# Wingtra

## Technical specifications






wingtra

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THE TRUE END-TO-END SURVEYING SOLUTION

# Wingtra
## The true end-to-end surveying solution

Wingtra gives you a complete drone surveying system. From flight planning to CAD and GIS-ready outputs, it's the only aerial survey solution that keeps it all in one, connected toolchain. It's built for speed, accuracy and ease of use, so you can focus less on setup and more on results that move your projects forward.

### Absolute accuracy

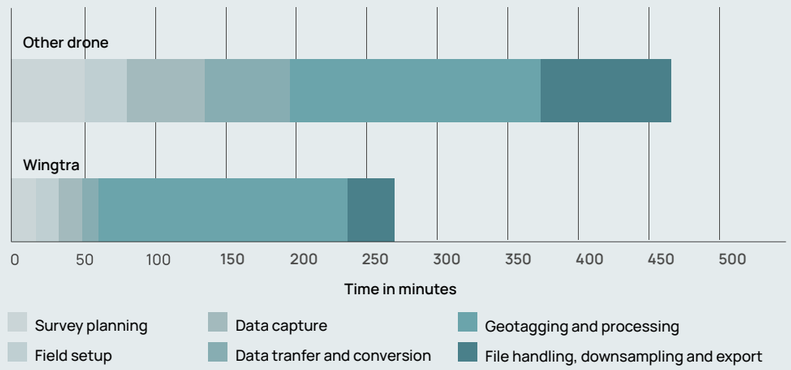
**3 cm (0.1 ft)***

**(RMS x, y, z) with PPK**

*Following Wingtra's recommended workflow with WingtraGROUND or a survey-grade base station within 10 km, and processing in WingtraCLOUD. Depending on the payload, this is achieved „Without GCPs" (SURVEY61, LIDAR) or „With GCPs" (Other Payloads), see Sensors chapter.

### Save time at every survey stage

Wingtra offers a perfectly integrated solution that takes you from planning to final deliverables faster and easier—to make you up to 60% more efficient across your entire workflow.















### 1. Plan
Easily plan flights to get accurate results the first time, every time.

### 2. Capture
Capture accurate, photo-realistic survey data with WingtraRAY and the field kit. (Also possible with 3rd party base station like Trimble.)

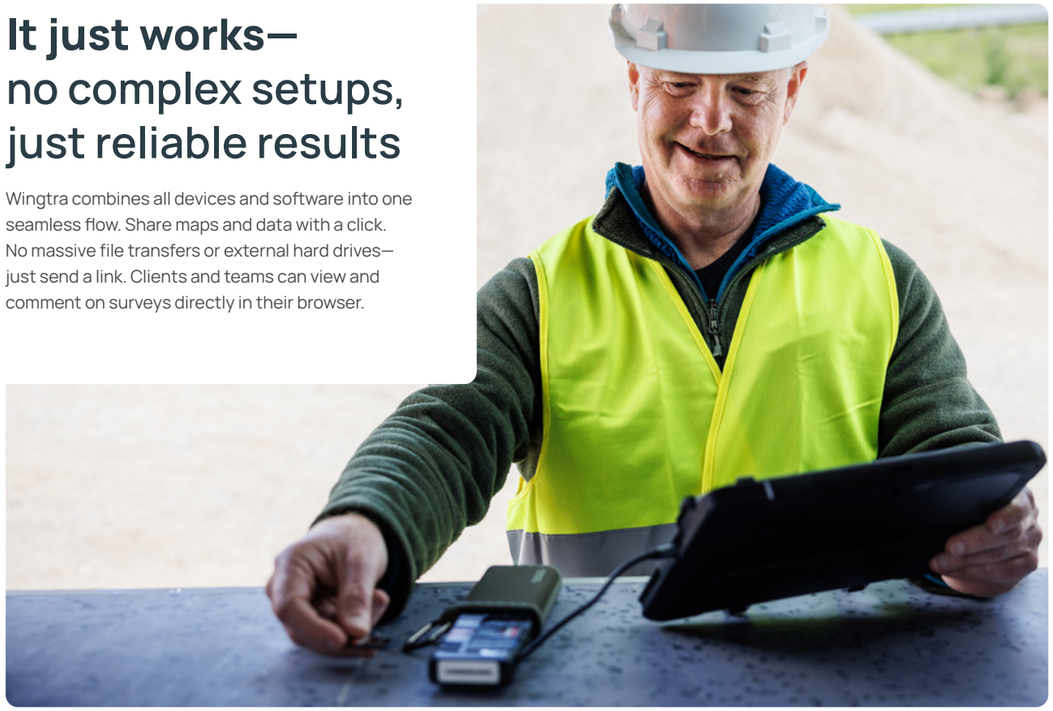
### 3. Process
Turn the data points that you captured into accurate 2D maps and 3D models.

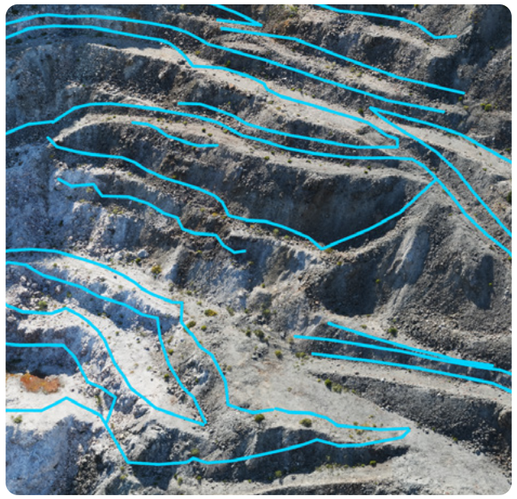
### 4. Collaborate
Work together on a single, cloud-based source of truth.

### 5. Integrate
Plug aerial survey data into your favorite CAD or GIS software.

# It just works—
## no complex setups, just reliable results

Wingtra combines all devices and software into one seamless flow. Share maps and data with a click. No massive file transfers or external hard drives—just send a link. Clients and teams can view and comment on surveys directly in their browser.





## Share and work on accurate, photorealistic survey data—keeping teams and clients aligned

More than just lines and points, photorealistic maps bring the site to life and let stakeholders instantly see what's happening, reducing misunderstandings.

