

# Autel EVO II Pro RTK Photogrammetry Quick-Reference Guide

## 1. Pre-flight Preparation

- a. Ensure operator and drone is registered with the Civil Aviation Safety Authority (CASA).
- b. Consider the weather conditions, obstacles, and airspace regulations.  
Use CASA-verified drone safety apps to check if the drone can fly in the chosen area.  
<https://www.casa.gov.au/knowyourdrone/drone-safety-apps>
- c. Check the drone batteries and storage capacity of the MicroSD card.
- d. Verify that GPS equipment is functioning correctly.  
Configure NTRIP RTK on RC Controller (optional).
- e. Set up Ground Control Points (GCPs) – The more the better, even distribution at edges and middle of the mapping area and ensure GCPs visibility are unobstructed from above.

## 2. Aerial Mission Planning

- a. Power on the RC Controller, Autel Explorer software will automatically load\*.  
Tap the **Mission** button to define the type of flight (e.g Rectangular, Oblique etc.) and plan flight path of the mapping area.  
\*Ensure controller is connected to the internet.
- b. Tap mission parameters : Set the flight speed, image overlap, gimbal pitch, altitude.  
Considerations:
  - Consider the Ground Sampling Distance (GSD); higher resolution or accuracy require a lower GSD value (cm/pixel)
  - Flying too fast can produce motion blur and reduced sharpness to images.
  - Allow enough batteries for the drone to return safely upon completion of mission.
  - Recommended mission settings:

| Scene         | Terrain Mapping                             |
|---------------|---------------------------------------------|
| Mission Type  | Rectangular, Polygon                        |
| Camera Angle  | 90°                                         |
| Front Overlap | 70-85%                                      |
| Side Overlap  | 70-75%                                      |
| GSD           | 2-3.5cm/pixel                               |
| Altitude      | 70-100m                                     |
| Speed         | 8-12km/h                                    |
| Weather       | Set to condition                            |
| Notes         | Consider double grid for accurate 3D model. |

| Scene         | Urban Mapping                                                        |
|---------------|----------------------------------------------------------------------|
| Mission Type  | Oblique                                                              |
| Camera Angle  | Oblique: 60-70°                                                      |
| Front Overlap | 80%   Oblique Front OL: 70%                                          |
| Side Overlap  | 75%                                                                  |
| GSD           | 2.5cm or less                                                        |
| Altitude      | 60-90m                                                               |
| Speed         | 8-12km/h                                                             |
| Weather       | Set to condition                                                     |
| Notes         | Consider Oblique when higher level of vertical accuracy is required. |

### Note:

Maintain records of flight data, mission parameters for future reference. This can be helpful to test different settings to determine the best configuration for achieving the desired outcome of your project.

- c. Tap the  **Camera** button to adjust drone camera settings to the conditions:  
(Aircraft will need to be powered on for this).
  - **Exposure:** Set correct exposure based on weather & lighting conditions.  
Shutter Speed:  
Sunny day = Faster shutter (e.g 1/1000 or faster)  
Cloudy day = Slower shutter (e.g 1/800 or slower)  
Avoid using Auto Exposure mode.
  - **EV** - Shutter priority
  - **White Balance** (WB): Sunny or cloudy

### 3. Data Collection

- a. Prepare drone system for flight:
  - Remove gimbal cover.
  - Inspect & set propellers then place aircraft on landing pad.
  - Power on the aircraft.  
(Press and hold power button until LED lights illuminate. Same method to power off.)
  - Set the antenna of the RC Controller into correct position.
- b. Open planned mission in RC Controller & tap the  button to send the mission to the drone.  
Aircraft will automatically execute mission and capture aerial imagery.
  - Observe the live view from RC Controller for image overexposure.  
Tip: Enable exposure warning in *Settings* menu.
  - Ensure the drone is within line of sight and RC controller is on the operator at all times.
- c. Upon mission completion, the drone will automatically return home (if enabled in *Settings*).  
Otherwise, safely land and power off the drone system.
- d. Allow batteries to cool and avoid recharging batteries immediately after a flight.

#### **Safety precautions:**

- If you become aware of crewed aircraft nearby, you must use the controls sticks to manoeuvre away and land your drone as quickly and safely as possible.
- In the event of an emergency, it may be necessary to stop a drone immediately to prevent it from causing harm or damage.

The **Emergency Stop Propellers During Flight** feature (if enabled) will stop the drone propellers by moving both the control sticks towards the bottom inner or outer corners simultaneously.



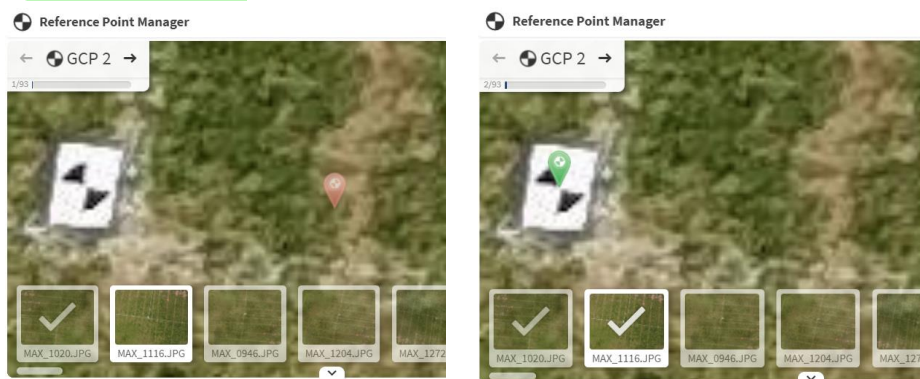
## 4. Image Processing – Carlson PhotoCapture

- Remove MicroSD from drone, insert to PC & copy project folder with the image dataset locally.
- Open Carlson PhotoCapture software:
  - Click **CREATE** to create a new project. Complete *Project Details* section.
  - Set coordinate system the same as used on the GPS equipment.
  - Import (Drag/drop or Browse) image dataset.  
\*Exclude the .bin, .obs & .mrl files.

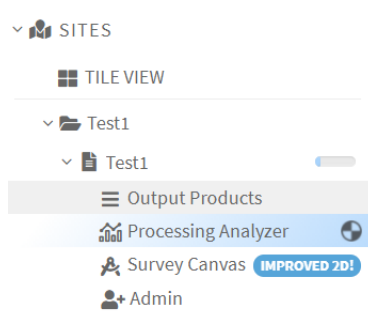
- Click **Add Ground Control** then import the ground control file from GCPs measurement. Ensure Coordinate Format and coordinate system are correct.
- Click **Create** to begin image pre-processing.
- When prompted click  **Correct Reference Points** button.

Move the drop-pin to the centre of the GCP in the image then proceed to the next GCP.

Click  **Process Project** when all GCPs are corrected.



- Progress of the output products can be viewed in Sites – **Output Products**.



When a deliverable has finished processing it can be viewed immediately by clicking on the

 **View** button.

- All deliverables along with an Adjustment Report are automatically exported to the Carlson Projects - PhotoCapture directory (C:\Carlson Projects\PhotoCapture). Alternatively, the exports can be accessed by navigating to *Project name* – Output Products then click on the **Open On Disk** button.