STANDARD OPERATING PROCEDURES

Operating the DJI INSPIRE[™] 2 Drone

I. General

This standard operating procedure references the user manual provided by DJI manufacturer in terms of the operating procedure of the DJI INSPIRETM 2. The INSPIRETM 2 is a filmmaking drone that integrates an HD video transmission system and 360° rotating gimbal. The drone weighs 7.58 lbs (3440 g, including two batteries, without gimbal and camera), and the maximum takeoff weight is 9.37 lbs (4250 g). The camera unit is independent from the image processor, and a Zenmuse X5STM camera is used to capture RAW videos for the data collection task. The drone has a dual battery system that prolongs the flight time to a maximum of 25 minutes, and its operating temperature should be within the range of -4° to 104° F (-20° to 40° C). Figure 1 shows the front and overhead views of a DJI INSPIRETM 2 drone.



Figure 1. DJI INSPIRE™ 2 Drone



Figure 2. DJI INSPIRE™ 2 Drone Diagram

II. Operating Procedures

The drone operating procedures can be separated into three stages: pre-flight, during flight and post-flight. During each stage, the drone will have a corresponding flight mode. For the pre-flight stage, the drone should change from travel to landing mode, then after takeoff, the drone will transform into flight mode, and once the drone is landed, it will switch back to the initial travel mode.



Figure 3. Different Forms of Drone during Different Flight Modes

This section provides instructions and diagrams of procedures involved in each stage. Additionally, it is also recommended for users to watch the tutorial videos available at www.dji.com or in the DJI GOTM 4 app, and refer to the user manual provided by the manufacturer for further detailed information and other special situations that are not discussed in this document. The user manual can be downloaded at <u>https://www.dji.com/downloads/products/inspire-2</u>.

A. Pre-flight Preparation

1. Download DJI GO[™] 4 app

The operation of Inspire 2 requires the usage of DJI GO^{TM} 4 app or other apps compatible with DJI aircraft during flight. If the drone is not connected to the app, then the flight is restricted to a height of 98 ft (30 m) and distance of 164 ft (50 m) for safety reasons. The DJI GO^{TM} 4 app can be found in the App Store or Google Play Store and may be downloaded to a mobile device. Figure 4 shows the icon and user interface of the app.



Figure 4. User Interface of the DJI GO[™] 4 App

2. Install Batteries and Check the Battery Level

Step 1: Press the power button located on one side of the battery once, then press again and hold for 2 seconds to power it on. The power LED will turn red, and the battery level indicators will display the current battery level. If the battery level is low, it is recommended to charge it to full capacity before flight. The battery charging procedures can be found in the standard operating procedure 1 document.

Step 2: If the battery pair is fully charged, insert them into the battery slots located at the end of the drone. It is encouraged to use paired batteries for better performance. It should be noted that the battery slot located on the right-hand side should be used when using only one battery to supply power.



Figure 5. Insert Batteries into the Drone Battery Slots

3. Attach the 1550T Quick Release Propellers

Step 1: Pair the propellers and motors with arrows of the same color (red or white).

Step 2: To attach the propeller onto the motor, press down the spring pad, then hold it and rotate the propeller lock until the arrows are aligned and a click sound is heard.

Step 3: Check the propellers and ensure they are in good condition and installed correctly.



Figure 6. Steps to Attach the 1550T Quick Release Propellers

4. Insert Micro SD Card if Necessary

Since the drone is used for video/image data collection, it is necessary to equip the drone with a Micro SD card to store the captured photos and videos. The Inspire 2TM comes with a 16 GB Micro SD card and supports up to a 128 GB Micro SD card. A UHS-3 type Micro SD card is recommended, because the fast read and write capability of these cards enables users to store high-resolution video data. The Micro SD card can be inserted into the camera Micro SD card slot ([8] in Figure 2) shown in Figure 7 before powering on the Inspire 2. The inserted card can activate still capturing and video recording.



Figure 7. Insert Micro SD Card to the Slot

5. Unlock Travel Mode

The default mode of the drone is set to travel mode when it is powered off. For takeoff, it is necessary for the drone to switch to landing mode first, and the procedure is as follows:

Step 1: Place the drone in an open area on a flat ground.

