Wingtra

Technical specifications



wingtra 台灣總代理

WINGTRA.COM

森泰儀器有限公司
CENTURY INSTRUMENT

臺中市西區臺灣大道二段105號12樓
04-23011000 04-23010099
www.sokkia.com.tw

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.



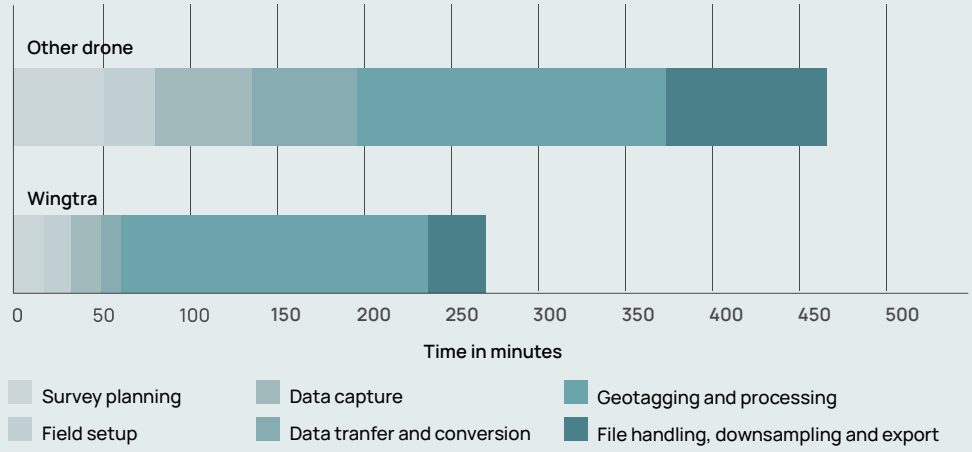


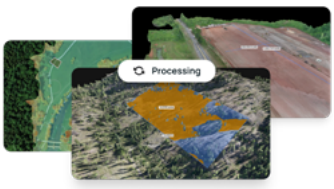
1. Plan
Easily plan flights to get accurate results the first time, every time.

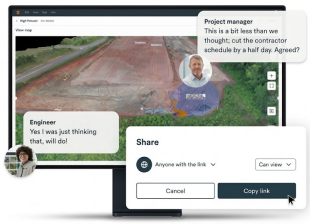
2. Capture
Capture accurate, photo-realistic survey data with WingtraRAY and the field kit. (Also possible with 3rd party base station like Trimble.)

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.









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.

