

Remote controller pairing

When the aircraft is powered on, the pairing ways are as follows:

1. Power on the remote controller and connect it to the App. On the flight interface of the App, click “Settings” - “Remote Controller Settings” - “Remote Controller Pairing” to enter the pairing interface;
2. Power on the aircraft and make sure that the original battery is installed. Press the aircraft’s power button (about 8 times) until the rear arm indicator light turns white, indicating that the aircraft has entered pairing mode.
3. At this point, click the pair button in the App again. When the App feeds back that the pairing is successful, the green indicator light on the aircraft will be continually lit. The remote controller status indicators will.

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- ⚠ • Turn green when pairing is completed.
 - During pairing, keep the distance between the aircraft and remote controller within 50 cm.
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Switching among remote controller flight modes

Use the flight mode switch button on the remote controller to switch the aircraft’s flight mode by pushing the switch to A mode (attitude), S mode (sport), or P mode (standard).

1.A mode (attitude)

The forward / backward obstacle sensing system, GPS positioning and downward visual positioning system are disabled; when the aircraft is not under navigation control, it will drift in a horizontal direction if the control stick is not pushed. Use of the control stick is required for real-time control.

2.S mode (sport)

The F mode is the enhanced mode under the P mode. The aircraft performance is enhanced, and the GPS and the downward vision positioning system is functioning. The aircraft’s control sensitivity value is prompted, and the flight response is quick. Please fly with caution. In this mode, the obstacle avoidance system is disabled, and the aircraft is unable to avoid obstacles automatically.

3.P mode (standard)

If the GNSS signal is strong, the aircraft will be positioned through GNSS; if the GNSS signal is weak and the light conditions meet the needs of the intelligent visual positioning system, the intelligent visual positioning system will be used. If both the GNSS signal and visual assistance positioning fail, the aircraft will automatically switch to A mode to be controlled by a professional pilot.

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- ⚠ • A mode (attitude) is a professional mode. Please do not switch to this mode unless the conditions demand it.
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Remote controller function button

Channel	Definition
Power button	Press once to turn on / off the remote controller display screen. When the remote controller is powered off, press and hold the power button for 6 s to power it on; when the remote controller is powered on, press and hold the power button for 6 s and click the "Off" button displayed on the remote controller screen to power it off; when the remote controller is powered on, press and hold the power button for 8 s for forced shutdown.
Return button / system function button	Click to return to the previous interface, and double click to return to the system's homepage. For combination buttons using the return button and other buttons, refer to the "Remote Control Button Function" section for details.
Confirm button	Click to confirm the current operation.
5D button	Up, down, left, right and re-center.
Intelligent return button	Press and hold to start intelligent return, and press once to cancel intelligent return.
E-stop button	Press once and the aircraft will carry out emergency braking and hover in place (when the GNSS or vision system is in effect).
Control stick	Switch flight modes in GDU Flight II.
Left dial wheel	Toggle to adjust the gimbal camera's pitch angle.
Right dial wheel	Toggle to adjust the gimbal camera's EV value.
Photograph button	Press to take photos.
Video button	Start or stop recording.
Flight mode switch	Switch flight modes. Includes A mode (Attitude), P mode (Standard) and S mode (Sport), which can be customized in the App.
C1	Customizable function button
C2	Customizable function button
L1	Customizable function button
L2	Customizable function button
R1	Customizable function button
R2	Customizable function button

Customizable function buttons

The controls corresponding to the customizable buttons C1, C2, L1, L2, R1, and R2 of the remote controller can be set in the GDU Flight II App interface.

Remote controller combination buttons

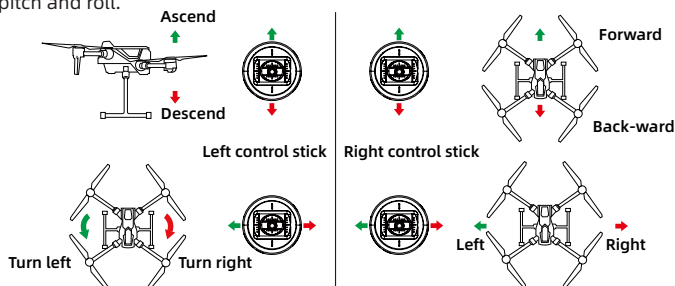
The default combination buttons on the remote controller cannot be modified. The table below lists all default combination buttons and their corresponding functions. During use, press the return button and operate another button synchronously to activate the functions in the list.

Combination buttons	Function
Press and hold the return button + left dial wheel	Adjust screen brightness
Press and hold the return button + right dial wheel	Volume adjustment
Press and hold the return button + video button	Video recording
Press and hold the return button + photograph button	Screenshot
Press and hold the return button + 5D button	Toggle the dial wheel upwards to enter the home page; downwards to enter the shortcut menu; to the left to enter multiple task management; and to the right to enter the App center.

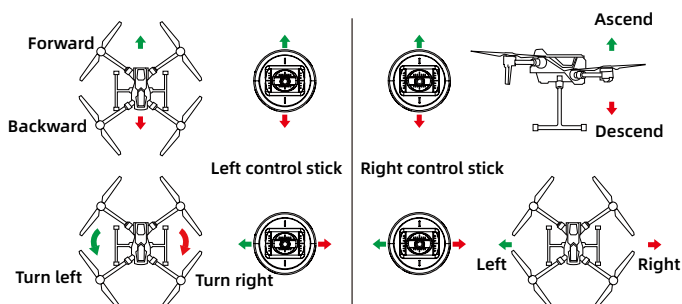
Control of the aircraft

The remote controller supports three operation modes: American mode, Japanese mode, and Chinese mode. The control stick definitions in the three operation modes are as follows:

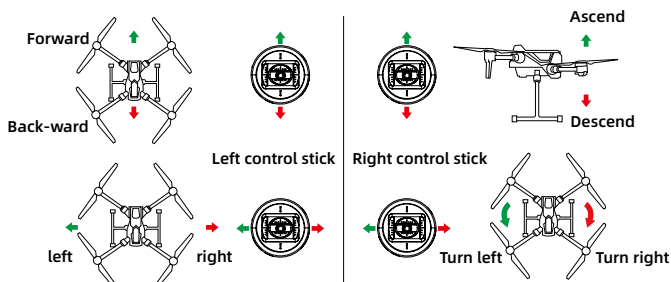
1. American mode: The left-hand stick controls the throttle and yaw, while the right-hand stick controls pitch and roll.



2. Japanese mode: The left-hand stick controls pitch and yaw, while the right-hand stick controls the throttle and roll.



3. Chinese mode: The left-hand stick controls pitch and roll, while the right-hand stick controls the throttle and yaw.

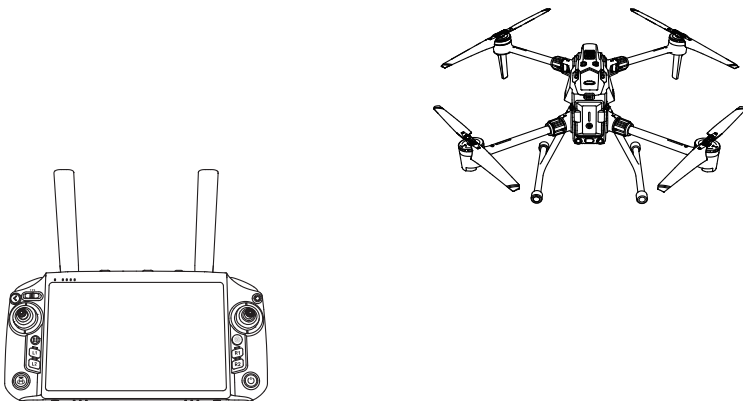


The default operation mode of the remote controller upon leaving the factory is American mode. You can enter the "Control Settings" interface in the GDU Flight II App or the remote controller debugging software to change the remote controller's operation mode.