Step 2: Press the power button ([13] in Figure 2) a minimum of five times. Then the battery level indicators ([14] in Figure 2) will display a green light to show the battery level.



Figure 8. Steps to Power on the Drone

Step 3: Lower the landing gear to Landing Mode and power on automatically.



Figure 9. Drone Changing from Travel Mode to Landing Mode

6. Mount the Zenmuse X5STM Camera to the Gimbal

Step 1: Take the Zenmuse X5S[™] camera out of the box and remove the lens cap ([7] in Figure 10). Find the gimbal cap, and rotate to remove it from the camera.



Figure 10. Zenmuse X5S™ Camera Diagram

Step 2: Press the gimbal and camera release button ([4] in Figure 2) on the Inspire 2 and hold. Rotate to remove the gimbal cap from the drone.

Step 3: Align the white dot on the gimbal of the camera to the red dot on the drone and insert the gimbal.

Step 4: Rotate the gimbal lock to the locked position by aligning the red dots on the gimbal and drone.



Figure 11. Steps to Mount the Zenmuse X5S[™] Camera to the Drone

The camera can only be mounted to the drone when the drone is in landing mode. When the camera is mounted correctly, the drone will perform an automatic calibration sequence by spinning the gimbal on its own.

7. Prepare the Remote Controller

Step 1: Adjust the mobile device holder to the desired position and adjust the antenna located at the back of the remote controller.

Step 2: Press the button on the side of the mobile device holder to release the clamp, adjust it to fit the size of the mobile device and then attach the mobile device.

Step 3: Connect the mobile device to the remote controller with a USB cable. Plug one end of the cable into the mobile device, and the other end into the USB port on the back of the remote controller.



Figure 12. Steps to Prepare the Remote Controller

Step 4: Press and hold the Power Button to power on the remote controller, and a beep sound will be heard when it powers on. The LEDs on the front panel indicate the battery level of the remote controller.



Figure 13. Power on the Remote Controller

Step 5: Launch the DJI GO^{TM} 4 app on the mobile device. Enter camera view and then tap "Linking Remote Controller" button as shown below. When the remote controller is ready to link, the status indicator located at the front panel will blink blue with a beep sound.

| Remote Controller Settings | | | \times | | |
|---|----|-------------|----------|--|--|
| Charge Mobile Phone | | Never | | | |
| Button Customization | C1 | Not Defined | | | |
| Customize with the C1 and C2 button on the back of the Remote Controller. | | | | | |

Figure 14. Link Remote Controller Window in the DJI GO™ 4 App

Step 6: Locate the Linking button on the drone, as shown in Figure 15. Press the Linking button to start linking and the remote controller status LEDs will blink green rapidly. When linking is completed, the status LEDs will display a solid green light.



Figure 15. Location of the Linking Button on Inspire 2™

8. Preflight Checklist

Once all the previous steps are completed, the drone will be ready to take off. Users are encouraged to use the following checklist to ensure every requirement is satisfied for a safe flight:

- Remote controller, Intelligent Flight Battery, and mobile device are fully charged.
- Propellers are mounted correctly and firmly.
- Micro SD card has been inserted, if necessary.
- Gimbal is functioning normally.
- Motors can start and are functioning normally.
- The DJI GO[™] 4 app is successfully connected to the drone.
- Ensure that the sensors for the Obstacle Sensing System are clean.

B. In-flight Operation

The drone operation should avoid severe weather conditions (wind speeds exceeding 22 mph (10 m/s), snow, rain, and fog) and be conducted in open areas. To fly the drone, launch the DJI GO 4 app and tap the 'GO FLY' button, as shown in Figure 4. Before taking off, it is required to ensure that the aircraft status bar in the upper left corner of the DJI GO 4 app indicates 'Ready to Go (GPS)' or 'Ready to Go (Vision)' in flying indoors without any warning messages.



