

Operating Manual

GHOSTDRONE 2.0 Aerial

GHOSTDRONE 2.0 created by EHang, Inc.

GHOSTDRONE 2.0 Operating Manual includes packing list, assembly, parts and specification information.

Congratulations on purchasing your new GHOSTDRONE 2.0!

For customer service and support, please e-mail support@ehang.com

or contact our customer service hotline: 888-800-7056.

www.ehang.com

www.twitter.com/theghostdrone

www.facebook.com/theghostdrone

www.instagram.com/theghostdrone

forum.ehang.com

Thank you, and enjoy your GHOSTDRONE!

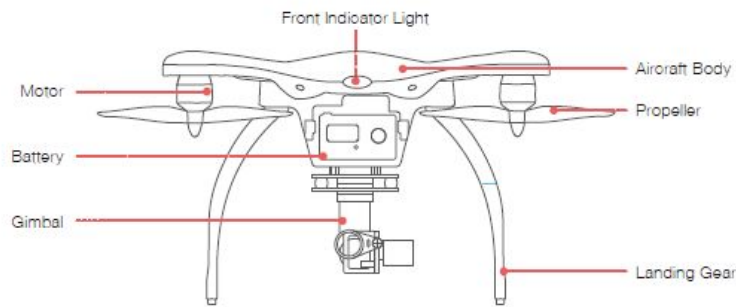
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INTRODUCTION

With dual-sensor flight controller and high efficiency dynamic system, GHOSTDRONE 2.0 secures safer and more stable flight. Its smart battery LCD screen displays real-time battery status information. Our GHOSTDRONE 2.0 Aerial version contains the 3-axis gimbal, which ensures the camera always steady and stable, helping you record the exciting moments in your life.

Diagram



Front Indicator Light

Motor

Smart Flight Battery

Gimbal

Aircraft Body

Propeller

Landing Gear

Packing List

Aircraft*1 Propeller*8 Propeller Guard*4

Battery Charger*1 Info Package*1

G-BOX*1 Tool Kit*1

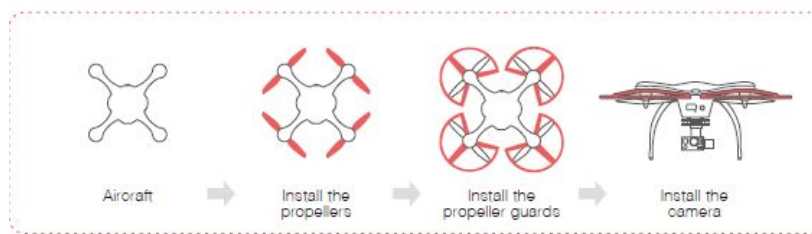
Note:

The tool kit contains a USB charging cable, a battery charging cable, a wrench, a screw driver, 4 vibration dampeners and 15 screws.

Extra 4 propellers, 4 vibration dampeners and 3 screws are provided for free.

The USB cable is used to charge the G-BOX as well as connecting the GHOSTDRONE to a PC to update the aircraft's firmware.

ASSEMBLY



Aircraft

Install the propellers

Install the propeller guards

Install the camera

Propellers

GHOSTDRONE 2.0 uses 2-bladed 8.5-inch self-tightening propellers. Propeller nuts have two colors, silver and black. Each indicates different rotating directions.

Icon Explanations

LOCK: Tighten the propeller in this direction.

UNLOCK: Remove the propeller in this direction.

Installation

1. Put the aircraft upside down on soft surface to avoid scratches.
2. Match the silver nut propellers with the L motors (with silver motor shaft), and tighten the propellers according to the LOCK instructions.
3. Attach the black nut propellers to the R motors in the same way.

Disassembling

Keep the motor deadlocked in place with one hand and remove the propeller according to the UNLOCK instructions.

Propeller Guards

It is optional to use the propeller guards.

Installation: Place the guards over the aircraft. Use the screwdriver to tighten the 3 screws.

Disassembling: Unscrew the three holding screws and remove the guard.

Note: We recommend using propeller guards in a complex environment, such as crowd, group of buildings or obstacles.

Camera

The gimbal is compatible with GoPro 3, GoPro 3+, GoPro 4 and EHang camera. Camera is not included in the box.

1. Remove the camera guard. Connect the gimbal black plug with the Camera USB interface.
2. Use the camera guard to fix the Camera lens, and tighten the screws.

