



 soarability

*Speedip* V2

UAV-based Smart Water Sampling System

User Manual

V2.0 2023.08.17

# Table of Contents

<b>Disclaimer .....</b>	<b>3</b>
<b>1. Manual Tips.....</b>	<b>5</b>
1.1 Quick Search .....	5
1.2 Icons.....	5
<b>2. Product Overview.....</b>	<b>6</b>
2.1 Introduction .....	6
2.2 Main Components.....	9
2.3 Status LEDs.....	12
<b>3. Getting Started with Speedip V2 Web Platform .....</b>	<b>13</b>
3.1 Create and Login to Soarability Account.....	13
3.2 Link a Speedip V2 to an Account.....	14
3.3 Unlink a Speedip V2.....	16
<b>4. Platform Integration .....</b>	<b>17</b>
4.1 Integration with DJI M300 Series Aircraft .....	17
4.2 Check the Communication between Speedip V2 and DJI Pilot.....	21
4.3 DJI Pilot Layout on the Remote Control.....	22
4.4 Perform a Task Using DJI Pilot .....	31
4.5 Introduction to Speedip V2 Web Platform .....	37
<b>Appendix I: Packing List.....</b>	<b>44</b>
Standard Package.....	44
Optional Accessories .....	45
<b>Appendix II: Warranty and After-sales Service.....</b>	<b>46</b>
After-sales Service .....	46
Product Customization.....	47

## Disclaimer

Thank you for purchasing Soarability product(s). Before using Speedip V2, please read the manual carefully to ensure that the product has been properly assembled and set up. To obtain the latest User Manual, please visit Soarability's official website ([https://www.soarability.tech/index\\_en](https://www.soarability.tech/index_en)), and carefully read all the instructions, warnings and function upgrades in the manual. Failure to follow the instructions and warnings in the manual or lack of safety awareness during operation may damage Speedip V2 or other items, and may even cause harm to you and others around you. Before using Speedip V2, you must receive systematic training and practical learning to obtain the corresponding license. SZ Soarability Technology LLC (Soarability) reserves the right to the final explanation of this User Manual and all other relevant documents for Speedip V2. The document is subject to update, revision or discontinuation without notice. Please visit Soarability's official website for the latest product information.

Product names and brands in this manual including "Soarability" and "Speedip" are trademarks or registered trademarks of SZ Soarability Technology LLC.

### Export Compliance Disclaimers

You are required to comply with applicable export control laws, and you will be solely liable for any violation of export control laws resulting from your use, sales, gift, rental, or other acts of Speedip V2 and its relevant products. Soarability will not be responsible for your violation of export control laws under any circumstances. You shall ensure that Soarability and its affiliates, managers, employees, distributors, and representatives are exempt from any legal liability or damage caused by your aforementioned actions, or bear any relevant expenses, including but not limited to litigation fees, attorney fees, travel expenses, etc.

### No Disassemble Without Permission

All Speedip V2 units are strictly tested before delivery. Please do not disassemble, adjust or modify its internal structure, and do not add other components. Soarability will not provide warranty services for the damages caused by unauthorized disassembly, but will still be able to provide charged repair and maintenance services. If you have any needs, please contact the Sales Support Engineer of Soarability.

## **Use Official Integration Kit for Installation**

The official integration kits have been delicately designed for adaption and passed long-term tests for compatibility, so that there is no mutual interference between the Speedip V2 and the platform. Soarability will not be responsible for any interference, fall, or damage caused by the use of non-official integration kits.

## **Safety in Use**

Please ensure that you install, set up, and use the Speedip V2 correctly. Please read the User Manual and watch the tutorial video on Soarability's official YouTube channel to learn how to install Speedip V2 on the platform properly.

By using Speedip V2, you are deemed to have carefully read the disclaimer and the contents of this document, understood and accepted all terms of this and other relevant documents for Speedip V2. You agree to take full responsibility for all possible consequences from your use of the Speedip V2. You shall use Speedip V2 for legitimate purposes only, and agree on the relevant regulations, policies and guidelines made by Soarability.

Soarability will not be responsible for the damage, injury, and any legal liability caused directly or indirectly by the use of Speedip V2, or for the inappropriate use of the moving platform (DJI M300) and the violation of local laws and regulations. Users should follow all safety guidelines including but not limited to those mentioned in this document.

## **Storage and Transportation**

- 1.Speedip V2 and its accessories include small screws and fittings, please keep them out of reach of children to avoid accidental swallowing.
- 2.Please place Speedip V2 in its original carrying case to avoid falling after the task.
- 3.Please inspect and maintain Speedip V2 regularly to maximize its service life.
- 4.When shipping Speedip V2, please add anti-collision foam or bubble wrap around the carrying case to prevent damages caused by improper handling.

# 1. Manual Tips

## 1.1 Quick Search

### Search Texts (Ctrl+F)

PDF documents support searching texts by keywords. In Adobe Reader, click the icon  or use the shortcut Ctrl + F on Windows, and use Command + F on Mac to search for texts.

### Click the Table of Contents or Bookmark

You can skip to the corresponding content page by clicking the Table of Contents, or clicking the bookmark icon  and skip to a specific page through the bookmark link.

### Print Documents

The documents support high-resolution printing.



Scan the QR codes to follow Soarability' s official LinkedIn account and subscribe Soarability' s official YouTube channel for more information.

## 1.2 Icons

 **Forbidden** Failure to operate in accordance with the specifications may cause irreversible damage to the product. Damage caused by improper operation will not be covered by the warranty service.

 **Warning** Speedip V2 may not work properly if operations are not performed in accordance with the specifications.

 **Tip** Product operation and use tips.

## 2. Product Overview

### 2.1 Introduction

Speedip V2 is an intelligent system specially designed for UAV-based BVLOS water sampling. It provides large water sampling volume, powerful situational awareness and a variety of user-friendly functions. Speedip V2 aims to help users improve efficiency and reduce cost in sampling point navigation, water sample collection at designated depth, data logging, work reporting, etc.

#### 2L Max. sampling volume

Total weight including 2kg water is only ~2.7kg  
Well within the max. payload limit of DJI M300 RTK



#### One-touch auto water sampling at designated depth

Optional manual or semi-auto modes



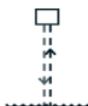
#### Task synchronization in the cloud

Task data logging & reviewing



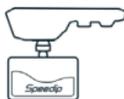
#### Built-in high-resolution mm-wave radar

1mm ultra-high resolution  
Accurate water surface distance detection



#### Ultra lightweight design

Effective payload ratio > 74%



#### Multi-ends collaboration

DJI Pilot and browser



#### Built-in 180° night vision camera

Starlight level performance



#### Mounting & dismounting within 10s

When used with DJI M300



## Highly-efficient Workflow

**High Sampling Volume:** Speedip V2 can be integrated to DJI M300 RTK within 10s. It can automatically send the sampling container to the designated depth with one touch on the screen. When integrated with DJI M300 RTK, Speedip V2 offers a Max. sampling volume of up to 2L with a total weight of only ~2.7kg (including 2kg water), achieving an effective payload ratio of >74%.

**No limitation to Terrain:** Speedip V2 supports remote target setting and synchronizing the data to DJI Pilot for guidance. After reaching the designated location, the built-in 180° night vision camera can assist in observing the surrounding environment, and the mm-wave radar can help accurately detect the water surface distance, achieving real BVLOS operation.

**Easy Reporting:** The sampling process can be synchronized to multi-ends including DJI Pilot and Speedip V2 web platform in real-time. The task data will be automatically saved, stored and can be reviewed later on the web platform, making data logging and work reporting easy like never before.

## Behind the Exceptional Performance of Speedip V2

**Water Sampling Container:** 3 types of sampling containers are available for different scenarios. (2L PMMA container is suitable for most surface sampling, 1L stainless steel container is suitable for corrosive liquids, and 1L PMMA container is suitable when using with other payload (e.g. H2O2)).

**Semi-coupled Connection:** The unique design of semi-coupled connection significantly decreases the shaking of the container after sampling, and reduces the rotational inertia of the whole system for better flight safety.

**Built-in 180° Night Vision Camera:** The camera built in Speedip V2 has 1/2-inch sensor, 180° D- FOV, F/2.0 aperture and starlight level performance to help the on-site team handle all kinds of BVLOS operations with ease.

**Built-in mm-wave Radar:** The 1mm ultra-high-resolution mm-wave radar allows accurate water surface distance measurement, reducing the flight risk of BVLOS water sampling tasks.

**Built-in 4G Connectivity:** Speedip V2 supports multiple-to-multiple data transmission with no distance limit. The on-site information can be sent to multi-ends in real-time for more efficient teamwork.

**High-brightness LED Warning Lights:** The warning lights show the working status at a glance, providing both system information and safe operations for people near the Speedip V2.

