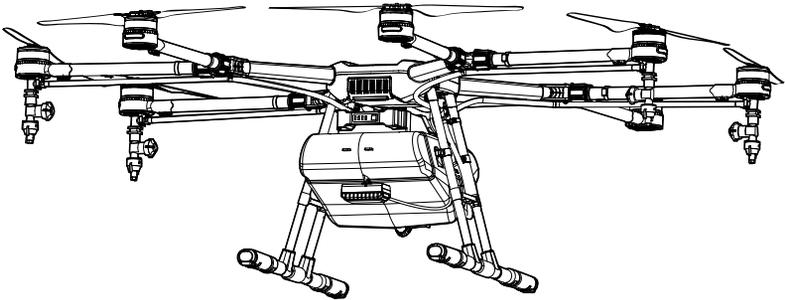


# AGRAS MG-1

User Manual V1.2

2016.07



### Searching for Keywords

Search for keywords such as “battery” and “install” to find a topic. If you are using Adobe Acrobat Reader to read this document, press Ctrl+F on Windows or Command+F on Mac to begin a search.

### Navigating to a Topic

View a complete list of topics in the table of contents. Click on a topic to navigate to that section.

### Printing this Document

This document supports high resolution printing.

## Information

The AGRAS™ MG-1 does not come with a battery. Please purchase the DJI™ approved MG-1 battery pack (Model: MG-12000). Read the battery's safety guidelines and take necessary precautions when handling the batteries to ensure your own safety. DJI assumes no liability for damage(s) or injuries incurred directly or indirectly from using batteries improperly.

## Using This Manual

### Legend

 Important

 Hints and tips

 Reference

### Before Flight

The following tutorials and manuals have been produced to help you get the most out of your Agram MG-1.

1. In the Box
2. Disclaimer and Safety Guidelines
3. Quick Start Guide
4. User Manual

Check all of the included parts listed in the In the Box document and read the Disclaimer and Safety Guidelines before flight. Complete the assembly and learn the basic operations with the help of the Quick Start Guide and the video tutorial on the official DJI website (<http://www.dji.com>). Refer to the User Manual for more comprehensive information.

### Watch Video Tutorial

Please watch the tutorial video below to learn how to install the Agram MG-1 correctly:

<http://www.dji.com/product/mg-1/info#video>



### Download Assistant Software

Download the MG-1 Assistant and DJI Assistant 2 from <http://www.dji.com/product/mg-1/info#downloads>



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# Safety at a Glance

## 1. Pesticide Usage

- Pesticides are poisonous and can pose serious risks to human safety. Use them in strict accordance with their specifications.
- Residue on the equipment caused by splashes or spills when pouring and mixing the pesticide can irritate your skin. Be sure to clean the equipment after mixing.
- Use clean water to mix the pesticide to avoid blocking the strainer. Clear any blockages before using the equipment.
- Wear protective clothing to prevent direct body contact with the pesticide. Always rinse your hands and skin after handling pesticides. Clean the aircraft and remote controller after applying the pesticide.
- Effective use of pesticides relies on pesticide density, spray rate, spray distance, aircraft speed, wind speed and wind direction. Consider all factors when using pesticides, but NEVER compromise the safety of people, animals and the environment in doing so.
- DO NOT contaminate rivers and sources of drinking water.



The Agras MG-1 aircraft is NOT a toy and is to be used by trained pilots only.

Note that 'Safety at a Glance' only provides a quick overview of the safety tips. Make sure you read and understand the remaining sections of this document.

## 2. Environmental Considerations

- Always fly at locations that are clear of building and other obstacles.
- DO NOT fly above or near large crowds.
- Avoid flying at altitudes above 50 m.
- Be very careful when flying over 2,000 m above sea level.
- Fly in moderate weather conditions with temperatures between 0° to 40° C.

## 3. Pre-flight Checklist

- Remote controller and aircraft batteries are fully charged.
- Landing gear and spray tank are firmly in place.
- All screws are firmly tightened.
- Propellers and frame arms are unfolded, and arm sleeves are firmly tightened.
- Propellers are in good condition and firmly tightened.
- There is nothing obstructing the motors.
- Spraying system is without any blockage and works properly.
- Compass is calibrated at every new flight location.

## 4. Operation

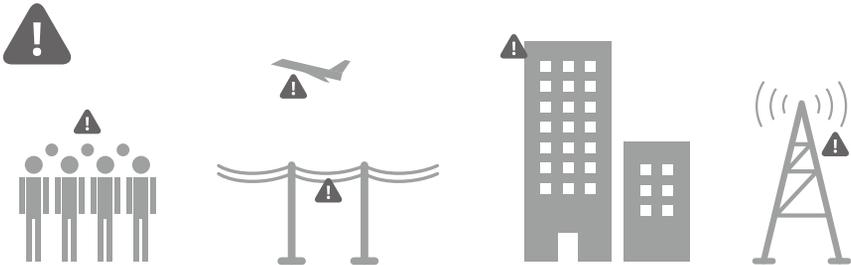
- Stay away from the rotating propellers and motors.
- The takeoff weight must not exceed 24.5 kg (taking off at sea level).
- Maintain line of sight of your aircraft at all times.
- NEVER stop the motors mid-flight.
- DO NOT answer incoming calls during flight.
- DO NOT fly under the influence of alcohols or drugs.
- During the Return-to-Home procedure, you can adjust the altitude to avoid obstacles.
- In the instance of a Low Battery Warning, land the aircraft at a safe location.
- Always keep your hands on the remote controller so long as the motor is still spinning. Power off the aircraft before turning off the remote controller after landing.

## 5. Maintenance and Upkeep

- DO NOT use aged, chipped or broken propellers.
- Remove or empty the spray tank during transportation or when not in use to avoid damaging the landing gear.
- Recommended storage temperature (empty spray tank): between -20° and 40° C.
- Clean the aircraft immediately after spraying.
- Inspect the aircraft every 100 flights or after flying for over 20 hours.
- For more maintenance guidelines, refer to the Product Care section in Disclaimer and Safety Guidelines.

## 6. Observe Local Laws and Regulations

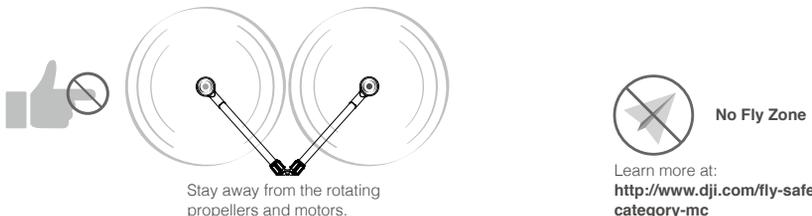
- DO NOT fly in the No Fly Zones. You can find a complete list of these areas at <http://www.dji.com/fly-safe/category-mc>
- The DJI No Fly Zone is not a replacement for local government regulations or good judgment.
- Avoid flying in areas where rescue teams are actively using the airspace.



Avoid flying over or near obstacles, crowds, high voltage power lines or bodies of water.  
 DO NOT fly near strong electromagnetic sources such as power lines and base stations as it may affect the onboard compass.



DO NOT use the aircraft in adverse weather conditions such as rain (precipitation rate exceeding 25 mm in 12 hours), wind speeds exceeding 8 m/s, fog, snow, and lightning.



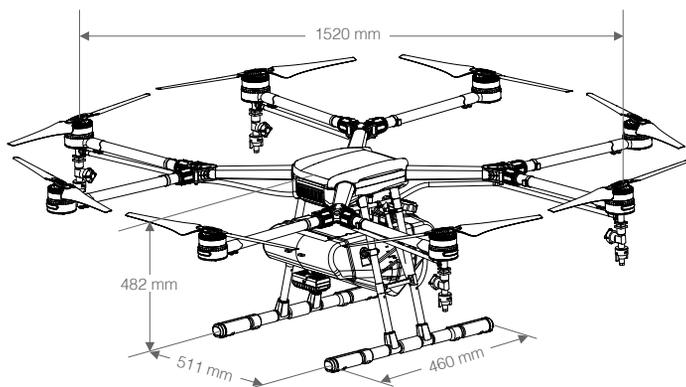
# Profile

## Introduction

The Agras MG-1 (abbreviated as MG-1) is a battery-powered multirotor aircraft designed for agricultural applications in variety of environments and terrains, including terraces, fields, forests and orchards. It is dust-proof, water-proof (IP43 protection rating, IEC standard 60529) and made of anti-corrosive materials, allowing it to be rinsed clean.

The MG-1 also includes DJI's industry-leading flight control system and three useful Operation Modes: Smart, Manual and Manual Plus. A microwave radar underneath the aircraft makes the MG-1 uniquely versatile across different terrains and the combined Altitude Stabilization System automatically maintains the aircraft's height above plants to ensure optimal spraying.

The remote controller features a Spraying Status Panel decorated with intuitive icons and a range of controls for navigation, mode and spraying. While the MG-1 does all the hard work in the fields, you keep full control over it in the palm of your hands.



## Feature Highlights

The MG-1 provides three useful Operation Modes: Smart, Manual and Manual Plus.

In Smart Operation Mode, the aircraft will travel along a pre-planned route and spray liquid payload. Users can set the operation gap, flying speed and other parameters. The MG-1 can cover an area of 7-10 acres per hour.

In Manual Operation Mode, users can start and stop spraying manually and also adjust the spray rate.

In Manual Plus Operation Mode, the flying speed is restricted and the aircraft's heading is locked. Except for the heading, users can control the movement of the aircraft.

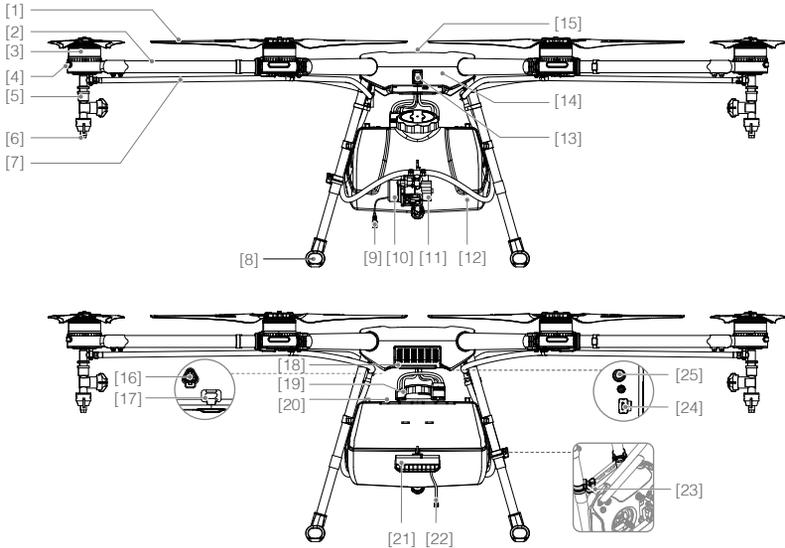
The MG-1 also includes two intelligent memory features: operation resumption and system data protection. When the operation mode is changed from Smart Operation Mode, operation resumption records a set point for the aircraft to return to when Smart Operation Mode is reinstated. System data protection keeps the system data for a period of time even when powered off so users can resume their missions after replacing the battery.

The spraying system includes a spray tank, sprinklers and other accessories. The four sprinklers placed on the aircraft's two sides provide well-distributed spraying and great coverage. The nozzles on the Agras MG-1 can also be swapped out to meet the needs of different applications.

The Altitude Stabilization System uses an advanced radar module to keep a constant height above crops in both Smart Operation Mode and Manual Plus Operation Mode.