Completed Assembly

Gimbal

The gimbal is preassembled and ready to use. If one needs to disassemble the gimbal, refer to the following instructions. The gimbal is compatible with GoPro 3, GoPro 3+, GoPro 4 and EHang camera.

Gimbal spare parts

 3-Axis Gimbal *1	 Plate Adapter *1	 Adapter Cable *1
 Copper Pillar *4	 Screw *4	

3-Axis Gimbal *1 Plate Adapter *1 Adapter Cable *1 Copper Pillar *4 Screw *4

Gimbal Assembly

1. Put the aircraft upside down on a soft surface to avoid unnecessary scratches, and use

ascrewdriver to tighten four copper pillars on the bottom of the aircraft.

2. Connect the gimbal wire to the P1 interface on the plate adapter.

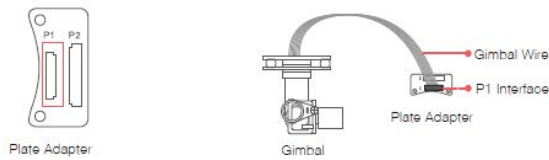
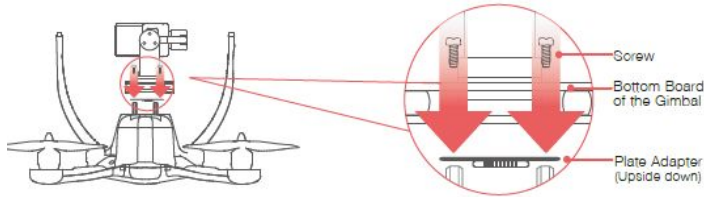


Plate Adapter Gimbal Gimbal Wire P1 Interface Plate Adapter

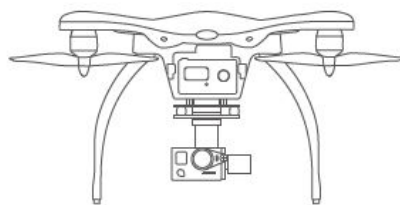
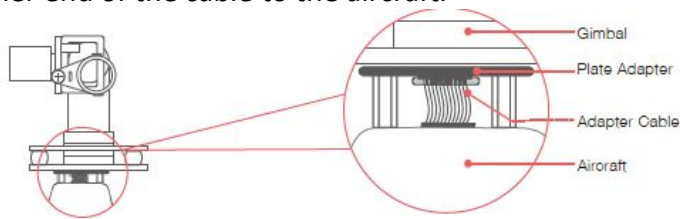
3. Mount the plate adapter to the gimbal by using two screws.



Screw Bottom Board of the Gimbal Plate Adapter(Upside down)

4. Fix the gimbal base by tightening two screws on the other two copper pillars.

5. Connect the plug of the adapter cable to the plate adapter P2 interface. Connect the other end of the cable to the aircraft.



Completed Assembly

Gimbal Plate Adapter Adapter Cable Aircraft Completed Assembly

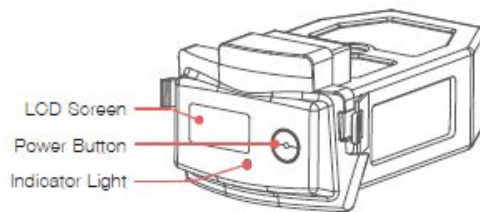
ACCESSORIES

Battery

Improper use of battery may lead to fire, explosion or other dangers. Please be familiar with the product before using.

The 4S lithium polymer battery is specially designed for the GHOSTDRONE 2.0, with capacity of 4500mAh, voltage of 14.8V, charge-discharge management functionality and a smart display screen. The battery should only be charged by EHang charger.

