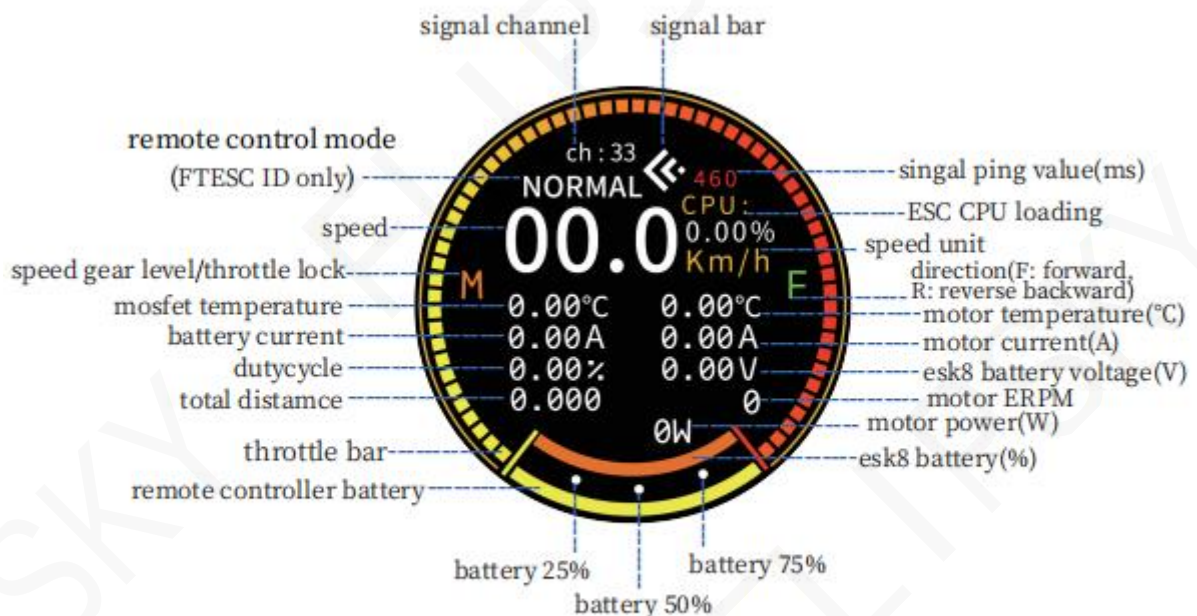
buttons again to back the Home Screen 1 to recover the normal control mode.

Notes: When one of escs under control only, the motor control mode is bidirectional current control supporting reverse. The rotation forward and reverse current is $\pm 50A$.



(Display Screen 1)

Screenshot 1



(Display Screen 2)

Screenshot 2

3.4 Remote Pairing

- The remote will not work unless it's paired with the receiver.

Step 1: Power on the remote and press the function button for 2 seconds, then the remote comes to parameters setting mode as screenshot 3.

Step 2: Long press the function button until "Pairing" blinking and the remote will enter in pairing mode.

Step 3: Connect the receiver with the ESC, and then power on so that the remote and receiver begin pairing, and then screen shows "Pairing succeed" with signal bar in home screen as screenshot 4 and screenshot 5.

Notes: For step 3, if the receiver without solid blue led within 10 seconds but blinking, and the screen doesn't show "Pairing succeed", which means pairing failure and will exit pairing mode. Please re-power on the receiver and try to pair again.



Screenshot3



Screenshot4



Screenshot5

3.5 Remote Control Modes Switching & Lights Control

3.5.1 Control Modes Switching

- Control Modes Setup

There are four control modes choices: Normal, Tank, Climb and Brake-Parking. The default control mode is Normal, and other control modes are in status of OFF. Please refer to 3.26.3.22 UART control mode settings.

- The way of switching control modes: Short press the model button to switch the control types.
 - NORMAL: screenshot 2
 - TANK: screenshot 4
 - CLIMB: screenshot 5

Note: Pull the remote controller throttle bar about 0.5S to enter into Brake-Parking Mode after the motor

stop running. The button model can not switch Brake-Parking Mode and needs to be enabled and disabled in Flipsky_ESC_Tool or the remote control settings.

3.4.2 Lights Control

■ Activate the light control mode

- The default light control mode is in status OFF. Please select the light control mode in “UART Extra Interface”. The way of selecting control mode and setup refers to “3.26.3.22 UART control setup”.
- Application condition: available for FT dual ESC FT85BD & FT60BD only at present, and in UART control type.

■ How to set the related lights?

- Front Light: Short press the power button to power on the front light (as screenshot 6), and short press the power button again to turn off the light.
- The front light has 3 different modes choices: low light, strong light and flashing light. The method to switch different light modes is to re-power on the light. For example, if the front light power on with strong light, power off it and power on it again, the light becomes low light, the same way as flashing light and back to strong light.
- Brake Light: Pull the brake trigger to power on the brake light.
- Horn: Press the horn button to buzz and release it to stop. as screenshot 7.



Screenshot 6



Screenshot 7

3.6 Connection Status Check

■ Connection Status:

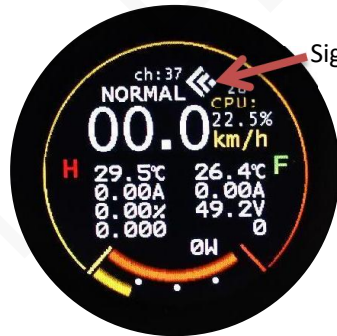
- A signal bar on the upper right corner of the remote screen as screenshot 9 and the receiver with solid led light as screenshot 8--Connected.
- No signal bar on the upper right corner of the remote screen and the receiver with blinking led--Not

connected.

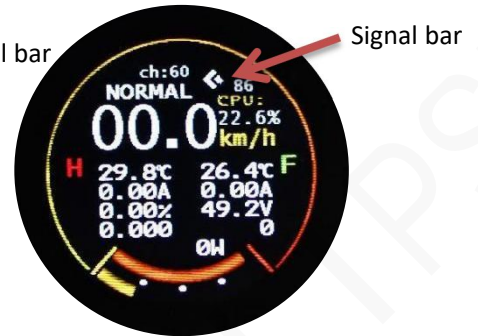
- The full signal is designed with 3 bars as screenshot 10. The more the stronger, the less the weaker of the signal. It may fluctuates for application environment signal interference or shielding.



Screenshot 8



Screenshot 9

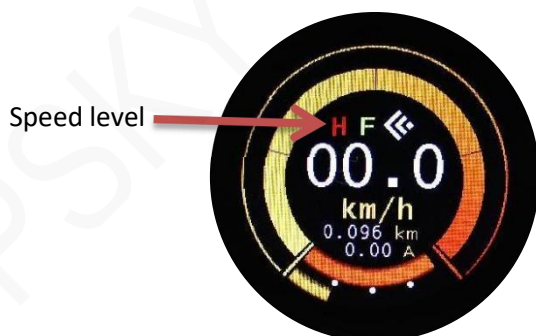


Screenshot 10

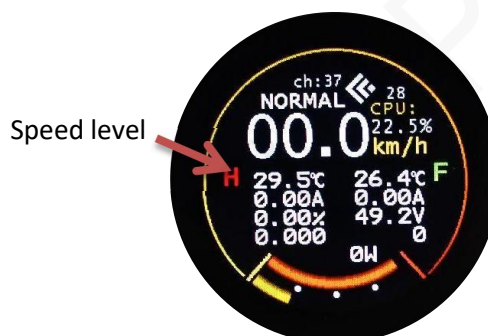
3.7 Throttle Acceleration / Brake / Speed Levels Switch / Default Speed Level

Setup

- Push the throttle for acceleration and pull it back for brake.
- Speed Gear Levels Switching: When the throttle gear is at the initial point, short press the remote function button to switch the speed gear levels accompanying with short vibration of the remote controller.
- 3 Speed Gear Levels: Low "L", Middle "M" and High "H". The default speed is high "H", and you can set per your requirement as details in "3.20 Speed Gear Level Default Setup".
- Speed gear level showing as below screenshots: Home Screen 1(screenshot 11); Home Screen 2 (screenshot 12).



