

Congratulations on your new Firefly SUP Drives (Firefly) product. Firefly electric paddleboard drives are handcrafted providing best-in-class performance. We do this by combining our unique forward-mounted drive with ePropulsion's advanced electronics. Your eSUP board is swift and balanced, providing fantastic range and maneuverability on the water.

Safety

Please read and honor all the safety items in this manual including the following important safety requirements.

- **Keep a safe distance** from people, docks, shore, shallow water, floating objects and submerged obstacles.
- Always wear a **personal floatation device (PDF)**. It is also recommended that you wear a safety leash that attaches the rider to the board.
- **Do not use a battery that shows any sign of damage.** Our batteries are designed to be waterproof, and damage can compromise the watertight integrity of the battery leading to a potential fire or explosion.

Warning: *Do not run the motor in air. This may damage the motor and cause excessive noise during operation.*

Rigging at the Beach

1. Place the wireless controller on your wrist and secure snugly with the Velcro strap.
2. Tip your board onto its rail, pull the pin from the motor shaft, and insert the motor wire and shaft through the board. Reinstall the pin making sure it goes through the hole in the deck adaptor plate and that the propeller portion of the motor is aft. There is a white mark on the shaft indicating the aft side of the motor. Secure the pin in place with the retainer clip. When installed properly, the motor is secured to the adaptor by the pin and the motor is oriented to propel the board forward.
3. Put your board in the water and attach the motor to the battery by twisting the collar clockwise. *Be careful not to over-tighten the collar and not to cross-thread the connector.*
4. Place the battery on the Velcro located on the deck of your board and slip the bungees over the battery for additional security.
5. Kneel on the board with your paddle in one hand. Press the battery activation button and hold until all LED lights are flashing. On the wireless controller, ensure the speed bar is in the off position (away from the button). A quick press of the controller button will pair the controller with the battery. When paired, all four LED lights on the battery will steadily illuminate indicating your battery has a full charge and the drive system is activated.
6. Check your surroundings for potential hazards. When clear, start the motor by sliding the speed bar on the controller to the desired speed. After a two second delay, the motor will ramp up to speed. Once moving, standup and begin to paddle.

Tips and Tricks

Clean Startup

Standup before starting the motor. Set the controller to full speed and time your first paddle stroke to coincide with the motor for a synchronized initial glide.

Smooth Turns

For smooth and easy turns, drop one foot back so your stance is facing into the turn (toe-side). Apply pressure to the inside rail and turn by putting your paddle blade flat against the back rail and twisting out. Hold steady with foot and blade pressure throughout the turn. Once you master this basic turning maneuver, try some back-side (heel-side) turns, or front bracing turns with your paddle forward and away from the rail.

Bungee Positioning

Position the battery on the aft portion of the Velcro for normal operation. In the aft position, the two bungee cords will cross over at the mid-section of the battery. For more aggressive riding, position the battery on the forward portion of the Velcro. In the forward position, the forward bungee can also be used to crossover the battery. Use this 6-point bungee securing method when going after boat wake or riding in rough conditions.

Fine Tune Your Steering

You can customize your steering by adjusting the deck adaptor plate so that the motor propels your board straight ahead, slightly to port, or slightly to starboard. Biasing steering to one side allows you to paddle primary on one side. Goofy and

regular footers (surf lingo) will gain control and comfort with a slight bias to toe-side.

To adjust, shutdown the motor and loosen the two screws on the deck adaptor plate. Rotate the adaptor clockwise or counterclockwise and retighten the screws. Check your adjustment by running at full speed and watching a distant object for reference. You may need adjust the adaptor two or three times to obtain your preferred steering direction.

Battery Optimization

Always charge your battery after use. Resting the battery a few times during a session is also helpful, especially if you run at full speed. If you prefer range over speed, running at a reduced speed can significantly increase your run times.

Fin Size

A small fin will loosen up the tail and make your board feel more responsive. We recommend a 7" surf style fin for good maneuverability.

Using Your Board Without the Motor

Put some tape on the bottom your board over the Firefly fitting when using your board for surfing or for stormy downwinders.

Warranty and Replacement Parts

We guarantee our drives to be free of manufacturing defects for six months from the date of purchase. Due to our handcrafted fabrication, there may be slight cosmetic blemishes. Rest assured, this will not affect product integrity or performance.

Safety Notice

Like any water sport, standup paddling boarding with a motor can be dangerous and involves certain risks which often cannot be predicted or avoided. Those risks include but are not limited to personal injury, property damage, even death, which may result from, among other things, loss of control and collisions with people and objects. By choosing to use a Firefly product, you assume these risks, so it is important that you understand and practice good safety techniques. Because it is impossible to anticipate every situation or condition that can occur, Firefly makes no representation or warranty about the use and safety of its products under all conditions.

