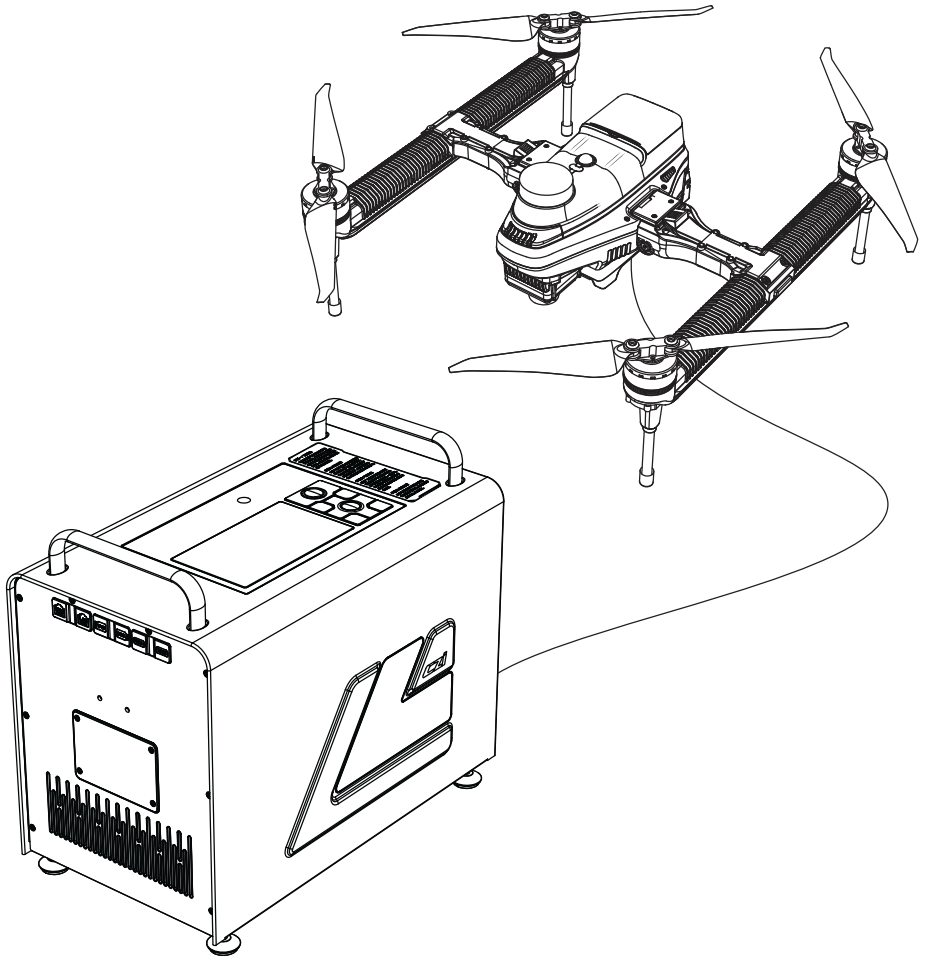
CZ100
系留悬浮灯

2025.06 V0.1

用户手册
User Manual



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目录

Contents

CZ100 User Manual

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Note: This document will be continuously updated and improved. The latest version will be available in digital format. Please refer to the latest version of the User Manual for accurate information. You can scan the QR code to view or download the latest CZ100 Tethered Lighting System User Manual.

Scan the QR code below to view or download this User Manual

1. Safety Instructions

1.1 Operator Qualification and Training

- Before using this product, please ensure that the operator has completed relevant training in accordance with the laws and regulations of the country or region where the product is used, and has legally obtained the required operator license. Unless otherwise permitted by applicable laws and regulations, the operator must not operate the equipment without the required license.

1.2 Pre-Operation Checks and Preparations

1.2.1 Environment Check

- Before operation, the operator should inspect the surroundings, ensure the area is clear of obstacles and crowds, and confirm there are no potential safety hazards.
- If the ground station is placed higher than the takeoff level of the airborne unit, there is a risk of tether entanglement with the propellers during landing.
- Choose an open area free of tall buildings or structures. Large objects may block GNSS signals, affecting positioning accuracy or causing positioning failure.
- Ensure there are no high-voltage power lines, communication base stations, or transmission towers nearby that may cause electromagnetic interference.
- Keep the product away from heat sources to avoid damage to electronic components or other parts.

- Ensure the takeoff area is open, and set an appropriate takeoff/return height based on the operation environment.
- Avoid prolonged use of the ground power system in areas with no signal coverage.

1.2.2 Equipment Status Check

- After prolonged operation, components such as lights, heat sinks, and motors may become hot. These areas are marked with warnings — do not touch them directly.
- Ensure that the propellers are undamaged, free of debris, and securely installed. The motors should be clean and in good condition.
- Before each use, check that all components are intact. If any parts are worn or damaged (such as propellers), ensure they are replaced or repaired before use.
- Before startup, make sure all components are installed correctly according to the User Manual.
- Before startup, make sure the firmware and app are updated to the latest version.
- Before startup, make sure all devices are fully charged.

1.2.3 Personal Protection

- When the system is powered with high voltage, always wear insulated gloves rated 400V or higher before handling the equipment.

1.2.4 Equipment Test Run

- Before use, it is recommended to perform a test run without propellers installed to check that the remote controller, motors, and other modules are functioning properly. Install the propellers only after confirming everything is normal to avoid safety hazards.

1.3 Equipment Operation and Procedures

1.3.1 Legal and Compliant Use

- Operate the equipment only within legal areas. Operators must strictly comply with local laws and regulations related to device usage, ensuring all operations are legal and compliant, including but not limited to altitude limits, designated operation areas, and visual line-of-sight requirements.

1.3.2 Equipment Monitoring and Maintenance

- Before operation, make sure the equipment remains within monitoring range.
- Before operation, make sure the GNSS signal in the operating area is strong enough for safe operation.
- Before operation, make sure the battery level is sufficient, and return promptly when the app warns of low battery.

- Before operation, make sure you are fully alert and never operate the equipment under the influence of alcohol or medication.
- Before operation, make sure any malfunctions are properly checked and fixed before attempting takeoff.

1.3.3 Safe Operation

- Stay clear of moving parts. Never touch the spinning propellers with your body or any objects. Avoid wearing loose clothing during operation to prevent entanglement. Always maintain a safe distance from the equipment and keep it away from people, animals, or obstacles.
- Do not disassemble modules or plug/unplug cables while the equipment is powered on.
- Never block, interfere with, or impact the equipment with people, animals, or objects.
- Do not use non-original accessories, as they may compromise safe operation.
- Never operate the equipment in heavy rain, standing water, or submerge it in water.
- Avoid prolonged use of visual recognition in dark environments, as poor image quality may lead to misidentification and cause safety risks.
- During airborne operation, do not close the app. Closing the app may result in the airborne unit losing connection with the controller and failing to receive commands.
- When operating the airborne unit, always choose an open area and strictly avoid buildings, high-voltage power lines, and other obstacles.

1.3.4 Equipment Maintenance and Care

- It is recommended to perform battery maintenance charging on the ground power supply system every six months to ensure battery performance and reliability.
- When using the ground power supply system, strictly follow the guidelines for cable layout and connection to ensure cable integrity and safety. Never pull out or move cables when the system is powered off to avoid insulation damage or electrical faults.
- Do not tilt or overturn the ground power supply system during use. Always keep it in its designated upright position.
- Keep ventilation and air inlets clear to maintain proper heat dissipation and avoid overheating risks caused by blocked airflow.

