V series electronic speed regulator user manual Ver.1.0.2

Version change history

Date	Version	Change log		
2024.6.15	Ver.1.0.0	Create version		
2024.0.2	Vor 1 0 1	Modify the throttle stroke and some		
2024.9.2	Ver.1.0.1	description errors		
		The description of the ESC protection		
		function has been updated, including the		
2025.04.08	Ver.1.0.2	display interface on the computer.		
		Additionally, information about the new		
		version of the ESC has been added.		

V series electronic speed regulator user manual Ver.1.0.2	1
Version change history	1
Contents	2
1 .Introduction	
2 .Precautions	
3. Feature of product	3
4.Product specifications	4
5.Technical Specifications	4
6. User Guide	6
7. Normal Power-on Process	6
8.Protection Function Description	7
9.Common Faults and Alert Tones Description	7
10. Mission Planner (APM Firmware) Connecting to the ESC	
11.11.QGround Control (PX4 Firmware) Connecting to the ESC	
12.Setting ESC ID via the upper computer	
13.Rotation direction setting	
14.Encoder Calibration	16
15.Rotor lock configuration	
16.Firmware Upgrade	
17.CAN protocol related	
18.Appendix	

Contents

1 .Introduction

FOC—Field-Oriented Control, a smart drive vector control technology, demonstrates higher efficiency, lower operating temperature, faster response speed, reduced noise, lower interference, linear throttle control, precise control performance, and efficient energy recovery compared to ESCs of the same power.

2.Precautions

- This series of ESCs uses FOC driving mode and requires strict matching of motor parameters. It is important to note that this program is unique; each program is only suitable for a specific combination of motor and propeller and cannot be simultaneously compatible with multiple combinations. If you need to use it, please be sure to contact the manufacturer.
- The power setup for this ESC does not recommend changing the propeller to avoid triggering ESC protection due to inappropriate combinations, which may cause the equipment to malfunction. During ground testing, please do not install the propeller to ensure safety.
- Before connecting the ESC and related components, ensure that the contact points are well-insulated to prevent short circuits that could damage the ESC. Carefully check the connections of each component, as poor connections may lead to improper control of the aircraft or cause unforeseen equipment damage.
- Before using this ESC, carefully read the V series ESC user manual to ensure proper matching of the power system and avoid damage to the ESC due to incorrect configurations.
- If you need to solder the input and output connectors of the ESC, use a soldering tool with sufficient power to ensure a secure connection.
- Do not allow the ESC's external surface temperature to exceed 90 °C, as high temperatures may damage the ESC and could potentially cause motor damage or a crash.
- To change the motor's direction during operation, you can either swap the order of any two phase wires or adjust the settings through the ground control station.

3. Feature of product

- 3.1 Supports DroneCAN protocol to achieve rapid integration with PX4 flight control.
- 3.2 Equipped with PWM and CAN dual throttle input design to back up each other.
- 3.3 PWM and CAN dual isolated inputs to ensure signal transmission reliability.
- 3.4 Support rotor lock.

4. Product specifications

Model	Persistent Current	Peak Current	BEC	Cells (4.2V)	Reference options	Weight(Not inc wires)g	Appearance Dimensions (mm)
V-40A-14S	20A	40A	No	6-14s	Adjustable Parameters	50	62*30*18
V-60A-14S	30A	60A	No	6-14s	Adjustable Parameters	63	77*33*19
V-80A-14S	40A	80A	No	6-14s	Adjustable Parameters	78	84*35*19
V-120A-14S	60A	130A	No	6-14s	Adjustable Parameters	130	103*50*26
V-150A-14S	70A	160A	No	6-14s	Adjustable Parameters	206	116*49*31
V-200A-14S	100A	200A	No	6-14s	Adjustable Parameters	243	127*56*33
V-60A-24S	35A	65A	No	12-245	Adjustable Parameters	283	115*57*27
V-120A-24S	65A	135A	No	12-24S	Adjustable Parameters	460	133*62*38

5.Technical Specifications

Model	Protoco I	Isolation Method	Firm war e Upg rade	Digi tal Co mm uni cati on Thr ottl e	PWM Level	PWM Frequre nce	PWM pulse width	Throt tle calibr ation	Dual Throttle	Rotor lock	Protection level
V-40A-14S	CAN bus (RS485 can be customi zed)	Fully Isolated	Sup port	Sup por t(C AN)	5V/3.3V	50-500 Hz	1040-1940 us	Non- calibr atabl e	Support (CAN+ PWM)	Support ,Custom motor required	IP55 (customizab le to IP67)
V-60A-14S	CAN bus (RS485 can be customi	Fully Isolated	Sup port	Sup por t(C AN)	5V/3.3V	50-500 Hz	1040-1940 us	Non- calibr atabl e	Support (CAN+ PWM)	Support ,Custom motor required	IP55 (customizab le to IP67)

