The Drone & Robot Hardware Guide

DroneDeploy

2024

Commercial drone use is skyrocketing

In the last two decades, drones have gone from a niche hobbyist toy to a powerful business tool. The global commercial drone market size is expected to reach $38.2 billion USD by 2027 – over four times the size of the consumer drone market. We have also seen acceleration in the use of ground based robots in the energy, public safety and other sectors.

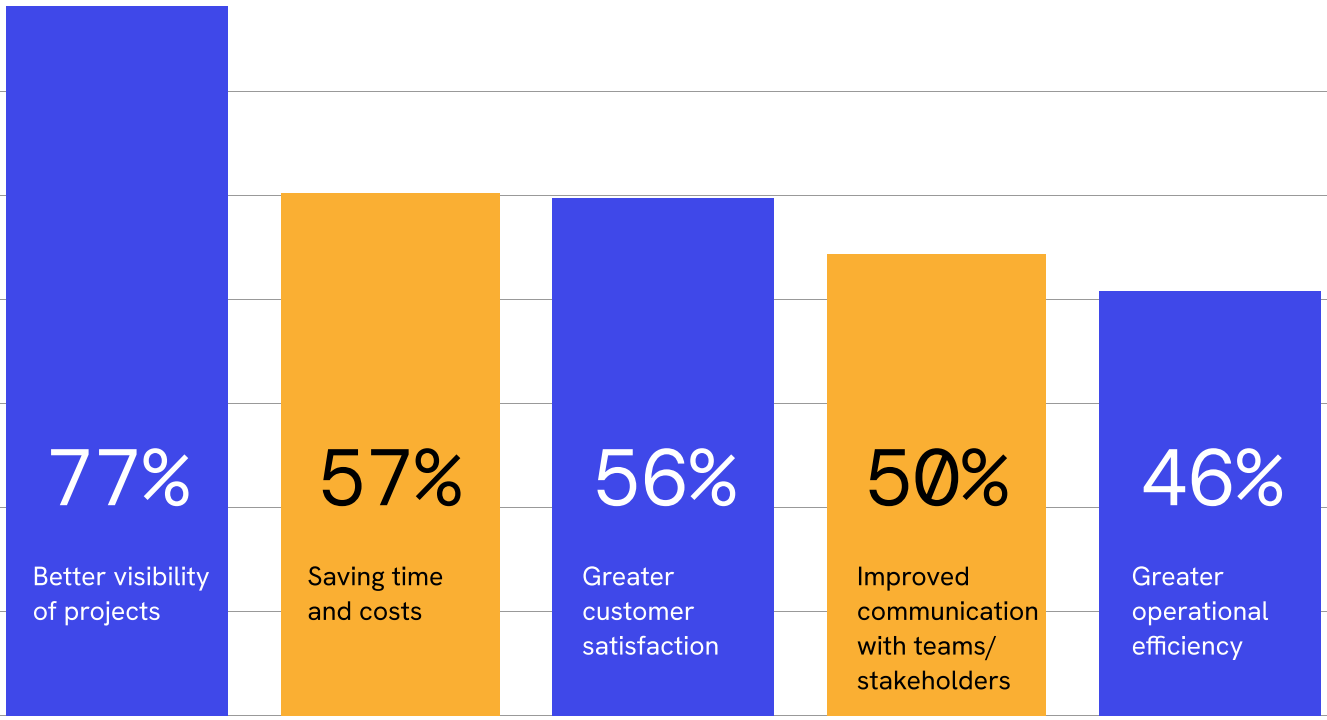
There are several factors driving this growth:

- The global proliferation of drone makes and models available
- The increasing affordability and sophistication of hardware
- The ever-expanding use cases for drone-based data capture
- The rise of AI unlocking greater value from this data

Businesses that use drones and robots to streamline their data capture are seeing impressive results.

According to a recent report, 96% of businesses using reality capture technology (e.g. drones, 360 cameras or robots) are seeing returns or benefits from their investment. Over half (53%) estimate that in the past year, reality capture has saved their business $10k or more.*

The top benefits businesses are seeing from reality capture



*DroneDeploy 'The State of Reality Capture Survey 2024'.

Which drone is right for my business?

The business value of capturing data with drones is clear. But if you're just starting out, the drone landscape can be confusing. There are manufacturers around the world and a huge range of models to choose from.

DJI is the most well-known manufacturer, but US-based companies like Skydio and European companies like Parrot and Wingtra are also having an impact.

This guide will showcase some of the different drones (and a few robots!) that DroneDeploy customers are using to achieve their business goals – from aerial topographic surveys and earthworks calculations to asset inspections.