1.3.5 Special Environmental Considerations

- Do not operate the equipment in rain, snow, fog, thunderstorms, hail, sandstorms, or strong winds (above level 7), or in areas with strong magnetic interference. If wind speeds exceed level 7 or weather conditions change suddenly, return the device or land it nearby as needed.
- The system must be connected to AC mains power for prolonged use.
- Only inverter generators are supported for external power supply. Do not use fixed-frequency generators, as they may cause load fluctuations and lead to overloading or underloading of the airborne unit.

1.4 Warnings

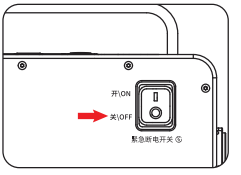
- Please read this manual carefully before using the equipment to ensure correct setup. Failure to follow the instructions and warnings may result in injury to yourself or others.
- Install the equipment properly by following the installation guide in the manual.
- Ensure the aviation connector is correctly and securely installed on the airborne unit to guarantee safe aerial operation.
- Do not disassemble the equipment without authorization. You will be responsible for any consequences resulting from unauthorized disassembly.

2. Emergency Handling

Emergency handling applies only to situations requiring an emergency power cut-off of the airborne unit. Avoid using emergency procedures during normal operation.

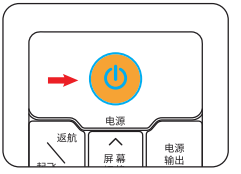
- Emergency Power Cut-off Switch:

  Turn the switch to " O " to perform an emergency shutdown and power cut-off.



- Power Button Shutdown:

  Press and hold the power button for 3 seconds to perform an emergency shutdown and power cut-off.



3. Disclaimer

- Please read this document carefully before using the product. This disclaimer has a significant impact on the safe use of the product and your legal rights. By using this product, you are deemed to have read, understood, and accepted all the terms and conditions herein.
- This product is not a toy and carries certain operational risks. It is not suitable for individuals under 18 years old, those with limited or no legal capacity, or those with mobility impairments. It must not be used by untrained individuals without czi's official certification. Keep out of reach of children and exercise caution when operating near minors.
- Operators agree to use the product lawfully and comply with these terms and any relevant policies or guidelines by czi. The product may automatically upload and store operation data. czi assumes no responsibility if data cannot be uploaded, stored, or analyzed due to user-related reasons.
- To the maximum extent permitted by law, czi provides no express or implied warranties, including but not limited to merchantability, fitness for a particular purpose, or non-infringement.
- To the maximum extent permitted by law, czi shall not be liable for any losses arising from the user’ s failure to follow this User Manual. czi shall not be responsible for any indirect, consequential, punitive, incidental, special, or exemplary damages, including losses resulting from the purchase, use, or inability to use this product, even if such damages were foreseeable or advised.
- To the maximum extent permitted by law, under no circumstances shall czi’ s total liability for any damages, losses, or causes of action exceed the amount paid by you to czi for the purchase of this product.
- Under all circumstances, the purchaser or user must comply with the applicable laws and regulations of the country or region where the product is used. czi shall not be held liable for any consequences arising from the purchaser’ s or user’ s violation of such laws or regulations.
- Some countries may not allow the exclusion or limitation of certain liabilities, so your rights may vary depending on local laws. However, this does not render the provisions of this disclaimer invalid.
- To the extent permitted by law, czi reserves the right of final interpretation and amendment of the above terms. czi may update, revise, or terminate these terms at its discretion via the official website, User Manual, or online app, without prior notice.

4. Product Overview

czi CZ100 is a high-efficiency, reliable, and lightweight aerial emergency lighting solution. Integrating advanced drone and lighting technologies, it uses a tethered ground power supply to provide strong support for nighttime emergency operations.

With a lightweight design, the airborne unit weighs only 2.6 kg and carries an 800W high-power LED light, delivering continuous aerial illumination for over 8,000㎡ throughout the night at a maximum altitude of 50 meters.Equipped with a built-in camera, the CZ100 transmits real-time aerial footage to the command center via the tethered cable — ensuring stable signal without radio interference.

5. Specifications

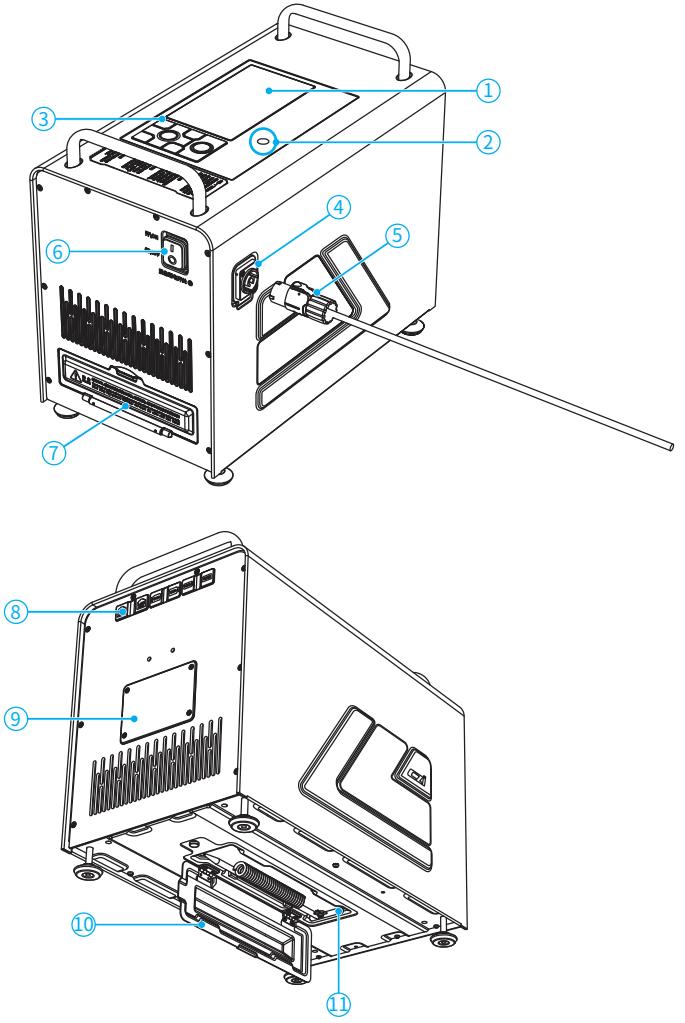
Airborne Unit Weight	⩽2.6kg
Airborne Unit Dimensions (Unfolded)	384*381*169mm
Airborne Unit Dimensions (Folded)	381*237*200mm
Diagonal Motor Axis Distance	480mm
Maximum Operating Altitude	4000m
Wind Resistance	level 7
Hovering Accuracy (in calm or light wind)	Horizontal: ±1.5m, Vertical: ±0.5m（in GNSS Mode）
Maximum Ascent Speed	1.5m/s
Maximum Descent Speed	1m/s
Propeller Size	12 inches
GNNS	GPS + BeiDou + Galileo
GNSS Bands Supported	B1C、B2a、E1B/C、E5a、L1C/A、L5
BeiDou-Only Mode (Software)	Supported
BeiDou-Only Mode (Hardware)	Supported

LED Matrix Light Power	800W
Total Luminous Flux	112,000 lumens (±5%)
Lighting FOV	120°
CMOS Sensor Size	1/2.8 ″
Video Resolution	1920*1080
Laser Safety Class	Class1（IE60825）