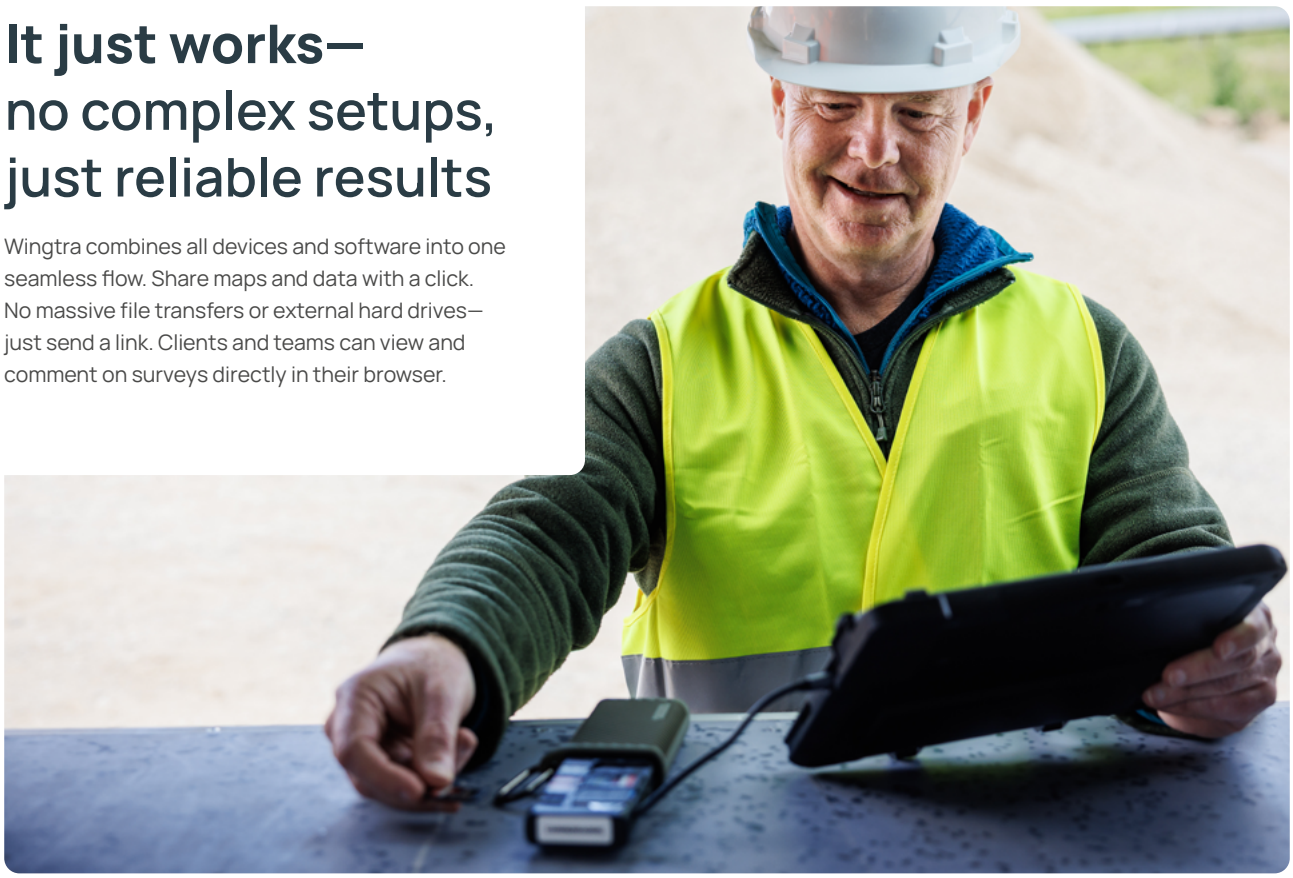
5. Integrate

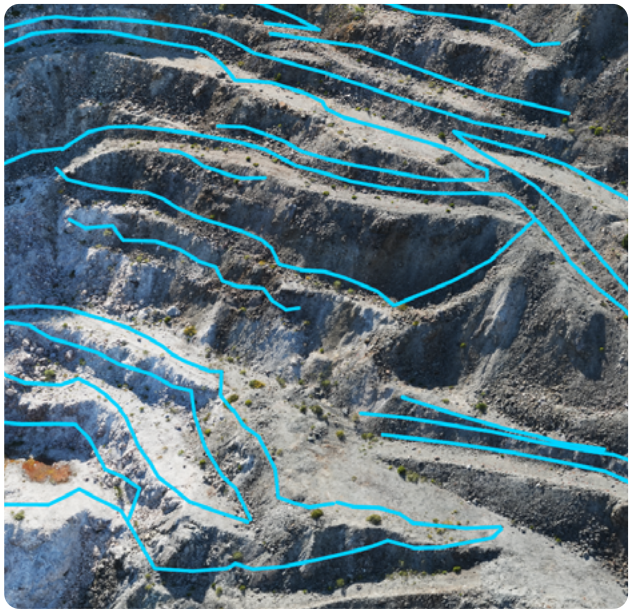
Plug aerial survey data into your favorite CAD or GIS software.

THE TRUE END-TO-END SURVEYING SOLUTION

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

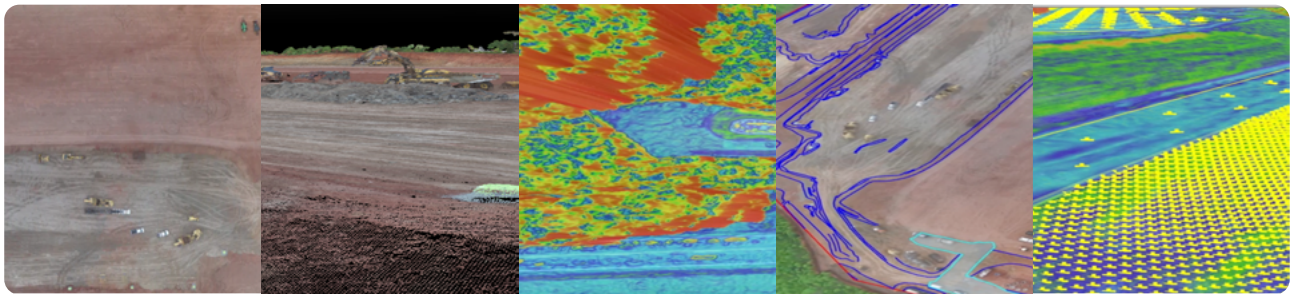
More than just lines and points, photorealistic maps bring the site to life and let stakeholders instantly see what's happening, reducing misunderstandings.

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

Accelerate your time to value

Get survey-grade maps across different sites in hours, not weeks



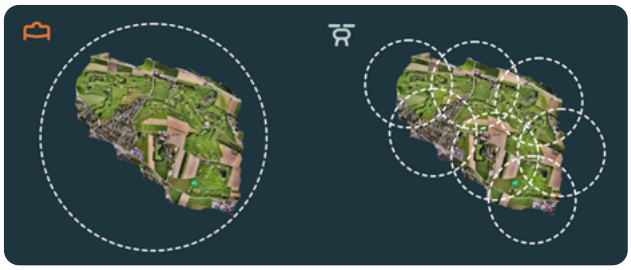
No more costly field revisiting

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)

* As measured with the wind measurement tool from the pilot box continuously over 30 seconds—approximately 2 m (7 ft) above the ground (raise the tool above your head to measure, do not stand close to large objects like buildings or trees since these are conducive to turbulence).

