AgEagle

eBee Geo

eBee Geo

Survey and map more for less.

The eBee Geo is an affordable fixed-wing mapping drone designed to meet the highest demands of surveyors, civil engineers and GIS professionals worldwide. Rugged and intuitive to operate, eBee Geo makes surveying and mapping small to large areas faster, more efficient and with less risk than using terrestrial surveying equipment alone.

Up to 45 minutes flight time*

Capture more data - efficiently cover up to 160 ha (395 A) while flying at 120m (400ft).

Down to 2.5 cm absolute accuracy

Available RTK allows you to achieve the high precision accuracy your project requires, without GCPs.

Optimized photogrammetry

Comes with S.O.D.A. sensor, purpose-built for capturing sharp aerial detail.

Lightweight and durable

Designed to operate in the harshest conditions, thanks to its optimized airframe and ultra-tough under-body skin.

Safe and easy to use

Simply plan your mission. Launch the drone and collect critical project data in minutes.

*Results can vary depending on the flight conditions.

S.O.D.A.

The sensor optimized for drone applications

The S.O.D.A. is the first camera to be built and optimized for professional drone use and has quickly become the reference sensor in its field. It captures amazingly sharp aerial images, across light conditions, with which to produce detailed, vivid orthomosaics and accurate digital surface and elevation models.

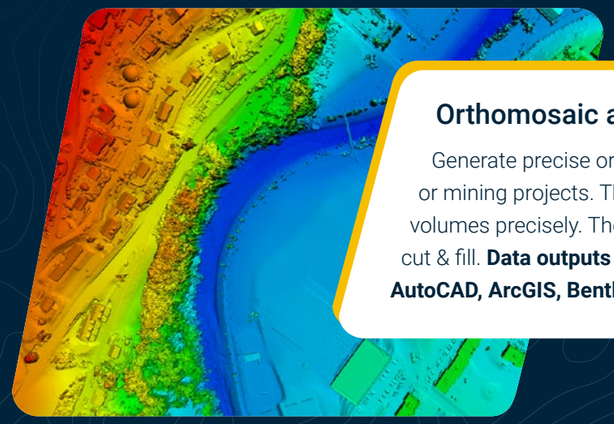
Use cases :

- **Surveying & cadastre**
- **Topographic mapping**
- **Urban Planning**
- **Water management**
- **Land Management**
- **Environmental monitoring**
- **Disaster Management**
- **Flood Simulation**
- **Forestry**

Easily Produce Orthomosaic & DSM of Urban Areas

Payload Used:
S.O.D.A.

Surface Mapped:
501 ha (1238 A)



Orthomosaic and Digital Surface Model

Generate precise orthomosaics for cadastre, urban planning, construction or mining projects. The Digital Surface Model adds the capability to measure volumes precisely. The 3D drone outputs can be used to accurately measure cut & fill. **Data outputs are compatible with popular survey software such as AutoCAD, ArcGIS, Bentley and others for sharing with project stakeholders.**