Ground Station Weight	⩽12kg
Ground Station Dimensions	385*337*224mm
Ground Station Input Voltage	90-264VAC
Ground Station Battery Capacity	2300mAh
Screen Size	5.5 ″
Screen Resolution	1920*1080
Screen Brightness	1000 nits
Ground Station Output Interfaces	HDMI, Ethernet port
Protection Rating	IP44
Operating Temperature	-20°C~+50°C
Storage Temperature	-40°C~70°C

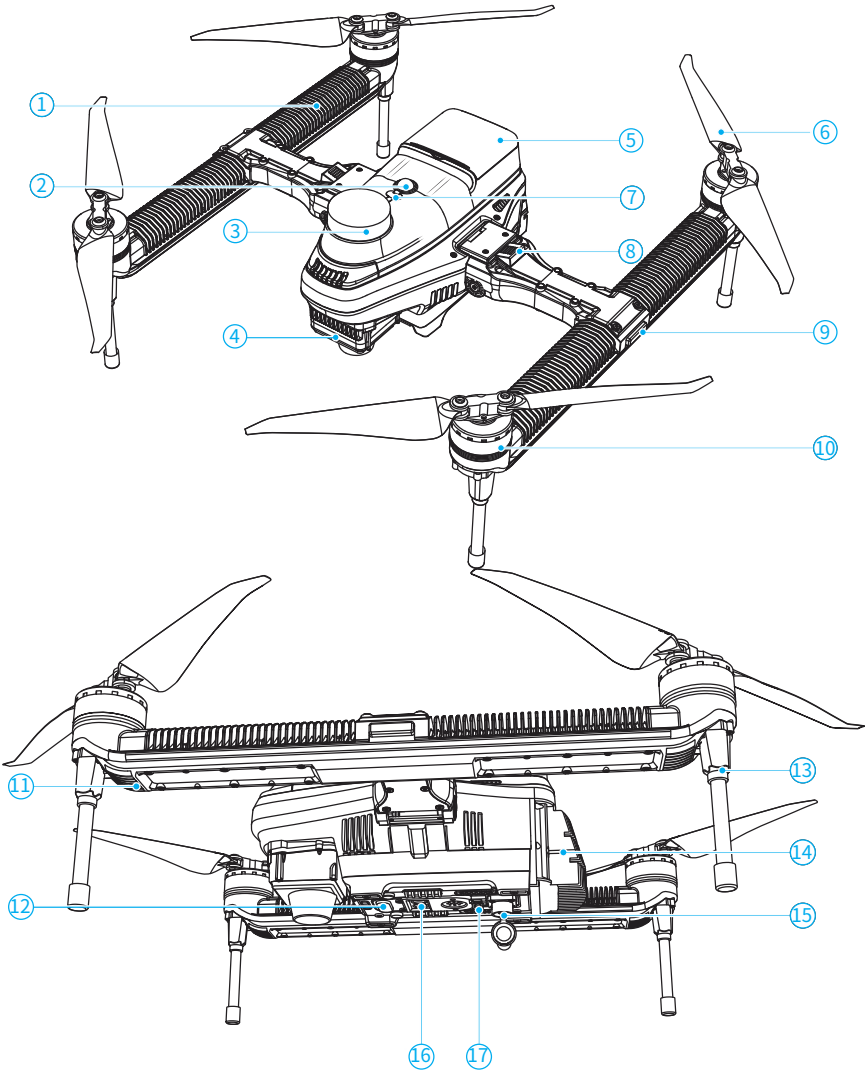
6. Main Components and Structure

6.1 Ground Station



① Display Screen ② Camera ③ Button Pane ④ Power Input Port ⑤ Power Cable
⑥ Emergency Power-Off Switch ⑦ Cable Cover ⑧ External Device Port
⑨ Battery Cover ⑩ Grounding Cover ⑪ Grounding Pin

6.2 Airborne Unit



① Heat-dissipating Arm ② Navigation Light ③ GPS Antenna ④ Camera
⑤ Parachute Module ⑥ Propeller ⑦ Type-C Port ⑧ Arm Folding Button
⑨ Heading Indicator Light ⑩ Motor ⑪ Spotlight ⑫ Downward Fill Light
⑬ Landing Gear ⑭ Power Heat Sink ⑮ Airborne Unit Aviation Connector
⑯ Laser Sensor ⑰ Tether Ring

7. Getting Started

7.1 Offline Upgrade Method

An offline upgrade is required upon first use or when a new firmware version is detected.

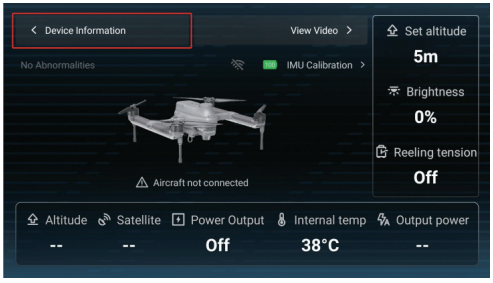
- You can download the offline firmware package from the official czi website to an external storage device (such as a TF card or USB drive). Open the czi GC App, go to HMS, and tap "Firmware Upgrade > Offline Upgrade." From there, you can select the desired firmware package for the airborne unit or payload from the external device, and simply click "One-click Upgrade" to complete the process.

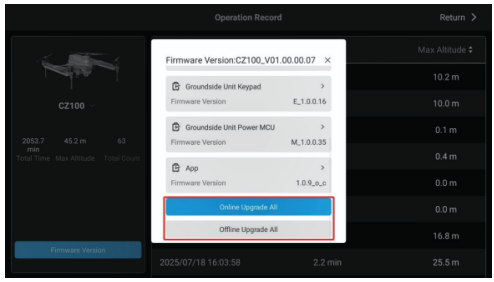
Precautions

- Before upgrading, ensure the airborne unit is connected to the ground station and high voltage is enabled.
- During the upgrade, do not operate the keypad or power off the device.
- **During the upgrade, ensure the airborne unit is kept away from people and animals.**
- Before operation, always update to the latest firmware version to ensure operational safety.

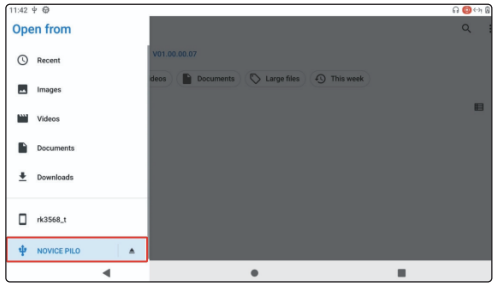
Upgrade Instructions:

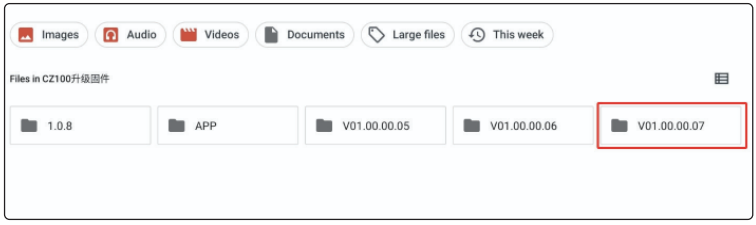
- Open the czi GC App, go to [Device Info] -> [Firmware Version], and choose the appropriate upgrade method.



