

# PHANTOM 2 User Manual v1.2

For PHANTOM 2 Flight Controller Firmware version V3.08

& PHANTOM 2 Assistant version V3.4

& PHANTOM RC Assistant version V1.1

2014.10

Congratulations on purchasing your new DJI product. Please thoroughly read the entire contents of this manual to fully use and understand the product.

It is advised that you regularly check the PHANTOM 2's product page at [www.dji.com](http://www.dji.com) which is updated on a regular basis. This will provide services such as product information, technical updates and manual corrections. Due to any unforeseen changes or product upgrades, the information contained within this manual is subject to change without notice.

DJI and PHANTOM 2 are registered trademarks of DJI. Names of product, brand, etc., appearing in this manual are trademarks or registered trademarks of their respective owner companies. This product and manual are copy righted by DJI with all rights reserved.

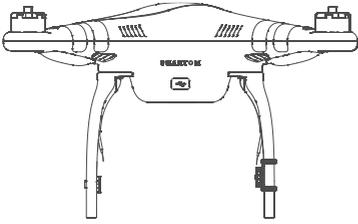
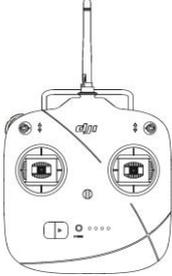
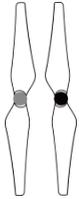
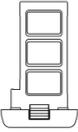
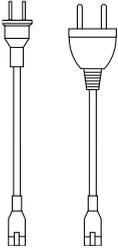
If you have any questions or concerns regarding your product, please contact your dealer or DJI Customer Service.

# Content

<b>CONTENT</b> .....	<b>2</b>
<b>IN THE BOX</b> .....	<b>4</b>
<b>LEGEND</b> .....	<b>4</b>
<b>1. PHANTOM 2 AIRCRAFT</b> .....	<b>5</b>
1.1 BUILT-IN FLIGHT CONTROL SYSTEM INSTRUCTIONS.....	5
1.2 CONNECTIONS WITH OTHER DJI PRODUCTS.....	5
<i>Important Notes of Using with Other DJI Products</i> .....	6
<i>Connections with Other DJI Products</i> .....	7
1.3 LED FLIGHT INDICATORS DESCRIPTION .....	11
1.4 NOTES FOR PHANTOM 2 USING WITH OTHER DJI PRODUCTS .....	12
<b>2 PROPELLERS</b> .....	<b>13</b>
2.1 ASSEMBLY.....	13
2.2 DISASSEMBLY .....	13
2.3 NOTES .....	13
<b>3 REMOTE CONTROL</b> .....	<b>14</b>
3.1 POWER ON THE REMOTE CONTROL.....	14
3.2 REMOTE CONTROL LED INDICATOR STATUS .....	15
3.2.1 <i>Remote Control Power LED Indicator Status</i> .....	15
3.2.2 <i>Remote Control Battery Level Indicator Status</i> .....	15
3.3 ANTENNA ORIENTATION .....	16
3.4 REMOTE CONTROL OPERATION.....	16
3.5 LINKING THE REMOTE CONTROL & BUILT-IN RECEIVER.....	18
<b>4 INTELLIGENT BATTERY</b> .....	<b>19</b>
4.1 CHARGING PROCEDURES.....	19
4.2 INSTALL THE BATTERY .....	20
4.3 BATTERY USAGE .....	20
4.4 DESCRIPTION OF THE BATTERY LEVEL INDICATOR.....	21
4.5 CORRECT BATTERY USAGE NOTES .....	22
<b>5 CALIBRATING THE COMPASS</b> .....	<b>23</b>

5.1 CALIBRATION WARNINGS .....	23
5.2 CALIBRATION PROCEDURES .....	23
5.3 WHEN RECALIBRATION IS REQUIRED.....	23
<b>6 FLIGHT .....</b>	<b>24</b>
6.1 FLYING ENVIRONMENT REQUIREMENTS .....	24
6.2 STARTING THE MOTORS .....	24
6.3 TAKEOFF/LANDING PROCEDURES.....	24
6.4 FAILSAFE FUNCTION.....	25
6.5 LOW BATTERY CAPACITY WARNING FUNCTION .....	27
6.6 FLIGHT LIMITS FUNCTION.....	27
<i>Max Height &amp; Radius Limits</i> .....	27
6.7 FLIGHT LIMITS OF SPECIAL AREAS .....	28
6.8 CONDITIONS OF FLIGHT LIMITS .....	30
<i>Disclaimer</i> .....	30
<b>7 ASSISTANT INSTALLATION AND CONFIGURATION .....</b>	<b>31</b>
7.1 INSTALLING DRIVER AND PHANTOM 2 ASSISTANT.....	31
7.2 USING THE PHANTOM 2 ASSISTANT ON A PC .....	32
7.3 FIRMWARE UPGRADE OF PHANTOM 2 .....	33
7.4 PHANTOM RC ASSISTANT DESCRIPTION .....	33
<b>8 APPENDIX.....</b>	<b>35</b>
8.1 SPECIFICATIONS.....	35
8.2 LED FLIGHT INDICATORS DESCRIPTION .....	35

## In the Box

PHANTOM 2	Remote Control-2.4GHz	Propeller Pair
		
Intelligent Battery	Charger	Plug Set
		
Screwdriver	Assistant Wrench	Cables
		
Micro-USB Cable	Screws	Accessories Box
		

## Legend



Forbidden(Important)



Caution



Tip



Reference

# 1. PHANTOM 2 Aircraft

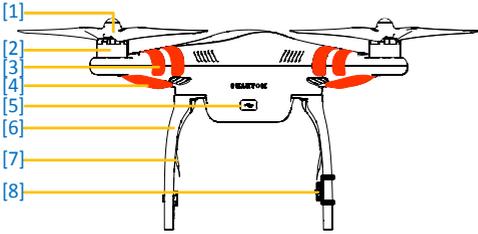


Figure 1-1

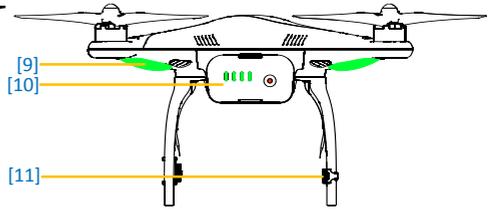


Figure 1-2

[1]Propeller [2]Motor [3]Front Side [4]Front LEDs [5]Micro-USB Port [6]Landing Gear [7]Receiver Antenna [8]CAN-Bus Connector [9]LED Flight Indicators [10]DJI Intelligent Battery [11]Compass

## 1.1 Built-in Flight Control System Instructions

The built-in flight control system is used to control the entire aircraft's functions in flight such as Pitch (forwards and backwards), Roll (left and right), Elevator (up and down) and Yaw (turn left or right). The flight controller contains the MC (Main Controller), IMU, GPS, compass, receiver.

The IMU (Inertial Measurement Unit) has a built-in inertial sensor and a barometric altimeter that measures both attitude and altitude. The compass reads geomagnetic information which assists the GPS (Global Position System) to accurately calculate the aircraft's position and height in order to lock the aircraft in a stable hover. The receiver is used to communicate with the remote control and the MC acts as the brains of the complete flight control system connecting and controlling all the modules together.



The PHANTOM 2 can be configured in the Assistant, by choosing Naza-M mode or Phantom 2 mode.

This manual is for Phantom 2 mode. Please refer to the [Naza-M V2 Quick Start Manual](#) for more information.

## 1.2 Connections with Other DJI Products

PHANTOM 2 is compatible with other DJI products, including ZENMUSE H3-2D and H3-3D gimbal , iOSD mini , iOSD Mark II. Below are connections for these products and wireless video transmission module.

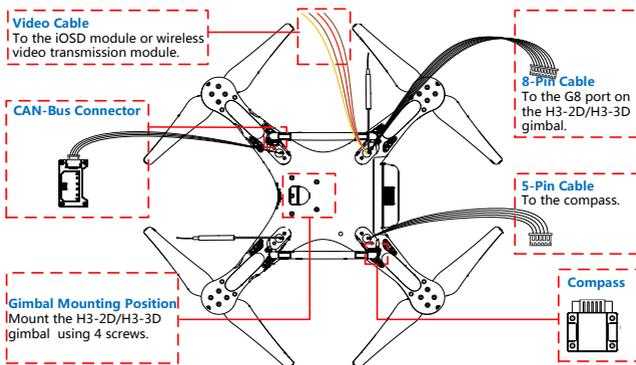


Figure 1-3

## Important Notes of Using with Other DJI Products

- ( 1 ) The video cable can provide power for the wireless video transmission module with a battery voltage (11.1V-12.6V) and a maximum current 2A.
- ( 2 ) Make sure the working current of the wireless video transmission module you connect can work with an operational voltage between 11.1V-12.6V and the total working current of the iOSD and wireless video transmission module is under 2A, as an overcurrent will damage the central board 's components. If the total current exceeds 2A, please be sure to provide power supplied from a separate power source for the wireless video transmission module.
- ( 3 ) PHANTOM 2 uses a 2.4GHz RC system. To avoid communication interference, it 's not recommended to use other 2.4GHz devices (including 2.4G Wi-Fi or 2.4G wireless video transmission module) except the 2.4G Bluetooth and 2.4G Datalink.
- ( 4 ) Be sure to keep the wireless video transmission module and other communicating devices away from the compass during installation and connection to avoid interference.
- ( 5 ) To improve the compatibility with ZENMUSE gimbals, the latest factory deliveries of PHANTOM 2 has updated to the Version 2 shown below. H3-2D/H3-3D gimbal can be directly installed for the Version 2 while for Version 1, a H3-3D adapter kit (coming soon) is required to install the H3-3D gimbal.