	zed)										
	CAN										
	bus			Sup				Non-	Support	Support	IP55
V-80A-14S	(RS485	Fully	Sup	por	5V/3.3V	50-500	1040-1940	calibr	(CAN+	,Custom	(customizab
	can be	Isolated	port	t(C		Hz	us	atabl	PWM)	motor	le to IP67)
	customi			AN)				e		required	,
	zed)										
	CAN										
	bus			Sup				Non-	Support	Support	IP55
V-120A-145	(RS485	Fully	Sup	por	5V/3.3V	50-500	1040-1940	calibr	(CAN+	,Custom	(customizab
	can be	Isolated	port	t(C		Hz	us	atabl	PWM)	motor	le to IP67)
	customi			AN)				e		required	
	zed)										
	CAN										
	bus			Sup				Non-	Support	Support	IP55
V-150A-14S	(RS485	Fully	Sup	por	5V/3.3V	50-500	1040-1940	calibr	(CAN+	,Custom	(customizab
	can be	Isolated	port	t(C		Hz	us	atabl e	PWM)	motor	le to IP67)
	customi			AN)						required	
	zed)										
	CAN										
	bus			Sup				Non-	Support	Support	IP55
V-200A-14S	(RS485	Fully	Sup	por	5V/3.3V	50-500	1040-1940 us	calibr atabl	(CAN+ PWM)	,Custom	(customizab
	can be	Isolated	port	t(C		Hz				motor	le to IP67)
	customi			AN)				e		required	
	zed)										
	CAN										
	bus		_	Sup				Non-	Support	Support	IP55
V-60A-24S	(RS485	Fully	Sup	por	5V/3.3V	50-500	1040-1940	calibr	(CAN+	,Custom	(customizab
	can be	Isolated	port	t(C		Hz	us	atabl	PWM)	motor	le to IP67)
	customi			AN)				e		required	
	zed)										
	CAN			C				Num		Gunnant	
	bus			Sup		50 500	1010 1010	Non-	Support	Support	IP55
V-120A-24S	(KS485	Fully	Sup	por	5V/3.3V	50-500	1040-1940	calibr	(CAN+	,Custom	(customizab
	can be	isolated	port			HZ	us	atabi	PWM)	motor	le to IP67)
	customi			AN)				e		required	
	zed)										

6. User Guide

6.1Precautions

1.Do not exceed the recommended operating voltage range of the ESC, otherwise it may cause irreversible damage to the ESC.

2.This ESC throttle has been solidified and does not require throttle calibration. The throttle stroke is 1040-1940us.

3. The FOC ESC features braking effect and reverse voltage. Please ensure the use of power equipment capable of absorbing reverse voltage during ESC testing or flight to avoid damage to the ESC and power supply.

4.The ESC supports both PWM and CAN throttle modes, with the ability to set which mode takes priority while the other serves as a backup. Upon startup, the throttle must be connected to the ESC to ensure normal operation. The backup throttle mode only becomes effective if the primary throttle mode fails during operation. The factory default setting is PWM throttle priority. If you need to change to CAN throttle priority, please contact the manufacturer or use the upper computer for settings.

5. If using the rotor lock mode, it is strictly forbidden to change the connection order of the three-phase wires with the motor, and ensure that the encoder wires do not become detached.



6.2Wiring diagram

VLINK(During debugging, connect the CAN wire.)

- 1) The 2P-JR connector is the PWM throttle input line, with the white line as the throttle signal line and the black line as the ground wire.
- 2) The 3P-JR connector is the CAN throttle input line, with the green line as CAN-L, the yellow line as CAN-H, and the gray line as the ground wire.
- 3) The M6 aviation connector is the encoder wire, which can be connected to the motor encoder wire to enable the fixed-pitch function.

7. Normal Power-on Process

- 1) Turn on the radio and set the throttle stick to the minimum position.
- 2) Connect the system to the battery. When the motor emits a beep, it indicates that the system is ready, and the self-check is complete, making it ready for takeoff.

8.Protection Function Description

This series of ESCs is designed for industrial drones, with no low voltage protection and over-temperature protection.

1) Stall protection

When the ESC detects that the motor stall, the ESC will completely shut down the output and report the fault after 5 seconds. If the motor stall fault is cleared, the motor can be restarted by setting the throttle to zero and then resuming the output.

2) Current Protection

40A/60A/80A:When the surge current exceeds 200A, the ESC will reboot three times. If the current remains abnormal, it will immediately cut off the output. Normal operation resumes after repowering.

120A/150A/200A: When the surge current exceeds 280A, the ESC will reboot three times. If the current remains abnormal, it will immediately cut off the output. Normal operation resumes after repowering.