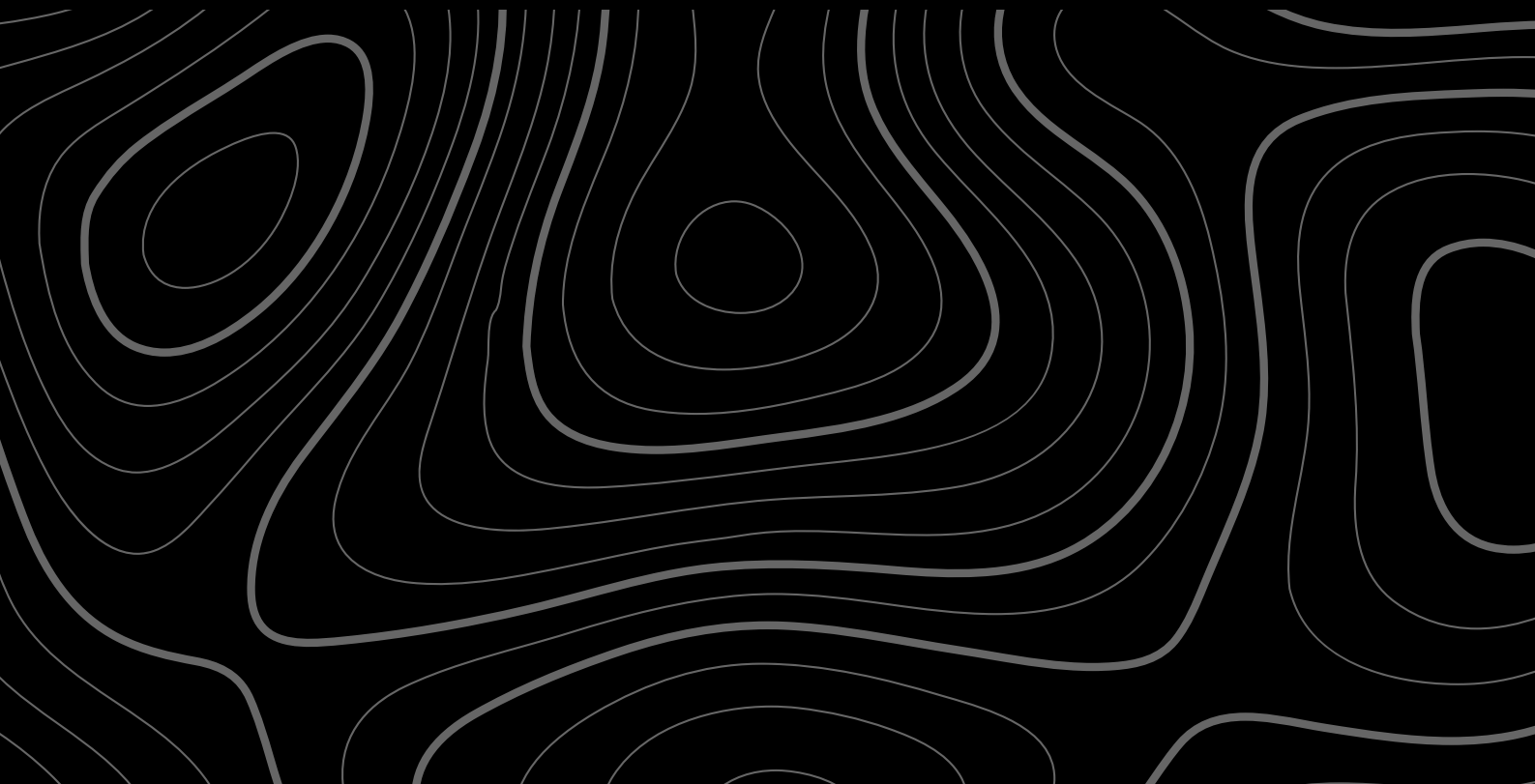
As DroneDeploy works with virtually all drone and robot makes, our platform can process data from almost any drone and a wide range of robots. We also offer flight app capabilities for selected drone models.

FREEFLY · YUNEEC · AeroVironment · dji · DELAIR · Skydio · Parrot · wingtra · AUTEL ROBOTICS · PowerVision · AIROBOTICS

Remember, we're always happy to discuss your specific business needs and offer drone recommendations. Contact us to book a chat.

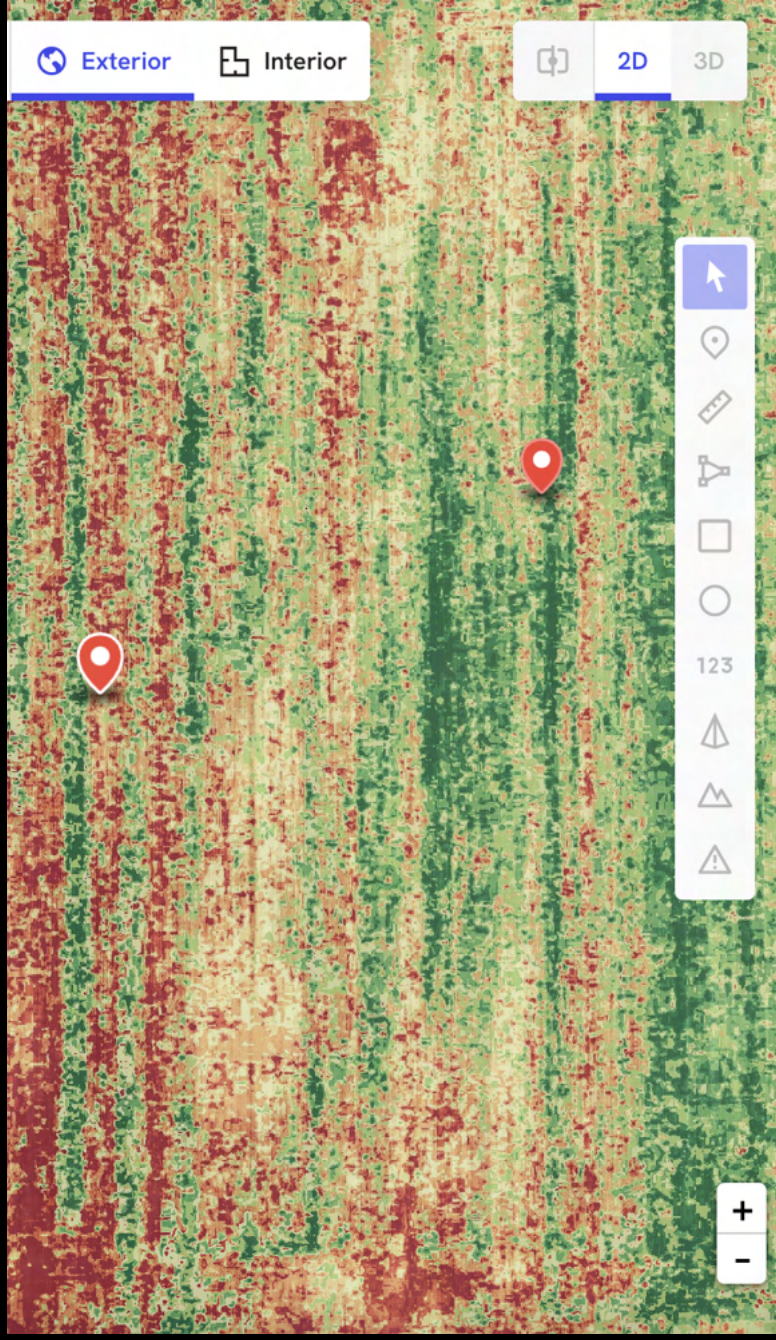
USE CASE

Large site or topographic surveys



Large site or topographic surveys

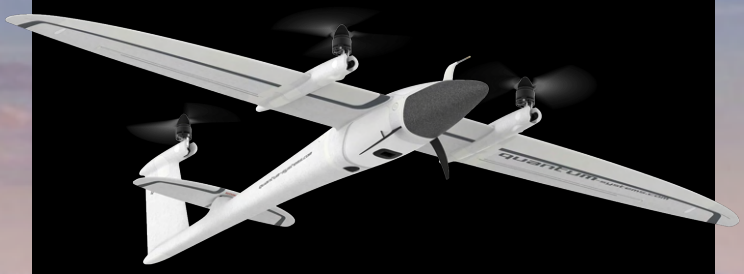
For agriculture and forestry professionals, large site or topographic surveys must be routinely performed to monitor crop and forest health. Compared to traditional aircraft, drones can perform high-accuracy visual or thermal assessments of multiple hectares of land at a fraction of the time and cost.