Figure 16. 'READY TO GO' Status Bar in the DJI GO 4 App

1. Compass Calibration

It is possible that the status bar in the app will indicate calibration is needed for the drone before takeoff. Under this circumstance, simply follow the instructions provided in the app, which are also listed below. The calibration procedures should be carried out in an open area.

Step 1: Tap the aircraft status bar in the app and select "Calibrate" option, then follow the onscreen instructions.

Step 2: Hold the drone horizontally and rotate 360 degrees. The aircraft status indicators will display a solid green light.



Figure 17. Rotate the Drone Horizontally

Step 3: Hold the drone vertically, with the battery side pointing upward, and rotate it 360 degrees around the center axis. Recalibrate the compass if the aircraft status indicator glows blinking red.



Figure 18. Rotate the Drone Vertically

Step 4: If the Aircraft Status Indicator blinks red and yellow after the calibration procedure, then move the drone to a different location and try again, until the app indicates the drone is ready to fly.

2. Takeoff

Step 1: Place the aircraft in an open, flat area with the battery level indicators facing towards the drone pilot.

Step 2: Launch the DJI GO 4 app and enter the Camera page.

Step 3: Wait until the aircraft indicators blink green, which means the Home Point is recorded and it is safe to fly. If the indicators flash yellow, then the Home Point has not been recorded.

Step 4: For manual takeoff, push both left and right sticks towards each other or away from each other to start the motors. Then slowly push forward the left stick to take off.



Combination Stick Command to start/stop the motors

Figure 19. Steps to Take off Manually

(slowly) to take off

For automatic takeoff, first confirm the surrounding environments are safe for flight, then use the Auto Takeoff function by tapping the 'Auto Takeoff' button in the app and sliding the icon to confirm for takeoff. The icon of the 'Auto Takeoff' function in the app is shown in Figure 20. The drone will then take off and hover at 4 ft (1.2 m) above the ground.



Auto Takeoff The aircraft will take off and hover at an altitude of 4 feet (1.2 meters).

Figure 20. 'Auto Takeoff' Function Icon in the DJI GO 4 App

3. Flight Control

Once the drone takes off, users can use remote controller to fly the drone. On the remote controller, the left stick controls the drone's elevation and heading while the right stick controls the drone's forward, backward, and lateral movements. The detailed stick operations and functions are discussed below.

Change Drone's Elevation: Users can push the left stick forward to ascend and backward to descend the drone's elevation. The more the stick is pushed away from the center position, the faster the drone will change elevation.



Figure 21. Left Stick Forward/Backward Movement to Change Drone Elevation

Rotate Drone: Users can push the sick to the left to rotate the aircraft counterclockwise, and push the stick to the right to rotate the aircraft clockwise. If the stick is centered, the drone will keep its current direction. The more the stick is pushed away from the center position, the faster the drone will rotate.



Figure 22. Left Stick Left/Right Movement to Rotate Drone

Move Drone Forward/Backward: Users can push the stick forward to fly the drone forward and backward to fly the drone backward. The drone will hover in the current place if the stick is centered. The stick can be pushed further away from the center position for a larger pitch angle and faster flight.



Figure 23. Right Stick Forward/Backward Movement to Move Drone Forward/Backward

Move drone to the Left/Right: Users can push the stick to the left to fly the drone left and push the stick to the right to fly the drone right. The drone will hover in the current place if the stick is centered. The stick can be pushed further away from the center position for a larger pitch angle and faster flight.



Figure 24. Right Stick Left/Right Movement to Move Drone to the Left/Right

Change Camera's Facing Direction: Users can turn the dial to the right to let the camera point upwards and turn the dial to the left to let camera point downwards. The camera will remain in its current position when dial is static.



Figure 25. Gimbal Dial to Change Camera's Facing Direction

Pause the Flight: Users can press the Intelligent Flight Pause button to pause the current task.



Figure 26. Press the Pause Button to Pause the Flight

4. Image/Video Shooting

To collect image/video data during flight, users can either use the shutter and record button on the remote controller to shoot images and videos, or use the touch interface in the DJI GO 4 app to capture photos, record videos and playback. The available functions and operations involved in each method are listed below.