## Overview

### Aircraft

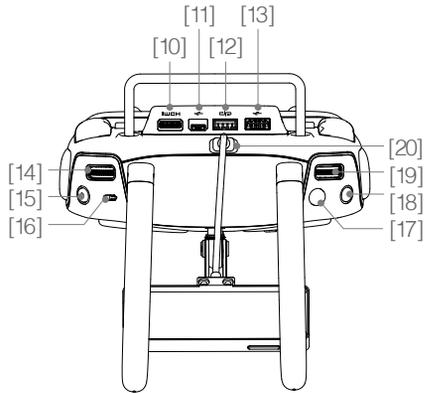
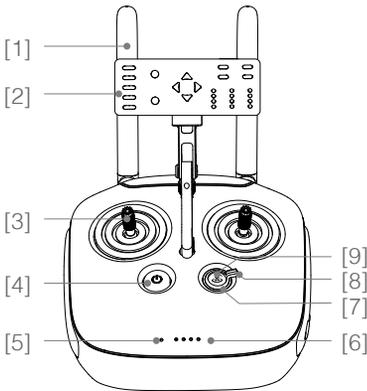


- |                            |  |   |
|----------------------------|--|---|
| [1] Propellers             | [11] Delivery Pump                           | [19] Power Ports                                |
| [2] Frame Arms             | [12] Spray Tank                              | [20] Battery Compartment                        |
| [3] Motors                 | [13] Aircraft Status Indicator               | [21] Radar Module                               |
| [4] Orientation Indicators | [14] Aircraft Body                           | [22] Radar Cable                                |
| [5] Sprinklers             | [15] GPS Module                              | [23] Remote Controller Holder                   |
| [6] Nozzles                | [16] Motor Port                              | [24] Lightbridge 2 / iOSD Data Port (Micro USB) |
| [7] Hoses                  | [17] Flight Controller Data Port (Micro USB) | [25] Radar Port                                 |
| [8] Landing Gear           | [18] Intake Vent (Aircraft's Front)          |   |
| [9] Pump Motor             |  |   |
| [10] Pump Motor            |  |   |

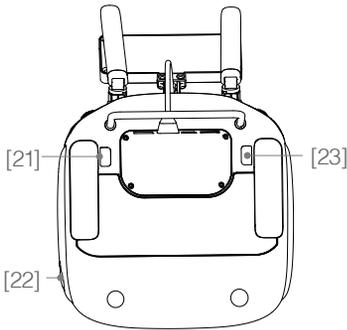


- DO NOT obstruct the GPS module located at the center of the aircraft, as this will reduce the GPS signal strength.
- The MG-1 does not come with a battery. Please purchase the DJI approved MG-1 battery pack (Model: MG-12000).

Remote Controller



- [1] **Antennas**  
Relays the aircraft control signals
- [2] **Spraying Status Panel**  
Displays the spraying status.
- [3] **Control Stick**  
Controls the aircraft movement. Can be set to Mode 1 or Mode 2, or to a custom mode.
- [4] **Power Button**  
Used to power on/off the remote controller.
- [5] **Status LED**  
Indicates whether the remote controller is linked to the aircraft.
- [6] **Battery Level LEDs**  
Display the current battery level.
- [7] **RTH Status LED**  
Circular LED around the RTH button which displays the RTH status.
- [8] **Operation Mode Switch**  
Used to switch between Smart, Manual and Manual Plus Operation Mode.
- [9] **RTH Button**  
Press and hold this button to initiate Return-to-Home (RTH).
- [10] **Mini HDMI Port**  
Reserved.
- [11] **Micro USB Port**  
Reserved.
- [12] **CAN Port**  
Connects to the Spraying Status Panel.
- [13] **USB Port**  
Connects to your mobile device to configure the remote controller.
- [14] **Spray Rate Dial**  
In Manual Operation Mode, turn the dial to adjust the spray rate.



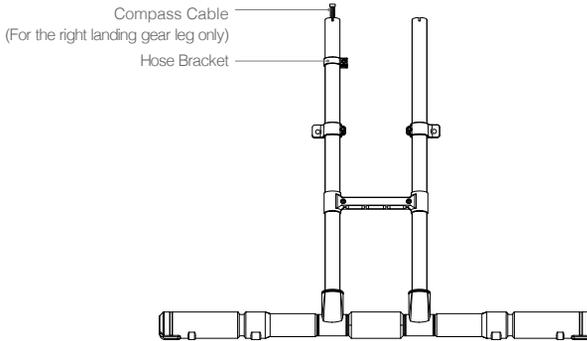
- [15] **Spray Button**  
In Manual Operation Mode, press to start / stop spraying.
- [16] **Flight Mode Switch**  
Used to switch between P-mode (Positioning), A-mode (Attitude) and M-mode (Manual).

- [17] **Button A**  
Records Point A of the operation route.
- [18] **Button B**  
Records Point B of the operation route.
- [19] **Flying Speed Dial**  
In Smart Operation Mode, turn and press the dial to adjust the flying speed.
- [20] **Panel Cable**  
Connects to the CAN port.
- [21] **Back Right Button C2**  
Press to choose operation route R for Smart Operation Mode.  
In Manual Plus Operation Mode, press to fly the aircraft right for one operation gap.
- [22] **Power Port**  
Connects to a power source to charge the remote controller's internal battery.
- [23] **Back Left Button C1**  
Press to choose operation route L for Smart Operation Mode.  
In Manual Plus Operation Mode, press to fly the aircraft left for one operation gap.

# Installation

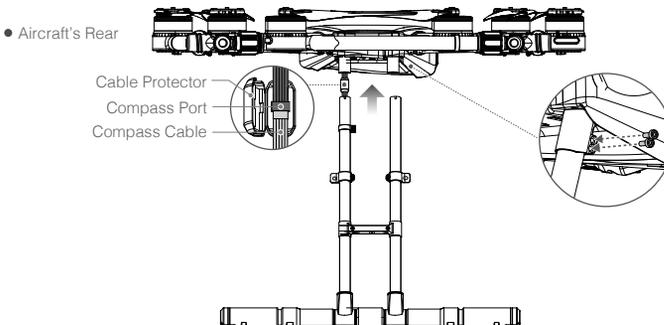
- ⚠ Threadlocker is required for installation. Apply threadlocker when mounting landing gear, spray tank, sprinklers and radar module. Ensure threadlocker is totally dry and solid before flight.
- Ensure that all installation and connection procedures are completed before powering on the aircraft.

## Mounting the Landing Gear



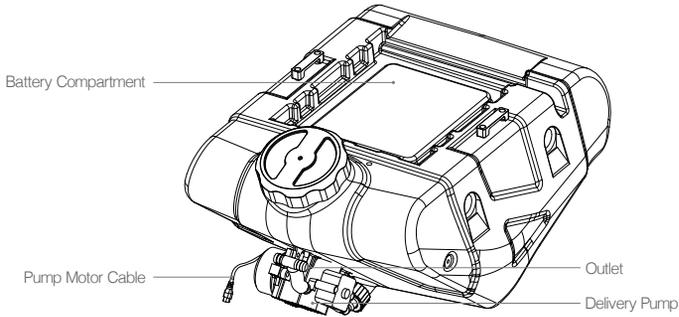
- ⚠ The structures of the two landing gear legs are different. The one with a compass cable should be mounted to the right side of the aircraft (when looking from the rear).

1. Identify the landing gear leg containing the compass cable.
2. Take out the cable protector from the landing gear leg and open it. Looking from the rear, connect the compass cable to the compass port on the right side of the aircraft body. Put the assembled cable into the cable protector slot and close it. Be careful not to damage the cable.
3. Place the cable protector and cable into the mounting position on the center frame then mount the right landing gear leg to the mounting position and tighten the M3x10 screws.

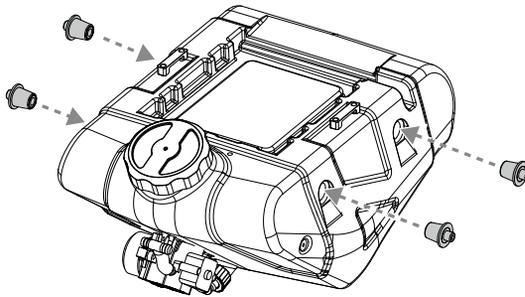


4. Mount the left landing gear leg and tighten the four M3x10 screws.

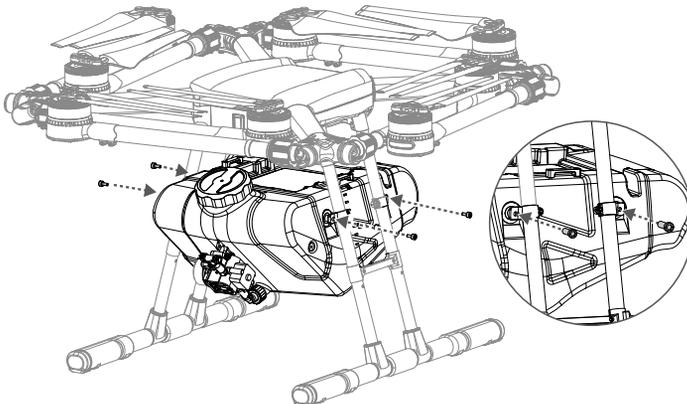
## Mounting the Spray Tank



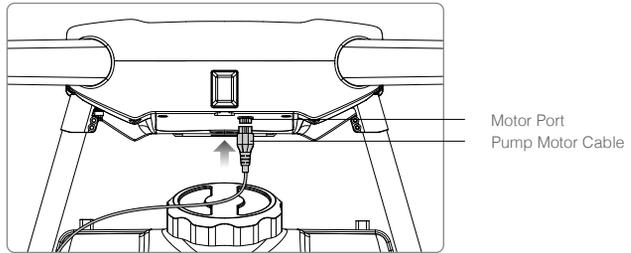
1. Insert the four spray tank plugs into the sides of the spray tank.



2. Place the spray tank between the landing gear legs with the delivery pump at the rear of the aircraft. Align the mounting holes and tighten the four M5×18 screws.

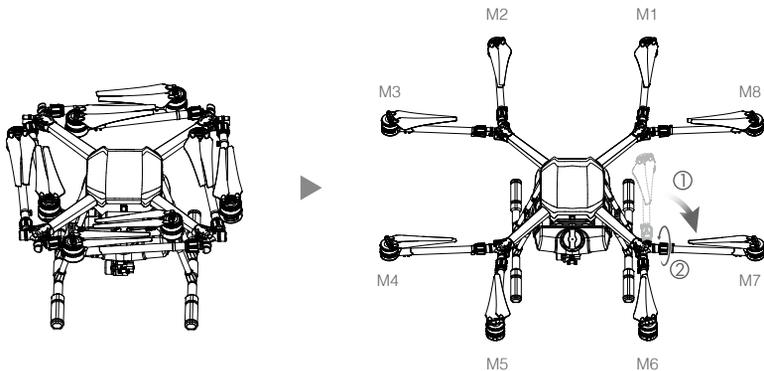


3. Connect the motor cable to the aircraft body. Be sure the plug is correctly orientated.



## Unfolding the Frame Arms

1. Unfold the frame arms ① and tighten the two arm sleeves at each of the junctions ②.

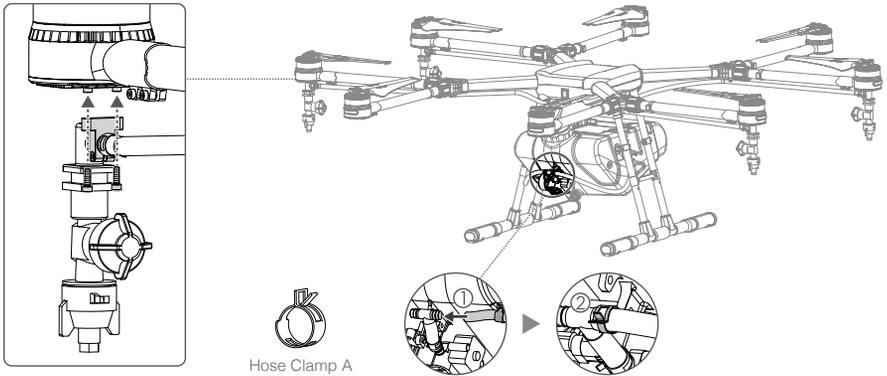


2. Identify the position and rotational direction of the motors. The top view shows motors M1 to M8 arranged in a counter-clockwise order, with motors M1 and M2 at the front of the aircraft, and motors M5 and M6 at the rear. Motors M1, M3, M5 and M7 rotate counter-clockwise as indicated by the "CCW" mark, while motors M2, M4, M6 and M8 rotate clockwise as indicated by the "CW" mark.