DroneDeploy offers specialized insights including real-time detection of crop health issues, accurate assessment of losses after weather events and thermal analysis of tree health and drought damage. But choosing the right drone is key – this use case requires long battery life, reliability and real-time positioning capabilities.

Wingtra One Gen II

- Multi-frequency L1/L2 PPK GNSS receiver
- 130HA coverage at <0.75 in/px GSD and 60 minute flight time
- VTOL ensures safety of the drone and its payload
- Origin: Switzerland



Quantum Trinity F90+

- PPK included with GNSS reference station
- 700HA coverage at <0.75in/px GSD and 90 minute flight time
- Wide variety of payloads (RGB, oblique, multispectral and LiDAR)
- Origin: Germany

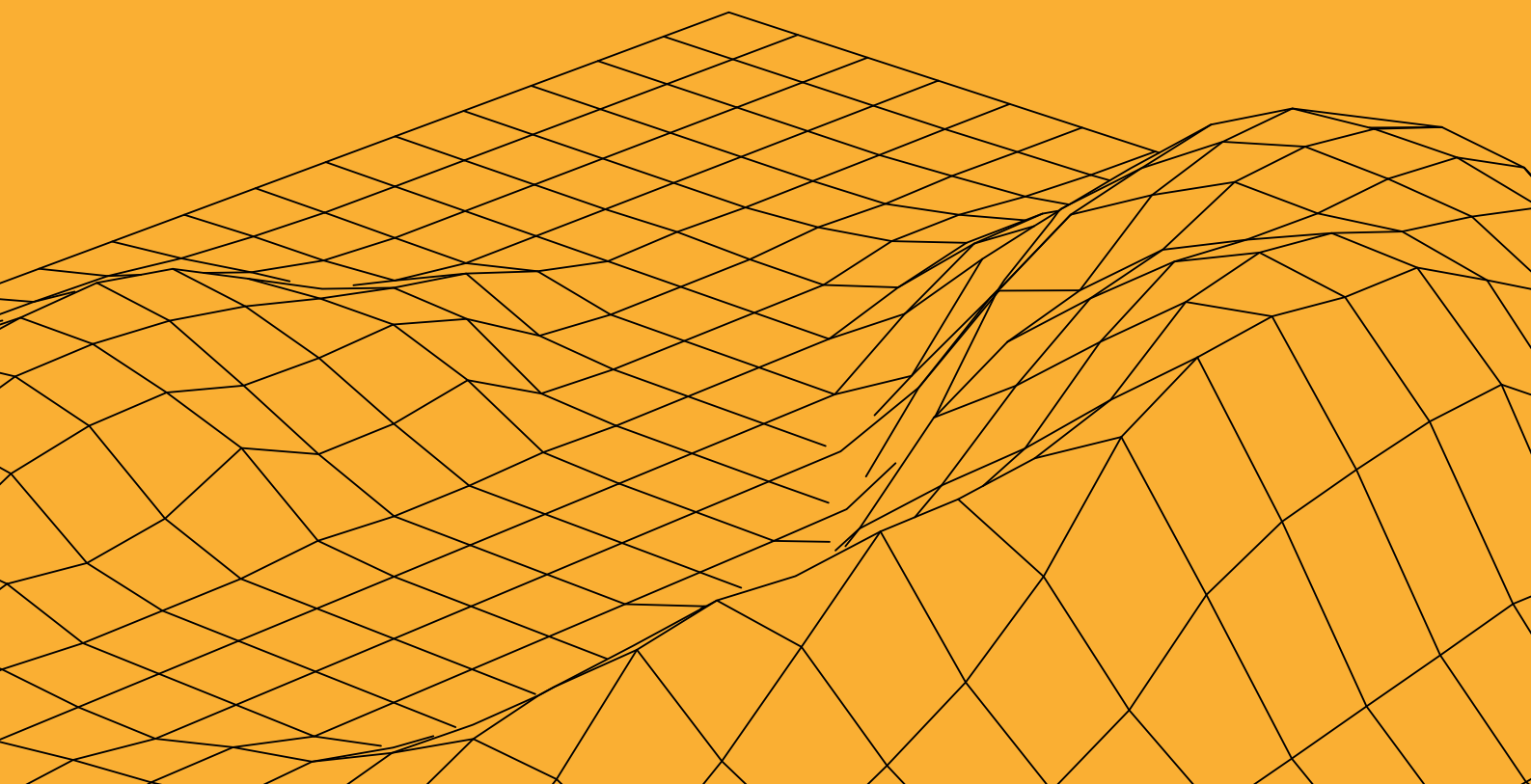
DJI Mavic 3 Enterprise RTK

- RTK and PPK capable, supported with DroneDeploy's RTK Flight App
- 120HA coverage at <1.5in/px GSD and 45 minute flight time
- Compact and portable - 915g
- Origin: China

Contact us to discuss which drone is right for your surveying needs.

USE CASE

Earthworks and volume calculations



Earthworks and volume calculations

Earthworks is all about accuracy. Your team needs to know exactly how much material has been cut, filled, dumped or blasted. In an industry with razor thin margins, measuring these quantities and changes accurately over time can mean the difference between a profitable job and one that operates at a loss.

Using DroneDeploy, the time taken for earthworks surveying and measurements can be cut drastically, from several weeks to a matter of hours. But having reliable, sub-inch accuracy aerial mapping hardware is key.