3) Temperature Warning

When the MOSFET or capacitor temperature exceeds 110° C, a temperature warning message will be sent via the CAN communication interface. If the temperature continues to rise after the warning, it may cause irreversible damage to the electronic components. Please land immediately or reduce the throttle output.

4) Low voltage warning

This series of ESCs does not have low voltage protection. When the voltage drops below 18V or Rises above 63V, some electronic components of the ESC may malfunction. Please land promptly.

5) Throttle signal loss protection

When the ESC detects a loss of throttle signal and there is a backup throttle, the ESC will immediately respond to the backup throttle's output. When the ESC detects a loss of throttle signal but there is no backup throttle, the ESC will continue to output with the last received throttle signal for 2 seconds. If a throttle signal is received within those 2 seconds, the ESC will continue to respond. If no throttle signal is received within 2 seconds, the output will be shut down, and the ESC needs to be re-powered to restore functionality.

9.Common Faults and Alert Tones Description

Fault Phenomena	Alarm	Possible cause	Solution
After powering on, the motor fails to start	Rapid single-tone "beep beep beep"	Throttle not at zero position	Move the throttle to the lowest position or Change throttle Minimum value to 1040us
After powering on, the motor fails to start	"Beep, beep, beep" (with a 1-second interval between each beep)	The receiver's throttle channel is not outputting a throttle signal	 Check if the radio and receiver are paired correctly. Check if the throttle channel wiring is connected properly. Verify the ESC communication priority (factory default is PWM).

The power supply voltage is either	"Beep beep, beep beep"	Battery voltage	Replace with a suitable fully
below 18V or above 63V.	(with 1-second intervals)	failure	charged battery
Motor stops or rostarts in the air		Motor and ESC are	Replace the motor or change the
		incompatible	propeller
During motor self-test, no sound, but the motor can rotate	During motor self-test, no sound, but the motor can rotate	Driver failure	 Replace the ESC Return to factory for repair
Motor fails to start normally, accompanied by a "clicking" or "thumping" sound	During motor self-test, no sound, but the motor can not rotate	Motor phase missing	 Check phase line connections Check the motor If the motor and connections are fine, contact after-sales service for factory repair

10. Mission Planner (APM Firmware) Connecting to the ESC

 \triangle Warning: When changing the ID, ensure the propeller is disassembled to avoid potential hazards. In the same aircraft, multiple ESCs must be assigned different IDs; otherwise, issues such as throttle control confusion may occur.

Mission Planner 1.3.82 build	1.3.8979.17128 ArduCopter V4.5.7 (2	2a3dc4b7)						- 🗆 🗙
							9600 M5-1-QU/	
GeoFence	Name	△ Value	Default	Units	Options	Desc	Fav ^	Load from file
Basic Tuning	CAN_D1_PROTOCOL				0:Disabled 11:Benewake	Enabling this option starts selected protocol that will use this virtual driver	•	Save to file
Extended Tuning	CAN_D1_PROTOCOL2	0			0.Disabled 11:Benewake	Secondary protocol with 11 bit CAN addressing		Write Parans
Onboard OSD	CAN_D1_UC_ESC_BM	15				Bitmask with one set for channel to be transmitted as a ESC command over DroneCAN	-	Befresh Parans
MAVF tp	CAN_D1_UC_ESC_OF	0	0		0 18	Offset for ESC numbering in DroneCAN ESC RawCommand messages. This allows for more efficient packing of ESC command messages. If your ESCs		All Units are in raw
Full Parameter List	CAN_D1_UC_ESC_RV	0	0			Bitmask with one set for each output channel that uses a revenable ESC over DoneCAN. Revenable ESCs use both positive and negative values in Brock DoneCAN.		3DR_Iris+_AC34. param -
Planner	CAN_D1_UC_NODE	10	10		1 125	DroneCAN node ID used by the driver itself on this network	•	Load Presaved
	CAN_D1_UC_NTF_RT	20	20	Hz	1 200	Maximum transmit rate for Notify State Message		Reset to Default Search
	CAN_D1_UC_OPTION	0	0			Option flags		CAR
	CAN_D1_UC_POOL	16384	16384		1024 16384	Amount of memory in bytes to allocate for the DroneCAN memory pool. More memory is needed for higher CAN bus loads		None Default
	CAN_D1_UC_RLY_RT	0	0	Hz	0 200	Maximum transmit rate for relay outputs, note that this rate is per message each message does 1 relay, so if with more relays will take longer to update at the same state activities and the same takes and the same state.		
	CAN_D1_UC_SER_EN				0.Disabled 1.Enabled	Enable DroneCAN vitual serial ports		
	CAN_D1_UC_SRV_BM	15	0			Bitmask with one set for channel to be transmitted as a servo command over DroneCAN	•	
	CAN_D1_UC_SRV_RT	50	50	Hz	1 200	Maximum transmit rate for servo outputs		
	CAN_D2_PROTOCOL	1	1		0.Disabled 11:Benewake	Enabling this option starts selected protocol that will use this virtual driver		
	CAN_D2_PROTOCOL2				0.Disabled 11:Benewake 14:Deduc 0.M	Secondary protocol with 11 bit CAN addressing		
	CAN_LOGLEVEL	0	0		0.4 0.Log None 1.1 Cent	Loglevel for recording initialisation and debug information from CAN Interface		
	CAN_P1_BITRATE	1000000	1000000		10000 1000000	Bit rate can be set up to from 10000 to 1000000		
	CAN_P1_DRIVER	1	1		0.Disabled 1.First driver 2.Second driver	Enabling this option enables use of CAN buses.		
	CAN_P1_FDBITRATE				1:1M 2:2M 4-4M	Bit rate can be set up to from 1000000 to \$000000		
	CAN_P2_BITRATE	1000000	1000000		10000 1000000	Bit rate can be set up to from 10000 to 1000000	•	
	CAN_P2_DRIVER		0		Second driver	Enabling this option enables use of CAN buses.		
	CAN_P2_FDBITRATE	4	4		1:1M 2:2M 4-4M	Bit rate can be set up to from 1000000 to 8000000		
	CAN_SLCAN_CPORT	0	0		0.Disabled 1:First interface 2:Second interface	CAN Interface ID to be routed to SLCAN, 0 means no routing		
								10

