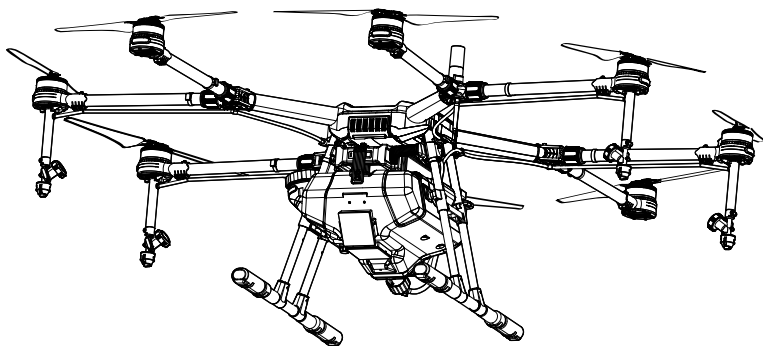


AGRAS MG-1S

MG-1S / MG-1S RTK

Quick Start Guide

V1.0



Before Flight

1. Read the *Disclaimer and Safety Guidelines* and *Quick Start Guide* carefully.



2. Download the User Manual and DJI ASSISTANT™ 2.

<http://www.dji.com/mg-1s/info#downloads>



3. Watch the video tutorials.

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



• DJI Assistant 2 supports Windows 7 (or later) or OS X 10.11 (or later).

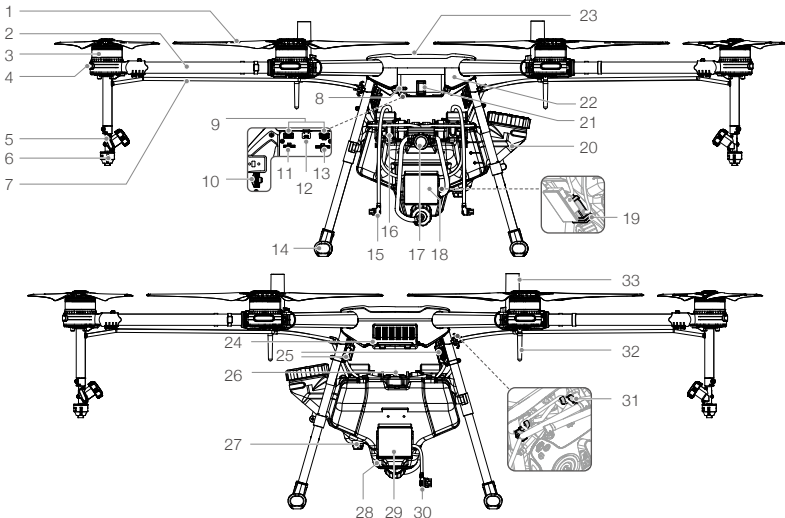
Profile

The AGRAS™ MG-1S / Agras MG-1S RTK (abbreviated as “MG-1S” / “MG-1S RTK”) is a battery-powered multirotor aircraft designed for agricultural applications in variety of environments and terrains, including 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-1S / MG-1S RTK contains DJI's dedicated A3 redundancy system with dual IMU and dual compass capabilities, ensuring safe and stable operation at all times. The MG-1S RTK has a built-in DJI™ Onboard D-RTK*, which provides more accurate data for centimeter-level positioning. F-mode, uses the DJI MG app for automatic intelligent flight planning. Radar Terrain Follow, consists of three radar modules, one on the front, rear, and underside of the aircraft, measuring distances from all three directions for terrain follow applications.

The remote controller is equipped with a bright, dedicated screen with a built-in Android system that runs the DJI MG app independently. The app features intelligent operation planning functions to produce flight routes automatically, according to marked operation areas and obstacles. The DJI MG app is able to display the system status, convenient when your aircraft is spraying far away from you.

