IPET
SYSTEM

IPET-I7 Product Specification & Operation Guide

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Content

I7 Integrated Propulsion System Specification

1. Introduction

The I series product is an integrated propulsion system developed for high-performance multi-rotor drones, designed with features of long endurance, high efficiency, high reliability, and low noise. The integrated design merges components seamlessly, compared to individual products.

Notes

- This series of propulsion systems is unique and requires strict matching of motor parameters. The firmware is exclusive, meaning one firmware version is only suitable for one specific motor + propeller combination. It cannot be compatible with multiple combinations simultaneously. Contact the manufacturer if usage is needed.
- It is not recommended to change the propeller for the propulsion system combo. Improper combinations may trigger ESC protection, rendering it unusable.
- Do not install propellers during ground tests to avoid unnecessary danger.
- Before connecting the ESC to related components, ensure good insulation at the contact ends. Short circuits will damage the ESC
- Please ensure that all components are connected carefully and securely. Poor contact may result in an inability to properly control the aircraft, or lead to equipment damage and other unforeseeable circumstances.

The I7 Integrated Power System is designed for drones with the following specifications:
4-axis (takeoff weight ranging from 10 to 16 kg) or
5- 6-axis (takeoff weight ranging from 16 to 24 kg).

2. Parameters

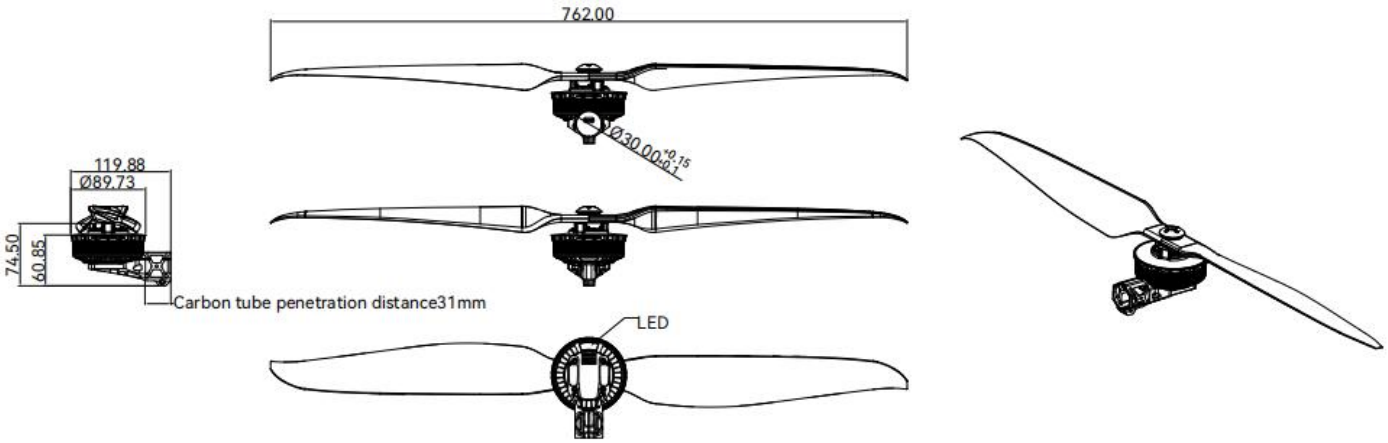
System Parameters	**Model**	I7 KV80
	Configuration	I7 Motor+14S FOC 50A ESC+I30 Propeller
	Recommended Battery	12-14S(LiPo)
	Max Thrust (kg)	7.5
	Recommended Takeoff Weight(kg)	10-16
	Rated Thrust Efficiency (g/w)	12.8
	Carbon Tube Diameter(mm)	30
	Total Weight with Wires(g)	528±2%
	Protection Rating	IP46
	Operating Temperature(℃)	-30～50
	Wire Length (mm)	650±5
	Wire Specifications	**Power Wire**：20# Silver-Plated Red & Black **Signal Wire**：5P PTFE Wire
Motor	**KV（RPM/V）**	80
	Single Box Motor Packaged Unit Weight (g)	2120g
ESC Parameters	**Throttle Range(μs)**	1050-1950（Fixed）
	Protocol	DroneCAN、 UAVCAN
	Control Method	PWM/CAN
	Max Voltage(V)	61
	Max Continuous Current (A)	80（Open environment, ≤60℃）
	Peak Current (A)	150（Open environment, ≤60℃）
Propellers Parameters	**Model**	I30
	Length(mm/inch)	762/30
	Single Box Propeller Packaged Unit Weight (g)	660g

3. Test Data

I7 KV80+14SFOC50A+I30				Ambient Temp:	33℃
Throttle (%)	**Thrust A (gf)**	**Voltage A (V)**	**Current A (A)**	**Motor Efficiency A (%)**	**Overall Efficiency A (gf/W)**
30	1329	53.95	1.42	88.99	17.40
35	1733	53.94	2.05	89.70	15.68
40	2187	53.90	2.87	90.40	14.14
45	2684	53.88	3.89	89.92	12.82
50	3256	53.85	5.12	89.47	11.81
55	3872	53.83	6.58	88.57	10.94
60	4572	53.75	8.41	86.90	10.11
65	5214	53.70	10.42	86.23	9.32
70	5947	53.62	12.78	85.00	8.68
75	6617	53.56	15.37	83.45	8.04
80	7371	53.49	18.48	80.69	7.46
85	7558	53.46	19.54	80.12	7.24
90	7573	53.47	19.61	79.87	7.22
95	7565	53.47	19.65	79.63	7.20
100	7596	53.49	19.85	79.19	7.15

The above data are measured by a professional laboratory test bench for reference in selection.

