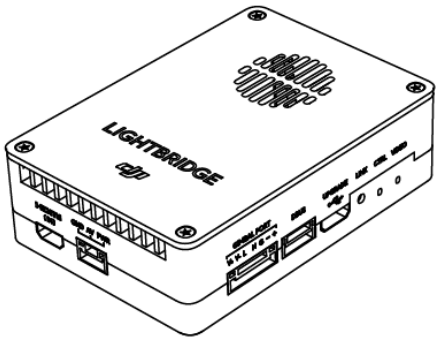
LIGHTBRIDGE 2

User Manual

V1.0 2015.9



Disclaimer

Thank you for purchasing the Lightbridge 2. Users must comply with local radio transmission laws and regulations when using this product. By using this product, you hereby agree to this disclaimer and signify that you understand all points completely. Please use this product in strict accordance with the manual and be sure to pay attention to the warnings. When assembling and using this product, follow all instructions carefully. SZ DJI TECHNOLOGY CO., LTD. and its affiliated companies assume no liability for damage(s) or injuries incurred directly or indirectly from improper use of this product.

This disclaimer is produced in various languages. In the event of divergence among different versions, the Chinese version shall prevail when the product in question is purchased in Mainland China, and the English version shall prevail when the product in question is purchased in any other region.

Profile

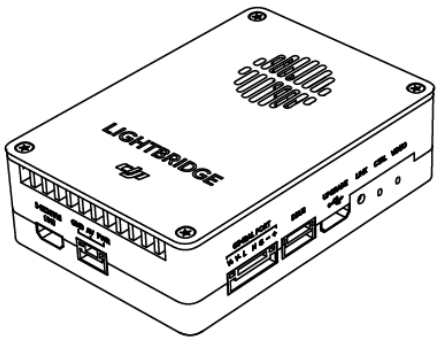
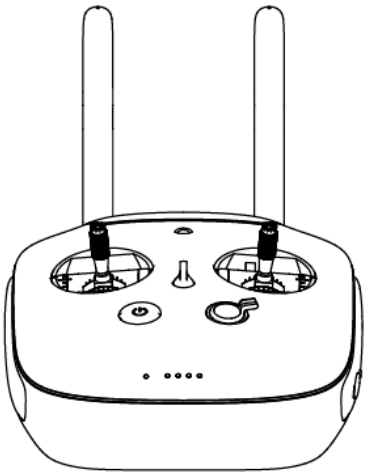
A complete Lightbridge 2 comprises of an air system and a Ground System. It is a high definition video transmitter, and supports Ground System using the 2.4GHz frequency band. As it is small, power efficient and highly sensitive, the Lightbridge 2 can be used for many activities. The air system must be attached to the aircraft and the Ground System must be connected to a monitor to display the video and flight controller information, you can also control your aircraft and gimbal with the Ground System.

When the Lightbridge 2 transmits the video and flight controller information, the air system is the transmitter while the ground is the receiver. The air system pulls video from the camera and flight controller information then modulates it and transmits to the Ground System. The Ground System then receives the information, demodulates it and sends it to a monitor or mobile device. The DJI GO app, available for mobile devices is required for an ideal viewing experience.

When the Lightbridge 2 transmits the Ground System signal, the Ground System works as a transmitter while the air system works as a receiver. The Ground System supports Dual Ground System mode. In Dual Controllers mode, the "Master" Ground System operator controls the orientation of the aircraft, while the "Slave" Ground System controls the movement of the gimbal and camera operation. A DJI flight control system with DBUS port is required as the built in receiver only supports the DJI DBUS protocol. The Ground System includes Remote Controller module, the reserved buttons on the Ground System can be customized set by the flight controller's assistant for expansion use.

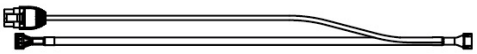
In the Box

Modules

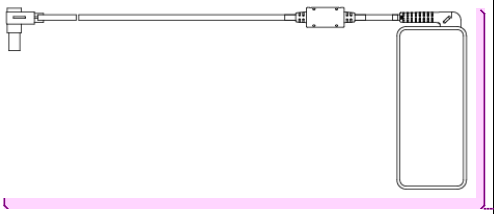
Air System x 1	Ground System x 1
	

Air System Cables

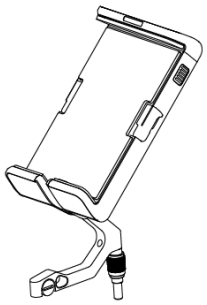
Air System Antennas x 2	
Air system communication signals output.	
DBUS Cable (A) x 1	
Connect to A2/WooKong-M flight control system DBUS port for communication.	
DBUS Cable (B) x 1	
Connect to other DJI flight control system DBUS port for communication.	

GIMBAL Cable x 1	
Connect to Air system GIMBAL port, one end for DJI HD gimbal, the other for CAN port.	
AV Cable x 1	
Connect camera’ s AV output to Air system AV port.	
HDMI Cable x 1	
Connect camera’ s HDMI output to Air system HDMI port..	
USB Cable x 1	
Upgrade the air system.	

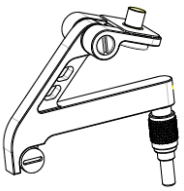
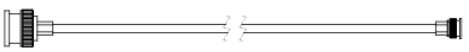
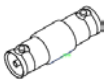
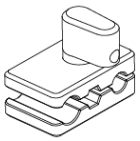
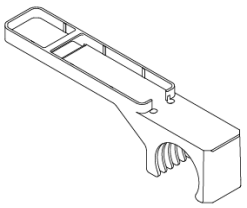
Ground System Cables

Charger x 1	
Charging for the Ground System.	

