microdrones®

PUTTING MICRODRONES TO WORK FOR YOU.

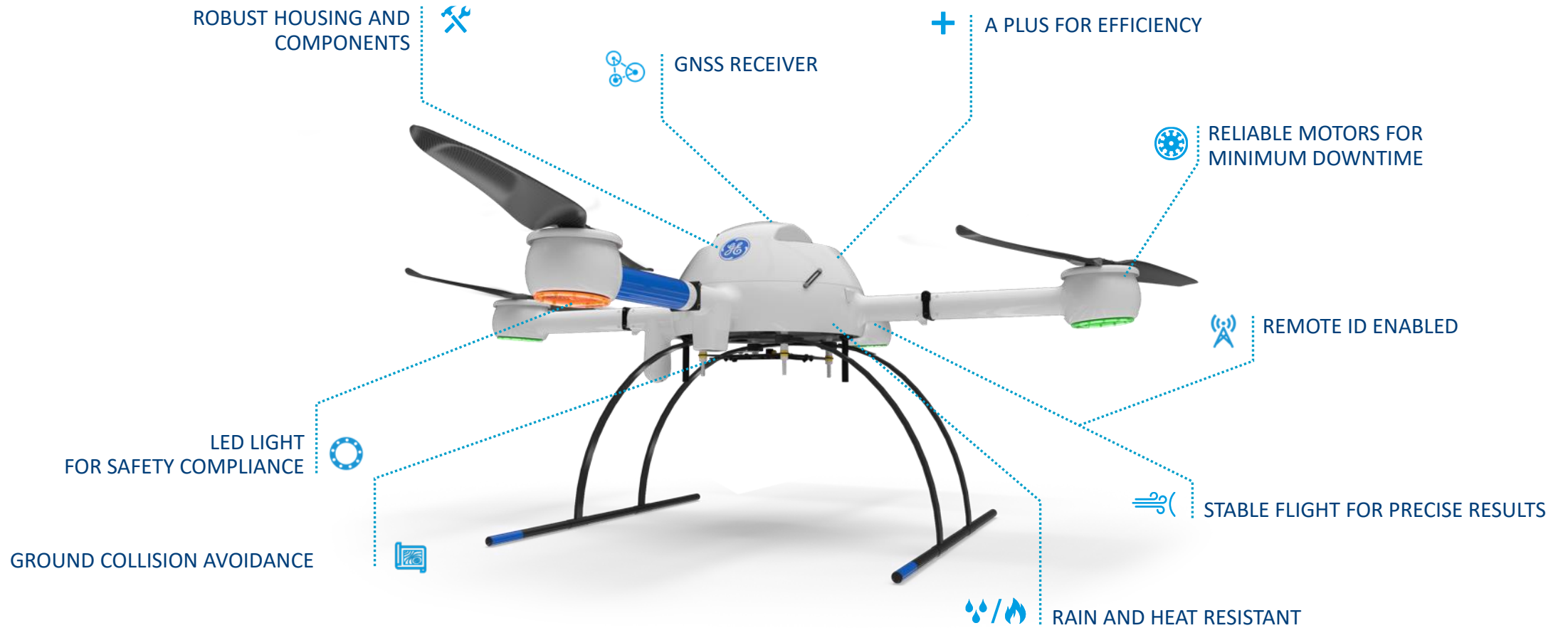General Presentation

Updated June 2021