Precise Results In Less Time

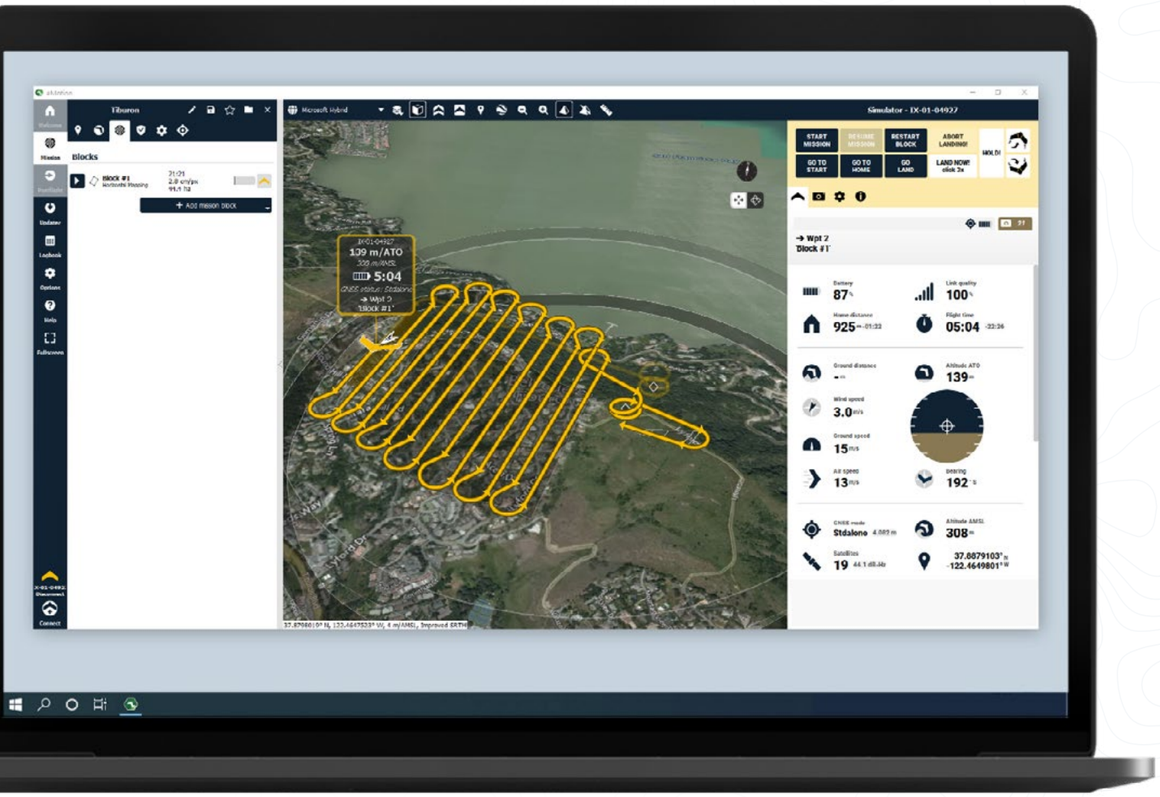
Available RTK allows you to achieve the high precision accuracy your project requires, without GCPs. **Expand your company's services using aerial photogrammetry. Get the precision you need in a fraction of the time required in comparison to using terestrial tools or quadcopters.**

Safe and Easy Workflow

The eBee Geo's light weight makes it the perfect tool to fly safely for advanced operations such as flying over people. **eMotion will help you create a safe mission plan and ensure reliable data capture for a successful mission.**

eMotion

Version 3 | Compatible with
Windows 8 and 10 | 64-bit



Beginner-friendly, yet packed with advanced features to tackle the toughest jobs, our eMotion flight planning software optimizes every step, helping to get your eBee Geo in the air quickly and with ease, so you can focus on what's important - collecting and analyzing site-critical geospatial data.

"A drone's flight management software defines your experience—if this is complicated or confusing, operations can quickly become a chore. eMotion is different: it's advanced, scalable drone software that anyone can use."

Scott Hiebert, CEO Green Aero Tech

How it works

With eMotion, flights are built using mission blocks. Just choose your block, highlight the region you want to map, define key settings, and eMotion auto-generates your drone's flight plan. Multi-flight missions are supported and you can activate/import elevation data for even safer, terrain-accurate flights.

Upload your flight plan wirelessly to your drone. After a simple hand launch, your eBee Geo drone will then fly, capture images and land by itself.

eMotion's built-in Flight Data Manager automatically handles the georeferencing & preparation of images required for post-processing in software such as Pix4Dmapper.

Compatible photogrammetry software

Pix4Dmapper/Pix4DCloud/Pix4Dmatic/Pix4Dfields, Agisoft PhotoScan, Esri Drone2Map, DroneDeploy, Trimble Business Center and Bentley ContextCapture

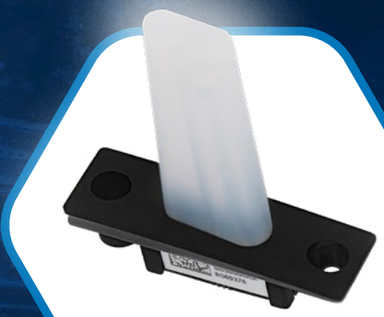
Field-ready and easy to maintain

The eBee Geo offers maximum reliability in the field while its modular design lets you easily swap out parts, as needed.