## Other User-friendly Features

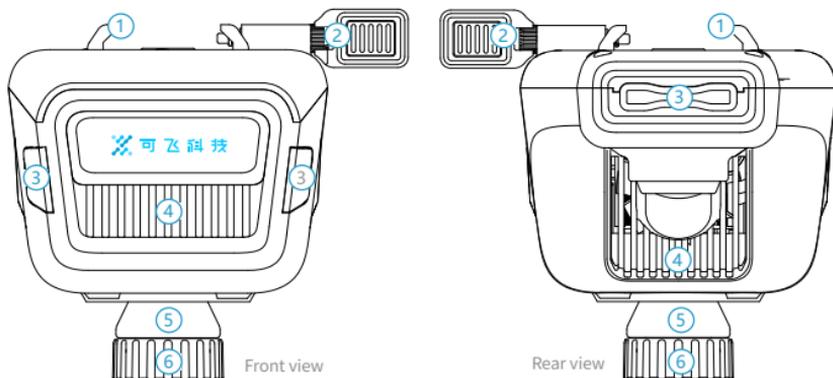
**Remote Target Setting:** After the off-site team finishes remote target setting, its coordinates will be automatically synchronized to DJI Pilot, guiding the on-site team to fly to the target and start the task.

**Fully Automated Water Sampling at Designated Depth:** The intelligent closed-loop motion controls (distance & speed) enable accurate & smooth one-touch automated water sampling at the designated depth. Semi-auto (speed control) and manual (throttle control) modes are also available.

**DJI PSDK 3.0 Supported:** The system can be controlled & monitored directly via DJI Pilot. The real-time camera view and working status can be displayed on DJI Pilot.

**Cloud Task Synchronization:** Speedip V2 can be controlled & monitored via a user-friendly Speedip V2 web platform. The real-time sampling process will be synchronously displayed on the browser and the data will be automatically uploaded to Speedip V2 Cloud after task completion. Users can view the historical tasks on the web platform at any time.

## 2.2 Main Components



### 1. All new quick-release bracket

Quickly install Speedip V2 to the aircraft and shorten the preparation time.

### 2. Limit buckle for quick-release bracket

Used for checking whether Speedip V2 is installed in place and fixing the device to prevent loosening.

### 3. High-brightness warning LEDs

Check the state of the water sampling container:

Lifting the container/canceling automated water sampling: **Green (4HZ)**;

Lowering the container/starting automated water sampling: **Red (4HZ)**;

Calibration: **Yellow (4HZ)**;

Retraction Completed: **Blue (0.5HZ)**

Stop: **Orange (0.5HZ)**;

\* Distance limit for lowering a container: **Blinking red twice (4HZ)**;

\*\* Emergency Cutting: **Blinking red-green-blue alternately until the rope breaks (4HZ)**;

Emergency Cutting Completed: **Orange (0.5HZ)**.

---

· **Distance limit for lowering a container:** If the distance between aircraft and the water surface is shorter than 1 meter, Speedip V2 will not allow lowering the container and the high-brightness warning LEDs will quickly blink red twice.

- **Emergency Cutting Mechanism:** When the water sampling container is stuck or entangled by an obstacle and can't get rid of it, the emergency cutting function of Speedip V2 will be triggered so that the aircraft can fly back safely and smoothly. Once the function is triggered, Speedip V2 will fuse the rope within 10s, and the function will be automatically turned off within 15s to avoid damage to the internal structure due to long-term heating. After the task, you need to send Speedip V2 to the manufacturer (Soarability) for rope replacement. Do not turn on the emergency cutting function unless it is necessary for emergency.

#### 4. Ventilation holes

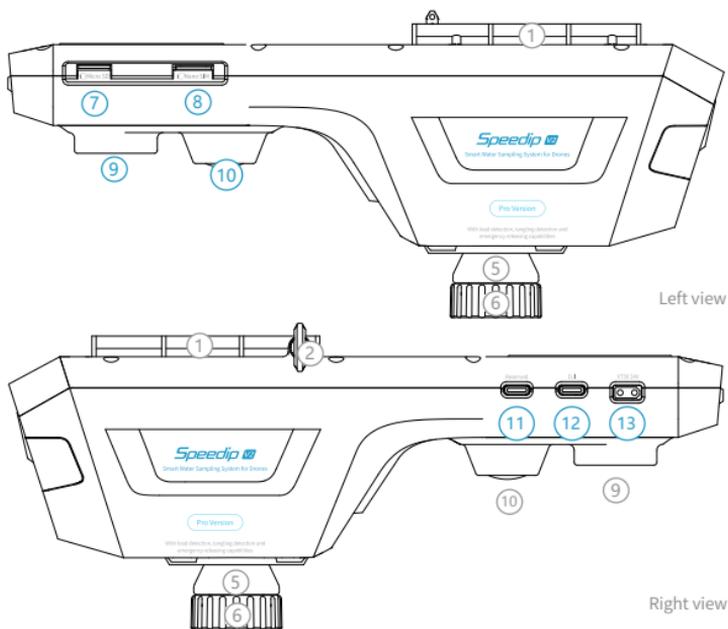
Do not cover the ventilation holes to avoid abnormal operation of the device caused by internal overheating.

#### 5. Semi-coupled cone

Made of silicone, the semi-coupled cone acts as a damper when the water sampling container retraction is completed. The conical design can help the joint return to its position, and the semi-coupled connection helps to keep Speedip V2 stable when the aircraft changes its attitude.

#### 6. Joint

Used for convenient disassemble and assemble of the water sampling container. Besides, the joint and the cone can work together to determine whether the water sampling container retraction is completed.



#### 7. Micro SD card slot

Speedip V2 is equipped with a 16GB MicroSD card (supporting up to 32GB). When the water sampling task ends in auto mode, the task record will be automatically saved in the SD card after submission.

## 8. Micro SIM card slot

No SIM card provided. For GPRS/EDGE/3G/4G real-time data transmission, please prepare a SIM card with cellular data yourself and set the APN in the Config file of the SD card.

## 9. Built-in mm-wave radar

1mm detection limit and 0.5-10m effective detection range.

## 10. Built-in 180° night vision camera

½-inch sensor, 180° D-FOV, and F/2.0 large aperture.

## 11. USB-C port

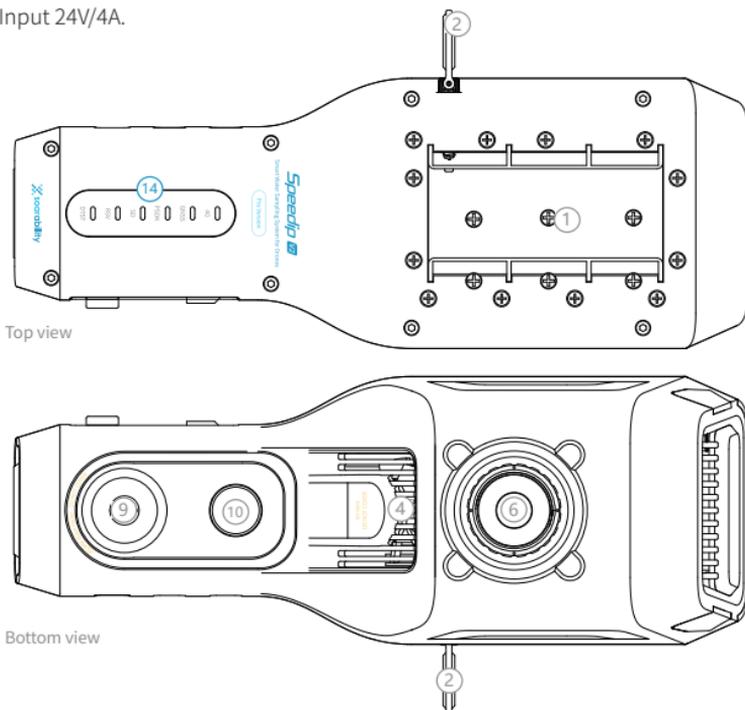
Connect for reserved functions.

## 12. SkyPort port

Power supply port for electric components. (input 5V/3A).

## 13. Power supply port

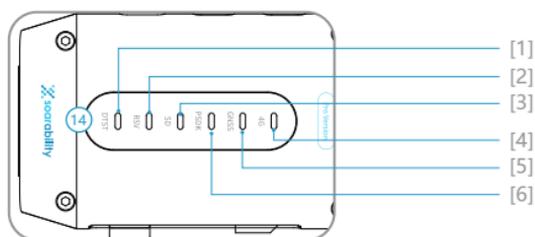
Input 24V/4A.



## 14. Status LEDs on the top

Indicating the working status of the device.