## Mounting the Sprinklers

Tools required: A pair of pliers

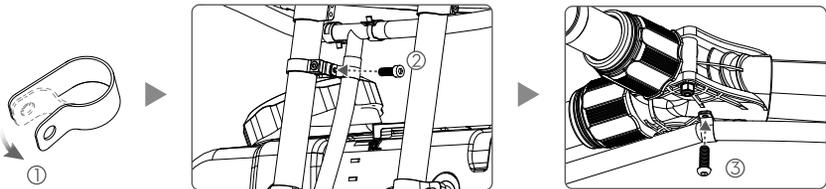
1. Mount one pair of sprinklers under the left motors (M3 and M4) and the other pair under the right motors (M7 and M8), and then tighten the M3x6 screws.
2. Connect the sprinklers to the delivery pump.
  - ① Thread the open ends of the hoses through hose clamps A (use pliers to open up the hose clamp if necessary). Connect the hoses to both sides of the delivery pump's T-shape outlet.
  - ② Press the hose clamps so that they grip the outlet firmly.



3. Fix the hoses to the landing gear and frame arms.
 

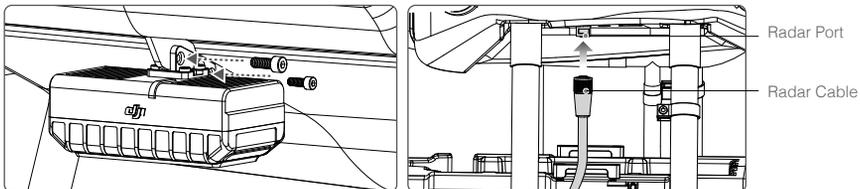
Prepare hose clamps B, M3x6 screws and M3x8 screws (self-tapping) to fix the hoses to the arms and landing gear.

  - ① Clip hose clamps B around the hose at positions that need to be fixed. The hoses should be fixed to the landing gear and at each frame arm junction that leads to a sprinkler.
  - ② Attach the hose clamp to the bracket on the landing gear leg and tighten the M3x6 screw.
  - ③ Attach the hose clamp to the bottom of the frame arm junction and tighten the M3x8 screw (self-tapping)



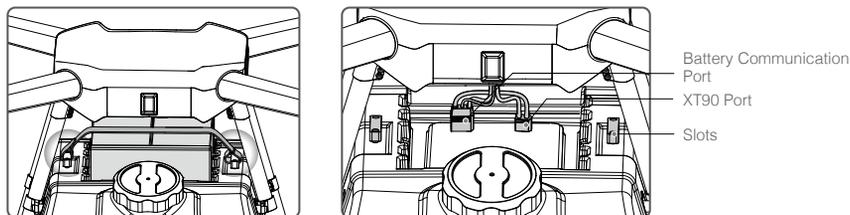
## Mounting the Radar Module

1. With the Radar Status Indicator facing outwards, align the mounting holes and tighten the two M3x8 screws.
2. Connect the radar cable to the radar port on the aircraft body. Be sure to insert the plug in the correct orientation and tighten its ring to secure.



## Mounting the Battery

Place the battery into the recessed area above the spray tank. Pull the Velcro strap through the slots and around the battery to secure.



- 
-  • The MG-1 does not come with a battery. Please purchase the DJI approved MG-1 battery pack (Model: MG-12000).
- The voltage on the aircraft can reach 50.4 V. Read the battery's safety guidelines and take necessary precautions when handling the battery to ensure your own safety. DJI assumes no liability for damages(s) or injuries incurred from using the battery improperly.
  - Ensure that all installation and connection procedures are completed before powering on the aircraft. To power on, connect the battery to the battery communication port then the XT90 port. To power off, disconnect the battery from the XT90 port then the battery communication port.
-

# Remote Controller

## Profile

The aircraft remote control system operates at 2.4 GHz and the maximum transmission distance is 1 km. The remote controller features a number of spraying system control functions to help complete operations. An internal battery ensures a long battery life (continuously operating for up to four hours) and ease of use.

 **Stick Mode:** Stick mode can be set to Mode 1 or Mode 2, or to a custom mode. It is set to Mode 2 by default.

**Mode 1:** The right stick serves as the throttle.

**Mode 2:** The left stick serves as the throttle

 To prevent transmission interference, do not operate more than three aircrafts in the same area.

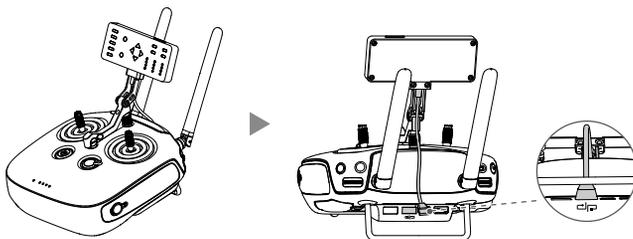
## Prepare the Remote Controller

### Mounting the Spraying Status Panel

1. Unfold the Spraying Status Panel.
2. Plug the screw lock into the screw hole and tighten.
3. Insert the slotted screw through the metal loop and tighten.



4. Tilt the Spraying Status Panel to the desired position. Adjust the antennas as shown.
5. Connect the panel cable to the CAN port on the back of the remote controller.

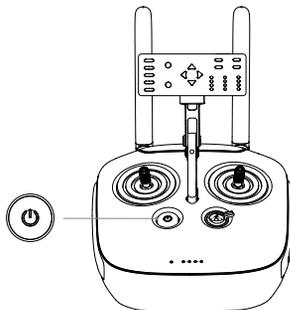


## Using the Remote Controller

### Turning the Remote Controller On and Off

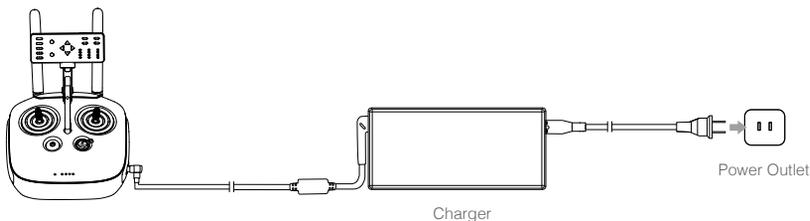
The remote controller is powered by a 2S rechargeable battery that has a capacity of 6000 mAh. The battery level is indicated via the Battery Level LEDs on the front panel. Follow the steps below to turn on your remote controller:

1. When the remote controller is turned off, press the Power Button once. The Battery Level LEDs will display the current battery level. Charge the battery if the battery level is low.
2. Press the Power Button once. Then press again and hold the Power Button to turn on the remote controller.
3. The remote controller will beep when it is turned on. The Status LED will rapidly blink green, indicating that the remote controller is linking to the aircraft. The Status LEDs will glow solid green when linking is complete.
4. Repeat Step 2 to turn off the remote controller.



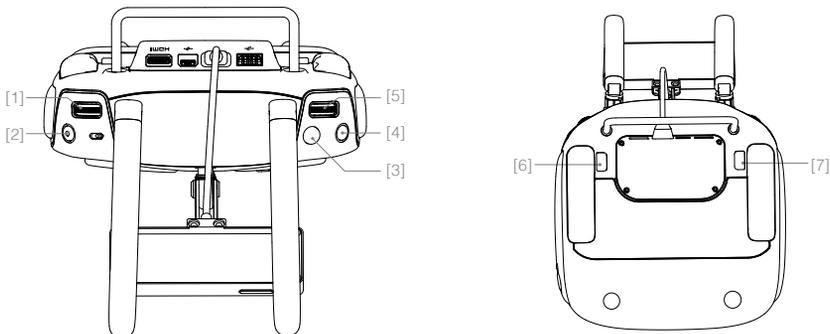
### Charging the Remote Controller

Charge the remote controller using the included charger. Refer to the figure below for more details.



### Controlling the Spraying System

Adjust the flying speed, record Point A and B, start or stop spraying, adjust spray speed, choose the route direction via the Flying Speed Dial, Button A / B, Spray Button, Spray Speed Dial, Button C1 / C2.



**[1] Spray Rate Dial**

In Manual Operation Mode, turn the dial to adjust the spray rate\*. Turn the dial to the left to reduce the spray rate. Turn the dial to the right to increase the spray rate. The Spraying Status Panel will indicate the current spray rate. Refer to [Spraying Status Panel \(p. 24\)](#) for details.

\* Spray rate may vary according to the nozzle model and viscosity of liquid. For water, when using four XR11001 nozzles, the minimum rate is 1.2 L/min and the maximum rate is 1.7 L/min.

**[2] Spray Button**

In Manual Operation Mode, press the button to start or stop spraying.

**[3] Button A**

Press the button to record Point A of the Smart Operation route.

**[4] Button B**

Press the button to record Point B after recording Point A.

**[5] Flying Speed Dial**

In Smart Operation Mode, turn and press the dial to adjust the flying speed. You can set four speed gears in the MG-1 Assistant. The four speed gears are set to 1, 3, 5, 7 m/s by default, and the initial flying speed is the speed of the first gear. Move the dial to the left and press the dial to change to the previous speed. Move the dial to the right and press the dial to change to the next speed. The Spraying Status Panel will indicate the current speed gear.



The final movement of the dial before you press the dial will be used to set the flying speed.

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**[6] Back Left Button C2**

Press to choose operation route R for Smart Operation Mode.

In Manual Plus Operation Mode, press to fly the aircraft right for one operation gap

**[7] Back Right Button C1**

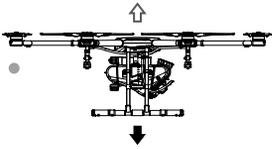
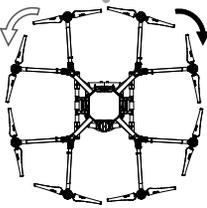
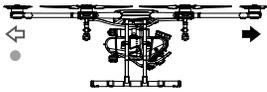
Press to choose operation route L for Smart Operation Mode.

In Manual Plus Operation Mode, press to fly the aircraft left for one operation gap.

In Smart Operation Mode, when the aircraft is hovering at the turning point, press Button C1 and C2 together and then the aircraft will fly to the next turning point and hover. Press and hold Button C1 and C2 together for 2 to 4 seconds until there is a beep emitted from the remote controller, and the aircraft will enter or quit Continuous Smart Operation Mode. Refer to [Smart Operation Mode \(p. 26\)](#) for more details.

## Controlling the Aircraft

The remote controller is set to Mode 2 by default.