Communication range of the remote controller

When controlling the aircraft, the orientation and distance between the remote controller and the aircraft should be adjusted in time to ensure that the aircraft always remains in optimal communication range.

To obtain optimal communication range, the recommended corresponding position of the remote controller and the aircraft is shown in the figure; in addition, continuously face the antenna directly toward the aircraft to ensure optimal signal quality status between the remote controller and the aircraft.

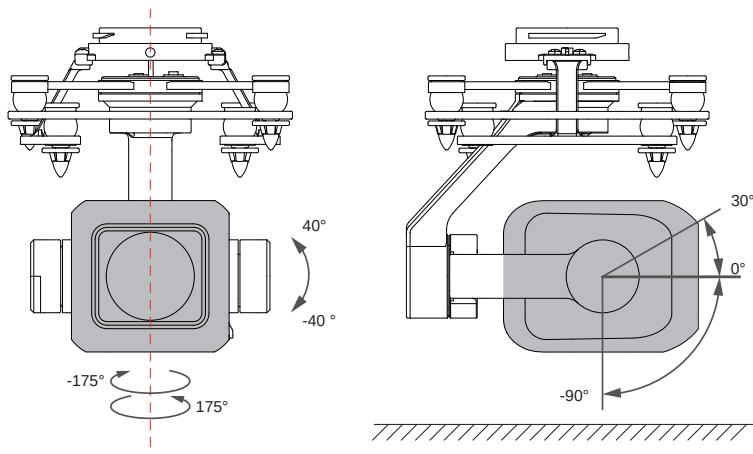


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- ⚠ • Do not use another communication device in the same frequency band, this may interfere with the remote controller's signal.
 - During actual operation, the GDU Flight II App will issue a prompt when the video transmission signal is weak. Please adjust the antenna position based on the prompt to ensure that the aircraft is in the optimal communication range.
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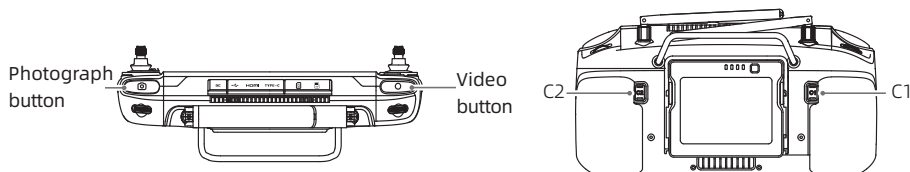
Control of the gimbal camera

The user can remotely operate the gimbal and camera in real time through the photograph button, video button and dial wheel on the remote controller to execute the various functions.

The left dial wheel of the remote controller controls the pitch angle of the gimbal, and the right dial wheel adjusts the EV of the camera (left “-” and right “+”).



The photograph button, video button and recentering button at the bottom are all one-click operation buttons; C1 and C2 buttons can be customized in the GDU Flight II App according to your requirements.



⚠ • The gimbal camera models shown in the figure are for illustration purposes only. The mounted gimbal camera configuration will vary based on the actual products used.

IP rating

1. The product can reach the IP54 rating stated in the IEC 60529 standards when tested under controlled lab conditions. The IP rating is not permanent and may be degraded due to wear and tear caused by long-term use.
 - a. Do not use the product under conditions of rainfall greater than 50 mm / 24 h.
 - b. Do not open any protective cover in the rain, such as the external interface cover, remote control rear cover, network card cover, air exhaust vent or air exhaust vent protective covers. Do not disassemble or assemble the control stick or antenna in the rain. Please move the remote controller to an indoor environment or shelter. Wipe the rain from the remote controller body before opening / closing each cover and assembling / disassembling the antenna.
 - c. When using the product in the rain, make sure that the external interface cover, remote control rear cover, network card cover, air exhaust vent and air exhaust vent protective covers are closed and snapped tightly, and that the control stick is tightened in place.

- d. When using the external interface, it is normal for there to be water stains around the interface after opening the cover. Wipe the water stains away before using the external interface normally.
 - e. Damage caused by liquid influx is not covered by the warranty.
2. The IP54 protection rating is not available in the following statuses:
 - a. The cover of the external interface is not snapped properly;
 - b. The remote controller rear cover is not snapped properly;
 - c. The air exhaust vent and air exhaust vent protective covers are not snapped properly;
 - d. The network card cover is not snapped properly;
 - e. The control stick is not tightened properly;
 - f. The antenna is not tightened properly;
 - g. The aircraft has other possible damages, such as a cracked shell, waterproof glue failure, etc.

Description of the remote controller display screen

Homepage

Turn on the remote controller to enter the home page.



1. **GDU Flight II App entry**
Click "Start" to enter the GDU Flight II App. Click to log in with the GDU account to directly enter the GDU Flight II App homepage.
2. **Album**
Click to enter the album and check the photos and videos stored in the settings.
3. **App information**
Click to check all Apps in the remote controller.

Shortcut panel interface

Swipe downward from the top of the screen on any interface to enter the shortcut panel.



- 1. Time / date**
Current time / date on remote controller.
- 2. Screen brightness adjustment**
Drag the slider to adjust screen brightness.
- 3. Volume adjustment**
Drag the slider to adjust voice volume.
- 4. Shortcut**
Wi-Fi: Click to turn on / off Wi-Fi network. Press and hold to select or set the Wi-Fi network.
Bluetooth: Click to turn on / off Bluetooth connection. Press and hold to set Bluetooth connection.
Screenshot: Click to start video recording. During video recording, the remote controller interface will display the recording time. Click "⏏" to end video recording.
Screenshot: Click once to return to the current interface to take a screenshot.
Mobile data: Click to turn on / off mobile data connection. Press and hold to check traffic usage.
USB: Click to turn on / off USB connection. Connect the remote controller to a computer for data import / export.
- 5. Homepage**
Click to return to the remote controller's homepage interface.
- 6. Recent tasks**
Click to check recent tasks.
- 7. Settings**
Click to enter system settings.

GDU Flight II App

This section describes the interfaces and functions of the GDU Flight II App.

GDU Flight II App

The GDU Flight II App is a software application which integrates a variety of professional functions to make manual flight simple and efficient. During a mission flight, the flight routes can be set through the flight planning function to control the autonomous operation of the UAV, thus simplifying the work process and improving work efficiency.

⚠ • This App is only suitable for mobile devices using Android 7.0 or above.

Homepage

Turn on the remote controller and connect to the App to enter the home page.



- 1. Return to main interface**
Click to return to main interface.
- 2. Status bar**
Displays the connection status between the aircraft and payload, and payload model. During first use, activate the UAV first.
- 3. Health management**
Click to check IMU, GPS, barometer, magnetometer, vision system, gimbal system, aircraft storage and battery system, UAV connection display, firmware version, log management, abnormal records and other statuses.
- 4. UAV status inspection**
Click to check UAV status. For details, refer to "UAV status inspection".
- 5. Album**
Click to check the photos and videos taken during the flight mission.
- 6. Manual flight function entry**
- 7. Mission flight function entry**
- 8. Settings**
Click to check the flight records, find your plane, about us, offline map, settings, etc.