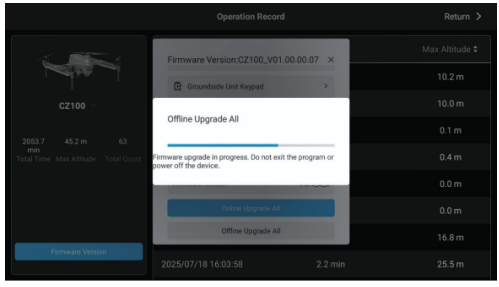


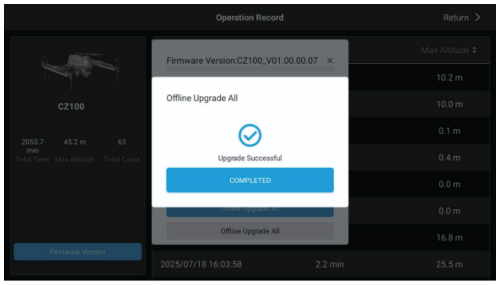
- After selecting "Offline Upgrade All", choose the downloaded upgrade file from the USB drive.





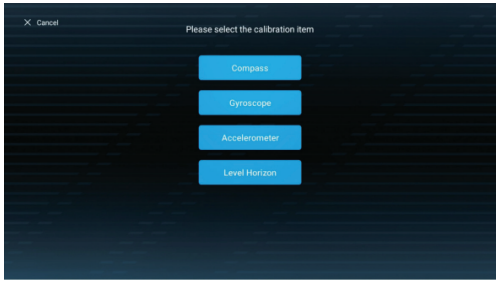
- The upgrade process takes approximately 5–10 minutes. Do not power off the device during the upgrade. Please wait patiently until it is completed. After the upgrade, IMU calibration is required, including compass, gyroscope, accelerometer, and leveling calibration.

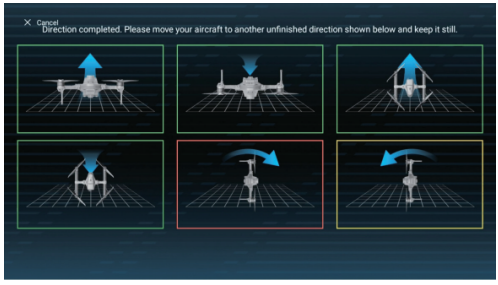




7.2 IMU Calibration for Airborne Unit

- After extended storage, the vision system may require recalibration. A prompt will appear on the airborne unit requesting IMU calibration. Please follow the on-screen instructions to proceed.

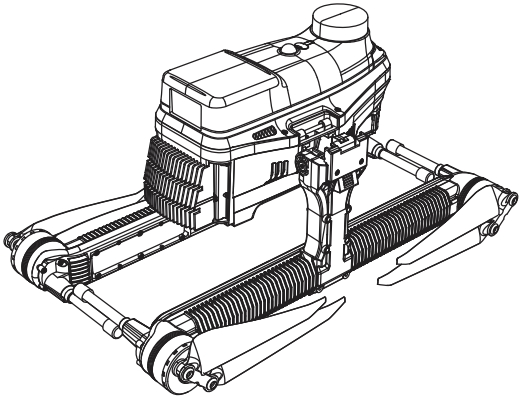


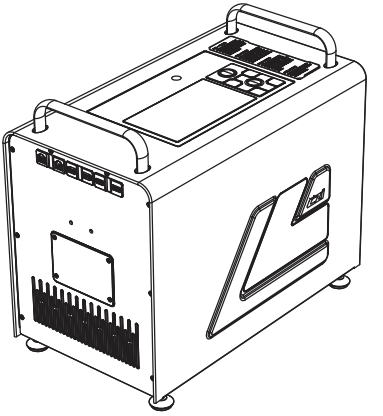


- Once calibration is successful, a “Calibration Successful” message will be displayed. Then, turn off the high-voltage power. Wait for one minute before turning it back on. The device will resume normal operation once the high-voltage system is restored.

8. Installation and Operation Guide

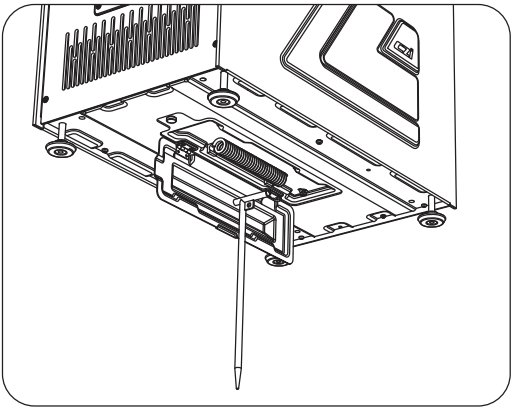
Unpack the backpack and take out both the ground station and airborne unit



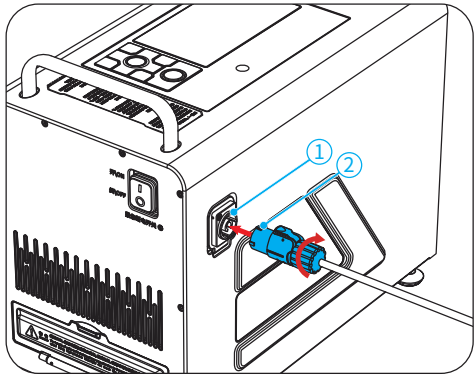


CZ100-Ground Station Installation:

8.1 Grounding Rod Installation: Open the bottom grounding cover and remove the grounding rod. Insert the grounding rod approximately 20 cm into the ground.



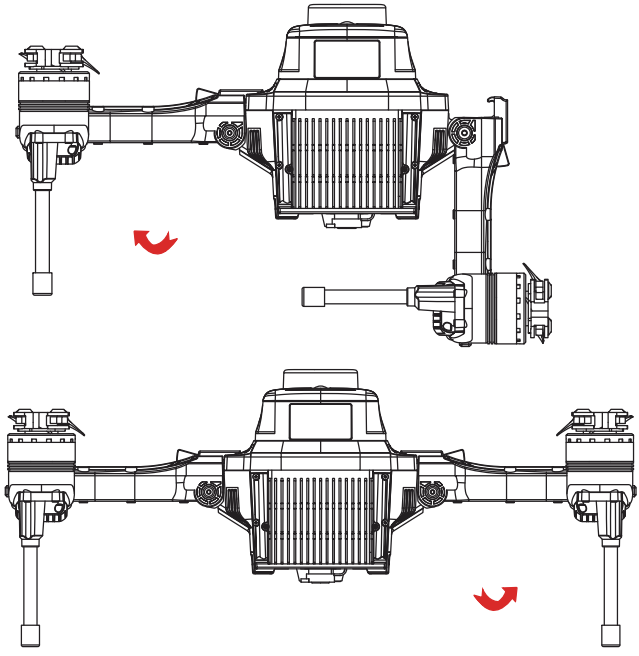
8.2 Ground Station Power Connection：Open the power socket cover, align the protrusion shown in Image 1 with the slot shown in Image 2, insert the power cable, and rotate it clockwise until you hear a “click” sound, indicating the connection is complete.



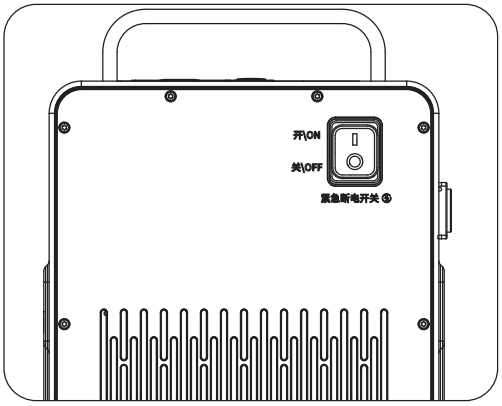
8.3 220V Power Connection: Connect the power plug to a mains outlet or a variable frequency generator socket.