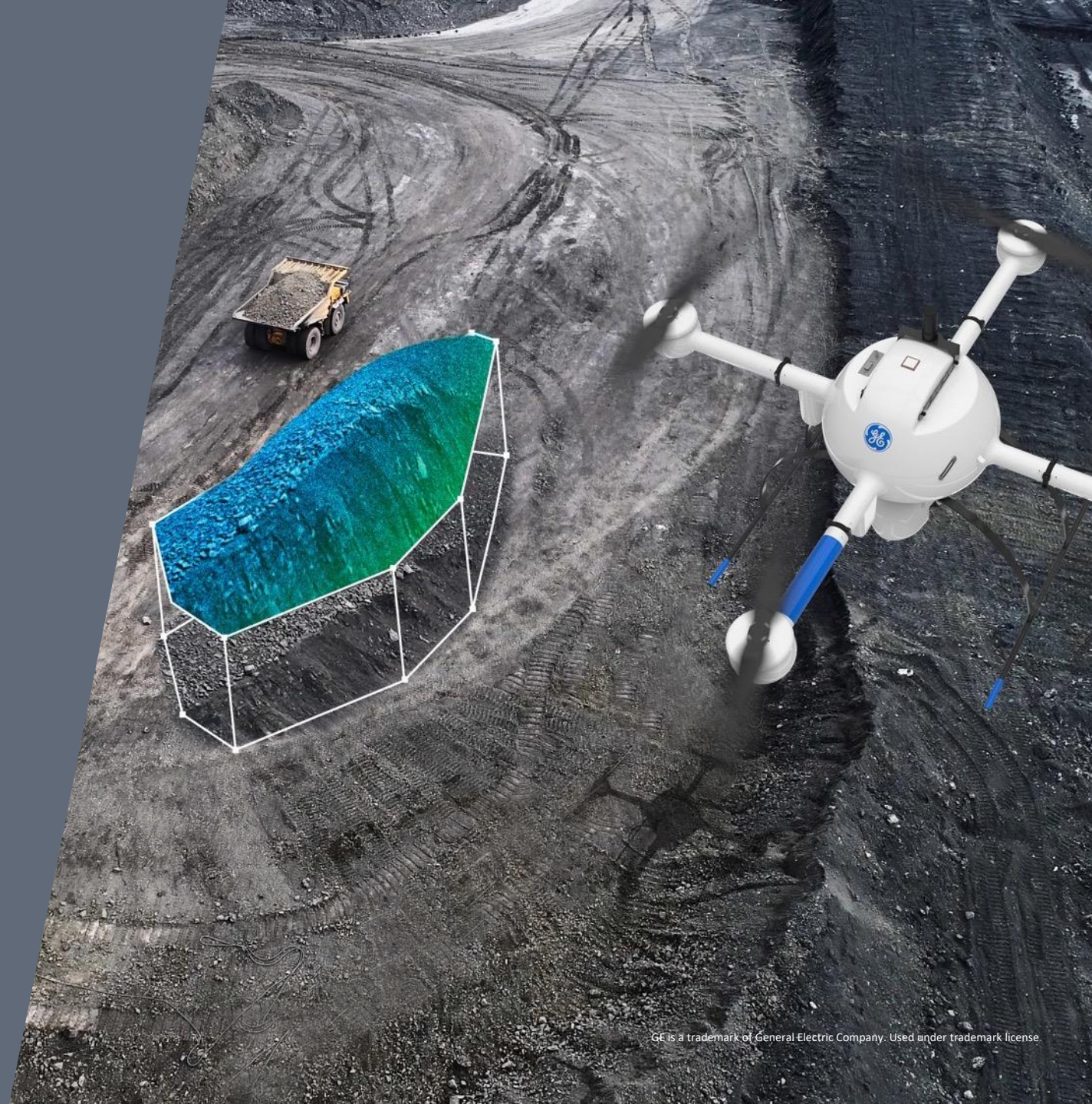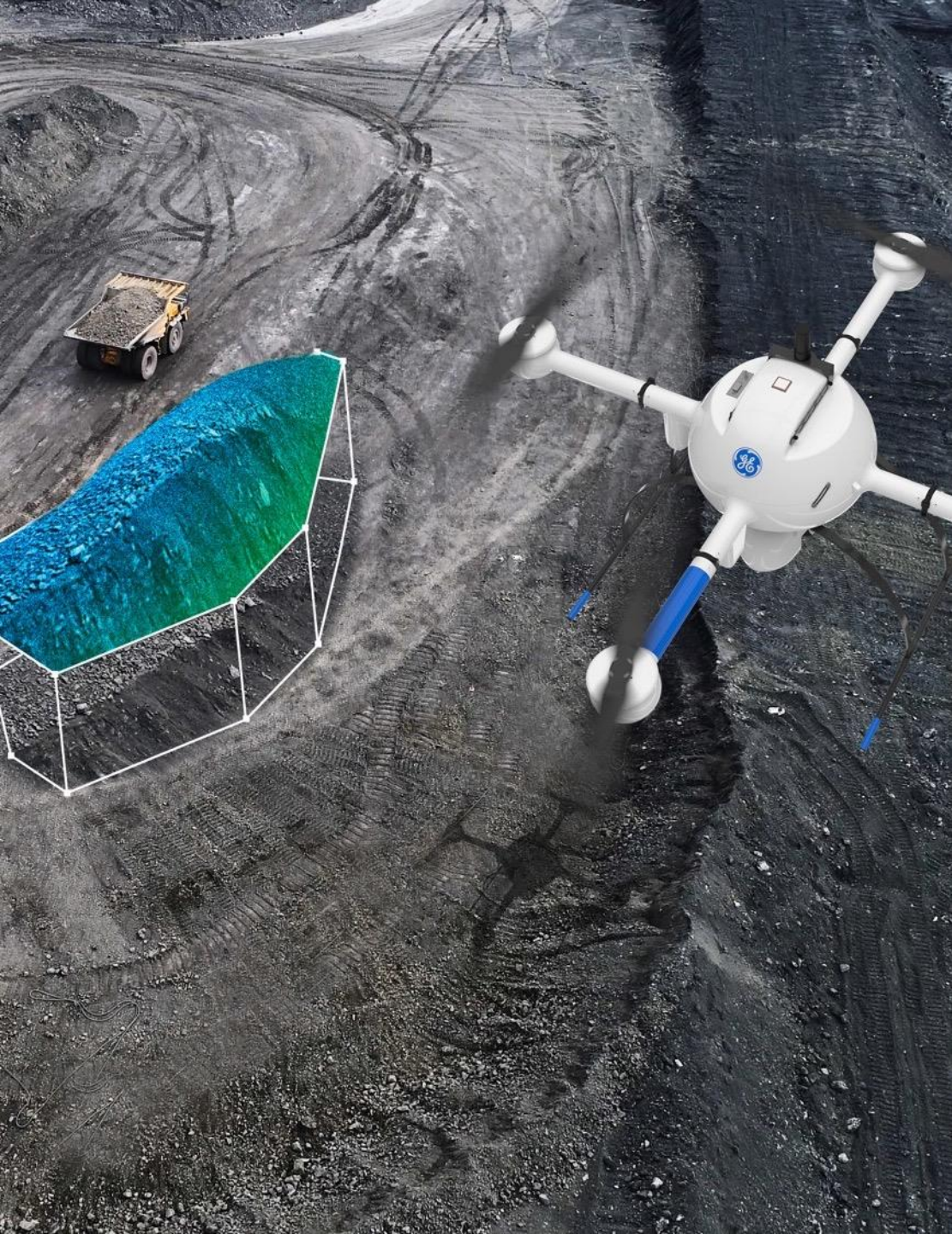
TWO INDUSTRY EXPERTS.
ONE SIMPLE CHOICE.

