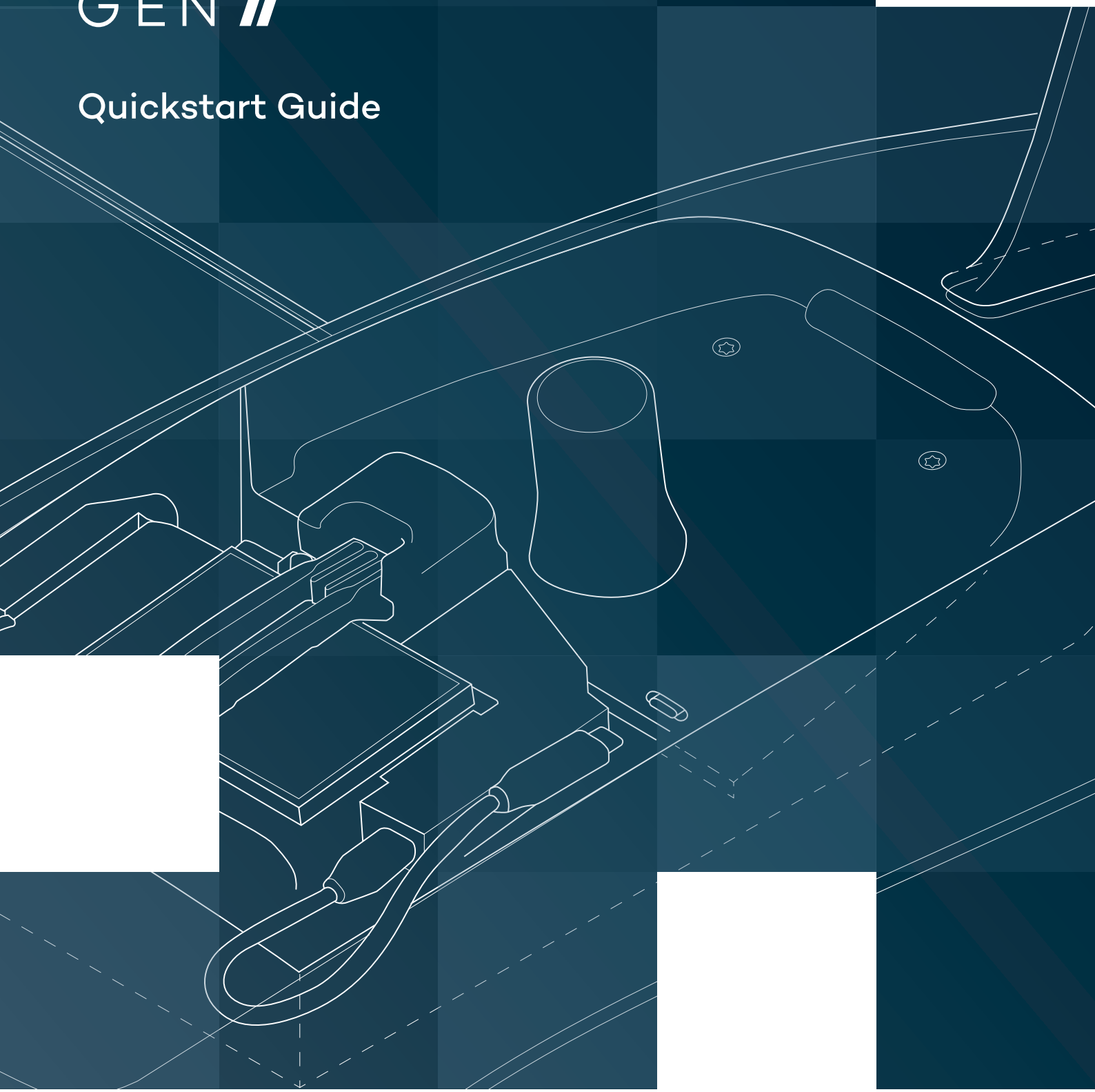
WingtraOne GEN II

Quickstart Guide



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Original English instructions.
Read this manual carefully and
keep it for future reference.
April 2022 / N° 04
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Welcome

The Wingtra team from Zurich and around the globe is excited to welcome you as a valuable customer.

Thank you for your trust, and you can be sure that we will do our best to support you with your mapping projects.

Know the rules before you fly

The regulatory environment for drone operations is constantly changing. For the most up-to-date information go to: knowledge.wingtra.com/regulations

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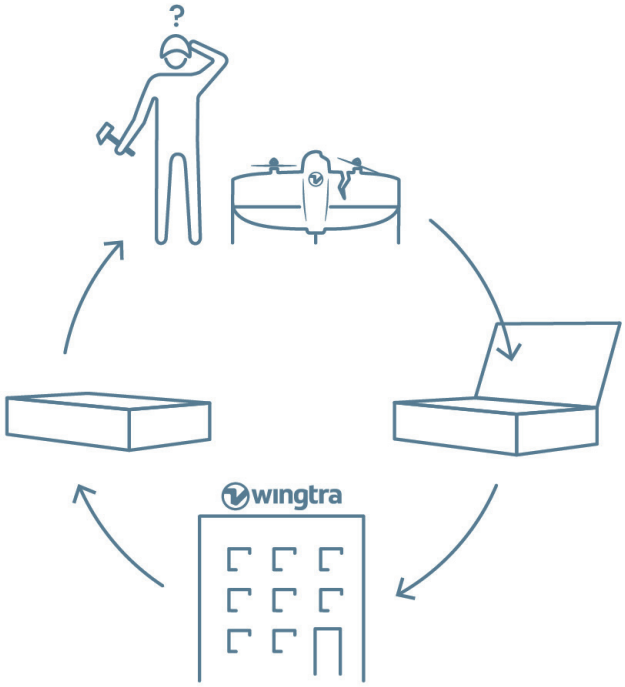
Learn more at
knowledge.wingtra.com
Give feedback at
feedback.wingtra.com
Open a ticket at
wingtra.com/support/#contact-support
Get help by writing to
support@wingtra.com

Unbox

Make sure you received all items from the next two pages (“Drone”, “Pilot box”).

