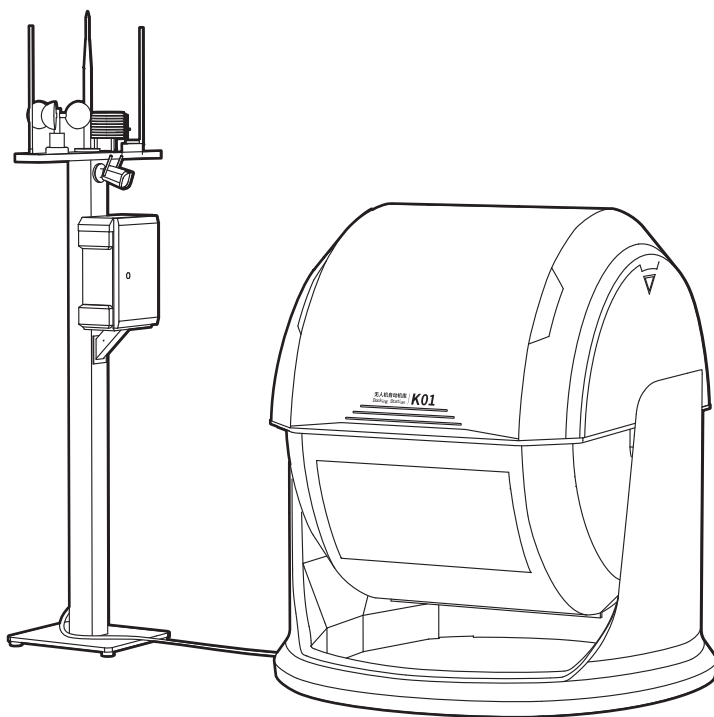


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K01 UAV Automatic Docking Station
Product Profile v3.0 2022.09

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User Instructions

WARNING

Thank you for using this product. This product is a special electronic product. Improper operation may result in property damage, personal injury, or even death. The user will bear the legal consequences of these actions. This product must not be used by juveniles under the age of 18. In order to ensure a positive operating experience and to protect your personal safety, please carefully read the following documents before use:

Product Profile of UAV Automatic Docking Station
UVER Intelligent Management and Control Platform
Docking Station Operation Guide
Disclaimer and Safety Guidelines
Item List
Intelligent Battery Safety Guide
After-sales Service Manual

This document is subject to updates without notification. Please refer to the latest version at www.gdu-tech.com.

Disclaimer

Before using this product, please carefully read and obey this document and all safety guidelines provided by GDU. Otherwise, it may cause harm to you and people around, or damage this product and surrounding items. By using this product, you have carefully read, understood, recognized, and agreed to this document and all terms and contents in documents related to this product.

You undertake the sole responsibility for using this product and the possible consequences therein. You commit that you will only use this product for purposes that are proper and obey the related rules listed in this article.

Manufacturer is not liable for any damage, injury, or any legal responsibility caused directly or indirectly from the use of this product.

For issues not covered in this disclaimer, please refer to local laws and regulations. In the event of any conflicts between this disclaimer and local laws and regulations, the latter shall prevail.

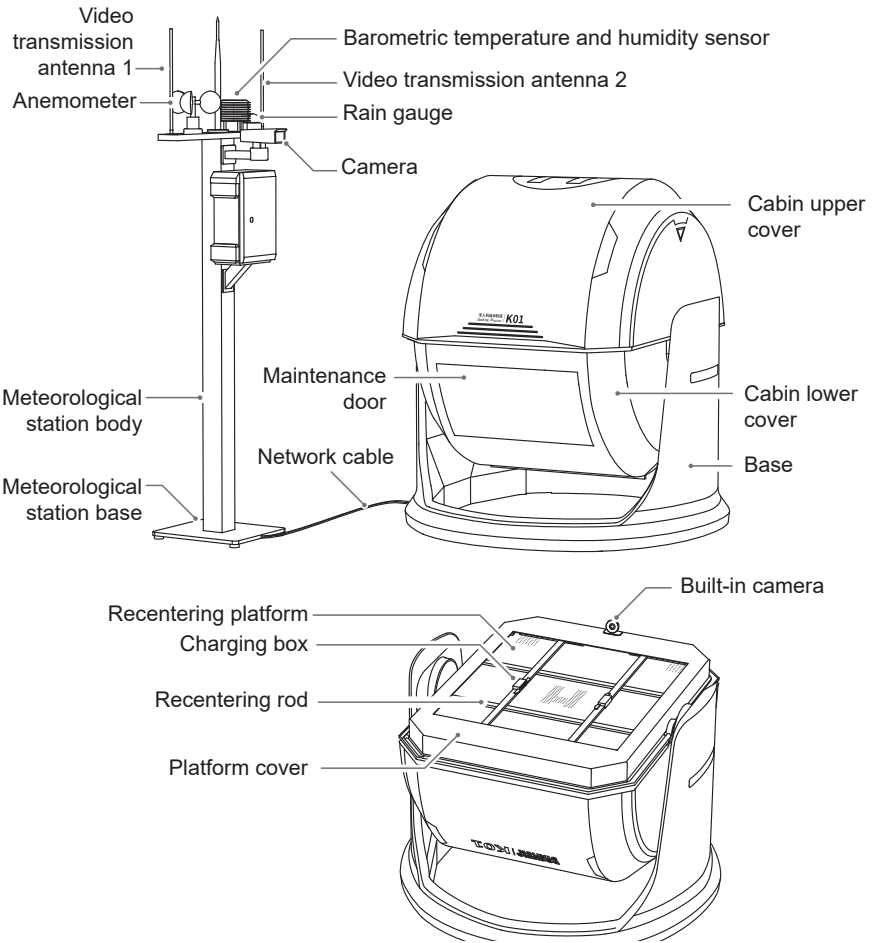
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Product Profile

