WingtraOne

GEN II

Technical specifications

wingtra.com

Original English
Technical Specifications
April 2022
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* Blue sections in this brochure will help you understand the intricacies of drone operations and how the environment and mission architecture influence drone performance and output. We therefore recommend that you read them carefully. With any arising questions, please contact Wingtra at support@wingtra.com

Map faster, map larger, map anywhere

Map faster

WingtraOne empowers you to minimize your time flying and get more work done, be it another project in the field or analyzing your data at the office.

Map larger

Whether it's a highway or a mine, you can now take on large projects that were previously impossible to map with a drone.

Data collection speed*

Up to

8x

faster than multicopter drones

Up to

2x

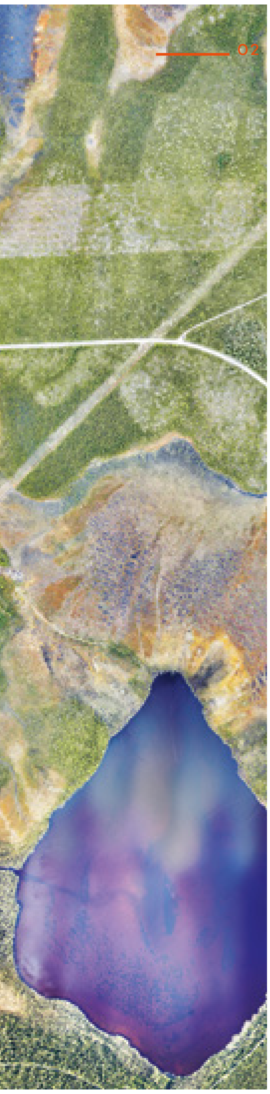
faster than standard fixed-wing drones

Map anywhere

Thanks to its VTOL design, WingtraOne can take off and land almost anywhere—even in confined spaces or on rough terrain.

This enables you to collect data where other drones cannot.

* This number can vary depending on factors such as overlap, camera model and altitude. The model takes into account data collection only. Flight planning, setting up GCPs, data processing, time to relocate between flights are not taken into account in this model.



Absolute horizontal accuracy down to

1 cm**

(0.4 in)

GSD down to

0.7 cm/px

(0.3 in/px)

Data quality that will set you apart

Together with a multi-frequency PPK GNSS receiver and a 42 MP sensor, WingtraOne delivers best-in-class absolute horizontal accuracy, down to 1 cm (0.4 in) without GCPs.**

A reliable workhorse

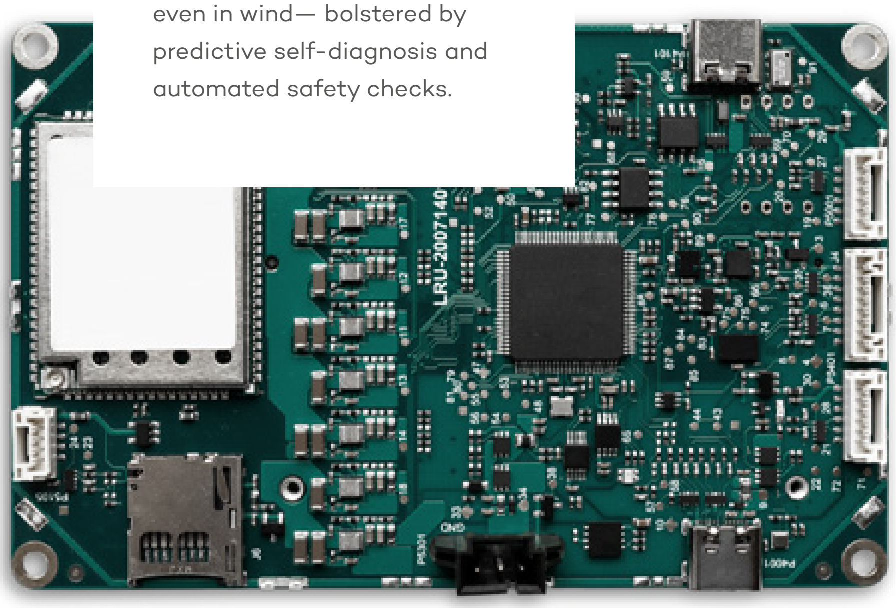
No matter the conditions, WingtraOne operates safely and delivers high-quality data, consistently.

