



Thank you for purchasing this product! Please read the following statement carefully before use and, once used, it is considered to be an acceptance of all the contents. Please strictly observe and adhere to the manual installation with this product. Unauthorized modification may result in personal injury and product damage.

We reserve the rights to update the design and performance of the product without notice.

This propulsion system is an industrial-grade component for unmanned aircraft. If you have more specialized application requirements, please contact us.



01 Introduction

The P65V is an industrial-grade brushless thrust system designed for VTOL rotor sections, supporting a rated single-axis load of 65 kg with a maximum thrust of 116 kg/axis. Featuring IP35 protection and high-efficiency thermal dissipation, it delivers a one-step power solution for heavy-load VTOL drone applications across logistics, emergency rescue, and other critical domains. The FOC ESC employs CAN communication protocol and dual-redundant throttle control (digital/PWM), integrating power-on self-diagnostics, fault logging, over-current protection, and stall protection to ensure operational safety.

02 Precautions

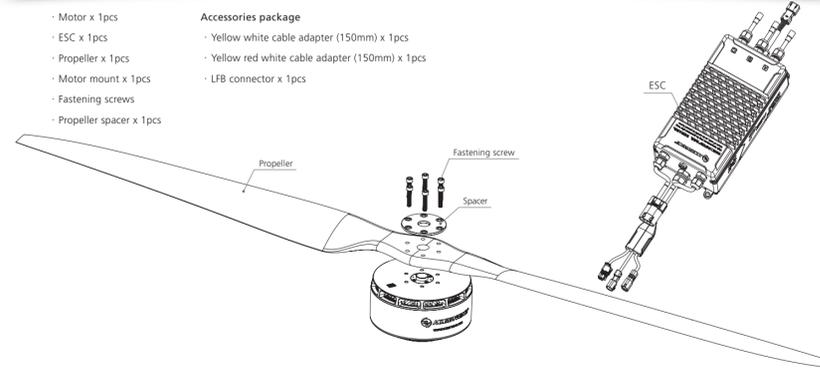
- Please stay away from crowds, high-voltage lines, obstacles, etc. when using, and be sure to follow safety regulations when using.
- The thrust system contains FOC driven ESC, which needs to strictly match the motor parameters. The program is unique. It is only suitable for one combination of propellers and is not compatible with multiple combinations at the same time. If you need to change it, please contact the manufacturer. Unreasonable combinations will trigger ESC protection and make it unusable.
- The ESC is equipped with CAN/485 function. This manual only introduces the CAN communication version. When using the CAN function, the ESC ID and the throttle channel of the same aircraft can not be the same, otherwise the multiple ESCs will be recognized as one ESC.
- Do not install propellers for ground testing to avoid unnecessary danger.
- Be sure to connect all parts carefully. If the connection is poor, you may not be able to control the aircraft normally, or other unpredictable situations such as equipment damage may occur.
- If you need to weld the input and output wire connectors of the ESC, please ensure that the welding is reliable and use welding equipment with sufficient power.
- Do not use this thrust system when the external ambient temperature exceeds 55°C. The high temperature will destroy the ESC and may cause damage to the motor and cause your drone to crash.
- The motor rotation direction of the thrust system has not been determined by the factory, the user can change the order of the motor phase wires to change the motor rotation direction according to the actual needs.
- It comes standard with an intelligent propeller control (IPC) function, which can be optionally enabled based on actual operational requirements.
- This product adopts a fully isolated design between protective earth (PE), power circuits, and low-voltage signal circuits, ensuring low-impedance connection (common grounding) between the motor base and ESC housing.
- When connecting the sensor-enabled cable, if sensor-assisted startup is used, calibration via the upper computer is required first. Without calibration, the motor will remain in sensorless startup mode. The motor temperature measurement (NTC) function works normally with or without calibration. The ESC program defaults to not requiring sensor-assisted startup; this logic is added solely to pursue stability during rapid motor startup and is not mandatory.
- The sensor cable and fixed-props functionality cable share the same wiring. If either function is used, calibration is required for it to take effect.
- This power system requires calibration before its first use; otherwise, the motor will not start when the throttle signal is given.