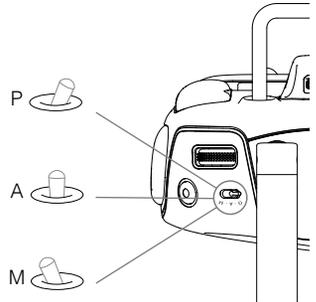
Remote Controller (Mode 2)	Aircraft (● Indicates Nose Direction)	Remarks
		<p>Vertical movement of the left stick controls the aircraft's elevation. Push up to ascend and press down to descend. Use the left stick to take off when the motors are spinning at idle speed. The aircraft will hover in place if the stick is in the central position.</p> <p>The more the stick is pushed away from the central position, the faster the aircraft will change elevation.</p>
		<p>Horizontal movement of the left stick controls the aircraft's heading. Move left to rotate the aircraft anticlockwise and move right to rotate the aircraft clockwise. The aircraft will hover in place if the stick is in the central position.</p> <p>The more the stick is pushed away from the central position, the faster the aircraft will rotate.</p>
		<p>Vertical movement of the right stick controls the aircraft's pitch. Push up to fly forwards and press down to fly backwards. The aircraft will hover in place if the stick is in the central position.</p> <p>Move the stick further for a larger pitch angle and faster flight.</p>
		<p>Horizontal movement of the right stick controls the aircraft's roll. Move the stick left to fly left and right to fly right.</p> <p>The aircraft will hover in place if the stick is in the central position.</p> <p>Move the stick further for a larger roll angle and faster flight.</p>

The description above is only for the P-mode and A-mode.

## Flight Modes

Toggle the Flight Mode Switch on the remote controller to one of the three modes.

Figure	Flight Mode
	P-mode (Positioning)
	A-mode (Attitude)
	M-mode (Manual)



**P-mode (Positioning):** The aircraft uses GPS for positioning. In P-mode, when the GPS signal is strong, users can start the motors.

**A-mode (Attitude):** GPS is NOT used for positioning and aircraft can only maintain altitude using the barometer. Aircraft can still record its position and return to the Home Point if a GPS signal is present.

**M-mode (Manual):** GPS and attitude stabilization are disabled and you have total control of the aircraft by yourself. For safety reasons, M-mode is disabled on the remote controller by default. You can change the flight mode switch "M" value from "Attitude" to "Manual" mode in the PC Assistant, but this is only recommended for experienced users.

## Operation Mode Switch

Toggle the Operation Mode Switch on the remote controller to one of the three modes.



Smart Operation Mode (S)



Manual Operation Mode (M)



Manual Plus Operation Mode (M+)

- Smart Operation Mode:** When the aircraft is in P-mode and the GPS signal is strong, toggle the switch to this mode after Points A and B are recorded. The aircraft will fly and spray liquid along the specified route.
- Manual Operation Mode:** In Manual Operation Mode, users can control all the movements of the aircraft and spray liquid via the Spray Button.
- Manual Plus Operation Mode:** In Manual Plus Operation Mode, the flying speed is restricted and the aircraft's heading is locked. Users can control the movement of the aircraft except for the heading. Press Button C1 or C2 and the aircraft will fly one operation width to the left or right.

## RTH Button

Press and hold the RTH Button to bring the aircraft back to the last recorded Home Point. The LED around the RTH Button will blink white during the RTH procedure. Users can control the aircraft during the procedure. Regain control manually to cancel the RTH procedure. Refer to [How to Regain Control \(p. 33\)](#) for details.

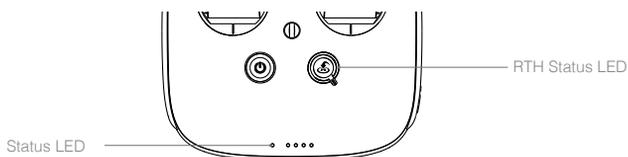


## Optimal Transmission Range



The signal transmission between the aircraft and the remote controller performs best when the aircraft is within the optimal transmission range. Open up the antennas on the remote controller to optimize transmission range. Ideally, the flat surface of the antenna should be facing the aircraft. If the signal is weak, fly the aircraft closer to you.

## Remote Controller LED



The Status LED indicates the connection status between the remote controller and the aircraft. The RTH Status LED indicates the Return-to-Home status of the aircraft. See the table below for details on these indicators.

Status LED	Sound	Remote Controller Status
— Solid Red	chime	The remote controller is not connected to the aircraft.
— Solid Green	chime	The remote controller is connected to the aircraft.
..... Blinks Red	1 slow beep repeating	Remote controller error.
RTH Status LED	Sound	Aircraft Status
— Solid White	chime	Return-to-Home procedure is initiated.
..... Blinks White	1 beep repeating	Sending Return-to-Home command to the aircraft.
..... Blinks White	2 beeps repeating	The aircraft is returning to the Home Point.

## Remote Controller Settings

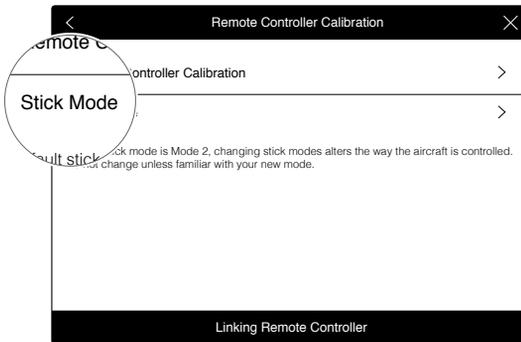
### Launch the DJI GO App

1. Scan the QR code or visit <http://m.dji.net/djigo> to download the app.  
DJI GO supports iOS 8.0 (or later) or Android 4.1.2 (or later).
2. Connect your mobile device to the remote controller via a USB cable.
3. Go to the Camera View, and tap  to enter the remote controller settings window. Tap "Remote Controller Settings" to set the stick mode and link the remote controller.



### Stick Mode

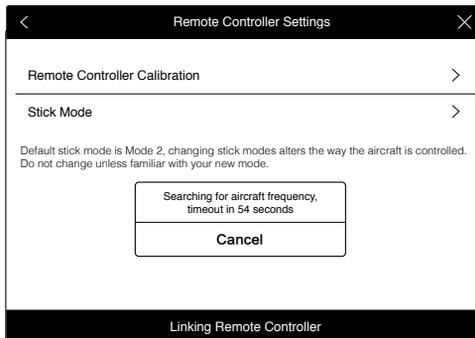
Tap "Stick Mode" to enter the stick configuration. It can be set to Mode 1, Mode 2, or to a custom mode.



### Linking the Remote Controller

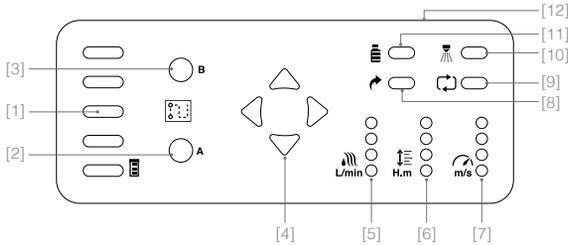
The remote controller is linked to your aircraft by default. Linking is only required when a new remote controller is used for the first time. Follow these steps to link a new remote controller:

1. Power on the aircraft. Tap "Linking Remote Controller" in the DJI GO app.
2. The remote controller Status LED will blink blue and beep to indicate that the remote controller is ready to be linked.



3. The remote controller will search for aircraft nearby. The remote controller Status LED will glow solid green if linking is successful

## Spraying Status Panel



### [1] Flight Battery Level LEDs

Displays the current flight battery level. See the table below for details. (The bottom is LED1 and the top is LED5.)

☐ LED is on. ☼ LED is blinking. ○ LED is off.

LED1	LED2	LED3	LED4	LED5	Battery Level
☐	☐	☐	☐	☐	90% ~ 100%
☐	☐	☐	☐	☼	80% ~ 90%
☐	☐	☐	☐	○	70% ~ 80%
☐	☐	☐	☼	○	60% ~ 70%
☐	☐	☐	○	○	50% ~ 60%
☐	☐	☼	○	○	40% ~ 50%
☐	☐	○	○	○	30% ~ 40%
☐	☼	○	○	○	20% ~ 30%
☐	○	○	○	○	10% ~ 20%
☼	○	○	○	○	0% ~ 10%
○	○	○	○	○	=0%

### [2] Point A LED

The LED is on when Point A is recorded.

### [3] Point B LED

The LED is on when Point B is recorded.

### [4] Orientation LEDs

In Smart Operation Mode, the LEDs indicate the current flying orientation.

### [5] Spray Rate LEDs

Displays the current spray rate. More glowing LEDs indicate a larger spray rate. Spray rate may vary according to nozzle model and viscosity of liquid. For water, when using four XR11001 nozzles, the minimum rate is 1.2 L/min (the LED at the bottom is blinking) and the maximum rate is 1.7 L/min (all the four LEDs are on).

### [6] Height LEDs

Displays the spraying distance between the aircraft and the crops (or the surface under the aircraft).

See the table below for details. (The bottom is LED1 and the top is LED4.)

● LED is on. ◐ LED is blinking. ○ LED is off.

LED1	LED2	LED3	LED4	Spraying Distance
◐	○	○	○	< 2 m
●	○	○	○	2 - 2.5 m
◐	◐	○	○	2.5 - 3 m
●	●	○	○	3 - 3.5 m
◐	◐	◐	○	3.5 - 4 m
●	●	●	○	4 - 4.5 m
◐	◐	◐	◐	4.5 - 5 m
●	●	●	●	> 5 m
◐	◐	◐	◐	The flight controller is not processing radar data: 1. The radar module is disabled in the MG-1 Assistant. 2. If the radar module is enabled in the MG-1 Assistant, enter Manual Operation Mode to adjust spraying distance to within the working range (2 - 3.5 m) and return to Smart Operation Mode.
○	○	○	○	Invalid data, adjust the spraying distance to within the detection range (1.5 - 7 m). Or abnormal radar cable connection, check the connection.

[7] Flying Speed LEDs

In Smart Operation Mode, the LEDs display the current speed gear. You can set four speed gears in the A2-AG Assistant. Select the speed gear via the Flying Speed Dial on the remote controller. The number (1 to 4) of the LED(s) that is/are on indicates the current speed gear (i.e. the first to the fourth gear).

[8] Return LED

In Smart Operation Mode, if the operation resumption function is initiated, the Return LED will be on when the aircraft flies back to the recorded stopping point.

[9] Continuous Smart Operation LED

The LED indicates that the aircraft is in Continuous Smart Operation Mode. In Smart Operation Mode, when the aircraft is hovering at the turning point, press and hold Buttons C1 and C2 together for 2 to 4 seconds until there is a beep emitted from the remote controller, and the aircraft will enter Continuous Smart Operation Status. Refer to Smart Operation Mode (p. 26) for more details.

[10] Spray LED

The LED is on when the aircraft is spraying liquid.

[11] Liquid Level LED

The LED is solid green when there is liquid in the liquid tank. The LED blinks red when there is no liquid in the liquid tank.

[12] Brightness Setting Button

Press to adjust the LED brightness of the panel. Adjusting to the left reduces the brightness and adjusting to the right increases the brightness.

# Aircraft

## Profile

The MG-1 provides Smart Operation Mode, Manual Operation Mode and Manual Plus Operation Mode. The Altitude Stabilization System included with the MG-1 keeps a constant height above crops in Smart Operation Mode and Manual Plus Operation Mode. Functions such as operation resumption, system data protection, empty tank warning, Return-to-Home (RTH) and low battery level warning are also available.



- When using your MG-1 for the first time, you will need to activate it in the MG-1 Assistant. Refer to [MG-1 Assistant \(p. 34\)](#) for details.
- Effective use of pesticides relies on pesticide density, spray rate, spray distance, aircraft speed, wind speed and wind direction. Consider all factors when using pesticides.
- Always fly at an appropriate height above crops to avoid damage.

