COPTRZ™

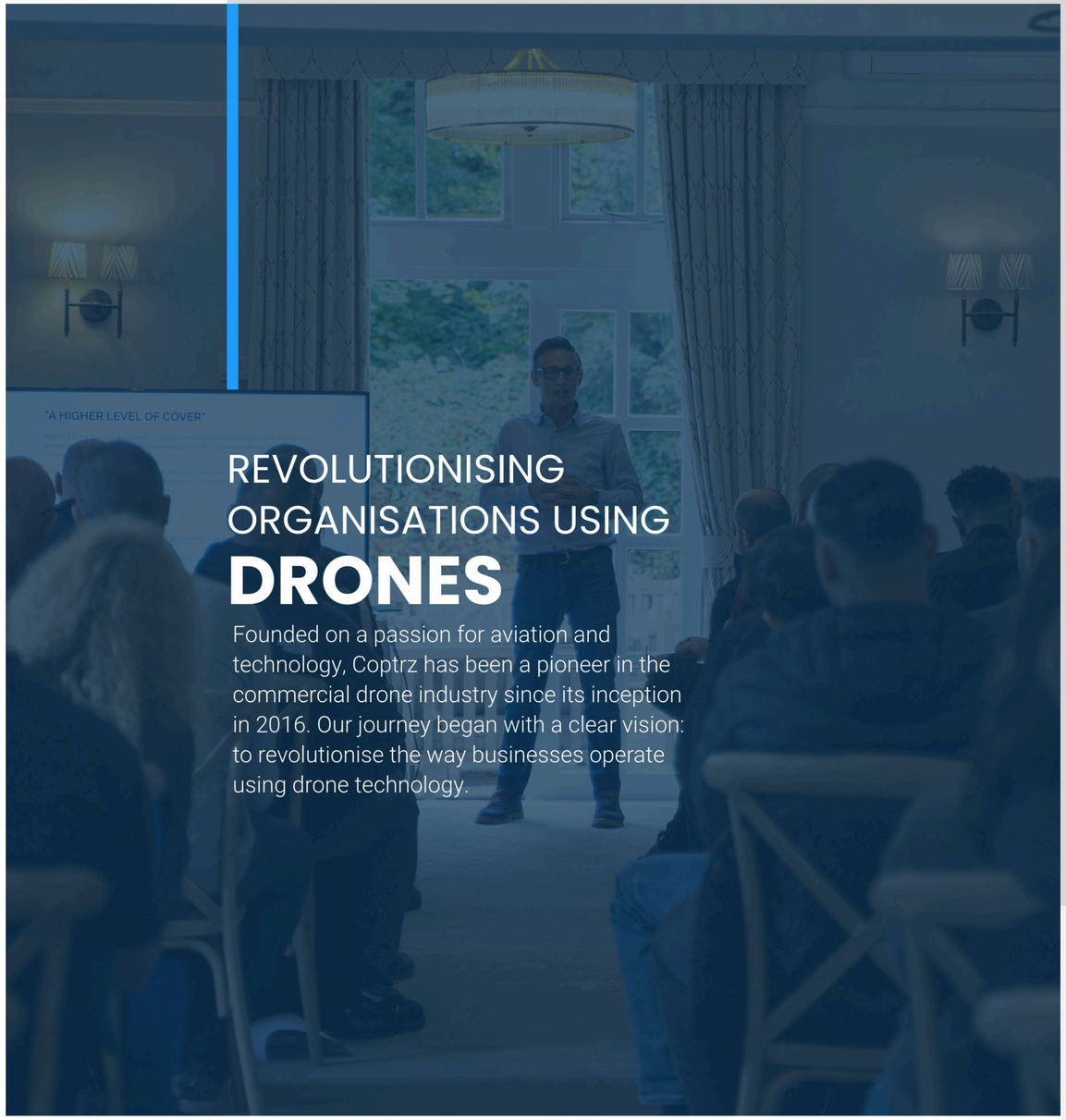

# DRONES
## FOR SURVEYING

2024

# IMPARTIAL EXPERTS IN UNMANNED TECHNOLOGY

The integration of drones in surveying has transformed industry practices, facilitating rapid and secure data collection processes. This innovation not only cuts down on costs but also enhances insights, empowering more informed and strategic decision-making. Recognising the significant advantages offered by drone technology, companies in the AEC industry are increasingly embracing its adoption. This guide aims to provide comprehensive insights into the diverse applications of drone technology in surveying, complemented by an overview of our state-of-the-art solutions tailored to meet industry needs.

## CONTENT




REVOLUTIONISING ORGANISATIONS USING

# DRONES

Founded on a passion for aviation and technology, Coptrz has been a pioneer in the commercial drone industry since its inception in 2016. Our journey began with a clear vision: to revolutionise the way businesses operate using drone technology.

ALL YOU NEED TO KNOW

# About Coptrz

Over the years, Coptrz has grown exponentially, becoming a leading authority in commercial drone solutions. Our commitment to excellence has driven us to constantly innovate and expand our services. We've partnered with industry giants, contributed to groundbreaking UAV research, and developed bespoke drone solutions that have set industry standards.

### Industry Specialists

We have a team of industry experts across Inspection, Surveying, Public Safety, & Education for ongoing support.

### One-Stop-Shop

We have everything you need in one place including hardware, software, training and technical support.

### Exclusive Technology

Coptrz has the UK's widest range of industry leading aerial inspection solutions.

### OFQUAL Courses

Go on to the next level and become a Chief Drone Pilot with our exclusive accredited courses.

### World-Class Suppliers

Your perfect drone solution will be custom built from a range of world-renowned suppliers.

### Expert Training

You will have access to industry-leading training including specialist courses in Thermography, OSC/BVLOS and 3D Mapping.

Our mission is to harness the power of UAV technology to deliver measurable benefits to your business. Whether it's enhancing efficiency in data collection, providing cutting-edge aerial photography, or ensuring precision in industrial inspections, Coptrz is dedicated to propelling your company to new heights. We don't just offer drones; we deliver the future of commercial aerial intelligence.

Today, Coptrz stands as a testament to where ambition and technology can lead. With over 30 industry-leading partners from across the globe, we have managed to assist over 2,000 business from the initial implementation of drone technology, to running fully-fledged drone programmes. We take pride in our history, our achievements, and the trust that our clients place in us.

GET TO KNOW THE INDUSTRY

# Industry Overview

The construction and surveying industries are undergoing significant transformation, with contractors actively pursuing innovative technologies to improve productivity, efficiency, and safety. Drone technology has emerged as a novel category of solutions designed to meet these evolving needs. Historically, surveying and Geographic Information Systems (GIS) operated as distinct domains. Yet, the integration of drones and advanced visualisation software has facilitated the convergence of these realms.

## Increased Speed

**Capture data faster than current methods of surveying**

With their manoeuvrability and advanced sensing systems, UAVs are significantly reducing the time required to conduct surveys across a whole host of landscapes. By swiftly covering vast areas from above, drones eliminate the need for labour-intensive ground surveys, expediting the data collection process. This accelerated pace not only enhances productivity, but also enables surveyors to adhere to project deadlines and rapidly assess changing conditions on-site.

## Improved Data

**Capture data in areas hard to reach areas**

Drones enable surveyors to capture data from more diverse perspectives, capturing intricate details of landscapes, structures, and terrain with clarity and precision. This level of detail enables surveyors to identify subtle features and anomalies that may have been overlooked using conventional surveying techniques, thereby enhancing the overall reliability of survey data.

## Cut Costs

**Cut costs by reducing job times and labour costs**

Drones offer access to remote or challenging terrain that may be difficult or costly to survey using traditional methods. By navigating these areas, drones eliminate the need for specialised equipment or infrastructure, reducing overall surveying costs. The additional ability to cover vast areas reduces job timelines and further reduces labour costs, enabling surveyors to take on more projects within a given timeframe, thereby increasing revenue potential.



