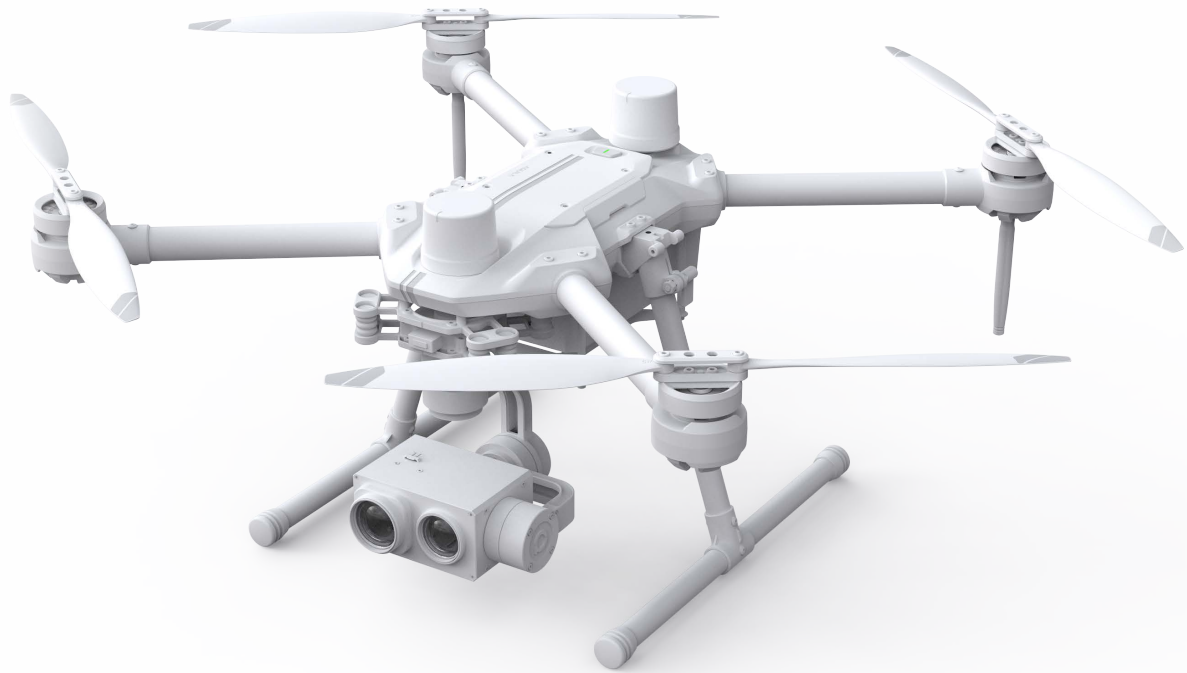


AQUILA2

USER MANUAL

ENG_V3.0



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Product Profile

This Section describes the features of the product, guide the preparation of the aircraft before flight, and lists the components of the aircraft and remote controller.

Product Profile

Introduction

AQUILA2 is a small quad-rotor, high-precision aerial survey drone with 51-minute flight time and IP4 waterproofing. Upgrade your next mapping mission with the AQUILA2 - the most compact and accurate low altitude mapping solution.

Based on the new H7 flight control system, it is compatible with PX4 and ArduPilot dual-system open source architecture. A new dual RTK module is integrated directly into the AQUILA2, providing real-time, centimeter-level positioning data for improved absolute accuracy on image metadata. At the same time, it has stronger anti-magnetic interference ability and precise positioning ability. In addition to optimized flight safety and precise data collection. Fit the AQUILA2 to any workflow, with the ability to connect this positioning system to the NTRIP (Network Transport of RTCM via Internet Protocol) using a 4G dongle or WiFi hotspot.

Users can also create customized solutions through the newly added Phalanx G1 expansion board module and customized auxiliary equipment according to business characteristics, so that AQUILA2 can be closely integrated with the operation scene.

Preparing the Aircraft

1. Installing the Landing Gears

Install the landing gears, tighten the latch clockwise, and make sure it's tight.