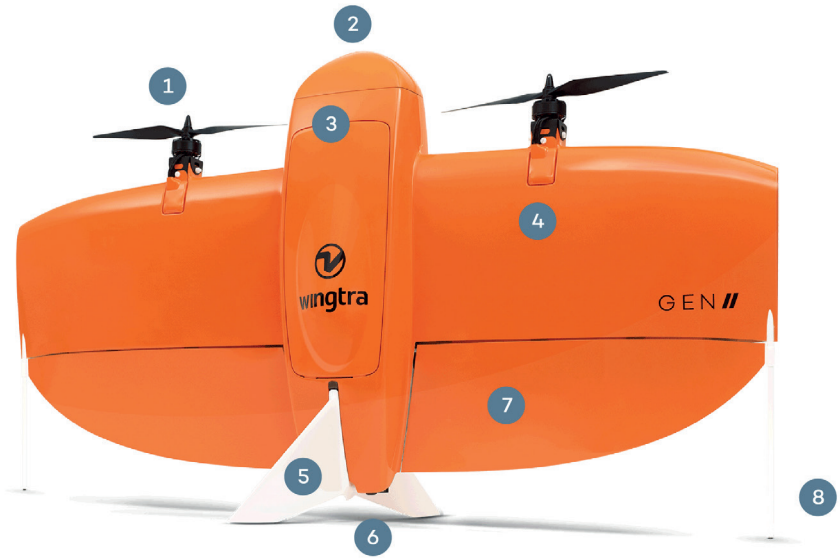
Keep the original packaging

In case of an incident, Wingtra Support might request a return of the equipment to Wingtra's office.



Drone

1. Propellers
2. Battery compartment
3. Top cover: access to camera, PPK and electronics
4. Motors
5. Middle stand
6. Distance sensor
7. Flaps
8. Side stands

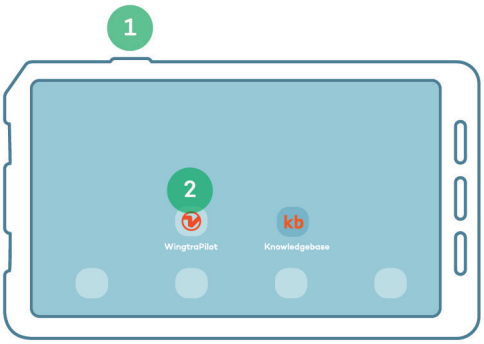


Pilot box

1. Tablet
2. Telemetry and its cable
3. Wind measurement tool
4. Flight batteries (2 sets)
5. Sapre propellers
6. Screwdriver and tablet SD card adapter
7. SD card holder (SD card comes with the camera)
8. USB sticks
9. Charger for flight batteries and tablet

Start WingtraPilot and activate your drone

1. Start the tablet
2. Open the WingtraPilot app
3. Follow set up instructions the on WingtraPilot screen

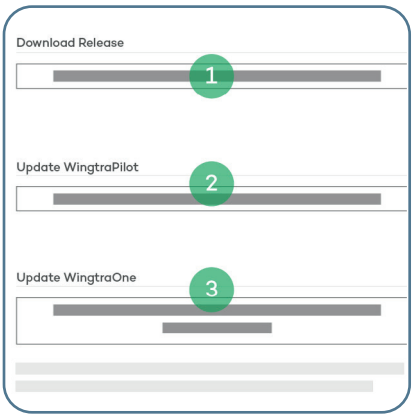


> You cannot operate your drone until it has been activated by following the first steps in the WingtraPilot app. If you are having difficulty with creating an account or activating your drone, please use the following link to find out more information:
> knowledge.wingtra.com/en/drone-activation

Update the software

Connect your tablet to the internet (WiFi). Update WingtraPilot if you receive a pop-up telling you that there is a new software update available. Skip this step if there is no pop-up.

1. Download latest release
2. Update WingtraPilot
3. Update WingtraOne—follow the steps described in WingtraPilot



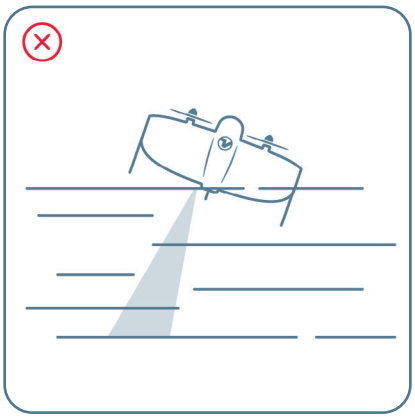
> Learn more about the update process at
> knowledge.wingtra.com/en/update-wingtrapilot-wingtraone

Install WingtraHub on your Windows PC

WingtraHub is Wingtra's application on Windows. You will need it to geotag the images after flight, and you can use it for flight planning instead of WingtraPilot.

> Download WingtraHub here:
> knowledge.wingtra.com/install-wingtrahub

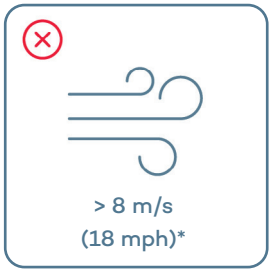
Do not fly in



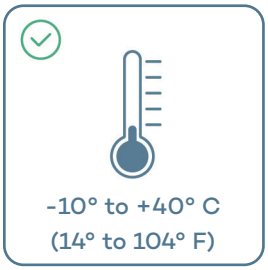
Fog

Snow or rain

Use return to home (RTH) if conditions change while flying!



Strong continuous winds*



Extreme temperatures

High altitude

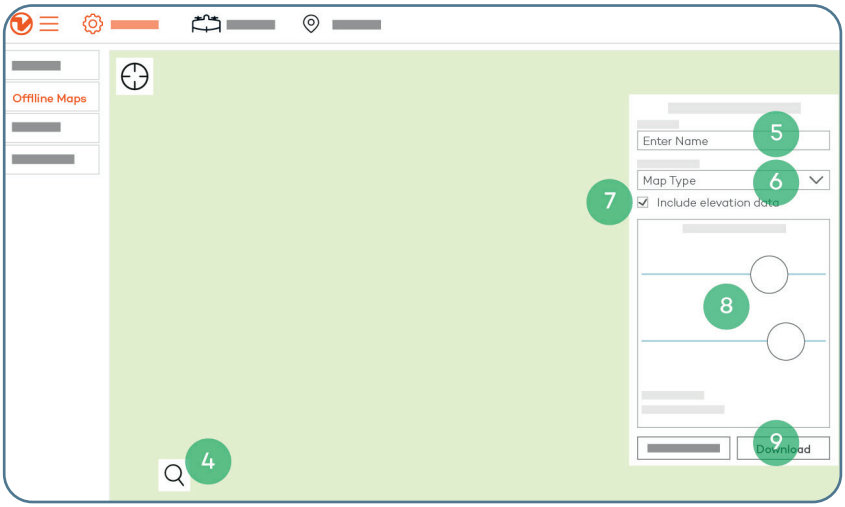
* 8 m/s (18 mph) continuous wind speed measured on ground corresponds to approx 10 m/s (22 mph) surface wind