Microdrones® and GE, have joined forces to offer you a full line of workhorse industrial equipment.

All systems are fully integrated and include the aircraft, sensors, workflow, service and support to help you work smarter.

BENEFITS OF THE MICRODRONES AIRCRAFT

ROBUST HOUSING AND COMPONENTS

GNSS RECEIVER

A PLUS FOR EFFICIENCY

RELIABLE MOTORS FOR MINIMUM DOWNTIME

REMOTE ID ENABLED

LED LIGHT FOR SAFETY COMPLIANCE

STABLE FLIGHT FOR PRECISE RESULTS

GROUND COLLISION AVOIDANCE

RAIN AND HEAT RESISTANT

LONGER RANGE LIDAR & 26MP CAMERA ALL IN ONE, TO COVER MORE GROUND

mdLiDAR1000LR means longer range. You'll cover more ground from above. This translates to more efficiency than ever - the survey equipment, software, workflow, training and support that you need to be productive in the field.

SURVEY GRADE DRONE
LASER SCANNING

By combining our robust and field proven md4-1000 airframe, with a fully integrated high-resolution LiDAR & camera payload, you can capture ultra dense LiDAR data quickly and safely in the field, and then turn it into a 3D point cloud back at the office or on your laptop.

LiDAR + mdaaS + EASY TO USE mdInfinity SOFTWARE = EXTREME GEOSPATIAL PRODUCTIVITY, NOW IN HIGH RESOLUTION

Microdrones has developed an end-to-end LiDAR solution combining a drone, a LiDAR payload, a fully integrated LiDAR processing and photogrammetry software workflow, and world class support to consistently provide quality deliverables.

mdLiDAR1000LR is a fully integrated system for producing 3D point clouds optimized for land surveying, construction, oil & gas and mining applications.
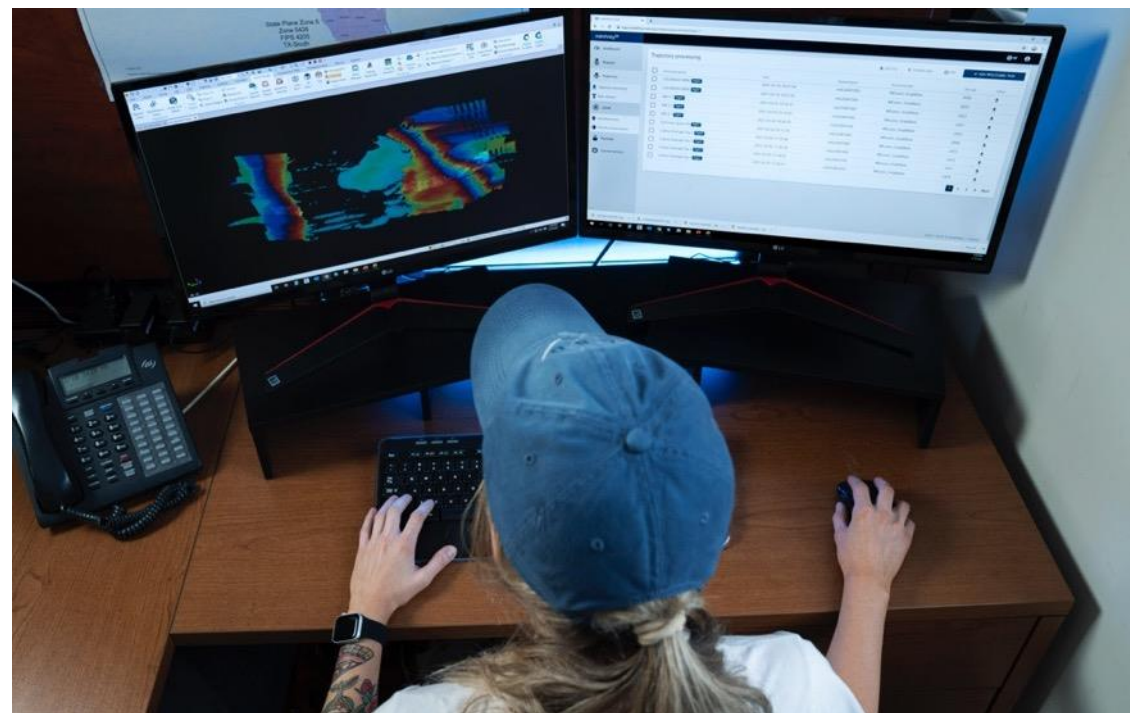
WHY SHOULD YOU INVEST IN DRONE BASED LiDAR?

The mdLiDAR1000LR can help streamline your
current workflow to become more efficient,
while helping you to complete more projects.