WingtraOne is engineered and assembled in Switzerland. It demonstrates sharp results— even in wind— bolstered by predictive self-diagnosis and automated safety checks.

Cut costs

Faster data collection and expanded coverage equals fewer people in the field for less time.

This lowers the man-hour costs associated with data collection.



** This level of accuracy is achievable under optimal conditions, on hard surfaces, using a well-established base station or correction data from a CORS network. The results can be validated with high-accuracy checkpoints. See Accuracy FAQ on the following page for more details.

Accuracy FAQ

Wondering about Wingtra's 1 cm (0.4 in) horizontal absolute accuracy and how the results were validated? Below you will find a summary of the most frequently asked questions we get related to accuracy. To get the full picture, please read Wingtra's white paper available at wingtra.com/drone-survey-accuracy

What equipment was used to perform the survey?
WingtraOne PPK drone with a 42 MP Sony RX1R II camera.

Did you use GCPs for processing?
No, we did not use GCPs for processing as photogrammetry software is sensitive to the accuracy and distribution of GCPs, i.e., they can introduce tensions in the block adjustment.

> Targets on the ground with known locations are called either ground control points (GCPs), when used for georeferencing, or checkpoints, when used only to validate accuracy after georeferencing. Checkpoints have no influence on the outputs.

How exactly did you validate the accuracy?
We performed two independent tests in the US and Switzerland. In Switzerland, we used a set of five checkpoints from the Institute of Geodesy and Photogrammetry at ETH Zurich. For research purposes, the institute defined the locations of these points within 2 mm (0.08 in) horizontal and 4 mm (0.16 in) vertical accuracy. Their accuracy is based on a high-accuracy network combining total stations and static long-time GNSS measurements. These measurements are then integrated into a stochastic model that takes into account the accuracy of each device (Januth, T. (2017), chapter three)*.

In the US (Phoenix), Wingtra used two HiPer V GNSS antennas from Topcon. One was set up as a base station and was logging for around three hours. The second was set up as a rover using the correction data from the local base to measure the nine checkpoints. Due to the small baseline between the rover and the base station, the coordinates were defined at sub-centimeter level relative to the base.

What measurement of accuracy are you using?
We used root mean square error (RMSE) on five (ETH) and nine (Phoenix) checkpoints and measured not just for one but over 14 flights.

Is this accuracy valid for every point of the point cloud?
Due to the variable quality of photogrammetry, we can only qualify validated checkpoints to achieve this level of accuracy and not all points in the point cloud. Some individual points might have varying accuracy which can be observed as noise in the point cloud (e.g. over asphalt or close to water).

What GSD is your accuracy based on?
0.8 cm (0.3 in).

How are you extracting the position of the checkpoints? Orthophoto, point cloud, DEM, or a mixture of the above?
Checkpoints are manually measured in the aerial triangulation, and are part of the tie points (=coarse point clouds). This is the common method based on the usual photogrammetry software.

Is this accuracy claim with respect to a global or local CRS?
All calculations have been done in WGS84 and CH1903+, the latter being local but derived from CHTR95 and ETRS89, which are global.

Is this accuracy claim valid for height, plan or 3D?
The 1 cm (0.4 in) accuracy claim refers to horizontal accuracy. As with all aerial mapping solutions, vertical absolute accuracy (RMS) for the WingtraOne RX1R II with PPK is slightly worse, i.e., down to 3 cm (1.2 in).

Where can I get more details?
You can read the white paper and download the raw data under wingtra.com/drone-survey-accuracy/. Or contact us at support@wingtra.com for further questions.

* Januth, T. Robot validation with the QDaedalus system: Integration of a robot in a global reference frame. (Master's thesis, HES-SO, Yverdon, Switzerland, 2017).