POPULAR USES OF DRONES

# Applications

## Infrastructure Planning

Aerial survey data is invaluable for creating detailed topographical models of sites, vital for pre-construction engineering assessments. This data seamlessly integrates with CAD or BIM platforms, allowing engineers to swiftly delve into 3D modelling. The low cost of drone surveys makes them an ideal choice for regular monitoring during a project's lifecycle, enabling teams to track progress and identify potential issues. By overlaying drone images onto initial designs, real-time insights into construction advancements can be aligned with plan specifications.

## Land Surveying

Drones can produce orthomosaics and detailed 3D renderings that enable rapid generation of cadastral maps, even in challenging or remote environments. Aerial images captured by drones allow for clear identification of features such as signage, curbs, road markings, and drainage systems, enhancing their utility for asset management purposes. Through post-processing techniques, images are further refined to generate detailed elevation models, contour lines, and break-lines, providing insights into terrain characteristics and topographical features.

## Volumetrics

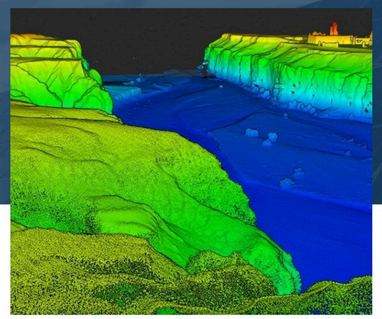
Utilising orthophotos generated from drone data, surveyors can efficiently compute distances and surface areas, facilitating tasks like stockpile monitoring. Additionally, 3D mapping tools enable professionals in mining or quarrying to conduct accurate volume calculations using drone-acquired data, thereby enhancing inventory management and providing comprehensive oversight of stock levels.

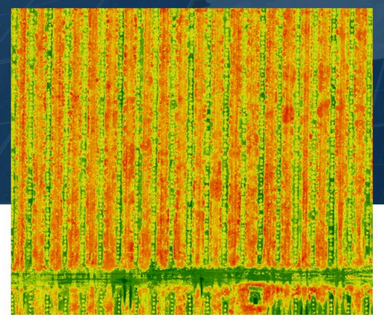
## Slope Measurements

Imagery and data captured via drones can be used for the measurements of slopes, enabling the direct determination of ground surface gradients and segmentation of regions. This information is invaluable for strategising slope oversight, which plays a pivotal role in landslide prediction and mitigation efforts. Sequential orthomosaics can pinpoint shifts in terrestrial movements and their rates, aiding in the prediction of geological events.

DRONE DATA EXPLAINED

# What the Camera Sees





## Photogrammetric Data

Photogrammetry is a widely utilised technique in drone mapping, leveraging aerial imagery captured by drones to generate detailed and accurate 3D models of the terrain, objects, or structures on the ground. In this process, drones equipped with high-resolution cameras capture overlapping images of the area of interest from different angles during flight. These images are then processed using photogrammetry software, which analyses the overlapping features and calculates the spatial relationships between them to reconstruct the three-dimensional geometry of the scene.

One of the primary advantages of photogrammetry for drone mapping is its accessibility and cost-effectiveness. Drones equipped with cameras are relatively affordable and widely available, making photogrammetry a practical solution.

## LiDAR Data

LiDAR, which stands for Light Detection and Ranging, is a remote sensing technology that measures distances to objects or surfaces using laser pulses. It operates on the principle of emitting laser beams towards the Earth's surface and measuring the time it takes for the light to return after hitting an object or surface. This data is then used to create detailed three-dimensional maps or models of the terrain, objects, or environments being scanned.

LiDAR is widely used for creating high-resolution digital elevation models (DEMs), topographic maps, and three-dimensional terrain models. Unlike photogrammetric sensors, LiDAR sensors can penetrate vegetation and other obstructing elements to capture the underlying terrain. This makes it particularly useful for mapping areas with dense vegetation or complex terrain where traditional photogrammetry methods may struggle to provide accurate results.

## Multispectral Data

Multispectral imaging is a technique used to capture images at specific wavelengths across the electromagnetic spectrum beyond what the human eye can perceive. Unlike standard RGB (Red, Green, Blue) imaging, which captures only three bands of light, multispectral imaging captures data across multiple bands, typically ranging from ultraviolet (UV) to near-infrared (NIR) wavelengths.

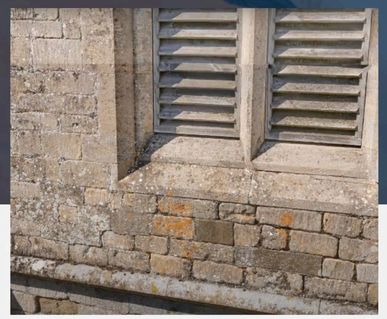
In multispectral imaging, sensors are equipped with filters or detectors that selectively capture light within predefined spectral bands. Each band represents a specific range of wavelengths, and by analysing the intensity of light within each band, multispectral imaging can reveal valuable information about the objects or surfaces being observed.

This data is particularly useful for crop management. For example, near-infrared light is often used to gauge biomass vitality, while other wavelengths can provide insights into moisture levels, chlorophyll content, and early signs of diseases or pest infestations.



DRONE DATA EXPLAINED

# Understanding the Outputs



## 3D Textured Mesh

A 3D textured mesh is a digital representation of a 3D object or scene that includes both geometric information and surface textures. Meshes are created by capturing multiple images of the object from different viewpoints and then processing these images to generate a 3D model.

The geometric information in a 3D textured mesh consists of the object's shape and structure, represented as a collection of vertices, edges, and faces. These elements define the object's surface geometry and spatial relationships, allowing it to be accurately visualised and manipulated in 3D space. The result is a model that captures the shape of the object in a visually appealing way. While a 3D textured mesh excels in presenting and visualising the model, especially for online sharing and display, it prioritises aesthetics over precision. Due to this emphasis on appearance rather than accuracy, it's not typically recommended for tasks that require precise measurements.

## Orthomosaic

An orthomosaic is essentially a 2D map where each point is defined by its X and Y coordinates and colour information. This map is characterised by its uniform scale, making it ideal for accurate 2D measurements like distance and surface area. It addresses and corrects key issues inherent in input images, such as the camera's perspective and the varying scale caused by different distances of objects or ground from the camera.

This process of creating an orthomosaic goes beyond simple photo stitching; it involves a sophisticated method of aligning and adjusting images to ensure a consistent scale and accurate representation of the Earth's surface.

Orthomosaics are highly valuable for their precise, true-to-scale representation of the Earth's surface, offering detailed surface information which is essential in various fields. Their consistent scale allows for accurate 2D measurements.

## Point Cloud

A point cloud is a collection of data points in a coordinate system. Each point is defined by 3D position (X, Y, Z), which represent the external surface of an object or area in 3D space. When these points are plotted, they form a visual representation of the surface of the scanned object or terrain. The result looks like a "cloud" of dots, hence the name point cloud.

Point clouds are highly valued for their ability to precisely and accurately capture the physical characteristics of real-world objects. This makes them indispensable for 3D modelling in both LiDAR and photogrammetry.

These models are valuable for urban planning, land development, environmental monitoring, and construction projects.

Solutions

# Drones

DRONE

# DJI
# Mavic 3 Enterprise

**Wide Camera**
20MP 4/3 CMOS

**Tele Camera**
12MP 1/2" CMOS, 56x Hybrid Zoom

**Mechanical Shutter**
Mechanical Shutter Speed: 8-1/2000s
Electronic Shutter Speed: 8-1/8000s

**Photo Formats**
JPEG/DNG (RAW)

**Flight Time**
45 minutes

**IP Rating**
No Rating

**Weight**
920g


## Overview

The DJI Mavic 3 Enterprise (M3E) is an industry-leading tool for surveying. Designed for precision and efficiency, the M3E features two high-resolution sensors, critical for detailed analysis and creating topographics. Its enhanced safety protocols and obstacle avoidance systems ensure secure operations in complex environments, while the compact, foldable design offers unparalleled portability and ease of deployment. Its mechanical shutters provide precise control over the exposure time, resulting in sharper and less distorted images compared an electronic shutter. The fast 0.7s shutter interval allows the DJI Mavic 3 Enterprise to capture images rapidly over large areas, maximising mapping efficiency and reducing the time and cost associated with aerial surveys.