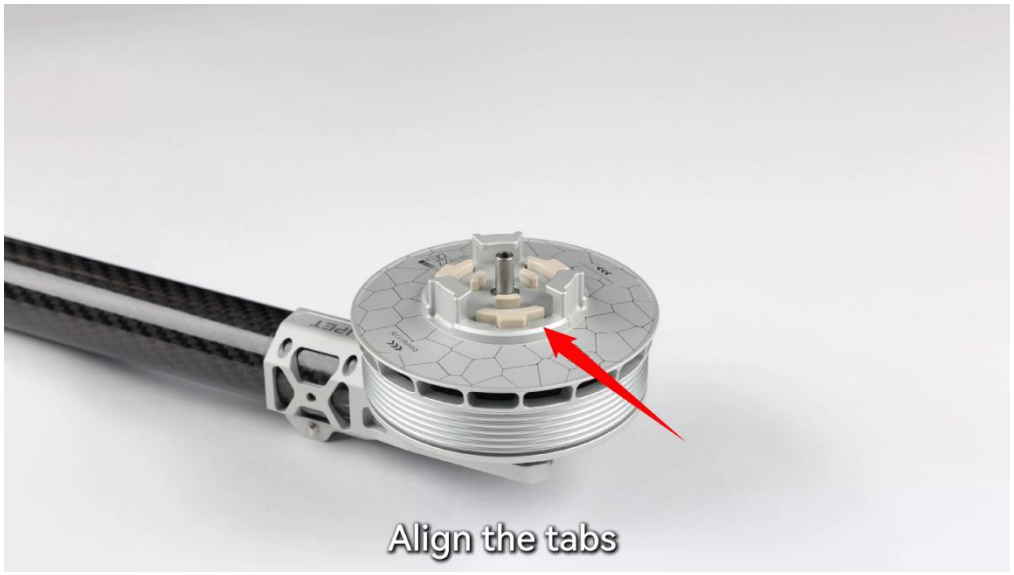
4. Appearance and mounting structure（mm）

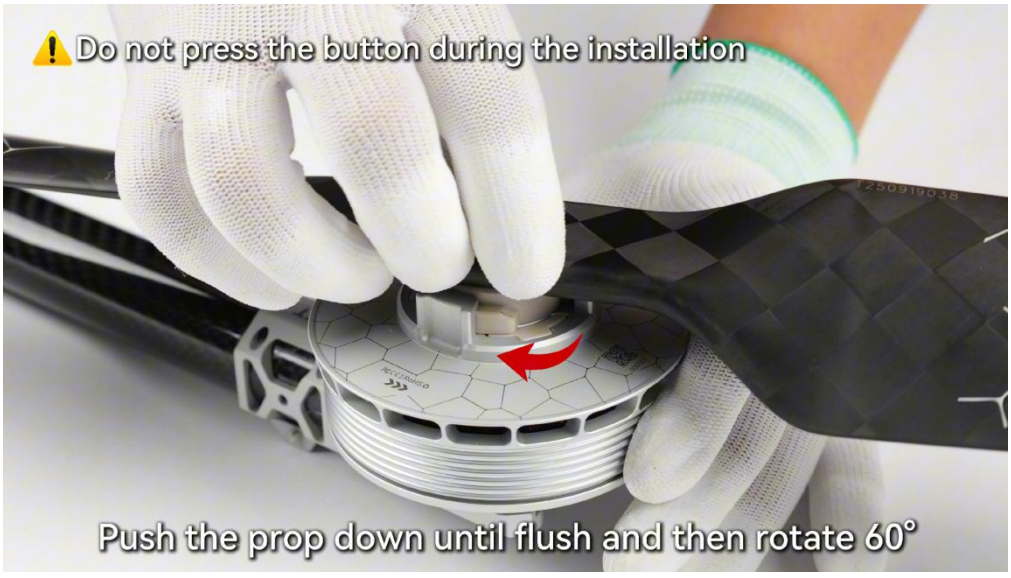


5. Quick-Release System Guide

5-1. Installation Steps

Step 1: Distinguishing between CCW and CW Propellers





Step 2: Align the propeller with the base, press it down to the bottom, then rotate it 60◦

Step 3: A "click" sound indicates the propeller is successfully installed

5-2: Disassembly Instructions

Step 1: Hold the propeller and press the button downwards

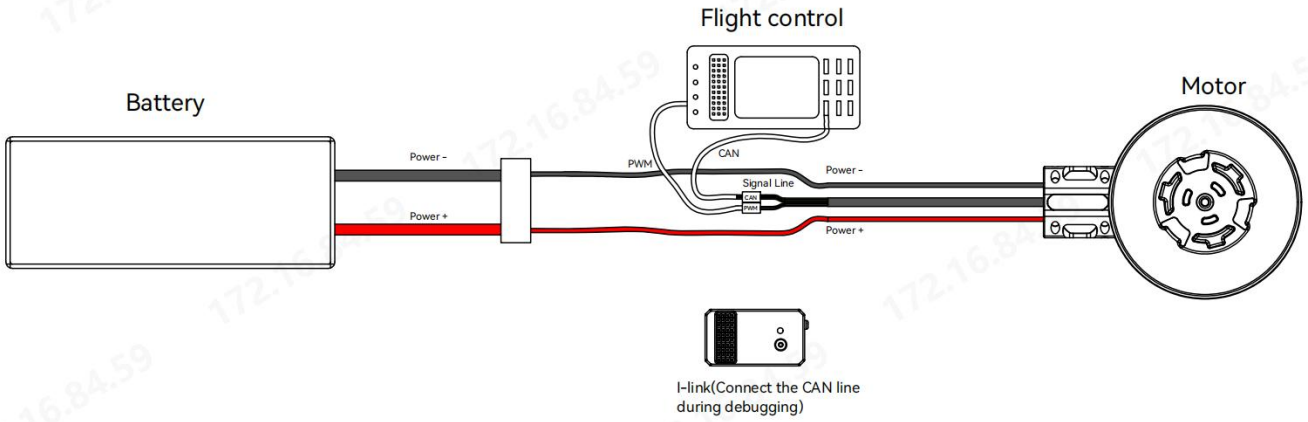
Step 2: Rotate 60◦ while pressing, then release the button to remove the propeller