Remote Controller

Gimbal Dial ([1] in Figure 27): Turn the dial to control the tilt of the gimbal.

Video Recording Button ([2] in Figure 27): Press the button once to start recording video, then press again to stop recording.

Shutter Button ([3] in Figure 27): Press the button to take a photo. If burst mode is activated, multiple photos will be taken with a continuous press. This function can be used during video recording as well.

Camera Settings Dial ([5] in Figure 27): Turn the dial to adjust camera settings such as ISO, shutter speed, and aperture without letting go of the remote controller. Press down on the dial to toggle between these settings.



Figure 27. Remote Controller Diagram

• DJI GO 4 App

Taking Photos: Tap the shutter/record switch ([6] in Figure 28) to select shutter. Tap the shutter/record button ([8] in Figure 28) to take photos. There are five shooting modes available:

Single Shooting, Multiple Mode, AEB (Auto Exposure Bracketing), Timed Shot, and RAW Burst Mode. The default mode is Single Shooting, and the shooting mode can be changed via the DJI GO 4 app.

Recording: Tap the shutter/record switch ([6] in Figure 28) to activate video recording mode, and then tap the shutter/record button ([8] in Figure 28) once to start recording, and tap again to stop recording. The recording time length will be displayed below the shutter/record button.

Change Camera Settings: Tap the Photography Configurations and Parameter Settings button ([10] in Figure 28) to set exposure modes, ISO, shutter, photo styles, and auto exposure values of the camera.

Playback: Tap the playback button ([11] in Figure 28) to review captured photos and videos. Press the same button again to return to the camera view.



1. Live HD Video

2. Current Camera Settings

- 5. AE Lock
- 6. Shutter/Record Switch
- 3. Spot Metering/ Focus 7. MF Adjustment (in MF mode) 11. Playback
 - 8. Shutter/Record
- Switch 4. AF/MF
- 9.Gimbal Slider
- 10. Photography Configurations and Parameter Settings
- - 12. FPV(Tablets only)
- Figure 28. Touch Interface of DJI GO 4 App

5. Landing

• Auto Landing

The auto landing function can only be used when the Aircraft Status Indicator is blinking green. The landing process can be paused by tapping the cross button on the screen. The steps involved in the auto landing process are discussed as follows:

Step 1: Let the drone hover over a level surface and ensure the landing condition is ideal.

Step 2: Tap on the Auto Landing button (shown in Figure 29) in the DJI GO 4 app and slide to confirm.



Auto Landing The aircraft will land vertically and stop its motors.

Figure 29. Auto Landing Button Icon

Step 3: Landing Protection will be activated during auto landing, and it determines whether the ground is suitable for landing. If so, the drone will land gently. If not, the drone will hover and wait for pilot confirmation. If Landing Protection is inactive, the DJI GO 4 app will display a landing prompt when the drone descends below 0.7 meters. Tap to confirm or pull down the control stick for 2 seconds to land when the environment is appropriate for landing.

Step 4: The drone will land and turn off automatically.

• Manual Landing

Step 1: Lower the drone landing gear by toggling the Return to Home (RTH) switch on the front panel of the remote controller down before landing. The drone will not be able to land if the landing gear is not lowered.



Raise



Figure 30. Auto Landing Button Icon

Step 2: Push the left stick on the remote controller backward slowly until the drone lands on the ground. Keep holding the stick for a few seconds to stop the motors.

C. Post-flight Procedures

1. Dismount the Gimbal and Camera

The gimbal and camera should be removed before transforming the drone from Landing Mode to Travel Mode.

Step 1: Press down the gimbal detach button and rotate the gimbal lock at the same time to remove the gimbal and camera. The gimbal lock should be fully rotated when removing the gimbal for the next installation.

Step 2: Put the cover back to the gimbal connector of the drone for protection.

Step 3: Put the lens cap and gimbal cap back on to the camera.

2. Power off the Drone

Press the power button ([13] in Figure 2) five times to transform the drone to Travel Mode. The battery level indicator lights should turn off.