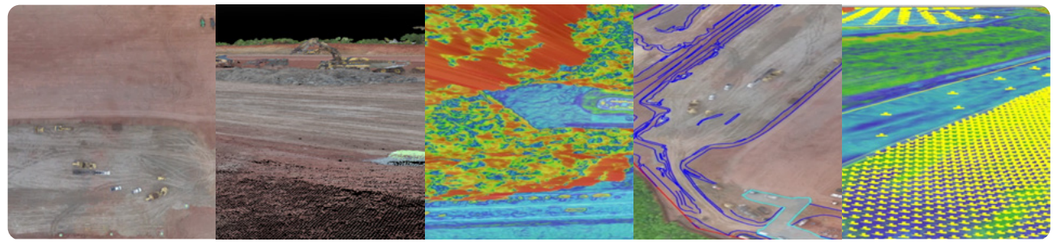
Built to American standards, trusted globally—enabling compliant, reliable and safe drone operations

NDAA COMPLIANT · BLUE UAS · green uas · Federal Aviation Administration · EASA · C3 CERTIFIED · C6 CERTIFIED · SORA · ENGINEERED IN SWITZERLAND



THE TRUE END-TO-END SURVEYING SOLUTION

# Accelerate your time to value
## Get survey-grade maps across different sites in hours, not weeks



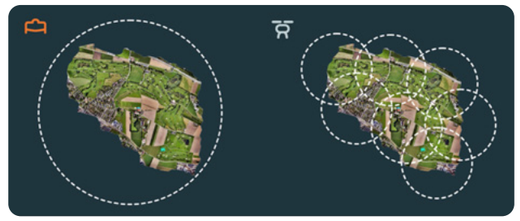
### No more costly field revisiting

One survey offers multiple deliverables without making you go back to the site—even if project requirements change.



### Free up surveyors for high-value tasks

With an intuitve, safeguared system, field teams can easily collect precise data so that surveyors can validate, quality control, and oversee projects.



### Cover more ground than other drones

WingtraRAY exceptional capture efficiency reduces the number of flights and relocations, while fast setup gets you back in the air quickly—so you survey more in less time.

**550 ha (1360 ac) with a one-hour flight**

**30x**
**Faster than terrestrial methods**

**6x**
**Faster than multicopter drones**

**40%**
**Faster than the previous generation (WingtraOne GEN II)**






WINGTRARAY

## Hardware

| | |
|---|---|
| **Drone type** | Tailsitter vertical take-off and landing (VTOL) |
| **Maximum take-off weight** | 5.2 kg (11.5 lb) |
| **Payload capacity** | 1'250 g (2.75 lb) |
| **Wingspan** | 125 cm (4.1 ft) |
| **Battery capacity** | Two 99 Wh batteries (required as a pair) |
| **Battery type** | Lithium-polymer, smart battery technology, UN3481 compliant |
| **Radio link (2.4 GHz, primary)** | Bi-directional 10 km (6 mi) in direct line of sight, obstacles reduce the range |
| **Radio link (LTE, secondary)** | Bi-directional unlimited range within mobile network coverage |
| **Onboard GNSS** | Redundant, using GPS (L1, L2), GLONASS (L1, L2), Galileo (L1) and BeiDou (L1) Frequencies range: 1227.6 MHz / 1242.9375-1251.6875 MHz / 1561,098 MHz / 1575,42 MHz / 1598.0625-1609.3125 MHz / 1602,00 MHz |
| **Dimensions of drone** | 125 × 68 × 12 cm (49.2 × 26.8 × 4.8 in, without landing fin) |
| **Dimensions of transport case** | 130 x 70 x 34 cm (51.2 x 27.6 x 13.4 in) |
| **Dimensions of transport case with cardboard shipping protection** | 134 x 74 x 37 cm (52.8 x 29.1 x 14.6 in) |
| **Weight of transport case incl. drone bundle** | 14.4 kg (32 lb) |
| **Weight of transport case fully loaded (drone bundle + all optional accessories)** | 18.6 kg (41 lb) |





# Flying in wind

WingtraRAY can safely fly and capture data in sustained winds up to 12 m/s (27 mph)* and gusts up to 18 m/s (40 mph).

* 12 m/s (27 mph) sustained wind at cruise height (120 m, 400 ft)corresponds to approximately 8 m/s (18 mph) measured on the ground with the wind measurement tool provided in the Wingtra pilot box.




| | **Max sustained wind**<br>Wind measured by the drone in cruise height over more than 30 seconds | **Max wind gusts**<br>Brief increase in the speed of the wind for less than 30 seconds. | **Max sustained wind on the ground**<br>Wind measured on the ground by the wind tool provided in the Wingtra pilot box (average over 30 seconds) |
|---|---|---|---|
| **m/s** | 12 m/s | 18 m/s | 8 m/s |
| **km/h** | 43 km/h | 65 km/h | 29 km/h |
| **mph** | 27 mph | 40 mph | 19 mph |

- We recommend measuring the wind on the ground. Do not fly if you measure more than 8 m/s (18 mph) over 30 seconds (sustained wind).
- If the wind speed during cruise flight exceeds 12 m/s (27 mph) for more than 30 seconds (sustained wind), WingtraRAY will automatically return home as the data integrity can no longer be guaranteed.
- Flight time may be affected by wind (see detailed section on flight time on the next page).

# Tipping expectations

Strong winds and uneven ground can cause the WingtraRAY to tip over. Generally, this is not a problem, since only some scratches might occur and the robustness of the system is not compromised.

Landings in the home point zone are always very accurate and predictable compared to belly landings. In light winds and calm conditions, WingtraRAY lands smoothly on its tail.

| **Sustained wind measured on ground**** | **Tipping expectations** |
|---|---|
| 0-5 m/s (0-11 mph) | Tippings rarely occur |
| 5-8 m/s (11-18 mph) | Tippings can occur |
| > 8 m/s (> 18 mph) | Not recommended to fly |

** As measured with the wind measurement tool continously over 30 seconds—approximately 2 m (7 ft) above the ground (holding device overhead) in an open area completely free from trees or tall objects that can cause turbulence.

## Operation

| | | |
|---|---|---|
| **Flight speed** | Operational cruise speed<br>Climb / sink cruise<br>Climb / sink hover | Adaptive between 16 and 22 m/s (36 and 49 mph)<br>8/8 m/s (18 / 18 mph)<br>6/2.5 m/s (13.4 / 5.6 mph) |
| **Wind resistance** | Max sustained wind<br>Max wind gusts<br>Max sustained wind on the ground | 12 m/s (27 mph)<br>18 m/s (40 mph)<br>8 m/s (18 mph) |
| **Flight time** | 59 min with MAP61, SURVEY61, INSPECT, RedEdge-P and SURVEY24<br>45 min with LIDAR<br>See next page or **knowledge.wingtra.com/flight-time**<br>for what flight time to expect in different flying conditions | |
| **Temperature (ambient)** | -10 °C to 40 °C (14 °F to 104 °F) | |
| **Maximum take-off altitude above sea level** | 4'800 m (15'700 ft) AMSL with high-altitude drivetrains<br>1'500 m (4'900 ft) AMSL with standard drivetrains | |
| **Maximum flight altitude above sea level** | 5'000 m (16'400 ft) AMSL with high-altitude drivetrains<br>2'000 m (6'600 ft) AMSL with standard drivetrains | |
| **Maximun propeller speed** | 8500 RPM | |
| **Ingress Protection** | IP53 | |
| **Weather** | Not receommended to fly in fog, rain and snow | |
| **Ground control points required** | No (with PPK option); using 3 checkpoints to verify the accuracy is recommended | |
| **Auto-landing accuracy** | < 2 m (< 7 ft) | |