Aircraft

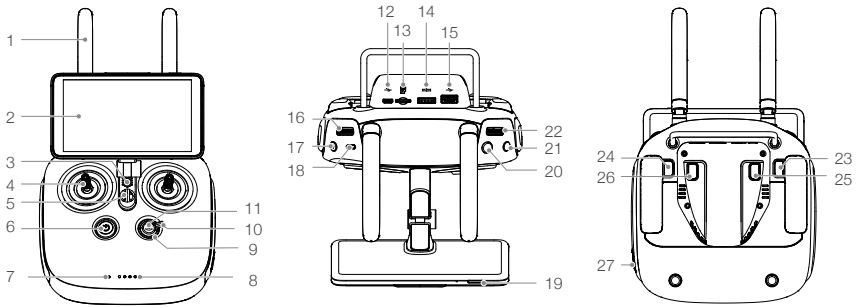


- | | | |
|------------------------------|--|---|
| 1 Propellers | 13 Reserved Expansion Port 2 | 24 Intake Vent (front of the aircraft) |
| 2 Frame Arms | 14 Landing Gear | 25 Power Ports |
| 3 Motors | 15 Pump Cables | 26 Battery Compartment |
| 4 Orientation LEDs | 16 Delivery Pumps | 27 Liquid Level Meter |
| 5 Sprinklers | 17 Flow Meter | 28 Downward Radar Module |
| 6 Nozzles | 18 Rear Radar Module | 29 Forward Radar Module |
| 7 Hoses | 19 Buffer Tank | 30 Radar Cable |
| 8 Link Button | 20 Spray Tank | 31 Remote Controller Holder |
| 9 Pump Ports | 21 Aircraft Status Indicator(rear of the aircraft) | 32 Datalink Pro Antennas |
| 10 Reserved Expansion Port 1 | 22 Aircraft Body | 33 Onboard D-RTK™ Antennas (for MG-1S RTK only) |
| 11 Radar Port | 23 Built-in GPS Module | |
| 12 Micro USB Port | | |

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

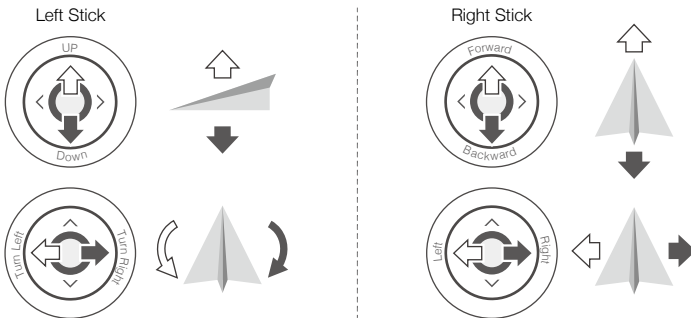
* This should be used with a DJI Base Station (purchased additionally) or DJI approved Network RTK service. Refer to the User Manual for details.

Remote Controller



- | | | |
|----------------------|--------------------------|----------------------|
| 1 Antennas | 10 Operation Mode Switch | 19 Sleep/Wake Button |
| 2 Display Device | 11 RTH Button | 20 Button A |
| 3 Speaker | 12 Micro USB Port | 21 Button B |
| 4 Control Sticks | 13 Micro SD Card Slot | 22 Settings Dial |
| 5 Lanyard Attachment | 14 CAN Port | 23 Button C1 |
| 6 Power Button | 15 USB Port | 24 Button C2 |
| 7 Status LED | 16 Spray Rate Dial | 25 Button C3 |
| 8 Battery Level LEDs | 17 Spray Button | 26 Button C4 |
| 9 RTH Status LED | 18 Flight Mode Switch | 27 Power Port |

For example, the following description uses Mode 2. The left stick controls the aircraft altitude and heading, while the right stick controls its forward, backward, left and right movements.



- ⚠ For more information about how to connect and use the remote controller, please refer to the User Manual.
- You can change the stick mode in the DJI MG app.

Installation

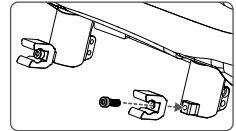


- Threadlocker is required for installation. Apply threadlocker when mounting the landing gear, spray tank, sprinklers and power port modules. Ensure threadlocker is totally dry and solid before flight.
- DO NOT bend the hose in an arc tighter than its minimum bend radius during installation. This is to avoid creasing, which may compromise the spraying effect.
- Ensure that all installation and connection procedures are completed before powering on the aircraft.

Installation steps are the same for both the MG-1S and MG-1S RTK. The illustrations below use the MG-1S as an example.