## Operation Mode

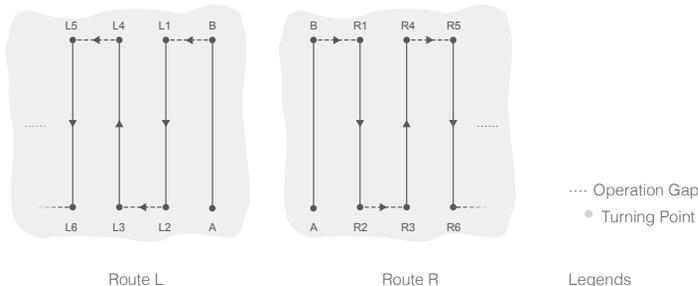
The MG-1 provides Smart Operation Mode, Manual Operation Mode and Manual Plus Operation Mode. Switch to one of the three modes via the Operation Mode Switch on the remote controller. In Smart Operation Mode, the aircraft will travel along a pre-planned route and spray liquid payload. In Manual Operation Mode, users can start and stop spraying manually and also adjust the spray rate. In Manual Plus Operation Mode, the flying speed is restricted and the aircraft's heading is locked. Except for the heading, users can control the movement of the aircraft.

### Smart Operation Mode

In Smart Operation Mode, the aircraft will travel along a pre-planned route. Operation resumption, data protection, and altitude stabilization system are available in this mode. Use the Flying Speed Dial on the remote controller to adjust flying speed, spray rates will automatically adjust accordingly. Smart Operation Mode is recommended for large, rectangular spray areas.

### Operation Route

The aircraft will travel along pre-designated square zig zag route after the turning points A and B have been recorded. The altitude difference between the aircraft and vegetation is maintained under optimal working conditions. The aircraft will spray liquid automatically while flying along the route and stop spraying liquid while hovering at the turning points. The length of the dotted lines, which are called Operation Gaps, can be adjusted in the MG-1 Assistant.

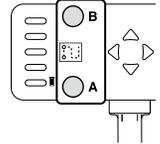


Operation Procedure

- ⚠ • Maintain line of sight of the aircraft at all times.
- Ensure that the Flight Mode Switch is toggled to the “P” position and the GPS signal is strong (GPS count  $\geq 6$ , refer to [Appendix on p. 47](#) for blinking pattern description). Otherwise, Smart Operation may be unreliable.

☀ Always inspect operating environments before flying.

Ensure that Flight Mode Switch on the remote controller is toggled to the “P” position and a strong GPS signal is present. In addition, ensure that the Operation Mode Switch on the remote controller is toggled to the “M” position.



1. Record Points A and B in Order

Fly the aircraft to the starting point, depicted as Point A (B), hover, and then press Button A (B) on the remote controller. The Point A (B) LED on the Spraying Status Panel will become solid green and the Aircraft Status Indicator will blink red (green) after the starting points have been recorded.

- ⚠ • Update Point B by flying the aircraft to a new position and record this position. Note that if a Point A has been updated, then Point B is also required to be updated accordingly.
- It's recommended to keep the direction of Point A to B parallel to one side of the rectangular spray area for optimal effect.

2. Select the Route

Press Back Left Button C1 or Back Right Button C2 on the remote controller to select the operating pattern. Press Back Left Button C1 for Route L and Back Left Button C2 for Route R. The Orientation LED on the Spraying Status Panel will blink to show that the selection has been made. The default route pattern is Route R, if no selection has been made.

3. Adjust the Aircraft Altitude

Adjust the aircraft altitude to the desired altitude by using the throttle stick before entering Smart Operation Mode, and the Altitude Stabilization System will start working automatically and maintain the spraying distance between the aircraft and the vegetation. Refer to [Altitude Stabilization System \(p. 30\)](#) for details.

4. Using Smart Operation Mod

Ensure that the Flight Mode Switch on the remote controller is toggled to the “P” position and a strong GPS signal is present, then toggle the Operation Mode Switch to the “S” position to enable Smart Operation Mode. The aircraft will align with the line between Point A and Point B with its heading pointing toward Point B, and the left and right Orientation LEDs on the Spraying Status Panel will start blinking.



☀ Aircraft nose will always point from Point A to Point B regardless of the flight direction. Heading cannot be adjusted.

### 5. Starting the Operation

- a. Press the Back Left Button C1 and Back Right Button C2 on the remote controller simultaneously to have the aircraft traverse from Point B to L1 (R1). The aircraft will then hover at Point L1 (R1) and wait for further commands. The left (right) Orientation LED on the Spraying Status Panel will light up when flying from Point B to L1 (R1). The four Orientation LEDs on the Spraying Status Panel will blink when hovering at Point L1 (R1).
- b. Repeat 'a' and the aircraft will fly to the next turning point along Route L (R) and hover.
- c. Enable Continuous Smart Operation Mode by pressing and holding the Back Left Button (C1) and Back Right Button (C2) for 2 to 4 seconds when the aircraft is hovering at any given turning point. The Continuous Smart Operation Mode LED on the Spraying Status Panel will light up and the Aircraft Status Indicator will turn solid purple for one second. The aircraft will then fly along Route L (R) continuously.
- d. To exit Continuous Smart Operation Mode, press the Back Left Button (C1) and Back Right Button (C2) and hold for 2 to 4 seconds. The aircraft will fly to the next turning point and hover.



- You will only be able to press and hold the C1 and C2 buttons for steps 'a' to 'c' when the aircraft is hovering at a turning point.
- If the GPS signal is weak (GPS count < 6) during operation, the aircraft will switch to Attitude Flight Mode automatically. Exit Smart Operation Mode and control the aircraft manually. When the MG-1 regains GPS signal, it will fly to the next turning point automatically.
- If you press Button A or Button B during operation, data for Point A and B of the current route will be erased and the aircraft will hover in place.



- The Operation Gap is set to 5m by default. Customize it from 3m to 10m in the MG-1 Assistant.
  - Use the control sticks to control the aircraft to avoid obstacles when it is in operation, even though the heading of the aircraft cannot be adjusted. The aircraft will resume the operation route automatically upon releasing the control sticks. Release the control sticks only after the aircraft is far away from any obstacles, or else the aircraft may still collide with obstacles when it resumes its operation route.
  - The aircraft sprays liquid automatically when flying, and does not spray when hovering.
  - The spray rate cannot be adjusted in Smart Operation Mode and is the same as the Manual Operation Mode rate. To adjust the spray rate, enter Manual Operation Mode (refer to [Controlling the Spraying System](#) on p. 18 for details) and then return to Smart Operation Mode after setting a new rate.
  - Flying speed can be adjusted via the Flying Speed Dial on the remote controller in Smart Operation Mode. Refer to [Controlling the Spraying System](#) (p. 18) for details.
- 

### Operation Resumption

The operation resumption function allows you to temporarily pause an operation (e.g. to refill the spray, change the battery, etc.) and then resume operation. Toggle the Operation Mode Switch to exit Smart Operation Mode or initialize the Failsafe RTH or Smart RTH procedure, and the aircraft will record its location as a stopping point if the GPS signal is strong enough (GPS count  $\geq 6$ ). Return to Smart Operation Mode and the aircraft will return to the recorded stopping point automatically and resume operations.

- 
- ⚠ • Ensure that the GPS signal is strong (GPS count  $\geq 6$ ) when using the operation resumption function. Otherwise, the aircraft cannot record and return to the stopping point.
  - The stopping point will be updated as long as the Operation Mode Switch is toggled from Smart Operation Mode to any other mode or RTH (Smart RTH or Failsafe RTH) is triggered
- 

Follow the instructions below to use this function:

1. Toggle the Operation Mode Switch to exit Smart Operation Mode or initialize the Failsafe RTH or Smart RTH procedure. The current location of the aircraft will be recorded as the stopping point.
2. Fly the aircraft to a safe location before resuming the operation. If the radar module is enabled, adjust the spraying distance between the aircraft and the vegetation to be within the working range (2 – 3.5 m). Refer to the [Altitude Stabilization System \(p. 30\)](#) for details.
3. Ensure that the aircraft is in P-mode and the GPS signal is strong enough (GPS count  $\geq 6$ ). Toggle the Operation Mode Switch to enter Smart Operation Mode. The aircraft will return to the recorded stopping point automatically and resume the operation.

### System Data Protection

The System Data Protection feature enables the aircraft to retain vital system data (e.g. the positions of Point A, Point B and the stopping point) for about 1 minute after the aircraft is powered off. Retaining vital system data allows the aircraft to resume operation after a short, temporary pause. Follow the instructions below to use this feature:

1. Toggle the Operation Mode Switch to exit Smart Operation Mode. The current location of the aircraft will be marked as the stopping point.
2. Land the aircraft and stop the motors.
3. System Data Protection is triggered automatically once the aircraft is powered off. The Aircraft Status Indicator will glow solid green to show that System Data Protection is successfully triggered.
4. Replace the battery within the 1 minute window.
5. Restart the aircraft and toggle the Operation Mode Switch to enter Manual Operation Mode.
6. Ensure that the aircraft is in P-mode and the GPS signal is strong enough (GPS count  $\geq 6$ ). Start the motors and elevate the aircraft to a safe altitude. Adjust the spraying distance between the aircraft and the vegetation, so that the value falls with the range of 2 to 3.5 meters. Refer to the [Altitude Stabilization System \(p. 30\)](#) for more details.
7. Toggle the Operation Mode Switch to enter Smart Operation Mode. The aircraft will fly back to the previously recorded stopping point and resume its operation

- 
- ⚠ The system data can only be retained for 1 minute. DO NOT power off the aircraft for more than 1 minute if you want to resume operation because the system data will be lost.
- 

### Manual Operation Mode

Toggle the Operation Mode Switch to enter Manual Operation Mode. You can control all the movements of the aircraft, spray liquid via the spray button on the remote controller, and adjust the spray rate via the dial on the remote controller. Refer to [Controlling the Spraying System \(p. 18\)](#) for more details on adjusting the spray rate. Manual Operation Mode is ideal for when the operating area is small.

## Manual Plus Operation Mode

Toggle the Operation Mode Switch to enter Manual Plus Operation Mode. The maximum flying speed is 8 m/s and the aircraft's heading is locked in Manual Plus Operation Mode. Press the Back Left Button (C1) or the Back Right Button (C2) on the remote controller to steer the aircraft to fly to the left or right. Spraying will not be interrupted while the aircraft is shifting to the left or right, and will only stop when the aircraft is hovering. Manual Plus Operation is ideal for irregularly shaped operating areas.

1. Elevate the aircraft to a desired altitude before entering Manual Plus Operation Mode. The Altitude Stabilization System starts working automatically by maintaining the spraying distance between the aircraft and the vegetation below. Refer to [Altitude Stabilization System \(p. 30\)](#) for details.
2. Ensure that the aircraft is in P-mode and ensure that GPS signal is strong (GPS count  $\geq 6$ ). Then toggle the Operation Mode Switch to the "M+" position to activate Manual Plus Operation Mode.



- Note that the Operation Gap value is identical to the one that has been set in Smart Operation Mode.
- The spray rate is fixed in Manual Plus Operation Mode. You can adjust the spray rate in Manual Operation Mode (refer to [Controlling the Spraying System on p. 18](#) for details) and then return to Smart Operation Mode after setting a new rate.

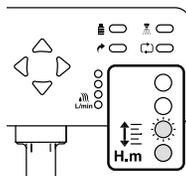
## Altitude Stabilization System

### Profile

To ensure that the spray is evenly dispensed, the aircraft uses the radar module on the Altitude Stabilization System to maintain the same distance above the crops at all times. The radar module is enabled by default, and can be disabled in MG-1 Assistant. If it is enabled, the aircraft will fly above the crops at a constant spraying distance in Smart Operation Mode and Manual Plus Operation Mode. The system can also measure the spraying distance above the crops or other surfaces, but the aircraft will not be able to fly at a constant spraying distance when performing this function.