** With high altitude propellers up to 4800 m (15'700 ft) AMSL. Learn more about high altitude flying at knowledge.wingtra.com/high-altitude

*** Above mean sea level

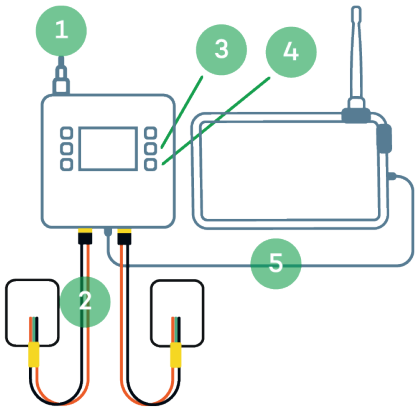
Download offline maps

If you do not have an internet connection in the field, you can download a map beforehand. To do so:



1. Open the "Settings" tab
2. Select "Offline maps"
3. Select "New offline map"
4. Navigate to the desired location, either by dragging the street map or by using the search function
5. Give the set a descriptive name
6. Choose a map type
7. Check the box "Include elevation data" if you require terrain following—this is always recommended
8. Adjust zoom levels if needed—14-18 is the recommended setting
9. Select "Download"

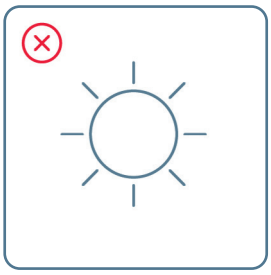
Charge your batteries and tablet



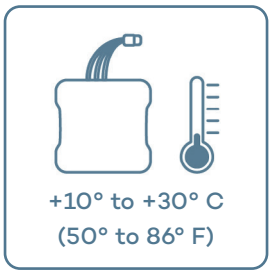
1. Power the battery charger
2. Connect the charger output cables to the charger first and only then to the batteries
3. On the side of the charger that the battery has been inserted into, press and hold the middle of the three buttons for 1 second
4. On the display screen, ensure the "task" is set to "charge" before navigating to and selecting "start"
5. Use the central USB port to charge your tablet

Once the battery has begun charging, the charger screen will turn red. When the charging is finished the screen will turn green momentarily before resting in blue. It is now safe for you to disconnect the battery from the charger output cable.

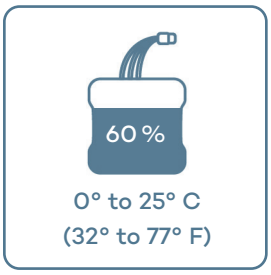
Keep your batteries healthy



Do not expose them to sun



Before flying, keep them at a moderate temperature



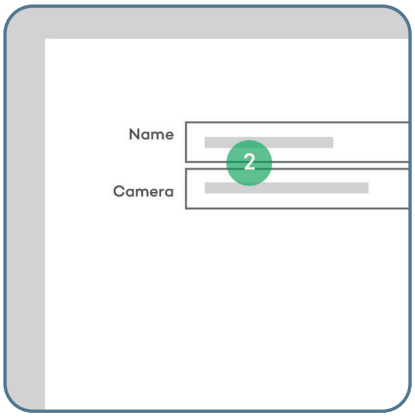
For longer storage, keep them at room temperature and charged at 60% capacity

For longer storage, keep them at room temperature and at 60% capacity. To do this perform the following steps:

1. Connect a battery using the adapter cable
2. Press and hold the middle button
3. Set “task” to “Storage”, then select “Start”
4. Repeat process of the other battery

Create a flight plan

1. Open WingtraPilot and press “New” to create a new flight plan



2. Give your flight plan a descriptive name, select the camera, and press “Next”

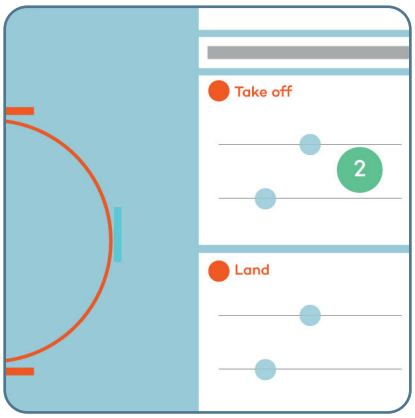
3. Import a KML file or skip if you want to plan from scratch

You can also plan your flights in WingtraHub (PC). Learn more at knowledge.wingtra.com/en/flight-planning-in-wingtrahub

Center your map

1. Use the “Center” or “Search” function to locate the area of interest
2. Click on “WingtraOne” to center the map on the current drone location

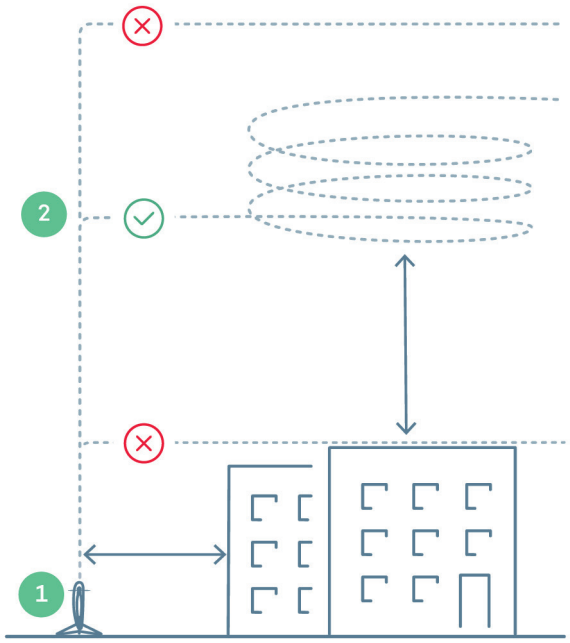
Create a home point and set the transition height



1. Tap the “Plan” and then “Home” icon to create a home point at the planned take-off location; it will be updated once connected to the drone
2. Adjust transition height and direction; it's the same for take-off and landing

Home point and transition height explained

1. Home point is the place where your WingtraOne takes off and lands
2. Transition height is where your drone transitions into a forward flight mode

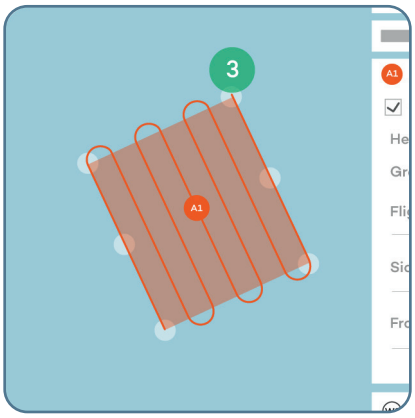


> Always set the transition height at least 20 m (65 ft) above obstacles, but not too high! Increased transition height reduces flight time.