Comment [M1]: 电源线？

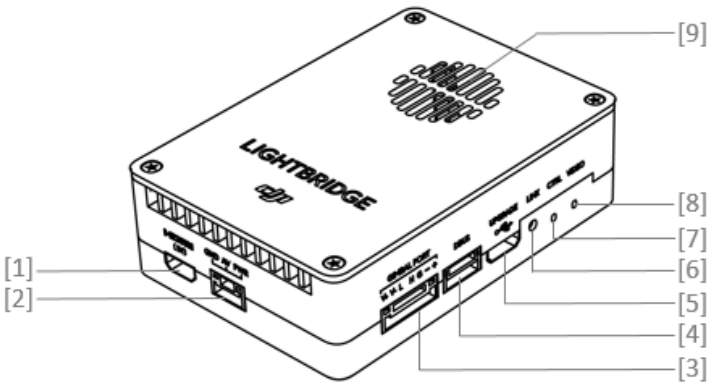
Mobile Device Holder x 1	
Mounting your mobile device onto the Ground System to launch the DJI GO app.	

Optional Packet (Purchased Separately)

Optional Packet 1	**HDMI Screen Holder × 1**	
Optional Packet 2	**SDI Cable x 1**	
	BNC Adapter x 1	
	Wire Holder x 1	
Optional Packet 3	**Air System Antenna Extension Cables x 2**	
	Air System Antenna Mounts x 2	
Optional Packet 4	**CAN HUB x 1**	

1. Introduction

1.1 Air System Diagram



[1] HDMI IN Port

Connect to HDMI input device. Maximum input rate is 1920*1080@60fps.

[2] AV Port

Connect to AV input device.

[3] GIMBAL PORT

Connect this port to the G7 port on a DJI HD gimbal or to other ports for the functions listed below:

a) Power supply: (V+,V-) On-board battery (9~12V) power connection.

b) CAN-Bus: (L,H) Access to the flight controller information. For DJI HD gimbal users, connect to the CAN-Bus port (for DJI A2/WooKong-M user, use the CAN 2 Bus port) on the flight controller with a seperated CAN bus cable.

c) DVSB: (G-,+) DVSB video input from DJI HD gimbal.

[4] DBUS Port

Connect built in receiver interface to DJI flight control system DBUS port, usually located on the main controller labled X2. No other receiver requried when DBUS is used.

[5] UPGRADE Port

Connect to PC to upgrade firmware of the air system using Lightbridge 2 Assistant.

[6] LINK Buttom

Press to link air system with Ground System.

[7] CONTROL Indicator

Indicate the communtation status of the air and Ground Systems.

Indicator	Description	Instruction
●●●●●●	Linking in progress.	Link button has been pressed. Air system is attempting to link with Ground System.
●●●●●●	Signal detected but not linked.	Link required.
▬▬▬	Successful link.	Normal.
▬▬▬	No detected signal.	Power on Ground System. Check distance between ground and air systems.

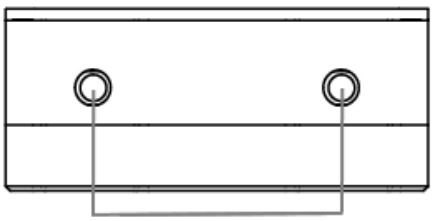
[8] VIDEO Indicator

Indicate video source transmission status.

Indicator	Description	Instruction
▬▬▬	AV/HDMI signal detected and functioning normally.	Normal.
●●●●●●	AV/HDMI signal detected. Transmission failed.	Air system or Ground System power cycle required.
▬▬▬	No video source detected or not supported by Lightbridge 2.	Check camera and connection.

[9] Ventilation inlet

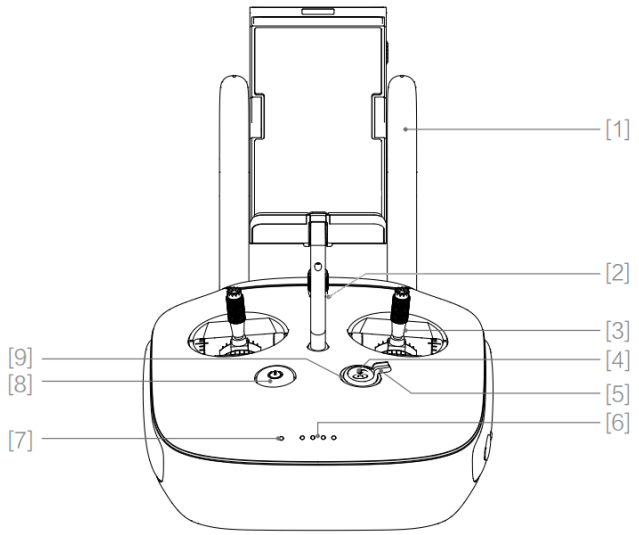
Do not obstruct ventilation fan outlet to ensure maximum cooling efficiency.



[10]

[10] Antenna Port

1.2 Ground System Diagram



[1] Antennas

Relays aircraft control and video signal.

[2] Mobile Device Holder Port

Mounting place for the mobile device holder.

[3] Control Stick

Controls the aircraft movement.

[4] Return Home (RTH) Button

Press and hold the button to initiate Return to Home (RTH).

[5] Transformation Switch

Customizable button in flight controller assistant.

[6] Battery Level LEDs

Displays the current battery level.

[7] Status LED

Indicates the connection status of the air and Ground System.

Status LED	Alarm	Ground System Status
Ⓡ — Solid Red	♪ chime	The Ground System is set as Master but is not connected to the aircraft.
Ⓖ — Solid Green	♪ chime	The Ground System is set as Master and connected to the aircraft.
Ⓟ — Solid Purple	D-D-	The Ground System is set as Slave but is not connected to the aircraft.
Ⓑ — Solid Blue	D-D- ♪	The Ground System is set as Slave and

		connected to the aircraft.
Ⓡ ····· Blinking Red Slowly	D-D-D·····	Ground System error.