Screenshot 11



Screenshot 12

3.8 Control Type Setup

- 3 Control Types: PPM, UART, PPM and UART. The factory default is "UART" type.
 - PPM: This type can control and drive the motor without data display, suitable for all ESCs supporting PPM signal.
 - UART: This mode can control and display data, compatible for all ESCs based on VESC and FTESCs.
 - PPM and UART: Adding this mode to fulfill customers' special needs under PPM mode like dutycycle control mode or speed control mode in needs of real time data. As for this type, it uses the PPM to control and uses the UART to read the VESC data (UART is only used to display data, not for control). Remember to set the "APP to Use" PPM and UART in VESC TOOL. If uses FTESCs, set the "Input Signal Type" PPM.
- Ways of switching control types as follows:
 - Step 1: Long press the function button 2 seconds to enter into the setting mode. Pull the throttle gear to switch the "Control Type".
 - Step 2: Short press the function button and switch for control type choices until the screen "UART" flashing.
 - Step 3: Pull / Push the throttle gear for control type selection.
 - Step 4: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 13

3.9 ESC Type Selection

- ESC type introduction:
 - 3 ESC choices available: "FSESC", "FOCBOX" and "FTESC". The factory default is "FSESC". "FSESC" is ESCs based on VESC; "FOCBOX" is UNITY; "FTESC" is the ESCs developed by Flipsky.
- Steps of changing ESC types:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "ESC Type" as screenshot 14. Short press the function button and switch for ESC type choices until the screen "FSESC" flashing. Pull / Push the throttle gear for ESC type selection.

Step 3: Short press the power button to confirm and then short press again to back the home screen.

Notes: If the ESC type is "FTESC" as screenshot 15, 3 more setting options will be showed in the remote setup: "Identify Motor Para", "ESC Setup" and "ESC Factory Reset".



Screenshot 14



Screenshot 15

3.10 Throttle Calibration

- Please do throttle calibration for the first time usage.
- The steps of calibrating throttle:

Step 1: Long press the function button to enter into parameters setting process after power on.

Step 2: Pull / push the throttle bar to switch the setting options. Enter in "Throttle Calibration", and the screen displays the throttle value: max, middle and min as screenshot 16.

Step 3: Short press function button to enter the calibration mode as screenshot 17 (the throttle value will be reset and the font turns red). Short press the function button again to reset the throttle value and re-do throttle calibration.

Step 4: Max pull and push the throttle trigger in full to gain the corresponding throttle value as screenshot 18. Short press the power on/off button to confirm the settings and then short press it again to exit and back to home interface.



Screenshot 16



Screenshot 17



Screenshot 18

3.11 Battery Cells and Motor Pole Pairs Setup

■ Battery Cells Setup: range 3~30S

- Correct battery cells setup determines the correct ESC battery percentage signal accuracy. Please set the correct battery cells number per your battery specification. The factory default is 12S.

- Steps of Setting Battery Cells:

Step 1: Long press the function button 2 seconds to enter into the setting mode;

Step 2: Pull the throttle gear to switch the "Battery Cells" as screenshot 19. Short press the function button until the screen "12" flashing to change the Cells. Pull / Push the throttle gear to increase or decrease the Cells number.

Step 3: Short press the power button to confirm and then short press again to back the home screen.

■ Motor Pole Pairs Setup: range 3-250

- Correct pole pairs q'ty setup determines the correct speed display in remote screen. Please set the pole pairs number per your motor specification. The factory default is 7.

- Steps of Setting Motor Pole Pairs:

Step 1: Long press the function button 2 seconds to enter into the setting mode;

Step 2: Pull the throttle gear to switch the "Pole Pairs" as screenshot 13. Short press the function button until the screen "7" flashing to change the pole pairs q'ty. Pull / Push the throttle gear to increase or decrease the pole pairs number.

Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 19



Screenshot 20

3.12 Speed Option Switching

- Two speed units are available: "km/h" and "mph". The factory default is "km/h";

- Steps of Speed Option:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Speed Option" as screenshot 21. Short press the function

button until the "km/h" screen flashing to change the speed unit. Pull / Push the throttle gear to change the speed unit.

Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 21

3.13 Wheel Type Setup

■ Motor Wheel type:

2 Motor Wheel Types Choices: "Pulleyed" and "HUB motor". The factory default is "Pulleyed".

■ Motor wheel type description:

- "HUB motor": Set the correct wheel diameter only.
- "Pulleyed": belt or geardrive motors. Besides the wheel diameter, please also set the motor and wheel gear teeth q'ty, which affect the speed display accuracy.

■ Steps of Motor Wheel Type Setup:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Wheel Type" as screenshot 22. Short press the function button until the "Pulleyed" screen flashing to choose the motor type. Pull / Push the throttle gear to select.

Step 3: Short press the power button to confirm and then short press again to back the home screen.

Notes: "Motor Pulley" and "wheel pulley" settings for "Pulleyed" Wheel Type only, neither of them for "HUB motor".



Screenshot 22



Screenshot 23

3.14 Wheel Diameter Setup

- Correct wheel diameter setup determines the accuracy of speed display in remote screen. Please do not set the incorrect wheel diameter, adjustable range: 5—999mm.
- Steps of Setting Wheel Diameter:
 - Step 1: Long press the function button 2 seconds to enter into the setting mode;
 - Step 2: Pull the throttle gear to switch the "Wheel Diameter" as screenshot 24. Short press the function button until the screen "5" flashing to change the wheel diameter. Pull / Push the throttle gear to increase or decrease wheel diameter number.
 - Step 3: Short press the power button to confirm and then short press again to back the home screen.

3.15 Motor Pulley and Wheel Pulley Setup

- Correct motor and wheel pulleys setup determines the accuracy of speed display in remote screen. Please set the correct pulley teeth q'ty per motor and wheel pulleys, adjustable range: 5-250.
- Steps of Setting Wheel Diameter:
- Motor Pulley Setup
 - Step 1: Long press the function button 2 seconds to enter into the setting mode;
 - Step 2: Pull the throttle gear to switch the "Motor Pulley" as screenshot 25. Short press the function button until the screen "10" flashing to change the motor pulley teeth q'ty. Pull / Push the throttle gear to increase or decrease teeth number.
 - Step 3: Short press the power button to confirm and then short press again to back the home screen.
- Wheel Pulley Setup
 - Step 1: Long press the function button 2 seconds to enter into the setting mode;
 - Step 2: Pull the throttle gear to switch the "Wheel Pulley" as screenshot 26. Short press the function button until the screen "5" flashing to change the wheel pulley teeth q'ty. Pull / Push the throttle gear to increase or decrease teeth number.
 - Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 24



Screenshot 25



Screenshot 26

3.16 Throttle Sensitive Level Setup

- 4 throttle sensitive levels are available: level 0-level 3, the higher level the more sensitive of the throttle gear. The factory default is "level 3".

- Steps of Setting Throttle Sensitive Level:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Thrott Sensitive" as screenshot 27. Short press the function button until the "level 3" screen flashing to change the throttle sensitive level. Pull / Push the throttle gear to increase or decrease the throttle sensibility.

Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 27

3.17 Remote Throttle Joystick DeadBand Setup

- Joystick DeadBand Setup: default deadband 5%; Adjustable range: 1%~25%.

- Steps of Setting Throttle Sensitive Level:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Joystick Deadband" as screenshot 28. Short press the function button until the "5%" screen flashing to change the deadband percentage. Pull / Push the throttle gear to increase or decrease the percentage.

Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 28

3.18 Low Battery Warning Setup

- The remote controller vibrates and the display screen shows "The Battery Power is less than xx%! Please charge!" when the power becomes less than 10% as screenshot 29. The factory default is "ON".