3. Remove the Batteries

Press the Battery Removal button ([15] in Figure 2) to remove the batteries from the drone. If necessary, charge the used batteries in preparation for the next flight.

4. Detach the Propellers

For each propeller, press down the spring pad and rotate the propeller lock to remove. Put all the propellers back to the drone box.

5. Power off the Remote Controller

Step 1: To power off the remote controller, simply press and hold the Power Button and wait until all the Battery Level LEDs have been turned off. The batteries should be turned off first before turning off the remote controller.

Step 2: Disconnect the mobile device with the remote controller by unplugging the USB cable.

Step 3: Press the button on the side of the mobile device holder to release the clamp and take off the mobile device. Change the mobile device holder to its original position and put the remote controller back into the drone box.

Procedure Checklist of Operating the DJI INSPIRE[™] 2 Drone

| Procedure Checklist of Operating the DJI INSPIRE [™] 2 Drone | | | |
|---|--|----------|--|
| | Project Number: | Comments | |
| General Information | Date: | | |
| | Time: | | |
| | Operator: | | |
| Required Equipment | | | |
| | DJI INSPIRE [™] 2 Drone | | |
| | TB50 Intelligent Flight Batteries [®] (1 set for each flight) | | |
| | DJI INSPIRE [™] 2 Remote Controller | | |
| Drone Equipment | 1550T Quick Release Propellers (2 red and 2 white) | | |
| | Zenmuse X5S [™] camera | | |
| | A 16 GB Micro SD card | | |
| | A mobile device with DJI GO TM 4 app installed | | |
| Preflight Preparation | | Check | |
| Download the DJI GO ^{тм} 4 app | Download and install the DJI GO [™] 4 app from the App Store or Google Play Store to a mobile device | | |
| Insert Intelligent Flight Battery | Press the battery power button once, then press again and hold for 2 seconds to check the battery level indicators to ensure the batteries are fully charged | | |
| | Insert a set of paired batteries into the battery slots located at the end of the drone | | |
| Install 1550T Quick Release Propellers | Pair the propellers and motors with arrows of the same color (red or white) | | |
| | Press down the spring pad, then hold it and rotate the propeller lock until the arrows are aligned and a click sound is heard | | |
| | Check the propellers and ensure they are in good condition and installed correctly | | |
| Insert Micro SD Card (if needed) | Insert the micro SD card into the camera Micro SD card slot located on one side of the drone before powering on the drone | | |
| Unlock Drone Travel Mode and Power on | Place the drone in an open area on a flat ground | | |
| | Press the drone power button a minimum of five times to power on the drone and switch it from travel to landing mode | | |