Create area(s) or corridor(s)

An “area” or a “corridor” is where you want your WingtraOne to fly and capture the data.

1. Add one or several areas by clicking on “Plan” and then "Area"
2. If you are using the corridor feature, click on “Plan” and then “Corridor”

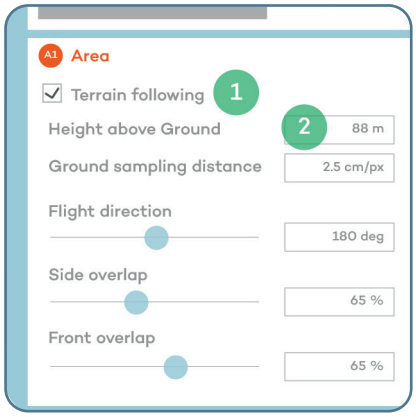


3. Move the corners until you have outlined the area(s); you can also move the position of the area(s) by moving the A1/A2 bubble in the middle

4. (Optional) loiter waypoints are automatically inserted between two areas; additional waypoints can be inserted manually to ensure safe flight paths between areas and back to the home point

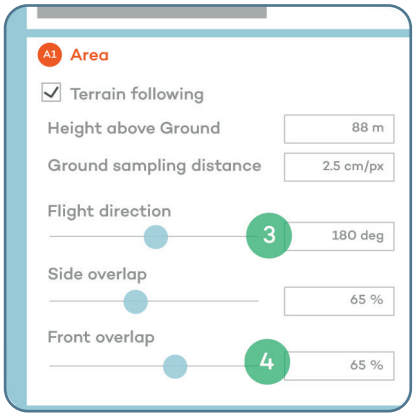
> Learn how to import a KML file at knowledge.wingtra.com/kml-for-flight-planning

Adjust parameters



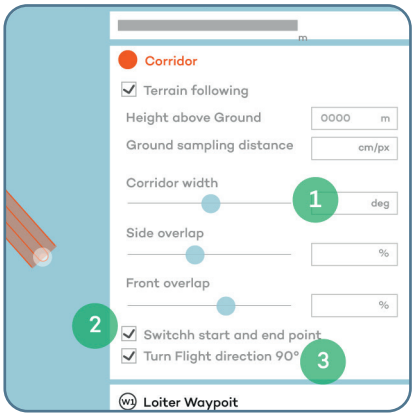
Important

1. "Terrain following"—make sure the box is ticked especially when flying over hilly terrain
2. "Height above ground" and "Ground sampling distance"—define at what height your drone should fly to get the required GSD



Optional

3. "Flight direction"—set the angle of your flight direction, if possible perpendicular to the wind direction
4. "Side overlap" and "front overlap" is based on percentage, and >60% is recommended (consult knowledge.wingtra.com/en/flying-wind for more detailed recommendations)



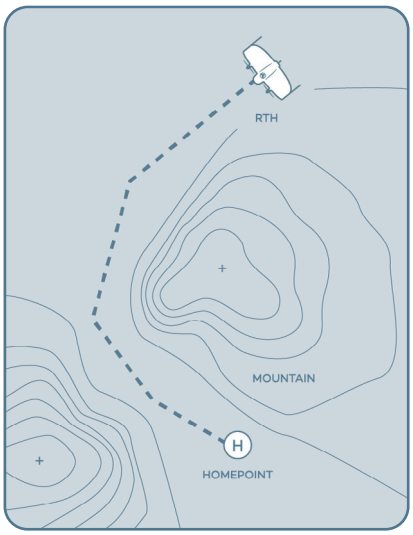
Optional "corridor" parameters

1. Define the corridor width
2. Switch start and end point
3. Turn flight direction 90°, e.g., if the slope gradient is too steep to approach head-on

Optional safety parameters

Safe Return To Home (RTH)

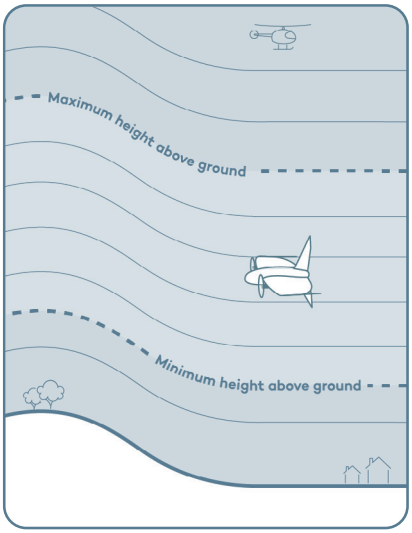
The drone will fly home on a safe path. This may not be a direct path to home, depending on the planned mission or topography of the area of operation.



Safe RTH is triggered if:

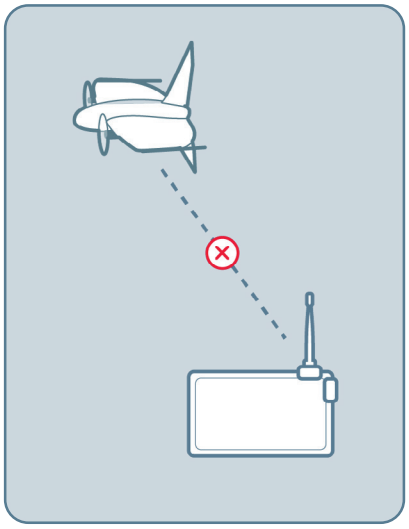
1. The drone flies beyond your geobarrier
2. The connection between operator and drone is lost
3. Battery gets low

You can adjust the thresholds for the triggers in the "Safety parameters" box of your flight plan.