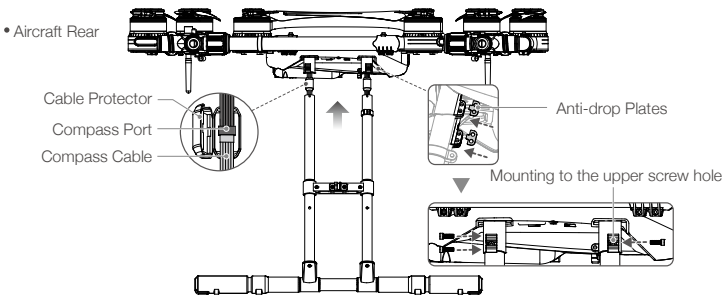
Mounting the Hose Clip

Mount the self-adhesive hose clip to the outside of the right landing gear leg mounting position (as shown) and tighten the M3x6 screw.



Mounting the Landing Gear

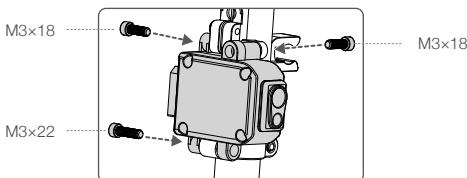
1. Identify the landing gear leg containing the two compass cables.
2. Take out each compass cable from the tube of the landing gear leg. Looking from the rear of the aircraft, connect each compass cable to the compass port on the right side of the aircraft body. Put the assembled cable into the cable protector slot and close it. Be careful not to damage the cable.
3. Place each cable protector and cable into its corresponding mounting position on the aircraft body then mount the right landing gear leg to the mounting position.
4. Insert the two anti-drop plates into the mounting position and tighten the three M3x10 screws.



5. Mount the left landing gear leg and tighten the three M3x10 screws.

Mounting the Power Port Modules

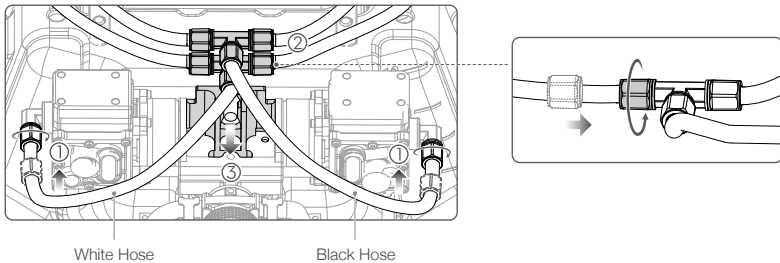
Mount the two power port modules on the bottom of the aircraft onto the two landing gear legs and tighten the two M3x18 screws and one M3x22 screw.



Mounting the Spray Tank

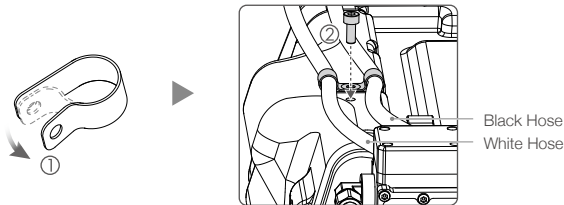
1. Connect the sprinkler kits to the spray tank.

- ① Remove the nuts on the left and right delivery pump outlets and pull the white hose on the T connector through the nut to the left outlet. Pull the black hose on the T connector through the nut to the right outlet, then tighten both nuts using an appropriate wrench. Be sure to securely tighten the nuts to avoid liquid leakage.
- ② Remove the nut on the T connector then pull the white (or black) hose with a sprinkler through the nut to the T connector with a white (or black) hose. Tighten the nut using an appropriate wrench.
- ③ Insert the two T connectors of the two sprinkler kits into the slots between the two delivery pumps. Note that the T connector with a white hose should be under the one with a black hose.



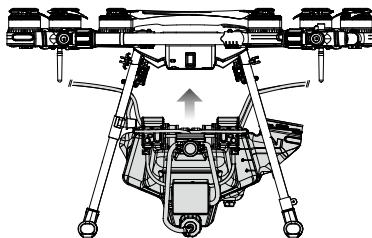
2. Prepare hose clamps B and M4x8 screws to fix the hoses to both sides on top of the spray tank.

- ① Open hose clamps B to an appropriate angle gently. DO NOT over-stretch the clamps to avoid damage.
- ② Clip the clamps around a white hose (outer position) and a black hose (inner position) at positions that need to be fixed. Ensure the flat side of the clamp is close to the spray tank, then tighten the M4x8 screw.