## 2.3 Status LEDs



## Normal status

No.	Indicator	Status
[1] Mm-wave radar	●... Solid	Normal
[2] Main program	●... Solid	Internal main program started normally
[3] SD card	●... Solid	Data is being written into the SD card
[4] PSDK	●... Solid	Successfully connected to the aircraft via PSDK
[5] GNSS	●... Solid	The GPS signal is good and can be positioned
[6] 4G	●●●... Blink quickly	Data is being transmitted

## Abnormal status

No.	Indicator	Status
[6] 4G	○... Off	No SIM card inserted / no cellular data in the SIM card
	●●●○●●●... Blink slowly 1	Long on and short off - searching network
	○●●○●●●... Blink slowly 2	Short on and long off - no data transmission
[3] Memory card	○... Off	No SD card detected
[4] PSDK	○●●○●●●... Blink ○... Off	Unsuccessful connection with the aircraft
[5] GNSS	○●●○●●●... Blink	GPS signal is poor and cannot be positioned
	○... Off	No PSDK connection

### 3. Getting Started with Speedip V2 Web Platform

 You can skip this chapter if you plan to control Speedip on DJI Pilot but not on the web platform

#### 3.1 Create and Login to Soarability Account

Please create a new account through [www.sniffer4d.com](http://www.sniffer4d.com). If you already have a Soarability account, please log in by entering your e-mail /account and password.



If you have not registered a Soarability account, please click "Sign up", enter your e-mail address, click "Get Code", the system will automatically send a 6-digit verification code to your e-mail (within 3 minutes). After creating your account and setting the password, click "Sign up" to complete the registration.



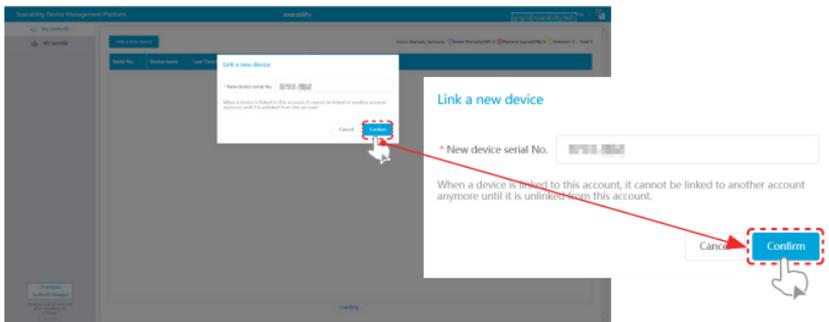
 If you do not create an account name during registration, the system will use your e-mail address as the account name by default.

### 3.2 Link Speedip V2 to an Account

Return to the login page, enter your e-mail/account and password to enter the "Soarability Device Management Platform". Click "Link a new device" and enter the new device serial No. The serial number is on the Certificate of Compliance inside the carrying case (the Certificate is attached to the inner lining of the case, and you can find it after taking out Speedip V2).

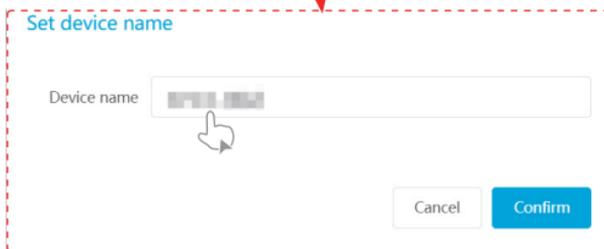
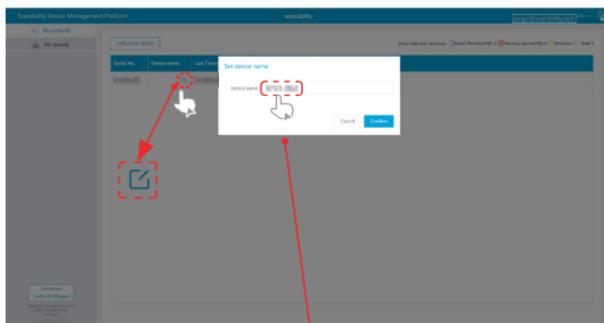


Enter the complete serial number of your Speedip V2 in the pop-up window, click "Confirm" and the window will prompt "Device linking successful", indicating that the Speedip V2 has been linked to your account.



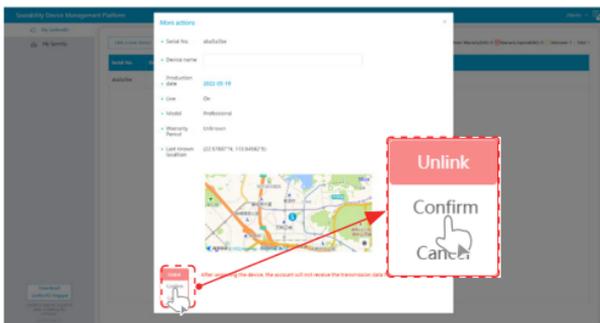
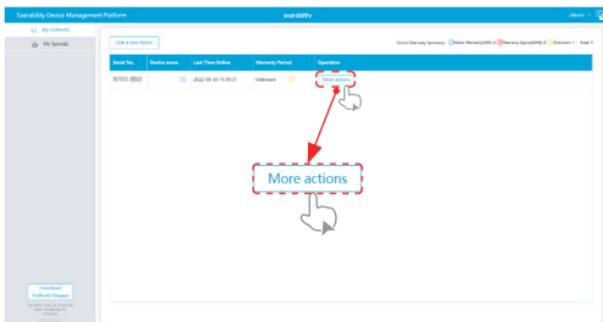
- Each Speedip V2 can only be linked to one account at a time. After linking the account, you can get the production date, warranty period, last time online and last known location (geographical location information) of your Speedip V2.
- **The serial number is a hexadecimal number, please note that there is no letter "O", "I", "L" but "0" and "1" in the serial number.**

After linking completed, the Speedip V2 interface under the submenu of "Soarability Device Management Platform" will display your Speedip V2 Serial NO., Device Name, Last Time Online, Warranty Period, and Operation (More actions). To better manage the devices under your account, you can set and modify the device name of each device. Device name setting supports in Chinese and English.



### 3.3 Unlink a Speedip V2

If you would like to link an already-linked Speedip V2 to a new account (when reselling for example), you can click "My Speedip V2" - "More actions" in the "Soarability Device Management Platform" to perform the "Unlink" operation.



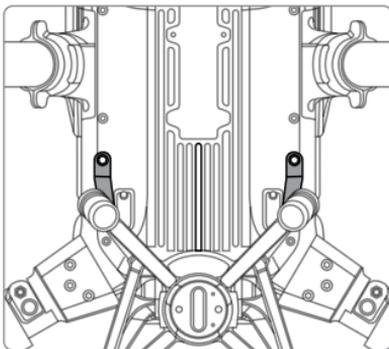
## 4. Platform Integration

### 4.1 Integration with DJI M300 Series Aircraft

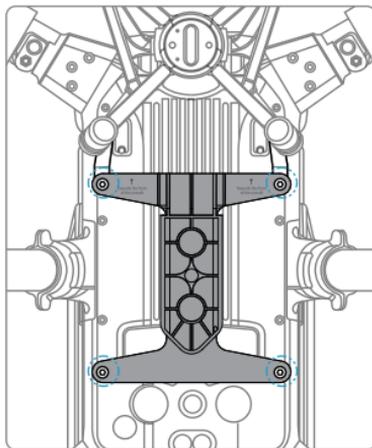
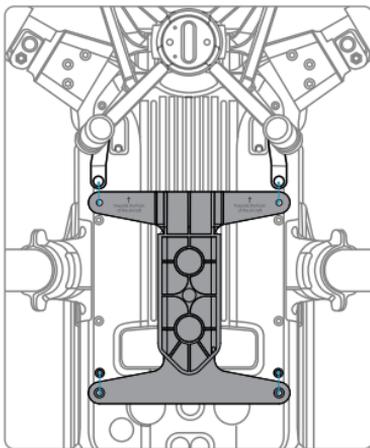
The procedure of how to integrate the Speedip V2 onto a DJI M300 aircraft is as follows. You can control Speedip V2 directly from DJI Pilot.

#### Installation

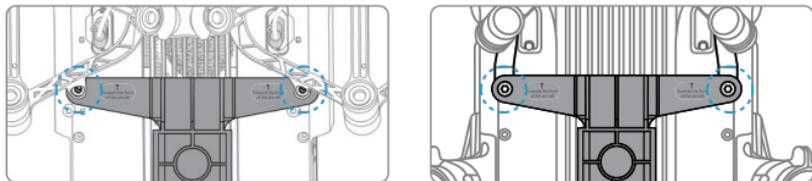
1. Place the DJI M300RTK upside down and remove the two screws on the back of the gimbals.



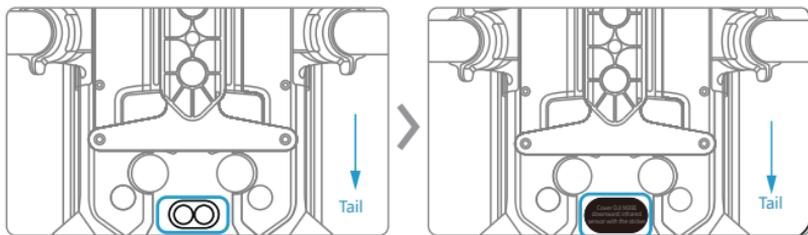
2. Place the quick-release bracket of Speedip under DJI M300, as shown in the picture below. Align the bracket holes with DJI M300 and fix them using four M3\*8 screws.