03 Thrust system composition

- Motor x 1 pcs
- ESC x 1 pcs
- Propeller x 1 pcs
- Motor mount x 1 pcs
- Fastening screws
- Propeller spacer x 1 pcs

Accessories package

- Yellow white cable adapter (150mm) x 1 pcs
- Yellow red white cable adapter (150mm) x 1 pcs
- LFB connector x 1 pcs



04 Thrust system installation

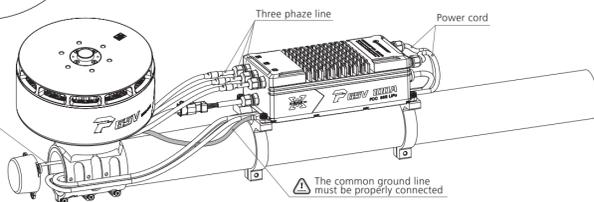
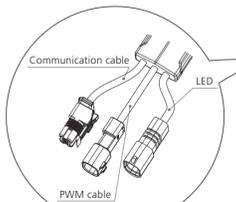
- The product comes standard with a signal cable adapter for debugging purposes. Yellow, red and white cables are data output and upgrade signal cables (The firmware of the ESC can be upgraded), yellow cable is GND, red cable is CAN-High (hereinafter referred to as CH), white cable is CAN-Low (hereinafter referred to as CL); yellow and white cables are PWM throttle signal cables for the ESC, yellow line is GND, and white cable is throttle signal cable.
- The data signal cable outputs real-time data such as throttle, motor speed, bus current, bus voltage, capacitor temperature, IGBT temperature, etc.
- The phase wire connection correspondence between the motor and ESC is: A-Blue, B-Yellow, C-Orange. When connected this way, the actual motor rotation direction is CW (Clockwise). To change the rotation direction, it should be configured via software.
- The standard sensor cable connector includes the motor temperature measurement (NTC) function via Pin7 and Pin8, which provide real-time feedback on motor temperature. The remaining pins are for the sensor cable, which also serve as the fixed-props control cable.
- ESC PWM throttle range is fixed to 1100-1940µs, no need to do calibration.

Communication cable	M200325-1*3-1R-B-male
CH	1
CL	2
-	3

PWM cable	M200335-1*3-1R-B-female
S	1
-	3

LED	M200335-2*2-B-female
+	1
R	2
G	3
B	4

Sensor connector	Wire color	Connector model number
A	white	1
B	yellow	2
Z	green	3
PWM	purple	4
+5V	blue	5
GND	brown	6
GND	/	/
NTC	red	7
GND	black	8



05 Specifications

Recommended uniaxial load: 65kg
 Max Torque: 116kg
 Lithium compatible: 96-107S (LiPo)
 Ambient temperature: -35°C-55°C
 Propeller positioning: IPC(Intelligent Propeller Control)
 Total weight (excluding propellers): 6165g / 6252g
 Protection level: IP35
 Support throttle frequency: 50-500Hz

ESC
 Continuous current: 40A (Non-airtight ambient temperature <60 °C)
 Lithium compatible: 280-450V DC
 Instantaneous current: 100A (3 seconds - good heat dissipation)
 Throttle solidified: 1100-1940µs
 Communication & digital throttle: CAN / RS485
 Firmware upgrade: supported

Motor
 Stator Size: Ø156*H35mm
 Outer diameter: Ø167.1*H100.5mm
 KV rating: 11 KV

Propeller
 Model: VSC 60x20 / USC 54x23
 Weight (straight propeller): 620g / 707g

06 Power system parameters

VSC 60x20 Load performance parameters

Voltage(V)	Propeller	Throttle(%)	Thrust(g)	Current(A)	Power (Watt)	Speed(RPM)	Efficiency (%)	Temp. (°C)	Power (Watt)	Temperature(°C)
33V	VSC 60x20	33%	24355	7.7	2560.5	1396	9.4	14.31	2076.8	
		35%	27794	9.3	3105.0	1481	8.9	18.33	2532.6	
		37%	31375	11.0	3675.3	1574	8.5	18.45	3040.5	
		39%	35078	12.8	4266.9	1663	8.2	20.65	3565.3	
		42%	40817	15.9	5331.5	1792	7.7	24.07	4517.4	
		45%	46718	19.3	6474.9	1914	7.2	27.82	5538.0	
		48%	52718	23.0	7702.3	2033	6.8	31.25	6643.3	
		51%	58756	27.0	9057.8	2140	6.5	34.93	7827.4	
		54%	64775	31.3	10475.5	2245	6.2	38.82	9078.8	
		57%	70721	36.0	11960.0	2344	5.9	42.29	10376.3	
		60%	76540	40.9	13495.2	2437	5.7	45.90	11712.7	87°C
		63%	82184	45.0	15066.5	2524	5.5	49.42	13061.5	
		66%	87605	49.7	16651.2	2604	5.3	52.82	14422.1	
		69%	92787	54.4	18258.9	2677	5.1	56.06	15742.7	
		72%	97688	59.0	19774.6	2744	4.9	59.11	16985.4	
		75%	102897	63.5	21264.1	2804	4.8	61.95	18189.1	
		78%	108153	67.7	22710.8	2858	4.7	64.54	19273.5	
		81%	108848	71.5	23960.0	2905	4.6	66.85	20334.3	
		84%	113049	75.0	25129.8	2946	4.5	68.86	21242.4	
		87%	115749	78.0	26138.9	2981	4.4	70.55	22022.2	
		100%	116531	78.9	26424.7	2991	4.4	71.04	22550.4	