Technical specifications WingtraOne GEN II

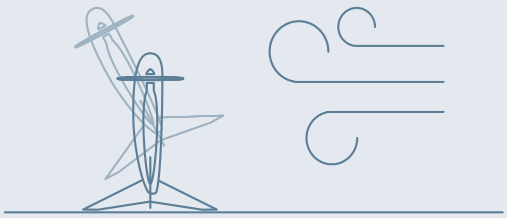
Hardware

Drone type	Tailsitter vertical take-off and landing (VTOL)
Maximum take-off weight	4.5 kg (9.9 lb)
Weight (empty)	3.7 kg (8.1 lb)
Maximum payload weight	800 g (1.8 lb)
Wingspan	125 cm (4.1 ft)
Dimensions of WingtraOne	125 × 68 × 12 cm (4.1 × 2.2 × 0.4 ft) (without middle stand)
Dimensions of Pilot Box	57 × 37 × 20 cm, 8.6 kg (1.8 × 1.2 × 1.0 ft, 19 lb)
Battery capacity	Two 99 Wh batteries (required as a pair)
Battery type	Li-ion, smart battery technology, UN3481 compliant
Radio link	Bi-directional 10 km (6 mi) in direct line of sight, obstacles reduce the range
Onboard GPS	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 travel hardcase (optional)	137 x 67 x 23 cm (54 x 26 x 9 in)
Weight of travel hardcase including the drone	18.6 kg (41 lb)

Flying in wind

WingtraOne 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 (19 mph) measured on the ground with the wind measurement tool provided in the Wingtra pilot box.



	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), WingtraOne 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 WingtraOne to tip over. Generally, this is not a problem since only some scratches might occur while 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, WingtraOne 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

* 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)

Operation

Flight speed	Operational cruise speed Climb / sink cruise Climb / sink hover	16 m/s (35.8 mph) 6 / 3 m/s (13.4 / 6.7 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 See page 5 for detailed information on how WingtraOne handles wind.	12 m/s (27 mph) 18 m/s (40 mph) 8/ms (19 mph)
Maximum flight time	Up to 59 min See next page or knowledge.wingtra.com/flight-time for what flight time to expect in different flying conditions	
Temperature	-10 to +40 °C (+14 to +104 °F)	
Maximum take-off altitude above sea level	2500 m (8200 ft); with high-altitude propellers it is possible to take off from up to 4800 m (15,700 ft) and fly up to 5000 m (16,400 ft) AMSL	
Weather	IP54, not recommended 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)	

Flight time, coverage and job time

WingtraOne'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 throughout different missions. In any case, coverage and job time are determined by more factors than just flight time, namely flight speed and payload.

Flight time

- **Payload**
  Using a heavier payload reduces flight time. For example, when switching from the MicaSense RedEdge-MX camera to the heavier Sony RX1R II camera, the flight time reduces from 59 minutes to 54 minutes.

- **Altitude above sea level**
  As the air gets thinner with increasing altitude above sea level, drone flight time is reduced. At the same time, WingtraOne will fly faster in high altitudes, which means that the coverage is only marginally reduced. For example, the RX1R II camera covers 400 ha (988 ac) in 54 minutes at 0-500 m (0-1640 ft) above sea level and 350 ha (865 ac) in 42 minutes at 2000 m (6562 ft) above sea level (with 3 cm (1.2 in)/px GSD).

- **Transition height**
  Because the WingtraOne 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	Take-off altitude above sea level	Max. flight time	Cruise speed	Max coverage at GSD 3 cm/px (1.2 in/px)	Max coverage at 120 m / 400 ft
RX1R II	0-500 m 0-1640 ft	54 min	16 m/s 36 mph	400 ha 990 ac	210 ha at GSD 1.5 cm/px 520 ac at GSD 0.6 in/px
RX1R II	2000 m 6560 ft	42 min	18 m/s 40 mph	350 ha 860 ac	180 ha at GSD 1.5 cm/px 440 ac at GSD 0.6 in/px
a6100	0-500 m 0-1640 ft	54 min	16 m/s 36 mph	310 ha 770 ac	240 ha at 2.4 cm/px 600 ac at 0.93 in/px
a6100	2000 m 6560 ft	42 min	18 m/s 40 mph	270 ha 670 ac	210 ha at 2.4 cm/px 520 ac at 0.93 in/px
RedEdge-MX	0-500 m 0-1640 ft	59 min	16 m/s 36 mph		150 ha at 8.2 cm/px 380 ac at 3.2 in/px
RedEdge-MX	2000 m 6560 ft	47 min	18 m/s 40 mph		130 ha at GSD 8.2 cm/px 320 ac at 3.2 in/px

Reference conditions: one flight, 20 m (66 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, 60% side overlap (70% for RedEdge-MX), high altitude propellers at 2000 m (6560 ft).
For more details, visit knowledge.wingtra.com/flight-time

Coverage

Coverage is the area of the ground you map in a single flight. For most applications, coverage per flight is much more important than flight time. It is influenced by resolution, flight altitude, sensor size, and side overlap.

