

Aeroscope

Stationary Unit Installation

User Guide V1.4

2019.10



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Lightning Protection

The DJI™ AEROSCOPE™ stationary unit system includes surge protection modules in the antenna module, power module, and Ethernet port. Aeroscope does not include a lightning induction system, and should be installed within the protected region of another lightning induction system. The protected region is calculated using the rolling sphere method.

The rolling sphere method assumes that an imaginary sphere of radius h_r exists above the surface of a substation. The sphere rolls up and over (and is supported by) lightning masts, shield wires, substation fences, and other grounded metallic objects that can provide lightning shielding. A piece of equipment is said to be protected from a direct stroke if it remains fully within the surface of the sphere.

For a simple scenario in which there is only one lightning rod standing on a flat surface, the maximum distance that the Aeroscope can be placed from the lightning rod and remain within the protected region is calculated by the following equation:

$$R_x = \sqrt{(h_r(2h_r - h))} - \sqrt{(h_x(2h_r - h_x))}$$

Where:

- r_x is the maximum distance the Aeroscope can be placed from the lightning rod.
- h_x is the height of the protected object.
- h is the height of the lightning rod.
- h_r is the rolling sphere radius. It depends on the lightning density and the protected matter and is given in the following table in the Chinese standard.

Protection Level	Rolling Sphere Radius (m)
Type 1	30
Type 2	45
Type 3	60

If Aeroscope is not under the protection of the nearest lightning rod, a designated lightning induction system should be designed by a qualified professional.

Finally, be sure to note the following:

- Ensure that rainwater cannot flow along the Antenna cable into the Aeroscope receiver.
- If the pole is made of metal, the frame and the pole should be separated using insulation.
- Indoor power outlets must have surge protection.
- Indoor Ethernet outlets must have surge protection.

Step-by-Step Installation Guide

For permanent setups, the Aeroscope unit can be mounted anywhere that meets all installation requirements, such as Lightning Protection, height restrictions, power connection, and network connection. The most common installation scenario is to attach it to a pole on the rooftop.

The standard procedure for pole-mounted scenarios is as follows:

1. The pole should be firmly fixed to the ground (or other solid surface such as a rooftop). The diameter of the pole plus the insulation layer should be 120 mm to utilize the frames supplied with the stationary unit and antennas. Figure 1 shows some real examples of Aeroscope stationary unit installation sites.



Figure 1 Installation examples

2. Attach the stationary unit and the antennas to the pole. The processes for installing the stationary unit, G8 antennas, and G16 antennas are illustrated in Figures 2, 3, and 4 respectively.