## Results

| | | |
|---|---|---|
| **Maximum coverage in one flight at 120 m (400 ft) flight altitude*** | MAP61<br>SURVEY61 | 550 ha (1360 ac) at 2.7 cm (1.06 in)/px GSD<br>310 ha (760 ac) at 1.3 cm (0.51 in)/px GSD |
| **Maximum coverage in one flight at lowest GSD*** | MAP61<br>SURVEY61 | 240 ha (600 ac) at 1.2 cm (0.47 in)/px GSD<br>120 ha (300 ac) at 0.5 cm (0.2 in)/px GSD |
| **Approximate field time for a 100 ha (250 ac) site at 120 m (400 ft) flight altitude*** | MAP61<br>SURVEY61 | 15 min at 2.7 cm (1.06 in)/px GSD<br>30 min at 1.3 cm (0.51 in)/px GSD |
| **Approximate field time for a 1'000 ha (2'500 ac) site at 120 m (400 ft) flight altitude (multiple flights required)*** | MAP61<br>SURVEY61 | 2 hours at 2.7 cm (1.06 in)/px GSD<br>4 hours at 1.3 cm (0.51 in)/px GSD |
| **Lowest possible GSD** | MAP61<br>SURVEY61<br>INSPECT | 1.2 cm (0.47 in)/px at 54 m (180 ft) flight altitude<br>0.5 cm (0.2 in)/px at 46 m (150 ft) flight altitude<br>0.25 cm(0.1 in)/px at 60 m (200 ft) flight altitude |
| **Absolute accuracy (RMS x, y, z) with PPK**** | 3 cm (0.1 ft) | |
| **Relative accuracy (distance measurement) with PPK**** | MAP61<br>SURVEY61 | 0.005%<br>0.003% |

* Side overlap: 60%.
** Following Wingtra's recommended workflow with WingtraGROUND or a survey-grade base station within 10 km, and processing in WingtraCLOUD. Depending on the payload, this is achieved „Without GCPs" (SURVEY61, LIDAR) or „With GCPs" (Other Payloads), see Sensors chapter.





# Flight time, coverage and job time

**WingtraRAY's maximum tested flight time is 59 minutes. However, the flight time of any drone is influenced by many factors, so it will not be uniform across different missions. In any case, coverage and job time are determined by many factors, like payload weight and flight speed.**

## Flight time

- **Payload**
  Using a heavier payload reduces flight time. For example, when switching from the MAP61 payload to the heavier LIDAR sensor, the flight time reduces from 59 mn to 45 mn.
- **Altitude above sea level (ASL)**
  As the air gets thinner with increasing altitude above sea level, drone flight time is reduced. At the same time, WingtraRAY will fly faster in high altitudes, which means that the coverage is only marginally reduced.*
- **Transition height**
  Because the WingtraRAY uses significantly more energy while hovering, the transition altitude affects flight time. A higher transition altitude will result in a reduced flight time.
- **Wind**
  In stronger winds, drones consume more energy while flying and landing, which means missions will end up with shorter flight times.
- **Temperature**
  As temperature influences air density, it impacts flight time directly. Generally, higher temperatures mean lower flight times.

## Payload performance based on altitude ASL

| Payload | Take-off altitude ASL | Flight time | Max coverage at 120 m / 400 ft |
|---|---|---|---|
| **MAP61** | 0-500 m<br>0-1600 ft | 59 min | 550 ha at GSD 2.7 cm/px<br>1360 ac at GSD 1.06 in/px |
| **MAP61** | 2000 m<br>6600 ft | 45 min | 470 ha at 2.7 cm/px GSD<br>1'160 ac at 1.06 in/px |
| **LIDAR** | 0-500 m<br>0-1600 ft | 45 min | 490 ha at 40 pts/m2<br>1'210 ac at 40 pts/m2 |
| **LIDAR** | 2000 m<br>6600 ft | 30 min | 380 ha at 35 pts/m2<br>940 ac at 40 pts/m2 |

Reference conditions: One flight, 25 m (80 ft) transition height, 1.2 km (0.7 miles) furthest distance from home, 15C (59F) air temperature, < 3 m/s (7 mph) wind, 60% side overlap for MAP61, 30% side overlap for LIDAR, high-altitude drivetrains for flights at 2'000 m (6600 ft)

## Job time

It's important to note that fast job time does not depend on more flight time like it is often marketed. Because your job time actually depends on how fast you get your data on any specific area. E.g., compared to multicopters, WingtraRAY captures data 11x faster. And compared to most fixed-wings, it's twice as fast. The right drone, payload and settings will get your data faster, and faster means less flight time.

## Coverage

What matters more than flight time is coverage, i.e., how much area you can cover in a single flight. Considering this, it is important to choose your payload based on the goal. What do you need? Moreover, how do you balance the precision level and capture speed to get the accuracy you need for the analytics you/your client plans to run? For example, The INSPECT payload offers mm-level detail, while MAP61 maximizes coverage for fewer images and less processing time.

* For example,the MAP61 camera covers 550 ha (1360 acres) in 59 minutes at 0-500 m (0-1640 ft) above sea level, and 470 ha (1,160 acres)in 45 minutes at 2000m (6562 ft) above sea level.

# WINGTRACLOUD

WingtraCLOUD is an end-to-end platform that enables you to scale your mapping operations with ease, from start to finish. Empower your team to collaborate effortlessly on survey data from anywhere, and consistently deliver high-quality results to confidently scale mapping operations.