- ⚠ • The App interface and function will be updated continuously. Please refer to the latest version.
- The main interface shown varies slightly depending on the payloads.
 - Turn on the aircraft. When the App displays that the aircraft has been connected, upgrade the firmware as prompted. During one-button upgrade, ensure that the mobile device has been connected to the Internet.

UAV status inspection

Before entering the flight interface, the system will check and confirm the aircraft status and important settings to ensure flight safety.



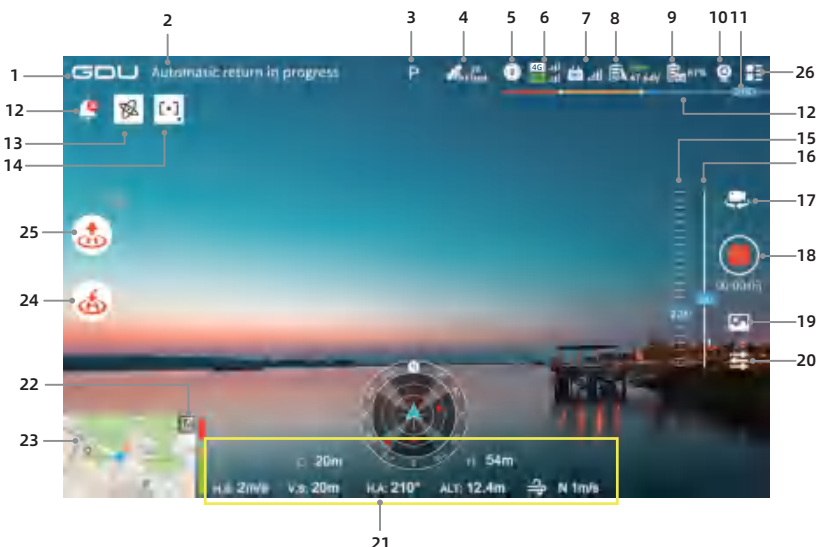
1. Aircraft system inspection: before takeoff, conduct a self-check for the aircraft system, including IMU, GPS, barometer, magnetometer, visual system, gimbal system, aircraft storage and battery system.
2. Alarm prompts.
3. Aircraft status display.
4. Flight return altitude, HOME point, low battery alert, vision sensing, 4-direction obstacle avoidance, upward obstacle avoidance and other quick settings.

Manual flight

Camera interface description

Click "Manual Flight" to enter the flight interface.

The text below uses the 8K gimbal camera as an example for illustration. The interface display may vary in the actual operation depending on the mounted gimbal camera.



1. **Return to main interface**
Click to return to the main interface of the App.
2. **Flight status alert**
Display the aircraft connection status and various warning messages. Click to enter the flight inspection interface.
3. **Flight mode**
Ⓟ Display the aircraft's current flight mode.
4. **GNSS status**
✈️ Display the GNSS status. After the RTK is connected, display the RTK's status information. The signals from strong to weak include Fixed, Float, 3D, and 2D.
5. **Working status of obstacle avoidance system**
Ⓜ️ Display whether the current obstacle avoidance system works or not.
When the obstacle avoidance system works, green is displayed; and otherwise, white is displayed. When all status are displayed green, it indicates that the obstacle avoidance system works; and when all status are displayed white, it indicates that the obstacle avoidance system does not work now. Please fly with caution.
6. **Aircraft video transmission**
5G HD Display the strength of aircraft signals. GNSS is in use when the icon is green, and not in use when the icon is white.
7. **Remote controller video transmission**
4G HD Display the strength of remote controller signals.

8. **UAV battery level**
 Display the UAV's remaining battery level and voltage.
9. **Remote controller battery level**
 Display the remote controller's remaining battery level.
10. **Livestream switch**
 Transmit the gimbal view to the backend platform in a real-time manner.
11. **Intelligent battery level icon**
 The remaining battery level and flight time of the current aircraft intelligent battery are displayed in real time. Different colors on the battery level progress bar indicate different battery level statuses. When the battery level is lower than the alert threshold, the battery icon becomes red to remind the user to land the aircraft and replace the battery as soon as possible.
12. **Message box**
 Click to read all error information.
13. **Object tracking**
 Click to enable object tracking and intelligent tracking to automatically identify the vehicles and personnel in the screen. After all objects are identified, the aiming icon will be marked and the icon will be refreshed in real time as the object moves. When the user clicks to confirm an object, the screen will lock and track the selected object, and place it right in the center of the screen. The gimbal orientation and focal length will be automatically adjusted to ensure the clarity of the object. If there is no object on the screen that can be automatically identified, objects can be manually selected and tracked.
14. **Accompanying flight / encircling**
Click to set accompanying flight / encircling functions.
15. **Variable power adjustment of variable power camera**
Click to adjust the variable power of the variable power camera.
16. **Gimbal angle**
 Display the current gimbal pitch angle.
17. **Photo / video switch button**
Photo / video  Click to switch between photo / video.
18. **Photograph / video button**
 Click to trigger photo taking or to start / stop video recording. Press the photograph / video button on the remote controller to take photos / record videos.
19. **Media preview**
 Click to quickly preview the photos / videos taken by the camera (non-camera's original photos / videos).
20. **Camera settings**
 Click the button to set camera parameters and control the gimbal.
21. **Flight data**

D: Distance; H: relative altitude; H.S: Horizontal speed; V.S: Vertical speed; H.A: Aircraft course angle; ALT: Altitude;
Wind direction / speed display; (for example: E4.0m/s: East wind, wind speed 4.0m/s)
22. **Map / attitude indicator switch**
 Click to switch the picture-in-picture window to map / attitude indicator.
23. **Real-time map**
The area displays the real-time position of the UAV and the user on the map. Click to switch to the map page.

24. One-button return

 Click to automatically return and land the UAV.

25. One-button takeoff / vertical landing

 /  Before takeoff, display the one-button takeoff button; and after takeoff, display the vertical landing button.

26. Settings

Click  to enter the Settings menu where you can set various module parameters.

Flight settings: Includes altitude limit switch, altitude limit, distance limit switch, return altitude, return speed and lost communication. It is permitted to switch the flight mode, advanced settings, sensor status, etc.

Intelligent batteries: Includes battery voltage difference, temperature, voltage, current, battery level and number of cycles, as well as setting the low battery alert value and emergency low battery alert value.

Video transmission settings: Includes video transmission mode, current server address, HDMI view screen output, channel mode, modulation bandwidth and noise.

RTK settings: Includes service type and corresponding parameter settings and status display, and RTK single-point assistance.

Remote controller settings: Includes control stick mode, remote controller customizable button, remote controller pairing and advanced networking mode.

Sensor settings: Includes vision sensing, obstacle avoidance strategy and corresponding parameter setting and status display, display radar chart, auxiliary light, enabling of landing protection, obstacle avoidance switch during return and upper TOF switch.

Gimbal settings: Includes video size, photo resolution, gimbal mode, gimbal drift calibration, storage capacity and gimbal rotation speed.

Slow starting / stopping of pitch and slow starting / stopping of yaw.

General settings: Includes display grids, sound prompts, attitude prompts, parameter units, video livestream, ADS-B switch, ESC beep, aircraft information and mounting payload.

Map interface description

Click to switch the map thumbnail to the map interface.