6. User Guide

6-1:Notes:

- Do not exceed the ESC's recommended operating voltage range, otherwise, it may cause irreversible damage to the ESC.
- The throttle for this ESC is fixed and does not require calibration. The throttle range is 1040-1940μs.
- The FOC ESC has a braking effect and generates back EMF. Please ensure you use a power supply capable of absorbing back EMF during ESC testing or flight to avoid damaging the ESC and power supply.
- The ESC supports both PWM and CAN throttle modes. One mode is set as the primary mode, and the other serves as a backup. Upon startup, the throttle signal must be connected to the ESC via the primary mode to ensure normal operation. The backup throttle only becomes effective if the primary throttle signal is lost during operation. The default factory setting is PWM throttle priority mode. To change it to CAN throttle priority mode, please contact the manufacturer or configure it via the PC software.

6-2: Wiring Method



1) Red: Positive; Black: negative
2) 2P-JR connector: PWM throttle input; white: signal; black: ground.
3) 3P-JR connector: CAN throttle input; green: CAN Low; yellow: CAN High; gray: ground.

7. Startup Process

1) Turn on the remote control and move the throttle stick to the lowest point.
2) Connect the system to the battery. The motor will emit a beep, indicating the system is ready and the self-check is complete, and it is ready for takeoff.

8. Protection Functions

Startup Protection:

When powered on normally, the ESC first initiates a self-check. If successful, it will beep normally and is ready to run. If the self-check fails, it cannot start.

Stall Protection:

When the ESC detects a motor stall, it will completely cut off output after 5 seconds and report a fault. If the stall fault is cleared, returning the throttle to zero and then outputting again can restart the motor.

Current Protection:

When an instantaneous current anomaly exceeds 60A, the ESC will attempt to restart three times. If the ESC is still in an overcurrent state on the fourth attempt, it will completely shut down output. Restoring power will return it to normal.

Temperature Warning:

When the MOS or capacitor temperature exceeds 110°C, a temperature alarm will be sent via the CAN communication interface. After the throttle is returned to zero, the LED light will flash yellow three times, with a 1-second interval between flashes. After 2 seconds, the flash cycle repeats. The motor will also emit a long "Beep...Beep...Beep..." (with a 2-second interval between each beep). If the temperature exceeds 130°C, the ESC may burn out. Please land immediately upon receiving the warning.

Throttle Signal Loss Protection:

When the ESC detects throttle loss and a backup throttle is available, it will immediately respond to the backup throttle output.

When the ESC detects throttle loss without a backup throttle, it will continue outputting based on the last received throttle for 2 seconds. If the throttle signal is received within 2 seconds, it will resume normal response. If no signal is received within 2 seconds, the output is cut off. Power must be cycled to restore operation.

9. Common Faults and Alert Tones Description

Fault Phenomenon	Alarm	Possible Cause	Solution
Motor fails to start after power-up	Rapid single-tone "beepp beep beep..."	Throttle not at zero position	Move the throttle stick to the lowest position.
Motor fails to start after power-up	"beep, beep, beep_" (1-second intervals)	The receiver's throttle channel is not outputting a throttle signal	1. Check if the radio and receiver are paired correctly. 2. Check if the throttle channel wiring is connected properly. 3. Verify the ESC communication priority (factory default is PWM).
The power supply voltage is above 63V.	"beep, beep, beep_" (1-second intervals)	Input battery voltage is too high.	Replace with a suitable, fully charged battery with voltage below 63V.
ESC LED indicator flashing	"beep, beep, beep_" (2-second intervals)	Secondary fault detected after landing.	Identify issues through electrical health management

10. Health Monitoring Management

Notes:

- To help users better monitor the integrated power system, the ESC diagnoses motor status through data acquisition and algorithms. Operational status is indicated by LED flash patterns and motor beeps.If no abnormalities are detected at startup, the ESC will returns to its default LED color.
- **Red flashing:** Primary fault. Stop using immediately, troubleshoot, or return to manufacturer for repair.
- **Yellow flashing:** Secondary fault. Land and inspect. If operation is not affected, flight may continue.
- Fault codes are cleared when throttle is zeroed after each power cycle. The last five fault records are saved. The LED light alarm function can be enabled or disabled via the PC software.

Specific LED flashing anomaly conditions are detailed in the table below:

Light Flash Pattern	Fault Category	Light Indication	Solution
Red light flashes once (3s cycle)	Primary fault	Overvoltage	Replace with a suitable battery (battery below 63V).
Red light flashes twice (4s cycle)		Short circuit	Check for potential power issues, or contact the manufacturer for repair.
Secondary fault (during flight)	Secondary fault (during flight)	Short circuit	Check the power wiring, or contact the manufacturer for repair.
		Overload	Please replace with suitable propellers or reduce throttle.
		Vibration	Please check if the power unit is installed correctly.
		MOSFET or capacitor over-temperature	Reduce operating power, or improve power system cooling conditions.
		Stall	Reduce operating power, or improve power system cooling conditions.

Notes:

- Primary faults prevent the motor from starting. If the abnormal condition is resolved after a power cycle, normal startup is possible.
- Secondary fault do not affect motor operation (but fault data is recorded). The alarm is triggered when the throttle is returned to zero. The fault status is cleared on the next power-up, but the last five fault records are saved. During flight, no LED light alarm flashes are shown; only fault codes are reported.