DRONE

# DJI
# Mavic 3 Multispectral

**Multispectral**
4 Multispectral Bands

**Wide Camera**
20MP 4/3 CMOS

**Mechanical Shutter**
Mechanical Shutter Speed: 8-1/2000s
Electronic Shutter Speed: 8-1/8000s

**Image Formats**
JPEG/TIFF/DNG (RAW)

**Flight Time**
55 minutes

**IP Rating**
No rating

**Weight**
951g


## Overview

The DJI Mavic 3 Multispectral (M3M) is the agricultural counterpart to the M3E. Built off the same airframe, the M3M benefits from the same compact, sleek design, making it quick and simple to deploy in short timeframes. The difference comes with the sensors. Equipped with a high-resolution RGB camera and 4x multispectral sensors, the M3M delivers detailed and accurate imagery across multiple spectral bands, allowing users to analyse plant health, detect crop stress, and monitor vegetation growth with unparalleled precision. With its portability and ease-of-use, the M3M empowers users to efficiently collect, analyse, and utilise actionable data for informed decision-making and optimised resource management.

DRONE

# WINGTRA
# WingtraOne Gen II

**GSD**
GSD down to 0.7 cm/px
Horizontal accuracy
down to 1cm

**Multi-Payload Support**

**Wide Coverage**
Cover up to 360 hectares
in one flight

**20km Transmission**

**Flight Time**
59 minutes

**IP Rating**
IP54

**Weight**
3.7kg


## Overview

The WingtraOne Gen II is a powerful VTOL (vertical take off and landing) drone that allows you to collect massive amount of data faster and more efficiently that other drones in the space. Equipped with state-of-the-art GNSS technology and a high-resolution camera, the Wingtra One Gen II delivers centimetre-level accuracy in aerial mapping and surveying applications, ensuring precise and detailed results every time. The WingtraPilot software simplifies the process of mission planning, data capture, and post-processing, streamlining the workflow and enabling users to generate accurate 2D maps and 3D models with minimal effort.



DRONE

# DJI
# Matrice 350 RTK

**Multi-Payload Support**

**Night-Vision FPV Camera**

**Dual Battery System**

**20km Transmission**

**Flight Time**
55 minutes

**IP Rating**
IP55

**Weight**
6.47kg

## Overview

The DJI M350 RTK is DJI's flagship commercial drone. With an IP55 rating, the airframe proves to be durable in the harshest of conditions. With a remarkable 55-minute flight time and supports up to three different payloads, both from DJI & third-parties, offering versatile solutions for asset inspection. Its impressive 2.7kg payload capacity ensures you can attach various cameras, sensors, or specialised equipment. This versatility provides the ability to tailor this platform to multiple surveying operations.

*The DJI M350 is an airframe only; your choice of payload/s need to be selected separately.

DRONE

# FLYABILITY
# Elios 3

**Collision-Tolerant Design**

**Real-Time Mapping**

**Plug & Play Payload Bay**

**Return to Signal**

**Flight Time**
12 minutes

**IP Rating**
IP44

**Weight**
1900g

## Overview

The Flyability Elios 3 is a sophisticated indoor drone designed for mapping and inspection, featuring cutting-edge technology for precise and efficient data collection. It is equipped with the FlyAware™ SLAM Engine for centimetre-accurate indoor GPS, enabling it to build real-time 3D maps for instant situational awareness. Its SLAM-based stabilisation provides unmatched stability, even under challenging conditions. The drone features a modular payload bay, allowing for versatile configurations with high-precision LiDAR data and dedicated payloads for close-up inspections. It also boasts a collision-resilient rugged design, an extended flight time of up to 12 minutes, and a Return-To-Signal feature for enhanced flight safety.



DRONE

# PARROT
# ANAFI AI

**1-Click Photogrammetry**

**4G Connection**
Internet Connectivity

**Zoom Camera**
48MP
6x Zoom

**Cybersecurity**
AES-256 Encrypted
Made In The USA

**Flight Time**
32 minutes

**IP Rating**
IP53

**Weight**
898g

## Overview

The Parrot ANAFI Ai is a cutting-edge 4G robotic UAV designed for advanced security and risk assessment tasks. Its autonomous photogrammetry and high-resolution 48MP camera, combined with robust 4G connectivity, ensure reliable operation in diverse environments. With a single click in the FreeFlight 3D map, it quickly maps security sites, while its AI optimises flight paths for efficiency. The precision of its geotagged 48MP images, aided by advanced sensors, allows for highly accurate 3D reconstructions, essential for effective site mapping and risk analysis.

Solutions

# Payloads

PAYLOAD

# DJI
# Zenmuse L2

### LiDAR Sensor
Up to 240,000 pts/s Effective Point Cloud Rate LiDAR

### RGB Camera
20MP 4/3 Sensor

### Detection Range
250m @10% reflectivity
450m @50% reflectivity

### High Accuracy
Horizontal: 5cm @ 150m
Vertical: 4cm @ 150m


**Sensor Type**
LiDAR

**IP Rating**
IP54

**Weight**
905g

## Overview

The DJI Zenmuse L2 LiDAR system features a 4/3 CMOS camera to provide colourised LiDAR point clouds. It achieves 4cm vertical and 5cm horizontal accuracy, covering up to 2.5km² per flight with a detection range up to 450m. It supports seamless integration with DJI Terra for efficient 3D data processing, making it ideal for detailed analysis and surveying tasks. Its high accuracy and capability to cover large areas enhance its utility in professional mapping applications.

Compatible with DJI Matrice 350 RTK



PAYLOAD

# DJI
# Zenmuse P1

### RGB Camera
45MP Full Frame Sensor

### Mechanical Shutter
Mechanical Shutter Speed: 1/2000*-1s
Electronic Shutter Speed: 1/8000-1s

### Dynamic Aperture
Aperture Range: f/2.8-f/16

### Stabilised Gimbal
3-axis (tilt, roll, pan)


**Sensor Type**
Photogrammetry

**IP Rating**
IP4X

**Weight**
800g

## Overview

The DJI Zenmuse P1 is designed for aerial photogrammetry and features a 45MP full-frame sensor, interchangeable lenses (24/35/50mm), and a 3-axis stabilised gimbal. It delivers 3cm horizontal and 5cm vertical accuracy without ground control points and can cover 3km² per flight. Its global mechanical shutter and onboard firmware ensure precise image capture. Compatible with the DJI Matrice 350 RTK, it's ideal for topographic mapping, advanced inspection, and detailed model creation, enhancing efficiency in large-area surveys and complex modelling tasks.

Compatible with DJI Matrice 350 RTK

PAYLOAD

# EMESENT
# Hovermap ST-X

### LiDAR Sensor
Up to 1,920,000pts/s Effective Point Cloud Rate LiDAR

### Field of View
360° x 290°

### Mapping Accuracy
General Environments: +/- 15mm
Internal Environments: +/- 10mm

### Deployment
Drone, handheld, backpack, vehicle, tether, ground robot

### Sensor Type
LiDAR

### IP Rating
IP65

### Weight
1.57kg

## Overview

The Emesent Hovermap ST-X is a high-end LiDAR scanner designed for autonomous mapping with a LiDAR range of up to 300 metres. It features advanced capabilities like a Multi-Return Mode, delivering up to 1,920,000 points per second for dense and accurate data collection. This model is versatile, suitable for drone, handheld, or vehicle-mounted applications, and is equipped with an IP65 rating for operation in challenging environments. The ST-X is ideal for detailed mapping in sectors like mining, engineering, and forestry, providing survey-grade accuracy and comprehensive insights.

**Compatible with DJI Matrice 350 RTK & AceCore Zoe**



PAYLOAD

# AGEAGLE MICASENSE
# Altum-PT

### Visual Imaging
12MP Panchromatic Sensor

### Thermal Imaging
320 x 256px Flir Boson

### Multispectral
5 Multispectral Bands

### Global Shutter
Global shutter allows for distortion-free imagery

### Sensor Type
Multispectral

### IP Rating
No Rating

### Weight
577g

## Overview

The MicaSense Altum-PT by AgEagle is a sophisticated drone camera sensor designed for advanced remote sensing and agricultural research. It integrates a 12MP panchromatic sensor, a new thermal sensor for higher ground resolution, and five discrete spectral bands. This sensor is optimised for high-resolution, machine learning applications like early-stage crop counting and features a global shutter for distortion-free images. It supports up to 2 captures per second with CFexpress storage, offering an efficient workflow for data management.