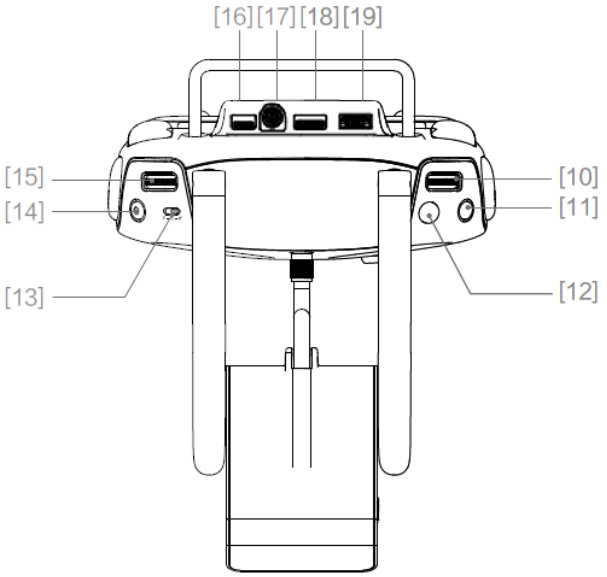
[8] Power Button

Used to power on or power off the Ground System.

[9] RTH LED

Circular LED around the RTH button displays RTH status.

RTH LED	Sound	Aircraft Status
Ⓦ — Solid White	♪ chime	Return-to-Home procedure is activated.
Ⓦ ····· Blinking White	D · · ·	Sending Return-to-Home command to the aircraft.
Ⓦ ····· Blinking White	DD ·· ·· ··	Return-to-Home is in progress.



[10] Camera Settings Dial

Customizable button in flight controller assistant.

[11] Playback Button

Customizable button in flight controller assistant.

[12] Shutter Button

Customizable button in flight controller assistant.

[13] Flight Mode Switch

Customizable switch in flight controller assistant to set manual, attitude or GPS mode.

[14] Video Recording Button

Customizable button in flight controller assistant.

[15] Gimbal Dial

Customizable dial in flight controller assistant

[16] Reserved Expansion Port

Reserved port.

[17] SDI Port

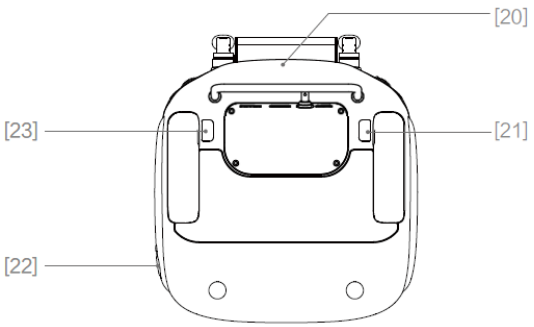
Connect a SDI display device.

[18] HDMI OUT Port

Connect an HD compatible monitor.

[19] USB Port

Connect to mobile device to launch DJI GO app, which displays the live camera preview and OSD information.



[20] GPS Module

Used to pinpoint the location of the Ground System.

[21] Back Left Button

Customizable button in flight controller assistant.

[22] Power Port

Connect to a power source to charge the Ground System' s internal battery.

[23] Back Right Button

Customizable button in flight controller assistant.

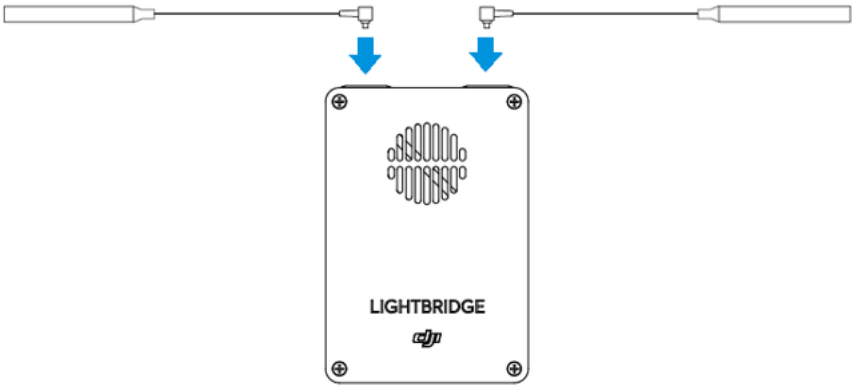
2. Installation

This chapter introduces in detail the installation of air system and Ground System before using Lightbridge 2.

2.1 Air System Antenna Installation

The air system communicates with the Ground System via antennas. Follow the steps below to install the antennas onto the air system.

1. Prepare two air system paddle antennas.
2. Insert antennas into positions shown below. Ensure they click into place.



3. Use foam tape to mount the air system to the XXX or other flat surfaces.

⚠

- Install antennas before powering on air system.
- Point antennas downward when in use and avoid obstructions to ensure transmission quality.
- Use only DJI antennas and install them correctly. Other antennas are incompatible.
- Do not apply excessive force on the antennas otherwise it may cause damages to the antennas.
- Do not unplug the antennas unless it is absolutely necessary. Use tweezers to clamp on the metal part of the antennas when unplugging the antennas.
- For use with large aircraft. Connect the antenna extension cable to the panel antenna before attaching the air system.
- Designed for DJI Spreading Wings aircraft. Place the panel antenna into the antenna mount, and then place the antenna mount onto the landing gear of the aircraft. Note that the panel antenna should be at a 90 degree angle to the landing gear. Watch the video tutorials on the DJI website for more

details.

2.2 Ground System Connection with Display Device

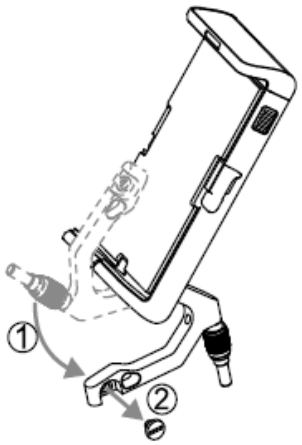
SDI, HDMI and USB ports output video. Select one output base on your choice of device.

- Connect monitor with SDI support to SDI port, and mount the SDI screen holder onto the Ground System.
- Connect monitor with HDMI support to HDMI Out port on Ground System for video.
- Connect your mobile device to the Ground System with a USB cable, and mount your mobile device safely with a mobile device holder. Use DJI GO App for video and flight controller information.

