

senseFly



eBee X
Map without limits

eBee X

You don't compromise in the field - neither should your drone.

The eBee X is our most advanced fixed-wing drone that's designed to meet all your surveying and mapping needs. Whether your project site is small or vast, straightforward or complex, the eBee X goes the distance while helping you boost the quality, efficiency and safety of your data collection.



“I immediately felt comfortable flying the eBee X and the senseFly Aeria X is a phenomenal mapping camera. As for that material on the body, I can't believe how strong that stuff is!”

Scott Hiebert, CEO, **Green Aero Tech**



Up to 90 minutes flight time*

Capture more - efficiently cover up to 500 ha (1,235 ac) while flying at 400 ft.



Down to 1.5 cm high-precision accuracy

Available RTK/PPK allows you to achieve the absolute accuracy your project requires, without GCPs.



Unmatched versatility

Compatible with more than seven sensors, eBee X is capable of getting the job done no matter the requirements.



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.

*Referenced flight time achieved with endurance battery and S.O.D.A. sensor.

SUITS EVERY MAPPING JOB



From surveying mines and complex construction sites to crop health analysis and disaster response, the eBee X is suited for any job thanks to its wide-range of groundbreaking, interchangeable cameras.

Learn more about our camera on our website
www.sensefly.com/cameras

S.O.D.A.



Light, robust and efficient. The first camera built specifically for professional drone photogrammetry. Offers the greatest flight time.

S.O.D.A. 3D



Generate stunning 3D reconstruction or increase your coverage to 500 ha with this unique photogrammetry sensor that changes orientation during flight to capture nadir and oblique images.

Duet T



Create high-resolution, geo-accurate thermal maps, reliably, on demand.

Aeria X



For those who demand the highest quality RGB outputs. The senseFly Aeria X is a compact photogrammetry powerhouse.

Duet M



senseFly Duet M is an innovative dual-purpose RGB and multispectral mapping camera. Use it to create geo-accurate multispectral maps and digital surface models quickly and easily.