## Key benefits

- Tighter collaboration—synchronize and share flight data across teams in real time
- Increased productivity—automate mission planning and efficiently manage survey projects
- Simplified mapping—user-friendly interface for fast, accurate mapping workflows
- Secure and scalable—cloud-based infrastructure for secure storage and easy scalability

| | Feature* | Description |
|---|---|---|
| **Inputs** | Compatible data sources | Aerial imagery (nadir and oblique) from WingtraRAY flight<br>Flight plans from WingtraPilot/WingtraHub<br>Geo-referenced imagery from WingtraHub |
| | Supported payloads | RGB: MAP61, RGB61, RXIRII, a6100, Oblique a6100, INSPECT, SURVEY61<br>Multispectral: RE-P (geotagging only)<br>LIDAR: flight planning only |
| | Supported file formats | Images .jpg<br>Geospatial data .dxf, .kml, .geojson, .csv<br>Background layers Web Map Services (WMS) |
| **Project and Data Management** | Project Organization | Store and access all mission files with digital sites |
| | Cloud synchronization | Automatic data sync between field and office devices |
| | Project sharing & collaboration | Invite unlimited users with different access levels<br>Share flight plans and processed maps instantly via url links |
| | Local (on-device) workflow support | Plan, capture, and geotag fully on device—no cloud syncing or data uploads |
| **Data capture** | Automated flights | Automated flights with WingtraRAY (all supported payloads) |
| | Flight management | Terrain following, pause and resume, return to home (RTH) |
| **Flight planning** | 2D/3D flight planning | Plan missions in complex terrain with elevation-based flight paths<br>Use offline maps for flight planning |
| | Custom background maps and elevation data | Import site-specific elevation models for accurate flight planning |
| | Viewshed analysis | Simulate line-of-sight coverage to assess visibility |
| | Obstacle awareness | 3D buildings overlay to detect potential obstructions |
| | Large-Area mission planning | Optimize multi-flight projects to ensure overlap and avoid gaps |
| **Processing, Outputs and Export Options** | Processing options | PPK single point processing (WingtraGROUND)<br>PPK image geotagging (multi-constellation)<br>Map processing, including check-points or ground control points<br>Batch geotagging and maps processing |
| | Output coordinate system selection | Process projects in published and local coordinate systems of choice to guarantee optimal workflows |
| | 2D Outputs | Orthomosaics .tif |
| | 3D Outputs | Point clouds .laz<br>3D mesh models .obj |
| | 2.5D Outputs | Digital surface models (DSM) .tif |
| | Flight records | Flight logs .ulg<br>Base files (rinex) .o,.b,.p<br>Checkpoints .csv<br>Raw images .jpg |
| | Reports and documentation | Quality report .pdf |
| **Measurement and Analysis Tools** | Annotations and measurements | Accurately measure points, slopes, distances and areas in project datasets |
| **Workflow Integration** | WingtraGROUND and WingtraCLOUD Sync | Automatic detection and in-field workflow for integrated GNSS receiver (WingtraGround)<br>Automatic sync of GNSS data (base correction, checkpoints) to WingtraCLOUD for fast post-processing and accuracy verification |
| | Pilot assignment and Team management | Assign pilots to specific missions remotely<br>Assign drones to specific missions remotely |
| **Third-Party Integrations** | GIS & CAD compatibility | Export cropped and downsampled project data to external platforms (e.g. ArcGIS, AutoCAD) for further analysis |
| | Web map services (WMS) | Overlay real-time GIS layers for enhanced mission planning |
| | Upload and share third- party maps | Upload, view and share processed 2D and 3D outputs from sources other than Wingtra acquired data |
| **Support and Availability** | Support options | Wingtra email support for license holders<br>Wingtra knowledge base<br>Wingtra community feedback portal |
| **Languages** | Available languages | English |

*Available features depend on the chosen software subscription (see all plans: https://wingtra.com/wingtracloud/).

# Tablets

**Unmatched performance for your Wingtra surveying operations. Your Wingtra drone comes with a rugged tablet to handle your planning operations.**

For professionals conducting full-day field operations in harsh and challenging environments, the Premium Tablet is designed to transform how you operate in the field, offering all-day power, extreme visibility and seamless connectivity. Built for the harshest conditions, it ensures uninterrupted, efficient, and confident operations from take-off to data delivery.





| | Samsung Tab Active 5 Pro (supplied) | Premium Tablet (available as add-on) |
|---|---|---|
| **Display size** | 10.1 “ | 10.1 “ |
| **Brightness** | 600-nit display for clear visibility in bright sunlight | 1000-nit display for clear visibility in bright sunlight |
| **Battery life** | 10’100 mAh | 17,840 mAh, with hot-swappable batteries for all-day use (included) |
| **Temperature range** | 0 °C to 50 °C (32 °F to 122 °F) | -30 °C to 55 °C (-22 °F to 131 °F) |
| **Wireless connectivity** | Wi-Fi and Bluetooth | 5G and Wi-Fi 6E for faster, reliable communication |
| **Performance** | SnapDragon 7S-Gen3 octa-core 2.5 GHz | Qualcomm® 6490 octa-core 2.7 GHz platform for smooth operation |
| **User environment** | IP68 dust tight and water resistant, MIL-STD-810 | IP66 dust tight and water resistant, MIL-STD-810H |





## Data link (primary)

| | |
|---|---|
| **Module name** | WingtraRAY Telemetry 2.4 |
| **Main function** | Telemetry connection for remote operation |
| **Frequency range telemetry** | 2.4016-2.4776 GHz |
| **Occupied bandwidth** | 6.0 MHz |
| **Operation mode** | FHSS (Frequency Hopping Spread Spectrum) |
| **Typical datarate** | 57.6 kb/s |
| **Transmission power (EIRP)** | 19,8 dBm |
| **Tested maximum range** | 10 km (6 mi) in direct line of sight, keep in mind that obstacles reduce the range |
| **Number of channels** | 76 |
| **Channel bandwidth** | 100 kHz |
| **Method of modulation** | GFSK |

## Data link (secondary)

| | | |
|---|---|---|
| **Module name** | WingtraRAY Telemetry LTE | |
| **Main function** | Telemetry connection fallback and for beyond-visual-line-of-sight (BVLOS) operations | |
| **Frequency range telemetry** | LTE FDD bands | 1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 26, 28 |
| | LTE TDD bands | 38, 39, 40, 41 |
| | UMTS / HSPA FDD | 1, 2, 5, 8 |
| | GMS / GPRS / EGPRS bands | Quad |
| **SIM card** | Global roaming* | |

**In case of many obstacles blocking visual line of sight or BVLOS missions, you can increase the connection loss timeout parameter on WingtraCLOUD. It defines the maximum time a connection loss of telemetry is tolerated until a mission is aborted. In this case, missions will run uninterrupted even if there is no telemetry connection.**

*some countries excluded, see https://knowledge.wingtra.com

# Parachute



## A parachute built for legal, safe flights

WingtraRAY's parachute deploys automatically, or you can trigger it manually. It's built to protect people below and help you avoid waivers, delays and legal risks.