Note! Before using the flight controller to control the ESC, you need to make some simple settings:

Set the value of CAN_D1_UC_ESC_BM to 15.

Set the value of CAN_D1_UC_SRV_BM to 15.

Set the value of CAN_P2_DRIVER to 2

(Current Mission Planner version: 1.3.8479.20539, Flight Controller firmware version: V4.3.7)

10.1 Setting the ESC ID

MPR M	ission Planner 182 build	1.3.897	79.17128	ArduCopter V4.5.7 (a	2a3dc4b7)											
DATA		ifig si									ARD	UPIL	<u>.01</u>	COM5 Stats	- 9600 - COM5-1-QUADROTOR -	DISCONNECT
Inst	allFirmware	Dron	IeCAN	/UAVCAN							🖌 Exit SLCAN	on leave?	Log			
≫∎a	ndatory Hardware	SLCar	Dir	HAVLink-CAN1	MAV1ink-CANS	Filter	Inspect	After You	ensbling SLC	AN, you will s screen and	no longer be ab wait 2 seconds	le to conn before con	ect via N necting a	AVLINK. Isain		
>> 0p	tional Hardware					Stats	li.									
2	RTK/GPS Inject		10	Nane	Mode	Health	Uptime	HW Versio	SW Version	SW CRC	Menu					
	CubeID Update		127	org missionpla	OPERATIONAL	OK	00:00:42	0.0	1.0.0	0	Menu					
	Sik Radio	<u> </u>	10	org.ardupilot:0	OPERATIONAL OPERATIONAL	OK	00:05:13	1.0	1.0.0	0	Henu					
	CAN GPS Order	Ľ		THEOR_1100_11							THERE					
	Battery Monitor															
3	Pattery Monitor															
	Torretick															
	gogstick					-										
	Compass/motor ca					UAVCA	N Params	-1					-	U X		
	Kange Finder					Command	M	△ Value	e Min	Max		Default	Fav	Load from fil		
	Airspeed					ESC_MAP	_ID		7			Empty		Save to file		
	PX4Flow					LED_MOD)E	0				Empty		Write Parans	8	
	Optical Flow													Refresh Paran	6	
	OSD															
	Camera Gimbal													Connit Parans		
	Lotor Test													format with no		
	Bluetooth Setup															
	Parachute	Node	ID / Na													
	ESP8266 Setup	Nonde	/ neart	fic code	OPERATIO)									Saarah		
	Antenna Tracker	Softw	are ver	sion/CRC64	12.04									o cu on		
	FFT Setup	Har da	are ver	sion/VID	2.3									Modified 🗖		
>> &c	lvanced		Node	Level Source T	ext											

(1)Click on "Initial Setup".

(2)Click on "Optional Hardware".

(3)Click on "DroneCAN/UAVCAN".

(4)Click on "MAVlink-CAN1" to search for the CAN device connected to the flight controller.

Note! If the ESC's CAN wire is connected to the flight controller's CAN1 port, click "MAVlink-CAN1". If the ESC's CAN wire is connected to the flight controller's CAN2 port, click "MAVlink-CAN2".

(5)Select the ESC you want to set, click on "Menu", then click on "Parameters" to open the ESC parameter interface.

(6)Click on "Refresh Parameters".

(7)Modify "ESC_MAP_ID" and change the value to the desired ESC ID.

(8) Click on "Write Parameters" to complete the ESC ID modification.