Minimum and maximum height above ground

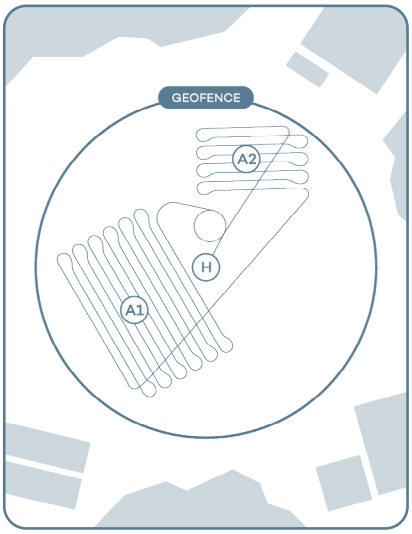
This sets the permissible flight height range for the drone, shown in red on the altitude graph when violated. Drone launch is denied if outside this range. The minimum height should be 10 m (30 ft) above your area's tallest object.



Connection loss timeout

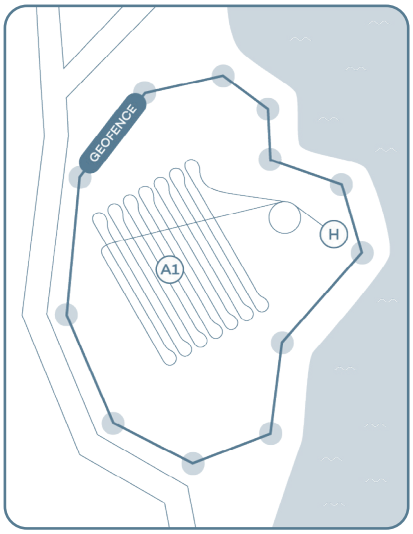
Defines the limit for telemetry connection loss before return to home (RTH) is triggered. Increasing this value is useful in environments with inconsistent telemetry connections or in cases of beyond visual line of sight (BVLOS) flights. Aerial data is still collected during connection loss, but real-time updates in WingtraPilot will be unavailable.

Adjust geobarrier



Geobarrier type: Circle

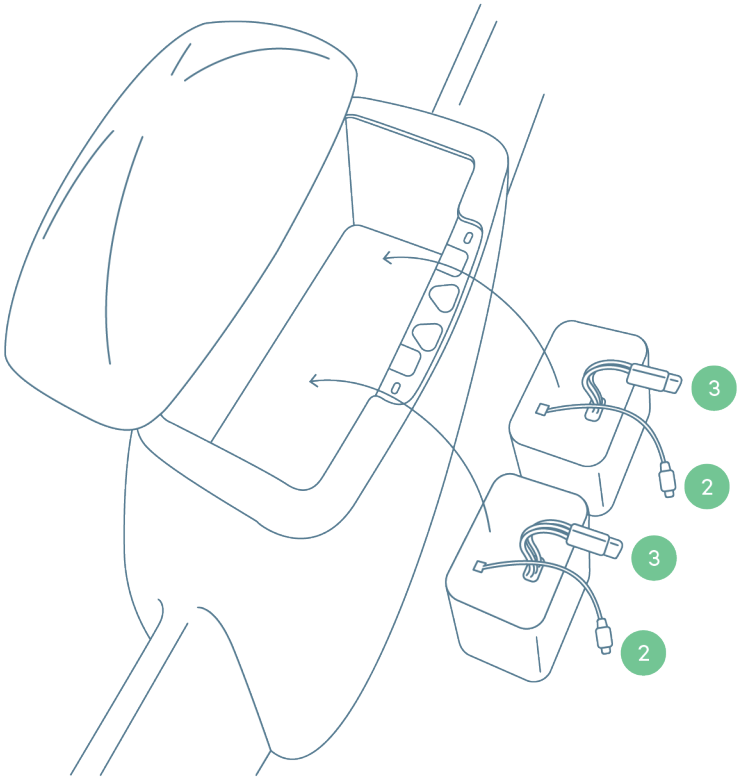
This geobarrier confines the drone's flight window in-flight. Crossing this geobarrier triggers RTH. The geobarrier size can be changed in the safety parameters.

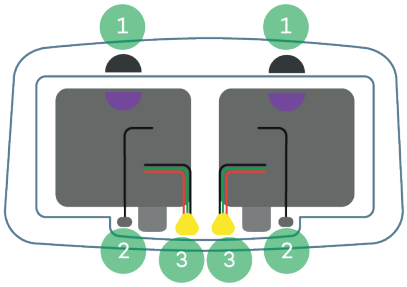


Geobarrier type: Polygon

This polygonal geobarrier confines the drone's flight area to a polygon shape. Its form can be changed by clicking and dragging the corners. Crossing the geobarrier triggers RTH.

Power your drone





1. Put the batteries in the battery compartment; use the battery pair that has the same color-coded half circles—the half circles on the batteries and on the drone should match
2. Plug in the two smart battery cables
3. Plug in the two power cables

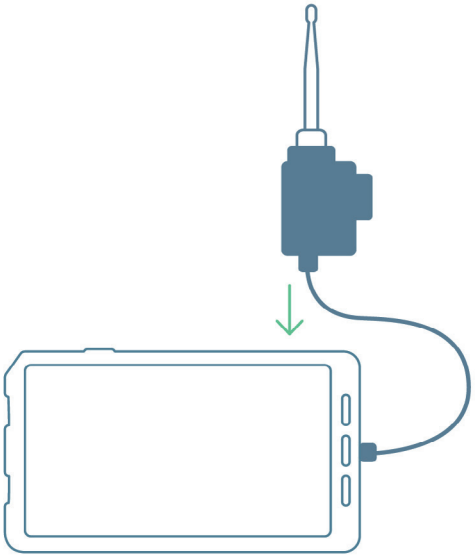
Unplug the flight batteries after the flight to power off the drone. If the drone is left powered during transport, the flaps are at risk to get damaged.

Assemble your ground station

The telemetry connection between drone and tablet operates on 2.4016 to 2.4776 GHz (EIRP: 19,8 dBm).

Optionally, you can operate the WingtraOne with a secondary RC link that operates on 2.405 to 2.474 GHz (EIRP: 19,5 dBm).

Ground stations are not interchangeable between drones. Make sure that the drone ID matches the ID of the ground station.



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Learn more about the RC at knowledge.wingtra.com/manual-flying

Measure the wind speed

1. Use the wind measurement tool to measure the wind speed.

Don't measure the wind speed while standing behind big objects, e.g., buildings or trees. Raise the tool above your head to get the most accurate results.