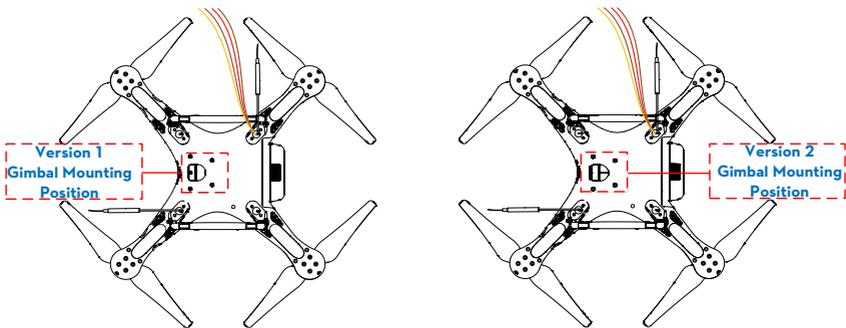


Figure 1-4

- ( 6 ) When using the H3-3D gimbal, please connect the 8-Pin cable of PHANTOM 2 to the G8 port of H3-3D shown below.

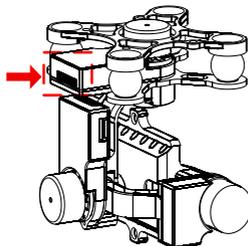


Figure 1-5

## Connections with Other DJI Products

- (1) Connecting the H3-2D and H3-3D gimbal and wireless video transmission module, the figure below uses H3-2D as an example.

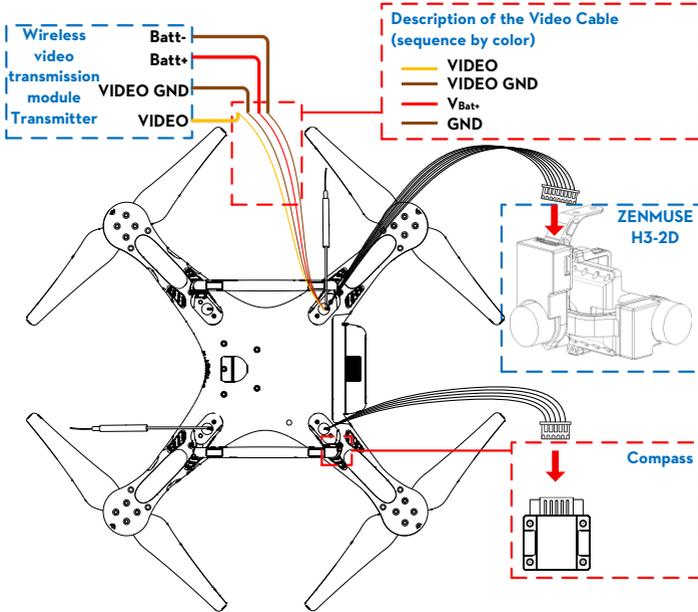


Figure 1-6

- (2) Connecting the H3-2D and H3-3D gimbal, iOSD mini and wireless video transmission module, the figure below uses H3-2D as an example.

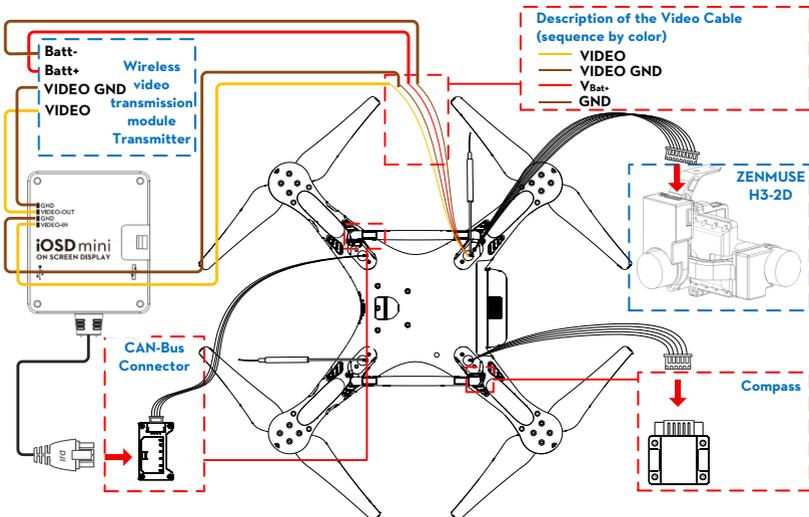


Figure 1-7

( 3 ) Connecting the H3-2D and H3-3D gimbal, iOSD mini and DJI specified wireless video transmission module AVL58, the figure below uses H3-2D as an example.

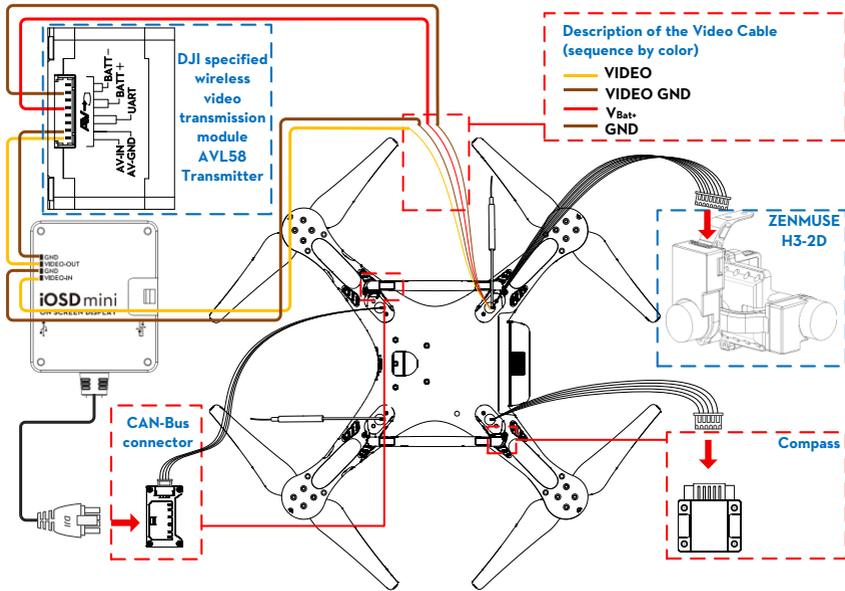


Figure 1-8



We recommend connecting the V<sub>Bat+</sub> port of the video cable to the two BATT+ ports of the AVL58 simultaneously. The same is true of the GND port of the video cable and two BATT- ports.

( 4 ) Connecting the H3-2D and H3-3D gimbal, iOSD Mark II and wireless video transmission module, the figure below uses H3-2D as an example.

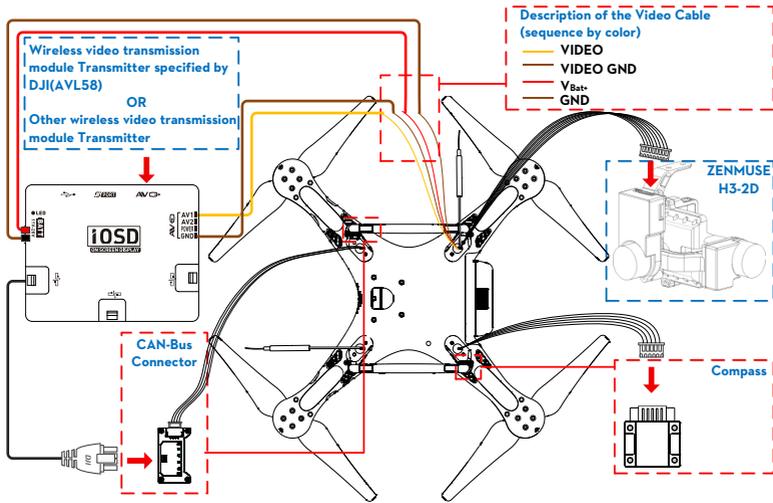
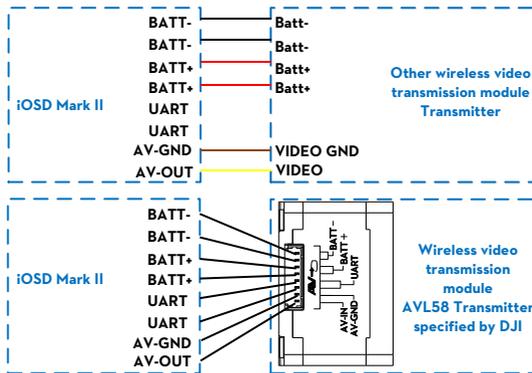


Figure 1-9

The diagram below illustrates the connection between the iOSD Mark II and the wireless video transmission module.