10.2 CAN Throttle Testing



(1)Click on "Initial Setup".

(2)Click on "Optional Hardware".

(3)Click on "Motor Test".

(4)Input motor test throttle, e.g. 10%.

(5)Input the test duration, e.g. 4s.

(6)Click "Test Motor A" (Motor A corresponds to the ESC ID is 1), you can see that the motor is running;

10.3 ESC status monitor

In the status bar, you can view data for ESC 1 under the throttle action, including current (esc1_curr), RPM (escl_rpm), temperature (esc1_temp), voltage (esc1_volt), and more.



11.QGround Control (PX4 Firmware) Connecting to the ESC

 \triangle Warning: When changing the ID, ensure the propeller is disassembled to avoid potential hazards. In the same aircraft, multiple ESCs must be assigned different IDs; otherwise, issues such as throttle control confusion may occur.

Parameter Configuration

Set UAVCAN BITRATE to 1000000.

UAVCAN_ENABLE configures Sensors and Actuators(ESCs)Automatic Config.

UAVCAN_BITRATE	1000000 bit/s	UAVCAN CAN bus bitrate
UAVCAN_ENABLE	Sensors and Actuators (ESC	's UAVCAN mode
UAVCAN_ESC_IDLT	Enabled	UAVCAN ESC will spin at idle throttle when armed, even if the mixer outputs zero setpoints

Set SYS_CTRL_ALLOC to Enabled to activate the CAN dynamic ID allocation function. The PX4 CAN dynamic ID allocation function requires an SD card; otherwise, PX4 cannot dynamically assign CAN node IDs to CAN devices.

After configuring the above parameters, reboot PX4. Enter "uavcan status" in the Mavlink console to view CAN port status and connected devices.

QGroundControl	– 🗆 X
Back < 🛃 An	alyze Tools
Log Download	Provides a connection to the vehicle's system shell.
GeoTag Images	Pool allocator status: Capacity hard/soft: 500/250 blocks Reserved: 109 blocks Allocated: 48 blocks
> MAVLink Console	UAVCAN node status: Internal failures: 13
MAVLink Inspector	Transfer errors: 41 RX transfers: 272 TX transfers: 40075
- Wbration	<pre>CAN1 status: HW errors: 35407 IO errors: 35475 RX frames: 1216 TX frames: 38454 CAN2 status: HW errors: 38170 IO errors: 41803 RX frames: 37765 ESC outputs: INFO [mixer_module] Param prefix: UAVCAN_EC control latency: 65392 events, 21058751us elapsed, 322.04us avg, min 158us max 1421us 163.587us rms Channel Configuration: Channel Configuration: Channel 1: func: 10.1, value: 65355, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 1: func: 10.3, value: 65535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 1: func: 10.3, value: 65535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 1: func: 10.4, value: 65535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 3: func: 0, value: 65535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 4: func: 0, value: 65535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 5: func: 0, value: 65535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 6: func: 0, value: 65535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 6: func: 0, value: 65535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 7: func: 0, value: 65535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Channel 6: func: 0, value: 05535, failsafe: 65535, disarmed: 65535, min: 1, max: 8191 Servo outputs: INFO [mixer_module] Param prefix: UAVCAN_SV control latency: 0 eventa, 0 us elapsed, 0.00us avg, min 0 us max 0 us 0.000us rms Channel 1: func: 0, value: 0, failsafe: 500, disarmed: 500, min: 0, max: 1000 Channel 1: func: 0, value: 0, failsafe: 500, disarmed: 500, min: 0, max: 1000 Channel 1: func: 0, value: 0, failsafe: 500, disarmed: 500, min: 0, max: 1000 Channel 3: func: 0, value: 0, failsafe: 500, disarmed: 500, min: 0, max: 1000 Channel 3: func: 0, value: 0, failsafe: 500, disarmed: 500, min: 0, max: 1000 Channel 4: func: 0, value: 0, failsafe: 500, disarmed: 500, min: 0, max: 1000</pre>

11.1 CAN Throttle Testing

(1)Set the Actuators Outputs tab to define the ESC-motor mapping and adjust the throttle's max/min values.

QGroundControl Back < 😵 Vehicle Setup Actuators Setup Adv Geometry: Multirotor Actuator Outputs Radio Flight Modes Actuators 1 uator Testing Camera Parameter

(2)Enable the Actuator Testing tab, then use the slider for the target motor to vary its throttle.

11.2 ESC status monitor

View Mavlink messages; the ESC_STATUS message contains ESC RPM, voltage, current, etc. Check the plotting option to view the trend curves of these data over time.