- 27. Map style switching
Click to change the map display style between normal map and satellite map.
 - 28. Orientation lock
Click to lock the mobile device map orientation. After locking, the orientation on the map is always facing north.
 - 29. Toolbox
Click to use ranging / side area function.
 - 30. Positioning
Click to see the current position of the aircraft.
 - 31. Camera interface switching
Click to switch to the camera interface.
 - 32. Point marking and positioning
Click to mark a point on the map center.
b) Point marking on the map interface: Click to mark a point on the map center. After selection, the interface will display the point position name and number, aircraft altitude (namely, the aircraft altitude while recording the point), relative altitude, altitude, and latitude and longitude. The selected point can be edited as follows:
1. Set the point as HOME point. 2. Edit the point position, including its name, latitude and longitude, altitude, and marked color. 3. The point can be deleted.
After entering the editing status, the point position can be changed by dragging it on the map
- The App interface language must be the same as the mobile device's system language. To change the interface language, please change the mobile device's system language first.

The interface shown varies slightly depending on the payloads.

The App interface and function will be updated continuously. Please refer to the latest version.

Advanced networking mode

Introduction

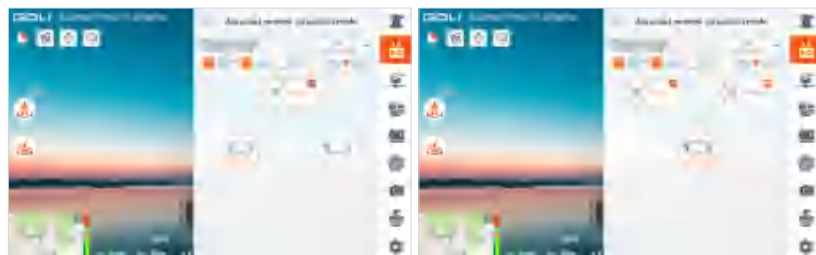
The S400E supports an advanced networking mode which is suitable for controlling one aircraft using multiple remote control terminals and controlling several aircraft with one remote control terminal. Based on the equal weight design principle (in other words, the roles of multiple remote controllers are not distinguished), after pairing is finished, all remote controllers can establish flight control over the UAV. During operation, the pilot can assign flight control over the aircraft and view display control as required to allow the user to be more focused and efficient during operation. There are two types of control operation parameters: Flight control and view display control. When a remote controller has the flight control assigned to it, it can control the flight; when the remote controller has the view display control assigned to it, it can display the real-time view of the current aircraft.

Setting of the advanced networking mode

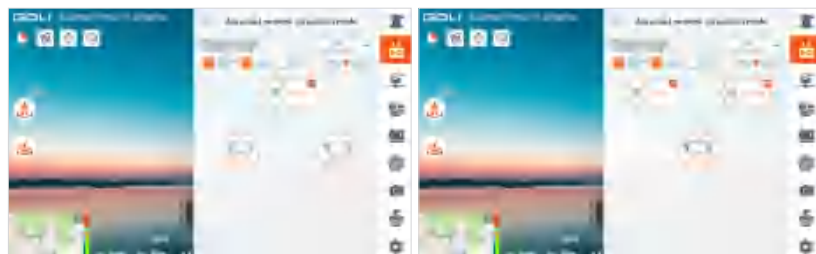
Before using the advanced networking mode, it is necessary to set the pairing of the remote controller and UAV respectively. Refer to the steps below:

Build a network in networking mode:

1. Select one set of one-to-one-paired aircraft and remote controller (if the aircraft is not paired with the remote controller, please pair it based on the one-to-one pairing mode);
2. Run the GDU Flight II App and click “” to enter the “Settings” interface and “Remote Controller Settings” interface;
3. Enter the Level 2 page in Advanced Networking mode. In the “Networking Mode” drop-down list, select the required Networking Mode (default: 1-to-1 mode);
4. After switching the Networking Mode interface, an empty gray node icon will appear on the App networking interface. Operate other nodes (remote controller or aircraft) to be added to the network; enter the pairing status and click the empty node on the App networking interface; a prompt stating “Paired sent successfully” will appear on the App networking interface;



5. When the network receives the addition of an empty node, the original remote controller will be temporarily disconnected. When the empty node is added, check the topology icon of the Advanced Networking mode interface in the App. If it is green, this indicates that the network connection was successful and the device is online.



Advanced networking description

1. Ensure that the first remote controller has been paired and connected to the aircraft. By default, the remote controller connected first has the control right over all devices (flight control right, view display control right), and the remote controller connected later can be repaired after the remote controller connected first assigns an unpaired node position.
2. When the remote controller has authorization to control devices (aircraft, gimbal camera, view display), it can control the device using the control stick, dial, shortcut key, UI icon, and other functions. The usage method is the same as using the remote controller alone.
3. The user can click to select the aircraft to be controlled and obtain the flight control permissions and view display control right over this aircraft. They can press and hold the aircraft to be controlled to only obtain the flight control right. Only a remote controller with flight control right can enable the function to return or cancel the return.
4. By default, the Advanced Network icon on the Flight Control interface is in the Networking Mode (namely, one remote controller controls one aircraft). In addition, this icon is not displayed. This icon is displayed in the non-default Networking mode to obtain the number of specified aircraft in the current Networking mode (including online, offline, and unpaired statuses).
5. In multi-control operation scenarios, when one remote controller loses communication with the aircraft, a message notification will be triggered. The user can manually select whether to take over the flight control rights. When the online remote controller opts not to take over the flight control rights, the aircraft will execute the lost communication solution. When the online remote controller fails to make a decision within specified time, the aircraft will also execute the lost communication solution.
6. During flight operation, when a remote controller that has lost communication is connected to the aircraft again, it is defaulted to have control over all devices.
7. All remote controllers can set the operation of devices related to flight, including flight control software, sensing system, battery, and video transmission settings provided that the flight control permission has been granted.
8. When no operation mission is being executed, the node can be removed by pressing and holding the paired node on the "Networking Mode Settings" page. After the node is removed, the node position will be adjusted to be unpaired, and the device's networking status will be reset. To pair the device again, a paired remote controller is required to specify an unpaired node position and connect the node to the network again after pairing.
9. When no operation mission is being executed, the networking mode can be set on the "Networking Mode Settings" page. When the number of devices in setting mode decreases, and this type of node has been connected to all corresponding device, it is required to manually remove excessive node devices to finish the mode switch; when the number of devices in setting mode increases, the total number of devices is restricted to 2-3, including the aircraft and remote controller.
10. The node type, node number, and node sequence in the Networking Mode cannot be changed.
11. When all nodes in the Networking Mode are paired, the device cannot be connected before specifying an unpaired node; however, the remote controller in the first node can be replaced for connecting through the default remote controller pairing mode. This is Applicable to initial pairing, a lost remote controller, and other scenarios.

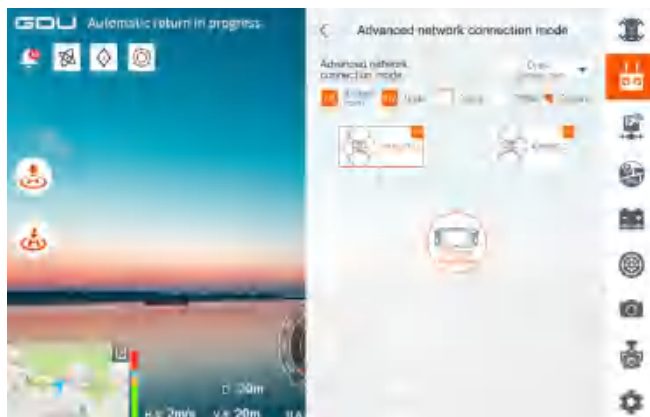
Description of video transmission

The S400E aircraft adopts the professional video transmission technology developed by GDU that supports dual-channel 1080p video transmission and the operation of a single remote controller or multiple remote controllers

 • The video transmission resolution is limited by the output capacity of different payloads. Please refer to the actual display.