USC 54x23 Load performance parameters

Voltage(V)	Propeller	Throttle(%)	Thrust(g)	Current(A)	Power (Watt)	Speed(RPM)	Efficiency (%)	Temp. (°C)	Power (Watt)	Temperature(°C)
33V	USC 54x23	33%	22163	7.8	2532.7	1487	8.8	12.90	2009.3	
		35%	25389	9.1	3046.0	1599	8.3	14.79	2461.3	
		37%	28796	10.8	3625.0	1691	7.9	16.50	2974.5	
		39%	32358	12.7	4266.6	1790	7.6	18.90	3543.3	
		42%	37013	15.9	5337.2	1934	7.1	22.21	4498.1	
		45%	42650	19.6	6263.9	2070	6.7	25.65	5592.2	
		48%	48406	23.3	7181.8	2198	6.3	29.18	6716.2	
		51%	55388	27.5	8208.1	2318	6.0	32.76	7951.5	
		54%	61279	31.9	10650.7	2431	5.7	36.36	9254.5	
		56%	65173	34.9	11764.4	2503	5.6	38.79	10150.8	
		60%	72850	41.3	13638.0	2638	5.3	43.48	12011.8	90°C
		63%	78455	46.3	15497.4	2732	5.1	46.97	13436.0	
		66%	83988	51.3	17187.6	2820	4.9	50.38	14870.9	
		69%	89094	56.4	18847.7	2901	4.7	53.63	16292.4	
		72%	94030	61.4	20559.0	2975	4.6	56.76	17681.0	
		75%	98524	66.2	22134.3	3041	4.4	59.68	19007.4	
		78%	102836	70.7	23688.3	3098	4.3	62.59	20238.0	
		81%	106548	74.8	25053.6	3145	4.3	64.79	21335.0	
		84%	109674	78.3	26218.3	3183	4.2	66.82	22289.0	
		87%	112092	81.0	27256.4	3211	4.1	68.40	23097.1	
		100%	112716	81.7	27361.9	3218	4.1	68.81	23185.3	

The above data was measured by HOBBYWING Laboratory at room temperature 25°C, at sea level, with varying throttle input. The motor temperature is measured after running for 10 minutes at rated thrust, for reference only.

07 ESC protection function

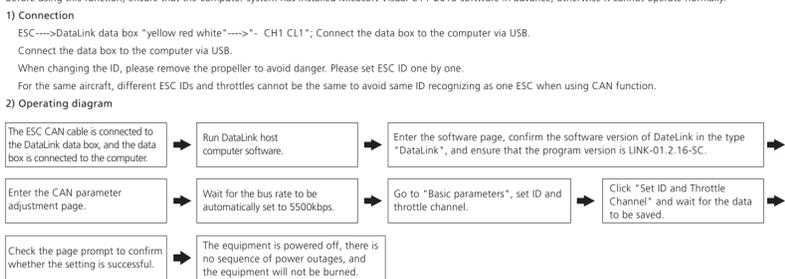
This ESC is specially designed for industrial drones, without low-voltage protection and over-heat protection.

- Stall protection**
When the ESC detects that the motor is locked, the ESC will completely turn off the output and repeatedly try to restart the motor. Please land the aircraft as soon as possible if the motor is unable to be restarted. The power output can only be resumed after the power is turned off and restarted, and the fault is eliminated.
- Over current protection**
When the instantaneous phase current abnormality reaches 250A, the ESC will turn off the output and keep trying to restart the motor. If the motor does not restart, it will return to normal after power on again.
- Over-heat warning**
A fault message will be sent out through the data interface when the IGBT temperature is higher than 110°C or capacitor temperature is higher than 100°C. Please land the aircraft in time or reduce the throttle output when the ESC reports an over-heat fault, if the temperature continues to rise, electronic components may be damaged.
- Low voltage protection**
This ESC has no low-voltage protection. Some electronic components of the ESC will work abnormally when the voltage falls below 280VDC. Please land the aircraft in time.
- Throttle signal loss protection**
When the ESC detects that the throttle signal is lost, the output will be turned off immediately to avoid greater losses caused by the continued high-speed rotation of the propeller. After the signal is restored, the ESC will resume normal operation immediately.