O N	1AVLink Inspector				<u></u>	· □ ×
Inspe	ect real time MAVLink messages.					
1	ACTUATOR_CONTROL_TARGET	30.0Hz	Message: Component:	ESC_STATUS (291) 8.9Hz 1		
1	ALTITUDE	10.0Hz	Count:	1022		
1	ATTITUDE	50.0Hz	Name index	Value	Type uint8 t	Plot 1 Plot 2
1	ATTITUDE_QUATERNION	50.0Hz	time_usec	583747987	uint64_t	
1	ATTITUDE_TARGET	8.0Hz	voltage	48, 0, 0, 0	float	Ý
1	BATTERY_STATUS	0.2Hz	current	0.0299988, 0, 0, 0	float	~
1	COMMAND_ACK	61.3Hz	Scale: 5 Sec	ESC_STATUS: rpm		
1	CURRENT_EVENT_SEQUENCE	0.0Hz	Range: Auto	ESC_STATUS: current		
1	ESC_INFO	8.9Hz	1095.0			
1	ESC_STATUS *	8.9Hz	821.3			
1	ESTIMATOR_STATUS	5.0Hz	547.5			
1	EVENT	0.0Hz	273.8			
1	EXTENDED_SYS_STATE	2.0Hz	06.13.793	08.15.043 08.10.293	08.17.543	08.18.793
1	HEARTBEAT	1.0Hz				
1	HIGHRES_IMU	50.0Hz				
		-				

12.Setting the ID via the upper computer

 \triangle Warning: When changing the ID, ensure the propeller is disassembled to avoid potential hazards. In the same aircraft, multiple ESCs must be assigned different IDs; otherwise, issues such as throttle control confusion may occur.

12.1Connection



Note: This feature requires the purchase of V-link.

1.By default, the ESC factory settings are: ID = 1, throttle channel = 1, and baud rate = 1 MHz. 2.Warning: Disconnect the propeller during setup to avoid hazards.

3.Warning: On the same vehicle, different ESCs must have unique IDs; otherwise, those with the same ID will be recognized as a single ESC when using CAN functions.

ESC---->V-Link "Green Yellow Gray" ----> "CL CH -"

Connect the V-Link to the computer via USB.

Run the upper computer software to enter the ESC manual control interface, select DroneCan control and the correct ESC ID.



12.20peration



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



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

🖸 Parm Set	×
Save Parameters successfully!	
ок	

13.Rotation direction setting

 \triangle Warning! When changing the motor rotation direction, check the propeller's rotation direction on the installed motor.

13.1Connection

Refer to Section 12.1 of this user manual to connect the device. Run the the upper computer software, enter the ESC manual control interface, select DroneCan control, and choose the correct ESC ID.

13.20peration



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



- 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:

🖸 Parm Set		>
	Save Parameters successfully!	

14.Encoder Calibration

 \triangle Warning! After calibrating the encoder, the three-phase wires must not be rewired, and ensure that the three-phase wires and encoder cables are properly connected.

14.1Connection

Refer to Section 12.1 of this user manual to connect the device. Run the the upper computer software, enter the ESC manual control interface, select DroneCan control, and choose the correct ESC ID.

14.20peration

▲ Warning! When clicking "Start Calibration", the motor will rotate slowly. Do not install the propeller to avoid unnecessary risks.



- 1) Click on "Calibrate".
- 2) Click on "Start Calibration". If the calibration is successful, the following prompt will appear:



3) Click on "Set Home", and if the setting is successful, the following prompt will appear:



15.Rotor lock configuration

 \triangle : Warning! When using the motor idle stop lock function for the first time, ensure that the encoder is calibrated correctly, and the connection of the three-phase wires and encoder wires is secure. Do not install the propeller during this process.

15.1Connection

Refer to Section 12.1 of this user manual to connect the device. Run the the upper computer software, enter the ESC manual control interface, select DroneCan control, and choose the correct ESC ID.

15.20peration



1) Click "Parameter Settings".

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



3) Click on "Rotor Lock" and select"Enable Auto Rotor Lock" or "Disable Auto Rotor Lock". Note!Disable Auto Rotor Lock: The motor will not automatically enter Rotor Lock mode, but it can be controlled via CAN bus by sending any position command. The motor will hold the position specified by the command.

Enable Auto Rotor Lock: A PWM pulse width below 1080 μ s is idle, 1080 – 1120 μ s activates Rotor Lock mode (motor holds the configured origin position), and above 1120 μ s resumes normal PWM speed control.

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



16.Firmware Upgrade

Firmware upgrade requires a V-link, a USB cable, and upper computer software. Multiple ESCs can be upgraded simultaneously.

Note: Obtain the upper computer software from the purchase source — official website, sales, or after-sales service.

16.1Connection

Refer to Section 12.1 of this user manual to connect the device. Run the the upper computer software, enter the ESC manual control interface, select DroneCan control, and choose the correct ESC ID.

