PHANTOM 4 RTK

Quick Start Guide

v2.0
Phantom 4 RTK

The Phantom 4 RTK is a smart mapping and imaging drone capable of highly accurate mapping functions. The aircraft has a built-in DJI™ Onboard D-RTK*, which provides precision data for centimeter-level positioning accuracy. Multi-directional obstacle sensing is enabled by forward, rear, and downward vision and infrared sensors*. The camera features a 1-inch 20-megapixel CMOS sensor housed within a high stability gimbal. When it comes to mapping, the high-performance mechanical shutter eliminates rolling shutter distortion when capturing images at speed. Image data can be used to generate maps for field planning when operating a DJI AGRAS™ aircraft. Users can also import photos to the DJI TERRA™ application or third-party mapping software to composite highly accurate maps for different applications.

The Phantom 4 RTK uses 9455S low-noise propellers to reduce noise and improve efficiency.

* This should be used with Network RTK service, a DJI D-RTK 2 High-Precision GNSS Mobile Station (purchased additionally) or post-processed kinematic (PPK) data (recommended when RTK signal is weak during operation). The Vision and Infrared Sensing Systems are affected by surrounding conditions. Read the Disclaimer and Safety Guidelines to learn more.
Remote Controller

The Phantom 4 RTK remote controller has a transmission range of up to 4.3 mi (7 km) * with controls for camera tilt and photo capture. DJI OcuSync is built into the remote controller, transmitting live HD imaging from the camera directly. Simply tap the screen in the DJI GS RTK app or import KML/KMZ files to plan an operation for convenient project management. Users can also connect the remote controller to a PC to access DJI Terra for planning and executing operations. The remote controller’s Multi-Aircraft Control mode can be used to coordinate the operation of up to five aircraft at the same time, enabling pilots to work more efficiently. Replaceable batteries can be easily hot-swapped and the antennas are easily removable for quick maintenance.

1. Power Button
2. RTH Button
3. Control Sticks
4. Speaker
5. Lanyard Attachment
6. Status LED
7. Battery Level LEDs
8. USB-C Port
9. 3.5 mm Audio Jack
10. MicroSD Card Slot
11. Display Device
12. Sleep/Wake Button
13. Antennas
14. Gimbal Dial
15. Aircraft Control Switch Dial
16. Record Button
17. Pause Switch
18. Shutter Button
19. Reserved Button
20. Button C1 (customizable)
22. Battery Compartment Cover
23. Battery Compartment Cover Lock
24. Dongle Compartment Cover

The figure below shows the function that each control stick movement performs, using Mode 2 as an example. The left stick controls the aircraft’s altitude and heading, while the right stick controls its forward, backward, left and right movements. The gimbal dial controls the camera’s tilt.

* The remote controller is able to reach its maximum transmission distance (FCC) in a wide open area with no Electro-Magnetic Interference, and at an altitude of about 400 feet (120 meters).
Using Phantom 4 RTK

1. Mount the Remote Controller Battery

The remote controller uses an easily removable interchangeable Intelligent Battery for long-term operation.

1. Slide the battery compartment cover lock on the back of the remote controller down to open the cover.
2. Insert the Intelligent Battery into the compartment and push it to the top.
3. Close the cover.

- To remove the Intelligent Battery, open the cover, press and hold the battery release button, then push the battery downward.

2. Mount the Dongle and SIM Card

- The Phantom 4 RTK remote controller can access the Internet using a 4G dongle with SIM card or Wi-Fi signal. For UK, EU, ACUK, or ACEU versions, a Network RTK server can only be accessed using a 4G dongle with SIM card. For AU or AFUS versions, using a 4G dongle with SIM card is recommended, but a WiFi signal can also be used. To confirm the version of your unit, please view the version code after the product name on the label on the product packaging. When uploading or downloading system logs or operation data, using a Wi-Fi signal for Internet access is recommended.
- Only use a DJI approved dongle.
- The dongle supports various network standards. Use a SIM card that is compatible with the chosen mobile network provider and select a mobile data plan according to the planned level of usage.
- The dongle and SIM card are used to enable the remote controller to access to specific networks and platforms, such as the DJI AG platform. Be sure to mount them correctly, or else network access will not be available.

- Test procedure: Press the remote controller power button once, then press again and hold to turn the remote controller on. In the DJI GS RTK app tap  and select Network Diagnostics. If the statuses of all the devices in the network chain are shown in green the dongle and SIM card are functioning properly.