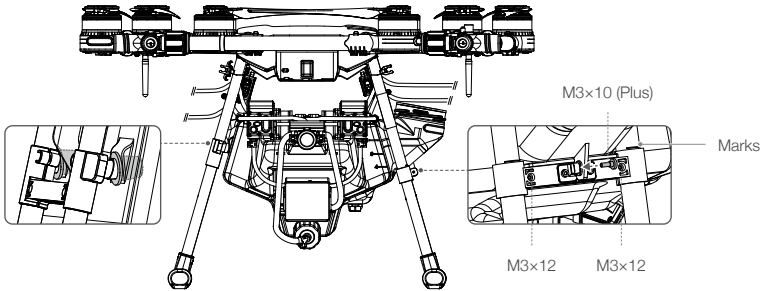


3. Remove the cover of the spray tank. Looking from the rear of the aircraft, pull the hoses on both sides through the space between the two tubes of the landing gear leg with the mouth of the tank facing to the right side of the aircraft.

4. Lift the spray tank and pull the mouth of the tank through the space between the two tubes of the right landing gear leg.



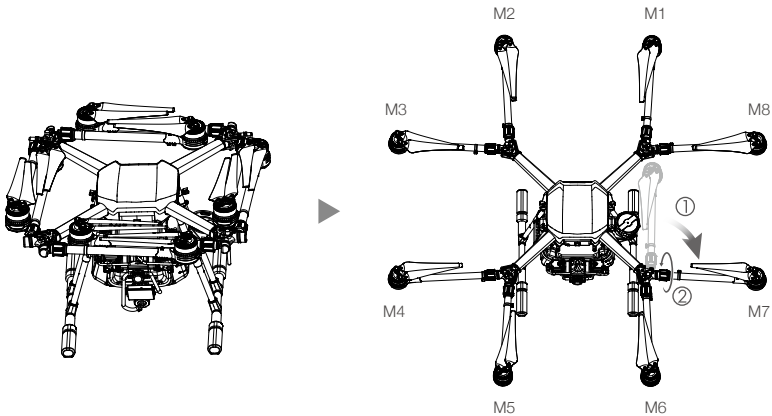
5. Insert the plugs on the left landing gear leg into the mounting holes on the spray tank.
6. Slide the fixing part on the right landing gear leg to the marks on the tube to align the screw holes on the fixing part and the fin on the right side of the spray tank. Then tight the two M3×12 screws and one M3×10 (Plus) screw.



7. Connect each of the two pump cables to the pump port on the aircraft body.
8. Connect the radar cable to the radar port on the aircraft body.

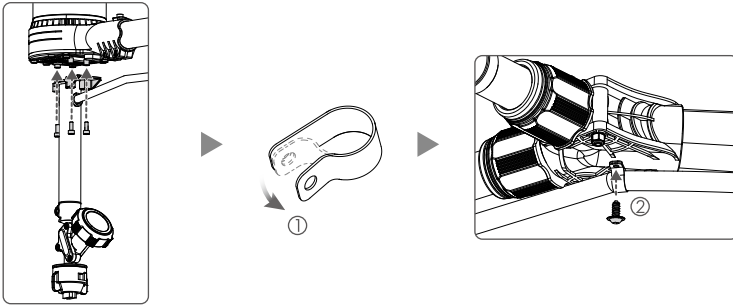
Unfolding the Frame Arms

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.

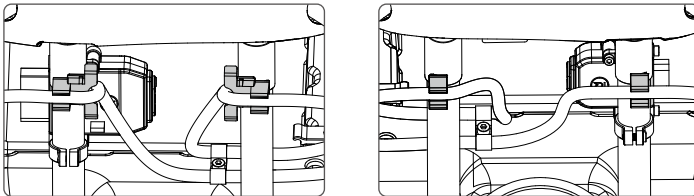


Mounting the Sprinklers

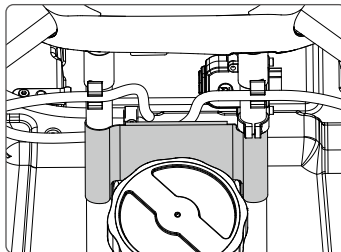
1. Mount the sprinklers with white hoses under motors M3 and M8. Mount the sprinklers with black hoses under motors M4 and M7. Mount each of the four sprinklers using three M3x5 screws.
2. Prepare hose clamps B and T3x8 screws to fix the hoses to the frame arms.
 - ① Open hose clamps B to an appropriate angle gently. DO NOT over-stretch the clamps to avoid damage.
 - ② Clip the clamps around the hoses at the position that needs to be fixed. Ensure that the flat side of the clamp is close to the bottom of the frame arm junction and tighten the T3x8 screw.