16.20peration



- 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 cycle the ESC;

UAVCAN IAP		– 🗆 ×					
Node Information Hardware ID:2711026406 Node ID:1 ESC ID:1 HW ver.:VLE0008 KW275 V2	Vpdate Option Select F VL5009_KV275_V2_0420 Select P UAVCAN						
Node Status:Normal Update state:Uploading	Jump IAP Jump APP Uploading Terminate Update						
Update Schedule	41%						

8) Wait for the progress bar to complete;

lardw 💭	Update no	×	
Hode ISC I ntrol	mcu updated fromVL5009_KV275_V2 to VL5009_KV275_V2_	0420Update	
lo de Iode			
puar	U.K.	at	

9) The update is complete when a prompt appears;

10) Click on the "ok", Power cycle the ESC, and check version update correctly.

Note: The upper computer software can upgrade multiple ESC firmware simultaneously. **Hardware Setup**: Parallel the CAN bus of multiple ESCs.

Software Setup: Assign unique IDs to each ESC. Run the upper computer, enter the ESC Manual Control Interface, select DroneCan Control, and choose target IDs (ID1 – ID9). After selecting the firmware, click Start Upgrade.

Process: The ESCs will require multiple repowering cycles. Each power cycle allows firmware upgrade for one ESC. Repeat the process to complete upgrades for all connected ESCs.

17.CAN protocol related

The ESC uses the DroneCAN protocol common in the drone industry, which can be configured and modified via the upper computer or DroneCAN GUI TOOL.

The ESC firmware can only be updated using the upper computer software; updates via other devices are not currently supported.

CAN Protocol Reference: <TM UAVCAN V2.3>

Related Protocol SourceCode: https://github.com/dronecan/DSDL/tree/master/com/tmotor/esc

18.Appendix



Serial number	Component name	Description	Unit	Quantity	Diagram
1	Power supply positive	silicone wire-Red-14AWG-150mm	PCS	1	Positive Power Supply
2	Power supply negative	silicone wire-Black-14AWG-150mm	PCS	1	Negative Power Supply
3	Three-phase	silicone wire-Orange-16AWG-65mm	PCS	3	Three Phase Wire
4	Encoder	UL2547-24AWG*5C-Black-300 mm-5-M6-6-core aviation plug female	PCS	1	
5	PWM Wire	Shielded wire -Black-300mm-1-JR-3P-Blac k-Blank-White	PCS	1	GND
6	CAN Wire	hielded wire -Black-300mm-1-JR-3P-Gree n-Yellow-Gray	PCS	1	GND CAN_H CAN_L
	ESC mounting hole 1	M2.5 threaded hole, depth 4mm	PCS	4	
8	ESC mounting hole 2	M3 threaded hole, depth 4mm	PCS	4	



Serial number	Component	Description	Unit	Quantity	Diagram
1	Power supply positive	Slicon-Red-14AWG-160mm	PCS	1	Positive Power Supply
2	Power supply negative	silicone wire-Black-14AWG-160mm	PCS	1	Negative Power Supply
3	Three-phase	silicone wire-Orange-16AWG-60mm	PCS	3	Three Phase Wire
4	Encoder	UL2547-24AWG*5C-Black-300mm-5-M6-6-core aviation plug female	PCS	1	
(5)	PWM Wire	Shielded wire -Black-300mm-1-JR-3P-Black-Blank-White	PCS	1	GND
6	CAN Wire	Shielded wire -Black-300mm-1-JR-3P-Green-Yellow-Gray	PCS	1	GND CAN_H CAN_L
Ø	ESC mounting hole 1	M2.5 threaded hole, depth 4mm	PCS	4	
8	ESC mounting hole 2	M3 threaded hole, depth 4mm	PCS	4	



Serial number	Component name	Description	Unit	Quantity	Diagram
1	Power supply positive	silicone wire-Red-12AWG-180mm	PCS	1	Positive Power Supply
2	Power supply negative	silicone wire-Black-12AWG-180mm	PCS	1	Negative Power Supply
3	Three-phase	silicone wire-Orange-14AWG-110mm	PCS	3	Three Phase Wire
4	Encoder	UL2547-24AWG*5C-Black-450mm-5-M6-6-core aviation plug female	PCS	1	
5	PWM Wire	Shielded wire -Black-450mm-1-JR-3P-Black-Blank-White	PCS	1	GND
6	CAN Wire	Shielded wire -Black-450mm-1-JR-3P-Green-Yellow-Gray	PCS	1	GND CAN_H CAN_L
7	ESC mounting hole 1	M2.5 threaded hole, depth 4mm	PCS	4	
8	ESC mounting hole 2	M3 threaded hole, depth 4mm	PCS	4	