- Steps of Setting Low Battery Warning:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Low Battery Warning" as screenshot 30. Short press the function button until the "ON" screen flashing to open or close the warning function. Pull / Push the throttle gear to select "ON" or "OFF".

Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 29



Screenshot 30

3.19 Screen Theme Colour Setup

- 3 screen theme color choices: red, green and blue. The factory default is red.

- Steps of Setting Screen Theme Colour:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Theme Color" as screenshot 31. Short press the function button until the "RED" screen flashing. Pull / Push the throttle gear to select the desired colour.

Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 31

3.20 Speed Gear Level Default Setup

- 3 speed gear level choices: LOW, MIDDLE and HIGH. The factory default is "HIGH".
- Steps of Setting Speed Gear Level:
 - Step 1: Long press the function button 2 seconds to enter into the setting mode.
 - Step 2: Pull the throttle gear to switch the "Default Speed Gear" as screenshot 32. Short press the function button until the "HIGH" screen flashing. Pull / Push the throttle gear to select the desired speed level.
 - Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 32



Screenshot 33

3.21 Cruise Mode Setup

- **Optimize the Cruise Control Mode:** achieve constant speed control in cruise mode, which is different from the vesc based escs' constant throttle current control.
- How to set cruising mode?
 - Enter into cruise mode: Push the throttle gear to a speed that you like , then short press the function button. The remote controller will vibrate one time, and then your are in cruise mode.
 - Stop the cruise mode: Press any button or throttle gear to finish the cruise mode.
- Cruise Mode Switch ON / OFF
 - "ON": start cruise mode.
 - "OFF": stop cruise mode.
- Cruise Mode Switch ON / OFF Setup

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Cruise Switch" as screenshot 33. Short press the function button until the "OFF" screen flashing. Pull / Push the throttle gear to select "ON" or "OFF".

Step 3: Short press the power button to confirm and then short press again to back the home screen.

3.22 Motor Rotation Forward and Reverse Setup

■ Motor Forward and Reverse Setup

- Condition: The control mode is UART and the remote controller is connected. (Please note that the one key reverse function is not available for PPM control mode.)
- Reverse operation way: double-press the function button to switch from forward (screenshot 34) to reverse (screenshot 35) accompanying with long vibration of the remote controller.

■ Motor Reverse Switch ON / OFF

- "ON": Activate the forward and reverse one key function
- "OFF": Inactivate the forward and reverse one key function

The factory default "Reverse Switch" is ON.

■ Steps of Motor Rotation Forward and Reverse Setup

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Reverses Switch" as screenshot 36. Short press the function button until the "OFF" screen flashing. Pull / Push the throttle gear to select "ON" or "OFF".

Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 34



Screenshot 35



Screenshot 36

3.23 Throttle Gear Lock Setup

- Adding the throttle "Gear Lock Switch" setup to prevent accidental touch of the throttle gear. The speed gear level cannot be changed when this function "ON". The factory default status is "OFF" (Screenshot 30).

■ Steps of throttle gear lock setup:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Gear Lock Switch" as screenshot 37. Short press the function button until the "OFF" screen flashing. Pull / Push the throttle gear to select "ON" or "OFF".

Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 37

3.24 Total Distance Display

- The travel distance odometer is auto-saved by remote controller. If you want to start from zero again, you can follow these steps below.

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Total Distance" to check the distance data. Long press the function button to restore zero.

Step 3: Short press the power button to back the home screen.



Screenshot 38

3.25 FTESC and Motor Parameters Setup by Remote Controller VX4

Notes: The ESC type must be set "FTESC" to enable the settings via this remote controller VX4.

3.25.1 Parameters Definitions and Identification

- Preparations for Parameters Identification:

- Motor Rated Current (Screenshot 39)

Write the motor rated current per motor specifications, not the max. or peak current (default: 50A; adjustable range: 5—500A)

- Battery Cells Series (Screenshot 40)

Write the battery Lipos per battery specifications (1S=4.2V full charge; default: 3S; adjustable range:

3-30S)

➤ Battery Cutoff Vott (Screenshot 41)

Battery voltage cutoff per cell setup to prevent the battery over discharge (default: 3.1V; adjustable range: 2.6V ~ 3.3V; LiFePO4 battery set to 2.6V/cell)

➤ Identify ESCs (Screenshot 42)

Select the motor that needs to do parameters identification.

- a.) All ESC (Set for all motors connected with the FTESCs)
- b.) Master ID: XX (Set for the motor connected with the master FTESC only)
- c.) Slave1 / Slave2 / Slave3 ID: XX (Set for the motors connected with FTESC slave boards slave 1, slave 2 or slave 3)

■ Steps of Motor Parameters Identification Precautions Setup:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "Identify Motor Para" (screenshot 39). Short press the function button to enter the settings interface (screenshot 40). Pull / Push the throttle gear to set the parameters. Short press the function button until the screen blinking, and then pull / push the throttle gear to increase or decrease the related data.

Step 3: Short press the power button to confirm and then short press again to back the home screen.



Screenshot 39



Screenshot 40



Screenshot 41



Screenshot 42

3.23.2 Identification Results Check and Fault Codes

■ Precautions before the motor parameters identification:

■ To make sure the success of "Identify Motor Para" process and best matching data, please do as follows:

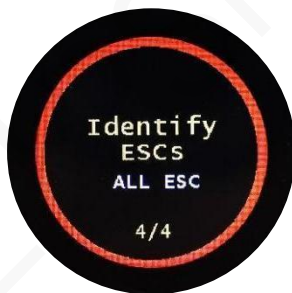
- With no loading.
- Motor rated current write in the ESC TOOL per your motor specifications to avoid the motor burnt or

damage.

- Battery cells series write correctly in the ESC TOOL based on your battery specifications to protect the battery from over-discharging or damage

■ Steps of Motor Parameters Identification:

After finishing the precautions mentioned setup in 2.22.1, do settings in the parameters identification interface as screenshot 39-43. Long press the function button to start the parameters settings (screenshot 44). The motor will start rotating after making a identification sound, and it will stop running and show the identification results after the process complete as screenshot 45.



Screenshot 43



Screenshot 44



Screenshot 45

■ Parameters Identification Results Explanation

- ESC ID: ESC ID Number
- Startup: Motor Starting Mode
 - a.) IPDS: Initial Position Detection Startup (sensorless mode)
 - b.) HFPI: High Frequency Pulse Injection (sensorless mode)
 - c.) HALL: Hall Sensor Mode
- Φ: Motor Flux Linkage (mWb)
- R: Motor Phase Resistance (mΩ)
- Lq: Motor Q-Axis Inductance (uH)
- Ld: Motor D-Axis Inductance (uH)
- Hall Code:
 - Code 1: HALL Sensor
 - Code 2: Hall One Phase Absence
 - Code 3: Hall Two-Phase Absence
 - Code 4: Hall Three-Phase Short Circuit
 - Code 5: Overloading, Undetected
 - Code 6: No HALL Sensor

■ Interpretation of motor parameters identification abnormal results:

- Failed 1: Please set the correct battery cell series.

Notes: Please make sure the battery Lipos matching the using battery. Otherwise, it leads to detection failure, battery over-discharge protection, battery life span etc.

- Failed 2: The ESC is still faulty, please check the fault code notice.

Notes: Please check the fault code and take corrective actions per codes notification.

- Failed 3: The motor R&L identify failed. Maybe the motor is NOT connected properly.

Notes: Please check the ESC and motor wires connections.

- Failed 4: The motor hall sensor identify failed. please check the motor hall sensor.

Notes: Please check the motor hall sensor wire connection and measure the motor hall sensor voltage to see if normal.

- Failed 5: The motor flux linkage identify failed. Maybe the motor load is too heavy.

Notes: Please check if overloading happens or the correct matching motor setup.

3.26 FTESC Setup

Notes: The ESC type must be set "FTESC" to enable the settings via this remote controller VX4.

3.26.1 Scan Multiple ESCs via CAN

■ Ways of Scanning the ESC IDs:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "ESC Setup". Short press the function button to enter the ESC setup interface (screenshot 47).