That's why RTK and PPK capabilities are a critical consideration when choosing drones for earthworks.

Freefly Astro

- RTK Capable for High Accuracy mapping
- Gimbaled Alpha 7R IVA 61MP Mapping Camera
- Interchangeable sensors (Sony A7RIV, Wiris Pro LIDAR)
- Origin: USA

DJI Mavic 3 Enterprise RTK

- RTK and PPK capable, supported with DroneDeploy's RTK Flight App
- 4/3″ CMOS 20MP Wide, 1/2" 12MP Telephoto, and 56x hybrid zoom
- Compact and portable – 915g
- Origin: China

Autel Evo II RTK

- Support PPK and RTK Base Station1" CMOS Sensor Gimbal Camera
- 38 Minutes Flight Time
- Origin: China

Contact us to discuss which drone is right for your earthworks needs.

USE CASE

Existing conditions surveys (including roofs)

Existing conditions surveys

Existing conditions surveys, infrastructure and exterior property inspections are notoriously time-consuming and expensive. Scaling walls and roofs puts team members at risk – not to mention the cost of scaffolding, swing stages and other specialist equipment required to capture data at heights. To reduce these expenses and improve the accuracy of as-built documentation, many businesses are turning to drones. With DroneDeploy, you can survey building exteriors in minutes and generate specialized reports (such as roof and paving assessments) in just a few clicks. When choosing a drone for these inspections, accuracy, portability and high-res imagery are important factors to consider.

Skydio X10

- Compatible with Skydio 3D Scan for efficient mapping
- 64/50/48MP camera, 40 minute flight time, and IP55 certified
- NightSense autonomous flight in zero light conditions
- Origin: USA

Skydio 2+

- Compatible with Skydio 3D Scan for efficient mapping
- 12 MP camera, 27 minute flight time,
- Skydio 2+ Controller for enterprise drone operations
- Origin: USA