By purchasing and using Firefly product(s) you acknowledge and agree that you fully understand and appreciate the danger involved in using the product(s) and you, on behalf of yourself and your heirs, executors, administrators, successors, and assigns: (1) Fully assume the risks involved and agree to use best judgement in undertaking these activities; (2) Agree to strictly follow all safety instructions set forth in this manual, other documents provided by Firefly and applicable laws and ordinances; and (3) Fully and voluntarily waive, relinquish, covenant not to sue, release and agree to indemnify and hold harmless Firefly, its members, officers, managers, agents, employees and representatives (each a "released person") from any claim or loss for personal injury, property damage, or death that may arise from use of the product(s).

Electronic System Operating Instructions

Firefly uses ePropulsion Vaquita technology. The following excerpts from the Vaquita User's provide important details on how the electronics operate. A full version of the Vaquita User's manual can be found at epropulsion.com


2.3 Technical Data

VAQUITA General Data	
Input power	300 W
Static thrust	23 lbs
Total weight	5 kg / 8.8 lbs
VAQUITA Motor weight	1.5 kg / 3.3 lbs
Dimension	162 mm x 167 mm x 182 mm / 6.4" x 6.6" x 7.2"
Propeller diameter	150 mm / 5.9"
Propeller pitch	115 mm / 4.5"
Maximum Rotation Speed	1800 rpm

VAQUITA Battery	
Battery type	Lithium-ion
Rated capacity	324 Wh
Rated voltage	21.6 V
Final charging voltage	25.2 V
Cutoff voltage	18 V
Weight	2.5 kg
Cycle life	≥500 cycles (80% of rated capacity)
Charging time	3 hrs
Temperature range	Charging: 0°C ~ 45°C / 32°F ~ 113°F Discharging: -20°C ~ 50°C / -4°F ~ 122°F
Dimension	216 mm x 178 mm x 100mm / 8.5" x 7" x 4"

VAQUITA Remote Control	
Type	Wireless
Throttle speed	8 levels
Forward/Reverse control	Forward control available
Power source	One in-built button cell (CR2032)

VAQUITA Charger	
Input power	180 W
Input voltage (AC)	100 V ~ 240 V
Input frequency	50 Hz / 60 Hz
Input current	≤ 3 A
Output voltage (DC)	25.2 V / 7 A
Temperature range	Operating: -29°C ~ 45.5°C / -20.2°F ~ 113.9°F Storage: -40°C ~ 75°C / -40°F ~ 167°F
Efficiency	≥87%

 Battery performance is dependent on many external factors such as operating environment and conditions of SUP board/kayak, etc.

2.4 Declaration

Object of the Declaration:

Product: Kayak/SUP Motor
Model: VAQUITA, VAQUITA S

Company Name: Dongguan ePropulsion Intelligence Technology Limited

Company Address:

Room 202, Bldg.17A, Headquarter No.1, 4th XinZhu
Road, SongShan Lake District, Dong Guan City, Guang Dong Province,
China

The object of the declaration is in conformity with the following directives:

EMC-directive	2014/30/EU
MD-directive	2006/42/EC
RED Directive	2014/53/EU

Applied standards:

EN 55014-1:2006+A1:2006+A2:2011	EN 55014-2:2015
EN 61000-3-2:2014	EN 61000-3-3:2013
EN 60204-1: 2016	EN ISO 12100: 2010
EN 301 489-3: V2.2.0	EN 301 489-1: V2.2.1

The original certificate was issued by

Shenzhen An-Teng Testing Service Co., Ltd. in Shenzhen, China.

CE Test Report No.: ATT11803260080E, ATT11803260080M,
ATT11803260080D

Issued Date: March 27, 2018

This device complies with part 15 of the FCC Rules: Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference and,
- (2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Test Report No.: GTS201803000218F02

Issued Date: March 26, 2018

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Signature: 陶师正

Shizheng Tao, Chief Executive Officer & Cofounder of
Dongguan ePropulsion Intelligence Technology Limited

4. Operation

To operate VAQUITA, it's critical to understand how to use the battery and remote control correctly. Read this part carefully before any operation.

4.1 Using the Battery

4.1.1 Battery LEDs

The four LEDs of VAQUITA Battery display battery level, indicate errors and show pairing status. Find the LEDs in below figure.