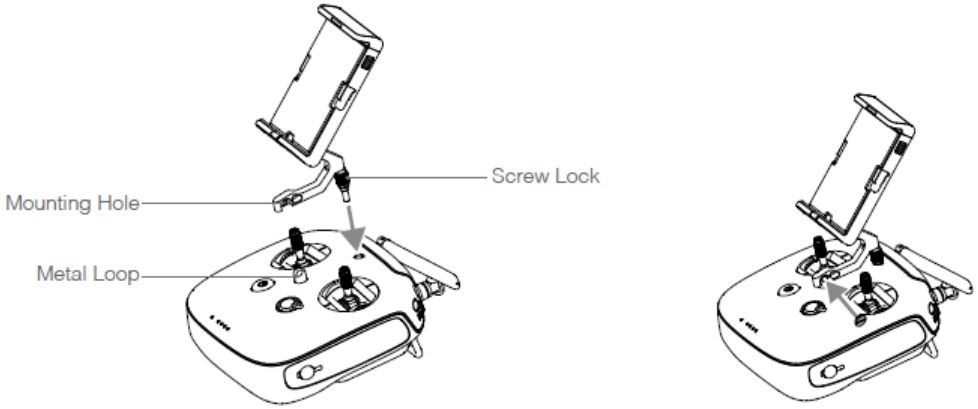
The below example uses the USB port connection, prepare a slotted screwdriver.

Mounting the Mobile Device Holder:

1. Unfold the Mobile Device Holder①. Remove the screw using the slotted screwdriver ②.

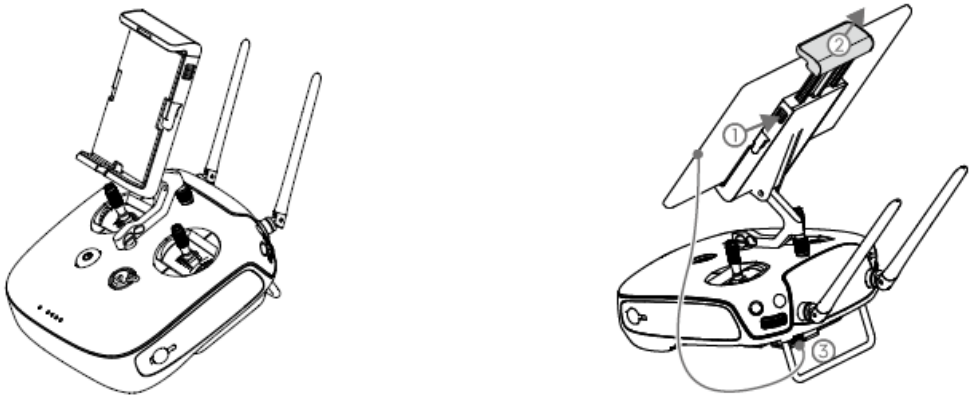


2. Plug the Mobile Device Holder into the Ground System and tighten the screw lock.
3. Line up the hole on the Mobile Device Holder with the metal loop on the Ground System. Insert and tighten the screw.



Tilt the Mobile Device Holder to the desired position and then adjust the antenna as shown. Follow the instructions below to connect your mobile device to the Ground System:

1. Press the button on the side of the Mobile Device Holder to release the clamp.
2. Place your mobile device inside the clamp and adjust it to secure your mobile device.
3. Connect your mobile device to the Ground System via a USB cable.



⚠ Do not attach SDI and HDMI devices to the Ground System simultaneously.

2.3 Connection Scenario

Lightbridge 2 offers several solutions to connect the gimbal to the flight controller. This section provides information about the most commonly seen solutions and their connection diagram. Follow the connection described in the solutions that best suits your requirements.

2.3.1 Air System

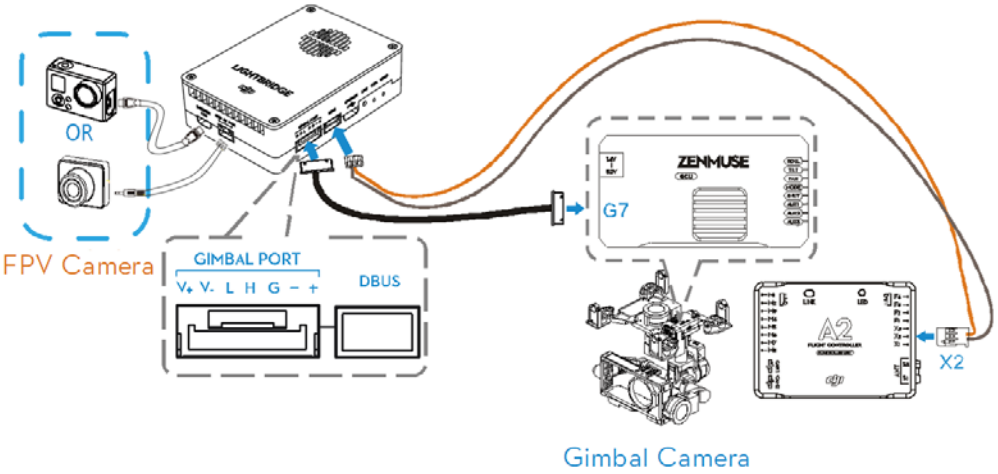
DJI HD Gimbal + DJI Flight Controller

When using with DJI HD gimbal, you can select either single or dual video source. By single video source mode, it means the air system relays either the gimbal camera video or the FPV camera video signal to the Ground System. These two video sources are mutually exclusive under single video source mode. On the other hand, the air system simultaneously relays gimbal camera and FPV camera video signal to the Ground System. Note that user should manually select "HD gimbal" in video output source when they are connecting DJI HD gimbal to the air system.

The connection steps are as follows:

1. Connect Gimbal Port on the air system with supplied Gimbal cable , then connect it to G7 port on DJI HD gimbal and CAN 2 Bus port on the flight controller.
2. Connect HDMI /AV port on the air system to the FPV camera.
3. Connect DBUS port on air system to DBUS port (X2 port) on flight controller with DBUS cable.
4. Refer to gimbal and flight controller manuals to complete connection.