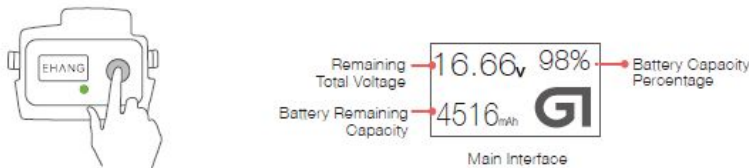
Battery Structural Diagram



LCD Screen Power Button Indicator Light

Powering On

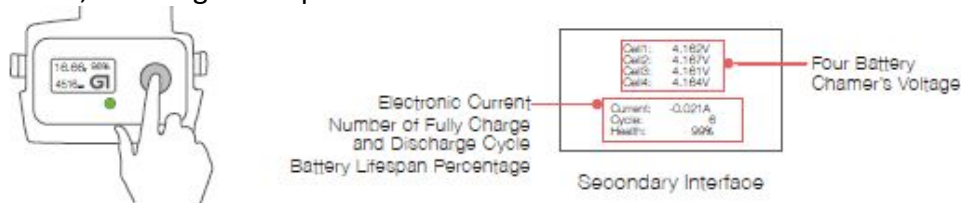
Press the power button, then press and hold the button again in 3 seconds until the last letter “G” of logo “EHANG” appears on the screen. The LED indicator light turns on once the battery is turned on, referring to the diagram below.



Remaining Total Voltage
Battery Remaining Capacity
Battery Capacity Percentage
Main Interface

Note: When the battery is powered off, press the power button to check the battery life. (Main interface will display for 3 seconds while the LED Indicator light stays off during the whole process.)

When the battery is powered on, press the power button once to enter the secondary interface, referring to the picture below:



Electronic Current
Battery Lifespan Percentage
Number of Fully Charge
and Discharge Cycle

Four Battery Chamber's Voltage
Secondary Interface

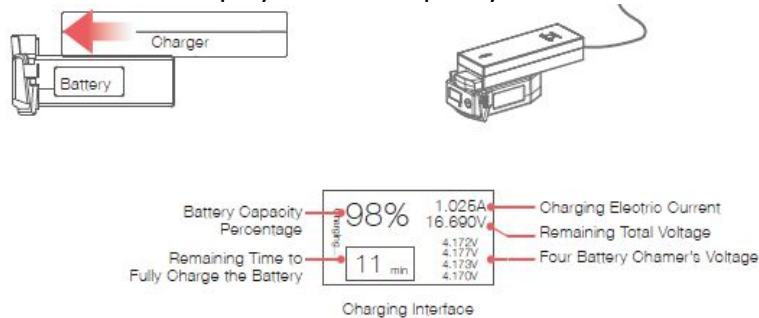
Powering Off

Press the power button, then press and hold again until the ‘!’ of ‘SEE YOU !’ sign

disappears on the screen.

Battery Charging

Connect the battery to the charger, and then connect the charger to a wall socket (use the plug if necessary). Once connected successfully, the LED indicator light flashes slowly and the screen displays current capacity level as below:



Battery Capacity Percentage

Remaining Time to Fully Charge the Battery

Charging Electric Current

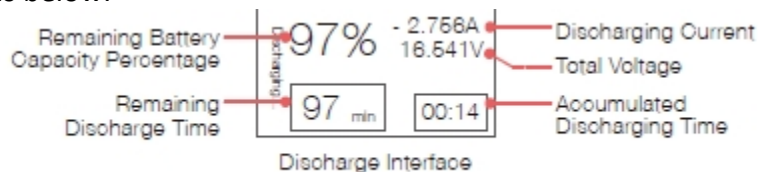
Remaining Total Voltage

Four Battery Chamer's Voltage

Charging Interface

Battery Discharging

When the battery is discharging, the LED indicator light stays on and the screen displays as below:



Remaining Battery Capacity Percentage

Remaining Discharge Time

Discharge Interface

Discharging Current

Total Voltage

Accumulated Discharging Time

LED Indicator Light Instructions

	Low frequency flash (Green)	Charging
	High frequency flash (Green)	Low battery
	Solid green	Working
	Light off	Standby

Low frequency flash (Green)	Charging
High frequency flash (Green)	Low battery
Solid green	Working
Light off	Standby

Warning

Only the EHang original charger should be used to charge the battery.

Do not use the batteries from other companies. EHang is not responsible for any dangerous accidents caused by third party batteries.

Do not use the battery if it is inflated, damaged or deformed.

Do not plug or unplug the battery into the aircraft when it is powered on, otherwise the battery interface will be damaged.

Recharge the battery only after it cools down to room temperature.

Do not leave the battery on combustibles or unattended when charging.

Do not charge or store the battery under direct sunlight.

Do not use the battery in strong electrostatic or electromagnetic environments, otherwise the electronic protection devices might be damaged leading to dangerous accidents.