Sequoia+

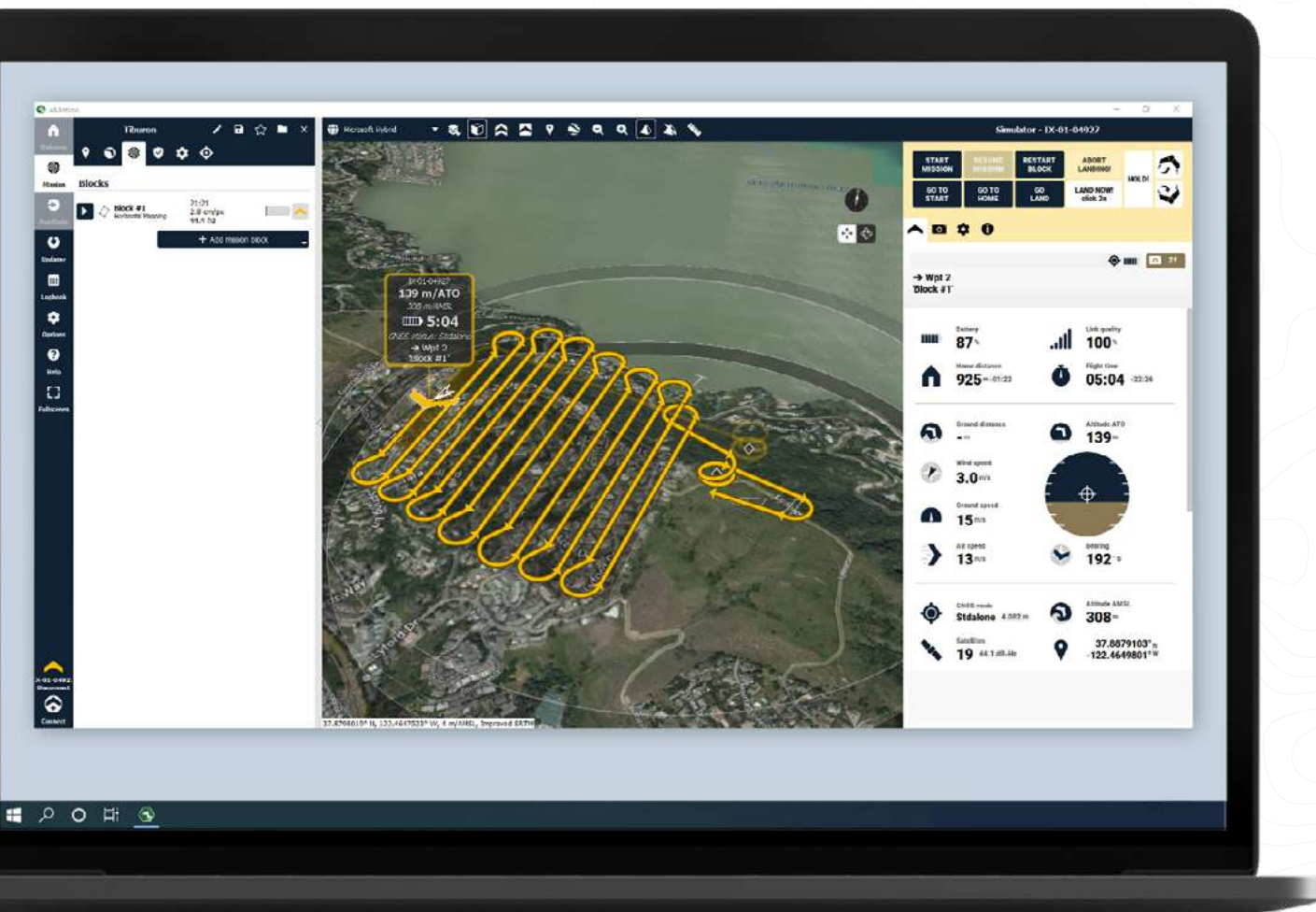


This multispectral crop camera captures imagery across four spectral bands, plus RGB. It features automatic radiometric calibration for consistent measurements and is RTK/PPK compatible for precise georeferenced results.

RedEdge-MX



The MicaSense RedEdge-MX is a rugged and professional multispectral sensor. It captures the spectral bands required for basic crop health indexes and additional bands needed for advanced analytics.



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 X 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 X 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

Reduce downtime and maintenance costs

The eBee X was designed to reduce both delays and repairs thanks to its modular design that lets you swap out parts, as needed.