The connection figure below take DJI HD gimbal and A2 fight controller as example:

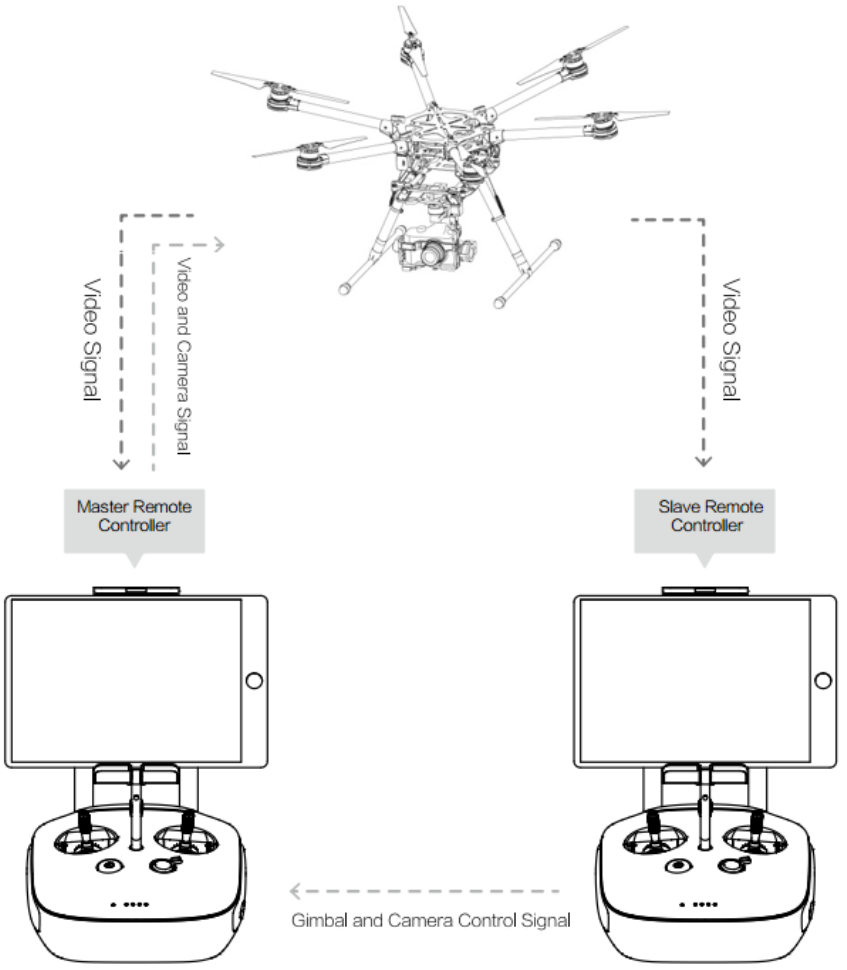


FPV camera is not needed in single video source mode.

2.3.2 Ground System

Dual Ground Systems Mode

More than one Ground System can connect to the same aircraft in Dual Ground System mode. In Dual Controllers mode, the Master Ground System controls the movement of the aircraft, while the Slave Ground System controls the movement of the gimbal and camera. When multiple Slave Ground Systems (max of 3) are connect to the aircraft, only the first connected Slave Ground System is able to control the gimbal, the remaining slave Ground System can view the live feed video from the aircraft, but they cannot control the gimbal.



⚠ Use the gimbal dial on the Ground System to control the pitch movement of the camera in the single Ground System mode, however, you cannot pan the camera.

3. Ground System

The Lightbridge 2 Ground System contains the remote controller, which integrates video downlink and aircraft control. The Ground System operates at 2.4 GHz with maximum transmission distance of 2km. The device features a number of standard and customizable buttons that allow users to quickly access certain aircraft functions, such as taking and reviewing photos/videos, as well as controlling the gimbal motion. It is powered by a 2S rechargeable battery.

- Compliance Version: The Ground System is compliant with both CE and FCC regulations.
- Operating Mode: Control can be set to Mode 1, Mode 2.
- Mode 1: The right stick serves as the throttle.
- Mode 2: The left stick serves as the throttle.

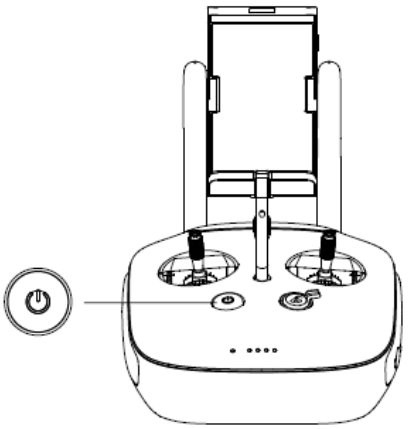
Do not operate more than 3 aircrafts within in the same area (size equivalent to a soccer field) to prevent transmission interference.

3.1 Ground System Operations

3.3.1 Powering On and Off the Ground System

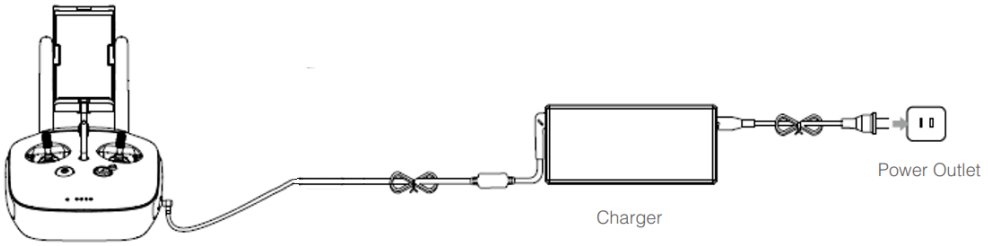
The Lightbridge 2 Ground System is powered by a 2S rechargeable battery with a capacity of 6000mAh. The battery level is indicated by the Battery Level LEDs on the front panel. Follow the steps below to power on/off your Ground System:

1. When powered off, press the Power Button once and the Battery Level LEDs will display the current battery level.
2. Press and hold t to power on the Ground System.
3. The Ground System will beep when it powers on. The Status LED will blink green (slave Ground System blinks solid purple) rapidly, indicating that the Ground System is linking to the aircraft, then turn solid green when linking is completed.
4. Press twice and hold the power button to power off the Ground System.