The docking station is an automatic ground facility that assists in UAV full-process operation. Without manual operation interference, this greatly improves full-automatic operation capacity of the UAV. It can be deployed in specific areas including field ground, on top of buildings and pylons.

The UAV is stored in the docking station. When there is a flight request, the UAV automatically takes off from the docking station, and automatically lands in the docking station following completion of the mission. In the docking station, the UAV can automatically charge in preparation for the next mission. With the docking station, the UAV can take off, execute flight missions, land, and return data for storage automatically without manual interference. Ground-to-air communication allows for fully-automatic operation and facilitates UAV routine inspection, 3D mapping, detail inspection and other operations in an unattended manner.

Introduction of Product Components



Product features

The docking station weighs about 240kg and can carry a UAV with a maximum inspection radius of 8km. Charging time is about 1 hour, and it can operate at least 12 times each day. The docking station comes with a meteorological station that determines whether to execute a mission based on actual weather conditions. It has an aluminum alloy and steel structure. It is easy to deploy and features a UPS and industrial air conditioner. The product has an IP54 protection rating, and is fire-, water-, lightning- and theft-proof.

1. Weather-resistant and wholly-covering top cover

The docking station is designed with a rotatory and wholly-covering top cover. This protects the product against freezing rain and snow, and ensures fast startup and operation in severe conditions.

2. Highly-integrated technology system of UAV and docking station

Using the same technology system, the UAV and docking station modules are highly integrated to fully optimize the link.

3. Accurate landing day and night

Fusion computing of accurate landing and flight control on an onboard platform achieves a higher landing accuracy. Automatic auxiliary light assists with accurate landing.

4. Unattended and automatic operation

The UAV can automatically complete complex missions on the operation site in an unattended manner, greatly cutting manpower costs.

5. Onsite monitoring with cloud management

Operate as scheduled and return results automatically to command center to manage everything on site thousands of miles away.

6. Up to one hour of single flight time

The optimized UAV propulsion system ensures up to one hour of single flight time.

7. Robust operation and compatible with different payloads

The UAV's maximum payload is 2.8kg, and supports a wide range of payloads, including laser radar, 8K visible camera, thermal & visible dual camera, 1K thermal & visible dual camera, quad-sensor camera, etc.

8. 8-km operation radius

The system operation radius reaches 8km. In addition, the UAV has a 4G backup link to ensure the flight safety.

9. Powerful environmental adaptation

The product features an IP54 protection rating, a working temperature range from -35°C~50°C, and automatic temperature control as well as rain and lightning protection to ensure normal operation in severe conditions. The UAV can operate for 5 hours after it is not connected to a power supply.

10. Private deployment

Open cloud API control port, abstract UAV underlying logic, and support of third-party development and private deployment.

11. Open edge computing

The docking station has edge computing extension interfaces in reserve enabling the user's pre-processing of operation data and further improving operation efficiency.

Docking station LED indicators

LED indicators	Description
Solid green	Docking station status is normal.
Solid red	Docking station status is abnormal.
Blink red alternately	Aircraft reports an abnormal alert.
Blink green alternately	Aircraft is executing a mission.
Blink red, blue, and green alternately	Aircraft is in the takeoff stage, and user is prompted to keep away.
Blink red, blue, and green alternately	Aircraft is in the accurate landing stage, and user is prompted to keep away.
Blink blue alternately	Aircraft battery is being charged.

Product deployment

The docking station system deployment includes the arrangement and construction of the docking station, meteorological station, and remote control center.