**Compatible with DJI Matrice 350 RTK & WingtraOne Gen II**

PAYLOAD

# AGEAGLE MICASENSE
# RedEdge-P

### Visual Imaging
5.1 MP RGB Sensor

### Thermal Imaging
640 × 512px Radiometric Thermal Camera

### Multispectral
5 Multispectral Bands

### Global Shutter
Global shutter allows for distortion-free imagery

### Sensor Type
Multispectral

### IP Rating
No Rating

### Weight
363 g

## Overview

The MicaSense RedEdge-P by AgEagle is a high-res multispectral camera. It features a 5.1MP panchromatic band for sharp, detailed imagery and five narrow multispectral bands for advanced vegetation analysis. It enables up to three captures per second, supports pan-sharpened output resolutions of 2cm per pixel at 60m, and is NDAA compliant. Designed for UAV and vegetation mapping, it's ideal for applications like plant counting, phenotyping, and disease identification, enhancing agricultural management and research.

**Compatible with DJI Matrice 350 RTK & WingtraOne Gen II**



PAYLOAD

# AGEAGLE MICASENSE
# RedEdge-P Dual

### Visual Imaging
5.1MP RGB Sensor
5.1MP Panchromatic Sensor

### GSD
Ground Sampling Distance: 7.7cm per pixel (per MS band) at 120m

### Multispectral
10 Multispectral Bands

### Global Shutter
Global shutter allows for distortion-free imagery

### Sensor Type
Multispectral

### IP Rating
No Rating

### Weight
745g

## Overview

The MicaSense RedEdge-P Dual Camera from AgEagle enhances drone multispectral capabilities, featuring ten spectral bands for detailed analysis, including a unique coastal blue band for water vegetation. It achieves a ground sample distance (GSD) of 2cm per pixel at 60m flight altitude, offering high-resolution imagery for precise agricultural and environmental monitoring. This dual system integrates seamlessly with the DJI Matrice 350 RTK supporting efficient data capture and analysis in a wide range of applications from crop monitoring to water body analysis.

**Compatible with DJI Matrice 350 RTK**

PAYLOAD

# PHASE ONE
# P3

**Full Frame Sensor**
100MP Sensor
11,664 x 8,750px

**Sensor Size**
43.9 x 32.9mm

**Light Sensitivity**
RGB: 50-6400
ACH: 200-25600

**Field of View**
Maximum 63°


**Sensor Type**
Photogrammetry

**IP Rating**
IP53

**Weight**
630g (excl. lens)

## Overview

The Phase One P3 payload is built on the renowned expertise of Phase One in medium format photography, providing intricate details of assets and sites. When paired with the 150mm lens, the P3 payload is capable of achieving a GSD of 0.6mm. Whether mapping large-scale terrain, conducting infrastructure inspections, or performing environmental monitoring tasks, the P3 Payload provides professionals with the tools they need to collect, analyse, and utilise actionable data for informed decision-making and optimised project outcomes.

**Compatible with DJI Matrice 350 RTK**



PAYLOAD

# FLYABILITY
# Ouster OS0-128 Rev 7

**LiDAR Sensor**
Up to 1,310,720pts/s
Effective Point Cloud
Rate LiDAR

**Sensing Range**
35 - 100m

**SLAM Accuracy**
From 0.1% drift

**LiDAR Accuracy**
± 1.3cm

**Sensor Type**
LiDAR

**IP Rating**
IP68

**Weight**
950g

## Overview

The Flyability Surveying Payload transforms the Elios 3 drone into a high-precision 3D scanner, capable of capturing centimetre-accurate data in inaccessible areas. It features an Ouster OS0-128 LiDAR sensor and FARO's leading SLAM algorithm, ensuring detailed 3D mapping with minimal drift. This payload can navigate tight spaces, making it ideal for capturing millimetre accurate data in complex environments where traditional survey methods are impractical. It's designed for industries requiring precise measurements such as engineering.

**Compatible with Flyability Elios 3**

PAYLOAD

# SONY
# RGB61

**Full Frame Sensor**
61MP Sensor
11,664 x 8,750px

**Sensor Size**
35.7 x 23.9mm

**Light Sensitivity**
RGB: 50-6400
ACH: 200-25600

**Wide Coverage**
Up to 310 ha (760 ac)
at 1.9 cm (0.74 in) GSD

**Sensor Type**
Photogrammetry

**IP Rating**
No rating

**Weight**
709g (excl. lens)


## Overview

With its exceptional resolution, the RGB61 captures vivid RGB imagery. Its unparalleled precision and accuracy in data collection makes it the premier choice for the WingtraOne Gen II. The sensor's wide coverage area enables efficient data collection over expansive terrains, optimising productivity and reducing flight time for large-scale projects. Compatible with leading photogrammetry and GIS software, it streamlines data processing and analysis workflows, facilitating efficient project management and decision-making.

Compatible with WingtraOne Gen II



PAYLOAD

# SONY
# RX1R II

**Full Frame Camera**
42.4MP Sensor
7952 x 5304px

**Sensor Size**
35 x 23.3mm

**Light Sensitivity**
RGB: 50-6400
ACH: 200-25600

**Wide Coverage**
Up to 210 ha (550 ac)
at 1.6 cm (0.63 in) GSD

**Sensor Type**
Photogrammetry

**IP Rating**
No rating

**Weight**
590g (excl. lens)


## Overview

Crafted to meet the exacting demands of professionals across diverse industries, the Sony RX1R II sensor offers unparalleled performance, versatility, and precision in aerial data collection. With its compact and lightweight design, the Sony RX1R II sensor minimises the payload weight of the WingtraOne drone while maximising flight endurance and efficiency, enabling extended coverage and increased productivity for aerial data collection missions. Boasting exceptional image quality, this sensor captures detailed imagery with clarity and accuracy, providing invaluable insights.

Compatible with WingtraOne Gen II

PAYLOAD

# SONY
# A6100

### ASP-C Sensor
24.2MP Sensor
6000 x 4000px

### Sensor Size
23.5 x 15.6mm

### Light Sensitivity
RGB: 50-6400
ACH: 200-25600

### Wide Coverage
Up to 240 ha (600 ac)
at 2.4 cm (0.9 in) GSD

### Sensor Type
Photogrammetry

### IP Rating
No rating

### Weight
550g


## Overview

Sony A6100 ensures the capture of detailed imagery through the use of its advanced autofocus system. This enables rapid and precise focusing, even in dynamic environments, ensuring sharp and clear images for detailed analysis. The sensor's impressive low-light performance further enhances its versatility, allowing for reliable data collection in various lighting conditions. Its compact and lightweight design minimises the payload weight of the WingtraOne drone, optimising flight endurance and efficiency for extended coverage and increased productivity at an affordable cost.