Advanced network connection function

Operation interface description:



By default, there is no control right, and only the images can be viewed.



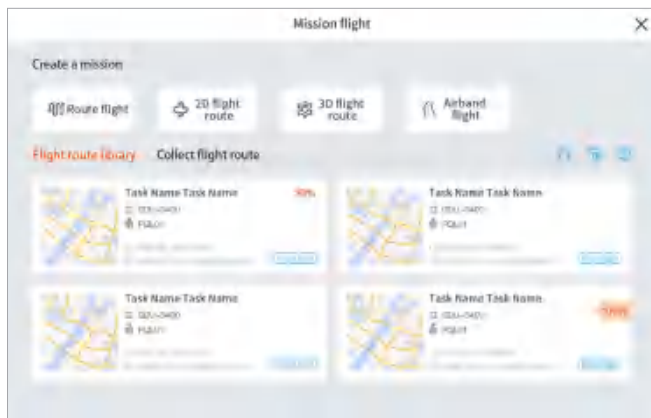
Double click to gain/cancel the control right (with a small green remote controller icon appeared) so as to control the selected aircraft. By default, there is no control right, and only the images can be viewed.



Press and hold to lock/unlock the control right (with a small golden lock appeared), so as to lock the control right. Then, the remaining remote controllers cannot be obtained.

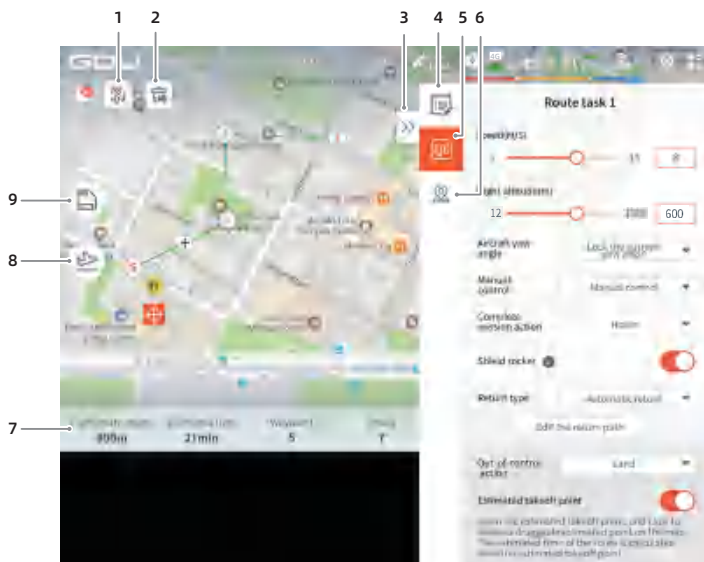
Mission flight

On the home page of the APP, entering the route mission list by clicking Mission Flight, you can view the created missions, or create new route flight, 2D flight, 3D flight and waypoint flight missions. All four route missions can be directly planned and generated through the APP. The mission flight function is illustrated by taking the route flight mission as an example.



Waypoint flight

Click waypoint flight to select the track mission in the mission list so as to execute the track mission; or create a new flight route mission.



Click the map to add waypoints, then set the flight route and waypoints.

1. **Clear flight route**
 : Click to clear the added flight route.
2. **Delete waypoints**
 : Click to delete the currently selected waypoint.
3. **Expanding / closing**
 : Click to expand / close the taskbar.
4. **Edit mission**
 Click to edit the flight route name (the aircraft is displayed as GDU-S400E) and set the payload selection and altitude mode.
5. **Flight route editing**
 Edit the entire flight route including speed, altitude, aircraft's course angle, gimbal control, completed mission action, shielding control stick, return type, out-of-control action and estimated takeoff point.
6. **Waypoint editing**
 Select the waypoint to be edited, and set a single waypoint. Waypoint settings include speed, relative takeoff point altitude, aircraft course, waypoint type, gimbal pitch angle, waypoint action and longitude / latitude.
7. **Flight route information**
 Displays the flight route length, estimated time, number of waypoints and number of estimated photos.
8. **Flight**
 Click to access the UAV status inspection list in App and check the parameters and flight status. Click "Start flight" to execute the current flight route mission.
9. **Mission saving**
 : Click to save the current parameters and create a flight route.

Aircraft point position collection

Click "Flight Route Flight" - "Aircraft Point Collection" to enter waypoint editing.

When the aircraft's takeoff altitude is above 10 m, click the Point Collection icon to record the aircraft's current latitude, longitude, and altitude as the waypoint. The App will calculate the flight route length and estimated flight time based on the number of waypoints.

Enter mission flight and select a flight route to import in the top right corner.

1. Generate files in XML, KML or KMZ format through the platform, and import the files into the mobile device file folder.
2. Select the required file and import it into the mission list to enter offline waypoint editing.

-  • When the user selects to respond to lost communication, please enter Flight Settings to set lost communication.
- When the user selects not to respond to the lost communication settings, if the aircraft and the remote controller cannot communicate normally, the flight track mission can continue.
 - Complete the execution.
 - During the aircraft point collection, the aircraft altitude is above 10 m.
 - When the aircraft is in "A" mode, it is unable to automatically return or land; if the aircraft enters "A" mode during auto return or auto landing, it will automatically exit auto return or auto landing.

Flight

This chapter introduces flight precautions, flight restricted areas and aircraft precautions

Flight

Before a normal flight, please ask the professionals to conduct flight training and guidance training. During flight, please choose an appropriate flight environment to ensure the flight safety. Before a flight, be sure to read the Disclaimer and Safety Guidelines to learn safety precautions.

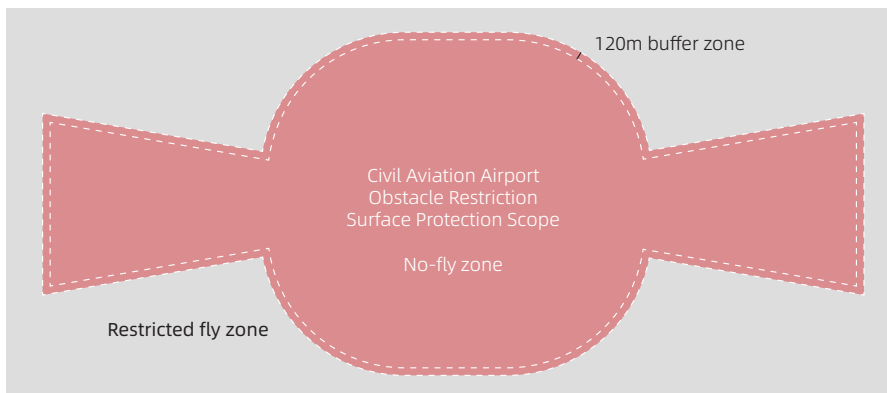
Flight restriction functions

No-fly zone

The no-fly zone is based on the 12 coordinate points of the restriction surface and tolerance buffer zone of civil airport obstacles published by the Civil Aviation Administration. The aircraft cannot take off in a no-fly zone. When approaching from an external area to the buffer zone at the no-fly zone boundary, the aircraft will automatically decelerate and hover.

When the aircraft enters a no-fly zone due to special reasons, the forced landing function will be triggered. At this point, the aircraft will be forced to land. During descending, the aircraft can move in the horizontal direction, but the control stick cannot be pushed upwards.