2. Mounting the Gimbal and Camera



1. Align the white and red dots and insert the gimbal.
2. Rotate the gimbal lock to the locked position.

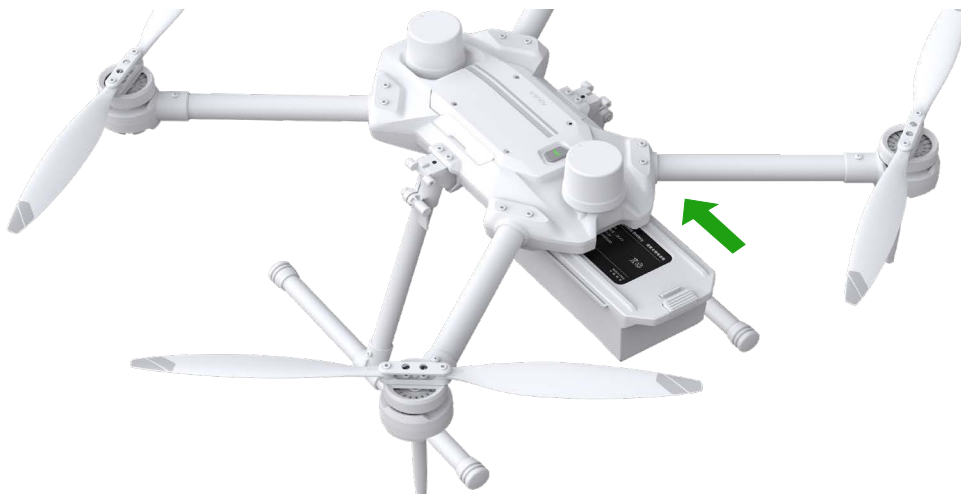
After installation, make sure that the gimbal lock is locked in place.

Make sure to press down the Gimbal Detachment button when rotating the gimbal lock to remove the gimbal and camera. The gimbal lock should be fully rotated when removing the gimbal for next installation.

3. Battery Installation

Slide battery into the battery compartment according to the arrow's direction as shown below.

When the upper and lower buckles on the battery are in place, a click sound indicates the battery is securely installed. Failure to do so may affect the flight safety of your aircraft.



Make sure to use included batteries, Do not use any other type of batteries.

4. Turning on the Aircraft

Turn on/off :

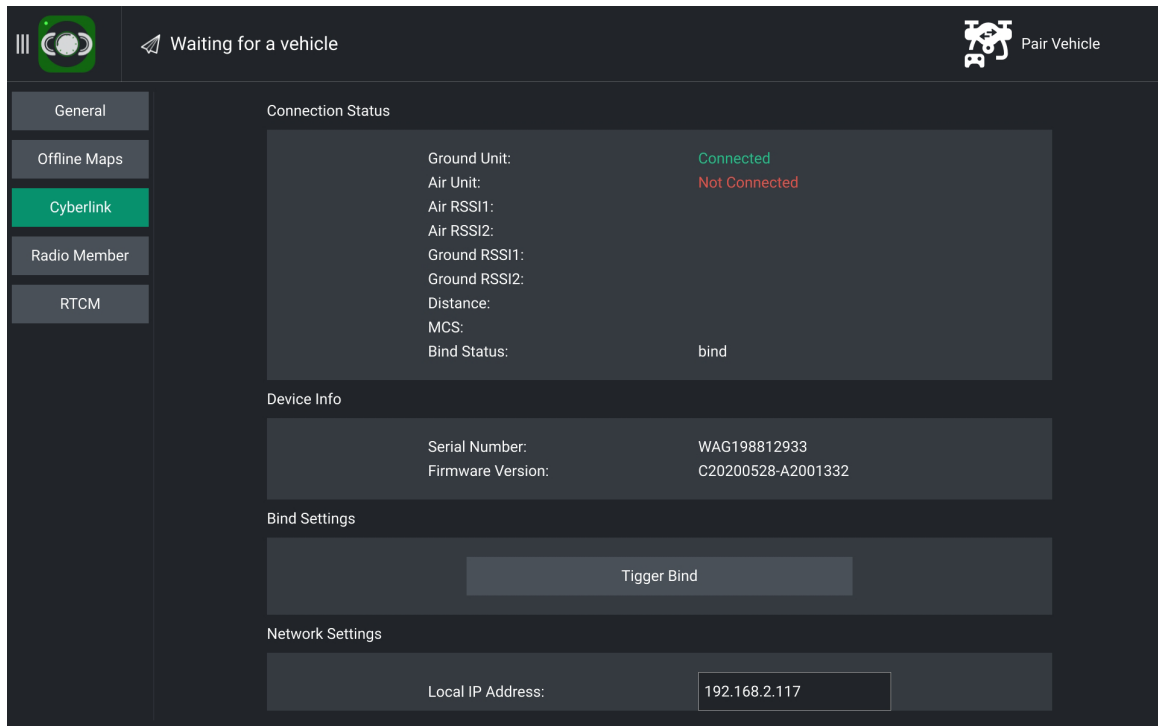
Short press the power button on the aircraft once to turn on the battery; long press for

2seconds to turn off the battery. The indicator light is always on after turning on the power.