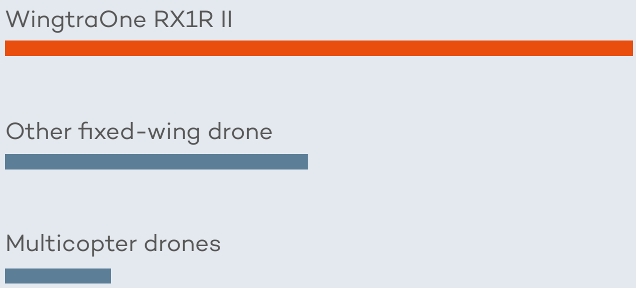
The RX1R II camera can cover 30 percent more area at 3 cm (1.2 in)/px GSD resolution than the a6100 camera in the same amount of time.

On the other hand, if you need to fly at a limited altitude, for example at 120 m (400 ft), the a6100 covers more area than the RX1R II. The flight with the a6100 results in a GSD of 2.4 cm (0.93 in)/px, which is a lower resolution compared to the 1.5 cm (0.6 in)/px of the RX1R II. Considering this, it is really important to choose the right configuration for your use case and environment.

Job time

An important point that tends to get missed when focusing on flight time numbers is that job time (and efficiency) is actually not about flight time, but rather about how fast you can acquire data on a given area. For example, compared to muliticopers, the WingtraOne can acquire data up to 8x faster. And compared to most fixed-wings it's twice as fast. So in many cases, the right camera and settings can get you the data you need faster, and faster in fact means less flight time.

Data collection speed



Average based on our coverage and labor cost calculator. This number can vary depending on factors such as overlap, camera model and altitude. The model takes into account data collection only. Flight planning, setting up GCPs, data processing, time to relocate between flights are not taken in account in this model.

Up to

8x

faster than multicopter drones

Up to

2x

faster than standard fixed-wing drones

Results

Maximum expected coverage in one flight at 120 m (400 ft) altitude above take-off point*	RX1R II a6100	210 ha (520 ac) 1.5 cm (0.6 in)/px GSD 240 ha (600 ac) 2.4 cm (0.9 in)/px GSD
Maximum expected coverage in one flight at 3 cm/px (1.2 in/px) GSD*	RX1R II a6100	400 ha (988 ac) 234 m (768 ft) altitude 310 ha (766 ac)) 153 m (503 ft) altitude
Lowest possible GSD	RX1R II a6100	0.7 cm (0.3 in)/px at 55 m (180 ft) altitude 1.2 cm (0.47 in)/px at 61 m (201 ft) altitude
Mapping accuracy with PPK (w/o GCPs)	Absolute accuracy (RMS) with RX1R II Relative accuracy	horizontal down to 1 cm (0.4 in) vertical down to 3 cm (1.2 in) down to 0.003 %
Mapping accuracy w/o PPK (w/o GCPs)	Absolute accuracy (RMS) Relative accuracy	3 to 5 m (9.8 to 16.4 ft) down to 0.15 %

Software & tablet

Flight planning & mission control software	WingtraPilot
Tablet (supplied)	Rugged Samsung Galaxy Tab Active 3, water and dust resistant, MIL-STD-810-certified, WingtraPilot pre-installed

Data link

Module name	WingtraOne Telemetry 2.4
Main function	Telemetry connection for remote operation
Frequency range telemetry	2.4016-2.4776 GHz
Occupied bandwidth	6.0MHz
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) indirect line of sight keep in mind that obstacles reduce the range
Channel spacing	1,0Mhz
Number of channels	76
Channel bandwidth	Low 400kHz High 280kHz
Method of modulation	GFSK

i

In case of many obstacles blocking visual line of sight or BVLOS missions, you can increase the connection loss timeout parameter on WingtraPilot. 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.