3.3.2 Charging Ground System

Charge the Ground System via the provided charger.



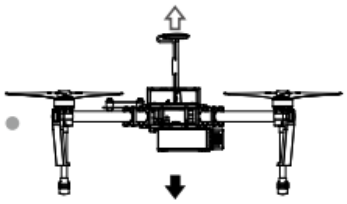
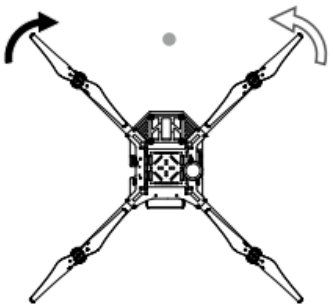
3.3.3 Controlling Aircraft

This section explains how to use the various features of the Ground System. Mode 2 (throttle stick on the left) is set by default.

Stick Neutral/mid point: Control sticks of the Ground System are placed at the central position.

Move the Stick: The control stick is pushed away from the central position.

Remote Controller (Mode 2)	Aircraft (indicates nose direction)	Remarks

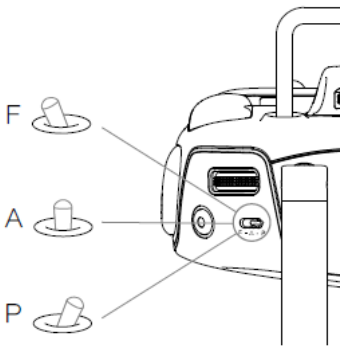
		Moving the Left Stick up/down changes the aircraft' s elevation. Push it up to ascend and down to descend. Use this stick to take off when the motors are spinning at idle speed. The aircraft will hover in place if the Left Stick is released.
		Moving the Left Stick left/right changes the heading of the aircraft. Push it left to rotate the aircraft counter clock-wise, and right to rotate the aircraft clockwise.
		Moving the Right Stick up/down changes the aircraft' s forward and backward pitch. Push it up to fly forwards and down to fly backwards. Push the Right Stick further for a larger pitch angle (max 35˚) and faster flight.
		Moving the Right Stick left/right changes the aircraft' s left and right pitch. Push it left to fly left and right to fly right. Push the Right Stick further for a larger pitch angle (max 35˚) and faster flight.

⚠ Always push the control sticks gently to prevent sudden and unexpected movement of the aircraft.

3.3.4 Flight Mode Switch

Toggle the switch to select the desired flight mode. You may choose between; P mode, F mode and A mode.

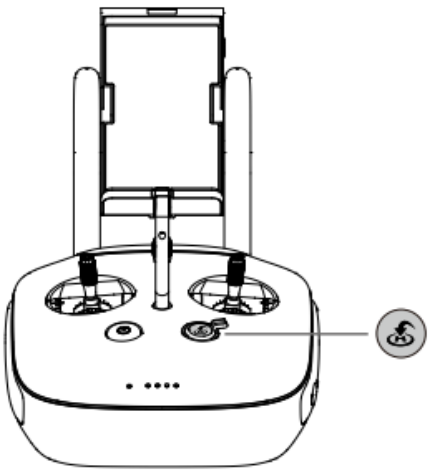
Figure	Flight Mode
F	F mode
A	A mode
P	P mode



P mode (Positioning): P mode works best when GPS signal is strong.
A mode (Attitude): The GPS is not used for holding position. The aircraft only uses its barometer to maintain altitude. If it is still receiving a GPS signal, the aircraft can automatically Return-To-Home if the Ground System signal is lost and if the Home Point has been recorded successfully.
F mode (Manual): Manual mode.

3.3.5 RTH Button

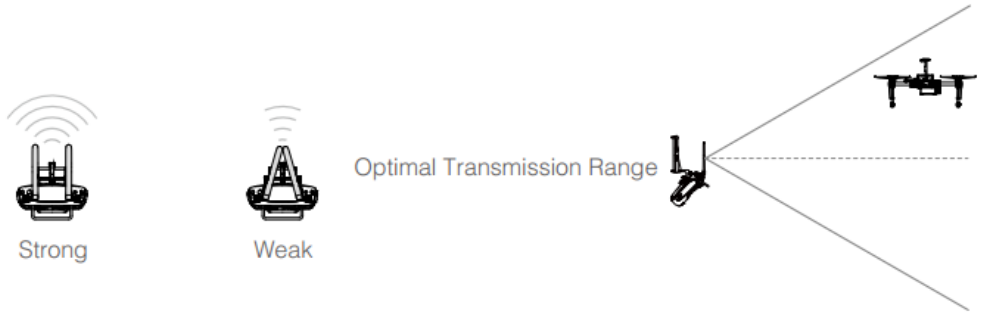
Press and hold this button to start the Return to Home (RTH) procedure. The LED around the RTH Button will blink white to indicate the aircraft is entering RTH mode. The aircraft will then return to the last recorded Home Point.



⚠ The RTH procedure can’ t be canceled since it started.