Linking The Remote Controller

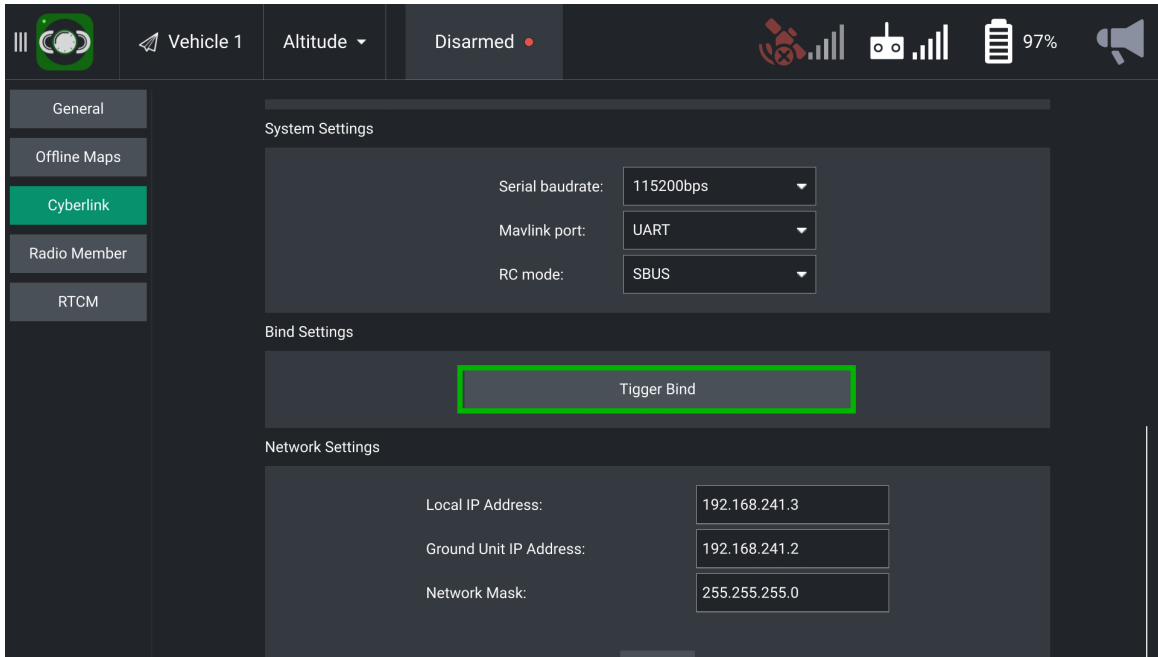
1. Turn on the remote controller to enter the main interface, as shown in the figure below, click the icon in the upper left corner of the screen to start setting the binding, click the Settings option in the lower left corner, and select the Cyberlink option.



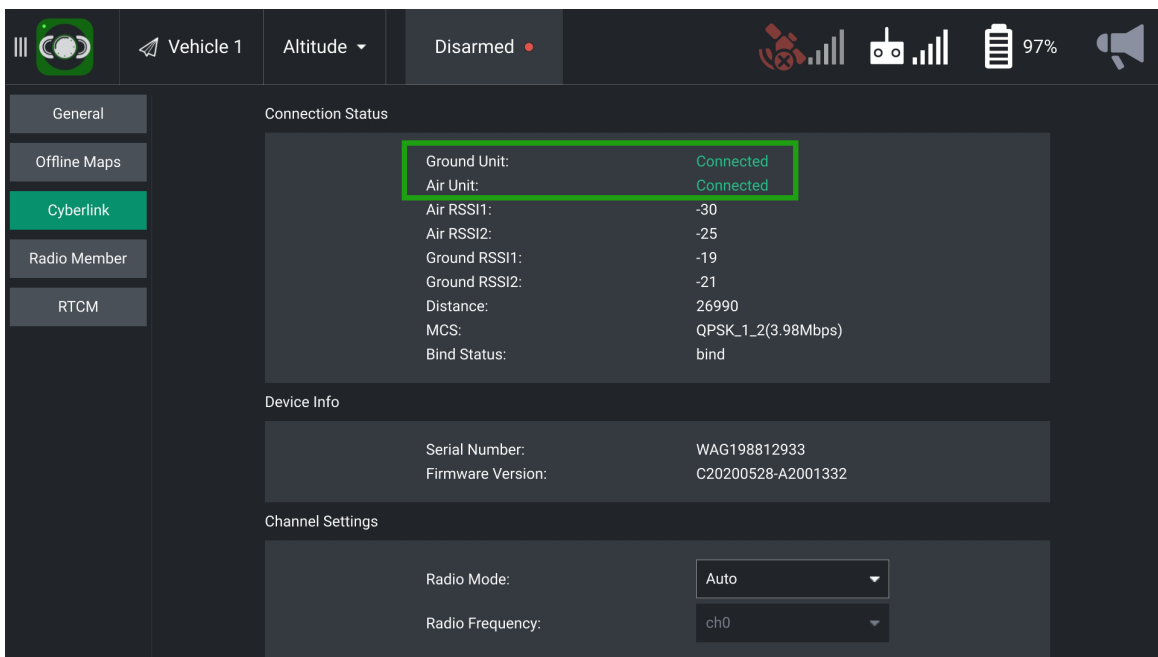
2. Align the tail of the aircraft to open a hole with slender hard objects like a screwdriver, reach forward to press connect button of the Transmission Module for 5 seconds until the indicator flashes quickly. The aircraft is ready to be connected.



