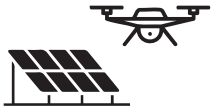
MAPPERX

FLIGHT INSTRUCTIONS



This documentation, prepared for the planning of flights to be carried out with DJI brand drones and for conducting the shoots in accordance with the instructions, serves as a guide to help you use the MapperX software effectively and efficiently.

Environmental Conditions

Irradiance	Wind	Temperature	Cloud Cover	Shooting Time
>600 Watt/m²	**<25 km/s**	**0° C - 50° C**	**<2 Oktas**	**3 hours after sunrise, 3 hours before sunset**

For mapping flights, it is ideal to fly the drone during midday hours when the sun is at its peak. During this time period, light conditions are at their maximum, enhancing the clarity of the images. Additionally, windless and cloudless days should be preferred to ensure the drone remains stable and image quality is not adversely affected.

Flight Settings

Aircraft Model Selection
When selecting the aircraft model, ensure you correctly choose the drone you own, and in the Lens Selection section, always select **"Wide" and "IR"** lenses.

Ground Sampling Distance (GSD)
Based on your reporting preference, **5 GSD** for the Professional Package, and **3 GSD** for the Enterprise Package. This allows you to analyze at different levels of detail according to your needs.
For rooftop solar power plants (GES), if the flight will be conducted from the ground rather than from the roof, the vertical distance between the roof and the ground should be calculated and added to the flight altitude.

Altitude Mode
ALT (Relative to Take-off Point): Can be used if the slope at the plant is less than 5%. The drone maintains a constant altitude relative to the take-off point.

AGL (Relative to Ground Surface): Preferred in uneven and sloped terrains. To use this mode, you can upload the DSM file obtained from an RGB orthophoto generated with 10 GSD to the controller via MicroSD card or download the required elevation data using the "Download from Internet" option.

Speed
To obtain accurate map data, it is recommended to fly at a **maximum speed of 50%** of the speed limit suggested by the controller.

Orientation Angle
The plant's map image should be observed from the controller, and flights should be conducted perpendicular to the strings (rows). In general, a 180° angle is suitable for solar plants in Turkey; however, adjusting according to the plant's location will provide better results.

Overlap Ratio
To ensure data accuracy during the flight, use the following overlap ratios and tolerance value:
Side Overlap Ratio: **70** Front Overlap Ratio: **80** Tolerance: **5.00**

Photo Mode
Always select **"Interval Shooting Distance"** mode.

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Camera Settings

Color Palette Selection
After switching to the camera view, switch to thermal view and select the **WhiteHot** option from the color palette settings located in the upper right corner. The custom settings in the color palette selection screen should be left as default.

Mode (Temperature)
In the thermal camera view, the "Mode" value displayed on the screen should always be between **-20 ~ 150.**

Thermal Camera Calibration
After setting the color palette and mode, position the camera to face the solar panels before the flight, and press the **FFC** button once in the upper right corner to calibrate the camera.

RTK Settings

RTK Positioning
Before the flight, the RTK Positioning and Maintain Positioning Accuracy Mode settings in the **Precision Positioning Settings** menu must be enabled.

From the Select RTK Service Type menu, select Custom Network RTK, and in the configuration menu that appears below, enter and save the address information of your local fixed GNSS network if you have a subscription. If you have a GNSS device, enter and save the address information of your GNSS device.

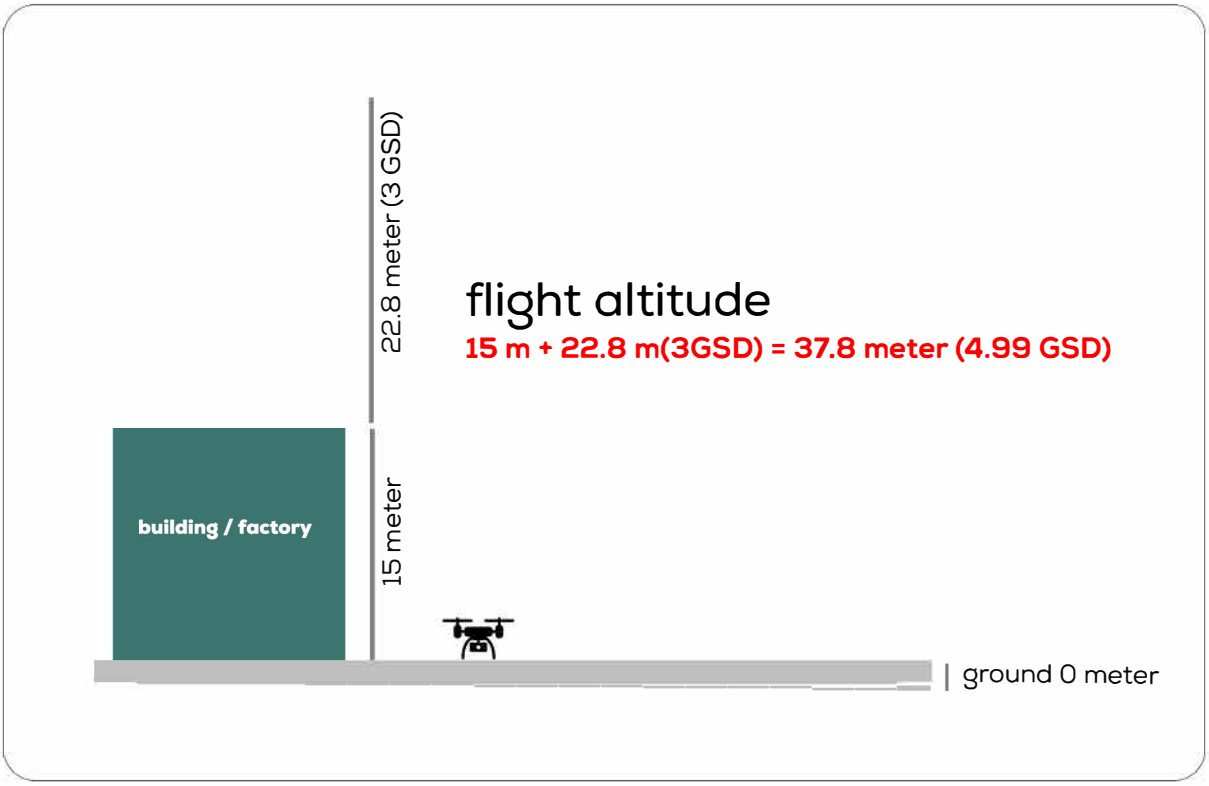
RTK Connection Status
The RTK connection status should be monitored under the "Status" menu, and it should be **FIX.** The numbers of GPS, Beidou, Glonass, and Galileo satellites should be visible underneath. Having a higher total number of satellites will improve mapping accuracy.