Compatible with WingtraOne Gen II



PAYLOAD

# WINGTRA
# LiDAR

### LiDAR Sensor
110pt/m² Point density

### Sensing Range
0.5 - 300 m

### Rotating Sensor
Inertial Labs Tactical-Grade IMU-P

### LiDAR Accuracy
± 3cm

### Sensor Type
LiDAR

### IP Rating
No rating

### Weight
1030g

## Overview

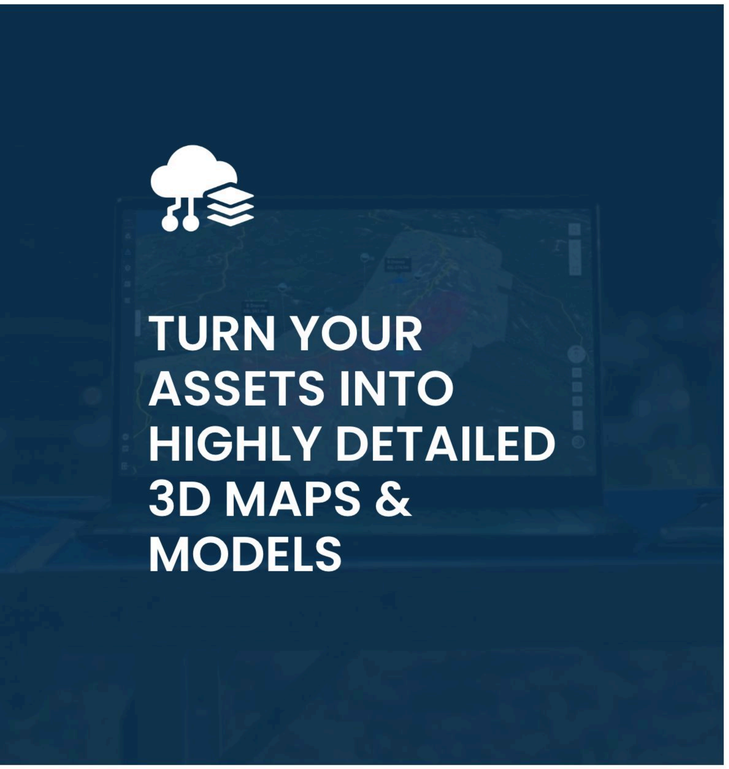
Designed to seamlessly integrate with the WingtraOne mapping drone, this cutting-edge LiDAR sensor redefines the standards of data capture for professionals across industries. WingtraOne LiDAR excels in capturing high-resolution 3D point clouds with unparalleled precision, enabling users to visualise terrain, structures, and vegetation with exceptional detail. Its fast data acquisition capabilities streamline the mapping process, allowing for swift coverage of large areas without compromising accuracy.

Compatible with WingtraOne Gen II

Solutions

# Software

# DJI Terra

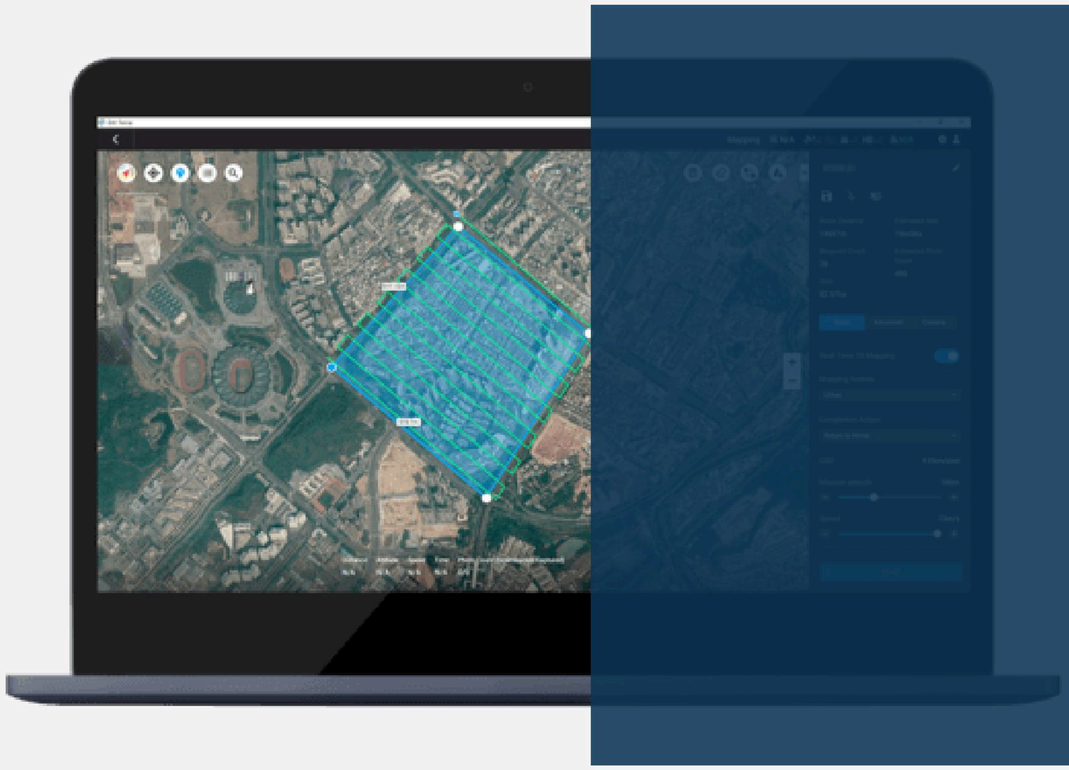



## Designed to capture, analyse, and visualise environments, DJI Terra transforms real-world scenarios into valuable digital assets.

DJI Terra is a cutting-edge 3D modelling software that utilises photogrammetry as its foundational technology. This supports a wide array of 2D and 3D reconstruction methods, including visible light and data processing through DJI LiDAR.

Catering to diverse industries such as land surveying, mapping, power transmission, construction, transport, and agriculture, DJI Terra stands out as an excellent solution.

The software can generate realistic 3D models in varying resolutions, optimising water surfaces through AI technology. These models can be crucial for inspecting sites, power grid equipment, and tracking construction progress. Its detailed inspection mission planning feature automates inspection workflows by generating waypoints and flight routes based on selected points in a 3D model or point cloud, ensuring thorough and efficient asset evaluations.



### Real-time 3D Mapping

When efficiency is key, quickly render and visualise a 3D model of the mapped area. Make decisions based on the preliminary model and check for completeness immediately or plan 3D flights on-site.

### Inspection Mission Planning

Automatically generate waypoints and flight routes based on one or more points selected in a local realistic 3D model or point cloud (or a third-party point cloud).

### Multiple Data Format Compatibility

Process a variety of data formats including LiDAR, photogrammetry, thermal, and multispectral, all under one application.

### Asset Measurement and Inspection

Acquire key dimensions across an array of terrains or assets with a variety of analysis tools that enable you to obtain a variety of measurement based data, including linear, areas, and volumetric.

### Annotations and Reporting

Edit labels of measurements on existing models, which can be used for reporting and improving communication throughout ongoing projects.

### DJI Modify Integration

With one click, DJI Terra can launch DJI Modify. DJI Terra can also easily generate files for model editing with another click. These simple steps make the subsequent model editing process quick and convenient.

SOFTWARE

# DJI Modify

## INTELLIGENT EDITING SOFTWARE FOR 3D MAPPING & MODELLING

## DJI Modify works seamlessly alongside DJI Terra, bringing new model editing features to increase workflow efficiency.

With no need for complex settings, DJI Modify swiftly imports and exports model files and performs consistent editing operations, like automatic texture repair and batch flattening of vehicles, significantly reducing the modelling workload. Intelligent and smooth integration between workflow stages makes task completion fast and worry-free.

DJI Modify supports viewing and editing high-and-low-quality models in a single interface. Any changes made are synchronised across both models so you can effortlessly address models and preview immediately.

DJI Modify renders and exports models rapidly in many formats, such as PLY, OBJ, and B3DM, which are compatible with DJI Terra & 3rd party software. Processed models can be quickly shared to the cloud, so others can view them in a browser via shared links without installing any software.

### Texture Repair

DJI Modify simplifies model refinement by supporting texture repairs, seamlessly blending patterns for a smooth repair effect, enhancing the quality of irregular regions in 3D models.

### Water Surface Repair

DJI Modify allows for the creation and customisation of water surfaces on models, offering real-time adjustments and filling options with textures or colours for enhanced water scene repairs.

### Hole Fill

DJI Modify streamlines model repairs by allowing for both one-click and customisable hole repairs for enhanced model accuracy and flexibility.

### Floating Parts Removal

DJI Modify enhances object management by allowing for precise selection and grouping of floating parts, offering quick removal and preview options for a smoother workflow.

### Object Flattening

DJI Modify offers a Flatten button for smoothing vehicle meshes, automating texture smoothing for a seamless repair without manual parameter adjustments.

### DJI Terra Integration

In a DJI Terra 3D modeling project, you can launch DJI Modify with one click for model editing for an efficient workflow and an end-to-end solution from modeling to model editing.