EASY END-TO-END WORKFLOW:

PLAN

- Simple mission planning using mdCockpit
- User selects flying height, drone speed and LiDAR strip overlap

FLY

- Fully automated mission execution, realtime monitoring, and flight control using mdCockpit

PROCESS

- Thorough georeferencing data processing using the Applanix APX-15 UAV DG and mdInfinity Software
- Automated final point cloud processing using mdInfinity processing software
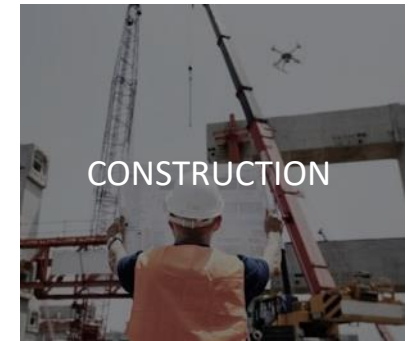
VISUALIZE

- Final point cloud in standard ASPRS LAS format, View your deliverable in mdInfinity software, or export to use within any GIS or CAD software environment that you currently use

WHAT CAN YOU DO WITH IT?

mdLiDAR1000LR is a versatile package that can be used for a wide range of applications. Some of the most common uses are:
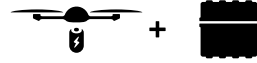

AREA MAPPING / SURVEYING

MINING

CONSTRUCTION

VOLUMETRICS

PRECISION AGRICULTURE

DIGITAL TWINS

SURVEY EQUIPMENT

PLATFORM

md4-1000

Charger, Flight Battery & Rugged Carrying Case

Integrated Cooling Covers

Mag-less Navigation

LED Light Rings

COMMUNICATIONS

Encrypted Digital Data Link

mdRC

Extended Communication Range Operation

Multiple Tablet Control

Remote ID Enabled

 mdLiDAR 1000LR

PAYLOAD

Fully Integrated High Resolution LiDAR & Camera

Applanix APX-15 UAV DG

Trimble POWERED

SURVEY EQUIPMENT SOFTWARE

mdCockpit Tablet Softwae

Tap & Fly

mdInfinity | mdaaS | DG ENABLED

DATA PROCESSING MODULES

mdLiDAR
1000LR

mdInfinity ∞

mdINFINITY IS A POWERFUL ECOSYSTEM THAT WILL ENABLE YOU TO QUICKLY AND EFFICIENTLY PROCESS GEOSPATIAL DATA, WITH CONVENIENT PAYMENT OPTIONS.

Available Data Processing Modules:

- Trajectory processing
- Georeferencing
- Boresight calibration
- Strip adjustment
- Precision enhancement
- Point Cloud Direct Colorization
- FORMap

mdInfinity is available in online and desktop versions.

TECHNICAL SPECS

SOLUTION COMPONENTS

Platform
md4-1000

Payload
- LiDAR Sensor: Velodyne PUCK VLP-32
- Camera Sensor: Microdrones CMOS APS-C 26MP (23.5mmx15.6mm)
- Georeferencing: APX-15 UAV