Use the 8-Pin cable in the iOSD Mark II package when connecting to the DJI specified wireless video transmission module AVL58.

### ( 5 ) Using the iPad Ground Station

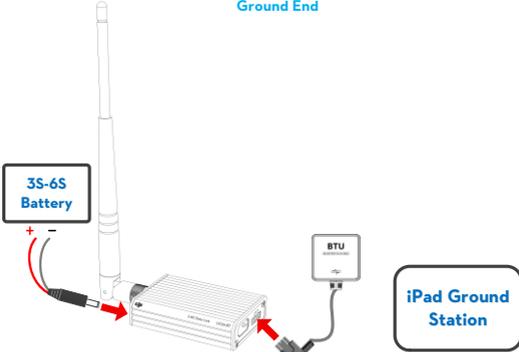
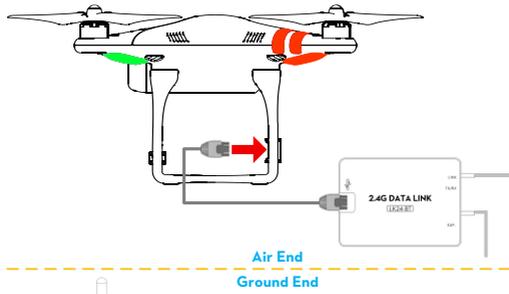


Figure 1-10



Connect the Air End of 2.4G Bluetooth Datalink to a spared CAN-Bus port of iOSD if an iOSD is used.

### ( 6 ) Using the PC Ground Station

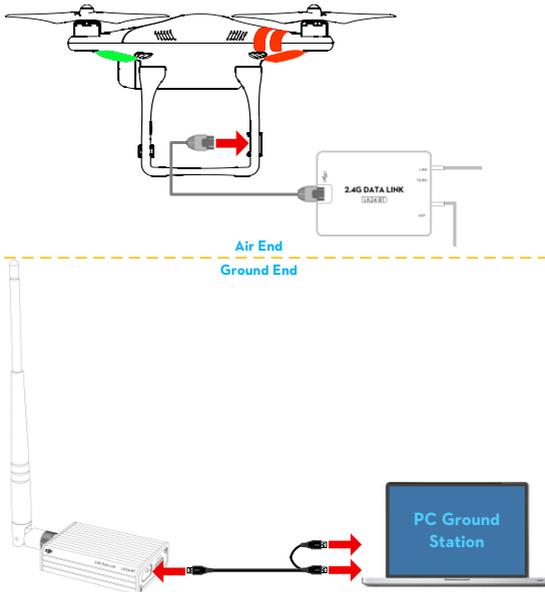


Figure 1-11

### 1.3 LED Flight Indicators Description

1. **LED flight indicators** are used to show the aircraft's current status. Once powered on, the indicators will light up.

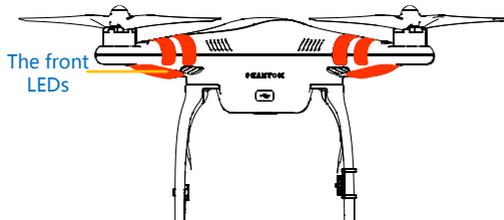


Aircraft in Normal status	Descriptions
●●●●●●	Power On Self-Test
●●●●●●	Warming Up & Aircraft cannot take off during warming up
●●●●●●	Ready to Fly
●●●●●●	Ready to Fly (non-GPS)
Aircraft in abnormal status	Warnings and errors
●●●●●●	Remote Control Signal Lost
●●●●●●	1 <sup>st</sup> Level Low Battery Capacity Warning
●●●●●●	2 <sup>nd</sup> Level Low Battery Capacity Warning
●●●●	Not Stationary or Sensor Bias is too big
■■■■	Errors & Aircraft cannot fly.
●●●●●●	Compass data abnormal because of ferro-magnetic interference or the compass needs calibration.

( 1 )  The LED indicators diagram above are for Phantom 2 mode. In Naza-M mode, LED indicators will work according to the Naza-M flight control system.

( 2 ) Connect to the PHANTOM 2 Assistant for detailed information about warnings and errors.

2. The front LEDs are for indicating where the nose of the aircraft is. They light up solid red only after the motors have spooled up.



## 1.4 Notes for PHANTOM 2 using with other DJI products

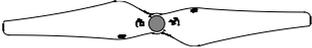
Before using PHANTOM 2 with other DJI products, users should connecting the products correctly and upgrade the firmware as requirements below .

Items to upgrade	Firmware versions required	Assistant for upgrading	Assistant version
P33OCB (built-in central board)	V1.0.1.19 or above	PHANTOM 2	V1.08 or above
Zenmuse H3-2D	CMU V1.0 , IMU V1.6 or above	PHANTOM 2	V1.08 or above
iOSD Mark II	V3.01 or above	iOSD	V4.0 or above
iOSD mini	V1.06 or above	iOSD	V4.0 or above

\*The iOSD Assistant is applied to both iOSD Mark II and iOSD mini.

## 2 Propellers

PHANTOM 2 uses the original 9-inch propellers which are classified by the color of each central nut. Damaged propellers should be replaced by purchasing new ones if necessary.

Propellers	Grey Nut (9450)	Black Nut (9450 R)
Diagram		
Assembly Location	Attach to the motor thread that <b>does not have a black dot</b> .	Attach to the motor thread that <b>has a black dot</b> .
Fastening/Un-fastening Instructions	 Lock: Tighten the propeller in this direction.	 Unlock: Remove the propeller in this direction.

### 2.1 Assembly

1. ( Figure 2-1 ) Remove the four warning cards from the motors after you've read them.
2. ( Figure 2-2 ) Prepare the two grey nut propellers and two black nut propellers. Make sure to match the black nut propellers with the correctly marked black dot motors. Tighten the propellers according to the fastening instructions.

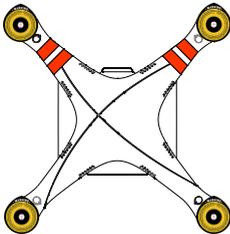


Figure 2-1

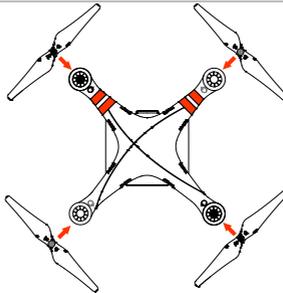


Figure 2-2

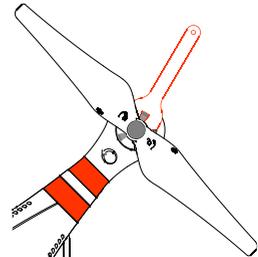


Figure 2-3

### 2.2 Disassembly

( Figure 2-3 ) Keep the motor deadlocked in place with the assistant wrench (or one hand) and remove the propeller according to the un-fastening instructions.

### 2.3 Notes

1. Propellers are self tightening during flight. **DO NOT** use any thread locker on the threads.
2. Make sure to match the propeller nut colors with the corresponding motors.
3. It is advised to wear protective gloves during propeller assembly and removal.
4. Check that the propellers and motors are installed correctly and firmly before every flight.
5. Check that all propellers are in good condition before flight. **DO NOT** use any ageing, chipped, or broken propellers.
6. To avoid injury, **STAND CLEAR** of and **DO NOT** touch the propellers or motors when they are spinning.
7. **ONLY** use original DJI propellers for a better and safer flight experience.

### 3 Remote Control

The PHANTOM 2 remote control can be configured in the PHANTOM RC Assistant. The sticks mode is Mode 2 on delivery.

	For upgraded remote control (models: NDJ6 or NRC900), select “Upgrade Version” in Phantom Assistant. For basic remote control (models: DJ6 or RC900), select “Basic Version” in Phantom Assistant.
--	---

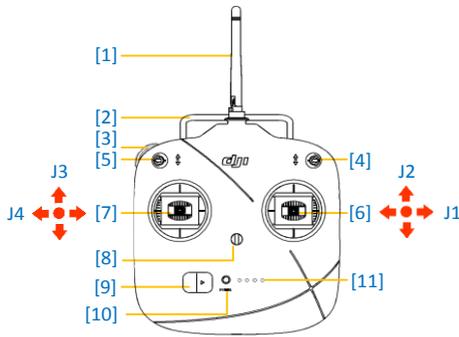


Figure 3-1

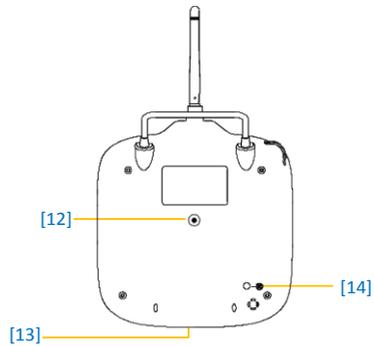
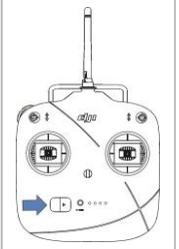


Figure 3-2

- [1]Antenna [2]Carrying Handle [3]Left Dial [4]3-Position Switch S1 [5]3-Position Switch S2 [6]Joystick(J1;J2)
- [7]Joystick2(J3;J4) [8]Neck Strap Attachment [9]Power Switch [10]Power Indicator
- [11]Battery Level Indicators LED1/LED2/LED3/LED4 (from left to right) [12]Trainer Port
- [13]Battery Charge & RC Assistant Port (micro-USB port) [14] Potentiometer

#### 3.1 Power on the Remote Control

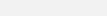
1. Set the S1 and S2 switches to the upper most position and ensure both joysticks are at the mid-point position. Then toggle on the power switch.
2. Push the power switch to the right to power on the remote control. If the power LED indicator is solid on, the remote control is functioning normally. The battery level indicators display the current battery level.