3.3.6 Optimal Transmission Range

The signal transmission between Air and Ground System perform best within the range that displayed in the picture shown below:



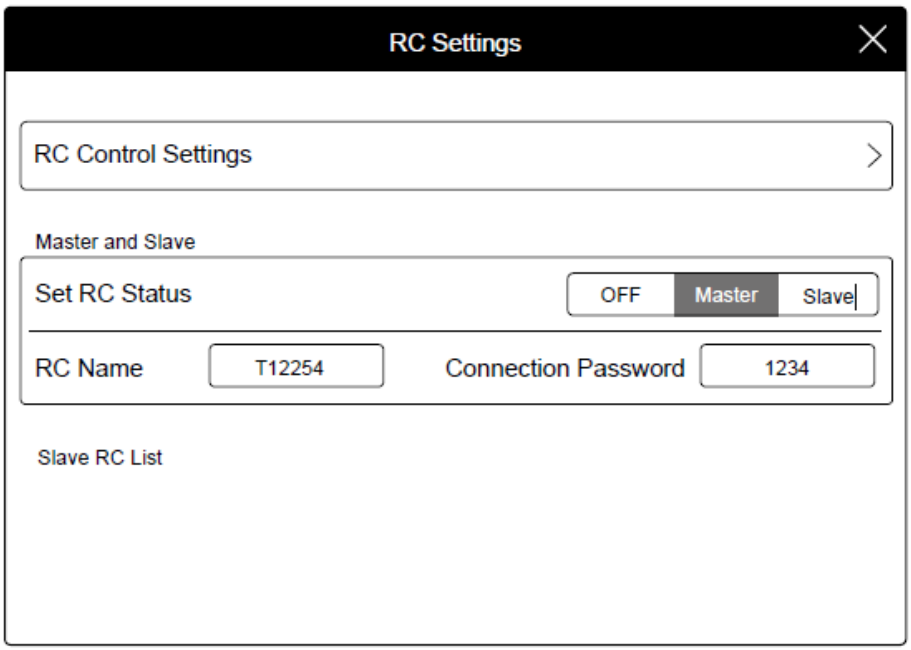
Ensure the aircraft is flying within the optimal transmission range. Adjust the distance and position between the operator and the air system to achieve optimal transmission performance.

3.2 Setting up Dual Ground Systems Mode

The Dual Ground Systems mode is disabled by default. Users must enable this feature on the Master Ground System through the DJI GO app. Follow the steps below for setup:

Master Ground System:

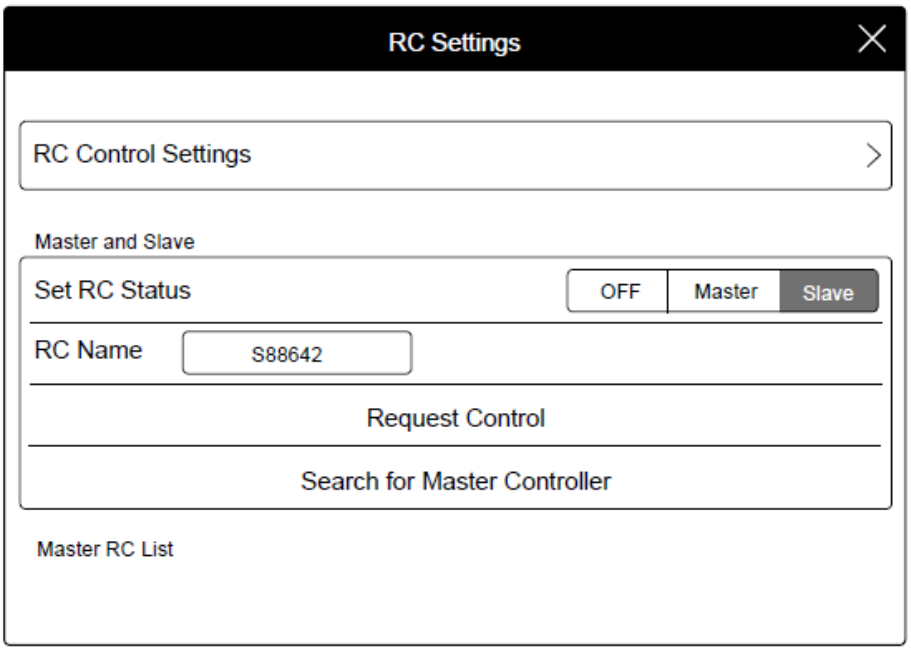
1. Connect the Ground System to your mobile device and launch the DJI GO app.
2. Go to the Camera View, and tap to enter the Ground System settings window.
3. Select Master in the Set RC Status section to set the Ground System as the Master Ground System.



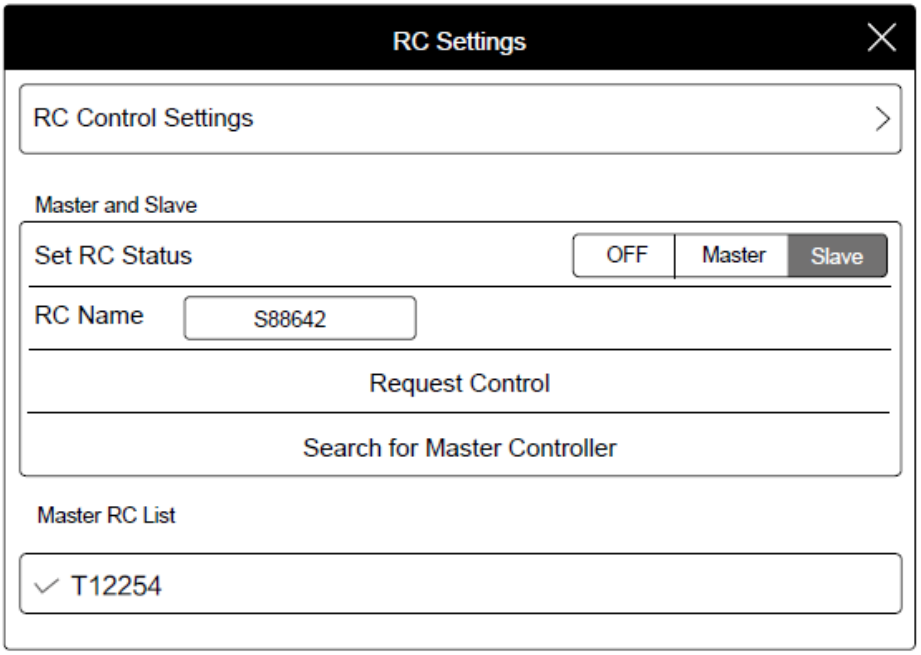
4. Enter the connection password for the Slave Ground System.