1. Docking station deployment

The docking station can be deployed on the ground, on pylons or on buildings, and must meet the following requirements:

a. Device handling and installation

The device weighs about 240kg, and has push tugs. Coordination is required during handling. The device is shipped in a wooden box, which must be handled with a pallet truck or a forklift. If the device is to be deployed on a building top, a crane is required for hoisting. The ground should be installed with fences.

b. Device deployment space

The installation space of the docking station and meteorological station is 4.5m×2.2m; and 5m×5m space must be reserved as the point of diversion field for UAV. There are no obstructions at the top of the device deployment space, and the docking station and UAV flight area must be mutually visible.

c. Power supply

220V mains supply (grounded) is required. The device's maximum peak power is 1700W (including charging, air conditioner, and device operation).

d. Network

For a better usage experience, upstream and downstream network bandwidth rates no lower than or equal to 20Mbps are recommended. Use the standard RJ45 network ports for connection.

e. Docking station installation and deployment

1. There are four $\phi 14$ holes on the bottom of the docking station body and four $\phi 13$ holes on the bottom of the meteorological station body. Fix the docking station and meteorological station on a flat ground/cement ground with piers. Select a flat and hard ground for punching and installation.
2. After fixing, connect the meteorological station cable to the corresponding interface of the docking station, and connect the power cables and network cables to the docking station.
3. After the system is powered on, debug the cabin cover and place the UAV inside.

2. Remote control center deployment

Configuration requirements for the remote control center:

Device	Components	Requirements
Server computer	CPU	Above 8 core and 16 threads
	Internal storage	Above 16GB
	Solid state disk	256G
	Mechanical hard disk	Above 2T
	Operation system	Above CentoOS 7.5
Console computer	CPU	Above I5
	Graphics card	2G discrete graphics card
	Display	Dual-screen or triple-screen display
	Internal storage	Above 8GB
	Hard disk	Above 500GB
	Operating system	Windows 10

Use of a local area network (LAN) or special network is recommended to connect the remote control center and the docking station device for stable connection and lower latency.

The required bandwidth for each docking station is no less than 20Mbps.

Appendix

Technical specifications of docking station

Entire machine	
Model	K01
Total weight	240KG
External dimensions	With cabin cover closed: 1460 × 1460 × 1590mm With cabin cover opened: 1460 × 1460 × 1010mm
Installation port	Bolt fixing
External interface	RJ45 network interface
Power supply mode	AC220V. The power supply has over current protection, over temperature protection, and short circuit protection.
Cabin	
Communication mode	Ethernet access (10/100/100Mbps Adaptive Ethernet port)
UAV and docking station video transmission delay	<300ms
Charging mode	Contact automatic charging
Charging time	57 minutes Notes: The aircraft's battery level will be charged from 10% to 90% in an ambient temperature of 25°C.
Industrial air conditioning	Fitted. The function can be automatically enabled or disabled within a set temperature range.

Video transmission and control distance	8km
UPS	Emergency usage >4H
Power dissipation	1700W (peak value)
Operating life	Up to 2000 flights or 5000 hours of failure-free operation
Loud-speaker	Fitted
Remote controller	Optional
Operation	
Frequency of operation attendance	≤12 (Night landing is supported,)
Startup time	≤3 minutes
Preparation time for operation	≤2 minutes
Accurate landing	Feature RTK, accurate landing vision system, and landing accuracy: Landing error ≤±10cm (in windless environments); ≤±20cm (Level-5 wind conditions)
Night landing function	Fitted with a nighttime precise landing function.
Landing time	≤3 minutes
Automatic data return	UAV images/videos/POS and other operation results, internal and external monitoring and real-time videos of UAV, real-time status of the UAV, and docking station status
Meteorological station	
Wind speed	Fitted
Precipitation level	Fitted
Temperature and humidity	Fitted
Atmospheric pressure	Fitted
Camera	
External camera	Fitted, 1080p
Built-in monitoring camera	Fitted, 720p
Sensor	
Smoke sensor	Fitted. Automatic alarm in the event of fire.
Water logging sensor	Fitted. Automatic alarm in the event of water logging.
Indicator	
Status indicator	Fitted
Landing platform light band	Fitted
Switch control	
Emergency maintenance switch	Fitted
Cabin cover manual switch	Fitted
Recentering and extending manual switch	Fitted

Control and Management platform

Background control mode	WEB platform
Remote control power off/on	Fitted
Task management	Flight route planning and task creation, receiving and executing, including manual tasks
Safe take-off self check	Fitted
Display of real-time status information of the docking station	Fitted, including internal and external real-time monitoring video.
Display of UAV real-time status information	Fitted, including real-time videos of payloads.
Display of weather status information	Fitted
Control and Management function	Control and Management functions related to the docking station, UAV, and gimbal, including sensor error alert, maintenance prompt, and other information
Result management and history playback	Fitted. Stores images/videos taken by the UAV and other operation results, docking station status, UAV status, real-time monitoring video of docking station, and real-time flight video of the UAV.
SDK development	Available

Environmental adaptation

Installation environment	Ground, buildings
Maximum working altitude	5000m
Operating temperature	-35°C to 50°C
Operating humidity	≤95%, without condensation
Anti-icing	Fitted
Anti-thunder	40 KA (8/20μs waveform)
Anti-aging	Fitted. Material and electrical systems can function free of failure for 3 years.
Resistance to shock and vibration	According to the national standard vehicle transport weight
IP rating	IP54

Safety and certification

EMC	Conduct anti-electromagnetic interference performance tests based on the DL/T1578-2016 standards, and the test meet the class requirements.
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