Do not use any conducting wires or any metallic substance that would cause battery short circuit.

Do not attempt to dismantle the battery case.

Do not attempt to dismantle, pierce or cut a battery.

If the battery terminal gets dirty, please clean it with a dry cloth before using, or might cause charging malfunction.

Storage Instructions

The battery should be stored in an environment with the temperature of $23\pm5^{\circ}\text{C}$.

The battery must be stored in places away from children, water, fire and metal.

If the battery is not being used for more than 1 week, keep the battery capacity between 50% to 60%. Charge and discharge the battery once every two months.

Do not discard batteries in general household waste. Damaged or unusable batteries must be disposed in containers specially reserved for this purpose. When disposing of batteries, follow appropriate local guidelines and regulations.

G-BOX

G-BOX is a wireless interface unit designed specifically for controlling and interfacing with the GHOSTDRONE. GHOSTDRONE 2.0 G-BOX is compatible with both Android and iOS system.

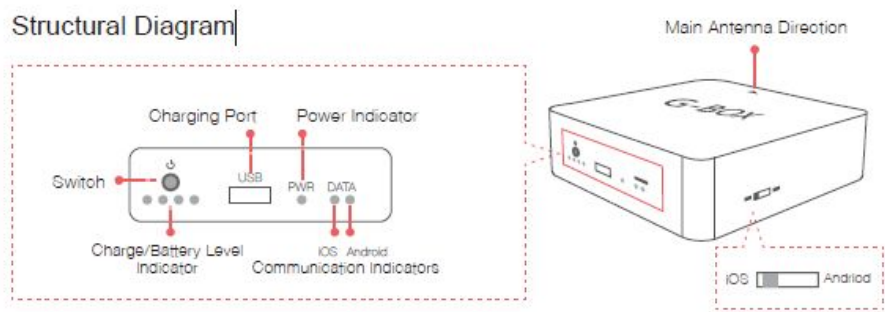
Each GHOSTDRONE is paired with one G-BOX. The GHOST App cannot operate the GHOSTDRONE without a G-BOX. Please store the G-BOX appropriately. If G-BOX is missing, it will be necessary to replace a new G-BOX unit.

G-BOX USB Power Cable

The USB port is for charge use only.



Structural Diagram



- Charging Port
- Power Indicator
- Switch
- Charge/Battery Level Indicator
- Power Indicator
- iOS Android Communication Indicators
- Main Antenna Direction
- iOS Andriod

Using the G-BOX

Power On	Press the power button once. After the G-BOX turns on, the battery indicator, PWR and DATA indicators will turn on. After several seconds the battery indicators turns off to save battery.
Power Off	Hold the power button until the PWR indicator turns off.
While Charging	The four LEDs next to the power button flash in sequence.
Fully Charged	The left side LED flashes while the right three LEDs on the right are solid.
Electric current	The number of flashing LEDs indicates G-BOX's power levels.



Note: You can charge the G-Box by connecting it to a PC with a USB cable. When charging through a USB adapter, the required input current is 500 mA or higher.

- Power On
- Press the power button once.
- After the G-BOX turns on, the battery indicator, PWR and DATA indicators will turn on.
- After several seconds the battery indicators turns off to save battery.

Power Off

Hold the power button until the PWR indicator turns off.

While Charging

The four LEDs next to the power button flash in sequence.

Fully Charged

The left side LED flashes while the right three LEDs on the right are solid.