* side overlap: 60%

Battery

Module name	Wingtra Battery 2
Trade name	Lithium-ion battery
Model number	10.00342.02
Battery capacity	99 Wh (a pair of batteries required)
Battery type	Li-ion, smart battery technology, UN compliant ; suitable for carry-on luggage
State-of-charge indicator	Integrated 5 level SoC indicator
Smart charging	Auto cell balancing
Rated energy content	99 Wh
Nominal voltage	14.4 V
Rated charge	7.5 A, 16.8 V cutoff
Rated discharge	35 A, 12 V cutoff
Cell type	Samsung_INR_18650_25R
Configuration	4s 3p configuration
Charging time	1 h
Maximum continuous discharge	35 A
Battery dimensions	80 × 60 × 75 mm (3.15 × 2.36 × 2.95 in)
Battery weight	604 g (1.3 lb)
Operating temperature (take-off)	+10 to +40 °C (+50 to +104 °F)
Operating temperature (in-flight)	+10 to +60 °C (+50 to +140 °F) The drone will automatically return to home in case the maximum battery temperature is exceeded during flight.
Storage temperature (90% capacity recovery)	+0 to +25 °C (+32 to +77 °F)
Shock protection	yes
Overvoltage protection	yes
Undervoltage protection	yes
Temperture protection	yes
Short circuit protection	yes
Material safety data sheet (MSDS)	Available on request

Battery charger

Module name	Wingtra Charger
Charger type	Dual AC/DC lithium-ion charger
Input voltage AC	110-120 V / 220-240 V (manual switch), 50 / 60Hz
Input power AC	350 W
Input voltage DC	11 - 18 V (optional, e.g. for charging from car)
Input power DC	300 W (reduced power possible)
Modes	Charge / storage / balance
Charging cylce	Standard lithium-ion CC-CV cycle
Charging time	1 h
Maximum charge current	7.5 A
Charge end voltage	16.4 V (4.1 V per cell)
Max. discharge current	0.6 A
Discharge end voltage	3.7 V (30 % charge)
Addtional outputs	USB 5V / 2.1 A
Dimensions	190 × 140 × 70 mm (7.5 × 5.5 × 2.75 in)
Weight	1170 g (2.6 lb)

Onboard WiFi module

Main function	Broadcast remote ID
WiFi Standard	802.11a/b/g/n/ac
Frequency	2.4 GHz and 5 GHz frequency bands
Speed	5 GHz: 867 Mbps (802.11ac), 2.4 GHz: 300 Mbps (802.11n)

Technical specifications cameras

Full mapping flexibility

Modular payloads	Yes, with a single USB-C connector
Power supply	Flight batteries (up to 45 W)
Payload protection	Yes, maintenance-free integration with full enclosure in main drone body, shock-protection, and smooth VTOL landings
Payloads	• Sony RX1R II with 35 mm lens, full-frame sensor, 42 MP, RGB nadir • Sony a6100 with 20 mm lens, APS-C sensor, 24 MP, RGB nadir • Oblique Sony a6100 with 12 mm lens, APS-C sensor, 24 MP, RGB oblique • MicaSense RedEdge-MX • MicaSense RedEdge-P
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 cameras nadir

		
	Sony RX1R II Highest precision and most popular	**Sony a6100** Most affordable
Technical specification	42 MP, full-frame sensor, 35 mm lens, nadir configuration	24 MP, APS-C sensor, 20 mm lens, nadir configuration
Payload weight (incl. mount)	590 g (1.27 lb)	550 g (0.73 lb)
Lowest possible GSD	0.7 cm/px 0.28 in/px	1.2 cm/px 0.47 in/px
Maximum coverage at lowest GSD*	Up to 90 ha (230 ac) at 55 m (179 ft) flight altitude	Up to 120 ha (300 ac) at 61 m (233 ft) flight altitude
Maximum coverage at 120 m (400 ft)*	Up to 210 ha (520 ac) at 1.5 cm (0.61 in) GSD	Up to 240 ha (600 ac) at 2.4 cm (0.9 in) GSD
Horizontal absolute accuracy (RMS) with PPK (w/o GCPs)	down to 1 cm (0.4 in)	down to 2 cm (0.8 in)
Vertical absolute accuracy (RMS) with PPK (w/o GCPs)	down to 3 cm (1.2 in)	down to 4 cm (1.6 in)
Sensor type	Full frame	APS-C
Sensor size x	35.9 mm (1.41 in)	23.5 mm (0.93 in)
Sensor size y	24 mm (0.94 in)	15.6 mm (0.61 in)
Mega pixel	42.4	24.2
Shutter type	Leaf shutter	Focal plane
Pixel in x	8000	6000
Pixel in y	5320	4000
Focal length of lens	35 mm (1.38 in)	20 mm (0.79 in)
Focal length (35mm equivalent)	35 mm (1.38 in)	29.8 mm (1.17 in)
Vertical field of view	37.8°	42.6°
Horizontal field of view	54.3°	60.9°
Minimal trigger time	0.6 s	1.0 s
Minimal trigger distance	9.6 m (31 ft)	16 m (52 ft)