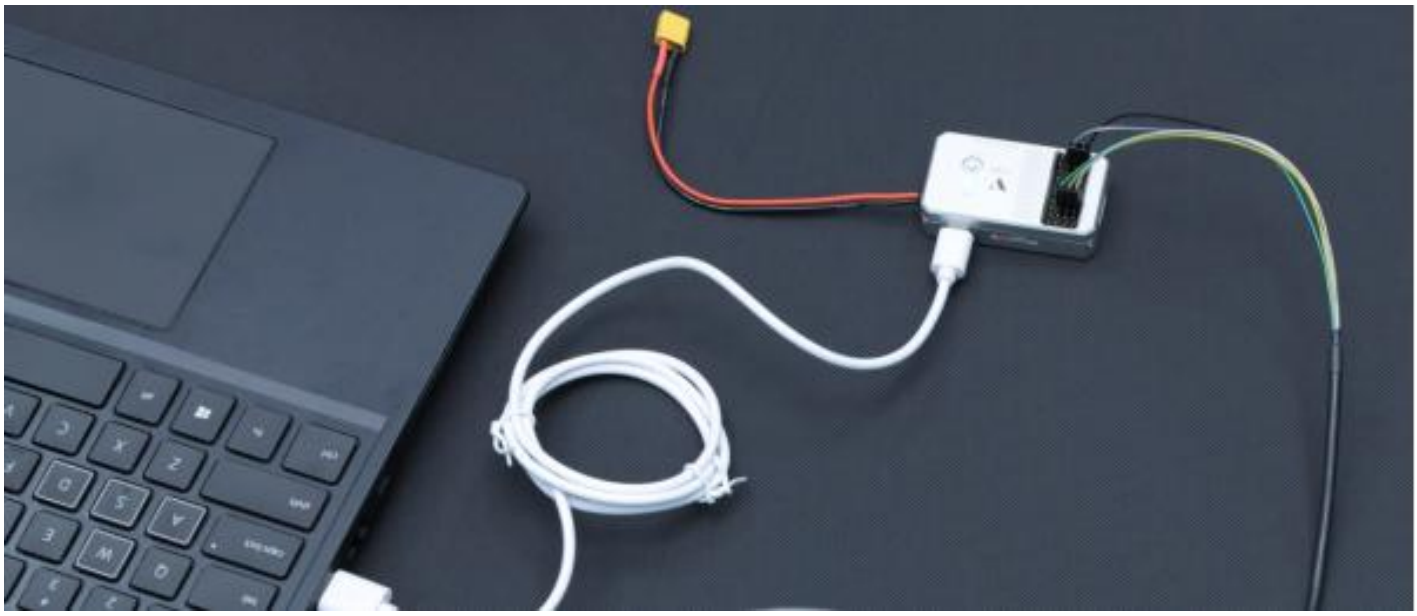
11. Setting the ID via the PC software

Notes:

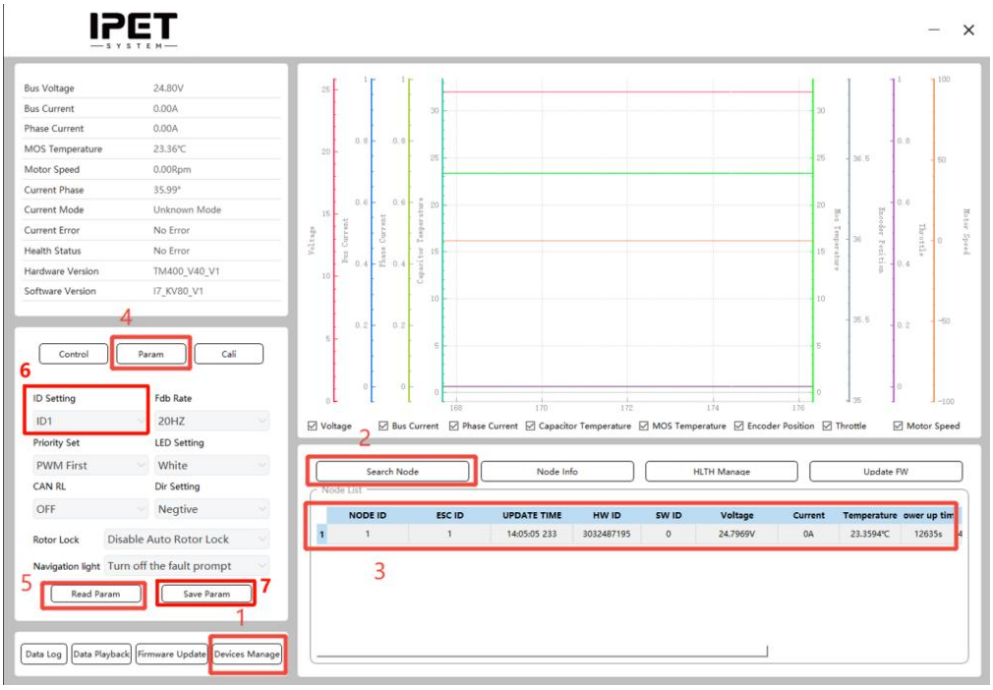
- Disconnect the propeller during setup to avoid hazards.
- On the same drone, different ESCs must have unique IDs; otherwise, those with the same ID will be recognized as a single ESC when using CAN functions.
- By default, the ESC factory settings are: ID = 1, throttle channel = 1, and baud rate = 1 MHz.
- This feature requires the purchase of I-link.

11-1: Connection

- ESC---->I-Link; “Green Yellow Gray”----> “CAN LOW CAN HIGH -”
- Connect the I-Link to the computer via USB.