CZ100-Airborne Unit Installation:

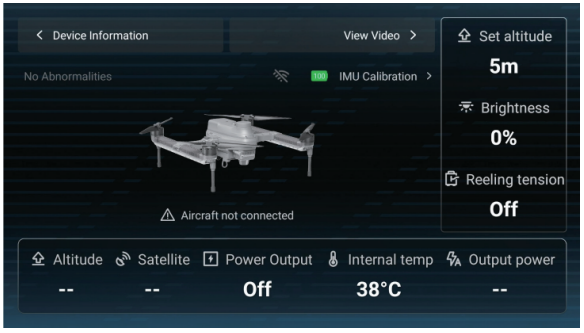
8.4 Remove the propeller protection strap. With the airborne unit' s heat sink facing you, press the button on the left arm to unfold the left arm first, then press the button on the right arm to unfold the right arm. Continue until you hear a "click" sound at each joint, indicating that the arms are locked in place. Check to ensure all folding parts and propellers are securely fastened.

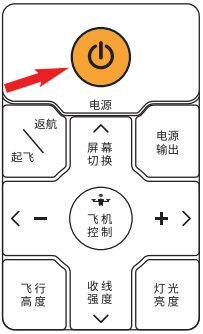


8.5 Turn on the Ground Station Power Switch: Flip the switch to the “ I ” position to power on the ground station.

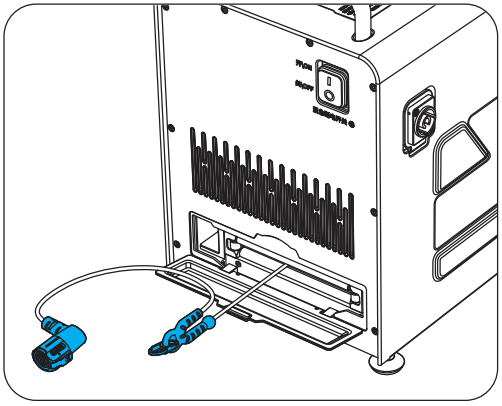


8.6 Ground Station Startup: Press and hold the “Power” button to power on the device.

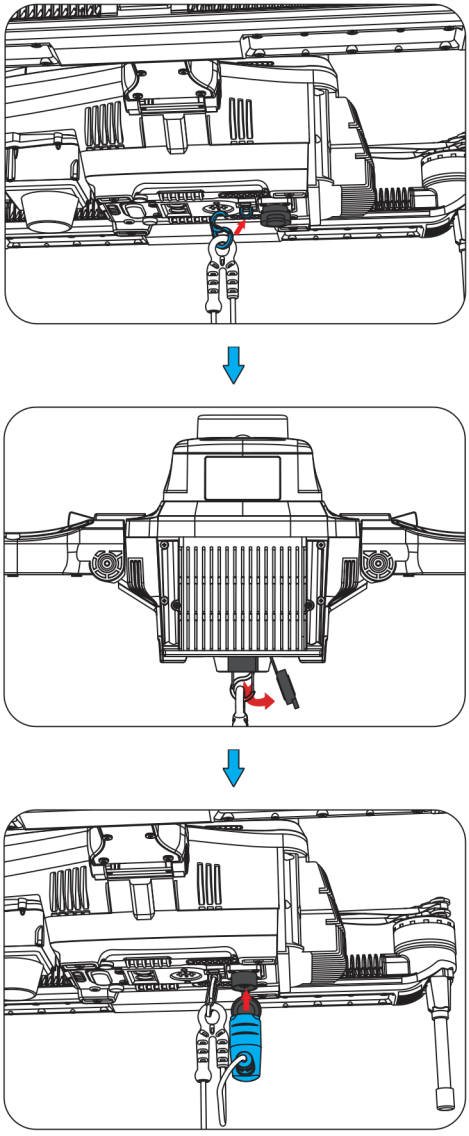


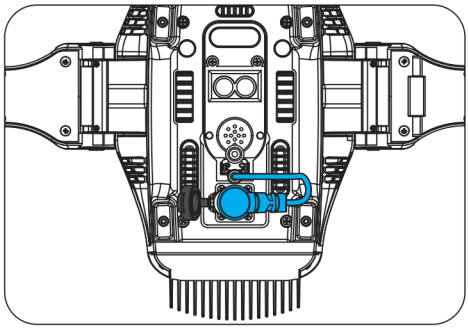


8.7 Aviation Connector Connection: Open the wire cover and pull out the tether cable.



8.8 Hook the clasp on the tether cable onto the tether ring at the bottom of the airborne unit. Then, open the protective cap on the airborne unit' s connector, and connect the aviation plug from the ground station to the airborne unit in the correct orientation. When you hear a "click," the connection is complete.
After connecting, check that the connection is secure and that the plug on the ground station is oriented correctly.

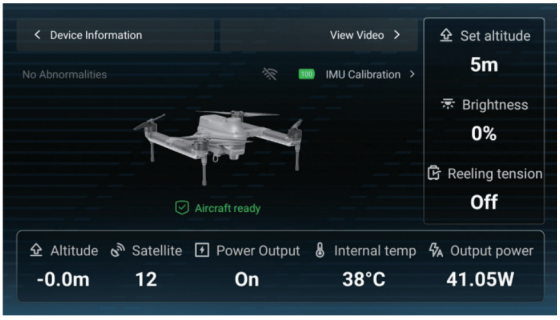




8.9 Place the airborne unit on a proper operation site and wear anti-static gloves. (See Safety Instructions for details)

8.10 Press and hold the “Power Output” button on the ground station. When you hear “High voltage on,” the high-voltage output is activated. The airborne unit will emit a "da-da-da" sound and its red navigation lights on the arms will start flashing.

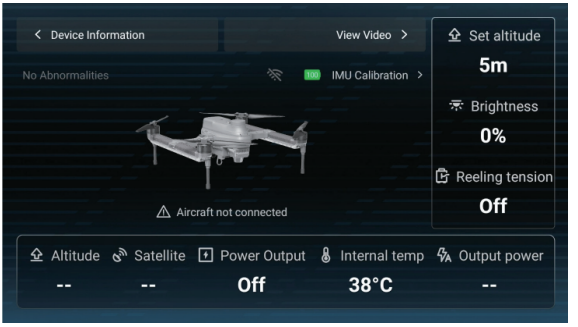
8.11 After powering on, wait for the ground station and airborne unit to complete self-checks until the airborne unit is ready.

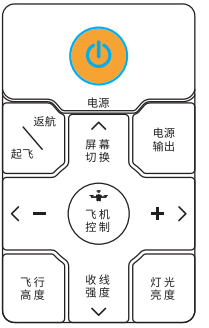


9. Product Usage Instructions

Before using the device for the first time, please update all firmware to the latest version.

9.1 Long press to power on/off:





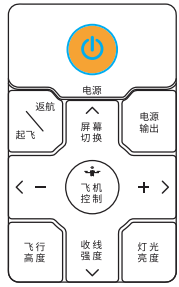
- **Power button:**

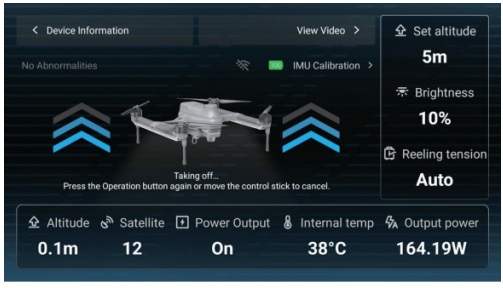
  When powered off, press and hold for 3 seconds to turn on the device. The button light will change from white to blue.
  When powered on, short press for 1 second. The screen will prompt for shutdown confirmation. Press again within 3 seconds to confirm shutdown. This method does not apply when high voltage is enabled.
  When powered on, press and hold for 3 seconds to force shutdown. This overrides high voltage and airborne unit status and may cause safety risks. Use only in emergencies.