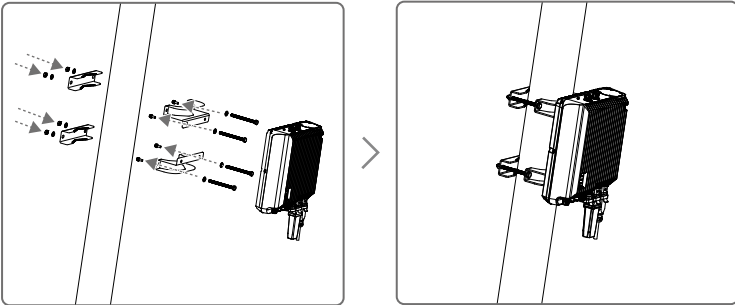


Figure 2. Attaching the stationary unit to the pole

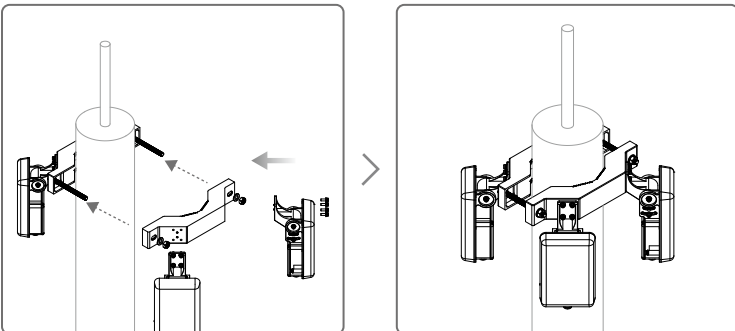


Figure 3. Attaching the G8 antennas to the pole

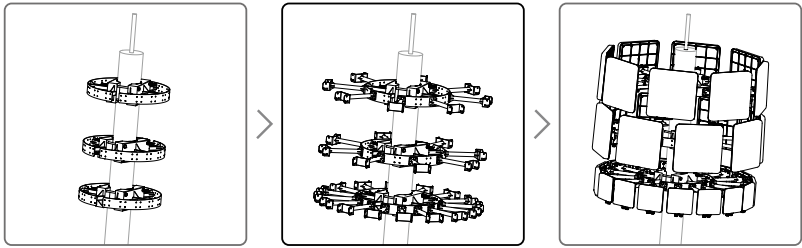


Figure 4. Attaching the G16 antennas to the pole

- 3. Connect the antennas to the unit via the antenna cable.
 - a. If using G8 directional antennas, connect each antenna to one antenna port of the stationary unit with an antenna cable. Note that two adjacent antennas should be connected to ports at the top of the stationary unit, while the other two adjacent antennas should be connected to ports at the bottom. This ensures diversity gains will be realized. Figure 5 shows the connection configuration between the G8 antennas and the stationary unit.

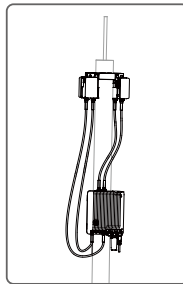


Figure 5. Connection configuration between G8 antennas and the stationary unit

- b. If using G16 high-gain antennas, the 2.4GHz antenna should be connected to a 5.8GHz antenna. Each 5.8GHz antenna has two antenna cable ports. The port marked "OUT" is for connecting to the Aeroscope unit, and the port marked "IN" is for connecting to the 2.4GHz antenna. Figure 6 shows the connection configuration and close-up view of a 2.4GHz antenna.

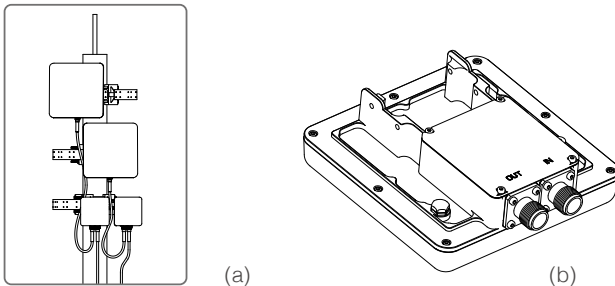


Figure 6. (a) The connections between the 2.4GHz antennas and the 5.8GHz antennas in G16 antenna installations. (b) The "IN" and "OUT" ports on a 5.8GHz G16 antenna.

4. Often, the supplied power cable is too short for the connection between the stationary unit and the nearest available power outlet. In such cases, a qualified electrical engineer must extend the initial power cable to complete the connection.
5. After powering on, check the LED indicators with reference to Figure 7.

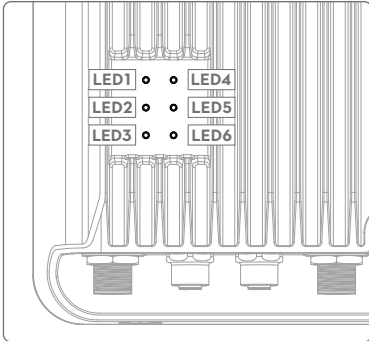


Figure 7. LED explanations

- LED1: Processor module status
- LED2: Network connection status
- LED3: UAV information capture status
- LED4: Type 3 receiver status
- LED5: Type 2 receiver status
- LED6: Type 1 receiver status

6. Download DJI Assistant 2.
from <https://www.dji.com/aeroscope/info#downloads>
7. Install and run DJI Assistant 2 on a windows computer (desktop or laptop).
8. Connect the computer and the Aeroscope unit to the same router, or connect them directly via the Ethernet port.
9. After the Aeroscope stationary unit is found on the DJI Assistant 2 start page, set the server IP and Port in Network Settings>Server Network Settings.
10. Set the network mode to Wireless if using a wireless dongle. Set to Wired if using an Ethernet connection. Depending on network provider requirements, set the parameters manually or set the mode to Auto.
11. Exit DJI Assistant 2.
12. Restart the stationary unit.
13. Connect the stationary unit to the internet.
 - a. It is recommended to always use Ethernet when possible, because the connection is stable and free of interference.
 - b. If using a wireless connection, the dongle must be installed with an active SIM card. You may need to configure some parameters such as APN in DJI Assistant 2.
14. Log into the Aeroscope web server <https://Aeroscope.djiservice.org> using your assigned account. The account management system in Aeroscope manages the relations between each account and each Aeroscope unit. Make sure the DJI admin has added your unit to your account. Otherwise, you will not see your unit when you log in.