- The screw holes of the dual-gimbals should be placed under the quick-release bracket; while the screw holes of the single-gimbal should be placed above the quick-release bracket.
- The quick-release bracket of Speedip V2 with pad indicates the rear end, while the bracket without pad indicates the front end and has a front-facing mark.

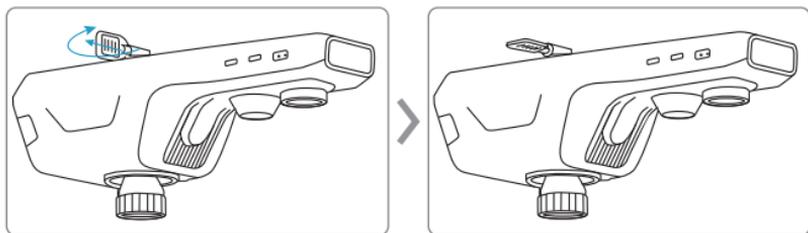


3. Use the complimentary light-tight sticker to cover the downward infrared sensor of DJI M300.

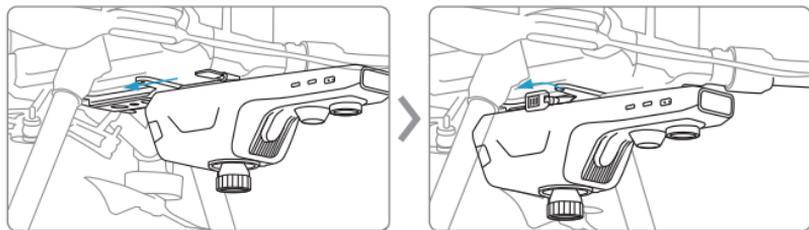


- If you do not cover DJI M300's downward infrared sensor, the DJI remote control may report an error during the task. In this case, the DJI remote control will indicate the need for immediate return or for landing to restart the aircraft.

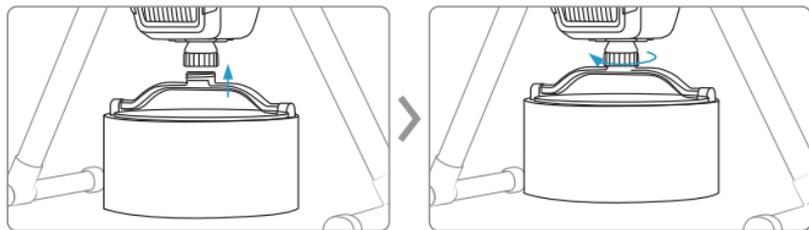
4. Pull out the limit buckle and rotate it 90° to the right, the handle of the limit buckle should be parallel to the ground.



5. Align the front end of the Speedip with the rear end of the quick-release bracket, push Speedip inwards and reset the limit buckle (rotate it 90° to the left). Check whether everything is installed firmly.

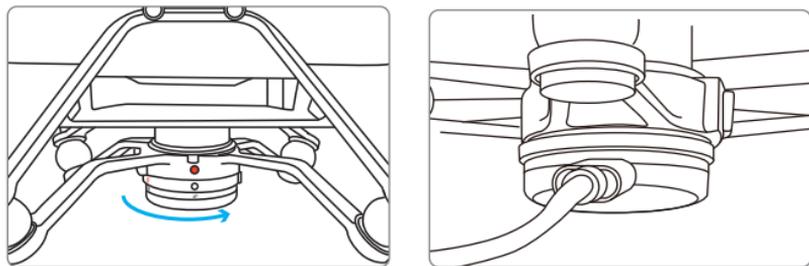


6. Align the container to the joint under Speedip, then rotate the joint clockwise to lock firmly.



7. Align the white dot on the Speedip SkyPort adapter with the red dot on the gimbal, rotate till the two red dots are aligned.

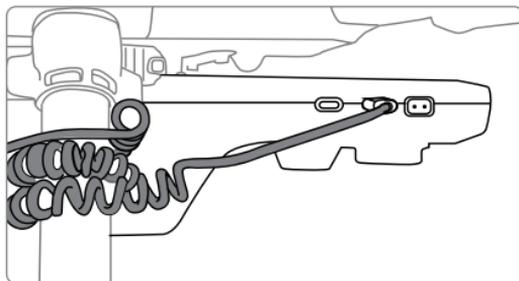
8. Connect one end of the Type-C cable to Speedip's PSDK adapter.



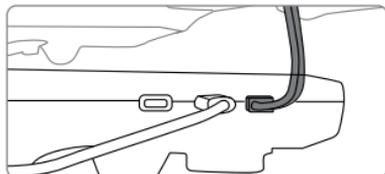
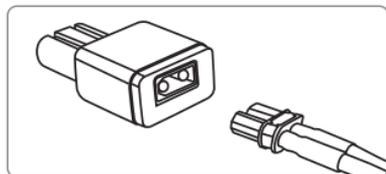
 · When using the dual-gimbals DJI M300, be sure to use the port I to connect the PSDK adapter.

 · Speedip SkyPort adapter and Sniffer4D SkyPort adapter are not interchangeable.

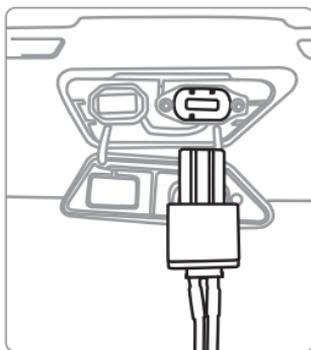
9. Wind the Type-C cable around the landing gear (avoid being hit by the propellers) before connecting the other end to the DJI Port on Speedip.



10. Connect one end of the XT30 cable to the OSDK adapter and the other end to the XT30 port on Speedip.



11. The XT30 cable connected to OSDK needs to pass through the rear of the aircraft, connect the OSDK adapter to the OSDK port on the top of DJI M300.

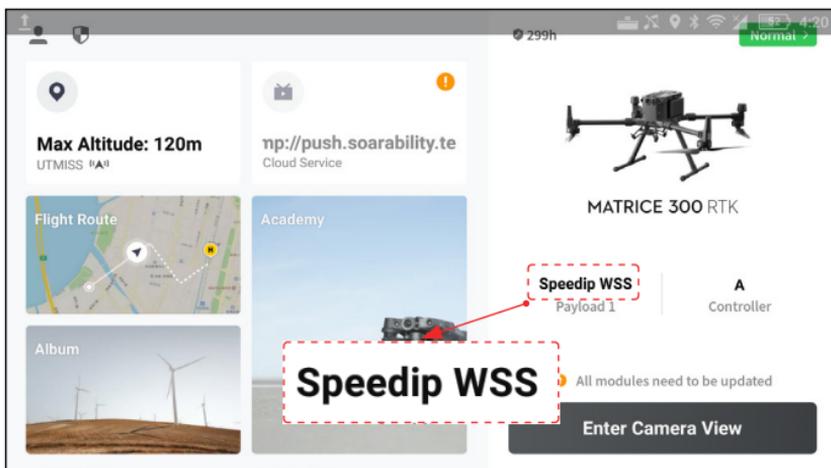


· If the XT30 cable connected to OSDK passes through the front of the aircraft, it may affect the obstacle avoidance system of the aircraft, resulting in failure to take off.

---

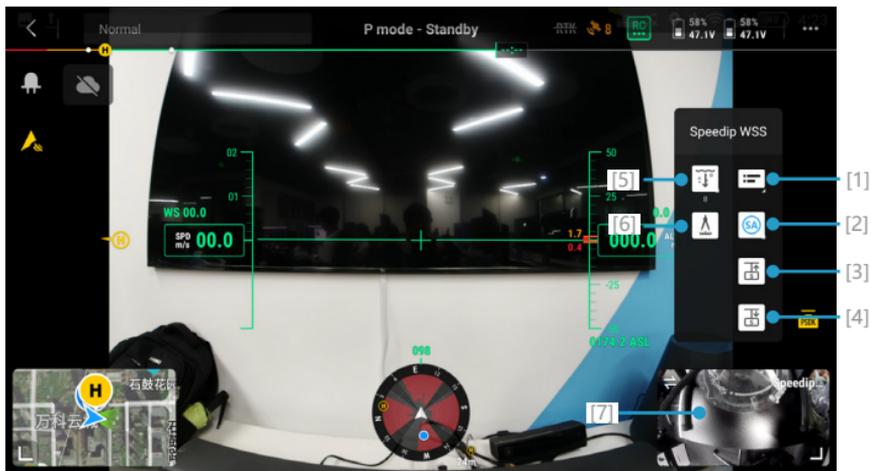
## 4.2 Check the Communication between Speedip V2 and DJI Pilot

First turn on the DJI M300 RTK remote control, then turn on the aircraft. The main interface of the DJI Pilot on the remote control displays "Speedip V2", indicating that the device has been successfully connected to the aircraft. If it is not displayed, you can exit and reconnect to the power supply, or check whether the hardware is properly connected.