### How to Use

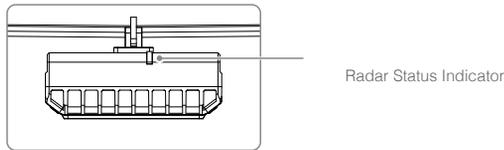
1. Ensure that the Operation Mode Switch is toggled to the Manual Operation Mode. Fly the aircraft above the vegetation and adjust the spraying distance between the aircraft and the vegetation. DO NOT operate the aircraft above vegetation beyond the detection range (1.5 - 7 m) while adjusting aircraft altitude, otherwise the Spraying Status Panel will not be able to display the current spraying distance.
2. Confirm the desired spraying distance by observing the Height LEDs on the Spraying Status Panel. Ideal spraying distance should fall within the working range (2 - 3.5 m) for altitude stabilization. DO NOT operate the aircraft beyond this range, otherwise the system will become unstable.



3. Toggle the Operation Mode Switch to enter Smart Operation Mode or Manual Plus Operation Mode. If operating environment is ideal, the aircraft will fly above the vegetation at the pre-set height.

- ⚠
- The Altitude Stabilization System will only maintain a fixed distance from vegetation within its working range (2-3.5 m).
  - The aircraft's pitch and roll angles must not exceed 20°.
  - Observe the aircraft's distance from the vegetation at all times.
  - Operate with extra caution in any of the following situations:
    - a. There are large height differences (> 1m) in vegetation (i.e. nearby ditches or ponds, above sparse trees or shrubs, terraced fields).
    - b. Flying at high speeds (> 5m/s).
    - c. Flying over surfaces that can absorb sound waves (e.g. dense vegetation comprised of small leaves such as well-maintained grass lawns).
    - d. Flying over inclined surfaces (depending on aircraft speed). Recommended maximum inclination at different speeds: 15° at 1 m/s, 6° at 3 m/s and 3° at 5 m/s.
  - Obey local radio transmission laws and regulations.

### Radar Status Indicator



The Radar Status Indicator shows the current status of the Altitude Stabilization System. See the table below:

Blinking Patter	Description
 — Solid Green	Warming up.
 ····· Blinking Green	Working.
 Off	Disconnected.

## Empty Tank Warning

### Profile

When the spray tank is empty, the Liquid Level LED on the Spraying Status Panel will blink red and the aircraft will move depending on the operation mode - ascend 3 meters and hover (Smart Operation Mode) or hover in place (Manual Operation Mode or Manual Plus Operation Mode).

### How to Use

1. Press the Spray Button on the remote controller to turn off the sprinklers when the empty tank warning is triggered in Manual Operation Mode. Failure to do so may cause the idling of the pump of the motor and subsequently damage the parts. The sprinklers will automatically turn off in Smart Operation Mode or Manual Plus Operation Mode.

2. Ensure the aircraft is in Manual Operation Mode, and then land the aircraft and stop the motors. Refill the liquid tank and tighten the lid.
3. Press the Spray Button on the remote controller to discharge the remaining air in the pump until the Liquid Level LED on the Spraying Status Panel glows solid green. Press the Spray Button again to stop discharging.
4. Ensure the aircraft is in Manual Operation Mode, and then take off.
5. Elevate the aircraft to a desired altitude in Smart Operation Mode or Manual Plus Operation Mode. Adjust the spraying distance between the aircraft and the vegetation to be within the working range (2 - 3.5 m). Refer to the [Altitude Stabilization System \(p. 30\)](#) for details. Then toggle the Operation Mode Switch.

## Return-to-Home (RTH)

---



RTH: The Return-to-Home (RTH) function brings the aircraft back to the last recorded Home Point.

**Home Point:** If the GPS signal is strong enough (GPS count  $\geq 6$ ) after powering on for 30 seconds, then the launching location of the aircraft will be recorded as the Home Point.

---



When using System Data Protection, the Home Point will not be updated if you restart the aircraft after changing the battery.

---

There are two events that will trigger RTH procedure: Smart RTH and Failsafe RTH.

### Smart RTH

Use the RTH button on the remote controller (see [RTH Button on p. 21](#) for more details) when GPS is available to enable Smart RTH. Press and hold the RTH button to enable Smart RTH. The same RTH procedure is applied to both Smart RTH and Failsafe RTH. With Smart RTH, you may control the aircraft's orientation to avoid collisions when it is returning to the Home Point. To exit Smart RTH, regain control manually. Refer to [How to Regain Control \(p. 33\)](#) for more details.

---



It is not possible to start the RTH procedure by pressing the RTH button when the Flight Mode is toggled to the "M" position.

---

### Failsafe RTH

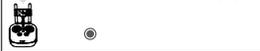
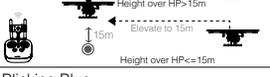


The Failsafe RTH must be enabled in the MG-1 Assistant. If Failsafe RTH is not enabled, the aircraft will hover in place when the remote controller signal is lost.

---

Failsafe RTH is activated automatically if the remote controller signal is lost for more than 3 seconds provided that the Home Point has been successfully recorded and the compass is working normally. The operator can interrupt the Return-to-Home procedure and regain control over the aircraft if the remote controller signal is recovered. Refer to [How to Regain Control \(p. 33\)](#) for details.

RTH Illustrator

<p>1 Record Home Point (HP)</p>  <p>Blinking Purple</p>	<p>2 Confirm Home Point</p>  <p>Blinking Purple 5 Times</p>	<p>3 Remote Controller Signal Lost</p>  <p>Blinking Blue</p>
<p>4 Signal Lost Lasts 3secs</p>  <p>Blinking Blue</p>	<p>5 Go Home (15m can be set)</p>  <p>Blinking Blue</p>	<p>6 Landing after Hovering 15secs</p>  <p>Blinking Blue</p>

- ⚠
- When the GPS count is less than 6 or GPS is not working, the aircraft can only stabilize the attitude without returning to the Home Point.
  - Start RTH by pressing and holding the RTH button in emergency situations. DO NOT power off the remote controller to start RTH.
  - Make sure there are no obstacles during RTH procedure and you are familiar with how to regain control of the aircraft.

How to Regain Control

The table below shows ways to regain control during the Failsafe RTH procedure. To regain control during the Smart RTH procedure, refer to the “Positioning” and “Attitude” Flight Mode sections in the table below.

Flight Mode Switch			
Flight Mode	Positioning	Attitude	Manual
Regain Control	Toggle the Flight Mode Switch once to regain control if the signal recovers.		Regain control as soon as the signal recovers.

Low Battery Level Warnings

There are two low battery level warnings:

1. Low battery level warning: the Aircraft Status Indicator blinks yellow. Fly the aircraft back and land it as soon as possible, then stop the motors and replace the batteries.
2. Critically low battery level warning: the Aircraft Status Indicator blinks red. The aircraft will begin to descend and land automatically. You can change the settings in MG-1 Assistant so that the aircraft does not automatically descend and land when the Aircraft Status Indicator LED blinks red.

 The threshold of the two low battery levels can be set in the MG-1 Assistant.

# MG-1 Assistant

When using your MG-1 for the first time, you will need to activate it in the MG-1 Assistant. Configure settings of the remote controller, gain values, RTH, Smart Operation Mode and more in the MG-1 Assistant after activation.

## Installation and Launching

1. Download the DJI Driver and the MG-1 Assistant installation file from the MG-1 download page. <http://www.dji.com/product/mg-1/info#downloads>
2. Complete the installations for the DJI Driver and the MG-1 Assistant software.
3. Launch the MG-1 Assistant software.

## Using the MG-1 Assistant

Connect the flight controller data port of the aircraft to your computer with a Micro USB cable. Then power on the aircraft.

 Be sure to remove the propellers before using the MG-1 Assistant.

### View Page

Check all basic settings on this page. Click the blue hyperlinks for detail settings.

### Basic Page

Be sure to use the default settings for the “Aircraft” and “Mounting” parts.

### RC



### Flight Mode Switch

Power on the remote controller and toggle the Flight Mode Switch to the M Flight Mode. Then set as Attitude or Manual mode in the MG-1 Assistant. Manual mode is only recommended for experienced users.

Gain

Basic and attitude gain value settings. It is recommended to use the default settings.

Advanced Page

F/S

Failsafe Methods

If you select "Hover", the aircraft will hover in place when RC signal is lost.

If you select "Alt Go-Home" and input a value (max. 50 m), the aircraft will fly back automatically at the input altitude when RC signal lost.

Battery Level

Turn ON / OFF the low battery level warnings or set the threshold of the two low battery levels and the types of warnings on this page.

Limits

Turn ON / OFF flight limits on this page.

Agriculture



Operation Gap

Set the Operation Gap from 3 to 10 m. It is set to 5 m by default.

Flying Speed

Set four speed gears for Smart Operation Mode from 1 to 8 m/s. The four speed gears are set to 1, 3, 5, 7 m/s by default.

Enable Radar Module

The module is enabled by default. Uncheck the checkbox if you want to disable the module, so that the aircraft will not detect the height above the crops.

Tools Page

Config

Export or import the parameters, restore the default settings and reset the BTU module.

## Sensors

Read gyroscope, acceleration and compass sensor values.

## IMU Calibration

There is no need to calibrate the IMU in general. Calibration is required when:

1. Gyroscope Mod value exceeds 1.5.
2. Acceleration Mod value below 0.98 or exceeds 1.02.

Calibration Instructions:

1. Power on the system and wait until the system enters "Ready" status.
2. Click "Calibration" and follow the steps in the software.

## Device Info & Connection

Check the current firmware version of the aircraft and ensure the installed firmware is up-to-date. If not, login with your DJI account and click the hyperlink to upgrade the firmware.

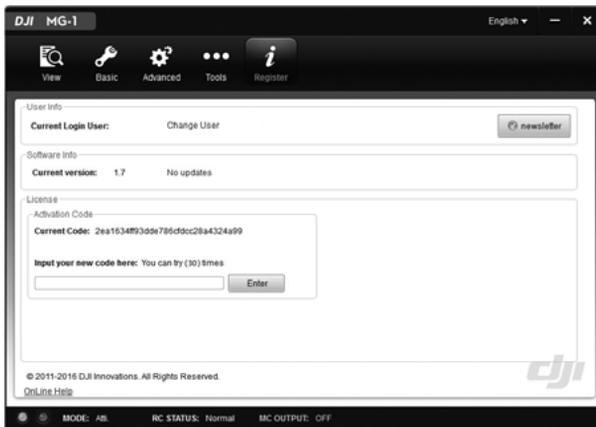
- 
- ⚠ After firmware upgrades, disconnect the Micro USB cable and power off the aircraft. Wait for the data protection module to fully discharge (Aircraft Status Indicator goes off) before powering the aircraft back on.
  - Upgrade the remote controller firmware via the DJI GO app. Refer to [Upgrading the Firmware](#) (p. 48) for details.
- 

## Register Page

Activate the aircraft, change user account or view the software information on this page.

## Activation Code

Login with your DJI account, enter your activation code and click "Enter" to activate your aircraft.



# DJI Assistant 2

Upgrade the Lightbridge 2 Air System firmware, export the flight data stored on the iOSD in the DJI Assistant 2.

## Installation and Launching

1. Download the DJI Assistant 2 installation file from the MG-1 download page.  
<http://www.dji.com/product/mg-1/info#downloads>
2. Complete the installation for the DJI Assistant 2 software.
3. Launch the DJI Assistant 2 software.