Importing Certificates

In most cases, when you receive your Aeroscope stationary unit the certificate should already be imported. If the certificate doesn't work or has expired, you will need to import a new certificate manually.

To import a new certificate, follow this procedure:

1. Acquire the certificate files from DJI. A single certificate consists of two files.
2. Download DJI Assistant 2.
3. Install and run DJI Assistant 2 on a windows computer (desktop or laptop).
4. Connect the computer and the Aeroscope unit to the same router or connect them directly via the Ethernet port.
5. After the stationary unit is found in Aeroscope, click it to enter the unit page. Under Advanced Functions, select the certificate. Import the certificate by selecting both files.

Temporary Setup

The Aeroscope stationary unit can be set up temporarily for urgent temporary events. In these scenarios, a tripod and battery are typically required for installation and power.

The Aeroscope portable unit has the advantage that no installation time is required. However, the Aeroscope stationary unit temporary setup has a longer detection range and supports centralized control. Figure 8 shows an example in which the Aeroscope stationary unit is set up in a temporary scenario.

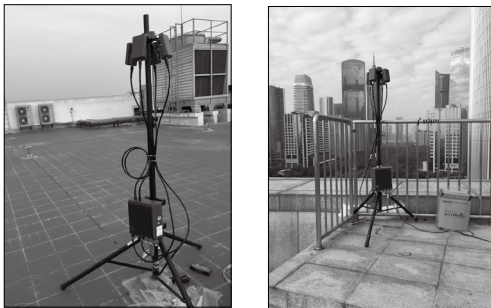


Figure 8. Temporary setup of the Aeroscope stationary unit

Power Cable Usage

Introduction

The Aeroscope Power Cable is used to connect the Aeroscope stationary unit to a power supply. You can connect it directly if it is long enough for your needs. Otherwise, you can extend it using the procedures provided below. In addition, the power cable can also be converted into a DC power cable if necessary.

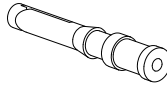
In the Box

Power Cable × 1



Various according to different national standards

Plug Pin × 5



Female plug bracket × 1

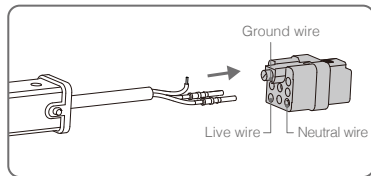
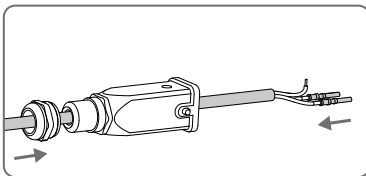
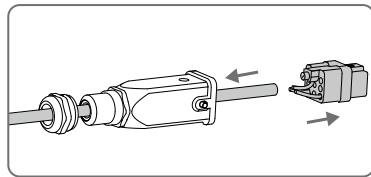
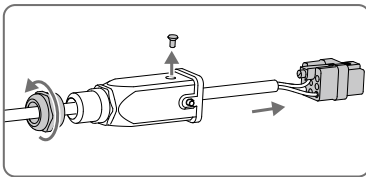


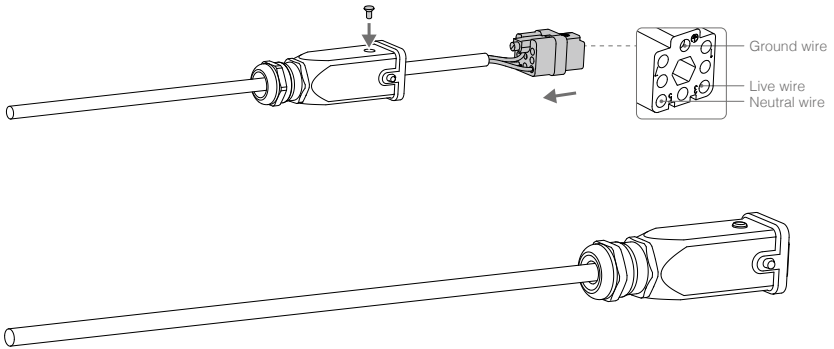
Modifying the Power Cable

You can use either of the first two procedures below to extend the power cable if it is not long enough for your needs. Additionally, you can use the third procedure to convert it into a DC power cable if necessary.