Drone tipping expectations

In calm conditions, WingtraOne lands smoothly on its tail. In windy conditions, the aircraft can tip over upon landing. Generally this is not a problem, and damages rarely occur.

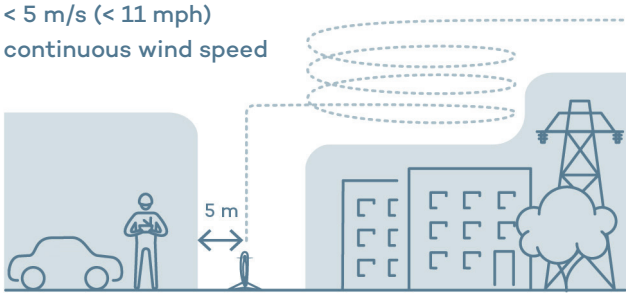
Measured on ground	Surface wind	Tipping expectations
0-5 m/s (0-11 mph)	0-7 m/s (0-16 mph)	Tippings rarely occur
5-8 m/s (11-19 mph)	7-10 m/s (16-22 mph)	Tippings can occur
> 8 m/s (> 19 mph)	> 10 m/s (> 22 mph)	Not recommended to fly

Avoid obstacles

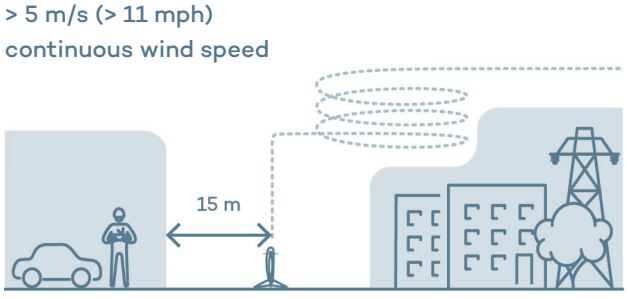
Be aware that the obstacle clearance zone should correspond to the wind conditions. The stronger the wind, the farther from obstacles the drone should be.

Distance from objects in different wind conditions

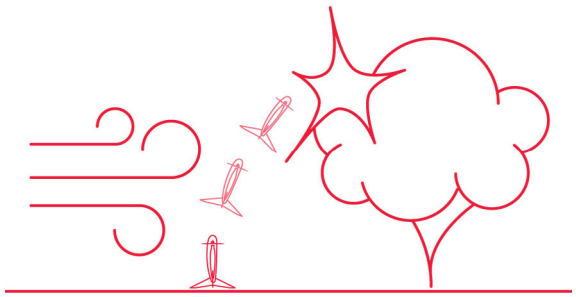
< 5 m/s (< 11 mph)
continuous wind speed



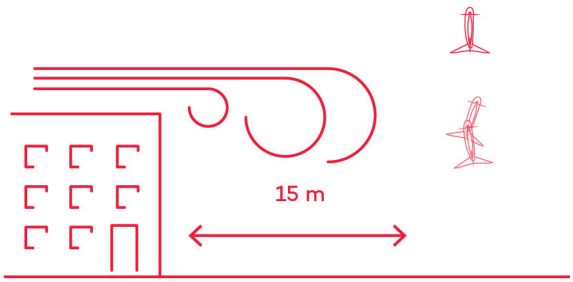
> 5 m/s (> 11 mph)
continuous wind speed



Generally, it is recommended to fly in open, obstacle-free areas.



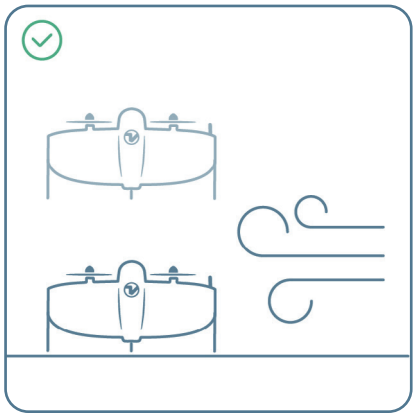
When not keeping the recommended distance from objects, you risk crashing the drone because of drift or turbulence.



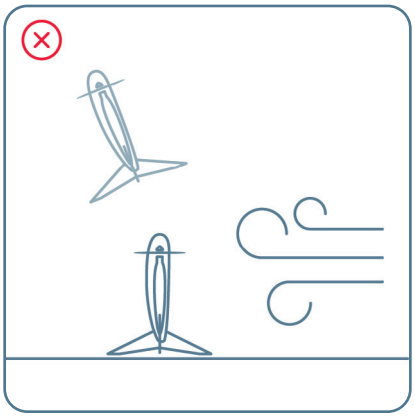
Turbulence occurs close to tall buildings, cliffs, mountains and valleys.

Take-off postion in wind

When placing the drone for take-off, make sure that it is positioned parallel to the wind direction.

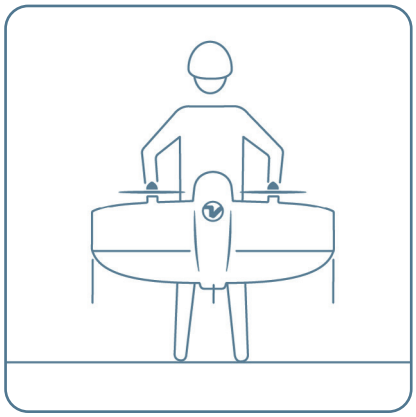


Parallel to wind

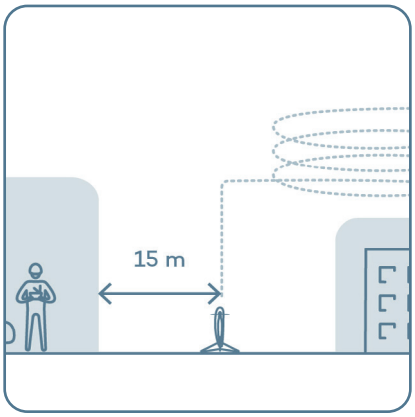


Perpendicular to wind

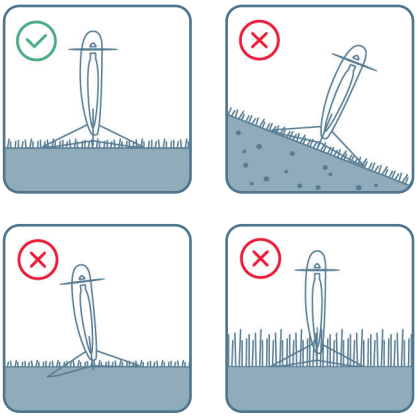
Prepare for take-off



1. Firmly insert the middle stand until you hear a click and, holding the motors, place the drone on the take-off point



2. Make sure the take-off point is a safe distance from people and obstacles



3. Place it on even ground, making sure it doesn't sink into mud and that the grass surrounding it is not too high

Go through the checklist and take off

1. Select the checklist
2. Follow the instructions
3. Once all the checklist items are green, press the button to take off