### Parachute

| | |
|---|---|
| **Module name** | WingtraRAY parachute add-on |
| **Purpose** | Safety feature for ground risk mitigation to enable operations over people and traffic<br>US: Enables operations over people (excl open-air assemblies) under part 107 (Cat. 3 OOP)<br>EU: Enables operations over populated areas in the specific category through SORA<br>Learn more under **https://knowledge.wingtra.com/en/parachute-safety-guide** |
| **Service interval** | 3 years |
| **Manual activation** | Through fully redundant and segregated ground station and activation circuit on the drone |
| **Automatic activation** | Based on loss of control, navigation or drone health |
| **Average sink rate** | 4 m/s (9 mph)* |
| **Minimum deployment altitude** | 45 m (148 ft) |



### Parachute manual trigger device

| | |
|---|---|
| **Module name** | WingtraRAY manual trigger device |
| **Main function** | Manual triggering of parachute deployment |
| **Tested maximum range** | 4 km |
| **Operating frequencies**** | 915/868 MHz |

*Depending on your drone configuration and environmental conditions, sink rate and wind limit for operations over people vary.
Learn more under https://knowledge.wingtra.com/en/parachute-safety-guide
**specific frequency profile depends on country, see knowledge.wingtra.com



# Obstacle Avoidance



## Peace of mind even on changing sites

The front-facing radar can detect static obstacles trigger an avoidance protocol in case you missed objects on maps, so you can fly confidently, even on busy, changing sites.

### Obstacle Avoidance

| | |
|---|---|
| **Purpose** | Safety feature to detect static objects in cruise mode and trigger an avoidance and return-to-home maneuver |
| **Detection likelihood*** | Buildings, cranes, towers and rock faces / bare earth: High detection likelihood<br>Vegetation and thin wires (transmission lines, telco tower stabilizers): Low detection likelihood<br><br>Detection is not guarenteed for any type of object and the feature does not replace careful mission planning |
| **Detection technology** | Radar – 12 virtual antennas |
| **Update rate** | 30 Hz |
| **Detection range** | 100 m (330 ft) |
| **Angular resolution** | 30° |
| **Frequency** | 60-64 GHz |
| **Global availability*** | WingtraRAY Obstacle avoidance is enabled in all countries where the use of radar technology is allowed |

*Learn more under https://knowledge.wingtra.com/en/obstacle-avoidance-faqs

# Charger and batteries

When navigating short weather windows and tight schedules is crucial, you can rely on fast charging, long-lasting batteries to help you conquer more ground in one go.



## Battery charger

| | |
|---|---|
| **Module name** | WingtraRAY Charger |
| **Charger type** | 4 channel dock, external DC supply |
| **Input voltage AC** | 110-240 V, 50-60 Hz |
| **Input power AC** | 200 W |
| **Input voltage DC** | 11 - 36 V (optional, e.g., for charging from car) |
| **Input power DC** | 24-36 V : 200 W<br>12 V : 50 W |
| **Modes** | Charge / storage |
| **Charging profile** | Standard lithium-ion CC-CV cycle |
| **Charging time** | 1 h per pair |
| **Storage discharge time** | Max. 4 hours per pair. |
| **Charge end voltage** | 35.2 V (4.4 V per cell) |
| **Maximum discharge power** | 30W |
| **Storage end voltage** | 31 V (30% SOC) |
| **Addtional outputs** | 2 x USB-C 5 V / 2.1 A |
| **Dimensions** | 190 × 150 × 40 mm (7.5 × 5.5 × 2.75 in) |
| **Weight** | 680 g |







## Battery

| | |
|---|---|
| **Module name** | WingtraRAY Battery |
| **Model number** | WRB01 |
| **Battery capacity** | 99 Wh (a pair of batteries required) |
| **Features** | Redundant design, high energy density, smart fuel gauging, latch detector, LED charge indicator, UN3481 compliant for air-travel |
| **Nominal voltage** | 30.8 V |
| **Cell type** | Lithium polymer |
| **Configuration** | 8 s |
| **Rated charge** | 3.3 A |
| **Charging time** | 1 h |
| **Battery dimension** | 108 × 69 × 55 mm (4.3 × 2.7 × 2.2 in) |
| **Battery weight** | 525 g (1.2 lb) |
| **Battery cell operating temperature (take-off)** | +10 to +40 °C (+50 to +104 °F)<br>Takeoff will be prevented outside of this range. |
| **Battery cell operating temperature (in-flight)** | +10 to +60 °C (+50 to +140 °F)<br>The drone will automatically return to home in case the maximum battery temperature is exceeded during flight |
| **Battery storage temperature (optimal capacity recovery)** | +0 to +25 °C (+32 to +77 °F) |
| **Battery storage temperature (safe storage up to 3 months)** | -20 to +45 °C (-4 to +113 °F) |
| **Shock protection** | Yes |
| **Overvoltage protection** | Yes |
| **Undervoltage protection** | Yes |
| **Temperature protection** | Yes |
| **Short circuit protection** | Yes |
| **Materlal safety data sheet (MSDS)** | Available on request |

# Sensors

Serve more customers and applications with Wingtra's extensive line of sensors. From fine, mm-resolution airport crack detection, to LIDAR terrain models, for mine planning, to 3D city maps—you can do it all on the Wingtra platform.



## Full mapping flexibility

| | |
|---|---|
| **Modular payloads** | Yes, with toolless payload swap (twist-lock) |
| **Power supply** | Powered by WingtraRAY (up to 80 W) |
| **Payload protection** | Yes, maintenance-free integration with full enclosure in main drone body, shock-protection, and smooth VTOL landings |
| **Mapping sensors** | MAP61 Most efficient mapping solution & best 3D results<br>SURVEY61 Highest quality photogrammetry with survey-grade accuracy<br>INSPECT Milimeter-resolution inspections<br>SURVEY24 The affordable mapping & surveying solution<br>RedEdge-P Multispectral insights<br>LIDAR Topographic mapping beneath vegetation |
| **Additional payloads** | Parachute add-on for operations over populated areas |
| **PPK equipped** | All drones are equipped with a high-precision GNSS board and antenna to produce centimeter-level accuracy with post-processed kinematic (PPK) |