* side overlap 60%

RGB camera oblique

Oblique Sony a6100
3D mapping camera

Technical specifications	24 MP, APS-C sensor, 12 mm lens, low oblique configuration
Payload weight (incl. mount)	730 g (1.61 lb)
Lowest possible GSD	1.6 cm/px 0.63 in/px
Maximum coverage at lowest GSD*	Up to 70 ha (180 ac) at 49 m (161 ft) flight altitude
Maximum coverage at 120 m (400 ft)*	Up to 180 ha (450 ac) at 3.9 cm (1.54 in) GSD
Horizontal absolute accuracy (RMS) with PPK (w/o GCPs)	down to 2 cm (0.8 in)
Vertical absolute accuracy (RMS) with PPK (w/o GCPs)	down to 4 cm (1.6 in)
Sensor type	APS-C
Sensor size x	23.5 mm (0.93 in)
Sensor size y	15.6 mm (0.61 in)
Mega pixel	24.2
Shutter type	Focal plane
Pixel in x	6000
Pixel in y	4000
Focal length of lens	12 mm (0.47 in)
Focal length (35mm equivalent)	18 mm (0.71 in)
Front tilt angle (off-nadir)	15°
Horizontal field of view	90° (-45° ... 45°)
Vertical field of view	66° (-18° ... 48°)
Minimal trigger time	1.0 s
Minimal trigger distance	16 m (52 ft)

* side overlap 80%

GSD overview RGB cameras

	Sony RX1R II Highest precision and most popular	Sony a6100 Most affordable	Oblique Sony a6100 3D mapping camera
GSD at 120 m flight altitude	1.5 cm/px (0.61 in/px)	2.4 cm/px (0.93 in/px)	3.9 cm/px (1.54 in/px)
Flight altitude	120 m (400 ft)	120 m (400 ft)	120 m (400 ft)
Maximum frontal overlap	88%	83%	90%
Maximum coverage*	210 ha (520 ac)	240 ha (600 ac)	180 ha (450 ac)
Lowest possible GSD	0.7 cm/px (0.28 in/px)	1.2 cm/px (0.47 in/px)	1.6 cm/px (0.63 in/px)
Flight altitude	55 m (180 ft)	61 m (200 ft)	49 m (160 ft)
Maximum frontal overlap	74%	67%	75%
Maximum coverage*	90 ha (230 ac)	120 ha (300 ac)	70 ha (180 ac)
1.5 cm/px GSD	1.5 cm/px (0.59 in/px)	1.5 cm/px (0.59 in/px)	-
Flight altitude	117 m (380 ft)	77 m (250 ft)	-
Maximum frontal overlap	88%	73%	-
Maximum coverage*	210 ha (520 ac)	150 ha (380 ac)	-
3.0 cm/px GSD	3 cm/px (1.18 in/px)	3 cm/px (1.18 in/px)	3 cm/px (1.18 in/px)
Flight altitude	234 m (770 ft)	153 m (500 ft)	92 m (300 ft)
Maximum frontal overlap	94%	87%	87%
Maximum coverage*	400 ha (990 ac)	310 ha (770 ac)	140 ha (350 ac)
6.0 cm/px GSD	6 cm/px (2.36 in/px)	6 cm/px (2.36 in/px)	6 cm/px (2.36 in/px)
Flight altitude	468 m (1540 ft)	306 m (1010 ft)	184 m (600 ft)
Maximum frontal overlap	95%	93%	93%
Maximum coverage*	780 ha (1930 ac)	600 ha (1480 ac)	280 ha (690 ac)
8.0 cm/px GSD	8 cm/px (3.15 in/px)	8 cm/px (3.15 in/px)	8 cm/px (3.15 in/px)
Flight altitude	624 m (2050 ft)	409 m (1340 ft)	245 m (800 ft)
Maximum frontal overlap	95%	95%	95%
Maximum coverage*	1020 ha (2530 ac)	790 ha (1960 ac)	370 ha (920 ac)
Highest possible GSD	25 cm/px (9.84 in/px)	25 cm/px (9.84 in/px)	25 cm/px (9.84 in/px)
Flight altitude	1950 m (6400 ft)	1277 m (4190 ft)	766 m (2510 ft)
Maximum frontal overlap	95%	95%	95%
Maximum coverage*	2380 ha (5890 ac)	2140 ha (5290 ac)	1050 ha (2600 ac)