3. After entering the Cyberlink settings interface, select the Bind Settings area on the right and click Tigger Bind to bind;

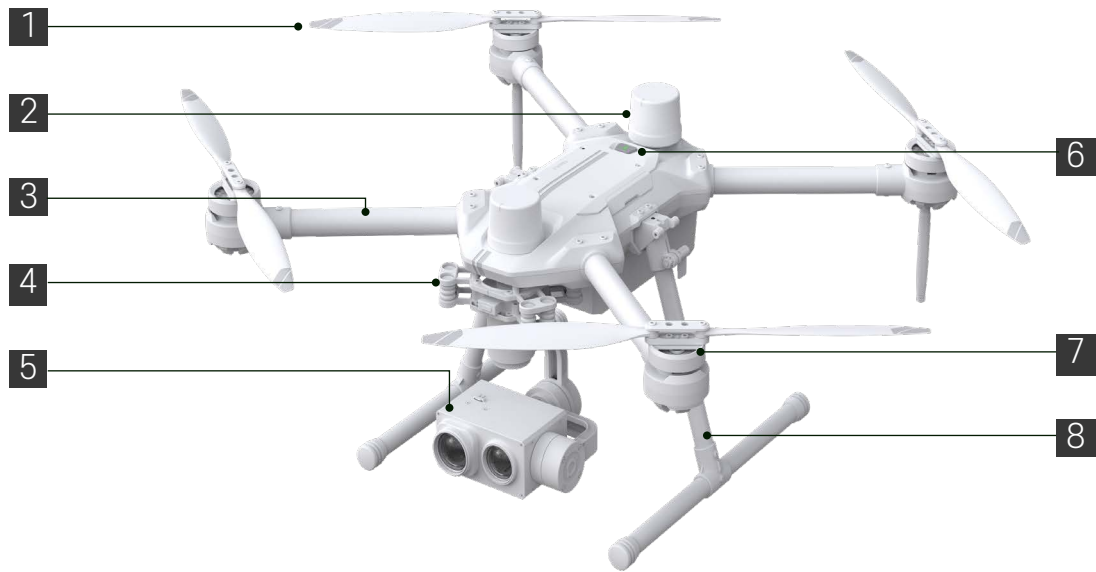


4. When connection is completed, the Transmission Module indicator will be solid and then be off. The controller will receive data from Aircraft.

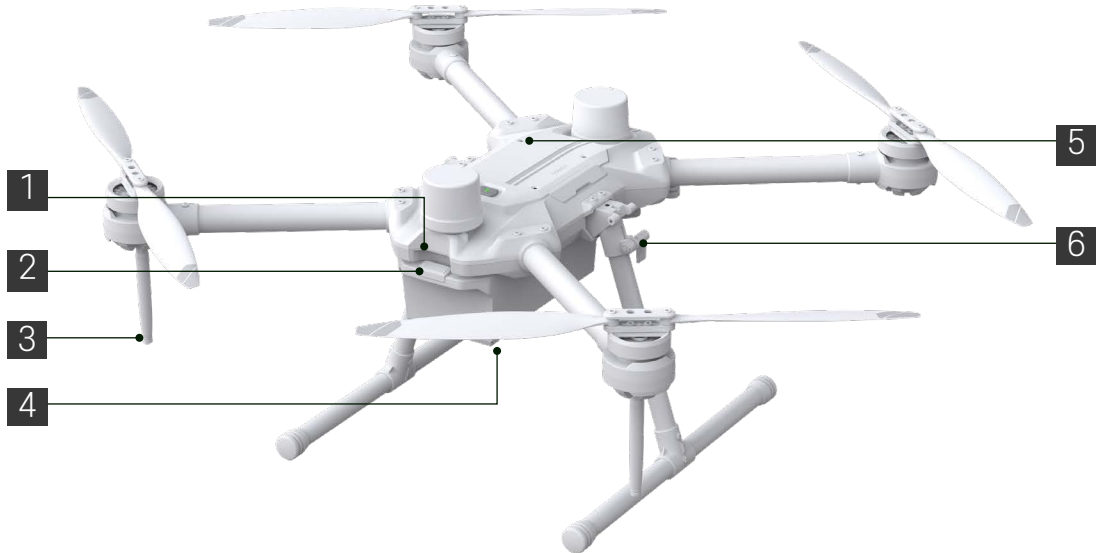


In the right interface of Connection Status, Ground and Air Unit will show as "Connected" in green.