## Using the DJI Assistant 2

Connect the Lightbridge 2 / iOSD Data Port of the aircraft to your computer with a Micro USB cable. Then power on the aircraft.

---

 Be sure to remove the propellers before using the MG-1 Assistant.

---

### Upgrading the Lightbridge 2 Air System Firmware

1. Choose "Lightbridge 2" from the list of connected devices, then sign in with your DJI account.
2. Choose the desired firmware version from the firmware list and click "Upgrade".
3. After reading the popup notice, click "Start Upgrade". The text "Upgrade Successful!" will be displayed when the upgrade is complete. If the upgrade fails, try again or contact DJI Support.

- 
-  • Both the Lightbridge 2 Air System and the remote controller firmware must be up-to-date, or else they will not link.
- Upgrade the remote controller firmware via the DJI GO app. Refer to [Upgrading the Firmware \(p. 48\)](#) for details.
- 

### Exporting Flight Data

1. Sign in with your DJI account, and then choose "iOSD" from the list of connected devices.
2. The iOSD will be connected to the computer as a device with removable storage. Export the data required from the device named "DJI-IOSDLOG" in the devices list on your computer.

# Flight

## Operation Environment

1. DO NOT use the aircraft in adverse weather conditions such as heavy rain (precipitation rate exceeding 25 mm or 0.98 inches in 12 hours), high winds exceeding 17 mph (28 kph), fog, snow, lightning, tornadoes or hurricanes.
2. Only fly in open areas. Tall buildings and steel structures may affect the accuracy of the compass and the GPS signal.
3. Maintain line of sight of the aircraft at all times, and avoid flying near obstacles, crowds, animals, trees and bodies of water.
4. Avoid flying in areas with high levels of electromagnetism, including mobile phone base stations and radio transmission towers.
5. Ensure that there is a strong GPS signal in the Smart or Manual Plus Operation Mode.
6. DO NOT operate any parts of the aircraft indoors.
7. The MG-1 cannot operate in P-mode within the Earth's polar regions.

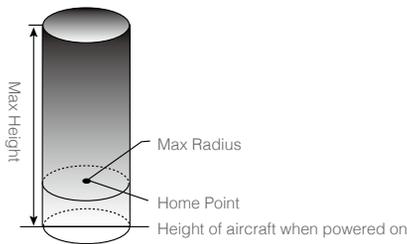
## Flight Limits and No Fly Zones

Unmanned aerial vehicle (UAV) operators should abide by the regulations from self-regulatory organizations such as the ICAO (International Civil Aviation Organization), the FAA and their local aviation authorities. For safety reasons, flight limits are enabled by default to help users use this product safely and legally.

When operating in P-mode, the height limit, distance limit and No Fly Zones work together to monitor flight. In Attitude Flight Mode, only the height limit prevents the aircraft from going above 50 meters.

### Maximum Height and Radius Limits

Users can change the maximum height and radius limits in the MG-1 Assistant. Once complete, your MG-1 will fly in a restricted cylinder that is determined by these settings. The tables below show the details of these limits.



## GPS Signal is Strong

### Flight Limits

Max Height	Flight altitude must be below the preset height.
Max Radius	Flight distance must be within the max radius.

**GPS Signal is Weak**

**Flight Limits**

Max Height	Flight altitude must be below the preset height.
Max Radius	No limits.

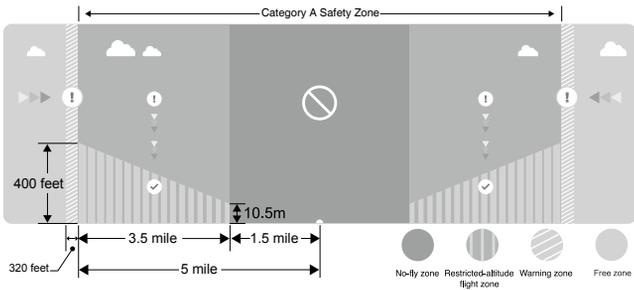
- ⚠ If you fly out of bounds, you can still control the MG-1, but cannot fly it further.
- If the MG-1 loses GPS signal and flies out of the max radius but regains GPS signal afterwards, it will fly back within range automatically.

**No Fly Zones**

All restricted areas are listed on the DJI official website at <http://www.dji.com/fly-safe/category-mc>. Restricted areas are divided into category A and category B. Category A areas cover major international airport such as LAX and Heathrow, while category B areas includes smaller airports.c

**Category A Safety Zone (requires GPS)**

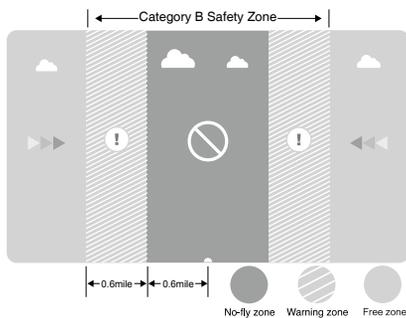
- The category A "safety zone" is comprised of a small "no-fly zone" and a range of "restricted-altitude zones". Flight is prevented in the "no-fly zone" but can continue with height restrictions in the restricted-altitude zone.
- 1.5 miles (2.4 km) around a designated safety zone is a no-fly zone, inside which takeoff is prevented.
- 1.5 miles (2.4 km) to 5 miles (8 km) around restricted areas are altitude restricted, with maximum altitude going from 35 feet (10.5 m) at 1.5 miles (2.4 km) to 400 feet (120 m) at 5 miles (8 km).
- A "warning zone" has been set around the safety zone.



Category A

## Category B Safety Zone (requires GPS)

- Category B “safety zone” is comprised of a “no-fly zone” and a “warning zone”.
- 0.6 miles (1 km) around the safety zone is a designated “no-fly zone”.
- A “warning zone” has been set around the safety zone.



GPS Signal is Strong		
Zone	Restriction	Aircraft Status Indicator
No-fly Zone ●	Motors will not start.  If the aircraft loses GPS signal and enters the restricted area but regains GPS signal afterwards, the aircraft will enter Semi-Automatic Descent and land itself.	Blink red quickly and continue for 3 seconds before normal blinks.
Restricted-altitude Flight Zone ●	If the aircraft loses GPS signal and enters the restricted area but regains GPS signal afterwards, it will descend to a safe altitude and hover 15 feet below the safe altitude.	
Warning Zone ●	No flight restrictions.	Blink yellow quickly and continue for 3 seconds before normal blinks.
Free Zone ●	No flight 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 Flight Mode Switch to regain control. This is the same as regaining control during RTH. Refer to *How to Regain Control* (p. 33).

- ⚠ • When flying in No-fly zone, the Aircraft Status Indicator will flash red rapidly and continue for 3 seconds, then switch to indicate the current flying status and continue for 5 seconds, at which point it will switch back to blinking red rapidly.
- When flying in restricted-altitude flight zone and warning zone, the Aircraft Status Indicator will flash yellow rapidly and continue for 3 seconds, then switch to indicate the current flying status and continue for 5 seconds, at which point it will switch back to blinking red rapidly.
- For safety reasons, please do NOT fly close to airports, highways, railway stations, railway lines, city centers or other busy areas. Try to ensure the aircraft is visible at all times.

### 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; x: unavailable).

All flights are restricted by height, distance and special areas simultaneously. The Failsafe is not restricted to flight limits.

Flight Mode	Number of GPS Found	Limits of Special Area	Max Height	Max Radius
GPS	≥6	√	√	√
	<6	x	√	x
Attitude	≥6	√	√	x
	<6	x	√	x
Manual	≥6	x	x	x
	<6	x	x	x

Flight Limits can be disabled in the Assistant.

- ⚠ Users cannot take off the aircraft in some Special Areas even the Flight Limits is disabled in the Assistant.

### Pre-Flight Checklist

1. The remote controller, aircraft battery are fully charged.
2. The pesticides required are adequate.
3. The position of aircraft battery is secured.
4. All parts are mounted securely.
5. All cables are connected correctly and firmly.
6. Propellers are unfolded and mounted onto the motors securely; frame arms are unfolded and arm sleeves are firmly tightened.
7. Spraying system is without any blockage.
8. Test the sprinklers. Bubbles in the hoses may lead to operation problems. Loosen the valve on the side of the sprinkler and start the pump to discharge the bubbles. Then tighten the valve and the sprinkler will work properly.

## Calibrating the Compass

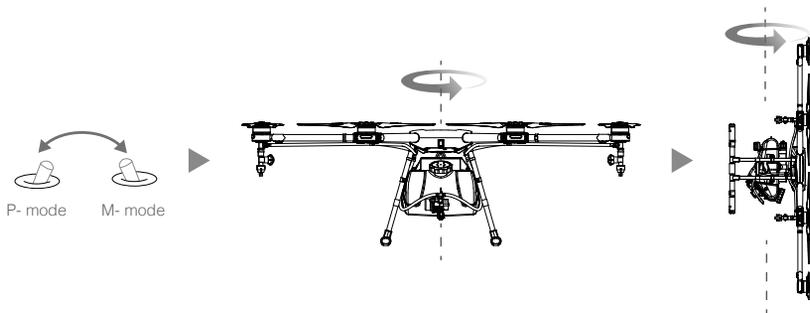
The compass is built in the landing gear. Be sure to calibrate the compass before your first flight, or else the aircraft cannot work properly. The compass is a very sensitive instrument that requires regular calibration to ensure optimal flight performance. Abnormal compass data due to a lack of calibration can lead to poor flight performance or even failure. Regular calibration enables the compass to keep optimal performance.

- ⚠ • DO NOT calibrate your compass where there is a chance of strong magnetic interference, such as magnetite quarries, parking structures, and underground steel reinforcements.
- DO NOT carry ferromagnetic objects such as cellular phones with you during calibration.
- DO NOT calibrate besides massive metal objects.
- DO NOT calibrate in an indoor space.

### Calibration Procedures

Choose an open space to carry out the following procedures. It is recommended to calibrate the compass with an empty tank.

1. Flip the Flight Mode Switch back-and-forth at least 6 times, until the Aircraft Status Indicator becomes solid blue.
2. Hold the aircraft upright and rotate it 360 degrees along the central axis, until the Aircraft Status Indicator changes from solid blue to solid green.
3. Hold the aircraft with its nose facing up and rotate 360 degrees along the central axis.



4. The Aircraft Status Indicator shows the current flight mode when calibration is complete. If the Aircraft Status Indicator becomes blinking red, repeat the steps above to recalibrate the compass.

### When to Recalibrate

1. The compass data is abnormal, and the Aircraft Status Indicator is blinking red and yellow alternatively.
2. Flying in a new location, or a location that is different from your last flight.
3. The mechanical structure of the MG-1 is changed.
4. Severe drifting occurs in flight, i.e. the MG-1 has difficulty flying in a straight line.

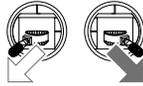
## Starting and Stopping the Motors

### Starting the Motors

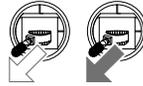
The Combination Stick Command (CSC) listed below is used to start/stop the motors. Ensure you perform the CSC in one continuous motion. The motors will begin to speed at an idle speed. Take off immediately after the motors are spinning, or else the aircraft may lose balance, drift or even takeoff by itself and injure nearby people.



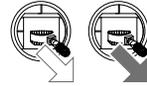
CSC 1



CSC 2



CSC 3

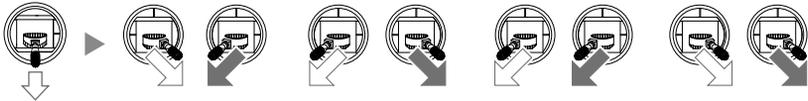


CSC 4

### Stopping the Motors

There are two methods to stop the motors.