3. Insert the hoses on both sides into the clips on the landing gear.

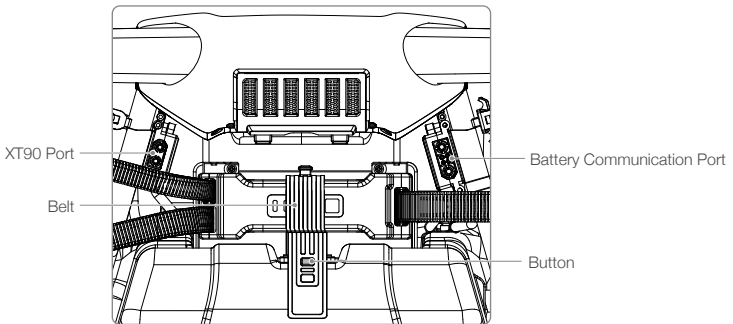


4. Mount the fender to the right landing gear leg to avoid spills when pouring liquids. Handle with care to avoid damage to the fender.



Mounting the Battery

Insert the battery into the battery compartment from the front of the aircraft. Ensure the battery is securely mounted and then buckle the belt to the button of the spray tank.

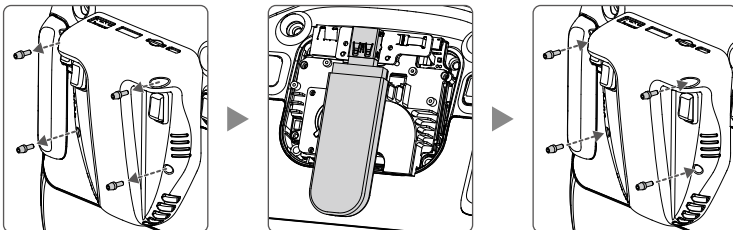


- The MG-1S / MG-1S RTK does not come with a battery. Please purchase the DJI approved MG-1S battery pack (Model: MG-12000S).
- The voltage on the aircraft can reach 50.4 V. Read the battery's safety guidelines and take necessary precautions when handling the battery to ensure your own safety.

Mounting the USB Stick

The USB stick is used for the display device of the remote controller to allow access to specific networks (such as connecting to the DJI Agriculture Management Platform, etc.). Be sure to mount it correctly onto the remote controller, or else the related services cannot be used.

1. Remove the four screws and the cover on the back of the remote controller.
2. Insert the SIM card into the USB stick correctly and then connect the USB stick to the USB port inside the remote controller. Test to ensure that they function properly.*
3. Re-mount the cover and tighten the screws.



- Be sure to use a DJI approved USB stick.
- Use the USB stick and the SIM card according to their manuals.

* Test procedure: Press once, again and hold the power button of the remote controller to turn it on. Go to DJI MG app > ⚙️ > Network Diagnostics. If the "DJI Agriculture Management Platform" is "Normal", it indicates that the USB stick and SIM card are working properly.

Fly Safe

It is important to understand some basic flight guidelines, both for your protection and for the safety of those around you.

1. **Flying in Open Areas:** Do not fly near or above people or animals, or near buildings, power lines and other obstacles.
2. **Maintain Control at All Times:** Always keep your hands on the remote controller and maintain control of your aircraft when it is in flight, even when using intelligent functions such as Intelligent Operating Planning System, Smart Operation Mode and Smart Return-to-Home.
3. **Maintain Line of Sight:** Maintain a line of sight to your aircraft at all times and avoid flying behind buildings or other obstacles that may block your view.
4. **Monitor Your Altitude:** For the safety of full-sized aircraft and other air traffic, always fly at altitudes less than 164 feet (50 meters) or according to local laws and regulations.

Visit <http://www.dji.com/flysafe/no-fly> for more information on critical safety features such as No Fly Zones.



Calibrating the Compass

Ensure the compass is calibrated before every flight. Failure to do so may lead to unexpected flight behavior.