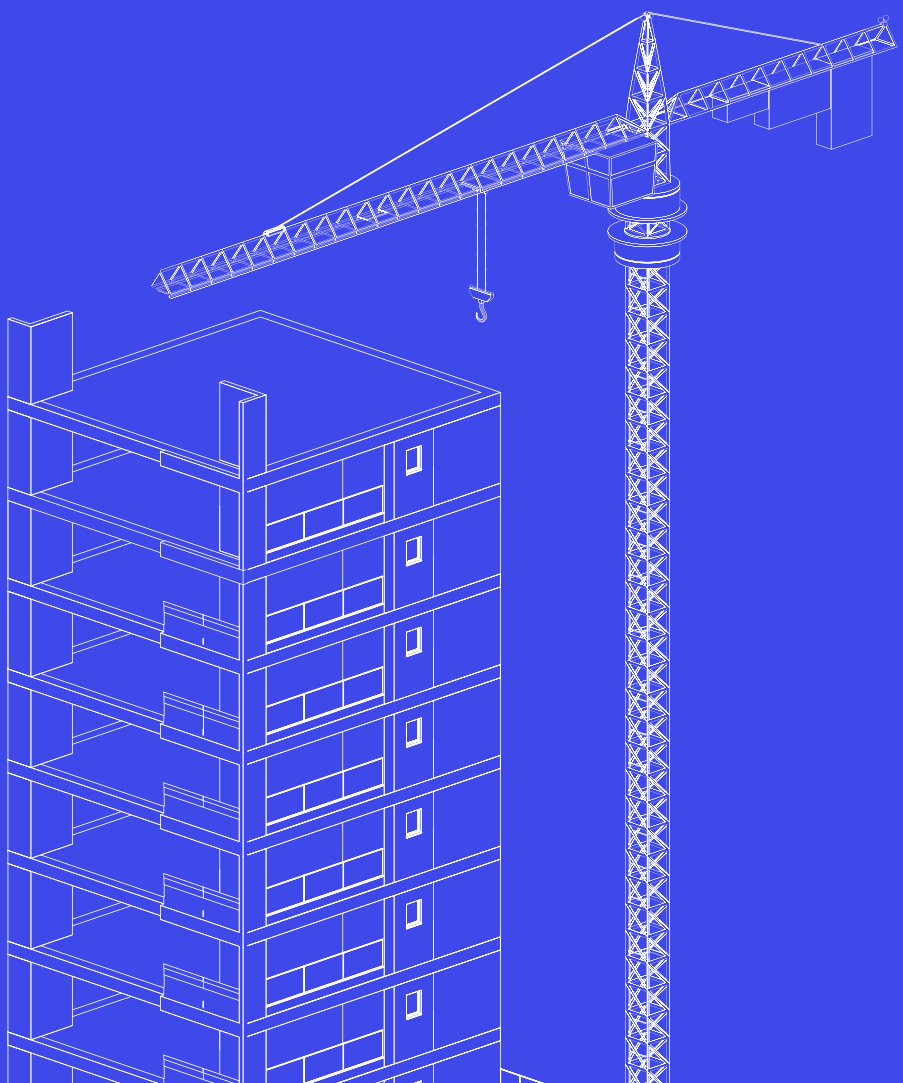
DJI Air 2S

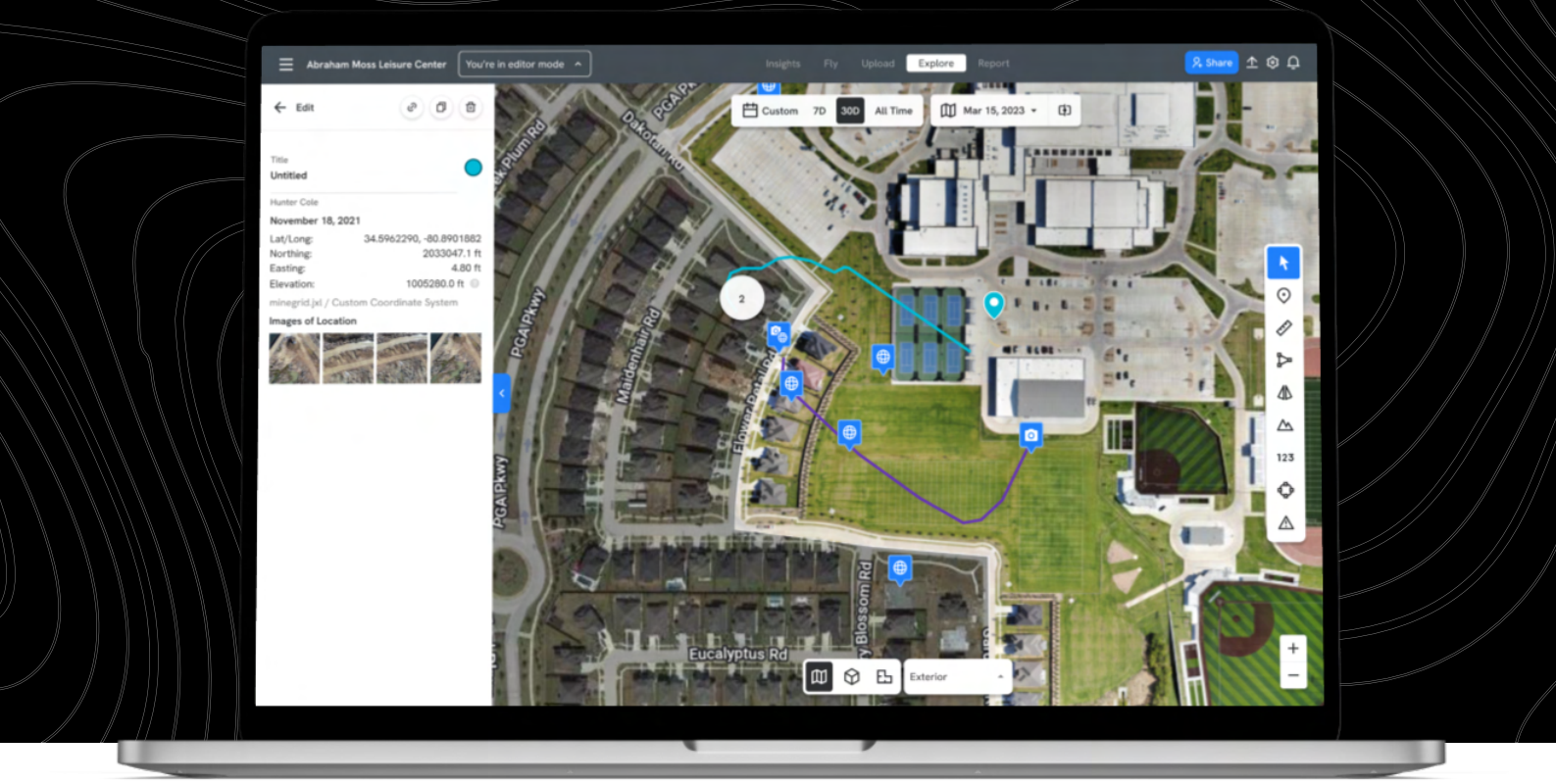
- Portable and lightweight drone - 595g
- 20MP camera, 1-inch CMOS Sensor, 30 minute flight time
- ADS-B for safe flight
- Origin: China

Contact us to discuss which drone is right for your property inspection needs.

USE CASE

Progress monitoring, QC and as-built documentation





Project Tracking

Every project manager knows that small mistakes can escalate and lead to scope creep, rework and major scheduling delays. Regular and accurate visual documentation is critical so you can compare as-built with design plans and detect mistakes early, rather than holding up successive stages.

With DroneDeploy project tracking, you can ensure that every team member and subcontractor is informed at every stage of the project lifecycle. Drones capture accurate aerial and exterior data, while ground robots record building interiors. Maps, panoramas, videos and photos are easily accessible by all involved, and reports can be generated in minutes with annotated issues.

Contact us to discuss which drone or robot is right for your progress tracking needs.

DJI Mavic 3 Enterprise RTK

- 4/3″ CMOS 20MP Wide, 1/2" 12MP Telephoto, with Global Mechanical Shutter
- RTK and PPK capable, supported with DroneDeploy's RTK Flight App
- Compact and portable - 915g
- Origin: China

Skydio X10 (with RTK)

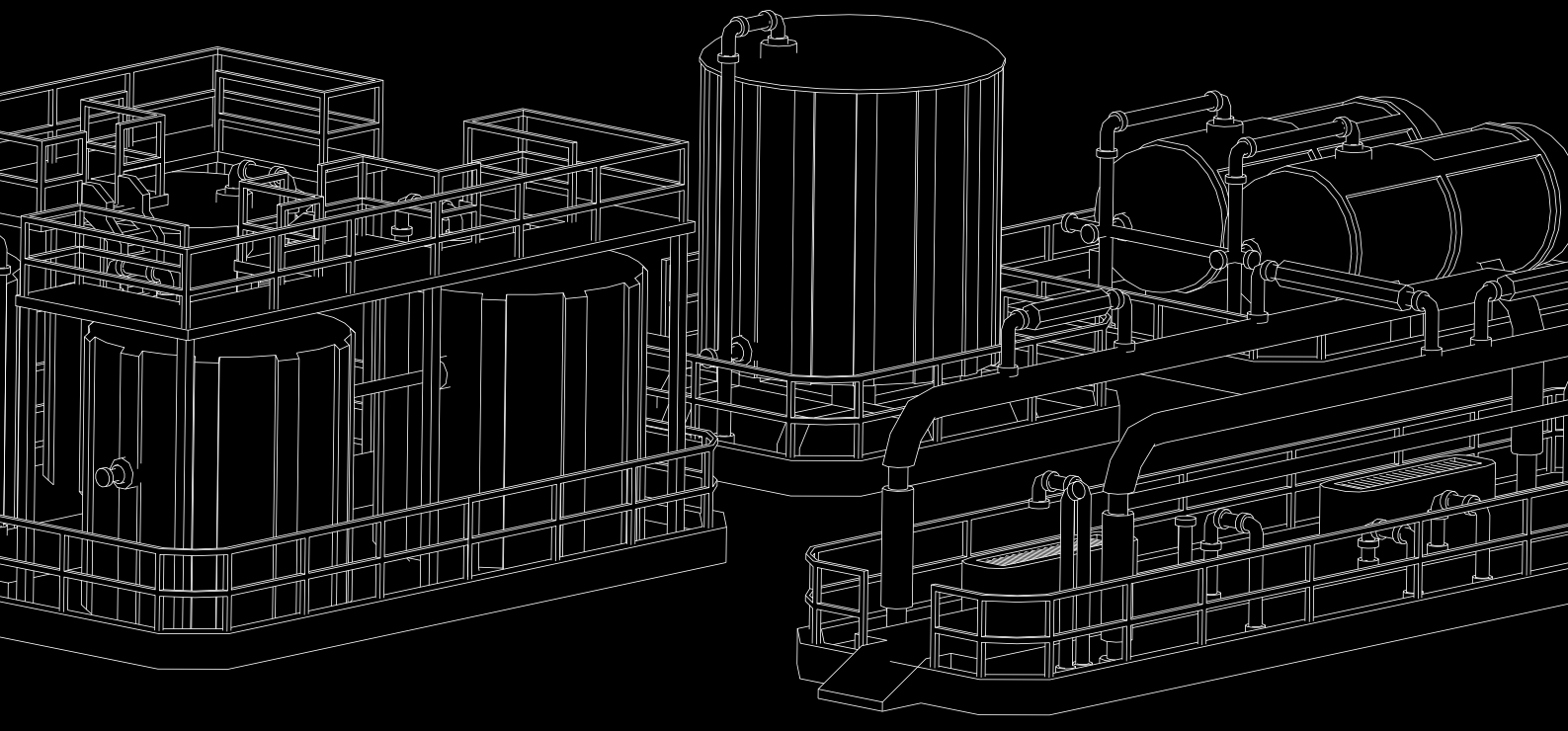
- 1″ CMOS 64MP Wide, 1/2" 48MP Telephoto
- RTK/PPK capable for high accuracy mapping
- Compatible with Skydio 3D Scan, 40 minute flight time, and IP55 certified
- Origin: USA