Software
- mdCockpit
- mdInfinity

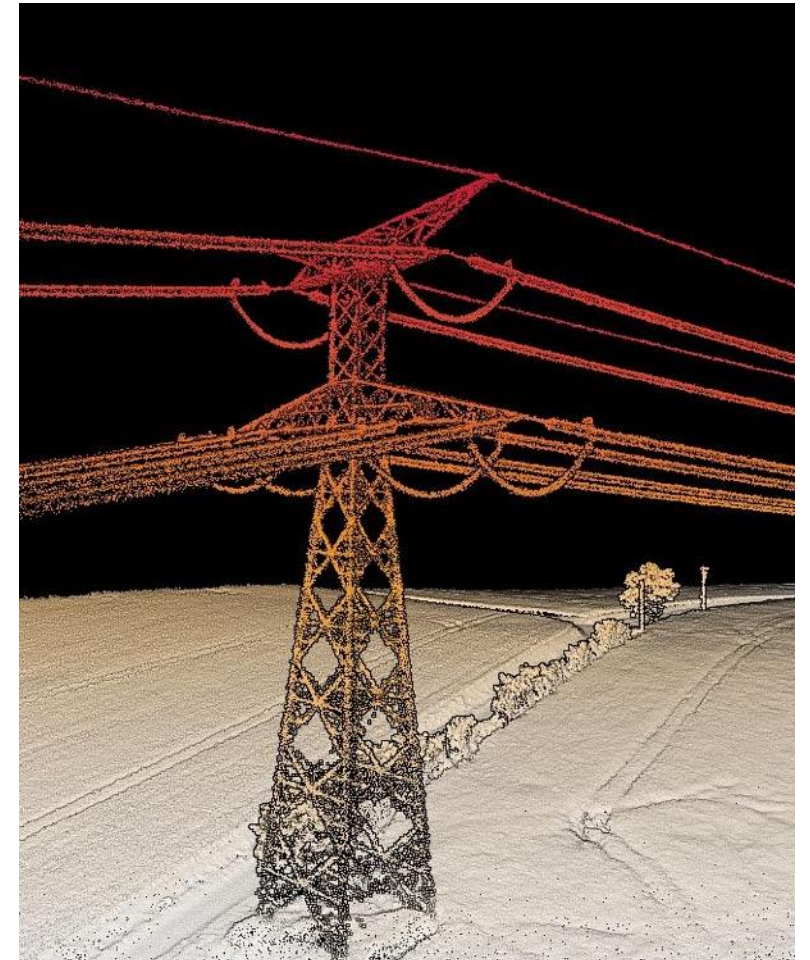## TECHNICAL SPECIFICATIONS

Takeoff Weight (TOW)
6400 g

System Operational Temperature
-10 °C to 40 °C
14 °F to 104 °F

System Accuracy
- LiDAR Point Cloud:
  - 4 cm RMSE

- Photogrammetry:
  - Horizontal: 2-3 pixels
 - Vertical: 3-5 pixels

TECHNICAL SPECS

| Flight Altitude AGL [1,2] (ft/m)	200/60	300/90	400/120
Speed (m/s)	**Covered square area at 30% sidelap (ac/ha)**		
4	94/38	116/47	126/51
6	128/52	155/63	222/90
8	158/64	235/95	297/120
Speed (m/s)	**Average Point Density in pts/m ^{2} [2,3] (square area/1 scan line)**		
4	313/368	208/245	156/184
6	208/245	139/163	104/123
8	156/184	104/123	78/92
Camera GSD (mm)	9	13.5	18
Number of Laser Returns	2	2	2
Swath Width (ft/m)	400/120	600/180	800/240
Flight Time (minutes)[2]	Up to 35 minutes, typically 25 minutes		
System Operating Temperature	-10°C (14°F) up to 40°C (104°F)		
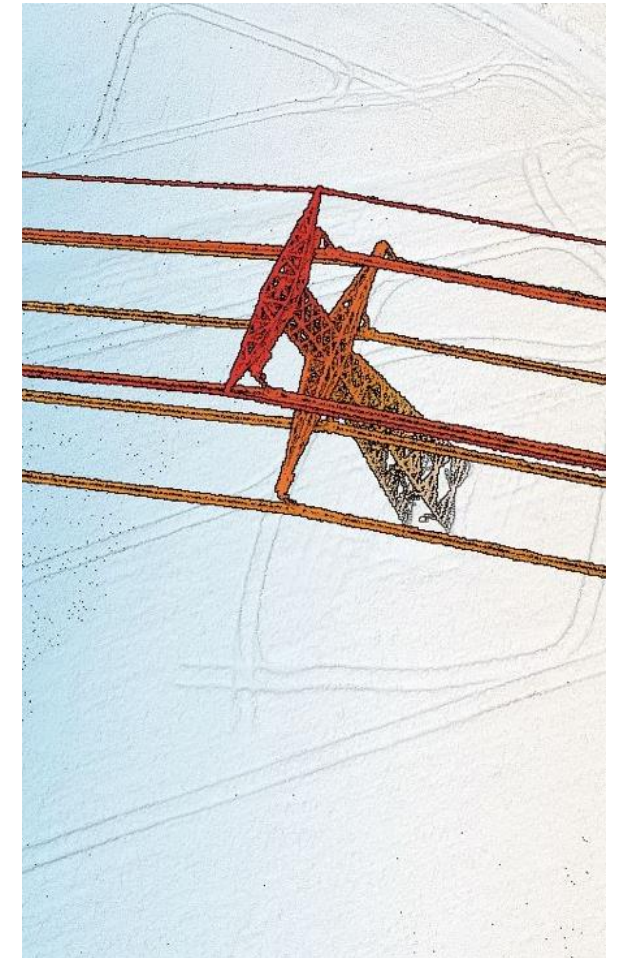
[1] Flight Altitude Above Ground Level (AGL)
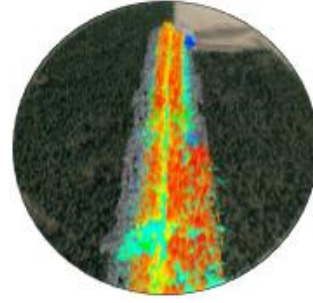[2] Coverage estimated for approximately 25 minutes of flight time
[3] Average density calculated with 30% overlap on 5 lines, average density will depend on surface type.
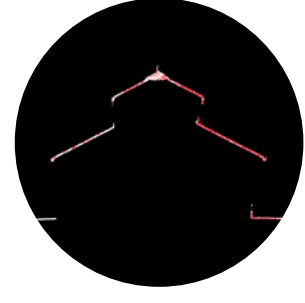
mdInfinity∞ | DATA PROCESSING MODULES
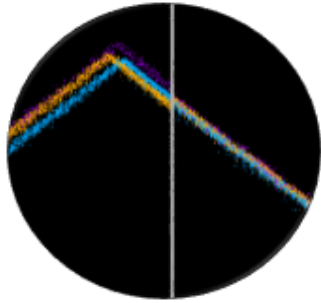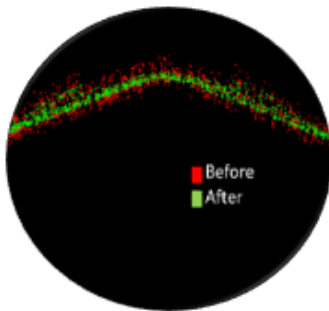
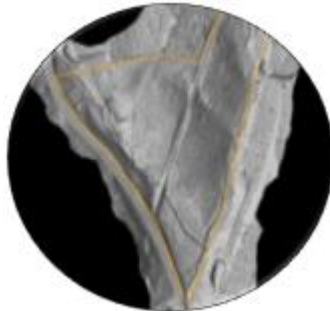BORESIGHT CALIBRATION
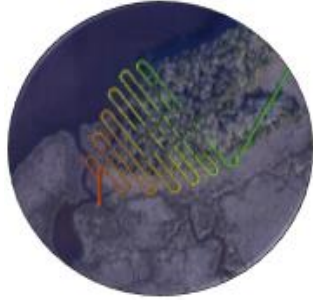
TRAJECTORY PROCESSING

GEOREFERENCING

STRIP ADJUSTMENT

PRECISION ENHANCEMENT

GROUND CLASSIFICATION

POINT CLOUD COLORIZATION

FORMap

TRAJECTORY PROCESSING

Improve the accuracy of the position and attitude of sensor collected during the flight.

The Trajectory Processing module is a user friendly workflow for users to process raw GNSS data (with or without base station), hybridize IMU and GNSS data to produce a smooth trajectory file and export it as a EO/sbet files in the desired coordinate system.