1. When the aircraft has landed, push the throttle stick down, then perform the CSC command to stop the motors. Release both sticks once the motors have stopped.



Throttle Stick

2. When the aircraft has landed, push the throttle down and hold. The motors will stop after 3 seconds. (In M-mode, when "M" is set as Manual mode in the MG-1 Assistant, use method 1 to stop the motors.)



Throttle Stick

## Flight Test

1. Place the aircraft near the operation area with the Aircraft Status Indicator facing you.
2. Power on the remote controller. Connect the battery to the communication port and then the XT90 port.
3. Toggle the Operation Mode Switch to Manual Operation Mode.
4. Toggle the Flight Mode Switch to P-mode. Wait until there is no red blinking from the Aircraft Status Indicator, which means the GPS signal is strong. Then perform CSC command to start the motors.
5. Push the throttle stick up to take off.
6. Select the desired Operation Mode and spray liquid.
7. To land, ensure the Operation Mode Switch is toggled to Manual Operation Mode and hover over a level surface and gently pull down on the throttle stick to descend slowly.

8. After landing, perform the CSC command to stop the motors.
9. Disconnect the battery from the XT90 port and then the communication port. Then power off the remote controller.



- When the Aircraft Status Indicator blinks blue during flight, the aircraft has entered Failsafe mode.
  - The low battery level warning is triggered when the Aircraft Status Indicator blinks yellow. Fly the aircraft back and land it as soon as possible, then stop the motors and replace the battery.
  - The critically low battery level warning is triggered when the Aircraft Status Indicator blinks red. The aircraft will begin to descend and land automatically. You can change the settings in MG-1 Assistant so that the aircraft does not automatically descend and land when the Aircraft Status Indicator LED blinks red.
-

# Appendix

## Specifications

### Airframe

Diagonal Wheelbase	1520 mm
Frame Arm Length	625 mm
Dimensions	1471×1471×482 mm (Frame arms unfolded, propellers removed) 780×780×482 mm (Frame arms folded)

### Propulsion System

#### Motors

Stator Size	60×10 mm
KV	130 rpm/V
Max Thrust	5.1 kg/rotor
Max Power	770 W
Weight (With cooling fan)	280 g

#### ESCs

Max Allowable Current (Continuous)	25 A
Operating Voltage	50.4 V(12S LiPo)
Signal Frequency	30 - 450 Hz
Drive PWM Frequency	12 kHz

### Foldable Propeller

Material	High-performance engineered plastics
Diameter × Pitch	21×7 inch
Weight	58 g

### Spraying System

#### Liquid Tank

Volume	10 L
Standard Operating Payload	10 kg
Max Battery Size	151 mm×195 mm×70 mm

#### Sprinklers

Model	XR11001
Quantity	4
Max Spray Rate	0.43 L/min (Single nozzle, using water)
Spray Width	4 - 6 m (4 nozzles, 1.5 - 3 m above the crops)
Droplet Size	130 ~ 250 μm (Depending on operating environment and spraying speed)

### Altitude Stabilization System

Detection Range	1.5 - 7 m (Varies when flying above different kinds of vegetation)
Working Range	2 - 3.5 m
Detection Accuracy	< 10 cm

**Flight Parameters**

Total Weight (Excluding battery)	8.8 kg
Standard Takeoff Weight	22.5 kg
Max Takeoff Weight	24.5 kg (At sea level)
Max Thrust-Weight Ratio	1.81 (Takeoff weight of 22.5 kg)
Battery	DJI approved battery pack (Model: MG-12000)
Max Power Consumption	6400 W
Hovering Power Consumption	3250 W (Takeoff weight of 22.5 kg)
Hovering Time*	24 min (Takeoff weight of 12.5 kg)
	10 min (Takeoff weight of 22.5 kg)
Max Operating Speed	8 m/s
Max Flying Speed	22 m/s
Max Service Ceiling Above Sea Level	2000 m
Operating Temperature	0° to 40° C

\*At sea level and in wind speeds under 3 m/s

**Remote Controller**

Model	GL658C, GL690B (Japan only)
Operating Frequency	920.6 MHz to 928 MHz (Japan)
	5.725 GHz to 5.825 GHz
	2.400 GHz to 2.483 GHz
Max Transmission Range	1 km (Unobstructed and free of interference)
EIRP	10 dBm @ 900M
	13 dBm @ 5.8G
	20 dBm @ 2.4G
Built-in Battery	6000 mAh, 2S LiPo
Output Power	9 W
Operating Temperature	-10° to 40° C
Storage Temperature	Less than 3 months: -20° to 45° C
	More than 3 months: 22° to 28° C
Storage Temperature	0° to 40° C

**Remote Controller Charger**

Model	A14-057N1A
Voltage	17.4 V
Rated Power	57 W

## Aircraft Status Indicator Description

Blinking Patterns	Description
 ..... Blinking Purple once	P-mode
 x2 Blinking Purple twice	P-mode, control stick not in mid-point
 ..... Blinking Yellow once	A-mode
 x2 Blinking Yellow twice	A-mode, sticks not in mid-point
No Red indicator	GPS signal is Best, GPS count > 6
 ..... Blinking Red once	GPS signal is Good, GPS count = 6
 x2 Blinking Red twice	GPS signal is Bad, GPS count = 5
 x3 Blinking Red three times	GPS signal is Worst, GPS count < 5, motors cannot be started.
 x3 Blinking White three times	Attitude status bad. Hover or land the aircraft and wait for the white indicator to go off.
 x4 Blinking Green four times	IMU data lost. Restart the aircraft, if not work, contact DJI Support.
 x4 Blinking Red four times	System error. Restart the aircraft, if not work, contact DJI Support.
 ..... Blinking Red (when powering on)	Compass data not ready, or compass abnormal. Check connection.
 ..... Blinking Yellow and Green alternately	Abnormal compass data, compass calibration required.
 ..... Blinking Red several times rapidly	Point A recorded
 ..... Blinking Green several times rapidly	Point B recorded
 x5 Blinking Blue five times	The aircraft flies to the next turning point in Smart Mode
 x5 Blinking Purple five times	Distance from the Home Point within 8 m
 Solid Purple for one second	Enters Continuous Smart Operation Mode
 ..... Blinking Yellow	Low battery level
 ..... Blinking Red (when flying)	Critically low battery level
 ..... Blinking Blue	Failsafe RTH
 — Solid Blue	Flight controller Activation Code not authorized
 — Solid Red	PMU abnormal or battery not verified
 — Solid Green	System Data Protection function working

## Upgrading the Firmware

### Aircraft Firmware

Connect the flight controller data port of the aircraft to the MG-1 Assistant on your computer to upgrade the aircraft firmware. Refer to the Tools Page under [Using the MG-1 Assistant \(p. 34\)](#) for details.

### Lightbridge 2 Air System Firmware

Connect the Lightbridge 2 / iOSD data port of the aircraft to the MG-1 Assistant on your computer to upgrade the Lightbridge 2 Air System firmware. Refer to [DJI Assistant 2 \(p. 37\)](#) for details.

### Remote Controller Firmware

Power on the remote controller, connect the mobile device to the remote controller, and then launch the DJI GO app to upgrade the remote controller firmware.

1. Go to the DJI GO app > Camera View > System Status bar > Overall Status. Tap Download Firmware to download and upgrade the firmware.
2. The Status LED will turn solid green when the upgrade is successful. The LED will turn solid red if the upgrade fails. Restart the remote controller and try again.

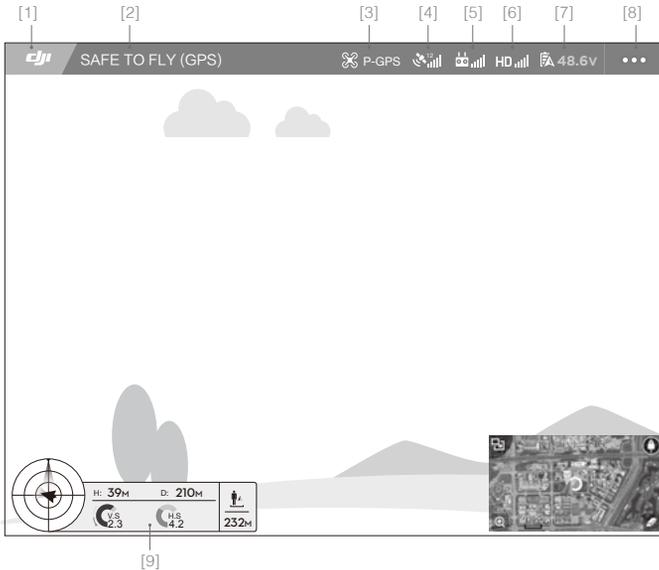


- The firmware upgrade process takes around 10 minutes. We recommend finding a comfortable environment to carry out the upgrade.
  - Both the Lightbridge 2 Air System and the remote controller firmware must be up-to-date, or else they will not link.
  - Check in the DJI GO app that you have the latest firmware installed before every flight.
  - The firmware update requires an internet connection. Connect your mobile device to a Wi-Fi network whenever possible.
  - Wait for the progress bar to reach 100% to ensure the firmware upgrade is complete.
  - The remote controller status indicator glows solid blue during the upgrade.
  - Do not power off the remote controller during the upgrade.
  - DO NOT perform the firmware upgrade while the aircraft is flying in the air. Only carry out the firmware upgrade when the aircraft is on the ground.
  - The remote controller may become unlinked from the aircraft after the firmware upgrade. Relink the remote controller and aircraft if necessary.
-

## DJI GO App

Upgrade and configure the remote controller and view the flying status in the DJI GO app.

Enter Camera View on the Equipment page.



[1] Back

**DJI**: Tap this icon to return to the main menu.

[2] System Status

**SAFE TO FLY (GPS)** : Indicates the current aircraft system status and GPS signal strength.

[3] Flight Mode

**P-GPS**: The text next to this icon indicates the current flight mode.

[4] GPS Signal Strength

**GPS Signal Strength Icon**: Shows the current GPS signal strength. White bars indicate adequate GPS strength. It will flash several times if a remote controller firmware upgrade is available. Refer to [Upgrading the Firmware \(p. 48\)](#) for details.

[5] Remote Controller Signal

**Remote Controller Signal Icon**: Shows the signal strength of the remote controller. Tap to enter remote controller settings.

[6] **Data Link Signal Strength**

**HD** : Shows the signal strength of the downlink between the aircraft and the remote controller. Tap to enter Lightbridge 2 settings.

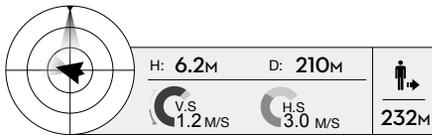
[7] **Battery Level**

**48.6V**: Shows the current battery voltage.

[8] **General Settings**

••• Tap this icon to view General Settings where you can set the units of measurement and enable the Flight Route display.

[9] **Flight Telemetry**



**Flight Attitude and Radar Function:**

The aircraft's flight attitude is indicated by the target-like icon.

- (1) The red arrow shows which direction the aircraft is facing.
- (2) The ratio of the grey area to the blue area indicates the aircraft's pitch.
- (3) The horizontal level of the grey area indicates the aircraft's roll angle.

**Flight Parameters:**

- Altitude: Vertical distance from the Home Point.
- Distance: Horizontal distance from the Home Point.
- Vertical Speed: Movement speed across a vertical distance.
- Horizontal Speed: Movement speed across a horizontal distance.

**Aircraft Distance:**

The horizontal distance between the aircraft and the operator.

DJI Support  
<http://www.dji.com/support>

This content is subject to change.

Download the latest version from  
<http://www.dji.com/product/mg-1>

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