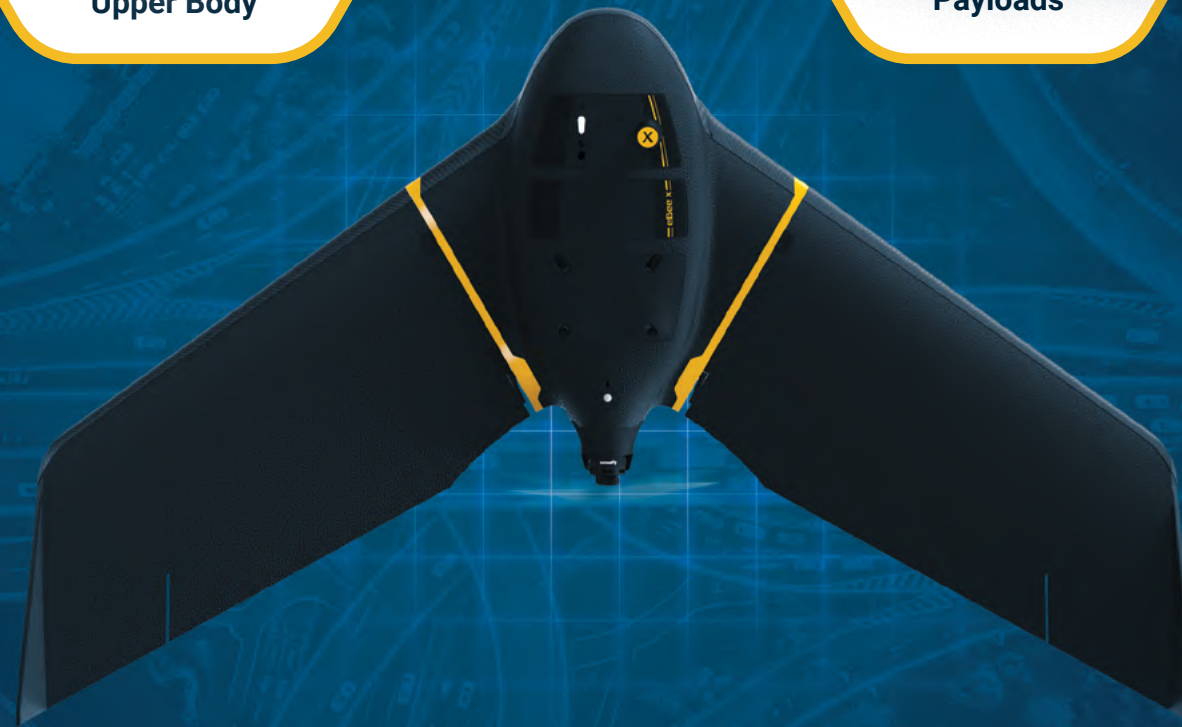
Upper Body



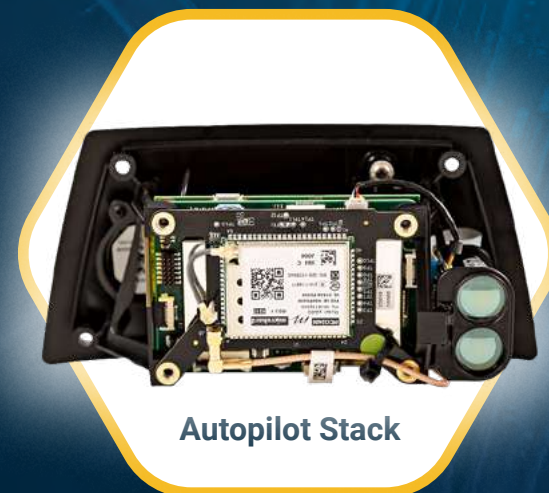
Payloads



Lower Body



Pitot Tube



Autopilot Stack



Clipped Wings

Maintenance made easy
Get your senseFly drone serviced locally, thanks to our global network of authorized service centers.

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

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



All your gear in one spot

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



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 senseFly eBee X comes with...



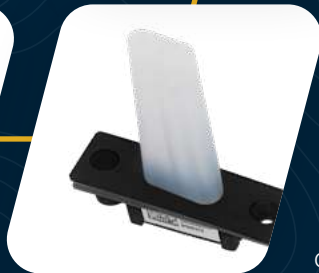
Go further, fly longer with senseFly accessories

Remote Control
Operate your eBee X 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 X 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 / PPK Activation
Achieve absolute accuracy of down to 1.5 cm (0.6 in) with available RTK/PPK

Endurance Battery
Available Endurance Batteries allow for flight times of up to 90 minutes



Endurance Extension
Fly up to 90 minutes in a single flight (Endurance Battery required)

Extended Warranty
1-year warranty extension



Hard Case
For extra protection in harsh environments

senseFly ACADEMY

Certified Operator Program
www.senseflyacademy.com

Accuracy is the measure of success.

Get the most out of eBee X with active RTK/PPK



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 jobsite. The eBee X is an advanced drone platform that makes your 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. Each of these methods have their own benefits and can improve drone pilot workflows. The following is a quick look at the use of GCPs and the added benefit of active RTK/PPK.

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 relative 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. In addition, GCPs allow the production of 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 as much as four times longer to setup 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 the spray paint and targets.

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. No GNSS post-processing is necessary with real-time correction.