1. Please make sure the battery level of remote control is enough. If the low voltage warning alert sounds (refer to «Remote Control Power LED Indicator Status»), please recharge the battery as soon as possible.
-  2. Charge the remote control’s battery by using the included micro-USB cable. Using the incorrect type of charging cable may cause damage.
3. Turn off the remote control before charging. The power LED indicator will display solid red when charging is in progress. The LED indicators will display solid green when the battery is fully charged.

## 3.2 Remote Control LED Indicator Status

### 3.2.1 Remote Control Power LED Indicator Status

Power LED Indicator	Sound	Remote Control Status
	None	Functioning normally.
	None	Charging( remote control is powered off)
	None	Remote control joysticks calibration error, need to be re-calibrate.
	BB---BB---BB	Low voltage (from 3.5V-3.53V), recharge the remote control.
	B-B-B.....	Critical low voltage (from 3.45V-3.5V). Recharge the remote control immediately.
	B--B--B.....	Alert will sound after 15 minutes of inactivity. It will stop once you start using the remote control.



The remote control will power off automatically when battery voltage drops below 3.45V. Land and recharge the battery as soon as possible when the low voltage alert occurs to avoid loss of control during flight.

### 3.2.2 Remote Control Battery Level Indicator Status

The battery level indicators will show the current battery level during both the discharging process. The following is a description of the indicators.



: The LED is solid on



: The LED will blink regularly



: The LED is light off

Discharging process				
LED1	LED2	LED3	LED4	Current battery level
				75%-100%
				50%-75%
				25%-50%
				12.5%-25%
				0%-12.5%
				<0%

### 3.3 Antenna Orientation

The remote control's antenna should point skywards without obstructions for maximum communication range during flight.

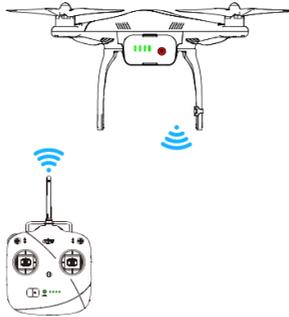


Figure 3-3

### 3.4 Remote Control Operation

The operations of remote control are based on mode 2 stick configuration.

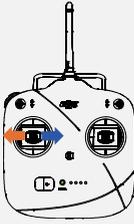
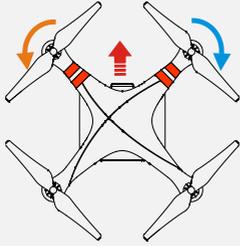
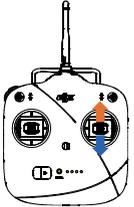
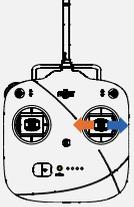
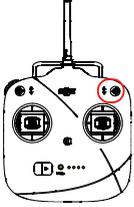
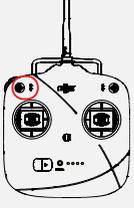
#### Definitions

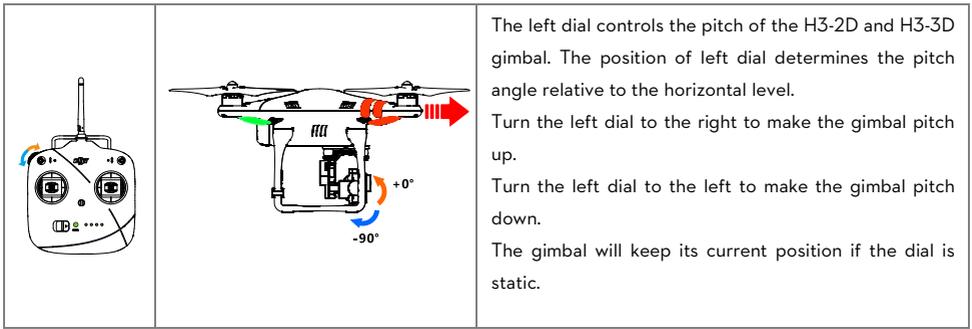
The **'stick neutral'** positions and **'stick released'** mean the control sticks of the remote control are placed at the central position.

To **'move the stick'** means that the stick of remote control is pushed away from the central position.

**Slide Lever** is used for the pitch control of the H3-2D and H3-3D gimbal.

Remote Control (Mode 2)	Aircraft ( ← nose direction )	Operation details
		<p>The throttle stick controls aircraft altitude/elevation.</p> <p>Push the stick up and the aircraft will rise.</p> <p>Pull the stick down and the aircraft will descend.</p> <p>The aircraft will automatically hover and hold its altitude if the sticks are centered.</p> <p>Push the throttle stick above the centered (mid-point) position to make the aircraft take off. When flying, we suggest that you push the throttle stick slowly to prevent the aircraft from sudden and unexpected elevation changes.</p>

		<p>The yaw stick controls the aircraft rudder.</p> <p>Push the stick left and the aircraft will rotate counter clock-wise.</p> <p>Push the stick right and the aircraft will rotate clock-wise. If the stick is centered, the aircraft will remain facing the same direction.</p> <p>The yaw stick controls the rotating angular velocity of the aircraft. Pushing the stick further away from center results in a faster aircraft rotation velocity.</p>
		<p>The pitch stick controls the aircraft's front &amp; back tilt.</p> <p>Push the stick up and the aircraft will tilt and fly forward.</p> <p>Pull the stick down and the aircraft will tilt and fly backward. The aircraft will keep level and straight if the stick is centered.</p> <p>Pushing or pulling the stick further away from center will result in a larger tilt angle (maximum of is 35°) and faster flight velocity.</p>
		<p>The roll stick controls the aircraft's left &amp; right tilt.</p> <p>Push the stick left and the aircraft will tilt and fly left.</p> <p>Push the stick right and the aircraft will tilt and fly right.</p> <p>The aircraft will keep level and straight if the stick is centered.</p> <p>Pushing the stick further away from center will result in a larger tilt angle (maximum of 35°) and faster flight velocity.</p>
	 <p>Position-1      Position-2      Position-3</p>	<p>S1 is for compass calibration. Toggle the S1 switch from position-1 to position-3 and back to position-1 at least 5 times, which will force the aircraft to enter into compass calibration mode.</p> <p>Users can configure position 3(bottom position) of the S1 switch to trigger the Failsafe in the Assistant.</p>
	 <p>OFF      Course Lock      Home point Lock</p>	<p>S2 is the IOC mode switch. IOC (Intelligent Orientation Control) function can be enabled in the Assistant when in Naza-M mode. Only use the IOC function after you are familiar with flying.</p>



- ⚠**
- ( 1 ) For `Ready to Fly` the aircraft will hover when all sticks are released.
  - ( 2 ) For `Ready to Fly (non-GPS)` the aircraft will only keep the altitude when all sticks are released.

### 3.5 Linking the Remote Control & Built-in Receiver

PHANTOM 2 has a built-in receiver, the link button and indicator located on the bottom of the aircraft as illustrated in the Figure 3-4.

The link between the remote control and aircraft is already established for you so you can initially skip this procedure. If you ever replace the remote control, re-establishing the link is required.

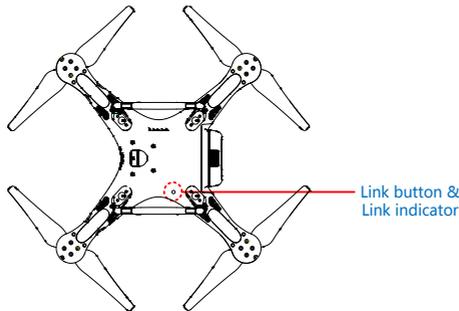


Figure 3-4

#### Linking procedures

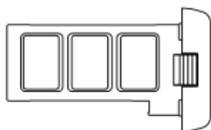
1. Power on the PHANTOM 2.
2. Turn on the remote control and place it 0.5m-1m away from the aircraft.
3. Push the link button with a thin object and hold it until the Link indicator blinks red, then release it.
4. When the Link indicator turns solid green, the link between the remote control and the built-in receiver has been successfully established.

Link Indicator	Status
	The remote control is turned off and there is no 2.4GHz signal around, please turn on the remote control.
	The receiver is ready for linking.
	There is 2.4GHz signal around but the remote control is not linked with the receiver,

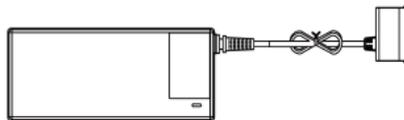
	please carry out the linking procedures.
	The remote control is linked with the receiver successfully.

## 4 Intelligent Battery

The intelligent battery is specially designed for the PHANTOM 2, with a battery capacity of 5200mAh, voltage of 11.1V and charge-discharge management functionality. The battery should only be charged with the DJI charger.