### 4.3 DJI Pilot Layout on the Remote Control

1. Enter the flight interface and open the Speedip V2 function menu  .



**[1] Display real-time information in the device floating window:**

When using Speedip V2 for water sampling tasks, you must open the real-time information floating window. You can follow the instructions in the floating window's content to complete the water sampling task in a secure and standardized manner.

**The information on the floating window includes:** Water sampling mode, Speedip V2 status, distance from Speedip V2 to the obstacle below, current water sampling depth and target water sampling depth, current release rope length and target release rope length, current speed and target speed, throttle and current, target.



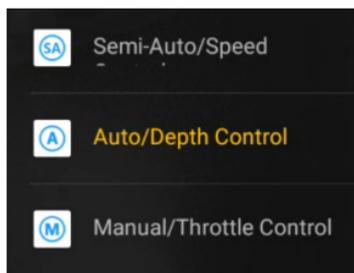
**[2] Water Sampling Mode:** Auto, Semi-auto, Manual. Auto Mode is recommended in most cases.

**Auto Mode:** In this mode, you can automatically perform water sampling tasks. You simply need to preset the target depth and speed for the task, and then click the [Icon] button to start the task. Speedip V2 will automatically calculate the required rope length to reach the water sampling depth according to the current flight height. The water sampling container will be automatically set down once the calculation is completed. When the container reaches the target depth, the aircraft hovers for a period of time for the water sampling to complete and then automatically retracts the container. No other operations are required by the user during the entire process.

**Semi-auto Mode:** In this mode, you can manually lift or lower the water sampling container. Speedip V2 automatically adapts to the payload condition

and lifts/lowers the container at a constant speed. The user needs to determine the target depth according to the real-time data.

**Manual Mode:** In this mode, you can manually control the entire water sampling process. Speedip V2 can customize the throttle rate, but will not automatically maintain a constant speed in manual mode. The user needs to determine the target depth according to the real-time data.



- [3] **Lift or cancel**, lift the container in manual/semi-auto mode, and cancel automatic water sampling in auto mode.
- [4] **Lower or start**, lower the container in manual/semi-auto mode, and start automatic water sampling in auto mode.
- [5] **Set the target depth for water sampling**, the setting range is between 5~120dm (decimeter) (e.g. the displayed value of the slider is 10dm, which equals 1 meter).



[6] Click to **calibrate the rope length**, the calibration function can only be used when Speedip V2 is the stationary state. Clicking the button will retract the rope and reset the length of the resealed rope to zero. Do not carry out other operations during calibration. Clicking the calibrate button again will lead to calibration failure. The calibration function cannot work when Speedip V2 is in the operational state.

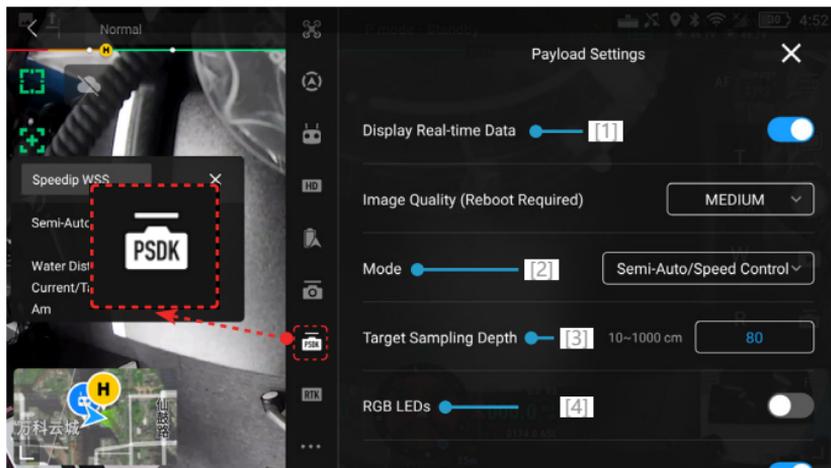


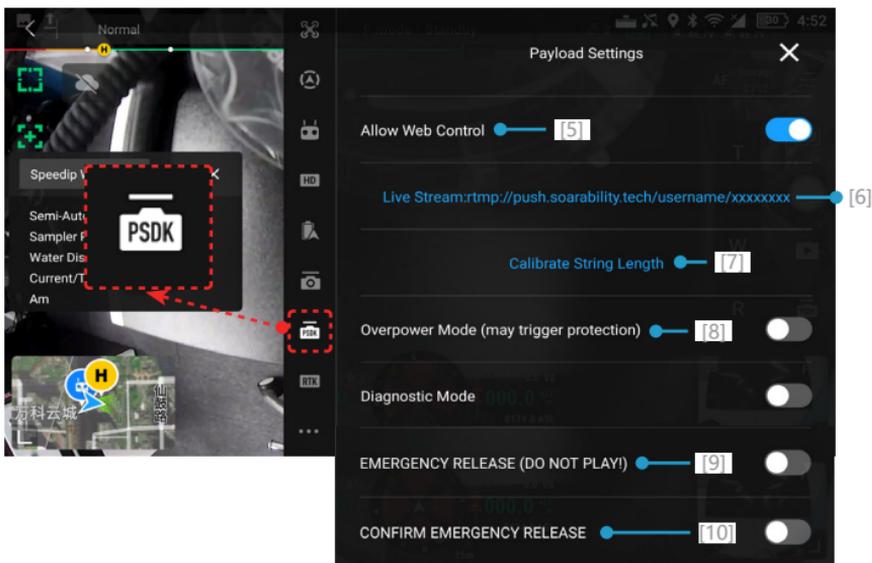
[7] Click to switch between the DJI M300 camera view and the Speedip V2 ultra-wide-angle night vision downward camera view. During the task, please switch to Speedip V2 camera view to check the sampling status of the container. When switching to Speedip V2 camera view, the menu bar on the right will be displayed in the upper right corner. Click the main camera screen in the lower right corner again to switch the monitoring screen of the operation page from the Speedip V2 camera view to the DJI M300 camera view.

- The infrared filter is removed from the Speedip V2 downward camera to maximize the night vision performance. It is normal that the camera view appears reddish in strong sunlight.



## 2. Enter "Payload Settings".





**[1] Display real-time data:** When using Speedip V2 for water sampling tasks, you must turn on the display of real-time data. You can follow the instructions from real-time data to complete the water sampling task in a secure and standardized manner.

**The information on the floating window includes:** Water sampling mode, Speedip V2 status, distance from Speedip V2 to the obstacle below, current water sampling depth and target water sampling depth, current release rope length and target release rope length, current speed and target speed, throttle and current, target. The function is consistent with [1] from Speedip V2 function menu on the flight interface.

**[2] Working Mode:** Auto, Semi-auto, Manual. Auto Mode is recommended in most cases. The function is consistent with the [2] from Speedip V2 function menu on the flight interface.

**[3] Target Depth:** The target depth of Speedip V2 can be set between 10~1100cm, whereas the unit is decimeter. The function is consistent with [5] from Speedip V2 function menu on the flight interface.

**[4] LED On/Off:** It is Off by default; "On" indicates that the function of high-brightness RGB warning lights is enabled (green for lifting the water sampling

container, red for lowering the container, yellow for calibration, blue for retraction completed, orange for stop).

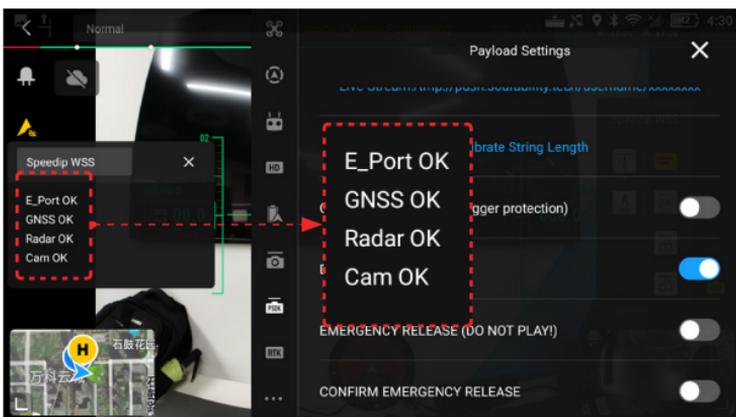
**[5] Allow Web Control:** It is enabled by default. When enabled, the device can be controlled from the Speedip V2 Web Platform.

**[6] Live Stream Address:** Input the video stream address for Speedip V2 (rtmp://push.soarability.tech/username/serial number) on DJI Pilot, then live stream the selected camera view from the remote control to the cloud (Speedip V2 Web Platform).