Users can validate the trajectory parameters before processing and obtain different types of EO files depending on the software they will use afterwards.

INTRO VIDEO ▶

BENIFITS VIDEO ▶

GEOREFERENCING

Anchor geographic coordinates to every point of your pointcloud.

Georeferencing transforms the raw data from the LiDAR (range and bearing angles), the GNSS and IMU (orientation and positioning) to 3D point cloud and associated data.

With the specifications of the raw data, Microdrones produces a georeferenced point cloud in geographic coordinates without any geodetic distortion, or in a local mapping frame specified by the user.

INTRO VIDEO ▶

BENIFITS VIDEO ▶
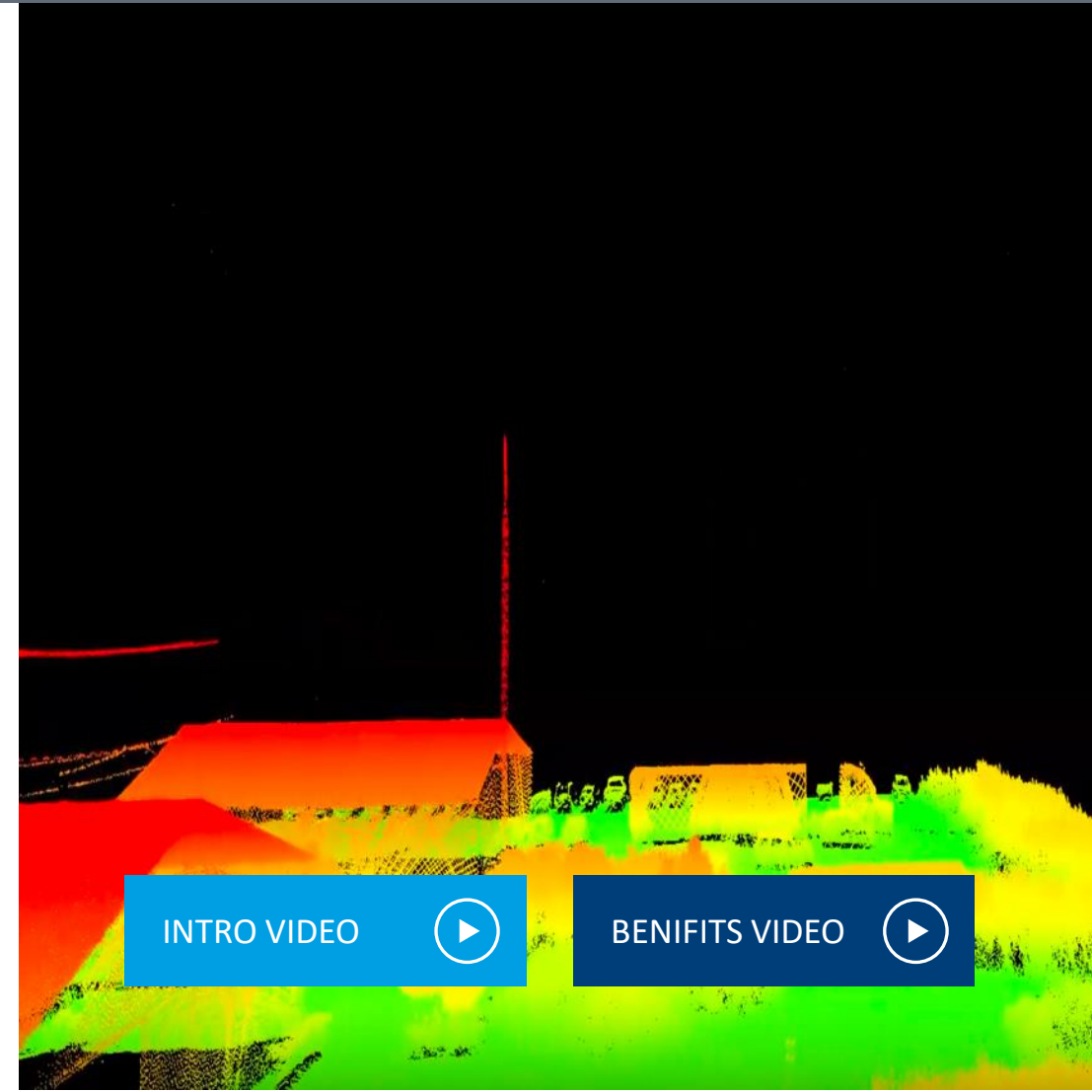
BORESIGHT CALIBRATION

Correct boresight misalignment of your specific product.

Calibration tackles the issue of the alignment of the LiDAR and the IMU body frames.

While a data set may seem clear at high-scale, LiDAR to IMU boresight angles mayproduce some inconsistency in the data set.

With the Microdrones LIBAC (LiDAR -IMU Boresight Automatic Calibration) tool, the misalignment is computed automatically and boresight angles can be applied to georeference the data set without any boresight bias.

INTRO VIDEO ▶

BENIFITS VIDEO ▶

STRIP ADJUSTMENT

Reinforce the consistency between LiDAR survey strips.

The Microdrones strip adjustment method offers numerous options to improve the consistency between lines. Using an advanced optimization engine and a smart tie point selector, position and angles of the drone are adjusted through time in order to get a perfect matching of the data.