- After powering on the CZ100 ground station, the main operation interface will display work record queries, real-time video feed, operation time, location data, satellite reception, high voltage status, temperature, power, and other information as shown above.

9.2 One-Key Takeoff

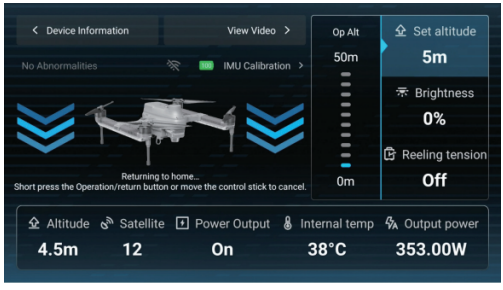
- Press and hold the [Takeoff/Return] button for 3 seconds to initiate takeoff at a default altitude of 5 meters, which can be adjusted as needed. If you need to stop the takeoff during the process, simply tap the [Takeoff/Return] button once, and the airborne unit will hover at its current position.

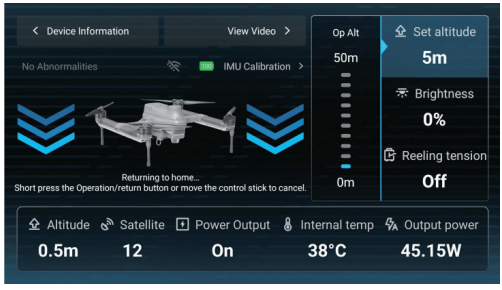




9.3 One-Key Return

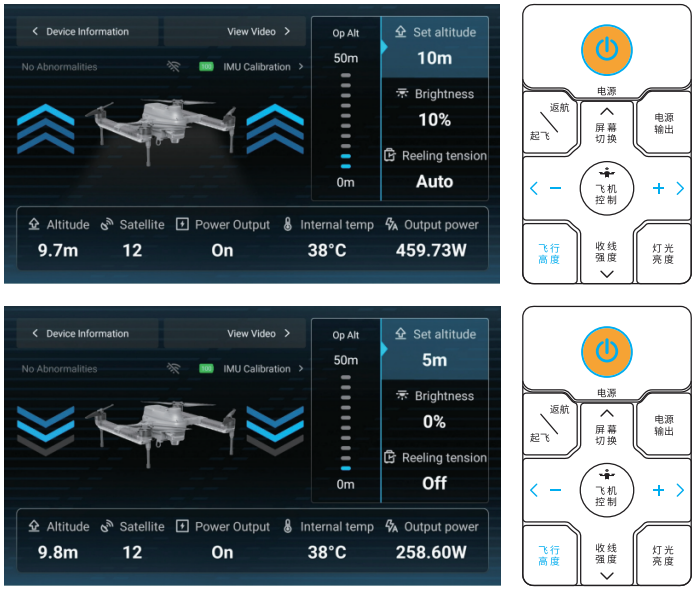
- Press and hold the [Takeoff/Return] button for 3 seconds to initiate one-key return. If you need to pause the return process during flight, short-press the [Takeoff/Return] button. The airborne unit will then hover at its current position.





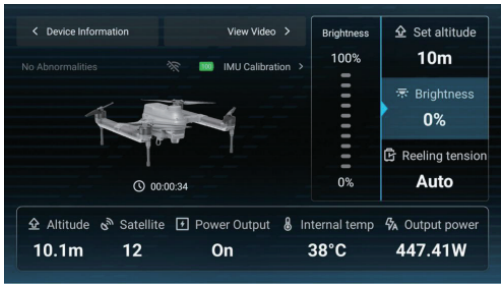
9.4 Setting the Flight Altitude

- After takeoff, press the [Flight Altitude] button on the keypad. This button, along with the [+] and [–] buttons, will light up blue. Use the [+] or [–] buttons to adjust the mission altitude in 5-meter increments.
  The maximum altitude is 50 m, and the minimum is 0 m.
- When the altitude is set to 0 m, the airborne unit will execute a landing command.



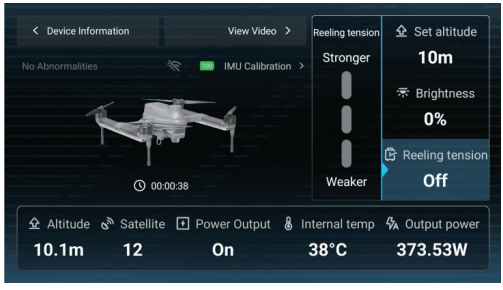
9.5 Light Brightness

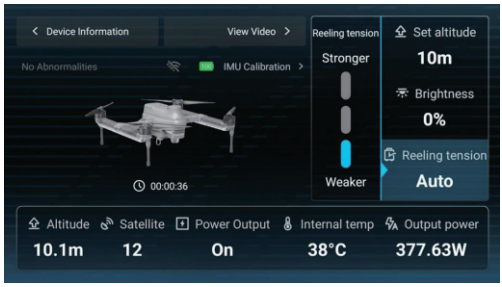
- The light brightness can be adjusted in 10% increments, with a maximum of 100% and a minimum of 0%.
  Before takeoff, press the [Light Brightness] button. This button and the [+]/[–] buttons will light up blue. Press the [+] or [–] buttons to adjust brightness by ±10%. The maximum brightness before takeoff is limited to 10%.
  After takeoff, press the [Light Brightness] button; this button and the [+]/[–] buttons will light up blue. Press the [+] or [–] buttons to adjust the brightness by ±10%, within a range of 0–100%. When the airborne unit ascends, if the light is off, it will automatically turn on at 10% brightness once reaching 10 meters.
- If the light is off, the airborne unit will automatically turn on the light at 10% brightness when ascending to 10 meters. When the unit reaches the set working height above 10 meters, the brightness will automatically increase to 100%. After exceeding 10 meters, if the airborne unit ascends or descends, the brightness will automatically adjust to 80%, and it will return to 100% brightness when hovering.



9.6 Tether Tension

- The tether tension is adjustable with four settings: Off, Auto, Low, and High. The default setting at startup is Auto.
  Press the Tether Tension button to activate the setting mode. The button and the +/- buttons will light up blue. Pressing the +/- buttons will adjust the tension level step by step.
  In Auto mode, the system automatically adjusts tether tension based on the airborne unit's status to keep the tether taut and straight. Low and High are fixed tension levels for manual control.

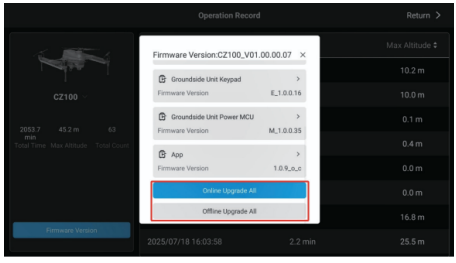


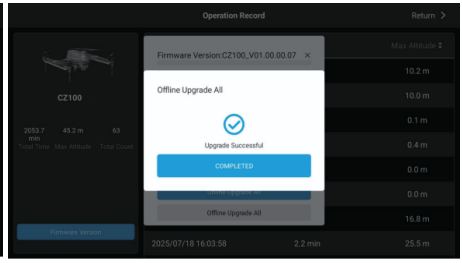


9.7 Device Information

- Operation Records: View details such as job date, duration, distance, and maximum altitude. Sorting and search functions are supported.