1. DO NOT attempt to calibrate your compass where there is a chance of strong magnetic interference, including areas near massive metal objects, parking lots, underground steel reinforcements or under bridges.
2. DO NOT carry ferromagnetic materials with you (i.e. keys and mobile phones) during compass calibration.
3. The compass should always be calibrated when moving from indoor spaces to outdoor spaces.
4. If the Aircraft Status Indicator is blinking red and yellow alternately after placing the aircraft on the ground, the compass has detected magnetic interference. Change your location.
5. If the Aircraft Status Indicator is blinking red, compass calibration has failed. Please recalibrate.

Flying Considerations

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 and lightning.
2. Only fly in open areas. Tall buildings and steel structures may affect the accuracy of the onboard compass and GPS signal.
3. Avoid flying in areas with high levels of electromagnetism, including near mobile phone base stations and radio transmission towers.
4. Aircraft and battery performance is subject to environmental factors such as air density and temperature. Be very careful when flying over 6,560 feet (2 km) above sea level as the battery and aircraft performance may be reduced.
5. The aircraft cannot operate in P-mode or F-mode within the Earth's polar regions.
6. Ensure that there is a strong GPS signal in F-mode or the Smart or Manual Plus operation mode.

Return-to-Home

It is important to take off with a strong GPS signal to ensure that the Home Point is recorded by the aircraft. The aircraft will automatically return to the Home Point in the following cases.

Smart RTH: You press the RTH button.

Failsafe RTH*: Remote controller signal is lost.

Always set an appropriate RTH altitude that goes above nearby buildings before takeoff. When the aircraft is returning to the Home Point, you should guide it with the control sticks.



* The Failsafe RTH must be enabled in the DJI MG app. If not enabled, the aircraft will hover in place when remote controller signal is lost.

Pesticide Usage

1. Pesticides are poisonous and pose serious risks to human safety. Please use them in strict accordance with their specifications.
2. 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.
3. Use clean water to mix the pesticide to avoid blocking the strainer. Clear any blockages before using the equipment.
4. 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.
5. 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.
6. DO NOT contaminate rivers and sources of drinking water.
7. Avoid the use of powder pesticides as much as possible or else they may reduce the service life of the spraying system.

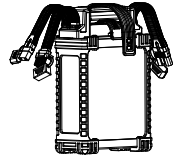


It is important to understand basic flight guidelines, for the safety of both you and those around you. Do not forget to read the *Disclaimer and Safety Guidelines*.

Using MG-1S / MG-1S RTK

Preparing the Flight Battery

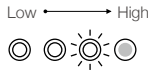
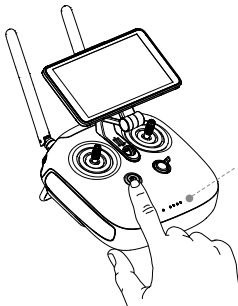
Only use DJI approved flight batteries (Model: MG-12000S). Check battery level before flying and charge according to instructions provided by the manufacturer.



Model: MG-12000S

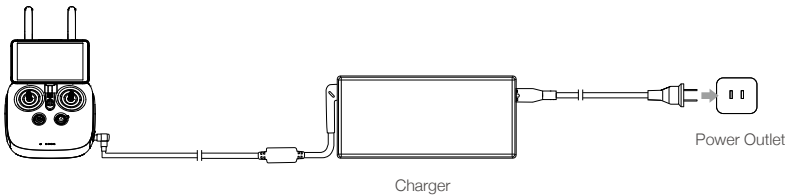
Preparing the Remote Controller

Checking Battery Level



Press once to check the battery level.
Press once, then again and hold to turn on/off.

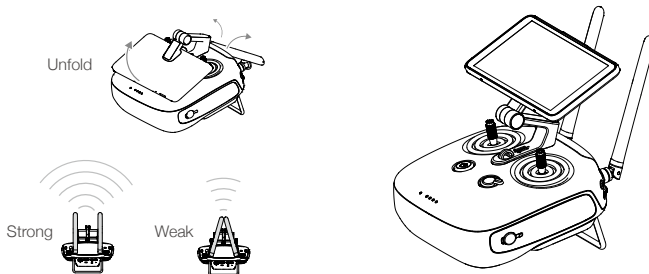
Charging the Battery



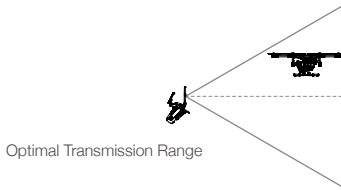
! When charging is complete, the battery level indicators will automatically turn off. The charge time is about 3 hours.