Step 3: When the ESC setup interface shows "SEARCHING", it indicates that the master ESC starts searching other CAN slave ESCs. All CAN ESC devices firmware version & ID will display after the finish as screenshot 48.

- a.) Master firmware version & ID: xx
- b.) Slave1 firmware version & ID: xx
- c.) Slave2 firmware version & ID: xx
- d.) Slave3 firmware version & ID: xx

- If it is a dual ESC or 2WD escs, i. and ii. will be displayed. At present, the remote controller VX4 can support settings up to 4 ESCs at the same time.



Screenshot 46



Screenshot 47



Screenshot 48

3.26.2 ESC Parameters Setup

■ Steps of setting parameters:

Step 1: Enter into the ESC parameters setup interface as 2.24.1 and set parameters by pulling / pushing the throttle gear.

Step 2: Short press the function button to do settings. Pull / Push the throttle gear to the setting items, and short press the function button until screen blinking. Pull / Push the throttle gear again to change the data per your needs.

Step 3: The Master ESC with one more set item "Set (2-26) to ALL ESC" for other slave escs.

- a.) Choose "Yes" and long press the function button, parameters 2-26 will be synchronized to setup to the Master ESC and other Slave ESCs.
- b.) Choose "No" and long press the function button, parameters 2-26 are setup to Master ESC only.

Step 4: No "Set (2-26) to ALL ESC" choice for slave escs, so long press the function button enables to do settings for itself only.

Step 5: After the complete of parameters settings, long press the function button to send related data to the ESCs and the display screen will show "Success". Short press the power button to exit the ESC parameters setup interface, and short press the power button again to exit the remote controller setup function mode.

3.26.3 ESC Parameters Explanation

3.26.3.1 ESC Synchronized Settings

- Set (2-26) to ALL ESC: Parameters settings (2-26) are sent to all ESCs simultaneously
 - a.) Yes
 - b.) No

3.26.3.2 Motor Erpm Setup

- H-Gear Max Erpm: The motor maximum Erpm at high speed gear, adjustable range: 500~250000.
- M-Gear Max Erpm: The motor maximum Erpm at middle speed gear, adjustable range: 500~250000.
- L-Gear Max Erpm: The motor maximum Erpm at low speed gear, adjustable range: 500~250000.
- R-Gear Max Erpm: The motor maximum Erpm in reverse direction, adjustable range: 500~250000.
- Positive Max Erpm: Motor forward maximum Erpm., adjustable range: 500~250000.
- Negative Max Erpm: Motor reverse maximum Erpm, adjustable range: -250000~-500.

3.26.3.3 Motor Startup Mode Setup

- Startup Mode: Motor Starting Mode
 - a.) IPDS: Initial Position Detection Startup (suitable for light loading sensorless mode such as underwater DPVs, multi-axis FPVs etc.)
 - b.) HFPI: High Frequency Pulse Injection (suitable for heavy loading sensorless mode such as E-Bike, E-Board, Go-cart etc.)
 - c.) HALL: Hall Sensored Mode (widely used, especially suitable for equipments with full load)
 - e.) Encoder: Encoder Control Mode Setup
- Motor Sensor Port:
 - a.) Hall sensor: 3 phase hall effect sensor with 120 degrees electrical apart.
 - b.) ABI Encoder: Phase A and phase B output orthogonal pulse sequences, and phase I outputs a pulse signal for each rotation. Note: As the ABI encoder cannot detect the initial position of the rotor, it is recommended to rotate the motor one circle manually for zero position calibration after starting the ESC for the first time, otherwise unexpected situations may occur if sending control commands forcibly .
 - c.) AS5047(SPI): The SPI encoder can detect the absolute position of the rotor, so no zero position calibration is required and it can work normally for the first time power-on.

■ HFPI Saliency Gain:

Adjustable range: 0.5~4.0

Parameter description: This parameter setup is designed for the accuracy of angle measurement and reduce noise in HFPI mode, which can be matched automatically after the motor parameter identification finish and it's not necessary to write manually.

■ HFPI Voltage Gain

Adjustable range: 0.2~3.0

Parameter description: This parameter setup is designed for high-frequency pulse voltage injection needs of motor D-axis in HFPI mode, which is determined by the motor specification and can be matched automatically after the motor parameter identification finish, so it's not necessary to write manually.

3.26.3.4 Max Current Setup

■ Max Motor Current (A): The motor maximum continuous current (A), adjustable range: 0~500.

■ Max Motor Brake Current(A): The motor maximum braking current (A), adjustable range:-500~0

Notes: If using the DC power supply, the Max Motor Brake Current must be set to "0". Otherwise, the large back EMF will damage the ESC or even the power supply when the motor brakes in a high speed state.

■ Max Battery Current(A): Battery maximum continuous output current (A), adjustable range: 0~500

Notes: When setting Max Battery Current, it must be set according to the battery specification. Set a battery with maximum continuous output current 50A as an example:

Single ESC, Max Battery Current: 50A

Dual ESC, Max Battery Current: $50/2=25A$

4WD ESC, Max Battery Current: $50/4=12.5A$

The total output current of the battery must not exceed the battery maximum continuous output current specification. Otherwise, the BMS will cut off the power supply leading to motor's running out of control, which is very dangerous and may result in hurt for you. Moreover, please make sure that the Max Battery Current setting value does not exceed than that of the DC power supply to avoid ESC damage or unsafe happenings.

- Max Battery Regen Current: battery max continuous regenerative current (A), adjustable range:-500~0
- Notes: If using the DC power supply, the Max Battery Regen Current must be set to “0”. Otherwise, the large back EMF will damage the ESC or even the power supply when the motor brakes in a high speed mode.

3.26.3.5 Motor Temperature Sensor Type Setup

- Motor Temp Sensor Types:

- NTC-10K-25°C
- NTC-100K-5°C
- PT1000
- PTC-1K-100°C
- KTY83-122
- KTY83-152
- KTY84-130
- KTY84-150
- KTY84-151
- KTY84-152

- NTC-25C-10K Beta Value:

Adjustable range: 0~10000K

Parameter description: It's suitable for temperature sensor NTC 10K resistors at 25°C. All Flipsky motors with this temperature sensor, and the β value is 3380K.

- PTC-100C-1K Alpha Value

3.26.3.6 Zero Duty Mode Setup

- Zero Duty Mode

- a.) Keep Output
- b.) Release Motor

Parameter description: If set duty cycle 0% in Zero Duty Mode, customers can choose the mode of Keep Output or Release Motor.

3.26.3.7 Flux Weakening Current Setup

■ Flux Weakening Current:

- Adjustable range: 0~350
- It stands for the current value applied to the D axis during Flux weakening control. Increasing this value can increase the maximum speed limit of the motor. The larger the value, the higher the maximum speed, but the current consumption is also greater and the motor becomes hotter at the same time. It is recommended to set it to no more than 1/4 of the motor max current.

3.24.3.8 Power On Beeping Hint Setup

■ Power On Beeping Hint:

- After enabling this function, 3 times “Beep” after ESC is powered on.
 - a.)OFF
 - b.)ON

It's workable only after finishing motor parameters setup, otherwise the sound will be abnormal.

- Beeping Level(%):
Adjustable range: 0%~95%

3.26.3.9 Observer Erpm Threshold Setup

■ Observer Erpm Threshold:

- Adjustable range: 500~250000

When ERPM is bigger than this value, it will switch to the flux observer to measure the rotor position and speed.

3.26.3.10 Battery Cells Series Setup

■ Battery Cells Series:

Adjustable range: 3~30S

Generally 1S=4.2V (full charge), please set the lipos per your battery specification. Default: 3S

- Battery Cutoff Volt:

Adjustable range: 2.6~3.3V

Setting cell cut-off voltage to prevent the battery from over-discharging, and then lengthening the battery life span. Default value: 3.1V.