Upper Body

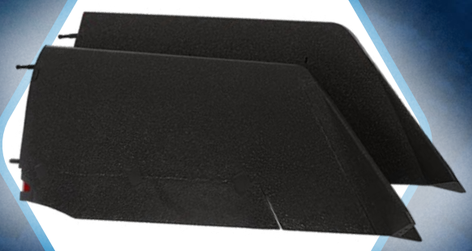
S.O.D.A. Camera

Lower Body



Pitot Tube

Autopilot Stack



Clipped Wings

Maintenance made easy

Get your eBee drone serviced locally, thanks to our global network of authorized service centers.

All you need to survey with your eBee Geo. On your back.

The eBee backpack is a smart and durable way to carry everything you need to transport your new eBee drone into and out of the field.

All your gear in one spot

Safely store and transport everything you need to operate your eBee drone.

Lightweight and durable

Comes with a rain cover to ensure your drone stays protected from the elements.

Laptop pocket

The eBee X series backpack features a helpful 45 cm x 45 cm (17.7 in) laptop pocket

Comfort and security

Ergonomic and adjustable straps help keep you comfortable while transporting your drone.

The eBee Geo comes with...

1x **eBee Geo Drone**

1x **Backpack**

2x **Spare Propellers**
10x Spare Propellller attachment rubber bands

2x **Lithium-Polymer Standard Batteries**

1x **Lithium-Polymer Battery Charger**

1x **Spare Pitot Kit**

1x **USB Ground Modem**

1x **USB Cable**
To connect your computer to the drone and some cameras

1x **S.O.D.A. Camera**

Go further, fly longer with eBee extensions

Remote Control
Operate your eBee Geo drone manually with the available remote control

GeoBase
Enable high-accuracy workflows with this plug-and-play GNSS instrument

USB Ping
View live air traffic data directly within eMotion

Spare Pitot Pro Kit
Contains 3 spare pitot tubes. The pitot tube is used by the eBee Geo to measure wind speed and direction for course correction as well as landing optimization

Radio Tracker
Safeguard against unexpected aircraft signal loss while flying in high winds, mountainous areas or very large areas out of line of sight

RTK Activation
Achieve absolute accuracy of down to 2.5 cm (1 in) with available RTK

Extended Warranty
1-year warranty extension

Hard Case
For extra protection in harsh environments

Certified Operator Program
www.senseflyacademy.com

Accuracy is the measure of success.

Get the most out of eBee Geo with active RTK

A surveyor's job is to capture **accurate data**. With boots on the ground, this responsibility is almost entirely up to the surveyor and their level of expertise with the equipment and job site. Advanced drone platforms such as the eBee have made the surveying process faster, safer and more efficient.

While laying ground control points (GCPs) has been a necessary step in drone surveying workflows from the beginning, advancements in GNSS technology have led to the evolution of real-time kinematic (RTK) and post-processing kinematic (PPK) methods. Thanks to the improved vertical and horizontal accuracy, RTK is ideally suited for surveying stockpiles, land change mapping and more. The following is a quick look at the use of Ground Control Points and the added benefit of a drone with active RTK.

Ground Control Points (GCPs)

A Ground Control Point is a location or object on the ground that has precisely known coordinates. **GCPs are used to accurately geo-reference and align projects from absolute accuracy —one to two meters—to absolute accuracy—two to five centimeters.**

This method has been used for years and trusted to consistently produce a high level of precision and overall accuracy. Also, GCPs used as checkpoints allow the production of a defensible quality report to prove the validity of technology and are used for consistent ground-truthing of a project's accuracy. There are some downsides however, as GCPs can take much longer to set up in comparison to RTK and large worksites may require an entire crew to set points. This can be a dangerous endeavor in certain environments and may require additional equipment including a GPS rover, base, VRS network license in addition to spray paint and targets. Also, there is a possibility of targets moving between the setup and data collection, impacting the accuracy of the results. And GCPs may require operator input during the processing phase to click on the target.