Serial	Component	Description	Unit	Quantity	Diagram
1	Power supply positive	silicone wire-Red-12AWG-120mm	PCS	1	Positive Power Supply
2	Power supply negative	silicone wire-Black-12AWG-120mm	PCS	1	Negative Power Supply
3	Three-phase	silicone wire-Orange-12AWG-75mm	PCS	3	Three Phase Wire
4	Encoder	UL2547-24AWG*5C-Black-420mm-5-M6-6-core aviation plug female	PCS	1	
(5)	PWM Wire	Shielded wire -Black-470mm-1-JR-3P-Black-Blank-White	PCS	1	GND PWM
6	CAN Wire	Shielded wire -Black-470mm-1-JR-3P-Green-Yellow-Gray	PCS	1	GND CAN_H CAN_L
Ø	ESC mounting hole 1	M2.5 threaded hole, depth 4mm	PCS	4	
8	ESC mounting hole 2	M3 threaded hole, depth 4mm	PCS	4	

V-150A-14S



Serial number	Component name	Description	Unit	Quant ity	Diagram
1	Power supply positive	silicone wire-Red-10AWG-130mm	PCS	1	Positive Power Supply
2	Power supply negative	silicone wire-Black-10AWG-130mm	PCS	1	Negative Power Supply
3	Three-phase	silicone wire-Orange-10AWG-100mm	PCS	3	Three Phase Wire
4	Encoder	UL2547-24AWG*5C-Black-4 00mm-5-M6-6-core aviation plug female	PCS	1	
5	PWM Wire	Shielded wire -Black-465mm-1-JR-3P-Bl ack-Blank-White	PCS	1	GND
6	CAN Wire	Shielded wire -Black-465mm-1-JR-3P-Gr een-Yellow-Gray	PCS	1	GND CAN_H CAN_L
	ESC mounting hole 1	M3threaded hole, depth 3mm	PCS	4	
8	ESC mounting hole 2	M3 threaded hole, depth 4mm	PCS	4	

V-200A-14S



Serial number	Component name	Description	Unit	Quantity	Diagram
1	Power supply positive	silicone wire-Red-10AWG-1140mm	PCS	1	Positive Power Supply
2	Power supply negative	silicone wire-Black-10AWG-1140mm	PCS	1	Negative Power Supply
3	Three-phase	silicone wire-Orange-10WG-205mm	PCS	3	Three Phase Wire
4	Encoder	UL2547-24AWG*5C-Black-395mm-5-M6-6-core aviation plug female	PCS	1	
5	PWM Wire	Shielded wire -Black-770mm-1-JR-3P-Black-Blank-White	PCS	1	GND
6	CAN Wire	Shielded wire -Black-770mm-1-JR-3P-Green-Yellow-Gray	PCS	1	GND CAN_H CAN_L
7	ESC mounting hole 1	M3threaded hole, depth 3mm	PCS	4	
8	ESC mounting hole 2	M3 threaded hole, depth 4mm	PCS	4	



Serial	Component	Description	Unit	Quantity	Diagram
number	name				
1	Power supply positive	silicone wire-Red-14AWG-1200mm	PCS	1	Positive Power Supply
2	Power supply negative	silicone wire-Black-14AWG-1200mm	PCS	1	Negative Power Supply
3	Three-phase	silicone wire-Orange-14WG-250mm	PCS	3	Three Phase Wire
4	Encoder	UL2547-24AWG*5C-Black-420mm-5-M6-6-core aviation plug female	PCS	1	
5	PWM Wire	Shielded wire -Black-330mm-1-JR-3P-Black-Blank-White	PCS	1	GND PWM
٦	CAN Wire	Shielded wire -Black-330mm-1-JR-3P-Green-Yellow-Gray	PCS	1	GND CAN_H CAN_L
Ø	ESC mounting hole 1	M2.5threaded hole, depth 5mm	PCS	4	
8	ESC mounting hole 2	M2.5 threaded hole, depth 5mm	PCS	4	



Serial	Component	Description	Unit	Quantity	Diagram
number	name				
	Power				
1	supply	silicone wire-Red-12AWG-1200mm	PCS	1	Positive Power Supply
	positive				
2	Power	silicone wire-Black-12AWG-1200mm	PCS	1	
	supply				Negative Power Supply
	negative				
3	Three-phase	silicone wire-Orange-14WG-250mm	PCS	3	Three Phase Wire
4	Encoder	UL2547-24AWG*5C-Black-420mm-5-M6-6-core aviation plug female	PCS	1	
5	PWM Wire	Shielded wire -Black-500mm-1-JR-3P-Black-Blank-White	PCS	1	GND PWM
6	CAN Wire	Shielded wire -Black-500mm-1-JR-3P-Green-Yellow-Gray	PCS	1	GND CAN_H CAN_L
7	ESC	M2.5threaded hole, depth 5mm	PCS	4	
	mounting				
	hole 1				
8	ESC	M2.5 threaded hole, depth 5mm	PCS	4	
	mounting				
	hole 2				