3.26.3.11 ABI Encoder Counts

- This parameter is 4 times the number of pulses output by the encoder when it rotates one circle. For example, if both phase A and phase B output 1000 pulses when they rotate one circle, they should be set to 4000 as 4 times of the frequency.

3.26.3.12 PWM Frequency Setup

- Min PWM Frequency

Adjustable range: 2000~45000

Parameter description: This parameter can be matched automatically after the motor parameter identification finish and no need to write manually.

- Max PWM Frequency

Adjustable range: 10000~45000

Parameter description: This parameter can be matched automatically after the motor parameter identification finish and no need to write manually.

3.26.3.13 Bus Voltage Resistance Setup

- Bus Voltage Resistance:

Adjustable range: 0~2000

Adding motor "Bus Voltage Resistance" setup to make the power supply voltage detected more accurately (adjust according to the voltage measured by the multi-meter or the power supply voltage). If not necessary, keep the default value without modification.

3.26.3.14 Motor Rotation Direction Setup

- Rotation Direction
 - a.) Positive
 - b.) Negative (Reverse)

3.26.3.15 ESC ID Setup

- ESC ID: ESC ID Number, adjustable range: 1~254 for multiple ESCs via CAN.

Please make sure the uniqueness of the ESC ID since the same ESC IDs result in parameter identification failures or abnormal control. ESC ID 0 (special command number) and ESC ID 255 (special broadcast command) are not available for setup.

- If multiple ESCs are connected via CAN but the ESC Tool fails to scan all devices, 3 possible reasons for failure as follows:
 - a.) The slave ESC boards' CAN terminal resistors haven't been removed.
 - b.) Different ESCs with same IDs
 - c.) One of ESCs' CAN baud rate is inconsistent with others.
- Troubleshooting:
 - a.) Make sure that the ESCs' CAN terminal resistors have been removed correctly except for the Start and the End CAN ESCs (section 4.1).
 - b.) Unplug the CAN-BUS wires. Check the ESCs IDs one by one by connecting them with the ESC Tool separately via USB cable. If same IDs happen, revise them to make sure the uniqueness of the ESC ID. (Notes: The IDs can also be set via Flipsky ESC Tool. See the details via Flipsky ESC Tool Manual 4.2)
 - c.) If still not workable and missing the ESCs, please check the ESC's CAN baud rate and make sure the consistency. (Notes: The ESC's CAN baud rate can be set via Flipsky ESC Tool only, not available by the remote controller. See the details via Flipsky ESC Tool Manual 7.2)
 - d.) If still not succeed after the above trials, please restore the factory default setup and try to connect the ESCs again.

3.26.3.16 Multi-ESC Sync Control Setup

- Multi-ESC Sync Control: synchronous control for multiple ESCs via CAN

- a.) ON
- b.) OFF

Parameter Description:

When the ESC is the master board and the "Multi-ESC Sync Control" is set to "ON", the input signal will synchronously control the master ESC and all CAN slave ESCs. If the "Multi-ESC Sync Control" is set to "OFF" in this situation, then the input signal controls the master ESC only.

When the ESC is the slave board and the "Multi-ESC Sync Control" is set to "ON", this slave ESC will under the control of master CAN-Bus. If the "Multi-ESC Sync Control " is set to "OFF" in this case, the slave ESC will shield the control commands from the master CAN-Bus.

Therefore, if you want multiple ESCs to be controlled synchronously, set all ESC's Multi-ESC Sync Control "ON". However, if you want to control each ESC separately in UART, PPM or ADC control type, set all ESC's Multi-ESC Sync Control "OFF".

If use your own control module as the master board and want to control the ESCs via CAN-Bus, set all ESC's Multi-ESC Sync Control "ON", and the Input Signal Type "OFF".

3.24.3.17 Throttle Response Level Setup

- Throttle Accel Level: Throttle Response Sensitive Level. 6 Levels: Level 0~Level 5.

- a.) Level 0
- b.) Level 1
- c.) Level 2-default
- d.) Level 3
- e.) Level 4-standard (no lead or lag on all input signals and is suitable for customers customized requirement)
- f.) Level 5

Parameter description: The higher of the level, the more sensitive of the throttle and brake response. The default level is Level 2, and Level 4 is the standard level which has no lead or lag on all input signals and is suitable for customers customized requirement.

3.26.3.18 Input Deadband Setup

- Input Signal Deadband: Adjustable range: 1%~25%

Parameter description: The ESC starts the current output only when the throttle input signal percentage is over than that of the input deadband setup . It's recommended to use the default value 10%. Regarding the input control type PPM and UART, the deadband percentage can be small or even 0% as the remote controller has set already, for example, the Flipsky remote controller VX4 with 5% deadband already . It's also fine to keep the default setting 10% as the ADC control type recommended.

3.26.3.19 Smart Switch Setup

- Smart Switch: applicable for FT ESC FT85BD only at present
 - a.) Keep Power On: status ON always until power off manually
 - b.) OFF 5min later/ESC5: auto shutoff without driving signal after 5 minutes later
 - c.) OFF 10min later /ESC10:auto shutoff without driving signal after 10 minutes later
 - d.) OFF 20min later/ESC20:auto shutoff without driving signal after 20 minutes later
 - e.) OFF 30min later/ESC30:auto shutoff without driving signal after 30 minutes later
 - f.) OFF 1hour later/ESC1:auto shutoff without driving signal after 1 hour later

3.26.3.20 Brake Light Duty (%) Setup

- Brake Light Duty(%): The brake light brightness setup in static.
Adjustable range: 20%~95%

3.26.3.21 Input Signal Control Type Setup

- Input Signal Types:
 - a.) OFF
 - b.) UART
 - c.) PPM
 - d.) ADC
 - e.) PAS

3.26.3.22 UART

■ UART Control Mode:

- a.) None
- b.) Current Gear Reverse Brake: Current control mode: gear speed level limit, reverse with brake, reverse
- c.) Current Gear Brake: Current control mode: gear speed level limit, reverse with brake
- d.) Current Reverse Brake: Current control mode: reverse with brake, reverse
- e.) Current Brake: Current control mode: reverse with brake
- f.) Duty Brake Reverse: Duty cycle control mode: gear speed level limit, reverse with brake, reverse

■ UART Extra Interface:

- a.) None (No extra interface connections)
- b.) Front Light: front light only
- c.) Brake Light: rear brake light only
- d.) Horn: horn only
- e.) Front and Brake Light: front+rear brake light
- f.) Front Light and Horn: front light+horn
- g.) Brake Light and Horn: rear brake light+horn
- h.) Front, Brake Light and Horn: front light+rear brake light+horn

Parameter Description:

Currently, UART Extra Interface is applicable to the UART mode of FT85BD、FT60BD's master board. For example, if choose Front, Brake Light and Horn mode in UART Extra Interface, you can control the front lights, rear brake lights and horn through the buttons and throttle joystick of the remote controller.

Ways of setting UART Extra Interface:

- Front Light: Short press the remote power button once to turn on the front light, and short press the power button again to turn off it.
- Note: Three light modes choices for our kit: weak, strong and flashing. The way to switch the light mode is to restart the front light. For example, when you turn on the front light for the first time, it will be in strong light mode. After turning off the front light and restarting, the front light will switch to weak light mode. When you power off the weak light mode and restart the front light the third time, it will be in flashing light mode.
- Brake Light: Pull down the throttle joystick gear to turn on the rear brake light.

- Horn: Press the power button twice quickly to activate the Horn or inactivate it.

■ UART Slow-Release:

Slow-Release Motor function enables FT series ESCs to maintain a certain current output after releasing the throttle under the UART input signal, which can offset the resistances of high gear ratios (>3.5:1) off-road skateboards or other sports kits and put the skateboards or sports kits in a release state with almost zero resistance and smoother starting process.

UART Slow Release Motor: default: OFF

UART Slow Dec Time: current output releasing time, default: 4.5s

UART Slow Dec Thro: current output throttle percentage, default: 5% ($0.05 \times \text{Motor Current}$)

UART Slow Dec Duty: the motor dutycycle percentage critical point. The function is inactive when the value is less. If more, then activate.