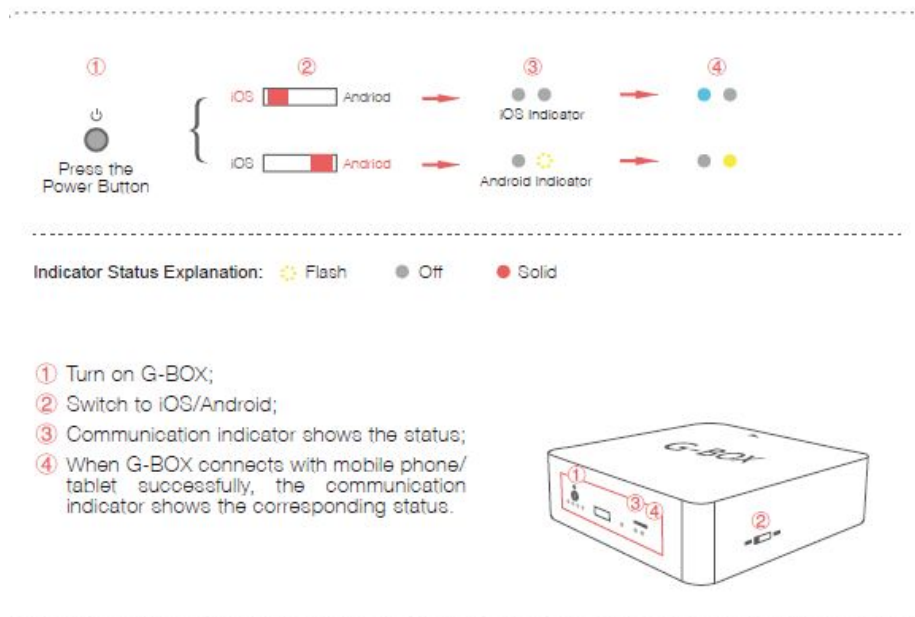
Electric current

The number of flashing LEDs indicates G-BOX's power levels.

Switch/Battery Level Indicator Charging G-BOX (with battery charger)

Note: You can charge the G-Box by connecting it to a PC with a USB cable. When charging through a USB adapter, the required input current is 500 mA or higher.

Procedure



Press the Power Button

iOS Indicator

Android Indicator

Indicator Status Explanation: Flash Off Solid

① Turn on G-BOX;

② Switch to iOS/Android;

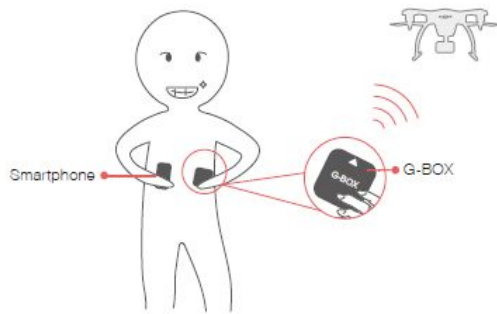
③ Communication indicator shows the status;

④ When G-BOX connects with mobile phone/tablet successfully, the communication indicator shows the corresponding status.

Important Tip

Keep the G-BOX within your 3 meter's radius during flight (We suggest keeping it in hand). If the G-BOX is not near you, you may lose connection with the GHOSTDRONE.

Best communication can be acquired when G-BOX's main antenna is pointing to the GHOSTDRONE.

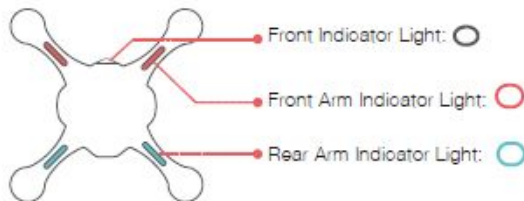


Smartphone G-BOX

Aircraft Indicator Lights Instructions

On GHOSTDRONE 2.0, there are four arm indicator lights and one front indicator light. The front indicator light displays multiple colors; the two front arm indicator lights display red; and the rear two lights display blue.

The following chart describes the display status of the lights and their corresponding explanation.



Front Indicator Light:

Front Arm Indicator Light:

Rear Arm Indicator Light:



























Legend

High Frequency

Low Frequency Flash

Medium Frequency Flash

Solid

Front Indicator Light	Arm Indicator Light	Descriptions
 After powering on, front indicator light shows in white solid color then flashes in blue and green at high frequency until stop	  \Rightarrow  	Initializing
 Flashes in yellow and blue at low frequency alternately	 	When transmitter "Unlock" or "Throttle" Joystick position is incorrect, do not unlock. (Skip this status when not using transmitter.)
 Medium frequency flash (red)	 	Unlock check not pass, do not unlock.
 Low frequency flash (yellow)	 	GPS is not 3D locked. Unlock is only accessible in manual mode.
 Low frequency flash (blue)	 	GPS is 3D locked. Ready to unlock.
 Solid yellow	 	GPS is not 3D locked. Unlock successful.
 Solid green	 	GPS is 3D locked. Unlock successful.
 Low frequency flash (yellow)	 	Low battery. (Not related to unlock or not.)