Intelligent Battery



Charger

DJI Intelligent Battery Functions	
( 1 ) Balance Charging	Automatically balance the voltage of each battery cell during charging.
( 2 ) Capacity Display	Display the current battery level.
( 3 ) Communicating	The main controller communicates with the battery via communication ports for battery voltage, capacity, current and other information.
( 4 ) Overcharging Protection	Charging stops automatically when the battery voltage reaches 12.8V to prevent overcharging damage.
( 5 ) Over Discharging Protection	Discharging stops automatically when the battery voltage reaches 8.4V to prevent over discharging damage.
( 6 ) Short Circuit Protection	Automatically cuts off the power supply when a short circuit is detected.
( 7 ) Sleep Protection	The battery will enter sleep mode after 10 minutes of inactivity to save power. The static current is 10nA in sleep mode when the battery is powered on without connecting to other devices.
( 8 ) Charging Temperature Detection	The battery will charge only when its temperature is within 0°C-55°C. If the battery temperature is out of this range, the battery will stop charging.

( 1 ) Before use, please read and follow the user manual, disclaimer, and the warnings on the battery.

Users take full responsibility for all operations and usage.



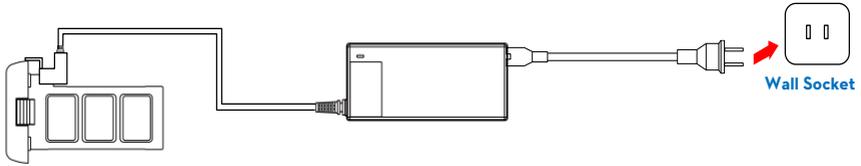
( 2 ) The battery should only be charged with the charger provided by DJI. DJI does not take any responsibility for operation of any charger from a third party.

### 4.1 Charging Procedures

1. Connect the charger to a wall socket (Use the plug set if necessary).
2. Connect the battery to the charger. If the current capacity of the battery is over 75%, you should power on the battery to begin charging.
3. The Battery Level indicators display current capacity level as the battery charges. Please refer to battery

level indicator description for details.

- The battery is fully charged when the Battery Level indicator lights are off. Please disconnect the charger and battery when the charging is completed.



## 4.2 Install the Battery

Push the battery into the battery compartment correctly as the following diagram shows. Make sure to push the battery into the compartment until you hear a 'click' sound.

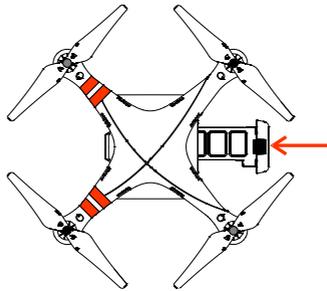


Figure 4-1



An incorrectly inserted battery may cause one of the following to occur: (1) Bad contact. (2) Unavailable battery information. (3) Unsafe for flight. (4) Unable to take off.

## 4.3 Battery Usage

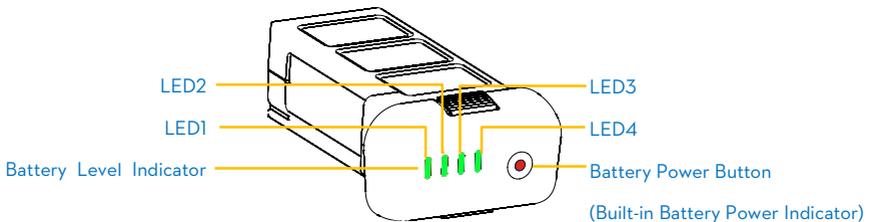


Figure 4-2

- Checking the battery level:** When the battery is powered off; pressing the battery power button once will indicate the current battery level. Refer to < Battery Level Indicator Description> for details.
- Powering on:** When the battery is powered off; press the battery power button once and then press and hold for 2 seconds to turn on the intelligent battery.
- Powering off:** When the battery is powered on; press the battery power button once and then press and hold for 2 seconds to turn off the intelligent battery.

**(4) Checking the battery life:** When the battery is powered off; press and hold the battery power button for 5 seconds to check the battery life. The battery level indicators will show the life and the battery power indicator will blink for 10 seconds, then all LEDs will light out and the intelligent battery will turn off. Refer to < Battery Level Indicator Description> for details.

 More battery information is available in the battery tab of the PHANTOM 2 Assistant.

#### 4.4 Description of the Battery Level Indicator

The battery level indicators will show the current battery level during both the charging and discharging process as well as battery life. The following is a description of the indicators.

 : The LED is solid on       : The LED will blink regularly

 : The LED is light off

Charging process				
LED1	LED2	LED3	LED4	Current battery level
				0%-25%
				25%-50%
				50%-75%
				75%-100%
				Full charged

Discharging process				
LED1	LED2	LED3	LED4	Current battery level
				87.5%-100%
				75%-87.5%
				62.5%-75%
				50%-62.5%
				37.5%-50%
				25%-37.5%
				12.5%-25%
				0%-12.5%
				<0%

Battery life				
LED1	LED2	LED3	LED4	Current battery life
				90%-100%

				80%-90%
				70%-80%
				60%-70%
				50%-60%
				40%-50%
				30%-40%
				20%-30%
				Less than 20%

#### 4.5 Correct Battery Usage Notes

1. **Never plug or unplug the battery into the aircraft when it is powered on.**
2. The battery should be charged in an environment that is between 0°C to 40°C, and be discharged in an environment that is between -20°C to 50°C. Both charging and discharging should be in an environment where the relative humidity is lower than 80%.
3. It's recommended to charge and discharge the battery thoroughly once every 20 charge/discharge cycles. Users should discharge the battery until there is less than 8% power left or until the battery can no longer be turned on. Users should then fully recharge the battery to maximum capacity. This power cycling procedure will ensure the battery is working at its optimal level.
4. For long term storage please place the battery with only a 40-50% capacity in a strong battery box securely. We recommend discharging and charging the battery completely once every 3 months to keep it in good condition. The capacity should be varied in such a cycle (40%-50%)—0%—100%—(40%-50%).
5. It's suggested you purchase a new battery after you have discharged your current battery over 300 times. Please completely discharge a battery prior to disposal.
6. It's suggested that you purchase a new battery if the current battery is swollen or damaged in any way.
7. Never try to recharge or fly with a battery that is swollen or damaged in any way.
8. Never charge the battery unattended. Always charge the battery on a non-flammable surface such as concrete and never near any flammable materials.
9. Safety is extremely important and users can get more information in the DISCLAIMER.

## 5 Calibrating the Compass

**IMPORTANT: Make sure to perform the Compass Calibration procedures prior to the first flight.**

The compass is very sensitive to electromagnetic interference which causes abnormal compass data and leads to poor flight performance or even flight failure. Regular calibration of the compass enables the compass to perform at its optimal level.

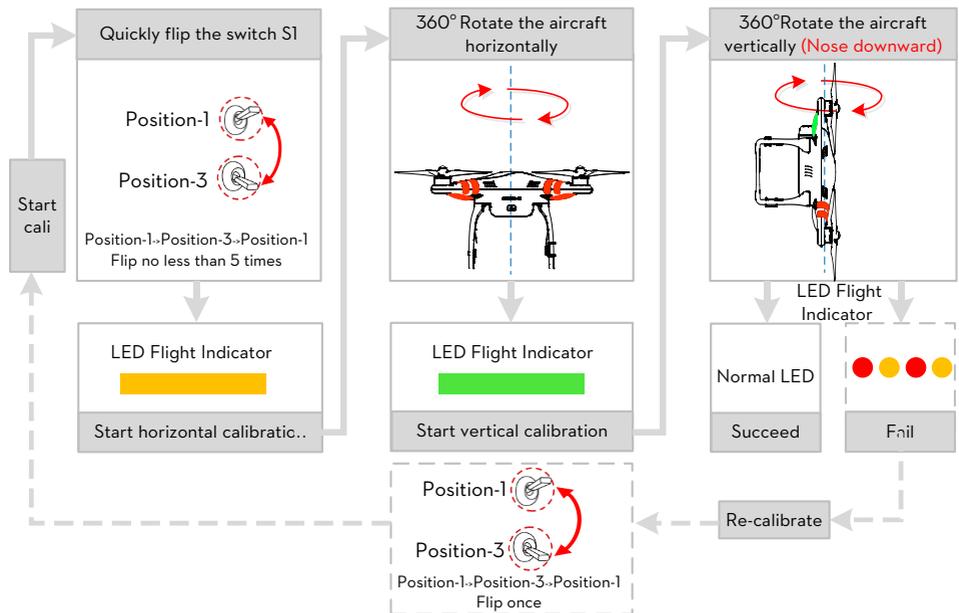
### 5.1 Calibration Warnings



- (1) DO NOT calibrate your compass where there is a possibility for the existence of strong magnetic interference such as magnetite, parking structures, and steel reinforcement underground.
- (2) DO NOT carry ferromagnetic materials with you during calibration such as keys or cellular phones.
- (3) Compass Calibration is very important; otherwise the flight control system will work abnormally.

### 5.2 Calibration Procedures

Please carry out the calibrating procedures in the flight field before flight. Please watch the quick start video of the PHANTOM 2 for more compass calibration details.