■ UART Reverse Delay Time:

Adjustable range: 0.10s ~ 5.00s (default 0.5s)

Parameter description: When the motor stops running, max pull or push the throttle gear for reverse as the Reverse Delay Time setup period, then the motor will run in reverse direction.

■ Turnaround Mode: Assisted Turnaround Mode Setup

- None: OFF the Assisted Turnaround function
- Dual Drive Mode: for two wheels driving. Two motors run in different direction during the turnaround process.
- Quad Drive Mode: for four wheels driving. One side motors rotate forward, but the other side motors rotate different direction reversely during the turnaround process.
- Note: This assisted turnaround function is applicable in UART control only. Also, it is only supported by VX4 remote controller firmware V1.4.0 or above and VX4 Pro firmware V1.0.0.

■ Brake-Parking Mode: Brake-Parking Mode Setup

- Brake-Parking Mode: Pull the remote controller throttle gear/bar 0.5S to enter into Brake-Parking Mode after the motor stop running. The greater percentage of pulling back the throttle gear, the bigger of the parking force.

Note:

- a.) This mode injects current into the motor d-axis to make the coil generate magnetic force and attract the rotor to achieve the parking effect, so current will be consumed when parking. The maximum d-axis current can reach Motor Current Max when parking. It is not recommended to park in this mode for a long time, otherwise the motor will get hot and lead to overload current limiting phenomenon.
- b.) When in Reverse Mode like Current Gear Reverse Brake or Current Gear Brake mode, max pulling the throttle gear / bar will end the Brake-Parking Mode but enter into Reverse Mode instead.
- c.) At present, this mode supports for remote VX4 (firmware version: V1.4) and VX4 Pro (firmware version: V1.0) only.

■ Off-Road Climbing Mode: Off-Road Climbing Mode Setup

- In this mode, all CAN escs will be switched to duty cycle control and allow users to pass off-road passing gravel roads or climbing high slopes easily by controlling speed of the four wheels synchronously via remote controller.

Note:

- a.) After using this mode, the reverse mode will be disabled.
- b.) At present, this mode supports for remote VX4 (firmware version: V1.4) and VX4 Pro (firmware version: V1.0) only.

■ Assisted Turnaround ESC ID Setup:

- a.) Left Front ESC ID(Slave):
- b.) Right Front ESC ID(Slave):
- c.) Left Rear ESC ID(Slave):
- d.) Right Rear ESC ID(Master):

3.26.3.23 PPM
■ PPM Control Mode:

- a.) None
- b.) Current (forward:1.0~2.0ms)

Current control mode, unidirectional control, only forward:1.0~2.0ms.

c.) Current Brake (brake:1.0~1.5ms,forward:1.5~2.0ms)

Current control mode, bidirectional control, brake:1.0~1.5ms, forward:1.0~2.0ms.

d.) Current Reverse (reverse1.0~1.5ms, forward:1.5~2.0ms)

Current control mode, bidirectional control, no brake, backward:1.0~1.5ms, forward:1.0~2.0ms.

e.) Current Reverse Brake(reverse/brake:1.0~1.5ms, forward:1.5~2.0ms)

Current control mode, bidirectional control, brake/reverse:1.0~1.5ms, forward:1.0~2.0ms.

f.) Duty(forward:1.0~2.0ms)

Duty control mode, unidirectional control, only forward:1.0~2.0ms.

g.) Duty Reverse(reverse:1.0~1.5ms, forward:1.5~2.0ms)

Duty cycle control mode, bidirectional control, backward:1.0~1.5ms, forward:1.0~2.0ms.

h.) Duty Reverse Brake(reverse/brake:1.0~1.5ms, forward:1.5~2.0ms)

Duty cycle control mode, bidirectional control, brake/reverse:1.0~1.5ms, forward:1.0~2.0ms.

■ PPM Reverse Delay Time:

Adjustable range: 0.10s ~ 5.00s (default 0.5s)

Parameter description: When the motor stops running, max pull or push the throttle gear for reverse as the Reverse Delay Time setup period, then the motor will run in reverse direction.

■ PPM Calibration:

a.) PPM Min

b.) PPM Mid

c.) PPM Max

Parameter description: Switch to the "PPM Calibration" option, and short press the function button to enter the PPM calibration mode. Short press the function button again for PPM signal receiving. Pull / Push the throttle gear to update the PPM signal minimum value (PPM Min), middle value (PPM Mid) and maximum value (PPM Max). Short press the power button to exit the calibration after the finish.

Notes: The FT ESC must connect the PPM input signal for finish the PPM calibration process by remote controller VX4 , which doesn't support writing the PPM signal value manually as the ESC Tool.

3.26.3.24 ADC

■ ADC Control Mode:

- a.) None: Does not respond to any ADC input signal.
- b.) Current: Current control mode, ADC throttle only without brake.
- c.) Bidirectional: bidirectional current control mode, ADC throttle only without brake.
- d.) Current Gear: Current control mode, only enable throttle ADC and L\H speed gear.
- e.) Current Brake: Current control mode, enable throttle ADC and brake ADC.
- f.) Current Brake Gear: Current control mode, enable throttle ADC, brake ADC and L\H speed gear.
- g.) Current Reverse: Current control mode, enable throttle ADC and reverse gear.
- h.) Current Reverse Gear: Current control mode, enable throttle ADC, reverse gear and L\H speed gear.
- i.) Current Reverse Brake: Current control mode, enable throttle ADC, brake ADC and reverse gear.
- j.) Current Reverse Brake Gear: Current control mode, enable throttle ADC, brake ADC, reverse gear and L\H speed gear.
- k.) Duty: Duty cycle control mode, ADC throttle only without brake.
- l.) Bidirectional Duty: Duty cycle control mode, ADC throttle bidirectional control.
- m.) Reverse Duty: Duty cycle control mode, ADC throttle and reverse.

■ ADC Cruise Control Mode:

- None: OFF the Cruise Control Mode
- Self-Locking Button: Self-Locking Button: Connect the PPM and GND pins for the self-locking button. Press the switch button to enter into cruise mode, and then re-press the button to bump out to end the cruise mode.
- Resetting Button: Connect the PPM and GND pins for the self-locking button. Press once to enter into the cruise mode, and press again to end the cruise mode.
- Keep Throttle ADC for a While: Enter the cruise mode by holding the throttle for a period of time. Keep the throttle at desired level for a period of time and then enter into the cruise mode. Stop the cruise mode after detecting any throttle change or brake signal. The throttle hold time can be set per users' needs via Time for Enter Cruising in ESC tool.

Note:

- The Self-Locking Button / Resetting Button cruise mode can be entered only in status of throttle signal detected or motor running with RPM

- The cruise mode will stop if receive a brake signal in ADC control mode.

■ Time for Enter Cruising:

- Adjustable range: 0.1~5
- If the cruise control mode is set to Keep Throttle ADC for a While, you can set the Time for Enter Cruising per your needs. Adjustable range: 0.1~5.

■ ADC Calibration:

- a.) ADC1 Min
- b.) ADC1 Max
- c.) ADC2 Min
- d.) ADC2 Max

Parameter description: Switch to the "ADC Calibration" option, and short press the function button to enter the ADC calibration mode. Short press the function button again for ADC signal receiving. Pull the throttle gear and push the brake handle to update the ADC throttle minimum value (Thro Min) and throttle maximum value (Thro Max); the ADC brake minimum value (Brak Min) and brake maximum value (Bra Max. Short press the power button to exit the calibration after the finish.

Notes: The FT ESC must connect the ADC input signal for finish the ADC calibration process by VX4 remote, which doesn't support writing the ADC signal value manually as the ESC Tool.