GCPs have been a proven method of accuracy for years, but with safer and faster methods available, it should be used only when RTK and PPK are not possible.

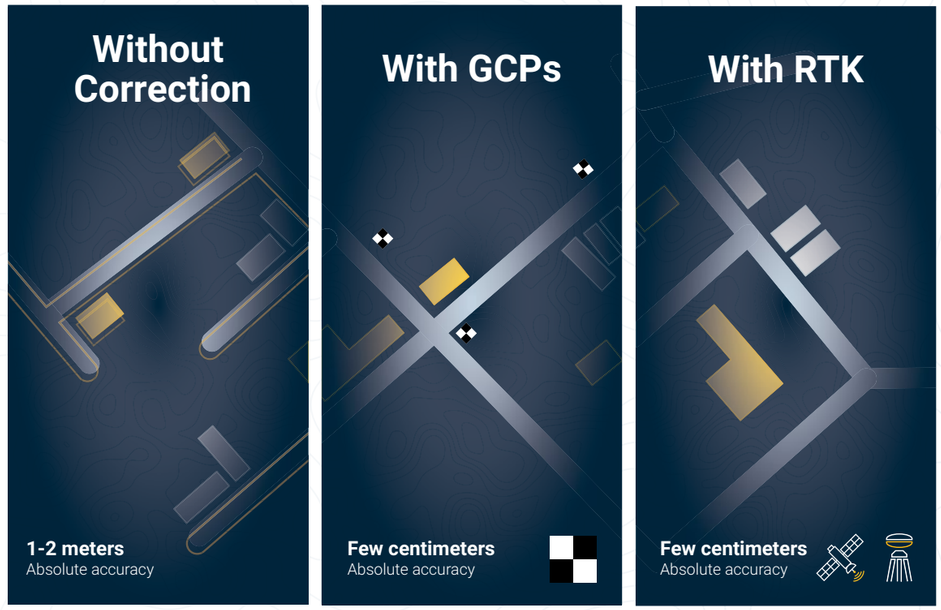
Real-Time Kinematic (RTK)

Real-time kinematic is a technique used to enhance the precision of position data derived from satellite-based positioning systems, which relies on a single reference station or interpolated virtual station to correct geotagged locations while in flight. In other words, RTK is a correction method that enhances GNSS precision.
RTK is advantageous for many surveying professionals because it increases safety.

The technique eliminates the need for teams to maneuver through dangerous terrain to set GCPs while also efficiently saving time and productivity. RTK provides corrections to the drone onsite and is ideal for geo-tagging in absolute accuracy throughout flights in real-time. GNSS post-processing can be avoided as the eBee Geo can directly geo-tag the images in real-time during flight. Following, the images can be used for processing from the payload SD card. This technique does require a base station and a consistent connection to process data in real-time. While this extra piece of equipment provides the benefit of increased accuracy, it also has a moderate possibility of malfunctioning.

The RTK methods work well in flat terrain where trees or mountains won't get in the way of the communication signal. RTK is restricted by the power of ground and air communication with the drone. If there are more than three kilometers between the drone and the ground station, or if there are obstructions such as trees or mountains, there's a chance it will lose signal.

As an operational best practice, it's ideal to use RTK on flights in open terrain and within two or three kilometers of the ground station to maintain the communications link. These flights can deliver highly accurate results without the need for using GCPs. This is an extremely helpful advantage for land surveyors working in dense vegetation, crops and other hard to distinguish terrain.



When considering factors such as ease of use, time and expense, the advantages of an RTK drone become more apparent. Difficult terrain, unreachable spots and safety concerns can be deterrents for using GCPs, not to mention the amount of time it could take to plan and measure each. By contrast, post-processing imagery collected via drone normally takes 10 to 20 minutes. And lastly, the measurement of GCPs is an expense you'll need to factor into every project unlike the one-time activation of RTK on a drone, which ultimately is a better investment long term.