Adjusting the Antennas

Tilt the display device on the remote controller to the desired position, then adjust the antennas so they are facing outward. The strength of the remote controller signal will fluctuate depending on the position of the antennas.



Try to keep the aircraft inside the optimal transmission range. If the signal is weak, adjust the antennas or fly the aircraft closer.



- Avoid using wireless devices that use the same frequency bands as the remote controller.

Getting Ready for Takeoff

When using your MG-1S / MG-1S RTK for the first time, activate it in the DJI MG app. Your DJI account and internet connection are required.

1. Place the aircraft on an open, flat ground with the Aircraft Status Indicator facing towards you.
2. Unfold the propellers and check that they are mounted onto the motors securely. Unfold frame arms and tighten arm sleeves firmly. (Refer to [Page 7](#) for how to unfold the frame arms.)
3. Power on the remote controller.
4. Ensure the battery is securely mounted. Connect the battery to the communication port and then the XT90 port.

Calibrating the Compass

1. Go to the app and tap Start to enter Operation View. Tap the Aircraft Status Bar on top of the screen and select Calibration in the Aircraft Status List, then follow the on-screen instructions.
2. Hold the aircraft upright and rotate it 360 degrees along the central axis until the Aircraft Status Indicator changes to solid green.
3. Hold the aircraft with its nose facing upwards and rotate it 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 blinks red, repeat the steps above to recalibrate the compass.

Flight

Ensure the Flight Mode Switch is in the "F" position and wait for a strong GPS signal. Tap "Start" in the bottom left corner of the DJI MG app and enter Operation View to start the motors.

Takeoff

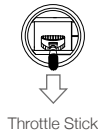
Perform the Combination Stick Command (CSC) and then slowly push the throttle stick up to take off.



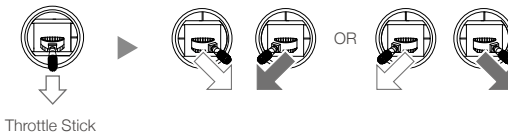
Landing

To land, pull down on the throttle stick down to descend until the aircraft touches the ground. There are two methods to stop the motors.

1. When the aircraft has landed, push the throttle down and hold. The motors will stop after 3 seconds.



2. 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.



- Take off immediately after the motors are spinning, or else the aircraft may drift and injure nearby people.
- Rotating propellers can be dangerous. DO NOT start the motors in narrow spaces or when there are people nearby.
- Always keep your hands on the remote controller when the motors are spinning.
- Never stop the motors mid-flight unless in emergency situations when doing so can reduce the risk of damage or injury.
- When using method 2 to stop the motors, the aircraft may rollover if it doesn't touch the ground completely. Please use it with caution. Method 1 is recommended for stopping the motors.
- After landing, power off the aircraft before turning off the remote controller. Disconnect the cable from the XT90 port and then the battery communication port.

Using Intelligent Operation Planning System

The remote controller equips a highlighted screen with a built-in Android system, which can run the DJI MG app. Measure operation area and obstacles, configure waypoints, and other settings via the intelligent operation planning system built-in the app, and the app will produce a flight route according to the settings. The aircraft can operate automatically following the flight route when it is in F-mode.

Planning Flight Routes

Ensure that the aircraft is powered off when planning your flight route.



Turn on the remote controller
Go to DJI MG app



Tap "Field Plan"



Satellite count \geq 10
Positioning accuracy:
~ 2m



Tap "Start Measuring"



Walk alongside the boundary
Tap "Add Waypoint C2"
at turning points



Tap "Start Obstacle Measurement C1" near the obstacle*



Walk alongside the obstacle and tap "Add Waypoint C2" to add several waypoints*



Tap "End Obstacle Measurement C1"*



Tap "End Measurement"



Adjusting the flight route: route angle, line spacing, and shrink distance



Walk to the location of the calibration point. Tap "Add Calibration Point C3"



Save the task

*If any obstacle exists in the operating area.



- The calibration point is used to rectify the bias of the flight route caused by the positioning difference between the remote controller and aircraft. Choose a fixed reference point for calibration like a metal peg or obvious marker that is easy to identify for bias rectification when executing the same task.