## RGB sensors






| | MAP61<br>Most efficient mapping solution & best 3D results | SURVEY61<br>Highest quality photogrammetry with survey-grade accuracy | INSPECT<br>Milimeter-resolution inspections | SURVEY24<br>The affordable mapping and surveying solution |
|---|---|---|---|---|
| **Technical specifications** | 61 MP, full-frame sensor, wide-angle lens (17 mm), low oblique configuration | 61 MP, full-frame sensor, low-distortion lens (35 mm), nadir configuration | 61 MP, full-frame sensor, tele lens (85 mm), nadir configuration | 24 MP, APS-C sensor, low-distortion lens (20 mm), nadir configuration |
| **Payload weight (incl. mount)** | 440 g (0.97 lb) | 670g (1.48 lb) | 780 g (1,29 lb) | 550 g (0.73 lb) |
| **GSD at 120 m (400 ft)*** | 2.7 cm/px (1.06 in/px) | 1.3 cm/px (0.51 in/px) | 0.5 cm/px (0.2 in/px) | 2.4 cm/px (0.9 in/px) |
| **Lowest possible GSD** | 1.2 cm/px (0.47 in/px) at 54 m (180 ft) | 0.5 cm/px (0.2 in/px) at 46 m (150 ft) | 0.25 cm/px (0.1 in/px) at 57 m (190 ft) | 1.2 cm/px (0.47 in/px) at 61 m (200 ft) |
| **Max coverage at 120 m (400 ft)** | 550 ha (1360 ac) | 270 ha (670 ac) | 80 ha (200 ac) | 330 ha (820 ac) |
| **Max coverage at lowest GSD*** | 240 ha (600 ac) | 100 ha (250 ac) | 35 ha (100 ac)*** | 170 ha (420 ac) |
| **Absolute accuracy (RMS x, y, z) with PPK without GCPs**** | 6 cm (0.2 ft) | 3 cm (0.1 ft) | 6 cm (0.2 ft) | 6 cm (0.2 ft) |
| **Absolute accuracy (RMS x, y, z) with PPK with GCPs** | 3 cm (0.1 ft) | 3 cm (0.1 ft) | 3 cm (0.1 ft) | 3 cm (0.1 ft) |
| **Absolute accuracy (RMS x, y, z) without PPK without GCPs** | 10 m (30 ft) | 10 m (30 ft) | 10 m (30 ft) | 10 m (30 ft) |
| **Sensor type** | Full frame | Full frame | Full frame | APS-C |
| **Sensor size x** | 35.7 mm (1.4 in) | 35.7 mm (1.4 in) | 35.7 mm (1.4 in) | 23.5 mm (0.93 in) |
| **Sensor size y** | 23.9 mm (0.93 in) | 23.9 mm (0.93 in) | 23.9 mm (0.93 in) | 15.6 mm (0.61 in) |
| **Mega pixel** | 61 | 61 | 61 | 24.2 |
| **Shutter type** | Mechanical, focal plane | Mechanical leaf shutter | Mechanical, focal plane | Mechanical, focal plane |
| **Pixel in x** | 9504 | 9504 | 9504 | 6000 |
| **Pixel in y** | 6336 | 6336 | 6336 | 4000 |
| **Focal length of lens** | 17 mm (0.67 in) | 35 mm (1.38 in) | 85 mm (3.35 in) | 20 mm (0.79 in) |
| **Focal length (35mm equivalent)** | 17 mm (0.67 in) | 35 mm (1.38 in) | 85 mm (3.35 in) | 29.8 mm (1.17 in) |
| **Front tilt angle (off-nadir)** | 15 ° | 0 ° | 0 ° | 0 ° |
| **Vertical field of view** | 70 ° (-20 ° ... 50 °) | 42 ° | 16 ° | 43 ° |
| **Horizontal field of view** | 93 ° (-47 ° ... 47 °) | 60 ° | 24 ° | 61 ° |
| **Minimal trigger time** | 0.4 s | 0.4 s | 0.4 s | 1.0 s |

* side overlap of 60%

**Achievable when following Wingtra's recommended workflow: flying Wingtra drones with built-in GNSS PPK, using WingtraGROUND or a survey-grade base station within 10 km, and processing in WingtraCLOUD. Accuracy refers to independent checkpoints—based on three established GCPs—in processing.

***Optimised for runway inspection and similarly flat inspection use cases.

# GSD overview RGB sensors



**MAP61**
Mostefficient and best 3D capabilities



**SURVEY61**
Highest quality photogrammetry with survey-grade accuracy



**INSPECT**
Milimeter-resolution inspections



**SURVEY24**
The affordable mapping and surveying solution

| | | | | |
|---|---|---|---|---|
| **GSD at 120 m (400 ft) flight altitude** | 2.7 cm/px (1.06 in/px) | 1.3 cm/px (0.51 in/px) | 0.5 cm/px (0.2 in/px) | 2.4 cm/px (0.9 in/px) |
| **Flight altitude** | 120 m (400 ft) | 120 m (400 ft) | 120 m (400 ft) | 120 m (400 ft) |
| **Max frontal overlap** | 95% | 90% | 81% | 83% |
| **Max coverage*** | 550 ha (1360 ac) | 270 ha (670 ac) | 80 ha (200 ac) | 330 ha (820 ac) |
| **Lowest possible GSD** | 1.2 cm/px (0.47 in/px) | 0.5 cm/px (0.2 in/px) | 0.25 cm/px (0.1 in/px) | 1.2 cm/px (0.47 in/px) |
| **Flight altitude** | 54 m (180 ft) | 46 m (150 ft) | 57 m (190 ft) | 61 m (200 ft) |
| **Max frontal overlap** | 90% | 81% | 62% | 67% |
| **Max coverage*** | 240 ha (600 ac) | 100 ha (250 ac) | 40 ha (100 ac) | 120 ha (300 ac) |
| **2.0 cm/px GSD** | 2 cm/px (0.79 in/px) | 2 cm/px (0.79 in/px) | 2 cm/px (0.79 in/px) | 2 cm/px (0.79 in/px) |
| **Flight altitude** | 92 m (300 ft) | 184 m (600 ft) | 460 m (1510 ft) | 102 m (330 ft) |
| **Max frontal overlap** | 96% | 96% | 96% | 87% |
| **Max coverage*** | 410 ha (1010 ac) | 390 ha (960 ac) | 300 ha (740 ac) | 205 ha (500 ac) |
| **GSD at 600 m (1970 ft) flight altitude** | 13.2 cm/px (3.7 in/px) | 6.5 cm/px (2.56 in/px) | 2.5 cm/px (1.0 in/px) | 12 cm/px (4.7 in/px) |
| **Flight altitude** | 600 m (1970 ft) | 600 m (1970 ft) | 600 m (1970 ft) | 600 m (1970 ft) |
| **Max frontal overlap** | 99% | 99% | 95% | 95% |
| **Max coverage*** | 2280 ha (5630 ac) | 1050 ha (2600 ac) | 500 ha (1240 ac) | 1100 ha (2700 ac) |