Aircraft Overview



- 1. Propellers
- 2. RTK Modules
- 3. Frame Arms
- 4. Gimbal Detachment Button
- 5. Gimbal and Camera
- 6. Power Button
- 7. Motors
- 8. Landing Gears



- 1. Binding Trigger Port
- 2. Battery Locker
- 3. Transmission Antennas
- 4. Flight Battery
- 5. Expansion Port
- 6. Landing Gear Latch

Expansion Port Overview



- 1. Expansion Board USB-C Port
- 2. Serial Interface D1

- 3. Serial Interface D2
- 4. Serial Interface D3



- 1. External Output Power Port (21V-26V)
- 2. Ethernet Port E1

- 3. Ethernet Port E2
- 4. FC USB-C Port

Aircraft

This section introduces the aircraft components, features and functions.

Aircraft

Profile

The AQUILA includes a flight controller, a communication system, a positioning system and an Flight Battery. This section describes the functions of these components.

Flight Modes

The AQUILA uses a CodevDynamics dedicated flight controller, which provides the flight modes below:

Position Mode :

The aircraft utilizes the GNSS/RTK module to automatically stabilize itself. When the GNSS signal is strong, the aircraft uses GNSS for positioning. When RTK module is enabled and the differential data transmission is good, it provides centimeter-level positioning.

Altitude Mode :

GNSS not used for positioning and aircraft can only maintain altitude using the barometer. It enters Altitude mode only when there is weak GNSS signal or when the compass experiences interference .

Altitude Mode Warning

The aircraft will fly in Position Mode by default. It enters Altitude mode only when there is weak GNSS signal or when the compass experiences interference .

In Altitude Mode, the aircraft cannot position or auto-brake in this mode and is easily affected by its surroundings, which may result in horizontal shifting. User need to use the remote controller to position the aircraft.

Maneuvering the aircraft in Altitude Mode can be difficult. Avoid flying in areas where GNSS signal is weak, or in confined spaces. The aircraft will otherwise be forced to enter Altitude mode , leading to potential flight risks, please land it in a safe place as soon as possible.

RTL Mode (Return To Launch)

In RTL Mode , the aircraft will automatically fly back to the point and land.

Mission Mode

In Mission Mode, the aircraft will perform the mission automatically.

Aircraft Status Indicators

The AQUILA has Front LEDs and Aircraft Status Indicators.

The positions of these LEDs are shown in the figure below:



The Front LEDs show the orientation of the aircraft. The Front LEDs glow solid white when the aircraft is turned on to indicate the front (or nose) of the aircraft. The Aircraft Status Indicators communicate the system status of the flight controller. Refer to the table below for more information about the Aircraft Status Indicators.

Aircraft Status Indicator Description

Normal:

Altitude Mode : Fast blue flashing

Position Mode : Alternate red and green flashing

RTL Mode : Fast yellow flashing

Mission Mode : Fast purple flashing

Warning !

Remote Controller Signal Lost : Fast red flashing
Low Battery Warning : Fast red flashing
CPU Warning: Fast purple flashing

Return to Launch (RTL)

The Return to Launch (RTL) function brings the aircraft back to the last recorded Home Point when there is a strong GNSS signal. There are three types of RTL: Smart RTL, Low Battery RTL, and Failsafe RTL.

Smart RTL:

Use the RTL button on the remote controller when GNSS is available to initiate Smart RTL(Long press for 2s).After booting up, the aircraft status indicator will be a yellow LED blinking continuously. In the process of RTL, press the Smart RTL button again to terminate the procedure and full contro of aircraft.

Low Battery RTL:

When the flight battery power is too low, there is not enough power to return home. At this time, the user should land the aircraft as soon as possible.In order to prevent unnecessary danger due to insufficient battery power, the aircraft will intelligently determine whether the current battery power is sufficient based on the flight position information.

When the battery level drops to 21%, if the aircraft's current position is greater than 500 meters from the take-off point, the aircraft will automatically return to home (if the aircraft's current position is less than 500 meters away from the take-off point, the aircraft will automatically return to home at 16% battery level). During the return home process, the user can cancel the return home mode by switching the mode switch. If the user cancels the low-voltage return to home reminder and continues to fly, when the battery level drops to 5%, the aircraft will make a forced landing at its current position, which may cause the aircraft to be lost or crashed.

Current Battery	Remark	Aircraft Status Indicator	FlyDynamics App	Flight Instructions
23%	Low battery Warning.	Fast red flashing.	Voice prompt low battery warning.	Flying normally.
21%	When the current position of the aircraft is greater than 500m from the take-off point, the battery is sufficient to return home safely.		Voice prompt low batterywarning, and automatically enter RTL moded.	The aircraft will return to the Home Point and land automatically. Users can also cancer the RTL process and land manually.
16%	When the current position of the aircraft is less than 500m from the take-off point, the battery is sufficient to return home safely.		Voice prompt low battery warning, and automatically enter RTL mode.	The aircraft will return to the Home Point and land automatically. Users can also cancer the RTL process and land manually.
5%	The aircraft must land immediately.		Voice prompt low battery warning, and automatically enter Land mode.	The aircraft will slowly land at the original position and stop the motors.