11-2: Operation



1) Click "Device Management" (If a node already exists, skip steps 1-3).
2) Click "Search Node".
3) The node information will be displayed.
4) Click the "Parameters" button. If the read is successful, the following prompt will appear.
5) Click "Read Parameters". If the read is successful, the following prompt will appear.

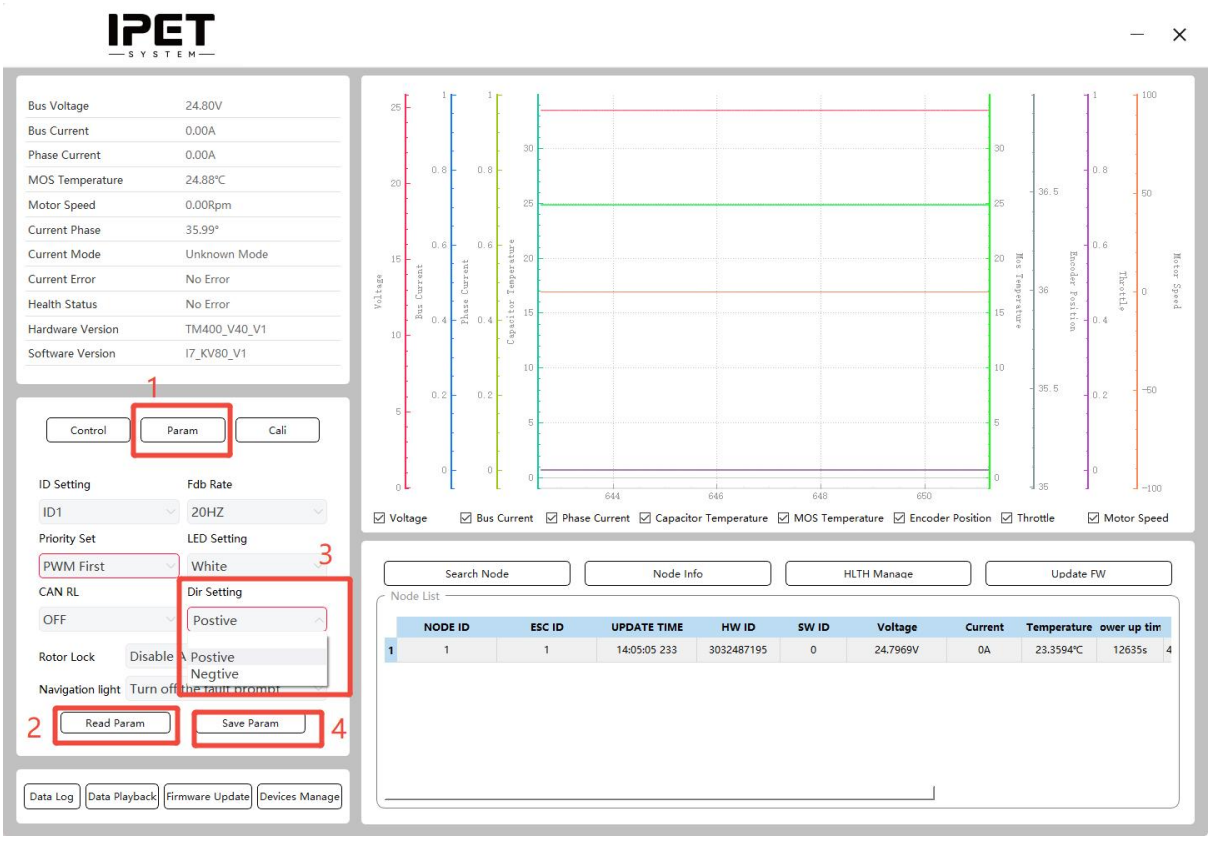
6) Click "ID Settings" and select the ID you want to change.
7) Click "Save Settings." If the save is successful, the following prompt will appear:

12. Rotation direction setting

Notes:

- Disconnect the propeller during setup to avoid hazards.
- On the same drone, different ESCs must have unique IDs; otherwise, those with the same ID will be recognized as a single ESC when using CAN functions.
- By default, the ESC factory settings are: ID = 1, throttle channel = 1, and baud rate = 1 MHz.
- This feature requires the purchase of I-link.

12-1: Operation



1) Click on "Parameter Settings".
2) Click "Read Parameters". If the read is successful, the following prompt will appear:

3) Click on "Rotation Direction Setting" and select the desired rotation direction for modification.