Hardware Datasheet

eBee Geo

Wingspan	116 cm (45.7 in)
Material	Expanded Polypropylene (EPP)
Underbody skin	Curv® Polypropylene thermoplastic composite
Weight (Empty)	0.8 kg
Max Take-off weight	1.3 kg
Backpack dimensions	75 x 50 x 29 cm (29.5 x 19.7 x 11.4 in)
Motor	Low-noise, brushless, electric
Detachable wings	Yes
Empty backpack weight	4.6 kg

Coverage & accuracy

Max. nominal coverage at 122 m (400 ft)	160 ha (395 A)
Ground sampling distance at 122 m (400 ft)	2.8 cm/px (1.1 in/px)
Lowest ground sampling distance (47m)	1.1 cm/px (0.4 in/px)
Absolute X, Y, Z accuracy (RTK activated)	2.5 cm (1 in)

High Precision

Upgradable on demand	Yes
RTK	Virtual Base Station, Base Station Unknown point, Base Station Known point
GNSS	GPS+GLONASS

Flight performance

Cruise speed	40-110 km/h (11-30 m/s or 25-68 mph)
Max wind resistance	Up to 46 km/h (12.8 m/s or 28.6 mph)
Landing type	Automatic linear landing (5 m/16.4 ft accuracy in 20° angle cone)
Service temperature	-15° to 40°C *
Humidity	Light rain resistance
Ground avoidance	Yes - LiDAR (range 120m)

*Working above 35°C/ 95°F requires to protect the drone from the sun while on the ground

Maintenance and service

Spare Parts Available	Pitot Tubes, Wings, Propellers and vertical surfaces
Modular Repair	Auto Pilot Stack, Upper Body and Lower Body
Service	Every 100 flight hours

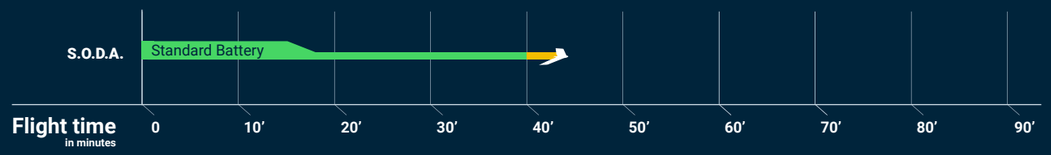
Battery

Power	3700 mAh
Voltage	15.2V
Number of cells	4 Cell
Type	LiHV
Energy	56.24Wh
Weight	330g

Radio Link

Certification	CE or FCC
Range	3 km nominal (up to 8 km) / 1.9 mi (up to 5 mi)
Frequency	2.400 - 2.4835 GHz
Encryption AES 254	Available
EIRP	CE/JP 20.0 dBm max FCC 22.5 dBm max

How long can you fly with your eBee Geo?

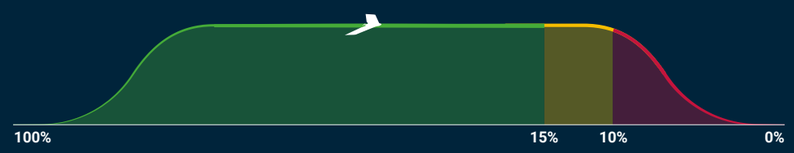


Automatic safe return when the battery is low

Mission
The drone is performing its mission and capturing images.

Low endurance
15% and below is enough to return Home and land.

Low battery
Below 10%, it is no longer possible to continue the mission. The drone returns home to land.



The above figures represent optimal flight conditions. It is not representative of all flight times and will vary depending on flight conditions. Also note that the condition of the pitot tube can influence flight time.

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AgEagle, now incorporating senseFly, believes in using technology to make work safer and more efficient. Our proven drone solutions simplify the collection and analysis of geospatial data, allowing professionals in surveying, mining, agriculture, engineering, environmental monitoring and humanitarian aid to make better decisions, faster.

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