* side overlap of 60% for Sony RX1R II and Sony a6100, side overlap of 80% for Oblique Sony a6100

Multispectral cameras

	MicaSense RedEdge-MX Industry-leading	Micasense RedEdge-P	
Technical specifications	5 multispectral sensors (R, G, B, RE, NIR), 5.5 mm lens, nadir configuration	5 multispectral sensors (R, G, B, RE, NIR, 5.5 mm lenses), panchromatic band, 10.3 mm lens, nadir configuration	
Payload weight (incl. mount)	380 g (0.84 lb)	502 g (1.1 lb)	
Lowest possible GSD	6.7 cm/px 2.6 in/px	2.0 cm/px 0.78 in/px	
Maximum coverage at lowest GSD*	Up to 140 ha (350 ac) at 98 m (321 ft) flight altitude	Up to 90 ha (230 ac) at 60 m (190 ft) flight altitude	
Maximum coverage at 120 m (400 ft)*	Up to 170 ha (430 ac) at 8.2 cm (3.2 in) GSD	Up to 160 ha (395 ac) at 4 cm/px (1.57 in/px) GSD	
Horizontal absolute accuracy (RMS) with PPK (w/o GCPs)	Down to 8 cm (3.1 in)	Down to 3 cm (1.18 in)	
Vertical absolute accuracy (RMS) with PPK (w/o GCPs)	Down to 15 cm (5.9 in)	Down to 5cm (1.97 in)	
Sensor type	5 individual sensors Red, Green, Blue, Rededge, Near-infrared	5 individual sensors Red, Green, Blue, Rededge, Near-infrared,	panchromatic sensor
Sensor size x	4.8 mm (0.19 in)	5.04 mm (0.19 in)	8.5 mm (0.33 in)
Sensor size y	3.6 mm (0.14 in)	3.78 mm (0.15 in)	7.1 mm (0.28 in)
Mega pixel	5 × 1.22	5 × 1.58	5.1
Shutter type	Electronic shutter	Electronic shutter	Electronic shutter
Pixel in x	1280	1456	2464
Pixel in y	960	1088	2056
Focal length of lens	5.5 mm (0.22 in)	5.5 mm (0.22 in)	10.3 mm (0.4 in)
Focal length (35mm equivalent)	40 mm (1.57 in)	41 mm (1.61 in)	38,6 mm (1.52 in)
Vertical field of view	36.2°	38.3°	37.7°
Horizontal field of view	47.1°	49.6°	44.5°
Minimal trigger time	1 s	0.5 s	0.5 s
Minimal trigger distance	16 m (52 ft)	8 m (26 ft)	8 m (26 ft)

* side overlap 70%

GSD overview of multispectral cameras

	MicaSense RedEdge-MX	Micasense RedEdge-P
GSD at 120 m flight altitude	8.2 cm/px (3.22 in/px)	4 cm/px (3.2 in/px)
Flight altitude	120 m (400 ft)	120 m (400 ft)
Maximum frontal overlap	80%	80%
Maximum coverage*	150 ha (380 ac)	150 ha (380 ac)
Lowest possible GSD	6.7 cm/px (2.62 in/px)	2 cm/px (0.78 in/px)
Flight altitude	98 m (320 ft)	60 m (195 ft)
Maximum frontal overlap	75%	75%
Maximum coverage*	120 ha (300 ac)	100 ha (300 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)
8.0 cm/px GSD	8 cm/px (3.15 in/px)	8 cm/px (3.1 in/px)
Flight altitude	117 m (380 ft)	240 m (787 ft)
Maximum frontal overlap	79%	79%
Maximum coverage*	150 ha (380 ac)	300 ha (740 ac)
Highest possible GSD	50 cm/px (19.69 in/px)	38 cm/px (14.9 in/px)
Flight altitude	733 m (2410 ft)	1166 m (3820 ft)
Maximum frontal overlap	95%	95%
Maximum coverage*	850 ha (2110 ac)	1500 ha (2110 ac)

* at 70% side overlap

NOTES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GEN II

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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