**[7] Automatic Rope Length Calibration:** The function can only be used when Speedip V2 is the stationary state. Clicking the button will retract the rope and reset the length of the resealed rope to zero. Do not carry out other operations during calibration. Clicking the calibrate button again will lead to calibration failure. The calibration function cannot work when Speedip V2 is in the operational state. The function is consistent with [6] from Speedip V2 function menu on the flight interface.

**[8] Overpower Mode:** It is disabled by default. When enabled, it will improve the efficiency of the task. Note that it may trigger over-current-protection of the M300 aircraft. Please use it with caution.

**[9] Diagnosis Mode:** It is disabled by default. When enabled, you can diagnose whether the camera, network access and radar status are normal. At the same time, the real-time data floating window will be closed, and it will display the real-time data when it is opened again.



**[10] Emergency Cutting Mechanism:** Click on the first switch button, and the floating window will flash a prompt; click on the second switch button and it will trigger the emergency cutting mechanism of Speedip V2. Once the function is triggered, Speedip will fuse the rope within 10s, and the function will be automatically turned off within 15s to avoid damage to the internal structure due to long-term heating.

---

 · Once the emergency cutting mechanism is triggered, you need to send Speedip V2 to the manufacturer (Soarability) for rope replacement. Do not disassemble the device without permission.

---

 · Do not turn on the emergency cutting function unless it is necessary for emergency.

---

 · Please note that the maximum rope length limit is 11m and the maximum target depth limit is 10m.

---

 · The downward visual obstacle avoidance system of the M300 is unavailable once Speedip V2 is installed. Please pay close attention to the data from the mm-wave radar built-in Speedip V2 during the task and land slowly after the task.

---

## 4.4 Perform a Task Using DJI Pilot

Before the task, please check whether the following items are normal, and make sure that the sampling environment meets the requirements for a safe and efficient task.

1. Hold Speedip V2 and gently shake it to check whether it is firmly installed.
2. Pull the limit buckle gently to check whether the connection is secure.
3. Check whether the SkyPort and the USB-C ports are properly connected.
4. Check whether the power supply through DJI OSDK port/ Speedip V2 XT30 port is normal.
5. Check whether the aircraft reports any error.

### Recommended Working Scenarios

- The density of the liquid collected by the PMMA container should be lower than 1100kg/m<sup>3</sup>.
- The weather is suitable for outdoor water sampling (no strong wind or heavy rain, etc.).
- No abundant aquatic plants, silt, sand or undercurrents underwater.

### Flight Distance & Speed

- A set of DJI M300 batteries allows 17~20 round trips with a payload of a 2L container at a distance of 300m.
- The recommended flight speed is 6m/s~10m/s (for reference only), and no emergency acceleration is allowed to prevent water sample leakage.
- During the task, the vertical ascending speed of the aircraft should not be too fast as it may affect the function of Speedip V2 mm-wave radar.

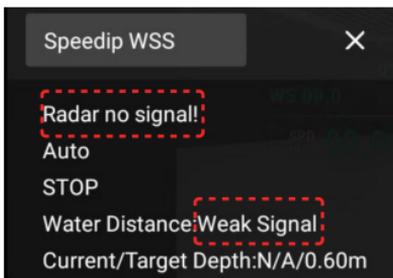
### Recommended Distance from Water Surface

- The recommended distance between the aircraft and the water surface is 2~3m when sampling.
- Please keep the aircraft at a constant height when performing sampling tasks in auto mode. Moving the aircraft up and down will lead to inaccurate sampling at the designated depth.
- When the aircraft flies over 10m, the real-time data will not display the specific altitude.

### "Weak Signal" Notification on Floating Window

"Weak Signal" notification will appear in any of the following situations: ① The mm-wave radar receives a weak signal. ② The mm-wave radar receives the signal but the sampling distance is over 10m ③ The mm-wave radar is not activated normally. In "Weak Signal" status, you can not perform the automated water sampling task in auto mode as DJI Pilot will display "Radar no signal!"; while you can still click Start/Release button to collect water samples in manual/semi-auto mode.

When performing automated water sampling task in auto mode, check whether the distance from the water surface plus the target depth is  $\leq 11\text{m}$  (maximum rope length). If the total calculated length exceeds the maximum rope length, automated water sampling will be disabled and DJI Pilot will display "Exceed rope limit!". In this case, you need to manually reset an appropriate target depth and Speedip will not automatically adjust the sampling depth.



**Auto mode is recommended in most cases. Below is to complete a task in auto mode.**

1. Click the real-time data floating window and select auto mode.
2. Set target depth for sampling.
3. Fly the aircraft to the designated sampling location.
4. Slowly descend at a proper height.
5. Click Start/Release button to lower the container to the target depth, and the container will be automatically retracted when it is full.
6. Fly back the aircraft slowly to avoid sample loss caused by strong turbulence. Collect water samples and start the next task.

**Below is to complete a task in manual mode.**

1. Click the real-time data floating window and select manual mode.
2. Fly the aircraft to the designated sampling location.
3. Slowly descend at a proper height.
4. Click container will button to lower the container to the appropriate depth.
5. Click the Retract button when the container is full and wait till the retraction completes.
6. Fly back the aircraft slowly to avoid sample loss caused by strong turbulence. Collect water samples and start the next task.

## Problems & Solutions

### 1. No Enough Load Detection

Please confirm if the container is installed correctly. If not, Speedip will stop releasing the rope. If confirmed, please click Start/Release button, or click Calibrate button and then Start/Release button to continue the task.

If still error reporting continually appears more than twice, please contact Soarability for support.



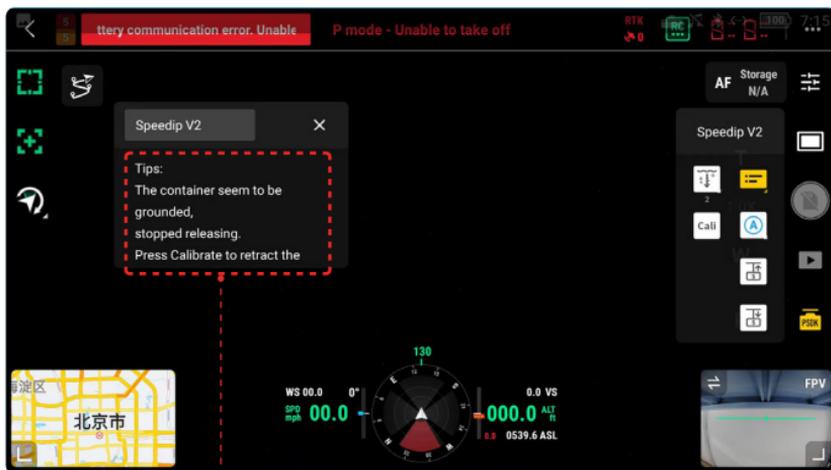
**Tips:**  
No enough load detected,  
stopped releasing.  
Make sure the rope has enough  
tension, then click Start/Release

## 2. Grounding Detection

When suspected grounding is detected, Speedip will stop releasing the rope.

To continue after confirming the water depth>released length, click Start/Release button to continue the task; If error reporting repeats when releasing again, please terminate the task and click Calibrate button to retract the container.

Do NOT repeat this action, or irreversible rope tangling may occur.

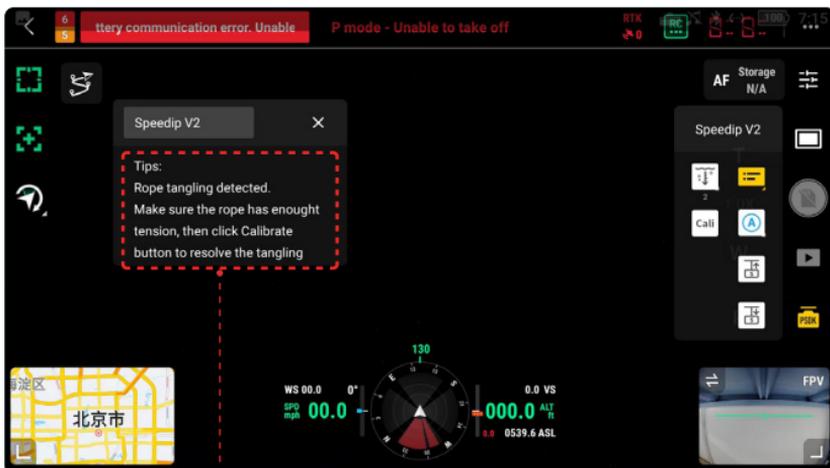


Tips:  
The container seem to be grounded,  
stopped releasing.  
Press Calibrate to retract the

### 3. Rope Tangling Detection

When rope tangling is detected, Speedip will stop releasing immediately. Please click Calibrate button to resolve the tangling issue, then click Start/Release button to continue the task.