3.26.3.25 PAS

■ PAS Control Mode:

- a.) None

No respond to any PAS input signal

- b.) Current--UART Speed Gear

Current control mode: UART Speed Gear--Use ESC UART port to connect the Flipsky TFT screen display to switch different speed gear levels

- c.) Current--Brake Signal--UART Speed Gear

Current control mode: Brake Signal--The ESC will cut off power output immediately once receiving the brake signal; UART Speed Gear--Use ESC UART port to connect the Flipsky TFT screen display to switch different speed gear levels

d.) Current--Throttle ADC--Brake Signal--UART Speed Gear

Current control mode: enable throttle ADC control; Brake Signal--The ESC will cut off power output immediately once receiving the brake signal; UART Speed Gear--Use ESC UART port to connect the Flipsky TFT screen display to switch different speed gear levels

e.) Current--Throttle ADC--Brake ADC--UART Speed Gear

Current control mode: enable throttle ADC and Brake ADC control; UART Speed Gear--Use ESC UART port to connect the Flipsky TFT screen display to switch different speed gear levels

f.) Current--Throttle ADC--Brake ADC--Brake Signal--UART Speed Gear

Current control mode: enable throttle ADC and Brake ADC control; Brake Signal--The ESC will cut off power output immediately once receiving the brake signal; UART Speed Gear--Use ESC UART port to connect the Flipsky TFT screen display to switch different speed gear levels

■ PAS Sensor Type

a.) Forward Square Wave, Reverse Low Level(KT-V12L, KT-D12L, etc)

Square wave output when rotates in forward direction; Low level output when rotates in reverse.

b.) Forward High Duty Cycle, Reverse Low Duty Cycle(V7-50P, KT-V6L, BZ-10C, etc)

High duty cycle rectangular wave output when rotates in forward direction; Low duty cycle rectangular wave output when rotates in reverse.

c.) Dual Quadrature Square Wave Signal

Dual quadrature square wave signal output

■ PAS Current Throttle

PAS Current Throttle: PAS max current output percentage (adjustable range: 1-95%)

The maximum PAS current output will be limited to this setting percentage of the motor current. For example, if set the default value at 15%, the maximum motor current output is motor current*15% though you are over the max pedal rpm.

■ PAS Pedal Rpm Min

PAS Pedal RPM Min: the minimum PAS pedal RPM (adjustable range: 1-200RPM)

The ESC starts current output when the pedal RPM is over the mini setting value. Otherwise, the current output is zero, no current output.

■ PAS Pedal Rpm Max

PAS Pedal RPM Max: the maximum PAS pedal RPM (adjustable range: 1-500RPM)

The ESC current output stops increasing if the pedal RPM is over the max setting value.

■ PAS Sensor Magnets

PAS Sensor Magnets: sensor magnets q'ty (adjustable range: 1-32)

PAS magnets q'ty, i.e.: 12pcs magnets have 12 pulses each turn circle.

■ PAS-ADC Calibration

a.) Throttle Min

b.) Throttle Max

c.) Brake Min

d.) Brake Max

Parameter description: Switch to the "PAS-ADC Calibration" option, and short press the function button to enter the ADC calibration mode. Short press the function button again for ADC signal receiving. Pull the throttle gear and push the brake handle to update the ADC throttle minimum value (Thro Min) and throttle maximum value (Thro Max); the ADC brake minimum value (Brak Min) and brake maximum value (Bra Max. Short press the power button to exit the calibration after the finish.

Notes: The FT ESC must connect the ADC input signal for finish the ADC calibration process by VX4 remote, which doesn't support writing the ADC signal value manually as the ESC Tool.

3.27 FTESC Restore Factory Default Setup

Notes: The ESC type must be set "FTESC" to enable the settings via this remote controller VX4.

■ FTESC Factory Default Parameters:

a.) Reset ESCs: resets all ESCs

b.) All ESC: reset all ESCs

c.) Master: reset the master ESC only

■ Steps of Restore Factory Default Setup:

Step 1: Long press the function button 2 seconds to enter into the setting mode.

Step 2: Pull the throttle gear to switch the "ESC Factory Reset" (screenshot 49). Short press the function

button to enter the setup interface (screenshot 50).

Step 3: If want to reset all ESCs, short press the function button until the screen "All ESC" blinking, and do the setup.

Step 4: Short press the power button to confirm and then long press the function button to reset the ESCs as screenshot 51. The screen will be back to the home after finishing the reset process.



Screenshot 49



Screenshot 50



Screenshot 51

3.28 Remote Charging

■ How to charge?

Connect the type C USB cable with remote's charging port.

■ Charging Status Check

A battery icon and charging percentage will appear on the screen as screenshot 52 when the remote controller is in power off status. The battery bar shows charging increase when the remote controller is in power on status.



Screenshot 52

3.26 Fault Codes Check

- The remote controller VX4 is built with fault codes check for ESCs' failures.
- Steps of Fault Codes Check:
 - Long press the function button 2 seconds to enter into the setting mode.
 - Pull / Push the throttle gear to switch the "FAULT CHECK:0". If there is no fault, the screen displays "FAULT CODE NONE", and the number after "FAULT CHECK" is 0; The number behind "FAULT CHECK" is the number of faults when there is a fault. The screen will display the cause of the fault.

The possible reasons for the fault are:

- ◆ "OVER VOLTAGE!"--The input voltage is too high;
- ◆ "UNDER VOLTAGE!"--Insufficient voltage;
- ◆ "DRIVER ERROR! " --The driver reports an error;
- ◆ "ABS OVER CURRENT!"--The MOSFET current is too high;
- ◆ "OVER TEMP FET!"--MOSFET temperature is too high;
- ◆ "OVER TEMP MOTOR!"--Motor temperature is too high!



Screenshot 53



Screenshot 54

3.30 Remote Firmware Version

- How to Check the Remote Controller Firmware Version?
 - Long press the function button 2 seconds to enter into the setting mode.
 - Pull / Push the throttle gear to switch the "Version" for firmware version check as screenshot 54.

4 Remote Controller VX4 Firmware Upgrade Manual

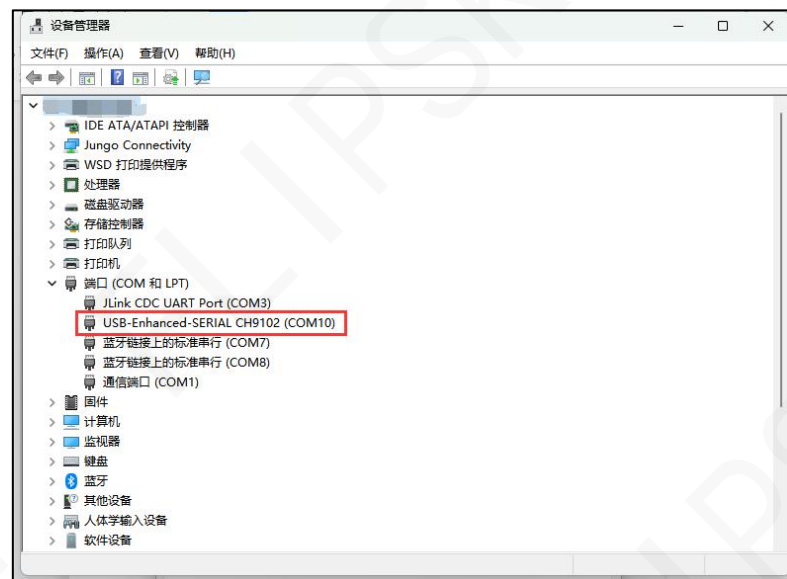
4.1 Remote Controller Upgrade

Step 1: Press the power button and function button at the same time for 2 seconds to enter into the Bootloader "IAP Mode" of the remote in the power off status without plugging USB cable as screenshot 55.