Failsafe RTL:

Failsafe RTL is automatically activated if the remote controller and the aircraft are disconnected over 3 seconds. The aircraft will return in a straight line to the takeoff point and land. When the remote controller is connected to the aircraft during return to home , the aircraft will continue to return home,But users can cancel RTL by switching the mode switch.

RTL Procedure:

1. Home Point is recorded automatically.
2. RTL procedure is triggered, i.e., Smart RTL, Low battery RTL, and Failsafe RTL.
3. Home point is confirmed and the aircraft adjusts its orientation.
4. When less than 30m from the Home Point, the aircraft will fly to the Home Point at the currunt altitude. If more than 30m from the Home Point and below the pre-set RTL altitude, the aircraft will ascend to the pre-set RTL altitude before flying to the Home Point. The aircraft will fly directly to the Home Point if it is above the pre-set RTL altitude.
5. The Aircraft will return to the Home Point, and Landing.

Safety precautions for RTL:

Set the return altitude in the settings menu to ensure that there are no dangerous objects in the aircraft's flight area before the RTL mode is activated.

In the RTLmode, the aircraft will land automatically, and the aircraft can also manually assist the landing of the Talon 1000 sRTK. Once the aircraft is close to the ground, the user should reduce the manual control to prevent the aircraft from tipping over. Under normal circumstances, the aircraft will automatically turn off the motors when landing, but the user should be prepared to slow down manually.

RTK Functions

Profile

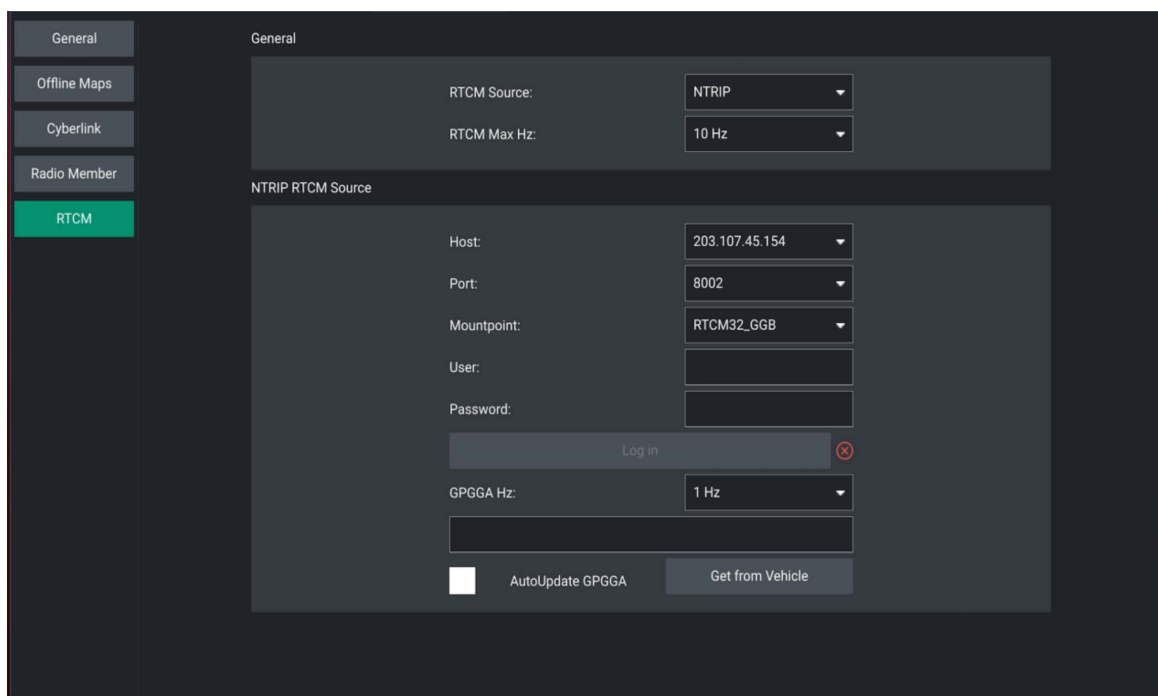
The aircraft has a built-in RTK , which can withstand magnetic interference from metal structures, ensuring stable flight. More accurate positioning data can be achieved when using a high precision GNSS Mobile Station or Internet network RTK service.

Enable/Disable RTK

Ensure that the "NTRIP RTCM Source" is log in and the RTK service type is correctly set (Mobile Station or Custom Network RTK service) before each use. Go to "RTCM" View to view and set.