Stay alert

Observe your airspace during flight and take action if needed
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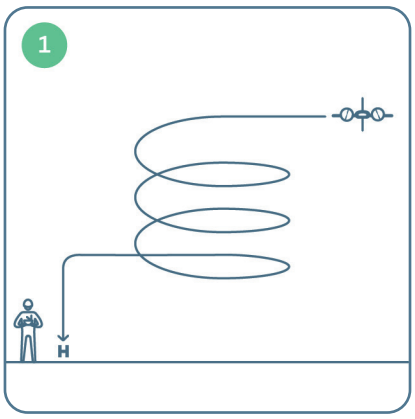
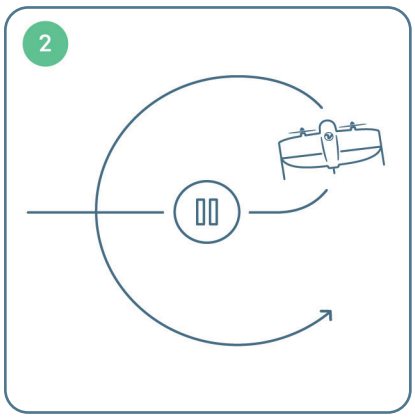
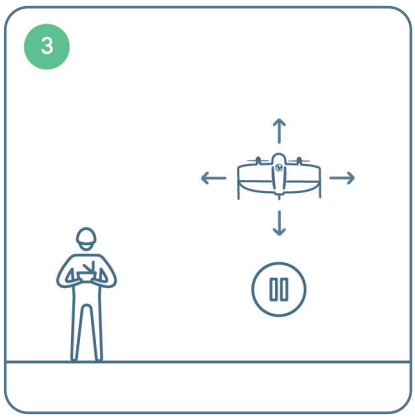


1. Return to home if it starts to rain or if an aircraft enters your airspace



2. Pause in cruise if you are unsure about the planned flight or need time to think

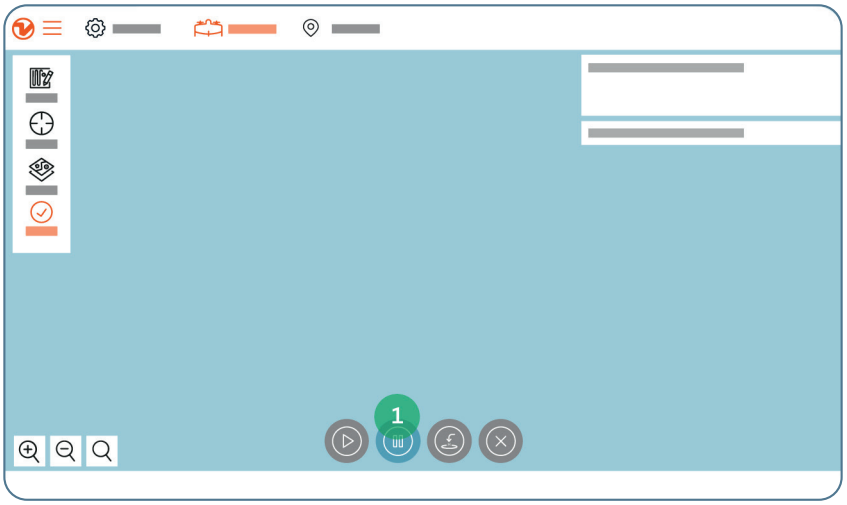


3. Pause in hover to reposition the drone for landing

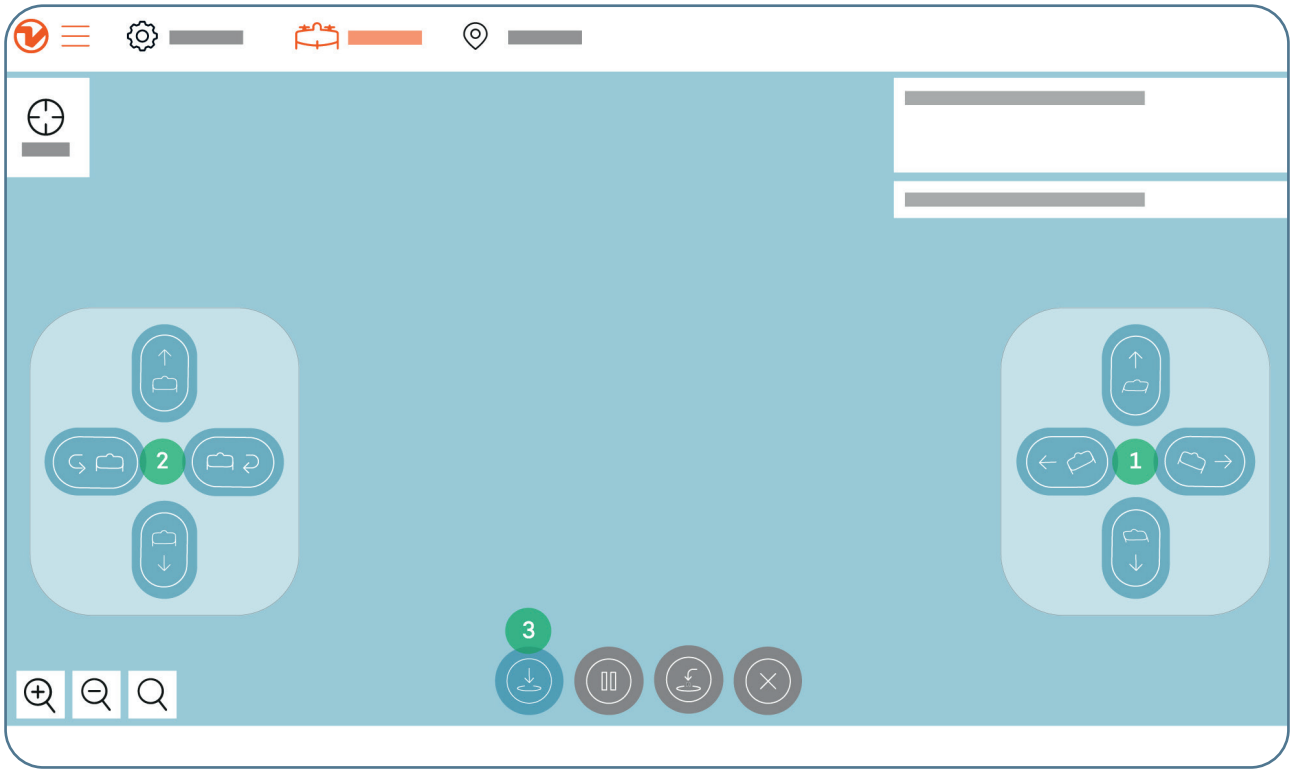
Pause and reposition the WingtraOne during landing