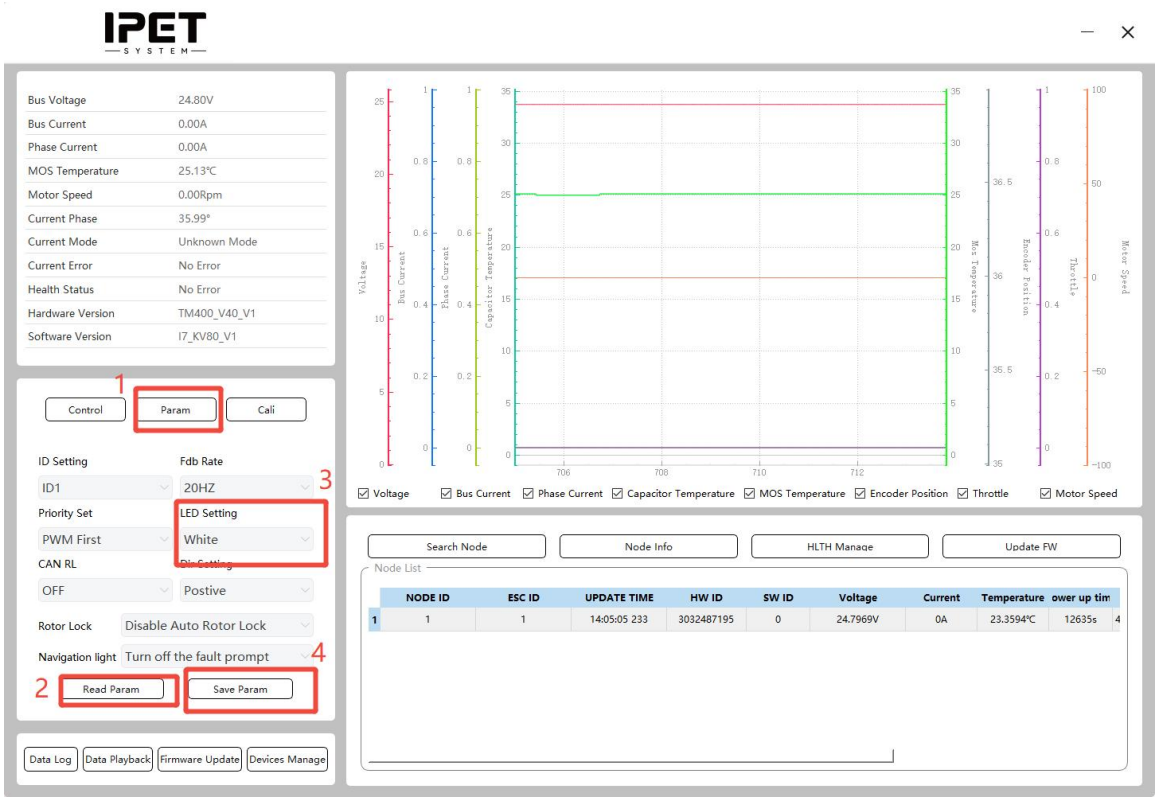
4) Click "Save Settings". If the save is successful, the following prompt will appear:

13. LED Color Setting

Notes:

- Disconnect the propeller during setup to avoid hazards.
- On the same drone, different ESCs must have unique IDs; otherwise, those with the same ID will be recognized as a single ESC when using CAN functions.
- By default, the ESC factory settings are: ID = 1, throttle channel = 1, and baud rate = 1 MHz.
- This feature requires the purchase of I-link.

13-1: Operation



1) Click on "Parameter Settings".
2) Click "Read Parameters". If the read is successful, the following prompt will appear:

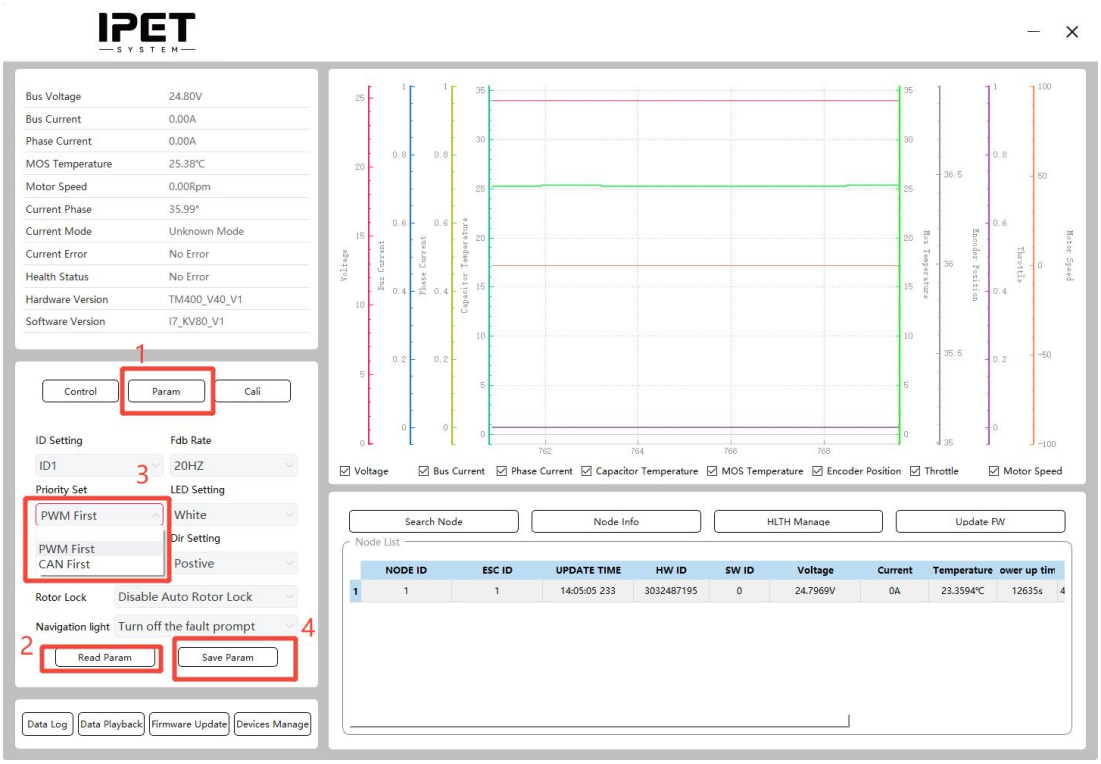
3) Click "LED Settings" and select the LED color you wish to change.
4) Click "Save Settings". If the save is successful, the following prompt will appear:

14. Throttle Priority Setting

Notes:

- Disconnect the propeller during setup to avoid hazards.
- On the same drone, different ESCs must have unique IDs; otherwise, those with the same ID will be recognized as a single ESC when using CAN functions.
- By default, the ESC factory settings are: ID = 1, throttle channel = 1, and baud rate = 1 MHz.
- This feature requires the purchase of I-link.