SOFTWARE

# EMESENT Aura

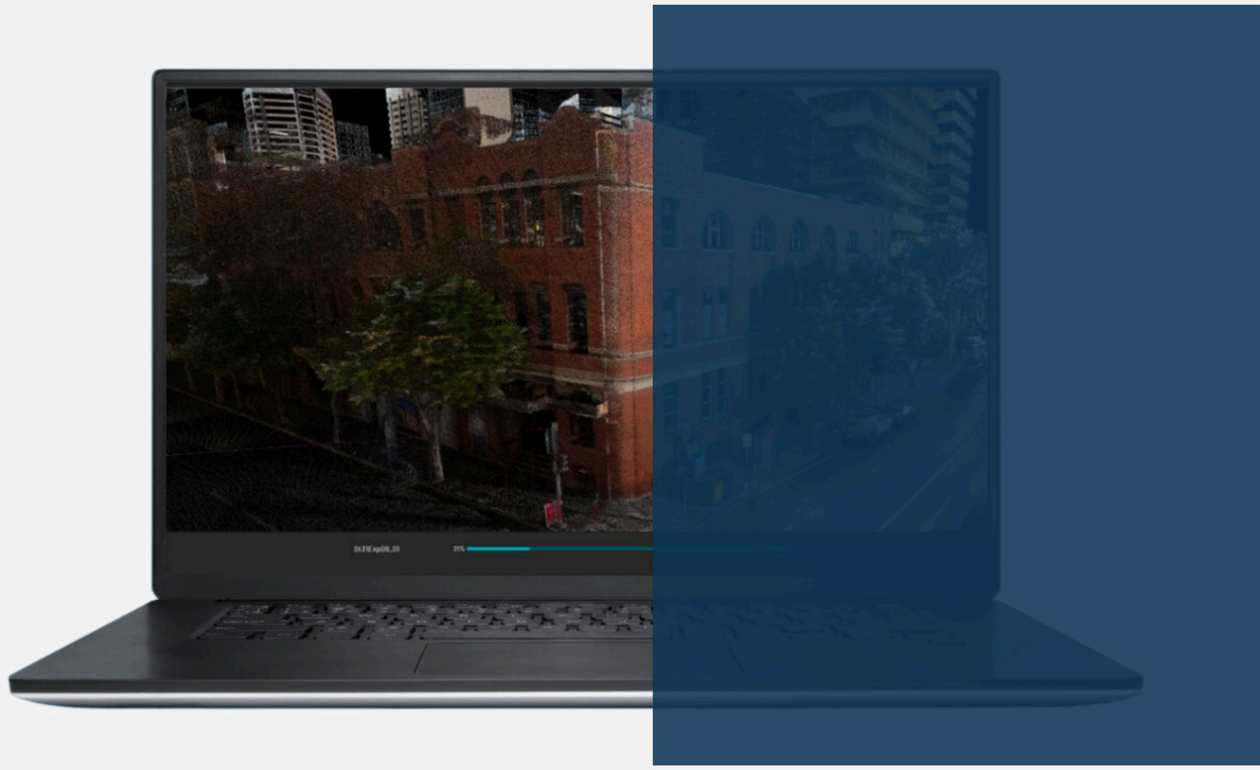
## PROCESS & ANALYSE EVERY DETAIL – EVEN FOR COMPLEX ASSETS

## Emesent's integrated processing and visualisation software simplifies 3D laser scanning workflows from capture to insight.

Emesent Aura facilitates the processing and visualisation of scans in one intuitive platform, streamlining the way Hovermap users process, view, and analyse point clouds for faster insights and improved decision-making.

SLAM-based mapping is known for its speed, ease of use, and ability to capture shadowless, dense point clouds. As use cases grow and data sizes increase, efficiently processing, viewing, and analysing the data becomes challenging.

Aura makes your workflow seamless no matter how dense your point clouds or complex your 3D structures are. Process, view, clean, edit, and take measurements from Hovermap point clouds in a single streamlined application. Automate previously manual and error prone tasks to improve the quality of analysis and for better decision-making.



### Manipulate Point Clouds

A range of 3D tools allows you to easily manipulate point clouds, reducing the risk of error and improving analysis.

### Process and Analyse at the Same Time

Aura gives you the ability to toggle between open point clouds, so you can work on multiple scans at the same time as you are processing, improving efficiencies and saving you time.

### Personalised Profiles

Create customised profiles, or reuse existing profiles to process scans with minimal configuration.

### Job Workflow Queuing

Job queuing allows for automatic, sequential processing of files, allowing you to spend your time more productively.

### Multi-Frame Rendering

Multi-Frame Rendering efficiently visualises your point cloud in the highest detail, no matter how dense the points or complex the asset, giving you deeper insights.

### Share Key Details with Stakeholders

Export high resolution screenshots from within Aura at the click of a button to share outputs in a stakeholder friendly format.

SOFTWARE

# FLYABILITY
# Inspector 4.0

## VISUALISE, LOCALISE, AND DOCUMENT YOUR INSPECTIONS WITH INSPECTOR 4.0

## An easy-to-use software solution developed to allow asset operators to make fast, data-driven decisions.

Without the right management solution, acting on raw drone data can be a real challenge, leading to approximative reporting, uncertain decisions, and eventually resulting in sub-optimal maintenance operations. Inspector 4.0 gives you a precise view of what's happening inside your assets so your team can act quickly in just the right place.

From data capture to decision making, Inspector 4 and Elios 3 work hand-in-hand to provide operational continuity, boosting your efficiency throughout the inspection process.

Thanks to Elios 3's LiDAR sensor, inspection data is now reported on a high density point cloud of your asset, offering a whole new level of data accuracy and reliability.

Whether captured in flight or tagged during data analysis, points of interest show instantly on the 3D model of your asset.

### One Seamless Workflow

From data capture to decision making, Inspector 4 and Elios 3 work hand-in-hand to provide operational continuity, boosting your efficiency throughout the inspection process.

### Instant Localisation

Whether captured in flight or tagged during data analysis, points of interest show instantly on the 3D model with no additional processing.

### Visualise Data on a 3D Map

Navigate through the 3D model of your asset by using the pan, rotate, and zoom functionalities. Click on a point of interest and see the corresponding frame in your mission video.

### Analyse Points of Interest

In the video player, screen the video frames to select the one that best shows your POI. Enhance its tiniest visual features by zooming and adjusting light contrasts.

### Document and Organise

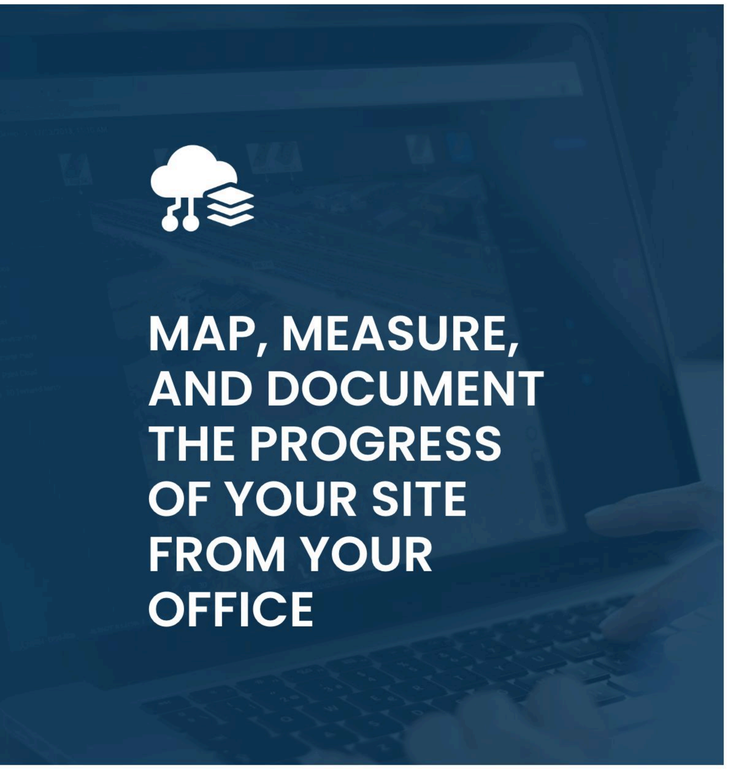
Report your findings directly in the video player. Give your POI a name and a description. Classify them by criticality and organise them with custom tags.