* side overlap of 60%





# LIDAR system



**LIDAR system**
Easy-to-use,preciseand efficient

| | | |
|---|---|---|
| **Payload weight (incl. mount)** | 1060 g | |
| **Point density at 45 m AGL (single pass, single return)** | 110 pt/m$^2$ | |
| **Effective point density of deliverable at 45 m AGL with 50% side overlap** | Hard surface: ~220 pts/m2 (20 pts/ft2) (single return)<br>Low vegetation: up to 440 pts/m2 (40 pts/ft2) (dual return)<br>High vegetation: up to 660 pts/m2 (60 pts/ft2) (triple return) | |
| **Effective point density of deliverable at 90 m AGL with 50% side overlap** | Hard surface: ~110 pts/m2 (10 pts/ft2) (single return)<br>Low vegetation: up to 220 pts/m2 (20 pts/ft2) (dual return)<br>High vegetation: up to 330 pts/m2 (30 pts/ft2) (triple return) | |
| **Effective point density of deliverable at 120 m AGL with 50% side overlap** | Hard surface: ~84 pts/m2 (7 pts/ft2) (single return)<br>Low vegetation: up to 168 pts/m2 (14 pts/ft2) (dual return)<br>High vegetation: up to 252 pts/m2 (21 pts/ft2) (triple return) | |
| **With PRS (Parachute Recovery System)** | Max coverage for highest density at 45 m (150 ft) | Up to 220 ha (545 ac) (30% side overlap) |
| | Max coverage at 90 m (300 ft) | Up to 415 ha (1025 ac) (30% side overlap) |
| **Without PRS (Parachute Recovery System)** | Max coverage for highest density at 45 m (150 ft) | Up to 245 ha (605 ac) (30% side overlap) |
| | Max coverage at 90 m (300 ft) | Up to 460 ha (1,140 ac) (30% side overlap) |
| **Vertical absolute accuracy at 90 m (RMS)** | 3 cm (0.1 ft) | |

## Scanner

| | |
|---|---|
| **Laser scanner** | XT32M2X |
| **Field of view (horizontal)** | 90 ° |
| **Field of view (vertical)** | 40.3 ° |
| **Number of returns** | 3 |
| **Sensor type** | Rotating sensor |
| **Wavelength** | 905 nm |
| **Range** | 0.5 - 300 m<br>80 m with 10% reflectivity (all channels) |
| **Pulse** | 640 k/s (single return)<br>1280 k/s (double return)<br>1920 k/s (triple return) |

* side overlap of 30%

## Imu

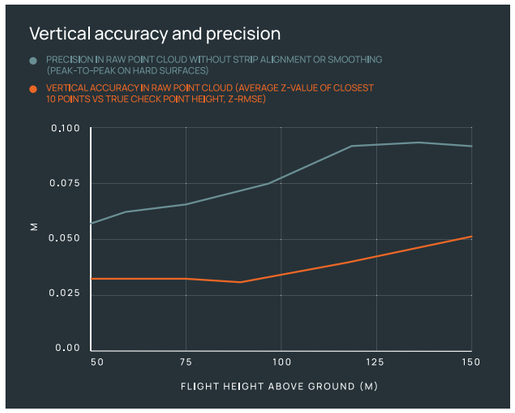
| | |
|---|---|
| **Inertial measurement unit** | Inertial Labs Tactical-Grade IMU-P |
| **Pitch/roll accuracy** | 0.006 ° |
| **Heading accuracy** | 0.03 ° |

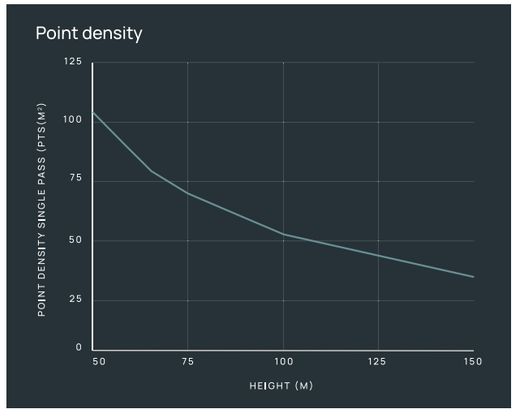
## GNSS

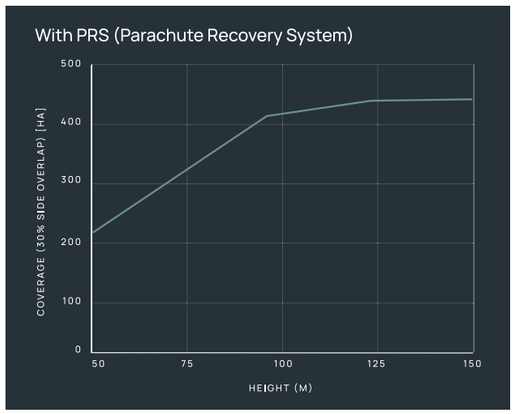
| | |
|---|---|
| **GNSS system** | NovAtel OEM7500 |
| **Constellations** | GPS, GLONASS, BEIDOU, GALILEO |
| **Position accuracy** | 0.5 cm |
| **PPK** | Yes |

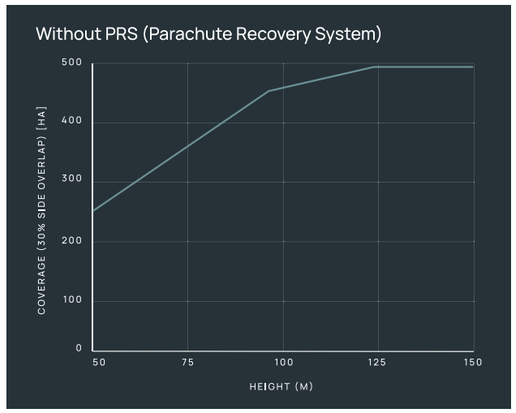
## Software

| | |
|---|---|
| **Processing SW** | WingtraCLOUD or Wingtra LIDAR app |
| **Point cloud generation** | LAS and LAZ |
| **Trajectory correction** | Yes |