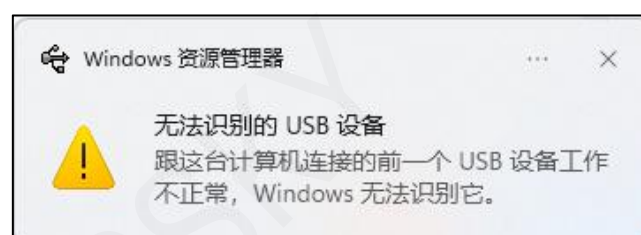
Screenshot 55

Step 2: Connect the remote controller with computer via USB cable. If no USB SERIAL COM as below screenshot 56 (red), please install it per our file (VX4_TX_USB_DRIVER) to proceed the next step.



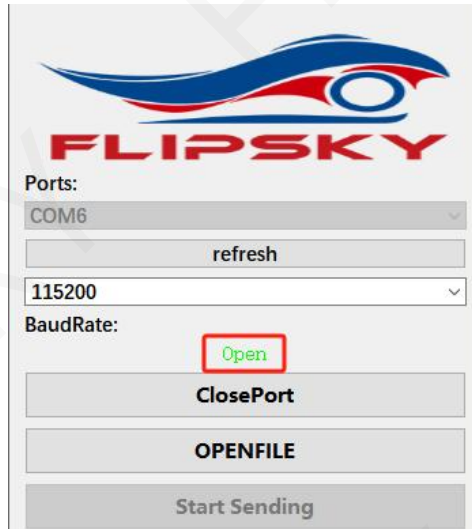
Screenshot 56

Notes: If the computer shows the below pop-up window as screenshot 57, it means that the USB device cannot be recognized, please unplug and replug the USB cable to see if workable. If not, please use another replaced USB cable to have a try.



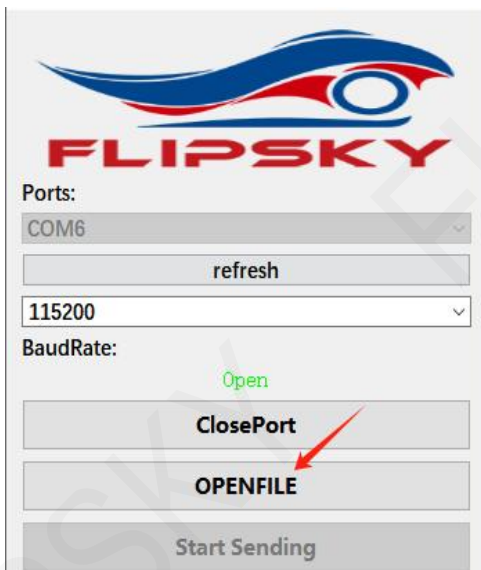
Screenshot 57

Step 3:After the USB SERIAL COM port installation, open the firmware file (FS-VX Remote Update Tool) and select the corresponding SERIAL COM port, and then click "OpenPort". If succeed, the menu "Open" will be green as below screenshot 58.

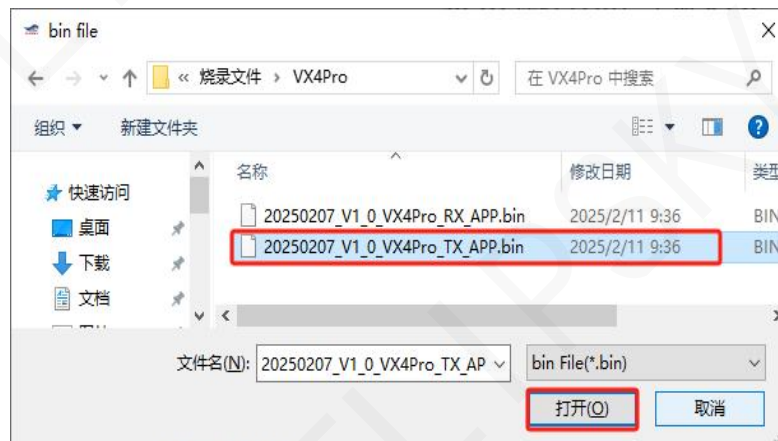


Screenshot 58

Step 4:Click "Open File" as screenshot 59-choose the desired firmware "20250207_V1_0_VX4Pro_TX_APP.bin" as screenshot 60.

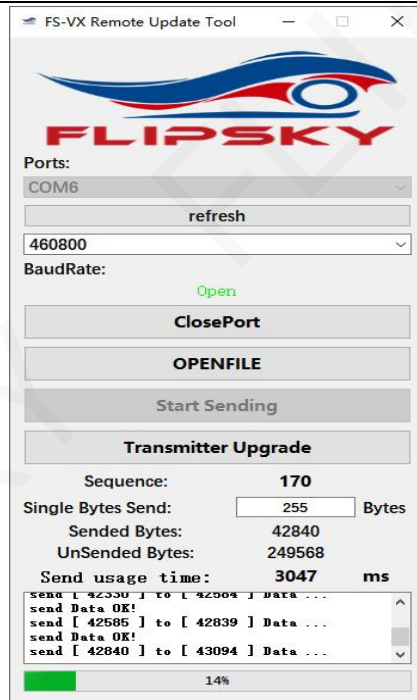


Screenshot 59



Screenshot 60

Step 5:The remote screen will display "Sending..." after clicking "Start Sending". The remote will be back to the home automatically once finish the upgrade successfully. (See in screenshot 61)



Screenshot 61

4.2 Receiver APP Upgrade Online

- Connect the remote controller with the computer via USB to do upgrade.
- Update the receiver APP steps:

Step 1: Enter into the setting interface, and then switch to IAP Receiver mode as screenshot 62. Short press the setting button to enter the receiver online upgrade. The VX4 Pro screen shows START as screenshot 63.



Screenshot 62



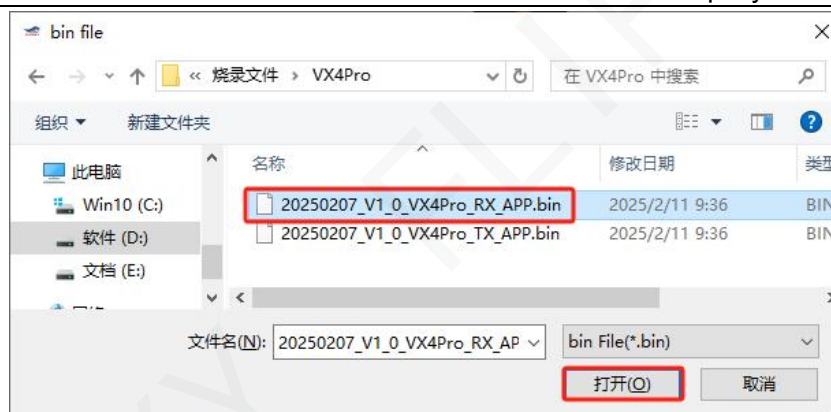
Screenshot 63



Screenshot 64

Step 2: Power on the receiver. If the blue and red lights on the receiver start flashing at a certain frequency and the remote control interface displays READY as screenshot 64, it means that the receiver is ready for upgrade.

Step 3: Select the download file: 20250207_V1_0_VX4Pro_RX_APP.bin as screenshot 65. Click the Start Sending to start.



Screenshot 65

Step 4: After transmit finished, the remote screen displays Succeed and back to the main interface, and the receiver blue led light is blinking, which means the success of receiver upgrade.

Note: If the remote controller and receiver are not paired after the receiver upgrade, please do pairing again for the remote and receiver.

5 Version

Table 1. File Version

Date	Firmware Version	Contents Change
2025.02.07	V1.0	■ VX4pro_V1.0 is based on VX4_V1.4 and has made some improvements. ■ VX4pro_V1.0 adds new functions ➤ Button: add a horn button and a model button. Press the horn button to buzz and release it to stop. The model button has three mode choices: NORMAL, TANK and CLIMB. ➤ Setting interface: upgrade the throttle calibration. Click the settings button during the calibration process will reset the calibration value. ➤ Throttle lock: double click the power on/off button to unlock/lock the throttle. ■ Bootload improvement: Both TX and RX have added program integrity checks. When the TX upgrade fails, it will display upgrade failure, and if the RX upgrade fails, the red light will keep flashing.