The altitude limit zone is a rectangle area of roughly 20km wide and 40km long by extending the midpoints at both ends of the runway outward for 20km, and extending for 10km along the two sides of the runway (the non-intersect part with the no-fly zone). In the altitude limit zone, the aircraft's flight altitude is restricted to 120m.



Flight environment requirements

1. No flight is allowed in severe weather conditions, such as heavy winds (with wind speed > 15 m/s). When flying in the rain, be sure to follow the IP rating requirements. Please read details of IP45 rating description.
2. Select an open area without tall buildings around as the flight site. Buildings with a large amount of reinforcing steel bars will affect the compass usage, and block GNSS signals, resulting in a poor effect or even failure of aircraft positioning. Please fly as prompted in the App.
3. During flight, please use the aircraft only within your own visual range, and avoid any obstacles, people, water, etc.
4. DO NOT use the product in close proximity to high-voltage cables when RTK mode is not enabled.
5. DO NOT use the product in proximity to communications base stations or towers, as they are prone to interfere with communication signals.
6. In high altitude areas, environmental factors may result in aircraft battery and propulsion system performance impairment, thus affecting the flight performance. Please fly with caution.
7. In the antarctic circle and arctic circle, the aircraft cannot fly in P mode. Please fly with caution.

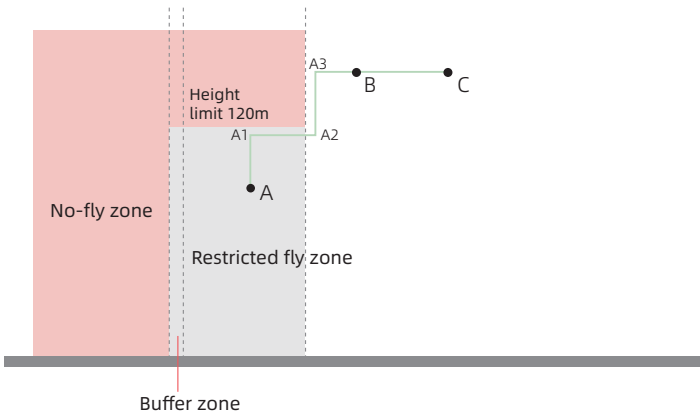
Buffer zone

The buffer zone is the zone by extending the no-fly zone outwards by 120m.

1. When the aircraft approaches to the buffer zone, the App starts to prompt the user that the aircraft is approaching the no-fly zone. Please note the flight direction.
2. When the aircraft enters the buffer zone, the same will start automatic braking until hovering. Within the buffer zone, pushing the control stick towards the no-fly zone direction will not work. However, the control stick can be pushed in other directions within the altitude limit range.

Mission flight

1. When the mission flight route is within the no-fly zone, the aircraft cannot take off and cannot execute the mission.
2. In the restricted zone, when the point height of the flight route mission does not exceed the 120m altitude limit, the mission can be executed normally; and when the set altitude is higher than the 120 m altitude limit, the aircraft will hover at 120m.
3. When the waypoint A in the flight route is within the restricted zone, and waypoint B is outside the restricted zone and above the altitude limit, the aircraft will first fly to the altitude limit A1 and move horizontally out of the restricted zone to A2 position. Then, it will adjust the altitude to B point altitude and reach the A3 position to execute the mission. As shown in the figure below:



Pre-flight check

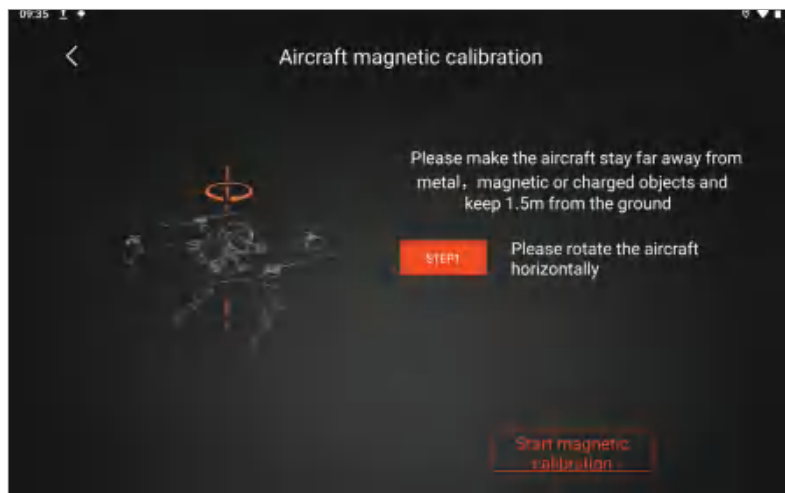
- Carefully check whether all parts of the aircraft are in good condition. If there are any cracks or damage, please stop flying.
- Check whether the battery, remote controller, and mobile device have sufficient battery level.
- Ensure that the arms as well as the landing gear are unfolded and make sure the propellers are installed firmly.
- Ensure that the remote controller is properly connected to the aircraft.
- Check whether all firmware versions are the latest and whether the app is properly connected to the remote controller.
- Ensure that "Normal flight" is displayed on the app camera interface.
- Check whether the motor and gimbal are functioning after the aircraft is powered on.

Compass Calibration

If you are using the aircraft for the first time or if the flight area changes significantly, please calibrate the sensor.

Calibration method: When the green light is solid on, open the App, enter "Flight Settings" - "Sensor Status" - "Compass", enter the interface and click "Calibrate" to enter calibration mode. The aircraft indicator light is yellow and solid on.

- 1) Rotate the aircraft clockwise in the horizontal direction, the App prompts "horizontal calibration successful", the indicator light flashes white, vertical calibration can be performed.
- 2) Rotate the aircraft clockwise in the vertical direction, and wait for the app to prompt "vertical calibration successful", the indicator light is green and solid on, means calibration completed.



Takeoff/landing

Takeoff: Click “One-button take-off ”, in the app. The aircraft will take off and ascend to 1.5m for hovering; or push the control stick to the inner corner to unlock the aircraft   motor startup. Push the throttle stick upwards .

Landing: Press or click the “one-button return ” / “vertical landing ”; on the remote controller; Or, push the throttle stick downward until the aircraft lands , After maintaining this status for 2 seconds, the motor will stop. After flight, please power off the aircraft and remote controller in succession.

-
-  • Before takeoff, the user should face the tail and keep an appropriate safety distance from the place where the aircraft is located.
- Do not unlock and launch the aircraft from a slope that is at a substantial incline.
-

Appendix

Technical specifications

S400E technical indexes

Entire machine	
Dimension	Folded (including propellers): 347×367×424mm (L×W×H) Unfolded (including propellers): 950×995×424mm (L×W×H) Unfolded (excluding propellers): 549×592×424mm (L×W×H)
Maximum flight time	No load: 58min
Symmetrical motor diagonal distance	≤ 725mm
Weight	2.35kg Left and right (excluding batteries)
Maximum takeoff weight	7kg
Maximum payload	3kg (Under the maximum payload, the maximum safe flight speed is only 15m/s)
Noise	≤ 58dB@5m position
Propeller	1866 folded propellers
Flight control software performance index	
Hovering accuracy (GNSS)	Horizontal: ±1.5m (with GNSS positioning) Vertical: ±0.5m (with GNSS positioning)
Hovering accuracy (with vision positioning)	Horizontal: ±0.3m (with GNSS positioning) Vertical: ±0.3m (with GNSS positioning)
Hovering accuracy (RTK)	Horizontal: ±0.1m (with RTK positioning) Vertical: ±0.1m (with RTK positioning)
RTK position accuracy	When RTK is fixed: 1cm+1ppm (horizontal) 1.5cm+1ppm (vertical)
Maximum angular velocity	Pitch axis: 200°/s Yaw axis: 100°/s
Maximum pitch angle	30° (45° during emergent braking and startup)
Maximum ascent speed	S mode: 5 m/s P mode: 4 m/s
Maximum descent speed	S mode: 4 m/s P mode: 3 m/s
Maximum wind resistance	15 m/s (Level VII) The maximum wind resistance is 12m/s during taking off and landing.
Maximum flight speed	S mode: 23 m/s P mode: 15 m/s
GNSS satellite search time	Cold-startup satellite search time: ≤3.5 minutes Hot-startup satellite search time: ≤50 seconds
IP rating	IP45
Operating temperature	-20°C~55°C
Maximum takeoff altitude	5000m