### Share Formatted Reports

Share your analysis and POI information in a PDF or Word document.

SOFTWARE

# PIX4D Cloud



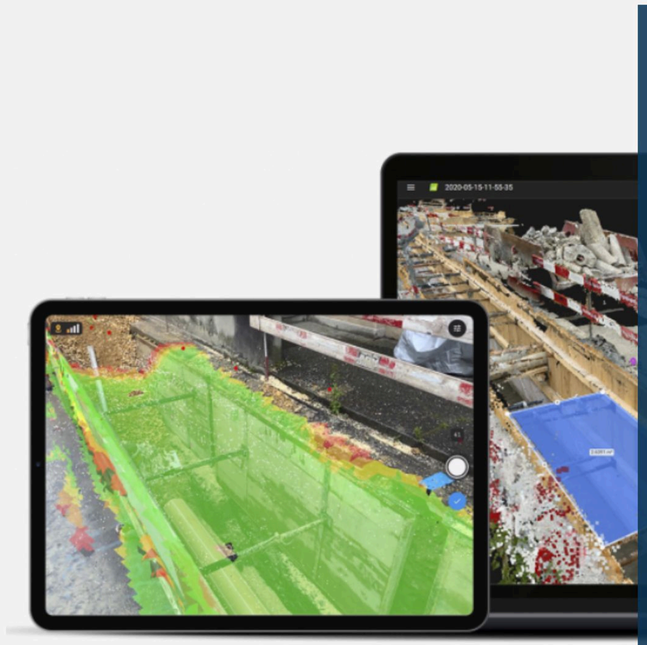
## MAP, MEASURE, AND DOCUMENT THE PROGRESS OF YOUR SITE FROM YOUR OFFICE

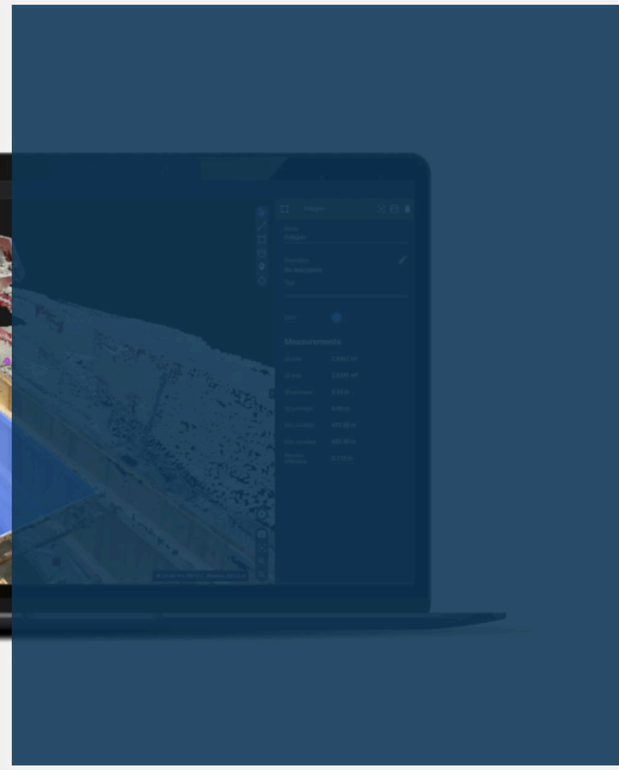
## Pix4Dcloud is the leading online platform for ground and drone mapping, progress tracking, and site documentation.

Pix4Dcloud is an advanced photogrammetry software that automates the processing of drone or terrestrial imagery to create 2D maps and 3D models. It offers tools for measuring distances, areas, and volumes without the need for large software installation, enhancing project management and collaboration through easy sharing of results.

Designed for professionals in construction & asset management, Pix4Dcloud supports efficient workflow management, enabling users to monitor progress over time with timeline slider features and compare different datasets.

Pix4Dcloud enhances team collaboration and project management by offering easy sharing of 2D maps and 3D models directly from the browser, enabling stakeholders to access, review, and comment on project data in real-time, fostering efficient decision-making and progress tracking.





### Time Analysis

Get a visual timeline of your job-site for site tracking and project documentation.

### Calculate & Compare

Perform quick and precise volume calculations and compare them over time.

### Overlay Design Plans

Overlay your IFC files onto the 3D point cloud or mesh and get better visualisation of your project. Compare the as-built with the as-designed to instantly verify site progress.

### Manage Progress

Compare two specific days to spot what has changed. Overlay your DXF, PDF or IFC file on one side and your orthomosaic/3D point cloud/mesh on the other to get better visualisation of your progress.

### Virtual Inspection

Remotely inspect any job-site from any device or location, just with an internet connection.

### Annotate & Share

Measure distances, highlight critical elements and share data with a simple URL to ensure seamless information flow and greater collaboration.

SOFTWARE

# PIX4D Fields

**CREATE AND USE PRESCRIPTION MAPS DIRECTLY WITH YOUR MACHINERY**

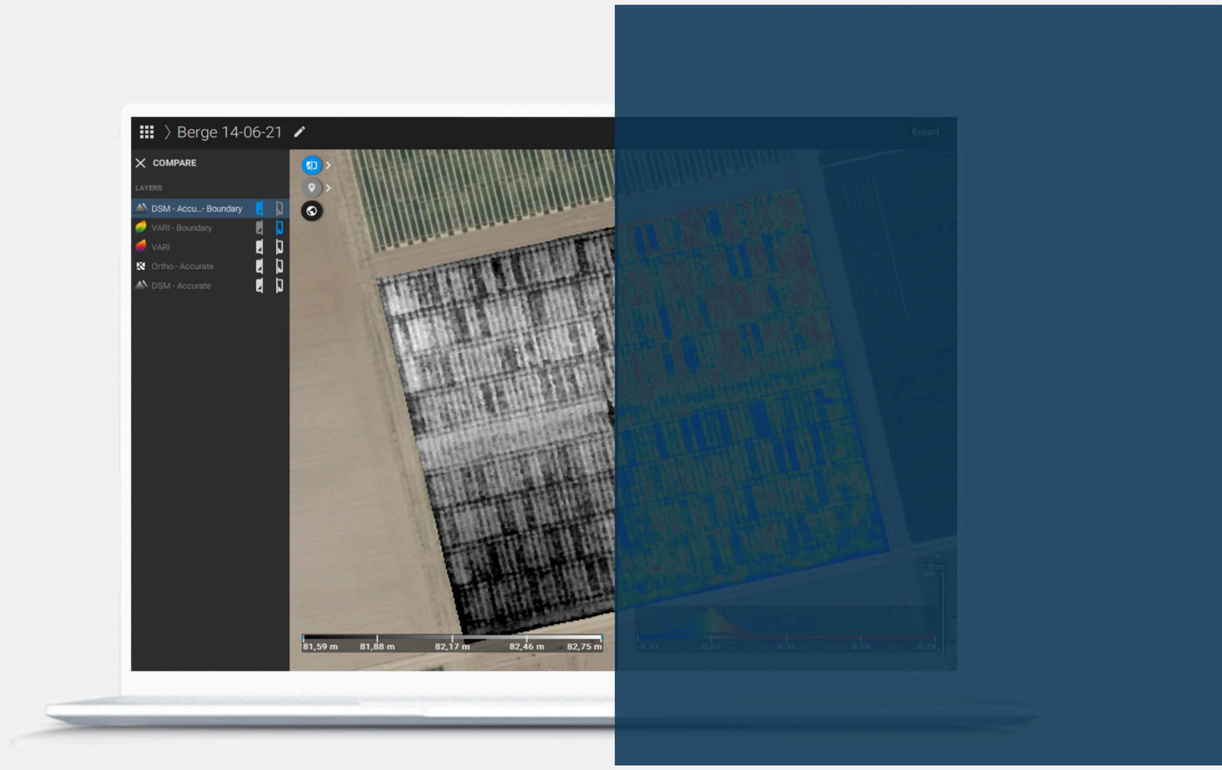
## Pix4Dfields allows you to inspect, analyse and visualise your crop changes all year round

Pix4Dfields is an agricultural mapping and analysis software designed to change the way you manage crops and fields. Pix4Dfields offers a suite of tools tailored specifically for the agricultural industry.