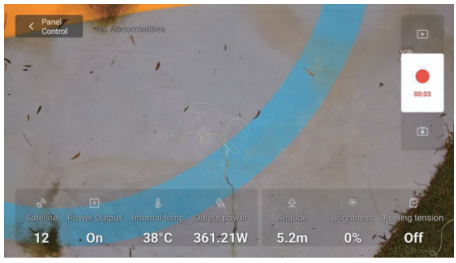
- Firmware Upgrade: Users can download firmware updates via the system or select local firmware files to upgrade. After clicking upgrade, a progress popup will appear. Firmware cannot be upgraded during operation (see Section 7 of this manual).

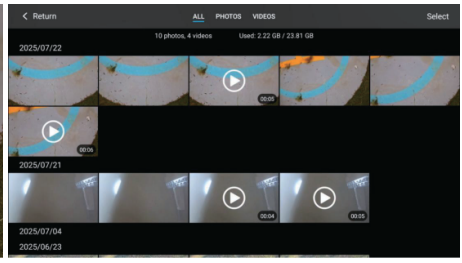




9.8 Video Viewing

- Camera Operation: Switch between photo and video modes, trigger photo capture, or start/stop recording.
- Media: View, edit, and delete photos and videos captured by the airborne unit.





9.9 Auto Return

Please read this section carefully to fully understand the airborne unit' s behavior during auto return mode.

- The airborne unit supports an auto return feature, which can be triggered mainly in two ways: manually by the user or automatically when the airborne unit' s battery is critically low.
- Auto return supports precise landing on a czi QR code landing pad (when conditions are met). If the QR code landing pad is not deployed, the airborne unit will rely on its recorded return point for landing.
- If the airborne unit successfully records the return point during pre-flight checks and GPS signals are strong, it will automatically return to this point and land when auto return is triggered.
  (Return point: When satellite positioning is stable, the airborne unit records its takeoff location as the return point during pre-flight checks. The app will give a voice prompt confirming the return point has been recorded.)

Standard Auto Return Procedure:

9.9.1 Auto return is triggered.

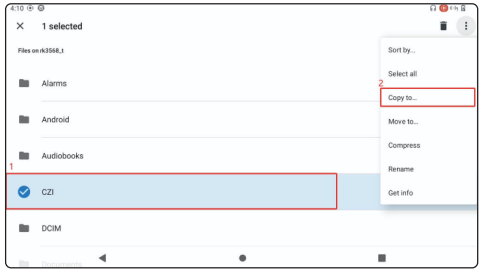
9.9.2 The airborne unit maintains its current altitude and moves horizontally to hover directly above the return point.
(If a czi QR code landing pad is correctly placed, the airborne unit will move directly above it.)

9.9.3 The airborne unit then slowly descends and lands on the ground.

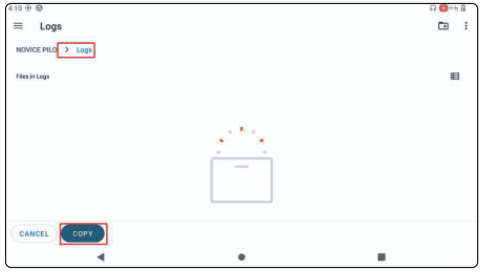
9.10 Log Export Method

- To export operation logs: insert a USB drive, open the file manager, and select the device name to access the internal storage path. The USB drive path will appear as ESD-USB (note that different USB drives may have different names).

- Simply copy all files from the internal storage directory CZI/LOG to the USB drive. Press and hold to select the files you want to copy (folders or compressed files are both supported), then tap “Copy to...” in the top right corner.



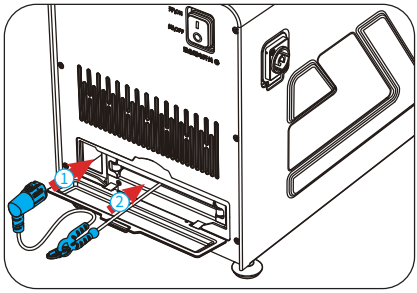
- Select the USB drive folder and tap “Copy” to complete the transfer.



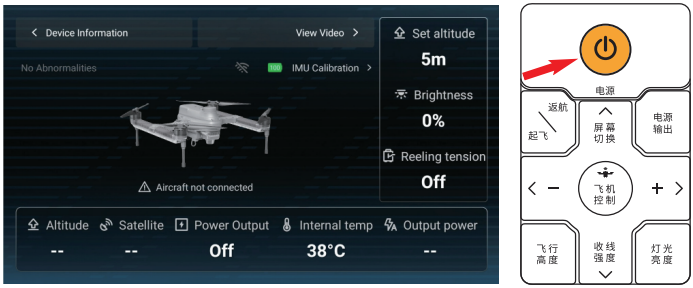
10. Post-Use Disassembly and Storage

Disassembly of the CZ100 Ground Station: (Before disassembling the ground station, make sure the high voltage is turned off.)

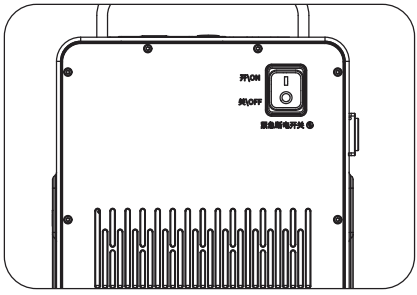
10.1 Remove the Aviation Plug: Unfasten the hook, disconnect the aviation plug from the airborne unit, and retract the tether cable using the ground station. Retract the plug in the direction indicated by Arrow ① and the hook in the direction of Arrow ②. Then, close the wire cover.



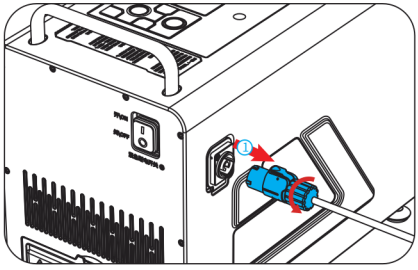
10.2 Power Off the Ground Station: Press and hold the "Power" button to turn off the device.



10.3 Emergency Power-Off Switch: Turn off the ground station by flipping the switch to the “O” position.

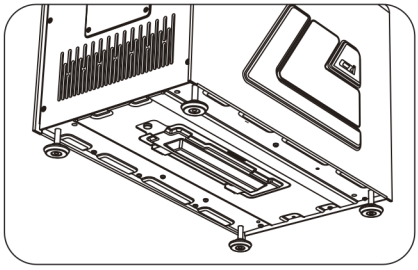


10.4 Disconnecting Ground Station Power: Slide the power cord button in the direction indicated by Arrow ①, then rotate it counterclockwise to unplug the power connector from the socket. Retract the power cord and close the power cover.