DJI Matrice 350 RTK with P1

- 48MP Full Frame Sensor with Global Mechanical Shutter
- RTK/PPK capable for high-precision flight & mapping
- 55 minute flight time & DJI RC Plus controller, and Multi-payload support
- Origin: China

USE CASE

Asset inspections, monitoring & maintenance



Asset inspections, monitoring & maintenance

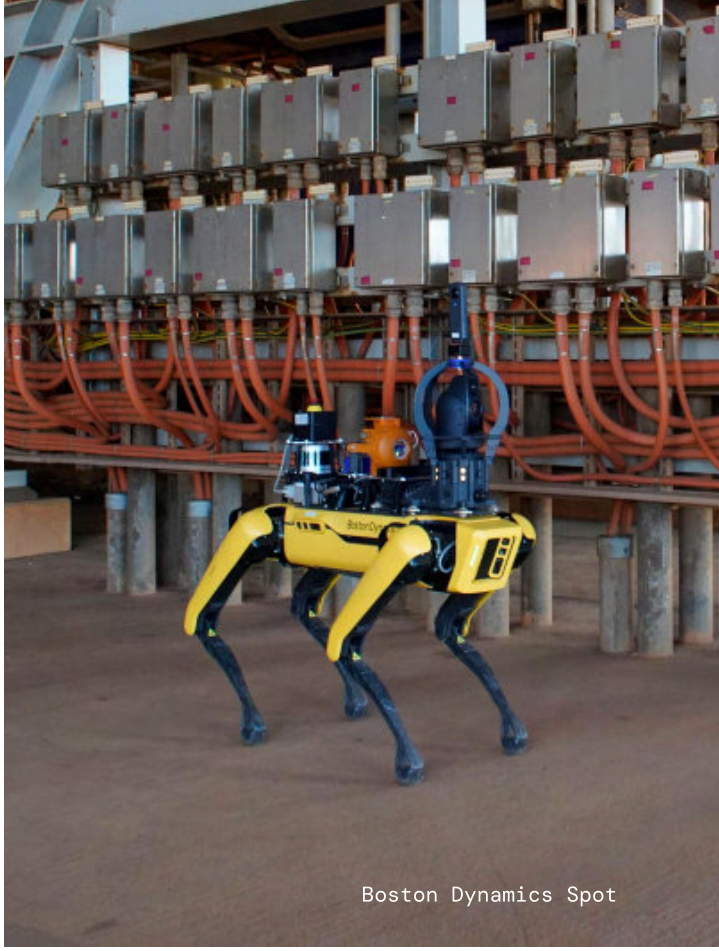
In industries like oil and gas, solar energy and utilities, where service reliability is key, operators need to continually monitor assets and infrastructure performance. But this often requires traveling long distances to remote sites or entering hazardous environments to inspect equipment.

Drones and robots can both play a critical role here – performing routine inspections of equipment and infrastructure and giving engineers eyes on sites at all times, reducing the need for boots on the ground. In some cases, geolocated inspection data can be piped directly to asset management systems and digital twins.

The type of drone or robot required for inspections will depend largely on the business use case and industry. Here are some popular options.

Elios 2

ics Spot



Boston Dynamics Spot

Oil & gas inspections

Boston Dynamics' Spot is a powerful tool for inspecting oil and gas assets, sites and infrastructure. It can be equipped with heavy payloads (PTZ cameras, thermal sensors and more) and sent on automated missions 24/7 via the DroneDeploy platform. With its rugged quadruped form, it can climb stairs and navigate a wide range of terrains.

For aerial inspections (e.g. tanks, towers rigs), Flyability Elios 2 is designed to navigate tight spaces and dangerous environments safely and efficiently. It has built-in GPS-free stabilization, a distance lock for smooth visual inspections and full HD live-streaming.