| Mount the Zenmuse X5S™ Camera to the Gimbal | Remove the lens cap and gimbal cap from the camera | |
|---|---|-------|
| | Press the gimbal and camera release button located on the drone bottom and hold, then rotate to remove the gimbal cap from the drone | |
| | Align the white dot on the gimbal of the camera to the red dot on the drone and insert the gimbal | |
| | Rotate the gimbal lock to the locked position by aligning the red dots on the gimbal and drone | |
| Link the Remote Controller to the drone | Put the mobile device in the mobile device holder of the remote controller | |
| | Connect the mobile device to the remote controller with a USB cable | |
| | Press and hold the Power Button to power on the remote controller, and a beep sound will be heard when it powers on | |
| | Ensure the remote controller has enough power by checking the battery level indicator on the front panel of the remote controller | |
| | Launch the DJI GO [™] 4 app on the mobile device. Enter camera view and tap "Linking Remote Controller" button | |
| | Locate the Linking button on the drone, and press the Linking button to | |
| | start linking and the remote controller status LEDs will display a solid green light when linking is completed | |
| | start linking and the remote controller status LEDs will display a solid green light when linking is completed In-flight Operation | Check |
| | start linking and the remote controller status LEDs will display a solid green light when linking is completed In-flight Operation Avoid controlled airspace | Check |
| Flight Environment | start linking and the remote controller status LEDs will display a solid green light when linking is completed In-flight Operation Avoid controlled airspace Avoid severe weather conditions (wind speeds exceeding 22 mph (10 m/s), snow, rain, and fog) | Check |
| Flight Environment | start linking and the remote controller status LEDs will display a solid green light when linking is completed In-flight Operation Avoid controlled airspace Avoid severe weather conditions (wind speeds exceeding 22 mph (10 m/s), snow, rain, and fog) Avoid large/ special events | Check |
| Flight Environment | start linking and the remote controller status LEDs will display a solid green light when linking is completed In-flight Operation Avoid controlled airspace Avoid severe weather conditions (wind speeds exceeding 22 mph (10 m/s), snow, rain, and fog) Avoid large/ special events Place the aircraft in an open, flat area with the battery level indicators facing towards the drone pilot | Check |
| Flight Environment | start linking and the remote controller status LEDs will display a solid green light when linking is completed In-flight Operation Avoid controlled airspace Avoid severe weather conditions (wind speeds exceeding 22 mph (10 m/s), snow, rain, and fog) Avoid large/ special events Place the aircraft in an open, flat area with the battery level indicators facing towards the drone pilot Launch the DJI GO 4 app and tap the 'GO FLY' button, then enter the Camera page | Check |
| Flight Environment | start linking and the remote controller status LEDs will display a solid green light when linking is completed In-flight Operation Avoid controlled airspace Avoid severe weather conditions (wind speeds exceeding 22 mph (10 m/s), snow, rain, and fog) Avoid large/ special events Place the aircraft in an open, flat area with the battery level indicators facing towards the drone pilot Launch the DJI GO 4 app and tap the 'GO FLY' button, then enter the Camera page Ensure the aircraft indicators blink green, which means the Home Point is recorded and it is safe to fly | Check |
| Flight Environment Take off | start linking and the remote controller status LEDs will display a solid green light when linking is completed In-flight Operation Avoid controlled airspace Avoid severe weather conditions (wind speeds exceeding 22 mph (10 m/s), snow, rain, and fog) Avoid large/ special events Place the aircraft in an open, flat area with the battery level indicators facing towards the drone pilot Launch the DJI GO 4 app and tap the 'GO FLY' button, then enter the Camera page Ensure the aircraft indicators blink green, which means the Home Point is recorded and it is safe to fly Ensure that the aircraft status bar in the upper left corner of the DJI GO 4 app indicates 'Ready to Go (GPS)' or 'Ready to Go (Vision)' in flying indoors without any warning messages | Check |

| | Ensure the left stick on the remote controller can change the drone's elevation and heading | |
|------------------------------------|--|-------|
| Flight Control | Ensure the right stick on the remote controller can change the drone's forward, backward, and lateral movements | |
| | Turn the dial located on the side of the remote controller to ensure it can change the camera's facing direction | |
| Landing | Use the shutter and record button on the remote controller or use the touch interface in the DJI GO 4 app to capture photos or record videos | |
| | Let the drone hover over a level surface and ensure the landing condition is ideal | |
| | Tap on the Auto Landing button in the DJI GO 4 app and slide to confirm | |
| | If a landing prompt appears due to the activated Landing Protection, tap to confirm to land when the environment is appropriate for landing | |
| Post-flight Operation | | Check |
| Dismount the Gimbal and | Press down the gimbal detach button and rotate the gimbal lock at the same time to remove the gimbal and camera | |
| Camera | Put the cover back to the gimbal connector of the drone for protection | |
| | Put the lens cap and gimbal cap back on to the camera | |
| Power off the Drone | Press the drone power button five times to switch the drone back to Travel Mode | |
| Remove Batteries | Press the Battery Removal button to remove the batteries from the drone | |
| Detach Propellers | For each propeller, press down the spring pad and rotate the propeller lock to remove. Then put all the propellers back to the drone box | |
| | Press and hold the Power Button and wait until all the Battery Level LEDs have been turned off | |
| Power off the Remote Controller | Disconnect the mobile device with the remote controller by unplugging the USB cable | |
| | Take off the mobile device and put the remote controller back into the drone box | |
| Operator Signature | | |