Accessory Requirements

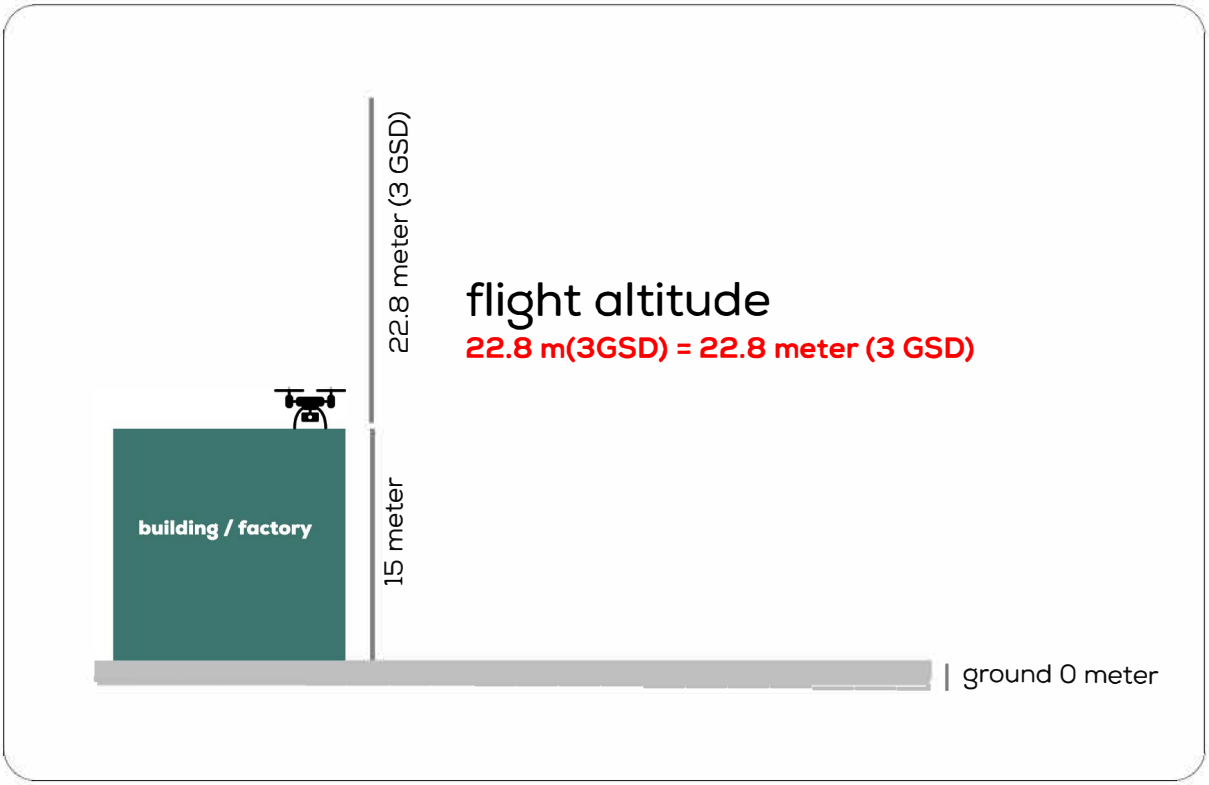
Memory Card Selection
To ensure your photos are accurately and completely written to the memory card, the minimum write speed must be 120 MB/s. MapperX recommends using a card with a write speed between **150 MB/s - 160 MB/s.**

GNSS Receiver
RTK (Real-Time Kinematic) technology uses GNSS signals to provide centimeter-level accuracy. Therefore, for maps requiring precise positioning, the use of a **GNSS device** is mandatory to ensure a stable RTK connection and minimize signal loss.

Plan A


22.8 meter (3 GSD)
flight altitude
15 m + 22.8 m(3GSD) = 37.8 meter (4.99 GSD)
building / factory
15 meter
ground 0 meter

Plan B


22.8 meter (3 GSD)
flight altitude
22.8 m(3GSD) = 22.8 meter (3 GSD)
building / factory
15 meter
ground 0 meter