OnSight Rover

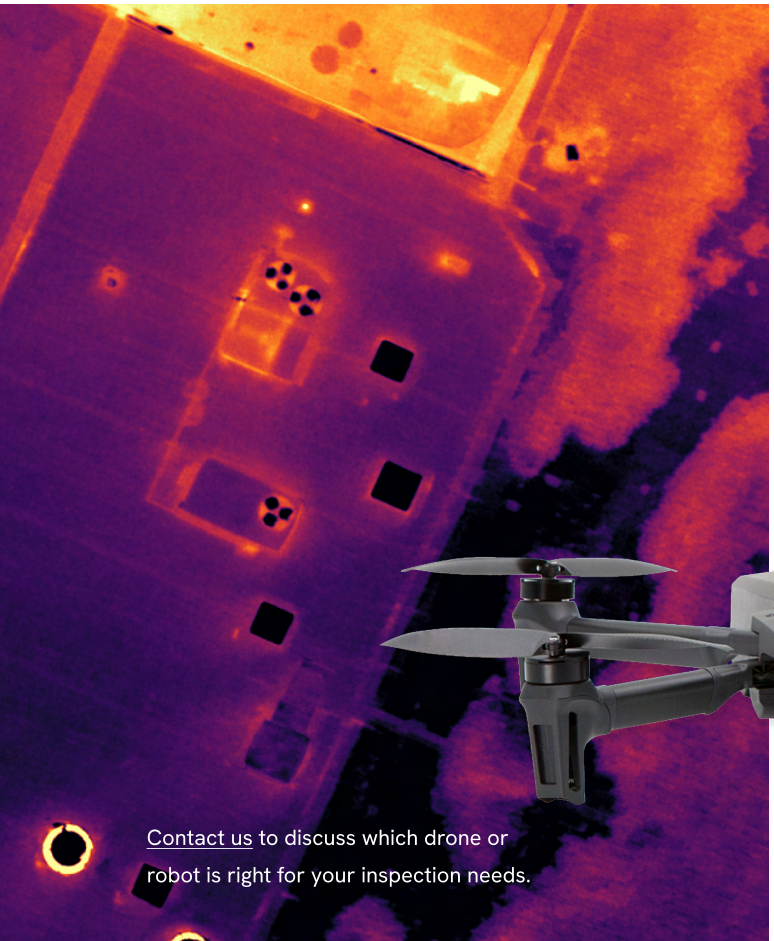
Solar farm inspections

The solar industry has unique inspection requirements due to harsh climates and the size and remoteness of sites. The OnSight rover was specifically designed for this purpose. It is equipped with radiometric thermal imaging and optical zoom cameras that use AI visual learning to assess the condition of solar panels and detect anomalies.

Public safety inspections

Drones increasingly play an important role in search and rescue operations, helping to find survivors in the wake of natural disasters. The Parrot Anafi is IP53 weather resistant and able to fly in wet and windy conditions. It is compact, quick to deploy and equipped with powerful visual zoom and thermal imaging capabilities to assess scenes from up to 3.1 miles away and guide rescuers to individuals. Other popular drones for this use case include Freefly Astro and Skydio X10.

Contact us to discuss which drone or robot is right for your inspection needs.



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Parrot Anafi USA

Flyability Elios 3

- Surveying LiDAR & RAD Payloads
- Optimized for GPS denied environments, SLAM Engine for flight
- Collision-Resilient, Rugged Design
- Origin: Switzerland

Boston Dynamics Spot

- Autonomous operations through DroneDeploy Robotics
- Multi-purpose robot built for industrial environments, 90 minute runtime
- Multi-payload support (Insta 360, Leica, Trimble, etc)
- Origin: USA

Parrot Anafi, USA

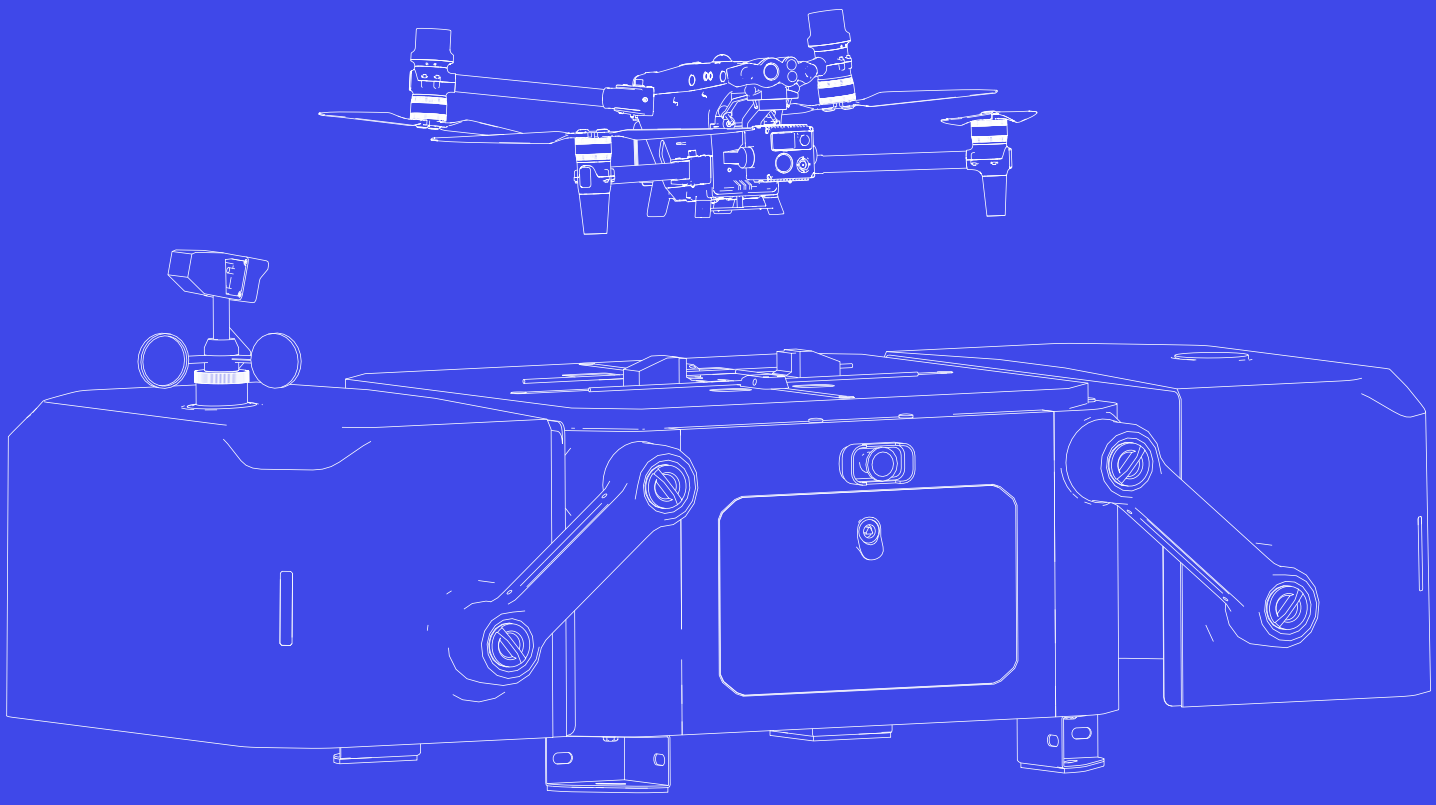
- Built in the USA for US based operations
- 1/2.4″ sensor with 32x zoom
- FLIR Boson 320 sensor for hotspot inspections
- Origin: France