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's 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.**

Post-Processing Kinematic (PPK)

An alternative method to RTK is post-processing kinematic. This kinematic technique corrects geotag accuracy after capturing and uploading drone data. **The data is corrected in the flight data manager and then processed in the cloud.** PPK also offers a safety advantage because similar to RTK, the technique eliminates the need for teams to maneuver through dangerous terrain to set GCPs. Also, there's an even greater timesavings in comparison to RTK-to-GCP because less time is spent on-site preparing the RTK connection.

Setup is easier because no cable or Bluetooth connection is required with the base station. **PPK is more dependable than RTK because it does not depend on signal strength or GNSS information from the base station in real-time.**

This method offers more flexibility in flight since a connection isn't required for data capture however, additional processing time will be needed post-flight to georeference the data. The PPK method is ideal for longer flights, especially BVLOS missions. The longer the flight, the greater chance there is of losing signal to the connection needed for RTK.

In Summary

When considering factors such as ease of use, time and expense, the advantages of an RTK/PPK-enabled 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. **The integration of GNSS technology within the drone industry has helped improve the workflow of drone pilots by making mapping missions more accurate, efficient, cost-effective and —most importantly—safe.**

Hardware Datasheet

eBee X

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	1.6 kg
Backpack dimension	75 x 50 x 29 cm (29.5 x 19.7 x 11.4 in)
Motor	Low-noise, brushless, electric
Detachable wing	Yes
Empty backpack weight	4.6 kg

Coverage & accuracy

Nominal coverage at 122 m (400 ft)	220 ha (550 ac), with senseFly S.O.D.A. and without Endurance Extension
Max. nominal coverage at 122 m (400 ft)	500 ha (1,235 ac), with senseFly S.O.D.A. 3D and with Endurance Extension
Ground sampling distance at 122 m (400 ft)	2.5 cm/px (1.0 in/px), with senseFly Aeria X
Lowest ground sampling distance	1,0 cm/px (0.4 in/px) with senseFly Aeria X
Absolute X, Y, Z accuracy (RTK/PPK activated)	1.5 cm (0.6 in)

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	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)