Visual system	
Obstacle sensing range (Buildings, trees, telegraph poles, and pylons above 10 m)	Front: 0.7 m ~ 40 m (the maximum detection distance is 80 m for large-size metal objects) Left and right: 0.6 m ~30 m (For large-size metal objects, the maximum detection distance is 40 m) Up, down, and rear: 0.6 m ~ 25 m
Operating environment	Surfaces with clear patterns and adequate lighting (> 15 lux, normal lighting environment under fluorescent lamps indoor)
Compatible gimbal	
Gimbal types	PVL-8K gimbal camera, PDL-300 thermal & visible dual gimbal camera, PDL-1K dual-lens gimbal camera, PQL01 quad-sensor gimbal camera
Gimbal mechanical interface	Gimbal payload standard interface
Data interface	Second-generation extension interfaces
Video transmission	
Video transmission distance	15 km (maximum distance in a line-of-sight and unobstructed environment)
Remote controller	
General	
Display	7.02-inch touch LCD display with a resolution of 1920 × 1200 and a highest brightest of 1000 cb/m ²
Dimensions (folded antenna)	268x139x103 mm (LxWxH)
Weight	Approximately 1 kg (excluding the external battery) Approximate 1.25 kg (including external battery)
Internal battery	Li-ion: 7000mAh@7.2V
External battery	Li-ion: 7000mAh@7.2V
Maximum battery life	Built-in battery: 3 hours Internal battery + external battery: 6 hours
IP rating	IP54
Operating ambient temperature	-20°C~50°C
Professional Generation 2 video transmission	
Operating frequency	2.400-2.4835GHz; 5.725-5.850GHz;
Maximum signal effective distance (free of interference and obstacles)	15 km (FCC); 8 km (CE / SRRC / MIC)
Equivalent omnidirectional radiated power (EIRP)	2.4GHz; < 28dBm (FCC) ; < 20dBm (CE/SRRC/MIC) 5.8GHz; < 25dBm (FCC) ; < 14dBm (CE) ; < 23dBm (SRRC)

WiFi	
Protocol	802.11 / a / b / g / n / ac
Operating frequency	2.400-2.4835GHz; 5.725-5.850GHz;
Equivalent omnidirectional radiated power (EIRP)	2.4GHZ: <14dBm (FCC) ; <12dBm (CE/SRRC/MIC) 5.8GHZ: <12dBm (FCC/SRRC) ; <12dBm (CE)
Bluetooth	
Protocol	Bluetooth 4.2
Operating frequency	2.400-2.4835 GHz;
Equivalent omnidirectional radiated power (EIRP)	<8dBm
Video transmission distance	15 km (maximum distance in a line-of-sight and unobstructed environment)
Battery	
Internal battery capacity	7000 mAh
Operating ambient temperature	-20°C~55°C
Maximum battery life	3.3H
Expansion battery capacity	7000 mAh
FPV camera	
Resolution	1080P
FOV	132°
Frequency	30 fps

Firmware update

Remote controller upgrading steps

S400E remote controller firmware upgrade

Use the remote controller's parameter adjustment tool for performing upgrades:

1. Visit the official website to download the remote controller's firmware upgrade package and the remote controller's parameter adjustment tool.
2. When the remote controller is powered off, use the Micro USB cable to connect the Micro USB interface on the bottom of the remote controller to the computer.
3. Launch the remote controller parameter adjustment tool and power on the remote controller.
4. Click "Start Connection" and check whether the remote controller's connection status is normal.
5. Click "Firmware Upgrade." Select the downloaded remote controller's firmware upgrade package and open the file to start the upgrade.
6. Wait until the remote controller upgrade is completed. After upgrading, the remote controller will power off automatically.
7. Manually restart the remote controller. Click "Start Connection" to check the new remote controller's firmware version number.

-  • When upgrading, ensure that remote controller's battery level is above 20%.
• Do not plug or unplug the USB cable while upgrading.

Aircraft upgrading steps

1. Launch the GDU Flight II App to automatically enter the firmware testing status.
2. If there are different versions, a prompt to upgrade will appear on the interface. Click "upgrade immediately" to begin downloading the firmware installation package.
3. After downloading, the firmware installation package will be installed automatically.
4. After upgrading, please restart the device.

S400E payload compatibility table

S400E supports a single downward gimbal. For compatible payloads, refer to the table below.

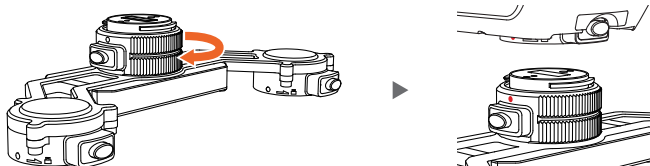
Number	Product name	Model
1	8K camera	PVL-8K
2	Thermal & visible dual camera	PDL-300
3	1K infrared thermal & visible dual camera	PDL-1K
4	Quad-sensor camera	PQL01

Use the multi-payload module

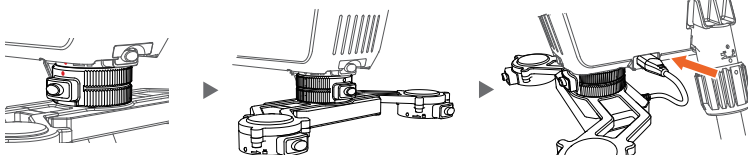
The multi-payload module is used to mount the gimbal camera to the bottom of the S400E aircraft.

Installation steps of dual-payload module:

1. Press the rotating ring button on the dual-payload module and rotate it clockwise to the left.
2. Align the dual-payload module and the red point on the UAV payload interface.

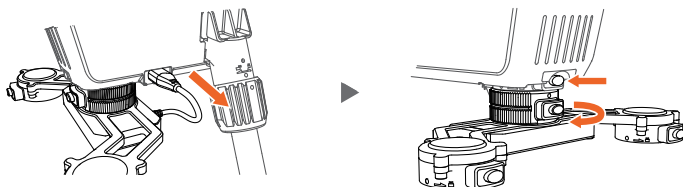


3. Rotate the rotating ring by 90° based on the direction shown in the figure to lock it tightly. After locking, the support will be fixed and unable to rotate.
4. After the multi-payload module is attached firmly, connect the power connection cable with the external power supply port. Then, the multi-payload module can be used.

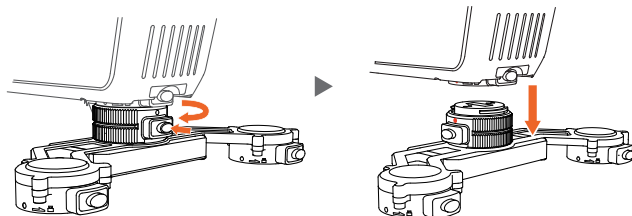


Removal steps for the dual-payload module:

1. Remove the power connection cable from the external power port of the aircraft.
2. Press the upper payload interface button and rotate the multi-payload module clockwise to make it disengage from the center position.