A separate module enables the user to achieve the absolute point cloud registration to GCP, as defined by the user.
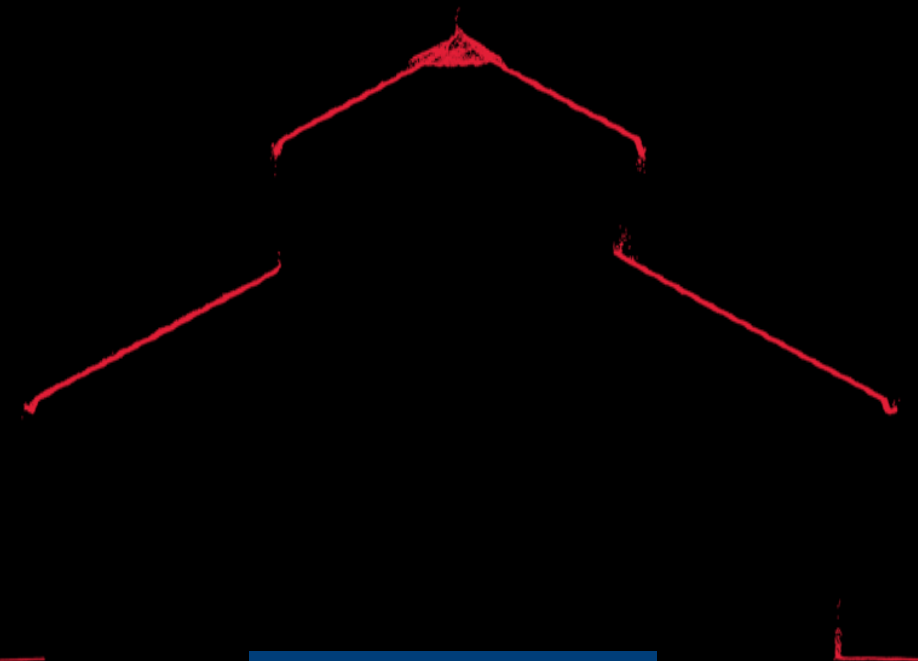
BENIFITS VIDEO ▶
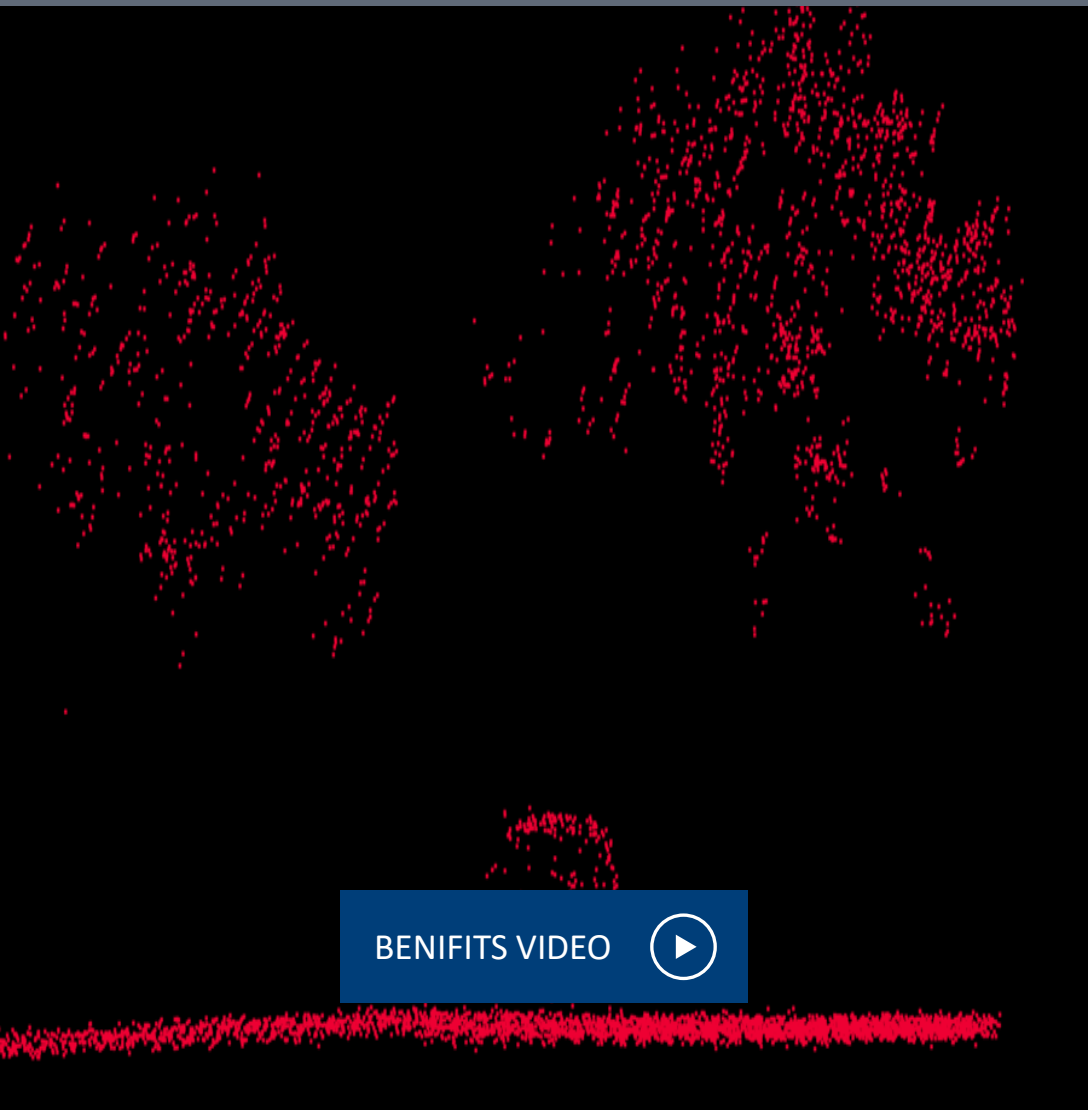
BENIFITS VIDEO ▶

PRECISION ENHANCEMENT

Remove outliers and reduce the noise level of your point clouds.