# Multispectral sensor



## RedEdge-P

Multispectral insights

| | |
|---|---|
| **Technical specifications** | 5 multispectral sensors<br>(R, G, B, RE, NIR, 5.5 mm lenses) + panchromatic band, 10.3 mm lens, nadir configuration |
| **Payload weight (incl. mount)** | 502 g (1.1 lb) |
| **Ground sampling distance (GSD) at 120 m (400 ft)** | 4.0 cm/px (1.57 in/px) |
| **Lowest possible GSD** | 2.0 cm/px 0.78 in/px at 60 m (200 ft) |
| **Maximum coverage at 120 m (400 ft)*** | Up to 180 ha (440 ac) |
| **Maximum coverage at lowest GSD*** | Up to 90 ha (230 ac) |
| **Absolute accuracy (RMS x, y, z) with PPK**** | 3 cm (0.1 ft) |

| | | |
|---|---|---|
| **Sensor type** | 5 individual sensors<br>Red, Green, Blue, Rededge,<br>Near-infrared | Panchromatic sensor |
| **Sensor size x** | 5.04 mm (0.19 in) | 8.5 mm (0.33 in) |
| **Sensor size y** | 3.78 mm (0.15 in) | 7.1 mm (0.28 in) |
| **Mega pixel** | 5 × 1.58 | 5.1 |
| **Shutter type** | Electronic shutter | Electronic shutter |
| **Pixel in x** | 1456 | 2464 |
| **Pixel in y** | 1088 | 2056 |
| **Focal length of lens** | 5.5 mm (0.22 in) | 10.3 mm (0.4 in) |
| **Focal length (35mm equivalent)** | 41 mm (1.61 in) | 38,6 mm (1.52 in) |
| **Vertical field of view** | 38.3 ° | 37.7 ° |
| **Horizontal field of view** | 49.6 ° | 44.5 ° |
| **Minimal trigger time** | 0.5 s | 0.5 s |
| **Minimal trigger distance** | 8 m (26 ft) | 8 m (26 ft) |

* side overlap of 70%

**Achievable when following Wingtra's recommended workflow: flying Wingtra drones with built-in GNSS PPK, using WingtraGROUND or a survey-grade base station within 10 km, and processing in WingtraCLOUD. Accuracy refers to independent checkpoints—based on three established GCPs—in processing.

SENSORS

# GSD overview of multispectral sensor



## RedEdge-P

Multispectral insights

| | |
|---|---|
| **GSD at 120 m (400 ft) flight altitude** | 4 cm/px (1.6 in/px) |
| **Flight altitude** | 120 m (400 ft) |
| **Maximum frontal overlap** | 80% |
| **Maximum coverage*** | 180 ha (440 ac) |
| **Lowest possible GSD** | 2 cm/px (0.78 in/px) |
| **Flight altitude** | 60 m (195 ft) |
| **Maximum frontal overlap** | 75% |
| **Maximum coverage*** | 80 ha (200 ac) |
| **6.0 cm/px GSD** | 6 cm/px (2.4 in/px) |
| **Flight altitude** | 180 m (590 ft) |
| **Maximum frontal overlap** | 81% |
| **Maximum coverage*** | 240 ha (400 ac) |
| **GSD at 600 m (1970 feet) flight altitude** | 20 cm/px (8 in/px) |
| **Flight altitude** | 600 m (1970 ft) |
| **Maximum frontal overlap** | 95% |
| **Maximum coverage*** | 600 ha (1480 ft) |



* side overlap 70%

# WINGTRAGROUND

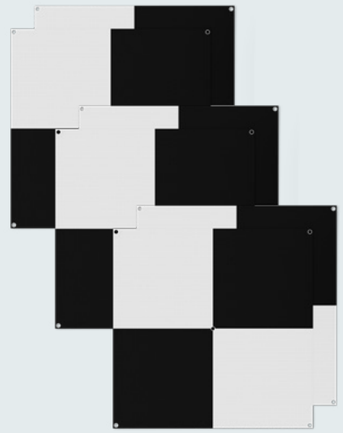
## What's in the kit

Everything you need for surveying—GNSS receivers, tripods, checkpoints, nails, and a hammer—in a single, portable hard case.




### 2x GNSS receivers with 2x tripods

One used as a stationary (base) and one used to collect data from checkpoints (rover). Two Tripods with fixed dimensions and height, eliminating antenna offset user error.



### 6x flexible targets

Ground control points and/or checkpoints to verify your accuracy.






### Nails and hammer

Industry-grade to fix your targets on the ground and/or mark new sites and known points.



* Under specific conditions: <1 cm GSD, <10 km baseline, well-textured land cover, good weather conditions, known point with survey-grade accuracy available.



## Base logging

| | |
|---|---|
| **Relative positioning** | Setup on known point |
| **Absolute positioning** | PPP coming soon |
| **Base logging** | Max 22 h |

## Checkpoint logging

| | |
|---|---|
| **Duration** | 30 s |
| **Max distance to base** | Up to 10 km for best accuracy |

## WingtraCloud integration

| | |
|---|---|
| **Accuracy** | 3 cm* |
| **Communication** | Bluetooth or WiFI |
| **Processing options** | PPK single point processing<br>PPK image geotagging<br>Map processing including checkpoints or ground control points |

## WingtraRECEIVER

| | |
|---|---|
| **Type** | Emlid Reach RS3 |
| **Positioning accuracy PPK** | H: 5 mm +0.5 ppm<br>V: 10 mm+1 ppm |
| **Signal tracked** | GPS/QZSS L1C/A, L2C,<br>GLONASS L1OF, L2OF,<br>BeiDou B1I, B2I<br>Galileo E1B/C, E5b |
| **Number of channels** | 184 |
| **Weight** | 950 g |
| **Size** | 126 x 126 x 142 mm |
| **Waterproof** | Up to one meter depth (IP67) |
| **Temperature range** | -20 °C to +65 °C |
| **Batteries** | Li-Ion |
| **Battery lifetime** | Over 2000 cycles of charging and discharging |
| **Internal storage** | 16 GB |

# WINGTRA*CARE*

## Comprehensive coverage for your Wingtra drone

Fly with peace of mind and enjoy maximum uptime with an extended service plan that keeps costs predictable, and projects on track and on time. Whether you're surveying construction sites, vast wetlands, or property boundaries, WingtraCARE ensures your Wingtra drone is always operational.

### Fly without fear

Fly confidently from day one thanks to our online training and premium support. And just in case, you're covered in case of an accidental crash or hard landing due to user error. You'll be back in the air quickly without hidden fees.

### Simple and predictable budget

A simplified, upfront cost structure helps you avoid budget surprises and administrative hassle. With no deductibles or hidden charges, you'll always know what you're paying and when.

### Maximum uptime

Enjoy priority repairs, express shipping options, and advanced replacements that ensure uninterrupted operations.

### Peace of mind and reliability

In case you need repairs or maintenance, all work is performed by Wingtra certified technicians using original parts. So you can trust the team who will apply the most expertise and care possible to your system.

## What's included

### Hardware replacement

Replace your drone, sensor (including LIDAR) and accessories in case of product malfunctions or accidents caused by user error.

### Wear and tear coverage

Replace your consumable parts like propellers and batteries that have worn down due to normal use.

### Premium support

Access our priority support queue for dedicated help from our solutions engineering team.

### Free advanced training

Get basic and advanced online training for up to five pilots to operate the drone confidently and safely.



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



Wingtra AG

Giesshübelstrasse 40
8045 Zürich, Switzerland

sales@wingtra.com
wingtra.com