Aircraft Indicator Light Status Information Chart

Front Indicator Light Arm Indicator Light Descriptions

After powering on, front indicator light shows in white solid color then flashes in blue and green at high frequency until stop

Initializing

Flashes in yellow and blue at low frequency alternately

When transmitter "Unlock" or "Throttle" Joystick position is incorrect, do not unlock. (Skip this status when not using transmitter.)

Medium frequency flash (red) Unlock check not pass, do not unlock.

Low frequency flash (yellow) GPS is not 3D locked. Unlock is only accessible in manual mode.

Low frequency flash (blue) GPS is 3D locked. Ready to unlock.

Solid yellow GPS is not 3D locked. Unlock successful.

Solid green GPS is 3D locked. Unlock successful.

Low frequency flash (yellow)

Low battery. (Not related to unlock or not.)

Aircraft Indicator Light Status Information Chart

Terminologies

3D Lock: Lock aircraft's current three-dimension location using GPS.

High Frequency Flash: Flash rapidly at the frequency of 5 Hz.

Medium Frequency Flash: Flash at the frequency of 2 Hz.

Low Frequency Flash: Flash slowly at the frequency of 1 Hz.

SPECIFICATIONS

Aircraft

Weight	1150 g
Shaft Distance	350 mm
Height	195 mm
Hover Accuracy	horizontal: ± 1 , mvertical: ± 0.2 m
Maximum Tilt Angle	$\pm 45^\circ$
Maximum Horizontal Speed	30 km/h (GPS mode) / 60 km/h (Manual mode)
Maximum Ascend Speed	2.5 m/s
Maximum Descend Speed	1.5 m/s
Maximum Hover Time	25 min
Communication Frequency	2.400 GHz ~ 2.483 GHz
Maximum Communication Distance	1000 m
Stable Transmission Distance	500 m
Output Power	255 W (Hover) 450 W (Maximum)
Operating Temperature	-10°C ~ 40°C
Wind Resistance	< 10.7 m/s (24 mph)

Weight 1150 g
Shaft Distance 350 mm
Height 195 mm
Hover Accuracy horizontal: ± 1 , mvertical: ± 0.2 m
Maximum Tilt Angle $\pm 45^\circ$
Maximum Horizontal Speed 30 km/h (GPS mode) / 60 km/h (Manual mode)
Maximum Ascend Speed 2.5 m/s
Maximum Descend Speed 1.5 m/s
Maximum Hover Time 25 min
Communication Frequency 2.400 GHz ~ 2.483 GHz
Maximum Communication Distance 1000 m
Stable Transmission Distance 500 m
Output Power 255 W (Hover) 450 W (Maximum)
Operating Temperature -10°C ~ 40°C
Wind Resistance < 10.7 m/s (24 mph)

G-BOX

Communication	Wi-Fi + Bluetooth + 2.4 GHz wireless data transmission
Voltage	3.7 V
Electronic Current	1500 mAh

Communication Wi-Fi + Bluetooth + 2.4 GHz wireless data transmission
Voltage 3.7 V
Electronic Current 1500 mAh

Live Stream Video

Frequency	5.645 GHz~5.945 GHz
Maximum Operating Distance	1000 m
Stable Transmission Distance	500 m

Frequency **5.725 GHz~5.850 GHz**

Maximum Operating Distance 1000 m

Stable Transmission Distance 500 m

Propeller

8.5-inch 2-bladed self-tightening propellers

Battery

Weight	400 g
Type	LiPo 4S
Voltage	14.8 V
Current	4500 mAh (67 Wh)
Operating Temperature	-10°C~ +40°C
Maximum Charging Power	60 W
Charging Time	60 min ~70 min

Weight 400 g

Type LiPo 4S

Voltage 14.8 V

Current 4500 mAh (67 Wh)

Operating Temperature -10°C~ +40°C

Maximum Charging Power 60 W

Charging Time 60 min ~70 min

Battery Charger

Input Voltage	100 V~240 V
Input Current	2 A (max)
Input Frequency	50/60 Hz
Output Voltage	16.8 V
Output Current	0.8 A
Rated Power	60 W
Operating Temperature	0°C~40°C
Storage Temperature	20°C~85°C

Input Voltage 100 V~240 V
 Input Current 2 A (max)
 Input Frequency 50/60 Hz
 Output Voltage 16.8 V
 Output Current 3.8 A
 Rated Power 60 W
 Operating Temperature 0°C~40°C
 Storage Temperature Storage Temperature