### 5.3 When Recalibration is required

- (1) When Compass Data is abnormal, the LED flight indicator will blink alternating between red and yellow.
- (2) Last compass calibration was performed at a completely different flying field/location.
- (3) The mechanical structure of the aircraft has changed, i.e. changed mounting position of the compass.
- (4) Evident drifting occurs in flight, i.e. the aircraft doesn't fly in straight lines.

## 6 Flight

### 6.1 Flying Environment Requirements

- ( 1 ) Before your first flight, please allow yourself some flight training (Using a flight simulator to practice flying, getting instruction from an experienced person, etc.).
- ( 2 ) DO NOT fly in bad weather, such as rain or wind (more than moderate breeze) or fog.
- ( 3 ) The flying field should be open and void of tall buildings or other obstacles; the steel structure within buildings may interfere with the compass.
- ! ( 4 ) Keep the aircraft away from obstacles, crowds, power lines, trees, lakes and rivers etc.
- ( 5 ) Try to avoid interference between the remote control and other wireless equipment (No base stations or cell towers around).
- ( 6 ) The flight control system will not work properly at the South Pole or North Pole.
- ( 7 ) Never use the aircraft in a manner that infringes upon or contravenes international or domestic laws and regulations.

### 6.2 Starting the Motors

A Combination Stick Command (CSC) is used to start the motors. Push the sticks according to one of the options below to start motors. Once the motors have started, release both sticks simultaneously. The same CSC is used to stop the motors.

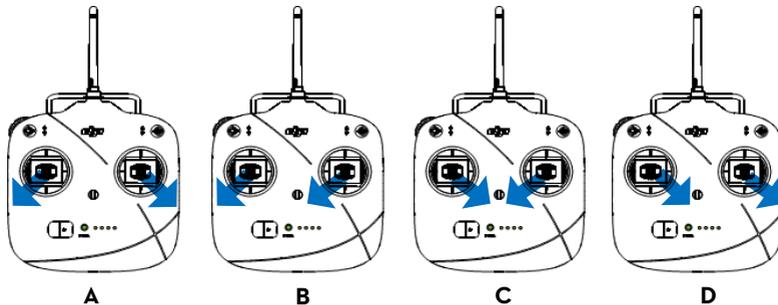


Figure 6-1

### 6.3 Takeoff/Landing Procedures

1. Start by placing the PHANTOM 2 on the ground with the battery level indicators facing you.
2. Turn on the remote control.
3. Power on the aircraft by turning on the intelligent battery.
4. When LED flight indicator blinks green/yellow, the PHANTOM 2 is entering Ready to Fly/Ready to Fly (non-GPS) mode. Start the motors with the CSC command.
5. Push the throttle stick up slowly to lift the aircraft off the ground. Refer to <Remote Control Operation> for more details.
6. Be sure you are hovering over a level surface. Pull down the throttle stick to descend. The stick will lock into

place and the aircraft will descend steadily.

7. After landing, leave the throttle stick down for 3 to 5 seconds to stop the motors. Return throttle stick to middle position after the motors have stopped.



You **SHOULD NOT** execute the CSC during normal flight! This will stop the motors and cause the aircraft to descend rapidly and drop without any type of control.

( 1 ) When the LED flight indicator blinks yellow rapidly during flight, the aircraft has entered into Failsafe mode, refer to <Failsafe Function> for details.

( 2 ) A low battery capacity warning is indicated by the LED flight indicator blinking red slowly or rapidly during flight. Refer to the <Low Battery Capacity Warning Function> for details.

( 3 ) Watch the quick start video about flight for more flight information.



( 4 ) Aircraft and battery performance is subject to environmental factors such as air density and temperature. Be very careful when flying 3000 meters (9800 feet) or more above sea level, as battery and aircraft performance may be reduced.

( 5 ) When used with a H3-3D gimbal, a GoPro camera, and the iOSD mini, your Phantom 2 will be very close to its maximum takeoff weight. It is not recommended that you attach the Phantom 2 propeller guards at this weight. Otherwise, the aircraft will be unable to fly normally.

## 6.4 Failsafe Function

The aircraft will enter Failsafe mode when the connection from the remote control is lost. The flight control system will automatically control the aircraft to return to home and land to reduce injuries or damage. The following situations would make the aircraft fail to receive a signal from the remote control and enter Failsafe mode:

- ( 1 ) The remote control is powered off.
- ( 2 ) The remote control is powered on but the SI is toggled in the position triggering the Failsafe (this must have been configured in the PHANTOM 2 Assistant).
- ( 3 ) The aircraft has flown out of the effective communication range of the remote control.
- ( 4 ) There is an obstacle obstructing the signal between the remote control and the aircraft, essentially reducing the distance the signal can travel.
- ( 5 ) There is interference causing a signal problem with the remote control.

Failsafe works differently depending on the mode the aircraft is in when Failsafe mode is initiated whether it is in the Ready to Fly or Ready to Fly (non-GPS) mode.

### Ready to Fly (non-GPS) ---- Automatic landing

The flight control system will try to keep the aircraft level during descent and landing. Note that the aircraft may be drifting during the descent and landing process.

### Ready to Fly ---- Automatic go home and land

The flight control system will automatically control the aircraft to fly back to the home point and land.

## Home Point

When the aircraft is initializing the Ready to Fly status, the aircraft will record the current GPS coordinates as the home point. It is recommended to lift off only after Ready to Fly status is confirmed for the safety of being able to fly back to home point successfully in case the Failsafe mode is initiated.

## Go Home Procedures

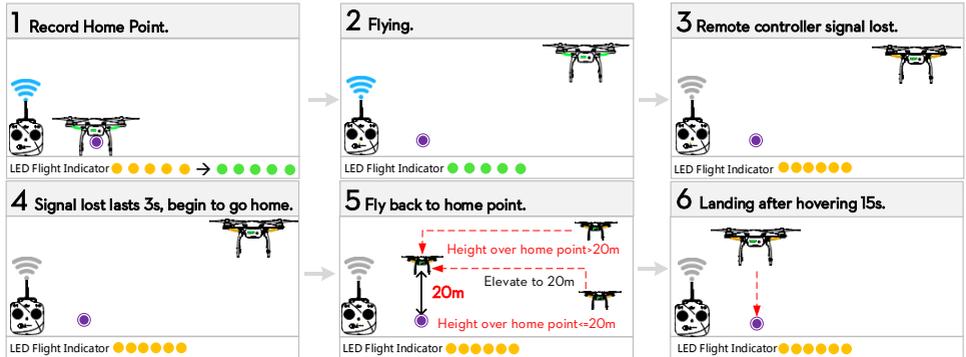


Figure 6-2



- (1) In a Failsafe situation, if less than 6 GPS satellites are found for more than 20 seconds, the aircraft will descend automatically.

In Phantom 2 mode, users can set a new home point manually when the aircraft is in “Ready to fly” status as long as a home point has been recorded automatically. Quickly flipping the S2 switch of the remote control from upper most to lower most positions 5 times or more will reset the current aircraft position as a new home point of PHANTOM 2. When successfully reset, you will see a series of rapid green blinks on the LED Flight Indicator. The definition of “home point” is:



- (1) The home point is the place PHANTOM 2 returns to when the control signal is lost, which is recorded last time.
- (2) The home point is used to calculate the horizontal distance between you and the aircraft, the

distance will be displayed as  if using iOSD module.

## Regaining Control during Failsafe Procedure

Position of Switch S1	 Position-1	 Position-2	 Position-3 (No triggering the Failsafe)
How to regain control	When the S1 switch is switched to Position-1, toggle the S1 switch to any other position once to regain control. If remote control’s signal is recovered, control is returned back to the pilot.	Regain control as soon as signal is recovered.	

## 6.5 Low Battery Capacity Warning Function

The low battery capacity warning alerts users when the battery is close to depletion during flight. When it appears, users should promptly fly back and land to avoid accidental damage. The PHANTOM 2 has two levels of low battery capacity warning. The first appears when the battery has less than 30% power and the second appears when it has less than 15% power.

- (1) When battery power drops below 30% and LED indicator will blink red slowly.
- (2) At lower than 15% the LED indicator will blink red rapidly, the PHANTOM 2 will also begin to descend and land automatically. After it has landed, keep the throttle stick at its lowest point or execute CSC.
- (3) There is a hidden third low battery threshold in addition to the 1st and 2nd level warnings. This uses 10.65V as its threshold. Both this voltage threshold and the 2nd Level Low Battery Warning will trigger auto-landing. Altitude can be maintained if necessary by pushing up on the throttle stick.



- (1) Remember to fly your PHANTOM 2 back as soon as you see a low battery capacity warning.
- (2) Keeping the battery contact needles and pads clean is very important. Any dirt and dust may cause a communication failure.

## 6.6 Flight Limits Function

All UAV (unmanned aerial vehicle) operators should abide by all regulations from such organizations at ICAO (International Civil Aviation Organization) and per country airspace regulations. For safety reasons, the flight limits function is enabled by default to help users use this product safely and legally. The flight limits function includes height, distance limits.

In Ready to Fly status, height, distance limits works together to restrict the flight. In Ready to Fly (non-GPS) status, only height limit works and the flying height restricted to be not over 120m.