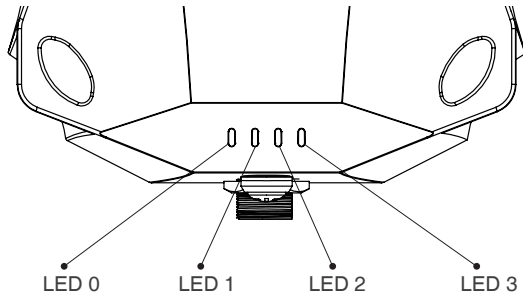



Figure 4-1

This table illustrates LED status while charging and discharging.

Battery Condition	Description	Battery Level (L-R)			
		LED 0	LED 1	LED 2	LED 3
Charging	0%~40%	★			
	40%~60%	●	★		
	60%~80%	●	●	★	
	80%~99%	●	●	●	★
	100%	●	●	●	●
Discharging	0%~20%	★	★	★	★
	20%~40%	●			
	40%~60%	●	●		
	60%~80%	●	●	●	
	80%~100%	●	●	●	●

Note: ● refers to steady light, ★ refers to flashing light (1Hz).

 If the battery is between 0% ~ 20% when discharging, all LEDs will flash simultaneously to remind you to charge the battery ASAP.

If the LEDs present abnormal flashing states, please check the below troubleshooting table for proper solutions.

Abnormal LED States				Errors	Solutions
L0	L1	L2	L3		
☆	☆			Error1: VAQUITA Remote Control communication failure	1. Make sure the remote control is powered on. 2. Please refer to <i>section 4.3 Pairing VAQUITA Remote Control with VAQUITA Battery</i> to conduct pairing.
		☆	☆		
		☆		Error2: VAQUITA Battery communication failure	Please restart the VAQUITA Battery.
		☆	☆	Error3: Other errors of the battery	Please restart the VAQUITA Battery.
	☆	☆	☆	Error4: VAQUITA Battery over-temperature	Stop operation and wait until the temperature falls within the normal operating temperature range.

Note: ☆ refers to flashing light (an interval of 0.2s, a frequency of 5Hz).



If error1 occurs, L0 and L1 flash alternately with L2 and L3.



If an error occurs in a non-charging state, the LEDs will display the battery level (for 3s) and the error (for 3s) alternately.



If multiple errors occur simultaneously, the errors will be displayed in this priority sequence: Error4 → Error3 → Error1 → Error2.



Error4 VAQUITA Battery over-temperature may occur during charging.



If the error persists, please consult the authorized dealers for help.

4.1.2 Switching On/Off VAQUITA Battery

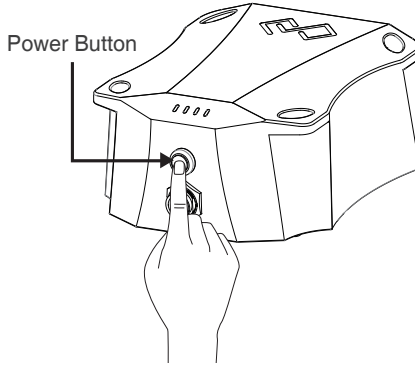







Figure 4-2

The below table indicates how to switch on/off VAQUITA Battery.

Operation	Description
Switch on	In power-off state, press the power button and hold until all LEDs light up one by one. Then release the button.  The battery will fail to be switched on if the power button is released before all LEDs light up.
Switch off	In power-on state, press the power button and hold until all LEDs light off one by one. Then release the button.  The battery will fail to be switched off if the power button is released before all the four LEDs light off, and all the four LEDs will flash simultaneously.

 Before switching on VAQUITA Battery, make sure VAQUITA Motor is safely mounted on the bottom of the SUP board/kayak, etc.

 If no electrical activity is detected within an hour after the battery is switched on, the battery will enter sleep mode automatically, and the LEDs will all go out. The battery should be restarted if it is going to be used again.

 If communication breaks (eg. the remote control is turned off), the battery LEDs will flash in pair. When communication resumes, the LEDs will light steadily.

4.1.3 Charging the Battery

Important notes before charging

- Only use VAQUITA Charger to charge VAQUITA Battery. Do not use any third-party chargers.
- Only charge the VAQUITA Battery in within 0°C~45°C (32°F~113 °F).
- Avoid water contact during charging process.
- Avoid direct sun/rain exposure during charging process.
- Do not overcharge the battery.
- Keep the battery away from flammable substance like a carpet or wood during charging process.
- In case of emergency, please stop charging the battery immediately.