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).



	Max sustained wind Wind measured by the drone in cruise height over more than 30 seconds	Max wind gusts Brief increase in the speed of the wind for less than 30 seconds.	Max sustained wind on the ground 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 (19 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 (11-19 mph)	Tippings can occur
> 8 m/s (> 19 mph)	Not recommended to fly

* 12 m/s (27 mph) sustained wind at cruise height (120 m, 400 ft) corresponds to approximately 8 m/s (19 mph) measured on the ground with the wind measurement tool provided in the Wingtra pilot box.

Operation

Flight speed	Operational cruise speed Climb / sink cruise Climb / sink hover	Adaptive between 16 and 22 m/s (36 and 49 mph) 8/8 m/s (17.9 / 17.9 mph) 6/2.5 m/s (13.4 / 5.6 mph)
Wind resistance	Max sustained wind Max wind gusts Max sustained wind on the ground	12 m/s (27 mph) 18 m/s (40 mph) 8 m/s (19 mph)
Flight time	59 min with MAP61, SURVEY61, INSPECT, RedEdge-P and SURVEY24 45 min with LIDAR See next page or **knowledge.wingtra.com/flight-time 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 propellers	
Maximum flight altitude above sea level	5'000 m (16'400 ft) AMSL with high-altitude propellers	
Ingress Protection	IP53	
Weather	Not receommended to fly in fog, rain and snow	
Auto-landing accuracy	< 2 m (< 7 ft)	

Results

Maximum coverage in one flight at 120 m (400 ft) flight altitude*	MAP61 SURVEY61	550 ha (1360 ac) at 2.7 cm (1.06 in)/px GSD 310 ha (760 ac) at 1.3 cm (0.51 in)/px GSD
Maximum coverage in one flight at lowest GSD*	MAP61 SURVEY61	240 ha (600 ac) at 1.2 cm (0.47 in)/px GSD 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 SURVEY61	15 min at 2.7 cm (1.06 in)/px GSD 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 SURVEY61	2 hours at 2.7 cm (1.06 in)/px GSD 4 hours at 1.3 cm (0.51 in)/px GSD
Lowest possible GSD	MAP61 SURVEY61	1.2 cm (0.47 in)/px at 54 m (180 ft) flight altitude 0.5 cm (0.2 in)/px at 46 m (150 ft) flight altitude
Absolute accuracy (RMS x, y, z) with PPK**	3 cm (0.1 ft)	
Relative accuracy (distance measurement) with PPK**	MAP61 SURVEY61	0.005% 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 0-1600 ft	59 min	550 ha at GSD 2.7 cm/px 1360 ac at GSD 1.06 in/px
MAP61	2000 m 6600 ft	45 min	470 ha at 2.7 cm/px GSD 1'160 ac at 1.06 in/px
LIDAR	0-500 m 0-1600 ft	45 min	490 ha at 40 pts/m2 1'210 ac at 40 pts/m2
LIDAR	2000 m 6600 ft	30 min	380 ha at 35 pts/m2 940 ac at 40 pts/m2

Reference conditions: one flight, 25 m (80 ft) transition altitude, 1.2 km (0.7 mi) farthest distance from home, < 1 m/s (2.2 mph) wind, 15 °C (59 °F) air temperature, side overlap: 60% for MAP61, 30% for LIDAR, high altitude propellers at 2000 m (6560 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 Flight plans from WingtraPilot/WingtraHub Geo-referenced imagery from WingtraHub	
	Supported payloads	RGB: MAP61, RGB61, RXIRII, a6100, Oblique a6100, INSPECT, SURVEY61 Multispectral: RE-P (geotagging only) LIDAR: flight planning only	
	Supported file formats	Images Geospatial data Background layers	.jpg .dxf, .kml, .geojson, .csv 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 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)	

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

Flight planning	2D/3D flight planning	Plan missions in complex terrain with elevation-based flight paths 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) PPK image geotagging (multi-constellation) Map processing, including check-points or ground control points 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 3D mesh models	.laz .obj
	2.5D Outputs	Digital surface models (DSM)	.tif
	Flight records	Flight logs Base files (rinex) Checkpoints Raw images	.ulg .o,.b,.p .csv .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) 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 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 Wingtra knowledge base Wingtra community feedback portal	
Languages	Available languages	English	

Original English
Technical Specifications
February 2026, Version 2.7
© Wingtra

森泰儀器有限公司
CENTURY INSTRUMENT
臺中市西區臺灣大道二段105號12樓
04-23011000 04-23010099
www.sokkia.com.tw

@civil-net