14-1: Operation



1) Click on "Parameter Settings".
2) Click "Read Parameters". If the read is successful, the following prompt will appear:

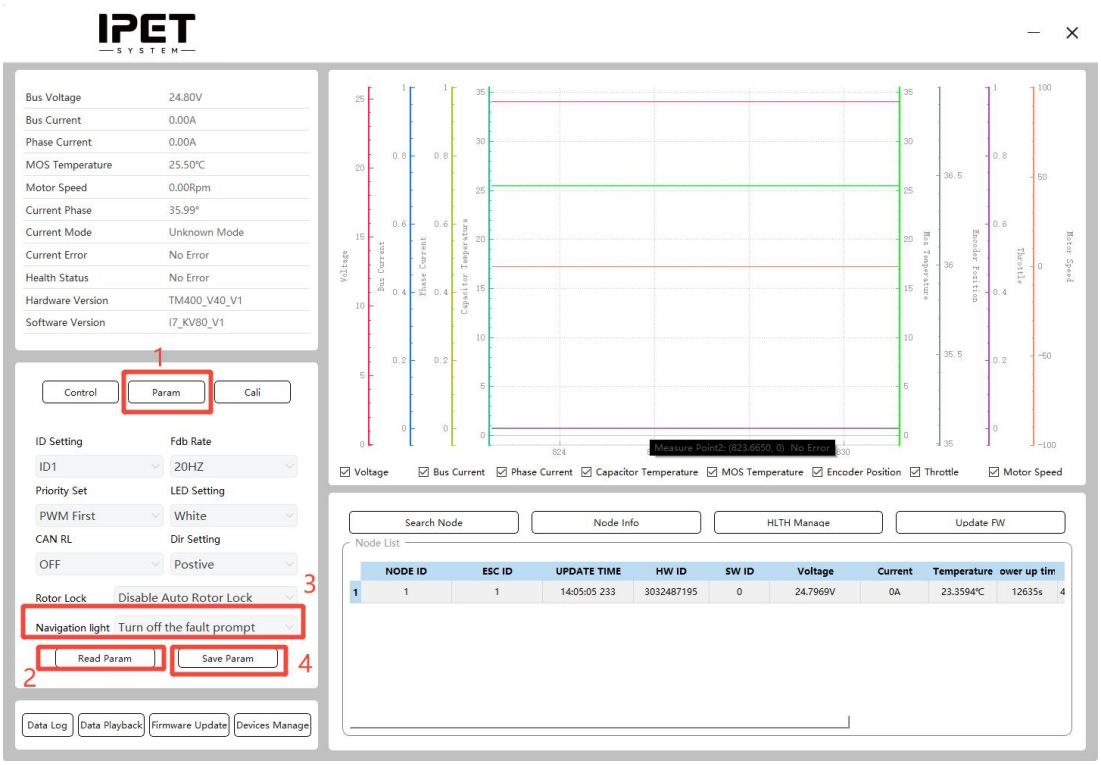
3) Click "Throttle Priority Settings" and select the throttle priority you wish to change.
4) Click "Save Settings". If the save is successful, the following prompt will appear:

15. LED Light Setting

Notes:

- Disconnect the propeller during setup to avoid hazards.
- On the same drone, different ESCs must have unique IDs; otherwise, those with the same ID will be recognized as a single ESC when using CAN functions.
- By default, the ESC factory settings are: ID = 1, throttle channel = 1, and baud rate = 1 MHz.
- This feature requires the purchase of I-link.

15-1: Operation



1) Click on "Parameter Settings".
2) Click "Read Parameters". If the read is successful, the following prompt will appear:

3) Click "LED light Settings" and select the light color you wish to change.

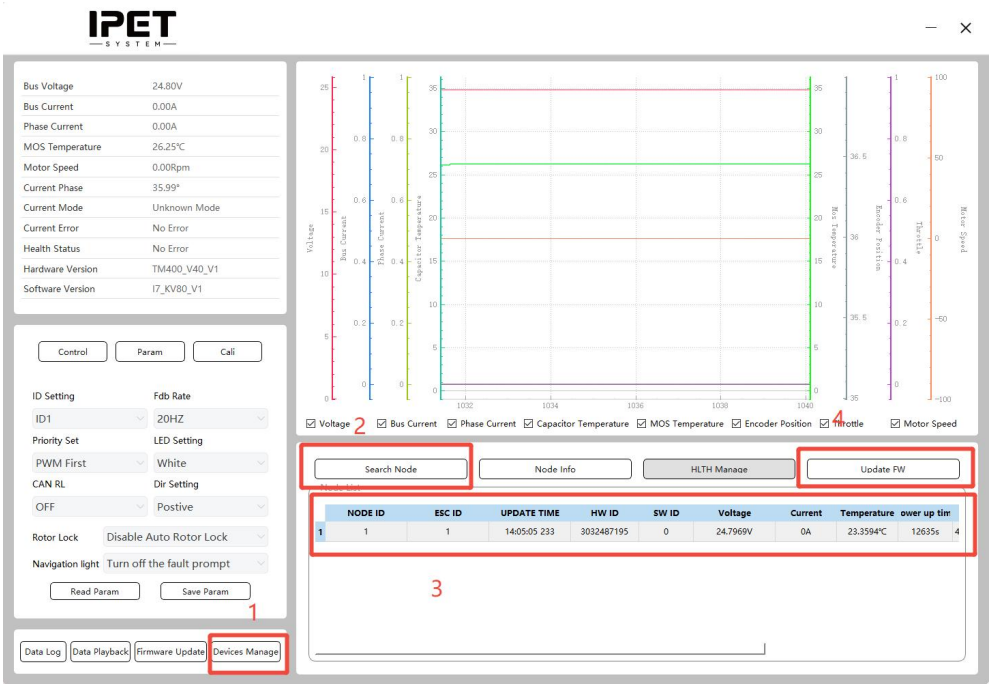
4) Click "Save Settings". If the save is successful, the following prompt will appear:

16. Firmware Update

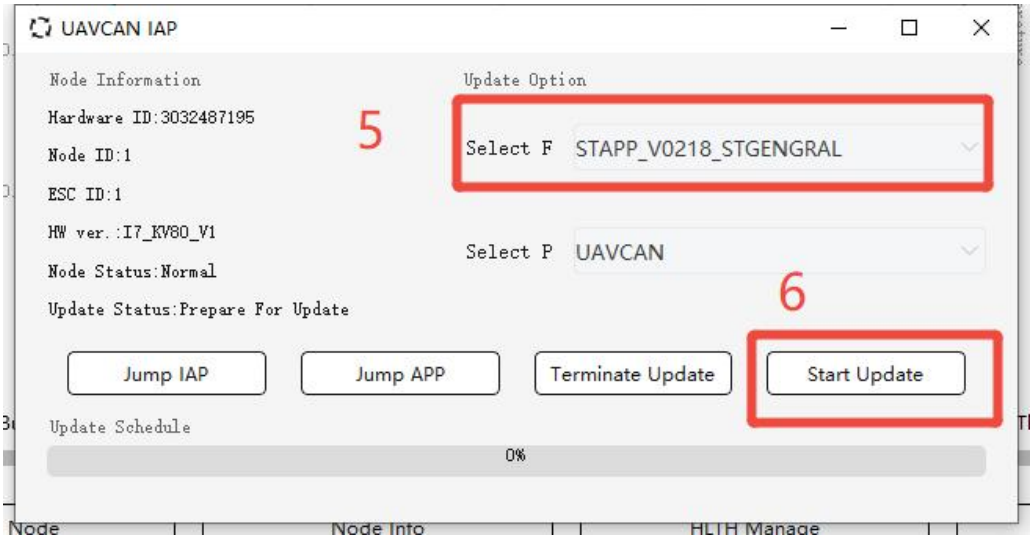
Notes:

- Firmware upgrade requires an I-link, a USB cable, and PC software. Multiple ESCs can be upgraded simultaneously.
- Obtain the PC software from the purchase source — Leave a message on IPET official website, sales, or after-sales service.

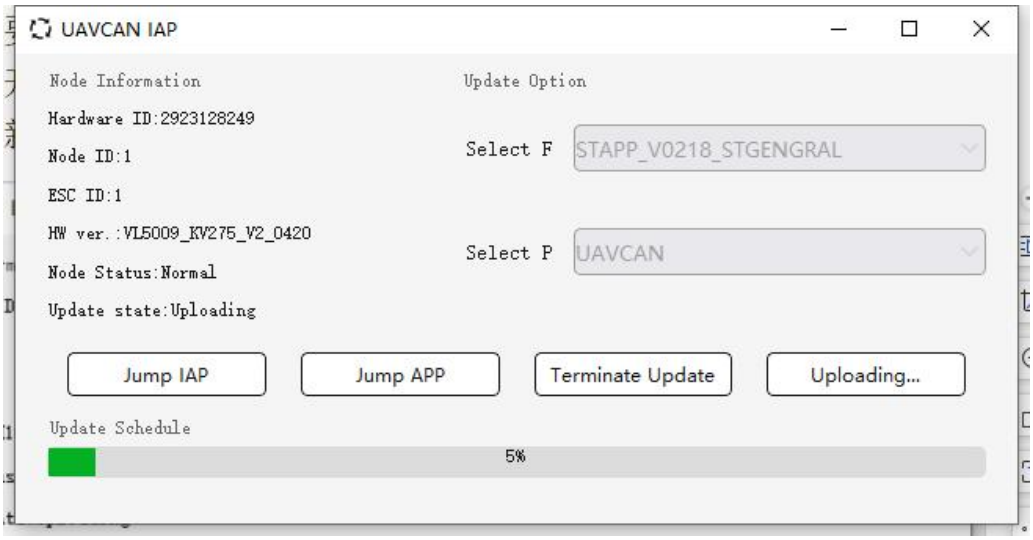
16-1: Operation



1) Click "CAN Device Management".
2) Click "Search Nodes".
3) Select ESC.
4) Click "Upgrade Node Firmware"



5) Select the corresponding firmware
6) Click "Start Upgrade".
7) Power on the ESC.



8) Wait for the progress bar to complete.

17. Frequently Asked Questions

1) This series of propulsion systems is unique and requires strict matching of motor parameters. The firmware is exclusive, meaning one firmware version is only suitable for one specific motor + propeller combination. It cannot be compatible with multiple combinations simultaneously. Contact the manufacturer if usage is needed.

2) It is not recommended to change the propeller for the propulsion system combo. Improper combinations may trigger ESC protection, rendering it unusable.

3) Do not install propellers during ground tests to avoid unnecessary danger.

4) To change the motor's rotation direction, you can configure it via the PC software.

5) Ensure the propeller is installed only when its markings match those on the motor.

6) Do not exceed the ESC's recommended operating voltage range, otherwise, it may cause irreversible damage to the ESC.

7) The throttle for this ESC is fixed and does not require calibration. The throttle range is 1040-1940μs.

8) The FOC ESC has a braking effect and generates back EMF. Please ensure you use a power supply capable of absorbing back EMF during ESC testing or flight to avoid damaging the ESC and power supply.

9) The ESC supports both PWM and CAN throttle modes. One mode is set as the primary mode, and the other serves as a backup. Upon startup, the throttle signal must be connected to the ESC via the primary mode to ensure normal operation.

10) The backup throttle only becomes effective if the primary throttle signal is lost during operation. The default factory setting is PWM throttle priority mode. To change it to CAN throttle priority mode, please contact the manufacturer or configure it via the PC software.

11) For quick-release components, both snaps must spring back to the calibrated position to achieve the best positioning effect. If they become stuck and do not pop up, try tightening them further.