Charge VAQUITA Battery following the below steps:

- 1) Power off the battery, disconnect the battery power cable with the motor. Remove the battery off the SUP board/kayak and take it to a dry and safe place.
- 2) Plug the output cable of VAQUITA Charger into the charge/discharge port of VAQUITA Battery and tighten the connector. Then plug the input cable of VAQUITA Charger into the socket. Please refer to *4.1.1 Battery LEDs* for LED charging status.

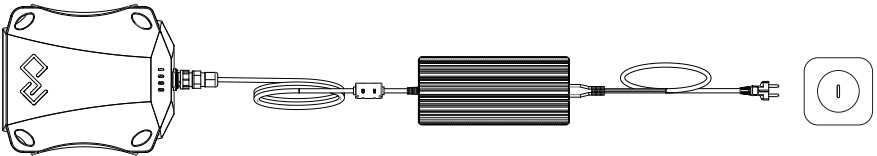





Figure 4-3

 It is recommended to fully charge the battery before each use as self-discharge may occur in the process of transportation and storage.

 It takes about 3 hours to fully charge a depleted battery. If fully charged, the LEDs will light off in half an hour.

4.2 Use of VAQUITA Remote Control

4.2.1 Switching On/Off the Remote Control

 Before switching on the remote control, please check to

- make sure the throttle is at zero position.
- make sure the motor is securely attached to the SUP board or kayak.

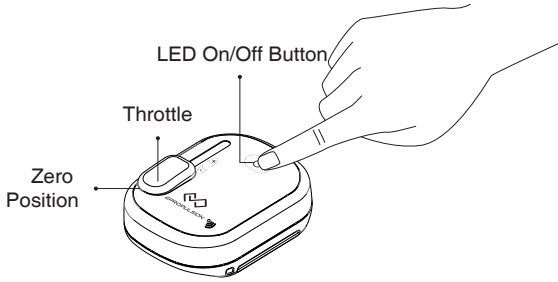






Figure 4-4

Switch On/Off	Operation	LED	Buzzer
Switch on	Short press on/off button	On	One beep
Switch off	Press on/off button for 3s	Off	One beep

 While switching on the remote control, if it beeps every 1s for 5 successive times, it is warning the remote control is running out of power. After the low battery warning, the remote control will resume normal and can last only for a short period of time. Please prepare a new button cell (model: CR2032) and replace the battery as soon as possible. Please refer to *section 4.2.3* to learn how to replace the button cell.

 If it is not at the pairing mode, but the LED is flashing quickly, it is warning that there is a communication failure, and the remote control will turn off in 5 minutes automatically.

 If the throttle is not at zero position before switching on the remote control, after switched on, the LED will flash slowly to indicate dislocation of throttle. Return the throttle to zero position, and the LED will resume normal.

 If the remote control is switched on but without any operation for 30 minutes, it will switch off automatically.

4.2.2 Controlling the Motor

⚠ If the throttle is not at zero position, the LED will flash slowly. Please return the throttle to zero position first then starting the motor, otherwise you will fail to start the motor.

Operations	Description	LED
Speed control	Slide the throttle forward to speed up and, slide the throttle backward to slow down. (Figure 4-5)	On
Stop	a. Normal condition: Slide the throttle back to zero position, and the motor will stop slowly.	On
	b. In emergency: Short press the remote's on/off button, and the motor will stop immediately (throttle not at zero position).	Flash

💡 Restart after stop:

- In normal conditions, just slide the throttle forward to speed up.
- For emergency stop, first reset the throttle to zero position then restart.

💡 If the remote control falls overboard by accident, the system will stop immediately to protect you.

💡 If there is not any operation for 30 minutes after the motor is stopped, the remote will switch off automatically.

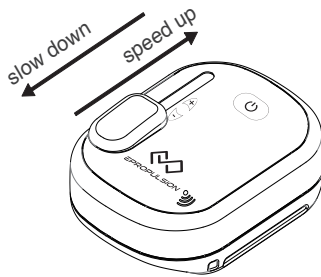


Figure 4-5

4.2.3 Replacing Battery for Remote Control

VAQUITA Remote Control is powered by an in-built battery (model: CR2032). If the remote beeps every 1s for 5 successive times before normally switched on, it indicates the remote is running out of power.

Replace a new button cell by below steps:

Step1: Screw the battery cover counterclockwise (from ① to ②) to unlock.

Step2: Replace a new button cell with the "+" side up.

Step3: Screw the cell cover clockwise to lock.