Slave Ground System:

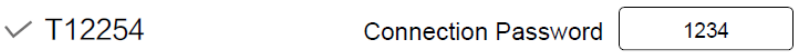
1. Select Slave in the Set RC Status section to set the Ground System as the Slave Ground System.



2. Tap Search for Master Controller to register the Master Ground System.



3. Select the name of the Ground System from the Master RC List and input the connection password to connect to the desired Master Ground System.

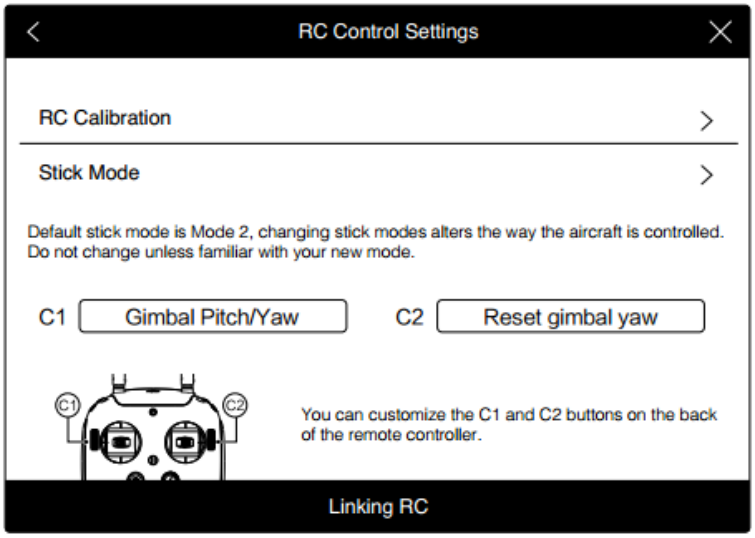


⚠ The Ground System cannot link to the aircraft or control aircraft movement if it is set to Slave. Set the Ground System as Master in the DJI GO app if you want to link the Ground System to the aircraft.

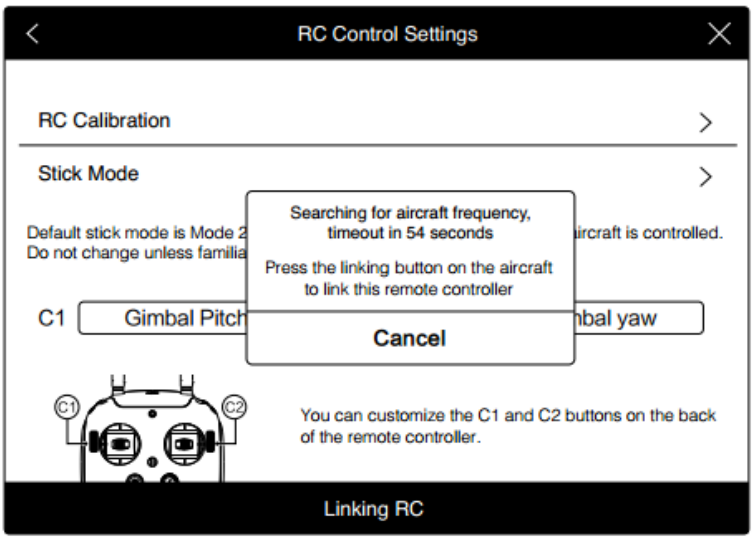
3.3 Linking the Ground System

The Ground System is linked to your air system by default. Linking is only required when a new Ground System is used for the first time. Follow these steps to link a new Ground System:

1. Power on the Ground System and connect it to your mobile device.
2. Launch the DJI GO app. Go to the DJI GO app > Camera View > > RC Control Settings >Linking RC.



3. The Ground System Status LED will blink blue and emit a 'beep' sound to indicate that the Ground System is ready to be linked.



4. Press the LINK Button on the air system to begin linking. The Ground System Status LED will glow solid green if linking is successful.

⚠

- The Ground System cannot link to the aircraft or control aircraft movement if it is set to Slave. Set the Ground System as Master in the DJI GO app if you want to link the Ground System to the aircraft.
- The Ground System will disconnect from the linked aircraft if another Ground System attempts to link to the same aircraft.

3.4 Ground System Compliance

The Ground System is compliant with CE and FCC standards.

4. Appendix

4.1 Specification

Performance Parameters	
Max Transmission Distance (outdoors and unobstructed)	2Km (Stadia, no interference)
EIRP	100mW
Working Frequency	2.4GHz ISM
Air System Antennas Gain	2dBi@2450MHz
Ground System Antennas Gain	3.5dBi@2450MHz
Physical Parameters	
Operating Temperature	-10~40℃
Dimension (no antennas)	• Air system: 68mm (L)X48mm (W)X21mm(H) • Ground System:182mm (L) X 167mm(W) X 104mm(H)
Gross Weight (no antennas)	• Air system: 70g • Ground System: 810g
Hardware Functions Supported	
Antenna Connector	MMCX Male (air system)
Air System Operating Voltage	9~12V
Air System Operating Amperage	650mA(@12V)
Ground System Battery	7.4V 6000mAH
Ground System Operating Amperage	900mA

4.2 Supported DJI Products

Please upgrade to the latest firmware version.

DJI HD Gimbal	Z15-GH4, Z15-5D3, Z15-A7
Flight Control System	A2, WooKong-M

4.3 Supported Video Sources

Mode	Format
AV	PAL25，NTSC30
HDMI	720p50，720p60，1080i50，1080i60，1080p25，1080p30，1080p50，1080p60

4.4 Supported Video Outputs

Mode	Format
HDMI	720p50，720p60，1080i50，1080i60，1080p50，1080p60
SDI	720p50，720p60，1080i50，1080i60，1080p50，1080p60

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

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 complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio

exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne

doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage

radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.