08 ID setting

If there is no requirement, the default factory ID of the ESC is 1, the throttle channel is 1, and the bus speed is 500kbps. This function requires the additional purchase of DataLink data box.

Before using this function, ensure that the computer system has installed Microsoft Visual C++ 2013 software in advance, otherwise it cannot operate normally.



09 Fault data read

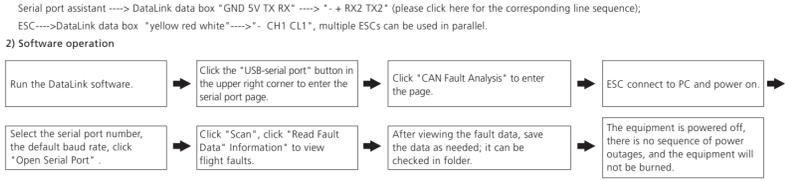
The ESC has its own fault storage function to store the times upon powering-on, flight time, and fault times information. It is convenient for flight fault analysis. This function needs to use DataLink data box, serial port assistant, and DataLink host computer software.

Note: DataLink data box can be obtained from Hobbywing official website, dealers, Hobbywing sales, and Hobbywing after-sales.

DataLink software box firmware version requirements: LINK-01.2.16-SC or later; serial port assistant requirements: USB to TTL protocol; DataLink host computer software requirements: fault storage version. It can be obtained on the official website, WeChat official account or after-sales service.

The DataLink box has three power supply methods (+5V), USB data cable, serial port assistant, and external power supply cable. You can choose one of the power supply methods, and you don't need to repeat the power supply.

Note: For detailed steps, please refer to the DataLink user manual.



10 Firmware upgrade

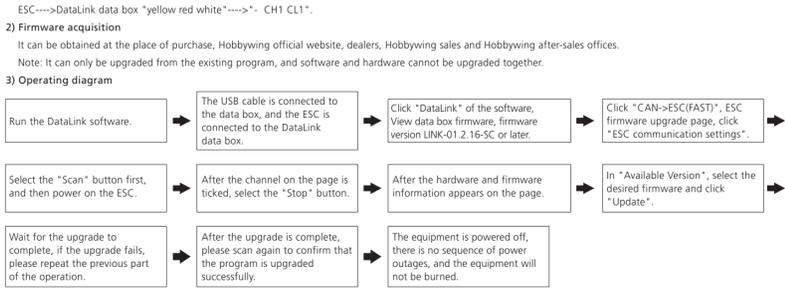
Firmware upgrade is divided into two ways: computer online upgrade and flight controller remote upgrade. It supports online upgrade of multiple ESCs at the same time, and the upgrade port is CAN-ESC (Fast).

The upgrade of the flight control needs to cooperate with the flight control(not explained here).

This function needs to use DataLink data box, special DataLink software for upgrade package, and USB data cable.

DataLink data box version requirements, LINK-01.2.16-SC or later; DataLink software can be obtained from Hobbywing official website, distributors, Hobbywing sales, and Hobbywing after-sales.

Note: Please ensure that the computer system has installed Microsoft Visual C++ 2013 software before using this function, otherwise it cannot be used. An upgrade package usually only contains one program for one type of ESC. For other ESCs, please re-obtain the upgrade package for the corresponding ESC model.



11 Common Faults and Prompt Sound Description

Symptoms	Alarm tone	Possible causes	Solutions
Motor fails to start after power on	"Beep beep beep..." rapid monophonic	Throttle not reset to zero	Push the throttle to the lowest point or recalibrate the throttle point
Motor fails to start after power on	"Beep, beep, beep..." (1 second for each interval)	Receiver throttle channel has no throttle signal output	1. Check whether the transmitter and receiver operates normally 2. Check whether the throttle control channel wiring is normal
The power-on voltage is lower than 280VDC	"Beep, beep" (interval 1 second)	Battery voltage is too low	Replace with a suitable fully charged battery
The power-on voltage is higher than 450VDC	"Beep, beep" (interval 1 second)	Battery voltage too high	Replace with a suitable fully charged battery
The motor stops or restarts		The motor is not compatible with the ESC	Replace the motor, or replace the propeller
There is no sound during the self-test of the motor, but the motor can rotate	There is no prompt sound during self-test, and the motor rotates	Driver exception	1. Replace ESC 2. Return to factory for repair
The motor cannot start normally, accompanied by "click" "click" jitter	There is no prompt sound during the self-test, and the motor is unable to rotate	Motor phase loss	1. Check phase connection 2. Check motor 3. If there is no problem with the motor and connection, return the ESC to the factory for repair