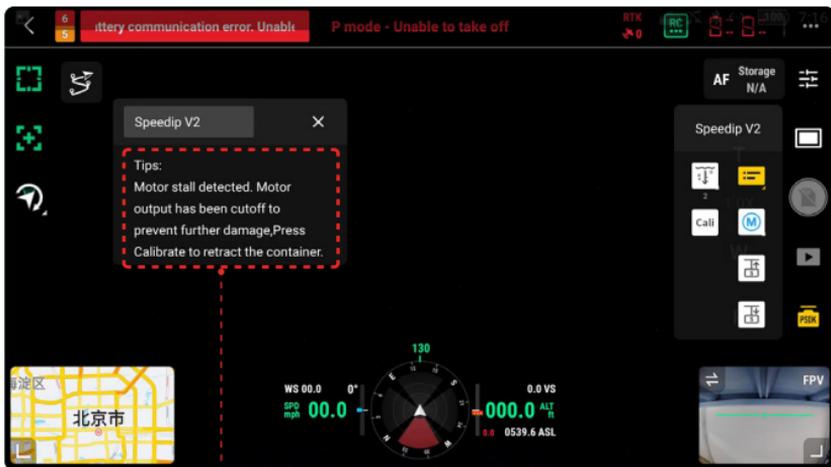
Please wait until calibration is completed before restarting the task.



**Tips:**  
Rope tangling detected.  
Make sure the rope has enough tension, then click Calibrate button to resolve the tangling

#### 4. Motor Stall Detection

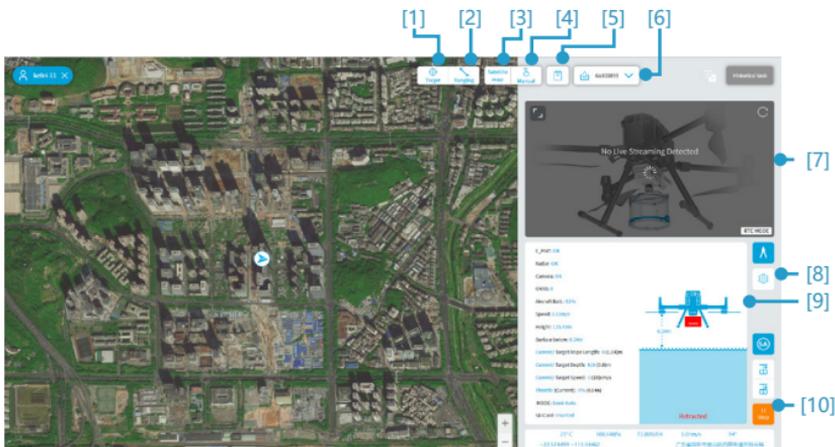
When motor stall is detected, motor output will be cutoff to prevent further damage from overheating. Click Calibrate button or Retract button to retract the container. If the container can not be retracted by the solution mentioned above, please fly back and land slowly, or use the emergency releasing function if necessary. Please contact Soarability for troubleshooting and support after landing.



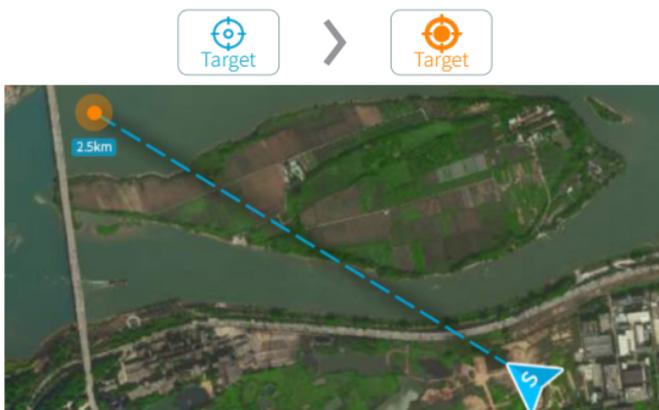
**Tips:**  
Motor stall detected. Motor output has been cutoff to prevent further damage, Press Calibrate to retract the container.

## 4.5 Introduction to Speedip V2 Web Platform

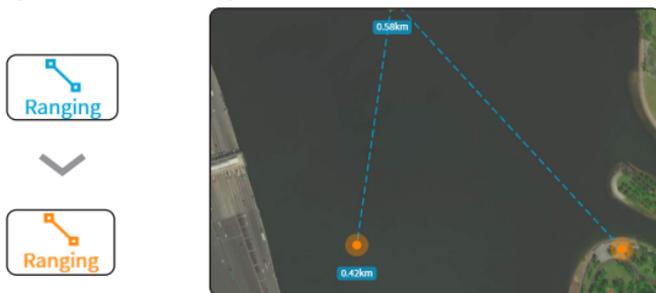
URL to Speedip V2 Web Platform: <https://speedip.soarability.tech/>



**[1] Target:** Set a target on the map, the cloud will share the target with the remote control and the remote control will provide flight guidance for the on-site personnel. You can set the target when the icon appears orange. Press the target button to lock the current target and press it again to unlock; press and hold the target button to delete the current target. Note that the Target function and the Ranging function cannot be turned on at the same time.



- [2] **Ranging:** Measure the distance between the current location and the target on the map; click the button to turn on the ranging function. You can set multiple locations on the map for ranging, which is convenient for route planning. The interface only displays the distance between locations but not the specific total length. Click the button again to turn off the function and cancel all current locations. Note that the Ranging function and the Target function cannot be turned on at the same time.



-  · The Ranging function and the Target function cannot be turned on at the same time.

- [3] **Switching Maps:** Switch the current map display (satellite map/street map) to adapt to different scenarios.

Satellite  
map

Street  
map

- [4] **Map Display** (Switching among four modes):

**North Up Mode:** In this mode, the aircraft will always stay in the center of the screen, the map will always remain towards truth north, and the direction will be determined by up north, down south, back east, and out west.

**Plane Up Mode:** In this mode, the aircraft will always stay in the center of the screen, the map will rotate with the head of the aircraft and always keep it upward. Users need to determine the orientation themselves.

**Overview Mode:** Entering this mode requires successfully setting the target. The map will show the current location of the aircraft and the target location. As the two locations gradually approach, the map will always remain towards truth north, and the direction will be determined by up north, down south, back east, and out west.

**Manual Mode:** Drag the map in any mode to automatically enter manual mode. In this mode, the map is not centered on the aircraft. You can drag and view the map casually, and click the return button to return to the previous mode.

  
North up

  
Plane up

  
Overview

  
Manual

[5] **Submitting Task:**

When the sampling task is completed and the container is retracted, the task information(task name, organization, crew, water temperature, sampling depth, note, task number, sampling time, sampling location, and meteorological information) will pop up automatically for you to choose whether to record the task. The sampling depth will be filled in automatically in auto mode; while in other modes, you need to manually input the sampling depth.

Submit this task

\* Task name:       \* Organization:

\* Crew:       \* Water Temp.:

\* Sampling depth:       Note:

Task No.: 6a103893 | 2022-11-21 17:31:17      Sampling time: 2022-11-21 17:31:17

Met. info: 25°C 100.6kPa 72.00%RH 6.03m/s 94°      Sampling: +22.5744714 +113.944721 广东省深圳市南山区西丽街道

Location: 万科云城

Abort      Submit

[6] **Device List:** You can select the online device(s) linked to this account, and view the information of any device in this list.

Product info ×

Device name: 6a103893      Serial No.: 6a103893

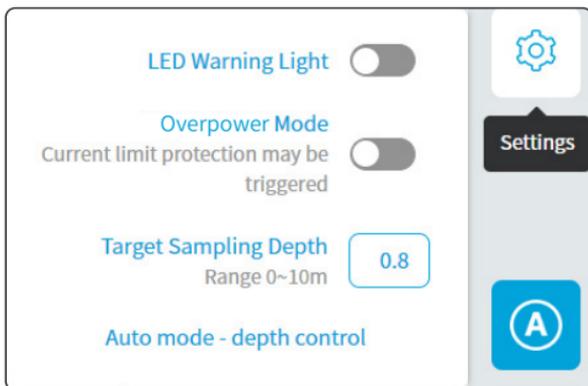
Warranty Period: 2021-11-22-2022.02.22      Warranty status: Warranty expired

- [7] **Live Streaming Display Window:** Display the camera view live streamed from the current device. You can switch between the DJI M300 camera view and the Speedip V2 ultra-wide-angle night vision downward camera view, without affecting the on-site personnel and other users who log in to the same account.