High Precision

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

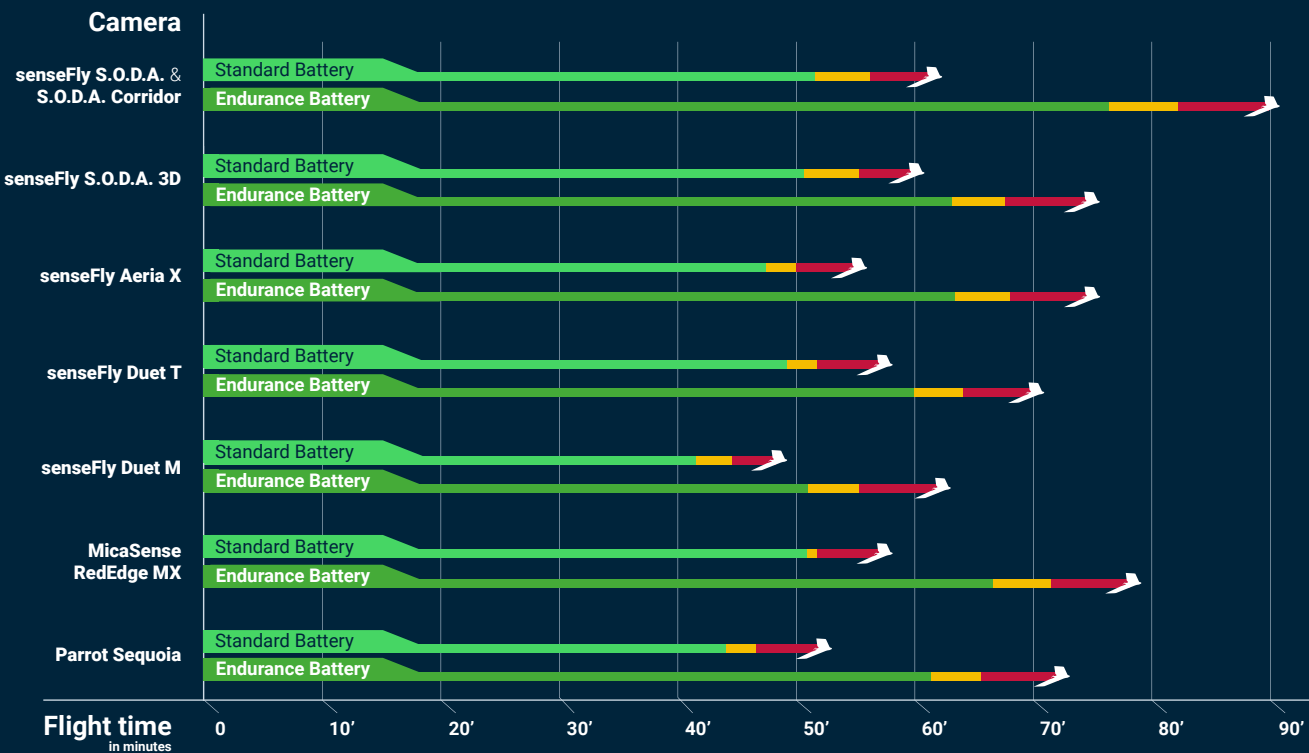
Maintenance and service

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

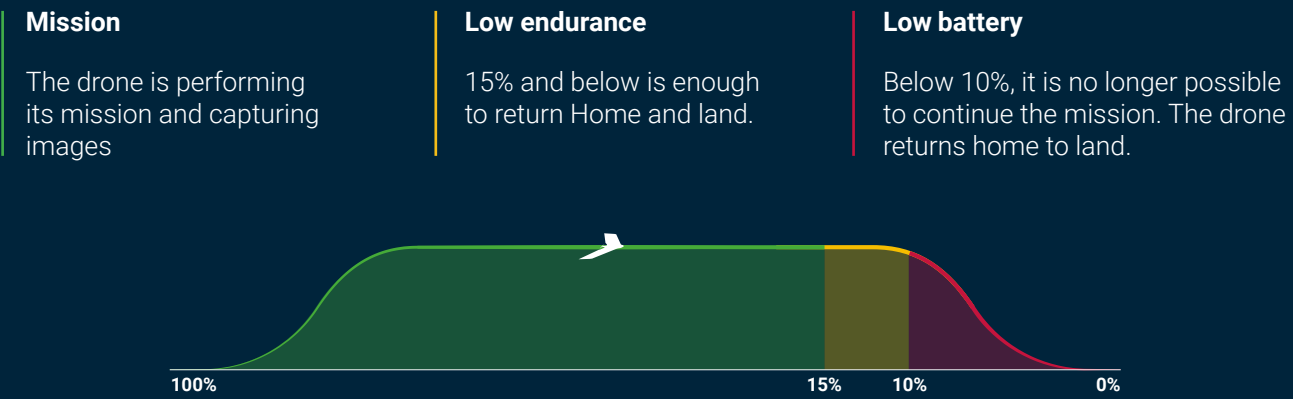
Battery	Standard	Endurance
Power	3700 mAh	4900 mAh
Voltage	15.2V	15.2V
Number of cells	4 Cell	4 Cell
Type	LiHV	LiHV
Energy	56.24Wh	74.48Wh
Weight	330g	420g

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 X?



Automatic safe return when the battery is low



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. Flights longer than 60 minutes require Endurance Activation. **Max. coverage figures based on eBee X flight over flat terrain, in optimal conditions, using a senseFly S.O.D.A. 3D camera.

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

You don't compromise in the field - neither should your drone.

The eBee X is our most advanced fixed-wing drone that's designed to meet all your surveying and mapping needs. Whether your project site is small or vast, straightforward or complex, the eBee X goes the distance while helping you boost the quality, efficiency and safety of your data collection.

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. senseFly is a commercial drone subsidiary of Parrot Group.



senseFly SA

Route de Genève 38
1033 Cheseaux-sur-Lausanne
Switzerland

+41 21 552 04 40

senseFly Inc.

Raleigh
North Carolina

+1 919 917 9602

senseFly

www.sensefly.com
info@sensefly.com