12 The blinking of the light

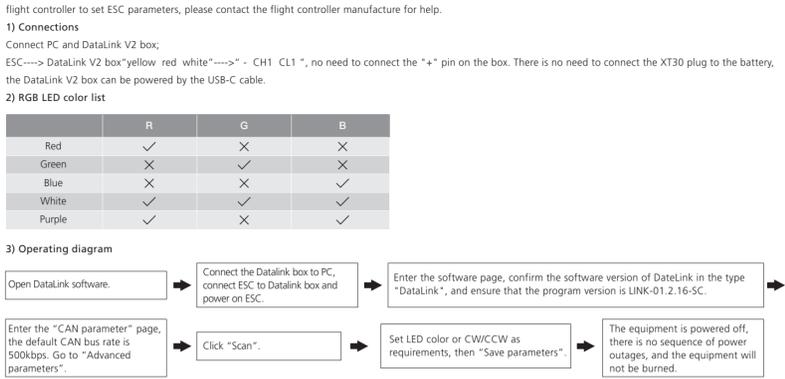
Condition	normal	Full of throttle	Over voltage	Low voltage	Over current	Throttle lost	The input throttle signal is not at the 0% position	MOS overheat	Capacitor over heat	Motor block
Number of blinking of the light	The light is always on	Continuous short blinking	1 short	2 short	3 short	1 long	1 long and 1short	1 long and 2 short	1 long and 3 short	1 long and 4 short

Others	Condition	The input throttle signal is not at the 0% position	Shorted circuit of signal line	Open circuit of motor
Sound & blinking	Continous short loudly beep & LED continuous short blinking	Continous short with blinking & LED off with LED off	Continous short blinking without beep	

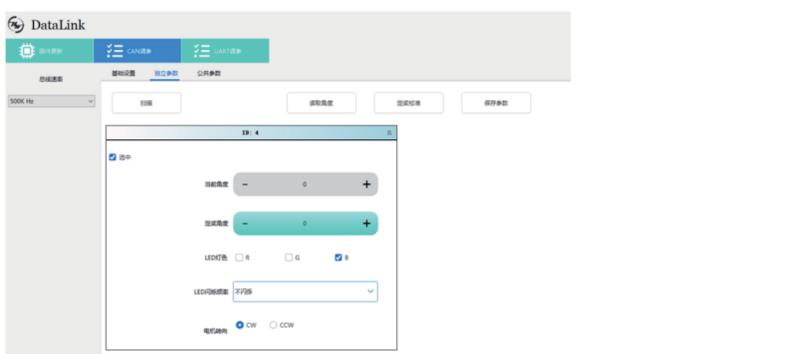
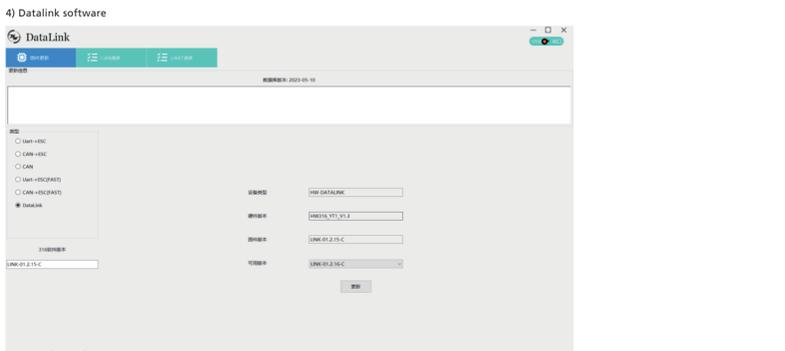
13 Settings of LED color and CW/CW

Please purchase the DataLink V2 box from Hobbywing or Hobbywing distributors. Please buy CAN analyzer if needed. Please contact to the manufacture of your flight controller in advance to check if our products have communication protocol with your flight controller already. In parameter settings, gray area means unable to set. For other parameters, please do not modify at will to avoid crash.

We only include how to set parameters with DataLink V2 box in this user manual. If you are using CAN analyzer please follow HW CAN protocol document. If you are using flight controller to set ESC parameters, please contact the flight controller manufacture for help.



	R	G	B
Red	✓	×	×
Green	×	✓	×
Blue	×	×	✓
White	✓	✓	✓
Purple	✓	×	✓



Resources & Specifications
 Visit www.hobbywing.com/en/product/p65v for more details about HOBBYWING P65V VTOL Drone Integrated Propulsion System