Using the Custom Network RTK

You can mount a SIM Card to remote controller or use the app to connect to a wifi, and enable Internet network to use Custom Network RTK. Custom Network RTK can be used to replace the RTK base station. Connect the Custom Network RTK account to the designated Ntrip serve to send and receive differential data. Keep the remote controller turned on and the Internet network connected.



1. Make sure the remote controller turned on and the aircraft are linked , and the app is connected to the Internet network.
2. In RTCM interface, select the RTCM Source type as "NTRIP", fill in NTRIP's Host,Port,Mountpoint,User and Password,and then tap to set by following the instructions.
3. Wait to connect to the Ntrip server. In the Flight main pages , the status of the aircraft's positioning in the status table will show "FIX" to indicate that the aircraft has obtained and used the differential data from the mobile station.

Propellers

Propellers Usage Guide

Only use Codev Dynamics approved propellers. Do not mix propeller types.

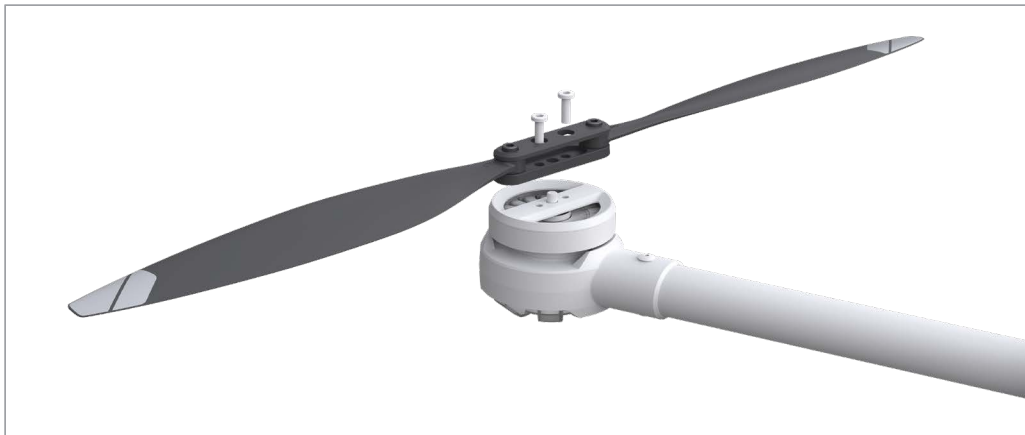
Ensure to check that the propellers and motors are installed firmly and correctly before each flight.

Ensure that all propellers are in good condition before each flight. Do not use aged, chipped, or broken propellers.

To avoid injury, stand clear of and do not touch propellers or motors when they are spinning.

Replacing the Propellers

In order to replace the propellers, use the H2.5 hex key with ball-end.



Propeller blades are sharp, please handle with care.

Flight Battery

The flight battery is specially designed for AQUILA. It uses a brand-new high-performance battery. Please be sure to fully charge the battery before using it for the first time. Must use the special charger provided by Codev Dynamics for charging.

Capacity :	10000mAh
Voltage :	26.4V
Battery Type :	Lipo 6S
Energy :	270wh

Please read carefully and strictly abide by the requirements of Codev Dynamics in this manual, disclaimer, and battery surface before using the battery. The user shall bear the consequences caused by failure to use it as required.

Warnings:

1. The Flight Battery is significantly reduced when flying in low temperature environments (temperatures below 5°C).
2. Ensure that the battery is fully charged and the cell voltage is at 4.4V before each flight.
3. Enter the flight as soon as FLYDynamics App displays the "Low Battery Level Warning" in low temperature environments.
4. You will still be able to control the aircraft's movement when this warning is
5. triggered.

In extremely cold weather, the battery temperature may not be high enough even after warming up. In these cases, insulate the battery as required.

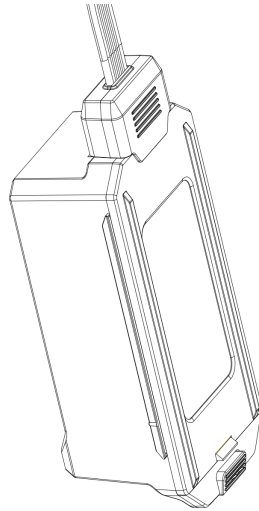
In order to ensure optimal performance of the battery, keep the battery temperature above 16°C.

In low temperature environments, it will take a longer time for the batteries to warm up. It is recommended to keep the battery warm before use to reduce the warm-up time.

Charger

Charge

1. Use the AC power cord to connect the power interface of the charger to an AC power
2. source.
3. Press the power button to turn on the charger.
4. Connect the battery.
5. Set up and start charging.



Do not frequently charge in a low temperature environment, as the charging time will become longer and the battery life may be impaired.

Do not use charging settings greater than 1C to charge.

Flight

This section describes flight restrictions and safe flight practices.