- (1) The default parameters in the Assistant is compliant within the definitions of class G ruled by ICAO. (Refer to [Airspace Classification](#) to get more details). As each country has its own rules, make sure to configure the parameters to comply with these rules too, before using the PHANTOM 2.
- (2) Users in Mainland China can refer to [民用航空空域使用办法](#).

### Max Height & Radius Limits

The Max Height & Radius restricts the flying height and distance. Configuration can be done in the PHANTOM 2 Assistant. Once complete, your aircraft will fly in a restricted cylinder.



Figure 6-3

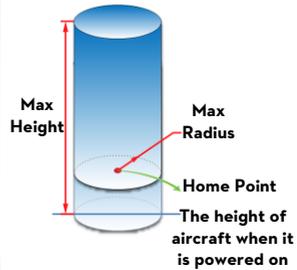


Figure 6-4

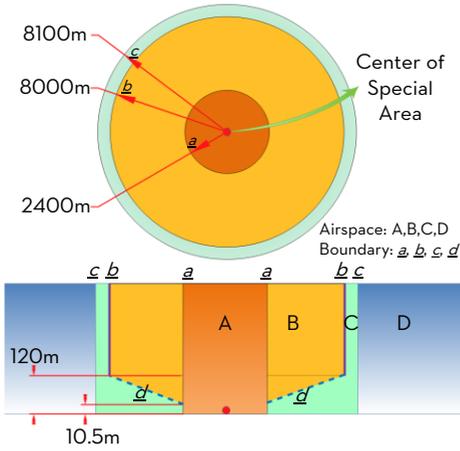
Ready to Fly <span style="color: green;">●●●●●</span>			
	Limits	Ground Station	Rear LED flight indicator
<b>Max Height</b>	The flight height is restricted to fly under the max height.	Warning: Height limit reached.	None.
<b>Max Radius</b>	The flight distance is restricted to fly within the max radius.	Warning: Distance limit reached.	Rapid red flashings <span style="color: red;">●●●●●</span> when close to the Max radius limit.

Ready to Fly(non-GPS) <span style="color: yellow;">●●●●●</span>			
	Flight Limits	Ground Station	Rear LED flight indicator
<b>Max Height</b>	The flight height is restricted to fly under the minor height between the Max height and 120m.	Warning: Height limit reached.	None.
<b>Max Radius</b>	Not limited, no warnings or LED indicators.		

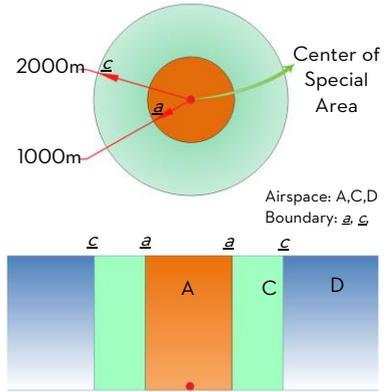
- (1) If the aircraft flies out of the limits, you can still control your aircraft except to fly it further away.
- (2) If the aircraft is flying out of the max radius in Ready to Fly (non-GPS) status, it will fly back within the limits range automatically if 6 or more GPS satellites have been found.

## 6.7 Flight Limits of Special Areas

Special areas include airports worldwide. All special areas are listed on the DJI official website. Please refer to <http://www.dji.com/fly-safe/category-mc> for details. These areas have been divided into category A and category B.



Category A



Category B

Ready to Fly <span style="color: green;">●●●●●</span>		
Airspace	Limits	Rear LED Flight Indicator
<b>A</b> Orange	Motors will not start. If the Phantom flies into a special area in Ready to Fly (non-GPS) mode and Ready to Fly mode activates, it will automatically descend and land then stop its motors.	<span style="color: red;">●●●●●</span>
<b>B</b> Yellow	If the Phantom flies into a special area in Ready to Fly (non-GPS) mode and Ready to Fly mode activates, it will descend to airspace C and hover 5 meters below edge <u>d</u> .	
<b>C</b> Green	No restrictions of flight, but the Phantom will not enter Category A, the aircraft can fly free, but it will not enter Airspace B through Boundary <u>b &amp; d</u> . Around Category B sites, the phantom can fly freely, but it will not enter into Airspace A through Boundary <u>a</u> .	
<b>D</b> Blue	No restrictions.	None.



**Semi-automatic descent:** All stick commands are available except the throttle stick command during the descent and landing process. Motors will stop automatically after landing. Users must toggle the S1 switch to regain control. This is the same as regaining control during Failsafe. Please refer to [Regaining Control During Failsafe Procedure \(Page23\)](#).



- When flying in the airspace (A/B/C) of restricted special area, LED flight indicators will blink red  quickly and continue for 3 seconds, then switch to indicate current flying status and continue for 5 seconds at which point it will switch back to red blinking.
- For safety reasons, please do not fly close to airports, highways, railway stations, railway lines, city centers and other special areas. Try to ensure the aircraft is visible.

## 6.8 Conditions of Flight Limits

In different working modes and flight modes, flight limits will differ according to number of GPS satellites found. The following table demonstrates all the cases(√: available; ×:unavailable).

All flights are restricted by height, distance and special areas simultaneously. The Failsafe and Ground Station operations are not restricted to flight limits, but if Ground Station function is used, the flight will be restricted the special area limits built in to Ground Station. Refer to the Ground Station manual for details.

Phantom mode			
Flight Status	Limits of Special Area	Max Height	Max Radius
Ready to Fly	√	√	√
Ready to Fly (non-GPS)	×	√	×

Naza-M mode				
Control Mode	number of GPS found	Limits of Special Area	Max Height	Max Radius
GPS	≥6	√	√	√
	<6	×	√	×
ATTI.	≥6	√	√	×
	<6	×	√	×
Manual	≥6	×	×	×
	<6	×	×	×

### Disclaimer

Please ensure that you are kept up to date with International and Domestic airspace rules and regulations before using this product. By using this product, you hereby agree to this disclaimer and signify that you have read this fully. You agree that you are responsible for your own conduct and content while using this product, and for any direct or indirect consequences caused by not following this manual, violate or disregard any other applicable local laws, administrative rules and social habits thereof.

## 7 Assistant Installation and Configuration

### 7.1 Installing Driver and PHANTOM 2 Assistant

#### Installing and running on Windows

1. Download driver installer and Assistant installer in **EXE** format from the download page of PHANTOM 2 on the DJI website.
2. Connect the PHANTOM 2 to a PC via a Micro-USB cable.
3. Run the driver installer and follow the prompts to finish installation.
4. Next, run the Assistant installer and follow the prompts to finish installation.
5. Double click the PHANTOM 2 icon on your Windows desktop to launch the software.



The installer in EXE format only supports Windows operating systems (Win XP, Win7, Win8 (32 or 64 bit)).

#### Installing and running on Mac OS X

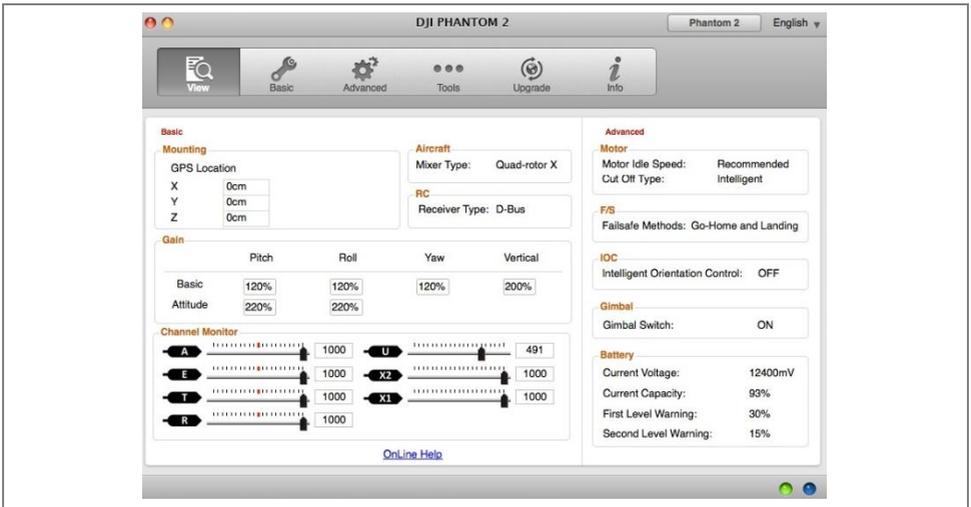
1. Download the Assistant installer in **DMG** format from the download page of PHANTOM 2 on the DJI website.
2. Run the installer and follow the prompts to finish installation.



3. **When launching for the first time** if use Launchpad to run the PHANTOM 2 Assistant, Launchpad won't allow access because the software has not been reviewed by Mac App Store.



4. Locate the PHANTOM 2 icon in the Finder, press the Control key and then click the PHANTOM 2 icon (or right-click the PHANTOM 2 icon using a mouse). Choose Open from the shortcut menu, click open in the prompt dialog box and then software will launch.
5. After the first successful launch, directly launching of the software can be achieved by double-clicking the PHANTOM 2 icon in the Finder or using Launchpad.