Pix4Dfields enables users to effortlessly process aerial imagery captured by drones or satellite, and transform it into valuable insights for crop monitoring, management, and decision-making.

By generating accurate orthomosaics, vegetation indices, and 3D models, Pix4Dfields empowers agronomists, farmers, and crop consultants to assess crop health, detect stress factors, and optimise agricultural practices with unprecedented precision and efficiency.

With its seamless integration with existing agricultural workflows and compatibility with a wide range of hardware and software solutions, Pix4Dfields is the go-to choice for professionals seeking to unlock the full potential of aerial imagery in precision agriculture.




### Generate Indices

Use the predefined list of agricultural indices or input your own custom index formula to understand your plant stress better.

### Zonate & Prescribe

Aggregate the information from the vegetation index maps into zones and assign application rates.

### Measure & Annotate

Add annotations and measure important farm areas.

### Magic Tool

AI-assisted selection tool to quickly detect and select weed nests, damage, and other anomalies in orthomosaic and index layers

### Prescription Maps

Create highly customisable variable rate and spot spraying prescription maps for spray drones, tractors, and field sprayers.

### Fast Processing

Process imagery with the Pix4Dfields instant processing engine and achieve results in minutes in-office and in-field. No internet required.

SOFTWARE

# PIX4D Matic

## NEXT GENERATION SOFTWARE FOR PROFESSIONAL DRONE AND TERRESTRIAL MAPPING

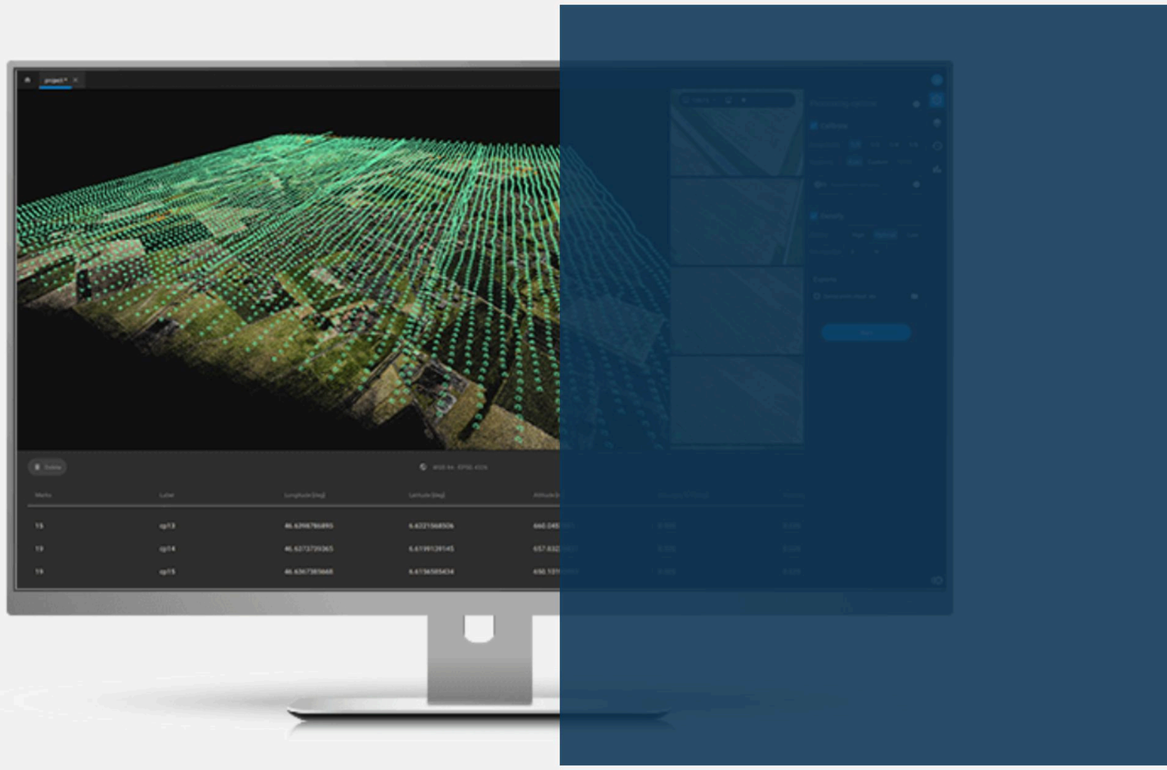
## Optimised for next-gen of mapping challenges, Pix4Dmatic allows you create accurate 3D models from thousands of images

Pix4Dmatic is designed for large-scale photogrammetry, processing vast amounts of drone and ground images into precise 2D maps and 3D models efficiently.

Pix4Dmatic processes thousands of images while maintaining survey-grade accuracy, halving the processing time, without the trouble of splitting and merging.

Developed in close-collaboration with surveyors and mapping professionals to streamline your workflow: import, process and assess the quality of a project in just a few clicks, and move seamlessly from Pix4Dmatic to Pix4Dsurvey.

Leverage the benefits of both photogrammetry and LiDAR technology. Process LiDAR and RGB image outputs from Pix4Dcatch for a full terrestrial workflow.



### Handle & Process Large Dataset

Handling and processing large amounts of data is easy with Pix4Dmatic. Get your results up to 50% faster, while keeping a survey-grade accuracy.

### Ensure Data Accuracy

Ensure the accuracy of your project with GCPs, Checkpoints, or Manual Tie Points. Accuracy metrics are available in a dedicated tie points table and in an exportable quality report.

### Coordinate Systems & Geoid Support

Pix4Dmatic supports the most frequently used vertical coordinate systems and their corresponding geoids.

### Import from Pix4Dcatch

Process both LiDAR and RGB image outputs from Pix4Dcatch.

### Fast Development Cycles

Updates are released every three weeks in a new preview or stable version, ensuring you get all the latest improvements and features.

### Fully Automated Processing

Import, process and assess the quality of a project in just a few clicks, and move seamlessly from Pix4Dmatic to Pix4Dsurvey.

Solutions

# Training

# GVC
# General Visual Line of Sight


## Commercial drone operations in the UK necessitate specific training requirements due to the elevated risks compared to recreational flying.

The **General Visual Line of Sight Certification (GVC)** is an advanced qualification that enables you to operate drones within the Specific category, which is necessary for most surveying-related drone applications. There are two options available for the GVC course:

### Classroom / Bespoke Course

Learn everything in just **two days and a flight test** at any of our UK venues. The classroom course is a full immersive learning experience to fast-track you and your team to obtaining your GVC in only a few days. Lunch and refreshments are provided.

### Online Course

Learn in **your own time** and at your own pace from anywhere with internet connection. After passing your online theory exam, complete your practical exam at any of our UK venues, which typically takes about 2 hours.


## THE GVC PROCESS

### Learning & Exam

The theory involves studying drone laws, safety, and principles. The first two days of the course are classroom based. You'll then complete a multiple-choice theory exam.

### Operations Manual

You will then complete a manual detailing your safe and responsible drone use in the Specific Category. We provide templates to simplify the process.

### Practical Test

We will then conduct your practical flight test near the location to show you can safely handle the drone in various situations.

### Applying For OA

After passing the tests and completing your manual, you can then apply for Operational Authorisation via the Civil Aviation Authority (CAA) for permission to fly in the Specific Category.

### Validity

Once approved, you're good to go. Your GVC is valid for **five years**, after which you'll need to renew it.


**WE HELP ELIMINATE ORGANISATIONAL RISK AND WASTE WITH IMPARTIAL DRONE SOLUTIONS THAT TRANSFORM OPERATIONAL EFFICIENCY TO ACHIEVE EXCELLENCE - BETTER, FASTER, SAFER.**

# Arrange a Meeting

**Reach out to our team** for a specialised drone technology consultation. Our team are experts in understanding and addressing your specific needs and developing practical, comprehensive drone solutions tailored to you. Get in touch today.

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