Flight Environment Requirements

1. Do not use the aircraft in bad weather such as where wind speeds exceed 15m/s.
2. When flying in open areas, tall and large metal structures may affect the accuracy of the on board compass and GNSS system. Make sure to operate the aircraft by following the prompts in the app.
3. Avoid obstacles, crowds, high voltage power lines, trees, and bodies of water.
4. Minimize interference by avoiding areas with elevated levels of electromagnetism, including base stations and radio transmission towers.
5. Aircraft and battery performance are subject to environmental factors such as air density and temperature. Be very careful when flying at high altitudes, as battery and aircraft performance may be affected.

Preflight Checklist

1. Remote controller, Flight Battery, and display device are fully charged.
2. Landing gears are mounted firmly, and batteries are locked firmly.
3. All the devices' firmware is up-to-date.
4. Ensure that a microSD card has been inserted.
5. The Camera and Gimbal work normally after the power is turned on.
6. Motors can start and are functioning normally.
7. The FlyDynamics App is successfully connected to the aircraft.
8. Do not face the battery connector downwards to the ground to avoid getting dust or water into the battery connector.
9. Make sure that the gimbal dampener is without obvious wear and tear, and the gimbal anti-drop has been fastened.

Starting/Stopping the Motors

Starting Motors

Push both sticks to bottom inner or outer corners to start the motors.



Stopping Motors

When the aircraft has landed, push and hold the left stick down. The motors will stop after three seconds.



Emergency Propeller Stop

Click "Disarmed" can be used to execute the emergency propeller stop once the flight controller detects critical error during flight.

1. Place the aircraft in an open, flat area with the battery level indicators facing towards
2. you.
3. Turn on the remote controller, then turn on the aircraft.

Launch FlyDynamics App, connect the display device and remote control, and enter

4. the Camera View.

5. Wait until the Aircraft Status Indicators blink red and green alternately.

6. Turn on the motors and push the left stick up slowly to take off.

7. To land, hover over a level surface and gently pull down on the left stick to descend.

Turn off the aircraft, then the remote controller.

When the Aircraft Status Indicators blink yellow rapidly during flight , the aircraft has entered Failsafe mode.

A low battery level warning is indicated by the Aircraft Status Indicators appear red on the left and green on the right, and continuous fast blinking.

Appendix

Appendix

Specifications

Aircraft	AQUILA2
Dimensions	500*450*265mm
Diagonal Wheelbase	600mm
Weight	Approx. 1.3 kg (without batteries) Approx. 2.5 kg (with one battery)
Max Payload	1.4kg
Operating Frequency	2.4000 - 2.4835 GHz
Transmitter Power	2.4000 - 2.4835 GHz ; 29.5 dBm (FCC) ; 18.5dBm (CE) 18.5 dBm (SRRC) ; 18.5dBm (MIC)
Hovering Accuracy	Vertical : ± 0.5 m (GPS enabled) ± 0.1 m (RTK enabled) Horizontal : ± 0.5 m (GPS enabled) ± 0.1 m (RTK enabled)
RTK Positioning Accuracy	1cm + 1ppm (Horizontal) 1.5cm + 1ppm (Vertical)
Max Angular Velocity	120°
Max Pitch Angle	30°
Max Ascent Speed	5m/s
Max Descent Speed (vertical)	4m/s
Max Speed	12m/s
Service Ceiling Above Sea Level	5000m
Max Wind Resistance	15m/s
Max Flight Time	51min (no load)
GNSS	GPS+GLONASS+BeiDou+Galileo
Operating Temperature	-10° C to 50° C (32° F to 104° F)
IP Rating	IP53

Flight Battery	LPB610HV
Capacity	10000mAh
Voltage	26.4V
Battery Type	Lipo 6S
Energy	231wh
Weight	1.2kg
Operating Environment	0° C to 40° C (32° F to 104° F)

Firmware Update

Aircraft firmware upgrade

Please download the latest Aircraft firmware from CodevDynamics official website before upgrading.

1. Connect the aircraft to a PC with a Type-C USB cable.
2. Run the FlyDynamics. First select the Gear icon (Vehicle Setup) in the top toolbar and then Firmware in the sidebar.
3. Please unplug your Pixhawk and/or Radio from USB. Then plug your device via USB to start firmware upgrade.
4. Tap to Advanced settings , choose Custom firmware file, Click the OK button to start the upgrade.
5. Restart the device after the firmware update is complete.

FlyDynamics APP firmware upgrade

Please download the latest FlyDynamics APP firmware from CodevDynamics official website before upgrading.

Please connect the latest App firmware to the remote control via a USB Flash Disk or SD card, select the installation file in the file manager, and overwrite the installation.

Extended Screw Holes Description

Be sure to use the specified type of screw to avoid damaging the screw hole thread and ensure that the accessories are installed firmly.