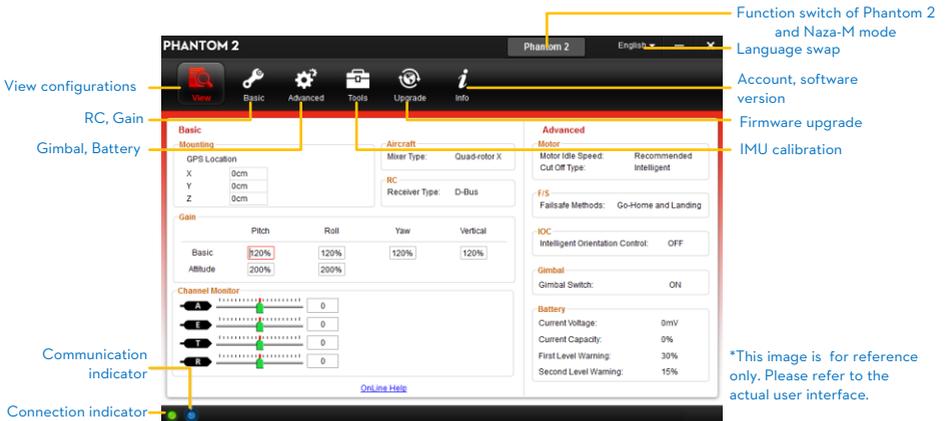


 Installer in DMG format supports only Mac OS X 10.6 or above.

 Usage of PHANTOM 2 Assistant on Mac OS X and Windows are exactly the same. The Assistant pages appear in other places of this manual are on the Windows for example.

### 7.2 Using the PHANTOM 2 Assistant on a PC

1. Start up the PC, power on the PHANTOM 2, then connect the PHANTOM 2 to the PC with a Micro-USB cable. DO NOT disconnect until configuration is finished.
2. Run the PHANTOM 2 Assistant and wait for the PHANTOM 2 to connect to the Assistant. Observe the indicators  on the bottom of the screen. When connected successfully, the connection indicator is  and communication indicator is blinking .
3. Choose [Basic] or [Advanced] configuration pages.
4. View and check the current configuration in the [View] page.



(1) Users should not enable the Naza-M function before finishing Advanced Flight Maneuvers procedure in the " PHANTOM Pilot Training Guide". If the Naza-M mode is enabled, users can switch the control mode between ATTI. Mode, GPS Mode or Manual Mode, and access the advanced settings (e.g. IOC). In addition, the LED located on the rear frame arms will display Naza-M flight status indications instead of the PHANTOM 2's indicators. Do not enable the Naza-M mode unless you are an experienced user or guided by a professional.



(2) You can change to the Phantom 2 mode by clicking the same button used to turn on the Naza-M mode. This operation will disable the Naza-M mode and enable Phantom 2 mode. All parameters will be returned to factory settings.

### 7.3 Firmware upgrade of PHANTOM 2

Please refer to the PHANTOM 2 Assistant to install driver and PHANTOM RC Assistant, and then follow the procedures below to upgrade the software and firmware; otherwise the PHANTOM 2 might not work properly.

1. An internet connection is required to upgrade PHANTOM 2's firmware.
2. Click the [Upgrade] icon to check the current firmware version and whether the installed firmware is the latest version. If not, click the relative links to upgrade.
3. Be sure to wait until the Assistant shows "finished". Click OK and power cycle the PHANTOM 2 after 5 seconds. Once completed, the firmware is up to date.

	Loader	Hardware ID	Firmware	Upgrade
Main Controller	---	1000684463	1.0.4	<a href="#">Latest version 1.05</a>
GPS	---	6.1.1.2	6.0.1.4	
Receiver-Phantom 2	15.0.0.6	0400000425	1.0.0.0	<a href="#">No updates</a>
P330CB	26.0.0.0	02F0028130	1.0.1.16	<a href="#">Latest version: 1.0.1.18</a>
Gimbal CMU	1.0	200050605	1.0	<a href="#">No updates</a>
Gimbal IMU	0.8	200050605	1.6	<a href="#">No updates</a>
Battery	1.0.0.0	000000636	16.0.0	<a href="#">No updates</a>

(1) DO NOT power off until the upgrade is finished.



(2) If the firmware upgrade failed, the main controller will enter a waiting for firmware upgrade status automatically. If this happens, repeat the above procedures.

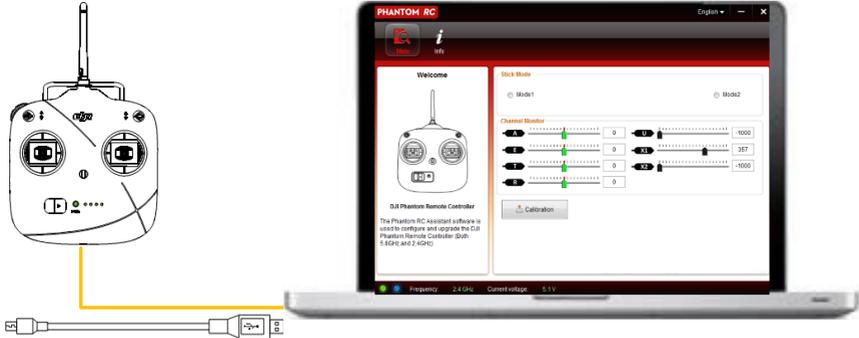


Firmware upgradable items: (1) Main Controller (2) P330CB(Main Board) (3) Receiver (4) Gimbal CMU (5) Gimbal IMU (6) Battery

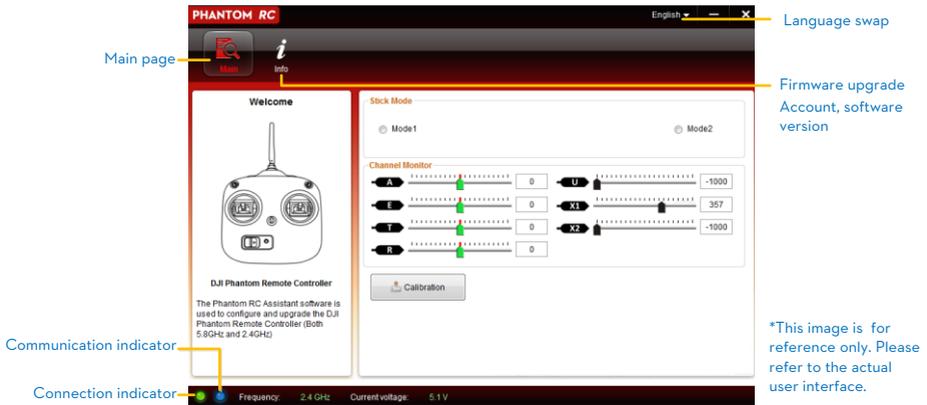
### 7.4 PHANTOM RC Assistant Description

Please follow the procedures to finish the configuration of the remote control.

1. Turn off the remote control and find the Micro-USB port on the bottom of it.
2. Start up the PC, power on the remote control, and then connect the remote control to the PC with a Micro-USB cable. DO NOT disconnect until the configuration is finished.
3. Run the PHANTOM RC Assistant and wait for the remote control to connect to the Assistant. Observe the indicators  on the bottom left of the screen. When connected successfully, the connection indicator is  and communication indicator is blinking .
4. Finish configuration in the [Main] page.
5. Finish upgrade in the [Info] page if necessary.



### Main Page of the 2.4GHz Remote Control



## 8 Appendix

### 8.1 Specifications

Aircraft	
Operating environment temperature	-10°C to 50°C
Power consumption	5.6W
Supported Battery	DJI Intelligent battery
Weight (including the battery)	1000g
Take-off Weight	≤1300g
Hovering Accuracy (Ready to Fly)	Vertical: 0.8m; Horizontal: 2.5m
Max Yaw Angular Velocity	200° /s
Max Tilt Angle	35°
Max Ascent / Descent Speed	Ascent: 6m/s; Descent: 2m/s
Max Flight Speed	15m/s (Not Recommended)
Wheelbase	350mm
2.4GHz Remote Control	
Operating Frequency	2.4GHz ISM
Communication Distance (open area)	1000m
Receiver Sensitivity (1%PER)	-97dBm
Working Current/Voltage	120 mA@3.7V
Built-in LiPo Battery Working Current/Capacity	3.7V, 2000mAh
DJI Intelligent Battery	
Type	3S LiPo Battery
Capacity	5200mAh, 11.1V
Charging Environment Range	0°C to 40°C
Discharging Environment Range	-20°C to 50°C

### 8.2 LED Flight Indicators Description

Aircraft in Normal status	Descriptions
	Power On Self-Test
	Warming Up & Aircraft cannot take off during warming up
	Ready to Fly
	Ready to Fly (non-GPS)
Aircraft in abnormal status	Warnings and errors
	Remote Control Signal Lost
	1 <sup>st</sup> Level Low Battery Capacity Warning

	2 <sup>nd</sup> Level Low Battery Capacity Warning
	Not Stationary or Sensor Bias is too big
	Errors & Aircraft cannot fly.*
	Compass data abnormal because of ferro-magnetic interference or the compass needs calibration.

\* Users can connect to the PHANTOM 2 Assistant to get detailed information about warnings and errors.