10.5 Disconnecting 220V Power: Unplug the power plug from the mains (or generator) socket.

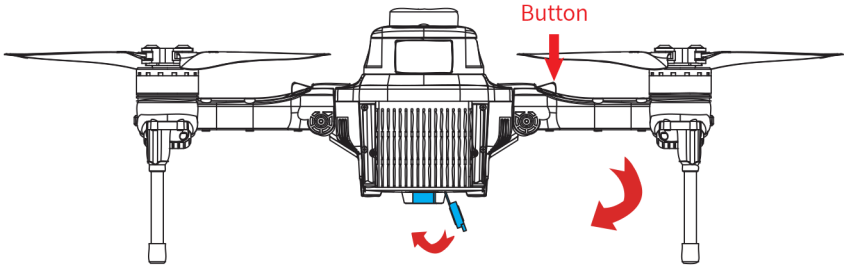
10.6 Retracting the Grounding Pin: Pull out the grounding pin, store it in the bottom compartment, and close the grounding cover.



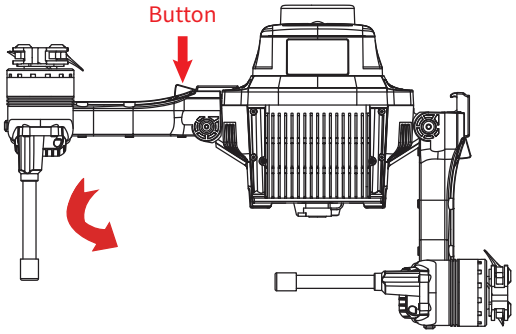
10.7 Storage: Place the ground station into the backpack for storage.

CZ100-Airborne Unit Storage:
Align the rear heat sink of the airborne unit toward yourself. Be careful not to pinch your fingers when folding the arms.

10.8 Close the aviation plug protective cover (small arrow). Press the right arm folding unlock button, then fold the right arm 90° clockwise (large arrow).

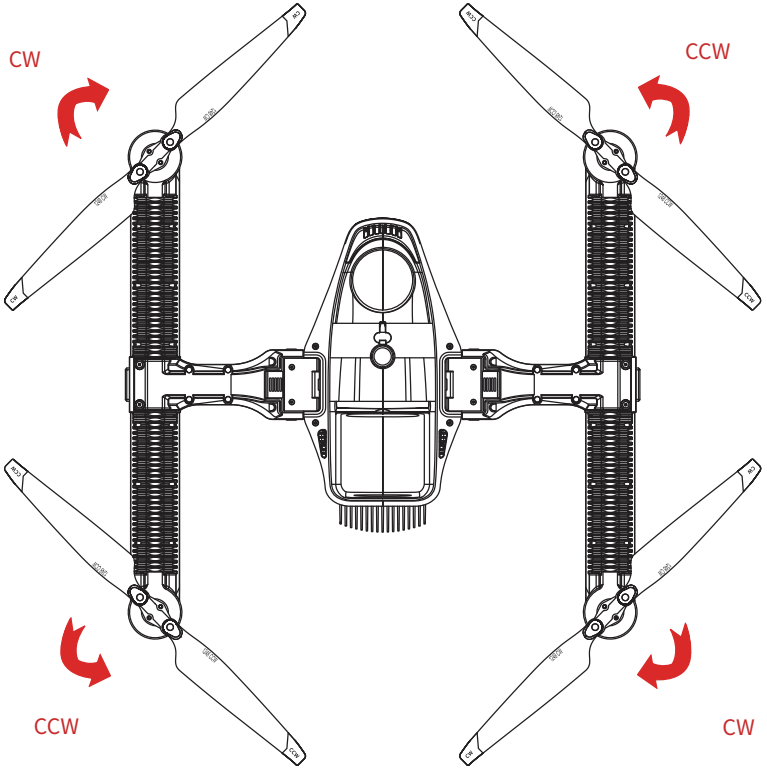


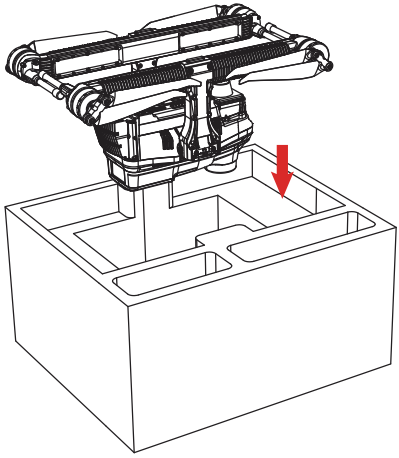
10.9 Press the left arm unlock button, then fold the left arm 90° counterclockwise.



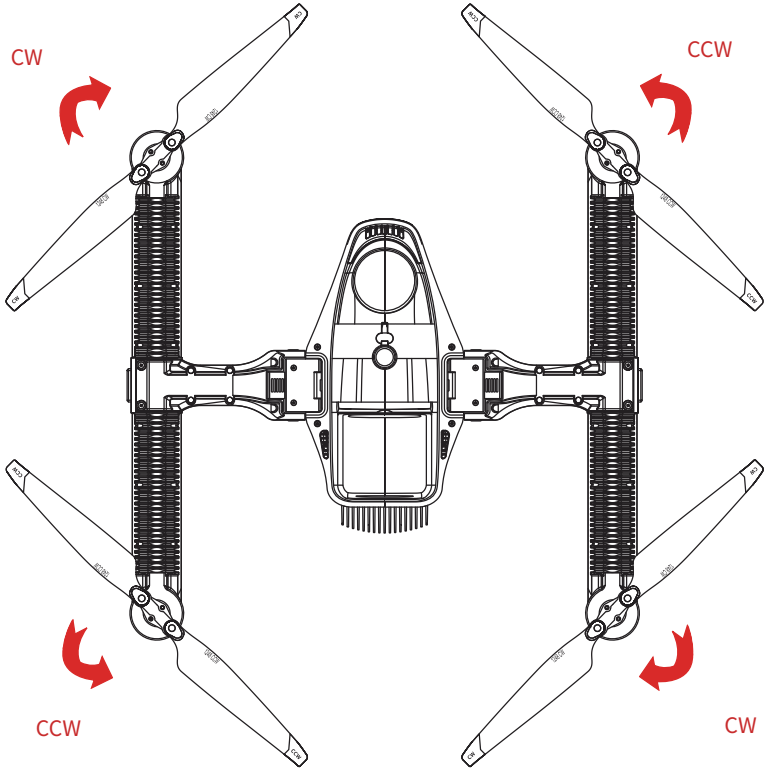
10.10 Install the propeller clip protector, rotate the aircraft 180°, and place it into the protective foam inside the backpack.

10.11 Storage: As shown in the figure, place the airborne unit into the foam in the direction of the arrows.



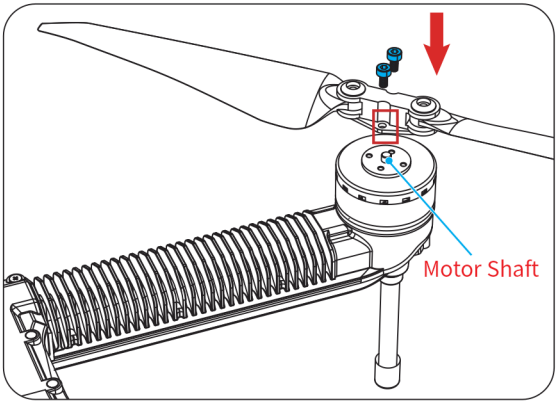


If the propeller of the airborne unit is damaged, please replace it as follows:



The drone is facing forward in the diagram

- There are two types of propellers: When the drone' s nose is facing forward, the front-left and rear-right positions use CW (clockwise) propellers, while the front-right and rear-left positions use CCW (counterclockwise) propellers..
- Propeller Installation: Align the center hole of the propeller clamp with the motor shaft, then insert and tighten two M3×6 socket head screws.



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