Onsight Robotic Platform

- Autonomous operations through DroneDeploy Robotics
- Radiometric thermal imaging camera and an optical zoom camera
- Can inspect 360 miles per month (1 mile/hr at 12 hrs/day)
- Origin: USA

USE CASE

Automated data capture with docked drones




Skydio Dock
Origin: USA

Automated data capture with docked drones

Docked drones are suitable for many of the use cases in this eBook but remove several manual steps from the process. That's why they're one of the most hotly anticipated new technologies. Our recent survey found that 42% of businesses using reality capture technology plan to implement them in the next five years.*

Docked drones automatically upload data to DroneDeploy and charge themselves between flights – eliminating the need for battery swapping, manual setup or SD card removal. They can be left on-site in almost all weather conditions.

Back in 2020, some of these solutions cost $250,000, but you can now buy a docked drone for a fraction of that cost. And they're only going to get more sophisticated and affordable as time goes on. Two manufacturers are leading the charge in this space – DJI and Skydio.


DJI Dock (closed)


DJI Dock (open)

*DroneDeploy 'The State of Reality Capture Survey 2024'.

DJI Dock

- Made for the DJI Matrice 3D and 3DT
- High accuracy with built-in D-RTK
- Operating range of 6 miles
- Smaller footprint than the original DJI Dock
- IP55 weather protection
- Origin: China

Skydio Dock

- Cutting-edge autonomous navigation and obstacle avoidance
- Easily upload and process flight data via Skydio Cloud Sync
- Small and light - dock footprint of 4 square feet, weighs just 62 pounds
- IP56 weather protection
- Origin: USA

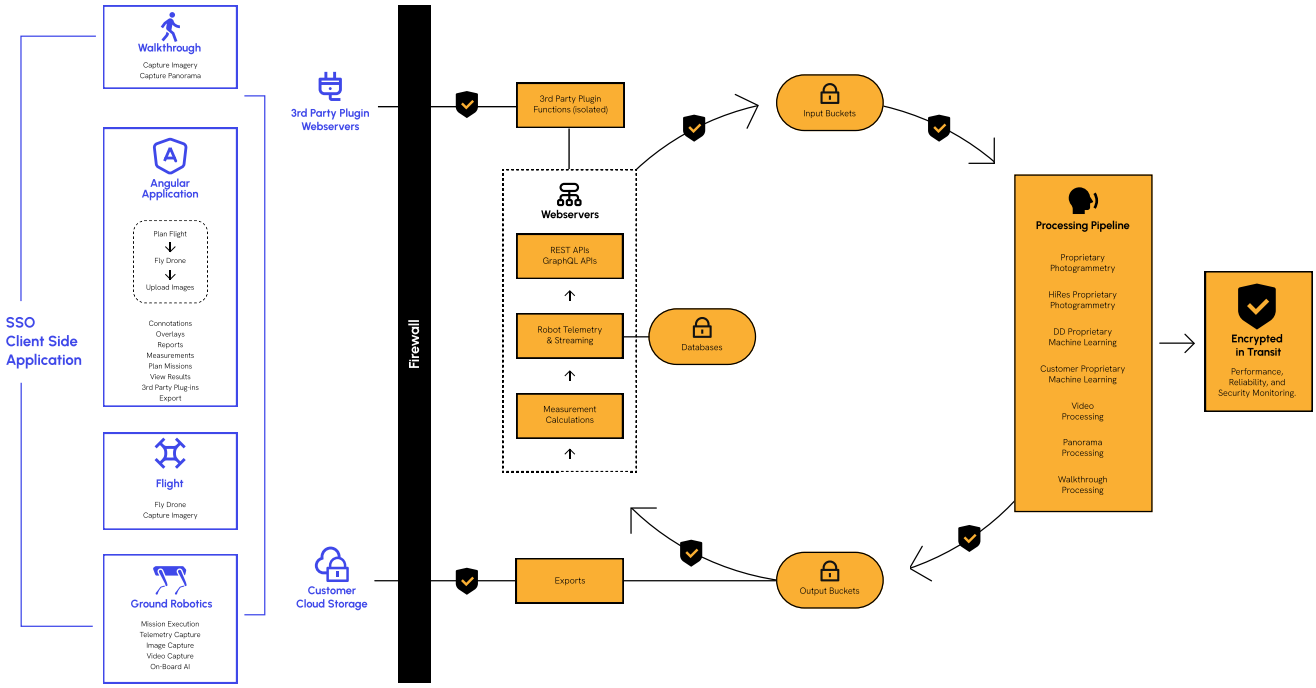
Contact us to discuss which drone is right for your property inspection needs.

Your security is our top priority.

Your data security is our top priority

No matter which drone or robot hardware you choose, you will always be protected by DroneDeploy's robust security and data privacy policies. Once your data is in our platform it is kept secure with DroneDeploy Shield – a comprehensive suite of security measures and best practices.

All DroneDeploy customer data is encrypted in-transit (TLS 1.2+) and at-rest (AES 256), and continuously monitored for performance, reliability and security. We also utilize the defense-in-depth security measures described below to ensure your data's safety.



Learn more about our data security and privacy policies here.
Or contact us to discuss which drone or robot is right for your business.

Shield

Shield Plus

DroneDeploy.com