Procedure 1: Extending the AC Power Cable (New Plug Bracket)

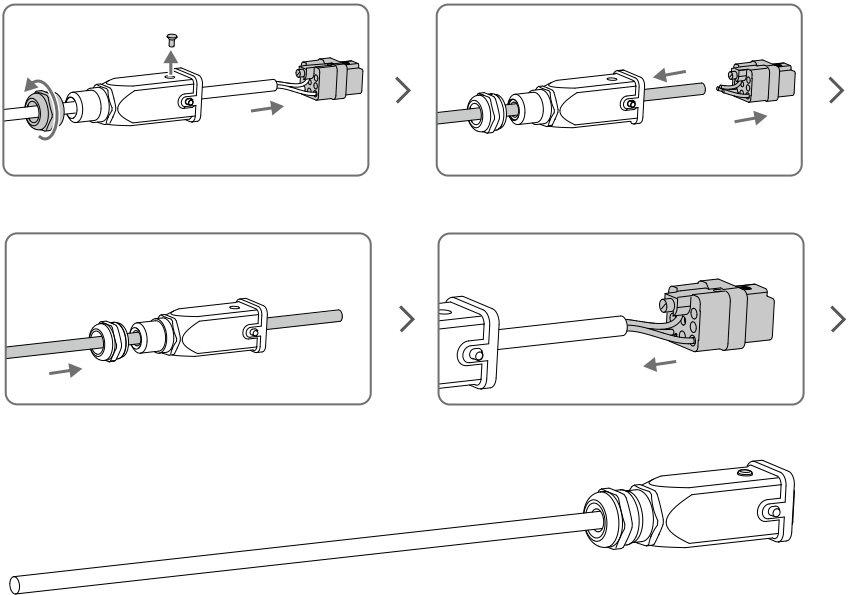
1. Loosen the nut that seals the cable in the waterproof module, and remove the screw on the top of the module to open it.
2. Cut off the original female plug bracket. Remove the power cable and replace it with a longer one provided by yourself.
3. Solder the provided plug pins onto the neutral and live wires of the new power cable (crimping pliers can also be used), then plug the two pins into the female plug bracket provided in the box.
4. Remove the screw on the ground wire connector of the female plug bracket, then insert the ground wire of the power cable into the female plug bracket and retighten the screw.
5. Insert the female plug bracket into the waterproof module and tighten the screw. Tighten the nut to ensure a good seal between the cable and waterproof module.





Procedure 2: Extending the AC Power Cable (Original Plug Bracket)

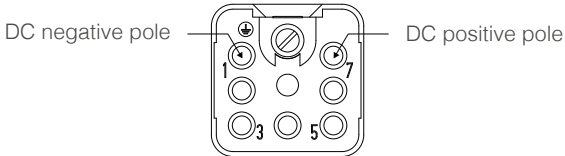
1. Loosen the nut that seals the cable in the waterproof module, and remove the screw on the top of the module to open it.
2. Cut off the original female plug bracket. Remove the power cable and replace it with a longer one provided by yourself.
3. Solder the original female plug bracket onto the new power cable.
4. Insert the female plug bracket into the waterproof module and tighten the screw. Tighten the nut to ensure a good seal between the cable and waterproof module.



Procedure 3: Converting to a DC Power Cable

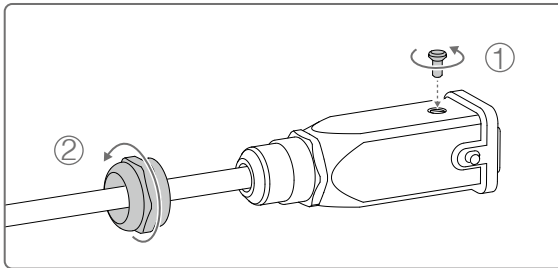
Follow the procedure shown in the figure below to convert the power cable to a DC power cable.

The modification procedure is the same as that of Procedure 1 for extending an AC power cable, but different pins are required. Connect the cable wires to the DC negative and DC positive poles on the female plug bracket to use the cable as a DC power cable.



After Modification

1. Make sure the screw and washer on the waterproof module are securely tightened to fix the female plug bracket in place.
2. After securing the female plug bracket in place, make sure to tighten the nut. The internal rubber on the nut should form a tight seal to ensure that the cable and plug are waterproof.



This content is subject to change.

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