Precision enhancement solves the problem of outlier rejection and denoising in a unified environment.

Microdrones outlier rejection is based on density and morphology which enable the user to isolate points belonging to relevant structures. (e.g. poles, cables) The Microdrones denoising module reduces the noise level while preserving edges and irregular features in the point cloud.

POINT CLOUD DIRECT COLORIZATION

Colorize a point cloud without referring to a full photogrammetric process by managing occlusions.

Microdrones point cloud colorization is done after the LiDAR point cloud generation, without the need of a full prior photogrammetric process.
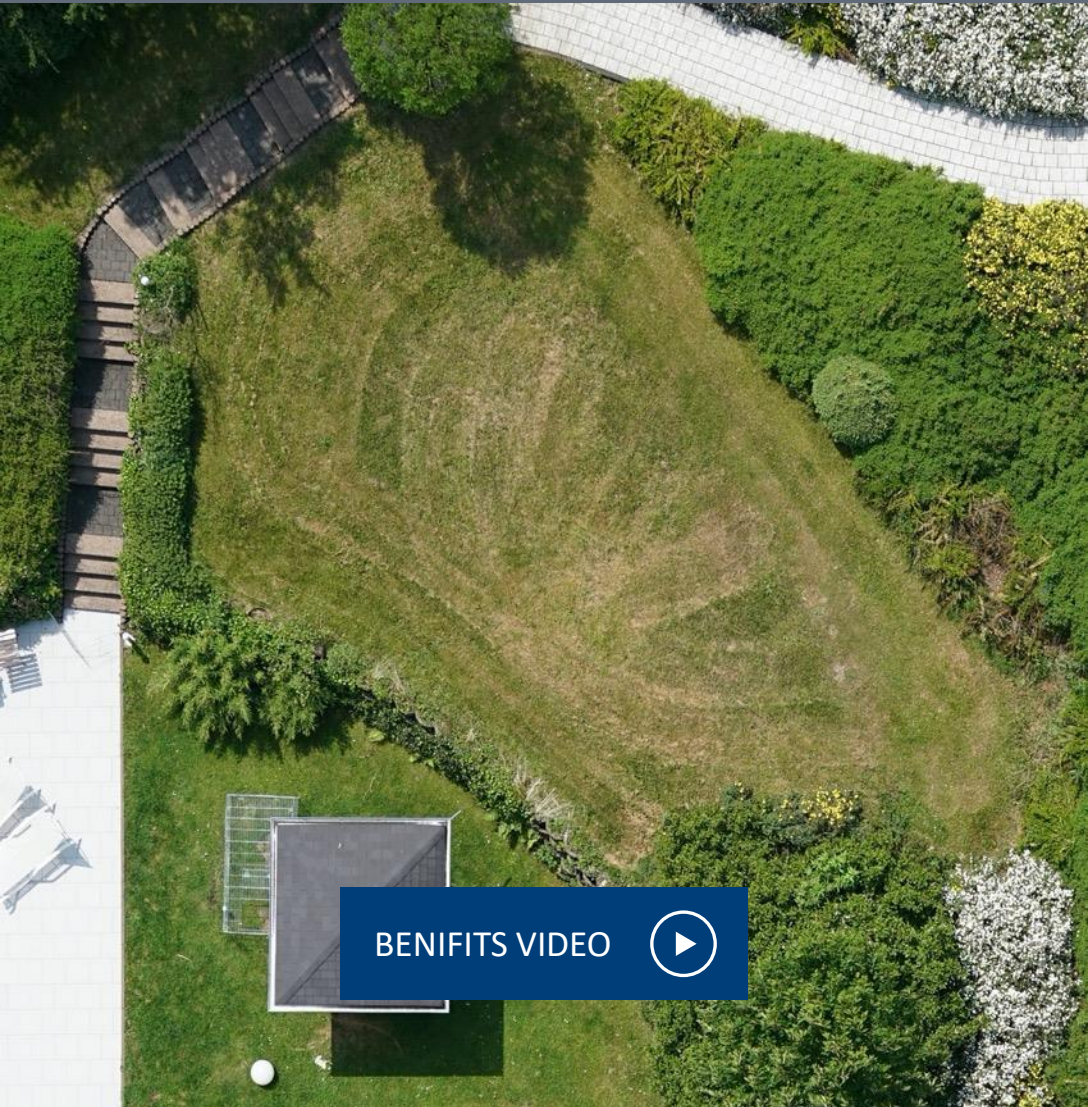
Occlusions in the point cloud are colorized by considering only the relevant part of the point cloud.

Only available through mdInfinity Custom Services

BENIFITS VIDEO ▶

BENIFITS VIDEO ▶

FORMap

Generate an orthomosaic and dense point cloud from photogrammetric survey data.

FORMap implements a rapid and comprehensive photogrammetric workflow to transform images and navigation data in an orthomosaic and a dense point cloud. The main feature of FORMap is a fast response time (2-4 sec/image) to produce results in a few minutes after drone landing.

Orthomosaic produced by FORMap are geometrically consistent and without distortion.

Only available through mdInfinity Custom Services

NEXT STEPS