3. Press the lower multi-payload module rotating ring button and rotate the rotating ring of multi-payload module by 90° based on the direction shown in the figure until it is aligned with the red point on the UAV payload interface. Then, remove the multi-payload module downward.



⚠ • During installation and removal, rotate the support of the multi-payload module to help increase the speed of installation and removal

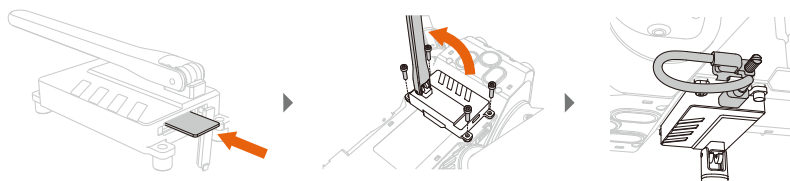
A4G-400 network card package

Installation

Please follow the steps below to install the kit in the aircraft.

1. Insert the wireless dongle with a SIM card to the USB port of the installation support, and cover the wireless dongle protective cover.
2. Use a cross-head screwdriver to remove the screws on the bottom of the fuselage and remove the rubber plug.
3. Align the A4G-400 network card package to the fuselage screws and use a cross-head screwdriver to secure the screws.

- ⚠ • The LTE backup link is prone to be affected by the operator's real-time network environment. It is recommended to use an non-IOT network card.



Use

1. Ensure that remote controller and the aircraft are properly installed with the wireless dongle with an SIM card and ensure that the network page can be accessed normally.
2. Power on the remote controller and aircraft.
3. Launch the GDU Flight II App and enter the video transmission settings interface to set the HD and LTE link. There are the following modes:
 - 1) Automatic mode: This mode HD is a master video transmission link HD. When there is interference with the video transmission signal, it will automatically switch to LTE video transmission. When the video transmission signal is restored, the mode will be automatically switched back to the video transmission link.
 - 2) Video transmission link mode: This mode only supports the video transmission link and does not support the LTE video transmission.
 - 3) LTE link mode: This mode is LTE link mode, and LTE link is a master video transmission link. it will be switched to the video transmission link only when the LTE link fails. If it is not set again, it will not return to the LTE link.

- ⚠ • LTE link must be used with the A4G-S400E component module. This function is not available if the A4G-S400E component is not installed (The A4G-S400E component module is an optional accessory).
- Currently, the LTE backup link function is only supported in mainland China.
 - Before takeoff, ensure that the A4G-S400E network card package and the wireless dongle have been fixed onto the aircraft to avoid having them fall off due to heavy wind or aircraft vibration during the flight process.
 - The LTE backup link cannot be used with dual remote controllers.
 - Due to the LTE signal coverage issues, it is likely to encounter a signal dead zone, resulting in the aircraft going out of control. Before takeoff, be sure to set the aircraft behavior (such as return altitude and HOME point) when the signal is weak based on the flight environment. If the signal is weak or lost due to the communication operator, GDU is not liable for any product damage and other issues caused by this.
 - The LTE network signal is weak at high altitudes. It is recommended that the flight altitude not be higher than 120m when using the LTE backup link.
 - The operating temperature of the A4G-S400E network card package is 0-40°C. Please do not use it in high temperature environments. For the LTE backup link, the remote controller can use Wi-Fi or a wireless dongle for access. If the wireless dongle is used to achieve connection, it is recommended to disable Wi-Fi.

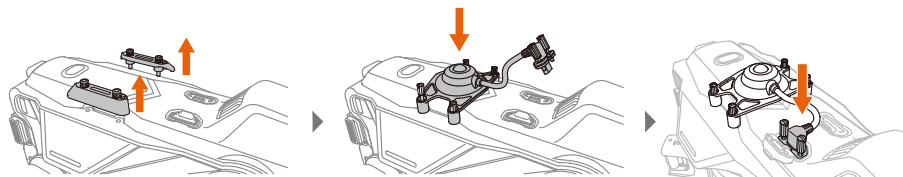
Using the night navigation light component

The night navigation light is installed on the top of the aircraft to facilitate lighting at night or poorly-lit environments. Turning the night navigation on/off and causing it to blink can be controlled through the app.

Installation

Please follow the steps below to install the kit in the aircraft.

1. Remove the fuselage's decorative cover first.
2. Fix the night navigation light on the top of the aircraft and tighten the screws.
3. Insert the power cable into the top interface of the aircraft.



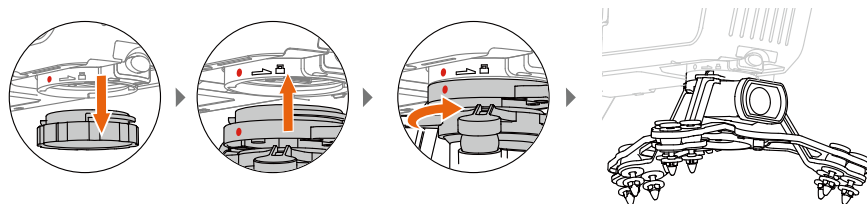
Using the FPV component

The FPV component is a camera device installed at the bottom of the S400E aircraft for fixing the direction. It can also be used with another payload.

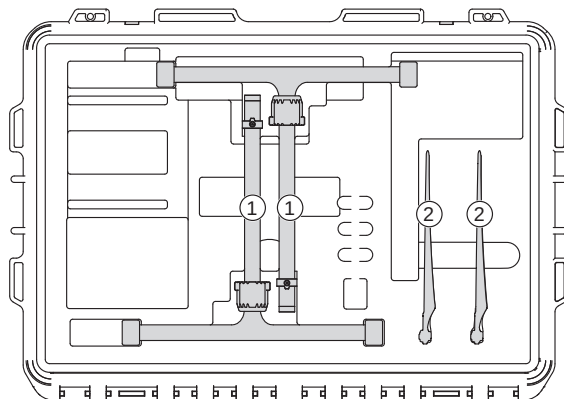
Installation

Please follow the steps below to install the kit in the aircraft.

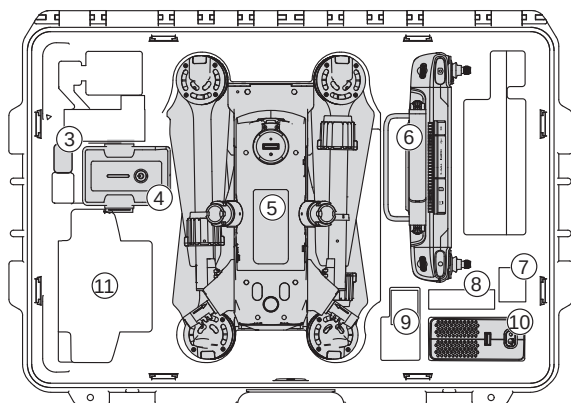
1. Press the payload unlocking button to remove the protective cover.
2. Align the red point on the payload interface and insert the gimbal into the installation position.
3. Rotate it by 90° based on the direction shown on the casing to lock it.



Transportation box description



- 1 Landing gear
- 2 Backup propellers
- 3 Card reader
- 4 Aircraft battery
- 5 Aircraft
- 6 Remote controller
- 7 Remote controller neck strap
- 8 SD card
- 9 Charger adapter
- 10 Charger
- 11 Screwdriver set



FCC STATEMENT :

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

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

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