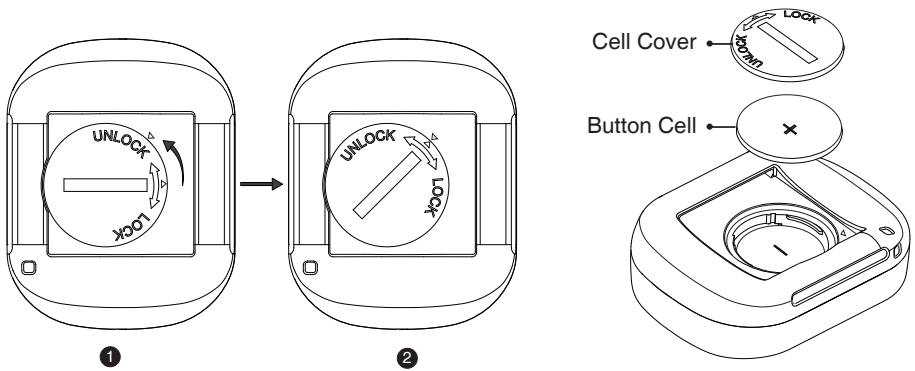



Figure 4-6

4.3 Pairing Remote Control with Battery

VAQUITA Remote Control and VAQUITA Battery in each package are well paired prior to delivery, but if: ① the remote is a new one, or ② the battery is a new one, communication will fail and users need to build wireless communication between the remote control and the battery.

 Follow below instructions to pair. We strongly recommend you to read and understand all process before implementing pairing operation.

Preparation

Turn off the remote control and turn on the battery.


Entering Pairing Mode

Step 1 Put the Battery into Paring Mode

- ① Press the battery power button.


All battery LEDs simultaneously enter slow flash mode. This mode lasts only a few seconds, during which execute ②, otherwise you have to repeat ①.

- ② Press the battery power button again and hold for about 5s until all LEDs flash quickly (which indicates the battery has entered pairing mode successfully). Then release the button.

 The battery's pairing mode only continues for a limited period of time, so execute step 2 during this period, otherwise pairing fails.

Step 2 Put the Remote Control into Pairing Mode

- ① Hold the remote control close to the battery.
- ② Press and hold the remote's on/off button for 10s until it issues two beeps (to indicate the remote control has entered pairing mode). Release the button and you'll hear another beep to indicate pairing succeeds.

 Do not release the button within 10s, otherwise pairing fails.

6. Transport and Storage

6.1 Transport


For long-distance transport, please apply the original package of VAQUITA to pack the product prior to delivery.

 Important notes before transport:

- Check and ensure the package is intact without any damage.
- Avoid violent vibration, strike or squeeze during transport. Get adequate damping protection measures before transport.
- Do not expose VAQUITA Battery to the sun or rain during transport.
- Check applicable laws and regulations before transport.

6.2 Storage

If you are not going to use VAQUITA for a long time, it is advised to clean and check it prior to storage. It is recommended to pack VAQUITA with its original package for storage.

 Important notes before storage:

- Make sure that each part of the product is dry before storing it in the package.
- Get adequate damping protection before storage.
- Store VAQUITA Battery in a clean, dry and well-ventilated area without direct sun exposure.
- Avoid contact with corrosive substance which may cause permanent damage, weaken or destroy the plastic of VAQUITA.
- Keep VAQUITA Battery away from any sources of fire, sparks, open flame or heat.
- Fully charge VAQUITA Battery before use after long-time storage.

7. Routine Maintenance

Various factors like operation environment (such as temperature, humidity, dust, etc.), aging and wear of internal components, will affect the performance of the product. Routine maintenance is very important for keeping VAQUITA in its optimal operating state.

- It's suggested to take VAQUITA Motor out of the water after use.
- Check the cable regularly for damage.
- Charge VAQUITA Battery after each use.
- Do not run VAQUITA Motor in the air or in shallow water.
- Do not run VAQUITA Motor in water area with thick sediment.
- Clean the exterior of VAQUITA Motor with fresh water after each use.
- Clean the debris in the cave of the adapters after each use.
- Do not drop VAQUITA Battery and avoid it from direct sun/rain exposure for a long time.
- Check the battery level on a regular basis.
- Stop discharging VAQUITA Battery and charge it soon if the battery gets low.
- Before the first time use or reuse after long-term storage, charge VAQUITA Battery to its full capacity in order to achieve its best performance.
- Only use VAQUITA Charger designed for VAQUITA Battery. Other chargers may lead to shortened runtime, premature battery failure, or even fire or explosion.
- Use the battery in moderate temperature to avoid negative effects of extreme temperature posed on battery lifespan and useful cycles.
- Once a fault occurs, deal with the problem in time to avoid any further damage. If necessary, consult the ePropulsion authorized dealer for repair or parts replacement.
- Always follow the instructions in this user manual.