Starting Task



Put the aircraft to the calibration point



Power it on



Toggle the Flight Mode Switch to F-mode



Select from the "Task List" and "Use Task"



Tap "Rectify Offset"



Tap "Start Task"



"Slide to Execute"



- Be sure to take off in open areas.
- The task will be cancelled automatically if motors are started before starting the task. You need to re-call the task in the task list.
- The aircraft will hover at the ending point of the flight route after the task is completed.

Operation Modes

Refer to the User Manual for details about the Smart, Manual and Manual Plus operation modes.

More Function



Operation Resumption



System Data Protection



Empty Tank Warning

Refer to the User Manual for details.

Specifications

Airframe	
Diagonal Wheelbase	1515 mm
Frame Arm Length	625 mm
Dimensions	MG-1S: 1471 mm × 1471 mm × 482 mm (Frame arms unfolded, propellers removed) 780 mm × 780 mm × 482 mm (Frame arms folded) MG-1S RTK: 1471 mm × 1471 mm × 522 mm (Frame arms unfolded, propellers removed) 780 mm × 780 mm × 522 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	
Spray Tank	
Volume	10 L
Standard Operating Payload	10 kg

Max Battery Size	151 mm × 195 mm × 70 mm
Sprinklers	
Model	XR11001VS
Quantity	4
Max Spray Speed	0.45 L/min (Single nozzle, using water)
Spray Width	4 - 6 m (4 nozzles, 1.5 - 3 m above plant)
Droplet Size	130 - 250 μ m (Depending on operating environment and spraying speed)
Radar Terrain Follow System	
Detection Range	1 - 5 m (Varies when flying above different kinds of vegetation)
Working Range	1.5 - 3.5 m
Detection Accuracy	< 10 cm
Flight Parameters	
Total Weight (Excluding battery)	MG-1S: 10 kg, MG-1S RTK: 10.2 kg
Standard Takeoff Weight	23.8 kg
Max Takeoff Weight	24.8 kg (At sea level)
Max Thrust-Weight Ratio	1.71 (Takeoff weight of 23.8 kg)
Hovering Accuracy (P-mode or F-mode, strong GNSS signal)	D-RTK enabled: horizontal \pm 10 cm, vertical \pm 10 cm D-RTK disabled: horizontal \pm 0.6 m, vertical \pm 0.3 m (0.1 m, Radar Terrain Follow System enabled)
GNSS*	GPS+GLONASS
Battery	DJI approved battery pack (Model: MG-12000S)
Max Power Consumption	6400 W
Hovering Power Consumption	3800 W (Takeoff weight of 23.8 kg)
Hovering Time*	22 min (Takeoff weight of 14 kg with a 12000 mAh battery) 10 min (Takeoff weight of 23.8 kg with a 12000 mAh battery)
Max Operating Speed	7 m/s
Max Flying Speed	12 m/s (P-mode or F-mode, with GNSS), 15 m/s (A-mode)
Max Wind Resistance	8 m/s
Max Service Ceiling Above Sea Level	2000 m
Operating Temperature	32° to 104° F (0° to 40° C)

* For the Asia-Pacific version of the MG-1S RTK, GNSS is GPS+GLONASS+BEIDOU when RTK is enabled. Estimated hovering time was measured at sea level and in wind speeds under 3 m/s. This value should be used for reference only.

Remote Controller	
Model	DLG60A
Operating Frequency	2.400 GHz to 2.483 GHz
Max Transmission Range	FCC: 1.5 km, CE/KCC/TELEC/SRRC: 1 km (Unobstructed and free of interference)
EIRP	FCC: 24 dBm, CE/KCC/TELEC/SRRC: 19 dBm
Built-in Battery	6000 mAh, 2S LiPo
Display Device	5.5 inch screen, 1920×1080, 1000 cd/m ² , Android system, 4G RAM+16G ROM
Output Power	7 W
Operating Temperature	14° to 104° F (-10° to 40° C)

Storage Temperature	Less than 3 months: -4° to 113° F (-20° to 45° C) More than 3 months: 72° to 82° F (22° to 28° C)
Charge Temperature	41° to 104° F (5° to 40° C)
Remote Controller Charger	
Model	A14-057N1A
Voltage	17.4 V
Rated Power	57 W

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

※ This Quick Start Guide is subject to change without prior notice.

Download the user manual for more information:
<http://www.dji.com/mg-1s>



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