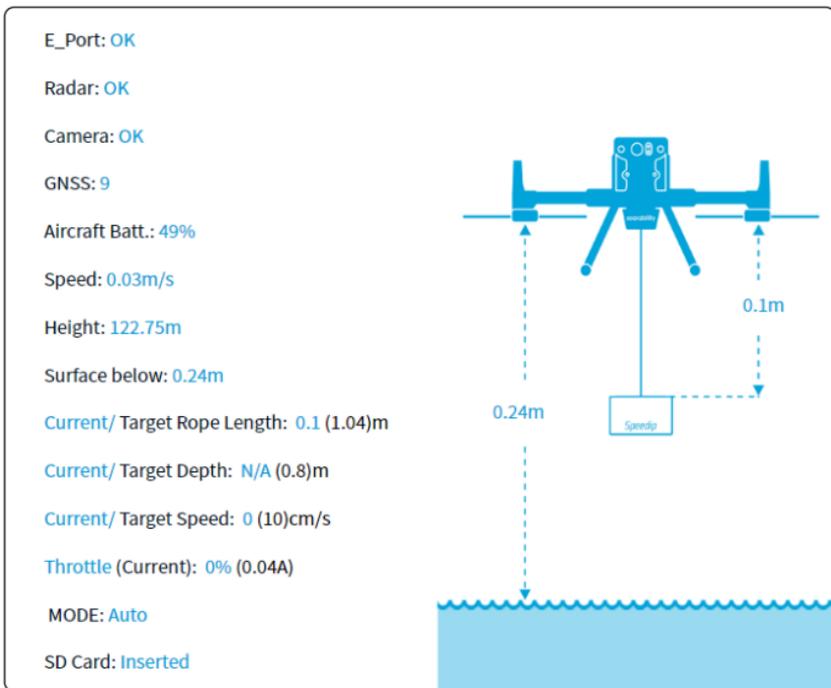


-  · The live-streamed camera view can be switched between RTC mode or FLV mode. The web uses RTC mode by default, and you can manually switch to FLV mode if a black screen appears. The video image in RTC mode is more stable and smooth, but it only supports mainstream browsers, such as Chrome, Firefox, Opera, Edge, and QQ browsers. Other browsers use FLV mode by default.

- [8] **Settings:** You can set whether the high-brightness LED warning lights are on/off, whether to turn on/off Overpower Mode, and set water sampling depth before task in auto mode.

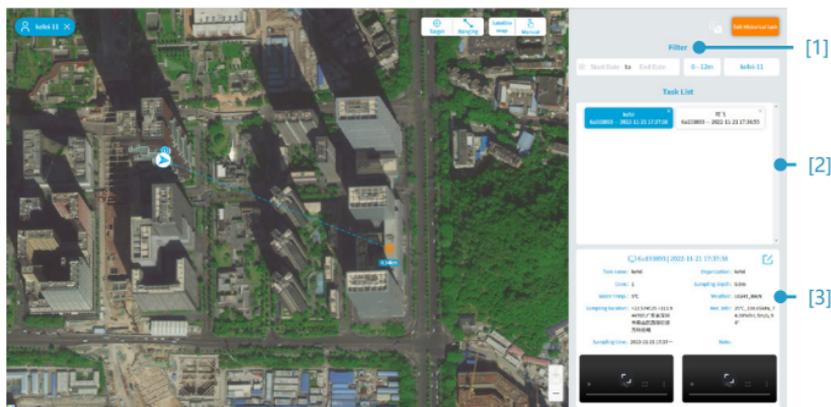


- [9] **Real-time Data Display Window:** Display the information of the current device in real-time, including device status, container status, current, rope length, speed, target, and distance to the surface below.



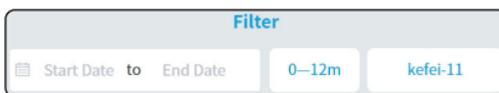
- [10] **Meteorological and Geographical Information Display Window:** Display the wind speed, wind direction, temperature, atmospheric pressure, humidity (hourly) and detailed geographical information of the current location.



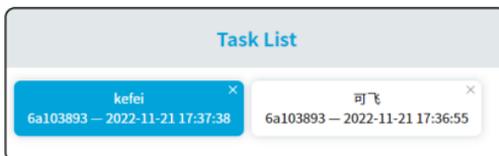


## Historical Task:

- [1] **Filter:** You can filter the tasks in the list by start date and end date/sampling depth/ specific device to locate historical tasks with efficiency.



- [2] **Task List:** Click Historical task to enter the task list. You can view the historical tasks recorded by all devices under the same account. The task name, device serial number, year, month, day, hour, minute, and second will be displayed in the list. Click the task window and the map will skip to the geographical location recorded by the task. Click the target on the map to skip back to the corresponding task.



[3] **Task Details:** The list below is the task details overview, where you can get an overview of the task contents. Click the  icon in the upper right corner to enter the task editing page, where you can edit historical tasks.



The diagram illustrates the transition from a task details overview to an edit form. The overview (top) shows task information for '6a103893 | 2022-11-21 17:37:38' with a red dashed box around an edit icon. A blue arrow points from this icon to the edit form (bottom).

**Task Details Overview:**

- Task name: kefei
- Organization: kefei
- Crew: 1
- Sampling depth: 0.8m
- Water Temp.: 5°C
- Weather: LIGHT\_RAIN
- Sampling location: +22.574525 +113.944765 广东省深圳市南山区西丽街道万科云城
- Met. info: 25°C, 100.65kPa, 7.400%RH, 5m/s, 94°
- Sampling time: 2022-11-21 17:37:38
- Note:

**Task Edit Form:**

- Task name:
- Organization:
- Crew:
- Sampling time:
- Sampling depth:
- Water Temp.:
- Met. info: 25°C, 100650.18kPa, 0.74%RH, 5m/s, 94°
- Weather: LIGHT\_RAIN
- Note:
- Sampling location: +22.574525 +113.944765 广东省深圳市南山区西丽街道万科云城

Buttons:

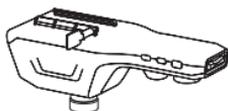
The icon next to the title indicates the end to perform and record the task.

-  This icon indicates that the task is recorded on the web platform
-  This icon indicates that the task is recorded by DJI Pilot

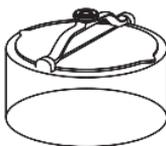
## Appendix 1: Packing List

### Standard Package

Speedip V2 base unit x 1



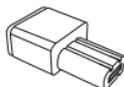
2L PMMA container x 1



Quick-release bracket x 1



OSDK adapter x 1



XT30 power cable x 1



Dual USB-C cable x 1



Speedip SkyPort adapter x 1



M3\*12 hex screw x 6



16GB MicroSD card \* x 1



Carrying case x 1



User Manual

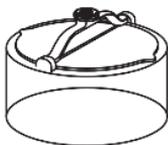


\*Speedip V2 only supports Micro SIM cards, and a 16GB MicroSD card has been inserted in the SD card slot by default. No SIM card provided.

## Optional Accessories

---

2L PMMA container



Suitable for most surface sampling/Non-corrosive

1L PMMA container



Suitable when using with other payload/Non-corrosive

1L Stainless steel container



Suitable for corrosive liquid

## Appendix II: Warranty and After-sales Service

After-sales service		
Service items	Scope of service	Remarks
Free warranty service for non-human damages in the first year	<ul style="list-style-type: none"> <li>We provide a 1-year limited warranty for each order. During the warranty period, we will repair the unit for free if it's not damaged by human error.</li> <li>Man-made damage includes, but is not limited to: damage caused by dropping, water permeating, etc.</li> </ul>	
User Training	<ul style="list-style-type: none"> <li>Onsite training &amp; support can be arranged (additional cost will occur).</li> </ul>	
Remote Training & Technical Support	<ul style="list-style-type: none"> <li>During warranty period, remote training &amp; technical support are provided via phone and video conferencing.</li> </ul>	
Warranty Extension	<ul style="list-style-type: none"> <li>Extend the default warranty to another 1-2 years and the extension depends on individual cases.</li> <li>In principle, warranty extension needs to be purchased together with the product.</li> </ul>	
Paid Repair Service	<ul style="list-style-type: none"> <li>Paid repair is provided for man-made damages.</li> <li>You could send the broken product back to the manufacturer (Soarability) for paid repair, or you could also ask the manufacturer (Soarability) to provide onsite repair at additional cost.</li> </ul>	

**Product Customization**

Custom items	Main functions and parameters	Remarks
Speedip Base Unit Surface Logo Customization	<ul style="list-style-type: none"><li>· Customize laser-engraved logo on the top surface of Speedip V2.</li><li>· Details about the manufacturer and the product may not be able to be modified due to compliance requirements.</li></ul>	
Deep Customization	<ul style="list-style-type: none"><li>· For more options for customization, please contact the Sales Support Engineer.</li></ul>	

This manual is subject to update without notice.

You can check the latest User Manual from Soarability's official website:  
[www.soarability.tech/index\\_en](http://www.soarability.tech/index_en)

If you have any questions or suggestions, please contact us via the following e-mail address:  
[support@soarability.tech](mailto:support@soarability.tech)



LinkedIn

YouTube

Scan the QR codes to follow Soarability's official LinkedIn account and subscribe Soarability's official YouTube channel for more information.