3. Check the Battery Levels

Press once to check the battery level. Short press once, then long press and hold to turn on/off.
4. Charge the Batteries

- Fully charge the batteries before first-time use.

5. Prepare the Remote Controller

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

6. Prepare for Takeoff

- Remove the gimbal clamp from the camera.
- Power on the remote controller and the aircraft.
- Enter the DJI GS RTK app.

When using your Phantom 4 RTK for the first time, activate it using the DJI GS RTK app. Ensure that the remote controller has access to the Internet.
Before taking off, make sure the Aircraft Status Bar in the DJI GS RTK app indicates *Ready to Go (RTK)* or *Ready to Go (GNSS).*

### Takeoff
- **Combination Stick Command** to start/stop the motors

### Landing
- Left stick down slowly until you touch the ground
- Hold for 3 seconds to stop the motors

- **Spinning propellers can be dangerous. Stay away from spinning propellers and motors. DO NOT start the motors in confined spaces or when there are people nearby.**
- **Always keep your hands on the remote controller when the motors are spinning.**
- **Stopping motors mid-flight: Perform the CSC to stop the motors. This function can be enabled in the app. Only stop motors mid-flight in emergency situations when doing so can reduce the risk of damage or injury.**

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.

*RTK positioning is recommended. Go to DJI GS RTK > Fly > ••• > RTK to enable RTK module and select a method for receiving RTK signals.*
8. Start Operations

Photogrammetry and waypoint actions can be performed using both DJI Terra software and the DJI GS RTK app. The following example includes instructions for photogrammetry operation using the DJI GS RTK app. Refer to DJI Terra User Manual for details (if in use).

- Only take off in open areas.
- An operation can be paused by toggling the Pause Switch. The aircraft will hover and record the breakpoint, and then the aircraft can be controlled manually. To continue the operation, select it from the list again and then resume. The aircraft will automatically return to the breakpoint and resume the operation.
- The aircraft will return to the Home Point automatically once the operation is complete. Instead of RTH, the aircraft can also be set to perform other flight actions within the app.

9. Applications

Field Planning
Import aerial photos into DJI Terra to perform map post-processing. Then plan the field in DJI Terra. Use a microSD card to import the plan file from DJI Terra into the Agras MG-1S Advanced / MG-1P series remote controller. Refer to corresponding user manuals for more details.

High Accuracy Mapping
Import the original aerial photos into DJI Terra and perform map post-processing to produce a high-accuracy map. Please refer to the DJI Terra User Manual for more details.

Visit the link below to learn more about DJI Terra:
http://www.dji.com/dji-terra
Specifications

- **Aircraft**
  - Weight (Battery & Propellers Included): 1391 g
  - Max Service Ceiling Above Sea Level: 19685 ft (6000 m)
  - Max Ascent Speed: 6 m/s (automatic flight); 5 m/s (manual control)
  - Max Descent Speed: 3 m/s
  - Max Speed: 31 mph (50 kph) (P-mode); 36 mph (58 kph) (A-mode)
  - Max Flight Time: Approx. 30 minutes
  - Operating Temperature: 32° to 104° F (0° to 40° C)
  - Operating Frequency:
    - 2.4 GHz for Europe, Japan, Korea
    - 5.8 GHz for United States, China
  - EIRP:
    - 2.4 GHz: CE (Europe) / MIC (Japan) / KCC (Korea): < 20 dBm
    - 5.8 GHz: FCC (United States) / SRRC (Mainland China) / NCC (Taiwan, China): < 26 dBm
  - Hover Accuracy Range:
    - RTK enabled and functioning properly: Vertical: ±0.1 m; Horizontal: ±0.1 m
    - RTK disabled:
      - Vertical: ±0.1 m (with vision positioning); ±0.5 m (with GNSS positioning)
      - Horizontal: ±0.3 m (with vision positioning); ±1.5 m (with GNSS positioning)
  - Image Position Offset: The position of the camera center is relative to the phase center of the onboard D-RTK antenna under the aircraft body's axis: (36, 0, and 192 mm) already applied to the image coordinates in Exif data. The positive x, y, and z axes of the aircraft body point to the forward, rightward, and downward of the aircraft, respectively.