3-Axis Gimbal

Weight	154 g
Accuracy	0.09°
Operating Voltage	12 V
Angle Restrictions	Roll Angle $\pm 45^\circ$ / Pitch Angle -90° to $+30^\circ$
Supported Camera	EHang camera, GoPro3, GoPro3+, GoPro4

Weight 154 g
 Accuracy 0.09°
 Operating Voltage 12 V
 Angle Restrictions Roll Angle $\pm 45^\circ$ / Pitch Angle -90° to $+30^\circ$
 Supported Camera EHang camera, GoPro3, GoPro3+, GoPro4

FAQ

1. Is the G-BOX compatible with Android and iOS?

Yes. GHOSTDRONE 2.0 G-BOX is compatible with both Android and iOS. Move the paddle to the desired operating system with G-BOX turned on.

2. What's the battery capacity? How long is the charging time?

GHOSTDRONE 2.0 is equipped with 4500-mAh 4S Lithium polymer battery and an LCD screen showing information including battery capacity, voltage, remaining capacity etc. The charging time is about 60 to 70 minutes which will also be shown on the screen for viewing conveniently.

3. How to download the App?

1. Go to www.ehang.com to download Android/iOS App.
2. Search "GHOSTDRONE" on Google Play to download Android App.
3. Search "GHOSTDRONE" on App Store to download iOS App.

4. How to use AVATAR App?

AVATAR App is used to fly the aircraft with smart gesture control. Connect smartphone with G-BOX and aircraft, and open AVATAR App. After the aircraft takes off, tilt the phone forward to direct the aircraft flying forward; Tilt the phone backward to direct the

aircraft flying backward. Similar controls can apply for flying the aircraft leftward or rightward. The AVATAR smart gesture control is simpler and more intuitive, which definitely brings you more fun.

5. Can GHOSTDRONE 2.0 automatically dodge obstacles?

Obstacle avoidance function is currently unavailable for GHOSTDRONE 2.0. Please beware of the flying environment and it is highly recommended to fly the aircraft in an open area.

6. What will happen if “Lock” button is accidentally hit during flight?

If the “Lock” button is pressed during flight, a confirmation dialog box will pop up. The aircraft will be locked after confirmation. But it is still recommended to operate cautiously during flight.

7. Can the propeller guards and landing gears be used at the same time?

Yes. It is recommended to use the propeller guards in a complex environment, such as crowd, group of buildings or obstacles to avoid unnecessary lost.

8. What will happen if the smartphone goes out of battery during flight?

The aircraft will return automatically if not receiving any command in 5 seconds.(The aircraft battery life should be sufficient)

9. How to update App and download user manual?

Update reminder will automatically pop up on the App interface. You can also visit official website to download the latest App and user manual.

Website: www.ehang.com

Business Hour: Monday – Friday 10:00 A.M – 6:00 P.M (PST)

Customer Service Phone: 888-800-7056

Customer Service Email: support@ehang.com

The SAR limit of Europe is 2.0 W/kg. Device types G-BOX has also been tested against this SAR limit. The highest SAR value reported under this standard during product certification worn on the body is 0.343 W/kg. This device was tested for typical body-worn operations with the back of the G-BOX kept 0cm from the body. To maintain compliance with RF exposure requirements, use accessories that maintain a 0cm separation distance between the user's body and the back of the G-BOX. The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with RF exposure requirements, and should be avoided.

Regulatory Conformance

Hereby, **Guangzhou EHang Intelligent Technology Co.,Ltd.** declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. For the declaration of conformity, visit the Web site <http://www.ehang.com/cn/>

CE 0700

Notice: Observe the national local regulations in the location where the device is to be used. This device may be restricted for use in some or all member states of the European Union (EU)

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.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications 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
- This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

The SAR limit of USA (FCC) is 1.6 W/kg averaged over one gram of tissue. Device types G-BOX (FCC ID: 2ADPF-GBO-200) has also been tested against this SAR limit. The highest SAR value reported under this standard during product certification when properly worn on the body is 1.084W/kg. This device was tested for typical body-worn operations with the back of the G-BOX kept 0cm from the body. To maintain compliance with FCC RF exposure requirements, use accessories that maintain a 0cm separation distance between the user's body and the back of the G-BOX. The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.