If your landing spot is not free, you can pause WingtraOne during landing, reposition it, and land at another location:

1. Pause the landing and take control by pressing the pause button



Watch the video to learn how to reposition WingtraOne through WingtraPilot at knowledge.wingtra.com/reposition-wingtraone-at-landing



1. Adjust position with the left/right/forward/ back controls on the right side. “Forward” means “towards the camera.”
2. Adjust the altitude or turn WingtraOne around its axis with the controls on the left side (up/down/turning)
3. Land at the current position with the land button. Alternatively, you can press the “down” button until you land.

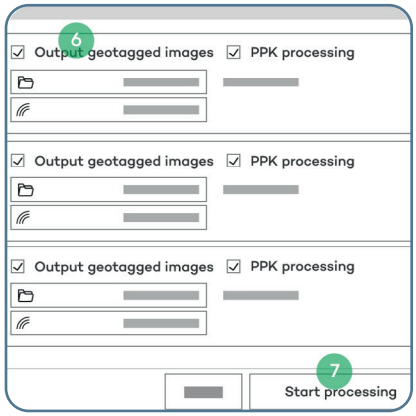
Emergency shut-off

As the last option in dangerous situations, it is possible to immediately switch off the motors of WingtraOne at any time in-flight.

1. Press the red button with a cross
2. Slide to confirm in the emergency shut-off screen

Careful! Emergency shut-off cuts the motors instantly, and the drone will fall on the ground. We hope that you never need to use this feature.

To geotag your collected data

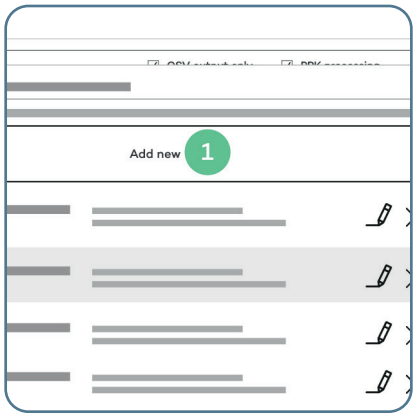


1. Install WingtraHub on your computer; find instructions at knowledge.wingtra.com/en/install-wingtrahub
2. Take the SD card out of the camera inside the drone and copy the WingtraPilotProjects folder to your computer
3. Open WingtraHub
4. Open the WingtraPilotProjects folder
5. Select the projects you want to process and press “Next”
6. Tick the “Output geotagged images” box to generate a copy of the images with EXIF/XMP geotags and untick the option to only output the CSV file. Note that generating the geotagged images requires more processing time and more storage space
7. Select "Start processing"

i Learn more about geotagging of MicaSense data at knowledge.wingtra.com/multispectral-data-acquisition-with-wingtraone-rededge

Optional for PPK data processing

Add “Base file(s)” from your computer—select all available RINEX files.
Then add “Base location” as follows

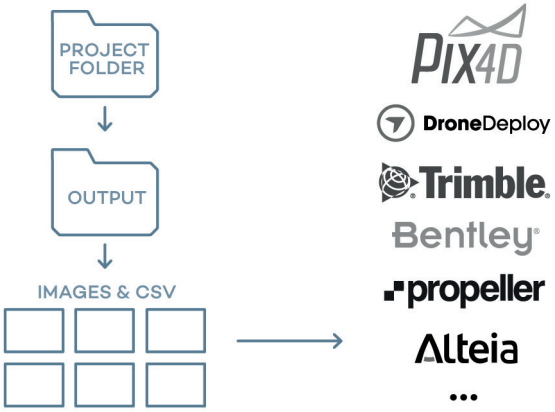


1. Select “Add new”
2. Enter the coordinates of the base and give a descriptive name
3. Select “Save”
4. Select “Select”

Load your data on a photogrammetry software

Data captured with WingtraOne is compatible with all major post-processing tools. Prepare it as follows, and start analyzing:

1. Once the geotagging in WingtraHub is finished, locate your results in the WingtraPilotProjects folder on your computer's file explorer
2. Navigate to the folder “ProjectName”
3. Locate the “OUTPUT” folder
4. From there, upload the images and the CSV files to your preferred photogrammetry software



You are good to go!
Thank you for using WingtraOne in your surveying operations. Contact us at support@wingtra.com if you have any questions.

For professional users in the European Union (EU)

If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

For disposal in countries outside of the EU

This symbol is only valid in the EU. If you wish to discard the product, please contact your local authorities or dealer and ask for the correct method of disposal.

The WiFi on Sony cameras

The electromagnetic compatibility of the Sony RX1R II and Sony a6100 camera integrations has been tested with the camera internal WiFi turned off. Wingtra ships the camera with the WiFi turned off and cannot accept responsibility for any failure to satisfy the protection requirements resulting from a change of this setting.

EU conformity statement

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European standard EN55032. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication devices.

This is a Class A product. In a domestic environments this product may cause radio interference, in which case the user may be required to take adequate measures.

South Korean market

The products introduced in the South Korean market have been tested under the applicable standards in a designated testing laboratory in South Korea, and it is verified that the foregoing equipment has been registered under Clause 3, Article 58-2 of Radio Waves Act with the following registration numbers:

WingtraOne
R-R-WTa-WINGTRAGEN2
Ground Data Terminal
R-R-WTa-WINGTRAGDT
Telemetry module
R-R-WTa-M-P2400
SD Card reader
R-R-WTa-USBCtoSD
Orange USB License
R-R-WTa-OrangeUSBLic
Grey USB PPK Key
R-R-WTa-SeptPPKUSB

For a quote, a live demonstration or more information on the Wingtra products please contact us via **wingtra.com** or **hello@wingtra.com**

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