- **GNSS**
  - Single-Frequency High-Sensitivity GNSS: GPS+GLONASS
  - Multi-Frequency Multi-System High-Precision RTK GNSS: Frequency Used
    - GPS: L1/L2; GLONASS: L1/L2; BeiDou: B1/B2; Galileo: E1/E5
    - First-Fixed Time: < 50 s
    - Positioning Accuracy: Vertical 1.5 cm + 1 ppm (RMS); Horizontal 1 cm + 1 ppm (RMS).
    - 1 ppm indicates error with a 1 mm increase over 1 km of movement.
    - Velocity Accuracy: 0.03 m/s

- **Mapping Functions**
  - Mapping Accuracy:
    - Mapping accuracy meets the requirements of the ASPRS Accuracy Standards for Digital Orthophotos Class III.
  - Ground Sample Distance (GSD): (H/36.5) cm/pixel, H indicates the aircraft altitude relative to the shooting scene (unit: m)
  - Acquisition Efficiency:
    - Max operating area of approx. 1 km² for a single flight (at an altitude of 182 m, i.e., GSD is approx. 5 cm/pixel, meeting the requirements of the ASPRS Accuracy Standards for Digital Orthophotos Class III).

- **Gimbal**
  - Controllable Range: Pitch: -90° to +30°

- **Vision System**
  - Velocity Range: ≤ 31 mph (50 kph) at 6.6 ft (2 m) above ground with adequate lighting
  - Altitude Range: 0 - 33 ft (0 - 10 m)
  - Operating Range: 0 - 33 ft (0 - 10 m)
  - Obstacle Sensory Range: 2 - 98 ft (0.7 - 30 m)
  - Operating Environment: Surfaces with clear patterns and adequate lighting (> 15 lux)

- **Infrared Sensing System**
  - Obstacle Sensory Range: 0.6 - 23 ft (0.2 - 7 m)
  - Operating Environment: Surface with diffuse reflection material, and reflectivity > 8% (such as wall, trees, humans, etc.)

- **Camera**
  - Sensor: 1" CMOS; Effective pixels: 20M
  - Lens: FOV (Field of View) 84°, 8.8 mm (35 mm format equivalent: 24 mm), f/2.8 - f/11, auto focus at 1 m - ∞
  - ISO Range: Video: 100 - 3200 (Auto), 100 - 6400 (Manual); Photo: 100 - 3200 (Auto), 100 - 12800 (Manual)

* The actual accuracy depends on surrounding lighting and patterns, aircraft altitude, mapping software used, and other factors when shooting.
Mechanical Shutter 8 - 1/2000 s
Electronic Shutter 8 - 1/8000 s
Max Image Size 4864×3648 (4:3); 5472×3648 (3:2)
Video Recording Modes H.264, 4K: 3840×2160 30p
Photo JPEG
Video MOV
Supported File Systems FAT32 (< 32 GB); exFAT (> 32 GB)
Supported SD Cards microSD, Max Capacity: 128 GB. Class 10 or UHS-1 rating required
Operating Temperature 32° to 104° F (0° to 40° C)

Remote Controller
Operating Frequency 2.400 GHz to 2.483 GHz (Europe, Japan, Korea)
5.725 GHz to 5.850 GHz (United States, China)
EIRP 2.4 GHz
CE / MIC / KCC: < 20 dBm
5.8 GHz
FCC / SRRC / NCC: < 26 dBm
Max Transmission Distance FCC / NCC: 4.3 mi (7 km); CE / MIC / KCC / SRRC: 3.1 mi (5 km)
(Uncubstructed, free of interference)
Power Consumption 16 W (typical value)
Display Device 5.5 inch screen, 1920×1080, 1000 cd/m², Android system, 4G RAM + 16G ROM
Operating Temperature 32° to 104° F (0° to 40° C)

Intelligent Flight Battery (PH4-5870mAh-15.2V)
Capacity 5870 mAh
Voltage 15.2 V
Battery Type LiPo 4S
Energy 89.2 Wh
Net Weight 468 g
Operating Temperature 14° to 104° F (-10° to 40° C)
Max Charging Power 160 W

Remote Controller Intelligent Battery (WB37-4920mAh-7.6V)
Capacity 4920 mAh
Voltage 7.6 V
Battery Type LiPo 2S
Energy 37.39 Wh
Operating Temperature -4° to 104° F (-20° to 40° C)

Intelligent Battery Charging Hub (WCH3)
Input 5V/9V/12V/15V = 3.7A max
Operating Temperature 41° to 104° F (5° to 40° C)

AC Power Adapter
Voltage 17.4 V

Download the user manual for more information:
http://www.dji.com/phantom-4-rtk

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